MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd
A Govt. of Maharashtra Undertaking
CIN: U40109MH2005SGC153645

Office of the Regional Director
"PrakashBhavan" 4th floor, SenapatiBapat Road, Near Chatushrungi Temple,
Ganeshkhind, Pune- 411016
E-mail : rdpune@mahadiscom.in / rdmsedclpune@gmailcom
Website: www.mahadiscom.in
Phone no. 020-25635906(o)/25635933(P)

RD/Pune/Tech/GTP- 25 kVA/Shivshakti/ No- 1552 Dtd:- 28 NOV 2018

To,
M/s Shivshakti Power Devices India Pvt. Ltd.,
Sr.No.46, Hissa No. 35,
Narhegaon, Tal- Haveli
Pune – 411 041

Sub: - **Proposal submitted by M/s Shivshakti Power Devices India Pvt Ltd, Narhegaon, Pune, for approval of GTP and Drawings of BIS Certified 25 kVA, 22/ 0.433 kV ,Three Phase Distribution Transformers, Outdoor Type, ONAN, Energy Efficient Level-III for supply in Schemes/ works such as DDF/ DPDC / SCP/ under 1.3 % supervision charges in MSEDCL network.**

Ref: -
1. Offer letter from M/s Shivshakti Power Devices India Pvt Ltd Pune Dt.:- 28.08.2018.
2. CE/MMC/MSC-I/3 Phase/ (25-200KVA)/DT/T/2017/01 Amended on Date:- 12.05.2017.
3. CE/Infra II/EE-IV/Vendor/36802 Dtd 16.10.2015.
4. CE/Infra II/EE-IV/Vendor/29405 Dtd 24.07.2015.
5. BIS Certification No L- **7500154813.**
6. The Gazette of India, (MoP-Notification) Dtd. - 17/02/2017.
7. CE / MMC / Gr. XII / 000604 Dtd. - 23/02/2017.
8. SE/TQA/ PR/Office Note/ No 28 Dtd. 01.11.2018.

Dear Sir,

In connection to above, this office is in receipt of your proposal, regarding approval of GTP and drawings of **22/0.433 kV, 25 kVA Level-III, as per BIS 1180 Part-I, 2014, Outdoor Type, Distribution Transformers.**

Accordingly the submitted GTP, Drawings and Type Test reports of **22/0.433 kV, 25 kVA Level -III, as per BIS 1180 Part-I, 2014, Outdoor Type, Distribution Transformers** are technically scrutinized as per IS: 1180, Part I: 2014, MSEDCL Technical specifications vide references (2, 3 & 4) & submitted Type Test Reports (*ERDA Vadodara*).

Details of Drawings submitted:-

Sr.no	Title of Drawings (for 25 kVA, 22/0.433 kV)	Drawing Number (Outdoor type)
1	Rating & Diagram Plate	SPD / 25 / 22 /L3 / NP/ OD/ 03
2	General Arrangement	SPD / 25 / 22 /L3 / GA/ OD/ 01
3	Internal Construction	SPD / 25 / 22 /L3 / IC / OD/ 02
4	Technical Details Drawing	SPD / 25 / 22 /L3 / TD / OD/ 04
5	General Arrangement & Creepage of 24 kV, 250 A, HV Bushing	SPD / 25 / 22 / HV/ 05
6	General arrangement & Creepage distance of 1.1 kV ,630 A, LV Bushing	SPD / 25 / 22 / LV / 06
7	Silica Gel Breather	SPD / 25 / 22 / SILLICA / 07

Details of Type Test Reports:-

Sr.No	Type Test Particulars	Type Test Report No. & date	
		22 kV , 25 kVA	Place of Testing
1	Lightening Impulse Test [IS:2026 (Part 3)]	RP-1819-015136, dt:-20.07.2018	E.R.D.A.-Vadodara
2	Temperature Rise Test	RP-1819-019044, dt:-14.08.2018	E.R.D.A.-Vadodara

3	Short Circuit withstand test	RP-1819-018659, dt:-11.08.2018	E.R.D.A.-Vadodara
4	Pressure Test	RP-1819-019044, dt:-14.08.2018	E.R.D.A.-Vadodara
5	Oil Leakage Test	RP-1819-019044, dt:-14.08.2018	E.R.D.A.-Vadodara

The submitted Type Test report are of **Energy Efficient Level-3** and as per IS: 1180 (Part-I), 2014 with amendment No.1 & 2; are within the stipulated validity of 5 years.

The offered / submitted GTP and drawings were technically scrutinized as per IS: 1180, Part I: 2014 the relevant IS, submitted Type Test Report (ERDA Vadodara) and MSEDCL Technical specifications vide ref.no. 2, 3 & 4 and are generally found in order.

One set of approved GTP, Drawing with duly signed & stamped copy are enclosed herewith. The approval is given subject to the following terms & conditions

1) All routine & acceptance test shall be carried out on all above Transformers as per IS-2026, IS-1180 (amended up to date) at firm's factory in presence of Executive Engineer (Testing), MSEDCL.
2) This approval shall not be considered for any technical/ commercial evaluation for procurement in MSEDCL.
3) All transformers supplied against this specification shall be guaranteed for a period of 66 months from the date of receipt at the consignee's Stores Center or 60 months from the date of commissioning, whichever is earlier. However, any engineering error, omission, wrong provisions, etc. which do not have any effect on the time period, shall be attended to as and when observed/ pointed out without any price implication.
4) The firm should maintain same design & Construction of all above rating transformers strictly in accordance with the approved GTP's and Drawings and MSEDCL Technical Specifications and IS-2026 & IS-1180 only. However if any minor changes in the equipments are required changes shall be made locally in consultation with Executive Engineer (Testing) with intimation to this office.
5) The balance tests as per MSEDCL Specifications /IS 1180 Part I (2014) shall be carried out in consultation with Executive Engineer (Testing).
6) This approval shall not relieve you from the responsibility and liability to ensure correctness of the drawings and its correct interpretation for meeting the requirements as per MSEDCL Technical specifications and latest amended IS Specifications. The Distribution Transformers shall conform to IS: 1180 (Part 1): 2014 amended up to date or other International Standards for equal or better performance.
7) The procedure of RST & inspection are laid down in MSEDCL Technical Specification shall be adopted scrupulously.
8) The validity of type test is 5 years. The type test should be renewed before the said validity period. On expiry of validity of the type tests approval stands cancelled.
9) Other guarantee technical particular for 22/0.433kV, 25 kVA BIS approved Dist. Transformer should be strictly in accordance with the technical specifications & relevant IS standards (amended up to date).
10) This approval shall be reviewed after 2 years by doing sample testing of the commissioned Distribution Transformers. After testing if the performance of the job is not satisfactory, then this vendor approval will be treated cancelled.
11) This approval is accorded for GTP/ Drawings of **22/0.433 kV, 25 kVA Level- III, as per BIS 1180 Part-I, 2014, Outdoor Type, Distribution Transformers** for supply in Schemes / works such as DDF / DPDC/ SCP / under 1.3 % supervision charges in MSEDCL network (except for Infra Plan/ IPDS/ DDUGJY/ HVDS Schemes).

Superintending Engineer (O)
MSEDCL, Pune Region

Copy S.w.rs.to:-

1. Jt. Managing Director, MSEDCL Aurangabad Region.
2. Regional Director, MSEDCL Pune /Kokan / Nagpur Region.

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED.
RATING 25 KVA 22KV/0.433 KV Level '3' DISTRIBUTION TRANSFORMER
GUARANTEED TECHNICAL PARTICULARS

SR NO	GTP PARAMETERS	OFFERED
1	Name of Manufacturer.	M/s Shivshakti Power device (India) Pvt Ltd, Pune
2	Reference Standard	IS 1180 (Part):2014
3	MSEDCL Specification Reference	CE/MMC/MSC-I/3 Phase (25-200 kVA)/DT/T/2017/01. Date:12.05.2017.
4	Whether transformer is Oil Natural Air Natural cooled type(Yes/ No)	Yes
5	Whether transformer is suitable for Indoor /Outdoor installation	Outdoor
6	Type of transformer	Non- sealed Type Transformer
7	Energy Efficiency Level As per IS 1180 part: 1	Level-3
8	BIS License No.	CM/L-7500154813
9	Rating of transformer in KVA	25KVA
10	Primary Voltage in kV	22 KV
11	Highest System Voltage	24 KV
12	Frequency in HZ	50 HZ
13	Secondary Voltage in kV	0.433 KV
14	Rated Primary Current in Amp	0.65 Amp
15	Rated Secondary Current in Amp	33.33 Amp
16	Impedance Voltage at 75 degree Centigrade	4.5+/-10 % Tol As per IS.
17	Whether neutral is solidly earthed (Yes/ No)	Yes
18	Colour of transformer	Air Craft Blue Shade No 108 IS-5; Powder coated
19	Vector Group	Dyn-11
20	Rated Basic Insulation Level for Rated voltage-HV	50 KVrms/125 Kvp
21	Rated Basic Insulation Level for Rated voltage-LV	3 KVrms
22	Maximum Temperature rise of top oil over an Ambient Temperature of 50 Degree celcius	35 degree celecius
23	Maximum Temperature rise of winding over an Ambient Temperature of 50 Degree celcius	40 degree celecius
24	Name Plate details are as per the requirement specified in tender	Yes
25	Thickness of Name plate & material used	18 SWG / Alluminium Anodized
26	Approximate overall length of transformer in mm	950 mm
27	Approximate overall breadth of transformer in mm	650 mm
28	Approximate overall height of transformer in mm	1250mm
29	Approximate length of transformer tank in mm	800mm
30	Approximate breadth of transformer tank in mm	320mm
31	Approximate height of transformer tank in mm HV/LV	615/585 mm
32	Thickness of the side of transformer Tank plate in mm	3.15 mm
33	Thickness of the bottom of transformer tank plate in mm	5 mm
34	Thickness of the top of transformer tank plate in mm	5 mm
35	Size of reinforced welding Angle to Transformer tank in mm	50X50X5
36	Type of Tank (corrugated/conventional)	Conventional
37	In case of corrugated tank , thickness of corrugated sheet (In Mm)	NA
38	Degree of slope to the top plate of Transformer.	5 to 10 Degree
39	Shape of Transformer Tank	Rectangular
40	Weight of Tank & fittings in Kgs	85Kg

This GTP is found generally in order hence Approved
Supdtg. Engr.(O)
M.S.E.D.C.L.
Regional Office,
Pune

Shivshakti Power Device (I) Pvt. Ltd.
Pune-09

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED.
RATING 25 KVA 22KV/0.433 KV Level '3' DISTRIBUTION TRANSFORMER
GUARANTEED TECHNICAL PARTICULARS

SR NO	GTP PARAMETERS	OFFERED
41	Total Weight of Transformer in kgs	342 Kg
42	In case of corrugated tank , thickness of corrugated sheet (In Mm)	Not Applicable
43	Size of Base channel provide to tank	75x40 mm -2 nos
44	No of Roller provided to Transformer (diameter & width)	NA
45	Marking as MSEDCL & Sr No of tranformer is engraved on transformer main tank	Yes
46	Conservator tank to the transformer with oil level indicator (showing three levels) and drain plug is provided (Yes/ No)	Yes
47	Size of Conservator tank in mm	600X265mm
48	Total Volume of Conservator Tank	33 Liters
49	Rating and Diagram Plate	01No
50	Eathing terminals with lugs	2 No,8 mm size on opposite side
51	Lifting lugs	8mm-2Nos For tank ,8 mm Top lifting-2 Nos
52	Pullings lugs	4 Nos,8 mm
53	Oil filing hole with metalic cap (on conservator)	1 No , 40 mm diameter
54	Draing Valve - 32mm for all T/Fs (It shall be covered with metalic box spot welded to tank) IS554	Yes
55	Filter Valve (32mm Dia)	Yes
56	Conservator with drain plug	Yes
57	The pipe connecting the conservator to the main tank	yes,2Nos, 33mm diameter
58	Thermometer pocket with cap	yes,1No.
59	Air release device	yes,1No.
60	Explosion vent with diaphragm	yes
61	Silica Gel Breather 250/500gms with make	1No,250gram , Press _N Forge , Yashwant Scientific Industries , Ghorpade Industries , Darshan Sales , Shreeji.
62	Platform mounting channel (with hole suitable for axle of rollers)	2No, 75 x 40 mm-460mm long
63	Oil level gauge indicating 3 positions of oil marked asMinimum(-) 5deg C, Normal 30 deg C,Maximum 98 deg C	Yes, Provided as per specification.
64	HT & LT bushing and terminal connectors	3No of HT bushing & 4 No of LT bushing
65	Radiators	No.
66	Lightening Arrestors for HT bushings	18KV,5KA Lighting arrestors-3Nos provided.
67	Rating of lightning Arrester And make thereof	18KV,5 KA, Elpro / RPG/ New Aquaria/Genesis/Shreem Electricals / Orange Power /Lamco
68	Reference Standard Of Lightning Arrester	IS:3070, 1993
69	No of radiators provided and location with arrangement	-
70	Thickness of the radiator of transformer in mm	1.25 mm
71	No of radiator fins.	-
72	Radiating surface of transformer tank only in Sq. Mtrs.(A)	1.344 Sq. Mtrs.
73	Radiating surface of Radiators in Sq. Mtrs.(B)	-
74	Total Radiating surface of Transformer tank in Sq. Mtrs.(A+B)	1.344 Sq. Mtrs.
75	Core material used & its grade	CRGO M-4

The GTP is found generally in order hence Approved
Suptdg. Engr.(O)
O&M Circle
Regional Office,
Pune

M/s. Shivshakti Power Device (I) Pvt. Ltd.
Pune 09

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED.
RATING 25 KVA 22KV/0.433 KV Level '3' DISTRIBUTION TRANSFORMER
GUARANTEED TECHNICAL PARTICULARS

SR NO	GTP PARAMETERS	OFFERED
76	Thickness of core lamination in mm	0.23mm
77	Type of core	Stack
78	No. of steps of core for CRGO core	10Nos.
79	Weight of Core in kgs	105Kgs
80	Weight of winding in Kg	70Kg
81	Diameter of core in mm	98 mm
82	Effective core area.(sq.cm)	69.54
83	Flux density in Tesla	1.498Tesla
84	Material of H.V. winding	COPPER
85	Material of L.V.Winding	COPPER
86	Current density of H.V. winding (in Ampere/ sq.mm)	1.524 Ampere/sq.mm
87	Current density of L.V. Winding (in Ampere/mm 2)	1.89Ampere/ sq.mm
88	The temperature shall in no case reach a value that will damage the core itself, other parts or adjacent materials (Yes/No)	Yes
89	Type of connection for H.V. Winding (Delta) (Yes/ No)	Yes
90	Type of connection for L.V. Winding (Star) (Yes/ No)	Yes
91	Insulation provided to H.V winding.	D.P.C.
92	Insulation provided to L.V. Winding.	D.P.C.
93	No of LV winding turns	108 Nos
94	No of HV winding turns	9504 Nos
95	Resistance of LV winding per phase at 20 deg C in ohms	0.04097 ohms
96	Resistance of HV winding per phase at 20 deg C in ohms	418.14 ohm
97	Whether taps are provided on HV side	NA
98	Size of Wire used for HV winding in mm (DIA)	0.56mm
99	Cross section area of the coil used for HV winding (sq.mm)	0.246
100	Size of strip used for LV winding in mm	(8.00 X 2.2 mm)
101	No. of conductors in parallel for LV winding	2Nos.
102	Total cross section area of LV conductor in sq. mm	17.6Sq. mm
103	No. of H.V coils /phase	4 Nos.
104	No. of L.V coils /phase	1 Nos.
105	Length of coil used in HV winding in Meter	5792.53mtrs /ph
106	Length of coil used in LV winding in Meter	3412.53mtrs/ph
107	Clearance between Core & L.V. winding in mm	4 mm Radial
108	Clearances between L.V. & H.V. winding in mm	13.5mm Radial
109	Clearances between HV Phase to Phase in mm	10 mm (Min.)
110	Clearances between end insulation to Earth in mm	35 mm
111	Clearances between winding to tank in mm (Min 30MM)	40mm
112	Weight of Copper in kgs	70 Kg
113	Inter layer insulation provided in H.V winding to design for Top & bottom layer	0.10 mm,EC Grade Paper
114	Inter layer insulation provided in L.V winding to design for Top & bottom layer	0.25 mm,.EC Grade Paper

This GTP is found generally in order hence Approved
Supdtg. Engr.(O)
M.S.E.D.C.L.
Regional Office,
Pune

Shivshakti Power Devices (I) Pvt. Ltd.
Pune-09

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED.
RATING 25 KVA 22KV/0.433 KV Level '3' DISTRIBUTION TRANSFORMER
GUARANTEED TECHNICAL PARTICULARS

SR NO	GTP PARAMETERS	OFFERED
115	Inter layer insulation provided in between all layer in H.V winding	0.1mm.,EC Grade Paper
116	Inter layer insulation provided in between all layer in L.V winding	0.25 mm.,EC Grade Paper
117	Thickness of LV & HV Paper Used	2 Mil For HV & 10 Mil for LV
118	Details of end insulation & Make there of	press board , Lamtex Insulation , Energy Insulation , Alco wire Industries , Star Trading , Raman Board
119	Whether wedges are Provided at 50% turns of the Coil (Yes/ No)	No
120	Insulation materials provided for core	Carlit , Hot Oil Proof Insulation
121	Thickness of locking spacers between H.V. coils (in mm)	10mm
122	Weight of Oil in kgs	82 Kgs.
123	Volume of Oil in Ltrs	100 Ltrs.
124	Quantity of Total Oil absorption(in Liters) in first filling	5.36Ltrs
125	Total Oil Volume Including + Total Oil absorption in Liters	105.36 Ltrs
126	Breakdown Values of Oil at the time of first filling (kV/mm) considering 2.5 mm gap	60 Kv for 1 minute withstand
127	Grade of oil	EHV Grade, IS 335
128	Make of oil	Apar, Columbia, Savita, Transol, Electrol,Servo
129	Material of HV and LV Bushings and makes thereof	Porcelain, CJI/ Genesis Insulator/ Shreeji Group/ Udyog Center/ JS Insulators.
130	Reference standard of Bushings	As per IS 3347 , 8603
131	Minimum Creepage Distance of HV Bushing in mm (min.25 mm per kV)	Yes 605 mm
132	Minimum Creepage Distance of LV Bushing in mm (min.25 mm per kV)	Yes 55mm
133	Rating of H.V. Bushings (in kV/A)	24 KV / 250 A
134	Rating of L.V. Bushing (in kV, A)	1.1KV / 250A
135	Min. External clearances of H.V. bushing terminals between ph. to ph. (330 mm)	330mm
136	Min. External clearances of H.V. bushing terminals between ph. to earth (230mm)	230mm
137	Min. External clearances of L.V. bushing terminals between ph. to ph. (75 mm)	75 mm
138	Min. External clearances of L.V. bushing terminals between ph. to earth (40 mm)	40 mm
141	Magnetizing current (No load) in Amps and its % of full load current at rated voltage referred to L.V. side. (Cl No-6.1)	3% of LV Current
142	Magnetizing current (No load) in Amps and its % of full load current at maximum voltage (112.5% of rated voltage) referred to L.V. side. (Cl No-6.1)	6% of LV Current
143	Total Losses at 50 % Loading	183.75Watts
144	Total Losses at 100 % Loading	624.75Watts
145	Efficiency at 75 °C at unity P.F. at 125% load	97.78%
146	Efficiency at 75 °C at unity P.F. at 100% load	98.21%
147	Efficiency at 75 °C at unity P.F. at 75 % load	98.65%

The GTP is found generally in order hence approved
Supdtg. Engr.(O)
M.S.E.D.C.L.,
Regional Office,
Pune

M/s. Shivshakti Power Device (I) Pvt. Ltd.

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED.
RATING 25 KVA 22KV/0.433 KV Level '3' DISTRIBUTION TRANSFORMER
GUARANTEED TECHNICAL PARTICULARS

SR NO	GTP PARAMETERS	OFFERED
148	Efficiency at 75 °C at unity P.F. at 50% load	98.66%
149	Efficiency at 75 °C at unity P.F. at 25% load	99.55%
150	Efficiency at 75 °C at 0.8 P.F. lag at 125% load	97.65%
151	Efficiency at 75 °C at 0.8 P.F. lag at 100 % load	97.77%
152	Efficiency at 75 °C at 0.8 P.F. lag at 75 % load	98.32%
153	Efficiency at 75 °C at 0.8 P.F. lag at 50 % load	98.32%
154	Efficiency at 75 °C at 0.8 P.F .lag at 25% load	99.43%
155	Efficiency at 75 °C at 0.8 P.F. leading at 125% load	97.65%
156	Efficiency at 75 °C at 0.8 P.F. leading at 100% load	97.77%
157	Efficiency at 75 °C at 0.8 P.F. leading at 75% load	98.32%
158	Efficiency at 75 °C at 0.8 P.F. leading at 50%load	98.32%
159	Efficiency at 75°C at 0.8 P.F. leading at 25 % load	99.43%
160	Regulation at Unity P.F (in %)	1.174
161	Regulation at 0.8 P.F. lag. (in %)	3.37
162	Regulation at 0.8 P.F. leading. (in %)	3.37
163	Separate source power frequency withstand test for HV for 1 minute in kv(min) for Transformer	50 kV
164	Separate source power frequency withstand test for LV for 1 minute in kv(min) for Transformer	3 KV
165	Induced over voltage withstand test for 1 min. specify voltage frequency, time for test.(Transformer)	0.866 kV for 1 min at 100 Hz
166	Impulse test value (in KVp) for Transformer.	125 kVp
167	Power frequency withstand voltage dry & wet in kV(rms) for H.V Bushing	50 KV for one minute
168	Dry lightning Impulse withstand voltage test in kV (peak) Stating the wave form adopted for H.V. bushing	125 KV duration of 1.2/50 micro seconds
170	BIS Licence Copy is attached with this offer	Yes
171	All type test report of type tests carried out on transformer at NABL laboratory shall be submitted along with GTP and soft copy	Yes
173	All drawings shall be furnished for each offered item separately along with this offer (Yes/ No)	Yes
174	Oil absorption calculation sheet shall be furnished for each offered item separately along with GTP (Yes/ No)	Yes
175	Heat dissipation calculation shall be furnished for each offered item separately along with this offer (Yes/ No)	Yes
176	Flux density calculation sheet with no. of Primary & Secondary turns shall be furnished for each offered item separately along with this offer (Yes/ No)	Yes
177	The performance Guarantee of the transformers in years	5 yrs from the date of commissioning
NOTE 1) Weights and Dimensions are subjected to +10% tolerance. No negative tolerance applicable		
2) Efficiency and Regulation are calculated based on the nominal values of NLL,LL@75 DEG.C., %Z @75 DEG.C.		

M/s. Shivshakti Power Devices (I) Pvt. Ltd. Pune 09

The GTP is found generally in order hence Approved
Supdtg. Engr.(O)
M.S.E.D.C.L.
Regional Office,
Pune