

PURCHASE SPECIFICATIONS

FOR

16A - 125A, 5 Pin, 500 VAC PLUGS & SOCKETS


FOR

OIL RIG APPLICATIONS

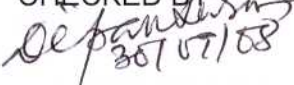


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GENERAL SPECIFICATIONS FOR 500 VOLTS AC 5 PIN PLUGS AND SOCKETS FOR OIL RIGS

1. SCOPE :

This specification applies to plugs and sockets, with a rated operational voltage not exceeding 500 VDC or AC and 50/60Hz AC and a rated current not exceeding 125A, primarily intended for indoor/Outdoor industrial use when the ambient temperature does not normally exceed 50 deg C.

Following International / National Standards are generally referred to meet requirements of plugs and sockets covered in this specification :

- 1) IEC – 309-1
- 2) IS – 1293-1988 Second Revision - Amd. No 8 - May 2002

Requirement of Plugs & Sockets covered in this specification is for ONGC Karaikal (UT of Pondy), ONGC Rajamundhary (AP) & ONGC Ankleshwar (Gujrat).

2 DESIGN & CONSTRUCTION :

The Plugs & Sockets shells or outer housings shall be made of Cast in Aluminum/Brass/Glass filled Nylon with robust construction to meet Oil Rig duty. The internal terminal insulators shall be moulded from High grade nylon reinforced with glassfibre. This material should possess considerable resistance to arc tracking. The material for terminal housing shall have good electrical insulation, mechanical strength, shall exhibit self extinguishing properties if ignited and shall be free from any porosity. These units shall be weather- proof and of robust construction. Sockets shall have flanges and protective covers which are held closed when plug is not inserted and retained by a spring latch. The opening of lid should be automatic on pressing of latch button. This latch should also retain the plug in the ON position or fully engaged position. These plugs and sockets shall be suitable for use in dusty, salt laden and 100% damp atmosphere and should conform to meet weather proof construction as per IP65 degree of protection.

Plugs & Sockets shall be so designed that, when inserting the plug the earth connection is made before the current carrying contacts of the plug become live. When withdrawing the plug, the current carrying contacts shall get disconnected before the earth connection is broken. Live contact should not be accessible whether plug is inserted or fully withdrawn. There should be integral switching device in the sockets so that plug can not be withdrawn from the socket while power is applied to the plug. Plug & socket design should be such to have a unique keying feature and safety shutter system and an asymmetrical pin layout to make it not possible to insert plug incorrectly.

Plug and socket contacts assemblies should be made of Copper for current carrying parts. Socket contact assemblies shall have sufficient resilience to ensure adequate contact pressure on the plug pins. Contact should be Silver-Nickel plated to have low contact resistance. As the plugs and sockets are intended for frequent plug-in and out operations due to mobility of the rigs, only Butt type contacts are acceptable as it provides consistent & constant contact pressure for longer period in use and thus



heating, burning/melting of contacts can not occur. Contacts design should be such to help in self cleaning and self wiping action during insertion and removal of plugs. Temperature rise at rated current should not exceed the limits as per IEC309-1.

The sockets should have a dead front feature in such a way that live female contacts of socket are shrouded and inaccessible when no plug is fitted.

Plugs shall be designed and shaped in such a way that can easily be withdrawn by hand from the relevant socket-outlet. In addition the gripping surfaces shall be so designed that the plug can be withdrawn without having to pull on the flexible cable or cord.

Pins of plugs and socket pins of socket outlets shall be polarized (for e.g. earth terminal of higher diameter) & shall have adequate mechanical strength as per relevant standard, also they should be locked against rotation in the respective housing.

3. TERMINALS :

The design and properties of all terminals shall be such that connections do not slacken or overheat under the normal conditions of use. They shall allow a conductor to be connected without special preparation, for example, soldering of strands, use of cable lugs etc.

- 3.1 The terminals should be specially designed to clamp stranded or solid conductors with sufficient pressure to withstand vibration and arduous conditions. These terminals should be suitable to enable the flowage and compression of conductors should be compensated for by applying a constant force which is produced by the elliptical deformation of elastic ring in the terminal assembly. This will avoid any loosening of the conductors due to vibration and heating effect.
- 3.2 All terminals shall be of sufficient size and cross section suitable relative to the rated current of the plugs and socket outlets and shall be suitable for termination of cables with conductor size as mentioned in Clause 9.0 of this specification. Only screw type terminations are acceptable.
- 3.3 All terminations shall be made in such a way that the strands of the conductors are prevented from slipping or spreading at the terminals. Terminals shall be so located that the conductors are correctly fitted. There should be no risk of accidental contact between live parts of different polarity or between such parts and accessible metal parts.

4. MOUNTING ENTRIES IN SOCKET OUTLETS :

Rear cable entry in the Sockets shall be provided.

5. CABLE ENTRIES IN PLUGS :

Rear cable entry in the plugs shall be provided. Plugs shall be provided with cable glands, which shall be capable of accepting and gripping the flexible cable in order to prevent any stress on the connection to the terminal while preventing ingress of moisture. There should be no sharp bent at the point of entry of the cable.

6. **SIZE :**

Detailed catalogue/drawing indicating overall dimensions, mounting dimensions, weight and mode of cable termination at socket & plug terminals to be given necessarily by the supplier along with quotation to evaluate the offer.

7. **MARKINGS :**

The following shall be marked clearly and indelibly on both plug & socket outlets:

- i) Continuous current rating
- ii) Voltage rating
- iii) The socket & plug terminations shall be marked.
- iv) Manufacturer name, type no of the assembly, month & year of manufacture.

The markings shall be durable and easily legible.

8. **TEST CERTIFICATE :**

The necessary Routine & Acceptance test certificate shall be furnished by supplier. Witnessing of tests shall be at the discretion of BHEL Bhopal and shall be as per PO terms and conditions.

If supplier has carried out any type tests on plugs and sockets in the past test reports of the same may be enclosed with the offer.

9. **CABLE DETAILS FOR PLUGS & SOCKETS :**

The plugs and sockets shall be suitable for the cables as per following chart :-

SL.	DESCRIPTION	SUITABLE CABLE	OVERALL DIA OF CABLE
001	16 A, 500V, 5 Pin Plugs & sockets	1.5 sqmm. 4 core Screened cable	14 mm
002	32 A, 500V, 5 Pin Plugs & sockets	6 sqmm. 4 core Screened cable	21 mm
003	63 A, 500V, 5 Pin Plugs & sockets	16 sqmm. 4 core Screened cable	29 mm
004	125 A, 500V, 5 Pin Plugs & sockets	35 sqmm. 4 core Screened cable	37.5 mm

Note : The diameter of the rubber grommet/ cable entry in cable gland should match the respective cables to ensure tight grip.



10. **MODEL NOS & MAKE :**

SL.	DESCRIPTION	BHEL Style Code	BCH Part No.
001	16 A, 500V, 5 Pin Plugs	BP9048126207	DS1A7A1
002	32 A, 500V, 5 Pin Plugs	BP9048126215	DS3A7A1
003	63 A, 500V, 5 Pin Plugs	BP9048126223	DS6A7A1
004	125 A, 500V, 5 Pin Plugs	BP9048126231	DS9A7A1
005	16 A, 500V, 5 Pin Socket with flap	BP9048126240	DS1B7A1
006	32 A, 500V, 5 Pin Socket with flap	BP9048126258	DS3B7A1
003	63 A, 500V, 5 Pin Socket with flap	BP9048126266	DS6B7A1
004	125 A, 500V, 5 Pin Socket with flap	BP9048126274	DS9B7A1

Note : Above Cat. Nos are of M/s BCH Electric Ltd India, however exact equivalent of M/s Group Schneider meeting this specification requirement shall also be acceptable provided technical details, drawings & Catalogues are furnished in Technical offer.

11. **REFERENCES :**

Supplier/Manufacturer should be a regular manufacturer of above items and should have supplied offered plugs and sockets for Drilling Oil Rig (on-shore type) applications in AC / DC Power Control Rooms where frequent rig-up & rig-down are done due to mobility of operational requirements. A reference list for this to be furnished with the offer with details for supplies during last 5 years.

12. **Delivery Period**

The delivery, Ex-works factory, should not exceed 8-10 weeks from date of PO. Supplier to indicate delivery in the offer.

13. **Offer & Prices**

Offer should be given in two-bid system as per BHEL standard purchase procedures

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

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

Shall contain all technical & commercial offers with respect to requirement of specification. Any deviation from the specification/commercial terms & condition shall be clearly mentioned in clause wise comments. No deviation shall be acceptable for make of items specified. Techno-commercial bid to be submitted in a separate sealed envelope clearly mentioning "TECHNICAL BID" and "ENQUIRY NO....."



on the envelope. In case bidder is not manufacturer then Bidder to produce manufacturer authorization certification for marketing their products (Distributorship / Channel Partner authorization from OEM) along with technical bid.

13.2 Part B – Price Bid

In price bid, supplier shall item wise price as per BHEL enquiry.

Price bid to be submitted in a separate sealed envelope clearly mentioning "PRICE BID" and "ENQUIRY NO....." on the envelope.

Both Techno-commercial bid envelope and Price bid envelope to be submitted in BHEL tender room before specified time and date as per BHEL purchase procedures. Price bid of only qualified bidders shall be opened after settlement of techno-commercial portion of the un-priced bid (after scrutiny of un-priced offer).

BHEL standard purchase procedures shall be applicable for the tendering system.

Prices should be quoted as below:

- (a) The price should be quoted for delivery to CRX BHEL Bhopal.
- (b) No extra charges shall be payable for Packing & forwarding.
- (c) All prices should be fixed prices. No Price variation clause is acceptable.
- (d) All applicable taxes and duties to be mentioned separately.

Note : Due to electrical compatibility requirement and socket board design features all items (All ratings of plugs and sockets) of same make shall be procured. Each individual vendor to offer same/single make for all ratings and compatible plugs and sockets. Prices shall be compared on total package value offered by individual vendor.

14. Packing

All items should be individually packed in sturdy hard board or suitable packing and should be capable of withstanding inland freight conditions up to 55° C and 100% humidity. Packing shall be done to ensure no damage to equipment can occur during freight, handling and storage.

All packs should have item identification slip pasted on the box with BHEL style code & PO No.

