TITLE	**SPECIFICATION FOR MOULDED CASE CIRCUIT BREAKERS**	REFERENCE **CP_TSSPEC_018**	REV **7**
		DATE:	**AUGUST 2021**
		PAGE: **1**	OF **26**

COMPILED BY	FUNCTIONAL RESP	APPROVED BY	AUTHORIZED BY
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FOREWORD

Recommendations for corrections, additions or deletions should be addressed to the:

Technology Services General Manager

City Power Johannesburg (SOC) Ltd

P O Box 38766

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2016

INTRODUCTION

City Power, in accordance with international practice, utilise moulded case circuit breakers for protection of electrical appliances, human beings and control of LV circuits from electrical shocks and faults. The primary function of circuit breakers is to protect an installation or appliance against sustained overloading and short circuit faults instead of fuses. It is therefore important to ensure that MCCB's comply with the required specifications and are of acceptable quality. The implication to suppliers is that City Power will only purchase moulded circuit breakers that meet SABS standards.

1 SCOPE

This specification covers City Power's requirements for moulded case circuit breakers in accordance with SANS 556 -1 and SANS/IEC 60947-2 and the main contacts of which are intended to be connected to circuits with rated voltages not exceeding 1000 V a.c. or 1500 V d.c.

2 NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 556 -1, - 2018, *Moulded case circuit breakers*

SANS/IEC 60947-1:2015, *Low Voltage Switchgear and Controlgear Part 1: General rules*

SANS/IEC 60947- 2:2017, *Low Voltage Switchgear and Controlgear Part 2: Circuit-breakers*

3 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations contained in SANS 556-1 and SANS/IEC 60947-1 shall apply.

4 REQUIREMENTS

4.1 General

4.1.1 All live parts shall be shielded against inadvertent contact by strong covers of insulating material.

4.1.2 The design of the circuit breaker shall not endanger the safety of City Power personnel.

4.1.3 The MCCB shall comply with SANS 556-1 or SANS/IEC 60947-2 and shall bear either mark of approval.

4.1.4 City Power often mount their circuit breakers as stand-alone devices, not as part of a distribution board. MCCB design shall take this factor into account.

4.1.5 Circuit breakers shall be suitable for use at an altitude of 1800m.

4.1.6 Circuit breakers shall be suitable for use at temperatures of between 0 and 70^0 C.

4.2 Physical Characteristics

4.2.1 Terminals

4.2.1.1 The terminals shall be of robust construction and when the circuit breaker is mounted the terminals shall be accessible from the front.

4.2.1.2 The connection shall not require the use of special tools. City Power generally use lugged and bolted connections.

4.2.2 Markings

4.2.2.1 Each circuit breaker shall be legibly and indelibly marked in accordance with SANS 556-1 and/or SANS/IEC 60947-2.

4.2.2.2 The toggle position shall be clearly indicated – on, off and trip.

4.2.2.3 Terminals shall be labelled “line” and “load”, where this information is critical to the operation of the circuit breaker.

4.2.3 Physical size

The MCCB's shall be suitable for retrofitting on the City Power network. In order to give effect to this requirement they shall comply with the following approximate dimensions. The dimensions apply to the main body of the circuit breaker and the depth does not include the toggle.

SAP number	Physical Dimensions (approximate - HxWxD in mm)
954	160x110x100
5313	250x140x130
6273	250x140x130
7005	330x220x160
1291	350x 240x180
4721	250x140x130

4.3 Electrical Characteristics

4.3.1 Time delay characteristics

Time-delay circuit-breakers are required in order to allow for inrush currents and to prevent nuisance tripping.

4.3.2 D-Curves

4.3.2.1 The tenderer shall submit current-time characteristic curves for the MCCB.

4.3.2.2 A circuit-breaker having a non-adjustable time-delay release shall carry its rated current continuously without tripping, but shall release automatically, subject to the requirements of clause 4.7.4 of SANS/IEC 60947-2.

4.3.3 Fault trip indication

4.3.3.1 The circuit breaker shall default to a neutral position between the on and off position, when tripping due to overcurrent has occurred.

4.3.3.2 It shall not be possible to energise the circuit breaker by moving the toggle from the tripped position directly to the "ON" position.

4.3.4 Rated Service Short Circuit Breaking Capacity

All MCCBs shall have a rated service breaking capacity (Ics) and an ultimate breaking capacity (Icu) equal to or greater than the values stipulated for rated service breaking capacity (see point 4.3.8.2)

4.3.5 Thermal sensitivity

The MCCB rating shall be, as unaffected by ambient temperature change, as possible.

4.3.6 Energy limiting capability

Energy limiting capability is required, as opposed to zero point extinction. Graphs which show the sub-cycle interrupting capacity, as well as the joule energy let through characteristic curves, of the MCCB are required.

4.3.7 Test button

The MCCB shall be equipped with a clearly marked “push to trip” button, accessible from the front, to test operation.

4.3.8 Current ratings

4.3.8.1 The standard MCCB's shall be triple pole, and shall be adjustable, with the exception of item 3.

4.3.8.2 Rated service breaking capacity and current ratings at 415V shall be as follows:

Item number	SAP Short Description	Required Breaking Capacity	Required Rating
1	MCCB 160 - 250A TP LV 30KA	30kA	160 to 250 A (adjustable)
2	MCCB 160 - 400A TP LV 35KA	35kA	160 to 400A (adjustable)
3	MCCB 300A TP LV 35KA	35kA	300A (fixed)
4	MCCB 600 - 1000A TP LV 40KA	40kA	600 to 1000A (adjustable)
5	MCCB 800 - 1600A TP LV 45KA	45kA	800 TO 1600A
6	MCCB 280 - 400A TP LV 35KA	35kA	280 to 400A (adjustable)

4.4 Accessories

4.4.1 Flash barriers

All MCCB’s shall be supplied with interphase flash barriers of a suitable insulating material. This applies to both line and load side.

4.4.2 Arc chute covers

Where applicable MCCB’s shall be supplied with arc chute covers of a suitable material and design. This applies to MCCB's requiring this type of device.

4.4.3 Sealing facilities

The MCCB shall have facilities for sealing to prevent tampering once it has been set to the desired current rating.

4.4.4 Mounting facilities

All bolts, nuts and washers for mounting shall be provided with the circuit breaker.

4.4.5 Instructions for use

All circuit breakers shall be accompanied by clear, legible, illustrated instructions for the mounting and setting of the circuit breaker. Photocopied documents are not acceptable.

4.5 Packaging and labeling

4.5.1 Packaging shall prevent damage or deterioration of the product during transport, handling and storage.

4.5.2 The box shall be labelled with the contract number, City Power sap number, supplier name, and basic circuit breaker details. Each box shall contain the circuit breaker as well as the equipment detailed in section 4.4.

4.6 Documentation

4.6.1 Full technical and descriptive details, relating to all the items offered in this enquiry, shall be submitted so the offer can be fully evaluated.

4.6.2 The information shall include:

a) Company history.

b) Business address.

c) Contact person and details.

d) Relevant current-time curves.

e) Training details (see 6).

f) Completed Annexure C.

g) Copy of type test certificate.

h) Catalogue detailing the specific items on offer.

i) Documentation indicating energy limiting ability as specified in point 4.3.6.

5 TESTS

General

Tests shall be made to prove compliance with the requirements laid down in this standard, where applicable, and in the relevant product standard.

Tests are as follows:

5.1 Type tests

5.1.1 Circuit breakers shall be type tested as per SANS/IEC 60947-2 and/or SANS 556-1.

a) Temperature-rise

b) Tripping limits and characteristics

c) Dielectric properties

d) Operational performance capability

e) Overload performance (where applicable)

f) Short-circuit breaking capacities

g) Short-time withstand current (where applicable)

h) Performance of integrally fused circuit-breakers

i) Critical d.c. load current

5.1.2 Type test shall be made on representative samples of each particular equipment.

5.1.3 Type tests are intended to verify compliance of the design of a given equipment with this standard, where applicable, and the relevant product standard.

5.1.4 The type tests to which the equipment shall be submitted, the results to be obtained, and, if relevant, the test sequences and the number of samples, shall be specified in the relevant product standard.

5.2 Routine tests

5.2.1 Circuit breakers shall be routine tested as per SANS 60947-2 and SANS 556- 1.

a) mechanical operation

b) verification of the calibration of overcurrent releases

c) verification of the operation of undervoltage and shunt releases

d) additional tests for CBRs to Annex B

e) dielectric tests

f) verification of clearances

5.2.2 Routine tests shall be made on each individual piece of equipment manufactured to this standard, where applicable, and the relevant product standard;

5.2.3 The above tests may consist of test sequences, according to the requirements of the relevant product standard.

5.2.4 Where such test sequences are specified in a product standard, tests, the result of which are not influenced by preceding tests and have no significance for subsequent tests of a given test sequence may be omitted from that test sequence, and made on separate new samples, by agreement with the manufacturer.

5.2.5 The product standard shall specify such tests, where applicable.

5.2.6 The tests shall be carried out by the manufacturer, at his works or at any suitable laboratory of his/her choice.

5.2.7 Where appropriate, subject to specification in the relevant product standard, and to agreement between manufacturer and user, special tests may also be performed.

6 TRAINING

The supplier shall provide certified training to City Power staff on the correct installation and application of the MCCB.

7 QUALITY MANAGEMENT

A quality management plan shall be set up in order to assure the proper quality management of the moulded case circuit breakers during design, development, production, installation and servicing phases. Guidance on the requirements for a quality management plan may be found in the ISO 9001:2015. The details shall be subject to agreement between City Power and the Supplier.

8 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to assure the proper environmental management of the moulded case circuit breakers throughout its entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning and disposal phases). Guidance on the requirements for an environmental management system may be found in ISO 14001:2015 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy

9 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance of the moulded case circuit breakers during installation operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in OHSAS 18001:2007 standards. This is to ensure that the asset conforms to standard operating procedures and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier.

Annex A - Bibliography

none

Annex B - Revision information

DATE	REV. NO.	NOTES
Dec 2002	0	First issue
Sept 2004	1	4.1.4 - cb mounting details
		4.1.5 - altitude requirement
		4.2.1.2 - connection details
		4.2.3 - physical size details
		4.3.5 - ambient temperature influence
		4.3.6 - current limiting changed to energy limiting
		4.3.8.2 - info in table form, breaking capacity requirement increased
		4.3.8.3 - table shows current ratings required, 3 cb's not 1
		4.4.2 - arc chute cover requirement
		4.4.4 - mounting equipment required
		4.4.5 - instructions required
		4.6.2 - more prescriptive re documentation required following problems with tender
		Annexure C - more detailed and one for each of the 3 cb's

Nov 2007	2	All reference to SANS 159 changed to SANS 556- 1
		Introduction of item 3, sap 6273 – fixed rating 300A MCCB
		Introduction of item 5 – adjustable 800A to 1600A MCCB
		4.3.4 – Ics and Icu required to be equal to or greater than the rated service breaking capacity
		4.6.2, j – Documentation re energy limiting capability required
Nov 2011	3	Format changes
		4.1.6 Circuit breakers shall be suitable for use at temperatures of between 0 and 70^0 C.
		Inclusion of paragraph 7 – QUALITY ASSURANCE
		Inclusion of paragraph 8 – ENVIRONMENTAL MANAGEMENT
Oct 2018	4	General Editing
		Added clause 9 Health and Safety
		Added the new work group
March 2020	5	Added new work group
May 2021	6	General Editing
		Added new work group
August 2021	7	Added a new item

Annex C - Item 1 - MCCB 160 - 250A TP LV 30KA - SAP NO: 954

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word "Noted" are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	160 x 110 x 100	
6	4.3.8.3	Adjustable current ratings	A	160-250	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	30	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 30kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 1 - MCCB 160 - 250A TP LV 30KA - SAP NO: 954

Technical schedules A and B

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Subclause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Item 2 - MCCB 160 - 400A TP LV 35KA - SAP NO: 5313

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word "Noted" are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	250 x 140 x 130	
6	4.3.8.3	Adjustable current ratings	A	160-400	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	35	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 35kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 2 - MCCB 160 - 400A TP LV 30KA - SAP NO: 5313

Technical schedules A and B

Deviation schedule

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Item	**Subclause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Item 3 - MCCB 300A TP LV 35KA - SAP NO: 6273

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word “Noted” are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	250 x 140 x 130	
6	4.3.8.3	Fixed current rating	A	300	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	35	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 35kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA [“To Be Advice”] will not be accepted

Tender Number: _____

Tenderer’s Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 3 - MCCB 300A TP LV 35KA - SAP NO: 6273

Technical schedules A and B

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Subclause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Item 4 - MCCB 600 - 1000A TP LV 40KA - SAP NO: 7005

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word “Noted” are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	330 x 220 x 160	
6	4.3.8.3	Adjustable current ratings	A	600-1000	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	40	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 40kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA [“To Be Advice”] will not be accepted

Tender Number: _____

Tenderer’s Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 4 - MCCB 600 - 1000A TP LV 40KA - SAP NO: 7005

Technical schedules A and B

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Subclause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Item 5 - MCCB 800 - 1600A TP LV 45KA - SAP NO: 1291

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word "Noted" are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	350 x 240 x 180	
6	4.3.8.3	Adjustable current ratings	A	600-1000	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	45	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 45kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 5 - MCCB 800 - 1600A TP LV 45KA - SAP NO: 1291

Technical schedules A and B

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Item 6 - MCCB 280 - 400A TP LV 35KA - SAP NO: 4721

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered - Note: The use of ticks, crosses, asterisks, TBA, and the word “Noted” are not acceptable.

Item	Subclause of CP_TSSPEC_018	Description		Schedule A	Schedule B
1		Manufacturer's name		REQUIRED	
2		Product serial number		REQUIRED	
3		Nominal voltage rating	V	415	
4	4.2.2	Marking requirements in compliance with SANS/IEC 60947-2		Yes	
5	4.2.3	Dimensions - HxWxD	mm	250x140x130	
6	4.3.8.3	Adjustable current ratings	A	600-1000	
7	4.3.8.2	Rated short circuit breaking capacity at 415V	kA	45	
8	4.3.3	Fault trip indication		Yes	
9	4.3.4	Ics and Icu equal to or greater than 45kA		Yes	
10	4.3.6	Is the MCCB energy limiting?		Yes	
11	4.4.3	Sealing facility		Yes	
12	4.5.2	Accessories supplied with MCCB		Yes	
13		Maximum ambient temperature at which the MCCB is designed to operate	ºC	REQUIRED	
14		Catalogue to be provided		Yes	
15	5.1	Certified copy of type test to be provided		Yes	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA [“To Be Advice”] will not be accepted

Tender Number: _____

Tenderer’s Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

Annex C - Item 6 - MCCB 280 - 400A TP LV 35KA - SAP NO: 4721

Technical schedules A and B

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_018**	**Proposed deviation**

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex D – Stock Items

Material Group: ELEC - MCCB

Item	SAP No.	SAP Short Description	SAP Long Description
1	954	MCCB 160 - 250A TP LV 30KA	MOULDED CASE CIRCUIT BREAKER 160 - 250A TRIPLE POLE LOW VOLTAGE 30KA ITEM SPECIFICATION NO. CP_TSSPEC_018
2	5313	MCCB 160 - 400A TP LV 35KA	MOULDED CASE CIRCUIT BREAKER 160 - 400A TRIPLE POLE LOW VOLTAGE 35KA ITEM SPECIFICATION NO. CP_TSSPEC_018
3	6273	MCCB 300A TP LV 35KA	MOULDED CASE CIRCUIT BREAKER 300A TRIPLE POLE LOW VOLTAGE 35KA ITEM SPECIFICATION NO. CP_TSSPEC_018
4	7005	MCCB 600 - 1000A TP LV 40KA	MOULDED CASE CIRCUIT BREAKER 600 - 1000A TRIPLE POLE LOW VOLTAGE 40KA ITEM SPECIFICATION NO. CP_TSSPEC_018
5	1291	MCCB 800 - 1600A TP LV 45KA	MOULDED CASE CIRCUIT BREAKER 800 - 1600A TRIPLE POLE LOW VOLTAGE 45KA ITEM SPECIFICATION NO. CP_TSSPEC_018
6	4721	MCCB 280 - 400A TP LV 35KA	MOULDED CASE CIRCUIT BREAKER 280 - 400A TRIPLE POLE LOW VOLTAGE 35KA ITEM SPECIFICATION NO. CP_TSSPEC_018