BSES

TECHNICAL SPECIFICATION

OF

MOULDED CASE CIRCUIT BREAKER (MCCB) WITH ENCLOSURE

Specification no – BSES-TS-153-MCCB-R0

Rev:		0
Date:		14-Sep-2023
Prepared by	Abhishek Vashistha	
	Naved Ahmad	
	Rohit Patil	
Reviewed by	Puneet Duggal	
	Amit Tomar	
Approved by	Gaurav Sharma	
	Gopal Nariya	

BSES

TECHNICAL SPECIFICATION

OF

MOULDED CASE CIRCUIT BREAKER (MCCB) WITH ENCLOSURE

Specification no – BSES-TS-153-MCCB-R0

Rev:		0
Date:		14-Sep-2023
Prepared by	Abhishek Vashistha	
	Naved Ahmad	
	Rohit Patil	
Reviewed by	Puneet Duggal	
	Amit Tomar	
Approved by	Gaurav Sharma	
	Gopal Nariya	

Index

1.0 Scope of supply

Design, Manufacture, Testing at manufacturers works before dispatch, Packing, Material Delivery at BSES Stores and submission of documents to purchaser

2.0 Codes & standards

The equipment shall conform to the specification and latest revision of all of the following standards with latest amendments –

Sl No	Standard no	Title
2.1	IS/IEC 60947-2	Low-Voltage Switchgear and Control gear Part 2 - Circuit-Breakers
2.2	IS 13947 (Part 5/Sec 2) / IEC 60947-5-2	Low-voltage switchgear and control gear — specification part 5 control circuit devices and switching elements

3.0 Service condition

MCCB shall be designed to work for following conditions –

3.1	Supply voltage	3 phase – neutral, AC 415 volt
3.2	Supply frequency	50 Hz
3.3	Location	Indoor
3.4	Pollution	High corrosive dust
3.5	Humidity	90% maximum
3.6	Ambient temperature	Average 45^0 C, Maximum 50^0 C

4.0 Guaranteed Technical Particulars of MCCB & Enclosure

Sl No	BSES Requirement		Vendor Data
4.1	**MCCB Design Particulars**		
4.1.1	Offered MCCB Make & Model	Vendor to specify	
4.1.2	Current Rating at 40 Deg C	100 A with following configuration a. Three Pole b. Four Pole	
4.1.3	MCCB Configuration	The MCCBs shall comprise of Three/ Four poles in a single construction with in-built microprocessor release	
4.1.4	Rated Voltage	415V	

Sl No	BSES Requirement		Vendor Data
4.1.5	Rated Frequency	50 Hz	
4.1.6	Protection Classification	Protection shall be provided in all poles including neutral pole	
4.1.7	Method of cable Connection &Terminals arrangement	a. MCCB Terminals shall be provided with Spreader type extension links with Phase barriers suitable for installation of cable with aluminium Lug. b. Finger touch proof Shrouded cover shall be provided on Terminals	
4.1.8	Indications	a. MCCBs shall be provided with mechanical position indicator. b. MCCB's shall have ON/OFF/trip positions.	
4.1.9	MCCB ingress protection (without enclosure)	IP2X minimum	
4.1.10	MCCB Installation Position	Horizontally mounted in Enclosure	
4.1.11	Rated insulation voltage at 50 Hz	1000 V	
4.1.12	Rated impulse withstand voltage	8 kV	
4.1.13	Short circuit breaking current capacity (Icu)	50 kA	
4.1.14	Service Short circuit capacity (Ics)	50 kA	
4.1.15	Rated short term withstand current for 1 sec at rated voltage – (Icw)	50 kA	
4.1.16	Rated making current capacity (Icm)	Icm = 220% Icu	
4.1.19	BIS certification & CML No.	To be marked on MCCB	
4.1.20	Marking on each MCCB	As per clause 5 of IS: 13947 Part-1	
		'BSES' mark with indelible ink	
		Month & year of manufacture, P.O. no.	
4.1.21	MCCB terminals suitable for cable size	Suitable for minimum 50 sq.mm Aluminum conductor	
4.1.22	MCCB mounting	On surface mounting, bolted type, Horizontal	
4.1.23	MCCB ingress protection	IP20 minimum	
4.1.24	Line load reversibility	Required	

Sl No	BSES Requirement		Vendor Data
4.1.25	Guaranteed number of Electrical operations	Vendor to specify	
4.1.26	Guaranteed number of Mechanical operations	Vendor to specify	
4.1.27	Pollution Category as per IS/IEC 60947	Category 3	
4.1.28	Protection Requirement		
4.1.28.1	Microprocessor release	a. Release shall be in built type along with MCCB b. Microprocessor based release with true RMS based sensing. c. Self-powered, tapped from incoming side of supply, setting panel with locking arrangement d. Separate fault indication shall be provided for each protection stage i.e overload, short circuit and earthfault	
4.1.28.2	Electrical Protection	Overload, Short Circuit & Earth fault	
4.1.28.3	Tripping characteristic	Inverse definite minimum time characteristics for Short circuit and earth fault protection	
4.1.28.4	Overload setting	40% -100% In, steps of 10%.	
4.1.28.5	Overload setting time delay	2.5 s to 40 s minimum three settings	
4.1.28.6	Short Circuit Setting	100% - 800% of In, steps of 10%.	
4.1.28.7	Short Circuit Setting time delay	50 ms - 400 ms in steps of 50ms	
4.1.28.8	Instantaneous setting	200% - 1500% of In & OFF	
4.1.28.9	Earth fault setting	10- 100 % of In, steps of 10%	
4.1.28.10	Earth fault setting time delay	50ms - 400 ms in steps of 50ms	
4.1.28.11	Neutral unbalance	Earth fault function should not operate during neutral unbalance. Same will be verified during inspection.	
4.2	**MCCB enclosure box Design Particulars**		
4.2.1	Enclosure Material	S3S grade of SMC as per IS 13410 with flammability level FV0 (as per IS 11731 Part 2)	
4.2.2	MCCB Mounting provision in enclosure	On surface Horizontal Mounting	
4.2.3	Provision of Cable Entry	Both incoming and outgoing cables shall enter in enclosure from bottom only.	
4.2.4	Enclosure Dimensional clearances	Most Compact enclosure dimension shall be preferred.	
A	Cable Entry gland plate to MCCB bottom	80 mm minimum	

Sl No	BSES Requirement		Vendor Data
B	MCCB Left terminal to enclosure Left side wall	80 mm minimum	
C	MCCB Right Terminal to enclosure Right side wall	80 mm minimum	
D	MCCB top to enclosure Top wall	15 mm	
4.2.5	Enclosure overall Dimensions		
A	Length	Vendor to specify	
B	Width	Vendor to specify	
C	Depth	Vendor to specify	
D	Base thickness	3 mm (min)	
E	Cover thickness	2 mm (min)	
4.2.6	Overall weight of enclosure including MCCB	Vendor to specify	
4.2.7	GI Gland Plate	Required, 2 mm thickness	
4.2.8	Gland	Two nos. of Elbow shaped glands made out of Polyamide nylon-66 suitable for incoming & outgoing aluminium armoured cable shall be provided on both cable entries in the box.	
4.2.9	Degree of ingress protection	IP55 for MCCB enclose box	
4.2.10	MCCB Position Indication and Operation feasibility when enclosure is closed & sealed	Required by Transparent Polycarbonate flap, screwed on enclosure cover - for Operation of MCCB - for MCCB Position indication	
4.2.11	Enclosure sealing provision	With 2 no's U - flange with sealing provision	
4.2.12	Enclosure mounting provision	4 no's M8 size fasteners to be provided with enclosure for mounting	
4.2.13	Base-cover fixing arrangement	The box shall have concealed / internal hinges (minimum 2 no's) not visible or accessible from outside the box.	
4.2.15	Sample submission	Sample of all type of offered MCCB with enclosure shall be submitted during Technical Bid evaluation along with bid. No deviation shall be acceptable in this regard.	
4.2.16	GTP & Drawing Submission	GTP & Drawing of all type of offered MCCB & Enclosure shall be submitted separately for review during Technical evaluation	

5.0 Testing & inspection

MCCB & Enclosure shall have following features –

5.1	Type test	Only type tested MCCB & Enclosure shall be accepted
5.2	Type Tests reports as per IS/IEC-60947-5-2	To be submitted by vendor
	Test reports from CPRI/ ERDA or NABL accredited laboratory only acceptable	
5.3	Type test report validity	Type test report of MCCB & Enclosure shall remain valid till there is no design change in the offered design
5.4	Inspection test witness by purchaser	On samples selected from lot
5.5	Acceptance & routine test	As per relevant IS /IEC on each lot
5.6	Inspection by Purchaser	On 15 days advance notice

6.0 Packing & delivery

MCCB packing & delivery shall have following features –

6.1	Packing protection	Against shocks, vibration & corrosion
6.2	Packing identification labels as per IS/IEC 60947-5-2	To show purchaser name, P.O. number, Quantity of MCCB,MCCB type, Manufacturer serial number
6.3	Handling instruction	To be marked on packing boxes
6.4	Direct delivery from manufacturer to purchaser store to avoid transitional adulteration	Assurance scheme to be submitted by manufacturer

7.0 Documentation

Document/Drawing submission shall be as per the matrix given below:

a) All documents/drawings shall be provided in soft copy only.
b) Language of the documents shall be English only.
c) Incomplete submission shall be liable for rejection.
d) Document check sheet compliance shall be the first sheet for each submission stage i.e. Technical bid, Drawing Approval, Pre Dispatch, Pre closure.
e) No submission is acceptable without check list compliance.
f) Order of documents shall be strictly as per the check list.
g) Any drawing not included in the below table but necessary for detailed engineering shall be deemed to be included in bidder's scope.

S#	Description	Technical Bid	Drawing Approval	Pre-Dispatch	Pre-Closure
7.1	Tender No.	Required			
7.2	Communication Details				
7.2.1	Name of the Bidder	Required			
7.2.2	Name of Authorized contact person	Required			
7.2.3	Contact No. of Authorized contact person	Required			
7.2.4	E-mail id of Authorized contact person	Required			
7.3	Document Submission Format				
7.3.1	Index of documents with page numbers for each document	Required			
7.3.2	Separator with document description shall be provided before each document	Required			
7.4	Qualifying Requirement Compliance				
7.4.1	Summary of compliance of qualifying criteria in tabular form along with summary of documentary proof provided	Required			
7.4.2	Detailed Documents supporting compliance of qualifying criteria	Required			
7.5	Drawings/ Documents as per Technical Specification				
7.5.1	Signed copy of technical specification	Required			
7.5.2	Type Test reports of offered model/ type/ rating	Required	Required		
7.5.3	Deviation Sheet	Required	Required		
7.5.4	Detailed Drawings	Required	Required		

S#	Description	Technical Bid	Drawing Approval	Pre-Dispatch	Pre-Closure
7.5.5	Other documents mentioned in technical specification	Required	Required		
7.5.6	Design Calculation		Required		
7.5.7	Manufacturer's Quality Assurance Plan		Required		
7.5.8	GTP & Drawing		Required		
7.5.9	Inspection Reports			Required	
7.5.10	As manufacturing Drawings			Required	
7.5.11	Operation and Maintenance Manual			Required	
7.5.12	As built Drawings				Required
7.6	Soft Copy of complete documentation as mentioned above	Required	Required	Required	Required