

MATERIAL SPECIFICATIONS CELL

TECHNICAL SPECIFICATION

6/8 WAY LT FEEDER PILLER WITH PROVISION OF
ENERGY METER, AIR CIRCUIT BREAKER, MS/SMC BOX

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1.00 SCOPE

This specification covers design, manufacture, testing, inspection at manufacturer's works, packing and supply of LT Feeder Pillars made out of either complete enclosure of Mild Steel or complete enclosure of thermosetting plastic i.e. glass reinforced polyester sheet molding compound confirming to IS: 13410/1992. The system shall be A.C.

3 phase, 4 wire, 433 V, 50 Hz with effectively grounded neutral. L.T. feeder pillars shall be 6Way/8Way with ACB along with provision for Energy meter and Resin cast CT arrangement at various stores/sites in Maharashtra state.

It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to relevant standard and high quality and workmanship capable to perform continuous and satisfactory operations in the actual service conditions at site. Bidder shall have proven experience of 3 years of manufacturing of similar products and supplying to electrical utilities.

2.00 SERVICE CONDITIONS:

The feeder pillar to be supplied against this specification shall be suitable for satisfactory continuous operation under the following environmental conditions:

a) Maximum ambient temperature	55°C
b) Maximum ambient temperature in shade	45°C
c) Minimum temperature of air in shade	35°C
d) Maximum daily average temperature	40°C
e) Maximum yearly weighted average temperature	32°C
f) Relative Humidity	10 to 95 %
g) Maximum Annual rainfall	1450 mm
h) Maximum wind pressure	150 kg/m ²
i) Maximum altitude above mean sea level	1000 meter
j) Isoceraunic level	50 days/year
k) Seismic level (Horizontal acceleration)	0.3 g
l) Climate: Moderately hot and humid tropical climate conducive to rust and fungus growth.	

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3.00 STANDARDS (to which feeder pillar shall comply):

IS: 5039/1983	Distribution pillars for voltage not exceeding 1000 V
IS:14772/2000	General Requirements for Enclosures for Accessories for Household and Similar Fixed Electrical Installations - Specification
IS :13947/ 1993(Part 1) & (Part 2)	Specification for Low-voltage Switchgear and Controlgear – Part 1 : General Rules& Annex ‘C’ for Degrees of Protection provided by enclosures of electrical Equipments
	Part 2 : Circuit Breakers
IS: 13410/1992	Glass reinforced polyester sheet molding compounds (SMC)
IS: 13411/1992	Glass reinforced polyester dough molding compounds (DMC)
IS: 13703/1993	Low voltage Fuses (part 1,Part 2 sec1, Part 2 sec 2 & Part 4)
IS/IEC 127-2 : 1989	Miniature Fuses - Part 2 : Cartridge Fuse Links – Specification
IS/IEC 127-6 :1994	Miniature Fuses - Part 6 : Fuse Holders for Miniature Cartridge Fuse Links - Specification
IS:8623/1993 (Part 1,2 &3)	Specification for Low-Voltage Switchgear and Controlgear Assemblies for general requirement of L.T. Switchgears
IS: 4237/1982	General arrangement for switch gear and control Gear for voltage not exceeding 1000 V with enclosure Box
IS: 732/1989	Code of Practice for Electrical Wiring Installations
IS: 5082/1998	Wrought aluminum and aluminum alloy bars, rods, tubes and sections for electrical purposes
IS: 6005/1998	Code of practice for phosphating iron and steel
IS: 5/2004	Colour for ready mixed paints and enamel
IS: 8588(Part- 1/ 1977	Thermostatic bimetals: General requirements and methods of tests

4.00 PRINCIPLE TECHNICAL PARAMETERS:

Rated Supply Voltage : 3 phase, 440 V, 50Hz
 Rated Current : 800A, 1000A,1250 A (as per requirement)
 Insulation level: 1100V AC 50 Hz Continuous
 : 2.5 kV for 1 Min
 : 2000 V DC

Rated short circuit Current :80KA
 Temperature rise : Shall not exceed delivery operating temperature of components conforming to relevant standards limited to 30° C above ambient.

5.00 GENERAL TECHNICAL PARAMETERS:**5.1) CUBICLE**

5.1.1 The cubicle of LT feeder pillars shall be made out of either 10 SWG (3.25 mm thick) cold rolled M.S sheet steel, plates and shaped sections or thermosetting plastic i.e. glass reinforced polyester sheet molding compound (SMC) conforming IS: 13410- 1992 as per the requirements specified. All panel edges and door edges shall be reinforced against distortion by rolling, bending etc. The complete cubical shall be rigid self supporting and free standing. The enclosure shall comply with the requirement of IP- 43 type as per the IS – 13947 or the latest version thereof. The enclosure shall be anti corrosive, dust proof, rust proof, vermin and water proof, ultra violet stabilized and flame retardant property.

5.1.2 The LT feeder pillars shall have front and rear compartments. Front compartment shall be suitable for HRC fuses and the rear for cable terminations. Asbestos sheet of at least 6 mm thick shall be provided for separation between front & rear compartments; between ACB & Meter compartment; between R-Y-B HRC fuse compartments. L.T. Feeder pillar shall have Air Circuit Breaker of rating 800/1000/1250 Amp on incoming circuit as per the actual requirement and HRC fuse base with links of 630/400A on outgoing circuits as per the requirement with necessary interconnecting Bus Bars/ Links etc.

5.1.3 The cubicles shall have center lift up type slanting roof rain hood made up of 10 SWG MS sheets or minimum 10 SWG SMC sheets conforming to IS: 13410-1992. The depth and width of the rain hood shall be at least 120% of the depth and width of the pillars. The doors shall not be detachable after fixing the rain hood.

5.1.4 The base and doors of cubicle shall be individually in one piece except for fixing of the accessories like hinges, clamps, mounting clamps, bolts etc. The Average minimum thickness of the MS/SMC sheet for cubicle and door shall be 4mm for SMC and 10 SWG for MS sheet for 6way/8way Pillar. The details of SMC material shall be as per the annexure 'I' attached. Base and doors shall have flange / collars as shown in drawing. Collar of Base and doors shall overlap by 10mm.

5.1.5 Standard General Arrangement of Air Circuit Breaker, HRC fuse base with links, Link Disconnecter, Bus Bars, connecting links, Cable termination arrangement etc. inside the L.T. pillars shall be as per the drawings attached with the specification for various types of L. T. Feeder

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pillars. The clearances & creepage distances shall be in accordance with IS: 13947(Part 1) / 1993. Air Circuit breaker's operating handle shall be accessible only after opening of the doors.

5.1.6 The general overall dimensions of L.T. feeder pillars shall be as in the table below. The enclosure shall have doors from front & back side. The complete cubical shall be rigid self supporting and freestanding.

The dimensions mentioned below are overall dimensions without rain hood. However, Compact size with adequate clearances as per I. E. Rules 1956/IS: 13947 (Part 1) / 1993 is also acceptable.

Width	1400 mm for 6 Way and 1930 mm for 8 way
Depth	650 mm
Height	1850 mm

The supplier shall submit their own drawing for approval of the competent authority before manufacturing. Proto shall be inspected by the representative of the C.E. (Testing) before bulk manufacturing.

5.1.7 Suitable no. of hinges as mentioned below shall be fitted from inside of the box to fix the doors. Hinges shall be 50 mm in length and made from 2mm thick M. S. sheet. Hinge pin diameter shall be minimum 4mm. Doors shall be fixed with three screws in each hinge. The hinges shall not be visible from outside. On closing of doors, right door shall rest on the left door. Hinges shall be of such construction that the doors shall be swung open by not less than 150°. The details of doors & hinges to be provided shall be as mentioned below:

Front Door-3 no., Back Door-3 no., Hinges/door-3

5.1.8 The doors shall be centrally closed with "Godrej" type triple position locking arrangement and shall be operational with a common handle from outside the door. Movement of handle will lock the doors at center, top & bottom. A Nylon washer shall be provided between the handle and door to avoid penetration of water. One central lock with brass levers shall be provided inside the door. Key way with suitable cover shall be provided on the door for operating the lock from outside. Two keys shall be supplied for each pillar. In addition cleat arrangement shall be provided for putting two nos. of padlocks for each size of doors.

5.1.9 Four Louvers (two on each side) shall be provided to L.T. feeder

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pillars. Louvers with stainless steel wire mesh with shall be provided on both sides of the feeder pillars and at the top and bottom of both sides of L.T. pillars. Mounting of components inside the enclosure shall allow free air circulation keeping the clearances as per specification.

5.1.10 The cubicles shall be provided with pedestal arrangement having suitable no. of bottom holes for grouting bolts at all four corners & at the middle as per requirement.. The pedestal shall be covered from all sides with 10 SWG M.S./ SMC sheets.

5.1.11 Suitable no. of detachable gland plates made up of 10 SWG MS sheets/SMC material shall be provided in the cubicle at the bottom. Gland plate shall be provided with suitable size cable gland & with four screws for fixing the plate from inside. Size & no. of the glands to be provided will be intimated to the successful tenderer along with approval of drawings.

Fuse base shall be mounted on MS / SMC base channel of size 60 x 20 x 3.15 mm thick. All Nuts & Bolts in electrical circuit shall be of non-magnetic stainless steel.

5.1.12 A bayonet lamp holder complying with IS: 1258/1987 with a tumbler switch complying with IS: 3854/1988, a three pin plug & socket complying with IS: 1293/1988 with necessary fuses & wiring shall be provided inside the pillar on the front bottom portion of the shade near the neutral bus bar.

5.1.13 Rigid stand shall be made from M.S. angle or FRP Pultruded sections as per IS: 6146. Horizontal and vertical members of the cubicle shall be of size 50 x 50 x 6 mm.

5.1.14 Two galvanized earthing Bolts of M12 X 50 mm size shall be welded from inside and projecting outside of the box. Two Nuts with washers shall be provided on each bolt.

5.1.15 Enameled name plate of the supplier, type of pillar and M.S.E.D.C.L. Tender Number & date shall be displayed on front door.

5.1.16 Enameled Danger Board with "DANGER 440 VOLTS" mark shall be displayed on the left hand side of front and back doors as per IS 2551.

5.1.17 Toughened glass window with rubber gasket of 175 mm X 90 mm size should be provided on main door of cubicle in such a way to see meter readings.

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5.2) AIR CIRCUIT BREAKERS

5.2.1 Air Circuit Breakers of the following rating & technical specifications shall be provided for the Incomer of L.T. Feeder pillars with ACB, with split Bus bar type & with split with ACB as per the actual requirement.

5.2.2 ACB shall be of 440V, 50 HZ, 800/1000/1250 A (as per actual requirement) with short time current rating of 50KA for 1 sec. Air Circuit Breaker shall conform to IS: 13947 part - 2 of 1993 with latest amendments. Other technical details shall be as below:

Sr. No.	Particulars	Requirements
1	Rated operational voltage (V) at 50 Hz	440V
2	Rated frequency (Hz)	50
3	Current rating Amps (rms)	800/1000/1250 A
4	Rated insulation voltage (V) at 50 Hz	1000
5	Number of poles	3
6	Mounting arrangement	Fixed type front mounting
7	Rated impulse withstand voltage(kV)	12 KV
8	Rated Ultimate Short circuit breaking capacity at 415 V, 50 Hz (kA rms) Icu	50
9	Rated Service Short circuit breaking capacity at 415 V,50 Hz (kA rms), Ics	50
10	Rated short circuit making capacity at 50Hz (kA peak), expressed as multiples of Icu	2.1
11	Rated short time withstand current for 1 sec at 50 Hz (kA rms), Icw, expressed as percentage of Icu	50 KA
12	Line-load reversibility	Required
13	Category of utilization	B
14	Shutters on 'Trip' & 'Close' push button with sealing facility	Required
15	Accessory mounting	Accessories shall be front accessible plug in type. Accessories namely motor shunt trip & closing coil, UVT

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		etc. should be common for the entire range & shall be suitable for both AC & DC voltages.
16	Operating mechanism	Spring charging stored energy type, Manual & Automatic.
17	Mechanical life (Operating cycles)	20000
18	Electrical life (Operating cycles) per set of arcing contacts	5000
19	Indications	Breaker shall have following mechanical indications: 1. ON, 2. OFF, 3. TRIP 4. SPRING CHARGE STATUS
20	Sensing	True RMS based
21	Type	Microprocessor based
22	Control Terminal	Control Terminal should be front accessible & minimum 25 pairs of contacts shall be available. Minimum ten Auxiliary NO / NC contacts shall be provided for electrical interlocking between ACBs.
23	Working temperature	Suitable for operation at 50°C
24	Protection required	Following protections with selective ranges required.
24a	Overload	Pick – up: 0.4 to 1.0 Time delay : 0.2 to 40 sec.
24b	Short Circuit	Pick – up: 2 to 10 Time delay: 20 to 400 msec
24c	Instantaneous over current	Pick – up: 4 to 16 & OFF
24d	Earth fault	Pick – up: 0.2 to 0.6 & OFF Time delay: 100 to 400 msec
25	Metering Required	Provision for following measurement functions shall be made on the ACB i) 3 phase current

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		ii) 3 phase voltage iii) KWH iv) KVAH v) Power Factor vi) Max. demand(KVA) vii) Fault History of Minimum 50events
26	Indication	Release shall give individual indication for each type of fault.
27	Power	Release shall be self powered & independent of incoming supply.
28	Safety	Local controls shall be secured by padlocking arrangement

For Air Circuit Breakers used for Bus coupler /split bus bar purpose, metering is not required to be provided as per requirement at sr. no. 25 of the above table.

5.3) BUS BARS:

5.3.1 The bus bars shall be made up of electrolytic grade aluminum confirming to grade 63401 WP of IS:5082.

5.3.2 The bus bars shall be with PVC sleeves of Colour Red, Yellow ,Blue and black for top ,middle and Bottom and below bottom(neutral) busbar respectively Or painted with non deteriorating type Epoxy paint for full length as below:

Red colour for top busbar.

Yellow colour for middle bus bar,

Blue colour for bottom bus bar,

Black colour for neutral bus bar below bottom bus bar

5.3.3 Size of the bus bar For R,Y&B phase shall be 60 x 10 mm and for Neutral it shall be 50 x 6 mm.

5.3.4 Electrolytic grade aluminum twin flat cable terminals (Z Patti) shall be provided in staggered formation for connecting cable cores for each phase from rear side in all. L. T. pillars (except mini pillar). The arrangement shall be suitable for taking Load current reading with clip on type of meter. Insulated horizontal Bakelite bar of at least 50 x 12 mm shall be provided to support and take care of weight of cables, jointing etc.

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5.3.5 Neutral bus bar shall have one terminal for each circuit way and shall be provided with two nickel plated, nuts, bolts, spring washers and plain washers at each end for earthing. Cross sectional area of neutral bus bar shall be at least 50% of cross sectional area of phase bus bar.

5.3.6 Suitable insulated phase barriers of at least 6 mm thick asbestos cement sheet shall be provided between front and rear compartment, between adjacent set of phase and neutral bus bars and between doors and bus bars with firm fixing arrangements.

5.3.7 The current rating – current carrying parts shall not generally exceed the limits those given in Clause No.5.4.7 Higher current rating adopted if any in special cases shall be subject to successful temperature rise tests carried out in reputed laboratories.

5.3.8 Minimum clearances, wherever shown, shall be as per General Arrangement Indicative Drawing enclosed with this specification. Other clearances shall be as per requirement of IS: 4237/1982 amended up to date.

5.3.9 There should be provision to insert Ring type CTs of required ratio into the bus bars. Ratios are 200/5, 300/5A, 500/5A, 1000/5A for 100/200/315/630 kVA distribution transformer respectively. The feeder pillar manufacturers shall provide ring CTs of appropriate capacities only. It shall be part of the feeder pillar. Ring CTs have to be procured from MSEDCL's approved vendor. Feeder pillar manufacturers should provide the required wires for CT connections of standard size & colour.

5.4) FUSE BASE ASSEMBLY:

5.4.1 The Fuse bases shall be suitable for HRC fuse links and strips. All fuse bases shall be identical and interchangeable irrespective of whether they are provided in incoming or outgoing circuits and shall be capable to carry rated normal current without exceeding safe temperature as per relevant standard duly tested at Lab like CPRI, ERDA etc.

5.4.2 The base of the HRC Fuse shall be of non-tracking, heat resistant insulating porcelain material of superior electrical and mechanical properties equivalent to Dough Molding Compound (DMC). The Fuse Base shall be sturdy in construction. The insulation shall not get affected due to dust, moisture etc, at wide fluctuation in temperature. The holes for fasteners shall be plugged by insulating filling compound which shall not drain at operating temperature in service.

5.4.3 The contacts shall be made up of electrolytic grade copper alloy with corrugated terminal pad and spring action to yield high contact pressure. G. I. spring ring shall be made out of at least 6 mm dia. spring

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steel round. The spring action shall not get affected by operations and variations in operating temperatures in service.

5.4.4 Thermostatic bimetal device shall be provided between terminal pad and bus bars and between terminal pad and cable terminals (Z Patti) to prevent bimetallic deterioration.

5.4.5 HRC Fuse Base should withstand the breaking capacity of the fuse link of 80kA.

5.4.6 The complete assembly shall be so fixed and secured that there shall be no turn, fall out displacement and vibration of any part during inserting and removal of fuses/Links. Load current reading, cable end connection etc

5.4.7 The current rating adopted shall generally not exceed the following limits. Higher current density adopted if any in special corrugated and other shapes shall be subject to successful temperature rise tests carried out in reputed laboratory.

Size of section mm x mm	Maximum current in Amps	
	Single Section	Double Section
30 x 3	205	385
30 x 5	270	500
40 x 3	280	500
40 x 5	350	650
40 x 10	515	975
50 x 5	425	780
50 x 10	625	1150
60 x 5	500	900
60 x 10	730	1330
80 x 5	680	1170
80 x 10	940	1700

5.5) FUSE LINKS:

The HRC Fuse Links shall be sturdy in construction of “Din Type”. Corrugated fuse links shall be made out of electrolytic grade copper flat of at least 4 mm thick and shall be capable of carrying the rated current of the fuse base and shall be suitable for inserting and pulling out by insulated fuse pulling handle. Breaking capacity shall be 80 kA. For fault indication red pop up indicator should come out instantly on fusing. Manufacturer’s name, current rating, breaking capacity and type shall be marked on HRC fuse link.

The successful bidder shall submit the complete type test reports as per specification for approval of CE (Testing & QC) before commencement of supply.

5.6) PAINTING:

5.6.1 The M.S. cubicles shall be provided with anti corrosive high quality post office red colour paint conforming to shade No 538 of IS:5 from inside and outside to withstand the corrosive and humid atmosphere. The colour of SMC cubicle shall be red conforming to shade No 538 of IS:5

5.6.2 For M.S. Cubicle, all interiors and exteriors of the cubicle shall be degreased in 5% solution at 75°C for 15 minutes. They shall then be washed in hot water bath at 65°C to remove all rust, scale corrosion, grease and other adhering foreign matter and shall be rinsed in cold running water.

5.6.3 M.S. cubicles shall then be pickled in 25% hot sulphuric acid at 65°C for 5 minutes. Care shall be taken to avoid over pickling by addition of adequate quantities of inhibitor and avoid loss of tensile strength. The cubicle shall then be rinsed in cold running water and put in alkaline solution at 65°C for 1 to 2 minutes. The cubicle shall then be immersed in cold water (still agitated) to remove all traces of alkali and untreated salt. The cubicle shall then be dipped in deoxidize chamber to ensure complete removal of moisture.

5.6.4 Corrokill rust converter conforming to IS 13515 shall be preferably applied as primer. The cubicle stoved at 150°C for 10 to 12 minutes. It shall then be cooled, filled with putty to get smooth and flawless surface. Enameled paint shall then be sprayed and towed at 150°C for about 12 minutes.

6.00 TESTS:**6.1) TYPE TESTS:**

6.1.1 Type test reports as per cl.no.8.1.1 of IS: 5039/1983 shall be submitted along with the offer for the type and rating of circuit breakers offered, Type test reports shall be from any NABL approved laboratory such as M/s CPRI, ERDA. Type tests carried out prior to five years of the date of opening of the tender are not valid.

Following Type Test Reports shall be submitted for approval.

(a) ON COMPLETE L. T. PILLER:

Type tests as per IS:5039/1983 shall be carried out on complete L.T. feeder pillars .

1. Verification of temperature rise limits (As per Cl.8.2)

- 2.Verification of Dielectric Properties (As per Cl.8.3)
- 3.Verification of short circuit strength (As per Cl.8.4)
- 4.Verification of clearance & creepage distances (As per Cl.8.5)
- 5.Verification of Degree of protection for IP- 43 (As per Cl.8.6)

(b)ON AIR CIRCUIT BREAKER:

All type tests as per IS: 13947/1993 (Part II amended up to date) shall be carried out on Air Circuit Breakers

(c)ON HRC FUSES BASE AND HRC FUSE LINKS:

All type tests on HRC fuses and HRC fuse links shall be carried out as per IS:13703/of 1993 (Part I & II amended up to date) for HRC Fuse Base and HRC fuse link.

6.2) ROUTINE TESTS:

It should be carried out on all boxes on complete L.T. Feeder Pillar. In case of bought out items, routine and acceptance tests as per relevant IS and this specification shall be carried out at the original manufacturers' works.

1. Overall Dimensions Checking.
2. Insulation Resistance Tests.
3. High Voltage Test at 2500 V, 50 Hz AC for one minute.
4. Operation Test HRC fuse base and fuse links.

7.00 TEST CERTIFICATES:

The L.T. Pillar enclosure, Air Circuit Breakers, HRC fuse, HRC Fuse Link etc. offered shall be fully type tested as per relevant IS and this specification. The successful Bidder shall furnish detailed type test reports before commencement of supply. The detailed Type Test Reports shall be furnished with relevant oscillogram and certified Drawings of the equipment tested. The purchaser reserves the right to demand repetition of some or all the Type Tests in presence of purchaser's representative at purchaser's cost.

All the type tests shall be carried out from laboratories which are accredited by the National Board of Testing and Calibration Laboratories (NABL) of Government of India such as CPRI Bangalore/Bhopal, ERDA Baroda to prove that the complete L.T. Pillar, meet the requirements of the specification.

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Following test certificates and documents shall be furnished at the time of inspection.

- a) Chemical analysis certificate and documents showing genuine source of procurement of electrolytic grade conductivity Aluminum Sections.
- b) Chemical analysis certificate and Document for having genuine & standard SMC body material of L.T. feeder pillar as per specification & IS: 13410. Source of procurement of the same shall be furnished.
- c) Document showing genuine source of procurement of steel sheet and sections.
- d) Certificate of temperature rise test.
- e) Certificate of painting with degreasing, pickling phosphate, and painting and oven treatment by seven tank oven process in respect of M.S. Cubicles.

The supplier shall conduct voltage withstand test and operations tests at the time of inspection.

8.00 PROTOTYPE SAMPLE:

The successful bidders should manufacture 3 Nos. of prototype L.T. feeder pillars as per the specification and keep ready at their works for the purpose of sample inspection and testing. The MSEDCL at their option may send a team of Engineers to the works. Prior intimation of this inspection may not be given to the Bidder.

9.00 INSPECTION:

9.1 The supplier shall prepare a prototype and offer the same for inspection and approval before taking up mass production.

9.2 All routine & acceptance tests and inspection of material shall be carried out at the place of manufacturer. The manufacturer shall offer the Inspector (representing the purchaser) all reasonable facilities, free of charge at the time of Inspection

9.3 The supplier shall offer inspection of the material at his works before dispatch. If required the supplier shall also offer inspection of manufacturing painting and assembly processes and quality control system. If any material is not found in line with relevant specification the supplier shall carry out the modification and offer for re-inspection.

9.4 Inspection and acceptance shall not absolve the supplier of his responsibility to supply the material in accordance with the specifications. The purchaser reserves the right to reject the material not confirming the relevant specifications.

10.00 DRAWINGS AND DOCUMENTATION:

10.1 The successful bidder shall submit set of all drawings of the L.T. Pillar and its components in triplicate to CE (Testing & QC) office and get the same approved before commencement of supply.

10.2 Following indicative drawings are enclosed herewith.

Outdoor Type 6/8 way L.T. feeder Pillar with ACB with Energy Meter-
Drawing No.MSEDCL/MS I/feeder Piller/08

10.3 The tenderer shall furnish all details and clarifications required if any for scrutiny and evaluation of the offer.

10.4 Manufacture of material to be supplied shall be done strictly as per approved drawing.

10.5 Approval of drawing shall not absolve the supplier of his liability for ensuring correctness according to applicable standards & regulations.

10.6 The Bidder/Supplier shall fill-in the following schedules which form part of the specification if any schedule is not filled or incompletely filled the offer is liable to be treated as incomplete and rejected.

Schedule-A: Guaranteed technical particulars

Schedule-B: Deviations from specifications

Schedule-C: Bidder's/Supplier's Experience

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ANNEXURE - I

Specifications for Fiberglass Reinforced Plastic Sheet moulding compound used for Pillar Body and doors

1. SMC Sheet Molding Compound shall conform to IS:13410-1992
2. The Surface appearance of the door must be smooth, non porous, and homogeneous, free of ripples, defects, and marks. No filler or fiber shall be visible at anyplace.
3. Other properties of SMC material shall be as follows & shall pass the test mentioned against the same.

Sr. No.	Characteristic	Requirement	Type of test	Method of test Ref. to
1	Material.	Thermosetting Plastic		
2	Grade of material	SMC Electrical grade S3		IS:13410-1992
3	Grade of material for frame	FRP Pultruded sections		As per IS :6746
Material requirement for Sheet Molding Compound				
4	Glass content, percent by mass (Min.)	20	Type	Annexure A of S:13411-1992
5	Mould shrinkage, linear % Max	0.25	Acceptance	Annexure B of IS:13411-1992
6	Flow, mm, Minimum	170	Acceptance	Annexure C of IS:13411-1992
Requirement for Molded Sheet Molding Compound				
7	Water Absorption, % Max	0.20	Type	Annexure D of IS:13411-1992
8	Izod impact strength (Notched), KJ/m ²	55	Type	Annexure E of IS:13411-1992
9	Flexible Strength ,MPa , Min	170	Type	Annexure F of IS:13411-1992
10	Power Arc Resistance Sec.Min.	180	Type	Annexure G of IS:13411-1992
11	Modulus of Elasticity, 103 ,MPa	12 to 15	Type	IS: 8543 Part-4 (Sec-1)/1984
12	Tracking Resistance CTI,Min	1000	Type	IS: 2824/1975
13	Dielectric Strength at 90oC in Oil KV/mm	11	Type	IS:6262/1971
14	Dissipation factor (4 days at 80 % RH & 1 KHz)	0.01	Type	IS: 4486/1967
15	Heat Distortion Temperature, °C ,Min	150	Type	Annexure H of IS:13411-1992

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16	Oxygen Index,% Min	24	Type	IS: 13360 art-6 (Sec-6)/1992
17	Post shrinkage, % Max	0.01	Acceptance	Annexure B of IS:13411-1992
18	Tensile Strength ,MPa , Min	70	Acceptance	IS: 8543 Part-4 (Sec-1)/1984
19	Density of Moulding, g/ml	1.8 to 2.1	Routine	IS: 8543 Part-I /Sec 2/1979
20	Surface resistivity (24 H in water), Ohm,Min	1×10^{13}	Routine	IS: 3396/1979
21	Volume resistivity, Ohm-cm, Min	1×10^{14}	Routine	IS: 3396/1979
22	Exposure to flame	Self-Extinguishing		IS:4249
23	Melting Point	test up to 400°C		IS:13360 Part 6 : Sec 10 : 1992
24	Cross Breaking Strength	1723 Kg/sq.cm		As per ASTM D790
25	Shear Strength	879 Kg/sq.cm		As per ASTM D732
26	Flammability (V2)	UL 94 or IS : 11731 (Pt.II)		IS : 11731 (Part-II)
27	Water absorption			IS : 14772
28	Mechanical Strength			IS : 14772
29	Marking, Dimensions and construction			IS : 14772

TECHNICAL SPECIFICATION OF 6/8 WAY LT FEEDER PILLER WITH METER, AIR CIRCUIT BREAKER, MS/SMC BOX

SCHEDULE – A

GUARANTEED TECHNICAL PARTICULARS (GTP) OF L. T. FEEDER PILLER WITH ACB

Sr. No.	Parameter Name	Parameter type
1	Name or Trademark of Manufacturer.	Text
2	Type of L.T. Pillar	Text
3	Rated normal voltage	Text
4	Material of construction of L. T. Pillar enclosure & doors	Text
5	Thickness of SMC sheet / M.S.sheet for enclosure	Text
6	Thickness of SMC/MS sheet for doors	Text
7	Colour of the L. T. Pillar enclosure	Text
8	Dimensions of cubicle without rain hood – Width x Depth x Height (in mm)	Text
9	Dimensions of rain hood – Width x Depth x Height of center lift (in mm)	Text
10	Fiberglass Reinforced Plastic Sheet Molding Compound	
10(a)	Material (Thermosetting Plastic)	Text
10(b)	Grade of material (SMC as per IS:13410-1992)	Text
10(c)	Grade of material for frame (FRP Pultruded sections as per IS 6746)	Text
10(d)	Heat deflection Temperature (As per IS:13411) (min 150°C)	Text
10(e)	Exposure to flame (Ref. Std. IS:4249) (Self-Extinguishing)	Text
10 (f)	Melting Point (Ref. Std. IS:13360) (Does not melt)	Text
10(g)	Fiberglass reinforcement (Minimum 25%)	Text
10(h)	Density of Fiberglass materials (450 gms. Per sq. mt.)	Text
10 (i)	Maximum permissible Temperature(≥ 90° C)	Text
10 (j)	Door material (U.V. resistant & resistant to salty & humid atmosphere)	Text
10(k)	Insulation Resistance (As per ASTM D257)	Text
10 (l)	Specific Gravity as per IS:10192 of SMC material (1.8)	Text
10 m	Dielectric Strength as per IS:1998 (12kV /mm)	Text
10(n)	Tensile Strength as per IS:867-1963 (1058 Kg/sq.cm)	Text
10(o)	Cross Breaking Strength as per ASTM D790 (1723 Kg/sq.cm)	Text
10(p)	Shear Strength as per ASTM D732 (879 Kg/sq.cm)	Text
10(q)	Ball Pressure Test as per IS:335	Text
10 (r)	Water Absorption as per IS:14772	Text
10(s)	Mechanical Strength as per IS:14772	Text
11	Hinges	
11(a)	Hinges : Type	Text
11(b)	Hinges : Length (50mm)	Text
11(c)	Hinges : Thickness of material	Text
11(d)	Hinges : pin Diameter	Text

TECHNICAL SPECIFICATION OF 6/8 WAY LT FEEDER PILLER WITH METER, AIR CIRCUIT BREAKER, MS/SMC BOX

11(e)	Number of hinges per door	Text
12	Type of locking arrangements	Text
13	Number of padlocking arrangements	Text
14	Number and size of ventilating louvers with wire mesh	Text
15	Details of painting	Text
16	Dimensions and details of asbestos sheets	Text
17	Dimensions and details of bakelite sheets	Text
18	Dimensions and details of gland plates	Text
19	Bus Bar, Fuse Base & Fuse Link	
19(a)	Size of bus bar	Text
19(b)	Size of neutral bus bar	Text
19(c)	Grade and specification of material of Bus bars	Text
19(d)	Rated normal current of Bus bars	Text
19(e)	Rated safe temperature of Bus bars	Text
19(f)	Make & Type of Fuse base assembly	Text
19(g)	Grade and specification of material of Fuse base contacts	Text
19(h)	Thickness and dimensions of contacts of fuse base	Text
19(i)	Rated normal current of Fuse base	Text
19(j)	Rated safe temperature of Fuse base	Text
19(k)	Grade and specification of material of Fuse links	Text
19(l)	Make & Type of Fuse link	Text
19m	Rated normal current of Fuse link	Text
19(n)	Rated safe temperature of Fuse link	Text
19(o)	Grade and specification of material of spring steel round	Text
19(p)	Dimensions of spring steel round	Text
20.	Make & Type of bimetallic lugs	Text
21.	One Minute P. F. withstand voltage	Text
22	Rated short time current	Text
23	Rated temperature rise	Text
24	Size & Thickness of Bakelite sheets provided	Text
25	Air Circuit Breaker	
25(a)	Make & Type	Text
25(b)	Rated Voltage (440V)	Text
25(c)	Rated Current (800/1000/1200 Amps as per requirement)	Text
25(d)	Rated Frequency (Hz)	Numeric
25(e)	Whether facilities as per table in cl.no.5.6 are included in ACB offered	Boolean
25(f)	Whether Type test reports for ACB & other components are submitted separately	Text
26	List of test conducted on similar equipment's	Text
27	List of copies of test certificate enclosed	Text
28	Any other details	Text

SCHEDULE – B
DEVIATIONS FROM SPECIFICATION

All deviations from this specification shall be set out by the tenderer clause by clause in this schedule. Unless mentioned in this schedule the tender shall be deemed to confirm to the specification.

Sr.No.	Clause Number	Details of deviations	Justification

NAME OF FIRM _____

NAME & SIGNATURE OF TENDERER _____

DESIGNATION _____

DATE _____

SCHEDULE - C**SCHEDULE OF TENDERERS' EXPERIENCE**

The Bidder/Supplier shall furnish a list of similar orders executed under execution by him and name of persons to whom reference may be made by the purchaser in care such a reference is considered necessary.

Sr.No.	Name and Description of work executed	Month and year of commissioning	Client	Name of person

NAME OF FIRM _____

NAME & SIGNATURE OF TENDERER _____

DESIGNATION _____

DATE _____

TECHNICAL SPECIFICATION OF 6/8 WAY LT FEEDER PILLER WITH METER, AIR CIRCUIT BREAKER, MS/SMC BOX

INDICATIVE DRAWING

Drawing for 8 way LT Feeder Piller with provision of meter & ACB

