FLP-LED-1 IIA/B-22	Same as FLP-LED-1 but suitable for zone-22, dust group—IIIB and temp class-T4		As per vendor list
FLP-LED-1B	Same as FLP-LED-1 but with total lumen output in the range of 4000-4500 lumens.		As per vendor list
FLP-LED-1B-IIA/B-22	Same as FLP-LED-1B but suitable for zone-22, dust group—IIIB and temp class-T4		As per vendor list
FLP-LED-2	Same as FLP-LED-1 but with total lumen output in the range of 10000-10500 lumens.		As per vendor list
FLP-LED-2 IIA/B-22	Same as FLP-LED-2 but suitable for zone-22, dust group—IIIB and temp class-T4		As per vendor list
FLP-LED-3	Same as FLP-LED-1 but with total lumen output in the range of 15000-15500 lumens.		As per vendor list
FLP-LED-4	Flameproof and weatherproof Ex-d flood light LED fixture complete with LED lamp, driver, accessories, including other materials as applicable for installation, suitable for gas group IIA/IIB, temperature class T3, total lumen output in the range of 10000-10500 with minimum efficiency greater than 100 lumen/watt.		As per vendor list
FLP-LED-5	Same as FLP-LED-4 but with lumen output in the range of 15000-15500 lumens.		As per vendor list
FLP-LED-6	Flameproof and weather proof Ex-d well glass LED lamp, driver, accessories including other materials as applicable for installations, suitable for gas group IIA/IIB, temperature class T3, total lumen output in the range of 4000-4500 lumens with minimum efficiency greater than 100 lumens/watt and suitable for 220V DC.		As per vendor list
FLP-LED-6 IIA/B-22	Same as FLP-LED-6 but suitable for zone-22, dust group—IIIB and temp class-T4		As per vendor list
FLP-LED-7	Same as FLP-LED-1 but with total lumen output in the range of 20000 lumens		As per vendor list
FLP-LED-1-IIC	Same as FLP-LED-1 but suitable for gas group IIC, temp. Class T3.		As per vendor list
FLP-LED-1B-IIC	Same as FLP-LED-1B but suitable for gas group IIC, temp. Class T3.		As per vendor list
FLP-LED-2-IIC	Same as FLP-LED-2 but suitable for gas group IIC, temp. Class T3.		As per vendor list
FLP-LED-3-IIC	Same as FLP-LED-3 but suitable for gas group IIC temperature class T3.		As per vendor list
FLP-LED-4-IIC	Same as FLP-LED-4 but suitable for gas group IIC temperature class T3.		As per vendor list

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FLP-LED-5-IIC	Same as FLP-LED-5 but suitable for gas group IIC temperature class T3.		As per vendor list
FLP-LED-6-IIC	Same as FLP-LED-6 but suitable for gas group IIC temperature class T3.		As per vendor list
FLP-LED-7-IIC	Same as FLP-LED-7 but suitable for gas group IIC temperature class T3.		
FLP-LED12	Flameproof and weatherproof Type-C Medium intensity, RED, FIXED (Not flashing), 2000cd, LED cluster based aviation obstruction light complete with LEDs (twin type) for use in IIA/IIB area.		As per vendor list
FLP-LED-12- IIC	Same as FLP-LED-12 but suitable for gas group IIC temperature class T3.		As per vendor list

Notes:

1. All fixtures shall be latest energy efficient type. Power factor shall be >= 0.95.
2. For Hazardous Area Lighting Fittings Lumen Efficacy shall be 100 Lumen/Watt (min.).
3. LED lamps and Drivers shall be provided with min. 5 years warranty period. Driver shall have valid BIS certification and copy of same shall be furnished during drawing review stage.
4. The LED light fixtures should be tested for luminous lux level as per IES-LM-79. Type test certificates shall be furnished in compliance to same. Type test certificates for LM-79 for all fixtures shall be from a NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited Lab or UL Laboratory.
5. The LED's used in the lighting fixtures should be tested for the service life as per IES-LM-80. Type test certificates shall be furnished in compliance to same.
6. The LED Driver shall comply with the requirement of IEC 61347-2-13.
7. Fixture life time (L70) shall be > 50000 hrs at 45 deg.
8. LED fixtures shall be complete with internal reflectors. No external reflector is envisaged for LED.
9. All mirror optics luminaries should be epoxy powder coated.
10. Make of fixtures shall be embossed on the body of the lighting fixtures.
11. LED lamps shall have wide beam angle suitable for uniform light distribution.
12. LED lamps shall be provided with highly translucent diffusers with advance optical system with high internal reflectivity material of excellent and smooth output for glare free light and no visibility of LED to eyes.
13. All lighting fixtures shall be supplied with fixture mounting nuts and bolts of stainless-steel SS-304.
14. For corrosive areas, die-cast Aluminium enclosed light fixtures shall be installed with die cast aluminium JBs / DBs (in hazardous areas).
15. All above Luminaries with controllers & drivers must be suitable for a working voltage range of 150 to 270 Volts – 50 / 60 Hz - AC.
16. All above luminaries are inclusive of LED lamps / Electronic Drivers / Transformers / RGB Controllers / internal luminaries wiring.
17. In case any of the above referred models / makes are discontinued, prior approval from the engineer-in- charge has to be taken for supplying any alternate makes / models.

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18. Retrofit type of flameproof LED fixtures will not be acceptable (implies LED bulbs fixed inside flameproof enclosures). All flameproof fixtures shall have integral panelled LED clusters (COB - Chip on Board or SMD - Surface mount Device).
19. Vendor shall indicate the following parameters as a minimum in fixture drawings:
    - Offered Fixture Wattage and LED Wattage
    - Actual Consumption of Fixture
    - Driver Consumption
    - Fixture Life time
    - Luminous Efficacy of fixture
    - Lumen Output of Fixture
    - Tolerance for Voltage and wattage rating
    - Power factor of Fixture
    - Beam Angle of Lighting Fixture
    - Weight of Fixture
    - LED LAMP and Driver Warranty Period
    - Driver Surge Protection
    - Compliance to IEC-61347-2-13 for LED Driver
    - BIS Certification no. for Driver
    - Driver Make and Model No.
    - LED Make and Model no.
    - LED type i.e. COB (Chip on Board) or Multichip etc.
    - Quantity of Fixtures
    - No. of Cable entries for Fixture along with quantity of FLP Cable glands and FLP Stopper plug.
    - PESO/CIMFR/BIS License certificates numbers along with dates.
20. The vendor shall submit the IES files of all LED lighting fixtures during detail engineering for record
21. Lighting fixtures shall comply to IS 16101, IS16102, IS 16103 Part-1, IS 16103 Part-2,IS 16106, IS 16107-Part-1 and IS 16107-Part-2 Sec-1
22. All fixtures shall be suitable for installation in Zone-2 areas. Flameproof LED lighting fixtures shall comply with the requirement of IEC 60079-1 & 0. All hazardous area lighting fixture shall be min IP-65.

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PURCHASER'S DATA

	Project: PDH PP			**Location:**	**Dahej, Gujarat**
	Client: PLL				
A	**Site conditions**				
1	Maximum ambient temperature:	45 °C	4	Relative humidity:	90 %
2	Minimum ambient temperature:	10°C	5	Altitude above MSL (mm):	Less than 1000
3	Design ambient temperature:	45 °C	6	Environment:	Heavily Polluted
B	**Technical particulars**				
1	Area classification	Zone-1/ Zone-2	9	Earthing Terminals	10mmφ stud (External- 2nos, Internal-1no.)
2	Type of panel enclosure	Flameproof, Ex-d	10	Incoming supply	415 V, 50 Hz, TPN (Note-1)
3	Gas group	IIA/IIB	11	Outgoing supply	415 V, 50 Hz, TP (Note-4)
4	Surface temperature	T3	12	Incomer feeder rating	125A TPN switch with interlock
5	Degree of ingress protection	IP-55 (Min)	13	Outgoing feeder rating	As per ITV
6	Cable entry	Bottom	14	Short cut capacity	65kA (1sec)
7	Panel mounting	Floor/ Pedestal	15	Applicable standard	EIL std. 6-51-0008
8	Exterior painting	RAL-7032	16	Type test	Required
9	Interior painting	RAL-7031	17	Canopy	Required
			18	Control JB	2 Nos (min. 100 terminal)

MANUFACTURER'S DATA

	Equipment	
1	MR item no.	
2	Explosion protection class	
3	Tag no.	
4	Type reference no.	
5	Ref. No. & date of CMRI/ other test certificates of recognized test authority	
6	Ref. No. & date of CCE approval certificates	
7	Ref. No. & date of DGFASLI approval certificates	
8	Ref. No. & date of DGMS approval certificates	
9	BIS license no. date	
10	Dimension L x D x H (mm)	
11	Weight (kg)	

Notes:

1) 2 nos. 125A TPN switch incomer with interlock along with voltmeter, Voltage Selector switch (VSS) shall be provided in each Incomer of each Distribution board.

2) Ammeter & ammeter selector switch (ASS) shall be provided in each incomer of each distribution board.

3) LED phase indication lamp shall be provided at each incomer.

4) 12 nos. TPN 32A MCCB outgoing feeder shall be provided at each MOV distribution board.

5) Bidder to refer EIL specification, 6-51-0007 & Instruction to vendor Doc. No B862-000-16-50-TR-0510.

Rev.	Date	Purpose	Prepared	Checked	Approved
A	30.04.2026	ISSUED WITH MR	MS	PK	SA

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Project PDH PP Plant with Ethane and Propane handling facilities **Client** PETRONET LNG LIMITED (PLL)

Unit Common **Location** **Job No.** B862 **Unit No.** 000

PURCHASER'S DATA

A.	**Site Conditions**		
1.	Maximum Ambient Temperature	°C	45
2.	Minimum Ambient Temperature	°C	10
3.	Design Ambient Temperature	°C	45
4.	Relative Humidity	%	90
5.	Altitude Above MSL	mm	less than 1000
6.	Environment		Heavily polluted
B.	**Technical particulars**		
1.	Area classification		Zone-1/Zone-2
2.	Type of panel enclosure		Flameproof, Ex-d
3.	Gas group		IIA/IIB, IIC
4.	Surface temperature		T3
5.	Degree of ingress protection		IP 55
6.	Cable entry		Bottom
7.	Panel Mounting		Column
8.	Exterior painting		RAL 7031
9.	Interior painting		EIL Spec 6-51-0008
10.	Earthing Terminals		10mm¿ stud(External-2nos,Internal-1no.)
11.	Incoming supply		415 V, 50 Hz, TPN
12.	Outgoing supply		240 V, 50 Hz, SPN
13.	Incomer feeder rating		4 pole, 40A MCB
14.	Outgoing feeder rating		MCB & RCCB, 2 pole, 16A, 30mA
15.	Short Circuit capacity-MCB/ELCB		9 kA (M9 Category)
16.	Applicable standard		EIL std. 6-51-0008
17.	Type test		Required

MANUFACTURER'S DATA

	Equipment.	LP ---ways	LP ---ways	LP ---ways	PP ---ways	PP ---ways	PP ---ways	PP ---ways	PP ---ways
1.	MR item no.								
2.	Explosion protection class								
3.	Tag no.								
4.	Type reference no.								
5.	Ref. No. & date of CIMFR/ other test certificates of recognised test authority								
6.	Ref. No. & date of CCE/PESO approval certificates								
7.	Ref. No. & date of DGFASLI approval certificates								
8.	Ref. No. & date of DGMS approval certificates								
9.	BIS license no. date								
10.	Dimension L x D x H (mm)								
11.	Weight (kg)								

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
A	21-NOV-2024	ISSUED WITH MR	MOHD SAQIB	SHIRALI AGGARWAL	SHIRALI AGGARWAL

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Project	PDH PP Plant with Ethane and Propane handling facilities		**Client**	PETRONET LNG LIMITED (PLL)	
Unit	Common	**Location**	**Job No.**	B862	**Unit No.** 000

Eil Notes

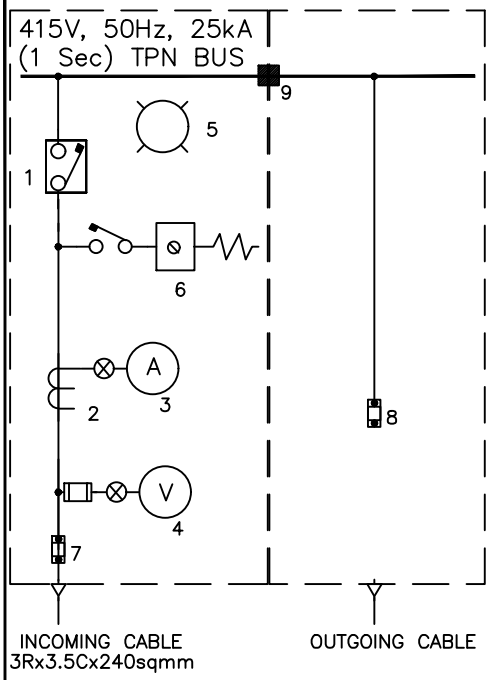
1 RCCB+MCB for each outgoing circuit of lighting & power panel shall be provided. RCCB shall be rated for 30mA and shall be of Type-AC.

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
A	21-NOV-2024	ISSUED WITH MR	MOHD SAQIB	SHIRALI AGGARWAL	SHIRALI AGGARWAL

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PROJECT: PDH-PP PROJECT CLIENT: M/S PLL	REV	DATE	PURPOSE	BY	CHKD	APPRV
	A	13.11.2024	ISSUED WITH MR/TENDER	MS	PK	SA



EQUIPMENT DATA FOR INCOMER

ITEM NO.	NEMA NO.	QTY.	DESCRIPTION
1	–	1	MCCB WITH S/C, O/C & E/F RELEASE AND SHUNT TRIP
2	–	3	METERING CT, CL-1, 10VA, 400/1A
3	–	1	AMMETER WITH 4WAY SELECTOR SWITCH.
4	–	1	VOLTMETER WITH 4WAY SELECTOR SWITCH & FUSE
5	–	3	R Y B INDICATING LAMPS – LED TYPE
6	–	1	PANEL SPACE HEATER WITH MCB AND THERMOSTAT
7	–	AS REQ	TERMINAL BLOCKS SUITABLE FOR INCOMING CABLES
8	–	AS REQ	TERMINAL BLOCKS SUITABLE FOR OUTGOING CABLES
9	–	AS REQ	CONNECTION & SEALING BETWEEN THE ENCLOUSERS
10	–	AS REQ	FLP & WP ENCLOUSER SUITABLE FOR GAS GR. IIA/IIB & TEMP. CLASS T3

NOTES

1. THE ONE LINE DIAGRAM SHOWN ABOVE IS ONLY INDICATIVE. ALL THE ITEMS SPECIFIED UNDER "EQUIPMENT DATA" SHALL BE IN VENDOR'S SCOPE.
2. MCCB SHALL BE SUITABLE FOR CURRENT RATING OF 400A AND SYSTEM FAULT LEVEL 25 kA (1 SEC.)
3. DOUBLE COMPRESSION FLAMEPROOF CABLE GLANDS (AS PER IEC:60079-1) FOR INCOMING CABLE SHALL BE SUPPLIED WITH THE PANEL.
4. FOR OUTGOING CABLES IN ADDITION TO SUITABLY SIZED DOUBLE COMPRESSION FLAMEPROOF CABLE GLANDS (AS PER IEC:60079-1), BLANKING PLUGS OF SIMILAR SIZE AND SUITABLE FOR THE SAME HAZARDOUS AREA SHALL ALSO BE SUPPLIED. SIZE OF SAME SHALL BE SPECIFIED DURING DRAWING APPROVAL.
5. THE HYDRO BLASTING PANEL SHALL BE PROVIDED WITH CANOPY AND SHALL BE OF FREE STANDING TYPE WITH CABLE ENTRY/EXIT FROM BOTTOM.
6. MCCB, VOLTMETER, AMMETER, INDICATING LAMPS ETC. SHALL BE PROVIDED IN ONE ENCLOSURE WITH SPACE FOR TERMINATION OF INCOMING CABLE AS MARKED ABOVE.
7. TERMINAL BLOCK FOR OUTGOING CABLES SHALL BE PROVIDED IN SEPARATE ENCLOSURE SO THAT WITH THE MCCB IN OFF CONDITION THE SEPARATE ENCLOSURE FOR OUTGOING CABLES IS COMPLETELY DE-ENERGISED.
8. CONNECTION BETWEEN THE TWO ENCLOSURES SHALL BE SEALED AGAINST ENTRY OF GASES FROM ONE ENCLOSURE TO THE OTHER.
9. EIL SPECIFICATION 6-51-0007 SHALL BE FOLLOWED FOR DETAILED REQUIREMENTS.

ENGINEERS INDIA LIMITED NEW DELHI	HYDRO BLASTING POWER PANEL HARDWARE DETAILS INCOMER & OUTGOING	DRAWING NO.	REV
		B862-000-16-50-DS-0510	A

अग्निरोधक नियंत्रण स्टेशन के लिए विनिर्देश

SPECIFICATION FOR FLAMEPROOF CONTROL STATIONS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
7	09.04.26	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/ SAC	ANPS	HK	NK
6	29.9.20	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/ RKS	ANPS	SA	SM
5	24.02.16	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/AK	ANPS	BRB	SC
4	11.04.11	REVISED AND ISSUED AS STANDARD SPECIFICATION	PS	ANPS	UAP	DM
3	24.08.07	REVISED AND ISSUED AS STANDARD SPECIFICATION	ANPS	UAP	JMS	VC
2	30.01.02	REVISED AND ISSUED AS STANDARD SPECIFICATION	UAP	AAN	VPS	GRR

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Abbreviations:

AC	Alternating Current
BIS	Bureau of Indian Standards
CEA	Central Electricity Authority
CT	Current Transformer
DC	Direct Current
FRLS	Flame Retardant Low Smoke
FRP	Fibre Reinforced Plastic
GI	Galvanised Iron
IEC	International Electro-technical Commission
IP	Ingress Protection
IS	Indian Standards
LED	Light Emitting Diodes
LV	Low Voltage
MR	Material Requisition
NABL	National Accreditation Board for Testing and Calibration Laboratories
PB	Push Button
PESO	Petroleum and Explosives Safety Organisation
PVC	Poly Vinyl Chloride
SMD	Surface Mounted Device
SWG	Standard Wire Gauge
XLPE	Cross Linked Poly Ethylene

Electrical Standards Committee

Convenor: Mr. Harish Kumar

Members: Ms. Arvind N. P. Singh
Mr. Rajiv Kumar Saha
Mr. Vijay Kumar
Ms. Shirali Aggarwal
Ms. Rashmi Singh Rathaur
Mr. Supriya Talukder
Mr. Ayush Mathur (Projects)
Mr. Rajesh Sinha (PDD)
Mr. G. Suresh (Inspection)

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1.0 SCOPE

This specification covers the requirements of design, manufacture, testing, packing and supply of flameproof control stations and accessories suitable for installation in locations handling flammable liquids and gases/ vapors.

2.0 CODES AND STANDARDS

2.1 The equipment shall comply with the requirements of latest revision of the following standards issued by BIS:

IS-5	: Colours for ready mixed paints and enamels.
IS-1248	: Direct acting indicating analogue measuring instruments and their accessories.
IS / IEC 60079-0	: Electrical apparatus for explosive gas atmospheres (General Requirements).
IS / IEC 60079-1	: Electrical apparatus for explosive gas atmospheres (Equipment Protection by Flameproof Enclosures "d").
IS / IEC 60529	: Degree of protection provided by enclosures (IP Code).
IS / IEC 60947	: LV switchgear and control gear.

2.2 In case of imported equipment, only IECEx (or equivalent, if more stringent than the applicable IEC) certified equipment shall be used.

2.3 The equipment shall also confirm to the provisions of CEA Regulations with latest amendments and other statutory regulations currently in force in the country.

2.4 In case Indian standards are not available for any equipment, standards issued by IEC or equivalent agency (if more stringent than IEC) shall be applicable.

2.5 In case of any conflict between requirements specified in various applicable documents for the project, the most stringent requirement shall govern. However, Owner/ EIL's decision in this regard will be final and binding.

3.0 GENERAL REQUIREMENTS

3.1 The offered equipment shall be brand new with state of art technology and having proven field track record. No prototype equipment shall be offered.

3.2 Vendor shall ensure availability of spare parts and maintenance support services for the offered equipment for at least 10 years from the date of supply.

4.0 SITE CONDITIONS

The equipment shall be suitable for installation and satisfactory operation in classified hazardous locations in tropical, humid and corrosive atmosphere as prevalent in refineries, petrochemical and fertilizer plants. Unless otherwise specified, a design ambient temperature of 40° C and an altitude not exceeding 1000 m above mean sea level shall be considered.

5.0 CERTIFICATION

All Hazardous area equipment shall have hazardous area test certificates and approvals as per following:

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For Indigenous manufactured hazardous area equipment:
For all electrical items manufactured in India, the testing shall be carried out & test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

Alternatively, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

For Imported hazardous area equipment:
For all electrical items manufactured outside India, test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

As an alternative option-1 to this, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

As an alternative option-2 to this, EU Type Examination Certificate, which is applicable for manufacturers having manufacturing locations in countries covered under the European Union, valid copy of Production Quality Assessment / Assurance Notification shall be furnished.

All equipment i.e. Indigenous & imported, shall also have valid statutory approvals, as applicable for the specified location and marking as per IS/IEC 60079 and as required by statutory authorities.
For installations in India, PESO approval letter shall be provided.

6.0 TECHNICAL REQUIREMENTS

6.1 Construction

6.1.1 The enclosures of the control stations shall be made of cast light metal alloy, unless otherwise specified. The enclosures of the control stations intended for use in units handling sulphuric acid/ other corrosive materials shall be made of stainless steel grade SS-316L, if specified in MR/ tender.

6.1.2 The control stations shall be suitable for use in outdoor open locations and shall have minimum IP-55 degree of protection. They shall preferably be provided with integral canopy. However, where the enclosure has been certified without integral canopy, a separate canopy can be accepted. The separate canopy shall be made of at least 1.6 mm (16 gauge) galvanised sheet steel/ FRP/ stainless steel minimum SS-304 (as specified in purchase specifications). The canopy shall be suitable for providing protection against rain from top, back and two sides.

6.1.3 The control station enclosure shall be provided with gaskets for IP, if required by equipment certification. Gaskets, wherever provided, shall be made of non-inflammable and self-extinguishing material.

6.1.4 All metal surfaces shall undergo manufacturer's standard cleaning/ painting/ powder coating cycle. After surface preparation, the equipment shall be painted with two coats of epoxy based final paint or epoxy powder coated with minimum coating thickness of 80 microns, with colour shade as below:

- Flame proof (Gas group IIA/ IIB) : Dark admiralty grey shade 632 of IS-5/ RAL 7031
- Flame proof (Gas group IIC) : Light yellow shade 355 of IS-5/ RAL 1012

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All unpainted parts shall be suitably treated to prevent rust formation/ corrosion. If these parts are moving then these shall be greased. Grease, which does not solidify, shall be applied to flamepath. However, in case of Stainless Steel control stations, finish shall be Electropolish/ Buffed/ equivalent finish.

6.1.5 Equipment shall be marked as per IS/IEC 60079.

6.1.6 All accessories like nuts, bolts, washers etc. and operating shaft of push buttons, switches etc. shall be made of stainless steel SS-304. Alternatively, Nickel-plated brass material may be used for the operating shafts of push buttons, switches etc.

6.1.7 The control stations shall be provided with two earthing studs (minimum M10 bolt, nut with spring and plain washer) with lugs on the external surface of the enclosures suitable for termination of 8 SWG GI wire. No screw type fixing arrangement shall be allowed.

6.1.8 The control station shall be provided with two cable entries at bottom, and one entry to be blocked with flameproof nickel plated brass sealing plug, unless otherwise specified. Required number of flameproof double compression nickel plated brass cable glands shall be provided. The cable termination chamber of the control station shall be large enough to provide a minimum space of 100mm between top of the cable gland and bottom of the terminal block.

6.1.9 The control stations shall have external fixing lugs for mounting on wall or column. The holes provided on these lugs shall be of oblong type.

6.1.10 A tag plate indicating Tag Number shall be provided on each control station. Separate nameplate shall also be provided to indicate the details of Name of Manufacturer, testing agency, test certificate no. with date, statutory approval no. with date and agency (PESO/ DGMS etc.), BIS licence number and date, applicable gas group etc. The nameplates shall be engraved on 3 ply black white black lamicold / Stainless steel sheets using square cutters. Black engraved perspex sheet nameplate shall also be acceptable. Nameplates shall be fixed by screws and shall not be pasted. In case the standard details given above are embossed on the enclosures, the same need not be repeated on the main nameplate.

6.1.11 All flameproof control stations shall be suitable for 240V AC as well as 110V/ 220V DC control supply.

6.2 Component Specification

6.2.1 Push buttons for START/ OPEN and STOP/ CLOSE shall be of GREEN and RED colour respectively. The STOP push button shall be mushroom type with stay put feature and lockable in pressed position. Refer Sketch 1 for wiring and other details for various types of local control stations.

6.2.2 All selector switches shall have minimum two poles for each position. Each position of switch shall be indelibly marked on the control station. Exact configuration of selector switch (e.g. LOCAL-OFF-REMOTE) shall be as per datasheet/ MR requirement.

6.2.3 All ammeters shall be of moving iron type having an accuracy class of 1.5 and suitable for 1 Ampere CT secondary. Minimum size of ammeter shall be either 72mm x 72 mm or 65 mm diameter. 80% of the scale length shall cover 100% of the CT primary current uniformly and the balance 20% of the scale shall cover 100-800% of the CT primary. A red mark corresponding to the full load current of the motor shall be provided on the ammeter dial. The ammeter front glass shall be toughened.

6.2.4 Indicating lamp(s) wherever provided shall be clustered LED type or SMD chip type LED with colour lens of minimum 25mm diameter.

6.3 Terminals & Wiring

6.3.1 The control stations shall be provided with sufficient number of terminals. More than 2 wires per terminal shall not be permitted. If required, additional terminal with shorting link may be used. Each terminal for external cable connection shall be suitable for termination of 2.5 mm^2

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(unless otherwise specified) stranded copper conductor. Tinned copper lugs shall be provided for cable termination wherever applicable.

6.3.2 All internal wiring shall employ 1.5 mm², 660V/ 1100V grade, FRLS type, XLPE/ PVC insulated copper conductor wires. All termination shall be with suitable lugs.

7.0 INSPECTION, TESTING AND ACCEPTANCE

7.1 During fabrication, the equipment shall be subjected to inspection by EIL/ Owner or by an agency authorized by the Owner, as per agreed Inspection Test Plan. Manufacturer shall furnish all necessary information concerning the supply to EIL/ Owner's inspector. All routine/acceptance tests shall be carried out at manufacturer's works under his care & expense.

7.2 Type test certificates from NABL accredited/ Central Government Labs in India/ IECEx-certified/ equivalent Labs, Manufacturer's works test reports, applicable PESO approval and BIS license and original drawings referred in type test certificates shall be shown to the inspection agency on demand during inspection. The test certificates, BIS license and PESO approval must be valid at the time of despatch.

7.3 Test certificates of bought out components shall be submitted to the inspection agency, as per Inspection and Test Plan no. 6-81-1006.

7.4 All equipments shall be subjected to various routine / acceptance tests as per Inspection and Test Plan no. 6-81-1006.

8.0 PACKING AND DESPATCH

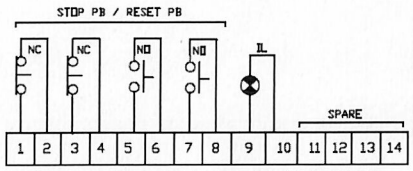
All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for the selected mode of transportation, i.e. by ship/ rail or trailer, and shall be wrapped in polythene sheets before being placed in crates/ cases to prevent damage to finish. The crates/ cases shall have skid bottom for handling. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO no.' etc., shall be clearly marked on the packages together with other details as per purchase order.

The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed. A set of instruction manuals for installation, testing and commissioning, a set of operation & maintenance manuals and a set of final drawing shall be enclosed in a waterproof cover along with the shipment.

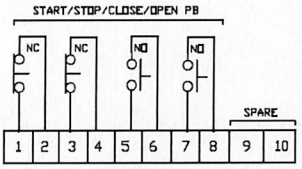
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SKETCH–1

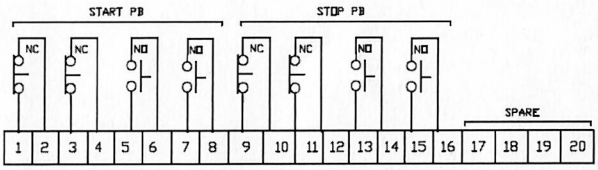
WIRING DETAILS OF LOCAL CONTROL STATIONS



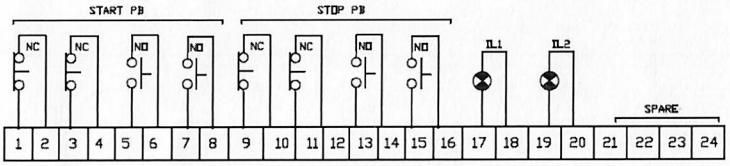
TYPE–A1 (STOP P.B. WITH LAMP)
OR
(RESET P.B. WITH LAMP)
(CABLE SIZE : 4Px2.5 Sq.mm)



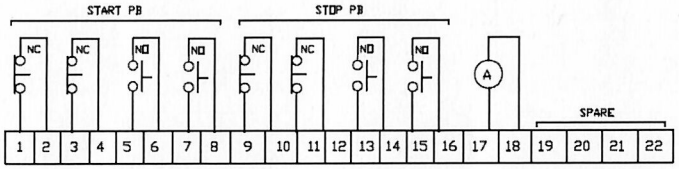
TYPE–A2
(START PB) OR (STOP PB) OR (CLOSE PB) OR (OPEN PB)
(CABLE SIZE : 2Px2.5 Sq.mm)



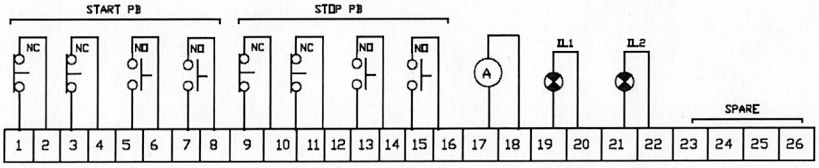
TYPE–B1 (WITH START & STOP PBs) OR (WITH CLOSE & OPEN PBs)
(CABLE SIZE : 4Px2.5 Sq.mm)



TYPE–B2 (WITH START & STOP PBs & INDICATION LAMPS)
OR
(WITH CLOSE & OPEN PBs & INDICATION LAMPS)
(CABLE SIZE : 6Px2.5 Sq.mm)

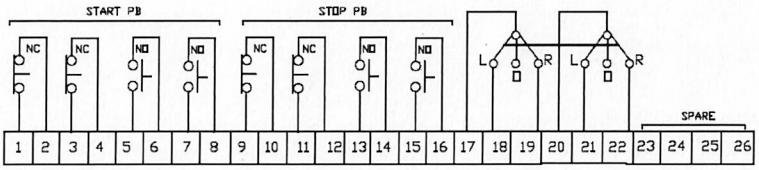


TYPE–C1 (WITH START & STOP PBs & AMMETER)
(CABLE SIZE : 4Px2.5 Sq.mm)

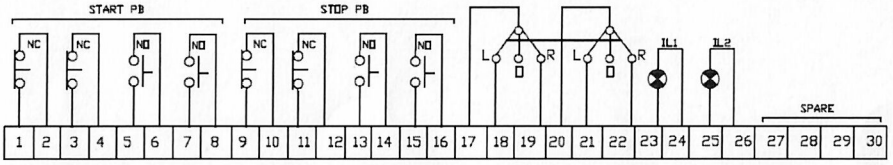


TYPE–C2 (WITH START & STOP PBs, AMMETER & INDICATION LAMPS)
(CABLE SIZE : 6Px2.5 Sq.mm)

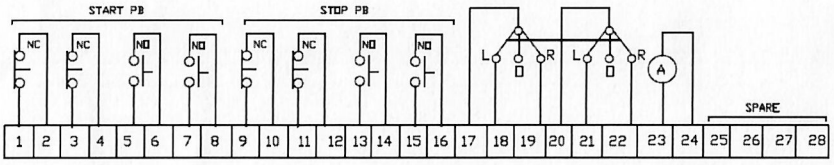
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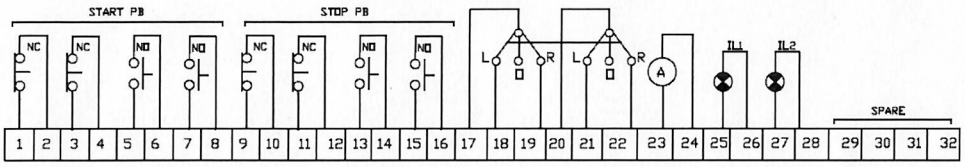
TYPE–D1 (WITH START & STOP PBs & L–O–R SELECTOR SWITCH)
(CABLE SIZE : 6Px2.5 Sq.mm) (REFER NOTE–11)



TYPE–D2 (WITH START & STOP PBs, L–O–R SELECTOR SWITCH & INDICATION LAMPS)
(CABLE SIZE : 12Px2.5 Sq.mm) (REFER NOTE–11)

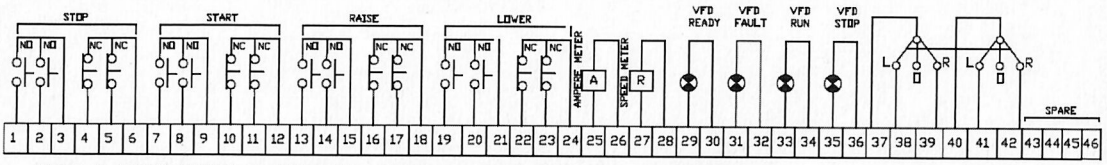


TYPE–E1 (WITH START & STOP PBs, AMMETER & L–O–R SELECTOR SWITCH)
(CABLE SIZE : 6Px2.5 Sq.mm) (REFER NOTE–11)

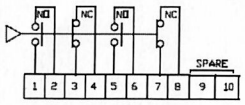


TYPE–E2 (WITH START & STOP PBs, AMMETER, L–O–R SELECTOR SWITCH & INDICATION LAMPS)
(CABLE SIZE : 12Px2.5 Sq.mm) (REFER NOTE–11)

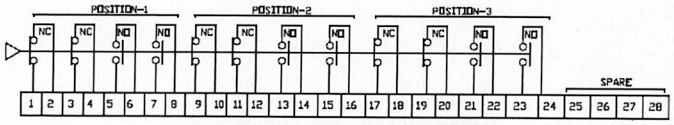
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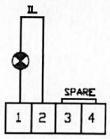
TYPE–F (WITH START & STOP PBs, RAISE & LOWER PBs, L–O–R SWITCH, AMPERE METER, SPEED METER & INDICATING LAMPS) (REFER NOTE–5,6,7)
(CABLE SIZE : 12Px2.5 Sq.mm)



TYPE–I1
SEL SWITCH (2POSITION)



TYPE–I2 SEL SWITCH (3POSITION)



TYPE–I3
(LAMP STATION)

GENERAL NOTES:

1. SHORTING LINKS SHALL BE PROVIDED BY VENDOR. REQUIREMENT SHALL BE INFORMED DURING VENDOR DRAWING REVIEW.
2. WIRING DETAILS SHALL BE READ IN CONJUNCTION WITH MR/TENDER.
3. CABLE SIZES AS INDICATED ABOVE ARE TENTATIVE AND MINIMUM. EXACT CABLE SIZES SHALL BE INFORMED DURING VENDOR DRAWING REVIEW. VENDOR TO PROVIDE REQUIRED SIZE OF CABLE TERMINATION CHAMBER WITH SUITABLE TERMINALS, CABLE ENTRIES, CABLE GLANDS AND LUGS. CROSS SECTIONAL AREA SHALL BE 2.5 SQ.MM, UNLESS OTHERWISE SPECIFIED.
4. AMMETER WHEREVER PROVIDED, SHALL BE ANALOGUE OR 4–20mA TYPE AS DEFINED IN MR/TENDER.
5. FOR VFD LCS, LAMP SUPPLY VOLTAGE SHALL BE SAME AS VFD CONTROL SUPPLY VOLTAGE.
6. FOR VFD LCS, IF EXTERNAL SUPPLY IS REQUIRED FOR METERS, THEN SAME SHALL BE AS VFD CONTROL SUPPLY VOLTAGE.
7. METERS IN VFD LCS SHALL BE SUITABLE FOR 4–20mA TRANSDUCER OUTPUTS AND SHALL BE CALIBRATED FOR THE ACTUAL MOTOR CURRENT. FOR DRIVERS WITH BYPASS FACILITY, METERS SHALL BE CAPABLE OF READING BYPASS MODE FULL LOAD AND STARTING CURRENTS AS WELL AS VFD MODE DRIVE CURRENT.
8. NUMBER AND COLOUR OF INDICATING LAMPS SHALL BE AS PER THE JOB SPECIFATION/TENDER.
9. LCS TYPE "I" ARE TYPICALLY FOR INSTRUMENTATION USE.
10. ALL PUSH BUTTON AND CONTROL SWITCH CONTACTS SHALL BE RATED FOR MINIMUM 5A AT 240V(AC–15) AND 1A AT 110V(DC–13) DUTY. CONTACT RATINGS FOR LCS FOR INSTRUMENTATION USE SHALL BE AS PER INSTRUMENTATION REQUIREMENT.
11. SECOND CONTACT OF L–O–R SWITCH REQUIRED ONLY WHERE DCS INTERFACE IS REQUIRED BY INSTRUMENTATION.
12. THE EXACT DESCRIPTION OF PB'S WHETHER START/STOP OR OPEN/CLOSE SHALL BE INFORMED DURING VENDOR DRAWING REVIEW.
13. ALL L–O–R SELECTOR SWITCHES SHALL BE LOCKABLE IN OFF POSITION.

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अग्निरोधक विद्युत वितरण बोर्ड के लिए विनिर्देश

SPECIFICATION FOR FLAMEPROOF POWER DISTRIBUTION BOARDS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
0	31.03.22	ISSUED AS STANDARD SPECIFICATION	SAC/RKS	ANPS	MKS	SM

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Abbreviations:

AC	Alternating Current
BIS	Bureau of Indian Standards
CEA	Central Electricity Authority
CT	Current Transformer
DGMS	Directorate General of Mines Safety
EIL	Engineers India Limited
FRLS	Flame Retardant Low Smoke
GI	Galvanised Iron
IEC	International Electro-technical Commission
IP	Ingress Protection
IS	Indian Standards
kW	Kilo Watt
kWH	Kilo Watt Hour
MR	Material Requisition
MV	Medium Voltage
MCB	Miniature Circuit Breaker
MCCB	Moulded case circuit breaker
NABL	National Accreditation Board for Testing and Calibration Laboratories
PDB	Power Distribution Board
PESO	Petroleum and Explosives Safety Organisation
PO	Purchase Order
PVC	Poly Vinyl Chloride
SPN	Single Phase and Neutral
SWG	Standard Wire Gauge
SS	Stainless Steel
TPN	Three Phases and Neutral
XLPE	Cross Linked Poly Ethylene

Electrical Standards Committee

Convenor: Mr. Manjit Kumar Sahu

Members: Mr. Harish Kumar
Ms. Arvind NP Singh
Ms. Shalini Verma
Mr. Raman Sood
Mr. Bishan Dass
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1.0 SCOPE

This specification covers the requirements of design, manufacture, testing, packing and supply of free standing flameproof Power Distribution Board (PDB) for field power distribution to MOVs, soot blowers, auxiliary motors, electric heat tracing, high masts etc. suitable for installation in hazardous locations handling flammable liquids and gases/ vapours.

2.0 CODES AND STANDARDS

2.1 The equipment shall comply with the requirements of latest revision of the following standards issued by BIS:

IS : 5	:	Colours for ready mixed paints and enamels.
IS : 1248	:	Direct acting indicating analogue measuring instruments and their accessories
IS : 2824	:	Method for determining the proof and the comparative tracking indices of solid insulating materials
IS : 5082	:	Wrought aluminum and aluminum alloy bars, rods, tubes and sections for electrical purposes
IS : 5578	:	Guide for marking of insulated conductor
IS : 11353	:	Guide for uniform system marking and identification of conductors and apparatus terminals
IS : 12640	:	Residual current operated circuit breakers
IS : 13703	:	Low voltage fuses for voltages not exceeding 1000V AC or 1500V DC
IS : 16227/ IEC 61869	:	Instrument transformers (Current transformers & Voltage transformers)
IS/IEC 60255		Measuring Relays & Protection Equipment
IS/IEC 60269	:	Low voltage fuses
IS/IEC 60079-0	:	Electrical apparatus for explosive gas atmospheres (General requirements).
IS/IEC 60079-1	:	Electrical apparatus for explosive gas atmospheres (Equipment Protection by Flameproof Enclosures "d").
IS/IEC 60529	:	Degree of protection provided by enclosures (IP Code).
IS/IEC 60898	:	Electrical Accessories circuit breakers for over protection for household and similar installations
IS/IEC 60947	:	LV switchgear and control gear.
IS/IEC 61439	:	Low voltage switchgear and control gear assemblies

2.2 In case of imported equipment, only IECEx (or equivalent, if more stringent than the applicable IEC) certified equipment shall be used.

2.3 The Equipment shall also confirm to the provisions of CEA Regulations with latest amendments and other statutory regulations currently in force in the country.

2.4 In case Indian standards are not available for any equipment, standards issued by IEC or equivalent agency (if more stringent than IEC) shall be applicable.

2.5 In case of any conflict between requirements specified in various applicable documents for the project, the most stringent requirement shall govern. However, Owner's/ EIL's decision in this regard will be final and binding.

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3.0 GENERAL REQUIREMENTS

3.1 The offered equipment shall be brand new with state of art technology and having proven field track record. No prototype equipment shall be offered.

3.2 Vendor shall ensure availability of spare parts and maintenance support services for the offered equipment for at least 10 years from the date of supply.

4.0 SITE CONDITIONS

4.1 The equipment shall be suitable for installation and satisfactory operation in tropical, humid and corrosive atmosphere as prevalent in refineries, petrochemical and fertilizer plants, which are classified as hazardous. The power distribution boards shall be designed to operate under site conditions as specified in the data sheet. If not specifically mentioned therein, a design ambient temperature of 40° C and an altitude not exceeding 1000m above mean sea level shall be considered.

4.2 All the equipments described in this specification are intended for continuous duty with the specified rating under the specified ambient conditions unless indicated otherwise.

5.0 POWER SUPPLY

5.1 PDB shall be suitable for 415V, 50Hz, TPN incoming supply.

5.2 The outgoing of PDB shall be 415V TP/TPN power supply circuits and/or 240V SPN circuits as specified in the data sheet/ job specification.

6.0 CERTIFICATION

The equipment shall have test certificates issued by NABL accredited/ Central Government labs in India/ IECEx-approved/ equivalent labs. All equipment (indigenous & imported) shall also have valid statutory approvals, as applicable, for the specified location, and marking as per IS/IEC 60079 and as required by statutory authorities. All indigenous flameproof equipment shall have valid BIS license. All flameproof equipment shall have PESO approval.

7.0 TECHNICAL REQUIREMENTS

7.1 Construction

7.1.1 The Flameproof PDB shall be designed for service at project ambient temperature and shall be suitable for continuous operation without harmful effect with voltage and frequency variations as specified in the data sheets. The flameproof PDB shall have rated current and fault level rating as specified in the datasheet/ job specification.

7.1.2 The Flameproof PDB shall be free standing on a self-supporting pedestal mounting steel framework of angles and channel section, suitable for installation on concrete base with front access for operation and maintenance. The Flameproof PDB shall be fixed type, in single front execution, assembled in single line up with multiple flameproof cubicles housing feeders, cable terminations and bus bar. The arrangement shall provide adequate spacing between enclosures for direct vertical installation of power and control cables, entering enclosures from bottom/ top as specified in data sheet/ job specification. Adequate spacing and clearances shall be provided both on the top and at the bottom for maintenance works.

7.1.3 The devices and components mounted inside the cubicles shall have adequate clearances. The quantity and type/rating of components inside each cubicle shall be in accordance with the statutory test certificate details.

7.1.4 The enclosure of the flameproof PDB shall be made of cast light metal alloy. The enclosure of the flameproof PDB intended for use in units handling sulphuric acid/ other corrosive materials shall be made of stainless steel grade SS-316L, if specified in MR/Tender.

7.1.5 The flameproof PDB shall be suitable for use in outdoor open locations and shall have minimum IP-55 degree of protection. It shall preferably be provided with integral canopy.

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However, where the enclosure has been certified without integral canopy, a separate canopy shall be accepted for installation over the PDB. The separate canopy shall be made of at least 1.6 mm (16 gauge) galvanized sheet steel/stainless steel minimum SS-304. The canopy shall be suitable for providing protection against rain from top two sides and front.

7.1.6 The flameproof PDB shall be provided with gaskets made of non-inflammable and self-extinguishing material.

7.1.7 All metal surfaces shall undergo manufacturer's standard cleaning/ painting / powder coating cycle. After preparation of under surface, the panels shall be painted with two coats of epoxy based final paint or epoxy powder coated with minimum coating thickness of 80 microns, with colour shade as below:

- Flameproof Ex'd' (Gas group IIA/IIB) : Dark admiralty grey shade 632 of IS-5/ RAL 7031
- Flameproof Ex'd' (Gas group IIC) : Light yellow shade 355 of IS-5 / RAL 1012.

All unpainted steel parts shall be suitably treated to prevent rust formation. If these parts are moving elements, then these shall be greased with non-solidifying grease. However, in case of stainless steel flameproof power distribution boards, finish shall be Electropolish/ Buffed/ equivalent finish.

7.1.8 A warning inscription "DO NOT OPEN WHEN ENERGIZED" shall be provided on each enclosure. The warning inscription shall be embossed on the enclosure or a separate warning plate with above inscription shall be fixed to the enclosure with screws. The warning plate shall be of nickel plated brass or stainless steel.

7.1.9 All accessories like nuts, bolts, washers etc. shall be made of stainless steel SS-304, as minimum.

7.1.10 Main bus bars shall be of high conductivity electrolytic aluminium having uniform current rating, for specified fault level throughout their length. The bus bars shall be sized depending upon the maximum expected current and to limit the specified maximum operating temperature at specified design ambient temperature. Bus bars shall be supported by non-hygroscopic insulators. Bus bars shall be colour coded for identification of phases and neutral.

7.1.11 Copper earth bus of suitable size for specified fault level shall be provided throughout the length of the PDB. The earth bus shall be provided with alternate bands of yellow and green. All earth connection wires shall be suitably colour coded. All the non-current carrying metallic parts of the board shall be inherently bonded together. Each flameproof PDB shall be provided with two earthing studs with lugs on the exterior of the board suitable for termination of earth bus bar.

7.1.12 Neutral and earth bars shall be suitable for connecting the neutral and earth conductors of the circuits. The earth bars shall be drilled and tapped unnumbered brass link bars with stud bolts and screws. The neutral and earth terminals shall 10% more than the number of circuit breakers.

7.1.13 Provision shall be made for the bonding of earth conductor, cable glands and cable armouring at cable termination point.

7.1.14 Each cubicle shall be provided with space heater rated for 240V AC supply, provided with a switch, fuse or double pole MCB and thermostat having variable setting range of 30-70 °C, to prevent moisture condensation.

7.1.15 The PDB shall be provided with suitable sized cable entries as mentioned in datasheet/ job specification for incoming and outgoing cables. Unless otherwise specified, the PDB shall be suitable for bottom cable entry. Top cable entry shall be provided if specified in data sheet/ job specification.

All connections to incoming and outgoing cables shall terminate in terminal block, which shall be adequately sized for termination of the cables as specified in MR/ Tender. Sufficient space shall be provided inside the PDB for easy connection of Purchaser's cable. Suitable terminal blocks/ terminal studs, adequately rated, shall be provided for cable termination of each of the

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feeders. Adequate number of terminals shall be provided for terminating incoming and outgoing cable entries. Board shall be supplied complete with double compression type nickel plated brass flameproof cable glands and Tinned copper lugs for incoming and outgoing cables. Flameproof nickel plated brass sealing plugs shall be supplied, for plugging the unused cable entries. The quantity of sealing plugs shall be equal to 20% of the total number of outgoing cable entries.

7.1.16 Inside the PDB, the wiring for power, control, signaling protection and instrument circuits shall be done with FRLS, PVC/ XLPE insulated copper conductor & BIS approved having 660/ 1100 V grade insulation. For modules rated above 100A, preferably copper strip connections shall be used. The control connections shall be done with 660V grade PVC/ XLPE insulated FRLS wires having stranded copper conductors. Minimum size of control wire shall be 1.5 mm^2 copper for circuits having fuse rating 10 A or less. For higher fuse rating control circuits, minimum 2.5 mm^2 copper conductor shall be used. Each wire shall be identified at both ends by self-sticking wire marker tapes or PVC ferrules. Cable sheath colours to be consistent with the phase/ neutral/ earth circuit to which they are connected. Only one conductor shall be connected to each terminal; additional linked terminals shall be provided where more connections are required. All terminals shall be shrouded. All wiring shall be clearly identified at both ends by individual non-ambiguous characters using barrel type ferrules/ marker tapes.

7.1.17 Clamp type terminals shall be acceptable for wires upto 10 mm^2 size. For conductors larger than 10mm^2, bolt type terminals with crimping lugs shall be provided. Each wire shall be terminated at a separate terminal. A minimum of 10% spare terminals shall be provided on each terminal block. Shorting links shall be provided for all CT terminals.

7.1.18 A Tag plate indicating Tag Number, engraved, 3 ply laminate fixed with screws shall be provided on each PDB. Nameplates shall also be provided for each incoming and outgoing feeder. A separate nameplate shall be provided to indicate the name of manufacturer, testing agency, test certificate number, serial number, BIS license number, applicable gas group as per IS/IEC 60079, statutory agency (PESO) approval number and any additional marking required by statutory authority. The nameplates shall be Al anodized or SS-304 engraved type or laser-marked and permanently fixed on the equipment. In case the standard details given above are embossed on the enclosures, the same need not be repeated on the name plate.

7.2 Equipment/ Component Specification

7.2.1 The Flameproof PDB shall be provided with incoming and out-going feeder with MCCBs/switches/ switch fuse unit/ MCBs as per data sheets/ job specification.

Unless otherwise specified, main incomers shall be suitable for 415V incoming TP/TPN power supply and provided with microprocessor based MCCB/ Switch along with CT, Ammeter, Voltmeter with selector switches and R,Y,B indicating lamps on line side.

7.2.2 The TPN outgoing feeders shall be with MCCB or switch fuse as specified in data sheet/ job specification. Further contactor, CT, ammeter, 3 pole ELCB with maximum sensitivity of 30 mA shall be provided for outgoing feeders as specified in MR/ Tender.

7.2.3 The SPN outgoing feeders, shall have 2 pole isolation, i.e. Phase and Neutral. Each outgoing circuit shall comprise of Miniature Circuit Breaker (MCB) with thermal over current and magnetic short circuit releases. 2 pole Earth Leakage Circuit Breaker (ELCB) (M9 Category) with maximum sensitivity of 30 mA & power contactor, CT, ammeter of required rating shall be provided if specified in data sheet/ job specification. MCB shall be double pole for single phase circuits. MCB rating shall be such that it shall not operate on starting current.

7.2.4 MCCBs shall be provided with spring assisted quick make/ break manually operated trip free mechanism with external operating handle mounted on the cubicle. MCCBs shall have provision for padlocking in OFF position. The ON and OFF position shall be clearly indicated.

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7.2.5 Where specified, the MCCBs for feeder circuits such as those for Motor Operated Valve Actuators shall be suitable for motor duty. MCCBs as part of motor starter module shall be current limiting type and type tested for type-2 co-ordination as per IS/ IEC-60947 considering energy efficient motors of IE-3 type unless otherwise specified elsewhere.

7.2.6 MCB shall have minimum breaking capacity of 9kA unless otherwise specified. Positive ON/ OFF indication shall be provided.

7.2.7 All switches shall be load break, heavy duty/ motor duty, air break type with the operating handle. All switches other than rotary switches shall be lockable in OFF position. Rating of switches for starter module shall meet the requirements of AC-23 duty as per IS/ IEC 60947 and minimum rating shall be as specified in job specification/ data sheets.

7.2.8 All contactors shall be air break type, equipped with main contacts and provided with 1NO+1NC potential free spare auxiliary contacts wired to the terminal block for owner's use. The main contacts of contactor for motor starter module shall have AC-3 or AC-4 rating as per package requirements. Unless specified otherwise, the coil of the contactor shall be suitable for operation on 240 V, 1 Phase, AC supply.

7.2.9 All fuses shall be non-deteriorating HRC cartridge link type, BIS approved. Power fuses shall be pressure fitted type and shall preferably have ribs on the contact blades to ensure good line contact. It shall be possible to handle fuses during off load conditions with full voltage available on the terminals. Two nos. fuse pullers shall be provided. The fuse base shall be so located in the modules to permit insertion of fuse pullers and easy removal of fuse links without any problem.

7.2.10 Bimetal relays shall be provided for protecting the motor from thermal overload. Bimetal thermal overload relays shall be manually reset type with the reset push button provided on the cubical door. Bimetal relays shall be three elements, positive acting ambient temperature compensated type with adjustable setting range and built-in single phasing prevention feature, which operates even with 50% rated current at the time of single phasing.

7.2.11 All contactor controlled motor feeders for auxiliary motors etc. shall meet the requirements of type-2 co-ordination as per IS/IEC: 60947 considering energy efficient motors of IE-3 type, unless otherwise specified elsewhere.

7.2.12 Current transformers for metering shall have an accuracy class 1.0 and instrument security factor not greater than 5. Protective current transformers shall have an accuracy class 5P and an accuracy limit factor greater than 10.

7.2.13 All measuring AC instruments shall be moving iron, flush mounting type for incomer and outgoing feeders. The accuracy class for all instruments shall be 1.0 as per IS-1248. Ammeters shall suitable for 1 Ampere CT secondary. Minimum size of ammeter shall be either 72mm x 72 mm or 65 mm diameter. For Ammeters of motor feeders 80% of the scale length shall cover 100% of the CT primary current uniformly and the balance 20% of the scale shall cover 100-800% of the CT primary. A red mark corresponding to the full load current of the motor shall be provided on the ammeter dial. The ammeter front glass shall be toughened. The kW/ kWH meters shall be suitable to measure unbalanced loads on 3 phases 4- wire system. Test terminal block shall be provided for kWH meters.

7.2.14 All control/ selector switches shall be rotary back-connected types having a cam operated contact mechanism with knob type handle. Ammeter selector switch shall have make before break feature on its contacts. The selector switch shall generally have 4 positions, three for reading 3 phase currents and the fourth position for OFF. The voltmeter selector switch shall also have 4 positions. Three positions shall be used to measure phase-to-phase voltage and fourth shall be OFF position.

7.2.15 Auxiliary relays/ contactors shall generally be used for interlocking and multiplying contacts.

7.2.16 All selector switches shall have minimum two poles for each position. Each position of switch shall be indelibly marked on the PDB. Exact configuration of selector switch (e.g. LOCAL-OFF-REMOTE etc.) shall be as per datasheet/ job specification.

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7.2.17 Indicating lamps shall be cluster LED type or SMD chip type LED with colour lens of minimum 25mm diameter. The following indicating colours shall be used.

Closed/ ON	:	Red
Open/ OFF	:	Green
Fault trip	:	Amber

7.2.18 Push button colours shall be as follows:

Stop/open/emergency stop	:	Red
Start/close	:	Green
Reset	:	Black
Test	:	White

The 'Stop' push button shall be stayput type.

All motor starter feeders shall have Stop and Reset push buttons and ON and Trip indication lamps.

8.0 INSPECTION, TESTING AND ACCEPTANCE

8.1 During fabrication, the equipment shall be subjected to inspection by Owner/ EIL or by an agency authorized by the Owner/ EIL, if specified/ agreed in Approved Inspection Test Plan. Manufacturer shall furnish all necessary information concerning the supply to Owner's/ EIL's inspector. All routine/ acceptance tests shall be carried out at manufacturer's works under his care and expense.

8.2 Type test certificates from NABL accredited/ Central Government Labs in India/ IECEx-certified/ equivalent Labs, Manufacturer's works test reports, applicable PESO approval and BIS license and original drawings referred in type test certificates shall be shown to the inspection agency on demand during inspection. The test certificates, BIS license and PESO approval must be valid at the time of despatch.

8.3 Test certificates of bought out components shall be shown to the inspection agency on demand during inspection.

8.4 All equipments shall be subjected to various routine / acceptance tests as per Approved Inspection & Test plan.

9.0 PACKING AND DESPATCH

All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for the selected mode of transportation, i.e. by ship/ rail or trailer and shall be wrapped in polythene sheets before being placed in crates/ cases to prevent damage to finish. The crates/ cases shall have skid bottom for handling. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO no.' etc., shall be clearly marked on the packages together with other details as per purchase order.

The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed. A set of instruction manuals for installation, testing and commissioning, a set of operation & maintenance manuals and a set of final drawing shall be enclosed in a waterproof cover along with the shipment.

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अग्निरोधक लाइटिंग और पावर पैनलों के लिए विनिर्देश

SPECIFICATION FOR FLAMEPROOF LIGHTING AND POWER PANELS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
7	09.04.26	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/SAC	ANPS	HK	NK
6	22.03.21	REVISED AND ISSUED AS STANDARD SPECIFICATION	RKS	ANPS	PG	SM
5	24.02.16	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/AK	ANPS	BRB	SC
4	11.04.11	REVISED AND ISSUED AS STANDARD SPECIFICATION	PS	ANPS	UAP	DM
3	24.08.07	REVISED AND ISSUED AS STANDARD SPECIFICATION	ANPS	UAP	JMS	VC
2	30.01.02	REVISED AND ISSUED AS STANDARD SPECIFICATION	UAP	AAN	VPS	GRR

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Abbreviations:

AC	Alternating Current
BIS	Bureau of Indian Standards
CEA	Central Electricity Authority
DGMS	Directorate General of Mines Safety
EIL	Engineers India Limited
ELCB	Earth Leakage Circuit Breaker
FRLS	Flame Retardant Low Smoke
GI	Galvanized Iron
IEC	International Electro-technical Commission
IP	Ingress Protection
IS	Indian Standards
LV	Low Voltage
MCB	Miniature Circuit Breaker
MR	Material Requisition
NABL	National Accreditation Board for Testing and Calibration Laboratories
PESO	Petroleum and Explosives Safety Organisation
PO	Purchase Order
PVC	Poly Vinyl Chloride
SPN	Single Phase and Neutral
SS	Stainless Steel
TPN	Three Phases and Neutral
XLPE	Cross Linked Poly Ethylene

Electrical Standards Committee

Convenor: Mr. Harish Kumar

Members: Ms. Arvind N. P. Singh
Mr. Rajiv Kumar Saha
Mr. Vijay Kumar
Ms. Shirali Aggarwal
Ms. Rashmi Singh Rathaur
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1.0 SCOPE

This specification covers the requirements of design, manufacture, testing, packing and supply of flameproof Lighting and Power panels/ accessories suitable for installation in locations handling flammable liquids and gases/ vapours.

2.0 CODES AND STANDARDS

2.1 The equipment shall comply with the requirements of latest revision of the following standards issued by BIS:

IS-5	:	Colours for ready mixed paints and enamels
IS-12640	:	Residual current operated circuit breakers
IS / IEC 60079-0	:	Electrical apparatus for explosive gas atmospheres (General requirements)
IS / IEC 60079-1	:	Electrical apparatus for explosive gas atmospheres (Equipment Protection by Flameproof Enclosures "d")
IS / IEC 60529	:	Degree of protection provided by enclosures (IP Code)
IS / IEC 60898	:	Electrical Accessories - circuit breakers for over protection for household and similar installations
IS / IEC 60947	:	LV switchgear and control gear.
IS/16724-2018/ IEC-60079-14: 2003 (Ed 5.0)	:	Explosive atmospheres -Part 14: Electrical Installation design, selection and erection
IEC 61009-1	:	Residual current operated circuit breakers with integral over current protection for Household and similar uses.

2.2 In case of imported equipment, only IECEx (or equivalent, if more stringent than the applicable IEC) certified equipment shall be used.

2.3 The equipment shall also confirm to the provisions of CEA Regulations with latest amendments and other statutory regulations currently in force in the country.

2.4 In case Indian standards are not available for any equipment, standards issued by IEC or equivalent agency (if more stringent than IEC) shall be applicable.

2.5 In case of any conflict between requirements specified in various applicable documents for the project, the most stringent requirement shall govern. However, Owner's/ EIL's decision in this regard will be final and binding.

3.0 GENERAL REQUIREMENTS

3.1 The offered equipment shall be brand new with state of art technology and having proven field track record. No prototype equipment shall be offered.

3.2 Vendor shall ensure availability of spare parts and maintenance support services for the offered equipment for at least 10 years from the date of supply.

4.0 SITE CONDITIONS

The equipment shall be suitable for installation and satisfactory operation in classified hazardous locations in tropical, humid and corrosive atmosphere as prevalent in refineries, petrochemical and fertilizer plants. The lighting and power panels shall be designed to operate

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under site conditions as specified in the data sheet. If not specifically mentioned therein, a design ambient temperature of 40° C and an altitude not exceeding 1000m above mean sea level shall be considered.

5.0 POWER SUPPLY

5.1 Lighting and power panels shall be suitable for 415V, 50Hz, TPN incoming power supply and outgoing circuits for 240V, SPN power supply.

5.2 For projects falling under the jurisdiction of DGMS, the following additional requirements shall apply:

5.2.1 The phase-to-phase voltage shall not exceed 125V (where electric lighting is used in underground mine)/ 250V (where electric lighting is used in open cast mine or surface of a mine), with the neutral or the mid-point of the lighting system connected with earth.

5.2.2 The panels shall have three phase, 3-wire system, without neutral.

5.2.3 Outgoing circuits shall be controlled by 2-pole MCBs. Earth leakage protection shall be provided for all outgoing circuits, which shall isolate both poles.

6.0 CERTIFICATION

All Hazardous area equipment shall have hazardous area test certificates and approvals as per following:

For Indigenous manufactured hazardous area equipment:
For all electrical items manufactured in India, the testing shall be carried out & test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

Alternatively, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

For Imported hazardous area equipment:
For all electrical items manufactured outside India, test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

As an alternative option-1 to this, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

As an alternative option-2 to this, EU Type Examination Certificate, which is applicable for manufacturers having manufacturing locations in countries covered under the European Union, valid copy of Production Quality Assessment / Assurance Notification shall be furnished.

All equipment i.e. Indigenous & imported, shall also have valid statutory approvals, as applicable for the specified location and marking as per IS/IEC 60079 and as required by statutory authorities.
For installations in India, PESO approval letter shall be provided.

7.0 TECHNICAL REQUIREMENTS

7.1 Construction

7.1.1 The enclosures of the lighting and power panels shall be made of cast light metal alloy, unless otherwise specified. The enclosures of the lighting and power panels intended for use in units

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handling sulphuric acid/ other corrosive materials shall be made of stainless steel grade SS-316L, if specified in MR/ Tender.

7.1.2 The panels shall be suitable for use in outdoor open locations and shall have minimum IP-55 degree of protection. They shall preferably be provided with integral canopy. However, where the enclosure has been certified without integral canopy, a separate canopy can be accepted. The separate canopy shall be made of at least 1.6 mm (16 gauge) galvanized sheet steel/ stainless steel minimum SS-304 (as specified in MR/ Tender). The canopy shall be suitable for providing protection against rain from top, back and two sides.

7.1.3 The lighting and power panels shall be provided with gaskets made of non-inflammable and self-extinguishing material.

7.1.4 All metal surfaces shall undergo manufacturer's standard cleaning/ painting/ powder coating cycle. After surface preparation, the panels shall be painted with two coats of epoxy based final paint or epoxy powder coated with minimum coating thickness of 80 microns, with colour shade as below:

- Flame proof Exd (Gas group IIA/IIB): Dark admiralty grey shade 632 of IS-5/ RAL 7031
- Flame proof Exd (Gas group IIC): Light yellow shade 355 of IS-5/ RAL 1012.

All unpainted steel parts shall be suitably treated to prevent rust formation/ corrosion. If these parts are moving elements, then these shall be greased with non-solidifying grease. However, in case of stainless steel lighting and power panels, finish shall be Electropolish/ Buffed/ equivalent finish.

7.1.5 A warning inscription "DO NOT OPEN WHEN ENERGIZED" shall be provided on each enclosure. The warning inscription shall be embossed on the enclosure or a separate warning plate with above inscription shall be fixed to the enclosure with screws. The warning plate shall be of nickel plated brass or stainless steel.

7.1.6 All accessories like nuts, bolts, washers etc. shall be made of stainless steel SS-304.

7.1.7 All the non-current carrying metallic parts of the panel shall be inherently bonded together. Each lighting and power panel shall be provided with two earthing studs (bolt, nut with spring and plain washer) with lugs on the exterior of the panel enclosure suitable for termination of 10 mm dia GI wire rope. No screw type fixing arrangement shall be allowed.

7.1.8 Each outgoing feeder shall be provided with distinct terminals for phase, neutral and earth. The terminal block enclosures shall be adequately sized to properly terminate the cables by taking into account the required bending radii of cable cores and shall have the following minimum gland to terminal distances:

Conductor Size	Up to 2.5 mm^2	Above 2.5 mm^2 & Up to 10 mm^2	Above 10 mm^2 & Up to 35 mm^2	Above 35 mm^2 & Up to 95 mm^2	Above 95 mm^2 & Up to 185 mm^2	Above 185 mm^2 & Up to 300 mm^2
Gland to terminal distance	40 mm	60 mm	100 mm	150 mm	200 mm	300 mm

7.1.9 The panels shall be provided with suitably sized cable entries at the bottom/ sides, for incoming and outgoing cables. Panels shall be complete with double compression type nickel plated brass flameproof cable glands. Flameproof nickel plated brass sealing plugs shall be supplied, for plugging the unused cable entries. The quantity of sealing plugs shall be equal to 20% of the total number of outgoing cable entries.

7.1.10 The panels shall have external fixing lugs for mounting on wall or column. The holes provided on these lugs shall be of oblong type.

7.1.11 A tag plate indicating Tag Number shall be provided on each lighting and power panel. Nameplates shall also be provided for each incoming and outgoing feeder. A separate

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nameplate shall be provided to indicate the name of manufacturer, testing agency, test certificate number, serial number, BIS license number, applicable gas group as per IS/IEC 60079, statutory agency (PESO) approval number and any additional marking required by statutory authority. The nameplates shall be engraved on 3 ply black white black lamicold sheets using square cutters. Black engraved perspex sheet nameplate shall also be acceptable. Nameplates shall be fixed by screws and shall not be pasted. In case the standard details given above are embossed on the enclosures, the same need not be repeated on the main nameplate.

7.2 Component Specification

7.2.1 Bus bars in the lighting and power panels shall be made of high conductivity copper, and shall be supported by non-hygroscopic insulators. Bus bars shall be colour coded for identification of phases and neutral.

7.2.2 The incomer shall have one no. 4 pole MCB isolator (without overload and short-circuit release) and one no. 4 pole RCCB (if specified in the MR/ Tender). RCCBs shall have a maximum sensitivity of 30mA.

7.2.3 The outgoing feeders shall be provided with double pole MCBs having overload and short-circuit releases. Further, separate 2 pole ELCBs with maximum sensitivity of 30mA shall be provided for outgoing feeders if specified in MR/ Tender.

7.2.4 All MCBs (except isolators) and RCCBs shall be with 10kA interrupting capacity.

7.2.5 The RCCB shall be self-reset type.

7.2.6 The operating knobs (ON/ OFF/ RESET) shall be provided with a suitable rack and pinion arrangement or cam type operating mechanism for operating them smoothly from outside.

7.3 Terminals & Wiring

7.3.1 The panels shall be provided with sufficient number of terminals. More than 2 wires per terminal shall not be permitted. If required, additional terminal with shorting link may be used. Tinned Copper lugs shall be provided for cable termination. Incoming and outgoing terminals shall be suitably segregated.

7.3.2 All internal wiring in lighting and power panels shall employ adequately sized, 660V/ 1100V grade, FRLS type, XLPE/ PVC insulated, Copper conductor wires, colour coded for phase, neutral and earth, with minimum conductor sizes as below:

Incomer	:	16 mm^2
Outgoing	:	2.5 mm^2

All terminations shall be with suitable lugs.

8.0 INSPECTION, TESTING AND ACCEPTANCE

8.1 During fabrication, the equipment shall be subjected to inspection by EIL/ Owner or by an agency authorised by the Owner, as per agreed Inspection Test Plan. Manufacturer shall furnish all necessary information concerning the supply to EIL/ Owner's inspector. All routine/ acceptance tests shall be carried out at manufacturer's works under his care and expense.

8.2 Type test certificates from NABL accredited/ Central Government Labs in India/ IECEx-certified/ equivalent Labs, Manufacturer's works test reports, applicable PESO approval and BIS license and original drawings referred in type test certificates shall be shown to the inspection agency on demand during inspection. The test certificates, BIS license and PESO approval must be valid at the time of despatch.

8.3 Test certificates of bought out components shall be submitted to the inspection agency, as per inspection and Test Plan no. 6-81-1008.

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8.4 All equipments shall be subjected to various routine/ acceptance tests as per Inspection and Test plan no. 6-81-1008.

9.0 PACKING AND DESPATCH

All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for the selected mode of transportation, i.e. by ship/ rail or trailer and shall be wrapped in polythene sheets before being placed in crates/ cases to prevent damage to finish. The crates/ cases shall have skid bottom for handling. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO no.' etc., shall be clearly marked on the packages together with other details as per purchase order.

The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed. A set of instruction manuals for installation, testing and commissioning, a set of operation & maintenance manuals and a set of final drawing shall be enclosed in a waterproof cover along with the shipment.

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अग्निरोधक प्लगों, साकेटों तथा हैंडलैम्पों के लिए विनिर्देश

SPECIFICATION FOR FLAMEPROOF PLUGS, SOCKETS AND HAND LAMPS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
7	09.04.26	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/SAC	ANPS	HK	NK
6	31.08.20	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/AR	ANPS	SA	SM
5	24.02.16	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/AK	ANPS	BRB	SC
4	11.04.11	REVISED AND ISSUED AS STANDARD SPECIFICATION	PS	ANPS	UAP	DM
3	29.08.07	REVISED AND ISSUED AS STANDARD SPECIFICATION	ANPS	UAP	JMS	VC
2	30.01.02	REVISED AND ISSUED AS STANDARD SPECIFICATION	UAP	AAN	VPS	GRR

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Abbreviations:

BIS	Bureau of Indian Standards
BS	British Standard
CEA	Central Electricity Authority
COB	Chip On Board
DGMS	Directorate General of Mines Safety
DOB	Driver On Board
ES	Edison Screw
FRLS	Flame Retardant Low Smoke
FRP	Fibre Reinforced Plastic
GI	Galvanised Iron
HRC	High Rupturing Capacity
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical & Electronics Engineers
IP	Ingress Protection
IS	Indian Standard
LED	Light Emitting Diode
LV	Low Voltage
NABL	National Accreditation Board for Testing and Calibration Laboratories
NEMA	National Electrical Manufacturers Association
PCB	Printed Circuit Board
PESO	Petroleum and Explosives Safety Organisation
PVC	Poly Vinyl Chloride
RCCB	Residual Current Circuit Breaker
SPN	Single Phase Neutral
SS	Stainless Steel
TPN	Three Phase Neutral
VDE	Verband der Elektrotechnik, Elektronik und Information stechnik

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Mr. G. Suresh (Inspection)

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1.0 SCOPE

This specification covers the requirements of design, manufacture, testing, packing and supply of flameproof plugs, sockets, transformers, hand lamps and accessories suitable for installation in locations handling flammable liquids and gases/ vapours.

2.0 CODES AND STANDARDS

2.1 The equipment shall comply with the requirements of latest revision of the following standards issued by BIS:

IS-5	:	Colours for ready mixed paints and enamels.
IS-10322	:	Luminaires
IS-13383	:	Photometry of luminaires - Method of measurement
IS-16101	:	General lighting – LEDs and LED modules – Terms and definitions.
IS-16102	:	Self-ballasted LED lamps for general lighting services.
IS / IEC 60079-0	:	Electrical apparatus for explosive gas atmospheres (General Requirements).
IS / IEC 60079-1	:	Electrical apparatus for explosive gas atmospheres (Equipment Protection by Flameproof Enclosures "d").
IS / IEC 60529	:	Degrees of protection provided by enclosures (IP Code).
IS / IEC 60947	:	LV switchgear and control gear.
IS/16724-2018/ IEC-60079-14: 2003 (Ed 5.0)	:	Explosive atmospheres -Part 14: Electrical Installation design, selection and erection

National Lighting Code (NLC)-2010

2.2 In case of imported equipment, only IECEx (or equivalent, if more stringent than the applicable IEC) certified equipment shall be used.

2.3 The equipment shall also conform to the provisions of CEA Regulations with latest amendments and other statutory regulations currently in force in the country.

2.4 In case Indian standards are not available for any equipment, standards issued by IEC or equivalent agency (if more stringent than IEC) shall be applicable.

2.5 In case of any conflict between requirements specified in various applicable documents for the project, the most stringent requirement shall govern. However, Owner's/ EIL's decision in this regard will be final and binding.

3.0 GENERAL REQUIREMENTS

3.1 The offered equipment shall be brand new with state of art technology and having proven field track record. No prototype equipment shall be offered.

3.2 Vendor shall ensure availability of spare parts and maintenance support services for the offered equipment for at least 10 years from the date of supply.

4.0 SITE CONDITIONS

The equipment shall be suitable for installation and satisfactory operation in classified hazardous locations in tropical, humid and corrosive atmosphere as prevalent in refineries, petrochemical and fertilizer plants. Unless otherwise specified, a design ambient temperature of 40° C and an altitude not exceeding 1000 m above mean sea level shall be considered.

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5.0 CERTIFICATION

All Hazardous area equipment shall have hazardous area test certificates and approvals as per following:

For Indigenous manufactured hazardous area equipment:
For all electrical items manufactured in India, the testing shall be carried out & test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

Alternatively, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

For Imported hazardous area equipment:
For all electrical items manufactured outside India, test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

As an alternative option-1 to this, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

As an alternative option-2 to this, EU Type Examination Certificate, which is applicable for manufacturers having manufacturing locations in countries covered under the European Union, valid copy of Production Quality Assessment / Assurance Notification shall be furnished.

All equipment i.e. Indigenous & imported, shall also have valid statutory approvals, as applicable for the specified location and marking as per IS/IEC 60079 and as required by statutory authorities.
For installations in India, PESO approval letter shall be provided.

6.0 TECHNICAL REQUIREMENTS

6.1 Construction

6.1.1 The enclosures of the plugs, sockets, transformers and hand lamps shall be made of cast light metal alloy.

6.1.2 The equipment shall be suitable for use in outdoor open locations and shall have minimum IP-55 degree of protection. The sockets for fixed installation, i.e. 415 V three phase sockets and 240 V single phase sockets, shall preferably be provided with integral canopy. However, where the enclosure has been certified without integral canopy, a separate canopy can be accepted. The separate canopy shall be made of at least 1.6 mm (16 gauge) galvanised sheet steel/ FRP/ stainless steel minimum SS-304 (as specified in purchase specifications). The canopy shall be suitable for providing protection against rain from top, back and two sides.

6.1.3 The enclosures shall be provided with gaskets for IP, if required by equipment certification. Gaskets, wherever provided, shall be made of non-inflammable and self-extinguishing material.

6.1.4 All metal surfaces shall undergo manufacturer's standard cleaning/ painting/ powder coating cycle. After surface preparation, the equipment shall be painted with two coats of epoxy based final paint or epoxy powder coated with minimum coating thickness of 80 microns, with colour shade as below:

- Flame proof (Gas group IIA/ IIB) : Dark admiralty grey shade 632 of IS-5/ RAL 7031
- Flame proof (Gas group IIC) : Light yellow shade 355 of IS-5/ RAL 1012

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All unpainted steel parts shall be suitably treated to prevent rust formation/ corrosion. If these parts are moving then these shall be greased. Grease, which does not solidify, shall be applied to flamepath.

6.1.5 Equipment shall be marked as per IS/IEC 60079.

6.1.6 All accessories like nuts, bolts, washers etc. shall be made of stainless steel SS-304.

6.1.7 All the non current carrying metallic parts of the equipment shall be inherently bonded together. The TPN sockets shall be provided with two earthing studs, with lugs on the exterior of the enclosure, suitable for termination of 10 mm dia. GI wire rope. Internal earth terminals shall be provided in each enclosure for all single phase plugs and sockets for connecting the earth core of the cables.

6.1.8 The terminal block enclosures shall be adequately sized to properly terminate the cables by taking into account the required bending radii of cable cores and shall have the following minimum gland to terminal distances:

Conductor Size	Up to 2.5 mm^2	Above 2.5 mm^2 & Up to 10 mm^2	Above 10 mm^2 & Up to 35 mm^2	Above 35 mm^2 & Up to 70 mm^2	Above 95 mm^2 & Up to 185 mm^2	Above 185 mm^2 & Up to 300 mm^2
Gland to terminal distance	35 mm	60 mm	100 mm	150 mm	200 mm	300 mm

6.1.9 The sockets shall be provided with 2 nos. suitably sized cable entries at the bottom for specified cable sizes and complete with 2 nos. flameproof double compression type nickel plated brass flameproof cable glands. The plugs shall be supplied with 1 no. suitably sized cable entry for specified cable size and complete with 1 no. double compression type nickel plated brass flameproof cable gland. Each socket shall be supplied with 1 no. flameproof nickel plated brass sealing plug, for plugging the unused cable entry.

6.1.10 The sockets shall have external fixing lugs for mounting on wall or column. The holes provided on these lugs shall be of oblong type.

6.1.11 A tag plate indicating Tag Number shall be provided on each socket. A nameplate shall be provided to indicate the Name of Manufacturer, test certificate number, serial number, BIS license number, applicable gas group etc. as per IS/IEC 60079 and any additional marking required by statutory authority like approval no. etc. The nameplates shall be engraved on 3 ply black white black lamicold sheets using square cutters. Black engraved perspex sheet nameplate shall also be acceptable. Nameplates shall be fixed by screws and shall not be pasted. In case the standard details given above are embossed on the enclosures, the same need not be repeated on the main nameplate.

6.2 Socket Outlets & Plugs

6.2.1 The sockets shall be provided with a switch and a mechanical interlock so as to break the electrical circuit before the plug is completely withdrawn and make the circuit after the plug is fully inserted.

6.2.2 In order to prevent accidental removal of plug from socket, the engagement and disengagement shall be by two separate and distinct movement and positions.

6.2.3 415V, 63A three phase flameproof plugs and socket meant for welding receptacle/ any other three phase auxiliary load, shall be provided with 4 pins (3P+E).

6.2.4 4 pin socket shall be provided with 63A, three pole heavy duty switch; whereas, 5 pin socket shall be provided with four pole (TPN) heavy duty switch. Heavy duty switch shall be suitable for AC duty rating as applicable.

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6.2.5 Both 24V and 240V, 15A single phase flameproof plug and socket shall be provided with 3 pins (2P+E).

6.2.6 Provision shall be made so that it shall not be possible to insert 24V plug on to a 240V socket.

6.2.7 The sockets shall be provided with either a spring loaded hinged cover, or with a cap connected through metallic chain/wire, to close the same when not in service.

6.2.8 Scraping earth connection shall be provided between the plug and socket. Earth pin of plug shall first engage with earth pin of switch socket.

6.2.9 The plug assembly shall be mechanically rugged, light and shall not unduly stress the socket or its own pins when fitted on to the socket. The diameter of the earth pin of the plug and socket shall be at least 1.1 times the diameter of the phase pins.

6.3 240V/ 24V Portable Transformer units

6.3.1 The 240V/ 24V portable transformer unit shall be supplied complete with 240V/ 24V transformer having a 24V socket on the secondary side and 5 meter length of 3x1.5 mm2 tinned copper conductor, PVC insulated, metal braided flexible cable, duly terminated in the transformer primary at one end and having 240V plug on the other end. The socket outlets and plugs shall meet the requirements of clause 6.2 above.

6.3.2 The 240V/ 24V transformer shall be designed for 30VA rating on continuous basis. Insulation Class shall be "B", as a minimum. Automatic protection employing earth leakage detection scheme with 30mA current sensitivity shall be provided to disconnect supply on occurrence of an earth fault. 30mA RCCB (preferable)/ HRC fuses shall be provided on primary and secondary side of the transformer. The transformer shall have an earthed screen between primary and secondary winding.

6.3.3 Suitable handle for carrying the transformer unit shall be provided.

6.3.4 Alternatively, 24V socket outlet (as per Cl. 2.5 above) shall be provided with a built-in 240V/24V 30VA transformer duly protected by HRC fuse in phase on primary side. In this case, a separate portable 240/24V transformer unit is not required.

6.4 24V Hand Lamp units

6.4.1 Each hand lamp unit shall be supplied complete with 15 meter length of 3x1.5 mm^2 copper conductor, PVC insulated, metal braided flexible cable, duly terminated in the hand lamp at one end and having 24V plug on the other end. The plug shall meet the requirements of clause 6.2 above.

6.4.2 The well glass provided shall be clear and toughened type. Hand lamp shall be provided with 10W, 24V AC LED lamp with ES27 cap having minimum output of 900 lumens. Alternatively, if specified in MR, it shall be with lens/ glass and 20W, 24V AC COB/ discrete LED with driver/ LED PCB with DOB having minimum output of 1800 lumens. The minimum output for 10W or 20W shall be guaranteed at 18V to 26V.

6.4.3 Hand lamp shall be provided with either galvanised steel or epoxy powder coated mild steel protective wire cage using minimum 3mm welded steel construction and having mesh dimension not exceeding 50mm x 50mm.

6.4.4 Suitable handle for carrying the hand lamp unit and a stand type guard suspension hook shall be provided.

6.5 Terminals & Wiring

6.5.1 All equipments shall be provided with sufficient number of terminals. More than 2 wires per terminal shall not be permitted. If required, additional terminal with shorting link may be used. The terminals shall be suitable for termination of stranded conductors. Tinned copper lugs shall be provided for cable termination.

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6.5.2 All internal wiring shall employ adequately sized, 660V grade, FRLS type, PVC insulated Copper conductor wires, colour coded for phase, neutral and earth, with minimum conductor sizes as below:

TPN Plugs and sockets:	16 mm²
SPN Plugs and sockets:	2.5 mm²

7.0 INSPECTION, TESTING AND ACCEPTANCE

7.1 During fabrication, the equipment shall be subjected to inspection by EIL/ Owner or by an agency authorised by the Owner, as per agreed Inspection Test Plan. Manufacturer shall furnish all necessary information concerning the supply to EIL/ Owner's inspector. All routine/ acceptance tests shall be carried out at manufacturer's works, under his care and expense.

7.2 Type test certificates from NABL accredited/ Central Government Labs in India/ IECEx-certified/ equivalent Labs, Manufacturer's works test reports, applicable PESO approval and BIS license and original drawings referred in type test certificates shall be shown to the inspection agency on demand during inspection. The test certificates, BIS license and PESO approval must be valid at the time of despatch.

7.3 Test certificates of bought out components shall be submitted to the inspection agency, as per Inspection and Test Plan no. 6-81-1021.

7.4 All equipments shall be subjected to various routine/ acceptance tests as per Inspection and Test Plan no. 6-81-1021.

8.0 PACKING AND DESPATCH

All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for the selected mode of transportation, i.e. by ship/ rail or trailer, and shall be wrapped in polythene sheets before being placed in crates/ cases to prevent damage to finish. The crates/ cases shall have skid bottom for handling. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars','PO no.' etc., shall be clearly marked on the packages together with other details as per purchase order.

The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed. A set of instruction manuals for installation, testing and commissioning, a set of operation & maintenance manuals and a set of final drawing shall be enclosed in a waterproof cover along with the shipment.

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संकटमय क्षेत्रों में लाइटिंग फिक्सचरों एवं जंक्शन बक्सों के लिए विनिर्देश

SPECIFICATION FOR HAZARDOUS AREA LIGHT FIXTURES AND JUNCTION BOXES

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
7	09.04.26	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/SAC	ANPS	HK	NK
6	23.12.20	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/RKS	ANPS	PG	SM
5	24.02.16	REVISED AND ISSUED AS STANDARD SPECIFICATION	NNB/AK	ANPS	BRB	SC
4	11.04.11	REVISED AND ISSUED AS STANDARD SPECIFICATION	PS	ANPS	UAP	DM
3	27.08.07	REVISED AND ISSUED AS STANDARD SPECIFICATION	ANPS	UAP	JMS	VC
2	30.01.02	REVISED AND ISSUED AS STANDARD SPECIFICATION	UAP	AAN	VPS	GRR

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Abbreviations:

AC	Alternating Current
BIS	Bureau of Indian Standards
CEA	Central Electricity Authority
CRI	Colour Rendering Index
DC	Direct Current
DGCA	Director General Civil Aviation
EIL	Engineers India Limited
FRLS	Flame Retardant Low Smoke
IEC	International Electrotechnical Commission
IES	Illuminating Engineering Society
IP	Ingress Protection
IS	Indian Standard
LED	Light Emitting Diode
MR	Material Requisition
NABL	National Accreditation Board for Testing and Calibration Laboratories
PESO	Petroleum and Explosives Safety Organisation
PO	Purchase Order
PVC	Poly Vinyl Chloride
SPD	Surge Protection Device
SPN	Single Phase Neutral
SS	Stainless Steel
XLPE	Cross Linked Poly Ethylene

Electrical Standards Committee

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1.0 SCOPE

This specification covers the requirements of design, manufacture, testing, packing and supply of LED lighting fixtures, complete with LED lamp and driver, junction boxes and accessories suitable for installation in locations handling flammable liquids and gases/ vapours.

2.0 CODES AND STANDARDS

2.1 The equipment shall comply with the requirements of latest revision of the following standards issued by BIS:

IS-5	:	Colours for ready mixed paints and enamels
IS-10322	:	Luminaires
IS-13383	:	Photometry of luminaires - Method of measurement
IS 15885 (Part 2/ Sec 13)	:	Safety of lamp control gear-Part-2 Particular requirements-Section 13 d.c. or a.c. supplied electronic control gear for LED modules
IS-16101	:	General lighting – LEDs and LED modules – Terms and Definitions
IS-16102	:	Self-ballasted LED lamps for general lighting services
IS-16107	:	Luminaires performance
IS / IEC 60079-0	:	Electrical apparatus for explosive gas atmospheres (General requirements)
IS / IEC 60079-1	:	Electrical apparatus for explosive gas atmospheres (Equipment Protection by Flameproof Enclosures "d")
IS / IEC 60079-7	:	Electrical apparatus for explosive gas atmospheres (Equipment Protection by Increased Safety "e")
IS / IEC 60079-15	:	Electrical apparatus for explosive gas atmospheres Construction, test & marking of type of protection "n"
IS / IEC 60529	:	Degrees of protection provided by enclosures (IP Code).

2.2 In case of imported equipment, only IECEx (or equivalent, if more stringent than the applicable IEC) certified equipment shall be used.

2.3 The equipment shall also confirm to the provisions of CEA Regulations with latest amendments and statutory regulations currently in force in the country.

2.4 In case Indian standards are not available for any equipment, standards issued by IEC or equivalent agency (if more stringent than IEC) shall be applicable.

2.5 In case of any conflict between requirements specified in various applicable documents for the project, the most stringent requirement shall govern. However, Owner's/ EIL's decision in this regard will be final and binding.

3.0 GENERAL REQUIREMENTS

3.1 The offered equipment shall be brand new with state of art technology and having proven field track record. No prototype equipment shall be offered.

3.2 Vendor shall ensure availability of spare parts and maintenance support services for the offered equipment for at least 10 years from the date of supply.

4.0 SITE CONDITIONS

The equipment shall be suitable for installation and satisfactory operation in classified hazardous locations in tropical, humid and corrosive atmosphere as prevalent in refineries,

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petrochemical and fertilizer plants. Unless otherwise specified, a design ambient temperature of 40° C and an altitude not exceeding 1000 m above mean sea level shall be considered.

5.0 POWER SUPPLY

All AC lighting fixtures/ junction boxes shall be suitable for 240V ± 10%, SPN, 50Hz ± 3% power supply and all DC lighting fixtures/ junction boxes shall be suitable for 110/ 220V ± 10% power supply.

6.0 CERTIFICATION

All Hazardous area equipment shall have hazardous area test certificates and approvals as per following:

For Indigenous manufactured hazardous area equipment:
For all electrical items manufactured in India, the testing shall be carried out & test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

Alternatively, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

For Imported hazardous area equipment:
For all electrical items manufactured outside India, test report issued by Indian test laboratory recognized by the Chief Controller of Explosives shall be furnished. For Ex protection Electric Apparatus having flameproof type protection, a copy of valid BIS license shall be furnished.

As an alternative option-1 to this, IECEx Certificate of Conformity, valid copy of IECEx Quality Assessment Report (summary) and IECEx Test Report shall be furnished.

As an alternative option-2 to this, EU Type Examination Certificate, which is applicable for manufacturers having manufacturing locations in countries covered under the European Union, valid copy of Production Quality Assessment / Assurance Notification shall be furnished.

All equipment i.e. Indigenous & imported, shall also have valid statutory approvals, as applicable for the specified location and marking as per IS/IEC 60079 and as required by statutory authorities.
For installations in India, PESO approval letter shall be provided.

7.0 TECHNICAL REQUIREMENTS

7.1 Construction

7.1.1 The enclosures of the lighting fixtures and junction boxes shall be of cast light metal alloy.

7.1.2 All equipment shall be suitable for use in outdoor open locations and shall have minimum IP-55 degree of protection.

7.1.3 The enclosures shall be provided with gaskets made of non-inflammable and self-extinguishing material.

7.1.4 All metal surfaces shall undergo manufacturer's standard cleaning/ painting/ powder coating cycle. After surface preparation, the equipment shall be painted with two coats of epoxy based final paint or epoxy powder coated with minimum coating thickness of 80 microns, with colour shade as below:

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- Flameproof Exd (Gas group IIA/IIB) and AC supply: Dark admiralty grey shade 632 of IS-5/ RAL 7031
- Flameproof Exd (Gas group IIC) and AC Supply : Light yellow shade 355 of IS-5/ RAL 1012
- Non-sparking ExnR/ Increased safety Exec and AC Supply : Dark admiralty grey shade 632 of IS-5/ RAL 7031
- DC lighting fixtures : Bright red shade 538 of IS-5/ RAL 3003

All unpainted parts shall be suitably treated to prevent rust formation/ corrosion. If these parts are moving elements then these shall be greased with non-solidifying grease.

7.1.5 A warning inscription "DO NOT OPEN WHEN ENERGIZED" shall be provided on each enclosure. The warning inscription shall be embossed on the enclosure or a separate warning plate with above inscription shall be fixed to the enclosure with screws. The warning plate shall be of nickel plated brass or stainless steel.

7.1.6 All accessories like nuts, bolts, washers etc. shall be made of stainless steel SS-304.

7.1.7 All equipments on single phase supply shall be provided with an independent earth terminal with lug inside the enclosure for terminating the third (earth) core of the cable and shall have facility for looping.

7.1.8 A nameplate shall be provided to indicate the details of testing agency, name of manufacturer, test certificate number, statutory approval agency (PESO), serial number, BIS license number, applicable gas group etc. and any additional marking required by statutory authority like approval no. etc. The nameplates shall be engraved on 3 ply black white black lamicold sheets using square cutters. Black engraved perspex sheet nameplate shall also be acceptable. Nameplates shall be fixed by screws and shall not be pasted. In case the standard details given above are embossed on the enclosures, the same need not be repeated on the main nameplate.

7.2 Lighting Fixtures

7.2.1 Glass used for all types of lighting fixtures shall be clear and suitable for use under conditions involving exceptional risk of mechanical damage. Glass shall be toughened type.

7.2.2 All well/ bowl glass fixtures shall be provided with Stainless Steel SS-304 protective wire cage using minimum 5mm welded steel construction and having mesh dimension not exceeding 50mm x 50 mm. The mounting bolts of SS-304 required for physically connecting the hazardous area well/ bowl glass lighting fixtures (bracket/ ceiling mounted type) to the respective mounting bracket shall be supplied by Vendor along with the fixtures.

7.2.3 The fixing parts of the enclosure, which are to be opened for replacement of lamp, shall be so fastened that they can be unfastened only with special tools.

7.2.4 The lighting fixtures in Zone-2 area shall be Ex nR type, unless otherwise specified in the MR/ Tender.

7.2.5 For LED fixture, integral junction box shall be provided with 3 nos. cable entries for loop-in, loop-out and associated wiring to fixture. Alternatively, lighting fixtures shall be provided with 2 nos. threaded entries and 2 nos. hazardous area double compression nickel plated brass cable glands, and internal wiring shall be provided for driver and lamp. The glands shall be suitable for the specified cable size. 20% of the fixtures shall be supplied with 1 no. nickel plated brass plug for sealing the unused entry.

7.2.6 The top of all well/ bowl glass lighting fixtures shall be identically drilled/ threaded to facilitate installation on pole/ column or ceiling.

7.2.7 The flood lighting fixtures shall be supplied with adjustable mounting arrangement both in horizontal and vertical plane.

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7.2.8 The aviation warning lighting fixtures shall have cluster LED lamps of Type C, medium intensity (as per DGCA civil aviation statutory regulations) and of red colour, fixed (not flashing), 2000cd, unless otherwise specified.

7.2.9 All lighting fixtures shall be provided with suitable mirror-polished aluminum internal reflector of suitable thickness to ensure adequate mechanical strength.

7.2.10 Lighting fixtures shall be tested for resistance to impact in line with IS/ IEC 60079-0. Impact test certificates shall be furnished by vendor.

7.2.11 All LED fixtures shall be supplied complete with lamp and driver. LED driver shall be suitable for surge protection of minimum 4 kV surge. However, for flood lights, aviation warning lights, and lighting fixtures with wattage higher than 90W, LED driver shall be suitable for surge protection of minimum 10 kV surge. An additional fail safe SPD may be provided, as required, to achieve 10 kV surge protection. LED driver shall comply with the requirement of IS 15885-2-13. Fixture lifetime (L70) shall be greater than 50000 hours at ambient temperature of 40°C.

7.2.12 LED type lighting fixtures shall fulfill the following requirements:

a. Minimum power factor shall be 0.95.

b. LED lighting fixture luminous efficacy shall be minimum 100 lumen per watt.

c. LED lighting fixture beam angle shall be 120°/ 90° depending upon fixture location and mounting height.

d. The CRI for LED lighting fixtures shall be greater than 80 for indoor fixture and greater than 70 for outdoor fixture.

e. The colour temperature of white colour LED shall be from 5700K to 6500K, unless otherwise specified.

f. Polar curves/ photometric drawings shall be submitted by vendor for the offered lighting fixtures.

g. LED lamps and drivers shall be provided with minimum 5 years warranty period, unless specified otherwise in the MR/ Tender. Driver shall have valid BIS certification and the same shall be furnished during drawing review stage.

h. The LED light fixtures, should be tested for luminous lux level as per IES-LM-79. Wherever wire guard is provided, testing shall be done with wire guard. Type test certificates for LM-79 for all fixtures shall be from an NABL-accredited/ IECEx-certified/ equivalent lab.

i. The LEDs used in the lighting fixtures should be tested for the service life as per IES-LM-80. Type test certificates shall be furnished in compliance to same.

7.3 Junction Boxes

The junction boxes shall be of flameproof or non-sparking type construction as mentioned in the MR/ Datasheet. All junction boxes for looping of single phase lighting circuits using cables up to 6mm^2 shall be minimum 125mm diameter in size. Each junction box shall be complete with requisite number of cable entries and double compression flameproof nickel plated brass cable glands to suit the specified cable size.

7.4 Terminals & Wiring

7.4.1 The fixtures and junction boxes shall be provided with sufficient number of terminals. More than 2 wires per terminal shall not be permitted. If required, additional terminal with shorting link may be used. The terminals for external cable termination shall be suitable for 2.5mm^2 solid Copper conductor. Tinned copper lugs shall be provided for cable termination wherever applicable.

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7.4.2 All internal wiring shall employ 1.5mm², 660/ 1100 V grade, FRLS type, XLPE/ PVC insulated Copper conductor wires, colour coded for phase, neutral and earth. All termination shall be with suitable lugs.

8.0 INSPECTION, TESTING AND ACCEPTANCE

8.1 During fabrication, the equipment shall be subjected to inspection by EIL/ Owner or by an agency authorised by the Owner, as per agreed Inspection Test Plan. Manufacturer shall furnish all necessary information concerning the supply to EIL/ Owner's inspector. All routine/ acceptance tests shall be carried out at manufacturer's works under his care and expense.

8.2 Type test certificates from NABL accredited/ Central Government Labs in India/ IECEx-certified/ equivalent Labs, Manufacturer's works test reports, applicable PESO approval and BIS license and original drawings referred in type test certificates shall be shown to the inspection agency on demand during inspection. The test certificates, BIS license and PESO approval must be valid at the time of despatch.

8.3 Test certificates of bought out components shall be submitted to the inspection agency, as per Inspection and Test Plan no. 6-81-1061.

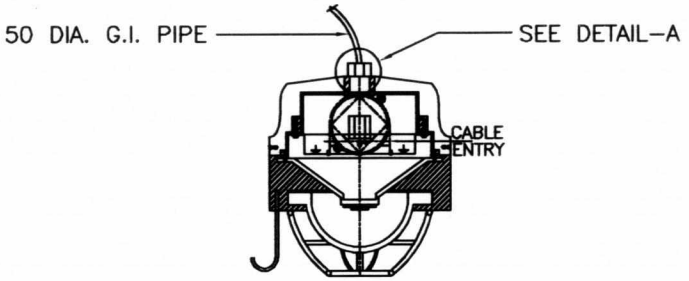
8.4 All equipments shall be subjected to various routine/ acceptance tests as per Inspection and Test Plan no. 6-81-1061.

9.0 PACKING AND DESPATCH

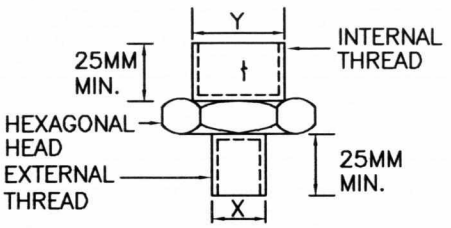
All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for the selected mode of transportation, i.e. by ship/ rail or trailer, and shall be wrapped in polythene sheets before being placed in crates/ cases to prevent damage to finish. The crates/ cases shall have skid bottom for handling. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight',' Owner's particulars', 'PO nos.' etc., shall be clearly marked on the packages together with other details as per purchase order.

The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed. A set of instruction manuals for installation, testing and commissioning, a set of operation & maintenance manuals and a set of final drawing shall be enclosed in a waterproof cover along with the shipment.

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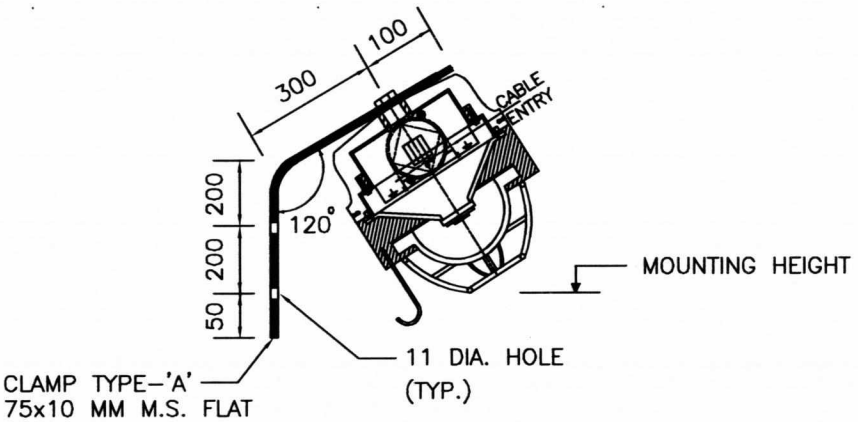
DETAIL–1
POLE MOUNTED



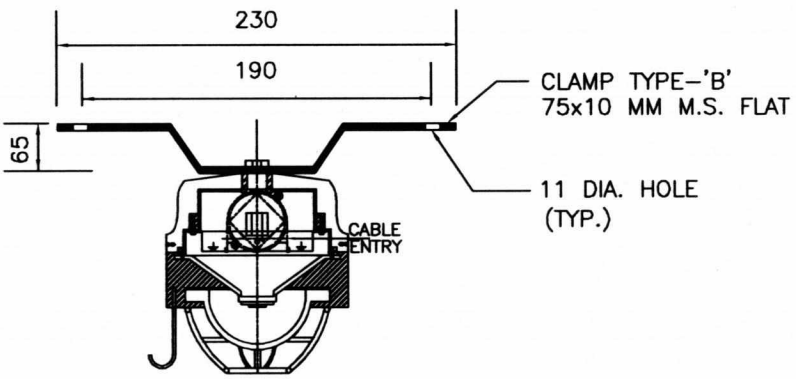
DETAIL–A
(ADAPTOR)

DIMENSIONS	
X	Y
*TO SUIT 19 DIA.	TO SUIT 50 DIA.

* ALTERNATIVELY SIZE TO SUIT FIXTURE



DETAIL–2
BRACKET MOUNTED



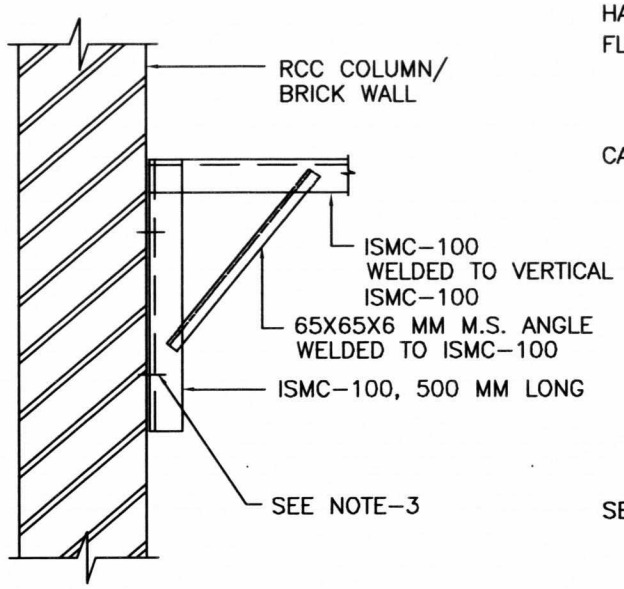
DETAIL–3
CEILING MOUNTED

NOTES:–

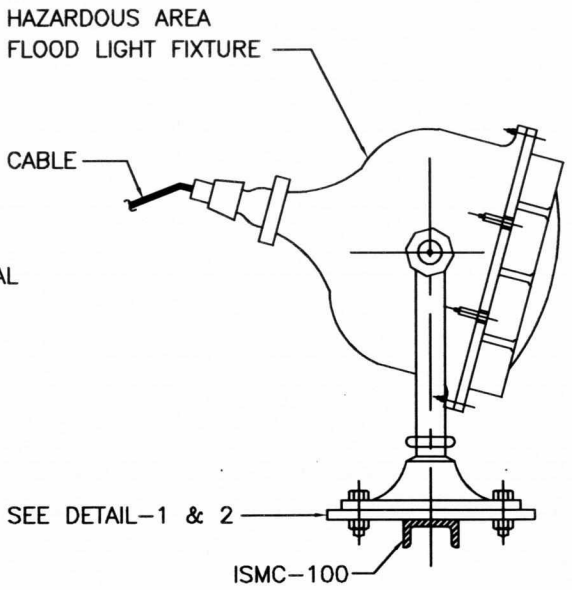
1. ALL DIMENSIONS ARE IN MM.
2. SUPPORT ACCESSORIES VIZ THE BRACKET, CEILING ADAPTOR SHALL BE PAINTED WITH EPOXY BASED PAINT.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
6	15.09.22	REAFFIRMED & ISSUED AS STANDARD	JSK	VKS/HK	MKS	SM
5	26.02.18	UPDATED & ISSUED AS STANDARD	RSD	VKS/HK	BRB	RN
4	17.07.13	REAFFIRMED & ISSUED AS STANDARD	BP	FA/SA	UAP/JMS	DM

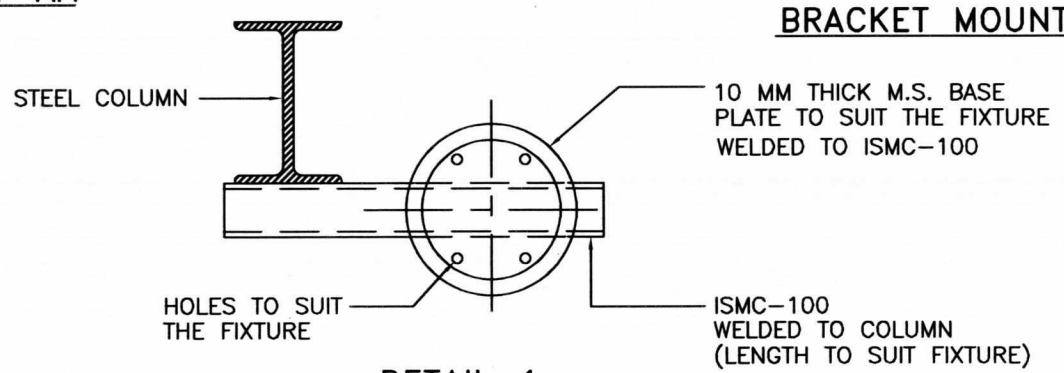
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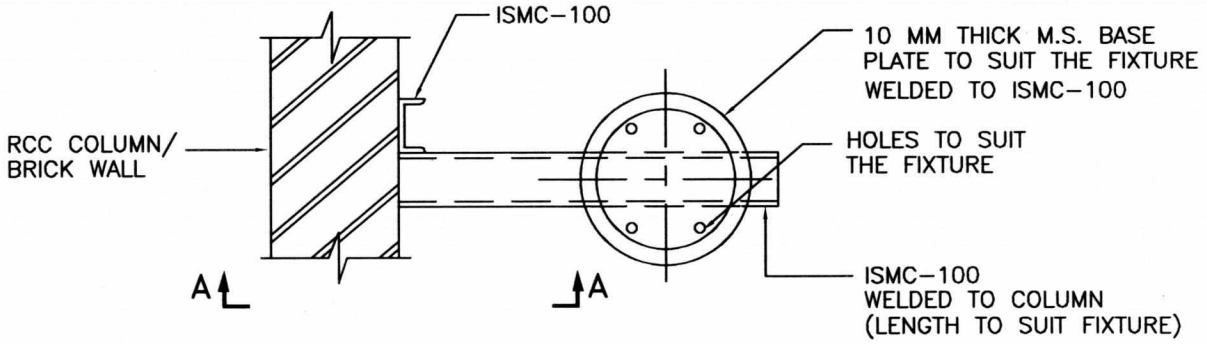
VIEW–AA



ELEVATION
BRACKET MOUNTED



DETAIL–1
MOUNTED ON STEEL COLUMN



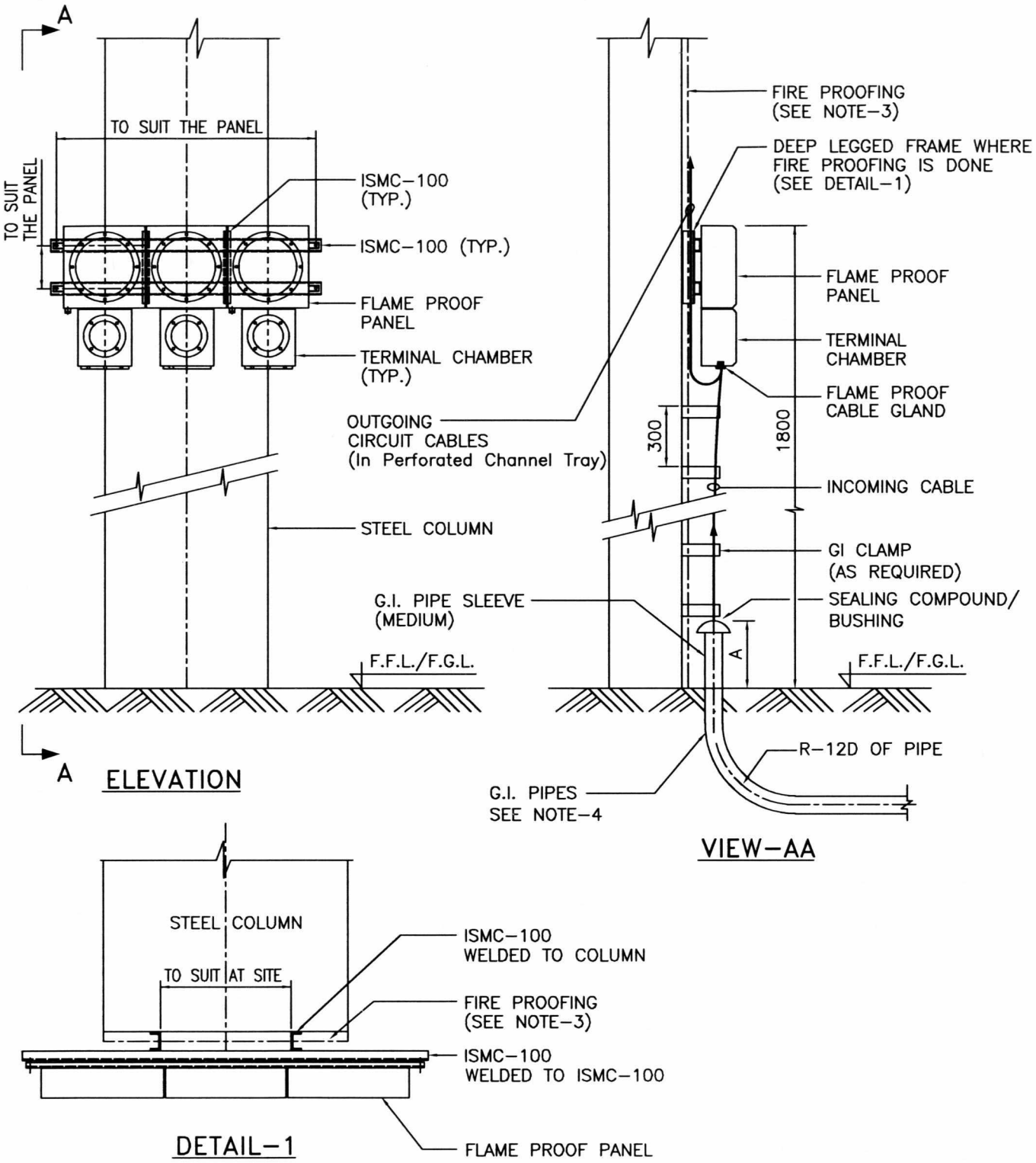
DETAIL–2
MOUNTED ON RCC COLUMN/BRICK WALL

NOTES:–

1. ALL DIMENSIONS ARE IN MM.
2. WHERE FIRE PROOFING COLUMNS / STRUCTURES ARE ENCOUNTERED FIXTURE/ JUNCTION BOX AND CABLE/CONDUIT SHALL BE INSTALLED ON A SUITABLE DEEP LEGGED ANGLE IRON FRAME / DISTANCE BRACKET.
3. SUPPORT FOR FLOOD LIGHT FIXTURE SHALL BE SUITABLY FIXED TO RCC COLUMN/ BRICK WALL BY USING ANCHOR FASTENER.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
6	15.09.22	REAFFIRMED & ISSUED AS STANDARD	JSK	VKS/HK	MKS	SM
5	22.02.18	UPDATED & ISSUED AS STANDARD	BP	VKS/HK	BRB	RN
4	17.07.13	REAFFIRMED & ISSUED AS STANDARD	BP	FA/SA	UAP/JMS	DM

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NOTES:–

A= { 150 MM (MIN.) FOR INDOOR LOCATIONS.
300 MM (MIN.) FOR OUTDOOR LOCATIONS.

1. ALL DIMENSIONS ARE IN MM.
2. THE SUPPORT STRUCTURES SHALL BE PAINTED WITH SAME PAINT, AS FOLLOWED FOR CORRESPONDING STRUCTURE.
3. WHERE FIRE PROOFING COLUMNS / STRUCTURES ARE ENCOUNTERED, FLAME PROOF PANEL AND CABLE SHALL BE INSTALLED ON A SUITABLE DEEP LEGGED CHANNEL FRAME / DISTANCE BRACKET.
4. QUANTITY AND SIZE OF PIPE SLEEVES SHALL BE AS PER LAYOUT DRAWINGS.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
6	25.08.23	UPDATED & ISSUED AS STANDARD	SONU	VKS/HK	MKS	SM
5	16.07.18	UPDATED & ISSUED AS STANDARD	RSD	VKS/HK	BRB	RKT
4	17.07.13	REAFFIRMED & ISSUED AS STANDARD	BP	FA/SA	UAP/JMS	DM

Approved by

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VENDOR DATA REQUIREMENTS
FOR
ELECTRICAL ITEMS

Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by
A	30-APR-2026	ISSUED WITH MR	MS	PK	SA

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VENDOR DATA REQUIREMENTS

The following drawings/documents marked "✔" shall be furnished by the bidder.

LOCAL CONTROL STATION

S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
1.	Schedule of Vendor Documents		✔		✔	
2.	Dimensional/Assembly Drawings : GA Drawings (For control station and canopy)		✔		✔	
3.	Dimensional/Assembly Drawings : Installation and mounting details			✔	✔	
4.	Wiring Diagram And Terminal Details			✔	✔	
5.	Type Test Certificate from Independent Test Lab			✔	✔	
6.	Statutory approval certificate			✔	✔	
7.	BIS Licence			✔	✔	
8.	List of Maintenance Spares			✔	✔	
9.	List of Special Tools & Tackles			✔	✔	
10.	Inspection & Test Plan (ITP) -For review by Inspection Dept.		✔		✔	*Refer Note-'*'*
11.	Test Records				✔	
12.	Data Books/ Manuals : Installation Manual				✔	
13.	Data Books/ Manuals : Operating/ Maintenance Manual				✔	
14.	Data Books/ Manuals : Catalogues/ Brochures				✔	
15.	Equipment storage procedure at site				✔	

LIGHTING & POWER PANEL

S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
1.	Schedule of Vendor Documents		✔		✔	
2.	Data Sheets (Duly filled-in)			✔	✔	
3.	Dimensional Drawings : G.A. Drawing			✔	✔	
4.	Dimensional Drawings : Crossectional view			✔	✔	
5.	Dimensional Drawings : Cable gland, sealing plug drawings			✔	✔	
6.	Dimensional Drawings : Terminal details, wiring diagram			✔	✔	

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S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
7.	Test Records			✔	✔	
8.	Inspection & Test Plan (ITP) -For review by Inspection Dept.		✔		✔	*Refer Note-'*'*
9.	Type Test Certificate from Independent Test Lab			✔	✔	
10.	Statutory approval certificate			✔	✔	
11.	BIS Licence			✔	✔	
12.	List of spares			✔	✔	
13.	List of Special Tools & Tackles			✔	✔	
14.	Data Books/ Manuals : Installation Manual				✔	
15.	Data Books/ Manuals : Operating/ Maintenance Manual				✔	
16.	Data Books/ Manuals : Catalogues/ Brochures				✔	
17.	Equipment storage procedure at site				✔	

PLUG, SOCKETS & HAND LAMPS

S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
1.	Schedule of Vendor Documents		✔		✔	
2.	Dimensional/Assembly Drawings : GA Drawings			✔	✔	
3.	Dimensional/Assembly Drawings : Installation and mounting details			✔	✔	
4.	Wiring Diagram And Terminal Details			✔	✔	
5.	Type Test Certificate from Independent Test Lab			✔	✔	
6.	Statutory approval certificate			✔	✔	
7.	BIS Licence			✔	✔	
8.	List of spares			✔	✔	
9.	List of Special Tools & Tackles			✔	✔	
10.	Test Records			✔	✔	
11.	Inspection & Test Plan (ITP) -For review by Inspection Dept.		✔		✔	*Refer Note-'*'*
12.	Data Books/ Manuals : Installation Manual				✔	
13.	Data Books/ Manuals : Operating/ Maintenance Manual				✔	
14.	Data Books/ Manuals : Catalogues/ Brochures				✔	
15.	Equipment storage procedure at site				✔	

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LIGHT FITTINGS

S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
1.	Schedule of Vendor Documents		✔		✔	
2.	Dimensional/Assembly Drawings : GA Drawings			✔	✔	
3.	Dimensional/Assembly Drawings : Installation Plan/Mounting Details			✔	✔	
4.	Dimensional/Assembly Drawings : Terminal Box Arrangement			✔	✔	
5.	Performance Curves : Polar Curves For Each Type Of Fixture			✔	✔	
6.	Performance Curves : Photomatric Data For Each Type Of Fixture			✔	✔	
7.	Test Records			✔	✔	
8.	Inspection & Test Plan (ITP) -For review by Inspection Dept.		✔		✔	*Refer Note-'*'*
9.	Statutory approval certificate			✔	✔	
10.	Type Test Certificate from Independent Test Lab			✔	✔	
11.	List of Commissioning Spares			✔		
12.	List of Maintenance Spares			✔		
13.	List of Special Tools & Tackles			✔		
14.	Data Books/ Manuals : Installation Manual				✔	
15.	Data Books/ Manuals : Operating/ Maintenance Manual				✔	
16.	Data Books/ Manuals : Catalogues/ Brochures				✔	
17.	Equipment storage procedure at site				✔	

MOV DB

S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
1.	Schedule of Vendor Documents		✔			
2.	Confirmation of Technical Compliance					
3.	Data Sheets (Duly filled-in)		✔		✔	
4.	Dimensional/Assembly Drawings : GA Drawings		✔		✔	
5.	Dimensional/Assembly Drawings : Installation Plan/Mounting Details			✔	✔	

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S. NO.	DESCRIPTION	WITH BID	POST ORDER			REMARKS
			FOR REVIEW	FOR RECORD	WITH DATA BOOK (FINAL)	
6.	Dimensional/Assembly Drawings : Cross Sectional View			✔	✔	
7.	Dimensional/Assembly Drawings : Bus Duct GA Drawing					
8.	Dimensional/Assembly Drawings : Bus Duct Termination Drawing					
9.	Dimensional/Assembly Drawings : Cubicle Arrangement Drawing			✔	✔	
10.	Dimensional/Assembly Drawings : Name Plate Drawing			✔	✔	
11.	Dimensional/Assembly Drawings : GA drawing of Data Concentrator, HMI					
12.	Electrical Wiring Drawings : Single Line Diagram		✔		✔	
13.	Electrical Wiring Drawings : Block and Logic Diagrams					
14.	Electrical Wiring Drawings : Control Schematics			✔	✔	
15.	Electrical Wiring Drawings : Wiring Diagram and Terminal Details			✔	✔	
16.	Electrical Wiring Drawings : Interpanel Wiring Diagram			✔	✔	
17.	Electrical Wiring Drawings : System Architecture					
18.	Bill Of Material			✔	✔	
19.	Relay Characteristic Curve					
20.	Auxiliary Power Requirement Data (AC & DC)					
21.	Test Records			✔	✔	
22.	Inspection & Test Plan (ITP) -For review by Inspection Dept.		✔		✔	
23.	Type Test Certificate for Panel			✔	✔	
24.	List of Commissioning Spares			✔	✔	
25.	List of Maintenance Spares			✔	✔	
26.	List of Mandatory Spares					
27.	List of Special Tools & Tackles			✔	✔	
28.	Data Books/ Manuals : Installation Manual					
29.	Data Books/ Manuals : Operating/ Maintenance Manual					
30.	Data Books/ Manuals : Catalogues/ Brochures					
31.	Relay Parameterisation					
32.	Data Mapping Details					
33.	ECS I/O List					

Notes :

1. "TICK" denotes applicability.
2. Post order, drawing / document review shall commence only after approval of Document Control Index (DCI).

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3. All post order documents shall be submitted / approved through EIL eDMS portal.
4. Final documentation shall be submitted in hard copy (Six prints) and soft (two CDs/DVDs) in addition to submission through EIL eDMS.
5. Refer - 6-78-0001: Specification for quality management system from Bidders.
6. Refer - 6-78-0003: Specification for documentation requirement from Suppliers.
7. All drawings & documents shall be submitted in A4 or A3 paper sizes. Documents in higher paper size shall be submitted in exceptional circumstances or as indicated in the MR/Tender.
8. Post order- The schedule of drawing / data submission shall be mutually agreed between EIL & the bidder / contractor / supplier during finalization of Document Control Index (DCI).
9. "@" indicates submission of documents to Inspection Agency.
10. Bill of Material shall form part of the respective drawing.
11. Also refer other department's VDR :-
12. '*' indicates the following:
a. Equipments whose ITP is attached with Contract -ITP for respective equipment shall be followed. Therefore, no ITP is to be furnished for review for those equipments.
b. Equipments whose ITP is not attached with Contract-Manufacturer's ITP shall be submitted by Packager/ Vendor/Contractor to respective Regional Procurement Office (RPO) near to manufacturer's works for approval by EIL Inspection.

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13GB		**Description :** CONTROL STATIONS-FLAME PROOF		
Approved Suppliers				
1	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
2	4364	SAI INDUSTRIES	INDIA	
3	G159	PEPPERL & FUCHS MANUFACTURING (INDIA) PRIVATE LIMITED	INDIA	
4	4245	FCG HI-TECH PRIVATE LIMITED	INDIA	
5	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
6	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
7	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
8	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
9	3706	PHOENIX MECANO INDIA PVT. LTD.	INDIA	
10	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13LA		**Description :** LIGHTING FIXTURE & ACCESSORIES-HAZARDOUS		
Approved Suppliers				
1	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
2	3990	SHREYA EX-TECH PRIVATE LIMITED	INDIA	
3	4245	FCG HI-TECH PRIVATE LIMITED	INDIA	
4	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
5	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
6	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
7	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
8	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13MA		**Description :** JUNCTION BOXES (FLAME PROOF)		
Approved Suppliers				
1	4245	FCG HI-TECH PRIVATE LIMITED	INDIA	
2	G159	PEPPERL & FUCHS MANUFACTURING (INDIA) PRIVATE LIMITED	INDIA	
3	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
4	4364	SAI INDUSTRIES	INDIA	
5	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
6	3706	PHOENIX MECANO INDIA PVT. LTD.	INDIA	
7	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
8	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
9	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
10	R175	R STAHL PVT LTD	INDIA	
11	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13MB		**Description :** LIGHTING & POWER PANELS (FLP)		
Approved Suppliers				
1	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
2	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
3	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
4	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
5	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
6	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	
7	3990	SHREYA EX-TECH PRIVATE LIMITED	INDIA	
8	3706	PHOENIX MECANO INDIA PVT. LTD.	INDIA	
9	4364	SAI INDUSTRIES	INDIA	
10	4245	FCG HI-TECH PRIVATE LIMITED	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13MC		**Description :** PLUGS/SOCKETS/HANDLAMPS (FLAME PROOF)		
Approved Suppliers				
1	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	
2	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
3	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
4	3815	VICTORY LUMINAIRES	INDIA	
5	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
6	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
7	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 13MD		**Description :** FLAMEPROOF POWER DISTRIBUTION BOARD		
Approved Suppliers				
1	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
2	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	
3	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
4	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
5	3706	PHOENIX MECANO INDIA PVT. LTD.	INDIA	
6	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
7	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14AB		**Description :** AUXILIARY RELAYS		
Approved Suppliers				
1	3642	M/S JVS ELECTRONICS PVT LTD	INDIA	
2	3860	HITACHI ENERGY INDIA LIMITED	INDIA	
3	4339	C & S ELECTRIC LTD	INDIA	
4	A392	GE VERNOVA T&D INDIA LIMITED	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14CA		**Description :** CABLE GLANDS (HAZARDOUS AREA)		
Approved Suppliers				
1	3681	FCG POWER INDUSTRIES PVT LTD	INDIA	
2	C205	COMET INDUSTRIES	INDIA	
3	B024	BALIGA LIGHTING EQUIPMENTS (P) LIMITED	INDIA	
4	C195	COMET BRASS PRODUCTS	INDIA	
5	F024	FLEXPRO ELECTRICALS PVT LTD	INDIA	
6	F036	FLAMEPROOF EQUIPMENTS PVT.LTD	INDIA	
7	K173	KAYSONS TECHNO EQUIPMENTS PVT. LTD.	INDIA	
8	S158	SUDHIR SWITCHGEARS PVT LTD	INDIA	
9	S375	STANDARD METAL INDUSTRIES	INDIA	
10	4187	SIGMA INDUSTRIES	INDIA	
11	4245	FCG HI-TECH PRIVATE LIMITED	INDIA	
12	4360	CLEON OPTOBIZ PRIVATE LIMITED	INDIA	
13	4244	METALMECH ENGINEERING	INDIA	
14	27421	CMP PRODUCTS LIMITED	UNITED KINGDOM	
15	3704	METAL CRAFT INDUSTRIES	INDIA	
16	4364	SAI INDUSTRIES	INDIA	
17	3890	AKSHAR BRASS INDUSTRIES	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14CD		**Description :** CONTACTORS		
Approved Suppliers				
1	L103	SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED	INDIA	
2	B002	BCH ELECTRIC LTD	INDIA	
3	G147	GE INDIA INDUSTRIAL PVT LTD	INDIA	
4	S450A	SCHNEIDER ELECTRIC INDIA P LTD-HYDERABAD	INDIA	
5	4312	SIEMENS LIMITED	INDIA	
6	A200B	ABB INDIA LTD	INDIA	
7	3791	C & S ELECTRIC LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14CF		**Description :** CONTROL SWITCHES / SELECTOR SWITCHES		
Approved Suppliers				
1	K143	KAYCEE INDUSTRIES LTD.	INDIA	
2	4002	P.P. INDUSTRIES	INDIA	
3	S373	SWITRON DEVICES	INDIA	
4	H142	HOTLINE SWITCHGEAR & CONTROLS	INDIA	
5	R159	RELIABLE ELECTRONIC COMPONENTS PVT LTD	INDIA	
6	4312	SIEMENS LIMITED	INDIA	
7	L103	SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED	INDIA	
8	4012	TEKMEC SWITCHGEAR & CONTROLS	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14FA		**Description :** FUSES		
Approved Suppliers				
1	4312	SIEMENS LIMITED	INDIA	
2	3790	C & S ELECTRIC LTD	INDIA	
3	I013	NOVATEUR ELECTRICAL & DIGITAL SYSTEMS P	INDIA	
4	L103	SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED	INDIA	
5	C194	EATON POWER QUALITY PRIVATE LIMITED	INDIA	
6	G147	GE INDIA INDUSTRIAL PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14HA		**Description :** HEAVY DUTY SWITCHES		
Approved Suppliers				
1	4312	SIEMENS LIMITED	INDIA	
2	3790	C & S ELECTRIC LTD	INDIA	
3	L103	SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14IA		**Description :** INSTRUMENT TRANSFORMERS CT & PT (MV)		
Approved Suppliers				
1	G135	GILBERT & MAXWELL ELECTRICALS PVT LTD	INDIA	
2	4160	RECO TRANSFORMERS PRIVATE LIMITED	INDIA	
3	3901	NEWTEK ELECTRICALS	INDIA	
4	3789	PRAGATI ELECTRICALS PVT LTD	INDIA	
5	S372	SILKAANS ELECTRICALS MFG.CO.PVT.LTD	INDIA	
6	P237	PRECISE ELECTRICALS	INDIA	
7	P228	PRAGATI ELECTRICALS PVT LTD	INDIA	
8	N119	NARAYAN POWERTECH PVT LTD	INDIA	
9	K149	KALPA ELECTRIKAL PVT LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14MA		**Description :** MCB		
Approved Suppliers				
1	4312	SIEMENS LIMITED	INDIA	
2	I168	INDIANA CURRENT CONTROL LTD	INDIA	
3	S450	SCHNEIDER ELECTRIC INDIA PVT LTD	INDIA	
4	L071	LEGRAND (INDIA) PVT. LTD (FORM. M-006)	INDIA	
5	A372	ABB INDIA LTD	INDIA	
6	3793	C & S ELECTRIC LTD	INDIA	
7	S393	STANDARD ELECTRICALS LTD	INDIA	
8	3726	NOVATEUR ELECTRICAL & DIGITAL SYSTEMS PVT. LTD.	INDIA	
9	3824	HAVELLS INDIA LIMITED	INDIA	
10	3888	POLYCAB INDIA LIMITED	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14MC		**Description :** METERS		
Approved Suppliers				
1	3901	NEWTEK ELECTRICALS	INDIA	
2	4233	ELMEASURE INDIA PRIVATE LIMITED	INDIA	
3	N130	NIPPEN ELECTRICAL INSTRUMENTS CO.	INDIA	
4	R042	RISHABH INSTRUMENTS LIMITED	INDIA	
5	M239	MECO INSTRUMENTS PVT LTD	INDIA	
6	A028A	AUTOMATIC ELECTRIC LTD.	INDIA	
7	S141	SECURE METERS LIMITED	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14PB		**Description :** PUSH BUTTON AND INDICATING LAMPS		
Approved Suppliers				
1	H142	HOTLINE SWITCHGEAR & CONTROLS	INDIA	
2	S365	SHRI TULSI SWITCHGEARS PVT LTD	INDIA	
3	E173	ESSEN DEINKI	INDIA	
4	P291	PRECIFINE PRODUCTS PVT. LTD.	INDIA	
5	B002	BCH ELECTRIC LTD	INDIA	
6	S450A	SCHNEIDER ELECTRIC INDIA P LTD-HYDERABAD	INDIA	
7	T166	TEKNIC ELECTRIC (I) PVT. LTD.	INDIA	
8	4012	TEKMEC SWITCHGEAR & CONTROLS	INDIA	
9	4312	SIEMENS LIMITED	INDIA	
10	3791	C & S ELECTRIC LTD	INDIA	
11	4002	P.P. INDUSTRIES	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14SA		**Description :** FUSE SWITCH COMBINATION		
Approved Suppliers				
1	3825	HAVELLS INDIA LIMITED	INDIA	
2	L103	SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED	INDIA	
3	4312	SIEMENS LIMITED	INDIA	
4	S393	STANDARD ELECTRICALS LTD	INDIA	
5	G147	GE INDIA INDUSTRIAL PVT LTD	INDIA	
6	I013	NOVATEUR ELECTRICAL & DIGITAL SYSTEMS P	INDIA	
7	3790	C & S ELECTRIC LTD	INDIA	

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Sr No	Supplier Code	Supplier Name	Country	Holiday Description
Item Code : 14TA		**Description :** TIMERS		
Approved Suppliers				
1	4312	SIEMENS LIMITED	INDIA	
2	E151	ELECTRONIC AUTOMATION PVT LTD	INDIA	
3	B002	BCH ELECTRIC LTD	INDIA	

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अग्निरोधक नियंत्रण स्टेशनों के लिए निरीक्षण एवं परीक्षण योजना

INSPECTION AND TEST PLAN FOR FLAMEPROOF CONTROL STATIONS

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
5.	28.08.2024	Revised and Reissued	RP	GS	RK	MN
4.	14.01.2020	Revised and Reissued	MM	RS	RKS	RKT
3.	21.11.2013	Revised and Reissued	MJ	RS	SCG	SC
2	29.06.2012	Revised and Reissued	AB	HVJ	AKC	DM
1	28.09.2007	Revised and Re-issued	AKG	PPM	MVKK	VC
0	30.04.2002	Issued for implementation	RG	AKC	AKB	GRR

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Abbreviations

BIS	:	Bureau of Indian Standard
CIMFR	:	Central Institute of Mining & Fuel Research
DFT	:	Dry Film Thickness
ERTL	:	Electronics Regional Test Laboratory
FM	:	Factory Mutual
FLP	:	Flame Proof
IL	:	Indicating Lamps
ITP	:	Inspection and Test Plan
IP	:	Ingress Protection
IC	:	Inspection Certification
IS	:	Indian Standard
IEC	:	International Electro technical Commission
JEC	:	Japanese Electro technical Committee
MTC	:	Material Test Certificate
NEMA	:	National Electrical Manufacturers Association
PB	:	Push Button
PO	:	Purchase Order
PESO	:	Petroleum Explosive Safety Organization
PR	:	Purchase Requisition
PVC	:	Poly Vinyl Chloride
QC	:	Quality Control
TC	:	Test Certificate
TPI or TPIA	:	Third Party Inspection Agency
VDR	:	Vendor Data Requirement
XLPE	:	Cross Linked Poly Ethylene

Inspection Standards Committee

Convenor : Mr. R K Singh

Members:

Mr. G Suresh	Mr. Himangshu Pal	Mr. Chandrashekhar	Mr. R Muthu Ramalingam
Mr. Mahendra Mittal	Mr. Avdesh Agrawal	Mr. Anil Kumar	Mr. Arvind NP Singh (Engg)

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1.0 SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Flameproof Control Stations.

2.0 REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/Job specifications/Approved documents/Relevant IS/IEC Standards.

3.0 INSPECTION AND TEST REQUIREMENTS

SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.0	**Procedures**	--	--	--	--	--	--
2.0	**Material Inspection**						
2.1	Incoming material like castings, glass, meters, PBs, ILs, Fasteners etc	Visual, Dimensional, Chemical, Physical and Operational checks, (as applicable)	100%	MTC / Lab test records	H	H	R
3.0	**In process Inspection**						
3.1	Machining, Joints, Sealing methods	As per Test Lab Certified Drawings for Hazardous Area Applications	100%	Test Certificates	-	H	-
3.2	Assembly and Wiring Checks	Visual, Dimensional, Bill of Material, Rating of Components, Tightness of wiring terminations, Size, Type (FR/FRLS), continuity, color coding.	100%	Test Certificates	-	H	-

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
3.3	Flameproof enclosure without components	Routine Over-Pressure test	100%	Test Certificates	-	H	R
4.0	**Final Inspection**						
4.1	Flameproof Control Station (Routine tests)	• Visual/Dimensional/BOM Checks • Nameplate and Tag Number checks • Adherence of panels to Hazardous Area Certification conditions including Flame Path, Flame Gap, Thread Check, Thickness of Enclosure, No. of Cable Entries, Rating of mounted components, Maximum number of door/ cover mounted components, Joints, Sealing etc. • Wiring Checks/Electrical/ Functional Checks • High voltage test • IR test before and after High voltage Test • Paint Shade, Thickness and Adhesion check.	100% by Supplier 10% by EIL/TPIA	Test Records / Inspection Witness Record	-	H	H
4.2	Submission of Certificates & Documents	• Test Certificate of testing agency (CIMFR/ KLPL etc) for suitability of model to intended Hazardous area classification as per latest IS/IEC standards. • Certificate of Statutory authority (PESO). • Valid BIS License.	For each Type/Model	Certificates from test agencies	-	H	R

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
5.0	**Painting**						
5.1	Painting and Packing	• Visual checks for compliance to Painting requirements as per contract. • Suitable protection to prevent entry of foreign material. • Proper packing to prevent any damage during transportation and storage, as per contract.	100%	Packing list / Supplier's Records	-	H	-
6.0	**Documentation and IC**						
6.1	Documentation and IC	• Review of Internal Test Reports & MTC • IC Issuance	100%	Supplier's Test Records / Inspection Certificate	-	H	H

Legends: H- Hold (Do not proceed without approval), Random 10% , R-Review, RW-Random witness, W- Witness (Give due notice, work may proceed after scheduled date).

NOTES :-

1. This document describes the generic test requirements. Any additional test or inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms shall be as per PO/PR/ Standards referred there in/ Job specifications /Approved documents/ Hazardous Area certifications.
3. Supplier has to furnish internal test reports before scheduled inspection date.

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अग्निरोधक लाइटिंग एवं पावर पैनलों के लिए निरीक्षण एवं परीक्षण योजना

INSPECTION AND TEST PLAN FOR FLAMEPROOF LIGHTING AND POWER PANELS

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convener	Standards Bureau Chairman
			Approved by			
4.	28.08.2024	Revised and Reissued	RP	GS	RK	MN
3.	14.01.2020	Revised and Reissued	MM	RS	RKS	RKT
2.	21.11.2013	Revised and Reissued	MJ	RS	SCG	SC
1	15.07.2011	Revised and Reissued	GS	SA	AKC	DM
0	07.10.2008	Issued for implementation	SA	SKD	SKP	VC

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Abbreviations

BIS	:	Bureau of Indian Standard	MTC	:	Material Test Certificate
CIMFR	:	Central Institute of Mining & Fuel Research	NEMA	:	National Electrical Manufacturers Association
DFT	:	Dry Film Thickness	PO	:	Purchase Order
ERTL	:	Electronics Regional Test Laboratory	PESO	:	Petroleum Explosive Safety Organization
FM	:	Factory Mutual	PQR	:	Procedure Qualification Record
FLP	:	Flame Proof	PR	:	Purchase Requisition
FRLS	:	Flame retardant low smoke	PVC	:	Poly Vinyl Chloride
ITP	:	Inspection and Test Plan	QC	:	Quality Control
IP	:	Ingress Protection	TC	:	Test Certificate
IS	:	Indian Standard	TPI or TPIA	:	Third Party Inspection Agency
IC	:	Inspection Certification	VDR	:	Vendor Data Requirement
IEC	:	International Electro technical Commission	XLPE	:	Cross Linked Poly Ethylene
JEC	:	Japanese Electro technical Committee			

Inspection Standards Committee

Convenor : Mr. Rajeev Kumar

Members:

Mr. G Suresh	Mr. Himangshu Pal	Mr. Chandrashekhar	Mr. R Muthu Ramalingam
Mr. Mahendra Mittal	Mr. Avdesh Agrawal	Mr. Anil Kumar	Mr. Arvind NP Singh (Engg)

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1.0 SCOPE

This Inspection and Test Plan covers the minimum inspection and testing requirements for Flameproof Lighting And Power panels.

2.0 REFERENCE DOCUMENTS

PO/PR / Standards referred there in /Job specifications / Approved documents/Relevant IS/IEC Standards.

3.0 INSPECTION AND TEST REQUIREMENT:

SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.0	**Procedures**	---	---	---	---	---	---
2.0	**Material Inspection**						
2.1	Incoming Materials like Castings, Glass, Meters, Wires/ Cables, Bus-Bars, Gaskets, Isolators, MCBs, MCCBs, RCCBs, CTs/ PTs etc (As applicable)	Visual, Dimensional, Physical, chemical & functional checks (as applicable)	100%	Material test certificates / Manufacturer's Test records/	H	H	R
3.0	**In process Inspection**						
3.1	Machining, Joints, Sealing methods	As per Test Lab Certified Drawings for Hazardous Area Applications	100%	Test records	-	H	---
3.2	Panel assembly	Visual, Dimensional, Bill of Material, Rating of Components.	100%	Test Records	-	H	---
3.3	Wiring Checks	Size, type (FR/FRLS), make, termination tightness, ferruling, continuity, color coding	100%	Test Records	-	H	----
3.4	Pressure Check	Over Pressure test on individual enclosures as per relevant standard	100%	Test Records	-	H	R

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
4.0	**Final Inspection**						
4.1	Final Inspection	• Visual and Dimensional check • Adherence of panels to Hazardous Area Certification conditions including Flame Path, Flame Gap, Thread Check, Thickness of Enclosure, No. of Cable Entries, Rating of mounted components, Maximum number of door/ cover mounted components, Joints, Sealing etc. • Bill of material. • Wiring checks • Paint shade, adhesion and thickness. • Verification of mechanical and electrical operations • Dielectric test (High Voltage) • Insulation check before & after High Voltage • Correctness of nameplate • Annunciation/ Indication Checks	100%	Test Records	-	H	H
4.2	Submission of Certificates & Documents	• Test Certificate of testing agency (CIMFR/ KLPL etc) for suitability of model to intended Hazardous area classification as per latest IS/IEC standards. • Certificate of Statutory authority (PESO). • Valid BIS License.	For each Type/Model	Certificates from Test Labs/ Agencies	-	H	R

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
5.0	**Painting**						
5.1	Painting and Packing	• Visual checks for compliance to Painting requirements as per contract. • Suitable protection to prevent entry of foreign material. • Proper packing to prevent any damage during transportation and storage as per contract.	100%	Packing list / Supplier's Records	-	H	-
6.0	**Documentation and IC**						
6.1	Documentation and IC	• Review of Internal Test Reports & MTC • IC Issuance	100%	Supplier's Test Records / Inspection Certificate	-	H	H

Legends: H- Hold (Do not proceed without approval), Random -10%, R-Review, RW-Random witness, W- Witness (Give due notice, work may proceed after scheduled date).

NOTES :-

1. This document describes the generic test requirements. Any additional test or inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms for all the activities shall be as per PO/PR/ Standards referred there in/ Job specifications /Approved documents/ Hazardous Area certifications.
3. Supplier has to furnish internal test reports before scheduled inspection date.

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अग्निरोधक प्लगों, साकेटों तथा हैंडलैम्पों के लिए निरीक्षण व परीक्षण योजना

INSPECTION AND TEST PLAN FOR FLAMEPROOF PLUGS, SOCKETS AND HAND LAMPS

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convener	Standards Bureau Chairman
					Approved by	
3	22.05.2020	Revised and reissued	NP	RS	RKS	SKS
2	21.11.2013	Revised and reissued	MJ	RS	SCG	SC
1	29.06.2012	Revised and reissued	AB	HVJ	AKC	DM
0	01.12.2008	Issued for implementation	RB	SKD	SKP	VC

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Abbreviations

ATEX	:	Atmosphère Explosibles	IS	:	India Standard
BASEEFA	:	British Approval Service for Electrical Equipment in Flammable Atmospheres	IRN	:	Inspection Release Note
			MTC	:	Material Test Certificates
BIS	:	Bureau of Indian Standards	ITP	:	Inspection and Test Plan
BOM	:	Bill of Material	Lab.	:	Third Party Laboratory
CEIL	:	Certification Engineers International Limited	Mfr	:	Manufacturer
CT	:	Current Transformers	MOC	:	Material of Construction
CIMFR	:	Central Institute of Mining & Fuel Research	No.	:	Number
DFT	:	Dry Film Thickness	NEMA	:	National Electrical Manufacturers Association
DGMS	:	Directorate General of Mines Safety	PESO	:	Petroleum Explosive Safety Organization
DT	:	Destructive Testing	PO	:	Purchase Order
EPC	:	Engineering Procurement Construction	PR	:	Purchase Requisition
ERTL	:	Electronics Regional Test Laboratory	PT	:	Voltage Transformers
FM	:	Factory Mutual	PVC	:	Poly Vinyl Chloride
HV	:	High Voltage	QC	:	Quality Control
IC	:	Inspection Certification	TC	:	Test Certificate
IEC	:	International Electrotechnical Commission	TPI or TPIA	:	Third Party Inspection Agency
IECEx	:	International Electrotechnical Commission Explosive	UL	:	Under writer Laboratories
IP	:	Ingress Protection	VDR	:	Vendor Data Requirement

Inspection Standards Committee

Convenor : Mr. R.K. Singh

Members :

Mr. Rajesh Sinha	Mr. Himangshu Pal	Mr. Chandrashekhar
Mr. R. Muthuramalingam	Mr. Avdhesh Agrawal	Mr. Mahendra Mittal
Ms. Arvind NP Singh(Engg.)		

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1.0 SCOPE

This Inspection and Test Plan covers the minimum inspection and testing requirements for Flameproof Plugs, Sockets and Hand Lamps .

2.0 REFERENCE DOCUMENTS

PO/PR / Standards referred there in /Job specifications / Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS

SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTU M OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.0	**Procedures**	---	---	---	---	---	---
2.0	**Material Inspection**						
2.1	Incoming Material like casting, etc	Physical, chemical & electrical properties as applicable	100%	MTC / Lab. TC	H	H	R
3.0	**In process Inspection**						
3.1	Flameproof plugs Sockets and Hand Lamps assembly	• Visual Check • Dimensional Check • Bill of Material Verification • Routine Press Test on Castings as per latest IS/IEC	100%	Test Records	-	H	R
4.0	**Final Inspection**						
4.1	Final Inspection	• Visual Check • Dimensional (flame path/gap/clearances etc.) • Bill of Material checks. • Compatibility of cable glands with cable sizes/cable entry . • Verification of mechanical and electrical operation.	100%	Test Records	-	H	R

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTU M OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
		• HV test /Insulation Resistance test before and after HV Test • Colour of metal enclosures.					
4.2	Submission of Certificates & Documents	• Type tests (if specified) • For Electrically Hazardous Area Item: a. Indigenous : Certificates from CIMFR / ERTL / Karandikar Lab, Valid PESO and BIS License for the corresponding Gas Group and Type of Protection as specified. b. Imported: ATEX/ IECex Certification from recognized test authorities and valid PESO approval for the specified gas group and type of protection . c. For use in Projects related to Mines, DGMS approval is required. • Degree of protection certificate (IP) for Instruments housing.	Proto-type from each Model	Certificates from test agencies / Statutory Bodies	-	H	R
5.0	**Painting**						
5.1	Painting and Packing	• Visual • Suitable protection to prevent entry of foreign material. • Proper packing to prevent any damage during transportation and storage.	100%	Packing list / Supplier's Records	-	H	-

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTU M OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
6.0	**Documentation**						
6.1	Documentation and IC/IRN	• Review of Internal Test Reports • Issuance of IC/IRN	100%	Supplier Test Records / IC/IRN	-	H	H
6.2	Final Document submission (if applicable)	Compilation of Inspection reports , Drawings, etc as per VDR / PR	100%	Final data folder /Completeness certificate	-	H	H

Legends: H- Hold (Do not proceed without approval, R-Review, RW-Random witness (As specified or 10 % - Samples must include min 1 No. of each type), W-Witness (Give due notice, work may proceed after scheduled date).

NOTES :

1. This document describes the generic test requirements. Any additional test or inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms for all the activities shall be as per PO/PR/ Standards referred there in/ Job specifications /Approved documents
3. For EPC Jobs, Scope of Inspection shall be under TPIA only, unless specified otherwise.

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संकटमय क्षेत्रों के लिए लाईटिंग फिक्सचरों एवं जंक्शन बक्सों के लिए निरीक्षण व परीक्षण योजना

INSPECTION AND TEST PLAN FOR HAZARDOUS AREA LIGHTING FIXTURES AND JUNCTION BOXES

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
4.	20.05.2020	Revised and Reissued	JA	RS	RKS	SKS
3.	21.11.2013	Revised and Reissued	MJ	RS	SCG	SC
2	29.06.2012	Revised and Reissued	AB	HVJ	AKC	DM
1	28.09.2007	Revised and Re-issued	AKG	PPM	MVKK	VC
0	12.08.2002	Issued for implementation	RG	AKC	AKB	GRR

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Abbreviations

BIS	:	Bureau of Indian Standard	MTC	:	Material Test Certificate
BOM	:	Bill Of Materials	IR	:	Insulation Resistance
CIMFR	:	Central Institute of Mining & Fuel Research	No.	:	Number.
CE	:	Carbon Equivalent	NEMA	:	National Electrical Manufacturers Association
DFT	:	Dry Film Thickness	PD	:	Partial Discharge
DIV	:	Division	PO	:	Purchase Order
DPT	:	Dye Penetrate Testing	PESO	:	Petroleum Explosive Safety Organization
ERTL	:	Electronics Regional Test Laboratory	EPC	:	Engineering Procurement Construction
FCRI	:	Fluid Control Research Institute	PR	:	Purchase Requisition
FLP	:	Flame Proof	PVC	:	Poly Vinyl Chloride
HV	:	High Voltage	IS	:	Indian Standars
ITP	:	Inspection and Test Plan	TPI or TPIA	:	Third Party Inspection Agency
IP	:	Ingress Protection	VDR	:	Vendor Data Requirement.
IC	:	Inspection Certification	UL	:	Under writer Laboratories
IEC	:	International Electrotechnical Commission			

Inspection Standards Committee

Convenor : Mr. R.K.Singh

Members:

Mr. Rajesh Sinha
Mr. R. Muthuramalingam
Ms. Arvind N P Singh (Electrical)
Mr. Himangshu Pal
Mr. Avdhesh Agrawal
Mr. Chandrashekhar
Mr. Mahendra Mittal

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1.0 SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Lighting fixtures, control gearboxes, junction boxes and accessories

2.0 REFERENCE DOCUMENTS

PO/PR/ Standards referred there in/Job specifications/Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS

SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.0	**Procedures**	--	--	--	--	--	--
2.0	**Material Inspection**						
2.1	Incoming materials like castings, terminals, Glass, Rubber gaskets, reflectors, Guards, Chokes, Capacitors, etc.	Physical & Chemical Properties, Dimensions, Surface finish, Light transmission thro' glass, tests on glass, Material Certificate, Make, IR for chokes, etc.	Samples as per relevant standard/ supplier's standard	Supplier's Test Records	H	H	R
3.0	**In process Inspection**						
3.1	Well glasses	Static Hydraulic test	100% by supplier and sample basis by EIL	Supplier's Test Records	-	H	R
3.2	Control gear boxes and junction Boxes	Routine Pressure test	100% by supplier and sample basis by EIL	Supplier's Test Records	-	H	R
4.0	**Final Inspection**						

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
4.1	Final Inspection	Acceptance Tests:- • Physical, Dimensional and BOM Verification • Flame paths, Clearances • Marking on each piece for suitability to area classification, Tag no. and other details as per relevant IS/IEC. • Marking on glass for type and other details as per IS/IEC • Test for restricted breathing enclosure for Div-2 • Impact test (on samples) • Thermal shock test (on samples) • Electrical operation check • Power factor test on choke • HV test • IR test before & after HV	100%	Inspection Witness Test Records	-	H	R
4.2	Type tests:-	• Temperature rise test • Test for suspension for Div 2 fittings • Test for enclosed Break lamp holder for Div 2 fittings. • Pressure Test (As Applicable)	Samples	Certificates from test agencies	-	R	R

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SL NO.	STAGE/ ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
4.3	Submission of Certificate & Documents	• Certificate of Statutory testing agency for suitability of area classification • Certificate of Statutory approval authority like PESO • License for Indigenous fittings from BIS • Degree of Ingress protection certificate.	Samples	Certificates from test agencies	-	H	R
5.0	**Painting**						
5.1	Painting and Packing	• Visual • Suitable protection to prevent entry of foreign material. • Proper packing to prevent any damage during transportation	100%	Packing list / Supplier's Records	-	H	R
6.0	**Documentation and IC**						
6.1	Documentation and IC	• Review of suppliers internal test reports • Issuance of IC	100%	Internal test reports & IC	-	H	H
6.2	Final Document submission	• Compilation of Inspection reports, drawings etc as per VDR / PR	100%	Final data folder /Completeness certificate	-	H	H

Legends: H- Hold (Do not proceed without approval, R-Review, RW-Random witness (As specified or 10 % - Samples must include minimum 1 No of each type), W- Witness (Give due notice, work may proceed after scheduled date).

NOTES :-

1. This document describes the generic test requirements. Any additional test or inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
2. Acceptance Norms for all the activities shall be as per PO/PR/ Standards referred there in/ Job specifications /Approved documents.
3. For EPC jobs, Scope of Inspection shall be under TPIA only, unless specified otherwise.

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बोलीकर्ता / आपूर्तिकर्ताओं / ठेकेदारों से गुणवत्ता प्रबंधन प्रणाली अपेक्षाओं हेतु विनिर्देश

SPECIFICATION FOR QUALITY MANAGEMENT SYSTEM REQUIREMENTS FROM BIDDERS / SUPPLIERS / CONTRACTORS

Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by: Standards Committee Convener	Approved by: Standards Bureau Chairman
3	29-09-2025	General Revision	QMS Standards Committee	QMS Standards Committee	AK	MN
2	12-06-2020	General Revision	QMS Standards Committee	QMS Standards Committee	SKB	SKS
1	12-03-2015	General Revision	QMS Standards Committee	QMS Standards Committee	MPJ	SC
0	04-06-2009	Issued as Standard Specification	QMS Standards Committee	QMS Standards Committee	SCT	ND

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Abbreviations:

EIL	Engineers India Limited
ISO	International Organization for Standardization
MR	Material Requisition
PO	Purchase Order
PR	Purchase Requisition
QMS	Quality Management System

QMS Standards Committee

Convener: Mr. Anil Kumar

Members: Mr. Himangshu Pal (SCM-Inspection)
Mr. Ravindra Kumar (Const.)
Mr. Vinod Kumar (CQA)
Mr. Swapnil Vaishnav (Projects)
Mr.Vijay Kumar Garg (SCM)
Mr.Raju Kumar Pandey (Equipment Division)

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1.0 SCOPE

This specification establishes the Quality Management System requirements to be met by BIDDER for following purpose:

- QMS requirements to be met by suppliers/contractors after award of work/duringcontract execution.

2.0 DEFINITIONS

2.1 Bidder

For the purpose of this specification, the word "BIDDER" means the person(s), firm, company or organization who is under the process of being contracted by EIL / Owner for delivery of some products (including service).The word "Bidder" is considered synonymous to supplier, contractor or vendor.

2.2 Project Quality Plan (PQP)

Document tailored from Standard Quality Management System Manual of BIDDER, specifying how the quality requirements of the project will be met.

2.3 Owner

Owner means the owner of the project for which services / products are being purchased and includes their representatives, successors and assignees.

3.0 REFERENCE DOCUMENTS

- Specification for Documentation Requirements from Contractors (Doc. No. 6-78-0002)
- Specification for Documentation Requirements from Suppliers (Doc. No. 6-78-0003)

4.0 QUALITY MANAGEMENT SYSTEM – GENERAL

Unless otherwise agreed with EIL / Owner, the BIDDER proposed quality system shall fully satisfy all relevant requirements of ISO 9001 "Quality Management Systems – Requirements."Evidence of compliance shall be current certificate of quality system registration to ISO 9001 or a recent compliance audit recommending registration from a certification agency.The quality system shall provide the planned and systematic control of all quality related activities for execution of contract.Implementation of the system shall be in accordance with BIDDER'S Quality Manual and PROJECT specific Quality Plan.

5.0 QUALITY SYSTEM REQUIREMENTS

5.1 BIDDER shall prepare and submit for review / record, Project Quality Plan / Quality Assurance Plan for contracted scope / job.The BIDDER'S Quality Plan shall address all of the applicable elements of ISO 9001, identify responsible parties within BIDDER'S organization, for the implementation / control of each area, reference the applicable procedures used to control / assure each area, and verify the documents produced for each area.The Project Quality Plan shall necessarily define control or make reference to the relevant procedures, for design and engineering, purchase, documentation, record control, bid evaluation, inspection, production/manufacturing, preservation, packaging and storage, quality control at construction site, pre-commissioning, commissioning and handing over (as applicable) in line with contract requirement and scope of work.

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5.2 BIDDER shall identify all specified or implied statutory and regulatory requirements and communicate the same to all concerned in his organization and his sub contractor's organization for compliance.

5.3 BIDDER shall deploy competent and trained personnel for various activities for fulfilment of PO / contract.BIDDER shall arrange adequate infrastructure and work environment to ensure that the specification and quality of the deliverable are maintained.

5.4 BIDDER shall do the quality planning for all activities involved in delivery of order.The quality planning shall cover as minimum the following:

- Resources
- Product / deliverable characteristics to be controlled.
- Process characteristics to ensure the identified product characteristics are realized
- Identification of any measurement requirements, acceptance criteria
- Records to be generated
- Need for any documented procedure

The quality planning shall result into the quality assurance plan, inspection and test plans (ITPs) and job procedures for the project activities in the scope of bidder. These documents shall be submitted to EIL/Owner for review/approval, before commencement of work.

5.5 Requirements for sub-ordering of outsourced items /sub-contracting / purchasing of services specified in MR/ contract / tender shall be adhered to. In general all outsourced items will be from approved vendors of EIL. Wherever requirements are not specified, or approved sub vendors do not exist, the sub-contractor shall establish and maintain a system for purchasing / sub-contracting to ensure that purchased product / service conforms to specified requirements in concurrence with EIL / Owner.Criteria for selection of sub-contractor, evaluation, re-evaluation, maintenance of purchasing data and verification of purchased product (sub-contractor services), constitute important components of this requirement.

5.6 BIDDER shall plan and carry production and service provision under controlled conditions.Controlled conditions shall include, as applicable

a) the availability of information that describes the characteristics of the product
b) the availability of work instructions
c) the use of suitable equipment
d) the availability and use of monitoring and measuring devices
e) the implementation of monitoring and measurement
f) the implementation of release, delivery and post-delivery activities

5.7 BIDDER shall validate any processes for production and service provision where resulting output cannot be verified by subsequent monitoring and measurement. This includes any process where deficiencies become apparent only after the product is in use or service has been delivered.

5.8 BIDDER shall establish a system for identification and traceability of product / deliverable throughout product realization.Product status with respect to inspection and testing requirements shall be identified.

5.9 BIDDER shall identify, verify, protect and safeguard EIL / Owner property (material / document) provided for use or incorporation into the product.If any Owner / EIL property is lost, damaged or otherwise found to be unsuitable for use, this shall be reported to the EIL / Owner.

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BIDDER shall ensure the conformity of product / deliverable during internal processing and delivery to the intended destination.Requirements mentioned in the MR/ tender shall be adhered to.

5.10 BIDDER shall establish system to ensure that inspection and testing activities are carried out in line with requirements.Where necessary, measuring equipment shall be calibrated at specified frequency, against national or international measurement standards; where no such standard exists, the basis used for calibration shall be recorded.The measuring equipment shall be protected from damage during handling, maintenance and storage.

5.11 BIDDER shall ensure effective monitoring, using suitable methods, of the processes involved in production and other related processes for delivery of the scope of contract.

5.12 BIDDER shall monitor and measure the characteristics of the product/deliverable to verify that product requirement has been met.The inspection (stage as well as final) by BIDDER and EIL / Owner personnel shall be carried out strictly as per the approved ITPs or ITPs forming part of the contract.Product release or service delivery shall not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by relevant authority and where applicable by Owner / EIL.

5.13 BIDDER shall establish and maintain a documented procedure to ensure that the product which does not conform to requirements is identified and controlled to prevent its unintended use or delivery

5.14 All non-conformities (NCs) / deficiencies found by the BIDDER'S inspection / surveillance staff shall be duly recorded, including their disposal action shall be recorded and resolved suitably.Effective corrective actions shall be implemented by the BIDDER so that similar NCs including deficiencies do not recur.The BIDDER shall take appropriate actions to address the Risks and Opportunities in the project.

5.15 All deficiencies noticed and reported by EIL / Owner shall be analysed by the BIDDER and appropriate corrective actions shall be implemented.BIDDER shall intimate EIL / Owner of all such corrective action implemented by him.

5.16 BIDDER should follow the standards, specifications and approved drawings. Concessions/Deviations shall be allowed only in case of unavoidable circumstances. In such situations Concession/deviation request must be made by the BIDDER through online system of EIL vendor portal for document exchange. URL of EIL vendor portal for document exchange is http://edocx.eil.co.in/vportal. BIDDER shall have documented procedure for control of documents.

5.17 All project records shall be carefully kept, maintained and protected for any damage or loss until the project completion, then handed over to EIL / Owner as per contract requirement (Refer Specification Nos. 6-78-0002 - Specification for Documentation Requirements from Contractors and 6-78-0003 - Specification for Documentation Requirements from Suppliers), or disposed as per relevant project procedure.

6.0 AUDITS

BIDDER shall plan and carry out the QMS audit for the job. Quality audit program shall cover design, procurement, construction management and commissioning as applicable including activities carried out by sub-vendors and sub-contractors. This shall be additional to the certification body surveillance audits carried out under BIDDER'S own ISO 9001 certification scheme.

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The audit programs and audit reports shall be available with bidder for scrutiny by EIL / Owner.EIL or Owner's representative reserves the right to attend, as a witness, any audit conducted during the execution of the WORKS.

In addition to above, EIL, Owner and third party appointed by EIL/Owner may also perform Quality and Technical compliance audits.BIDDER shall provide assistance and access to their systems and sub-contractor / vendor systems as required for this purpose.Any deficiencies noted shall be immediately rectified by BIDDER.

7.0 DOCUMENTATION REQUIREMENTS

BIDDER shall submit following QMS documents immediately after award of work (Within one week) for record / review by EIL / Owner/ TPIA(Third Party Inspection Agency), as applicable:

- Organization chart (for complete organization structure and for the project)
- Project Quality Plan/Quality Assurance Plan
- Job specific Inspection Test Plans, if not attached with PR
- Job Procedures
- Inspection/Test Formats

In addition to above QMS documents, following documentation shall be maintained by the BIDDER for submission to EIL / Owner on demand at any point of time during execution of the project:

- Quality Manual
- Certificate of approval for compliance to ISO9001 standard
- Procedure for Control of Non-conforming Product
- Procedure for Control of Documents
- Sample audit report of the QMS internal and external audits conducted during last one year
- Customer satisfaction reports from at least 2 customers
- Project QMS audit report
- Technical audit reports for the project
- Corrective action report on the audits

Documents as specified above are minimum requirements. BIDDER shall submit any other document/data required for completion of the job as per EIL/Owner instructions.

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SPECIFICATION FOR DOCUMENTATION REQUIREMENTS FROM SUPPLIERS

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convener	Standards Bureau Chairman
					Approved by	
3	29-09-2025	General Revision	QMS Standards Committee	QMS Standards Committee	AK	MN
2	01-06-2020	General Revision	QMS Standards Committee	QMS Standards Committee	SKB	SKS
1	12-03-2015	General Revision	QMS Standards Committee	QMS Standards Committee	MPJ	SC
0	04-06-2009	Issued as Standard Specification	QMS Standards Committee	QMS Standards Committee	SCT	ND

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Abbreviations:

DCI	Document Control Index
EIL	Engineers India Limited
EPS	Electronic Procurement System
FOA	Fax of Acceptance
IC	Inspection Certificate
IRN	Inspection Release Note
ITP	Inspection and Test Plan
LOA	Letter of Acceptance
LR	Lorry Receipt
MR	Material Requisition
ODC	Over Dimension Consignment
PO	Purchase Order
PR	Purchase Requisition
PVC	Polyvinyl Chloride
QAP	Quality Assurance Plan
QMS	Quality Management System
RPO	Regional Procurement Office
TPIA	Third Party Inspection Agency
URL	Universal Resource Locator
V-Portal	Vendor Portal

QMS Standards Committee

Convener: Mr. Anil Kumar

Members:
Mr. Himangshu Pal (SCM-Inspection)
Mr. Ravindra Kumar (Const.)
Mr. Vinod Kumar (CQA)
Mr. Swapnil Vaishnav (Projects)
Mr.Vijay Kumar Garg (SCM)
Mr.Raju Kumar Pandey (Equipment Division)

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2.0	DEFINITIONS	4
3.0	REFERENCE DOCUMENTS	4
4.0	DOCUMENTATION REQUIREMENTS	4

Annexures:

S. No.	Title	Doc. No.
1.	Format for completeness of Final Documentation	Format No. 3-78-0004

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1.0 SCOPE

This specification establishes the Documentation Requirements from Suppliers.

All documents/data against the PO / PR / MR shall be developed and submitted to EIL/Owner by the suppliers for review / records, in line with this specification.

2.0 DEFINITIONS

2.1 Supplier

For the purpose of this specification, the word "SUPPLIER" means the person(s), firm, company or organization who has entered into a contract with EIL / Owner for delivery of some products and/orservices.The word is considered synonymous to bidder, contractor or vendor.

2.2 Owner

Owner means the owner of the project for which services / products are being purchased and includes their representatives, successors and assignees.

3.0 REFERENCE DOCUMENTS

- Specification for Quality Management System Requirements from Bidders (Doc. No. 6-78-0001)

4.0 DOCUMENTATION REQUIREMENTS

4.1 Order Acknowledgement and Assigning Project Manager

After placement of order, Supplier shall acknowledge order through V-Portal within 7 days of receipt of FOA/PO. Supplier shall assign a Project Manager for that order though online portal and provide requisite details. Project Manager details shall include e-mail address, mailing address, mobile/telephone nos., fax nos. and name of Project Manager. All the system generated emails pertaining to that order shall be sent to the assigned Project Manager.

4.2 Documents/Data to be submitted by the Supplier

4.2.1 The Supplier shall submit the documents and data against the PO/PR/MR as per the list given in respectivePO/PR/MR.

4.2.2 Review of the supplier drawings/ documents by EIL would be only to review the compatibility with basic designs and concepts and in no way absolve the supplier of his responsibility/contractual obligation to comply with PR requirements, applicable codes, specifications and statutory rules/regulations.Any error/deficiency noticed during any stage of manufacturing/execution/inspection/ installation shall be promptly corrected by the supplier without any time and cost implications, irrespective ofcomments on the same were received from EIL during the drawing review stage or not.

4.2.3 Unless otherwise specified, submission of documents for Review/Records shall commence as follows from the date of Fax of Intent /Letter of Intent/ Fax of Acceptance (FOA)/ Letter of Acceptance (LOA):

QMS	-	1week
Document Control Index	-	2weeks
Other Documents/Drawings	-	As per approved Document Control Index

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4.2.4 Documents as specified in PO/PR/MR are minimum requirements.Supplier shall submit any other document/data required for completion of the job as per EIL/Owner instructions.

4.3 Style and Formatting

4.3.1 All Documents shall be in ENGLISH language and in M.K.S(Meter-Kilogram-Second) System of units.

4.3.2 Before forwarding the drawings and documents, contractor shallobtain the title block from EIL and ensure that the following information are properly mentioned in each drawing:

- Purchase Requisition Number
- Name of Equipment / Package
- Equipment / Package Tag No.
- Name of Project
- Client
- Drawing / Document Title
- Drawing / Document No.
- Drawing / Document Revision No. and Date

4.4 Review and Approval of Documents by Supplier

4.4.1 All, the Drawing/Documents shall be reviewed, checked, approved and duly signed/stamped by supplier before submission.Revision number shall be changed during submission of the revised supplier documents and all revisions shall be highlighted by clouds. Whenever the supplierrequires any sub-supplier drawings to be reviewed by EIL, the same shall be submitted by the supplier duly reviewed, approved and stamped by the supplier.Direct submission of sub-supplier's drawings without contractor's / suppliers' approval shall not be entertained.

4.5 Document Category

Following review codes shall be used for review of supplier Drawings/Documents:

Code 1 - No comments. Proceed with Manufacture / Fabrication / Construction as per the document.

Code 2 - Proceed with Manufacture / Fabrication / Construction as per commented document. Revised document required.

Code 3 - Document does not conform to basic requirements as marked.Resubmitfor review.

Code R - Document is retained for Records. Proceed with Manufacturing / fabrication as per Tender/ ContractRequirement.

Code V - Void, Document is returned as invalid.

Document is marked as Void under following conditions:

a) Wrong item drawing uploaded.
b) Superseded or obsolete submission.
c) Duplicate submission.
d) Out of sequence submission.
e) Mismatch in document name and title under which document uploaded.
f) Document not legible.
g) For PMC projects, document not signed and stamped by contractor and DEC

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4.6 Methodology for Submission of Documents to EIL/Owner

4.6.1 Document Control Index (DCI)

Supplier shall create and submit Document Control Index (DCI) forreview based on PO/PR/MR along with schedule date of submission of each drawing/document on EIL Vendor Portal.The DCI shall be specific with regard to drawing/document no. and the exact title. Proper sequencing of the drawings/documents should be ensured in schedule date of submission.

4.6.2 Submission of Drawings/Documents / Data

Drawings/documents, data and DCI shall be uploaded on the EIL Vendor Portal as per approved DCI. The detailed guidelines for uploading documents on EIL VendorPortal are available on URL:**http://edocx.eil.co.in/vportal**

4.6.3 Statutory Approvals

Wherever approval by any statutory body is required to be taken by Supplier, the Supplier shall submit copy of approval by the authority to EIL.

4.6.4 Manufacturing Schedule

Supplier shall prepare milestone based(milestones such as document submission, sub ordering, manufacturing, Inspection, dispatches, etc.) manufacturing schedule for the order, to meet delivery as per FOA/PO terms. Supplier shall submit manufacturing schedule to concerned Regional Procurement Office (RPO) of EIL, with a copy to Head office monitoring team/Owner for review within 7 days from date of FOA/PO.Same shall be uploaded in the EPS portal of EILi.e.,https://www6.eil.co.in/epsinspection/supp

4.6.5 Schedule and Progress Reporting

Supplier shall submit Monthly Progress Report(MPR) on or before the 9th of every monthindicating following milestone-based progress details as minimum:

- Drawing submission and approval status and schedule for submission of revised drawing / fresh Drawing requiring approval as per approved DCI
- Sub-ordering plan/details for all major items indicating item description, sub-order number, Date of sub-ordering, sub-vendor name, Location, contractual delivery data and expected delivery dates at main vendor's shop and other critical details requiring timely receipt of sub-ordered items at shop.
- Shop manufacturing progress indicating major milestone progress, in case of missing any milestone date, catch up plan for the same and expected dispatch date from shop and expected delivery date at site.
- Area requiring special attention/concern and proposed action plan to resolve the same.

First Monthly Progress Report (MPR) shall be submitted within2 weeks from FOA/LOA.In case of exigencies, EIL/Owner can ask for report submission as required on weekly/fortnightly/ad-hoc basis depending upon supply status and supplier shall furnish such reports promptly without any price implication.Format for progress report shall be submitted by the Supplier during kick off meeting or within 2 weeks of receiving FOA/LOA, whichever is earlier.

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4.7 Inspection and Testing

4.7.1 Quality Assurance Plan/Inspection and Test Plan

If Inspection and test plans (ITP)are attached with MR/PR same shall be followed along with additional tests requirement (if any) mentioned in MR/ PR. However for cases wherein EIL Standard ITPs not available/ have not been attached with MR/PR, Supplier shall submit within one week of receiving FOA/LOA, the Quality Assurance Plan for inspection & testing at various stages of production, quality control records for critical bought out items/ materials and site assembly & testing as may be applicable to the specific order and obtain approval from concerned Regional procurement Office of EIL/third party inspection agency, as applicable.

For Package equipment contracts, the supplier shall prepare a list of items/ equipment and their inspection categorization plan for all items included in the scope of supply immediately after receipt of order and obtains approval for the same from EIL. The items shall be categorized into different categories depending upon their criticality for the scope of inspection of TPIA and/or EIL.

4.7.2 Inspection Requirements:

Supplier shall perform internal inspection as per ITP/ approved QAP at their works based on approved documents/drawings. Upon satisfactory internal inspection, supplier shall raise inspection call through Inspection call Module of EPS (https://www6.eil.co.in/epsinspection) to concerned Regional Procurement Office (RPO) of EIL/ TPIA/ Owner with advance notice as per contractalong with Internal test reports. Where inspection is not in the scope of EIL and is carried out by nominated Third Party Inspection agency (TPIA), Inspection Release Note (IRN) issued by the nominated TPIA along with Manufacturer's Test Certificate (MTC) shall be uploaded in EIL EPS Portal (https://www6.eil.co.in/epsinspection).

All changes w.r.t. PR shall be recorded through agreed variations or Concessions & Deviations. Conflict, if any, between PR / Job specifications and approved drawings, shall be brought to the notice of EIL / owner bythe supplier/ contractor. Decision of EIL / owner will be binding on the supplier and to be complied without time and cost implications.

Identified bought out items/ raw material shall be procured under TPIA as per ITP.

4.7.3 Inspection Release Note (IRN)/ Inspection Certificate (IC)

IRN/ IC shall be issued by EIL Inspector/ third party inspection agency on successful inspection, review of test reports/ certificates as per specifications &ITP/ agreed quality plan (as applicable) and only after all the drawings/documents as per DCI are submitted and are accepted under review code-1or code R. Supplier shall ensure that necessary documents/manufacturing and test certificates are made available to EIL/TPIA as and when desired.

Note 1: Non fulfilling above requirement shall result into appropriate penalty or with- holding of payment as per conditions of PO/PR/MR.

Note 2: For items where IRN/IC is issued by TPIA, supplier to ensure that following as a minimum must be mentioned by TPIA in IRN/IC:

a) PR document number
b) List of drawings/documents with EIL approval code
c) Tests witnessed, documents reviewed

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d) Compliance statement by TPIA that product meets the requirement as specified in EIL PR, standard specifications, Inspection Test Plan/QAP and approved documents.

4.8 Transportation Plan

Transportation Plan for Over Dimensional Consignments (ODC), if any, shall be submitted within 2 weeks of receiving FOA/LOA, for approval. Unless otherwise specified, consignments with parameters greater than following shall be considered as over dimensional.

Dimensions : 4 meters width x 4 meters height x 20 meters length

Weight : 32 MT (Metric Ton)

Dimensions and weight provided above are inclusive of all nozzles, attachments, transportation saddles etc.

Physical Rout survey for ODC movement shall be submitted to EIL within 8 weeks of receiving FOA / LOA.

4.9 Dispatch Details

Upon receipt of IRN/IC from EIL inspector/TPIA, supplier shall dispatch items within 2 days. Item wise dispatch details shall be uploaded in EIL's EPS module within 24 hours of any item dispatched from shop, indicating PR item no, Quantity dispatched, Transporter's name, LR Number/ LR date.

4.10 Vendorshall ensure timely uploading of Manufacturing Schedule, Monthly Progress Report,Inspection Certificate (IRN)issued by the TPIA (as applicable for PO where Inspection is under nominated Third Party Inspection Agency)and updation ofitem wise dispatch details in EPS portal of EIL (https://www6.eil.co.in/epsinspection).

4.11 Final Documentation

4.11.1 Supplier shall prepare final documents in line with VDR(Vendor Document Requirements) attached with PR/Tender. A copy of final document along with filled in Format for Completeness of Final Documentation (Format No. 3-78-0004) to be submitted to EIL Inspector/TPIA for review & approval within 2 weeks from dispatch. Upon receipt of EIL/TPIA endorsement on Completeness of Final Documents, supplier shall submit soft/hard copies of Final documents to EIL/Owner in requisite quantity as per PO/PR details, along with covering letter. A copy of covering letter to be submitted to the concerned Regional Procurement Office (RPO) of EIL/Owner.

4.11.2 As Built Drawings

Minor Shop changes made by Supplier after approval of drawings under 'Code 1' by EIL and deviations granted through online system, if any, shall be marked in hard copies of drawings which shall then be stamped 'As-built' by the supplier.These 'As-built' drawings shall be reviewed and stamped by EIL Inspector/TPIA.Supplier shall prepare scanned images files of all marked – up 'As – built' drawings. Simultaneously Supplier shall incorporate the shop changes in the native soft files of the drawings also.

4.11.3 Packing/Presentation of Final Documents

Final Documents shall be legible photocopies in A4, A3 size only.Drawings will be inserted in plastic pockets (both sides transparent, sheet thickness minimum 0.1 mm) with an extra strip of 12 mm wide for punching so that drawings are well placed.

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Final Documentation shall be bound in Hard board Plastic folder(s) of size 265 mm x 315 mm (10½-inch x 12½-inch) and shall not be more that 75 mm thick. It may be of several volumes and each volume shall have a volume number, index of volumes and index of contents of that particular volume.Where number of volumes are more, 90mm thickness can be used.Each volume shall have top PVC sheet of minimum 0.15 mm thick duly fixed and pressed on folder cover and will have 2 lever clips.In case of imported items documents, 4 lever clip shall also be accepted.All four corners of folders shall be properly metal clamped.Indexing of contents with page numbering must be incorporated by supplier.Spiral/Spico bound documents shall not be acceptable.As mentioned above, books should be in hard board plastic folders with sheets punched and having 2/4 lever clips arrangement.

Each volume shall contain on cover a Title Block indicating package Equipment Tag No. & Name, PO/Purchase Requisition No., Name of Project and Name of Customer.Each volume will have hard front cover and a reinforced spine to fit thickness of book.These spines will also have the title printed on them.Title shall include also volume number (say 11 of 15) etc.

4.11.4 Submission of Soft Copies

Supplier shall submit to EIL, the scanned images files as well as the native files of drawings/documents, along with proper index.

In addition to hard copies, Supplier shall submit soft copies of all the final drawings and documents in pen drive or any other specified medium with proper identification tag, all text documents prepared on computer, scanned images of all important documents (not available as soft files), all relevant catalogues, manuals available as soft files (editable copies of drawings/text documents, while for catalogues/manuals/proprietary information and data, PDF files can be furnished). All soft files shall be appropriately named, systematically indexed, and duly bookmarked in PDF format to facilitate ease of reference and access.

All the above documents shall also be uploaded on the EILVendor Portal and if applicable on Client Server also.

4.11.5 Completeness of Final Documentation

Supplier shall get the completeness of final documentation verified by EIL/TPIA,as applicable, and attach the Format for Completeness of Final Documentation (Format No. 3-78-0004) duly signed by EIL Inspector or TPIA as applicable to the final document folder.

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COMPLETENESS OF FINAL DOCUMENTATION

Name of Supplier/Contractor	:	
Customer	:	
Project	:	
EIL's Job No.	:	
Purchase Order No./ Contract No.	:	
Purchase Requisition No./ Tender No.	:	Rev. No.:
Name of the Work/ Equipment	:	
Tag. No.	:	
Supplier's/ Contractor's Works Order No.	:	

Certified that the Engineering Documents/ Manufacturing & Test Certificates submitted by the supplier (as per Index sheet mentioned in Annexure-1) are complete in accordance with the Vendor Data Requirements of Purchase Requisition / Tender.

Signature	: ……	Signature	: ……
Date	: ……	Date	: ……
Name	: ……..	Name	: ……..
Designation	: ……	Designation	: ……
Department	: ……	Department	: ……
	Supplier/Contractor		EIL/TPIA

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Annexure-1

Final Documentation Index Sheet			
PR/PO/Tender No.		Revision No.	
Serial No.	Document Title	Page/ Folder No.	No. of Pages

Signature	: ……	Signature	: ……
Date	: ……	Date	: ……
Name	: ……..	Name	: ……..
Designation	: ……	Designation	: ……
Department	: ……	Department	: ……

Supplier / Contractor

EIL / TPIA

Signature Not Verified

Digitally signed by MOHIT KUMAR GAUTAM
Date: 2026.05.11 11:56:34 IST
Location: eProcure-EPROC

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