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Copy Right And Confidential The Information On This Document Is The Property Of Bharat Heavy Electricals Limited . It Must Not Be Used Directly Or Indirectly In Any Way		PURCHASE SPECIFICATION FOR DC Field discharge circuit breaker & AC Bar mounted power contactors			
		Revision: 00		Reviewed by: <u>R. Rukmani</u>	
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				Date 19/11/2020	



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1.0 General:

This purchase specification is for DC field discharge circuit breaker and AC power contactors used in excitation systems, both of which are bar mounted & mechanical latched type.

The above breakers / contactors are to be closed using 'closing coil' and opened using a separate 'tripping coil' supplied as part of the breaker / contactor. Suitable DC supply voltage is extended for the operation of these coils.

When closing command is issued, these breakers / contactors are switched on by electro-magnetic force from closing coil and retained in closed position by a mechanical latch. When the latch is released by trip coil, the breaker is thrown open. The circuit breaker shall also have auxiliary contacts to report the status.

Arc chute for poles for quenching arc as required.

Closing time < 300ms,

Opening time < 100ms,

DC Field discharge breaker:

The DC Field discharge circuit breaker is used to connect or disconnect the synchronous machine field from excitation equipment. It shall be capable of disconnecting the highly inductive synchronous machine field under the condition of a 3-phase short-circuit during full load operation at the machine stator terminals.

In addition to its main contacts (NO), the DC field discharge circuit breaker also has a de-excitation contact (NC) with which, the stored magnetic energy in the synchronous machine field, can be dissipated across the de-excitation resistor. The breaker shall be "make before break" type. The de-excitation contact closes shortly before the main contacts open so as to ensure proper commutation of the field current from the main contacts to the de-excitation contact when the breaker is switched off.

Overlapping time of rupturing pole and main pole during opening minimum 3ms.

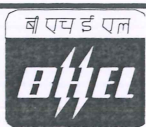
AC Bar mounted power contactor :

AC Bar mounted 3 pole power contactors are also mechanically latched & used for controlling power circuits of excitation.

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Copy Right And Confidential The Information On This Document Is The Property Of Bharat Heavy Electricals Limited. It Must Not Be Used Directly Or Indirectly In Any Way		2.0 INTENT OF PURCHASE SPECIFICATION 2.1 This purchase specification is intended to specify the requirements of Type and Routine tests of contactors / breakers, packing for Safe Delivery of items at BHEL-EDN. 2.2 The supplier shall confirm in writing, the complete compliance with the technical specification. If there are any queries regarding specification, it is supplier's responsibility to get the same clarified from the purchaser before submitting the offer. 2.3 Suppliers shall be fully responsible for the supplied item for its completeness, safe and satisfactory operation. 2.4 Item supplied shall be of proven quality both with respect to design and materials. Prototype items shall not be offered or supplied. The item shall have well proven system records.		

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Copy Right And Confidential The Information On This Document Is The Property Of Bharat Heavy Electricals Limited. It Must Not Be Used Directly Or Indirectly In Any Way			3.0 SCOPE OF SUPPLY 3.1 Quantity of Field breaker / contactor as per purchase order. 3.2 For every five numbers of contactor / breaker one no. of spare Closing coil and one no. of spare Tripping coil shall be supplied. 4.0 SUPPLIER DOCUMENT REQUIREMENT SCHEDULE 4.1 BIDDING STAGE Supplier shall provide the following information along with the offer. Bids without detailed and point wise compliance statement / documents required, will not be considered for further processing. i) Compliance to this specification and description in the Request For Quotation. List of deviations, if any, clause number-wise with reasons thereof, wherever applicable shall be clearly brought out. ii) Technical Data sheets, mechanical dimensional drawings, internal wiring diagrams 4.2 AFTER PLACEMENT OF PURCHASE ORDER Supplier shall submit following drawings/documents to purchaser on placement of purchase order for information. i) Document containing details of items provided for prevention of transit damage, which are to be removed before use. These items shall also be properly identified on the breaker / contactor. ii) Precautions for safety of personnel and equipment during handling, mounting, supporting, testing, operation and maintenance. iii) Document which is part of Operation and Maintenance manual shall contain various gaps / clearances which ensure proper operation of the breaker/ contactor. iv) Bill Of Material with part numbers for all spares for future ordering when required. v) Document not specifically mentioned, but required, as per manufacturer.	

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Copy Right And Confidential The Information On This Document Is The Property Of Bharat Heavy Electricals Limited. It Must Not Be Used Directly Or Indirectly In Any Way			5.0 Tests to be conducted: Routine and type tests shall be conducted as per IS/IEC 60947-1, IS/IEC 60947-4-1 or equivalent standard. 5.1 DC field discharge breaker : 5.1.1 Routine tests (to be conducted on each item & reports to be submitted before dispatch for dispatch clearance) 1. Mechanical adjustment for 100% alignment of contacts and adjustments required for proper retention of position. Measured gap values shall be indicated in the report. 2. Dielectric test 3. Functional test a) closing time b) opening time c) overlapping time (make before break) 4. Operation at different control voltage levels a) Rated control voltage (for example 220VDC) b) Rated control voltage +10% c) Rated control voltage -15% 5. Measured values of Closing coil and Tripping coil resistances (also economy resistor if applicable). 5.1.2 Type tests (Reports of similar rating breaker to be submitted along with offer) 1. Dielectric test 2. Temperature rise test 3. Short time current test on main contacts and discharge contact 4. Interrupting test on main contacts 5. Making current test on discharge contact 6. Endurance test	



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5.2 AC Bar mounted power contactors:

5.2.1 Routine tests (to be conducted on each item & reports to be submitted before dispatch for dispatch clearance)

1. Mechanical adjustment for 100% alignment of contacts and adjustments required for proper retention of position. Measured gap values shall be indicated in the report.
2. Dielectric test
3. Functional test
 - a) closing time
 - b) opening time
4. Operation at different control voltage levels
 - a) Rated control voltage (for example 220VDC)
 - b) Rated control voltage +10%
 - c) Rated control voltage -15%
5. Measured values of Closing coil and Tripping coil resistances (also economy resistor if applicable).

5.2.2 Type tests (Reports of similar rating power contactors to be submitted along with offer)

1. Dielectric test
2. Temperature rise test
3. Short time current test on main contacts
4. Endurance test

6.0 BUSBAR TINNING

Minimum coating of Tin thickness shall be 13 microns.

Finish : bright without black patches.

7.0 PACKING

The contactors / breakers shall be properly packed to ensure that there are no damages / dislocation of parts during transit.

8.0 ACCEPTANCE CRITERIA

1. Despatch clearance by purchaser after verification of routine test reports submitted.
2. On receipt of item at BHEL-EDN final acceptance will be by quality services of purchaser, verifying the conformance of item to this purchase specification and Inspection of item as per specification / drawings / documents at purchaser's works.