ZQM8X
low-voltage molded case circuit breaker






Characteristic

Rated voltage				
	Rated isolation voltage (V)		Ui	1000
	Rated impulse withstand voltage (kV)		Uimp	8
	Rated working voltage (V)		Ue AC 50/60Hz	400/690
Applicable to isolation			IEC/EN 60947-2	
Application category	Thermomagnetic type A	Icw:100/160/250 400/630	8kA 1S	
	Electronic B		15kA 1S	
Class of pollution			IEC 60664-1	3
Control				
	Manual		Direct or extended rotary handle	■
			remote control by toggle handle	■
	Electric		Remote control	■
Type				
	Stationary type			■
	Drawout type		Plug-in base frame	■
				■

Circuit breaker

Model			ZQM8X-100	ZQM8X-160	ZQM8X-250	ZQM8X-400	ZQM8X-630
Breaking level			N H S	N H S	N H S	N H S	N H S
Electrical performance conforms to IEC 60947-2.							
Rated current (A)	In	40℃	100	160	250	400	630
Number of poles			2[3], 3,4	2[3], 3,4	2[3], 3,4	3,4	3,4
(kArms)							
	Icu	AC 50/60 Hz 400V	55 100 150	55 100 150	55 100 150	55 100 150	55 100 150
		690V	25 35 65	25 35 65	25 35 65	35 50 65	35 50 65
Use breaking capacity (kArms)							
	Ics	%Icu	100%[4]	100%[4]	100%[4]	100%[4]	100%[4]
Life (C-O cycle)		machinery	50000	40000	20000	15000	15000
		Electrical 400V In	30000	20000	10000	7000	7000
		690V In	20000	15000	10000	6000	6000
Protection and measurement							
Short circuit protection		Magnetic protection	■	■	■	■	■
		Hermomagnetism	■	■	■	■	■
		With neutral line protection (Off-0.5-1-OSN)[1]	■	■	■	■	■
		With ground fault protection	■	■	■	■	■
		With Zone Selective Interlocking (ZSI)[2]	■	■	■	■	■
Display /I, U, P, F, E measurement/fault current measurement.			■	■	■	■	■
lectotype		Cabinet door display unit	■	■	■	■	■
		Operational management	■	■	■	■	■
		counter	■	■	■	■	■
		Historical logs and alarms	■	■	■	■	■
		Measurement communication	■	■	■	■	■
		Switch status/control communication	■	■	■	■	■
Leakage protection		Through Vigi leakage protection module	■	■	■	■	■

Technical parameters

Thermomagnetic tripping unit		TM16D to 630D																			
Rated current (A)	In40℃ (1)	16	25	32	40	50	63	80	100	125	160	200	250	320	350	400	500	550	600	630	
circuit breaker	ZQM8X-100	■	■	■	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—	
	ZQM8X-160	—	—	—	—	—	■	■	■	■	■	—	—	—	—	—	—	—	—	—	
	ZQM8X-250	—	—	—	—	—	■	■	■	■	■	■	■	—	—	—	—	—	—	—	
	ZQM8X-400	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	—	—	—	—	
	ZQM8X-630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■	
Overload protection (thermal protection)																					
Setting value of tripping current	Ir=In x ...	Adjustable range 0.7 to 1×In																			
Delay (s)	tr	Not adjustable																			
	Tr at 2×Ir	120 to 300																			
Short circuit protection (magnetic protection)																					
Short circuit protection current setting value (A)	Ii	Not adjustable											Adjustable								
Accuracy ±20%	ZQM8X-100/160	10In×In																			
	ZQM8X-250/630												5 至 10×In								
Delay	tr	Not adjustable																			
Neutral line protection																					
Neutral line protection	4P3D	Neutral line protection																			
Neutral line protection	4P4D	1×In																			

1) If the temperature is higher than 40℃ , the thermal protection characteristics should be corrected. Please refer to the temperature derating table for

Thermomagnetic tripping unit		T_gTM16G to 630G																			
Rated current (A)	In40℃ (1)	16	25	32	40	50	63	80	100	125	160	200	250	320	350	400	500	550	600	630	
Circuit breaker	ZQM8X-100	■	■	■	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—	
	ZQM8X-160	—	—	—	—	—	■	■	■	■	■	—	—	—	—	—	—	—	—	—	
	ZQM8X-250	—	—	—	—	—	■	■	■	■	■	■	■	—	—	—	—	—	—	—	
	ZQM8X-400	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	—	—	—	—	
	ZQM8X-630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■	
Overload protection (thermal protection)																					
Setting value of tripping current	Ir=In x ...	Adjustable range 0.7 to 1×In																			
Delay (s)	tr	Not adjustable																			
	Tr at 2×Ir	120 to 300																			
	Tr at 6×Ir	—																			
Short circuit protection (magnetic protection)																					
Short circuit protection current setting value (A)	Ii	Not adjustable																			
Accuracy ±20%	ZQM8X-100/160	Not adjustable																			
Delay	tr	Not adjustable																			
Neutral line protection																					
Neutral line protection	4P3D																				
Neutral line protection	4P4D	1×In																			

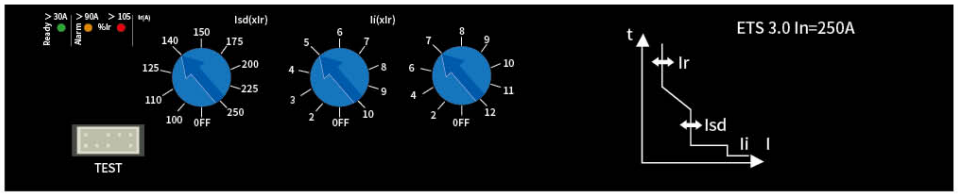
(1) If the temperature is higher than 40℃ , the thermal protection characteristics should be corrected. Please refer to the temperature derating table for details.

Functions and characteristics

ETS tripping unit can be used for ZQM8X-100 to 630 circuit breaker with breaking level of N/H/S, and can provide:

- ◆ Standard distribution cable protection
- ◆ Instructions:
- ◇ Overload local indication (via LED)

Distribution system protection ETS 3.0 tripping unit.



The circuit breaker equipped with ETS3.0 tripping unit is used to protect the distribution system powered by transformer. For generators and long cables, ETS3.0-G tripping unit can provide a more matching protection scheme.

Protection

It can be adjusted by the knob on the tripping unit.

Overload protection: long delay protection (Ir)

The overload protection is an inverse time limit feature. The overload protection current value Ir is adjustable, and the overload protection action time tr is not adjustable.

Short circuit short time delay protection: short circuit protection with fixed time delay (Isd)

The short circuit short delay current value Isd is adjustable.The circuit breaker trips after a very short time delay, which can be used for selective cooperation with the lower circuit breaker.

Short Circuit Instantaneous Protection (Ii)

The instantaneous short circuit protection current value is adjustable.

Neutral line protection

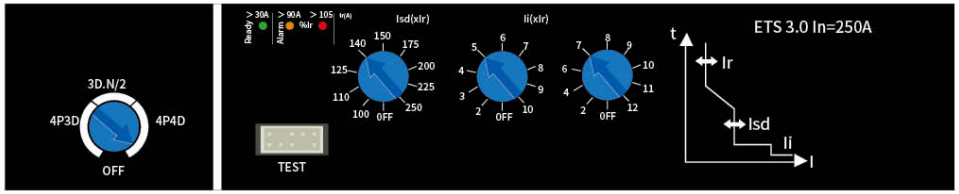
The 3-pole circuit breaker has no neutral protection.

◆ A three-position switch can be used to set the neutral line protection on the 4-pole circuit breaker.

◆ 4P3D: The neutral line is not protected.

◇ 4P3D+N/2: neutral line is half protected, neutral protection value is 0.5 × Ir.

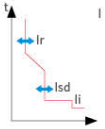
◇ 4P4D: neutral line is fully protected, and the neutral line protection value is Ir.



Indication

Local indication
Green "Ready" ready LED indicator: the LED flashes slowly when the circuit breaker is in the protection ready state
Orange overload pre-alarm LED indicator: When I > 90% IR, the orange LED indicator will be on for a long time.
Red overload alarm LED indicator: When I > 105% IR, the red LED indicator will be on for a long time.

Technical parameters



ETS 3.0											
Rated current (A)	In40℃ (1)		40	100	160	250	400	630			
Circuit breaker	ZQM8X-100		■	■	—	—	—	—			
	ZQM8X-160		■	■	■	—	—	—			
	ZQM8X-250		■	■	■	■	—	—			
	ZQM8X-400		—	—	—	—	■	—			
	ZQM8X-630		—	—	—	—	■	■			
L long delay protection											
Tripping current set value (A)		Ir	Rated current value of tripping unit (In) and setting value on knob								
	In=40A	Ir=	18	18	20	23	25	28	32	36	40
	In=100A	Ir=	40	45	50	55	63	70	80	90	100
	In=160A	Ir=	63	70	80	90	100	110	125	150	160
	In=250A	Ir=	100	110	125	140	160	175	200	225	250
	In=400A	Ir=	160	180	200	230	250	280	320	350	400
	In=630A	Ir=	250	280	320	350	400	450	500	570	630
Delay (s)	tr		Not adjustable								
Accuracy 0 to ±10%		1.5×Ir	64								
		6×Ir									
		7.2×Ir									
Thermal memory			20 minutes before tripping or after tripping								
S_0 Short circuit short time delay protection with fixed delay											
Tripping current set value (A)	Isd=Irx ...		2	3	4	5	6	7	8	9	10
Accuracy ±10%											
Delay (ms)	tsd		Irregulable								
	Non-tripping time		20								
	Maximum breaking time		80								
I short-circuit instantaneous protection											
Tripping current setting value (A)	Ii adjustable		2	4	6	7	8	9	10	11	12
Accuracy ±10%	Non-tripping time		10ms								
	Maximum breaking time		80ms								

(1)If the tripping unit is used in high temperature environment, the setting of ETS must consider temperature derating. See the temperature derating table for details.

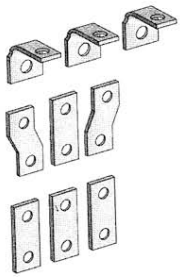
Attachment

Insulated accessories

Lead-sealable terminal sheath

Interphase partition

Connection accessories

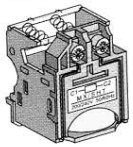


Terminal block

Rear terminal block

Electric attachments

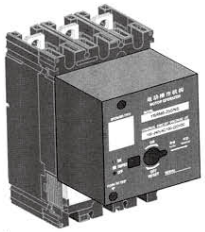
Indicating contact



Voltage coil

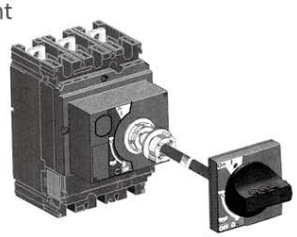
Leakage accessories

Control auxiliary equipment



Electric operating mechanism

Direct rotation handle



Extended rotary handle

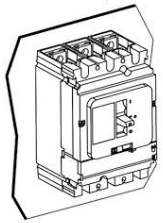
Accessories installing

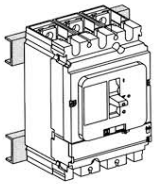
The ZQM8X circuit breaker can be installed horizontally or vertically, or horizontally or at the top, without affecting its performance. There are three installation methods:

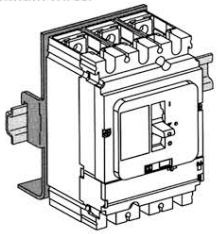
◇ Fixed type
◇ plug-in type
◇ Draw-out type (400/630A only)
If the latter two installation methods are adopted, corresponding accessories (base, side plate, etc.) need to be added on the fixed foundation.

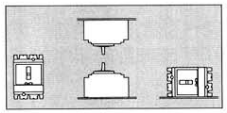
Fixed circuit breaker

The fixed circuit breaker can be directly connected to the bus or connected to the cable through the lug. In addition, bare cable connectors are provided for bare copper wires or bare aluminum wires.


Base plate installation


DIN-Rail Mounting


DIN rail installation (with adapter).


Installation mode

Plug-in circuit breaker

The plug-in circuit breaker can:

◆ Pull out or quickly replace the circuit breaker without exposing the incoming and outgoing lines and installing the base.
◆ The plug-in base is allowed to be installed in advance to facilitate users to add circuit breakers later.
◆ When the circuit breaker is installed on the bottom plate or through the plate, the power supply circuit can be isolated. Complete insulation is achieved through the short terminal sheath (which must be equipped) on the equipment. The protection level is as follows:
◇ Circuit breaker insertion =IP4
◇ Circuit breaker withdrawl=IP2
◇ The circuit breaker is taken out, and the base plate is equipped with baffle=IP4

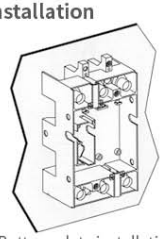
Configuration of plug-in circuit breaker

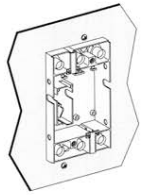
The plug-in structure is realized by adding "plug-in kit" on the fixed circuit breaker. In order to avoid connecting or disconnecting the power supply under load, before the circuit breaker is inserted or pulled out from the base, if the circuit breaker is in the ON state, the safety release device will make the circuit breaker automatically trip. This safety release device is included in the plug-in kit and must be installed on the circuit breaker.

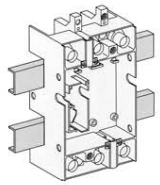
Attachment

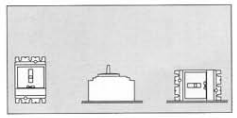
Optional insulation accessories:
◆ Terminal sheath to prevent direct contact with the terminal.
◆ Interphase partition board, which is used to enhance interphase insulation.

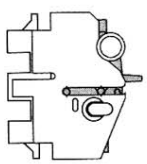
Installation


Bottom plate installation

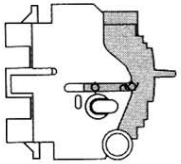

Through-plate installation


Rail mounting

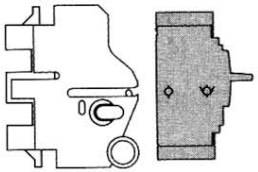

Installation mode



Connection position



Extraction position



Remove the circuit breaker

Drawout circuit breaker

The draw-out type has all the advantages of the plug-in type and is very easy to operate. The draw-out circuit breaker has three positions:

- ◆ Link position: the power circuit is connected.
- ◆ Extraction position: the power circuit is disconnected, and the circuit breaker can be operated to check the auxiliary circuit.
- ◆ Remove the circuit breaker: the circuit breaker can be removed from the base.

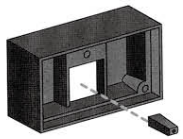
Configuration of drawout circuit breaker

In the configuration of draw-out circuit breaker, two side plates need to be installed on the base and circuit breaker respectively. Similar to the plug-in configuration, when inserting or withdrawing the circuit breaker, if the circuit breaker is in the closing ON state, the safety release device will automatically release the circuit breaker, so that the insertion or withdrawal operation can be performed at the "off" position.

Attachment

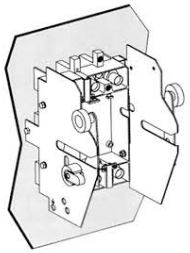
The base used is the same as the plug-in base, in addition:

- ◆ Draw frame auxiliary contact, indicating the "connection position" and "draw out position" of the circuit breaker
- ◆ Locking with 1 to 3 padlocks (5 to 8mm in diameter) can realize:
- ◇ Prevent inserting the circuit breaker.
- ◇ Lock the circuit breaker in the "connection position" or "extraction position".
- ◆ By pulling the switch sheath, the circuit breaker can ensure the appropriate protection level no matter where it is located.
- ◆ Telescopic axis for extending the rotary handle. The door can be closed when the equipment is in the "connection position" and "extraction position".

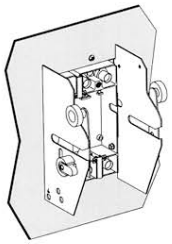


The shield used to toggle the switch can ensure the IP4 protection level in the "connected position" and "disconnected position".

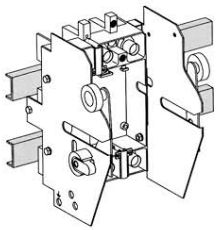
Installation



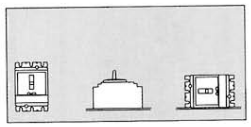
Bottom plate installation



Through-plate installation



Rail mounting

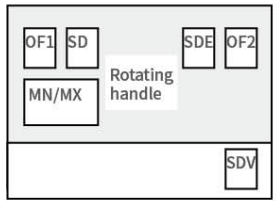


Installation mode

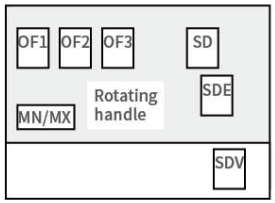
Accessory indicating contact

The indicating contact can indicate the state of the circuit breaker (OF-SD-SDE-SDV).

For ZQM8X-100-630



ZQM8X-100/160/250



ZQM8X-400/630

Indicates the status of the circuit breaker during normal operation or after the fault occurs.
A universal contact installed in different places can provide all different indication functions:
◆ OF indicates the position of the contact of the circuit breaker.
◆ SD (trip indication) indicates that the circuit breaker has tripped for the following reasons:
◇ Overload
◇ Short circuit
◇ Leakage (VigiZQM8X)
◇ Tripping caused by voltage coil
◇ Press the trip button.
◇ The connection is cut off when the equipment is in the ON state (when the switch is closed, pull the switch out of the plug-in or withdrawable base)

After the circuit breaker is reset, the SD contact is reset.

◆ SDE (Fault Trip Indication) indicates that the circuit breaker has tripped due to the following reasons.
◇ Overload
◇ Short circuit
◇ Leakage (VigiZQM8X)
◆ SDV indicates that the circuit breaker is tripped due to leakage. When Vig module is reset, the SDV is reset.

Installation

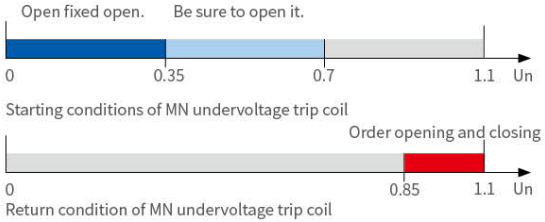
◆ OF, SD, SDE and SDV functions: the contact model is universal (the specific function depends on its position in the switch). The contact card is installed in the slot behind the front cover of the circuit breaker (in the case of SDV, in the Vigi module). To realize SDE function on ZQM8X-100-630 circuit breaker, SDE adapter is required.

Electrical characteristics

Contact			Standard				Low voltage			
Contact type			All				0F SD,SDE,SDV			
Rated load current (A)			6				5			
Minimum load			100mA at 24V DC				1mA at 4V DC			
Usage category (IEC 60947-5-1)			AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operating current (A)	24V	AC/DC	6	6	6	1	5	3	5	1
	48V	AC/DC	6	6	2.5	0.2	5	3	2.5	0.2
	110V	AC/DC	6	5	0.6	0.05	5	2.5	0.6	0.05
	220V/240V	AC	6	4	-	-	5	2	-	-
	250V	DC	-	-	0.3	0.03	5	-	0.3	0.03
	380/400V	AC	6	2	-	-	5	1.5	-	-

MN undervoltage trip coil

MX or MN voltage trip coil



- When the control voltage drops below the setting value of the tripping voltage, the circuit breaker trips.
- The tripping voltage setting value range is 0.35~0.7 times the rated voltage.
- When the voltage exceeds 0.85 times the rated voltage, the circuit breaker can be closed.

Characteristics		
Power Supply	V AC	50Hz:110/130-220/240-380/400
	V DC	24-125-250
Working threshold	Breaking	0.35 to 0.7Un
	Close	0.85Un
Operating range		0.85 to 1.1Un
Power consumption (VA or w)		Suction: 10- Hold: 5
Response time (ms)		50

Power Supply	Corresponding MN coil
Delay unit with fixed delay (200ms)	
48V AC	48V DC
220/240 V AC	250V DC

MX shunt trip coil

MX tripping coil opens the circuit breaker through a pulse type (⩾ 20ms) or self-holding signal.

Opening conditions

The MX trip coil will automatically open the circuit breaker when it is powered on. When the voltage U ⩾ 0.7×Un, it will definitely open.

Characteristics		
Power Supply	V AC	50Hz:110/130-220/240-380/400
	V DC	24-125-250
Working range		0.7 to 1.1Un
Power consumption (VA or w)		Suction: 10
Response time (ms)		50

Control circuit breaker through MN or MX

After MN or MX tripping coil releases the circuit breaker, it must be reset first before the circuit breaker can be closed
MX or MX tripping has higher priority than manual closing.
If there is always a trip command, the circuit breaker will no t be able to close (that is, it will be temporarily closed)
Connect the terminal with a connecting wire not exceeding 1.5mm2.

ZQM8X-100~630 electric operating mechanism

ZQM8X-100~250 electric operating mechanism

QM8X-400/630 Electric Operating Mechanism

1. Operating handle
2. Switch status indication (red opening, green closing and white tripping)
3 Reset
4. Terminal
5. Manual operation window
6. Manual/automatic selection switch

ZQM8X series electric operating mechanism, hereinafter referred to as electric operation, is a special accessory driven by a small permanent magnet DC motor for remote closing,breaking and re-tripping operation of 100~630A molded case circuit breaker. Electric operation is divided into two categories: ZQM8X-100/160/250 and ZQM8X-400/630.

Characteristics

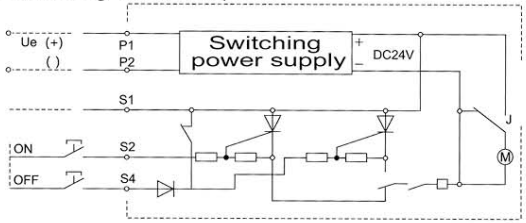
Compact structure, small size, convenient installation, reliable action, and manual operation with operating handle. The product adopts the internationally advanced switching power supply technology, and its mechanical life, electrical life and reliability are comparable with the current international similar products.
ZQM8X series electric operation, AC/DC universal, wide application range of control circuit and low working current.
ZQM8X series electric operation can correctly display the closing, opening and tripping status of the circuit breakers.

Technical parameters

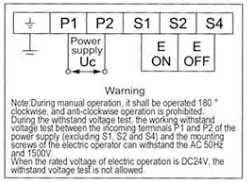
Electric operating mechanism		ZQM8X-100~250	ZQM8X-400~630
Control voltage (v)	DC	24,110,220	
	AC50/60Hz	110,240	
Action current (A)		⩽ 0.5	⩽ 2
	DC24V 时	⩽ 3	⩽ 5
Motor power (v)		14	35
Mechanism life (times)		10000	5000

Circuit diagram

Internal concise electrical schematic diagram of electric operation



External wiring



Note:During manual operation, it shall be operated 180 ° clockwise, and anti-clockwise operation is prohibited.
During the withstand voltage test, the working withstand voltage test between the incoming terminals P1 and P2 of the power supply (excluding S1, S2 and S4) and the mounting screws of the electric operator can withstand the AC 50Hz and 1500V.
When the rated voltage of electric operation is DC24V, the withstand voltage test is not allowed.

Direct rotating handle

ZQM8X-100~250 direct rotating handle

ZQM8X-100~250 extended rotary handle

Standard handle

Protection grade IP40,IK07.
The following functions can still be guaranteed by adding a direct rotating handle:
◆ Users can see and set the release.
◆ Applicability of isolation
◆ Indications of O (off), I(ON) and tripping positions.
◆ The "trip" trip test button can be contacted.

Locking

The circuit breaker can be locked by rotating the handle
◆ Padlock:
Under standard conditions, the circuit breaker can be hung with 1~3 padlocks in the off position, with a diameter of 5~8mm (provided by the user).

Extended rotary handle

ZQM8X-400/630 Direct Rotating Handle

ZQM8X-400/630 Extended Rotating Handle

Protection grade IP54, IK08.
The extended rotary handle can operate the circuit breaker installed in the switch cabinet on the door of the switch cabinet.
The following functions can still be guaranteed by installing the extended rotary handle:
◆ Applicability of isolation
◆ Indications of O (off), I(ON) and tripping positions.

Equipment and cabinet door padlock

The padlock can lock the circuit breaker handle and disable the door opening function:
◆ Under standard conditions, the circuit breaker can be hung with 1~3 padlocks in the off position, with a diameter of 5~8mm (provided by the user).

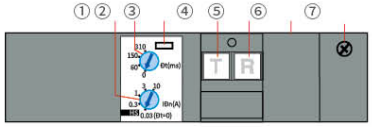
Composition of extended rotary handle

◆ Remove the part of the front cover of the circuit breaker (fixed with screws).
◆ The components (handle and nameplate) on the cabinet door are always fixed in the same position whether the circuit breaker is installed vertically or horizontally.
◆ The rotation axis of the extension handle can be adjusted according to the distance.

Leakage protection Vigi module

Leakage protection can be provided for all three-pole or four-pole ZQM8X-100 to 630 circuit breakers in two ways. These circuit breakers can be equipped with magnetic, thermal magnetic or ETS3, 5 or 6 tripping units.

VigiZQM8X-100 to 630



① Sensitivity setting
② Delay setting (for selective leakage protection)
③ setting value lead sealing
④ Test button-used to simulate leakage fault, so as to regularly check the leakage protection function.
⑤ Reset button (reset is required after tripping of leakage fault)
⑥ Nameplate
⑦ Location of SDV auxiliary contact

Plug-in device Vigi module can be used for plug-in circuit breaker by installing special power connection device.

Circuit breaker with Vigi leakage protection module (VigiZQM8X)

◆ Overall characteristics of these circuit breakers.
◆ Vigi module. The Vigi module can be directly installed at the lower port of the circuit breaker to realize the leakage protection function. The Vigi module can act directly on the tripping unit.
◆ The sensitivity can be adjusted from 30mA to 30A, and the delay setting value can be adjusted.

VigiZQM8X 100 to 630 Circuit Breaker with Leakage Protection

Adding Vigi module will not change the characteristics of circuit breaker;
◆ Meet the standard.
◆ Protection grade: Class II front insulation.
◆ Contact indication
◆ Electrical characteristics
◆ Characteristics of trip unit
◆ Installation and Link Mode
◆ Indicating, measuring and controlling accessories
◆ Installation and connection accessories

Size and weight		ZQM8X--100/160/250	ZQM8X--400/630
Size	3 -pole	105×236×86	140×355×110
W×H×D(mm)	4 -pole	140×236×86	185×355×110
Weight (kg)	3 -pole	2.5	8.8
	4 -pole	3.2	10.8

Vigi leakage protection module

Compliance with standards

◆ IEC60947-2, Appendix B.
◆ IIEC60255-4 and IEC60801-2~5 are capable of resisting transient overvoltage, lightning, switching overvoltage, electrostatic discharge and radio frequency interference.
◆ IEC60755, Class A, anti-interference capacity of DC component is 6mA.
Based on VDE664 standard, it can run at the temperature as low as -25℃ .

Remote indication

Vigi module can be equipped with an auxiliary contact (SDV), which can remotely transmit the tripping caused by leakage fault.

Power Supply

The Vigi module can be powered by the power distribution system itself, so no external power supply is required. It can continue to operate even under the condition of only AC two-phase power supply.

Selection of Vigi module

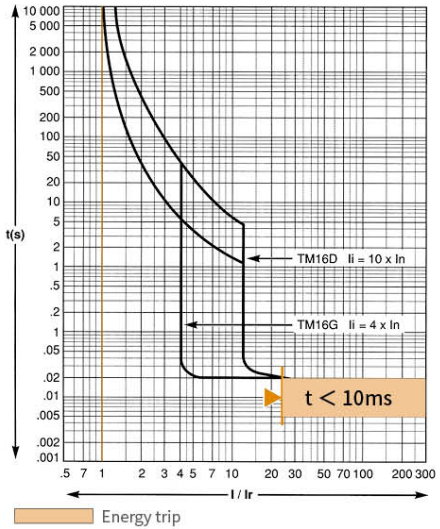
Model	Vigi ME	Vigi MH	Vigi MB
Number of poles	3,4	3,4	3,4
ZQM8X-100	■	■	-
ZQM8X-160	■	■	-
ZQM8X-250	-	■	-
ZQM8X-400	-	-	■
ZQM8X-630	-	-	■
Protective characteristics			
Sensitivity I △ n(A)	Fixed 0.3	Adjustable 0.03-0.3-1-3-10	Adjustable 0.3-1-3-10-30
IWhether the delay is adjustable	fixed	Adjustable	Adjustable
Delay setting (ms)	＜40	0-60-150-310	0-60-150-310
Maximum breaking time (ms)	＜40	＜40＜140＜300＜800	＜40＜140＜300＜800
Rated voltage	200...440	200...400-440...550	200...440-440...550
Ac 50V/60Hz			

operational safety

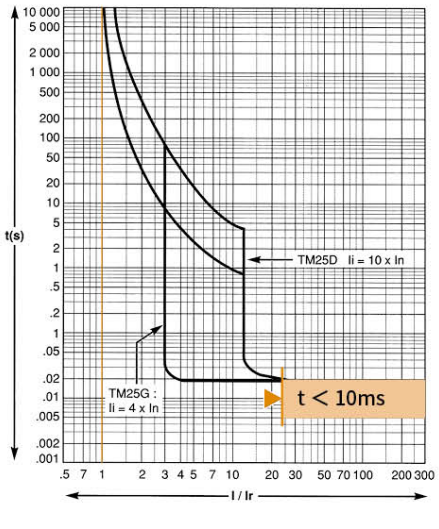
Vigi module is a user-safe device, and users need to test it regularly (every 6 months).

TM Thermomagnetic Trip Unit

◆ TM16D/TM16G

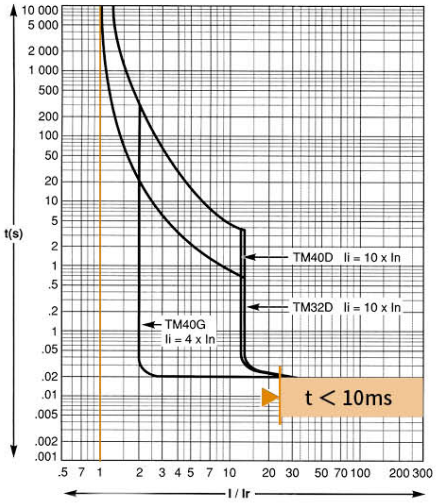


◆ TM25D/TM25G

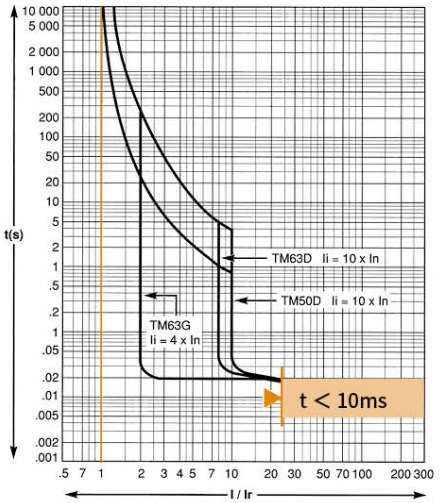


Energy trip

◆ TM32D/TM40D/TM40G



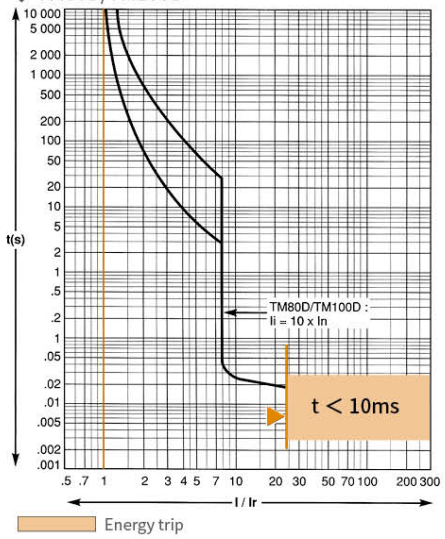
◆ TM50D/TM63D/TM63G



Energy trip

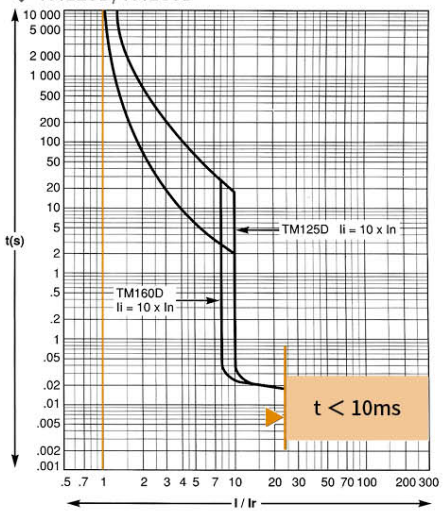
TM Thermomagnetic Trip Unit

◆ TM80D/TM100D

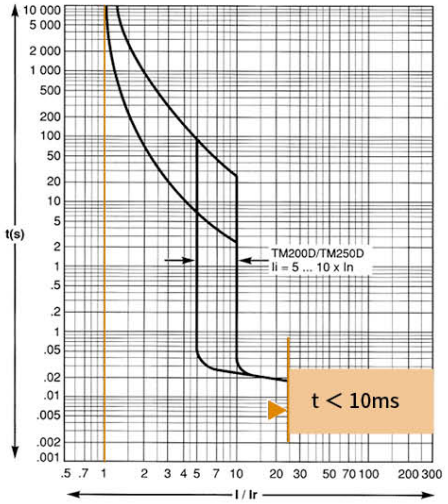


Energy trip

◆ TM125D/TM160D



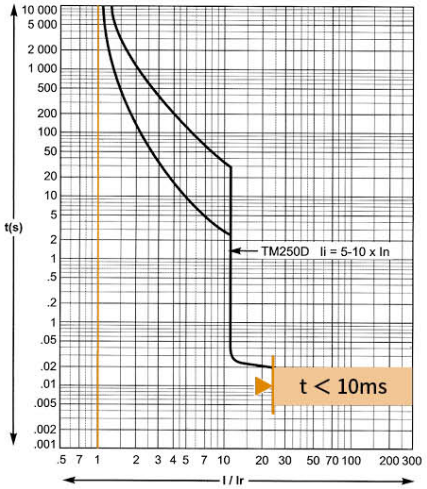
◆ TM200D/TM250D



Energy trip

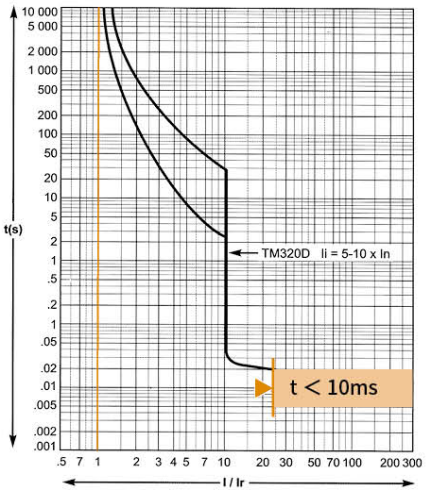
TM magnetic release

◆ 250A



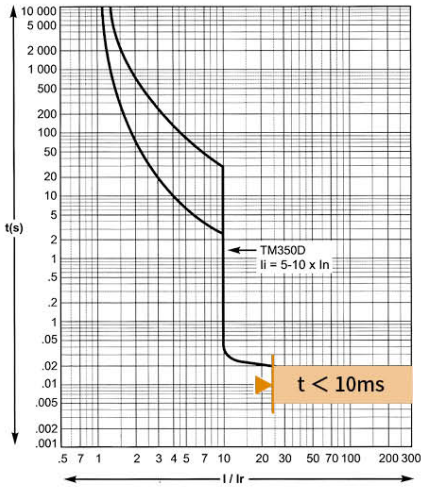
Kenke is extremely open

◆ 320A



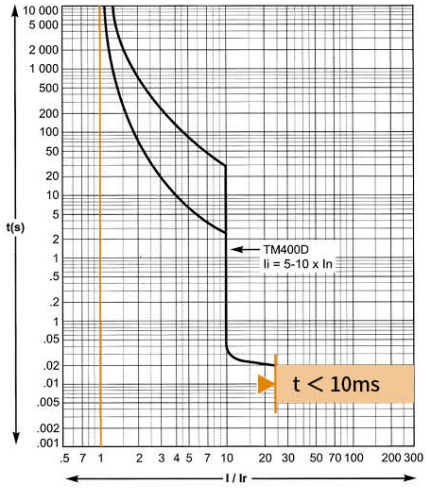
Energy trip

◆ 350A



Kenke is extremely open

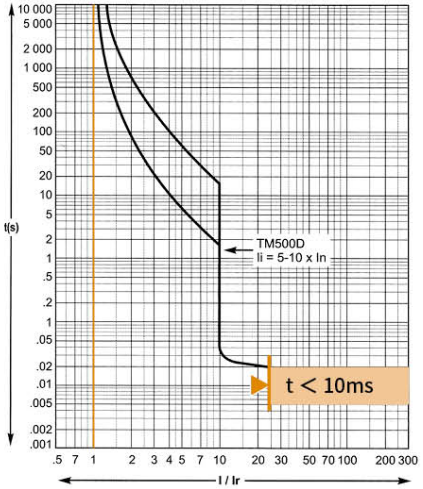
◆ 400A



Energy trip

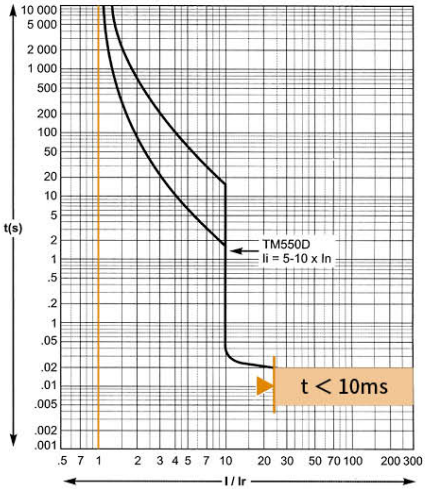
TM magnetic release

◆ 500A



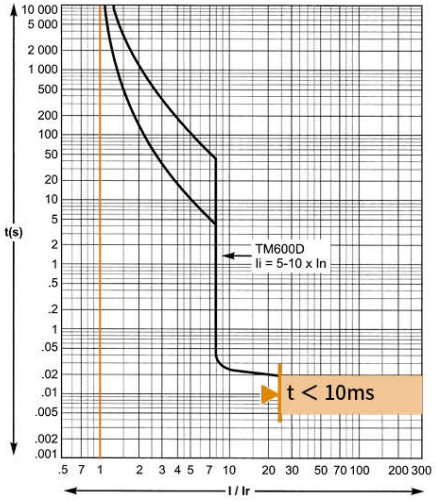
Energy trip

◆ 550A



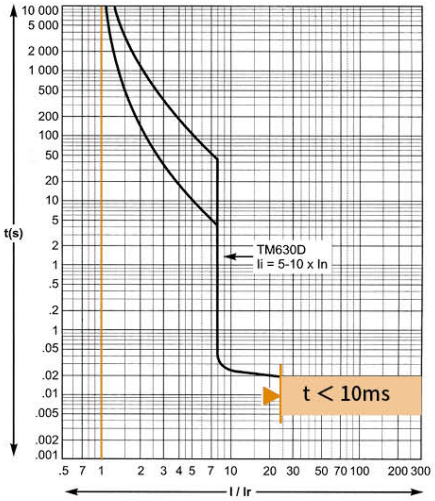
Energy trip

◆ 600A



Energy trip

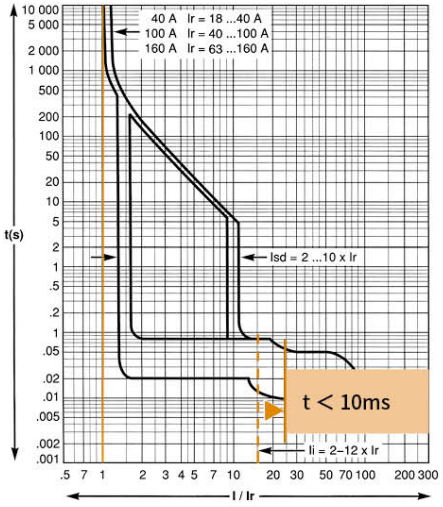
◆ 630A



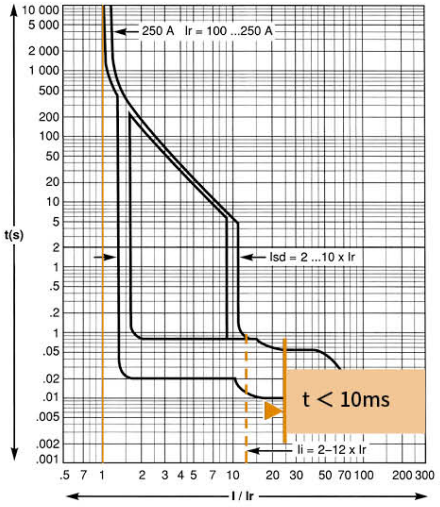
Energy trip

ETS 3.0 and 3.0 G electronic trip unit

◆ ETS 3.0-40 ...160A

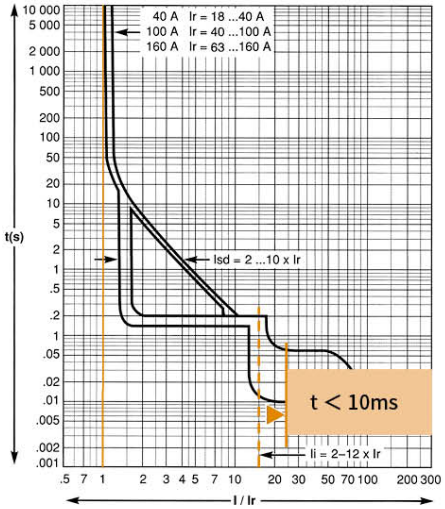


◆ ETS 3.0 - 250A

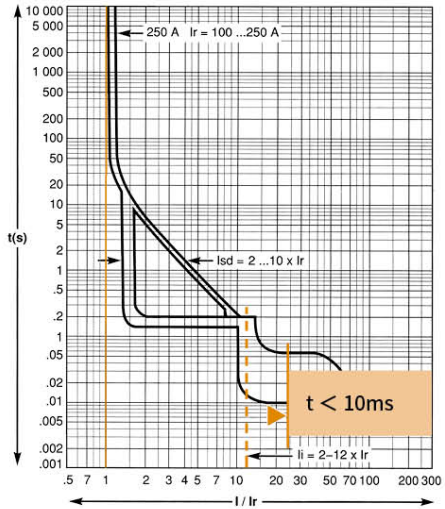


250 A：Ir=100...250A

◆ ETS 3.0 G - 40...160A

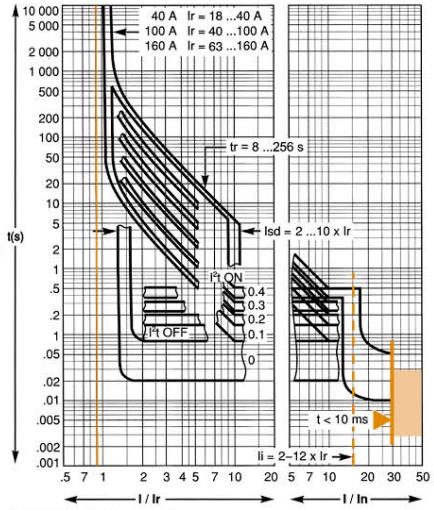


◆ ETE 3.0 G - 250A

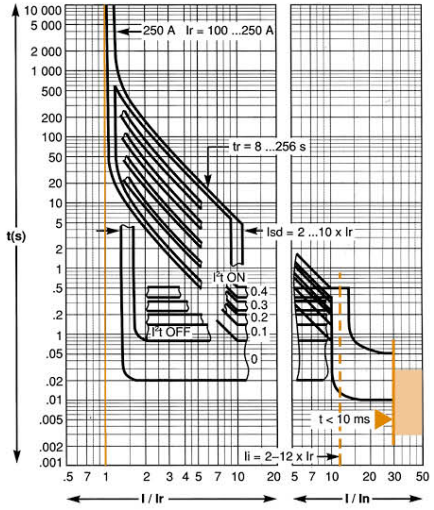


ETS 3.0S,5.0S/6.0A or E electronic trip unit

◆ ETS 3.5S,5.0S and 6.0A or E - 40 ...160A

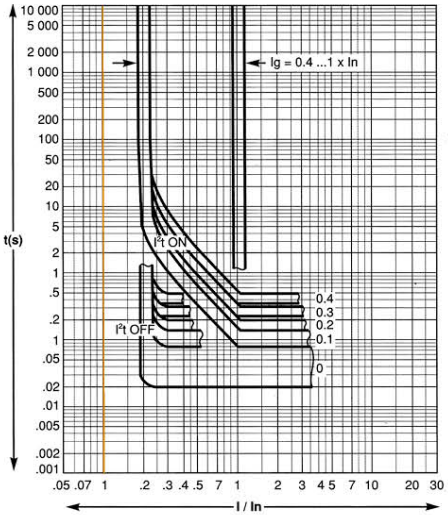


◆ ETS 3.0S,5.0S and 6.0A or E-250A



Energy trip

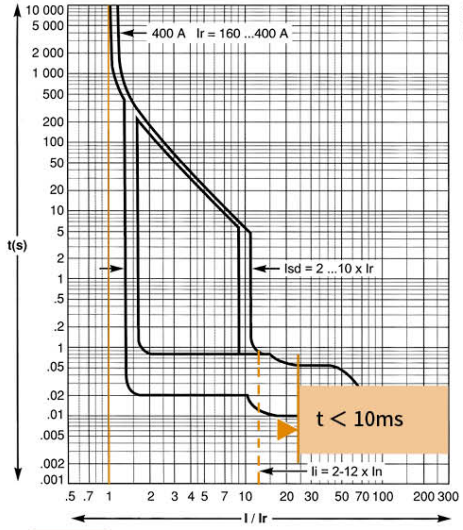
◆ ETS 5.0S and 6.0A or E(ground fault protection)



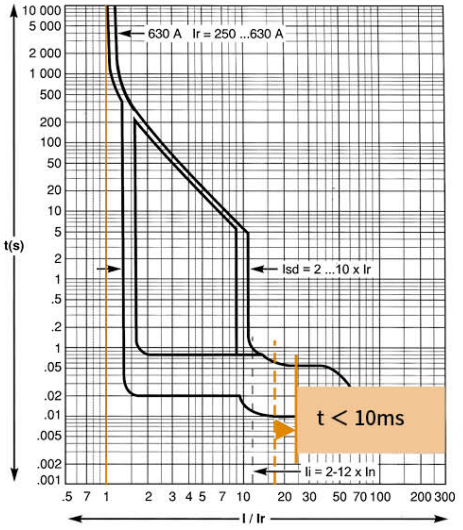
This tripping curve is the ground fault protection curve of ZQM8X ETS 5.0S/ETS 6.0 A or E.

ETS 3.0, 3.0S, 5.0S and 6.0A or E electronic trip unit

◆ ETS 3.0-400A

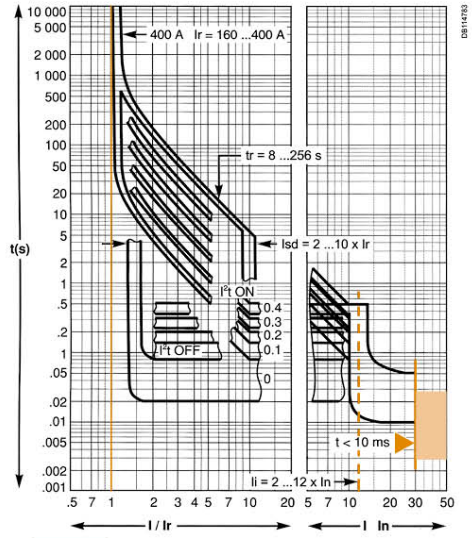


◆ ETS 3.0 - 630A

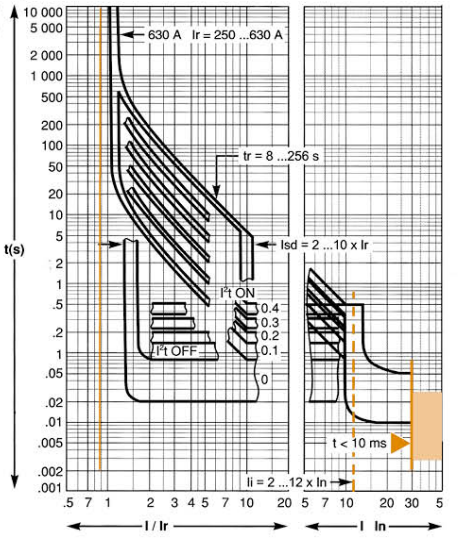


Energy trip

◆ ETS 3.0 G - 40...160A



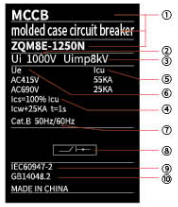
◆ ETE 3.0 G - 250A



Energy trip

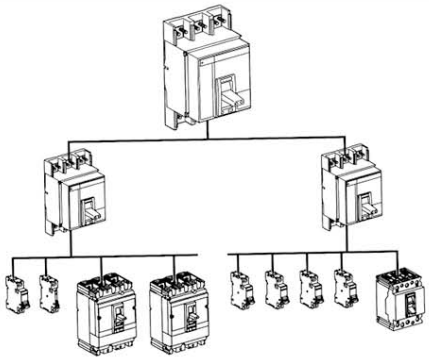
ZQM8X
low-voltage molded case circuit breaker

Overall characteristics



The standard features are indicated on the nameplate:
① Product model: product model and segment grade.
② Ui: rated isolation voltage.
③ Uimp: rated impluse withstand voltage
④ Ics: Use breaking ability
⑤ Icu: Ultimate breaking capacity
⑥ Ue: rated working voltage.
⑦ Cat: Use category A- Thermomagnetic, B- Electronic.
⑧ Symbol description with isolation function
⑨ ⑩ Reference standard

Safety selectivity as a standard feature



For various faults, ZQM8E-800~1600A and all molded case circuit breakers can achieve complete selectivity (overload, short circuit)

ZQM8E-800~1600A

Segmentation ability

Icu=Ics
415V N55kA H85kA
690V N25kA H35kA
Icw 25kA/1S

Meet the standard

ZQM8E-800~1600A circuit breakers and auxiliary equipment meet the following international standards:
◇ Iec 60 947-1: general rules
◇ IEC 60 947-2: Circuit Breaker
◇ IEC60 947-3: switches, isolators, disconnectors, etc.
◇ IEC 60 947-4: Contactor and Motor Starter
◇ IEC60 947-5.1 Control equipment and switches; Automatic control element

Anti-damp and heat measures

ZQM8E-800~1600A molded case circuit breaker has passed the test under strict environmental conditions specified in the following standards:
◇ IEC 68-2-1- Dry cooling (-55℃)
◇ IEC 68-2-2- Dry heat (+85℃)
◇ IEC 68-2-30 - Damp heat (humid heat condition 55 ℃ , 95% relative humidity)
Iec 68-2-52-salt mist

Environmental protection

The ZQM8E circuit breaker takes into account the current environmental protection issues, and most components can be reused, with special effective marks marked on the components.

Ambient temperature

◇ Ambient temperature range -25℃ ~+70℃
When the temperature is higher than 40 ℃ (higher than 65 ℃ for motor protection), derating shall be considered.
◇ Can work for a long time in normal environment.
It can work in a more severe environment of - 25~- 35 ℃
◇ The storage temperature is -50℃ ~+85℃ (1)

Class of pollution

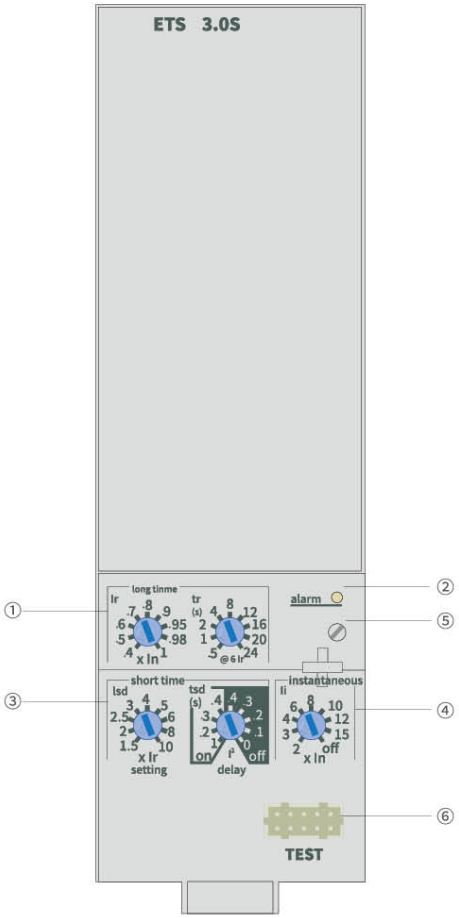
The pollution level of ZQM8E-800~1600A circuit breaker is confirmed as Grade III, which meets the definition in IEC standard 60947 (industrial environment).

Low voltage distribution and motor protection

ZQM8X circuit breaker					ZQM8E-800		ZQM8E-1000		ZQM8E-1250		ZQM8E-1600	
Number of poles					3.4		3.4		3.4		3.4	
Control	Manual		Toggle the handle directly or extend the rotary handle		● ●		● ●		● ●		● ●	
	Electric				●		●		●		●	
Circuit breaker type					N	H	N	H	N	H	N	H
Connection	fixed		Front connection		●	●	●	●	●	●	●	●
			Bare cable front connection		●	●	●	●	●	●	–	–
	Drawer type (based on drawer frame)		Rear connection		●	●	●	●	●	●	●	●
Electrical performance conforms to IEC 60947-2 and EN 60947-2 standards.												
Rated power (A)		In	50°C		800		1000		1250		1600	
			65°C (1)		800		1000		1250		1600	
Rated isolation voltage (V)		Ui			1000		1000		1000		1000	
Rated impulse withstand voltage (kV)		Uimp			8		8		8		8	
Rated working voltage (V)		Ue	AC	50/60 Hz	690		690		690		690	
Circuit breaker type					N	H	N	H	N	H	N	H
Breaking capacity (kA rms)		Icu	AC									
		Ultimate sectioning capacity (kA rms)	50/60 Hz	415V	55	85	55	85	55	85	55	85
				690V	25	35	25	35	25	35	25	35
		Ics	AC									
		Use segmentation capability (kA rms)	50/60 Hz	415V	55	85	55	85	55	85	55	85
				690V	25	35	25	35	25	35	25	35
Rated short-term withstand current (kA rms)		Icw	AC50/60Hz	1s	25	25	25	25	25	25	25	25
Integrated instant protection		kA	Peak value±10%		40	40	40	40	40	40	40	40
Isolation function					●	○	●	○	●	○	●	○
Application category					B	B	B	B	B	B	B	B
Maximum expected maintenance value (on-off cycle)	Machinery				10000		10000		10000		10000	
	Electric		440V	In/2	6000		6000		5000		5000	
				In	5000		5000		4000		2000	
			690V	In/2	4000		4000		3000		2000	
				In	2000		2000		2000		1000	
class of pollution					III		III		III			
Electrical characteristics according to Nema AB1.					N	H	N	H	N	H	N	H
Segmentation capacity 60 Hz(kA)				240V	50	65	50	65	50	65	50	65
				480V	35	50	35	50	35	50	35	50
				600V	25	50	25	50	25	50		50
Protection and measurement												
Interchangeable control unit					ETS 2.0	ETS 3.0S ETS 6.0	ETS 2.0	ETS 3.0S ETS 6.0	ETS 2.0	ETS 3.0S ETS 6.0	ETS 2.0	ETS 3.0S ETS 6.0
Overpower protection	Long delay	Ir	(Inx...)		●	●	●	●	●	●	●	
	Short delay	Isd	(Irx...)		●	–	●	●	–	●	●	
	Instant	Ii	(Inx...)		●	●	●	●	●	●	●	
Ground fault protection		Ig	(Inx...)		●	–	–	●	–	–	●	
Area selective interlocking		ZSI			–	●	●	●	●	●	●	
4-pole protection					●	●	●	●	●	●	●	
Current measurement					–	●	●	●	●	●	●	
Auxiliary indication control accessory												
Auxiliary contact					●							
Voltage coil			MX shunt coil MN undervoltage trip coil		●							
Installation												
Attachment	Terminal extension and expander Terminal protection and interphase insulation Screen nameplate				● ● ●							
Dimensions, fixed front connection (mm) H×W×D		3P 4P			327×214×147 327×280×147							
Weight, fixed front connection (kg)		3P 4P			14 18							

Control unit ETS "basic protection type"

ETS 20,30S and 60 control units protect the power supply circuit. ETS30S and 60 provide time selectivity in case of short circuit.



① Long delay current setting value and tripping delay
② Overload signal (LED)
③ Short-circuit delay current setting value and tripping delay.
④ Setting of instantaneous protection current
⑤ Fixing screw of long time delay setting module
⑥ Test hole

Protection

The protection threshold and delay are set by adjusting knob. Provide standard long delay setting module.

Overpower protection

Real rms long delay protection.
Thermal memory: heat accumulation before and after tripping.

Short circuit protection

Short delay (rms) and instantaneous protection.
On the delay, I2t (ON or OFF) can be selected

Neutral line protection

On the 3-pole circuit breaker, there is no neutral protection.
On the 4-pole circuit breaker, the neutral line protection can be set through the 3-position switch: neutral line protection (4P 3d), neutral line protection 0.5In(4P 3d+N/2) or neutral line full protection In(4P 4d).

Indication

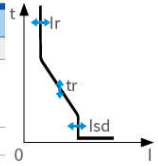
Overload indication is realized by the alarm LED on the panel. The LED lights up when the current exceeds the setting threshold of long delay.

Test

The circuit breaker can be detected through the test hole of the control unit through the hand-held tester and the full-function test box.

Control unit ETS "basic protection type"

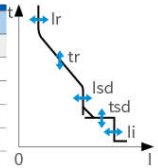
Protection				ETS 2.0								
Long delay												
Current setting (A)		Ir=In x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
Tripping between 1.05 and 1.20Ir.												
Delay			tr(s)	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accury	±10%	1.5×Ir	10	20	40	80	160	240	320	400	480
	Accury	±10%	6×Ir	0.7(1)	1	2	4	8	12	16	20	24
	Accury	±10%	7.2×Ir	0.7(2)	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6

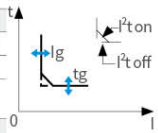


(1)0~-40%(2)0~-60%

Instant										
Setting value (A)	Isd=Ir x...	1.5	2	2.5	3	4	5	6	8	10
Accuracy ±10%										
Delay	Maximum setting time: 20ms; Maximum breaking time: 80ms									

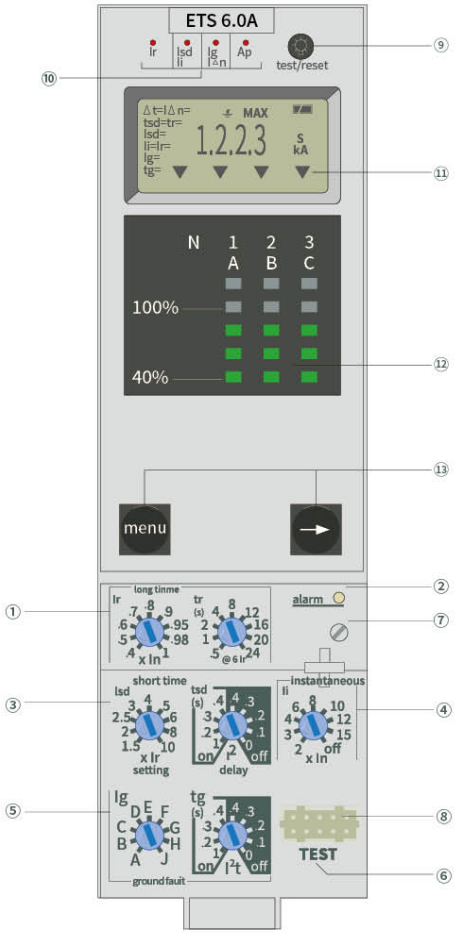
Protection				ETS 3.0S/6.0								
Long delay				ETS 3.0S								
Current setting (A)		Ir=In x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
Tripping between 1.05 and 1.20Ir.												
Delay			tr(s)	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accuracy	±10%	1.5×Ir 时	10	20	40	80	160	240	320	400	480
	Accuracy	±10%	6×Ir 时	0.7(1)	1	2	4	8	12	16	20	24
	Accuracy	±10%	7.2×Ir 时	0.7(2)	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory				20 minutes before and after tripping								
(1)0~-40%(2)0~-60%												
Short delay												
Setting value (A)		Isd=Ir x...		1.5	2	2.5	3	4	5	6	8	10
Accuracy ±10%												
Delay tsd(s)		Adjust	I^2t off	0	0.1	0.2	0.3	0.4				
			I^2t on		0.1	0.2	0.3	0.4				
Delay (ms) at 10Ir		t_{sd} (maximum overcurrent time)		20	80	140	230	350				
(I^2t off or I^2t on)		t_{sd} (maximum overcurrent time)		80	140	200	320	500				
Instant												
Setting		Ii=In x...		2	3	4	6	8	10	12	15	off
Accuracy±10%												
Delay				Maximum setting time: 20ms; Maximum breaking time: 60ms								
Ground fault				ETS 6.0								
Setting value (a)		Ig=In x ...		A	B	C	D	E	F	G	H	J
Accuracy±10%		In ⩽ 400A		0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
		400A < In < 1250A		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
		In ⩾ 1250A		500	640	720	800	880	960	1040	1120	1200
Time setting (s)		整定值	I^2t off	0	0.1	0.2	0.3	0.4				
			I^2t on		0.1	0.2	0.3	0.4				
Delay In in or 1200A (ms)		t_g(最大复归时间)		20	80	140	230	350				
		t(最大分断时间)		80	140	200	320	500				





Control unit ETS A "ammeter"

ETS 6.0A control unit protects the power circuit.
It also provides measurement, display and maximum value of current.
Protection type 6 provides ground fault protection.



① Long time delay, current setting value and tripping delay
② Overload signal (LED)
③ Short time delay, current setting value and tripping delay.
④ Instantaneous value
⑤ Ground fault and tripping delay
⑥ Ground fault test button
⑦ Long delay calibration fixing screw
⑧ Test hole
⑨ Test lamp, reset and battery test
⑩ Trip reason display
⑪ Digital display
⑫ Ammeter and three-phase column chart
⑬ Navigation keys

Protection setting

Use the adjustment button to set the protection threshold and delay. The current and time values are displayed on the screen. Provide standard long delay setting module.

Overpower protection
RMS long delay protection
Thermal reservoir: heat accumulation before and after tripping.

Short circuit protection
Short delay (rms) and instantaneous protection
On short delay, I^2t (ON or OFF) can be selected.

Ground fault protection
I^2t(ON or OFF) is optional.

Neutral line protection
No neutral line protection on 3-pole circuit breaker.
On the 4-pole circuit breaker, the neutral line protection can be set through the 3-position switch: the neutral line has no protection (4P 3t), the neutral line protection is 0.5In (4P, 3t+N/2), and the neutral line protection is In (4P 4t).

Zone selective interlocking (ZSI)
ZSI is connected with multiple control units to provide complete selectivity of ground fault protection and short time delay protection. No time delay is required before tripping

Ammeter

ETS control unit A measures the true effective value (RMS) of current.
The digital LCD continuously displays the maximum load phase current (Imax), or by pressing the navigation key. It can also display I_1, I_2, I_3, I_N, I_{GT}, $I_{\triangle N}$ storage current (maximum value) and set..
The external power supply option can display the current of<20% In.
If the current is lower than 0.05In, the measured value is meaningless. At 0.. 05 to 0.2 In, the accuracy is 0.5% In+1.5% reading.

Overload alarm

The yellow LED on the control unit panel provides overload alarm indication.

Failure indication

The LED light indicates the fault type.
◇ Overload (Ir)
◇ Short circuit (Isd,Ii)
◇ Grounding (Ig)
◇ Internal failure (Ap)

Battery

After the fault occurs, the trip indicator LED remains on until the test/reset button is pressed. Normally, the battery can power the LED arch for about 10 years.

Test

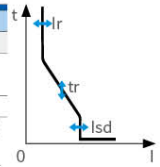
Small or portable test devices can detect circuit breakers through panel test holes. Corresponding to the Micrologic 6.0A control unit, the ground fault protection can be tested through the test button.

Note:
No auxiliary power supply is required for all current protection. The test/reset button resets the maximum measured value, clears the trip indication and tests the battery.

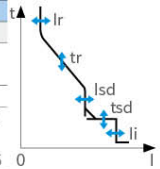
Control unit ETS A "ammeter"

Protection measures			ETS 2.0								
Long delay											
Current setting (A)	Ir=In x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
Tripping between 1.05 and 1.20Ir.											
Time setting (s)		tr(S)	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accuracy: ±10%	tr(1.5×Ir 时)	10	20	40	80	160	240	320	400	480
	Accuracy: ±10%	tr(6×Ir 时)	0.7(1)	1	2	4	8	12	16	20	24
	Accuracy: ±10%	tr(7.2×Ir 时)	0.7(2)	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
(1)0~-40%(2)0~-60%											
Instant											
Setting value (A)	Isd=Ir x...		1.5	2	2.5	3	4	5	6	8	10
Accuracy: ±10%											
Delay			Maximum setting time: 20ms; Maximum breaking time: 80ms								

Ammeter	ETS 6.0A
Continuous current measurement	
Measure 20 to 200%In.	I_1 I_2 I_3 I_N
Accuracy: 1.5% (including current transformer)	No auxiliary power supply(I > 20%In)
Maximum value	$I_{1maximum\ value}$ $I_{2maximum\ value}$ $I_{3maximum\ value}$ $I_{Nmaximum\ value}$

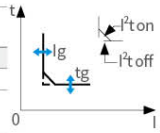


protection measures			ETS 6.0A								
Long delay											
Current setting (A)	Ir=In x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
Trip between 1.05 and 1.20Ir.											
Time setting (s)		tr(s)	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accuracy: ±10%	tr(1.5×Ir 时)	10	20	40	80	160	240	320	400	480
	Accuracy: ±10%	tr(6×Ir 时)	0.7(1)	1	2	4	8	12	16	20	24
	Accuracy: ±10%	tr(7.2×Ir 时)	0.7(2)	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory			20 minutes before and after tripping								
(1)0~-40%(2)0~-60%											
Short delay											
Setting value (A)	Isd=Ir x...		1.5	2	2.5	3	4	5	6	8	10
Accuracy±10%											
Time setting (s)	Setting	I^2t off	0	0.1	0.2	0.3	0.4				
		I^2t on		0.1	0.2	0.3	0.4				
At10×Irdelay(ms)	t_{sd}(maximum overcurrent time)		20	80	140	230	350				
	t_{sd}(maximum breaking time)		80	140	200	320	500				
Instant											
Setting value (a)	Ii=In x...		2	3	4	6	8	10	12	15	off
Accuracy ±10%											
Delay			Maximum setting time: 20ms； ; Maximum breaking time: 60ms								



Ground fault			ETS 6.0								
Setting value (A)	Ig=In x ...		A	B	C	D	E	F	G	H	J
Accuracy: ±10%	In ⩽ 400A		0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	400A < In < 1250A		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	In ⩾ 1250A		500	640	720	800	880	960	1040	1120	1200
Time setting (s)	Setting value	I^2t off	0	0.1	0.2	0.3	0.4				
		I^2t on		0.1	0.2	0.3	0.4				
Delay In in or 1200A (ms)	t_g(maximum reset time)		20	80	140	230	350				
	t(maximum breaking time)		80	140	200	320	500				

Ammeter	ETS 6.0A
Continuous current measurement	
Measure 20 to 200%In.	I_1 I_2 I_3 I_N I_g
Accuracy: 1.5% (including current transformer)	No auxiliary power supply(I > 20%In)
Maximum value	$I_{1maximum\ value}$ $I_{2maximum\ value}$ $I_{3maximum\ value}$ $I_{Nmaximum\ value}$ $I_{gmaximum\ value}$



Electrical and mechanical accessories ZQM8E-800~1600A

OF, SD and SDE switching contacts

All auxiliary contacts can be replaced by "small capacity" contacts for switching very small loads (such as for controlling PLC or electronic circuits).

Indicating contact

Contacts installed in circuit breakers

The changeover contact is used for remote control of circuit breaker status information, so it can be used for display, electric locking, relay control, etc. Comply with IEC 60947-5 international standard.

Function

◆ OF(ON/OFF) indicates the position of main contact of circuit breaker.
◆ SD (tripping indication) indicates that the circuit breaker has been tripped for the following reasons:
◇ Overload
◇ Short circuit
◇ Voltage coil action
◇ "Push to trip": trip button operation.
◇ When the circuit breaker is ON, disconnect it and return to the open state when the circuit breaker is reset.
◆ SDE (fault indication) indicates that the circuit breaker has tripped for the following reasons.
◇ Overload
◇ Short circuit
Return to the open state when the circuit breaker is reset.
◆ CAF/CAO (pre closing or pre opening function) indicates the position of rotary handle. Especially for advance opening of safety tripping device Energize the control device before switching on (pre opening) or closing the circuit breaker.
Installation
◆ SD and SDE function single type contacts perform different indication functions according to their positions installed in the circuit breaker.The contact is fixed in the long hole behind the front cover of the circuit breaker.
◆ The CAF/CAO function contact is installed in the rotary handle device (direct or extended). Electrical characteristics of of OF/SD/SDE/CAF/CAO auxiliary contacts

Contact		Standard				Small capacity			
Rated thermal current (A)		6				5			
Minimum load		100mA at 24V				1mA at 4V			
Type of use (IEC 60947-5-1)		AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operating current (A)	24V	6	6	6	1	5	3	5	1
	48V	6	6	2.5	0.2	5	3	2.5	0.2
	110V	6	5	0.6	0.05	5	2.5	0.6	0.05
	220V/240V	6	4	-	-	5	2	-	-
	250V	-	-	0.3	0.03	5	-	0.3	0.03
	380/440V	6	2	-	-	5	1.5	-	-
	480V	6	1.5	-	-	5	1	-	-
	660/690V	6	0.1	-	-	-	-	-	-

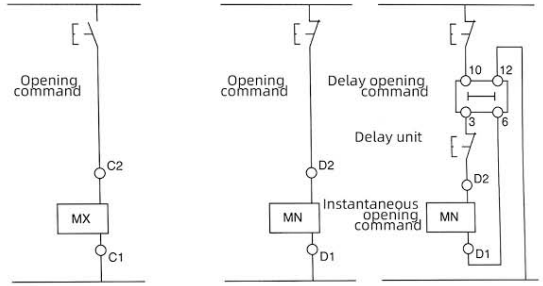
Electrical and mechanical accessories ZQM8E-800~1600A

MX voltage trip coil

Voltage trip

This functional element opens the circuit breaker through an electric command. The component of the element can be a shunt coil (MX) or an undervoltage trip coil (MN) or a delayed undervoltage trip coil (MN+delay unit).
The delay unit is installed outside the circuit breaker, and the emergency opening OFF button can be used to momentarily open the circuit breaker to cancel the delay.

Wiring diagram of remote controlrelease functional element



Voltage tripping coil (MX)
When the MX voltage tripping coil is energized, the circuit breaker will open instantaneously. The continuous power supply of MX locks the circuit breaker in the OFF position.

Characteristics		
Power Supply	V AC 50/60Hz	24-48-100/130-200/250-277-380/480
	V DC	12-24/30-48/60-100/130-200/250
Working range		0.7-1.1Un
Continuous locking function		0.85-1.1Un
Energy consumption (VA or w)		Suction: 200(200ms)
		Hold: 4.5
Response time of Un short circuit breaker		50ms±10

S instantaneous undervoltage coil (MN)
When the power supply voltage of MN drops to 35% - 70% of its rated voltage. MN causes the circuit breaker to open instantaneously.
If MN loses power, it is impossible to close the circuit breaker manually or electrically. Any attempt to switch on will not lead to the main contact. When the power supply voltage of the coil recovers to 85% of its rated value, the circuit breaker can be closed again.

characteristics		
Power Supply	V AC 50/60Hz	24-48-100/130-200/250-277-380/480
	V DC	24/30-48/60-100/130-200/250
Working range	Opening activation	0.35-0.7un
Continuous locking function	Closing activation	0.85Un
Energy consumption (VA or W)		Suction: 200(200ms)- Hold: 4.5
MN Energy consumption with delay unit (VA or W)		Suction: 200(200ms)- Hold: 4.5
Response time of Un short circuit breaker		90ms±5

MN, MX voltage coil wiring

In the process of suction, the initial power is about 150-200 VA. In the case of low power supply voltage (12,24,48V), the maximum cable length depends on the power supply voltage and cable size.

		12V		24V		48V	
		2.5mm²	1.5mm²	2.5mm²	1.5mm²	2.5mm²	1.5mm²
MN	100%U power supply voltage	-	-	58	35	280	165
	85%U power supply voltage	-	-	16	10	75	45
MX-XF	100%U power supply voltage	21	12	115	70	550	330
	85%U power supply voltage	10	6	75	44	350	210

Note: The above length refers to one of the two power conductors.

Electrical and mechanical accessories ZQM8E-800~1600A

ZQM8E-800 to 1600A with direct rotating handle

Rotary handle

There are two kinds of rotating handles:
◆ Direct rotation handle
◆ Extended rotary handle
There are two models:
◆ Standard type, black handle
◆ Yellow cover and red handle for machine tool control

Direct rotary handle

Protection level IP40, IK07
The direct rotary handle has the following characteristics:
◆ Visual tripping setting value
◆ Suitable for isolation.
◆ Indicating O(OFF),I(ON) and tripping positions.
◆ The "Push to trip" button can be operated.
◆ One to three padlocks can be used to lock the circuit breaker in the OFF position, and the shackle diameter is 5-8mm (not provided) handle replaces the front cover of the circuit break.
The accessories change the following conditions of the standard direct rotation handle:
◆ MCC switch board:
◇ Unable to open the door when the circuit breaker is
◇ The circuit breaker cannot be closed when opening the door.
◆ High protection level (IP 43, IK 07) machine control, in line with CNOMO E03.81.501, IP54, IK07

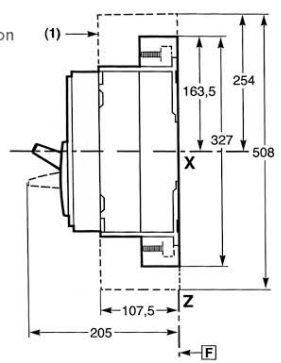
ZQM8E-800~1600A with extended rotary handle

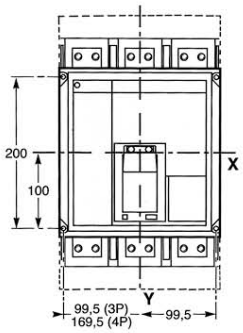
Extended rotary handle

Protection level IP55, IK07
The handle on the front of the switch board can operate the circuit breaker installed on the back of the switch board.
The handle has the following characteristics:
◆ Suitable for isolation.
◆ Indicating O(OFF),I(ON) and tripping positions.
◆ Visual trip setting when the switch panel door is opened.
◆ One or three padlocks can be used to lock the circuit breaker in the OFF position, and the shackle diameter is 5-8mm (not provided).The door cannot be opened when it is ON or locked.
Components of extended rotary handle:
◆ Replace a part of the front cover of the circuit breaker (fixed with bolts)
◆ A device (handle and front plate) on the door. Whether the circuit breaker is installed vertically or horizontally, the device is always fixed in the same position.
◆ An extension shaft. The axis must be adjusted for distance. The minimum/maximum distance between the back of the circuit breaker and the door is218/605mm

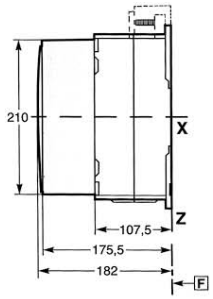
Fixed shape and installation dimensions

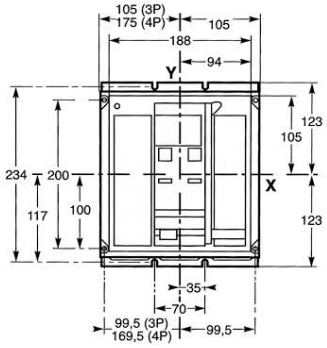
◆ Manual control
Front connection





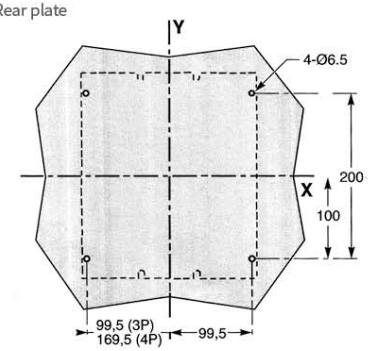
◆ Electrical control
Front connection



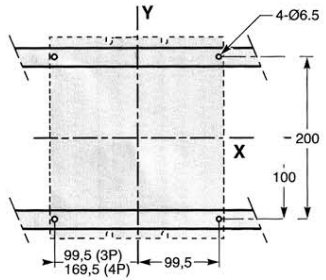


F datum point

◆ Front plate connection
Rear plate



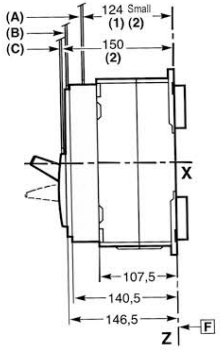
On the guide rail

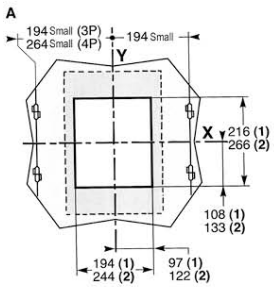


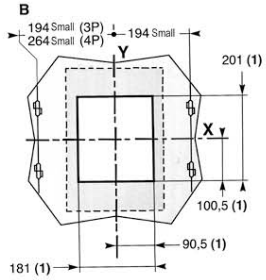
Note: X and Y are the symmetry plane of the 3-pole circuit breaker
Z is the rear plane of the circuit breaker

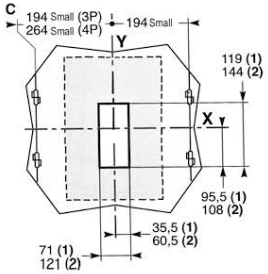
Electrical and mechanical accessories ZQM8E-800~1600A

◆ Handle operation



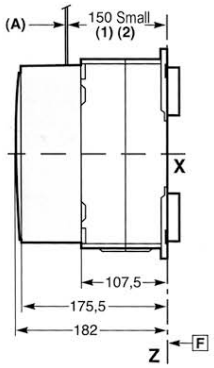




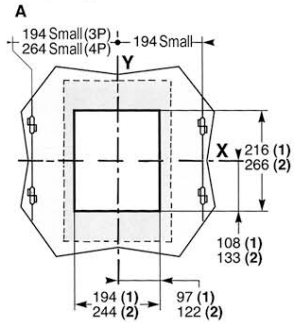


F Datum point
(1) No door frame
(2) With door frame

◆ Electrical control



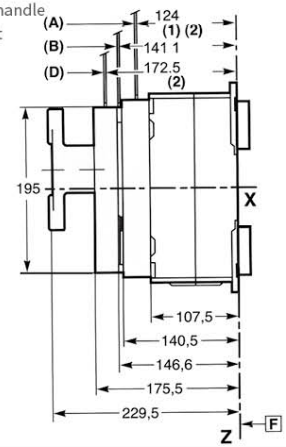
Door opening

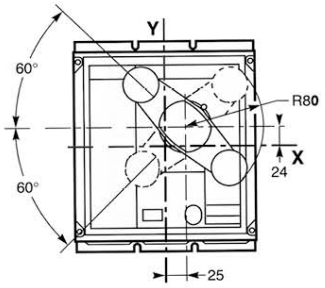


F Datum point
(1) No door frame
(2) With door frame

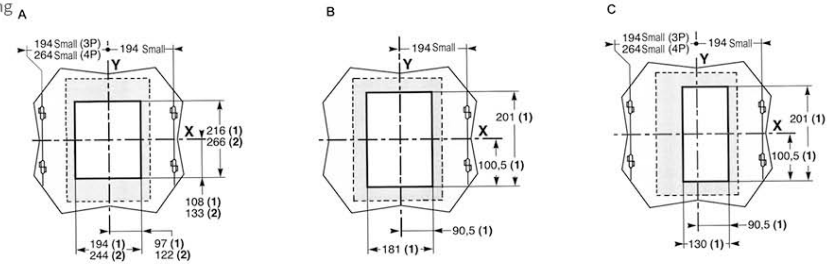
Fixed shape and installation dimensions

◆ Direct rotary handle
Measurement



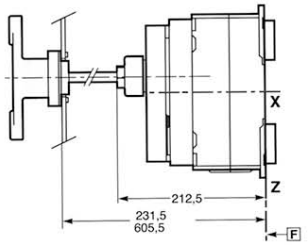


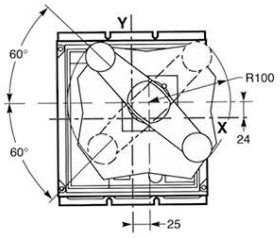
◆ Door opening

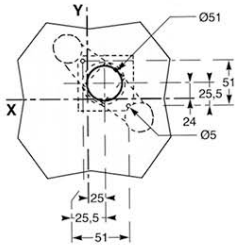


(1) No door frame
(2) With door frame

◆ Extended rotary handle
Measurement





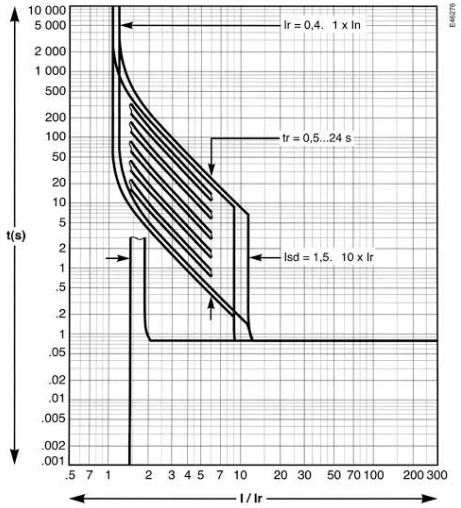


F Datum point

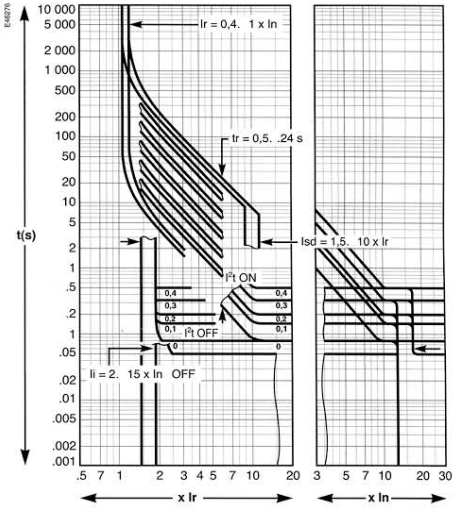
Note: X and Y are the symmetry plane of the 3-pole circuit breaker
Z is the rear plane of the circuit breaker

Electrical and mechanical accessories ZQM8E-800~1600A

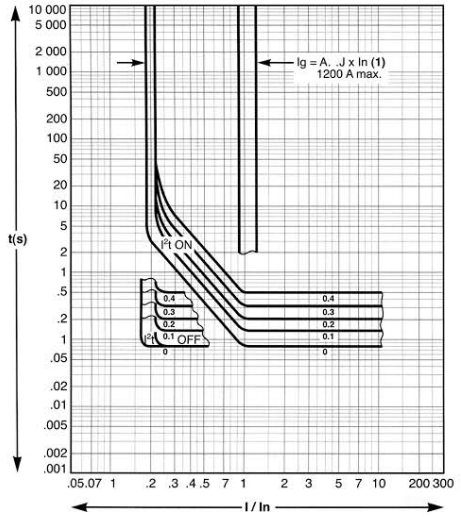
◆ ETS 2.0



◆ ETS 3.0S，6.0



◆ Ground fault protection (ETS 6.0)



(1)

Ig=In x...	A	B	C	D	E	F	G	H	J
Ig < 400A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
400 A ⩽ Ig ⩽ 1200A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Ig > 1200A	500	640	720	800	880	960	1040	1120	1200