The over current protection characteristics of MCCB for motor

Table 6

Rated current In (A)	Thermal release(ambient temperature is +40)				Electromagnetic release operating current (A)
	1.0In no operating time (h) (cold state)	1.2n operating time (min) (thermal state)	1.5In operating time Tp (min) (thermal state)	7.2In operating time Tp (s) (cold state)	
In=63	>2	⩽ 2	⩽ 2	2< Tp ⩽ 10	(12 ± 2.4)In
63<In<250			⩽ 4	4< Tp ⩽ 10	
250<In ⩽ 800			⩽ 8	8< Tp ⩽ 80	

Note: the operating current of HUM8-630, HUM8-800 MCCB's electromagnetic release is (5~14)In, adjustable.

Circuit breaker′s power loss , refer toTable 7

Table 7

Rated current of frame size Inm(A)	Rated current In (A)	Resistance per pole (mΩ)		Total power loss of three poles (W)			
				Fixed type		Inserted type or drawable type	
		C,S type	H,U type	C,S type	H,U type	C,S type	H,U type
63	63	2.1	-	25	-	-	-
100	100	0.83	1.33	25	40	30	46
250	250	0.32	0.51	60	115	75	135
400	400	0.20	0.33	96	158	120	187
630	630	0.14	0.22	167	262	195	296
800	800	0.11	0.18	216	336	260	389

Intelligent controller

Rated current of MCCB′s frame size Inm=400A~800A can be installed intelligence controller. Current transformer from a complete set of intelligent controller for MCCB′s power supply, named autogeny power supply. When the three-phase current >0.2In or single phase current >0.5 In, intelligent controller can work reliably. The intelligent controller can dispart into two type according to the function:

M type intelligent controller: Current transformer and electronic apparatus instead with thermal electromagnetic release, so it also named electronic type release.

H type intelligent controller: Except have the functions of M type intelligence controller, it also have RS485 serial communication interface, complying with the communication group network′s request of telecontrol test, telecontrol adjust, telecontrol, telecontrol communicate (namely four telecontrol).

1.M type intelligent controller

1.1 Function

a. Overload inverse time lag protection;

b. Short circuit, short time delay ″fixed time lag″protection or short circuit, short time delay ″fixed time lag + inverse time lag″protection;

c. Short circuit instantaneous operating protection;

d. Earthing protection;

e. Auxiliary function operating current indicate, power supply and self diagnosis indicate, forecast alarm and earthing alarm indicate;

f. It can choose single output of forecast alarm, release alarm, earthing alarm(4 pole MCCB) etc, and it needs ST-200 control module, connection type shown by Drawing 6;

g. Panel's parameter setting up and tripping test function;

1.2 The panel layout of M type intelligent controller shown by Drawing 7.

1.3 The over current protection characteristic curve of M type intelligent controller shown by Drawing 8 and 9.

Drawing 8:

Ir1 is long time delay release setting up current;TL is long time delay operating time;

Ir2 is short time delay release setting up current; TS is short time delay operating time;

Ir3 is instantaneous release setting up current; TG is earthing fault operating current;

Ir4 is earthing fault setting up current;

Ip is forecast alarming current.

Note: 4 pole MCCB′s forecast alarming current Ip=1.01Ir1.

2. H type intelligent controller

2.1 Function:

a. Overload inverse time lag protection;

b. Short circuit, short time delay ″fixed time lag″protection or short circuit, short time delay ″fixed time lag + inverse time lag″protection;

c. Short circuit instantaneous operating protection;

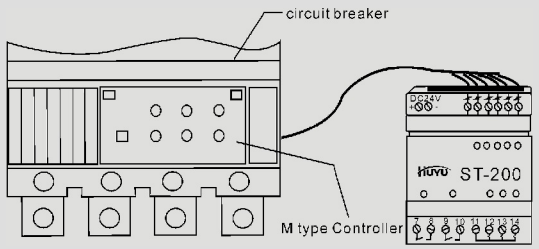
d. Earthing protection(4 pole MCCB)

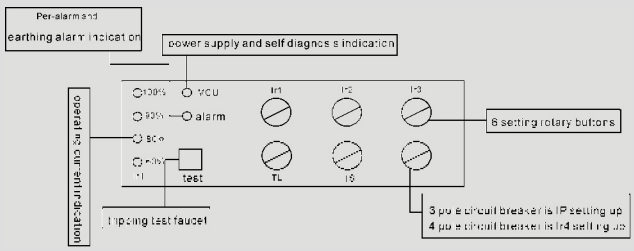
e. Auxiliary function operating current indication, power supply and self diagnosis indication, forecast alarm and earthing alarm indication;

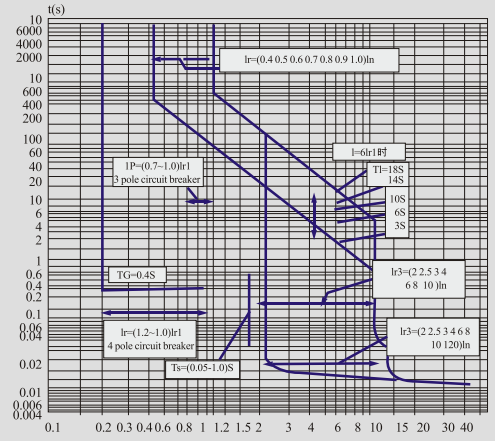
f. It can choose single output of forecast alarm, release alarm, earthing alarm, tripping alarm, switch on, switch off etc.

g. It has RS485 serial communication interface.

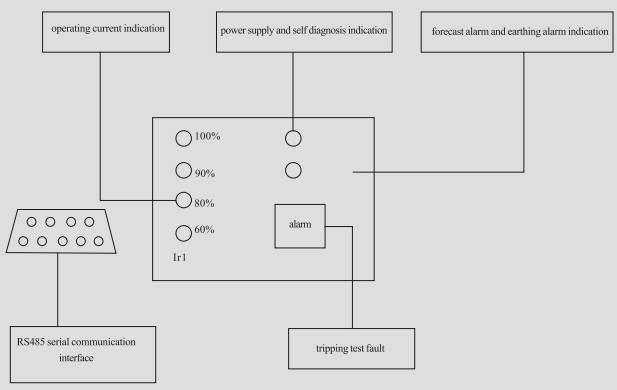
h. Panel′s parameter setting up and tripping test function;







Short time delay fixed time protection characteristic curve



4. The usage mode of intelligent controller and notice

4.1 Setting of over-current characteristic
If user want to reset the current characteristic, it should be operated by skillful man.
4.1.1 Setting of M type intelligent controller
Openning the panel cover of M type intelligent controller, use screw-driver revole the set up rotary button(refer to Picture 7), set up the parameter.
4.1.2 H type intelligence controller set up
Use ST hand editor to set up the protection characteristic of H type intelligent controller, more detail information please refer to ″ST editor manual″
4.1.3 Notice: request 1r1<1r2<1r3.
4.2 Intelligent controller tripping test
After user sets up the intelligent controller, maintained circuit breaker breaker and regular inspection should have tripping test, check whether the release is intact and whether the circuit breaker can tripping.
4.3 The fault inspecting function of H type intelligent controller after the circuit breaker breaks at over-current and has auxiliary power supply, the H type intelligent controller has the fault memory function. When electrify renew, press the key ″test″on the ST-CM video module, it can display the fault reason. If fault happens again, it will clear fault memory and save new fault memory.
4.4 Intelligent controller maintenance
4.4.1 The circuit breaker should be protected in transportation, installing and using, and avoid exquisite impacting and libration.
4.4.2 Don′t open the panel protection cover randomly for fear change the set up protection characteristic parameter or damage the electronic apparatus in the panel.
4.4.3 The circuit breaker should be inspected by skillful man for all kinds of parameter are correctly set up, the correct connecting of intelligent controller and module, at normal working state.
4.4.4 When the intelligent controller is operating,the user can see the circuit breaker′s operating state by indication light on the panel.

Structure characteristic

1.Adopt advanced arc extinguish technology, high breaking capacity of short circuit, complete series of circuit breakers are zero arcing.

Putting insulated material beside of moving contact and static contact, one of the function is limiting the arc area, and it will bring a lot of smoke at high temperature, enhance the pressure and cool the arc, make the resistance risen, enhance arc voltage.

2. Advanced design of operating mechanism

Reliable and steady of operating mechanism lock to ensure switch on, small tripping force Inm=400A~800A add class one enlarge mechanism to ensure switch off at over-current. The operating mechanism of Inm=100A~250A: when tripping at over current, the contact′s limiting distance is bigger than normal tripping (about bigger 50%), it will in favor of enhance short circuit breaking capacity.

Putting insulated material beside of moving contact and static contact; circuit breaker at normal breaking position

Circuit breaker at a tripping breaking position, the contact′s limiting distance is bigger than normal tripping position.

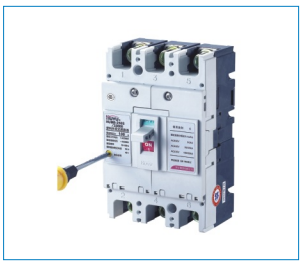
3. Adopt micro-electronic technology, intelligentize control

Inm=400A~800A not only has thermal electromagnetic release, it also has electronic release and intelligent release.
3.1 Electronic release is current transformer and electronic apparatus instead by thermal release and electromagnetic release, it has the function of set up protection characteristic parameter, facility use, accurate for saving characteristic.
3.2 Intelligent release has serial communication interface, no function of set-up panel parameter, editor set-up protection characteristic parameter by communication interface, it also can comply with the request of communication .

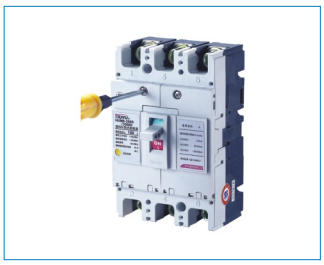
4. Complete accessory

The accessories are divided into inside accessories and outside accessories.
4.1 The inside accessories are: auxiliary contact, alarm contact, shunt release, under-voltage release. The accessories can be packed in a special accessories box(installation process,refer to under pictures),which has special connecting terminal base.

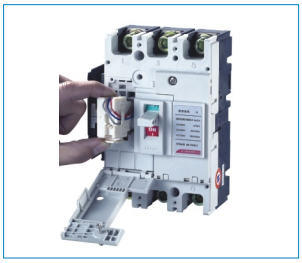
1.Press the tripping button to break it.



2.Screw out the front cover's screw.



3.Install the inside accessories

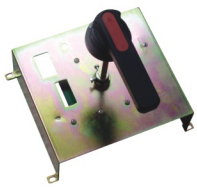


4.Close the front cover and screw down

Notice: tripping the circuit breaker before instaling the accessories.

4.2 Outside accessory

4.2.1 CS1 rotary operating handle



Install on the circuit breaker, which can use padlock to prevent the circuit breaker to switch on and swtich off.

4.2.2 MD motor operating mechanism

Used in Inm=100A, 125A circuit breaker.

4.2.3 MDX motor operating mechanism

Used in Inm=100A~800A circuit breaker.

5.Complete of specification

5.1 It can dispart 6 specifications from 63A to 800A according to frame case grade.
5.2 It can dispart 32 specifications from 10A to 800A according to rated current.
5.3 It can dispart 4 kinds according to short circuit breaking capacity: C-fundamental type, S-standard type, H-high class type, U-current limiting type
5.4 Two types of over-current tripping, one is thermal electromagnetic release, the other is digital electronic release(intelligent controller).
5.5 Connection type:
Front connection, rear connection and insert connection.
The Inm ⩾ 630A circuit breaker have drawable device, this device connects or insulates the circuit with circuit breaker by rocker.