सत्यमेव जयते

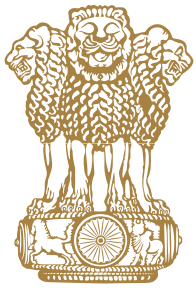
भारत सरकार
GOVERNMENT OF INDIA
केंद्रीय लोक निर्माण विभाग
CENTRAL PUBLIC WORKS DEPARTMENT

दिल्ली दर अनुसूची (ई एंड एम) (भाग–II)-2025
DELHI SCHEDULE OF RATES (E&M)
(Volume-II) 2025






महानिदेशक, के. लो. नि. वि., नई दिल्ली के प्राधिकार के अधीन प्रकाशित
PUBLISHED UNDER THE AUTHORITY OF DIRECTOR GENERAL, CPWD, NEW DELHI



GOVERNMENT OF INDIA

CENTRAL PUBLIC WORKS DEPARTMENT

DELHI SCHEDULE OF RATES VOLUME-II (E & M)

2025

PUBLISHED UNDER THE AUTHORITY OF
DIRECTOR GENERAL, CPWD, NIRMAN BAHAWAN, NEW DELHI-110011

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Published under the authority of

Director General

Central Public Works Department
Nirman Bhawan
New Delhi-110011

Satinder Pal Singh
Director General

भारत सरकार
Government of India

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FOREWORD

CPWD is the benchmarking organisation in the building construction sector and its documents are also useful to other Government Departments, undertakings and autonomous bodies for their works. This Delhi Schedule of Rates (E&M) (Vol -II)-2025 is specially prepared with items of Energy Efficient Material/ Technologies used in E&M services. This has been prepared by CPWD with the help of Bureau of Energy Efficiency (BEE) to achieve Energy Efficiency in Buildings, with compliance of Energy Conservation and Sustainable Building Code (ECSBC) - 2024 and Eco Niwas Samhita (ENS)- 2024 norms developed by BEE.

DSR (E&M) (Vol -II) - 2025 includes Energy Efficient material/items to help field units of CPWD to incorporate the Energy Efficient items in works. This is also a step towards fulfilling the commitments made in the Conference (United Nations Framework Convention on Climate Change UNFCCC) of the Parties in its 28th session, held in the United Arab Emirates from 30 November to 13 December 2023, on reducing carbon footprints and energy consumption, lowering utility costs and minimizing the environmental impact of buildings. In the construction industry, the integration of energy efficient appliances such as LED lighting, high efficiency HVAC system and energy saving appliances is essential for sustainable development. These technologies also enhance the comfort and functionality of buildings, in addition to meeting the global energy carbon emission goal and reduction.

I acknowledge the hard work put in by Sh. Chita Ranjan Nanda, ADG (Tech), Sh. Ram Raj Meena, CE CSQ (E), Sh. Ramayan Prasad Gupta, SE (E) TAS, Sh. Santosh Kumar Dhangar, SE (E) TLQA, Sh. Himanshu Phulwaria, EE (E), Sh. Sandeep Kumar Das, AE (E) and Sh. Harjeet Singh, AE (E) and other staff whose name is not mentioned here. I also acknowledge the work and inputs by Sh. Naimuddin E-in-C, PWD, Sh. Vikas Rana, CE (E) and Sh. Vimal Kumar CE (E) during their tenure in the Technical Unit of Directorate.

I also acknowledge the guidance and inputs to the team by Sh. Mohd. Kamal Ahmad, Special DG (HQ), CPWD, during the preparation of the DSR.

I am sure that this schedule of rates for Energy Efficient materials/ Technology will be useful to all Engineers of CPWD and also to many other Engineering Organizations of Central and State government, as well as practicing Architects and E&M Consultants.

Place: New Delhi
Dated: 26-03-2025

(Satinder Pal Singh)
Director General, CPWD

Mohd Kamal Ahmad
Spl. Director General (HQ)

सत्यमेव जयते

भारत सरकार
Government of India

केन्द्रीय लोक निर्माण विभाग
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MESSAGE

CPWD is the major Central Government organization setting norms in building construction and its documents are used by various government departments and organizations. CPWD aims to lead in executing, maintaining, and standardizing India's built environment while supporting sustainable development. Towards achieving this goal CPWD and Bureau of Energy Efficiency (BEE) have signed a memorandum of understanding to implement Energy Conservation & Sustainable Building code (ECSBC) and Eco Niwas Samhita (ENS). The Delhi Schedule of Rates (E&M) (Vol -II)-2025 focuses on Energy Efficient Materials/Technologies, prepared by CPWD with support from BEE and various stakeholders.

The DSR (E&M) (Vol -II) - 2025 supplements to the existing DSR (E&M) 2022 and aim to helps CPWD field units and other users to find energy efficient items include in their work. It supports commitments made at the UNFCCC conference in 2023 to reduce carbon footprints and energy use while minimizing the environmental impact of buildings. Using energy-efficient appliances like LED lighting and high-efficiency HVAC systems is crucial for sustainable development and improving building comfort.

Credit is given to individuals who contributed to the preparation of this schedule specially to Shri Chita Ranjan Nanda, ADG(Tech), Shri Ram Raj Meena, CE, CSQ(E) and others. Acknowledgment is also made of the guidance provided by Shri Naimuddin, E-in-C, PWD, GNCTD, Shri Vimal Kumar, CE (E), Shri Vikas Rana, CE (E) during the process.

This edition incorporates new technologies for energy efficiency and sustainable development. ENS and ECSBC introduces three levels of energy performance standards ensuring significant energy savings compared to conventional buildings.

Gratitude is expressed to Shri Satinder Pal Singh, Director General, CPWD and others for their trust and support in the document's preparation.

Place: New Delhi
Dated: 26/03/2025

(Mohd. Kamal Ahmad)
Special Director General (HQ), CPWD

Chita Ranjan Nanda
Additional Director General

भारत सरकार
Government of India

केन्द्रीय लोक निर्माण विभाग
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PREFACE

CPWD envisages a lead role for itself in the execution, maintenance and standardization of the built environment in India, while continuing to play the role of a government department in facilitating the implementation of policies for sustainable development with assimilation of knowledge and experience. CPWD strives to educate its clients to aspire building and develops norms for the same with vision to create and maintain sustainable and inclusive built environment within the available resources while ensuring quality. Keeping in mind above, CPWD and BEE has signed an MOU for inclusion of materials satisfying Energy Conservation & Sustainable Building Code (ECSBC) in this Schedule of Rates(E&M) (Vol.–II) 2025. This will help in better compliance of ECSBC – 2024 norms in building design of CPWD and other government departments and PSU who take CPWD Schedule of Rates as reference document.

This edition aims to incorporate items in SOR with latest technology to achieve Energy Efficiency measures in Buildings as envisaged in Energy Conservation & Sustainable Building Code – 2024 & Eco Niwas Samhita (ENS- 2024) developed by BEE. One of the major outcomes of ECSBC Code is three levels of energy performance standards i.e. ECSBC, ECSBC plus and super ECSBC. ECSBC compliant buildings shall demonstrate approximately 25% energy saving, ECSBC plus buildings 35% energy saving and super ECSBC buildings targeted to achieve 50% energy saving compared to conventional buildings.

In the present scenario it has become essential to adopt modern technology and Energy Efficient materials for reduced carbon emission footprint in ecofriendly built environment.

The following items/Chapters have been included in this DSR:-

1. **Fitting Fixtures and Fans**

Chapter -1	LED Lights including down lighters, LED panels, smart street light, Flood light. The LED lights are divided into three categories according to system lumen efficacy.
Chapter-2	The BLDC fans.

2. **Sub-Station Equipment**

Chapter-3	BEE star rated transformer (Oil and Dry Type).
Chapter-4	Automatic Power Factor Correction Panel i/c HYBRID System.
Chapter-5	UPS with 96% efficiency.

3. **DG Sets**

Chapter-6	Diesel Generator (DG) Set.

4. **Heating Ventilation and Air Conditioning**

Chapter-7	VRV/VRF Air conditioning System.

Chapter-8	Unitary Air conditioning System.
Chapter-9	Chillers for Central Air conditioning.
Chapter-10	Cooling Tower.
Chapter-11	Air Handling Unit (AHU) & Fan Coil Unit (FCU)
Chapter-12	Evaporative Cooling
Chapter-13	Air Cooled Heat Pump for Hot Water.

5. Other works

Chapter-14	Solar Water Heating system
Chapter-15	EV Charging System.

This edition supersedes the Item for BEE 5 star rated ceiling fan with Brush Less Direct Current (BLDC) Motor – 2019 and Items for VRF/VRV Air-Conditioning System – 2019.

As The Bureau of Energy Efficiency (BEE) has revised the Energy Conservation Building Code (ECBC) 2017 in October 2024 with Energy Conservation and Sustainable Building Code (ECSBC) 2024. The machines and equipment and details of specifications complying the ECSBC 2024 norms are not easily available in market, however manufacturers are consulted and the rates are discussed with the OEM. Accordingly, the prevailing market rate of highly energy efficient items are considered in this schedule of rates with discount ranging from 5% to 50% as prevailing in market.

The rate is inclusive of carriage, installation, testing and commissioning, contractor's profit and OH and GST on works contract in all the items of this DSR(E&M) (Vol.-II)-2025.

I am grateful to Shri Satinder Pal Singh, Director General, CPWD for reposing trust in our team to undertake this work. I convey my sincere thanks to Shri Mohd Kamal Ahmed SDG(HQ) for his guidance and support throughout the preparation of this document. I also express my deep appreciation for Shri R. R. Meena, CE CSQ (E) and the team for market research, preparation of analysis and drafting this DSR taking into account the updated standards, Codes and Energy Efficiency norms of related items.

I compliment Shri Ramayan Prasad Gupta SE (E) TAS, Sh. Santosh Kumar Dhangar SE (E) TLQA, Sh. Himanshu Phulwaria, EE (E) TAS, Sh. Sandeep Kumar Das AE (E) and Sh. Harjeet Singh AE (E) who made their sincere efforts to prepare the DSR and making the publication available in a very short time.

Errors or Omissions and suggestion for improvement, if any, may kindly be brought to the notice of the Superintending Engineer (E) TLQA in the office of the Chief Engineer (E) CSQ CPWD New Delhi- 110011 (Tel No. 01123061418, Emial: delceecsq.cpwd@nic.in & delseetas.cpwd@nic.in).

(Chita Ranjan Nanda)
Additional Director General, (Tech) CPWD

Place: New Delhi
Dated: 26|03|2025

CONTENTS

CHAPTER-1-LED LIGHT

Code No.	Description	Unit	Rate (₹)
1.1	**LED Down lighter (SMD Type) (System lumen efficacy ≥ 105 < 120 lm/Watt)** Supplying, installation, Testing & Commissioning of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free **(**flicker should be below 5%), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C) **Powder coated die cast /Extruded aluminum Body including trim**		
1.1.1	5 - 7 watt	Each	509
1.1.2	8 - 10 watt	Each	584
1.1.3	12 -15 watt	Each	666
1.1.4	18 watt	Each	853
1.1.5	22 watt	Each	898
1.1.6	30 watt	Each	1325
1.2	**LED Down lighter (SMD Type) (System lumen efficacy ≥120 <135 lm/Watt)** Supplying, installation, Testing & Commissioning of LED Recessed / surface Down lighter (Round / square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should		

be below 5 %), life time (LED,Driver & electrical circuitry), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast /Extruded aluminum Body including trim .

1.2.1	5 - 7 watt	Each	535
1.2.2	8 - 10 watt	Each	617
1.2.3	12 -15 watt	Each	708
1.2.4	18 watt	Each	936
1.2.5	22 watt	Each	960
1.2.6	30 watt	Each	1533

1.3 **LED Down lighter (SMD Type) (System lumen efficacy >135 lm/Watt)**

Supplying, installation, Testing & Commissioning of LED Recessed / surface Down lighter (Round /square/Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K / 6000°K /6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required

Code No.	Description	Unit	Rate (₹)
	with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast / Extruded aluminum Body including trim.		
1.3.1	5 - 7 watt	Each	561
1.3.2	8 - 10 watt	Each	650
1.3.3	12 -15 watt	Each	749
1.3.4	18 watt	Each	998
1.3.5	22 watt	Each	1023
1.3.6	30 watt	Each	1572
1.4	**LED Down lighter (COB Type) (System lumen efficacy ≥ 105 < 120 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) COB Type of following body material and construction as per IS : 10322 with driver as per the requirement with **Driver efficiency >85%,** Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free **(flicker should be below 5%)**, life time **(LED,Driver & electrical circuitry),** of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C)		
	Powder coated die cast /Extruded aluminum Body including trim with Aluminum Reflector		
1.4.1	5 - 7 watt	Each	819
1.4.2	8 - 10 watt	Each	871

Code No.	Description	Unit	Rate (₹)
1.4.3	12 -15 watt	Each	1035
1.4.4	18 watt	Each	1175
1.4.5	22 watt	Each	1323
1.4.6	30 watt	Each	1647
1.5	**LED Down lighter (COB Type) (System lumen efficacy ≥120 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of LED Recessed / surface Down lighter (Round / square/ Rectangular) COB Type of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector		
1.5.1	5 - 7 watt	Each	919
1.5.2	8 - 10 watt	Each	938
1.5.3	12 -15 watt	Each	1180
1.5.4	18 watt	Each	1464
1.5.5	22 watt	Each	1499
1.5.6	30 watt	Each	2045
1.6	**LED Panel light 2x2 ft. (System lumen efficacy ≥105 <120 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg		

centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K / 6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)

1.6.1	15 watt	Each	1502
1.6.2	18 watt	Each	2053
1.6.3	22 watt	Each	2363
1.6.4	36 watt	Each	2502
1.6.5	40 watt	Each	2675
1.6.6	45 watt	Each	3159

CRCA Sheet Body (Thickness ≥ 0.50 mm)

1.6.7	15 watt	Each	1381
1.6.8	18 watt	Each	1913
1.6.9	22 watt	Each	1941
1.6.10	36 watt	Each	2052
1.6.11	40 watt	Each	2190
1.6.12	45 watt	Each	2520

1.7 **LED Panel light 2x2 ft. (System lumen efficacy ≥120 <135 lm/Watt)**

Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with ,

Code No.	Description	Unit	Rate (₹)
	70% of initial Lumen maintained till life ends,CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)		
1.7.1	15 watt	Each	1627
1.7.2	18 watt	Each	2233
1.7.3	22 watt	Each	2689
1.7.4	36 watt	Each	2955
1.7.5	40 watt	Each	3678
1.7.6	45 watt	Each	3907
	CRCA Sheet Body (Thickness ≥ 0.50 mm)		
1.7.7	15 watt	Each	1543
1.7.8	18 watt	Each	1913
1.7.9	22 watt	Each	2024
1.7.10	36 watt	Each	2218
1.7.11	40 watt	Each	2520
1.7.12	45 watt	Each	2577
1.8	**LED Panel light 2x2 ft., (System lumen efficacy >135 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends ,CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/		

Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)

1.8.1	15 watt	Each	1752
1.8.2	18 watt	Each	2413
1.8.3	22 watt	Each	3575
1.8.4	36 watt	Each	3990
1.8.5	40 watt	Each	4239
1.8.6	45 watt	Each	4820

CRCA Sheet Body (Thickness ≥ 0.50 mm)

1.8.7	15 watt	Each	1704
1.8.8	18 watt	Each	2744
1.8.9	22 watt	Each	2786
1.8.10	36 watt	Each	2839
1.8.11	40 watt	Each	2860
1.8.12	45 watt	Each	2917

1.9 **LED Batten light (System lumen efficacy ≥105 <120 lm/Watt)**

Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as

Code No.	Description	Unit	Rate (₹)
	per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)		
1.9.1	18- 22 watt	Each	675
1.9.2	24 -26 watt	Each	685
1.9.3	36 watt	Each	698
1.9.4	40 watt	Each	714
	CRCA Sheet Body (Thickness ≥ 0.50 mm)		
1.9.5	18- 22 watt	Each	622
1.9.6	24 -26 watt	Each	632
1.9.7	36 watt	Each	642
1.9.8	40 watt	Each	657
1.10	**LED Batten light (System lumen efficacy ≥120 <135 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends,CCT 3000°K / 4000°K / 5700°K /6000°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)		

Code No.	Description	Unit	Rate (₹)
1.10.1	18- 22 watt	Each	727
1.10.2	24 -26 watt	Each	738
1.10.3	36 watt	Each	754
1.10.4	40 watt	Each	772
	CRCA Sheet Body (Thickness ≥ 0.50 mm)		
1.10.5	18- 22 watt	Each	675
1.10.6	24 -26 watt	Each	685
1.10.7	36 watt	Each	698
1.10.8	40 watt	Each	714
1.11	**LED Batten light (System lumen efficacy >135 lm/Watt)**		
	Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/ 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminum Body (Thickness ≥ 1.20 mm)		
1.11.1	18- 22 watt	Each	780
1.11.2	24 -26 watt	Each	791
1.11.3	36 watt	Each	809
1.11.4	40 watt	Each	830

Code No.	Description	Unit	Rate (₹)
	CRCA Sheet Body (Thickness ≥ 0.50 mm)		
1.11.5	18- 22 watt	Each	727
1.11.6	24 -26 watt	Each	738
1.11.7	36 watt	Each	754
1.11.8	40 watt	Each	772
1.12	**LED Street light fixture, powder coated pressure die cast aluminum body (System lumen efficacy ≥105 <120 lm/Watt)** Supplying, installation, Testing & Commissioning of Street light LED fixture powder coated pressure die cast aluminum body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80, under voltage and over voltage protection, EMI-EMC As per CISPR -15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin),SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
1.12.1	10 watt	Each	771
1.12.2	14 watt	Each	910
1.12.3	15 watt	Each	923
1.12.4	18 watt	Each	967
1.12.5	20 watt	Each	976
1.12.6	24 watt	Each	979
1.12.7	25 watt	Each	994
1.12.8	30 watt	Each	1014
1.12.9	36 watt	Each	1221
1.12.10	40 watt	Each	1290
1.12.11	45 watt	Each	1360
1.12.12	50 watt	Each	1775
1.12.13	72 watt	Each	1913

Code No.	Description	Unit	Rate (₹)
1.12.14	90 watt	Each	2156
1.12.15	100 watt	Each	2536
1.12.16	120 watt	Each	2606
1.12.17	150 watt	Each	3367
1.12.18	180 watt	Each	4544
1.12.19	200 watt	Each	4682
1.13	**LED Street light fixture, powder coated pressure die cast aluminum body (System lumen efficacy ≥120 <135 lm/Watt)** Supplying, installation, Testing & Commissioning of Street light LED fixture powder coated pressure die cast aluminum body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80, under voltage and over voltage protection, EMI-EMC As per CISPR 15 , lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
1.13.1	10 watt	Each	823
1.13.2	14 watt	Each	976
1.13.3	15 watt	Each	1004
1.13.4	18 watt	Each	1166
1.13.5	20 watt	Each	1290
1.13.6	24 watt	Each	1470
1.13.7	25 watt	Each	1519
1.13.8	30 watt	Each	1547
1.13.9	36 watt	Each	1623
1.13.10	40 watt	Each	1637
1.13.11	45 watt	Each	1737
1.13.12	50 watt	Each	1927
1.13.13	72 watt	Each	2121

Code No.	Description	Unit	Rate (₹)
1.13.14	90 watt	Each	2329
1.13.15	100 watt	Each	2675
1.13.16	120 watt	Each	2952
1.13.17	150 watt	Each	3436
1.13.18	180 watt	Each	4820
1.13.19	200 watt	Each	5028
1.14	**LED Street light fixture, powder coated pressure die cast aluminum body (System lumen efficacy >135 lm/Watt)** Supplying, installation, Testing & Commissioning of Street light LED fixture, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection,EMI-EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
1.14.1	10 watt	Each	909
1.14.2	14 watt	Each	1048
1.14.3	15 watt	Each	1080
1.14.4	18 watt	Each	1187
1.14.5	20 watt	Each	1221
1.14.6	24 watt	Each	1533
1.14.7	25 watt	Each	1584
1.14.8	30 watt	Each	1671
1.14.9	36 watt	Each	1740
1.14.10	40 watt	Each	1879
1.14.11	45 watt	Each	1960
1.14.12	50 watt	Each	2178
1.14.13	72 watt	Each	2571

Code No.	Description	Unit	Rate (₹)
1.14.14	90 watt	Each	2813
1.14.15	100 watt	Each	3367
1.14.16	120 watt	Each	4059
1.14.17	150 watt	Each	5083
1.14.18	180 watt	Each	5443
1.14.19	200 watt	Each	6135
1.15	**LED Flood Light, powder coated pressure die cast aluminum (System lumen efficacy 105 <120 lm/Watt)** Supplying, installation, Testing & Commissioning of Flood Light, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection, EMI-EMC as per CISPR -15 , lenses for beam angle 30 deg-120deg as per the application and the project requirement deg., suitable tilt able fitting, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy 105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).		
1.15.1	50 watt	Each	2606
1.15.2	70 watt	Each	4128
1.15.3	100 watt	Each	4405
1.15.4	150 watt	Each	7035
1.15.5	200 watt	Each	4544
1.15.6	250 watt	Each	5443
1.16	**LED Flood Light, powder coated pressure die cast aluminum (System lumen efficacy ≥120 and <135 lm/Watt)** Supplying, installation, Testing & Commissioning of Flood Light, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg		

to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection, EMI-EMC as per CISPR-15, lenses for beam angle 30 deg-120deg as per the application and the project requirement deg, suitable tilt able fitting, life time (LED,Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 and <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

1.16.1	50 watt	Each	2003
1.16.2	70 watt	Each	2293
1.16.3	100 watt	Each	2460
1.16.4	150 watt	Each	3450
1.16.5	200 watt	Each	4682
1.16.6	250 watt	Each	5962

1.17 **LED Flood Light, powder coated pressure die cast aluminum (System lumen efficacy >135 lm/Watt)**

Supplying, installation, Testing & Commissioning of Flood Light, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection, EMI-EMC as per CISPR-15, lenses for beam angle 30 deg-120deg as per the application and the project requirement deg., suitable tilt able fitting, life time (LED,Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt

output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

1.17.1	50 watt	Each	2082
1.17.2	70 watt	Each	2385
1.17.3	100 watt	Each	2561
1.17.4	150 watt	Each	3595
1.17.5	200 watt	Each	5498
1.17.6	250 watt	Each	6222

1.18 **LED Smart Street light fixture, powder coated pressure die cast aluminum (System. System lumen efficacy ≥105 and <120 lm/Watt)**

Supplying, installation, Testing & Commissioning of Smart Street light LED fixture, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).

Smart inbuilt controller shall have following features.

1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)
2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.
3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR).

Code No.	Description	Unit	Rate (₹)
	4. **Wi-Fi LoRA/Zigbee/Power line with Ethernet network based IOT feature as per site requirement or engineer in charge.** 5. should be controlled through auto/ manual 6. Programmable level of not less than 48 different light intensity settings, 7. Inbuilt repeater & relay signals function to other controllers		
1.18.1	45 watt	Each	5074
1.18.2	50 watt	Each	5293
1.18.3	72 watt	Each	5818
1.18.4	90 watt	Each	6081
1.18.5	100 watt	Each	7219
1.18.6	120 watt	Each	7570
1.18.7	150 watt	Each	9478
1.18.8	180 watt	Each	9653
1.18.9	200 watt	Each	11334
1.19	**LED Smart Street light fixture, powder coated pressure die cast aluminum (System. System lumen efficacy ≥120 and <135 lm/Watt)** Supplying, installation, Testing & Commissioning of Smart Street light LED fixture, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 and <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C). **Smart inbuilt controller shall have following features.** 1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy) 2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.		

Code No.	Description	Unit	Rate (₹)
	3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR). 4. **Wi-Fi LoRA/Zigbee/Power line with Ethernet network based IOT feature as per site requirement or engineer in charge.** 5. should be controlled through auto/ manual 6. Programmable level of not less than 48 different light intensity settings, 7. Inbuilt repeater & relay signals function to other controllers		
1.19.1	45 watt	Each	5556
1.19.2	50 watt	Each	5797
1.19.3	72 watt	Each	6375
1.19.4	90 watt	Each	6664
1.19.5	100 watt	Each	7916
1.19.6	120 watt	Each	8301
1.19.7	150 watt	Each	10401
1.19.8	180 watt	Each	10593
1.19.9	200 watt	Each	12443
1.20	**LED Smart Street light fixture, powder coated pressure die cast aluminum (System. System lumen efficacy >135 lm/Watt)** Supplying, installation, Testing & Commissioning of Smart Street light LED fixture, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C). **Smart inbuilt controller shall have following features.** 1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)		

Code No.	Description	Unit	Rate (₹)
	2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours. 3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR). 4. **Wi-Fi LoRA/Zigbee/Power line with Ethernet network based IOT feature as per site requirement or engineer in charge.** 5. should be controlled through auto/ manual 6. Programmable level of not less than 48 different light intensity settings, 7. Inbuilt repeater & relay signals function to other controllers		
1.20.1	45 watt	Each	5798
1.20.2	50 watt	Each	6049
1.20.3	72 watt	Each	6653
1.20.4	90 watt	Each	6955
1.20.5	100 watt	Each	8264
1.20.6	120 watt	Each	8667
1.20.7	150 watt	Each	10862
1.20.8	180 watt	Each	11064
1.20.9	200 watt	Each	12997
1.21	**Solar outdoor LED light**		
1.21.1	Supplying, installation, Testing & Commissioning of the integrated type solar PV lighting system on the existing pole structure, comprising of 20 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%),, Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) Charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install, With Lithium- Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 24 AH battery, charging time 6-8 hours, Battery backup time 12 hours (minimum), LED fixture 20 watt, Input voltage: 12V DC , Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPR 15 , lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)), life time (LED,Driver & electrical circuitary) of 50K hours lamp buring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic switch on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.		

Code No.	Description	Unit	Rate (₹)
	(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C)		
	20 Watt (System lumen efficacy >120 lm/Watt)	Each	18594
1.21.2	Supplying, installation, Testing & Commissioning of the integrated type solar PV lighting system on the existing pole structure, comprising of 30 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%), Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install, With Lithium- Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 30 AH battery, charging time 8-10 hours, Battery backup time 12 hours (minimum), LED fixture watt 30 watt, Input voltage: 12V DC , Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPER 15 A, lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)) , life time (LED,Driver & electrical circuitry) of 50K hours lamp burring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic switch on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.		
	(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminium housing such that LED junction temperature do'nt rise aboven 90°C)		
	30 Watt (System lumen efficacy >120 lm/Watt)	Nos	23093
1.21.3	Supplying, installation, Testing & Commissioning of the integrated type solar PV lighting system on the existing pole structure, comprising of 35 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%),, Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) Charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install. Operating temperature range: -35 to 60 deg C With Lithium-Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 35 AH battery, charging time 8-10 hours, Battery backup time 12 hours (minimum), LED fixture watt 35 watt, Input voltage: 12V DC, Operating temp range -15 deg to 50 deg centigrade, internal surge		

Code No.	Description	Unit	Rate (₹)
	protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPR 15 , lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)), life time (LED, Driver & electrical circuitry) of 50K hours lamp burring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic switch on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.		
	(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise aboven 90°C)		
	35 Watt (System lumen efficacy >120 lm/Watt)	Each	29322

CHAPTER-2- BLDC FAN

Code No.	Description	Unit	Rate (₹)
2.1	**Brush Less Direct Current (BLDC) Motor** Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal (Aluminum alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, remote (preferably mobile app based) for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req		
2.1.1	900mm, service value ≥ 5.1 CM/Min/Watt, air delivery 130 CM/Min (Minimum)	Each	2294
2.1.2	1050mm, service value ≥ 5.1 CM/Min/Watt, air delivery 150 CM/Min (Minimum)	Each	2323
2.1.3	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	Each	2381
2.1.4	1400mm, service value ≥ 6.0 CM/Min/Watt, air delivery 245 CM/Min (Minimum)	Each	2439
2.2	**Brush Less Direct Current (BLDC) Motor** Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal (Aluminum alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, suitable for operation with regulator for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req		
2.2.1	900mm, service value ≥ 5.1 CM/Min/Watt, air delivery 130 CM/Min (Minimum)	Each	2149
2.2.2	1050mm, service value ≥ 5.1 CM/Min/Watt, air delivery 150 CM/Min (Minimum)	Each	2176
2.2.3	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	Each	2230
2.2.4	1400mm, service value ≥ 6.0 CM/Min/Watt, air delivery 245 CM/Min (Minimum)	Each	2294

Code No.	Description	Unit	Rate (₹)

Oil Type
33/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting (Mineral oil filled)

3.1 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release

device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.1.1	500 KVA	Each	1328495
3.1.2	630KVA	Each	1673904
3.1.3	1000KVA	Each	2008307
3.1.4	1250 KVA	Each	2510384
3.1.5	1600KVA	Each	3213291
3.1.6	2000KVA	Each	4016614
3.1.7	500KVA	Each	5020768

3.2 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant

IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent

combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

Code No.	Description	Unit	Rate (₹)
3.2.1	500 KVA	Each	1594194
3.2.2	630KVA	Each	2008685
3.2.3	1000KVA	Each	2409969
3.2.4	1250 KVA	Each	3012461
3.2.5	1600KVA	Each	3855950
3.2.6	2000KVA	Each	4819937
3.2.7	2500KVA	Each	6024922
3.3	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.		

Code No.	Description	Unit	Rate (₹)
	Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.3.1	500 KVA	Each	1859893
3.3.2	630KVA	Each	2343466
3.3.3	1000KVA	Each	2811630
3.3.4	1250 KVA	Each	3514538
3.3.5	600KVA	Each	4498608
3.3.6	2000KVA	Each	5623260
3.3.7	2500KVA	Each	7029075
	11/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting(Mineral oil filled)		
3.4	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and		

facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil

temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.4.1	1000KVA	Each	1749171
3.4.2	1250 KVA	Each	2186463
3.4.3	1600 KVA	Each	2798673
3.4.4	2000KVA	Each	3498342

3.5 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as

per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.5.1	1000KVA	Each	2099005
3.5.2	1250 KVA	Each	2623756
3.5.3	1600 KVA	Each	3358408
3.5.4	2000KVA	Each	4198010

3.6 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase,

50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding

assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.6.1	1000KVA	Each	2448839
3.6.2	1250 KVA	Each	3061049
3.6.3	1600 KVA	Each	3918143
3.6.4	2000KVA	Each	4897678

3.7 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency

does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

Code No.	Description	Unit	Rate (₹)
3.7.1	200KVA	Each	336877
3.7.2	250KVA	Each	421097
3.7.3	315KVA	Each	530582
3.7.4	400KVA	Each	673755
3.7.5	500KVA	Each	842193
3.7.6	630KVA	Each	1061164

3.8 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard.The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Code No.	Description	Unit	Rate (₹)
	Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.8.1	200KVA	Each	377303
3.8.2	250KVA	Each	471628
3.8.3	315KVA	Each	594252
3.8.4	400KVA	Each	754605
3.8.5	500KVA	Each	943257
3.8.6	630KVA	Each	1188503
3.9	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for		

3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers

above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.9.1	200KVA	Each	471628
3.9.2	250KVA	Each	589535
3.9.3	315KVA	Each	742815
3.9.4	400KVA	Each	943257
3.9.5	500KVA	Each	1179071
3.9.6	630KVA	Each	1485629

3.10 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly

polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.10.1	63KVA	Each	106116
3.10.2	100KVA	Each	168439
3.10.3	160KVA	Each	269502

3.11 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound

transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One

filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.11.1	63KVA	Nos	118850
3.11.2	100KVA	Nos	188651
3.11.3	160KVA	Nos	301842

3.12 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site . The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo

setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.12.1	63KVA	Each	148563
3.12.2	100KVA	Each	235814
3.12.3	160KVA	Each	377303

33/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting (Synthetic organic Ester oil filled)

Code No.	Description	Unit	Rate (₹)

3.13 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site . The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size

thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.13.1	500 KVA	Each	1402300
3.13.2	630KVA	Each	1766899
3.13.3	1000KVA	Each	2119880
3.13.4	1250 KVA	Each	2649850
3.13.5	1600KVA	Each	3391808
3.13.6	2000KVA	Each	4239760
3.13.7	2500KVA	Each	5299700

3.14 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including

first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge

Code No.	Description	Unit	Rate (₹)
	(for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.14.1	500 KVA	Each	1682761
3.14.2	630KVA	Each	2120278
3.14.3	1000KVA	Each	2543856
3.14.4	1250 KVA	Each	3179820
3.14.5	1600KVA	Each	4070169
3.14.6	2000KVA	Each	5087712
3.14.7	2500KVA	Each	6359639
3.15	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air		

temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.15.1	500 KVA	Each	1963221
3.15.2	630KVA	Each	2473658
3.15.3	1000KVA	Each	2967832
3.15.4	1250 KVA	Each	3709790
3.15.5	1600KVA	Each	4748531
3.15.6	2000KVA	Each	5935663
3.15.7	2500KVA	Each	7419579

11/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting (Synthetic organic Ester oil filled)

Code No.	Description	Unit	Rate (₹)

3.16 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers;

g) Thermometer pocket with cap; h) Oil filling holes having (1¼" nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.16.1	1000KVA	Each	1846347
3.16.2	1250 KVA	Each	2307934
3.16.3	1600 KVA	Each	2954155
3.16.4	2000KVA	Each	3692694

3.17 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as

required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of

Code No.	Description	Unit	Rate (₹)
	capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.17.1	1000KVA	Each	2215616
3.17.2	1250 KVA	Each	2769520
3.17.3	1600 KVA	Each	3544986
3.17.4	2000KVA	Each	4431233
3.18	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.		

Code No.	Description	Unit	Rate (₹)
	Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.18.1	1000KVA	Each	2584886
3.18.2	1250 KVA	Each	3231107
3.18.3	1600 KVA	Each	4135817
3.18.4	2000KVA	Each	5169771
3.19	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable		

from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral

Code No.	Description	Unit	Rate (₹)
	separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.19.1	200KVA	Each	355593
3.19.2	250KVA	Each	444491
3.19.3	315KVA	Each	560059
3.19.4	400KVA	Each	711185
3.19.5	500KVA	Each	888982
3.19.6	630KVA	Each	1120117
3.20	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall		

be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.20.1	200KVA	Each	398264
3.20.2	250KVA	Each	497830
3.20.3	315KVA	Each	627266
3.20.4	400KVA	Each	796528
3.20.5	500KVA	Each	995660
3.20.6	630KVA	Each	1254531

Code No.	Description	Unit	Rate (₹)

3.21 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shallbe type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover

thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.21.1	200KVA	Each	497830
3.21.2	250KVA	Each	622287
3.21.3	315KVA	Each	784082
3.21.4	400KVA	Each	995660
3.21.5	500KVA	Each	1244575
3.21.6	630KVA	Each	1568164

3.22 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI

Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level

Code No.	Description	Unit	Rate (₹)
	indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
3.22.1	63KVA	Nos	112012
3.22.2	100KVA	Nos	177796
3.22.3	160KVA	Nos	284474
3.23	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the		

outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.23.1	63KVA	Each	125453
3.23.2	100KVA	Each	199132
3.23.3	160KVA	Each	318611

3.24 Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

3.24.1	63KVA	Nos	156816
3.24.2	100KVA	Nos	248915
3.24.3	160KVA	Nos	398264

DRY Type

33/0.433 KV, 3 Phase, 50 Hz Indoor mounting

3.25 Supply, installation, testing and commissioning of following capacity (continuous loading) 33/0.433 KV Delta/Star, step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for indoor applications with On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behavior class F1,climate class-C1, having cable end boxes

on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual, Geo-Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate.i) Additional neutral separately brought out on bushing for earthing.

Note : The permissible total losses value shall not exceed by 15% the losses as mentioned below.

Level 3

3.25.1	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Each	2397012
3.25.2	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Each	2996265
3.25.3	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Each	3835219
3.25.4	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Each	4794024
3.25.5	3.25.52500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Each	5992530

Code No.	Description	Unit	Rate (₹)
	Level 4		
3.25.6	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Each	2756564
3.25.7	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Each	3445704
3.25.8	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Each	4410502
3.25.9	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Each	5513127
3.25.10	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Each	6891409
	Level 5		
3.25.11	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Each	3116115
3.25.12	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt	Each	3895144
3.25.13	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Each	4985785
3.25.14	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Each	6232231
3.25.15	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Each	7790288
	33/0.433 KV, 3 Phase, 50 Hz Outdoor mounting		
3.26	Supply, installation, testing and commissioning of following capacity (continuous loading) 33/0.433 KV Delta/Star, step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for Outdoor applications with enclosure, On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behavior class F1,climate class-C1, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral		

brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications . Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The enclosure shall also have Welded Door handle , Danger plate on HV and LV side doors, caution plate for tap links for HT doors, Door limit switch on both HV and LV side doors to be wired up to WTI box terminal for tripping the transformer in case door is opened with the enclosure transformer energized, Phase marking plates on HV and LV doors.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate.i) Additional neutral separately brought out on bushing for earthing. Note : The permissible total losses value shall not exceed by 15% the losses as mentioned below.

Level 3

3.26.1	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Each	2530179
3.26.2	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Each	3162724
3.26.3	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Each	4048287
3.26.4	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Each	5060358
3.26.5	3.25.52500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Each	6325448

Level 4

3.26.6	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Each	2909706
3.26.7	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Each	3637132

Code No.	Description	Unit	Rate (₹)
3.26.8	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Each	4655530
3.26.9	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Each	5819412
3.26.10	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Each	7274265
	Level 5		
3.26.11	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Each	3289233
3.26.12	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt	Each	4111541
3.26.13	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Each	5262773
3.26.14	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Each	6578466
3.26.15	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Each	8223082
	11/0.433 KV, 3 Phase, 50 Hz Indoor mounting		
3.27	Supply, installation, testing and commissioning of following capacity (continuous loading) 11/0.433 KV Delta/Star,step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for indoor applications with On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behavior class F1,climate class-C1, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications . Design ambient condition :		

Code No.	Description	Unit	Rate (₹)
	a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate.i) Additional neutral separately brought out on bushing for earthing.		
	Level 3		
3.27.1	63 KVA (losses at 50% loading < 380watt, losses at 100% loading < 1250watt)	Each	138768
3.27.2	100 KVA (losses at 50% loading < 520watt, losses at 100% loading < 1800watt)	Each	220266
3.27.3	160 KVA (losses at 50% loading <770watt, losses at 100% loading < 2200watt)	Each	352426
3.27.4	200 KVA (losses at 50% loading < 890watt, losses at 100% loading < 2700watt)	Each	440532
3.27.5	250 KVA (losses at 50% loading < 1050watt, losses at 100% loading < 3150watt)	Each	550665
3.27.6	315 KVA (losses at 50% loading < 1100watt, losses at 100% loading < 3275watt)	Each	693838
3.27.7	400 KVA (losses at 50% loading < 1300watt, losses at 100% loading < 3875watt)	Each	881064
3.27.8	500 KVA (losses at 50% loading < 1600watt, losses at 100% loading < 4750watt)	Each	1101330
3.27.9	630 KVA (losses at 50% loading < 2000watt, losses at 100% loading < 5855watt)	Each	1387675
3.27.10	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Each	2202659
3.27.11	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Each	2753324
3.27.12	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Each	3524255
3.27.13	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Each	4405319
3.27.14	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Each	5506649

Code No.	Description	Unit	Rate (₹)
	Level 4		
3.27.15	63 KVA (losses at 50% loading < 340watt, losses at 100% loading < 1140watt)	Each	159583
3.27.16	100 KVA (losses at 50% loading <475watt, losses at 100% loading <1650watt)	Each	253306
3.27.17	160 KVA (losses at 50% loading < 670watt, losses at 100% loading < 1950watt)	Each	405289
3.27.18	200 KVA (losses at 50% loading < 780watt, losses at 100% loading <2300watt)	Each	506612
3.27.19	250 KVA (losses at 50% loading < 1050watt, losses at 100% loading < 3150watt)	Each	633265
3.27.20	250 KVA (losses at 50% loading < 980watt, losses at 100% loading < 2930watt)	Each	797913
3.27.21	400 KVA (losses at 50% loading < 1225watt, losses at 100% loading < 3450watt)	Each	1013223
3.27.22	500 KVA (losses at 50% loading <1510watt, losses at 100% loading < 4300watt)	Each	1266529
3.27.23	630 KVA (losses at 50% loading < 1860watt, losses at 100% loading < 5300watt)	Each	1595827
3.27.24	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Each	2533058
3.27.25	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Each	3166323
3.27.26	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Each	4052893
3.27.27	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Each	5066117
3.27.28	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Each	6332646
	Level 5		
3.27.29	63 KVA (losses at 50% loading < 300watt, losses at 100% loading <1050watt)	Each	180398
3.27.30	100 KVA (losses at 50% loading < 435watt, losses at 100% loading < 1500watt)	Each	286346
3.27.31	160 KVA (losses at 50% loading < 570watt, losses at 100% loading <1700watt)	Each	458153
3.27.32	200 KVA(losses at 50% loading <670watt, losses at 100% loading < 2100watt)	Each	572691
3.27.33	250 KVA(losses at 50% loading < 920watt, losses at 100% loading < 2700watt)	Each	715864
3.27.34	315 KVA (losses at 50% loading < 955watt, losses at 100% loading < 2750watt)	Each	901989
3.27.35	400 KVA (losses at 50% loading < 1150watt, losses at 100% loading < 3330watt)	Each	1145383
3.27.36	500 KVA (losses at 50% loading < 1430watt, losses at 100% loading < 4100watt)	Each	1431729

Code No.	Description	Unit	Rate (₹)
3.27.37	630 KVA (losses at 50% loading < 1745watt, losses at 100% loading < 4850watt)	Each	1803978
3.27.38	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Each	2863457
3.27.39	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt)	Each	3579322
3.27.40	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Each	4581532
3.27.41	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Each	5726915
3.27.42	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Each	7158643
	11/0.433 KV, 3 Phase, 50 Hz Outdoor mounting		
3.28	Supply, installation, testing and commissioning of following capacity (continuous loading) 11/0.433 KV Delta/Star, step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for Outdoor applications with enclosure, On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions Class E-O-3, suitable for fire behavior class F1,climate class-C1, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The enclosure shall also have		

Code No.	Description	Unit	Rate (₹)
	Welded Door handle , Danger plate on HV and LV side doors, caution plate for tap links for HT doors, Door limit switch on both HV and LV side doors to be wired up to WTI box terminal for tripping the transformer in case door is opened with then closure transformer energized, Phase marking plates on HV and LV doors. Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate. i) Additional neutral separately brought out on bushing for earthing.		
	Level 3		
3.28.1	63 KVA (losses at 50% loading < 380watt, losses at 100% loading < 1250watt)	Each	146477
3.28.2	100 KVA (losses at 50% loading < 520watt, losses at 100% loading < 1800watt)	Each	232503
3.28.3	160 KVA (losses at 50% loading <770watt, losses at 100% loading < 2200watt	Each	372005
3.28.4	200 KVA (losses at 50% loading < 890watt, losses at 100% loading < 2700watt)	Each	465006
3.28.5	250 KVA (losses at 50% loading < 1050watt, losses at 100% loading < 3150watt)	Each	581257
3.28.6	315 KVA (losses at 50% loading < 1100watt, losses at 100% loading < 3275watt)	Each	732384
3.28.7	400 KVA (losses at 50% loading < 1300watt, losses at 100% loading < 3875watt)	Each	930012
3.27.8	500 KVA (losses at 50% loading < 1600watt, losses at 100% loading < 4750watt)	Each	1162515
3.28.9	630 KVA (losses at 50% loading < 2000watt, losses at 100% loading < 5855watt)	Each	1464769
3.28.10	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Each	2325029
3.28.11	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Each	2906287
3.28.12	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Each	3720047
3.28.13	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Each	4650059
3.28.14	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Each	5812574

Code No.	Description	Unit	Rate (₹)
	Level 4		
3.28.15	63 KVA (losses at 50% loading < 340watt, losses at 100% loading < 1140watt)	Each	168448
3.28.16	100 KVA (losses at 50% loading <475watt, losses at 100% loading <1650watt)	Each	267378
3.28.17	160 KVA (losses at 50% loading < 670watt, losses at 100% loading < 1950watt)	Each	427805
3.28.18	200 KVA (losses at 50% loading < 780watt, losses at 100% loading <2300watt)	Each	534757
3.28.19	250 KVA (losses at 50% loading < 980watt, losses at 100% loading < 2930watt)	Each	668446
3.28.20	315 KVA (losses at 50% loading < 1025watt, losses at 100% loading < 3100watt)	Each	842242
3.28.21	400 KVA (losses at 50% loading < 1225watt, losses at 100% loading < 3450watt)	Each	1069514
3.28.22	500 KVA (losses at 50% loading <1510watt, losses at 100% loading < 4300watt)	Each	1336892
3.28.23	630 KVA (losses at 50% loading < 1860watt, losses at 100% loading < 5300watt)	Each	1684484
3.28.24	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Each	2673784
3.28.25	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Each	3342230
3.28.26	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Each	4278054
3.28.27	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Each	5347568
3.28.28	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Each	6684460
	Level 5		
3.28.29	63 KVA (losses at 50% loading < 300watt, losses at 100% loading <1050watt)	Each	190420
3.28.30	100 KVA (losses at 50% loading < 435watt, losses at 100% loading < 1500watt)	Each	302254
3.28.31	160 KVA (losses at 50% loading < 570watt, losses at 100% loading <1700watt)	Each	483606
3.28.32	200 KVA(losses at 50% loading <670watt, losses at 100% loading < 2100watt)	Each	604508
3.28.33	250 KVA(losses at 50% loading < 920watt, losses at 100% loading < 2700watt)	Each	755635
3.28.34	315 KVA (losses at 50% loading < 955watt, losses at 100% loading < 2750watt)	Each	952100
3.28.35	400 KVA (losses at 50% loading < 1150watt, losses at 100% loading < 3330watt)	Each	1209015
3.28.36	500 KVA (losses at 50% loading < 1430watt, losses at 100% loading < 4100watt)	Each	1511269

Code No.	Description	Unit	Rate (₹)
3.28.37	630 KVA (losses at 50% loading < 1745watt, losses at 100% loading < 4850watt)	Each	1904199
3.28.38	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Each	3022538
3.28.39	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt)	Each	3778173
3.28.40	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Each	4836061
3.28.41	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Each	6045077
3.28.42	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Each	7556346

Code No.	Description	Unit	Rate (₹)

4.1 **Automatic Power Factor Correction (APFC) System**

Supply, Installation, testing and commissioning of Automatic Power Factor Correction (APFC) panel, indoor type floor mounted free standing totally enclosed, extendable, IP 42, of following capacity for 3 phase, 415 V + 10 %, 50 Hz AC System for Ambient temperature -5°C to +40°C, fabricated in compartmentalized designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in-Charge), having front section (switch gear and control accessories) and rear section capacitor and reactor, front and rear access, having suitable current carrying capacity, extensible TPN Aluminum alloy bus bar of high conductivity, DMC/SMC bus bar supports, bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos. 8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP(Metalized Polypropylene) Capacitor (IS 13340 Part -1 & 2) APFC Panel shall be in compliance with IS :16636 & CPWD Specifications etc. as per below details

(A) Incomers

Suitable capacity MCCB Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity (Ics=Icu), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set along with required Instruments and accessories with extended rotary handle and door interlocking arrangement. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating.

(B) Instruments & Indications

i) 3-Phase current sensing APFC microprocessor relay/controller , advance 8/12 stages (8 stages for capacity below 100 KVAR and 12 stages 100 KVAR & above) with Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge and having display of Phase wise V, A, PF, Cos-Phi, Kw, KVA, KVAR, THD-V , THD-I, harmonics up to 31 level. 3 nos of dual core CT's accuracy class 1, 15VA at incomer of PCC Panel for APFC relay.

ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode.

iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency.

iv) Suitable rating control transformer shall be provided for control and indication circuit.

v) All components like control transformer, meter, relay and indicating lamp shall be protected by using suitable rating individual MCB's.

vi) Wiring of the control circuit shall be done by using 2.5 sq mm, FRLS 1100 V grade, PVC insulated multi stranded copper control wire.

(C) Bus Bars
1.3 Amp per Sq.mm, TPN, Electrolytic grade Aluminum bus bar of capacity 1.25 times of incomer rating as per CPWD specification.

(D) Outgoings (APFC Section)
Selection of the capacitors combinations shall be for continuous rating and each capacitor bank shall have suitable capacity Heavy Duty ISI Marked Capacitor, capacitor duty contactor, the capacitor shall be mounted on channel with base of perforated M S Powder coated sheet, connections inter connections etc. and other features as per CPWD Specifications and relevant IS Code having following:

(i) Capacitor bank ratings & stages shall be as per the technical specifications sheet of NIT.

(ii) Capacitor will be MPP self healing type with discharge resistor, pressure release mechanism.

(iii) Since Capacitor Voltage is 525 Volts, thus higher KVAR has to be considered to get rated output at 415 Volts.

(iv) 14% Detuned Reactor of class H insulation & 150% linearity in series with Capacitor.

(Note: Technical specifications sheet for selection of the capacitors combinations shall be provided by the NIT Approving Authority with due consideration of number of capacitors i.e. 1 KVAR, 2 KVAR, 3 KVAR, 5 KVAR, 10 KVAR.....for smooth correction).

4.1.1	50 KVAR	Set	219906
4.1.2	75 KVAR	Set	271373
4.1.3	100 KVAR	Set	297575
4.1.4	125 KVAR	Set	320033
4.1.5	150 KVAR	Set	374776
4.1.6	175 KVAR	Set	402381
4.1.7	200 KVAR	Set	428583

4.2 **HYBRID Power Factor Correction System**

Supply, Installation, testing and commissioning of HYBRID APFC Panel, 3 phase 4 wire, 415 V, 50 Hz AC System for Ambient temperature -5°C to +40°C of following capacity with passive solution of 60% capacity and active solution of 40% capacity,3Phase 4 wire Hybrid Power Factor Correction Solution (with arrangement for neutral current balance) to achieve >0.99 lag

and TDDI/THDV values within IEEE recommended limits.APFC should be designed as per IS 16636 Or IEC 61921. The active section and passive section shall work in sync to give optimized output. The degree of protection of passive section should be IP 42, and of active section should be minimum IP 21.The switching device for APFC passive section should be through capacitor duty contactor and for the active compensation system shall be IGBT based with 3 level topology having 12 IGBT in inverter circuit. The active compensation system should filter harmonics from 2nd to 50th individual harmonic order and shall be selectable for the entire range. The active compensation system should have feature to improve PF correction and harmonic filtration having response time <25Micro second. The hybrid panel shall be indoor type floor mounted free standing totally enclosed, extensible, fabricated in compartmentalized designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in-Charge), having front section (switch gear and control accessories) and rear section (capacitor and reactor), front and rear access, having suitable current carrying capacity, extensible TPN Aluminum alloy bus bar of high conductivity, DMC/SMC bus bar supports, bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos. 8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP(Metalized Polypropylene) Capacitor (IS 13340 Part -1 & 2) APFC Panel shall be in compliance with IS :16636 & CPWD Specifications etc. as per below details.

(A) Incomers

Suitable capacity MCCB/ACB (Upto 300 KVAR, MCCB and above 300 KVAR, ACB) Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity (Ics=Icu), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set along with required Instruments and accessories with extended rotary handel and door interlocking arrangement. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating.

(B) Instruments & Indications

a)For Passive Section :

i) 3-Phase current sensing APFC microprocessor relay/controller , advance 12/16 stages (12 stages for over all capacity of panel (active + passive) below 500 KVAR and 16 stages 500 KVAR & above) and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 31 level.

Code No.	Description	Unit	Rate (₹)
	ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode. iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency. iv) Suitable rating control transformer shall be provided for control and indication circuit. v) All components like control transformer, meter, relay and indicating lamp shall be protected by using suitable rating individual MCB's. vi) Wiring of the control circuit shall be done by using 2.5 sq mm, FRLS 1100 V grade, PVC insulated multi stranded copper control wire. vii) Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge. b) For Active Section : Dedicated HMI (Human Machine Interface) (Minimum 7 inch display) for controlling and communication and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 50th level. Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge.		
4.2.1	250 KVAR	Set	1365289
4.2.2	300 KVAR	Set	1624497
4.2.3	350 KVAR	Set	1818202
4.2.4	400 KVAR	Set	2183152
4.2.5	450 KVAR	Set	2350655
4.2.6	500 KVAR	Set	2662267
4.2.7	550 KVAR	Set	2853164
4.2.8	600 KVAR	Set	3132023
4.2.9	650KVAR	Set	3314499
4.2.10	700KVAR	Set	3566221
4.2.11	750KVAR	Set	3876897
4.2.12	800KVAR	Set	4067794
4.2.13	850KVAR	Set	4214710
4.2.14	900KVAR	Set	4482340
4.2.15	950KVAR	Set	4741548
4.2.16	1000KVAR	Set	4992335

CHAPTER-5-UPS

Code No.	Description	Unit	Rate (₹)
5.1	**Online UPS - Input supply: Single Phase, Output Supply : Single Phase** Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input, Single Phase output AC Supply. The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. The UPS systems shall be Microprocessor based Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology. The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current total harmonic distortion (ITHD)/ total demand distortion (TDD) on the input grid shall be < 5% at 100 %load. (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input pf to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1) however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins and 150% for 1 minute. Operating temperature 0 to 40 deg C, Relative humidity 0-95% non condensing, noise level less than 60db at 1 meter distance, Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output over current, short circuit, battery deep discharge , 10 KV surge. Display for watt/VA,Amp and Voltage power parameters etc. UPS shall comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI) type UPS (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accoseries are inclusive in the cost. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc		
5.1.1	2KVA	Each	42713
5.1.2	3KVA	Each	52051
5.1.3	6KVA	Each	100248
5.1.4	10KVA	Each	168506

Code No.	Description	Unit	Rate (₹)

5.2 **Online UPS- Input supply: Three Phase, Output supply: Three Phase**

Supplying, installation, Testing & Commissioning of of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 deg C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swappable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of moduels requird for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch alongwith provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant International standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality power to the 100% non-linear loads. Current total harmonic effect(ITHD) on the input grid shall be < 5% at 50 %load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. Communication RS232/RS485/SNMP port open protocol for BMS integration, all hardware & software for iOT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accoseries are inclusive of the cost). This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load, Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1,2 & 3, IS: 16242 and CPWD Specification. Display Panel (minimum) (In-build 5 inch or more LC Display / LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency. c) Output: Voltage, frequency, Current.

Code No.	Description	Unit	Rate (₹)
	d) Battery: Voltage, Capacity. e) Load: KVA, KW, Percentage. f)Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass / Total Running time, etc. i) Mains Mode of Operation /Battery Mode of Operation / Bypass feeding the load / UPS Fault /Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms : Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc.		
5.2.1	10KVA (Each Power module shall be ≤ 10 KVA)	Each	208893
5.2.2	20KVA (Each Power module shall be ≤ 10 KVA)	Each	341772
5.2.3	30KVA (Each Power module shall be ≤ 10 KVA)	Each	505748
5.2.4	40KVA (Each Power module shall be ≤ 10 KVA)	Each	599469
5.2.5	60KVA (Each Power module shall be ≤ 10 KVA)	Each	913600
5.2.6	80KVA (Each Power module shall be ≤ 25 KVA)	Each	1124076
5.2.7	100KVA (Each Power module shall be ≤ 25 KVA)	Each	1276967
5.2.8	120KVA (Each Power module shall be ≤ 25 KVA)	Each	1464409
5.2.9	160KVA (Each Power module shall be ≤ 25 KVA)	Each	1958639
5.2.10	200KVA (Each Power module shall be ≤ 50 KVA)	Each	2375417
5.2.11	300KVA (Each Power module shall be ≤ 50 KVA)	Each	3963347
5.2.12	400KVA (Each Power module shall be ≤ 50 KVA)	Each	5130901
5.2.13	500KVA (Each Power module shall be ≤ 50 KVA)	Each	6183283

Code No.	Description	Unit	Rate (₹)
6.1	Supply, installation, Testing & Commissioning of 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of KVA as below, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings: **(A) Diesel Engine:** Turbocharged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for above output of alternator at 40 Degree C, 50% RH & at 1000 Meter MSL , capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528.The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications. (B) Engine mounted Instrument Panel fitted with and having digital display for following: (i) Start-stop switch with key (ii) Water temperature indication (iii) Lubrication oil pressure indication (iv) Lubrication oil temperature indication (v) Battery charging indication and Voltage indication (vi) RPM indication (vii) Over speed indication (viii) Low lubricantion Oil trip indication (ix) Engine Running Hours indication (x) Fuel Level **(C) Alternator:** Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty, dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled,self-excited and self-regulated through AVR conforming to IS13364(Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation. **(D) Base Frame & Foundation:** Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.		

(E) FUEL TANK:
Daily service fuel tank of suitable liters capacity as per CPWD Specifications, fabricated out of 3 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications.

(F) Exhaust System:
Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.

(G) Starting System:
12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set.

(H) Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications.

(I) AMF Panel:
Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reative Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminum) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following:

1. Suitable numbers and appropriate capacity 4 pole motorised electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip.
2. Auto/Manual/Test/Off selector switch
3. Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay).

Code No.	Description	Unit	Rate (₹)
	4. 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering 5. Energy analyser unit to indicate current, Voltage(L-N & L-L), kW, kVA (Phase & Total), Frequency, KWH, PF. 6. LED Indicating lamps for load on mains and load on set. 7. Fuse/ MCB for instruments. 8. Battery charger, complete with transformer/ rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment. 9. Main supply failure monitor. 10. Supply failure timer. 11. Restoration timer 12. Control unit with three impulse automatic engine start/stop and failure to start lockout. 13. Impulse counter with locking and reset facility. 14. ON/OFF/Control circuit switch with indicator 15. Audio/Video annunciation for (i) High water temperature (ii) Low lubricating oil pressure (iii) Engine over speed (iv) Engine fails to start (v) Full load/maximum load warning 16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories 17. Maintenance notification based on Engine Run Hour & due date. 18. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel , interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring.		
6.1.1	25KVA	Each	382946
6.1.2	35KVA	Each	423976
6.1.3	40KVA	Each	506036
6.1.4	50KVA	Each	536808
6.1.5	62.5KVA	Each	567581
6.1.6	82.5KVA	Each	704347
6.1.7	100KVA	Each	820599
6.1.8	125KVA	Each	841114
6.1.9	160KVA	Each	1187133
6.1.10	200KVA	Each	1470239
6.1.11	250KVA	Each	1777964
6.1.12	320KVA	Each	2325029
6.1.13	380KVA	Each	2701137
6.1.14	400 KVA	Each	2803712
6.1.15	500KVA	Each	3282395
6.1.16	625KVA	Each	4786825
6.1.17	750KVA	Each	6086107

Code No.	Description	Unit	Rate (₹)
7.1	**OUTDOOR UNIT**		
	Supply, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual seperate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condensor fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius. The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 5.4, Capacity $\geq$ 40 and <70 ISEER 5.5, Capacity $\geq$ 70 ISEER 5.6 for ECSBC Building)		
	For Cooling or Heating or Both		
7.1.1	6 HP to 8 HP	Per HP	20947
7.1.2	10 HP to 12 HP	Per HP	20083
7.1.3	14 HP to 22 HP	Per HP	19111
7.2	Supply, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s),minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius.The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the		

surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 6.4, Capacity > 40 and <70 ISEER 6.5, Capacity > 70 ISEER 6.6 for ECSBC+ Building)

For Cooling or Heating or Both

7.2.1	6 HP to 8 HP	Per HP	22343
7.2.2	10 HP to 12 HP	Per HP	21422
7.2.3	14 HP to 22 HP	Per HP	20385

7.3 Supply, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s),minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius.The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity > 70 ISEER 7.6 for Super ECSBC Building)

For Cooling or Heating or Both

7.3.1	6 HP to 8 HP	Per HP	23740
7.3.2	10 HP to 12 HP	Per HP	22761
7.3.3	14 HP to 22 HP	Per HP	21659

7.4 **INDOOR UNIT**

Supply, Installation, Testing and Commissioning of following minimum capacity 4 way Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan /

Code No.	Description	Unit	Rate (₹)
	dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement in auto mode. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.4.1	0.8 TR	Each	22304
7.4.2	1.0 TR	Each	27880
7.4.3	1.2 TR	Each	38601
7.4.4	1.6 TR	Each	39464
7.4.5	2.0 TR	Each	39734
7.4.6	2.4 TR	Each	40814
7.4.7	2.6 TR	Each	40814
7.4.8	3.6 TR	Each	44269
7.4.9	4.1 TR	Each	45781
7.4.10	4.6TR	Each	52799
7.5	Supply, Installation, Testing and Commissioning of following minimum capacity 4-way compact VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.5.1	0.6 TR	Each	22610
7.5.2	0.8 TR	Each	25122
7.5.3	1.0 TR	Each	39410
7.5.4	1.2 TR	Each	39950
7.5.5	1.6 TR	Each	39950
7.6	Supply, Installation, Testing and Commissioning of following minimum capacity Single way wall/corner VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply,		

Code No.	Description	Unit	Rate (₹)
	complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.6.1	0.6 TR	Each	30233
7.6.2	0.8 TR	Each	30880
7.6.3	1.0 TR	Each	32392
7.6.4	1.2 TR	Each	42326
7.6.5	1.6 TR	Each	42326
7.6.6	2.0 TR	Each	43621
7.7	Supply, Installation, Testing and Commissioning of following minimum capacity Double way VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.7.1	0.6 TR	Each	44053
7.7.2	1.0 TR	Each	46861
7.7.3	2.0 TR	Each	57226
7.7.4	3.3 TR	Each	60541
7.7.5	4.2 TR	Each	64173
7.8	Supply, Installation, Testing and Commissioning of following minimum capacity **High wall type** Indoor unit equipped with and comfort washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V ± 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.8.1	0.6 TR	Each	16790
7.8.2	0.8 TR	Each	17276
7.8.3	1.0 TR	Each	17816
7.8.4	1.2 TR	Each	21595
7.8.5	1.6 TR	Each	22027
7.8.6	2.0 TR	Each	22674

Code No.	Description	Unit	Rate (₹)
7.9	Supply, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted low static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	Low static ductable units (minimum 19 to 29 pascal external static pressure)		
7.9.1	0.5 TR	Each	30233
7.9.2	0.6 TR	Each	30880
7.9.3	0.8 TR	Each	31204
7.9.4	1.03 TR	Each	31636
7.9.5	1.3 TR	Each	34444
7.9.6	1.6 TR	Each	34983
7.9.7	2.0 TR	Each	36063
7.10	Supply, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted mid static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	Mid static ductable units (minimum 30 to 48 pascal external static pressure)		
7.10.1	1.2 TR	Each	34336
7.10.2	1.6 TR	Each	34983
7.10.3	2.0 TR	Each	36063
7.10.4	2.4 TR	Each	37683
7.10.5	3.2 TR	Each	40166
7.11	Supply, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted mid high static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed		

Code No.	Description	Unit	Rate (₹)
	motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	High Static Ductable units (minimum 49 to 77 Pascal external static pressure)		
7.11.1	0.8 TR	Each	31510
7.11.2	1.03 TR	Each	32730
7.11.3	1.2 TR	Each	34514
7.11.4	1.6 TR	Each	34983
7.11.5	2.0 TR	Each	36063
7.11.6	2.4 TR	Each	37683
7.11.7	3.2 TR	Each	40166
7.11.8	4.0 TR	Each	45997
7.11.9	4.6 TR	Each	64568
7.12	Supply, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted high ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Signals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
7.12.1	High Static Ductable units (minimum 78 pascal external static pressure)		
7.12.2	5.5 TR	Each	74394
7.12.3	6.6 TR	Each	78065
7.12.4	8.0 TR	Each	85191
7.13	Supply, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs		
7.13.1	Indoor Units	Each	4535
7.13.2	Outdoor Multi Joint	Each	8098

Code No.	Description	Unit	Rate (₹)
	COPPER REFRIGERANT PIPING		
7.14	Supply, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :		
7.14.1	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	Mtr	256
7.14.2	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	Mtr	346
7.14.3	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	Mtr	487
7.14.4	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	Mtr	615
7.14.5	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	Mtr	739
7.14.6	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	Mtr	904
7.14.7	25.4 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	Mtr	1068
7.14.8	28.58 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	Mtr	1157
7.14.9	31.8 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm	Mtr	1222
7.14.10	34.9 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm	Mtr	1286
7.14.11	38.1 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm	Mtr	1322
7.14.12	41.27 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm	Mtr	1368

Code No.	Description	Unit	Rate (₹)
	WINDOW AC UNITS		
8.1	Supply, Installation, Testing and Commissioning of Window type Air conditioners complete with copper power cable upto 3 Mtr, wireless Remote, suitable for working between 180- 260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing, cooling, dehumidification, air circulation, R-32/R-410A /R-407B Green Refrigerant with Scroll / rotary compressor with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB), antifreeze thermostat on the coil as a safety feature, complete with fixing including T&P & labour etc as required complete in all respect as specified of following capacity. Sound level of up to 50dB inside the room is acceptable. The unit shall be in confirmation with IS 1391 Part-I 2023 and CPWD Specification. The system shall be able to deliver 100% of the rated capacity upto 42 Degree Celsius. The system shall be able to operate up to 50 0C (out door ambient temperature).		
	Non Inverter Type		
8.1.1	1.0 TR with fixed speed 5 Star BEE rating	Each	31023
8.1.2	1.5 TR with fixed speed 5 Star BEE rating	Each	34502
	Inverter Type		
8.1.3	1.0 TR with Inverter 5 Star BEE rating	Each	32495
8.1.4	1.5 TR with Inverter 5 Star BEE rating	Each	34407
	HI - WALL SPLIT SYSTEMS		
8.2	Supply , Installation, Testing and Commissioning of Air Cooled Hi Wall split type Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 3 Mtr (IDU to ODU), copper power cable upto 3.5 Mtr (IDU to ODU) i/c drain pipe R-32/R-410/ R-407 Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary compressor. The system shall be able to deliver 100% of the rated capacity upto 42 Degree Celsius. Min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). Must comply : Electrical cable IS 694 or IS 9968 temperature sensing control IS /International Electro technical Commission (IEC) 60730, hermetic compressor IS 10617, heat exchanger IS 11329, capacitor IS 2993 and motor IS 12615. Complete as per CPWD specification and IS : 1391 Part II 2023. The system shall be able to operate up to 50 0C (out door ambient temperature).		
	Inverter Type - Cooling only		
8.2.1	0.75 TR with 5 Star BEE Rating	Each	37762
8.2.2	1.0 TR with 5 Star BEE Rating	Each	39196

Code No.	Description	Unit	Rate (₹)
8.2.3	1.5 TR with 5 Star BEE Rating	Each	42055
8.2.4	2.0 TR with 5 Star BEE Rating	Each	55440
	Inverter Type - Hot & Cold		
8.2.5	1.0 TR with 3 Star BEE Rating	Each	34981
8.2.6	1.5 TR with 3 Star BEE Rating	Each	41959
	DUCTABLE TYPE SPLIT UNITS		
8.3	Supply, Installtion, Testing and Commissioning of air cooled ducted split type air conditioning machine with each having a capacity and details as mentioned below suitable for operation on R 32/R-410A /R-407 Green refrigerant comprising of Scroll type compressor hermetically sealed complete with automatic capacity, safety switches, lubrication system with min 5 year (OEM) warranty for both compressor and Printed Circuit Board (PCB) , Suitable capacity squirrel cage induction motor having class 'B' insulation suitable for operation on 415 + 10% volts, 50 Hz, A.C. supply for Blower motor, Necessary drive arrangement for blower motor, Matching Air cooled condenser with necessary fittings for refrigerant piping connections, necessary structural support for mounting condensers, Microprocessor based control panel complete with accessories, machine Isolation / disconnect switch, valves and accessories to inter connect compressor and condenser including pressure testing, vacuum. Necessary starters suitable for Indoor & outdoor unit complete with O/L ,U/V, phase reversal protection, single phase preventors i/c copper conductor control and power cable and drain pipe of suitable size and length etc complete as required. The total cooling capacity/heating capacity of tested unit shall have a capacity as per relevant IS code. The lab testing reports as per IS: 8148 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per ISO/International Electro technical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification as required.		
	Inverter		
8.3.1	1.5 TR (BEE 4 Star Rated)	Each	49409
8.3.2	2.2 TR (BEE 4 Star Rated)	Each	56053
8.3.3	3.0 TR (BEE 4 Star Rated)	Each	76265
8.3.4	3.5 TR (3.2 EER)	Each	110093
8.3.5	4.0 TR (3.2 EER)	Each	124645
	Non Inverter		
8.3.6	1.0 TR (BEE 4 Star Rated)	Each	36121
8.3.7	1.5 TR (BEE 4 Star Rated)	Each	37805
8.3.8	2.0 TR (BEE 4 Star Rated)	Each	49259
8.3.9	2.5 TR (BEE 4 Star Rated)	Each	64194
8.3.10	3.0 TR (BEE 4 Star Rated)	Each	69434

Code No.	Description	Unit	Rate (₹)
8.3.11	3.5 TR (3.2 EER)	Each	76452
8.3.12	4.0 TR (3.2 EER)	Each	84874
8.3.13	4.5 TR (3.2 EER)	Each	98711
8.3.14	5.5 TR (3.2 EER)	Each	107520
8.3.15	8.5 TR (3.2 EER)	Each	142518
8.3.16	11.0 TR (3.2 EER)	Each	183317
8.3.17	16.7 TR (3.2 EER)	Each	283538
	CASSETTE TYPE SPLIT UNITS		
8.4	Supply, Installation, Testing and Commissioning of Air Cooled Cassette type Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), R-32/R410A/R-407 Green Refrigerant, wireless Remote, inbuilt drain pump, suitable for 400/230V, 50 Hz ,1 /3 phase AC supply, including surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5.5 Mtr (IDU to ODU), copper power and control cable upto 5.5 Mtr (IDU to ODU) including drain pipe, the system shall be capable of performing cooling, dehumidification, Air circulation, filtration & ventilation of following capacity with Scroll/rotary compressor with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB) as specified. The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electro technical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required.		
	Inverter Type- Cooling only		
8.4.1	1.5 TR with 5 Star BEE Rating	Each	67095
8.4.2	2.0 TR with 5 Star BEE Rating	Each	74300
8.4.3	2.5 TR with 5 Star BEE Rating	Each	102373
8.4.4	3.0 TR with 5 Star BEE Rating	Each	107192
8.4.5	3.5 TR with 5 Star BEE Rating	Each	120995
8.4.6	4.0 TR with 5 Star BEE Rating	Each	123241
	Heating & Cooling		
8.4.7	1.5 TR with 3 Star BEE Rating	Each	52122
8.4.8	2.0 TR with 3 Star BEE Rating	Each	58111
8.4.9	2.5 TR with 3 Star BEE Rating	Each	69996
	TOWER TYPE SPLIT UNITS		
8.5	Supply, Installation, Testing and Commissioning of Air Cooled Floor standing Tower type split Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with		

insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5 Mtr (IDU to ODU), copper power cable upto 5.5 Mtr (IDU to ODU), i/c drain pipe of suitable length and size. R-32/R-410/R-407C Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). as specified. The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electro technical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required.

Heating & Cooling

8.5.1	3.3 TR BEE 4 Star Rating	Each	109323
8.5.2	3.8 TR BEE 4 Star Rating	Each	115622
8.5.3	4.6 TR BEE 4 Star Rating	Each	121920

Cooling Only

8.5.4	2.4 TR BEE 5 Star Rating	Each	81131
8.5.5	3.3 TR BEE 5 Star Rating	Each	90208
8.5.6	3.8 TR BEE 5 Star Rating	Each	95355
8.5.7	4.6 TR BEE 5 Star Rating	Each	100782

AIR COOLED PACKAGE UNITS

8.6 Supplying, installation , testing and commissioning of Air cooled ductable type Packaged air-conditioning units complete with Hermetically sealed Scroll compressors fitted inside the indoor unit & first charge of refrigerant R410A or equilant permitted green refrigerant & oil ,air cooled condenser, fan section with statically/dynamically balanced centrifugal blower driven by a Totally Enclosed Fan Cooled (TEFC) squirrel cage three speed motor, Multi rows cooling coil of copper with aluminum fins etc. The enclosures shall be fabricated of M.S. The Package unit shall be equipped with synthetic fiber filter, insulated drain pan, controls all encased in a unit. The casing shall be factory powder coated. Electrical panel board for Package units shall comprise of control and power panel with including all associries i/c Voltage scanner, overload, low voltage, high voltage & phase imbalance protection, along with VI Pads complete with all ancillaries including MS painted stand for Outdoor units of suitable size, foundation and allied minor civil works as per instructions of Engineer-in-charge of following ratings including electric control panel & fitting as per CPWD specifications and as per IS: 8148 complete as required.

Code No.	Description	Unit	Rate (₹)
	Inverter		
8.6.1	5.0 TR (2.8 EER)	Each	126329
8.6.2	8.0 TR (2.8 EER)	Each	170778
8.6.3	11.0 TR (2.8 EER)	Each	206679
8.6.4	16.5 TR (2.8 EER)	Each	289459
8.6.5	22.0 TR (2.8 EER)	Each	378447

Code No.	Description	Unit	Rate (₹)
	AIR COOLED CHILLERS		
	AIR COOLED SCREW CHILLERS		
9.1	Supply, installation, testing and commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled (suitable for out door installation) Screw Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, screw type compressor each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel compatible for BMS operation, motor, starter panel (VFD), machine mounted, air- cooled condensers with Copper tube and Aluminum fins, factory fitted chiller insulation, water flow switch, vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-134A. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser air entering temp. : As per Site Dry Bulb Temperature Suitable for Seismic Zone and Altitude as per location/site.		
9.1.1	Upto 74 TR BEE 3 Star rated	Per TR	28073
9.1.2	75 TR - 140 TR BEE 3 Star rated	Per TR	27137
9.1.3	141 TR - 200 TR BEE 3 Star rated	Per TR	25734
9.2	Supply, installation, testing and commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled Screw Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, multiple screw type compressor each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers with Copper tube and Aluminum fins, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with multiple circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-134a. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.		

Code No.	Description	Unit	Rate (₹)
	Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser air entering temp. : As per Site Dry Bulb Temperature Suitable for Seismic Zone and Altitude as per location/site.		
9.2.1	upto 200 TR - BEE 4 Star Rated	Per TR	29009
9.2.2	201 TR to 250 TR BEE 4 Star Rated	Per TR	26669
9.2.3	251 TR - 300 TR BEE 4 Star Rated	Per TR	25266
9.2.4	301 TR - 350 TR BEE 4 Star Rated	Per TR	24330
9.2.5	351 TR - 400 TR BEE 4 Star Rated	Per TR	23394
	AIR COOLED SCROLL CHILLERS		
9.3	Supply, installation, testing and commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled , Scroll Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic,multiple scroll type compressors each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-410A. The chiller shall be Building Management System (BMS) compatible. The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser air entering temp. : As per Site Dry Bulb Temperature Suitable for Seismic Zone and Altitude as per location/site.		
9.3.1	Upto 50 TR BEE 4 Star Rated	Per TR	22926
9.3.2	51 TR - 70 TR BEE 4 Star Rated	Per TR	22458
9.3.3	71 TR - 100 TR BEE 4 Star Rated	Per TR	21991
9.4	Supply, installation, testing and commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled Scroll Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, multiple scroll type compressors each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety controls mounted in central		

	console panel and i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-410A. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser air entering temp. : As per Site Dry Bulb Temperature Suitable for Seismic Zone and Altitude as per location/site.		
9.4.1	upto 50 TR BEE 3 Star Rated	Per TR	21991
9.4.2	51 TR - 70 TR BEE 3 Star Rated	Per TR	20587
9.4.3	71 TR - 100 TR BEE 3 Star Rated	Per TR	20119

WATER COOLED CHILLERS

WATER COOLED SCREW CHILLERS

9.5	Supply, installation, testing and commissioning of floor-mounted AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled screw-type chiller machine complete with VFD (Variable Frequency Drive), single/multi semi-hermatic twin screw type compressor, water-cooled Shell & Tube type condenser, Shell & Tube horizontal flooded type evaporator with carbon steel shell and seamless copper tubes with 19 mm nitrile rubber insulation i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, interconnected copper refrigerant piping and wiring, vibration Isolators, gauge panel, automatic safety controls, flow switch at evaporator and condenser and ozone friendly Chlorofluorocarbons (CFC)-free refrigerant gas R-134A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 PSI and hydraulically tested at 1.3 times of design pressure . A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Suitable for Seismic Zone and Altitude as per location/site.		
9.5.1	Upto 70 TR BEE 3 Star Rated	Per TR	19183
9.5.2	71 TR - 110 TR BEE 3 Star Rated	Per TR	16844
9.5.3	111 TR - 150 TR BEE 3 Star Rated	Per TR	16844
9.5.4	151 TR - 210 TR BEE 3 Star Rated	Per TR	16844

Code No.	Description	Unit	Rate (₹)
9.5.5	211 TR - 260 TR BEE 3 Star Rated	Per TR	16376
9.5.6	261 TR - 300 TR BEE 3 Star Rated	Per TR	15908
9.5.7	301 TR - 450 TR BEE 3 Star Rated	Per TR	14972
9.5.8	451 TR -600 TR BEE 3 Star Rated	Per TR	14504
9.6	Supply, Installation, Testing and Commissioning of floor-mounted AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified VFD (Variable Frequency Drive) Operated water cooled screw-type chiller machine complete with single/multi semi-hermatic twin screw type compressor, with independent circuits, water-cooled Shell & Tube type condenser, Shell & Tube horizontal flooded type evaporator with carbon steel shell and seamless copper tubes with 19 mm nitrile rubber insulation i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, common base frame, interconnected copper refrigerant piping and wiring, vibration Isolators, gauge panel, automatic safety controls, flow switch at evaporator and condenser and ozone friendly Chlorofluorocarbons (CFC)-free refrigerant gas R-134A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 psig and hydraulically tested at 1.5 times of design pressure . A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Suitable for Seismic Zone and Altitude as per location/site.		
9.6.1	Upto 74 TR BEE 4 Star Rated	Per TR	20587
9.6.2	75 TR - 150 TR BEE 4 Star Rated	Per TR	19651
9.6.3	151TR - 300 TR BEE 4 Star Rated	Per TR	17780
9.6.4	301TR - 450 TR BEE 4 Star Rated	Per TR	16844
9.6.5	451 TR - 525 TR BEE 4 Star Rated	Per TR	14972
9.6.6	526 TR - 600 TR BEE 4 Star Rated	Per TR	14037
9.7	Supply, installation, testing and commissioning of floor-mounted Variable Frequency Drive (VFD) water cooled scroll-type chiller machine complete with hermatic scroll type single/ multi compressors with independent circuits, water-cooled carbon steel shell, seamless copper tubes condenser and evaporator with 19 mm nitrile rubber insulation, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, gauge panel, automatic safety controls, flow switch at evaporator and condenser and		

ozone friendly Chlorofluorocarbons (CFC)-free refrigerant gas R-410A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 psig and hydraulically tested at 1.5 times of design pressure. A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser water Entering Temp. (32.2 deg. C)
Condenser water Leaving Temp. (36.4 deg. C)
Suitable for Seismic Zone and Altitude as per location/site.

9.7.1	Upto 40 TR BEE 3 Star Rated	Per TR	22926
9.7.2	41 TR - 75 TR BEE 3 Star Rated	Per TR	22458
9.7.3	76 TR - 150 TR BEE 3 Star Rated	Per TR	21991

WATER COOLED CENTRIFUGAL CHILLERS

9.8 a) Supplying, Installation, Testing & Commissioning of Centrifugal Water Cooled Chilling Machine Air-Conditioning, Heating, and Refrigeration Institute (AHRI) certified complete with factory fitted (unit mounted/ free standing) (Variable Frequency Drive (VFD)) with active harmonic filter with IP54 protection having actual capacity as below. The scope of work shall include Lifting, shifting & positioning of the equipment at location shown on the drawing. Chiller given hereunder, comprising of following and complete as per specification/drawings and as directed by Engineer-in-charge. - Chilled water inlet temperature of 12.2°C (54°F) & Chilled water outlet temperature 6.7°C (44°F) with chilled water circulation, Evaporator side fouling factor 0.018 m².°C /kW - Condenser water inlet temperature Inlet - 32.2°C (90°F) & condenser water outlet temperature of 36.4°C (97.5°F) with water circulation, Condenser side fouling factor 0.044 m². ºC/Kw.

b) Open/ Semi-Hermetic/ Fully hermetic Centrifugal Compressor complete with automatic capacity control system, safety switches, speed increasing mechanism, forced feed lubrication system etc. as per detailed specifications and compressor extended warranty of 1 year for refrigerant leakage & mechanical seal.

c) Suitable capacity TEFC/SPDP Squirrel Cage Induction Motor with enclosure IP 23/ as per Original Equipment Manufacturer (OEM) standard & class 'F' insulation suitable for operation on 415±10% Volt, 3 Phase, 50 HZ, AC Supply. Vendor must provide Junction box along with each set of unit including cable works from junction box to chiller.

d) Unit Mounted/ Free standing IP-54 protection (UL /EN certified) Variable Frequency Drive (VFD) Starter panel with air Cooled/ Refrigerant Cooled or as per Original Equipment Manufacturer (OEM) standard, suitable for

compressor motor, complete having over-load protection, under-voltage protection, protection against phase reversal, current sensing independent single phasing protection etc. including multi-function meter and CTs, complete as per detailed specifications. Variable Frequency Drive (VFD)s shall comply with International Electro technical Commission (IEC) 61800-3 & have THD less than 5% at all Loads Active / passive filters must be use to achieve desired THD levels and other parameters as per IEEE - 519. Variable Frequency Drive (VFD)s shall be compatible for Modbus/BACnet Protocols. The power factor shall be > 0.95 at all loads. Original Equipment Manufacturer (OEM) shall ensure quality for each set of chiller & Variable Frequency Drive (VFD) before dispatch. Chiller performance parameters shall be as per IS 16590 and BEE star labeling. The chiller shall be Building Management System (BMS) compatible.

e) Lubrication Device consisting of automatic electric oil pump, oil cooler, head tank, oil strainer, automatic pressure regulating valve, oil heater, thermal switch etc, as per detailed specifications and as required.

f) Matching Shell and Tube Water Cooled Condenser of M.S. Shell and integrally finned Copper Tubes, 2 pass heat exchanger. The Condenser shall have U- stamping / PED Certification. **Note- In case of R514a refrigerant, the relaxation on U stamping is applicable only after providing proper justification / proof documentation from Original Equipment Manufacturer (OEM) .**

g) Matching Shell and Tube Flooded type Chiller for centrifugal unit consisting of MS Shell and Copper Tubes, 2 pass Heat Exchanger, duly insulated at factory complete as per specifications and as required. The Evaporator shall have U- stamping.

h) Refrigerant Line Accessories comprising of safety valves, angle valve, liquid line indications, liquid level control, liquid line Isolation valve, etc. OR as per Original Equipment Manufacturer (OEM) design standard complete as per specifications.

i) DP/ Water Flow Switches at inlet and outlet of the condenser & chiller, water drain & air purge valves wherever required, complete as per specifications.

j) Suction Line and Chiller Insulation with minimum 19mm thick elastomeric nitrile rubber insulation complete as required from factory.

k) Foundation Frame Work for mounting the above condenser, chiller, compressor and motor with base plate, panel complete with anti-vibration pads (set of spring type), vibration isolators with Isolation efficiency more than 90%. Numbers shall be as per Original Equipment Manufacturer (OEM) standards.), complete as per specifications.

l) Initial/ First Charge of Refrigerant Gas and Compressor Oil.

m) Chiller shall be factory tested at 25%, 50%, 75% and 100% load at Constant Condenser Water inlet at AHRI test bed.

n) Each chiller shall be provided with set of grooved coupling along with the chiller for cooler and condenser inlet / outlet connection.

o) Chiller Original Equipment Manufacturer (OEM) shall provide undertaking in the name of end user for providing support for maintenance & spare availability for next 15 yrs from the date of Handover.

p) Software Selection Sheet to be Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Certified based on latest version. Which can be varified online through AHRI website.

q) Sound performance shall be as per relevant AHRI for all loads. This data shall be provided as apart of chiller technical submittal.

Suitable for Seismic Zone and Altitude as per location/site.

9.8.1	300 TR - 450 TR BEE 3 Star Rated	Per TR	25266
9.8.2	451 TR - 600 TR BEE 3 Star Rated	Per TR	24798
9.8.3	601 TR - 1000 TR BEE 3 Star Rated	Per TR	24330
9.8.4	1001 TR - 1600 TR BEE 3 Star Rated	Per TR	23862
9.8.5	1601 TR - 2000 TR BEE 3 Star Rated	Per TR	23862

WATER COOLED MAGNETIC CENTRIFUGAL CHILLERS

9.9 Supply, installation, testing & commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled Magnetic centrifugal type chiller machine complete with hermatic single/ multi compressors with independent circuits, with R-134A or equivalent refrigerant, complete with single Semi/hermetically sealed refrigerant cooled motor of working on 415 + 10% volts, 3 Phase, 50 Hz AC supply. Shell & tube flooded chiller & condenser with descaling & drain valves, victaulic /Flange coupling on condenser & evaporator, microprocessor panel for multiple start ups, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, electrical termination suitable for aluminum conductors along with thermal insulations anti vibration pads, flow switch and required accessories etc, Movable diffuser, Sight Glass at evaporator, Liquid line Isolation valves, Liquid Crystal Display (LCD) Human Machine Interface (HMI) . complete as per specifications and drawings. Complete with first charge of Refrigerant (Preferably at factory charge) .
Starter shall be Variable Frequency Drive (VFD) type and shall be Unit Mounted/ Floor Mounted ≥IP42 (UL Listed / CE Marked). Each Compressor shall be equipped with Suitable capacity Permanent Magnet Motor with class 'F' Insulation suitable for operation on 415 +/- 10% volts, 50 HZ, A.C. Supply. Chillers shall be factory AHRI tested at design conditions at 100%, 75%, 50% and 25% load respectively; test certificates shall be produced for all chillers.

Code No.	Description	Unit	Rate (₹)
	The chiller shall be Building Management System (BMS) compatible and shall have RS485/RS232 serial communication protocol; the motor shall be suitable for 3- Phase, 415 V ± 10%, 50 Hz AC electric supply. The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. 0C/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Condenser fouling factor = 0.044 m2. ºC/kW Suitable for Seismic Zone and Altitude as per location/site		
9.9.1	121 TR - 150 TR BEE 3 Star Rated	Per TR	27605
9.9.2	151 TR - 300 TR BEE 3 Star Rated	Per TR	22458
9.9.3	301 TR - 450 TR BEE 3 Star Rated	Per TR	21991
9.9.4	451 TR - 600 TR BEE 3 Star Rated	Per TR	20213
9.10	Supply, installation, testing & commissioning of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled Magnetic centrifugal type chiller machine complete with hermatic single/ multi compressors with independent circuits, with R-134A or equivalent refrigerant, complete with dual Semi/hermetically sealed refrigerant cooled motor of working on 415 + 10% volts, 3 Phase, 50 Hz AC supply. Shell & tube flooded chiller & condenser with descaling & drain valves, victaulic /Flange coupling on condenser & evaporator, microprocessor panel for multiple start ups, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, electrical termination suitable for aluminum conductors along with thermal insulations anti vibration pads, flow switch and required accessories etc, Movable diffuser, Sight Glass at evaporator, Liquid line Isolation valves, Liquid Crystal Display (LCD) Human Machine Interface (HMI). complete as per specifications and drawings. Complete with first charge of Refrigerant (Preferably at factory charge) . Starter shall be Variable Frequency Drive (VFD) type and shall be Unit Mounted/ Floor Mounted ≥IP42 (UL Listed / CE Marked). Each Compressor shall be equipped with Suitable capacity Permanent Magnet Motor with class 'F' Insulation suitable for operation on 415 +/- 10% volts, 50 HZ, A.C. Supply. Chillers shall be factory AHRI tested at design conditions at 100%, 75%, 50% and 25% load respectively; test certificates shall be produced for all chillers. The chiller shall be Building Management System (BMS) compatible and shall have RS485/RS232 serial communication protocol; the motor shall be suitable for 3- Phase, 415 V ± 10%, 50 Hz AC electric supply. The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.		

Code No.	Description	Unit	Rate (₹)
	Chilled water Leaving Temp. (6.67deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. 0C/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Condenser fouling factor = 0.044 m2. ºC/kW Suitable for Seismic Zone and Altitude as per location/site.		
9.10.1	120 TR - 210 TR BEE 4 Star Rated	Per TR	29945
9.10.2	211 TR - 300 TR BEE 4 Star Rated	Per TR	27137
9.10.3	301 TR - 355 TR BEE 4 Star Rated	Per TR	23862
9.10.4	356 TR - 450 TR BEE 4 Star Rated	Per TR	21991
9.10.5	451 TR - 600 TR BEE 4 Star Rated	Per TR	21897

CHAPTER-10- COOLING TOWERS

Code No.	Description	Unit	Rate (₹)
10.1	**COOLING TOWER** Supply, Installation, testing and commissioning of Induced Draft counter flow cooling Towers(CTI approved). The Cooling Tower shall be of Fiber Reinforced Plastic (FRP) Construction. The casing, basin/sump, fan deck and fan cylinder shall be of FRP, with direct driven fans, Galvanized hardware complete with sump and drain connection with suitable valve, PVC Honey comb fill, louvers, drift eliminator complete with spray nozzle having self rotating sprinklers, steel ladder, Isolating switch and other accessories to make it fully operational and maintaince National Accreditation Board for Testing and Calibration Laboratories (NABL) & positioning of cooling tower at Terrace of Building. Propeller Type Fan, weather proof IP 55 and Direct driven. The fan motor shall be premium efficiency IE3 class , as per IS 12615 The Cooling tower shall be capable to communicate effectively with Building Management System (BMS). Range of CT: 6 deg C. Designed Duty Conditions :-EWT, LWT, D/WBT Complete as per CPWD specification / drawings and as directed by Engineer-in-charge. (Note - Cooling tower size depends on the ambient temperature conditions , contractor must check the required design temperature).		
10.1.1	300 GPM	Each	320033
10.1.2	450 GPM	Each	427148
10.1.3	600 GPM	Each	597021
10.1.4	750 GPM	Each	800884
10.1.5	900 GPM	Each	931092
10.1.6	1050 GPM	Each	1021370
10.1.7	1200 GPM	Each	1179071
10.1.8	1350 GPM	Each	1246446
10.1.9	1500 GPM	Each	1373711
10.1.10	1800 GPM	Each	1691873
10.1.11	2100 GPM	Each	1916501
10.1.12	2400 GPM	Each	2276196
10.1.13	2700 GPM	Each	2383197
10.1.14	3000 GPM	Each	2549102

Code No.	Description	Unit	Rate (₹)
11.1	**CEILING SUSPENDED AHU**		
	Supply, Installation, testing and commissioning of Factory built ceiling suspended chilled water double skin type horizontal/vertical air handling units of following capacity, made of 25mm thick panels consisting of pre plasticized G.I. casing of thickness 0.8mm outside layer and 0.8 mm inside layer with Polyurethane Foam (PUF) insulation factory injected between them by injection moulding machine, complete with blower section with blower suitable for static pressure as required, minimum 2 bend PVC eliminators, cooling coil section with aluminum finned copper tubes (tubes thickness not less than 0.5mm) cooling coil of 4 row deep, filter section with 50mm thick metal viscous/ washable synthetic type air prefilters, belt drive package with Totally Enclosed Fan Cooled (TEFC) drive motor of efficiency class IE3 suitable for 415 ± 10% volts, 50Hz, 3 Phase AC supply suitably designed for Variable Frequency Drive (VFD) applications, drain connections, stainless steel (18G) drain pan with PUF insulation, 150 mm dia. dial type pressure gauges (2 nos.)and industrial type thermometers (2 nos.) and industrial type thermometers (2 nos.) at the inlet and outlet of coil, auto purge valve wherever required, necessary vibration Isolation arrangement, noise level shall not exceed 70 dBA. AHU shall be AHRI/Eurovent certified, fan shall be AMCA certified etc. Complete as per CPWD specification/drawings and as directed by Engineer-in-Charge. (Total static pressure considered is max. 50 mm WC).		
11.1.1	1000 CFM	Each	64662
11.1.2	1600 CFM	Each	75330
11.1.3	2000 CFM	Each	80476
11.1.4	2500 CFM	Each	91705
11.1.5	3000 CFM	Each	101063
11.1.6	4000 CFM	Each	116036
11.1.7	5000 CFM	Each	142237
11.1.8	6000 CFM	Each	160017
11.1.9	8000 CFM	Each	198383
11.1.10	10000 CFM	Each	254530
11.1.11	12000 CFM	Each	305997
11.2	**FCU (FAN COIL UNIT)**		
	DUCTABLE FAN COIL UNIT		
	Supply, installation ,testing and commissioning of Ceiling Concealed Fan Coil Unit comprising of 3 rows deep chilled water cooling coil, centrifugal blowers, fractional horse power (FHP) motor, synthetic fibre filters, insulated & extended condensate drain pan along with L-type auxillary tray, casing, coil piping connections, condensate drain piping connections & wiring. Fan coil units shall be suitable for operation on 220 +/- 6% Volts, 50Hz, single phase power supply of following sizes & capacities. Complete as per CPWD specification and as directed by Engineer-in-charge.		

Code No.	Description	Unit	Rate (₹)
11.2.1	3.0 TR nominal capacity with 1200 CFM air quantity.	Each	23114
11.2.2	2.5 TR nominal capacity with 1000 CFM air quantity.	Each	21336
11.2.3	2.0 TR nominal capacity with 800 CFM air quantity.	Each	18341
11.2.4	1.5 TR nominal capacity with 600 CFM air quantity.	Each	16002
11.2.5	1.0 TR nominal capacity with 400 CFM air quantity.	Each	14130
11.3	**CASSETTE FAN COIL UNIT**		
	Supply, installation, testing and commissioning of Chilled Water Ceiling Suspended Hydronic Cassette type fan coil unit, four(4) way directional flow, low noise, each complete with two(2) rows of deep chilled water cooling coil, multi-blade centrifugal fan, test reports from National Accreditation Board for Testing and Calibration Laboratories (NABL)/AHRI accredited lab, electronic air cleaning system, required set of ball valves with & without strainers & 2 way Motorized valve, insulated condensate drain pans with drain pump assembly & drain pump failure alarm, pipe connections through copper pipes, Infra-red remote control, Liquid Crystal Display (LCD), four (4) speed motor , fan four(4) direction air flow, auto swing louver, decorative panel etc., condensation drain connections, All units shall be suitable for 220 +/- 10% Volts, 50 Hz, single phase power supply etc. complete as per specification. The wireless Remote temperature control / thermostat shall have memory back up for set point re-store in case of power failure and re-start. Four(4)hanger rods with required anchoring fasteners, hooks, washers etc.complete as per CPWD specification and as directed by Engineer-in-charge.		
11.3.1	4.0 TR nominal capacity with 1600 CFM air quantity.	Each	46817
11.3.2	3.5TR nominal capacity with 1400 CFM air quantity.	Each	43512
11.3.3	3.0 TR nominal capacity with 1200 CFM air quantity.	Each	24049
11.3.4	2.5 TR nominal capacity with 1000 CFM air quantity.	Each	21897
11.3.5	2.0 TR nominal capacity with 800 CFM air quantity.	Each	16844
11.3.6	1.5 TR nominal capacity with 600 CFM air quantity.	Each	14411
11.3.7	1.0TR nominal capacity with 400 CFM air quantity.	Each	13569
11.4	**HIGH WALL FAN COIL UNIT**		
	Supply, installation ,testing and commissioning of High wall Fan Coil Unit comprising of two 2 rows deep chilled water cooling coil, centrifugal blowers, fractional horsepower (FHP) motor , synthetic fibre filters, insulated & extended condensate drain pan, casing, coil piping connections, condensate drain piping connections & wiring. Fan coil units shall be suitable for operation on 220 +/- 6% Volts, 50Hz, single phase power supply of following sizes & capacities. Complete as per CPWD specification and as directed by Engineer-in-charge.		
11.4.1	2.0 TR nominal capacity with 800 Cfm air quantity.	Each	24933
11.4.2	1.5 TR nominal capacity with 600 Cfm air quantity.	Each	21922
11.4.3	1.0 TR nominal capacity with 400 Cfm air quantity.	Each	17889

Code No.	Description	Unit	Rate (₹)
12.1	**EVAPORATIVE COOLING** Supply, Installation, Testing and Commissioning of factory assembled double skin central evaporative cooling plant having specifications as per A, B, C, D, E, F,G A. Air washer section comprising 50 mm thick pre-air filter made out from washable Aluminum wire mesh filter with 90 % down to 10 microns. B. Humidification section comprising of Wet pads 200 mm thick impregnated cellulose paper media (Celdec pads) of imported origin with two (2) bend PVC eliminator, internal casing with blank off's of wet section in SS-304 construction. C. Fan Section comprising of belt driven, Double Inlet Dounle Width (DIDW) backward curved fan with outlet velocity less than or equal to 10 m/s and minimum efficiency of 70% Air Movement & Control Association International (AMCA) certified centrifugal fan suitable for required cfm at 50 mm WC static pressure. D. Totally Enclosed Fan Cooled (TEFC) motor of IE-3 class as required with pulley, belt. E. The unit shall be fabricated with frame work hollow extruded aluminum profile with 0.80 mm precoated GSS on outside and on inside complete with 25 mm thick Chloroflouro Carbon (CFC) free Polyurthane Frame (PUF) insulation of minimum 40 kg/cum density sandwiched in between inner and outer skins, SS -304 (18 g) Sump tank, 25mm C-PVC piping, make up, drain & quick fill and drain connection, Butterfly/Gate valves for pumps, make up, drain & quick fill and drain connections of sump, 2 no. Pumps of suitable capacity and necessary fittings, stand, anti vibration pads etc.as required. F. Starter panel DOL/Star-Delta suitable for operation of Blower motor & pump made out of 1.6 mm thick sheet steel powder coated enclosure comprising of over load protection relay, short circuit & single phasing protection, ON / OFF push buttons, ammeter, voltmeter, indicating lamps, MCB, contactor etc. (As per Specification of CPWD & direction of Engineer-in-charge) complete in all respect. G. All as per pre approved by Engineer-in-charge.		
12.1.1	5000 CFM	Each	99192
12.1.2	8000 CFM	Each	131944
12.1.3	10000 CFM	Each	174053
12.1.4	12000 CFM	Each	206337
12.1.5	15000 CFM	Each	246108
12.1.6	20000 CFM	Each	345299
12.1.7	25000 CFM	Each	396767
12.1.8	30000 CFM	Each	483793

CHAPTER-13- AIR COOLED HEAT PUMP FOR HOT WATER

Code No.	Description	Unit	Rate (₹)
13.1	**AIR COOLED HEAT PUMP (FOR HOT WATER)**		
	Supply, installation , testing & commissioning of Heat pumps system for hot water using heat energy source from ambient air to Hot water, of High efficiency and energy saving operation, capable of heating water at 55º to 60º C with silent operation (the sound level should not exceed 65 dB). The Heat Pump shall have LCD display control panel with built in diagnostic and troubleshooting information and an inbuilt cycle for defrosting in case icing occurs on evaporator including all other mounting, fitting and controls, all interconnecting wiring/cabling between heat pump and electric panel etc complete in all respect with but not limited to following specifications. Power Supply V/Ph/Hz : 400~440V/3 PH/50Hz. Suggested Maximum output water temperature in Deg C : 55 º to 60º C, ambient temperature range in Deg C : -5 ºC~45 ºC , Type of Fan : Low Noise axial fan , Suggested Noise level: DBA <63 , COP: 3.0 to 4.0. Hot Water Storage Tank consisting of GI/MS/SS cylindrical shape clarifier tank. (inlet temperature of hot water storage tank 60- 65 deg.C) suitable for minimum 4 Kg /Sqm working pressure. Tank shall be provided with water flow meter, inlet / outlet, overflow, drain connection with MH cover, 6 mm thick tank, pressure relief valves, pressure gauge at inlet / outlet with isolation cock, thermometer at inlet / outlet, ball Valve, safety valve, check valve etc. The complete system to be tested to a pressure of 10 Kg/cm2 complete in all respects including temperature indicators, thermostat and other required accessories. Tank shall be insulated with 100 mm thick crown 150 grade & 50 mm rock wool pads of approved quality and cladded with 24 SWG aluminum sheet cladding.		
13.1.1	200 LPH	Each	112292
13.1.2	300 LPH	Each	149723
13.1.3	500 LPH	Each	196512

CHAPTER-14- SOLAR WATER HEATING SYSTEM

Code No.	Description	Unit	Rate (₹)
14.1	**SOLAR WATER HEATING SYSTEM (Evacuated Tube Collector)**		
	Supplying, installation, Testing, Commissioning of following capacity Evacuated Tube Collector (ETC) Solar Water Heating System comprising of all glass ETC tube absorber. The inner layer of absorber shall be of solar selected absorbing coated tube, Vacuum jacket, cover glass tube, getter and getter mirror surface, as per IS 16543. The system shall have temperature gauges, strainer, 2 nos. water meters, Suitable capacity cold and hot water tank, all MS structure for installation including suitable electric control panel complete with control and power wiring, necessary pluming including piping for cold and hot water line between tank and solar water system, water heater and thermostat including non-return valve, float valve and other valve etc. as required. The various component shall have following specification. 1. The Absorber area i.e. the number, dimension and thickness of solar evacuated tube as per IS: 16544 clause 5.4 and IS: 16543 clause 4.2 2. Boro Silicate Glass 3.3 for cover plate as per ISO: 3585 3. The material for three target coating shall be aluminum nitrate, aluminum nitrate stainless steel and copper multi layer selecting coating as per IS: 16543. 4. Manifold shall be of Mild steel section with PP coating and Inner material shall be of SS 304. 5. Recommended operating pressure:10 Bars. 6. The capacity of hot water tank shall be minimum 1.5 times the rated capacity system. Inner Material shall be Stainless Steel SS 316 b) as per IS 1730 grade SS304-2B (22SWG). The hot water tank shall be insulated with high density injected PUF insulation 50 mm thickness between inner and outer tank. Tank stand shall be of mild steel and shall be design to withstand wind velocity of 100km/hours (minimum) or more as per site. 7. Suitable nos. ISI Marked electrical heaters along control panel, MCCB, with all protections, and all safety provisions so as to achieve 60 ºC temperature rise in an hour. The range of thermostat shall be upto 80 ºC.		
14.1.1	100 LPD	Each	16477
14.1.2	200 LPD	Each	32378
14.1.3	300 LPD	Each	48351
14.1.4	500 LPD	Each	65835
14.2	**SOLAR WATER HEATER (FLAT PLATE TYPE COLLECTOR)**		
	Supply, Installation, Testing & Commissioning of Flat Plate collector (FPC) Solar Water Heating System comprising of solar flat plate collector ISI Marked made of copper sheet/copper tube, absorber toughened glass cover and aluminum extruded channel confirm to IS: 12933 (Part 1,2,3&5). The system shall have temperature gauges, strainer, water meter 2 nos., cold and hot water tank. The system shall have suitable electric backup complete with control and power wiring etc., as following.		

1. Cover plate: cover plate shall be toughened glass and thickness of 4.0 mm (min) conforming to section -1 of IS: 12933(pt-2)/2003 the solar transmittances of the cover plate shall be minimum 82 percent at near normal incidence.
2. Collector box: collector box shall be made of aluminum sections. The type grade, size, and finish of the material used shall be as per section-2 of IS: 12933 (pt-2)/2003: the minimum thickness of aluminum shall be as under:
   1. Channel section for sides 1.6 mm
   2. Sheet for bottom 0.7 mm
   3. Support for glass retaining 1.2 mm
   4. Sheet for entire body 1.0 mm

   The insulation of collector box shall be minimum 0.96 m2 ºC/W for back insulation and minimum 0.48 m square degree c/w for side insulation conform to sec. 4 of IS 12933 (pt – 2) / 2003. (b) Gaskets and grommets: gaskets and grommets shall conform to Sec. 5 of IS 12933 (pt-2)/ 2003.
3. Absorber Shall Consist of riser, Header and Sheet for absorber. The Diameter of header shall be 25.4 + /-0.5mm and thickness 0.71mm. The Diameter of riser shall be 12.7 + /-0.5 mm and thickness 0.56mm and made of copper only. The distance between the risers from center to center shall be 120mm. type grade, size , workmanship and finish of the material used shall be as per section- 3 of IS : 12933 (pt -2) /2003 the sheet for absorber shall be of copper sheet 34 gauge/copper tube (at least 10 nos.)
4. Riser and header assembly designed for working pressure up 245 k pa (2.5 kg/ cm square) shall be tested for leakage at a minimum hydraulic pressure of 490 k pa (5 kg/ cm square). Sheet for absorber shall be made of copper only. Type Grade, size, workmanship and finis of the material used shall be per Section -3 of IS: 12933 (pt -2) /2003.
5. HDPE/LDPE cold water tank and hot water tank shall be dully elected on MS angle /channel duly painted with dual coats of enamel paint. The overall structure of solar collector plate module shall be design to with stand wind velocity of 100 kms /hr (minimum) or more as per site.
6. Hot water tank : The tank capacity shall be minimum 1.25 time the rated capacity of system. Inner tank material shall be stainless steel SS 316, as per IS 1730 GRADE SS304-2B. Hot water shall be insulated with high density injected PUF insulation: 50 mm, of 50 mm thickness between inner and outer tank ensures maximum heat rotenone ever season.
7. Suitable nos. ISI Marked electrical heaters along control panel, MCCB, with all protections, and all safety provisions so as to achieve 60ºC temperature rise in an hour. The range of thermostat shall be upto 800C.

14.2.1	100 LPD	Each	20879
14.2.2	200 LPD	Each	41759
14.2.3	250 LPD	Each	48641
14.2.4	300 LPD	Each	62638
14.2.5	500 LPD	Each	104397

CHAPTER-15- ELECTRICAL VEHICLE CHARGER

Code No.	Description	Unit	Rate (₹)
15.1	Supply, Installation, Testing and commissioning of EV charging station As per specifications and in Compliance to relevant IS codes etc.		
15.1.1	**Light EV AC Charger (Mode-3)** Power : 7 kW, Input power supply: 1phase 230 +10% Volt, output supply: 230 Volt AC, Frequency:50 Hz +/-3%, Operational temperature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor)., RH upto 95%, Charging Device as per IS-17017-22-1 EV-EVSE Communication: as per relevant IS Codes, Bluetooth Low Energy, one Charge Point Plug/ Socket as per IS-60309 and IS-17017-2, Vehicle Inlet/ Connector As per EV manufacturer, suitable for 2 Wheelers and 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44. Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262.O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Separate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradable to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.	Each	23385
15.1.2	**Light EV DC Charger (Mode 4)** Power Level 1: Up to 7 kW, Input power supply: 1phase 230 +10% Volt/3phase 415 Volt, Frequency: 50 Hz +/-5%, output supply: 12/24 Volt DC. Operational temperature range : -25 to 55 degree C (outdoor), -5 to 55 degree C (Indoor), RH upto 95%, Charging Device as per IS-17017-25, EV-EVSE Communication:IS-17017-25, one Charge Point Plug/ Socket as per IS-60309 and IS-17017-2, Vehicle Inlet/ Connector As per EV manufacturer, suitable for 2 Wheelers and 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44.Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262.O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Separate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradable to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevant IS Codes.	Each	350914
15.1.3	**Parkbay AC Charger (Mode -3)** Power Level 2: Normal Power ~11kW/ 22 kW, 3 phase 415VAC(-40% to +20%), Frequency:50 Hz +/-5%, output supply: 240 Volt AC, Operational temperature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor), RH up to 95%, Charging Device as per IS-17017-1 EV-EVSE ISO-15118 for Smart Charging, Infrastructure Socket as per IS-17017-2-2, Vehicle Connector as per IS-17017-2-2 Vehicle Inlet/ Connector As per EV manufacturer, suitable for 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44.Mechanical Strength : protection of the external enclosure		

Code No.	Description	Unit	Rate (₹)
	against mechanical impact shall be IK08 according to IEC 62262. O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 . RCD having a rated residual operating current not exceeding 30 mA; Separate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradable to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.	Each	84219
15.1.4	**Parkbay DC Charger (Mode-3)** Power Level 2: Normal Power ~24KW and above, 3 phase 415VAC(-40% to +20%), Frequency:50 Hz +/-5%, output supply: DC 12/24 Volt, Operational temperature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor), RH upto 95%, Charging Device as per Device/protocol: IS-17017-23, EV-EVSE Communication as per IS-17017-24 ,ISO-15118, Infrastructure Socket as per IS-17017-2-2/3, Vehicle Connector as per IS-17017-2-3 Vehicle Inlet/ Connector As per EV manufacturer, suitable for 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44. Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262. O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Separate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradable to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevant IS Codes.	Each	888982

APPENDIX-I
BASIC RATE OF LABOUR & HIRE CHARGES

Code No.	Description	Unit	Rate (₹)
1001	Wireman	day	954
1002	Cable jointer	day	954
1003	Lineman	day	954
1004	Fitter, Grade 1	day	954
1005	Fitter, Grade 2	day	868
1006	Painter	day	868
1007	Khallasi	day	783
1008	Carpenter, Grade 1	day	954
1009	Blacksmith, Grade 2	day	868
1010	Mason, Grade 2	day	868
1011	Stone Chiseler	day	868
1012	Beldar / Coolie	day	783
1013	Bhisti	day	783
1014	Excavator	day	783
1015	Stone Breaker	day	868
1016	Mate	day	783
1017	Engineer	day	1500
1018	Highly Skilled	day	876
1019	Electrician	day	954
1020	Electronic Technician	day	954
1021	Technician	day	954
1022	Software Engineer	day	2100
1081	Hire charges for 5 ton truck	day	4000
1082	Hire charges for compressor and spray gun	day	350
1083	Drilling of 46 Nos 12 mm dia holes on G.I. pipe	L.S.	300
1084	Drilling holes	Each	6
1085	Solder jointing	Each	12
1086	Welding charges	mm	0.5
1087	Welder	day	954

Note:- **1) Labour rates are exclusive of contractor's profit and overheads and are inclusive of days for weekly day of rest.**

2) Hire charges:- These basic charges include cost of services of operating staff and supply of lubricating oil and diesel also etc.

Code No.	Description	Unit	Rate (₹)
	LED DOWN LIGHTS		
	LED Down lighter (SMD Type) (System lumen efficacy ≥ 105 < 120 lm/Watt)		
	Supplying of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5%), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C)		
	Powder coated die cast /Extruded aluminum Body including trim with Aluminum Reflector		
4201	5 - 7 watt	Nos	₹ 186
4202	8 - 10 watt	Nos	₹ 239
4203	12 -15 watt	Nos	₹ 299
4204	18 watt	Nos	₹ 434
4205	22 watt	Nos	₹ 467
4206	30 watt	Nos	₹ 775
	LED Down lighter (SMD Type) (System lumen efficacy ≥120 <135 lm/Watt)		
	Supplying of LED Recessed/surface Down lighter (Round / square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19,		

Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector

4207	5 - 7 watt	Nos	₹ 204
4208	8 - 10 watt	Nos	₹ 263
4209	12 -15 watt	Nos	₹ 329
4210	18 watt	Nos	₹ 494
4211	22 watt	Nos	₹ 512
4212	30 watt	Nos	₹ 925

LED Down lighter (SMD Type) (System lumen efficacy >135 lm/Watt)

Supplying of LED Recessed/surface Down lighter (Round /square/Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K / 6000°K /6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc.

Code No.	Description	Unit	Rate (₹)
	as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector		
4213	5 - 7 watt	Nos	₹ 223
4214	8 - 10 watt	Nos	₹ 287
4215	12 -15 watt	Nos	₹ 359
4216	18 watt	Nos	₹ 538
4217	22 watt	Nos	₹ 556
4218	30 watt	Nos	₹ 953
	LED Down lighter (COB Type) (System lumen efficacy ≥ 105 < 120 lm/Watt)		
	Supplying of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) COB Type of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5%), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C)		
	Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector		
4219	5 - 7 watt	Nos	₹ 410
4220	8 - 10 watt	Nos	₹ 447
4221	12 -15 watt	Nos	₹ 566

Code No.	Description	Unit	Rate (₹)
4222	18 watt	Nos	₹ 666
4223	22 watt	Nos	₹ 774
4224	30 watt	Nos	₹ 1,008

LED Down lighter (COB Type) (System lumen efficacy ≥120 lm/Watt)

Supplying of LED Recessed/surface Down lighter (Round / square/ Rectangular) COB Type of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector

4225	5 - 7 watt	Nos	₹ 482
4226	8 - 10 watt	Nos	₹ 495
4227	12 -15 watt	Nos	₹ 670
4228	18 watt	Nos	₹ 875
4229	22 watt	Nos	₹ 901
4230	30 watt	Nos	₹ 1,295

LED Panel light 2x2 ft.

LED Panel light 2x2 ft. (System lumen efficacy ≥105 <120 lm/Watt)

Supplying of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be

below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K / 6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)

4231	15 watt	Nos	₹ 903
4232	18 watt	Nos	₹ 1,301
4233	22 watt	Nos	₹ 1,525
4234	36 watt	Nos	₹ 1,625
4235	40 watt	Nos	₹ 1,750
4236	45 watt	Nos	₹ 2,100

CRCA Sheet Body (Thickness > 0.50 mm)

4237	15 watt	Nos	₹ 816
4238	18 watt	Nos	₹ 1,200
4239	22 watt	Nos	₹ 1,220
4240	36 watt	Nos	₹ 1,300
4241	40 watt	Nos	₹ 1,400
4242	45 watt	Nos	₹ 1,638

Panel Down light 2x2 ft.

LED Panel light 2x2 ft. (System lumen efficacy ≥120 <135 lm/Watt)

Supplying of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends,CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin),

Code No.	Description	Unit	Rate (₹)
	SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast / Extruded aluminium Body (Thickness > 1.20 mm)		
4243	15 watt	Nos	₹ 993
4244	18 watt	Nos	₹ 1,431
4245	22 watt	Nos	₹ 1,760
4246	36 watt	Nos	₹ 1,953
4247	40 watt	Nos	₹ 2,475
4248	45 watt	Nos	₹ 2,640
	CRCA Sheet Body (Thickness > 0.50 mm)		
4249	15 watt	Nos	₹ 932
4250	18 watt	Nos	₹ 1,200
4251	22 watt	Nos	₹ 1,280
4252	36 watt	Nos	₹ 1,420
4253	40 watt	Nos	₹ 1,638
4254	45 watt	Nos	₹ 1,679
	Panel Down light 2x2 ft.		
	LED Panel light 2x2 ft., (System lumen efficacy >135 lm/Watt)		
	Supplying of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends ,CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated		

copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)

4255	15 watt	Nos	₹ 1,083
4256	18 watt	Nos	₹ 1,561
4257	22 watt	Nos	₹ 2,400
4258	36 watt	Nos	₹ 2,700
4259	40 watt	Nos	₹ 2,880
4260	45 watt	Nos	₹ 3,300

CRCA Sheet Body (Thickness > 0.50 mm)

4261	15 watt	Nos	₹ 1,049
4262	18 watt	Nos	₹ 1,800
4263	22 watt	Nos	₹ 1,831
4264	36 watt	Nos	₹ 1,869
4265	40 watt	Nos	₹ 1,884
4266	45 watt	Nos	₹ 1,925

LED Batten light

LED Batten light (System lumen efficacy ≥105 <120 lm/Watt)

Supplying of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement.

Code No.	Description	Unit	Rate (₹)
	(Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)		
4267	18- 22 watt	Nos	₹ 305
4268	24 -26 watt	Nos	₹ 313
4269	36 watt	Nos	₹ 322
4270	40 watt	Nos	₹ 334
	CRCA Sheet Body (Thickness > 0.50 mm)		
4271	18- 22 watt	Nos	₹ 267
4272	24 -26 watt	Nos	₹ 275
4273	36 watt	Nos	₹ 282
4274	40 watt	Nos	₹ 292
	LED Batten light (System lumen efficacy ≥120 <135 lm/Watt)		
	Supplying of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends,CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)		
4275	18- 22 watt	Nos	₹ 343
4276	24 -26 watt	Nos	₹ 351
4277	36 watt	Nos	₹ 362
4278	40 watt	Nos	₹ 376

Code No.	Description	Unit	Rate (₹)
	CRCA Sheet Body (Thickness > 0.50 mm)		
4279	18- 22 watt	Nos	₹ 305
4280	24 -26 watt	Nos	₹ 313
4281	36 watt	Nos	₹ 322
4282	40 watt	Nos	₹ 334
	LED Batten light (System lumen efficacy >135 lm/Watt)		
	Supplying of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
	Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)		
4283	18- 22 watt	Nos	₹ 381
4284	24 -26 watt	Nos	₹ 389
4285	36 watt	Nos	₹ 403
4286	40 watt	Nos	₹ 417
	CRCA Sheet Body (Thickness > 0.50 mm)		
4287	18- 22 watt	Nos	₹ 343
4288	24 -26 watt	Nos	₹ 351
4289	36 watt	Nos	₹ 362
4290	40 watt	Nos	₹ 376

Code No.	Description	Unit	Rate (₹)
	Street light LED fixture		
	LED Street light fixture, powder coated pressure die cast aluminium body (System lumen efficacy ≥105 <120 lm/Watt)		
	Supplying of Street light LED fixture powder coated pressure die cast aluminium body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80, under voltage and over voltage protection, EMI-EMC As per CISPR -15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin),SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4291	10 watt	Nos	₹ 375
4292	14 watt	Nos	₹ 475
4293	15 watt	Nos	₹ 485
4294	18 watt	Nos	₹ 516
4295	20 watt	Nos	₹ 523
4296	24 watt	Nos	₹ 525
4297	25 watt	Nos	₹ 536
4298	30 watt	Nos	₹ 550
4299	36 watt	Nos	₹ 700
4300	40 watt	Nos	₹ 750
4301	45 watt	Nos	₹ 800
4302	50 watt	Nos	₹ 1,100
4303	72 watt	Nos	₹ 1,200
4304	90 watt	Nos	₹ 1,375
4305	100 watt	Nos	₹ 1,650
4306	120 watt	Nos	₹ 1,700
4307	150 watt	Nos	₹ 2,250
4308	180 watt	Nos	₹ 3,100
4309	200 watt	Nos	₹ 3,200

Code No.	Description	Unit	Rate (₹)
	LED Street light fixture, powder coated pressure die cast aluminium body (System lumen efficacy ≥120 <135 lm/Watt)		
	Supplying of Street light LED fixture powder coated pressure die cast aluminium body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range - 15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80, under voltage and over voltage protection, EMI-EMC As per CISPR 15 , lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4310	10 watt	Nos	₹ 413
4311	14 watt	Nos	₹ 523
4312	15 watt	Nos	₹ 543
4313	18 watt	Nos	₹ 660
4314	20 watt	Nos	₹ 750
4315	24 watt	Nos	₹ 880
4316	25 watt	Nos	₹ 915
4317	30 watt	Nos	₹ 935
4318	36 watt	Nos	₹ 990
4319	40 watt	Nos	₹ 1,073
4320	45 watt	Nos	₹ 1,000
4321	50 watt	Nos	₹ 1,210
4322	72 watt	Nos	₹ 1,350
4323	90 watt	Nos	₹ 1,500
4324	100 watt	Nos	₹ 1,750
4325	120 watt	Nos	₹ 1,950
4326	150 watt	Nos	₹ 2,300
4327	180 watt	Nos	₹ 3,300
4328	200 watt	Nos	₹ 3,450

Code No.	Description	Unit	Rate (₹)
	LED Street light fixture, powder coated pressure die cast aluminium body (System lumen efficacy >135 lm/Watt) Supplying of Street light LED fixture, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection,EMI-EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4329	10 watt	Nos	₹ 474
4330	14 watt	Nos	₹ 575
4331	15 watt	Nos	₹ 598
4332	18 watt	Nos	₹ 675
4333	20 watt	Nos	₹ 700
4334	24 watt	Nos	₹ 925
4335	25 watt	Nos	₹ 962
4336	30 watt	Nos	₹ 1,025
4337	36 watt	Nos	₹ 1,075
4338	40 watt	Nos	₹ 1,175
4339	45 watt	Nos	₹ 1,233
4340	50 watt	Nos	₹ 1,392
4341	72 watt	Nos	₹ 1,675
4342	90 watt	Nos	₹ 1,850
4343	100 watt	Nos	₹ 2,250
4344	120 watt	Nos	₹ 2,750
4345	150 watt	Nos	₹ 3,490
4346	180 watt	Nos	₹ 3,750
4347	200 watt	Nos	₹ 4,250

Code No.	Description	Unit	Rate (₹)
	Flood Light		
	LED Flood Light, powder coated pressure die cast aluminium (System lumen efficacy 105 <120 lm/Watt)		
	Supplying of Flood Light, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection,EMI-EMC as per CISPR -15 , lenses for beam angle 30 deg-120deg as per the application and the project requirementdeg., suitable tilt able fitting, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy 105 <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4348	50 watt	Nos	₹ 850
4349	70 watt	Nos	₹ 1,340
4350	100 watt	Nos	₹ 1,450
4351	150 watt	Nos	₹ 2,100
4352	200 watt	Nos	₹ 3,100
4353	250 watt	Nos	₹ 3,750
	LED Flood Light, powder coated pressure die cast aluminium (System lumen efficacy ≥120 and <135 lm/Watt)		
	Supplying of Flood Light, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection,EMI-EMC as per CISPR-15, lenses for beam angle 30 deg-120deg as per the application and the project requirementdeg, suitable tilt able fitting, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report ,		

Code No.	Description	Unit	Rate (₹)
	CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 and <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4354	50 watt	Nos	₹ 1,265
4355	70 watt	Nos	₹ 1,474
4356	100 watt	Nos	₹ 1,595
4357	150 watt	Nos	₹ 2,310
4358	200 watt	Nos	₹ 3,200
4359	250 watt	Nos	₹ 4,125
	LED Flood Light, powder coated pressure die cast aluminium (System lumen efficacy >135 lm/Watt)		
	Supplying of Flood Light, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-10, CRI >80 , under voltage and over voltage protection,EMI-EMC as per CISPR-15, lenses for beam angle 30 deg-120deg as per the application and the project requirementdeg., suitable tilt able fitting, life time (LED,Driver & electrical circuitary) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).		
4360	50 watt	Nos	₹ 1,322
4361	70 watt	Nos	₹ 1,541
4362	100 watt	Nos	₹ 1,668

Code No.	Description	Unit	Rate (₹)
4363	150 watt	Nos	₹ 2,415
4364	200 watt	Nos	₹ 3,789
4365	250 watt	Nos	₹ 4,313

Smart Street light LED fixture

LED Smart Street light fixture, powder coated pressure die cast aluminium (System. System lumen efficacy ≥105 and <120 lm/Watt)

Supplying of Smart Street light LED fixture, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection,EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Smart inbuilt controller shall have following features.

1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)
2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.
3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR).
4. Wi-Fi LoRA/Zigbee/Powerline with ethernet network based IOT feature as per site requirement or engineer in charge.
5. Should be controlled through auto/ manual
6. Programmable level of not less than 48 different light intensity settings,
7. Inbuilt repeater & relay signals function to other controllers

Code No.	Description	Unit	Rate (₹)
4366	45 watt	Nos	₹ 3,483
4367	50 watt	Nos	₹ 3,642
4368	72 watt	Nos	₹ 4,021
4369	90 watt	Nos	₹ 4,211
4370	100 watt	Nos	₹ 5,033
4371	120 watt	Nos	₹ 5,286
4372	150 watt	Nos	₹ 6,665
4373	180 watt	Nos	₹ 6,791
4374	200 watt	Nos	₹ 8,006

LED Smart Street light fixture, powder coated pressure die cast aluminium (System. System lumen efficacy ≥120 and <135 lm/Watt)

Supplying of Smart Street light LED fixture, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection,EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 and <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Smart inbuilt controller shall have following features.

1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)
2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.
3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR).
4. Wi-Fi LoRA/Zigbee/Powerline with ethernet network based IOT feature as per site requirement or engineer in charge.

Code No.	Description	Unit	Rate (₹)
	5. Should be controlled through auto/ manual		
	6. Programmable level of not less than 48 different light intensity settings,		
	7. Inbuilt repeater & relay signals function to other controllers		
4375	45 watt	Nos	₹ 3,832
4376	50 watt	Nos	₹ 4,006
4377	72 watt	Nos	₹ 4,423
4378	90 watt	Nos	₹ 4,632
4379	100 watt	Nos	₹ 5,536
4380	120 watt	Nos	₹ 5,815
4381	150 watt	Nos	₹ 7,331
4382	180 watt	Nos	₹ 7,470
4383	200 watt	Nos	₹ 8,806

LED Smart Street light fixture, powder coated pressure die cast aluminium (System. System lumen efficacy >135 lm/Watt)

Supplying of Smart Street light LED fixture, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection,EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).

Smart inbuilt controller shall have following features.

1. Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)
2. to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.

Code No.	Description	Unit	Rate (₹)
	3. Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR). **4. Wi-Fi LoRA/Zigbee/Powerline with ethernet network based IOT feature as per site requirement or engineer in charge.** 5. Should be controlled through auto/ manual 6. Programmable level of not less than 48 different light intensity settings, 7. Inbuilt repeater & relay signals function to other controllers		
4384	45 watt	Nos	₹ 4,006
4385	50 watt	Nos	₹ 4,188
4386	72 watt	Nos	₹ 4,624
4387	90 watt	Nos	₹ 4,842
4388	100 watt	Nos	₹ 5,788
4389	120 watt	Nos	₹ 6,079
4390	150 watt	Nos	₹ 7,665
4391	180 watt	Nos	₹ 7,810
4392	200 watt	Nos	₹ 9,207

Solar outdoor light

4393	Supplying of the integrated type solar PV lighting system on the existing pole structure, comprising of 20 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%),, Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) Charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install, With Lithium- Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 24 AH battery, charging time 6-8 hours, Battery backup time 12 hours (minimum), LED fixture 20 watt, Input voltage: 12V DC , Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPR 15 , lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)), life time (LED,Driver & electrical circuitary) of 50K hours lamp buring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic swich on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.		

Code No.	Description	Unit	Rate (₹)
	(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise aboven 90°C)	Nos	₹ 13,250
	20 Watt (System lumen efficacy >120 lm/Watt)		
4394	Supplying of the integrated type solar PV lighting system on the existing pole structure, comprising of 30 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%), Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install, With Lithium- Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 30 AH battery, charging time 8-10 hours, Battery backup time 12 hours (minimum), LED fixture watt 30 watt, Input voltage: 12V DC , Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPER 15 A, lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)) , life time (LED,Driver & electrical circuitary) of 50K hours lamp buring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic swich on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.		
	(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminium housing such that LED junction temperature do'nt rise aboven 90°C)	Nos	₹ 16,500
	30 Watt (System lumen efficacy >120 lm/Watt)		
4395	Supplying of the integrated type solar PV lighting system on the existing pole structure, comprising of 35 watt, 6V Mono Passivated Emitter and Rear Contact (PERC) Solar Panel (minimum efficiency 21%),, Pulse with modulation (PWM)/Maximum Power point tracking (MPPT) Charge Controller in the box with a sleek appearance and a sturdy structure, is weather-proof, and is simple to install. Operating temperature range: -35 to 60 deg C With Lithium-Iron Phosphate Battery (LiFePO4) 3.2Volt (Cell) 35 AH battery, charging time 8-10 hours, Battery backup time 12 hours (minimum), LED fixture watt 35 watt, Input voltage: 12V DC , Operating		

temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, Electro Magnetic Interference (EMI) Electro Magnetic Compatibility (EMC) As per CISPR 15 , lenses for beam angle as per Illuminating Engineering Society of North America (IESNA) type I/II/III as per the width of the road and the project requirement, Correlated Colour Temperature (CCT) 5700°K /6000°K (As per American National Standard Institute (ANSI Bin)), life time (LED,Driver & electrical circuitary) of 50K hours lamp buring hours till the 70 % of initial Lumen maintained as per LM80 extrapolation IES TM-21-11 report, automatic swich on/off, Alliuminium or Acrylonitrile Butadiene Styrene (ABS body), can be installed on a pole or wall. System lumen efficacy >120 lm/Watt output All as per pre approved by Engineer in-charge complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required.

(Part 1), for fixtures up to 60 watt. LED light Complete with mounting structure for the battery and accessories and wind storm withstand capacity as per the zone. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise aboven 90°C) Nos ₹ 21,000

35 Watt (System lumen efficacy >120 lm/Watt)

BLDC FAN

Code No.	Description	Unit	Rate (₹)
	Brush Less Direct Current (BLDC) Motor Supply of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminum alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, remote (preferably mobile app based) for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req.		
4396	900mm, BEE 5 star rating, service value ≥ 5.1 CM/Min/Watt, air delivery 130 CM/Min (Minimum)	each	1470
4397	1050mm, BEE 5 star rating,service value ≥ 5.1CM/Min/Watt, air delivery 150 CM/Min (Minimum)	each	1491
4398	1200mm, BEE 5 star rating, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	each	1533
4399	1400mm, BEE 5 star rating, service value ≥ 6.0 CM/Min/Watt, air delivery 245 CM/Min (Minimum)	each	1575
	Brush Less Direct Current (BLDC) Motor Supply of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminum alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al bodyPower Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, suitable for operation with regulator for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req.		
4400	900mm, service value ≥ 5.1 CM/Min/Watt, air delivery 130 CM/Min (Minimum)	each	1365
4401	1050mm, service value ≥ 5.1 CM/Min/Watt, air delivery 150 CM/Min (Minimum)	each	1385
4402	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	each	1424
4403	1400mm, service value ≥ 6.0 CM/Min/Watt, air delivery 245 CM/Min (Minimum)	each	1470

Code No.	Description	Unit	Rate (₹)

33/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting(Mineral oil filled)

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size

thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4404	500 KVA	Nos	₹ 9,22,793
4405	630KVA	Nos	₹ 11,62,719
4406	1000KVA	Nos	₹ 13,95,000
4407	1250 KVA	Nos	₹ 17,43,750
4408	1600KVA	Nos	₹ 22,32,000
4409	2000KVA	Nos	₹ 27,90,000
4410	2500KVA	Nos	₹ 34,87,500

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories

and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators

Code No.	Description	Unit	Rate (₹)
	with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4411	500 KVA	Nos	₹ 11,07,351
4412	630KVA	Nos	₹ 13,95,262
4413	1000KVA	Nos	₹ 16,74,000
4414	1250 KVA	Nos	₹ 20,92,500
4415	1600KVA	Nos	₹ 26,78,400
4416	2000KVA	Nos	₹ 33,48,000
4417	2500KVA	Nos	₹ 41,85,000
	Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo-		

Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4418	500 KVA	Nos	₹ 12,91,910
4419	630KVA	Nos	₹ 16,27,806
4420	1000KVA	Nos	₹ 19,53,000
4421	1250 KVA	Nos	₹ 24,41,250
4422	1600KVA	Nos	₹ 31,24,800
4423	2000KVA	Nos	₹ 39,06,000
4424	2500KVA	Nos	₹ 48,82,500

11/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting (Mineral oil filled)

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO)

Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip

Code No.	Description	Unit	Rate (₹)
	(where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4425	1000KVA	Nos	₹ 12,15,000
4426	1250 KVA	Nos	₹ 15,18,750
4427	1600KVA	Nos	₹ 19,44,000
4428	2000KVA	Nos	₹ 24,30,000
	Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive		

atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature;

c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4429	1000KVA	Nos	₹ 14,58,000
4430	1250 KVA	Nos	₹ 18,22,500
4431	1600KVA	Nos	₹ 23,32,800
4432	2000KVA	Nos	₹ 29,16,000

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil

Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature;

c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200

kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4433	1000KVA	Nos	₹ 17,01,000
4434	1250 KVA	Nos	₹ 21,26,250
4435	1600KVA	Nos	₹ 27,21,600
4436	2000KVA	Nos	₹ 34,02,000

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces

Code No.	Description	Unit	Rate (₹)
	one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked. Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4437	200KVA	Nos	₹ 2,34,000
4438	250KVA	Nos	₹ 2,92,500
4439	315KVA	Nos	₹ 3,68,550
4440	400KVA	Nos	₹ 4,68,000
4441	500KVA	Nos	₹ 5,85,000
4442	630KVA	Nos	₹ 7,37,100

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard.The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers;

g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size

thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4443	200KVA	Nos	₹ 2,62,080
4444	250KVA	Nos	₹ 3,27,600
4445	315KVA	Nos	₹ 4,12,776
4446	400KVA	Nos	₹ 5,24,160
4447	500KVA	Nos	₹ 6,55,200
4448	630KVA	Nos	₹ 8,25,552

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux

density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

Code No.	Description	Unit	Rate (₹)
4449	200KVA	Nos	₹ 3,27,600
4450	250KVA	Nos	₹ 4,09,500
4451	315KVA	Nos	₹ 5,15,970
4452	400KVA	Nos	₹ 6,55,200
4453	500KVA	Nos	₹ 8,19,000
4454	630KVA	Nos	₹ 10,31,940

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two

earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4455	63KVA	Nos	₹ 73,710
4456	100KVA	Nos	₹ 1,17,000
4457	160KVA	Nos	₹ 1,87,200

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180

and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers;
g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA

Code No.	Description	Unit	Rate (₹)
	and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4458	63KVA	Nos	₹ 82,555
4459	100KVA	Nos	₹ 1,31,040
4460	160KVA	Nos	₹ 2,09,664

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site . The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shallbe used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two

earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature;

c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4461	63KVA	Nos	₹ 1,03,194
4462	100KVA	Nos	₹ 1,63,800
4463	160KVA	Nos	₹ 2,62,080

33/0.433 KV, 3 Phase, 50 Hz outdoor/ indoor mounting (Synthetic Organic Ester Oil Filled)

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for

safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site . The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for

Code No.	Description	Unit	Rate (₹)
	transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4464	500 KVA	Nos	₹ 9,74,059
4465	630KVA	Nos	₹ 12,27,314
4466	1000KVA	Nos	₹ 14,72,500
4467	1250 KVA	Nos	₹ 18,40,625
4468	1600KVA	Nos	₹ 23,56,000
4469	2000KVA	Nos	₹ 29,45,000
4470	2500KVA	Nos	₹ 36,81,250
	Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative		

Code No.	Description	Unit	Rate (₹)

Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers)

d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4471	500 KVA	Nos	₹ 11,68,871
4472	630KVA	Nos	₹ 14,72,777
4473	1000KVA	Nos	₹ 17,67,000
4474	1250 KVA	Nos	₹ 22,08,750
4475	1600KVA	Nos	₹ 28,27,200
4476	2000KVA	Nos	₹ 35,34,000
4477	2500KVA	Nos	₹ 44,17,500

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) ,

33/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator);

l) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4478	500 KVA	Nos	₹ 13,63,682
4479	630KVA	Nos	₹ 17,18,240
4480	1000KVA	Nos	₹ 20,61,500
4481	1250 KVA	Nos	₹ 25,76,875
4482	1600KVA	Nos	₹ 32,98,400
4483	2000KVA	Nos	₹ 41,23,000
4484	2500KVA	Nos	₹ 51,53,750

11/0.433 KV, 3 Phase, 50 Hz Outdoor/ Indoor mounting (Synthetic Organic Ester Oil Filled)

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all

accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator,

minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4485	1000KVA	Nos	₹ 12,82,500
4486	1250 KVA	Nos	₹ 16,03,125
4487	1600KVA	Nos	₹ 20,52,000
4488	2000KVA	Nos	₹ 25,65,000

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,

as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4489	1000KVA	Nos	₹ 15,39,000
4490	1250 KVA	Nos	₹ 19,23,750
4491	1600KVA	Nos	₹ 24,62,400
4492	2000KVA	Nos	₹ 30,78,000

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus

trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200

Code No.	Description	Unit	Rate (₹)
	kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4493	1000KVA	Nos	₹ 17,95,500
4494	1250 KVA	Nos	₹ 22,44,375
4495	1600KVA	Nos	₹ 28,72,800
4496	2000KVA	Nos	₹ 35,91,000
	Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative		

Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature;

c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers

4497	200KVA	Nos	₹ 2,47,000
4498	250KVA	Nos	₹ 3,08,750
4499	315KVA	Nos	₹ 3,89,025
4500	400KVA	Nos	₹ 4,94,000
4501	500KVA	Nos	₹ 6,17,500
4502	630KVA	Nos	₹ 7,78,050

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-

Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers)
d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type

transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4503	200KVA	Nos	₹ 2,76,640
4504	250KVA	Nos	₹ 3,45,800
4505	315KVA	Nos	₹ 4,35,708
4506	400KVA	Nos	₹ 5,53,280
4507	500KVA	Nos	₹ 6,91,600
4508	630KVA	Nos	₹ 8,71,416

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications

complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level

Code No.	Description	Unit	Rate (₹)
	indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.		
4509	200KVA	Nos	₹ 3,45,800
4510	250KVA	Nos	₹ 4,32,250
4511	315KVA	Nos	₹ 5,44,635
4512	400KVA	Nos	₹ 6,91,600
4513	500KVA	Nos	₹ 8,64,500
4514	630KVA	Nos	₹ 10,89,270

Supply of following capacity (continous loading) BEE 3 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report

OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);
o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4515	63KVA	Nos	₹ 77,805
4516	100KVA	Nos	₹ 1,23,500
4517	160KVA	Nos	₹ 1,97,600

Supply of following capacity (continous loading) BEE 4 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on

HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers)

d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4518	63KVA	Nos	₹ 87,142
4519	100KVA	Nos	₹ 1,38,320
4520	160KVA	Nos	₹ 2,21,312

Supply of following capacity (continous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special

application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);

o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.

4521	63KVA	Nos	₹ 1,08,927
4522	100KVA	Nos	₹ 1,72,900
4523	160KVA	Nos	₹ 2,76,640

DRY TYPE
33/0.433 KV, 3 Phase, 50 Hz Indoor mounting

Supply of following capacity (continous loading) 33/0.433 KV Delta/Star,step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for indoor applications with On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behaviour class F1,climate class-C1, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max,

c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate.i) Additional neutral seperately brought out on bushing for earthing.

Code No.	Description	Unit	Rate (₹)
	Note : The permissible total losses value shall not exceed by 15% the losses as mentioned below.		
	Level 3		
4524	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Nos	₹ 16,65,000
4525	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Nos	₹ 20,81,250
4526	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading <13500watt)	Nos	₹ 26,64,000
4527	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading <17000watt)	Nos	₹ 33,30,000
4528	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading <20000watt)	Nos	₹ 41,62,500
	Level 4		
4529	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Nos	₹ 19,14,750
4530	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading <9200watt)	Nos	₹ 23,93,438
4531	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading <11800watt)	Nos	₹ 30,63,600
4532	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading <15000watt)	Nos	₹ 38,29,500
4533	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Nos	₹ 47,86,875
	Level 5		
4534	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading <7000watt)	Nos	₹ 21,64,500
4535	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading <8400watt)	Nos	₹ 27,05,625
4536	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading <11300watt)	Nos	₹ 34,63,200
4537	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Nos	₹ 43,29,000
4538	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading <17500watt)	Nos	₹ 54,11,250
	33/0.433 KV, 3 Phase, 50 Hz Outdoor mounting		
	Supply of following capacity (continous loading) 33/0.433 KV Delta/Star,step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled		

Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for Outdoor applications with enclosure, On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behaviour class F1,climate class-C1, having cable end boxes on HV side suitable for 3x400 sqmm XLPE cable of 33 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications . Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The enclosure shall also have Welded Door handle , Danger plate on HV and LV side doors, caution plate for tap links for HT doors, Door limit switch on both HV and LV side doors to be wired up to WTI box terminal for tripping the transformer in case door is opened with theenclosure transformer energized, Phase marking plates on HV and LV doors.

Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate.

i) Additional neutral seperately brought out on bushing for earthing.

Note : The permissible total losses value shall not exceed by 15% the losses as mentioned below.

Code No.	Description	Unit	Rate (₹)
	Level 3		
4539	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading <9000watt)	Nos	₹ 17,57,500
4540	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Nos	₹ 21,96,875
4541	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Nos	₹ 28,12,000
4542	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading <17000watt)	Nos	₹ 35,15,000
4543	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading <20000watt)	Nos	₹ 43,93,750
	Level 4		
4544	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Nos	₹ 20,21,125
4545	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading <9200watt)	Nos	₹ 25,26,406
4546	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Nos	₹ 32,33,800
4547	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Nos	₹ 40,42,250
4548	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading <18500watt)	Nos	₹ 50,52,813
	Level 5		
4549	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading <7000watt)	Nos	₹ 22,84,750
4550	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt)	Nos	₹ 28,55,938
4551	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Nos	₹ 36,55,600
4552	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading <14100watt)	Nos	₹ 45,69,500
4553	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading <17500watt)	Nos	₹ 57,11,875
	11/0.433 KV, 3 Phase, 50 Hz Indoor mounting		
	Supply of following capacity (continous loading) 11/0.433 KV Delta/Star,step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for indoor applications with On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control		

Code No.	Description	Unit	Rate (₹)
	(RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions class E4, suitable for fire behaviour class F1,climate class-C1, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications . Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. **Fitting and Accessories :** The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate. **i) Additional neutral seperately brought out on bushing for earthing.**		
	Level 3		
4554	63 KVA (losses at 50% loading < 380watt, losses at 100% loading < 1250watt)	Nos	₹ 96,390
4555	100 KVA (losses at 50% loading < 520watt, losses at 100% loading < 1800watt)	Nos	₹ 1,53,000
4556	160 KVA (losses at 50% loading <770watt, losses at 100% loading < 2200watt)	Nos	₹ 2,44,800
4557	200 KVA (losses at 50% loading < 890watt, losses at 100% loading < 2700watt)	Nos	₹ 3,06,000
4558	250 KVA (losses at 50% loading < 1050watt, losses at 100% loading < 3150watt)	Nos	₹ 3,82,500

Code No.	Description	Unit	Rate (₹)
4559	315 KVA (losses at 50% loading < 1100watt, losses at 100% loading < 3275watt)	Nos	₹ 4,81,950
4560	400 KVA (losses at 50% loading < 1300watt, losses at 100% loading < 3875watt)	Nos	₹ 6,12,000
4561	500 KVA (losses at 50% loading < 1600watt, losses at 100% loading < 4750watt)	Nos	₹ 7,65,000
4562	630 KVA (losses at 50% loading < 2000watt, losses at 100% loading < 5855watt)	Nos	₹ 9,63,900
4563	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Nos	₹ 15,30,000
4564	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Nos	₹ 19,12,500
4565	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Nos	₹ 24,48,000
4566	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Nos	₹ 30,60,000
4567	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Nos	₹ 38,25,000
	Level 4		
4568	63 KVA (losses at 50% loading < 340watt, losses at 100% loading < 1140watt)	Nos	₹ 1,10,849
4569	100 KVA (losses at 50% loading <475watt, losses at 100% loading <1650watt)	Nos	₹ 1,75,950
4570	160 KVA (losses at 50% loading < 670watt, losses at 100% loading < 1950watt)	Nos	₹ 2,81,520
4571	200 KVA (losses at 50% loading < 780watt, losses at 100% loading <2300watt)	Nos	₹ 3,51,900
4572	250 KVA (losses at 50% loading < 980watt, losses at 100% loading < 2930watt)	Nos	₹ 4,39,875
4573	315 KVA (losses at 50% loading < 1025watt, losses at 100% loading < 3100watt)	Nos	₹ 5,54,243
4574	400 KVA (losses at 50% loading < 1225watt, losses at 100% loading < 3450watt)	Nos	₹ 7,03,800
4575	500 KVA (losses at 50% loading <1510watt, losses at 100% loading < 4300watt)	Nos	₹ 8,79,750
4576	630 KVA (losses at 50% loading < 1860watt, losses at 100% loading < 5300watt)	Nos	₹ 11,08,485
4577	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Nos	₹ 17,59,500
4578	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Nos	₹ 21,99,375
4579	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Nos	₹ 28,15,200

Code No.	Description	Unit	Rate (₹)
4580	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Nos	₹ 35,19,000
4581	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Nos	₹ 43,98,750
	Level 4		
4582	63 KVA (losses at 50% loading < 300watt, losses at 100% loading <1050watt)	Nos	₹ 1,25,307
4583	100 KVA (losses at 50% loading < 435watt, losses at 100% loading < 1500watt)	Nos	₹ 1,98,900
4584	160 KVA (losses at 50% loading < 570watt, losses at 100% loading <1700watt)	Nos	₹ 3,18,240
4585	200 KVA(losses at 50% loading <670watt, losses at 100% loading < 2100watt)	Nos	₹ 3,97,800
4586	250 KVA(losses at 50% loading < 920watt, losses at 100% loading < 2700watt)	Nos	₹ 4,97,250
4587	315 KVA (losses at 50% loading < 955watt, losses at 100% loading < 2750watt)	Nos	₹ 6,26,535
4588	400 KVA (losses at 50% loading < 1150watt, losses at 100% loading < 3330watt)	Nos	₹ 7,95,600
4589	500 KVA (losses at 50% loading < 1430watt, losses at 100% loading < 4100watt)	Nos	₹ 9,94,500
4590	630 KVA (losses at 50% loading < 1745watt, losses at 100% loading < 4850watt)	Nos	₹ 12,53,070
4591	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Nos	₹ 19,89,000
4592	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt)	Nos	₹ 24,86,250
4593	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Nos	₹ 31,82,400
4594	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Nos	₹ 39,78,000
4595	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Nos	₹ 49,72,500

11/0.433 KV, 3 Phase, 50 Hz Outdoor mounting

Supply of following capacity (continous loading) 11/0.433 KV Delta/Star,step down, 3 Phase, 50 Hz, Dyn 11 vector group, Cast Resin / VPI (vacuum pressure impregnated) Dry Type, copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better) AN (air natural) cooled transformer suitable for Outdoor applications with enclosure, On Load Tap Changer (OLTC) on HV side having AVS relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote/ manual operation of OLTC HV side

Code No.	Description	Unit	Rate (₹)
	in range of +5% to -15% in steps of 2.5%, insulation class F (minimum), suitable for environment conditions Class E-O-3, suitable for fire behaviour class F1,climate class-C1, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade with necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers, bus trunking arrangement on LV side complete with all accessories and safety provisions as per relevant IS Code ,The transformer shall be provided with standard fittings/accessories as per relevant IS and mentioned below, protection alarm/trip protection, 3 nos. of Polymeric Zinc Oxide surge Arrestors on HV Side. Winding Temperature scanner (Digital) with alarm/Trip contacts with RTD Sensors per LV winding and space for mounting differential protection CT's in LV chamber with neutral brought out separately including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/HT Panel for safety tripping, complete as confirming to IS-2026 Part-11, i/c supplying and grouting of suitable M.S. Channel with all accessories ,complete in all respects as required at site as per CPWD specifications. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. All testing shall as per relevant IS Code. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The enclosure shall also have Welded Door handle , Danger plate on HV and LV side doors, caution plate for tap links for HT doors, Door limit switch on both HV and LV side doors to be wired up to WTI box terminal for tripping the transformer in case door is opened with theenclosure transformer energized, Phase marking plates on HV and LV doors. **Fitting and Accessories :** The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Rating and terminal marking plates; c) Thermometer pocket with cap; d) Lifting lugs for the complete transformer as well as for core and winding assembly; e) Bi-directional flat rollers (for transformers above 200 kVA); f) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); g) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. for transformers up to 200 kVA; h) Bird guard; i) Jacking pads (for transformer above 1 600 kVA); j) Name Rating & Diagram Plate. k) Monogram Plate. **i) Additional neutral seperately brought out on bushing for earthing.**		
	Level 3		
4596	63 KVA (losses at 50% loading < 380watt, losses at 100% loading < 1250watt)	Nos	₹ 1,01,745
4597	100 KVA (losses at 50% loading < 520watt, losses at 100% loading < 1800watt)	Nos	₹ 1,61,500
4598	160 KVA (losses at 50% loading <770watt, losses at 100% loading < 2200watt)	Nos	₹ 2,58,400
4599	200 KVA (losses at 50% loading < 890watt, losses at 100% loading < 2700watt)	Nos	₹ 3,23,000

Code No.	Description	Unit	Rate (₹)
4600	250 KVA (losses at 50% loading < 1050watt, losses at 100% loading < 3150watt)	Nos	₹ 4,03,750
4601	315 KVA (losses at 50% loading < 1100watt, losses at 100% loading < 3275watt)	Nos	₹ 5,08,725
4602	400 KVA (losses at 50% loading < 1300watt, losses at 100% loading < 3875watt)	Nos	₹ 6,46,000
4603	500 KVA (losses at 50% loading < 1600watt, losses at 100% loading < 4750watt)	Nos	₹ 8,07,500
4604	630 KVA (losses at 50% loading < 2000watt, losses at 100% loading < 5855watt)	Nos	₹ 10,17,450
4605	1000 KVA (losses at 50% loading < 3000watt, losses at 100% loading < 9000watt)	Nos	₹ 16,15,000
4606	1250 KVA (losses at 50% loading < 3600watt, losses at 100% loading < 10750watt)	Nos	₹ 20,18,750
4607	1600 KVA (losses at 50% loading < 4500watt, losses at 100% loading < 13500watt)	Nos	₹ 25,84,000
4608	2000 KVA (losses at 50% loading < 5400watt, losses at 100% loading < 17000watt)	Nos	₹ 32,30,000
4609	2500 KVA (losses at 50% loading < 6500watt, losses at 100% loading < 20000watt)	Nos	₹ 40,37,500
	Level 4		
4610	63 KVA (losses at 50% loading < 340watt, losses at 100% loading < 1140watt)	Nos	₹ 1,17,007
4611	100 KVA (losses at 50% loading <475watt, losses at 100% loading <1650watt)	Nos	₹ 1,85,725
4612	160 KVA (losses at 50% loading < 670watt, losses at 100% loading < 1950watt)	Nos	₹ 2,97,160
4613	200 KVA (losses at 50% loading < 780watt, losses at 100% loading <2300watt)	Nos	₹ 3,71,450
4614	250 KVA (losses at 50% loading < 980watt, losses at 100% loading < 2930watt)	Nos	₹ 4,64,313
4615	315 KVA (losses at 50% loading < 1025watt, losses at 100% loading < 3100watt)	Nos	₹ 5,85,034
4616	400 KVA (losses at 50% loading < 1225watt, losses at 100% loading < 3450watt)	Nos	₹ 7,42,900
4617	500 KVA (losses at 50% loading <1510watt, losses at 100% loading < 4300watt)	Nos	₹ 9,28,625
4618	630 KVA (losses at 50% loading < 1860watt, losses at 100% loading < 5300watt)	Nos	₹ 11,70,068
4619	1000 KVA (losses at 50% loading < 2790watt, losses at 100% loading < 7700watt)	Nos	₹ 18,57,250
4620	1250 KVA (losses at 50% loading < 3300watt, losses at 100% loading < 9200watt)	Nos	₹ 23,21,563

Code No.	Description	Unit	Rate (₹)
4621	1600 KVA (losses at 50% loading < 4200watt, losses at 100% loading < 11800watt)	Nos	₹ 29,71,600
4622	2000 KVA (losses at 50% loading < 5050watt, losses at 100% loading < 15000watt)	Nos	₹ 37,14,500
4623	2500 KVA (losses at 50% loading < 6150watt, losses at 100% loading < 18500watt)	Nos	₹ 46,43,125
	Level 5		
4624	63 KVA (losses at 50% loading < 300watt, losses at 100% loading <1050watt)	Nos	₹ 1,32,269
4625	100 KVA (losses at 50% loading < 435watt, losses at 100% loading < 1500watt)	Nos	₹ 2,09,950
4626	160 KVA (losses at 50% loading < 570watt, losses at 100% loading <1700watt)	Nos	₹ 3,35,920
4627	200 KVA(losses at 50% loading <670watt, losses at 100% loading < 2100watt)	Nos	₹ 4,19,900
4628	250 KVA(losses at 50% loading < 920watt, losses at 100% loading < 2700watt)	Nos	₹ 5,24,875
4629	315 KVA (losses at 50% loading < 955watt, losses at 100% loading < 2750watt)	Nos	₹ 6,61,343
4630	400 KVA (losses at 50% loading < 1150watt, losses at 100% loading < 3330watt)	Nos	₹ 8,39,800
4631	500 KVA (losses at 50% loading < 1430watt, losses at 100% loading < 4100watt)	Nos	₹ 10,49,750
4632	630 KVA (losses at 50% loading < 1745watt, losses at 100% loading < 4850watt)	Nos	₹ 13,22,685
4633	1000 KVA (losses at 50% loading < 2620watt, losses at 100% loading < 7000watt)	Nos	₹ 20,99,500
4634	1250 KVA (losses at 50% loading < 3220watt, losses at 100% loading < 8400watt)	Nos	₹ 26,24,375
4635	1600 KVA (losses at 50% loading < 3970watt, losses at 100% loading < 11300watt)	Nos	₹ 33,59,200
4636	2000 KVA (losses at 50% loading < 4790watt, losses at 100% loading < 14100watt)	Nos	₹ 41,99,000
4637	2500 KVA (losses at 50% loading < 5900watt, losses at 100% loading < 17500watt)	Nos	₹ 52,48,750

Code No.	Description	Unit	Rate (₹)

Automatic Power Factor Correction (APFC) System

Supply, Installation, testing and commissioning of Automatic Power Factor Correction (APFC) panel, indoor type floor mounted free standing totally enclosed, extendable, IP 42, of following capacity for 3 phase, 415 V + 10 %, 50 Hz AC System for Ambient temperature -5°C to +40°C, fabricated in compartmentalised designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in-Charge), having front section (switch gear and control accessories) and rear section capacitor and reactor, front and rear access, having suitable current carrying capacity, extensible TPN Aluminium alloy bus bar of high conductivity, DMC/SMC bus bar supports,bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos. 8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP(Metalized Polypropylene) Capacitor (IS 13340 Part -1 & 2) APFC Panel shall be in compliance with IS :16636 & CPWD Specifications etc. as per below details

(A) Incomers

Suitable capacity MCCB Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity (Ics=Icu), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set alongwith required Instruments and accessories with extended rotary handel and door interlocking arrangment. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating.

(B) Instruments & Indications

I) 3-Phase current sensing APFC microprocessor relay/controller , advance 8/12 stages (8 stages for capacity below 100 KVAR and 12 stages 100 KVAR & above) with Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge and having display of Phase wise V, A, PF, Cos-Phi, Kw, KVA, KVAR, THD-V , THD-I, harmonics up to 31 level. 3 nos of dual core CT's accuracy class 1, 15VA at incomer of PCC Panel for APFC relay.

ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode.

iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency.

iv) Suitable rating control transformer shall be provided for control and indication circuit.
v) All components like control transformer, meter, relay and indicating lamp shall be protected by using suitable rating individual MCB's.
vi) Wiring of the control circuit shall be done by using 2.5 sq mm, FRLS 1100 V grade, PVC insulated multi stranded copper control wire.
(C) Bus Bars
1.3 Amp per Sq.mm,TPN, Electrolytic grade Aluminium bus bar of capacity 1.25 times of incomer rating as per CPWD specification.
(D) Outgoings (APFC Section)
Selection of the capacitors combinations shall be for continuous rating and each capacitor bank shall have suitable capacity Heavy Duty ISI Marked Capacitor, capacitor duty contactor,the capacitor shall be mounted on channel with base of perforated M S Powder coated sheet, connections inter connections etc. and other features as per CPWD Specifications and relevant IS Code having following:
(I) Capacitor bank ratings & stages shall be as per the technical specifications sheet of NIT.

(ii) Capacitor will be MPP self healing type with discharge resistor, pressure release mechanism.

(iii) Since Capacitor Voltage is 525 Volts, thus higher KVAR has to be considered to get rated output at 415 Volts.

(iv) 14% Detuned Reactor of class H insulation & 150% linearity in series with Capacitor.

(Note: Technical specifications sheet for selection of the capacitors combinations shall be provided by the NIT Approving Authority with due consideration of number of capacitors i.e. 1 KVAR, 2 KVAR, 3 KVAR, 5 KVAR, 10 KVAR.....for smooth correction).

4638	50 KVAR	Set	152750.00
4639	75 KVAR	Set	188500.00
4640	100 KVAR	Set	206700.00
4641	125 KVAR	Set	222300.00
4642	150 KVAR	Set	260325.00
4643	175 KVAR	Set	279500.00
4644	200 KVAR	Set	297700.00

HYBRID Power Factor Correction System

Supply, Installation, testing and commissioning of HYBRID APFC Panel, 3 phase 4 wire, 415 V, 50 Hz AC System for Ambient temperature -5°C to +40°C of following capacity with passive solution of 60% capacity and active solution of 40% capacity,3Phase 4 wire Hybrid Power Factor Correction Solution (with arrangment for neutral current balance) to achieve >0.99 lag and TDDI/THDV values within IEEE recommended limits.APFC should be designed as per IS 16636 Or IEC 61921. The active section and passive section shall work in sync to give optimized output. The degree of protection

of passive section should be IP 42, and of active section should be minimum IP 21.The switching device for APFC passive section should be through capacitor duty contactor and for the active compensation system shall be IGBT based with 3 level topology having 12 IGBT in inverter circuit. The active compensation system should filter harmonics from 2nd to 50th individual harmonic order and shall be selectable for the entire range. The active compensation system should have feature to improve PF correction and harmonic filtration having response time <25Micro second. The hybrid panel shall be indoor type floor mounted free standing totally enclosed, extensible, fabricated in compartmentalised designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in-Charge), having front section (switch gear and control accessories) and rear section (capacitor and reactor), front and rear access, having suitable current carrying capacity, extensible TPN Aluminium alloy bus bar of high conductivity, DMC/SMC bus bar supports,bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos. 8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP(Metalized Polypropylene) Capacitor (IS 13340 Part -1 & 2) APFC Panel shall be in compliance with IS :16636 & CPWD Specifications etc. as per below details.

(A) Incomers

Suitable capacity MCCB/ACB (Upto 300 KVAR, MCCB and above 300 KVAR, ACB) Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity (Ics=Icu), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set alongwith required Instruments and accessories with extended rotary handel and door interlocking arrangment. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating.

(B) Instruments & Indications

a)For Passive Section :

i) 3-Phase current sensing APFC microprocessor relay/controller , advance 12/16 stages (12 stages for over all capacity of panel (active + passive) below 500 KVAR and 16 stages 500 KVAR & above) and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 31 level.

ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode.

Code No.	Description	Unit	Rate (₹)
	iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency. iv) Suitable rating control transformer shall be provided for control and indication circuit. v) All components like control transformer, meter, relay and indicating lamp shall be protected by using suitable rating individual MCB's. vi) Wiring of the control circuit shall be done by using 2.5 sq mm, FRLS 1100 V grade, PVC insulated multi stranded copper control wire. vii) Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge. b) For Active Section : Dedicated HMI (Human Machine Interface) (Minimum 7 inch display) for controlling and communication and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 50th level.Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge.		
4645	250 KVAR	Set	948350.00
4646	300 KVAR	Set	1128400.00
4647	350 KVAR	Set	1262950.00
4648	400 KVAR	Set	1516450.00
4649	450 KVAR	Set	1632800.00
4650	500 KVAR	Set	1849250.00
4651	550 KVAR	Set	1981850.00
4652	600 KVAR	Set	2175550.00
4653	650 KVAR	Set	2302300.00
4654	700 KVAR	Set	2477150.00
4655	750 KVAR	Set	2692950.00
4656	800 KVAR	Set	2825550.00
4657	850 KVAR	Set	2927600.00
4658	900 KVAR	Set	3113500.00
4659	950 KVAR	Set	3293550.00
4660	1000 KVAR	Set	3467750.00

UPS

Code No.	Description	Unit	Rate (₹)
	Online UPS - Input supply: Single Phase, Output Supply : Single Phase		
	Supplying of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input,Single Phase output AC Supply. The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch alongwith provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. The UPS systems shall be Microprocessor based Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology. The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current total harmonic distortion(ITHD)/ total demand distortion (TDD) on the input grid shall be < 5% at 100 %load. (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input pf to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1) however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins and 150% for 1 minute. Operating temperature 0 to 40 deg C, Relative humidity 0-95% non condensing, noise level less than 60db at 1 meter distance,Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output over current, short circuit, battery deep discharge , 10 KV surge. Display for watt/VA,Amp and Voltage power parameters etc. UPS shall comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI) type UPS (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accoseries are inclusive in the cost. The UPS should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc		
4661	2KVA	Each	₹ 21,604
4662	3KVA	Each	₹ 23,511
4663	6KVA	Each	₹ 45,439
4664	10 KVA	Each	₹ 75,947

Online UPS- Input supply: Three Phase, Output supply: Three Phase

Supplying of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 deg C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swapable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of moduels requird for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch alongwith provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality power to the 100% non-linear loads. Current total harmonic effect(ITHD) on the input grid shall be < 5% at 50 %load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. . Communication RS232/RS485/SNMP port open protocol for BMS integration, all hardware & software for iOT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accoseries are inclusive of the cost). This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load, Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1,2 & 3, IS: 16242 and CPWD Specification. Display Panel (minimum) (In-build 5 inch or more LC Display / LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency.

Code No.	Description	Unit	Rate (₹)
	c) Output: Voltage, frequency, Current. d) Battery: Voltage, Capacity. e) Load: KVA, KW, Percentage. f)Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass / Total Running time, etc. i) Mains Mode of Operation /Battery Mode of Operation / Bypass feeding the load / UPS Fault /Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms : Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual,Geo-Tag of manufacturing location etc		
4665	10KVA	Each	₹ 1,04,000
4666	20KVA	Each	₹ 1,55,200
4667	30KVA	Each	₹ 2,28,000
4668	40KVA	Each	₹ 2,52,000
4669	60KVA	Each	₹ 3,88,000
4670	80KVA	Each	₹ 4,52,000
4671	100KVA	Each	₹ 4,76,000
4672	120KVA	Each	₹ 5,24,000
4673	160KVA	Each	₹ 7,44,000
4674	200KVA	Each	₹ 8,28,000
4675	300KVA	Each	₹ 15,20,000
4676	400KVA	Each	₹ 19,20,000
4677	500KVA	Each	₹ 22,40,000
	Battery type AMF VRLA , ABS container, maintenance free		
4678	Battery 12V/65 AH	Each	₹ 4,080
4679	Battery 12V/120 AH	Each	₹ 7,565
4680	Battery 12V/150AH	Each	₹ 9,775

Code No.	Description	Unit	Rate (₹)

Supply of 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of KVA as below, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings:

(A) Diesel Engine:

Turbocharged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for above output of alternator at 40 Degree C, 50% RH & at 1000 Meter MSL , capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528.The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications.

(B) Engine mounted Instrument Panel fitted with and having digital disPlate for following:

(i) Start-stop switch with key
(ii) Water temperature indication
(iii) Lubrication oil pressure indication
(iv) Lubrication oil temperature indication
(v) Battery charging indication and Voltage indication
(vi) RPM indication
(vii) Over speed indication
(viii) Low lubricantion Oil trip indication
(ix) Engine Running Hours indication
(x) Fuel Level

(C) Alternator:

Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty, dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled,self-excited and self-regulated through AVR conforming to IS13364(Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation.

(D) Base Frame & Foundation:

Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.

(E) FUEL TANK:
Daily service fuel tank of suitable liters capacity as per CPWD Specifications, fabricated out of 3 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications.

(F) Exhaust System:
Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.

(G) Starting System:
12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set.

(H) Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications.

(I) AMF Panel:
Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reative Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminum) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following:

1. Suitable numbers and appropriate capacity 4 pole motorised electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip.
2. Auto/Manual/Test/Off selector switch
3. Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay).

Code No.	Description	Unit	Rate (₹)

4. 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering
5. Energy analyser unit to indicate current, Voltage(L-N & L_L), kW, kVA (Phase & Total), Frequency, KWH, PF.
6. LED Indicating lamps for load on mains and load on set.
7. Fuse/ MCB for instruments.
8. Battery charger, complete with transformer/ rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment.
9. Main supply failure monitor.
10. Supply failure timer.
11. Restoration timer
12. Control unit with three impulse automatic engine start/stop and failure to start lockout.
13. Impulse counter with locking and reset facility.
14. ON/OFF/Control circuit switch with indicator
15. Audio/Video annunciation for
    (i) High water temperature
    (ii) Low lubricating oil pressure
    (iii) Engine over speed
    (iv) Engine fails to start
    (v) Full load/maximum load warning
16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories
17. Maintenance notification based on Engine Run Hour & due date.
18. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel , interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring.

4681	25KVA	Set	₹ 2,66,000
4682	35KVA	Set	₹ 2,94,500
4683	40KVA	Set	₹ 3,51,500
4684	50KVA	Set	₹ 3,72,875
4685	62.5KVA	Set	₹ 3,94,250
4686	82.5KVA	Set	₹ 4,89,250
4687	100KVA	Set	₹ 5,70,000
4688	125KVA	Set	₹ 5,84,250
4689	160KVA	Set	₹ 8,24,600
4690	200KVA	Set	₹ 10,21,250
4691	250KVA	Set	₹ 12,35,000
4692	320KVA	Set	₹ 16,15,000
4693	380KVA	Set	₹ 18,76,250
4694	400KVA	Set	₹ 19,47,500
4695	500KVA	Set	₹ 22,80,000
4696	625KVA	Set	₹ 33,25,000
4697	750KVA	Set	₹ 42,27,500

Code No.	Description	Unit	Rate (₹)
	OUTDOOR UNIT		
	Supply of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual seperate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condensor fan shall be capable to operate at different speed with respect to load.The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius.The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 5.4, Capacity > 40 and <70 ISEER 5.5, Capacity > 70 ISEER 5.6 for ECSBC Building)		
	For Cooling or Heating or both		
4698	6 HP to 8 HP	Per HP	14,550
4699	10 HP to 12 HP	Per HP	13,950
4700	14 HP to 22 HP	Per HP	13,275
	Supply of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual seperate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condensor fan shall be capable to operate at different speed with respect to load.The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius.The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall		

performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 6.4, Capacity > 40 and <70 ISEER 6.5, Capacity > 70 ISEER 6.6 for ECSBC+ Building)

For Cooling or Heating or both

4701	6 HP to 8 HP	Per HP	15,520
4702	10 HP to 12 HP	Per HP	14,880
4703	14 HP to 22 HP	Per HP	14,160

Supply of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual seperate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condensor fan shall be capable to operate at different speed with respect to load.The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 Degree Celcius.The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity > 70 ISEER 7.6 for Super ECSBC Building)

For Cooling or Heating or both

4704	6 HP to 8 HP	Per HP	16,490
4705	10 HP to 12 HP	Per HP	15,810
4706	14 HP to 22 HP	Per HP	15,045

INDOOR UNIT

Supply of following minimum capacity 4 way Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply,

Code No.	Description	Unit	Rate (₹)
	complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement in auto mode. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
4707	0.8 TR	Each	15,493
4708	1.0 TR	Each	19,366
4709	1.2 TR	Each	26,813
4710	1.6 TR	Each	27,413
4711	2.0 TR	Each	27,600
4712	2.4 TR	Each	28,350
4713	2.6 TR	Each	28,350
4714	3.6 TR	Each	30,750
4715	4.1 TR	Each	31,800
4716	4.6TR	Each	36,675
	Supply of following minimum capacity 4-way compact VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
4717	0.6 TR	Each	15,705
4718	0.8 TR	Each	17,450
4719	1.0 TR	Each	27,375
4720	1.2 TR	Each	27,750
4721	1.6 TR	Each	27,750
	Supply of following minimum capacity Single way wall/corner VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		

Code No.	Description	Unit	Rate (₹)
4722	0.6 TR	Each	21,000
4723	0.8 TR	Each	21,450
4724	1.0 TR	Each	22,500
4725	1.2 TR	Each	29,400
4726	1.6 TR	Each	29,400
4727	2.0 TR	Each	30,300
	Supply of following minimum capacity Double way VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
4728	0.6 TR	Each	30,600
4729	1.0 TR	Each	32,550
4730	2.0 TR	Each	39,750
4731	3.3 TR	Each	42,053
4732	4.2 TR	Each	44,576
	Supply of following minimum capacity High wall type Indoor unit equipped with and comfort washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V ± 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
4733	0.6 TR	Each	11,663
4734	0.8 TR	Each	12,000
4735	1.0 TR	Each	12,375
4736	1.2 TR	Each	15,000
4737	1.6 TR	Each	15,300
4738	2.0 TR	Each	15,750
	Supply of following minimum capacity and external static pressure VRF/VRV ceiling mounted low static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration		

Code No.	Description	Unit	Rate (₹)
	Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	Low static ductable units (minimum 19 to 29 pascal external static pressure)		
4739	0.5 TR	Each	21,000
4740	0.6 TR	Each	21,450
4741	0.8 TR	Each	21,675
4742	1.03 TR	Each	21,975
4743	1.3 TR	Each	23,925
4744	1.6 TR	Each	24,300
4745	2.0 TR	Each	25,050
	Supply of following minimum capacity and external static pressure VRF/VRV ceiling mounted mid static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	Mid static ductable units (minimum 30 to 48 pascal external static pressure)		
4746	1.2 TR	Each	23,850
4747	1.6 TR	Each	24,300
4748	2.0 TR	Each	25,050
4749	2.4 TR	Each	26,175
4750	3.2 TR	Each	27,900
	Supply of following minimum capacity and external static pressure VRF/VRV ceiling mounted mid high static ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		

Code No.	Description	Unit	Rate (₹)
	High Static Ductable units (minimum 49 to 77 pascal external static pressure)		
4751	0.8 TR	Each	21,887
4752	1.03 TR	Each	22,735
4753	1.2 TR	Each	23,974
4754	1.6 TR	Each	24,300
4755	2.0 TR	Each	25,050
4756	2.4 TR	Each	26,175
4757	3.2 TR	Each	27,900
4758	4.0 TR	Each	31,950
4759	4.6 TR	Each	44,850
	Supply of following minimum capacity and external static pressure VRF/VRV ceiling mounted high ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature. (Make will be same as of Outdoor)		
	High Static Ductable units (minimum 78 pascal external static pressure)		
4760	5.5 TR	Each	51,675
4761	6.6 TR	Each	54,225
4762	8.0 TR	Each	59,175
	Supply of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs		
4763	Indoor Units	Each	3,150
4764	Outdoor Multi Joint	Each	5,625
	COOPER REFRIGERANT PIPING		
	Supply including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :		
4765	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	178
4766	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm hick insulation	Mtr	240

Code No.	Description	Unit	Rate (₹)
4767	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	338
4768	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	427
4769	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	513
4770	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	628
4771	25.4 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	742
4772	28.58 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	Mtr	804
4773	31.8 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	Mtr	849
4774	34.9 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	Mtr	893
4775	38.1 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	Mtr	918
4776	41.27 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19mm thick insulation	Mtr	950

Code No.	Description	Unit	Rate (₹)
	WINDOW AC UNITS		
	Supply of Window type Air conditioners complete with copper power cable upto 3 Mtr, wireless Remote, suitable for working between 180- 260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing, cooling, dehumidification, air circulation, R-32/R-410A /R-407B Green Refrigerant with Scroll / rotary compressor with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB), antifreeze thermostat on the coil as a safety feature, complete with fixing including T&P & labour etc as required complete in all respect as specified of following capacity.Sound level of up to 50dB inside the room is acceptable. The unit shall be in confirmation with IS 1391 Part-I 2023 and CPWD Specification. The system shall be able to deliver 100% of the rated capacity upto 42 Degree Celcius. The system shall be able to operate up to 50 0C (out door ambient temperature).		
	Non Inverter Type		
4777	1.0 TR with fixed speed 5 Star BEE rating.	Each	21549
4778	1.5 TR with fixed speed 5 Star BEE rating.	Each	23966
	Inverter Type		
4779	1.0 TR with Inverter 5 Star BEE rating.	Each	22572
4780	1.5 TR with Inverter 5 Star BEE rating.	Each	23899
	HI WALL SPLIT SYSTEMS		
	Supply of Air Cooled Hi Wall split type Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 3 Mtr (IDU to ODU), copper power cable upto 3.5 Mtr (IDU to ODU) i/c drain pipe R-32/R-410/ R-407 Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary compressor. The system shall be able to deliver 100% of the rated capacity upto 42 Degree Celcius. Min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). Must comply : Electrical cable IS 694 or IS 9968 temperature sensing control IS /International Electrotechnical Commission (IEC) 60730, hermetic compressor IS 10617, heat exchanger IS 11329, capacitor IS 2993 and motor IS 12615. Complete as per CPWD specification and IS : 1391 Part II 2023. The system shall be able to operate up to 50 0C (out door ambient temperature).		
	Inverter Type - Cooling only		
4781	0.75 TR with 5 Star BEE Rating.	Each	26230
4782	1.0 TR with 5 Star BEE Rating.	Each	27226

Code No.	Description	Unit	Rate (₹)
4783	1.5 TR with 5 Star BEE Rating.	Each	29212
4784	2.0 TR with 5 Star BEE Rating.	Each	38509
	Inverter Type - Hot & Cold		
4785	1.0 TR with 3 Star BEE Rating.	Each	24298
4786	1.5 TR with 3 Star BEE Rating.	Each	29146
	DUCTABLE TYPE SPLIT UNITS		
	Supply of air cooled ducted split type air conditioning machine with each having a capacity and details as mentioned below suitable for operation on R 32/R-410A /R-407 Green refrigerant comprising of Scroll type compressor hermatically sealed complete with automatic capacity, safety switches, lubrication system with min 5 year (OEM) warranty for both compressor and Printed Circuit Board (PCB) , Suitable capacity squirrel cage induction motor having class 'B' insulation suitable for operation on 415 + 10% volts, 50 Hz, A.C. supply for Blower motor, Necessary drive arrangement for blower motor, Matching Air cooled condenser with necessary fittings for refrigerant piping connections, necessary structural support for mounting condensers, Microprocessor based control panel complete with accessories, machine Isolation / disconnect switch, valves and accessories to inter connect compressor and condenser including pressure testing, vacuum. Necessary starters suitable for Indoor & outdoor unit complete with O/L ,U/V, phase reversal protection, single phase preventors i/c copper conductor control and power cable and drain pipe of suitable size and length etc complete as required. The total cooling capacity/heating capacity of tested unit shall have a capacity as per relevant IS code. The lab testing reports as per IS: 8148 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per ISO/International Electrotechnical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification as required.		
	Inverter		
4787	1.5 TR (BEE 4 Star Rated)	Each	34320
4788	2.2 TR (BEE 4 Star Rated)	Each	38935
4789	3.0 TR (BEE 4 Star Rated)	Each	52975
4790	3.5 TR (3.2 EER)	Each	76473
4791	4.0 TR (3.2 EER)	Each	86580
	Inverter		
4792	1.0 TR (BEE 4 Star Rated)	Each	25090
4793	1.5 TR (BEE 4 Star Rated)	Each	26260
4794	2.0 TR (BEE 4 Star Rated)	Each	34216
4795	2.5 TR (BEE 4 Star Rated)	Each	44590
4796	3.0 TR (BEE 4 Star Rated)	Each	48230

Code No.	Description	Unit	Rate (₹)
4797	3.5 TR (3.2 EER)	Each	53105
4798	4.0 TR (3.2 EER)	Each	58955
4799	4.5 TR (3.2 EER)	Each	68566
4800	5.5 TR (3.2 EER)	Each	74685
4801	8.5 TR (3.2 EER)	Each	98995
4802	11.0 TR (3.2 EER)	Each	127335
4803	16.7 TR (3.2 EER)	Each	196950
	CASSETTE TYPE SPLIT UNITS		
	Supply of Air Cooled Cassette type Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), R-32/R410A/R-407 Green Refrigerant, wireless Remote, inbuilt drain pump, suitable for 400/230V, 50 Hz ,1 /3 phase AC supply, including surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5.5 Mtr (IDU to ODU), copper power and control cable upto 5.5 Mtr (IDU to ODU) including drain pipe, the system shall be capable of performing cooling, dehumidification, Air circulation, filteration & ventilation of following capacity with Scroll/rotary compressor with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB) as specified.The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electrotechnical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required.		
	Inverter Type- Cooling only		
4804	1.5 TR with 5 Star BEE Rating	Each	46605
4805	2.0 TR with 5 Star BEE Rating	Each	51610
4806	2.5 TR with 5 Star BEE Rating	Each	71110
4807	3.0 TR with 5 Star BEE Rating	Each	74458
4808	3.5 TR with 5 Star BEE Rating	Each	84045
4809	4.0 TR with 5 Star BEE Rating	Each	85605
	Heating & Cooling		
4810	1.5 TR with 3 Star BEE Rating	Each	36205
4811	2.0 TR with 3 Star BEE Rating	Each	40365
4812	2.5 TR with 3 Star BEE Rating	Each	48620
	TOWER TYPE SPLIT UNITS		
	Supply of Air Cooled Floor standing Tower type split Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5 Mtr (IDU to ODU), copper power cable upto 5.5 Mtr (IDU to ODU), i/c drain pipe of suitable length and size. R-32/R-410/R-407C Green Refrigerant, wireless Remote control, suitable for		

Code No.	Description	Unit	Rate (₹)
	working between 180-260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). as specified.The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electrotechnical Commission (IEC) 17025 standards / Central Power Research Institute (CPRI)/Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required.		
	Heat Pump (Heating & Cooling)		
4813	3.3 TR BEE 4 Star Rating	Each	78975
4814	3.8 TR BEE 4 Star Rating	Each	83525
4815	4.6 TR BEE 4 Star Rating	Each	88075
	Cooling Only		
4816	2.4 TR BEE 5 Star Rating	Each	56355
4817	3.3 TR BEE 5 Star Rating	Each	62660
4818	3.8 TR BEE 5 Star Rating	Each	66235
4819	4.6 TR BEE 5 Star Rating	Each	70005
	AIR COOLED PACKAGE UNITS		
	Supplying of Air cooled ductable type Packaged air-conditioning units complete with Hermetically sealed Scroll compressors fitted inside the indoor unit & first charge of refrigerant R410A or equilant permitted green refrigerant & oil ,air cooled condenser, fan section with statically/dynamically balanced centrifugal blower driven by a Totally Enclosed Fan Cooled (TEFC) squirrel cage three speed motor, Multi rows cooling coil of copper with aluminium fins etc. The enclosures shall be fabricated of M.S. The Package unit shall be equipped with synthetic fiber filter, insulated drain pan, controls all encased in a unit. The casing shall be factory powder coated. Electrical panel board for Package units shall comprise of control and power panel with including all associries i/c Voltage scanner, overload, low voltage, high voltage & phase imbalance protection, along with VI Pads complete with all ancillaries including MS painted stand for Outdoor units of suitable size, foundation and allied minor civil works as per instructions of Engineer-in-charge of following ratings including electric control panel & fitting as per CPWD specifications and as per IS: 8148 complete as required.		
	Inverter		
4820	5.0 TR (2.8 EER)	Each	91260
4821	8.0 TR (2.8 EER)	Each	123370
4822	11.0 TR (2.8 EER)	Each	149305
4823	16.5 TR (2.8 EER)	Each	209105
4824	22.0 TR (2.8 EER)	Each	273390

Code No.	Description	Unit	Rate (₹)

AIR COOLED CHILLERS

AIR COOLED SCREW CHILLERS

Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled (suitable for out door installation) Screw Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, screw type compressor each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel compatible for BMS operation, motor, starter panel (VFD), machine mounted, air- cooled condensers with Copper tube and Aluminium fins, factory fitted chiller insulation, water flow switch, vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-134A. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser air entering temp. : As per Site Dry Bulb Temperature
Suitable for Seismic Zone and Altitude as per location/site.

4825	Upto 74 TR BEE 3 Star rated	Per TR	19500
4826	75 TR - 140 TR BEE 3 Star rated	Per TR	18850
4827	141 TR - 200 TR BEE 3 Star rated	Per TR	17875

Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled Screw Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, multiple screw type compressor each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers with Copper tube and Aluminium fins, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with multiple circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-134a. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.

Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser air entering temp. : As per Site Dry Bulb Temperature
Suitable for Seismic Zone and Altitude as per location/site.

4828	upto 200 TR - BEE 4 Star Rated	Per TR	20150
4829	201 TR to 250 TR BEE 4 Star Rated	Per TR	18525
4830	251 TR - 300 TR BEE 4 Star Rated	Per TR	17550
4831	301 TR - 350 TR BEE 4 Star Rated	Per TR	16900
4832	351 TR - 400 TR BEE 4 Star Rated	Per TR	16250

AIR COOLED SCROLL CHILLERS

Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled , Scroll Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic,multiple scroll type compressors each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety controls mounted in central console panel and all mounted on a steel frame (complete as per specifications) i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-410A. The chiller shall be Building Management System (BMS) compatible.The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser air entering temp. : As per Site Dry Bulb Temperature
Suitable for Seismic Zone and Altitude as per location/site.

4833	Upto 50 TR BEE 4 Star Rated	Per TR	15925
4834	51 TR - 70 TR BEE 4 Star Rated	Per TR	15600
4835	71 TR - 100 TR BEE 4 Star Rated	Per TR	15275

Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified Air-Cooled Scroll Chiller package complete with VFD (Variable Frequency Drive), hermetic/semi hermetic, multiple scroll type compressors each with step less capacity control of 25 % to 100 % of the rated capacity, with microprocessor based control panel, motor, starter panel (VFD), machine mounted, air- cooled condensers, factory fitted chiller insulation, water flow switch , vibration spring Isolators, victaulic couplings, integral refrigerant piping and wiring with single/ two circuits, automatic and safety

controls mounted in central console panel and i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply. Refrigerant gas used shall be R-410A. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser air entering temp. : As per Site Dry Bulb Temperature
Suitable for Seismic Zone and Altitude as per location/site.

4836	Upto 50 TR BEE 3 Star Rated	Per TR	15275
4837	51 TR - 70 TR BEE 3 Star Rated	Per TR	14300
4838	71 TR - 100 TR BEE 3 Star Rated	Per TR	13975

WATER COOLED CHILLERS

WATER COOLED SCREW CHILLERS

Supply of floor-mounted AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled screw-type chiller machine complete with VFD (Variable Frequency Drive), single/multi semi-hermatic twin screw type compressor, water-cooled Shell & Tube type condenser, Shell & Tube horizontal flooded type evaporator with carbon steel shell and seamless copper tubes with 19 mm nitrile rubber insulation i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, interconnected copper refrigerant piping and wiring, vibration Isolators, gauge panel, automatic safety controls, flow switch at evaporator and condenser and ozone friendly Chlorofluorocarbons (CFC)-free refrigerant gas R-134A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 PSI and hydraulically tested at 1.3 times of design pressure . A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser water Entering Temp. (32.2 deg. C)
Condenser water Leaving Temp. (36.4 deg. C)
Suitable for Seismic Zone and Altitude as per location/site.

4839	Upto 70 TR BEE 3 Star Rated	Per TR	13325
4840	71 TR - 110 TR BEE 3 Star Rated	Per TR	11700
4841	111 TR - 150 TR BEE 3 Star Rated	Per TR	11700

Code No.	Description	Unit	Rate (₹)
4842	151 TR - 210 TR BEE 3 Star Rated	Per TR	11700
4843	211 TR - 260 TR BEE 3 Star Rated	Per TR	11375
4844	261 TR - 300 TR BEE 3 Star Rated	Per TR	11050
4845	301 TR - 450 TR BEE 3 Star Rated	Per TR	10400
4846	451 TR -600 TR BEE 3 Star Rated	Per TR	10075
	Supply of floor-mounted AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified VFD (Variable Frequancy Drive) Operated water cooled screw-type chiller machine complete with single/multi semi-hermatic twin screw type compressor, with independent circuits, water-cooled Shell & Tube type condenser, Shell & Tube horizontal flooded type evaporator with carbon steel shell and seamless copper tubes with 19 mm nitrile rubber insulation i/c suitable foundation/mounting structure made of RCC/MS Structure i/c anticorosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, common base frame, interconnected copper refrigerant piping and wiring, vibration Isolators, gauge panel, automatic safety controls, flow switch at evaporator and condenser and ozone friendly Chlorofluorocarbons (CFC)-free refrigerant gas R-134A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 psig and hydraulically tested at 1.5 times of design pressure . A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67 deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Suitable for Seismic Zone and Altitude as per location/site.		
4847	Upto 74 TR BEE 4 Star Rated	Per TR	14300
4848	75 TR - 150 TR BEE 4 Star Rated	Per TR	13650
4849	151TR - 300 TR BEE 4 Star Rated	Per TR	12350
4850	301TR - 450 TR BEE 4 Star Rated	Per TR	11700
4851	451 TR - 525 TR BEE 4 Star Rated	Per TR	10400
4852	526 TR - 600 TR BEE 4 Star Rated	Per TR	9750
	Supply of floor-mounted Variable Frequency Drive (VFD) water cooled scroll-type chiller machine complete with hermatic scroll type single/ multi compressors with independent circuits, water-cooled carbon steel shell, seamless copper tubes condenser and evaporator with 19 mm nitrile rubber insulation, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, gauge panel, automatic safety controls, flow switch at evaporator and condenser and ozone friendly Chlorofluorocarbons (CFC)-		

free refrigerant gas R-410A. The refrigerant flow control shall use an electronic expansion valve. The chiller shall be designed for a Water Side working pressure of 150 psig and hydraulically tested at 1.5 times of design pressure. A number of properly spaced baffles shall be provided for maintaining optimum water velocity and heat transfer and the tubes shall be adequately supported. The chiller shall be Building Management System (BMS) compatible The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67 deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser water Entering Temp. (32.2 deg. C)
Condenser water Leaving Temp. (36.4 deg. C)
Suitable for Seismic Zone and Altitude as per location/site.

4853	Upto 40 TR BEE 3 Star Rated	Per TR	15925
4854	41 TR - 75 TR BEE 3 Star Rated	Per TR	15600
4855	76 TR - 150 TR BEE 3 Star Rated	Per TR	15275

WATER COOLED CENTRIFUGAL CHILLERS

a) Supplying of Centrifugal Water Cooled Chilling Machine Air-Conditioning, Heating, and Refrigeration Institute (AHRI) certified complete with factory fitted (unit mounted/ free standing) (Variable Frequency Drive (VFD)) with active harmonic filter with IP54 protection a) Supplying of Centrifugal Water Cooled Chilling Machine Air-Conditioning, Heating, and Refrigeration Institute (AHRI) certified complete with factory fitted (unit mounted/ free standing) (Variable Frequency Drive (VFD)) with active harmonic filter with IP54 protection having actual capacity as below. The scope of work shall include Lifting, shifting & positioning of the equipment at location shown on the drawing. Chiller given hereunder, comprising of following and complete as per specification/drawings and as directed by Engineer-in-charge. - Chilled water inlet temperature of 12.2°C (54°F) & Chilled water outlet temperature 6.7°C (44°F) with chilled water circulation, Evaportor side fouling factor 0.018 m2.°C /kW - Condenser water inlet temperature Inlet - 32.2°C (90°F) & condenser water outlet temperature of 36.4°C (97.5°F) with water circulation, Condensor side fouling factor 0.044 m2. °C/Kwb) Open/ Semi-Hermetic/ Fully hermetic Centrifugal Compressor complete with automatic capacity control system, safety switches, speed increasing mechanism, forced feed lubrication system etc. as per detailed specifications and compressor extended warranty of 1 year for refrigerent leakage & mechanical seal.c) Suitable capacity TEFC/SPDP Squirrel Cage Induction Motor with enclosure IP 23/ as per Original Equipment Manufacturer (OEM) standard & class 'F' insulation suitable for operation on 415±10% Volt, 3 Phase, 50 HZ, AC Supply. Vendor must provide Junction box along with each set of unit including cable works from juction box to chiller.

d) Unit Mounted/ Free standing IP-54 protection (UL /EN certified) Variable Frequency Drive (VFD) Starter panel with air Cooled/ Refrigerant Cooled or as per Original Equipment Manufacturer (OEM) standard, suitable for compressor motor, complete having over-load protection, under-voltage protection, protection against phase reversal, current sensing independent single phasing protection etc. including multi-function meter and CTs, complete as per detailed specifications. Variable Frequency Drive (VFD)s shall comply with International Electrotechnical Commission (IEC) 61800-3 & have THD less than 5% at all Loads Active / passive filters must be use to achieve desired THD levels and other parameters as per IEEE - 519. Variable Frequency Drive (VFD)s shall be compatible for Modbus/BACnet Protocols. The power factor shall be > 0.95 at all loads. Original Equipment Manufacturer (OEM) shall ensure quality for each set of chiller & Variable Frequency Drive (VFD) before dispatch. Chiller performance parameters shall be as per IS 16590 and BEE star labeling. The chiller shall be Building Management System (BMS) compatiblee) Lubrication Device consisting of automatic electric oil pump, oil cooler, head tank, oil strainer, automatic pressure regulating valve, oil heater, thermal switch etc, as per detailed specifications and as required.

f) Matching Shell and Tube Water Cooled Condenser of M.S. Shell and integrally finned Copper Tubes, 2 pass heat exchanger. The Condenser shall have U- stamping / PED Certification. **Note- In case of R514a refrigerant, the relaxation on U stamping is applicable only after providing proper justification / proof documentation from Original Equipment Manufacturer (OEM) .**

g) Matching Shell and Tube Flooded type Chiller for centrifugal unit consisting of MS Shell and Copper Tubes, 2 pass Heat Exchanger, duly insulated at factory complete as per specifications and as required. The Evaporator shall have U- stamping.

h) Refrigerant Line Accessories comprising of safety valves, angle valve, liquid line indications, liquid level control, liquid line Isolation valve, etc. OR as per Original Equipment Manufacturer (OEM) design standard complete as per specifications.

i) DP/ Water Flow Switches at inlet and outlet of the condenser & chiller, water drain & air purge valves wherever required, complete as per specifications.

j) Suction Line and Chiller Insulation with minimum 19mm thick elastomeric nitrile rubber insulation complete as required from factory.k) Foundation Frame Work for mounting the above condenser, chiller, compressor and motor with base plate, panel complete with anti-vibration pads (set of spring type), vibration isolators with Isolation efficiency more than 90%. Numbers shall be as per Original Equipment Manufacturer (OEM) standards.), complete as per specifications.l) Initial/ First Charge of Refrigerant Gas and Compressor Oil.m) Chiller shall be factory tested at 25%, 50%, 75% and 100% load at Constant Condenser Water inlet at AHRI test bed.n) Each chiller shall be provided with set of grooved coupling along with the chiller for cooler and condenser inlet / outlet connection.o) Chiller Original Equipment Manufacturer (OEM) shall provide undertaking in the name of end user for

providing support for maintenance & spare availability for next 15 yrs from the date of Handover.p) Software Selection Sheet to be Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Certified based on latest version. Which can be varified online through AHRI website.q) Sound performance shall be as per relevant AHRI for all loads. This data shall be provided as apart of chiller technical submittal.Suitable for Seismic Zone and Altitude as per location/site.

4856	300 TR - 450 TR BEE 3 Star Rated	Per TR	17550
4857	451 TR - 600 TR BEE 3 Star Rated	Per TR	17225
4858	601 TR - 1000 TR BEE 3 Star Rated	Per TR	16900
4859	1001 TR - 1600 TR BEE 3 Star Rated	Per TR	16575
4860	1601 TR - 2000 TR BEE 3 Star Rated	Per TR	16575

WATER COOLED MAGNETIC CENTRIFUGAL CHILLERS

Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled Magnetic centrifugal type chiller machine complete with hermatic single/ multi compressors with independent circuits, with R-134A or equivelant refrigerant, complete with single Semi/hermetically sealed refrigerant cooled motor of working on 415 + 10% volts, 3 Phase, 50 Hz AC supply. Shell & tube flooded chiller & condenser with descaling & drain valves, victaulic /Flange coupling on condenser & evaporator, microprocessor panel for multiple start ups, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, electrical termination suitable for aluminium conductors along with thermal insulations anti vibration pads, flow switch and required accessories etc, Movable diffuser, Sight Glass at evaporator, Liquid line Isolation valves, Liquid Crystal Display (LCD) Human Machine Interface (HMI) . complete as per specifications and drawings. Complete with first charge of Refrigerant (Preferably at factory charge) .

Starter shall be Variable Frequency Drive (VFD) type and shall be Unit Mounted/ Floor Mounted ≥IP42 (UL Listed / CE Marked). Each Compressor shall be equipped with Suitable capacity Permanent Magnet Motor with class 'F' Insulation suitable for operation on 415 +/- 10% volts, 50 HZ, A.C. Supply. Chillers shall be factory AHRI tested at design conditions at 100%, 75%, 50% and 25% load respectively; test certificates shall be produced for all chillers. The chiller shall be Building Management System (BMS) compatible and shall have RS485/RS232 serial communication protocol; the motor shall be suitable for 3- Phase, 415 V ± 10%, 50 Hz AC electric supply. The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date.
Chilled water Leaving Temp. (6.67deg. C)
Chilled water Entering Temp. (12.2 deg. C)
Evaporator fouling factor = 0.018 m2. ºC/kW
Condenser water Entering Temp. (32.2 deg. C)

Code No.	Description	Unit	Rate (₹)
	Condenser water Leaving Temp. (36.4 deg. C) Condenser fouling factor = 0.044 m2. ºC/kW Suitable for Seismic Zone and Altitude as per location/site.		
4861	121 TR - 150 TR BEE 3 Star Rated	Per TR	19175
4862	151 TR - 300 TR BEE 3 Star Rated	Per TR	15600
4863	301 TR - 450 TR BEE 3 Star Rated	Per TR	15275
4864	451 TR - 600 TR BEE 3 Star Rated	Per TR	14040
	Supply of AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Certified water cooled Magnetic centrifugal type chiller machine complete with hermatic single/ multi compressors with independent circuits, with R-134A or equivelant refrigerant, complete with dual Semi/hermetically sealed refrigerant cooled motor of working on 415 + 10% volts, 3 Phase, 50 Hz AC supply. Shell & tube flooded chiller & condenser with descaling & drain valves, victaulic /Flange coupling on condenser & evaporator, microprocessor panel for multiple start ups, i/c suitable foundation/mounting structure made of RCC/MS Structure with anti-corrosive paint, anti vibration pad, power control cable and connection inter connection etc. as per design approved by engineer-in-charge, electrical termination suitable for aluminium conductors along with thermal insulations anti vibration pads, flow switch and required accessories etc, Movable diffuser, Sight Glass at evaporator, Liquid line Isolation valves, Liquid Crystal Display (LCD) Human Machine Interface (HMI). complete as per specifications and drawings. Complete with first charge of Refrigerant (Preferably at factory charge). Starter shall be Variable Frequency Drive (VFD) type and shall be Unit Mounted/ Floor Mounted ≥IP42 (UL Listed / CE Marked). Each Compressor shall be equipped with Suitable capacity Permanent Magnet Motor with class 'F' Insulation suitable for operation on 415 +/- 10% volts, 50 HZ, A.C. Supply. Chillers shall be factory AHRI tested at design conditions at 100%, 75%, 50% and 25% load respectively; test certificates shall be produced for all chillers. The chiller shall be Building Management System (BMS) compatible and shall have RS485/RS232 serial communication protocol; the motor shall be suitable for 3- Phase, 415 V ± 10%, 50 Hz AC electric supply. The system shall be in confirmation to IS : 16590 and CPWD Specification as amended upto date. Chilled water Leaving Temp. (6.67deg. C) Chilled water Entering Temp. (12.2 deg. C) Evaporator fouling factor = 0.018 m2. ºC/kW Condenser water Entering Temp. (32.2 deg. C) Condenser water Leaving Temp. (36.4 deg. C) Condenser fouling factor = 0.044 m2. ºC/kW Suitable for Seismic Zone and Altitude as per location/site.		
4865	150 TR - 205 TR BEE 4 Star Rated	Per TR	20800
4866	210 TR - 300 TR BEE 4 Star Rated	Per TR	18850
4867	301 TR - 355 TR BEE 4 Star Rated	Per TR	16575
4868	356 TR - 450 TR BEE 4 Star Rated	Per TR	15275
4869	451 TR - 600 TR BEE 4 Star Rated	Per TR	15210

Code No.	Description	Unit	Rate (₹)
	COOLING TOWER		
	Supply of Induced Draft counterflow cooling Towers(CTI approved). The Cooling Tower shall be of Fiber Reinforced Plastic (FRP) Construction. The casing, basin/sump, fan deck and fan cylinder shall be of FRP, with direct driven fans, Galvanised hardware complete with sump and drain connection with suitable valve, PVC Honey comb fill, louvers, drift eliminator complete with spray nozzle having self rotating sprinklers, steel ladder, Isolating switch and other accessories to make it fully operational and maintaince National Accreditation Board for Testing and Calibration Laboratories (NABL) & positioning of cooling tower at Terrace of Building. Propeller Type Fan, weather proof IP 55 and Direct driven.The fan motor shall be premium efficiency IE3 class , as per IS 12615 The Cooling tower shall be capable to communicate effectively with Building Management System (BMS). Range of CT: 6 deg C. Designed Duty Conditions :- EWT, LWT , D/WBT Complete as per CPWD specification/drawings and as directed by Engineer-in-charge. (Note - Cooling tower size depends on the ambient temperature conditions , contractor must check the required design temperature).		
4870	300 GPM	Each	222300
4871	450 GPM	Each	296704
4872	600 GPM	Each	414700
4873	750 GPM	Each	556306
4874	900 GPM	Each	646750
4875	1050 GPM	Each	709459
4876	1200 GPM	Each	819000
4877	1350 GPM	Each	865800
4878	1500 GPM	Each	954200
4879	1800 GPM	Each	1175200
4880	2100 GPM	Each	1331230
4881	2400 GPM	Each	1581080
4882	2700 GPM	Each	1655404
4883	3000 GPM	Each	1770644

Code No.	Description	Unit	Rate (₹)
	CEILING SUSPENDED AHU		
	Supply of Factory built ceiling suspended chilled water double skin type horizontal/vertical air handling units of following capacity, made of 25mm thick panels consisting of pre plasticized G.I. casing of thickness 0.8mm outside layer and 0.8 mm inside layer with Polyurethane Foam (PUF) insulation factory injected between them by injection moulding machine, complete with blower section with blower suitable for static pressure as required, minimum 2 bend PVC eliminators,cooling coil section with aluminium finned copper tubes (tubes thickness not less than 0.5mm) cooling coil of 4 row deep, filter section with 50mm thick metal viscous/ washable synthetic type air prefilters, belt drive package with Totally Enclosed Fan Cooled (TEFC) drive motor of efficiency class IE3 suitable for 415 ± 10% volts, 50Hz, 3 Phase AC supply suitably designed for Variable Frequency Drive (VFD) applications, drain connections, stainless steel (18G) drain pan with PUF insulation, 150 mm dia. dial type pressure gauges (2 nos.)and industrial type thermometres (2 nos.) and industrial type thermometres (2 nos.) at the inlet and outlet of coil, auto purge valve wherever required, necessary vibration Isolation arrangement, noise level shall not exceed 70 dBA. AHU shall be AHRI/Eurovent certified, fan shall be AMCA certified etc. Complete as per CPWD specification/drawings and as directed by Engineer-in-Charge. (Total static pressure considered is max. 50 mm WC).		
4884	1000 CFM	Each	44915
4885	1600 CFM	Each	52325
4886	2000 CFM	Each	55900
4887	2500 CFM	Each	63700
4888	3000 CFM	Each	70200
4889	4000 CFM	Each	80600
4890	5000 CFM	Each	98800
4891	6000 CFM	Each	111150
4892	8000 CFM	Each	137800
4893	10000 CFM	Each	176800
4894	12000 CFM	Each	212550
	FCU (FAN COIL UNIT)		
	DUCTABLE FAN COIL UNIT		
	Supply of Ceiling Concealed Fan Coil Unit comprising of 3 rows deep chilled water cooling coil, centrifugal blowers, fractional horse power (FHP) motor, synthetic fibre filters, insulated & extended condensate drain pan along with L-type auxillary tray, casing, coil piping connections, condensate drain piping connections & wiring. Fan coil units shall be suitable for operation on 220 +/- 6% Volts, 50Hz, single phase power supply of following sizes & capacities.Complete as per CPWD specification and as directed by Engineer-in-charge.		

Code No.	Description	Unit	Rate (₹)
4895	3.0 TR nominal capacity with 1200 Cfm air quantity.	Each	16055
4896	2.5 TR nominal capacity with 1000 Cfm air quantity.	Each	14820
4897	2.0 TR nominal capacity with 800 Cfm air quantity.	Each	12740
4898	1.5 TR nominal capacity with 600 Cfm air quantity.	Each	11115
4899	1.0 TR nominal capacity with 400 Cfm air quantity.	Each	9815
	CASSETTE FAN COIL UNIT		
	Supply of Chilled Water Ceiling Suspended Hydronic Cassette type fan coil unit, four(4) way directional flow, low noise, each complete with two(2) rows of deep chilled water cooling coil, multi-blade centrifugal fan, test reports from National Accreditation Board for Testing and Calibration Laboratories (NABL)/AHRI accerdited lab, electronic air cleaning system, required set of ball valves with & without strainers & 2 way Motorized valve, insulated condensate drain pans with drain pump assembly & drain pump failure alarm, pipe connections through copper pipes, Infra-red remote control, Liquid Crystal Display (LCD), four (4) speed motor , fan four(4) direction air flow, auto swing louver, decorative panel etc., condensation drain connections, All units shall be suitable for 220 +/- 10% Volts, 50 Hz, single phase power supply etc. complete as per specification. The wireless Remote temperature control / thermostat shall have memory back up for set point re-store in case of power failure and re-start. Four(4)hanger rods with required anchoring fasteners, hooks, washers etc.complete as per CPWD specification and as directed by Engineer-in-charge.		
4900	4.0 TR nominal capacity with 1600 Cfm air quantity.	Each	32520
4901	3.5TR nominal capacity with 1400 Cfm air quantity.	Each	30224
4902	3.0 TR nominal capacity with 1200 Cfm air quantity.	Each	16705
4903	2.5 TR nominal capacity with 1000 Cfm air quantity.	Each	15210
4904	2.0 TR nominal capacity with 800 Cfm air quantity.	Each	11700
4905	1.5 TR nominal capacity with 600 Cfm air quantity.	Each	10010
4906	1.0TR nominal capacity with 400 Cfm air quantity.	Each	9425
	HIGH WALL FAN COIL UNIT		
	Supply of High wall Fan Coil Unit comprising of two 2 rows deep chilled water cooling coil, centrifugal blowers, fractional horsepower (FHP) motor , synthetic fibre filters, insulated & extended condensate drain pan, casing, coil piping connections, condensate drain piping connections & wiring. Fan coil units shall be suitable for operation on 220 +/- 6% Volts, 50Hz, single phase power supply of following sizes & capacities.Complete as per CPWD specification and as directed by Engineer-in-charge.		
4907	2.0 TR nominal capacity with 800 Cfm air quantity.	Each	17319
4908	1.5 TR nominal capacity with 600 Cfm air quantity.	Each	15228
4909	1.0 TR nominal capacity with 400 Cfm air quantity.	Each	12426

Code No.	Description	Unit	Rate (₹)

EVAPORATIVE COOLING

Supply of factory assembled double skin central evaporative cooling plant having specifications as per A, B, C, D, E, F,G

A. Air washer section comprising 50 mm thick pre-air filter made out from washable Aluminium wire mesh filter with 90 % down to 10 microns.

B. Humidification section comprising of Wet pads 200 mm thick impregnated cellulose paper media (Celdec pads) of imported origin with two (2) bend PVC eliminator, internal casing with blank off's of wet section in SS-304 construction.

C. Fan Section comprising of belt driven, Double Inlet Dounle Width (DIDW) backward curved fan with outlet velocity less than or equal to 10 m/s and minimum efficiency of 70% Air Movement & Control Association International (AMCA) certified centrifugal fan suitable for required cfm at 50 mm WC static pressure.

D. Totally Enclosed Fan Cooled (TEFC) motor of IE-3 class as required with pulley, belt.

E. The unit shall be fabricated with frame work hollow extruded aluminium profile with 0.80 mm precoated GSS on outside and on inside complete with 25 mm thick Chloroflouro Carbon (CFC) free Polyurthane Frame (PUF) insulation of minimum 40 kg/cum density sandwiched in between inner and outer skins, SS -304 (18 g) Sump tank, 25mm C-PVC piping, make up, drain & quick fill and drain connection, Butterfly/Gate valves for pumps, make up, drain & quick fill and drain connections of sump, 2 no. Pumps of suitable capacity and necessary fittings, stand, anti vibration pads etc.as required.

F. Starter panel DOL/Star-Delta suitable for operation of Blower motor & pump made out of 1.6 mm thick sheet steel powder coated enclosure comprising of over load protection relay, short circuit & single phasing protection, ON / OFF push buttons, ammeter, voltmeter, indicating lamps, MCB, contactor etc. (As per Specification of CPWD & direction of Engineer-in-charge) complete in all respect.

G. All as per pre approved by Engineer-in-charge.

4910	5000 CFM	Each	68900
4911	8000 CFM	Each	91650
4912	10000 CFM	Each	120900
4913	12000 CFM	Each	143325
4914	15000 CFM	Each	170950
4915	20000 CFM	Each	239850
4916	25000 CFM	Each	275600
4917	30000 CFM	Each	336050

Code No.	Description	Unit	Rate (₹)
	AIR COOLED HEAT PUMP (FOR HOT WATER)		
	Supply of Heat pumps system for hot water using heat energy source from ambient air to Hot water, of High efficiency and energy saving operation, capable of heating water at 55º to 60º C with silent operation (the sound level should not exceed 65 dB). The Heat Pump shall have LCD display control panel with built in diagnostic and troubleshooting information and an inbuilt cycle for defrosting in case icing occurs on evaporator including all other mounting, fitting and controls, all interconnecing wiring/cabling between heat pump and electric panel etc complete in all repsect with but not limited to following specifications.Power Supply V/Ph/Hz : 400~440V/3 PH/50Hz. Suggested Maximum output water temperature in Deg C : 55 º to 60º C, ambient temperature range in Deg C : -5 ºC~45 ºC , Type of Fan : Low Noise axial fan , Suggested Noise level: DBA <63 , COP: 3.0 to 4.0. Hot Water Storage Tank consisting of GI/MS/SS cylindrical shape clarifier tank. (inlet temperature of hot water storage tank 60- 65 deg.C) suitable for minimum 4 Kg /Sqm working pressure. Tank shall be provided with water flow meter, inlet / outlet, overflow, drain connection with MH cover, 6 mm thick tank, pressure relief valves, pressure gauge at inlet / outlet with isolation cock, thermometer at inlet / outlet, ball Valve, safety valve,check valve etc. The complete system to be tested to a pressure of 10 Kg/cm2 complete in all respects including temperature indicatiors, thermostat and other required accessories. Tank shall be insulated with 100 mm thick crown 150 grade & 50 mm rock wool pads of approved quality and cladded with 24 SWG aluminium sheet cladding.		
4918	200 LPH	Each	78000
4919	300 LPH	Each	104000
4920	500 LPH	Each	136500

Code No.	Description	Unit	Rate (₹)

SOLAR WATER HEATING SYSTEM (Evacuated Tube Collector)

Supply of following capacity Evacuated Tube Collector (ETC) Solar Water Heating System comprising of all glass ETC tube absorber. The inner layer of absorber shall be of solar selected absorbing coated tube, Vacuum jacket, cover glass tube, getter and getter mirror surface, as per IS 16543. The system shall have temperature gauges, strainer, 2 nos. water meters, Suitable capacity cold and hot water tank, all MS structure for installation including suitable electric control panel complete with control and power wiring, necessary pluming inlcuding piping for cold and hot water line between tank and solar water system, water heater and thermostat including non-return valve, float valve and other valve etc. as required. The various component shall have following specification.

1. The Absorber area i.e. the number, dimension and thickness of solar evacuated tube as per IS: 16544 clause 5.4 and IS: 16543 clause 4.2
2. Boro Silicate Glass 3.3 for cover plate as per ISO: 3585

3. The material for three target coating shall be aluminum nitrate, aluminum nitrate stainless steel and copper multi layer selecting coating as per IS: 16543.

4. Manifold shall be of Mild steel section with PP coating and Inner material shall be of SS 304.

5. Recommended operating pressure:10 Bars.

6. The capacity of hot water tank shall be minimum 1.5 times the rated capacity system. Inner Material shall be Stainless Steel SS 316 b) as per IS 1730 grade SS304-2B (22SWG). The hot water tank shall be insulated with high density injected PUF insulation 50 mm thickness between inner and outer tank. Tank stand shall be of mild steel and shall be design to withstand wind velocity of 100km/hours (minimum) or more as per site.

7. Suitable nos. ISI Marked electrical heaters along control panel, MCCB, with all protections, and all safety provisions so as to achive 60 ºC temperature rise in an hour. The range of thermostat shall be upto 80 ºC.

4921	100 LPD	Each	9750
4922	200 LPD	Each	19500
4923	300 LPD	Each	29250
4924	500 LPD	Each	39000

SOLAR WATER HEATER (FLAT PLATE TYPE COLLECTOR)

Supply of Flat Plate collector (FPC) Solar Water Heating System comprising of solar flat plate collector ISI Marked made of copper sheet/copper tube, absorber toughened glass cover and aluminum extruded channel confirm to IS: 12933 (Part 1,2,3&5). The system shall have temperature gauges,

strainer, water meter 2 nos., cold and hot water tank. The system shall have suitable electric backup complete with control and power wiring etc., as following.

1. Cover plate: cover plate shall be toughened glass and thickness of 4.0 mm (min) conforming to section -1 of IS: 12933(pt-2)/2003 the solar transmittances of the cover plate shall be minimum 82 percent at near normal incidence.

2. Collector box: collector box shall be made of aluminum sections. The type grade, size, and finish of the material used shall be as per section-2 of IS: 12933 (pt-2)/2003: the minimum thickness of aluminum shall be as under:

a. Channel section for sides 1.6 mm
b. Sheet for bottom 0.7 mm
c. Support for glass retaining 1.2 mm
d. Sheet for entire body 1.0 mm

The insulation of collector box shall be minimum 0.96 m2 ºC/W for back insulation and minimum 0.48 m square degree c/w for side insulation conform to sec. 4 of IS 12933 (pt – 2) / 2003. (b) Gaskets and grommets: gaskets and grommets shall conform to Sec. 5 of IS 12933 (pt-2)/ 2003.

3.Absorber Shall Consist of riser, Header and Sheet for absorber. The Diameter of header shall be 25.4 + /-0.5mm and thickness 0.71mm. The Diameter of riser shall be 12.7 + /-0.5 mm and thickness 0.56mm and made of copper only. The distance between the risers from center to center shall be 120mm. type grade, size , workmanship and finish of the material used shall be as per section- 3 of IS : 12933 (pt -2) /2003 the sheet for absorber shall be of copper sheet 34 gauge/copper tube (at least 10 nos.)

4.Riser and header assembly designed for working pressure up 245 k pa (2.5 kg/ cm square) shall be tested for leakage at a minimum hydraulic pressure of 490 k pa (5 kg/ cm square). Sheet for absorber shall be made of copper only. Type Grade, size, workmanship and finish of the material used shall be per Section -3 of IS: 12933 (pt -2) /2003.

5.HDPE/LDPE cold water tank and hot water tank shall be dully erected on MS angle /channel duly painted with dual coats of enamel paint. The overall structure of solar collector plate module shall be design to with stand wind velocity of 100 kms /hr (minimum) or more as per site.

6.Hot water tank : The tank capacity shall be minimum 1.25 time the rated capacity of system. Inner tank material shall be stainless steel SS 316, as per IS 1730 GRADE SS304-2B. Hot water shall be insulated with high density injected PUF insulation: 50 mm, of 50 mm thickness between inner and outer tank ensures maximum heat rotenone ever season.

7. Suitable nos. ISI Marked electrical heaters along control panel, MCCB, with all protections, and all safety provisions so as to achive 60ºC temperature rise in an hour. The range of thermostat shall be upto 80 ºC.

4925	100 LPD	Each	14509
4926	200 LPD	Each	29018
4927	250 LPD	Each	33800
4928	300 LPD	Each	43527
4929	500 LPD	Each	72545

ELECTRICAL VEHICLE CHARGER

Code No.	Description	Unit	Rate (₹)
	Supply of EV charging station **As per specifications and in Compliance to relevant IS codes etc.**		
4930	**Light EV AC Charger (Mode-3)** Power : 7 kW, Input power supply: 1phase 230 +10% Volt, output supply: 230 Volt AC, Frequency:50 Hz +/-3%, Operational temprature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor)., RH upto 95%, Charging Device as per IS-17017-22-1 EV-EVSE Communication: as per relevent IS Codes, Bluetooth Low Energy, one Charge Point Plug/ Socket as per IS-60309 and IS-17017-2, Vehicle Inlet/ Connector As per EV manufacturer, suitable for 2 Wheelers and 4 wheelers.Indoor use: at least IP41; Outdoor use: at least IP44. Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262.O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Seprate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradble to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.	Each	16244
4931	**Light EV DC Charger (Mode 4)** Power Level 1: Up to 7 kW, Input power supply: 1phase 230 +10% Volt/3phase 415 Volt, Frequency: 50 Hz +/-5%, output supply: 12/24 Volt DC. Operational temprature range : -25 to 55 degree C (outdoor), -5 to 55 degree C (Indoor), RH upto 95%, Charging Device as per IS-17017-25, EV-EVSE Communication:IS-17017-25, one Charge Point Plug/ Socket as per IS-60309 and IS-17017-2, Vehicle Inlet/ Connector As per EV manufacturer, suitable for 2 Wheelers and 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44.Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262.O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Seprate RCD for multiple outputs.Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradble to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.	Each	243750
4932	**Parkbay AC Charger (Mode -3)** Power Level 2: Normal Power ~11kW/ 22 kW, 3 phase 415VAC(-40% to +20%), Frequency:50 Hz +/-5%, output supply: 240 Volt AC, Operational temprature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor), RH upto 95%, Charging Device as per IS-17017-1 EV-EVSE ISO-15118 for Smart Charging, Infrastructure Socket as per IS-17017-2-2, Vehicle Connector as per IS-17017-2-2 Vehicle Inlet/ Connector As per EV manufacturer, suitable for 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44.Mechanical Strength :protection of the external enclosure	Each	58500

against mechanical impact shall be IK08 according to IEC 62262. O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 . RCD having a rated residual operating current not exceeding 30 mA; Seprate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradble to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.

4933	**Parkbay DC Charger (Mode-3)** Power Level 2: Normal Power ~24KW and above, 3 phase 415VAC(-40% to +20%), Frequency:50 Hz +/-5%, output supply: DC 12/24 Volt, Operational temprature range : -25 to 55 degree C (outdoor), -5 to 55 degree C(Indoor), RH upto 95%, Charging Device as perDevice/protocol: IS-17017-23, EV-EVSE Communication as per IS-17017-24 ,ISO-15118, Infrastructure Socket as per IS-17017-2-2/3, Vehicle Connector as per IS-17017-2-3 Vehicle Inlet/ Connector As per EV manufacturer, suitable for 4 wheelers. Indoor use: at least IP41; Outdoor use: at least IP44. Mechanical Strength :protection of the external enclosure against mechanical impact shall be IK08 according to IEC 62262. O/L,S/C protection. Insulation Resistance > 1 M Ω. Cable Length: 7.5 m. RCD having a rated residual operating current not exceeding 30 mA; Seprate RCD for multiple outputs. Telecommunication port of the EV supply equipment according to IS 13252 (Part 1) : 2010. OCPP(Open charge point protocol) 1.6J upgradble to ocpp 2.0. Device Should follow 17017 series of IS codes in general and the installation of the system shall comply with relevent IS Codes.	Each	617500

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