



KINGDOM OF CAMBODIA

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ELECTRICITE DU CAMBODGE

TECHNICAL SPECIFICATION

EDC-DTS-ME002

MOLDED CASE CIRCUIT BREAKERS

MCCB

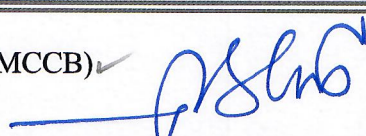
December 2021

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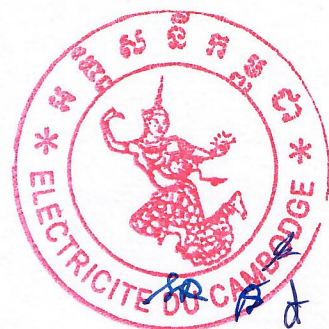




ELECTRICITE DU CAMBODGE

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EDC-DTS-ME002-Molded Case Circuit Breakers MCCB

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Le
MCCB



MOLDED CASE CIRCUIT BREAKERS

MCCB

1 Scope

This specification covers the design, manufacturing, testing, supply, delivery and performance requirements of Molded Case Circuit Breakers (MCCB) to be used on the LV Power Distribution networks of Electricité Du Cambodge (EDC) with a life expectancy of 30 years without any maintenance.

2 Standards

IEC : International Electro technical Commission

IEC 60947-1 Low-voltage switchgear and control gear - Part 1: General rules

IEC 60947-2 Low-voltage switchgear and control gear - Part 2: Circuit-breakers

IEC 60664 Insulation coordination for equipment within low-voltage systems - ALL PARTS

IEC 61000-4-1 Electromagnetic compatibility (EMC) - Part 4-1: Testing and measurement techniques

IEC 60068-2 Environmental testing

ISO : International Standard Organization

ISO/IEC 17025 : General requirements for the competence of testing and calibration laboratories

ISO 9001 : Quality management systems – Requirements

Unless if standard year is specified, the latest version and all amendments of the above standards apply.

The supplier may propose alternative standards, provided it is demonstrated that they give an equivalent degree of quality as the referenced standard. Acceptability of any alternative standard is at the discretion of the EDC.

3 Definitions

The definitions of the relevant IEC, and ISO standards apply to this technical specification.

4 Testing and inspection

4.1 General Notes for Test

Molded case circuit breakers may be inspected at the manufacturer's factory by EDC's representatives.

The inspection and routine tests shall be carried out in accordance with the provisions of the relevant IEC recommendations.

Molded case circuit breakers shall be subjected to tests as specified below.



4.2 Type Tests

All type tests required by the IEC 60947-2 specification shall be carried out.

Type test shall be carried out by internationally recognized electrical testing laboratories.

Full copies of type test reports shall be submitted within the bid of the manufacturer/supplier. Type test reports older than 10 years will not be accepted.

If the manufacturer is certified by EDC, it is not necessary to submit type test reports for the considered equipment.

Nevertheless, in case the testing laboratory is not internationally recognized, the testing laboratory shall be mandatorily accredited ISO/IEC 17025 by an international or national accreditation body specialized in testing laboratories accreditation/acceptance. In that case, the testing laboratory shall prove mandatorily its capability/capacity to carry out all type tests mentioned in the type tests reports by supplying: Full description of all tests the laboratory can carry out, list of testing equipment with full characteristics, drawing of testing rooms with location of testing equipment, ...etc, supported by pictures and copy of the ISO/IEC 17025 accreditation certificate.

Acceptability of any accredited testing laboratory is at the discretion of the EDC.

4.3 Routine Tests

The routine tests requested by IEC 60947-2 standard shall be carried out on all accessories. Routine test reports shall be sent to EDC prior the shipment for EDC acceptance and attached to the equipment.

4.4 Acceptance Tests

Acceptance tests shall consist of routine tests requested by IEC 60947-2 witnessed by EDC.

5 Quality Management

Design, development and production of the proposed equipment shall be ISO 9001 certified. The ISO 9001 certificate shall be submitted within the bid.

6 Ambient conditions

MCCB shall be suitable to operate in the ambient conditions described here after, when installed in a cabinet:

Altitude	Sea level to 1,000 meters
Climate	Tropical
Annual Rainfall	1,300 mm.140 days
Monsoon Period	June to November
Ambient Air Temperatures:	
Average	27.5°C
Minimum	13.3°C
Maximum	40.5°C
Relative Air Humidity	65-100%



Soil Thermal Resistivity:	
Average	1.20c m/W
Maximum	3.00c m/W
Solar Emissivity	0.8
Solar absorption	0.8
Wind Velocity:	
Average	37 km/h (10.3 m/s)
Maximum	72 km/h (20 m/s)

7 Electrical system

The molded case circuit breakers shall be designed for continuous operation on a 3 phase, 4 wires, 230/400 volts, +10%, -10%, 50 Hz, multiple neutral-earthed distribution network TT systems.

8 Design and construction

8.1 General

MCCB shall be used on big LV consumer metering system in order to limit the load and protect the distribution network as well as protect the consumer from any short circuit arising on the consumer distribution system.

All circuit breakers shall be designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined overcurrent.

They shall be used also for shutting down the power in case of the consumer does not pay electricity bill. For that purpose, thanks a MCCB accessory supplied separately, the operating MCCB lever shall be lockable in open position with a standard 6 or 8 mm padlock.

8.2 MCCB type

They shall be of 4 wires with 4 protected poles (4P) MCCB.

For specific application, as per example a customer who want to use a TN scheme in its own distribution system (small factory), 3 wires with 3 protected poles could be provided.

8.3 Rated Voltages

Service voltage	380/415 V
rated operational voltage Ue	415 V
rated insulation voltage Ui	690 V
rated impulse withstand voltage Uimp	6000 V



8.4 Rated Currents

The following rated currents MCCB according normal IEC standard currents range shall be provided:

AMPERES (In)													
80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600

Nevertheless, as most of MCCB range manufactured in Asia differs from that IEC range the following rated current will be accepted:

IEC normal current	Accepted current	Mandatory Condition
80 A	100A	Fitted with adjustable tripping unit allowing setting at 80 A
315 A	300 A	No condition
	320 A	No condition
	350 A	Fitted with adjustable tripping unit allowing setting at 315 A
1250 A	1200 A	No condition

8.5 Utilization category

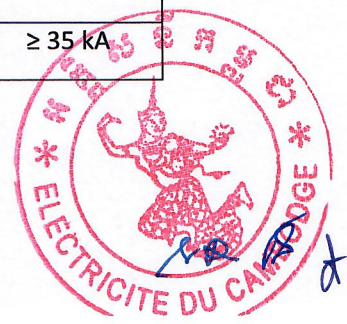
MCCB of less than 315 A shall be of utilisation **category A** as defined by IEC 60947-2.

MCCB of 315 A and more shall be either of utilisation **category A or B** as defined by IEC 60947-2.

8.6 Breaking capacity

The ultimate breaking capacity (Icu) and service breaking capacity (Ics) for each kind of MCCB shall be:

Rated current (A)	Ultimate breaking capacity (Icu) AC 380/415 V 50Hz	Service breaking capacity (Ics)	
		% Icu	kA
80	25 kA	100 %	25 kA
100	25KA	100 %	25KA
125	25kA	100 %	25kA
160	25 kA	100 %	25 kA
200	25 kA	100 %	25 kA
250	25 kA	100 %	25 kA
300 to 350	35 kA	100 %	35 kA
400	35 kA	100 %	35 kA
500	50 kA	≥ 70 %	≥ 35 kA
630	50 kA	≥ 70 %	≥ 35 kA
800	50 kA	≥ 70 %	≥ 35 kA



1000	85 kA	50 %	42.5 kA
	70 kA	70 %	35 kA
	50 kA	100 %	50 kA
	Other Icu and Ics may be proposed provided Ics value ≥ 40 kA		
1200 and 1250	85 kA	50 %	42.5 kA
	70 kA	70 %	49 kA
	50 kA	100%	50 kA
	Other Icu and Ics may be proposed provided Ics value ≥ 40 kA		
1600	85 kA	50%	42.5 kA
	70 kA	70 %	49 kA
	50 kA	100%	50 kA
	Other Icu and Ics may be proposed provided Ics value ≥ 40 kA		
Important Note: Icu and Ics are subject to modifications in the future under EDC request.			

8.7 Operational performance capability

The Operational performance capability cycle shall be conformed to the following requirements as per requirement of IEC 60947-2:

Rated Current (*)	Nb of operating cycles per hour (**)	Number of operating cycles		
		Without current	With current (***)	Total
≤ 100	120	8500	1500	10000
$100 \leq I_n \leq 315$	120	7000	1000	8000
$315 < I_n \leq 630$	60	4000	1000	5000
$630 < I_n \leq 2500$	20	2500	500	3000

(*): This means the maximum rated current for a given MCCB frame size.

(**): Column 2 gives the minimum operating rate. This rate may be increased with the consent of the manufacturer; in this case the rate used shall be stated in the test report.

(***): During each operating cycle, the circuit-breaker shall remain closed for a sufficient time to ensure that the full current is established, but not exceeding 2 s.

8.8 Isolation function

MCCB shall be Suitable for isolation with positive contact indication as defined in IEC 60947-2 standard. The isolation position shall correspond to the O (OFF) position.



The operating handle cannot indicate the OFF position unless the contacts are effectively open. Padlocking accessory cannot be installed unless the contacts are open.

8.9 Degree of protection

The degrees of protection of MCCB shall be IP (IEC 60529): 20 for the full MCCB including terminals.

8.10 Design

8.10.1 General

A standard MCCB base (or frame) is be designed to receive different trip units.

They may be mounted vertically, horizontally or flat on their back without any derating of characteristics. All poles shall operate simultaneously for circuit breaker opening, closing and tripping.

Insulated parts of the MCCB shall be made of a suitable reinforced plastic material which has in addition, a high resistance to solar radiation.

Any current carrying parts shall be of non-ferrous metal adequate for the rated current capacity. Padlocking facilities accessory should be available as option and spare to lock the breaker in the open position.

MCCB shall have the following characteristics:

- Designed of the one piece type, be removable and be interchangeable,
- The manual activator (lever) shall have 2 positions: On and Off.
- The colour identification for lever position or position indicator shall be:
 - Red for ON position
 - Green for OFF position
- In addition to the "on" and "off" positions, includes a third "tripped" position and the mechanism shall be of the trip free type.
- MCCBs shall be equipped with a "Push to trip" button in front face to test operation and the opening of the poles.

8.10.2 Tripping unit

8.10.2.1 Thermo-magnetic trip unit from 80 to 200 A

Theses trip units shall offer:

- Fixed magnetic and thermal protection for current ratings up to 200 A with exception of 100 A MCCB used as 80 A MCCB that must be fitted with adjustable tripping unit (see 8.4).
- Neutral protection shall be ensured in case of four poles MCCB. The tripping threshold shall be equal to that of the phases

8.10.2.2 Tripping units from 250A to 1600A

MCCB shall be equipped as a minimum with a fix magnetic and thermal trip unit with exception of 350 A MCCB used as 315 A MCCB that must be fitted with adjustable tripping unit (see 8.4).

Adjustable tripping units (either electronic or magnetic/thermal) are accepted provided the tripping setting being protected by a **sealable cover**.

The neutral protection shall be ensured. The neutral tripping threshold shall be equal to that of the phases



8.11 Connections

Each MCCB shall be delivered to be front connected on copper bus bar or copper palm lugs. They shall be fitted with all necessary terminal bolts or nuts and four insulation barriers to be installed upstream. Bolts on MCCB terminals and insulation barriers shall be provided mandatorily from MCCB manufacturer origin.

MCCB with a rated current from 125 A and more shall be equipped with extension Flat terminal bars made of copper with a cross section and holes according the MCCB rated current. As bolts and insulation barriers, the extension terminal bars shall be provided mandatorily from MCCB manufacturer origin.

8.12 Accessories

Necessary Fixing screws or complete fixing device as well as extension operation lever or rotating lever for MCCB with a rated current from 250 A and more shall be supplied.

8.13 Marking

Marking of MCCB shall be as follow:

- Brand name or Manufacturer's Name
- Model reference
- Standard
- Utilization category
- Operating voltage
- Rated current
- Breaking capacity
- And all other information requested by the IEC 60947-2

8.14 Delivery

MCCB shall be delivered in individual card box and on a suitably protected pallet.



9 Technical data sheets

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EDC-DTS-ME002-Molded Case Circuit Breakers MCCB

			1250 <input type="checkbox"/>	<input type="checkbox"/>
			Or 1200	<input type="checkbox"/>
			1600 <input type="checkbox"/>	<input type="checkbox"/>
9	Four wire MCCB		Mandatory	
10	MCCB Type		4 protected poles	
11	Utilisation category for MCCB less than 315 A		A	
12	Utilisation category for MCCB of 315 A and more		A or B	A <input type="checkbox"/> B <input type="checkbox"/>
13	Service voltage	V	380/415 V	
14	rated operational voltage Ue	V	415	
15	rated insulation voltage Ui	V	690	
16	Rated impulse withstand voltage Uimp	kV	6	
17	Minimum Ultimate breaking capacity (Icu) AC 380/415 V 50Hz	kA	80A: 25 kA	
			100A: 25KA	
			125A: 25kA	
			160A: 25 kA	
			200A: 25 kA	
			250A: 25 kA	
			300 to 350A: 35 kA	
			400A: 35 kA	
			500A: 50 kA	
			630A: 50 kA	
			800A: 50 kA	
			1000A: 85 kA, 70 kA or 50kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/> 50kA <input type="checkbox"/> Other
			1200A and 1250A: 85 kA, 70 kA or 50 kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/>



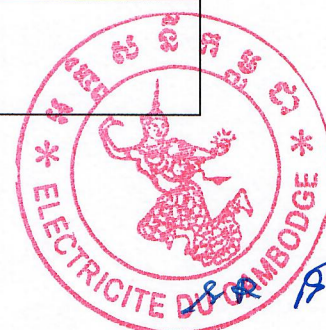
EDC-DTS-ME002-Molded Case Circuit Breakers MCCB

				50kA <input type="checkbox"/> Other:	
			1600A : 85kA, 70 kA or 50 kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/> 50kA <input type="checkbox"/> Other	
18	Minimum Service breaking capacity (Ics)	% Icu kA	80A: 100% so \geq 25 kA	% Icu	Value kA
			100A: 100% so \geq 25 kA		
			125A: 100% so \geq 25 kA		
			160A: 100% so \geq 25 kA		
			200A: 100% so \geq 25 kA		
			250A: 100% so \geq 25 kA		
			300 to 350A: 100% so \geq 25 kA		
			400A: 100% so \geq 35 kA		
			500A: 70% so \geq 35 kA		
			630A: 70% so \geq 35 kA		
			800A: 70% so \geq 35 kA		
			1000A:	% Icu	Value kA
			50% if Icu= 85 kA	<input type="checkbox"/> 50%	.....
			70% if Icu= 70 kA	<input type="checkbox"/> 70%	.....
			100% if Icu= 50kA	<input type="checkbox"/> 100%	.....
			Ics \geq 40 kA in any case	<input type="checkbox"/> Other	.....
			1200A and 1250A:	% Icu	Value kA
			50% if Icu= 85 kA	<input type="checkbox"/> 50%	.....
			70% if Icu= 70 kA	<input type="checkbox"/> 70%
			100% if Icu= 50kA	<input type="checkbox"/> 100%
			Ics \geq 40 kA in any case	<input type="checkbox"/> Other
			1600A	% Icu	Value kA



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			50% if I _{cu} = 85 kA 70% if I _{cu} = 70 kA 100% if I _{cu} = 50kA I _{cs} ≥ 40 kA in any case	<input type="checkbox"/> 50% <input type="checkbox"/> 70% <input type="checkbox"/> 100% <input type="checkbox"/> Other
19	Operational performance capability: 80A MCCB	C/O cycle	10000		
19a	Operational performance capability: 100A, 125A, 160A, 200A, 250A and 300/315 A MCCB	C/O cycle	8000		
19b	Operational performance capability: 320A, 350A, 400A, 500A and 630A MCCB	C/O cycle	5000		
19c	Operational performance capability: 800A, 1000A, 1200A, 1250A and 1600A MCCB	C/O cycle	3000		
20	Positive contact indication as defined in IEC 60947-2 standard. The isolation position shall correspond to the O (OFF) position.		Mandatory		
21	Minimum degree of protection full MCCB		IP (IEC 60529): 20		
22	MCCB may be mounted vertically, horizontally or flat on their back without any derating of characteristics.		Mandatory		
23	All poles operate simultaneously for circuit breaker opening, closing and tripping.		Mandatory		
24	Insulated parts of the MCCB are made of a suitable reinforced plastic material which has in addition, a high resistance to solar radiation.		Mandatory		
25	Any current carrying parts shall be of non-ferrous metal		Mandatory		



	adequate for the rated current capacity.			
26	Padlocking accessory is available as spare parts		Mandatory	
26a	Option Padlocking accessory is provided to lock the breaker in the open position		<input type="checkbox"/> Yes <input type="checkbox"/> No	
27	MCCB Designed of the one piece type, be removable and be interchangeable		Yes	
28	The manual activator (lever) has 2 positions: On and Off.		Mandatory	
29	The colour identification for lever position or position indicator is: Red for ON position Green for OFF position		Mandatory	
30	In addition to the "on" and "off" positions, includes a third "tripped" position		Yes	
31	The mechanism is of the trip free type.		Mandatory	
32	MCCBs are equipped with a "Push to trip" button in front face.		Mandatory	
33	MCCB of 250 A and more are supplied with extension operation lever		Mandatory	
	Tripping unit			
34	Thermo-magnetic trip unit from 80 to 200 A MCCB Theses trip units shall offer: • Fixed magnetic and thermal protection for current ratings up to 200 A • Neutral protection shall be ensured. The tripping		Yes Yes Exception 100A used as 80A	<input type="checkbox"/>



	threshold shall be equal to that of the phases		Yes	
35	<p>Tripping units from 250A to 1600A</p> <p>MCCB shall be equipped as a minimum with a fix magnetic and thermal trip unit.</p> <p>Adjustable tripping units (either electronic or magnetic/thermal) are accepted.</p> <p>The tripping setting is protected by a sealable cover.</p> <p>The neutral protection is ensured. The neutral tripping threshold is equal to that of the phases</p>		<p>Yes</p> <p>Exception 350A used as 315A</p> <p>To be clearly mentioned</p> <p>Mandatory</p> <p>Yes</p>	□
36	Each MCCB id delivered to be front connected on copper bus bar or copper palm lugs		Mandatory	
37	MCCB are fitted with all necessary terminal bolts or nuts		Mandatory	
38	Four insulation barriers to be installed upstream are supplied		Mandatory	
39	Bolts on MCCB terminals and insulation barrier supplied are from MCCB manufacturer origin.		Mandatory	
40	MCCB with a rated current from 125 A and more are be equipped with extension Flat terminal bars made of copper with a cross section and holes according the MCCB rated current.		Mandatory	

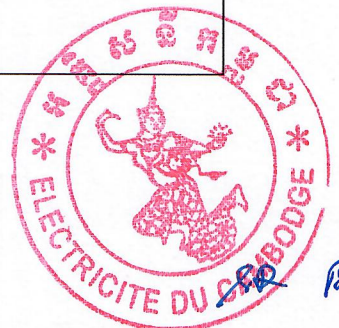


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41	Extension flat terminal bars from MCCB manufacturer origin.		Mandatory	
42	If Bolts on MCCB terminals, insulation barriers and extension terminal bars are not originated from the MCCB manufacturer, the offer shall be rejected			
43	MCCB 250 A and more are supplied with extension operation lever or rotating lever making easier the MCCB operations (O/C)		Mandatory	Extension lever <input type="checkbox"/> Rotating lever <input type="checkbox"/>
44	Fixing screws and/or complete fixing are supplied		Yes	
45	Marking Brand name or Manufacturer's Name Model reference Standard Utilization category Operating voltage Rated current Breaking capacity And all other information requested by the IEC 60947-2		Yes Yes Yes Yes Yes Yes Yes Yes	
51	Dimensions		To be specified 80 100 125 160 200 250 300/350 400 500	

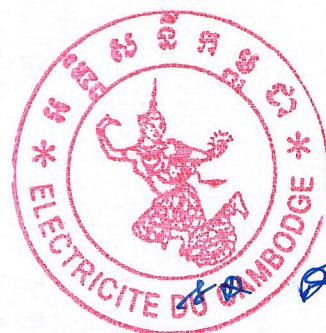


			630	
			800	
			1000	
			1200/1250	
			1600	
52	Weight		To be specified	
			80	
			100	
			125	
			160	
			200	
			250	
			300/350	
			400	
			500	
			630	
			800	
			1000	
			1200/1250	
			1600	
53	Packing		To be clearly specified	
<p>The manufacturer shall have at least 10 years' experience in manufacturing and supply of MCCB and the manufacturer shall furnish documentary evidence with the offer to prove his manufacturing experience.</p> <p>If not provided within the bid, the offer shall be rejected</p>				
<p>Deviation from the technical specification:</p> <p>The bidder shall list point after point and explain here in after all deviation from the requested technical specification.</p> <p>1/</p> <p>2/</p> <p>3/</p>				



Full technical information shall be supplied within the bid. If not, the offer shall not be considered

Bidder signature:



No.	Description	Unit	Requirements	Supplier's Offer
Supplier's offer column must be properly filled with the right figures. "Compliant, Yes, ", V , etc..." are not accepted.				
9.2 Three poles Molded case circuit breakers (customer LV TN scheme)				
1	Manufacturer Country		to be specified	
2	Manufacturer		to be specified	
3	Manufacturer's Reference		to be specified	
4	Manufacturing country		to be specified	
5	Applicable Standards		IEC 60947-1 IEC 60947-2	
6	Type tests reports		To be provided with bid	
7	Self-ignition type test report		To be provided with bid	
8	Rated Current (In)	A	80 <input type="checkbox"/> Or 100 with adjustable tripping unit 100 <input type="checkbox"/> 125 <input type="checkbox"/> 160 <input type="checkbox"/> 200 <input type="checkbox"/> 250 <input type="checkbox"/> 315 <input type="checkbox"/> Or 300, 320 300 <input type="checkbox"/> 320 <input type="checkbox"/> 350 only with adjustable tripping unit 400 <input type="checkbox"/> 500 <input type="checkbox"/> 630 <input type="checkbox"/> 800 <input type="checkbox"/> 1000 <input type="checkbox"/> 1250 <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 300 <input type="checkbox"/> 320 <input type="checkbox"/> 350 with Adjustable tripping unit <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

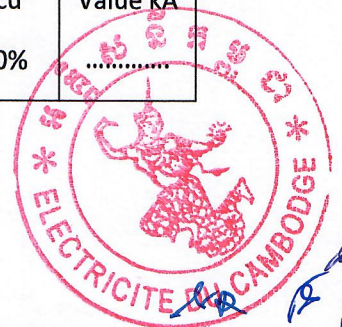


EDC-DTS-ME002-Molded Case Circuit Breakers MCCB

			Or 1200	<input type="checkbox"/>
			1600 <input type="checkbox"/>	<input type="checkbox"/>
9	Three wire MCCB		Mandatory	
10	MCCB Type		3 protected poles	
11	Utilisation category for MCCB less than 315 A		A	
12	Utilisation category for MCCB of 315 A and more		A or B	A <input type="checkbox"/> B <input type="checkbox"/>
13	Service voltage	V	380/415 V	
14	rated operational voltage Ue	V	415	
15	rated insulation voltage Ui	V	690	
16	Rated impulse withstand voltage Uimp	kV	6	
17	Minimum Ultimate breaking capacity (Icu) AC 380/415 V 50Hz	kA	80A: 25 kA	
			100A: 25KA	
			125A: 25kA	
			160A: 25 kA	
			200A: 25 kA	
			250A: 25 kA	
			300 to 350A: 35 kA	
			400A: 35 kA	
			500A: 50 kA	
			630A: 50 kA	
			800A: 50 kA	
			1000A: 85 kA, 70 kA or 50kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/> 50kA <input type="checkbox"/> Other
			1200A and 1250A: 85 kA, 70 kA or 50 kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/> 50kA <input type="checkbox"/>

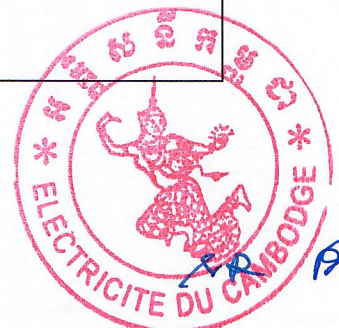


				Other:	
			1600A : 85kA, 70 kA or 50 kA	85kA <input type="checkbox"/> 70kA <input type="checkbox"/> 50kA <input type="checkbox"/> Other	
18	Minimum Service breaking capacity (Ics)	% Icu kA	80A: 100% so \geq 25 kA	% Icu	Value kA
			100A: 100% so \geq 25 kA		
			125A: 100% so \geq 25 kA		
			160A: 100% so \geq 25 kA		
			200A: 100% so \geq 25 kA		
			250A: 100% so \geq 25 kA		
			300 to 350A: 100% so \geq 25 kA		
			400A: 100% so \geq 35 kA		
			500A: 70% so \geq 35 kA		
			630A: 70% so \geq 35 kA		
			800A: 70% so \geq 35 kA		
			1000A:	% Icu	Value kA
			50% if Icu= 85 kA	<input type="checkbox"/> 50%	.....
			70% if Icu= 70 kA	<input type="checkbox"/> 70%	.....
			100% if Icu= 50kA	<input type="checkbox"/> 100%	.....
			Ics \geq 40 kA in any case	<input type="checkbox"/> Other	.....
			1200A and 1250A:	% Icu	Value kA
			50% if Icu= 85 kA	<input type="checkbox"/> 50%	.....
			70% if Icu= 70 kA	<input type="checkbox"/> 70%	.....
			100% if Icu= 50kA	<input type="checkbox"/> 100%	.....
			Ics \geq 40 kA in any case	<input type="checkbox"/> Other	.....
			1600A	% Icu	Value kA
			50% if Icu= 85 kA	<input type="checkbox"/> 50%	.....



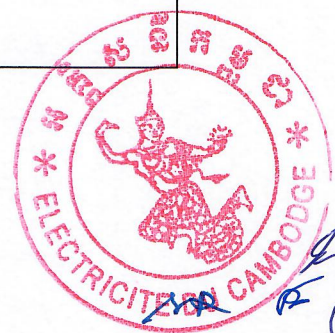
EDC-DTS-ME002-Molded Case Circuit Breakers MCCB

			70% if Icu= 70 kA 100% if Icu= 50kA Ics ≥ 40 kA in any case	<input type="checkbox"/> 70% <input type="checkbox"/> 100% <input type="checkbox"/> Other	...............
19	Operational performance capability: 80A MCCB	C/O cycle	10000		
19a	Operational performance capability: 100A, 125A, 160A, 200A, 250A and 300/315 A MCCB	C/O cycle	8000		
19b	Operational performance capability: 320A, 350A, 400A, 500A and 630A MCCB	C/O cycle	5000		
19c	Operational performance capability: 800A, 1000A, 1200A, 1250A and 1600A MCCB	C/O cycle	3000		
20	Positive contact indication as defined in IEC 60947-2 standard. The isolation position shall correspond to the O (OFF) position.		Mandatory		
21	Minimum degree of protection full MCCB		IP (IEC 60529): 20		
22	MCCB may be mounted vertically, horizontally or flat on their back without any derating of characteristics.		Mandatory		
23	All poles operate simultaneously for circuit breaker opening, closing and tripping.		Mandatory		
24	Insulated parts of the MCCB are made of a suitable reinforced plastic material which has in addition, a high resistance to solar radiation.		Mandatory		
25	Any current carrying parts shall be of non-ferrous metal adequate for the rated current capacity.		Mandatory		



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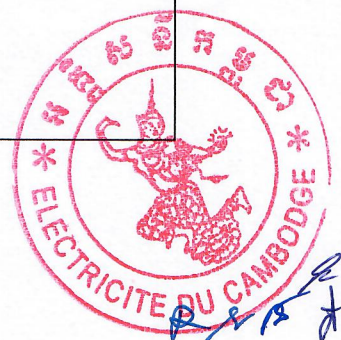
26	Padlocking accessory is available as spare parts		Mandatory	
26a	Option Padlocking accessory is provided to lock the breaker in the open position		<input type="checkbox"/> Yes <input type="checkbox"/> No	
27	MCCB Designed of the one piece type, be removable and be interchangeable		Yes	
28	The manual activator (lever) have 2 positions: On and Off.		Mandatory	
29	The colour identification for lever position or position indicator is: Red for ON position Green for OFF position		Mandatory	
30	In addition to the "on" and "off" positions, includes a third "tripped" position		Yes	
31	The mechanism is of the trip free type.		Mandatory	
32	MCCBs are equipped with a "Push to trip" button in front face.		Mandatory	
33	MCCB of 250 A and more are supplied with extension operation lever		Mandatory	
Tripping unit				
34	Thermo-magnetic trip unit from 80 to 200 A MCCB Theses trip units shall offer: • Fixed magnetic and thermal protection for current ratings up to 200 A • Neutral protection shall be ensured. The tripping threshold shall be equal to that of the phases		Yes Yes Exception 100A used as 80A Yes	<input type="checkbox"/>



35	<p>Tripping units from 250A to 1600A</p> <p>MCCB shall be equipped as a minimum with a fix magnetic and thermal trip unit.</p> <p>Adjustable tripping units (either electronic or magnetic/thermal) are accepted.</p> <p>The tripping setting is protected by a sealable cover.</p> <p>The neutral protection is ensured. The neutral tripping threshold is equal to that of the phases</p>		<p>Yes</p> <p>Exception 350A used as 315A</p> <p>To be clearly mentioned</p> <p>Mandatory</p> <p>Yes</p>	<input type="checkbox"/>
36	Each MCCB id delivered to be front connected on copper bus bar or copper palm lugs		Mandatory	
37	MCCB are fitted with all necessary terminal bolts or nuts		Mandatory	
38	Four insulation barriers to be installed upstream are supplied		Mandatory	
39	Bolts on MCCB terminals and insulation barrier supplied are from MCCB manufacturer origin.		Mandatory	
40	MCCB with a rated current from 125 A and more are be equipped with extension Flat terminal bars made of copper with a cross section and holes according the MCCB rated current.		Mandatory	
41	Extension flat terminal bars from MCCB manufacturer origin.		Mandatory	



42	If Bolts on MCCB terminals, insulation barriers and extension terminal bars are not originated from the MCCB manufacturer, the offer shall be rejected			
43	MCCB 250 A and more are supplied with extension operation lever or rotating lever making easier the MCCB operations (O/C)		Mandatory	Extension lever <input type="checkbox"/> Rotating lever <input type="checkbox"/>
44	Fixing screws and/or complete fixing are supplied		Yes	
45	Marking Brand name or Manufacturer's Name Model reference Standard Utilization category Operating voltage Rated current Breaking capacity And all other information requested by the IEC 60947-2		Yes Yes Yes Yes Yes Yes Yes	
51	Dimensions		To be specified 80 100 125 160 200 250 300/350 400 500 630 800 1000	



			1200/1250 1600	
52	Weight		To be specified 80 100 125 160 200 250 300/350 400 500 630 800 1000 1200/1250 1600	
53	Packing		To be clearly specified	
<p>The manufacturer shall have at least 10 years' experience in manufacturing and supply of MCCB and the manufacturer shall furnish documentary evidence with the offer to prove his manufacturing experience.</p> <p>If not provided within the bid, the offer shall be rejected</p>				
<p>Deviation from the technical specification:</p> <p>The bidder shall list point after point and explain here in after all deviation from the requested technical specification.</p> <p>1/ 2/ 3/</p> <p>Full technical information shall be supplied within the bid. If not, the offer shall not be considered</p> <p>Bidder signature:</p>				

