

**PURCHASE SPECIFICATIONS**  
**FOR**  
**RIG LIGHT FITTINGS & ACCESSORIES**  
**FOR**  
**OIL RIG APPLICATIONS**



SPECIFICATION NO. : OR 12297  
REVISION NO. : Rev 02  
DATE : 21.2.11  
DISTRIBUTION : PI - 4 copies  
O/C - 1 copy

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**ISSUED BY**

**CONTROL EQUIPMENT ENGINEERING DIVISION**  
**BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL**

**GENERAL SPECIFICATIONS FOR RIG LIGHT FITTINGS AND  
MOUNTING ACCESSORIES**

**1. SCOPE :**

This specification applies to General area and hazardous area rig lighting fittings and accessories primarily intended for outdoor drilling rig use in 100% humid, dusty, oily, hazardous area at an ambient of max. 50 deg C.

**2. TECHNICAL DETAILS OF RIG LIGHT FITTINGS**

**2.1 Flame proof 250 W flood light fitting**

250 W, 240 V AC 50Hz Flame proof flood light fittings suitable for 250 W HPMV lamps to be offered (Reference Cat Nos of M/s Flexpro Navasari Cat. No MFF/1000/1 or MFF/1000/IIC-IEC or M/s FCG type No LF31400 or equivalent). These Catalog Nos are only for reference however supplier to offer items meeting this specifications requirements having valid DGMS approvals as per applicable IS.

Flood light fittings shall have enclosure type Ex'd', class-1, zone/division-1, Gas groups IIA & IIB, for Hazardous area lighting application confirming to IS-2148.

Flood lights should confirm to protection class weather proof IP-65 as per IS-13947. Body construction should be of cast aluminum alloy LM-6. Glass should be clear flat heat & impact resistant glass and toughened type 'A' as per IS-2206 part I. Reflector should be of anodized polished aluminum. Fitting should be complete with cradle / stand for vertical & horizontal movements. Endless neoprene gaskets to be provided wherever required for proper sealing.

(4) Four equispaced mounting holes at 205 mm PCD suitable for M12 hardware to be provided at the bottom cast Iron mounting base plate.

Lamp holder should be of GES type E40, porcelain shock proof (anti loosening spring loaded arrangement to prevent loosening of lamps). Stud type terminals to be provided for termination of incoming 3 x 1.5 sqmm cable. Each Terminal should be provided 2 Nos solderless crimping type Dowells make copper cable terminals also. External & internal earthing terminals to be provided.

1 No. Cable entry ¾" ET (F) type for fitment of flame proof cable gland for cable size 3 x 1.5 sqmm with max. cable OD of 13.4 mm.

Finish of the body shall be anti-corrosive epoxy powder coated as per shade no 631 of IS 5.

All hardware in the fittings shall be of stainless steel SS304.

Note : The fitting tested by CMRI Dhanbad and approved by DGMS for Oil Mine application Zone/Div-1, Gas group IIA & IIB only to be offered. OGA drawing, Test certificate and DGMS approval certificate to be submitted with offer.

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### **2.2 250 W HPMV Flood light Lamp**

Heavy duty 250 W, 240 V AC 50 Hz HPMV lamp, screw cap type suitable for fitment in Flame proof flood light fittings as per CI No 2.1. M/s Philips or M/s Bajaj or M/s Crompton make lamps to be offered.

### **2.3 Flame proof control gear box for 250 W HPMV flood lights**

Flame proof control gear box complete with heavy duty copper wound polyester filled choke/ballast (only of Philips make), HRC fuse & P F Condensor (only of Siemens/EPCOS) suitable for 250 W HPMV lamp flood light fitting as per CI 2.1 to be offered (Reference Cat. Nos of M/s Flexpro Cat No MFC/1100/3 or MFC/1100/4/IIC-IEC or M/s FCG Type No LC31250/L31400 or equivalent). These Catalog Nos are only for reference however supplier to offer items meeting this specifications requirements having valid DGMS approvals as per applicable IS.

Enclosure type Ex'd', class-1, zone/division-1, Gas groups IIA & IIB, for Hazardous area lighting application confirming to IS-2148.

Control gear box should confirm to protection class weather proof IP-65 as per IS-13947. Body construction should be of cast aluminium alloy LM-6. Endless neoprene gaskets to be provided wherever required for proper sealing.

Mounting holes suitable for M8/M10 hardware to be provided for mounting on wall, Column & steel structure.

2 Nos Cable entry ¾" ET (F) type for fitment of flame proof cable gland for cable size 3 x 1.5 sqmm with max. cable OD of 13.4 mm.

Stud type terminals to be provided for termination of incoming 3 x 1.5 sqmm cable. Each Terminal should be provided with 2 Nos of solderless crimping type Dowells make copper cable terminals also.

Finish of the body shall be anti-corrosive epoxy powder coated as per shade no 631 of IS 5.

All hardware in the fittings shall be of stainless steel SS304.

Note : The fitting tested by CMRI Dhanbad and approved by DGMS for Oil Mine application Zone/Div-1, Gas group IIA & IIB only to be offered. OGA drawing, Test certificate and DGMS approval certificate to be submitted with offer.

### **2.4 Flame proof 160 W MLL lamp Well Glass light fitting**

160 W, 240 V AC 50 Hz Flame proof well glass light fittings suitable for 160 W MLL lamps to be offered ( Reference Cat Nos of M/s Flexpro Navasari Cat. No MFW/196 or MFW/198/IIC-IEC or M/s FCG Type No LW31200 or equivalent). These Catalog Nos are only for reference however supplier to offer items meeting this specifications requirements having valid DGMS approvals as per applicable IS.

Well Glass light fittings shall have enclosure type Ex 'd', class-1, zone/division-1, Gas groups IIA & IIB, for Hazardous area lighting application confirming to IS-2148.

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Well Glass light fittings should confirm to protection class weather proof IP-65 as per IS-13947. Body construction should be of cast aluminium alloy LM-6. Glass should be clear, heat & impact resistant glass and toughened type 'A' BOROSIL glass dome as per IS-2206 part I. Reflector should be of anodized polished aluminium. MS spot welded wire guard coated with white epoxy for protection of Glass dome to be provided. Endless neoprene gaskets to be provided wherever required for proper sealing. "J" Hook for fitting holding for lamp replacement to be provided.

Blind Mounting hole at top of size M16 (F) to be provided and duly fitted with a eye bolt of ID 26mm and OD 48mm for suspension of fittings from top. The eye bolt should be locked with the help of split pin/screw perpendicularly to prevent the loosening of the same during vibrations normally experienced in Drilling oil rigs.

Lamp holder should be of ES E-27 type, porcelain shock proof (anti loosening spring loaded arrangement to prevent loosening of lamps shall be preferred). Spring type lamp lock arrangement may be provided. Stud type terminals to be provided for termination of incoming 3 x 1.5 sqmm cable. Each Terminals should be provided with 2 Nos solderless crimping type Dowells make copper cable terminals also.

1 No. Cable entry  $\frac{3}{4}$ " ET (F) type for fitment of flame proof cable gland for cable size 3 x 1.5 sqmm with max. cable OD of 13.4 mm.

Finish of the body shall be anti-corrosive epoxy powder coated as per shade no 631 of IS 5.

All hardware in the fittings shall be of stainless steel SS304.

Note : The fitting tested by CMRI Dhanbad and approved by DGMS for Oil Mine application Zone/Div-1, Gas group IIA & IIB only to be offered. OGA Drawing, Test certificate and DGMS approval certificate to be submitted with offer.

### **2.5 160 W MLL Lamp for Well Glass Light fittings**

Heavy duty 160 W, 240 V AC MLL lamp, screw cap type suitable for fitment in Flame proof well glass light fittings as per CI No 2.4. M/s Philips or M/s Bajaj or M/s Crompton make lamps to be offered.

### **2.6 Red aviation warning light**

240 V AC Single Red aviation obstruction warning light fittings **duly fitted with Helix Lamp** & in line with M/s Flexpro Navasari Cat. No MFW/196 or equivalent to be offered. Red aviation light fittings shall have enclosure type Ex'd', class-1, zone/division-1, Gas groups IIA & IIB, for Hazardous area application confirming to IS-2148. Fittings should have integral flasher circuit for 2 flashes per second. Provision for switching off of the flashing should also be there with the help of an internal switch.

Red aviation light fittings should confirm to protection class weather proof IP-65 as per IS-13947. Body construction should be of cast aluminium alloy LM-6. Glass should be of red colour, clear, heat & impact resistant glass and toughened type 'A' BOROSIL or equivalent glass dome as per IS-2206 part I. Reflector should be of anodized polished aluminium. MS spot welded wire guard coated with white epoxy for protection of Glass dome to be provided. Endless neoprene gaskets to be provided wherever required for proper sealing.

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Mounting hole at top of size M16 (F) to be provided and duly fitted with a steel bolt with plain & spring washers for fitment of aviation light on a 10 mm thick plate (Bolt length should be more than depth of threaded hole by 15mm) . Alternatively pipe mounting type arrangement can be offered.

Stud type terminals to be provided for termination of incoming 3 x 1.5 sqmm cable. Each Terminal should be provided with 2 Nos solderless crimping type Dowells make copper cable terminals also.

1 No. Cable entry ¾" ET (F) type for fitment of flame proof cable gland for cable size 3 x 1.5 sqmm with max. cable OD of 13.4 mm.

Finish of the body shall be anticorrosive epoxy powder coated to Yellow Colour.

All hardware in the fittings shall be of stainless steel SS304.

Note : The fitting tested by CMRI Dhanbad for Oil Mine application Zone/Div-1, Gas group IIA & IIB only to be offered.

### **2.7 Flame proof double compression cable gland for light fittings - ¾ " ET (F)**

Hex Double compression type cable glands made of brass with nickel plating with Ex'd' flame proof/WP IP65 protection for Zone/Div-1, Gas group-IIA & IIB to be offered. Glands should have nipple size of ¾ " ET (F) suitable for mounting on Flood light fitting, Well Glass fitting, Control Gear box and Red aviation warning light fittings as per Cl 2.1, 2.3, 2.4 & 2.6 of this specification. The cable gland shall be suitable for 3 x 1.5 sqmm screened elastomeric insulated cable of nominal OD 13.4 mm with +/-1mm tolerance. The cable shall pass thru the gland without removal of overall sheathing of the cable at the entry part of the gland. The gland should be provided with oil resisting end less neoprene rubber grommets. The glands should be provided with shroud / hood made of PVC to be offered. (Reference Cat Nos for Glands MFCG/102/2 of M/s Flexpro or equivalent).

**Note** : The glands tested by CMRI Dhanbad for Zone/Div-1, Gas group IIA & IIB only to be offered.

### **2.8 Flame proof double compression cable gland for Appleton Sockets - ¾ " NPT**

Hex Double compression type cable glands made of brass with nickel plating with Ex'd' flame proof/WP IP65 protection for Zone/Div-1, Gas group-IIA & IIB to be offered. Glands should have nipple size of ¾ " NPT (14 TPI) total thread length 19mm and thread form angle 60 degrees suitable for mounting on M/s Appleton USA make flame proof double gang feed thru & dead end socket arrangement to Cat No EFS 275-20232 & EFSC 275-20232. The cable gland shall be suitable for 3 x 1.5 sqmm screened elastomeric insulated cable of nominal OD 13.4 mm with +/-1mm tolerance. The cable shall pass thru the gland without removal of overall sheathing of the cable. The gland should be provided with oil resisting end less neoprene rubber grommets. The glands should be provided with shroud / hood made of PVC to be offered. (Reference Cat Nos for Glands MFCG/102/2 of M/s Flexpro or equivalent).

**Note** : The glands tested by CMRI Dhanbad for Zone/Div-1, Gas group IIA & IIB only to be used.

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### 2.9 Industrial Weather proof junction box for safe area application

Junction boxes in cast aluminum alloy LM-6 with protection class IP65 confirming to Is:13947 for use in safe area and suitable for wall mounting to be offered. No of cable entries, sizes and terminal sizes shall be as per tables below.

NPT	Nominal Cable OD	No. of cable entries required	Cable entry side
1.25	22 mm	2	B (bottom side)
0.75	13.4mm	5	B (bottom side)

Terminal size	No. of Terminals	Terminal block location
6-10 sqmm	12 Nos	Bottom Tier
1.5-4 sqmm	15 Nos	Top Tier

Approximate dimensions of box : 470 (L) x 320 (W) x 140 (D) including cover.

The cover of the junction box should be of bolted type with endless neoprene rubber gasket. All hardware should be of SS304.

Junction boxes should be finished with anticorrosive epoxy powder coating as per shade no 631 of IS 5.

Terminal blocks should be of Elemex / Connectwell / Phoenix of melamine material. Earthing terminal should be provided inside and outside of the junction box.

Terminal blocks should be provided in two tier arrangement with 6-10 sqmm terminals on bottom tier and 1.5-4 sqmm terminals on top tier. Minimum distance of 50mm should be kept between two tiers of the terminal rows and from all the sides of the junction box.

Junction boxes are to be supplied with the industrial weather proof IP65 type nickel plated brass cable glands for nipple sizes and cable ODs as per table above duly fitted on the box. Junction boxes should have 4 mounting holes suitable for M8/M10 hardware.

Supplier to furnish the OGA Drawing of the junction box along with the offer showing all above details, overall dimensions and fixing dimensions.

### 2.10 Air Circulator – 18”

Heavy duty self standing Pedestal mounting strong MS fabricated frame type air circulator(Fan) for Dog House to be offered. The fan motor should be Flameproof / weather proof IP65 suitable for Ex-'d', Class-1, Zone/Div – 1, Gas Group IIA & IIB hazardous area application as per IS 2148.

The fan size of the air circulator should be **18 inches** and of 900-1500 RPM. Motor rating should be minimum 0.25 HP, 230V AC 50 Hz single phase motor.

The Pedestal should be adjustable type for adjusting height of the fan. Maximum height of the air circulator should be approx. 1700mm. The wire guard of the fan

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should be of 5mm dia rod of heavy duty welded construction. Air circulators should be finished with anti-corrosive epoxy powder coated as per shade no 631 of IS 5.

Cable entry should be suitable for ¾" ET(F) for 1 No gland and cable OD of 13.4mm. Flame proof double compression cable gland should be fitted with the air circulator and to be supplied.

Supplier to furnish drawing indicating overall arrangement and dimensions with the offer.

**Note** : The motors tested by CMRI for Zone/Div-1, Gas group IIA & IIB only to be used. Supplier to furnish OGA drawing, CMRI test certificate copy with the offer.

### **2.11 Air Circulator – 30"**

Heavy duty self standing Pedestal mounting strong MS fabricated frame type air circulator(Fan) for Dog House to be offered. The fan motor should be Flameproof / weather proof IP65 suitable for Ex-'d', Class-1, Zone/Div – 1, Gas Group IIA & IIB hazardous area application as per IS 2148.

The fan size of the air circulator should be 30 inches and of 900-1500 RPM. Motor rating should be minimum 0.5 HP, 230V AC 50 Hz single phase motor.

The Pedestal should be non-adjustable type. Maximum height of the air circulator should be approx. 1700mm. The wire guard of the fan should be of 5mm dia rod of heavy duty welded construction. Air circulators should be finished with anti-corrosive epoxy powder coated as per shade no 631 of IS 5.

Cable entry should be suitable for ¾" ET(F) for 1 No gland and cable OD of 13.4mm. Flame proof double compression cable gland should be fitted with the air circulator and to be supplied.

Supplier to furnish drawing indicating overall arrangement and dimensions with the offer.

**Note** : The motors tested by CMRI for Zone/Div-1, Gas group IIA & IIB only to be used. Supplier to furnish OGA Drawing, CMRI test certificate copy with the offer.

### **3.0 TEST CERTIFICATES :**

The necessary test certificate showing the compliance with above requirements to be furnished. Wherever requirements of CMRI & DGMS approvals is mentioned, same should be furnished along with the offer, other wise offer from supplier shall not be considered technically for supply of material.

### **4.0 INSPECTION :**

Supplier to furnish detailed QAP, acceptance test procedure & inspection schedule for the light fittings after the Placement of PO. Supplier to inform at least 2 weeks in advance for the inspection call. BHEL representative shall visit supplier works for the inspection.

**5.0 OFFERS :**

Offer should be given in **TWO BID** system :

- 1) Technical & Commercial offer
- 2) Price offer

**5.1 Part A – Technical & commercial Bid**

Part-A shall contain all technical & commercial offers with respect to requirement of specification along with all the required documents to be submitted. Unfilled price formats should be submitted with the bid. Techno-commercial bid to be submitted in a separate sealed envelope clearly mentioning "TECHNICAL BID" and ENQUIRY NO....." on the envelope

Detailed Techno-Commercial offer should contain all technical features of the offered items with respect to requirement of specification alongwith all the required documents, CMRI Test certificates and DGMS approvals to be submitted. Catalog sheets / Drgs of each item to be submitted with offer.

**5.2 Part B – Price Bid**

Part B of the offer shall contain price bid and supplier shall quote price for each items in unit rate and total for respective qty against each item. Price bid to be submitted in a separate sealed envelope clearly mentioning "PRICE BID" and ENQUIRY NO....." on the envelope.

Price bid of only qualified bidders shall be opened after settlement of techno-commercial portion of the unpriced bid (after scrutiny of unpriced offer).

**Note** : Item No as per CI 2.1 & 2.3 i.e. 250W HPMV Flood light fitting and its Control gear box shall be procured from single vendor for electrical compatibility and price comparison among different bidders for these two items shall be done after addition of prices of items in CI 2.1 & 2.3. L1 party for the total price of 2.1 & 2.3 shall be considered for ordering, if found technically suitable.

BHEL standard purchase procedures shall be applicable for the procurement other then specified in this specification.

**6.0 GENERAL CONDITIONS :**

1. Detailed name plate & rating plate along with warning inscription label as per relevant IS to be fixed on equipment wherever required. CMRI & DGMS approval no. & date may also be mentioned wherever applicable.
2. All light fitting, control gear box & junction box to be individually packed in polythene and then packed in individual hard carton boxes with plastic straps tied over to avoid transit damages. Each box to be labeled with item packed inside & handling instructions, if any for e.g. "GLASS INSIDE HANDLE WITH CARE" with top side and bottom side duly marked.
3. All lamps with company packing in hard cartons should be further packed in wooden / Plywood cases to avoid transit and handling damages.



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4. Cable glands as per CI No 2.7 & 2.8 are to be packed separately in wooden/plywood boxes i.e ¾” ET cable glands in one box and ¾” NPT cable glands in another box.
5. Air circulators as per CI No 2.10 & 11 to be packed in wooden boxes separately.
6. All items are to be supplied in different lots to destination as per Tender conditions directly by the supplier.
7. Guarantee/warranty for the offered items for 12 months from date of commissioning or 24 months from date of supply which ever is earlier. Supplier to confirm the same in the offer.

**7.0 SPECIAL CONDITION :**

Party to confirm in the offer that valid DGMS approval certificates shall be made available at the time of inspection of the items also and a copy shall be provided to BHEL inspector.

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