

Hyundai Innovative

Magnetic Contactor | Overload Relay



Hi Series Hyundai Innovative Magnetic Contactor | Overload Relay

Innovative Technology, High Performance Magnetic Contactor

Strong

Significantly Extended Lifetime

Silent

Noise Free

Small

Compact Design



Reliability

HiMC magnetic contactor series employ a modular design which allows quick and simple mounting of auxiliary contact blocks, timers, mechanical latching blocks, etc.

HiMC provides convenience, economic benefit and high reliability.

Solution

Featured with superior design for industrial applications such as motor control centers, HiMC contactors are appropriate for various control systems, and favored by shipyards and power plants, where high reliability and performance are the critical criteria.



Introduction

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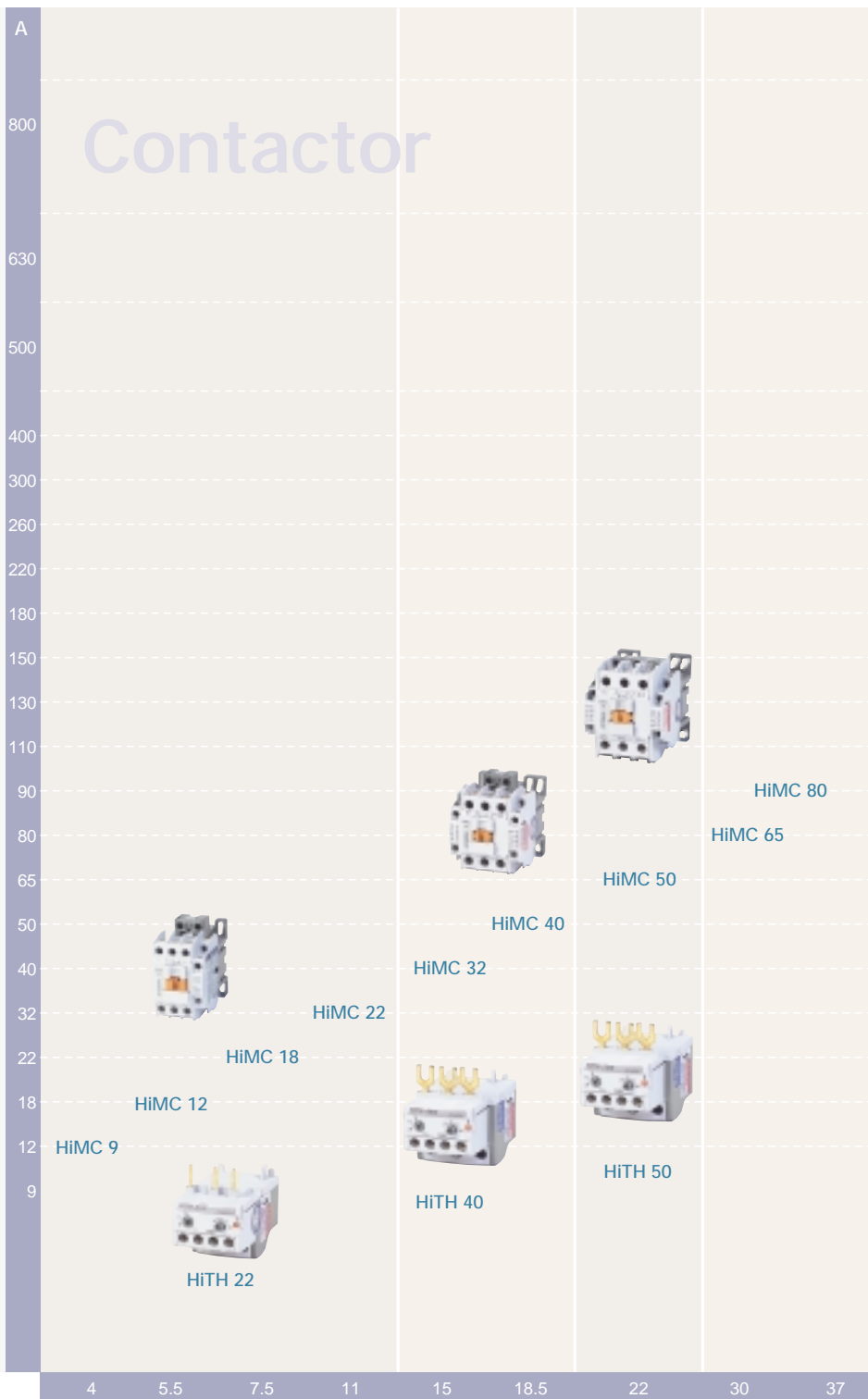
High Performance Contactor & Overload Relay

Standards

IEC 60947
EN 60947
UL 508
BS 47794, BS 5424, BS 4941
VDE 0660
Det Norske Veritas
KS C4504
JISC 8328, JEM 1038

Approvals

UL / C-UL
CE (Community European / TÜV Rheinland)
TSE
GOST-R
CCC
ISO 18001, 14001, 9001



(at 380/440 V)

Broad Range Covering up to 440 kW 800 A



HiMC 110B

HiMC 90



HiMC 110



HiTH 90



HiMC 150



HiTH 130



HiTH 220



HiMC 300

HiMC 260



HiTH 300



HiMC 400



HiTH 500



HiMC 630



HiTH 800

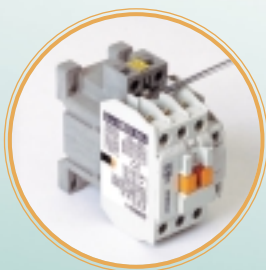
HiMC 800

HiMC 9 ~ HiMC 50

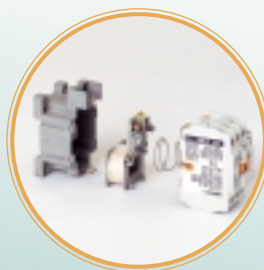
[Small Frame Size Contactor]



The electrical and mechanical lifetime of HiMC has been significantly extended. New materials prevent any generation of corroded substances, and the core maintains noise-free status with the help of special anti-rust oil treatment. Various accessories can be attached easily. Terminal wiring is designed to meet IEC 60529 and protection degree of IP 20. By using clips, HiMC's coil can be replaced easily and its frequency is available in both 50 Hz and 60 Hz.



Quick and Easy Disassembly



Fast and Easy Coil Change



Flexible Installation

HiMC 65 ~ HiMC 800

[Large Frame Size Contactor]



The electrical and mechanical lifetime of HiMC has been significantly extended. The optimized design of the arc chamber minimizes contact erosion.

HiMC contactor maintains noise-free operation through the DC-control method.

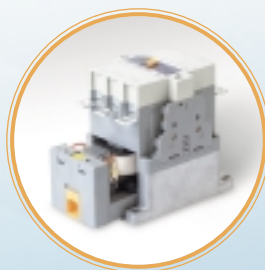
HiMC contactor is available in both AC/DC and 50 Hz / 60 Hz with an electronic circuit which enables operation through severe voltage drop.

HiMC contactors can be used in various environments by adopting special plastic(CTI/600 V) which has heat & waterproof characteristics.

By adopting a cassette unit, the coil assembly can be replaced conveniently.

As the cover of HiMC contactor can be easily opened, maintenance is very convenient.

Two auxiliary contact blocks of 1NO+1NC can be attached to each side of HiMC, allowing auxiliary contacts to be added up to 4NO+4NC.



Easy Coil Change



Easy Contacts Inspection

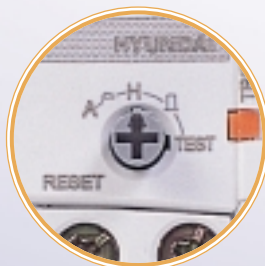
[Thermal Type]

Thermal Overload Relay

HiTH Series



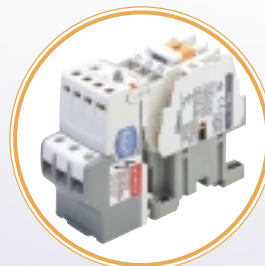
Current range covering all HiMC contactor rating 0.12 to 800 A, 9 frame sizes
 Compensating ambient temperature -25 ~55
 Safety cover for main terminal & control terminal
 Separated mechanical part to increase safety
 Additional auxiliary contact 1NO+1NC (1a1b)
 Three operational mode : MANUAL (H) / AUTO (A) / TEST (TEST)
 Trip indicator to indicate relay status
 Built-in trip free mechanism to make trip at any position
 Differential trip feature for effective motor protection, 40~60 % of trip time at phase loss
 Separate mounting unit to mount separately with screws or DIN rail



Three Operational Modes



Separate Mounting



Direct Mounting

[Electronic Type]

Digital Motor Protection Relay

HiMP Series



Economic Type

Various Protective Function

- Over current
- Under current
- Phase failure
- Phase unbalance
- Restriction

Various Wiring Method

- Tunnel type
- Terminal screw type
- Direct connection type

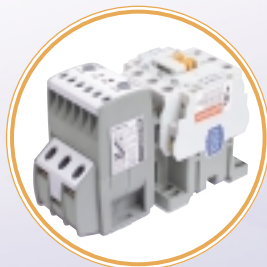
Standard Type

Various Protective Function

- Over current
- Under current
- Phase failure
- Phase unbalance
- Reverse phase
- Stall & Lock

Various Wiring Method

- Tunnel type
- Terminal screw type
- Direct connection type



Direct Connection Type can be mounted directly to the contactor

Deluxe Type

Various Protective Function

- Over current & Under current
- Phase failure & Phase unbalance
- Reverse phase / Stall & lock
- Earth leakage or short circuit (Option)

Alert Function

- Overload alert
- Accumulated operating time alert
- Setting time alert

Display Function

- Display ampere
- Trip cause & Trip current
- Separable display part

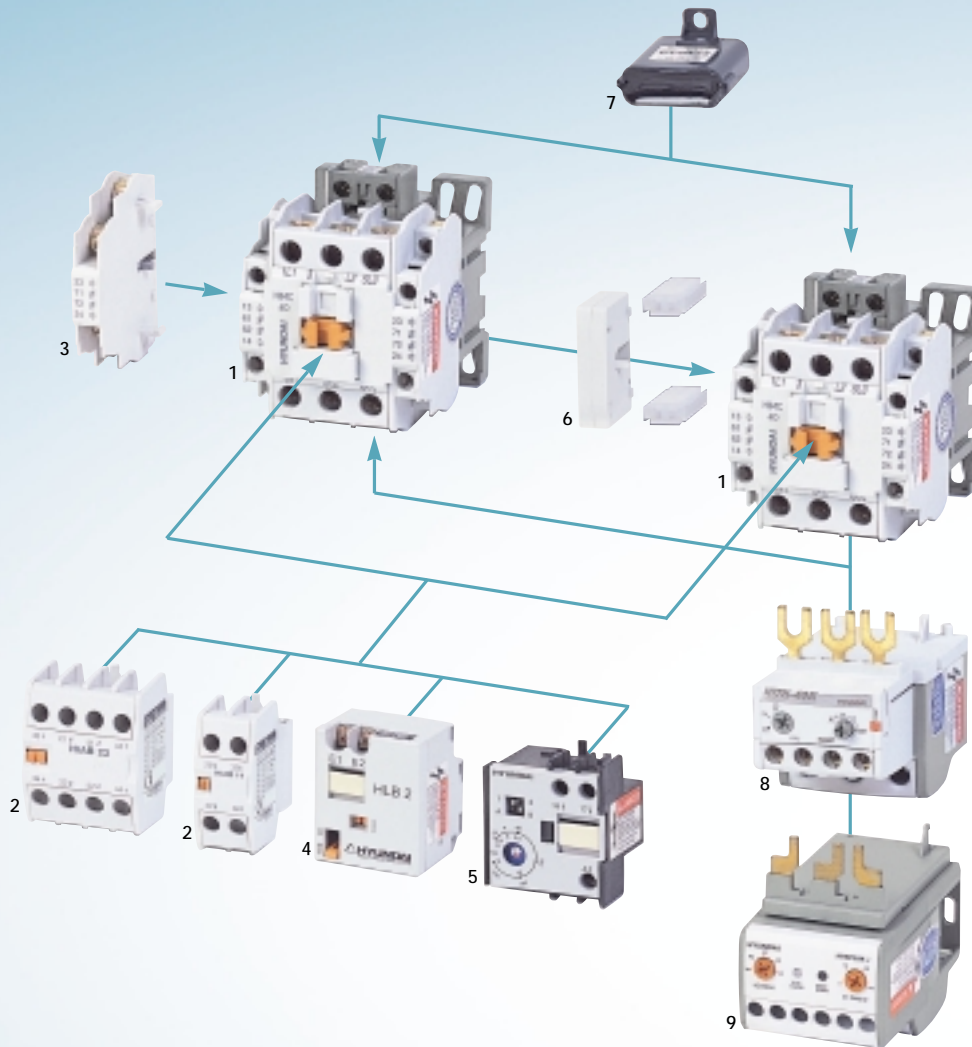
Various Wiring Method

- Terminal screw type
- Tunnel type

Trip Characteristics

Selectable inverse & Definite

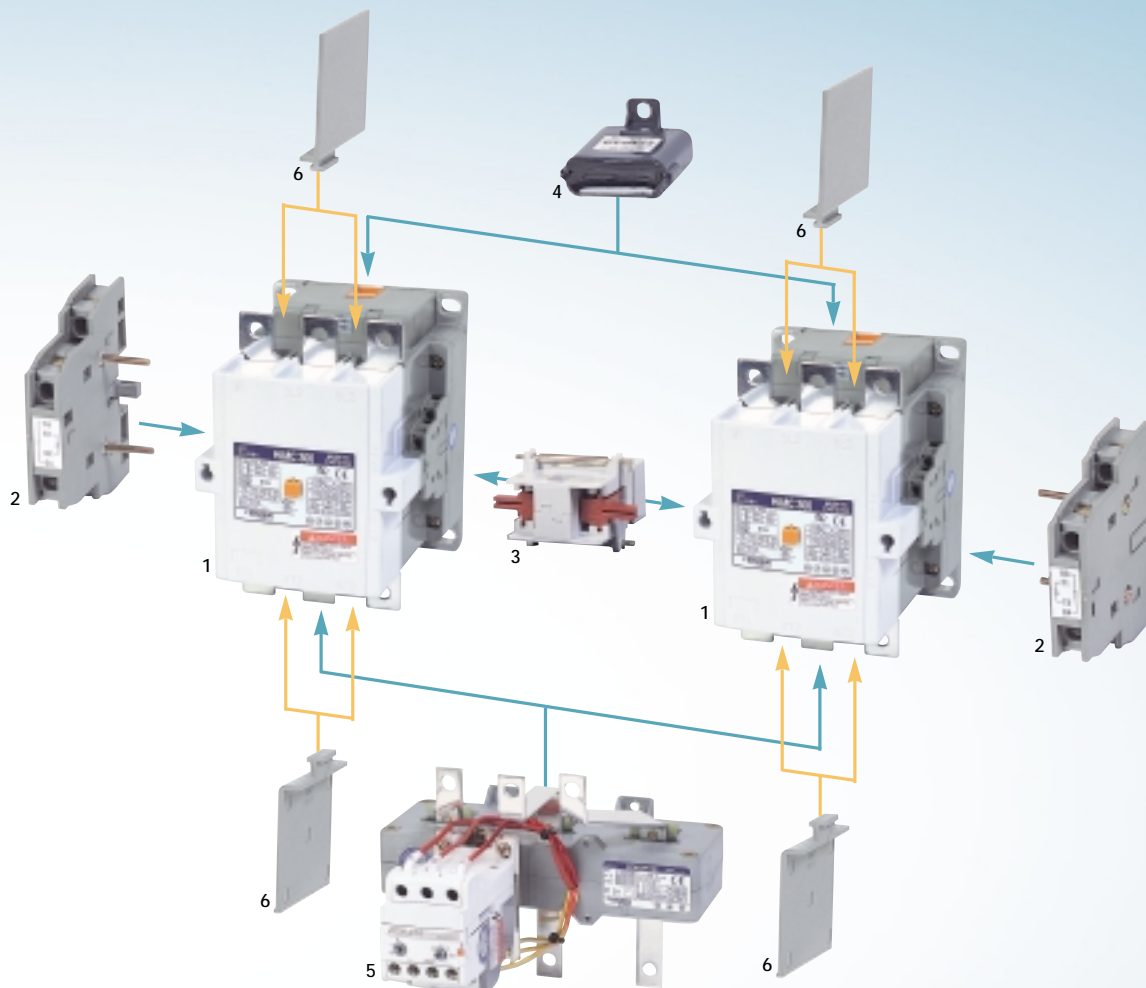
HiMC 9 ~ HiMC 50 [Small Frame Size Contactor]



Accessories

- | | | |
|--|--|--|
| <p>1. Contactor
HiMC 9~50</p> | <p>4. Mechanical Latching Block
HLB2</p> | <p>8. Thermal Overload Relay</p> <ul style="list-style-type: none"> • HiTH 22 for HiMC 9~22 • HiTH 40 for HiMC 32 & HiMC 40 • HiTH 50 for HiMC 50 |
| <p>2. Auxiliary Contact Block : Front Mounting
HiAB for HiMC 9~50
(4 pole and 2 pole blocks)</p> | <p>5. Electronic Timer Block
HOKZE</p> | <p>9. Digital Motor Protection Relay</p> <ul style="list-style-type: none"> • HiMP 22 for HiMC 9~22 • HiMP 40 for HiMC 32 & HiMC 40 • HiMP 50 for HiMC 50 |
| <p>3. Auxiliary Contact Block : Side Mounting
HiAL11 for HiMC 9~22
(2 pole (1NO+1NC) block)</p> | <p>6. Mechanical Interlock Unit</p> <ul style="list-style-type: none"> • HiTL 40 for HiMC 9~40 • HiTL 50 for HiMC 50 | |
| | <p>7. Surge Absorber
HRC for HiMC 9~50</p> | |

HiMC 65 ~ HiMC 800 [Large Frame Size Contactor]



Accessories

1. Contactor
HiMC 65 ~ 800

2. Auxiliary Contact Block : Side Mounting

- HiAL 5S, HiAR 6S for HiMC 65~150B
- HiAL 7S, HiAR 8S for HiMC 150~800
(2 pole (1NO+1NC) block)

3. Mechanical Interlock Unit

- HiTL 130 for HiMC 65~150B
- HiTL 220 for HiMC 150~220
- HiTL 300 for HiMC 260~300
- HiTL 800 for HiMC 400~800

4. Surge Absorber
HRC for HiMC 65~300

5. Thermal Overload Relay

- HiTH 90 for HiMC 65~110B
- HiTH 130 for HiMC 110~150B
- HiTH 220 for HiMC 150~220
- HiTH 300 for HiMC 260~300
- HiTH 500 for HiMC 400~500
- HiTH 800 for HiMC 630~800

6. Insulation Barrier Unit
Spare part

HiMC Contactor

(3 pole)



Type		HiMC 9		HiMC 12		HiMC 18		HiMC 22	
Selection		Page 22		Page 22		Page 22		Page 22	
Ratings according to IEC 60947									
Rated Insulation Voltage		750 V		750 V		750 V		750 V	
Rated Operational Voltage		690 V		690 V		690 V		690 V	
AC-1 (=I _{th})	Rated Current with Resistive Load	20 A		20 A		25 A		32 A	
AC-3	Rating of 3-phase Motor 50~60 Hz	kW	A	kW	A	kW	A	kW	A
	200~240 V	2.2	10	3.7	13	4.5	18	5.5	22
	380~440 V	4	9	5.5	12	7.5	18	11	22
	500~550 V	4	7	7.5	12	8.5	15	15	22
	660~690 V	5.5	7	7.5	9	7.5	9	15	18
Ratings according to UL508									
Continuous Current		20 A		20 A		25 A		32 A	
Rating of 1-phase Motor		HP	A	HP	A	HP	A	HP	A
100~120 V		0.5	9.8	0.5	9.8	1	16	1.3	20
220~240 V		1	8	1	8	3	17	3	17
Rating of 3-phase Motor		HP	A	HP	A	HP	A	HP	A
220~240 V		5	6.8	3	9.6	5	15.2	5	15.2
440~480 V		5	7.6	5	7.6	10	14	10	14

HiTH Thermal Overload Relay

for Direct Mounting
to HiMC Contactors



Type	HiTH 22	
Selection	Page 56	
Setting Range (Overload Trip)	0.12~1.18 A	2~3 A
	0.18~0.26 A	2.8~4.2 A
	0.25~0.35 A	3~5 A
	0.34~0.5 A	4~6 A
	0.5~0.7 A	5.6~8 A
	0.6~0.9 A	7~10 A
	0.8~1.2 A	9~13 A
	1.1~1.6 A	12~18 A
	1.5~2.1 A	16~22 A



HiMC 32		HiMC 40		HiMC 50		HiMC 65		HiMC 80		HiMC 90		HiMC 110B	
Page 22		Page 22		Page 22		Page 24		Page 24		Page 24		Page 24	
750 V		750 V		750 V		750 V		750 V		750 V		750 V	
690 V		690 V		690 V		690 V		690 V		690 V		690 V	
50 A		50 A		70 A		100 A		110 A		135 A		150 A	
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A	kW	A
7.5	32	11	40	15	50	18.5	70	22	80	25	90	30	110
15	32	18.5	40	22	50	30	65	37	80	45	90	55	110
18.5	28	22	32	30	45	37	60	45	64	50	80	60	110
18.5	22	22	26	25	31	37	44	45	52	50	60	55	65
45 A		50 A		65 A		80 A		90 A		100 A		150 A	
HP	A	HP	A	HP	A	HP	A	HP	A	HP	A	HP	A
2	24	2	24	3	34	-	-	-	-	-	-	-	-
5	28	5	28	7.5	40	-	-	-	-	-	-	-	-
HP	A	HP	A	HP	A	HP	A	HP	A	HP	A	HP	A
10	28	10	28	15	42	20	54	25	68	30	80	30	80
20	27	20	27	30	40	50	52	60	65	60	65	60	77



HiTH 40		HiTH 50	HiTH 90
Page 56		Page 56	Page 56
7~10 A	18~26 A	18~26 A	28~40 A
9~13 A	24~32 A	24~32 A	36~50 A
12~18 A	28~40 A	28~40 A	45~65 A
16~22 A		36~50 A	60~80 A
			70~90 A

HiMC Contactor

(3 pole)



Type		HiMC 110		HiMC 130		HiMC 150B		HiMC 150		HiMC 180	
Selection		Page 24		Page 24		Page 24		Page 24		Page 24	
Ratings according to IEC 60947											
Rated Insulation Voltage		1000 V		1000 V		1000 V		1000 V		1000 V	
Rated Operational Voltage		1000 V		1000 V		1000 V		1000 V		1000 V	
AC-1 (=I _{th})	Rated Current with Resistive Load	150 A		160 A		200 A		200 A		230 A	
AC-3	Rating of 3-phase Motor 50~60 Hz	kW A		kW A		kW A		kW A		kW A	
	200~240 V	30	110	37	130	45	150	45	150	55	180
	380~440 V	55	110	65	130	75	150	75	150	90	180
	500~550 V	60	110	70	120	90	140	90	140	110	180
	660~690 V	55	65	60	70	90	100	90	100	110	120
	1000 V	65	50	75	54	90	66	90	66	110	78
Ratings according to UL508											
Continuous Current		150 A		160 A		200 A		200 A		230 A	
Rating of 1-phase Motor		HP	A	HP	A	HP	A	HP	A	HP	A
100~120 V		-	-	-	-	-	-	-	-	-	-
220~240 V		-	-	-	-	-	-	-	-	-	-
Rating of 3-phase Motor		HP	A	HP	A	HP	A	HP	A	HP	A
220~240 V		30	80	40	104	50	130	50	130	60	154
440~480 V		60	77	75	96	100	124	100	124	125	156

HiTH Thermal Overload Relay

for Direct Mounting
to HiMC Contactors



Type	HiTH 130	HiTH 220
Selection	Page 58	Page 58
Setting Range (Overload Trip)	48~80 A 78~130 A	78~130 A 108~180 A 132~220 A



HiMC 220		HiMC 260		HiMC 300		HiMC 400		HiMC 500		HiMC 630		HiMC 800	
Page 24		Page 26		Page 26		Page 26		Page 26		Page 26		Page 26	
1000 V		1000 V		1000 V		1000 V		1000 V		1000 V		1000 V	
1000 V		1000 V		1000 V		1000 V		1000 V		1000 V		1000 V	
260 A		300 A		350 A		450 A		550 A		750 A		900 A	
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A	kW	A
63	220	75	260	90	300	125	400	140	500	190	630	220	800
110	220	132	260	160	300	220	400	250	500	330	630	440	800
132	200	150	220	160	273	220	350	300	426	330	500	500	720
132	150	160	173	200	220	250	300	335	360	400	412	500	630
132	96	160	113	200	141	250	178	275	192	300	213	400	284
260 A		300 A		350 A		450 A		550 A		750 A		900 A	
HP	A	HP	A	HP	A	HP	A	HP	A	HP	A	HP	A
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
HP	A	HP	A	HP	A	HP	A	HP	A	HP	A	HP	A
75	192	75	192	100	248	125	312	150	360	250	480	300	720
150	180	150	180	200	240	250	302	250	302	500	477	600	708



	HiTH 300	HiTH 500	HiTH 800
	Page 58	Page 58	Page 58
	132~220 A 180~300 A	180~300 A 240~400 A 300~500 A	378~630 A 480~800 A

Magnetic Contactor

HiMC				22		W		22		S		/ 220		X	
Rated Current(440VAC)						W AC Control		2 Number of NO		Safety Cover		Operation Voltage		Blank X	
Type	Current	Type	Current			G DC Control	2 Number of NC		Blank	S			60 Hz	50 Hz	
9	9 A	110	110 A			F Free Voltage			Without Cover	With Cover					
12	12 A	130	130 A												
18	18 A	150	150 A												
22	22 A	180	180 A												
32	32 A	220	220 A												
40	40 A	260	260 A												
50	50 A	300	300 A												
65	65 A	400	400 A												
80	80 A	500	500 A												
90	90 A	630	630 A												
		800	800 A												

Free voltage type is available from HiMC 65 to 800

Please refer to the technical data, page 34 & 35

Thermal Overload Relay

HiTH		22		K		22		S	
Hyundai innovative Thermal overload relay		Type	Applied MC	Type		Rated Current Name		Safety Cover	
				H	K			Blank	S
		22	HiMC 9~22	2 Element (Option)	3 Element (Standard)	Please refer to the technical data page 56 & 58		Without Cover	With Cover
		40	HiMC 32~40						
		50	HiMC 50						
		90	HiMC 65~90						
		130	HiMC 110~130						
		220	HiMC 150~220						
		300	HiMC 260~300						
		500	HiMC 400~500						
		800	HiMC 630~800						

Control Relay

HMX	22	/	220	X
Control Relay	Number of Contacts			Blank X
AC : HMX	22	31	40	
DC : HMT	2a 2b	3a 1b	4a	60 Hz 50 Hz
	Operation Voltage			
	AC 24~600 V			
	DC 24~250 V			

Separate Mounting Unit for HiTH

HiTHMB	22	S
Type	Applied TOR	Safety Cover
22	HiTH22	Blank S
40	HiTH40	Without Cover With Cover
50	HiTH50	
90	HiTH90	

Mechanical Interlock Unit

HiTL	50
Mechanical Interlock Unit	Type Applied MC
	40 HiMC 9~40
	50 HiMC 50
	130 HiMC 65~130
	200 HiMC 150~200
	300 HiMC 260~300
	800 HiMC 400~800

Aux. Contact Block

HiAB	22
Type Mounting Side Applied MC	2 2
HiAB Top HiMC 9~50	Number of NO Number of NC
HiAL 11 Left HiMC 9~22	
HiAC Top HMX, HMT	
HiAL 5S Left HiMC 65~130	
HiAR 6S Right	
HiAL 7S Left HiMC 150~800	
HiAR 8S Right	

Capacitor Switching Contactor

HiMK	22	W	21	/	220	X
Max. Power (440VAC)		AC Control	Aux. Contact		Operation Voltage	Blank X
Type	kVAR		Number of NO	Number of NO		60 Hz 50 Hz
9	9.7					
12	12.5					
18	16.7					
22	18					
32	30					
40	33.3					
50	45					

Capacitor Switching Unit

HiAD	1A	22
Aux. Contact		Type Applied MC
1A	1 NO	22 HiMC 9~22W
1B	1 NC	50 HiMC 32~50W

Digital Motor Protection Relay [Deluxe Type]

HiMP-D	06	S	Z	/	220
Hyundai innovative Motor Protection Deluxe type	Rated Current Setting Range		Connecting Method		Option
	06	0.5~6.0 A	T	Tunnel Type	- Standard
	60	5.0~60 A	S	Screw Type	I Short Circuit Protection
					Z Earth Leakage Protection
					Operation Voltage
					220 AC 220 V
					110 AC 110 V

• Separate Connection Cable

Specification	Length(m)
HiMP - CBL 1	1.0
HiMP - CBL 1.5	1.5
HiMP - CBL 2	2.0
HiMP - CBL 4	4.0

• Display Bracket

Order No.
HiMP - Bracket

• ZCT

Specification	Inner Diameter(mm)	Ratio of Zero Phase Current
HiMP - ZCT 30	30	200 mA/100 mV
HiMP - ZCT 50	50	
HiMP - ZCT 65	65	
HiMP - ZCT 80	80	
HiMP - ZCT 100	100	
HiMP - ZCT 120	120	

Digital Motor Protection Relay [Economic / Standard Type]

HiMP	22	H	-	P	D	03	S	/	220
Hyundai innovative Motor Protection Relay		Number of CT		Wiring Method	Characteristics		Safety Cover		Operation Voltage
		H 2CT K 3CT		P Pin Type S Screw Type T Tunnel Type	E Economic Type (1c aux.) S Economic Type (1a1b aux.) D Definite I Inverse N Inverse+ Reverse Phase		Blank S Without Cover With Cover		110 110VAC 220 220VAC
	Frame Applied MC								
	22 HiMC 9~22								
	40 HiMC 32~40								
	50 HiMC 32~50								
					Characteristics	Current Name	Rated Current Setting Range		
						03	0.3~3.0 A		
						06	0.6~6.0 A		
					Definite	22	2.2~22 A		
						40	4.0~40 A		
						50	5.0/6.0~50 A		
					Inverse	01	0.3~1.5 A		
						05	1.0~5.0 A		
						22	4.4~22 A		
						40	8.0~40 A		
						50	10~50 A		

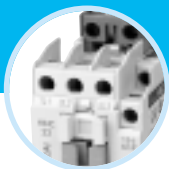
Accessory for Digital Motor Protection Relay

- Outer CT for Economic, Standard & Deluxe Type

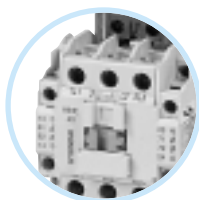
HiMP	-	CT	300	H
		Current Transformer	CT Ratio	CT Number of CT
			080 80 : 5	Standard Type H 2CT
			130 130 : 5	K 3CT
			180 180 : 5	
			220 220 : 5	Deluxe Type D 3CT
			300 300 : 5	
			400 400 : 5	
			500 500 : 5	
			630 630 : 5	
			800 800 : 5	

- 35 mm Din-Rail Bracket

HiMP	-	Rail
		35 mm Din-Rail Bracket



Contactor & Control Relay



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Technical Description

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Dimension

Location of Contactor 44

Location of Control Relay 45

Contactor 46

Motor Starter 49

Reversing Contactor 52

Ratings Overview

Type	AC-3					AC-1(=lth)
	220/240 V kW	380/440 V kW	500/550 V kW	660/690 V kW	380/440 V A	Open A
HiMC 9	2.2	4	4	5.5	9	20
HiMC 12	3.7	5.5	7.5	7.5	12	20
HiMC 18	4.5	7.5	8.5	7.5	18	25
HiMC 22	5.5	11	15	15	22	32
HiMC 32	7.5	15	18.5	18.5	32	50
HiMC 40	11	18.5	22	22	40	50
HiMC 50	15	22	30	25	50	70
HiMC 65	18.5	30	37	37	65	100
HiMC 80	22	37	45	45	80	110
HiMC 90	25	45	50	50	90	135
HiMC 110B	30	55	60	55	110	150
HiMC 110	30	55	60	55	110	150
HiMC 130	37	65	70	60	130	160
HiMC 150B	45	75	90	90	150	200
HiMC 150	45	75	90	90	150	200
HiMC 180	55	90	110	110	180	230
HiMC 220	63	110	132	132	220	260
HiMC 260	75	132	150	160	260	300
HiMC 300	90	160	160	200	300	350
HiMC 400	125	220	220	250	400	450
HiMC 500	140	250	300	335	500	550
HiMC 630	190	330	330	400	630	750
HiMC 800	220	440	500	500	800	900

Qualified Standards & Approvals



Standards

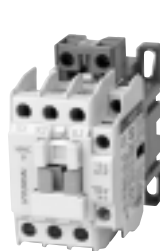
- IEC 60947
- EN 60947
- UL 508
- BS 47794, BS 5424, BS 4941
- VDE 0660
- Det Norske Veritas
- KS C4504
- JISC 8328, JEM 1038

Approvals

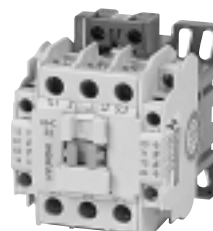
- UL / C-UL
- CE (Community European / TÜV Rheinland)
- TSE
- GOST-R
- CCC
- ISO 18001, 14001, 9001

	Type	CE	UL/CSA	KR	LR	ABS	BV	NK
Contactor	HiMC 9							
	HiMC 12							
	HiMC 18							
	HiMC 22							
	HiMC 32							
	HiMC 40							
	HiMC 50							
	HiMC 65							
	HiMC 80							
	HiMC 90							
	HiMC 110B							
	HiMC 110							
	HiMC 130							
	HiMC 150B							
	HiMC 150							
	HiMC 180							
	HiMC 220							
	HiMC 260							
	HiMC 300							
	HiMC 400							
	HiMC 500							
Control Relay	HiMC 630							
	HiMC 800							
Control Relay	HMX							
	HMT							
Auxiliary Contact	HiAB							
	HiAC							
	HiAL							
	HiAR							
Overload Relay	HiTH 22K (H)							
	HiTH 40K (H)							
	HiTH 50K (H)							
	HiTH 90K (H)							
	HiTH 130K (H)							
	HiTH 220K (H)							
	HiTH 300K (H)							
	HiTH 500K (H)							
	HiTH 800K (H)							

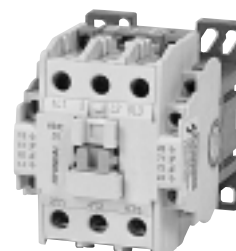
Contactor Selection by IEC 60947 : 9~50 A



HiMC 9



HiMC 32



HiMC 50

Type (Basic)	Contacts (Basic)			Rating of 3-phase Motor 50~60 Hz										Rated Current <small>(with resistive load)</small>	Dimension
	Main	Auxiliary		AC-3								AC-4		AC-1	External Size
		NO	NC	Max. Power				Operational Current				Operational Current		= I _{th}	W x H x D
		(a)	(b)	200 V 240 V kW	380 V 440 V kW	500 V 550 V kW	660 V 690 V kW	200 V 240 V A	380 V 440 V A	550 V 550 V A	660 V 690 V A	200 V 240 V A	380 V 440 V A	Open A	<u>AC Operation</u> DC Operation mm
HiMC 9	3NO	1	1	2.2	4	4	5.5	10	9	7	7	8	6	20	44 x 83 x 86 44 x 83 x 121
HiMC 12	3NO	1	1	3.7	5.5	7.5	7.5	13	12	12	9	11	9	20	
HiMC 18	3NO	1	1	4.5	7.5	8.5	7.5	18	18	15	9	15	9	25	
HiMC 22	3NO	1	1	5.5	11	15	15	22	22	22	18	18	13	32	
HiMC 32	3NO	2	2	7.5	15	18.5	18.5	32	32	28	22	22	17	50	63 x 83 x 87 63 x 83 x 122
HiMC 40	3NO	2	2	11	18.5	22	22	40	40	32	26	25	24	50	
HiMC 50	3NO	2	2 [*]	15	22	30	25	50	50	45	31	32	32	70	

* The auxiliary contact of HiMC 50 for DC operation is 2NO+1NC (2a1b).

Selection of Operation Voltage

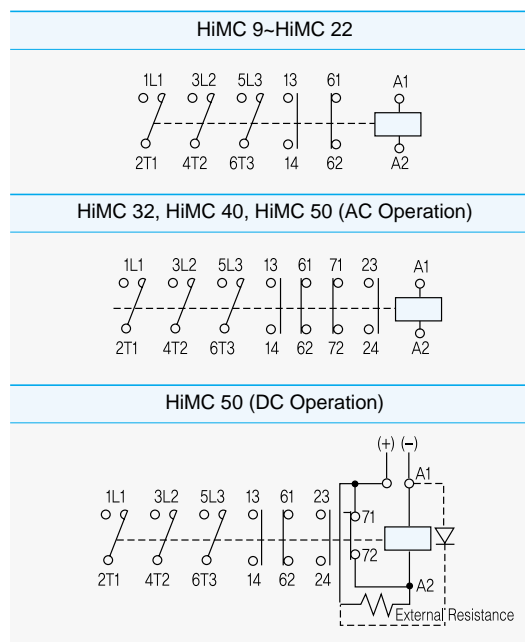
AC Operation Voltage (60 Hz)	AC Operation Voltage (50 Hz)	DC Operation Voltage
24	22	12
48	42	24
110	48	48
120	100	60
200	110	80
220	220	100
240	240	110
380	380	125
440	400	200
460	415	220
480	440	250
575	500	
600	550	

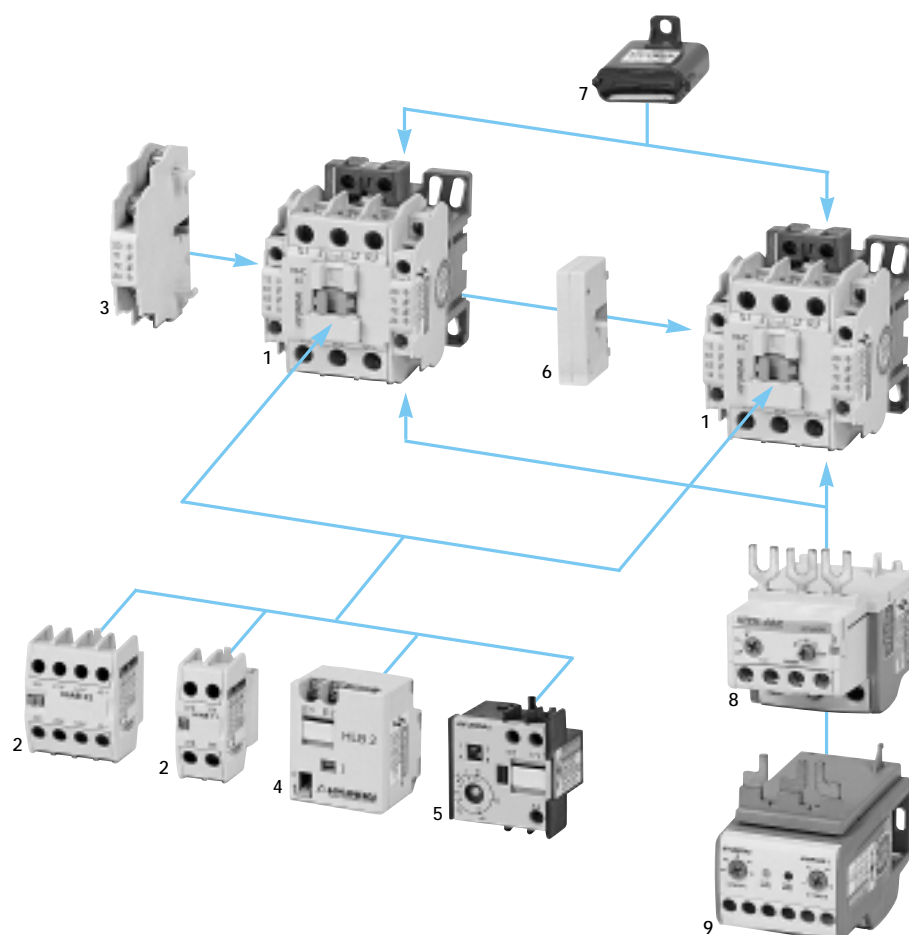
Coil Characteristics : Page 34

Ordering Information

Type + Operation Voltage : Page 16

Contact Arrangement





Accessories

- | | | |
|---|--|---|
| <p>1. Contactor
HiMC 9~50</p> <p>2. Auxiliary Contact Block : Front Mounting
HiAB for HiMC 9~50
(4 pole and 2 pole blocks)
Page 69</p> <p>3. Auxiliary Contact Block : Side Mounting
HiAL 11 for HiMC 9~22
(2 pole (1NO+1NC) block)
Page 69</p> | <p>4. Mechanical Latching Block
HLB2
Page 72</p> <p>5. Electronic Timer Block
HOKZE
Page 74</p> <p>6. Mechanical Interlock Unit
• HiTL 40 for HiMC 9~40
• HiTL 50 for HiMC 50
Page 70</p> <p>7. Surge Absorber
HRC for HiMC 9~50
Page 73</p> | <p>8. Thermal Overload Relay
• HiTH 22 for HiMC 9~22
• HiTH 40 for HiMC 32 & 40
• HiTH 50 for HiMC 50
Page 55</p> <p>9. Digital Motor Protection Relay
• HiMP 22 for HiMC 9~22
• HiMP 40 for HiMC 32 & 40
• HiMP 50 for HiMC 50
Page 77</p> |
|---|--|---|

Contactor Selection by IEC 60947 : 65~220 A



HiMC 90



HiMC 130



HiMC 220

Type (Basic)	Contacts (Basic)		Rating of 3-phase Motor 50~60 Hz														Rated Current (with resistive load)	Dimension		
			Main	Auxiliary		AC-3										AC-4			AC-1	External Size
		NO				NC	Max. Power					Operational Current								
				(a)	(b)		200 V 240 V kW	380 V 440 V kW	500 V 550 V kW	660 V 690 V kW	1000 V kW	200 V 240 V A	380 V 440 V A	550 V 550 V A	660 V 690 V A	1000 V A	200 V 240 V A	380 V 440 V A		
EA			EA																	
HiMC 65	3NO	2	2 [*]	18.5	30	37	37	-	70	65	60	44	-	50	47	100	94 x 138 x 143			
HiMC 80	3NO	2	2 [*]	22	37	45	45	-	80	80	64	52	-	55	52	110				
HiMC 90	3NO	2	2 [*]	25	45	50	50	-	90	90	80	60	-	65	62	135				
HiMC 110B	3NO	2	2 [*]	30	55	60	55	-	110	110	110	65	-	80	75	150				
HiMC 110	3NO	2	2 [*]	30	55	60	55	65	110	110	110	65	50	80	75	150	103 x 155 x 154			
HiMC 130	3NO	2	2 [*]	37	65	70	60	75	130	130	120	70	54	90	90	160				
HiMC 150B	3NO	2	2 [*]	45	75	90	90	90	150	150	140	100	66	125	110	200				
HiMC 150	3NO	2	2 [*]	45	75	90	90	90	150	150	14	100	66	125	110	200				
HiMC 180	3NO	2	2 [*]	55	90	110	110	110	180	180	180	120	78	150	150	230	138 x 189 x 171			
HiMC 220	3NO	2	2 [*]	63	110	132	132	132	220	220	200	150	96	180	180	260				

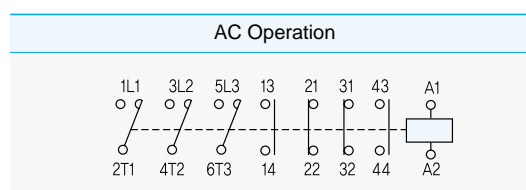
* The auxiliary contact for DC operation is 2NO+1NC (2a1b).

Selection of Operation Voltage

AC Operation Voltage (60 Hz)	AC Operation Voltage (50 Hz)	DC Operation Voltage	AC/DC Operation Voltage
24	22	24	220 AC : 100~240 DC : 110~220
48	42	48	
110	48	60	
120	100	80	
200	110	100	
220	220	110	
240	240	125	440 AC : 380~450
380	380	200	
440	400	220	
460	415	250	
480	440		
575	500		
600	550		

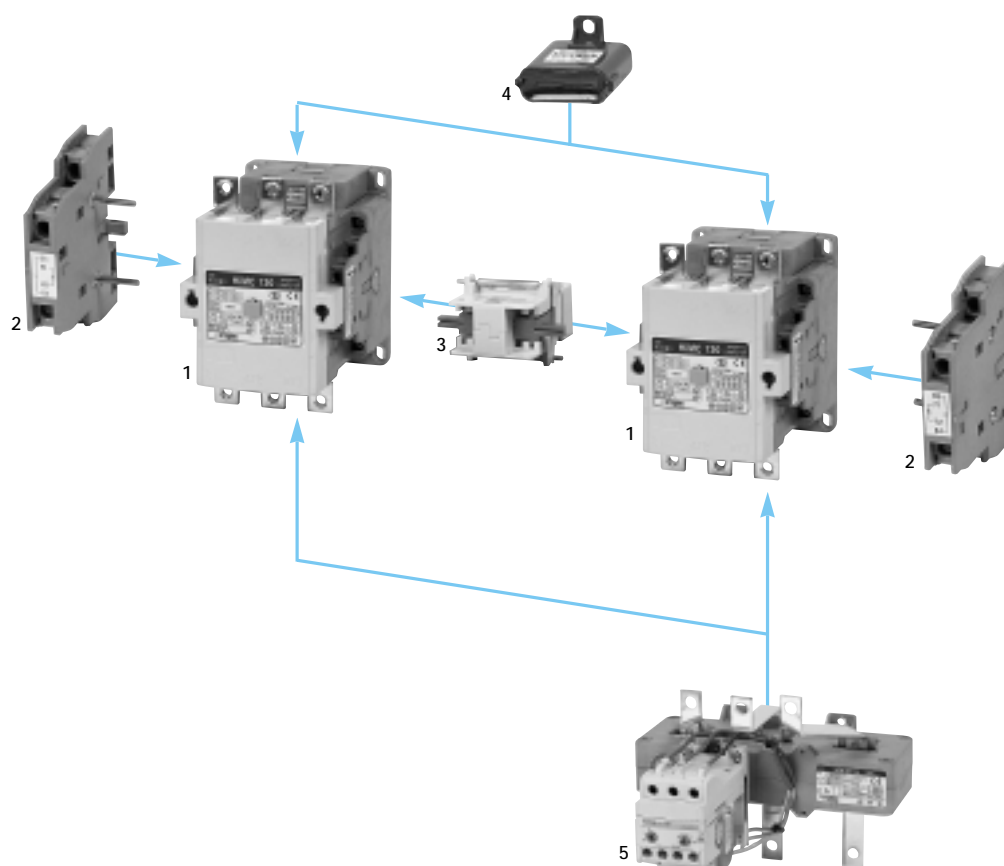
Coil Characteristics : Page 34

Contact Arrangement



Ordering Information

Type + Operation Voltage : Page 16



Accessories

1. Contactor
HiMC 65 ~220

2. Auxiliary Contact Block : Side Mounting
 • HiAL 5S, HiAR 6S for HiMC 65~150B
 • HiAL 7S, HiAR 8S for HiMC 150~220
 (2 pole (1NO+1NC) block)
 Page 69

3. Mechanical Interlock Unit
 • HiTL 130 for HiMC 65~150B
 • HiTL 220 for HiMC 150~220
 Page 70

4. Surge Absorber
 HRC for HiMC 65~220
 Page 73

5. Thermal Overload Relay
 • HiTH 90 for HiMC 65~110B
 • HiTH 130 for HiMC 110~150B
 • HiTH 220 for HiMC 150~220
 Page 55

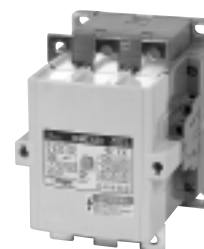
Contactor Selection by IEC 60947 : 260~800 A



HiMC 260



HiMC 400



HiMC 630

Type (Basic)	Contacts (Basic)			Rating of 3-phase Motor 50~60 Hz												Rated Current <small>(with resistive load)</small>	Dimension
					Auxiliary		AC-3								AC-4		
	Max. Power						Operational Current				Operational Current		= I _{th}	W x H x D			
	NO	NC	200 V 240 V kW		380 V 440 V kW	500 V 550 V kW	660 V 690 V kW	1000 V kW	200 V 240 V A	380 V 440 V A	550 V 550 V A	660 V 690 V A			1000 V A		
HiMC 260	3NO	2	2 [*]	75	132	150	160	160	260	260	220	173	113	200	200	300	150 x 210 x 190
HiMC 300	3NO	2	2 [*]	90	160	160	200	200	300	300	273	220	141	220	220	350	
HiMC 400	3NO	2	2 [*]	125	220	220	250	250	400	400	350	300	178	300	300	450	179 x 251 x 238
HiMC 500	3NO	2	2 [*]	140	250	300	335	275	500	500	426	360	192	350	350	550	
HiMC 630	3NO	2	2 [*]	190	330	330	400	300	630	630	500	412	213	400	400	750	276 x 300 x275
HiMC 800	3NO	2	2 [*]	220	440	500	500	400	800	800	720	630	284	630	630	900	

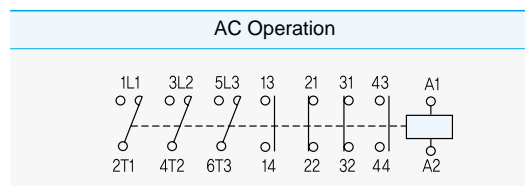
* The auxiliary contact for DC operation is 2NO+1NC (2a1b).

Selection of Operation Voltage

AC Operation Voltage (60 Hz)	AC Operation Voltage (50 Hz)	DC Operation Voltage	AC/DC Operation Voltage
110	100	48	For HiMC 260~500
120	110	60	
200	220	80	
220	240	100	
240	380	110	220
380	400	125	AC : 100~240
440	415	200	DC : 110~220
460	440	220	440
480	500	250	AC : 380~450
575	550		For HiMC 630
600			

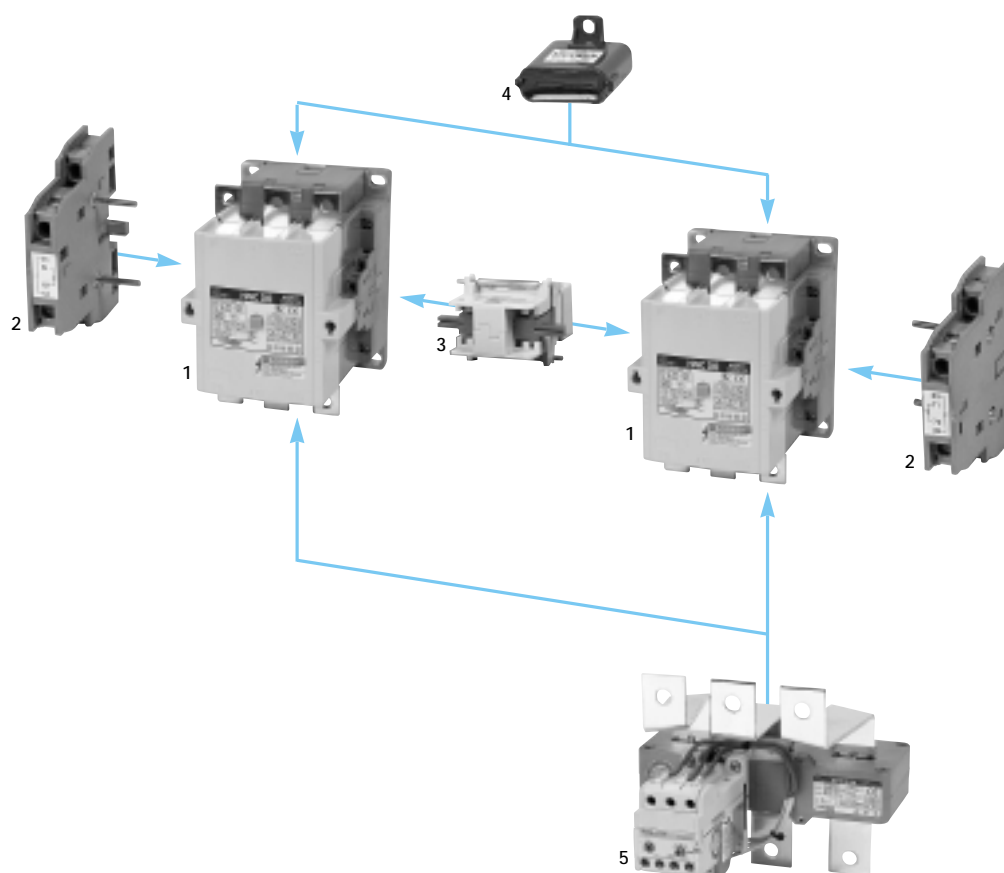
Coil Characteristics : Page 34

Contact Arrangement



Ordering Information

Type + Operation Voltage : Page 16



Accessories

1. Contactor
HiMC 260 ~800

2. Auxiliary Contact Block : Side Mounting
HiAL 7S, HiAR 8S for HiMC 150~220
(2 pole (1NO+1NC) block)
Page 69

3. Mechanical Interlock Unit
• HiTL 300 for HiMC 260~300
• HiTL 800 for HiMC 400~800
Page 70

4. Surge Absorber
HRC for HiMC 260~300
Page 73

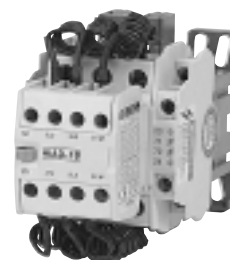
5. Thermal Overload Relay
• HiTH 300 for HiMC 260~300
• HiTH 500 for HiMC 400~500
• HiTH 800 for HiMC 630~800
Page 55

Capacitor Switching Contactor Selection

The capacitor switching contactor is fitted with a special mounted block, which ensures safety and long lifetime of the installation.

The capacitor switching contactor is precharged by means of the mounted leading NO contacts of unit and resistive wire, only then does the main contacts of contactor close.

Capacitor switching unit is composed of three NO main contacts and one auxiliary contact (1NO or 1NC).



HiMK 9W

Type (AC Operation)	Rating of 3-phase Capacitor 50~60 Hz (at ambient temperature 55 °C)						Composed Devices			Dimension
	AC-6b						Contactor	Capacitor Switching Unit		External Size
	Max. Power						AC Operational	Type	Auxiliary	W x H x D
	200 V kVAR	230 V kVAR	400 V kVAR	440 V kVAR	500 V kVAR	690 V kVAR			NO (53-54) NC (51-52)	mm
HiMK 9W 21	5	5	9.7	9.7	14	14	HiMC 9W	HiAD 1A 22	1 -	44 x 166 x 123
HiMK 9W 12								HiAD 1B 22	- 1	
HiMK 12W 21	6.7	6.7	12.5	12.5	18	18	HiMC 12W	HiAD 1A 22	1 -	
HiMK 12W 12								HiAD 1B 22	- 1	
HiMK 18W 21	8.5	8.5	16.7	16.7	24	24	HiMC 18W	HiAD 1A 22	1 -	
HiMK 18W 12								HiAD 1B 22	- 1	
HiMK 22W 21	10	10	18	18	26	26	HiMC 22W	HiAD 1A 22	1 -	
HiMK 22W 12								HiAD 1B 22	- 1	
HiMK 32W 32	14	16	27.5	30	34	45	HiMC 32W	HiAD 1A 50	1 -	63 x 166 x 123
HiMK 32W 23								HiAD 1B 50	- 1	
HiMK 40W 32	20	20	30	33.3	48	48	HiMC 40W	HiAD 1A 50	1 -	
HiMK 40W 23								HiAD 1B 50	- 1	
HiMK 50W 32	21	24	40	45	50	65	HiMC 50W	HiAD 1A 50	1 -	70 x 178 x 136
HiMK 50W 23								HiAD 1B 50	- 1	

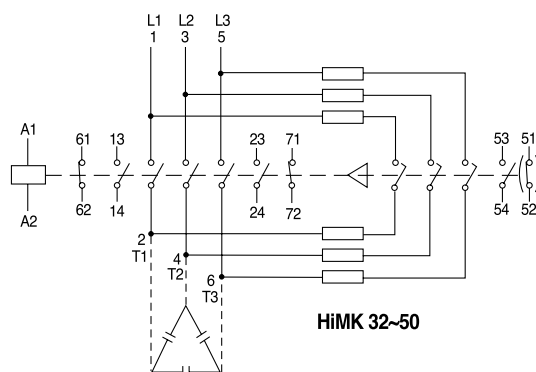
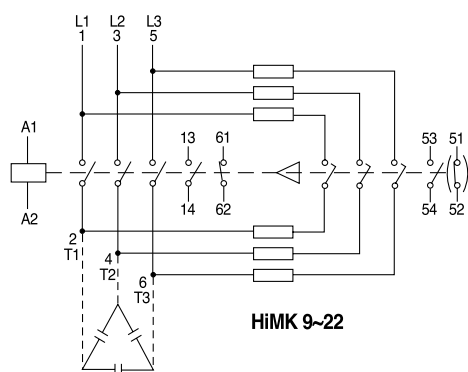
Technical Information

Operation Frequency	240 Operations/Hour			
Electrical Lifetime (AC-6b)	Ue 440Vac	500Vac	Ue 690Vac	
	250k Operations	100k Operations		

Ordering Information

Type + Operation Voltage : Page 18

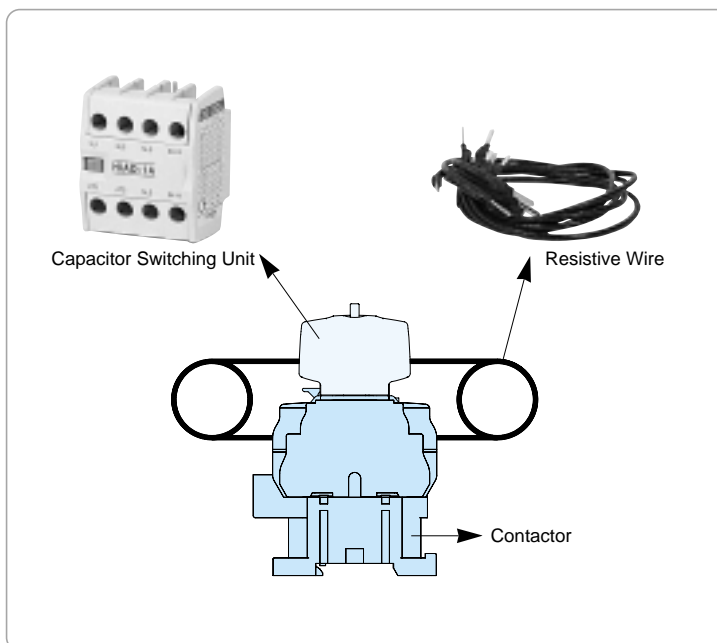
Wiring Diagram



Selection of Operation Voltage

Operation Voltage (AC 60 Hz)	Operation Voltage (AC 50 Hz)
24 V	22 V
48 V	42 V
110 V	48 V
120 V	100 V
208 V	110 V
220 V	220 V
240 V	240 V
380 V	380 V
440 V	400 V
460 V	415 V
480 V	440 V
575 V	500 V
600 V	550 V

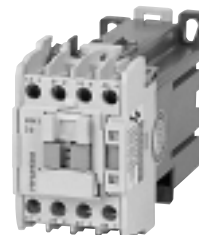
Coil Characteristics : Page 34



Control Relay



HMX



HMT

Type	Contacts		IEC Ratings												Operation Time		UL Ratings				Dimension			
	Composition		AC-15, Coil Load					DC-12, Resistive Load					DC-13, Coil Load				AC-1	Closing	Opening	AC		DC		External Size
	NO	NC	Operational Current					Operational Current					Operational Current				Thermal Current			Operational Current				W x H x D
	(a) EA	(b) EA	220 V A	380 V A	440 V A	500 V A	690 V A	24 V A	48 V A	110 V A	220 V A	24 V A	48 V A	110 V A	220 V A	A	ms			ms	120V A	240V A	120V A	240V A
HMX (AC Operation)	2	2																10...25	5...20					44 x 74 x 80
	3	1	10	4	3.5	3	2	5	3	2.5	1	3	2	1	0.6	20	6			3	1.1	-		
	4	0																						
HMT (DC Operation)	2	2																20...50	15...35					44 x 74 x 115
	3	1	10	4	3.5	3	2	5	3	2.5	1	3	2	1	0.6	20	6			3	1.1	-		
	4	0																						

Description

HMX is for AC operation, and HMT is for DC operation.

The protection degree is IP20.

Screw and 35 mm DIN-Rail mounting is available.

Both HMX and HMT have three types of contact;

2NO+2NC, 3NO+1NC, & 4NO.

Additional contact block can be added on it.

These are proper for control circuit and factory automation.

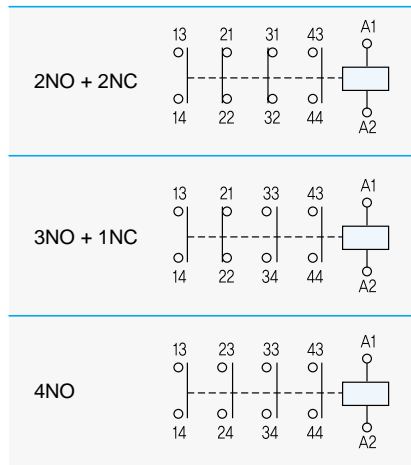
Accessories can be attached by one-touch method.

- Aux. contact block
- Timer
- Latching block
- Surge absorber (RC-Unit)

Applicable Standard

IEC 60947-5-1, UL 508, VDE 0660, CENELEC-EN 50011

Contact Arrangement



Technical Information

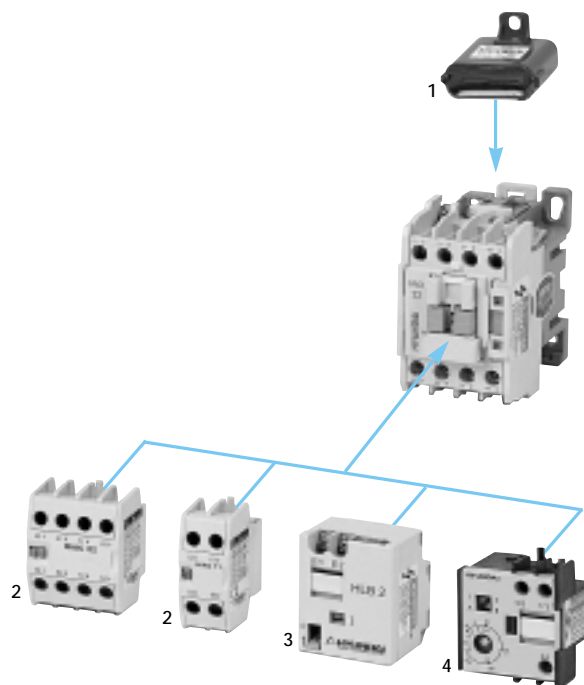
Rated Insulation Voltage	750VAC (IEC 60947), 1000VAC (VDE 0660)		
Mechanical Lifetime	15 mil. Operations		
Operation Frequency	3000 Cycles/Hour		
Wire Size	2 x 0.75 ... 2.5 mm ²		
Short-circuit Protection	Plug-fuse (Fast/Slow)	MCB (C feature)	HRC Fuse (DIN/BS88)
	35 A/25 A	16 A	25 A

Ordering Information

Type + Contact Composition + Operation Voltage
: Page 17

Accessories

1. Surge Absorber
HRC
Page 73
2. Auxiliary Contact Block : Front Mounting
 - HiAC
 - 4 pole and 2 pole blocks
 Page 69
3. Mechanical Latching Block
HLB2
Page 72
4. Electronic Timer Block
HOKZE
Page 74



Selection of Operation Voltage

AC Operation Voltage (60 Hz)	AC Operation Voltage (50 Hz)	DC Operation Voltage
24	22	12
48	42	24
110	48	48
120	100	60
200	110	80
220	220	100
240	240	110
380	380	125
440	400	200
460	415	220
480	440	250
575	500	
600	550	

Coil Consumption

	AC		DC
Pick-up	60 VA	44 W	6.5 W
Sealing	7.5 VA	1.9 W	6.5 W

Contactor Rating

Type			HiMC 9	HiMC 12	HiMC 18	HiMC 22	HiMC 32	HiMC 40	HiMC 50	HiMC 65	HiMC 80	HiMC 90		
IEC 60947	Rated Insulation Voltage		V	750	750	750	750	750	750	750	750	750		
	Rated Operation Voltage		V	690	690	690	690	690	690	690	690	690		
	AC1(Ith)		A	20	20	25	32	50	50	70	100	110	135	
	AC3	200~240 V	kW/A	2.2/10	3.7/13	4.5/18	5.5/22	7.5/32	11/40	15/50	18.5/70	22/80	25/90	
		380~440 V		4/9	5.5/12	7.5/18	11/22	15/32	18.5/40	22/50	30/65	37/80	45/90	
		500~550 V		4/7	7.5/12	8.5/15	15/22	18.5/28	22/32	30/45	37/60	45/64	50/80	
		660~690 V		5.5/7	7.5/9	7.5/9	15/18	18.5/22	22/26	25/31	37/44	45/52	50/60	
		1000 V		-	-	-	-	-	-	-	-	-	-	
		200 V	HP	2	3	5	5	10	10	15	20	25	30	
		230 V		2	3	5	7.5	10	10	15	20	30	30	
		460 V		5	7.5	10	15	20	30	40	50	60	60	
		575 V		7.5	10	15	20	25	30	40	50	60	75	
	AC4	200~240 V	A	8	11	15	18	22	25	35	50	55	65	
		380~440 V		6	9	9	13	17	24	32	47	52	62	
	Lifetime	Electrical (AC3)	x1,000	2,500	2,500	2,500	2,500	2,000	2,000	2,000	2,000	2,000	2,000	
		Mechanical	x1,000	25,000	25,000	25,000	25,000	15,000	15,000	15,000	10,000	10,000	10,000	
	Operating Times AC/DC	Closing	ms	15~25				15~25		14~25	50~65			
		Opening	ms	4~15				4~15		4~15	25~90			
	Operating Frequency per Hour(AC3)			times	1000	1000	1000	1000	750	750	750	450	450	450
	AC Making Capacity	220 VAC	A	100	130	180	220	320	400	500	700	800	900	
		480 VAC		90	120	180	220	320	400	500	650	800	900	
	AC Breaking Capacity	220 VAC	A	80	104	144	176	256	320	400	560	640	720	
		480 VAC		72	96	144	176	256	320	400	520	640	720	
UL508	Continuous Current		A	20	20	25	32	45	50	65	80	90	100	
	Max. HP	100~120 V	1-Ph	0.5/9.8	0.5/9.8	1/16	1.5/20	2/24	2/24	3/34	-	-	-	
		220~240 V	HP/A	1/8	1/8	3/17	3/17	5/28	5/28	7.5/40	-	-	-	
		220~240 V	3-Ph	2/6.8	3/9.6	5/15.2	5/15.2	10/28	10/28	15/42	20/54	25/68	30/80	
		440~480 V	HP/A	5/7.6	5/7.6	10/14	10/14	20/27	20/27	30/40	50/52	60/65	60/65	
NEMA	Size			00		0		1		2			3	
	Max. HP	115 V	1-Ph	0.33		1		2		3			7.5	
		230 V	HP	1		3		3		7.5			15	
		200 V	3-Ph HP	1.5		3		7.5		10			25	
		230 V		1.5		3		7.5		15			30	
		460/575 V		2		5		10		25			50	
Mounting Method			Screw & DIN-Rail							Screw				
Auxiliary Contact			1a1b	1a1b	1a1b	1a1b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b		
Weight	W (AC)	Kg	0.37	0.37	0.37	0.37	0.47	0.47	0.74	2.1	2.1	2.1		
	G (DC)		0.68	0.68	0.68	0.68	0.77	0.77	0.77	2.15	2.15	2.15		
	F (A/DC)									2.23	2.23	2.23		

The auxiliary contact for DC above HiMC 50 is 2a1b.
 AC making and AC breaking capacity are 50 operations.

HiMC 110B	HiMC 110	HiMC 130	HiMC 150B	HiMC 150	HiMC 180	HiMC 220	HiMC 260	HiMC 300	HiMC 400	HiMC 500	HiMC 630	HiMC 800
750	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
690	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
150	150	160	200	200	230	260	300	350	450	550	750	900
30/110	30/110	37/130	45/150	45/150	55/180	63/220	75/260	90/300	125/400	140/500	190/630	220/800
55/110	55/110	65/130	75/150	75/150	90/180	110/220	132/260	160/300	220/400	250/500	330/630	440/800
60/110	60/110	70/120	90/140	90/140	110/180	132/200	150/220	160/273	220/350	300/426	330/500	500/720
55/65	55/65	60/70	90/100	90/100	110/120	132/150	160/173	200/220	250/300	335/360	400/412	500/630
-	65/50	75/54	90/66	90/66	110/78	132/96	160/113	200/141	250/178	275/192	300/213	400/284
30	30	40	40	40	50	60	75	100	125	150	200	250
40	40	40	50	50	60	75	75	100	150	200	250	300
75	75	100	100	100	125	150	200	200	300	400	500	600
100	100	100	125	125	150	200	200	250	350	400	500	600
80	80	90	125	125	150	180	200	220	300	350	400	630
75	75	90	110	110	150	180	200	220	300	350	400	630
2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	500	500	500	500
10,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
50~65	55~65			50~55			55~65		55~65		55~65	
25~90	55~65			42~55			45~65		45~65		45~65	
450	450	450	450	300	300	300	300	300	300	300	300	300
1100	1100	1300	1500	1500	1800	2200	2600	3000	4000	5000	6300	8000
1100	1100	1300	1500	1500	1800	2200	2600	3000	4000	5000	6300	8000
880	880	1040	1200	1200	1440	1760	2080	2400	3200	4000	5040	6400
880	880	1040	1200	1200	1440	1760	2080	2400	3200	4000	5040	6400
150	150	160	200	200	230	260	300	350	450	550	750	900
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
30/80	30/80	40/104	50/130	50/130	60/154	75/192	75/192	100/248	125/312	150/360	250/480	300/720
60/77	60/77	75/96	100/124	100/124	125/156	150/180	150/180	200/240	250/302	250/302	500/477	600/708
			4	4				5			6	7
			-	-				-			-	-
			-	-				-			-	-
			40	40				75			150	-
			50	50				100			200	300
			100	100				200			400	600
Screw												
2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b	2a2b
2.1	2.95	2.95	2.95	5.45	5.45	5.45	7.05	7.05	14.50	14.50	26.55	26.55
2.15	3.0	3.0	3.0	5.60	5.60	5.60	7.20	7.20	14.50	14.50	26.55	26.55
2.23	3.23	3.23	3.23	5.67	5.67	5.67	7.40	7.40	14.60	14.60	27.55	27.55

Characteristics of Operation Coil

Contactor Type	Power Consumption									
	AC Operation Coil		DC Operation Coil		AC/DC Common Coil					
	220 V, 60 Hz		DC		220 V, 60 Hz		110 V, 60 Hz		DC	
	Inrush VA	Sealed VA/W	Inrush W	Sealed W	Inrush VA	Sealed VA/W	Inrush VA	Sealed VA/W	Inrush W	Sealed W
HiMC 9	60	14/2.9	6.5	6.5	-	-	-	-	-	-
HiMC 12										
HiMC 18										
HiMC 22										
HiMC 32										
HiMC 40	140	16/5	100	14	-	-	-	-	-	-
HiMC 50										
HiMC 65										
HiMC 80										
HiMC 90										
HiMC 110B	390	36/10	160	14	180	6.7/3.3	100	2.7/1.6	91	1.7
HiMC 110										
HiMC 130										
HiMC 150B										
HiMC 150										
HiMC 180	515	36/10	280	16	290	7.4/3.8	180	3.3/2.1	193	2.3
HiMC 220										
HiMC 260										
HiMC 300										
HiMC 400										
HiMC 500	981	67/21	389	16	360	9.3/5.8	240	6.4/4.4	234	3.4
HiMC 630										
HiMC 800										
HiMC 900										
HiMC 1000										
HiMC 1200	1090	74/23	432	16	380	9.3/5.8	250	6.4/4.4	234	3.4
HiMC 1400										
HiMC 1600										
HiMC 1800										
HiMC 2000										
HiMC 2500	3500	185/70	730	4	1700	14.7/7.2	800	10/5.2	850	5.9
HiMC 3000										
HiMC 3500										
HiMC 4000										
HiMC 4500										
HiMC 5500	4450	200/95	1650	4	1700	17.1/10.6	850	10.5/8	850	9.5
HiMC 6000										
HiMC 6500										
HiMC 7000										
HiMC 7500										

Operation Voltage of Coil

Contactor Type	AC Operation Coil		AC Operation Coil	DC
	60 Hz V	50 Hz V		
HiMC 9	24	22	12	
HiMC 12	48	42	24	
HiMC 18	110	48	48	
HiMC 22	120	100	60	
HiMC 32	208	110	80	
HiMC 40	220	220	100	
HiMC 50	240	240	125	
	380	380	200	
	440	400	220	
	460	415	250	
	480	440		
	575	500		
	600	550		

Contactor Type	AC Operation Coil		AC Operation Coil	AC/DC Common Coil
	60 Hz V	50 Hz V		
HiMC 65	24	22	24	
HiMC 80	48	42	48	
HiMC 90	110	48	60	
HiMC 110B	120	100	80	
HiMC 110	208	110	100	
HiMC 130	220	220	125	
HiMC 150B	240	240	200	
HiMC 150	380	380	220	
HiMC 180	440	400	250	
HiMC 220	460	415		
	480	440		
	575	500		
	600	550		

- The rated voltage shall be applied to the contactor coil.
- The coil can operate correctly during short period even at 85~110 % of the rated voltage, when it is saturated at 40 on the rated voltage and frequency.
- If none-rated voltage is applied to the coil continuously, it is apt to be deteriorated in electrical insulation and mechanical operation.
- Different voltage range shall be informed in advance.

Contactor Type	Operation Time								Control Transformer	
	Closing (Coil ON Contact ON)				Opening (Coil OFF Contact OFF)				Min. Capacity	
	AC or DC Coil		AC/DC Common Coil		AC or DC Coil		AC/DC Common Coil		AC or DC Coil	AC/DC Common Coil
	AC ms	DC ms	AC ms	DC ms	AC ms	DC ms	AC ms	DC ms	VA	VA
HiMC 9	15~25	38~45	-	-	4~15	5~10	-	-	50	-
HiMC 12										
HiMC 18										
HiMC 22										
HiMC 32										
HiMC 40	14~25	32~40	-	-	5~15	10~14	-	-	100	-
HiMC 50										
HiMC 65										
HiMC 80										
HiMC 90										
HiMC 110B	15~25	34~42	25~100	25~100	5~15	12~16	25~100	25~100	200	100
HiMC 110										
HiMC 130										
HiMC 150B										
HiMC 150										
HiMC 180	19~30	34~42	25~100	25~100	5~15	12~16	25~100	25~100	250	150
HiMC 220										
HiMC 260										
HiMC 300										
HiMC 400										
HiMC 500	19~34	34~42	25~100	25~100	8~15	10~16	25~100	25~100	500	200
HiMC 630										
HiMC 800										
HiMC 260										
HiMC 300										
HiMC 400	15~30	55~65	25~100	25~100	8~15	12~17	25~100	25~100	1000	1000
HiMC 500										
HiMC 630										
HiMC 800										
HiMC 260										
HiMC 300	25~40	45~51	25~100	25~1004	10~17	10~25	25~100	25~100	1500	1000
HiMC 400										
HiMC 500										
HiMC 630										
HiMC 800										

Contactor Type	AC Operation Coil		DC Operation Coil	AC/DC Common Coil
	60 Hz V	50 Hz V	DC V	V
HiMC 260	24	22	24	220 : AC 100~240/DC 110~220 440 : AC 380~450
HiMC 300	48	42	48	
HiMC 400	110	48	60	
HiMC 500	120	100	80	
	208	110	100	
HiMC 630	220	220	125	110 : AC 100~127/DC 100~110 220 : AC 200~240/DC 200~220 440 : AC 380~450
HiMC 800	240	240	200	
	380	380	220	
	440	400	250	
	460	415		
	480	440		
	575	500		
	600	550		

Inching & Plugging Duty (AC-4 Duty)

Operational Voltage		Ratio of Inching	Electrical lifetime (million)	HiMC 9	HiMC 12	HiMC 18	HiMC 22	HiMC 32	HiMC 40	HiMC 50	HiMC 65	HiMC 80	HiMC 90	
Inching	220 V	10 %	1	kW	1.5	2.7	3.7	4	5.5	7.5	11	15	18.5	19
			5		1	1.5	2.7	3.7	4.5	5.5	7.5	11	15	15
		50 %	1		1	1.5	2.7	3.7	4.5	5.5	7.5	11	15	15
			5		0.5	0.75	1.1	1.5	2.2	3.7	3.7	5.5	7.5	7.5
		100 %	1		0.75	1.1	1.5	2.5	4.5	4.5	5.5	7.5	9	11
			5		0.3	0.5	0.75	1.1	1.8	2.7	3.7	4	4	5.5
	440 V	10 %	1		2.2	4	4	7.5	11	15	22	30	37	37
			5		1.5	2.2	3.7	7.5	9	11	15	22	30	30
		50 %	1		1.5	3.7	4	7.5	9	11	15	22	30	30
			5		0.75	1.5	2.2	3.7	4.5	5.5	7.5	11	15	15
		100 %	1		1.1	2.2	3.7	5.5	7.5	11	15	15	15	22
			5		0.5	1.1	1.5	2.2	3.7	3.7	5.5	7.5	7.5	11
Plugging	220 V	100 %	1	0.75	0.75	1.5	2.2	2.5	3.7	5.5	7.5	9	9	
			5	0.2	0.4	0.5	0.75	1.1	1.5	2.2	3	3.7	3.7	
	440 V		1	0.75	1	2.2	3.7	4.5	4.5	7.5	11	15	18.5	
			5	0.2	0.4	0.75	1.5	2.2	2.2	3.7	5.5	5.5	7.5	

- Ratio of inching (%) = $\frac{\text{Inching operations}}{\text{Standard operations} + \text{Inching operations}} \times 100$

- The inching limit of making & breaking frequency is below the continuous 10 operations based on 1 operation per 1 second.

Rated Operational Current for DC-load

Con- nection	Application	Operational Voltage	HiMC 9	HiMC 12	HiMC 18	HiMC 22	HiMC 32	HiMC 40	HiMC 50	HiMC 65	HiMC 80	HiMC 90
2 Poles Series	DC-1 Duty (L/R 1 ms)	24 V	10	12	18	20	25	35	50	65	75	80
		48 V	10	12	18	20	25	35	40	65	65	65
		110 V	6	10	13	15	25	25	35	65	50	50
		220 V	3	7	8	10	12	12	15	50	20	20
	DC-3, DC-5 Duty (L/R 15 ms)	24 V	8	12	12	20	25	35	45	45	65	65
		48 V	4	6	6	15	20	20	25	25	40	40
		110 V	2.5	4	4	8	10	10	15	15	20	20
		220 V	0.8	1.2	1.2	2	3	3	3.5	3.5	5	5
	DC-13 Duty (L/R 40 ms)	24 V	8	12	12	20	25	35	-	-	-	-
		48 V	4	6	6	12	15	15	-	-	-	-
		110 V	2	3	3	3	4	4	-	-	-	-
		220 V	0.3	0.5	0.5	1.2	1.2	1.2	-	-	-	-
3 Poles Series	DC-1 Duty (L/R 1 ms)	24 V	10	12	18	20	25	35	50	65	75	80
		48 V	10	12	18	20	25	35	50	65	75	80
		110 V	8	12	18	20	25	35	50	65	75	80
		220 V	8	12	18	20	22	30	40	50	55	60
	DC-3, DC-5 Duty (L/R 15 ms)	24 V	8	12	12	20	25	35	50	50	80	80
		48 V	6	10	10	20	25	30	35	35	60	60
		110 V	4	8	8	15	20	20	30	30	50	50
		220 V	2	4	4	8	10	10	12	12	20	20
	DC-13 Duty (L/R 40 ms)	24 V	8	12	12	20	25	35	-	-	-	-
		48 V	6	10	10	15	25	25	-	-	-	-
		110 V	3	5	5	10	12	12	-	-	-	-
		220 V	0.8	2	2	4	4	4	-	-	-	-

- DC-1 duty is applied to resistance load and DC-13 duty is applied to inductive coil load (IEC 60947).

- DC-3 duty is applied to starting or inching of shunt motors and DC-5 duty is applied to starting or inching of series motors (IEC 60947).

- DC-3 and DC-5 duty of making & breaking capacity is 4 times to above table and its operation is fifty times.

- Electrical lifetime is up to 500 thousand when the frequency is below than 100 operations per a hour.

HiMC 110B	HiMC 110	HiMC 130	HiMC 150B	HiMC 150	HiMC 180	HiMC 220	HiMC 260	HiMC 300	HiMC 400	HiMC 500	HiMC 630	HiMC 800
25	25	30	37	37	45	55	65	75	110	132	160	200
15	15	22	25	25	30	37	45	50	65	70	75	132
19	19	22	30	30	37	45	50	55	75	80	90	150
9	9	9	11	11	15	19	22	25	30	32	37	45
11	11	15	19	19	25	30	32	37	45	50	55	75
5.5	5.5	7.5	9	9	11	15	17	22	25	30	37	45
50	50	60	75	75	90	110	132	150	200	250	300	400
37	37	45	55	55	75	90	110	125	132	140	150	190
37	37	45	55	55	75	90	110	132	150	167	190	220
18.5	18.5	22	30	30	37	37	42	50	75	80	90	110
25	25	30	45	45	55	60	65	75	110	120	132	160
13	13	15	22	22	25	30	32	37	55	63	75	90
11	11	15	19	19	22	25	30	37	45	50	55	75
4.5	4.5	5.5	7.5	7.5	11	13	15	18.5	22	25	30	37
22	22	30	37	37	45	45	49	55	75	90	110	150
11	11	15	19	19	22	25	26	30	37	40	45	75

HiMC 110B	HiMC 110	HiMC 130	HiMC 150B	HiMC 150	HiMC 180	HiMC 220	HiMC 260	HiMC 300	HiMC 400	HiMC 500	HiMC 630	HiMC 800
100	100	120	150	150	180	220	260	300	400	500	630	800
100	100	100	120	120	180	180	220	240	240	300	630	800
80	80	80	100	100	150	150	180	200	200	220	630	630
50	50	50	100	100	150	150	180	200	200	220	630	630
100	100	120	150	150	180	220	260	300	400	500	630	800
60	60	60	100	100	150	150	180	200	200	260	630	630
40	40	40	80	80	120	120	130	150	150	180	630	630
30	30	30	60	60	80	80	80	90	90	130	210	210
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	120	150	150	180	220	260	300	400	500	630	800
100	100	120	150	150	180	220	260	300	400	500	630	800
100	100	100	150	150	180	220	260	300	400	500	630	630
80	80	80	150	150	180	220	260	300	300	400	630	630
100	100	120	150	150	180	220	260	300	400	500	630	800
90	90	90	130	130	180	220	260	280	280	400	630	630
80	80	80	120	120	150	150	180	200	200	260	630	630
50	50	50	80	80	100	100	130	150	150	180	310	310
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Star-delta Starting Contactor

Voltage, Current & Torque of Star-delta Starting Contactors

Starting Method	Starting (Star-use Contactor)				Operating (Delta-use Contactor/C2)		
	Starting Current	Torque	Full Load Current	Contact Voltage	Full Load Current	Contact Current	Contact Voltage
Direct	6 Im	1.5T	6 Im	Em / 3	Im	Im	Em / 3
Star-delta	2 Im	0.5T	2 Im	Em / 3	Im	Im / 3	Em

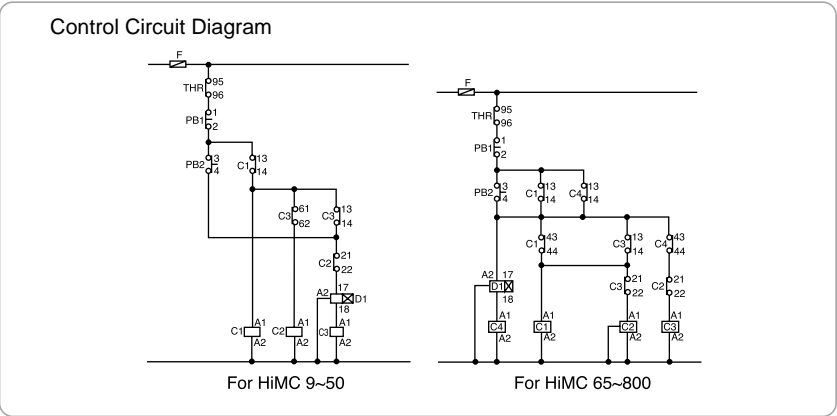
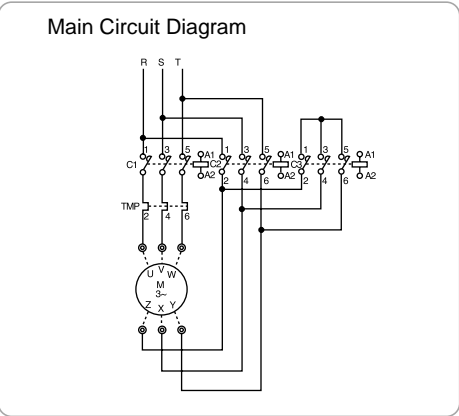
Im: Delta wiring load current Em: line-to-line voltage T: Rated torque (assumed torque fluctuations)

Contactors for Normal Star-delta Starters

200~240 V AC, 3Ø, 60 Hz						
Motor Capacity			Main Circuit (C1)	Circuit (C2)	Y Circuit (C3)	TOR
kW	HP	FLC				
5.5	7.5	22	HiMC 22	HiMC 22	HiMC 22	HiTH 22K
7.5	10	32	HiMC 32	HiMC 32	HiMC 22	HiTH 40K
11	15	40	HiMC 40	HiMC 40	HiMC 32	HiTH 40K
15	20	50	HiMC 50	HiMC 50	HiMC 32	HiTH 50K
18.5	25	70	HiMC 50	HiMC 50	HiMC 40	HiTH 50K
22	30	80	HiMC 65	HiMC 65	HiMC 40	HiTH 90K
30	40	110	HiMC 90	HiMC 90	HiMC 50	HiTH 90K
37	50	130	HiMC 110	HiMC 110	HiMC 65	HiTH 130K
45	60	150	HiMC 130	HiMC 130	HiMC 65	HiTH 130K
55	75	180	HiMC 150	HiMC 150	HiMC 90	HiTH 220K
75	100	260	HiMC 180	HiMC 180	HiMC 110	HiTH 220K
90	125	300	HiMC 220	HiMC 220	HiMC 130	HiTH 220K
110	150	367	HiMC 300	HiMC 300	HiMC 150	HiTH 300K
132	180	434	HiMC 400	HiMC 400	HiMC 220	HiTH 500K
160	220	519	HiMC 400	HiMC 400	HiMC 220	HiTH 500K
250	350	810	HiMC 630	HiMC 630	HiMC 400	HiTH 800K
300	-	-	-	-	-	-

380~440 V AC, 3Ø, 60 Hz						
Motor Capacity			Main Circuit (C1)	Circuit (C2)	Y Circuit (C3)	TOR
kW	HP	FLC				
5.5	7.5	12	HiMC 22	HiMC 22	HiMC 22	HiTH 22K
7.5	10	18	HiMC 22	HiMC 22	HiMC 22	HiTH 22K
11	15	22	HiMC 22	HiMC 22	HiMC 22	HiTH 22K
15	20	32	HiMC 32	HiMC 32	HiMC 22	HiTH 40K
18.5	25	40	HiMC 40	HiMC 40	HiMC 22	HiTH 40K
22	30	50	HiMC 40	HiMC 40	HiMC 32	HiTH 40K
30	40	65	HiMC 50	HiMC 50	HiMC 40	HiTH 50K
37	50	80	HiMC 65	HiMC 65	HiMC 40	HiTH 90K
45	60	90	HiMC 65	HiMC 65	HiMC 40	HiTH 90K
55	75	110	HiMC 90	HiMC 90	HiMC 50	HiTH 90K
75	100	150	HiMC 110	HiMC 110	HiMC 65	HiTH 130K
90	125	180	HiMC 130	HiMC 130	HiMC 90	HiTH 130K
110	150	220	HiMC 150	HiMC 150	HiMC 110	HiTH 220K
132	180	260	HiMC 180	HiMC 180	HiMC 110	HiTH 220K
160	220	300	HiMC 220	HiMC 220	HiMC 130	HiTH 220K
250	350	500	HiMC 400	HiMC 400	HiMC 220	HiTH 500K
300	402	560	HiMC 400	HiMC 400	HiMC 300	HiTH 500K

- Above data are based on squirrel cage motor (AC-3) and slip-ring motor (AC-2). Those data are subject to change according to motor classes and motor manufacturers.
- Above data are based on less than 10 seconds motor starting time. Motor starting time must be considered when over 10 seconds motor starting time shall be applied.
- Inrush current shall be considered when a capacitor is used.
- Recommendable change-over time from Y to is between 30 ms and 80 ms.
- 58 % of motor full load current is recommended for HiOR setting current.



Contactor & Control Relay

- Electrical endurance: 100,000 (IEC 60947-4-1, AC-6a, 6b)
The inrush shall be less than 30 times of the full load current of the transformer.
The condenser must be discharged before being re-energized. Maximum residual voltage at terminals shall be under than 50 V.

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Utilization Category & Electrical Endurance

The contactors can be operated according to rated thermal current (I_{th}), rated operating current (I_e), making & breaking capacities, electrical & mechanical endurance and utilization category.

Utilisation Categories According to IEC60947

AC-1	Non-inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: starting, plugging
AC-3	Squirrel cage motors: starting, switching off motors during running
AC-4	Squirrel cage motors: plugging, inching
AC-12	Resistive heating loads
AC-15	Coil loads
DC-1	Non-inductive or slightly inductive loads, resistance furnaces
DC-3	Shunt motors: plugging, inching
DC-5	Series motors: plugging, inching
DC-12	Resistive heating loads
DC-13	Coil loads

Making and Breaking Capacities According to Utilization Category

Duty Type	Make				Make and Break			
	Current	Voltage	Cos Ø	Number of operation	Current	Voltage	Cos Ø	Number of Operation
AC-1	-	-	-	-	1.5I _e	1.05U _e	0.8	50
AC-2	-	-	-	-	4.0I _e	1.05U _e	0.65	50
AC-3	10I _e	U _e	0.45(100 A)	50	8.0I _e	1.05U _e	0.45(100 A)	50
AC-4	12I _e	U _e	0.35(100 A)	50	10.0I _e	1.05U _e	0.35(100 A)	50
DC-1	-	-	-	-	1.5I _e	1.05U _e	1.0	50
DC-3	-	-	-	-	4.0I _e	1.05U _e	2.5	50
DC-5	-	-	-	-	4.0I _e	1.05U _e	15	50
AC-15	-	-	-	-	10I _e	1.1U _e	0.3	10
DC-13	-	-	-	-	1.1I _e	1.1U _e	6P	10

Operating Cycles According to Utilization Category

Duty Type	Make and Break				
	Current	Voltage	Cos Ø	On-time	Number of Operation
AC-1	1.0I _e	1.05U _e	0.8	0.05 sec	6000
AC-2	2.0I _e	1.05U _e	0.65	0.05 sec	6000
AC-3	2.0I _e	1.05U _e	0.45(I _e 100 A)	0.05 sec	6000
AC-4	6.0I _e	1.05U _e	0.35(I _e 100 A)	0.05 sec	6000
DC-1	1.0I _e	1.05U _e	1.0	0.05 sec	6000
DC-3	2.5I _e	1.05U _e	2.0	0.05 sec	6000
DC-5	2.5I _e	1.05U _e	7.5	0.05 sec	6000
AC-15	10I _e	1.1U _e	0.3	0.05 sec	6000
DC-13	1.1I _e	1.1U _e	6P	0.05 sec	6000

Electrical Endurance According to Utilization Category

Duty Type	Make			Break		
	Current	Voltage	Cos Ø	Current	Voltage	Cos Ø
AC-1	1Ie	1Ue	0.95	1Ie	1Ue	0.95
AC-2	2.5Ie	1Ue	0.65	2.5Ie	1Ue	0.65
AC-3	6Ie	1Ue	0.65(Ie 17 A)	1Ie	0.17Ue	0.65(Ie 17 A)
AC-4	6Ie	1Ue	0.35(Ie 17 A)	6Ie	1Ue	0.35(Ie 17 A)
DC-1	1Ie	1Ue	1	1Ie	1Ue	1
DC-3	2.5Ie	1Ue	2	2.5Ie	1Ue	2
DC-5	2.5Ie	1Ue	7.5	2.5Ie	1Ue	7.5

Ie: Rated Current
Ue: Rated Voltage

Selection of AC-3 & AC-4 Contactors

When the frequency of operation is lower than the recommendation, motor output can be increased, but should not exceed the making and breaking capacities of the contactor. If thermal overload relay is used, the short-circuit protection should be carefully considered and the recommended fuse ratings should not be exceeded.

The contactors can be chosen considering the electrical endurance by means of the diagrams.

The electrical endurance of the contactor for AC-3, AC-4 duty can be calculated using this formula.

$$L = \frac{1}{P1/L1 + P2/L2 + \dots + Pn/Ln}$$

- L: electrical endurance of the contactor.
- L1: electrical endurance in AC-3 duty
- L2: electrical endurance in AC-4 duty
- P1: part of use in AC-3 duty
- P2: part of use in AC-4 duty
- P1 + P2 + ... + Pn = 1

Example

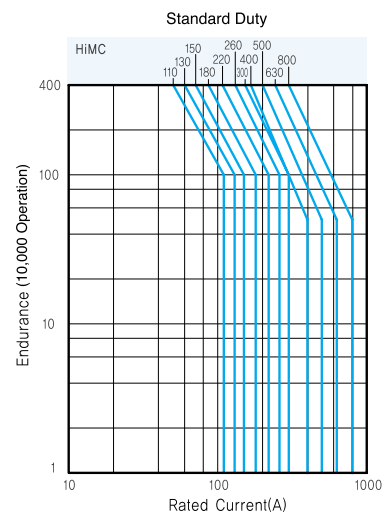
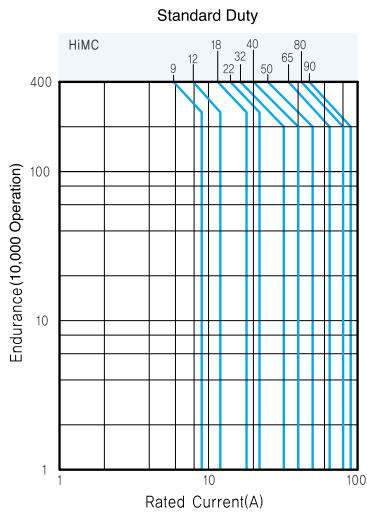
In=80 A, Is=480 A, 95 % non-plugging duty Ia=60 A and 5 % plugging duty Is=360 A. What is the electrical endurance of contactor HiMC 90.

$$L = \frac{10^6}{(Operation) \ 0.95/3.0 + 0.05/0.35} = 0.57 \times 10^6$$

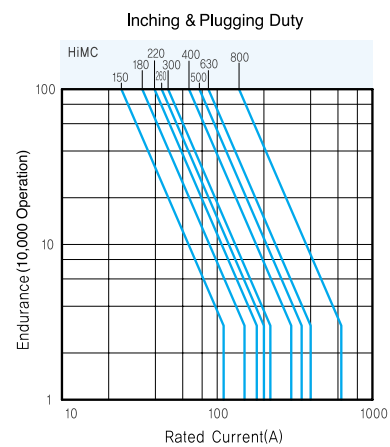
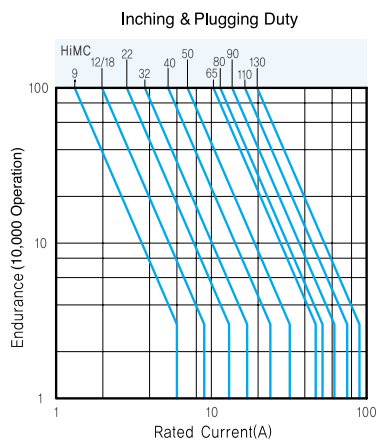
- On AC-3 duty endurance curve, lifetime of HiMC 90 is 3.0x10⁶ at 60 A
- On AC-4 duty, lifetime of HiMC 90 is 0.035x10⁶ at 360 A

Electrical Endurance Curve of Contact

Electrical Endurance in AC-3 Duty (380~440VAC)



Electrical Endurance in AC-4 Duty (380~440VAC)



Starting current shall be under 6 times of rated current.

Wire Size & Tightening Torque

Main Circuit

Type	Terminal Screw	Wire Size (mm ²)	Compressing Terminal Size (mm ²)	Tightening Torque (kgf.cm)
HiMC 9	M4	1.25~5.5	1.25/M4 ~ 5.5/M4	23
HiMC 12	M4	1.25~5.5	1.25/M4 ~ 5.5/M4	23
HiMC 18	M4	1.25~5.5	1.25/M4 ~ 5.5/M4	23
HiMC 22	M4	1.25~5.5	1.25/M4 ~ 5.5/M4	23
HiMC 32	M5	2~14	1.25/M5 ~ 14/M5	26.5
HiMC 40	M5	2~14	1.25/M5 ~ 14/M5	26.5
HiMC 50	M5	2~22	2/M5 ~ 22/M5	28.8
HiMC 65	M8	2~38	2/M8 ~ 38/M8	60
HiMC 80	M8	2~38	2/M8 ~ 38/M8	60
HiMC 90	M8	2~38	2/M8 ~ 38/M8	60
HiMC 110B	M8	2~38	2/M8 ~ 38/M8	60
HiMC 110	M8	2~60	2/M8 ~ 60/M8	60
HiMC 130	M8	2~60	2/M8 ~ 60/M8	60
HiMC 150B	M8	2~60	2/M8 ~ 60/M8	60
HiMC 150	M10	2~150	2/M10 ~ 150/M10	100
HiMC 180	M10	2~150	2/M10 ~ 150/M10	100
HiMC 220	M10	2~150	2/M10 ~ 150/M10	100
HiMC 260	M10	2~200	2/M10 ~ 200/M10	100
HiMC 300	M10	2~200	2/M10 ~ 200/M10	100
HiMC 400	M10	2~240	2/M10 ~ 240/M10	100
HiMC 500	M10	2~240	2/M10 ~ 240/M10	100
HiMC 630	M12	80~325	80/M12 ~ 325/M12	140
HiMC 800	M12	80~325	80/M12 ~ 325/M12	140

Control Circuit

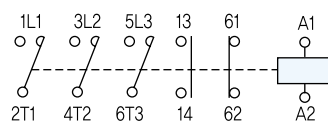
Type	Terminal Screw	Wire Size (mm ²)	Compressing Terminal (mm ²)	Tightening Torque (kgf.cm)
HiMC 9~50	M3.5	1.25~2	1.25/M3.5 ~ 2/M3.5	12
HiMC 65~800				

Location of Contactor

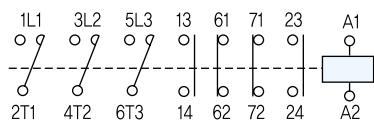
Contactor



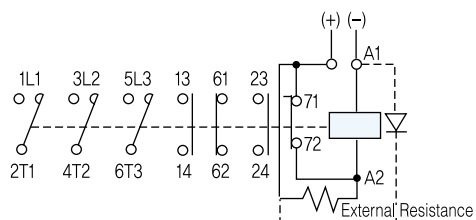
HiMC 9W11 HiMC 9G11
 HiMC 12W11 HiMC 12G11
 HiMC 18W11 HiMC 18G11
 HiMC 22W11 HiMC 22G11



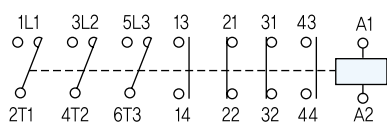
HiMC 32W22 HiMC 32G22
 HiMC 40W22 HiMC 40G22
 HiMC 50W22



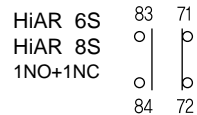
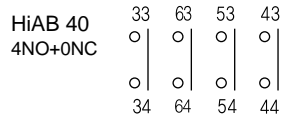
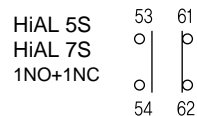
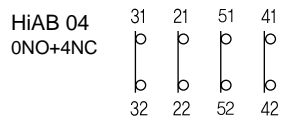
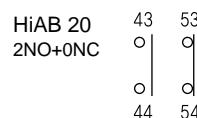
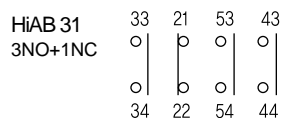
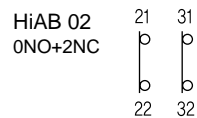
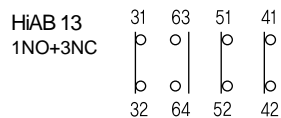
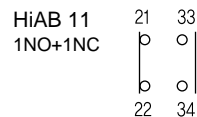
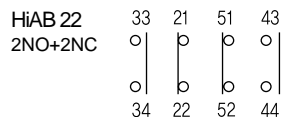
HiMC 50G21



HiMC 65W22 HiMC 220W22
 HiMC 80W22 HiMC 260W22
 HiMC 90W22 HiMC 300W22
 HiMC 110W22 HiMC 400W22
 HiMC 130W22 HiMC 500W22
 HiMC 150W22 HiMC 630W22
 HiMC 180W22 HiMC 800W22



Aux. Contact Block

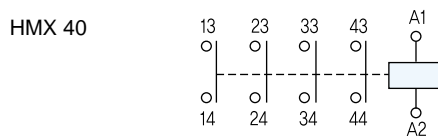
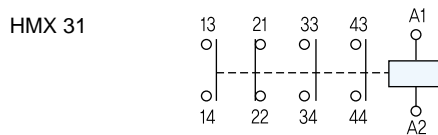
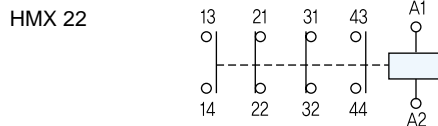


Location of Control Relay

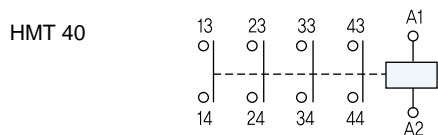
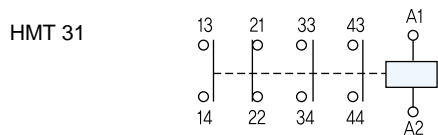
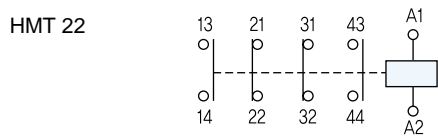
Control Relay



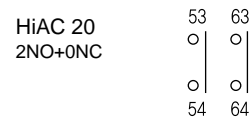
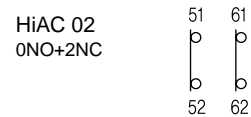
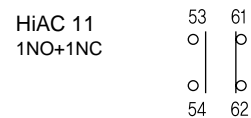
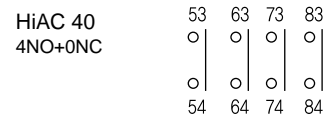
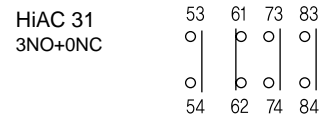
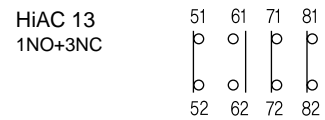
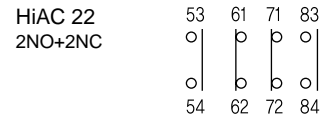
AC Operation Type



DC Operation Type

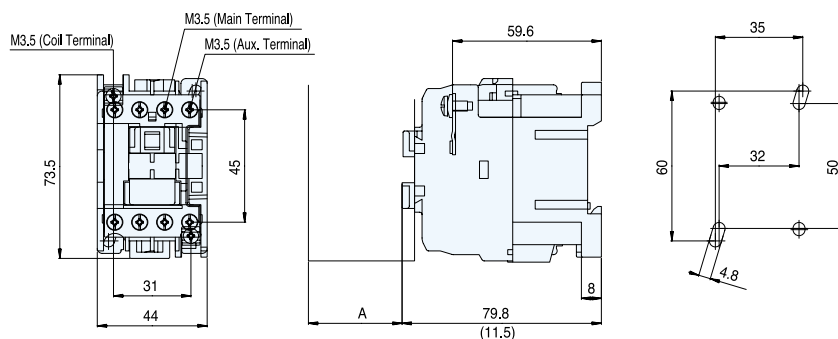


Aux. Contact Block



Contactor

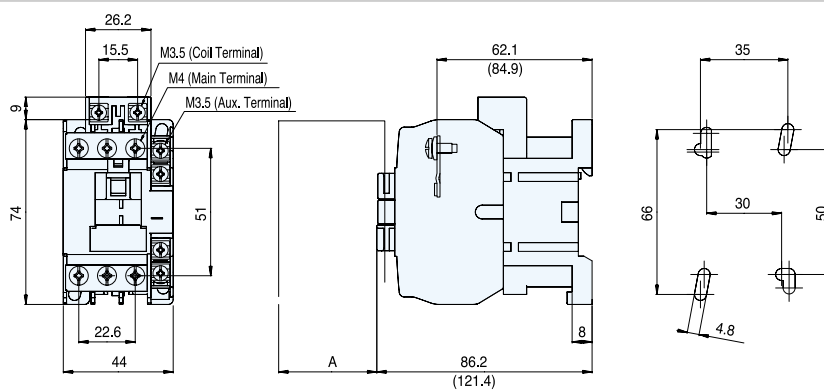
HMX
HMT
(Control
Relays)



Accessories	A(mm)
HiAC	35
HLB2	42.5
HOKZE	39

() : HMT(DC)

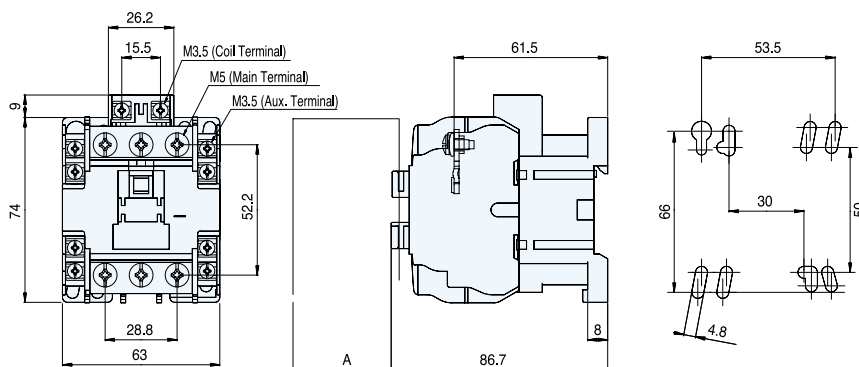
HiMC 9
HiMC 12
HiMC 18
HiMC 22



Accessories	A(mm)
HiAB	35
HLB2	42.5
HOKZE	39

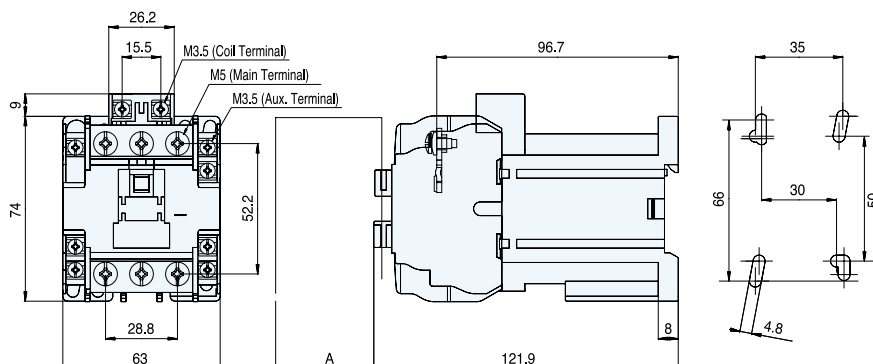
() : G type(DC)

HiMC 32W
HiMC 40W



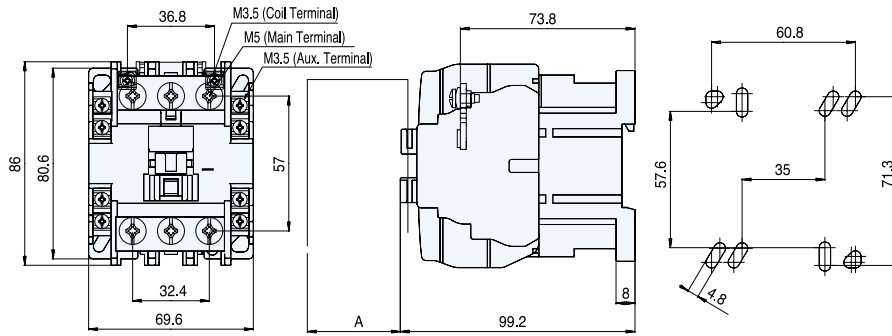
Accessories	A(mm)
HiAB	35
HLB2	42.5
HOKZE	39

HiMC 32G
HiMC 40G



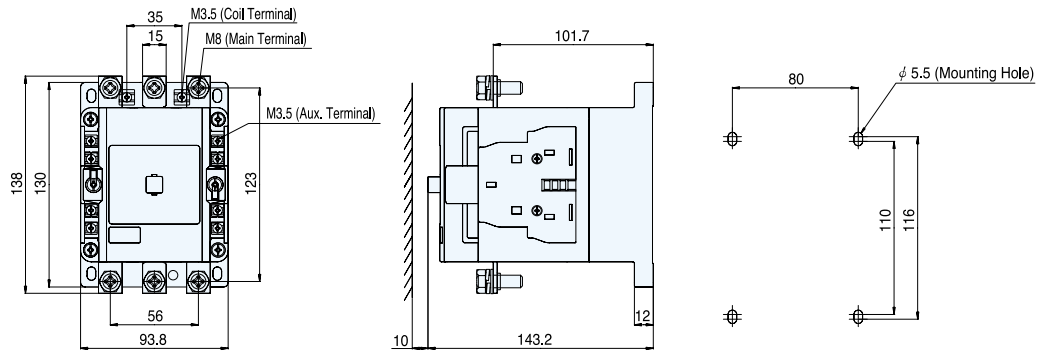
Accessories	A(mm)
HiAB	35
HLB2	42.5
HOKZE	39

HiMC 50

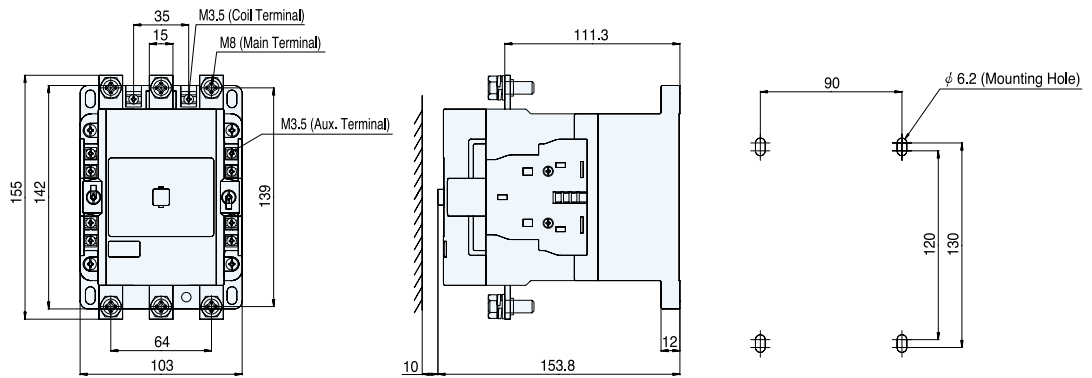


Accessories	A(mm)
HiAB	35
HLB2	42.5
HOKZE	39

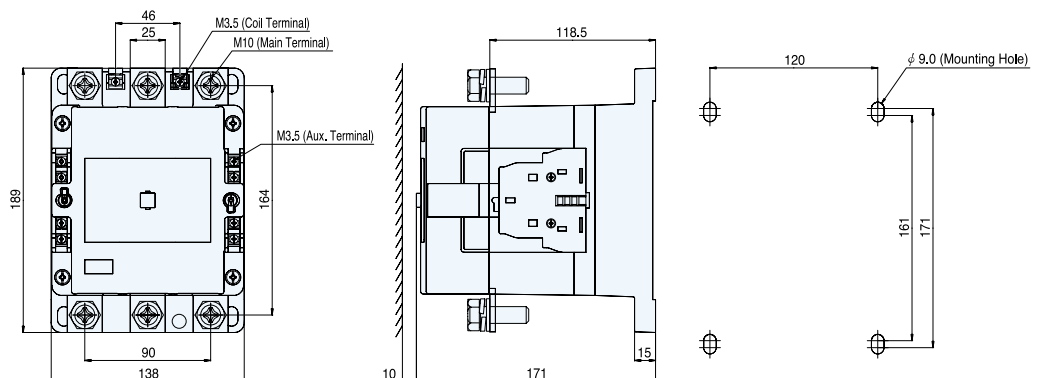
HiMC 65
HiMC 80
HiMC 90
HiMC 110B



HiMC 110
HiMC 130
HiMC 150B

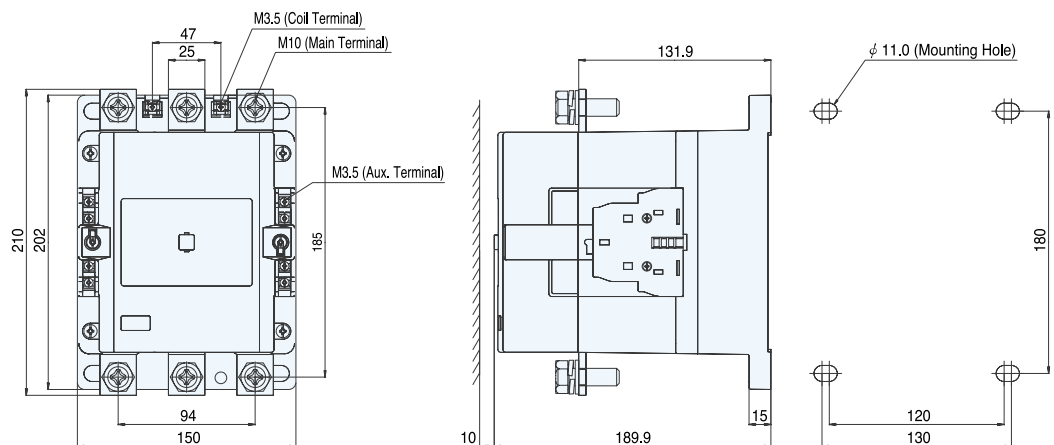


HiMC 150
HiMC 180
HiMC 220

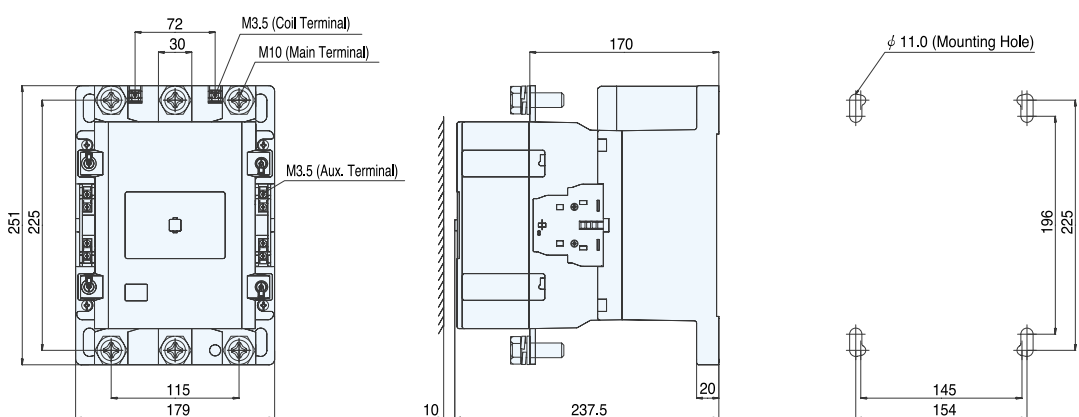


Contactor

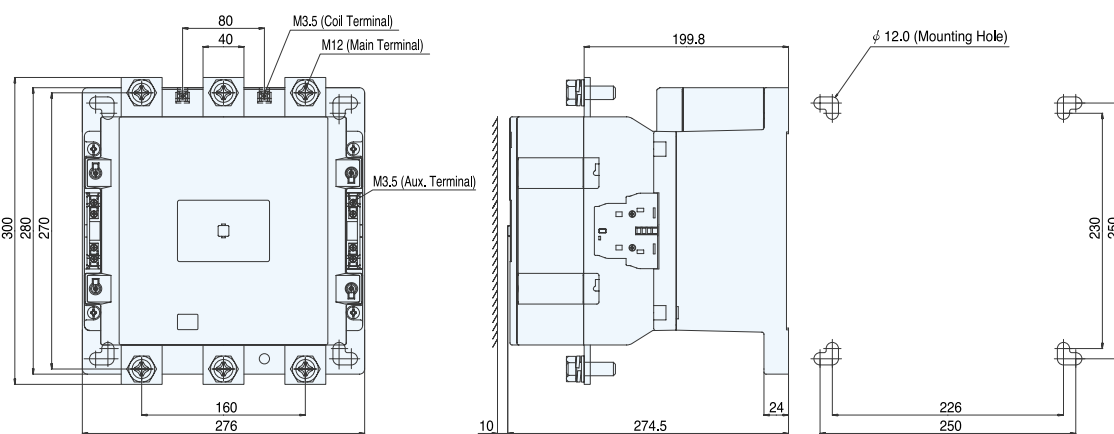
HiMC 260
HiMC 300



HiMC 400
HiMC 500

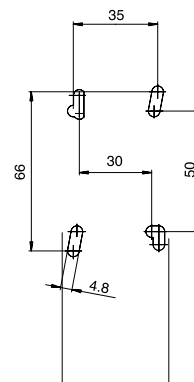
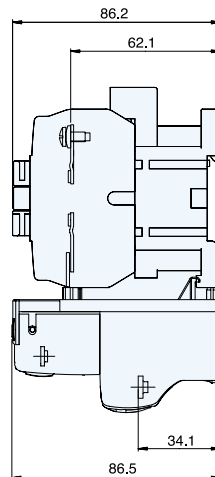
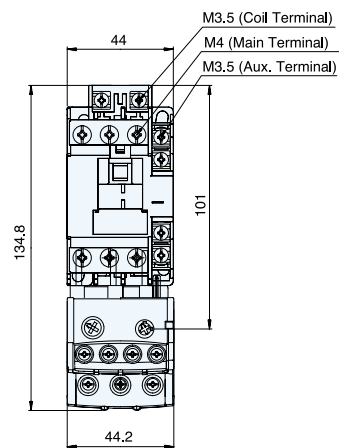


HiMC 630
HiMC 800

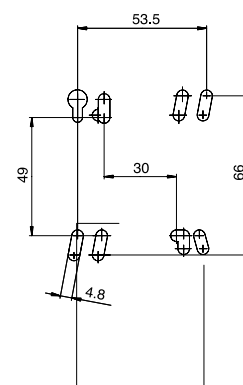
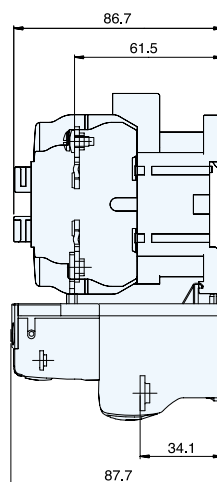
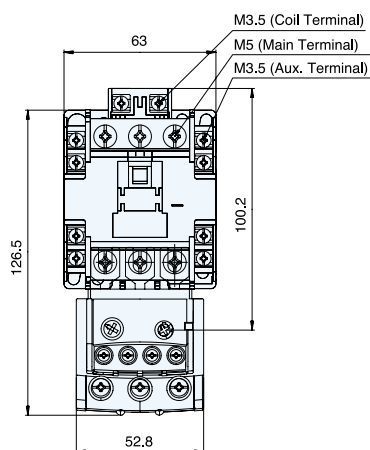


Motor Starter

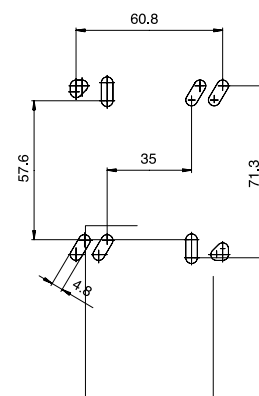
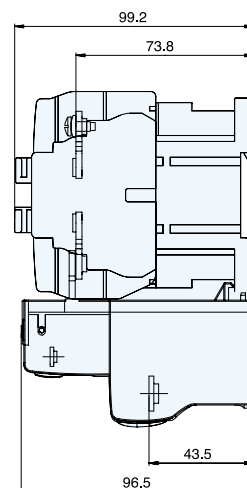
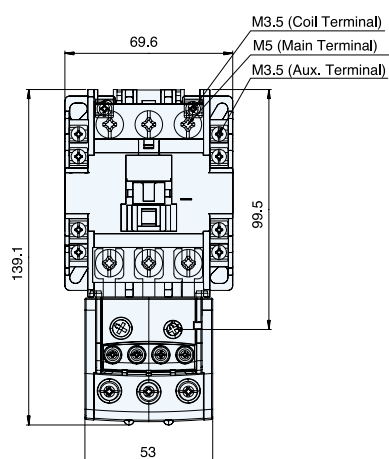
HiMC 9
HiMC 12
HiMC 18
HiMC 22
+
HiTH 22



HiMC 32
HiMC 40
+
HiTH 40

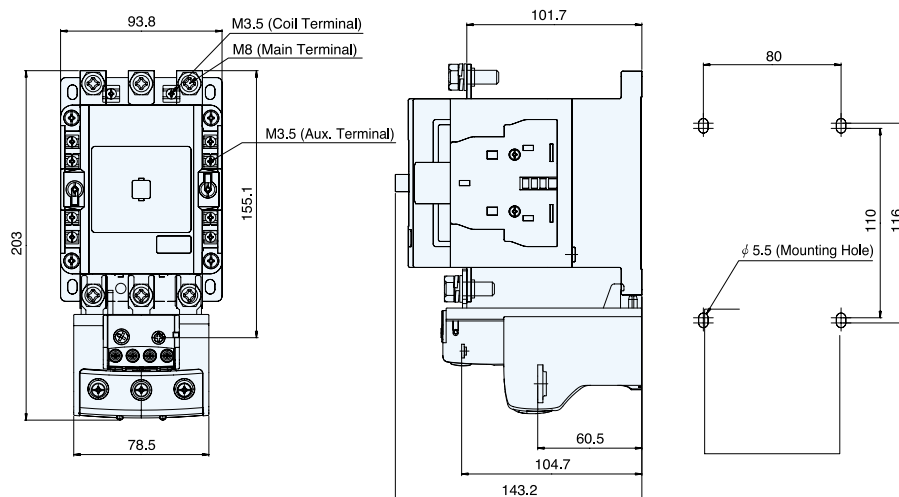


HiMC 50
+
HiTH 50

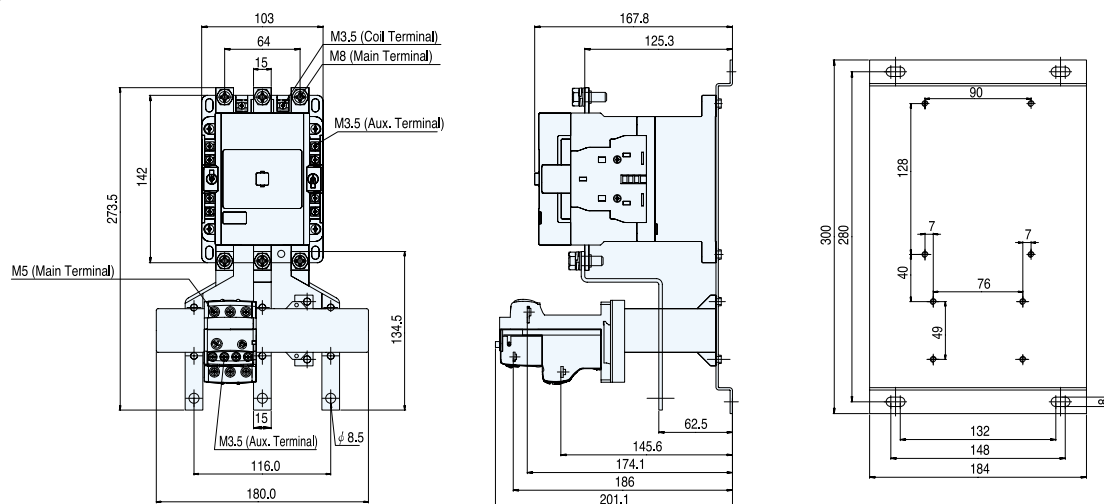


Motor Starter

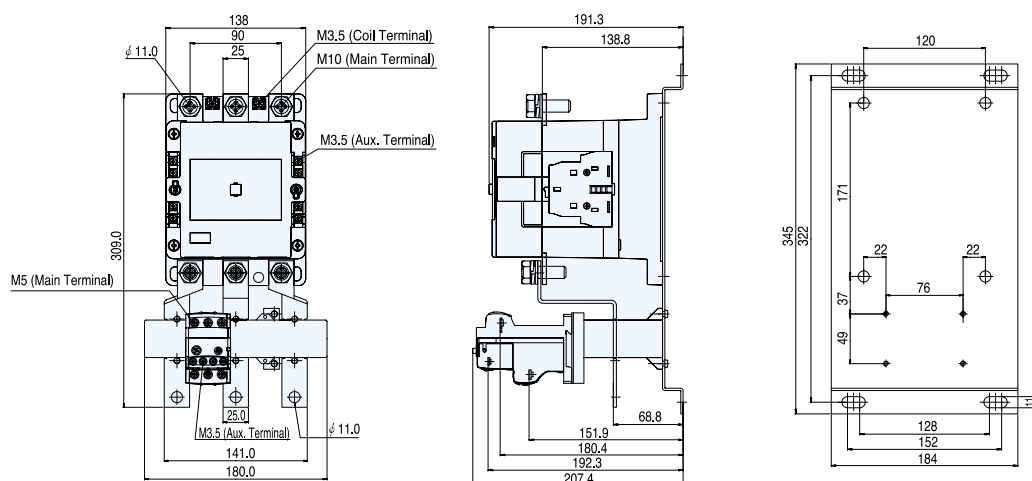
HiMC 65
HiMC 80
HiMC 90
+
HiTH 90



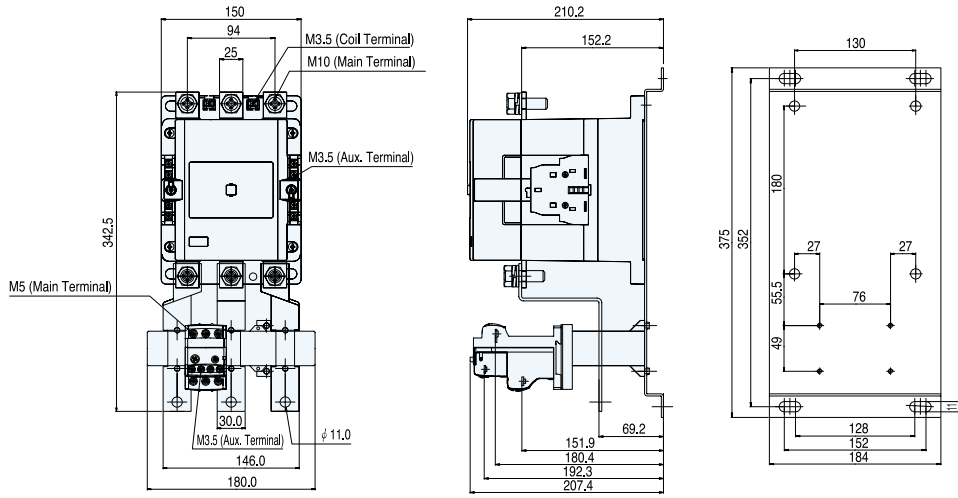
HiMC 110
HiMC 130
+
HiTH 130



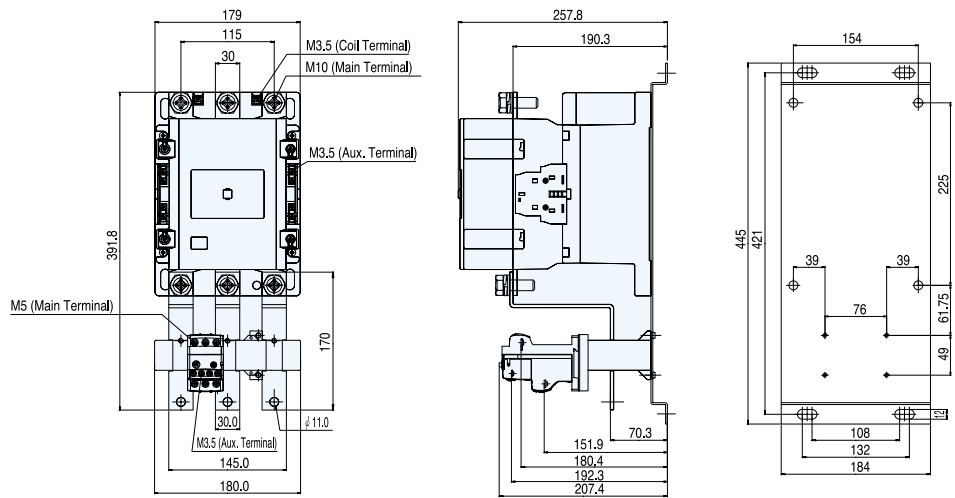
HiMC 150
HiMC 180
HiMC 220
+
HiTH 220



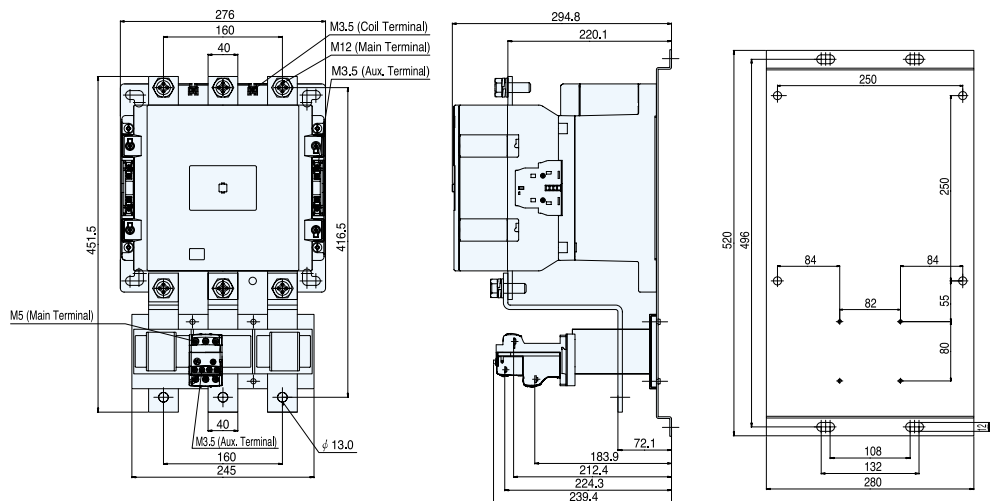
HiMC 260
HiMC 300
+
HiTH 300



HiMC 400
HiMC 500
+
HiTH 500

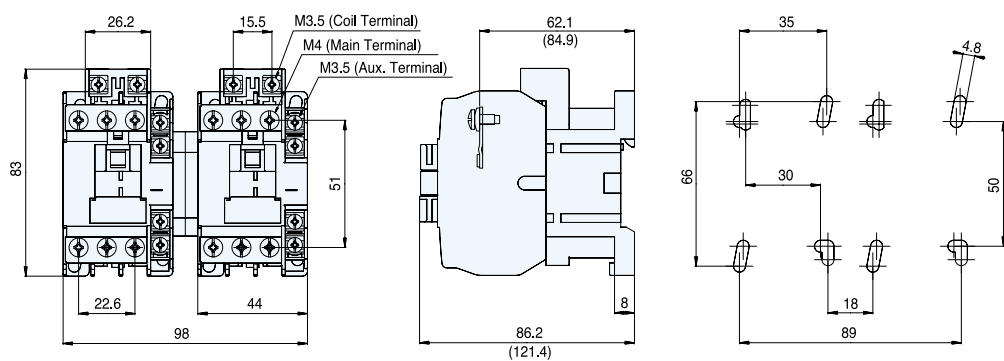


HiMC 630
HiMC 800
+
HiTH 800



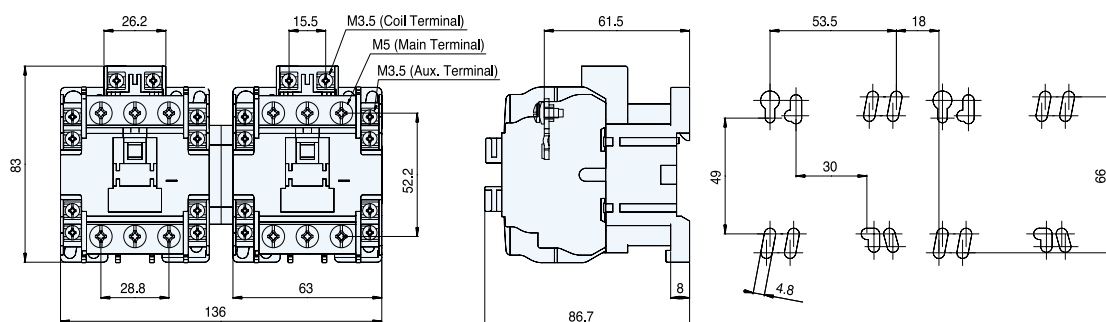
Reversing Contactor

HiMR 9
HiMR 12
HiMR 18
HiMR 22

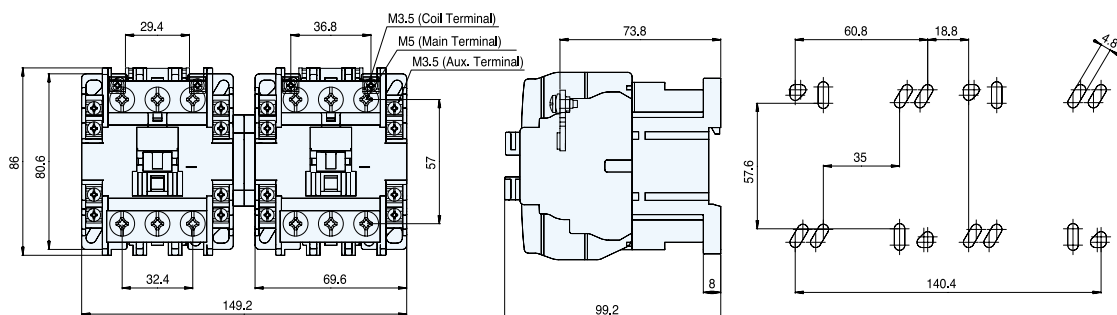


(): G type(DC)

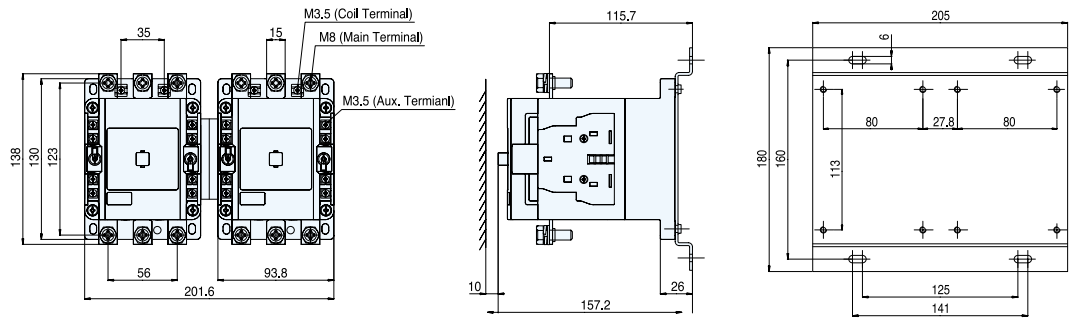
HiMR 32
HiMR 40



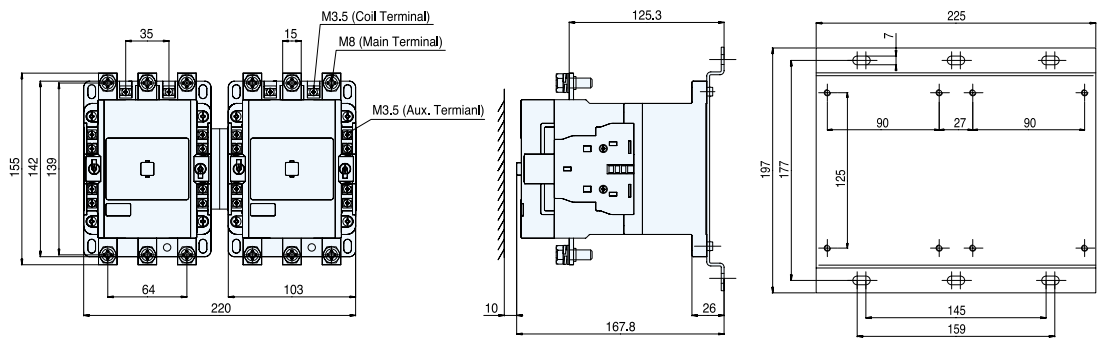
HiMR 50



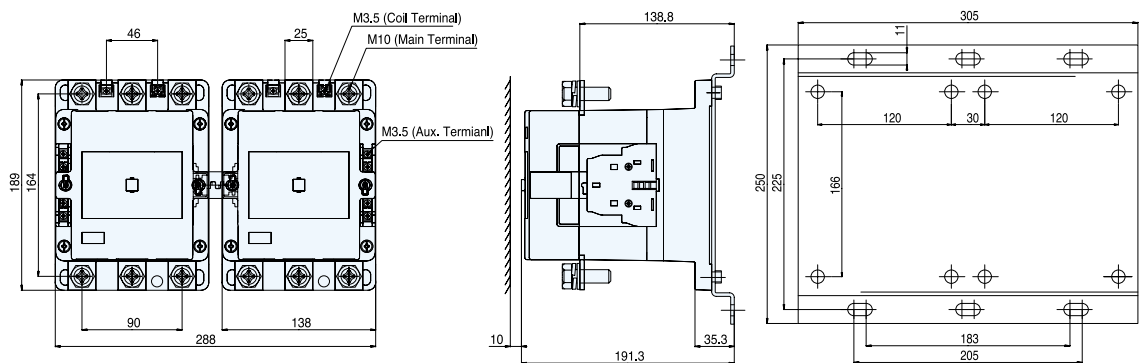
HiMR 65
HiMR 80
HiMR 90
HiMR 110B



HiMR 110
HiMR 130
HiMR 150B

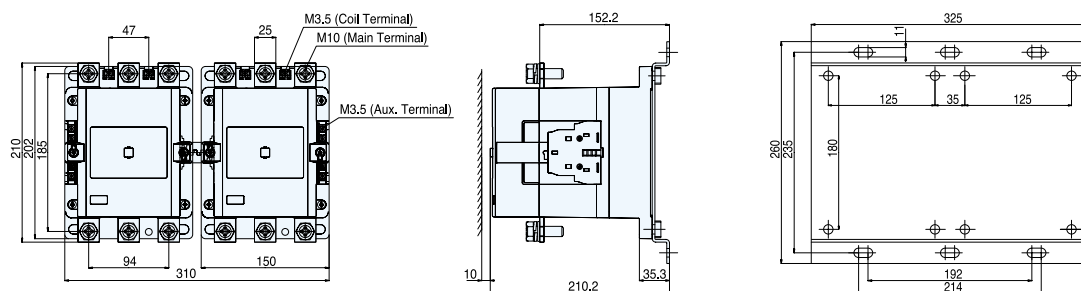


HiMR 150
HiMR 180
HiMR 220

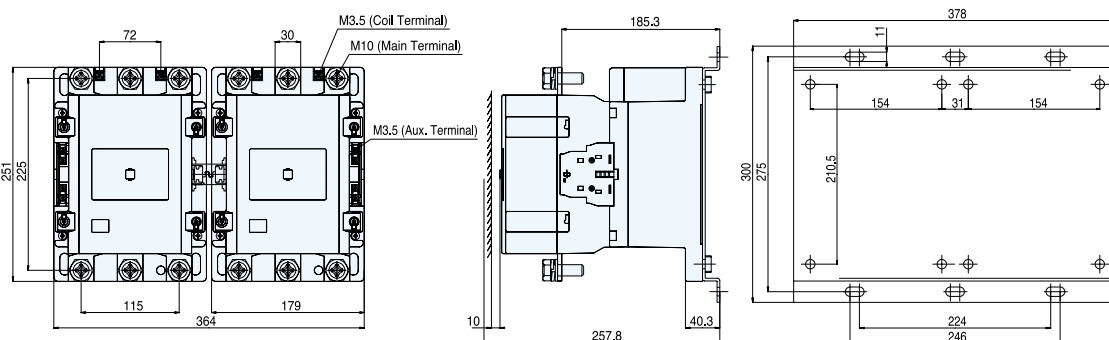


Reversing Contactor

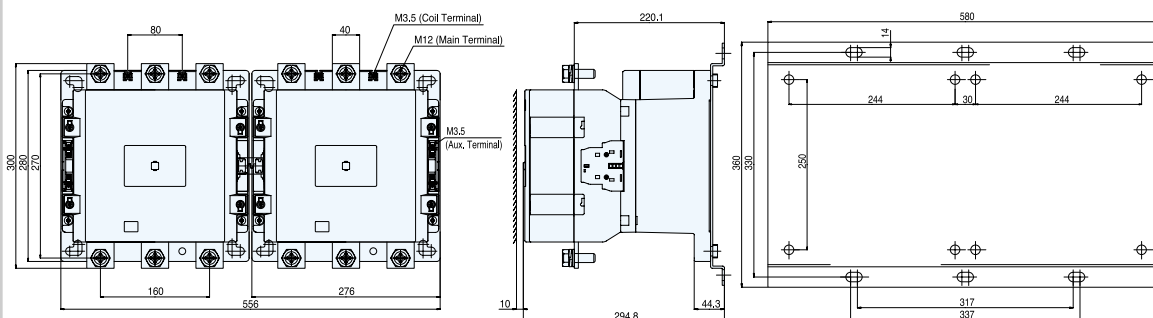
HiMR 260
HiMR 300



HiMR 400
HiMR 500



HiMR 630
HiMR 800





Thermal Overload Relay



Contents

Rating & Selection

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Technical Description

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Tripping Curve 62

Separate Mounting Unit 64

Surrounding & Installation 64


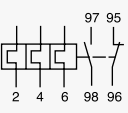
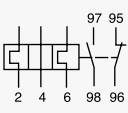

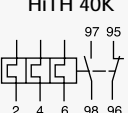
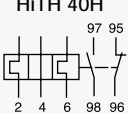

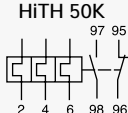
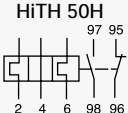

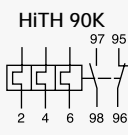
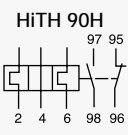
Dimension 65

Ratings Overview

Setting Range	Relay Types (Standard Type)								
	HiTH 22K	HiTH 40K	HiTH 50K	HiTH 90K	HiTH 130K	HiTH 220K	HiTH 300K	HiTH 500K	HiTH 800K
0.12~0.18 A									
0.18~0.26 A									
0.25~0.35 A									
0.34~0.5 A									
0.5~0.7 A									
0.6~0.9 A									
0.8~1.2 A									
1.1~1.6 A									
1.5~2.1 A									
2~3 A									
2.8~4.2 A									
3~5 A									
4~6 A									
5.6~8 A									
7~10 A									
9~13 A									
12~18 A									
16~22 A									
18~26 A									
24~32 A									
28~40 A									
36~50 A									
45~65 A									
60~80 A									
70~90 A									
48~80 A									
78~130 A									
108~180 A									
132~220 A									
180~300 A									
240~400 A									
300~500 A									
378~630 A									
480~800 A									

CT Operated Type

Thermal Overload Relay Selection : 0.18~90 A

	Type (For Direct Mounting)		Current Range Overload Trip		Auxiliary Contacts		Applied Contactor (For Direct Mounting)
	3-heater (Standard) Phase Fault Protection	2-heater (Optional)	Nominal	Setting Range	Composition	Contact Type	
			A	mim.~max. A	NO (a) EA (b) EA		
 HiTH 22	 HiTH 22K 0.17 kg	 HiTH 22H 0.16 kg	0.18	0.12~0.18	1	1	HiMC 9 HiMC 12 HiMC 18 HiMC 22
			0.26	0.18~0.26			
			0.35	0.25~0.35			
			0.5	0.34~0.5			
			0.7	0.5~0.7			
			0.9	0.6~0.9			
			1.2	0.8~1.2			
			1.6	1.1~1.6			
			2.1	1.5~2.1			
			3	2~3			
			4.2	2.8~4.2			
			5	3~5			
			6	4~6			
			8	5.6~8			
			10	7~10			
			13	9~13			
			18	12~18			
			22	16~22			
 HiTH 40	 HiTH 40K 0.23 kg	 HiTH 40H 0.22 kg	10	7~10	1	1	HiMC 32 HiMC 40
			13	9~13			
			18	12~18			
			22	16~22			
			26	18~26			
			32	24~32			
 HiTH 50	 HiTH 50K 0.28 kg	 HiTH 50H 0.27 kg	40	28~40	1	1	HiMC 50
			26	18~26			
			32	24~32			
			40	28~40			
 HiTH 90	 HiTH 90K 0.53 kg	 HiTH 90H 0.51 kg	50	36~50	1	1	HiMC 65 HiMC 80 HiMC 90 HiMC 110B
			40	28~40			
			50	36~50			
			65	45~65			
			80	60~80			
			90	70~90			

Ordering Information

Type + Nominal Current : Page 16

Dimension & Suitable Wire

W x H x D

mm
mm²

External Size : 44 x 65 x 87

Wire : 1~6 mm² for main
2 x 0.75~2.5 mm²
for control circuit

External Size : 53 x 70 x 88

Wire : 2~14 mm² for main
2 x 0.75~2.5 mm²
for control circuit

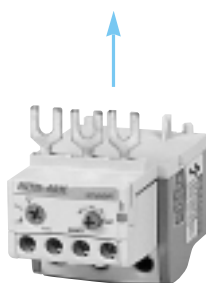
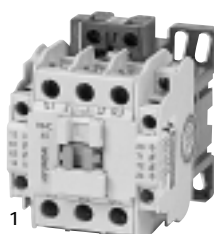
External Size : 53 x 73 x 97

Wire : 2~22 mm² for main
2 x 0.75~2.5 mm²
for control circuit

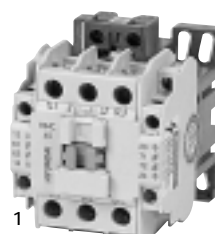
External Size : 79 x 84 x 117

Wire : 2~35 mm² for main
2 x 0.75~2.5 mm²
for control circuit

Direct Mounting to a Contactor



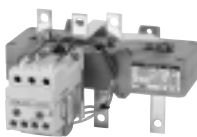
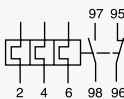
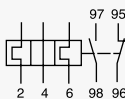

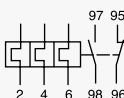
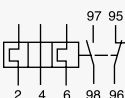

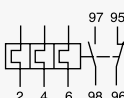
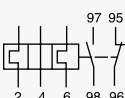
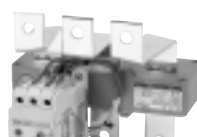
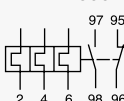
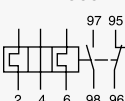

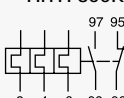
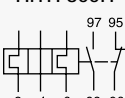
Separate Mounting



Accessories

1. Contactor
HiMC 9~50
Page 22, 24
2. Separate Mounting Unit
 - HiTHMB 22 for HiTH 22
 - HiTHMB 40 for HiTH 40
 - HiTHMB 50 for HiTH 50
 Page 64

Thermal Overload Relay Selection : 80~800 A

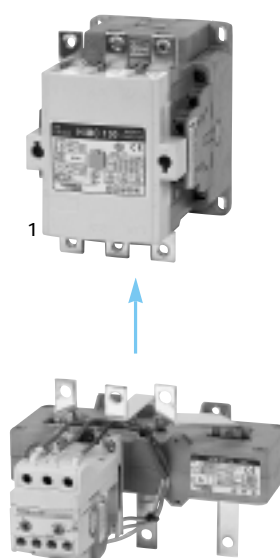
	Type (CT Operated Type)		Current Range Overload Trip		Auxiliary Contact		Applied Contactor (For Direct Mounting)
	3-heater (Standard)	2-heater (Optional)	Nominal	Setting Range	Composition		Contactor Type
	Phase Fault Protection			mim.~max.	NO	NC	
			A	A	(a) EA	(b) EA	
<div></div> <div>HiTH 130</div>	<div>HiTH 130K</div> <div></div> <div>1.65 kg</div>	<div>HiTH 130H</div> <div></div> <div>1.3 kg</div>	80	48~80	1	1	HiMC 110
			130	78~130			HiMC 130
							HiMC 150B
<div></div> <div>HiTH 220</div>	<div>HiTH 220K</div> <div></div> <div>1.85 kg</div>	<div>HiTH 220H</div> <div></div> <div>1.49 kg</div>	130	78~130	1	1	HiMC 150
			180	108~180			HiMC 180
			220	132~220			HiMC 220
<div></div> <div>HiTH 300</div>	<div>HiTH 300K</div> <div></div> <div>1.94 kg</div>	<div>HiTH 300H</div> <div></div> <div>1.59 kg</div>	220	132~220	1	1	HiMC 260
			300	180~300			HiMC 300
<div></div> <div>HiTH 500</div>	<div>HiTH 500K</div> <div></div> <div>2.25 kg</div>	<div>HiTH 500H</div> <div></div> <div>1.88 kg</div>	300	180~300	1	1	HiMC 400
			400	240~400			HiMC 500
			500	300~500			
<div></div> <div>HiTH 800</div>	<div>HiTH 800K</div> <div></div> <div>5.74 kg</div>	<div>HiTH 800H</div> <div></div> <div>4.62 kg</div>	630	378~630	1	1	HiMC 630
			800	480~800			HiMC 800

Ordering Information

Type + Nominal Current : Page 16

	Dimension	Remarks CT Ratio
	W x H x D	
	mm	
180 x 135 x 187		80 : 5
		130 : 5
180 x 145 x 187		130 : 5
		180 : 5
		220 : 5
180 x 159 x 187		220 : 5
		300 : 5
180 x 170 x 187		300 : 5
		400 : 5
		500 : 5
245 x 187 x 219		630 : 5
		800 : 5

Mounting to the Contactor



Accessories

1. Contactor
HiMC 110~800
Page 24, 26

Feature

The HiTH series thermal overload relay compensates the ambient temperature automatically.

The compensation range is between -25 and +55 .

The HiTH series has the phase unbalance protection device, which increases the reliability of the motor protection.

These relays are provided with the built-in free tripping mechanism, which can be tripped regardless of the Reset Button position.

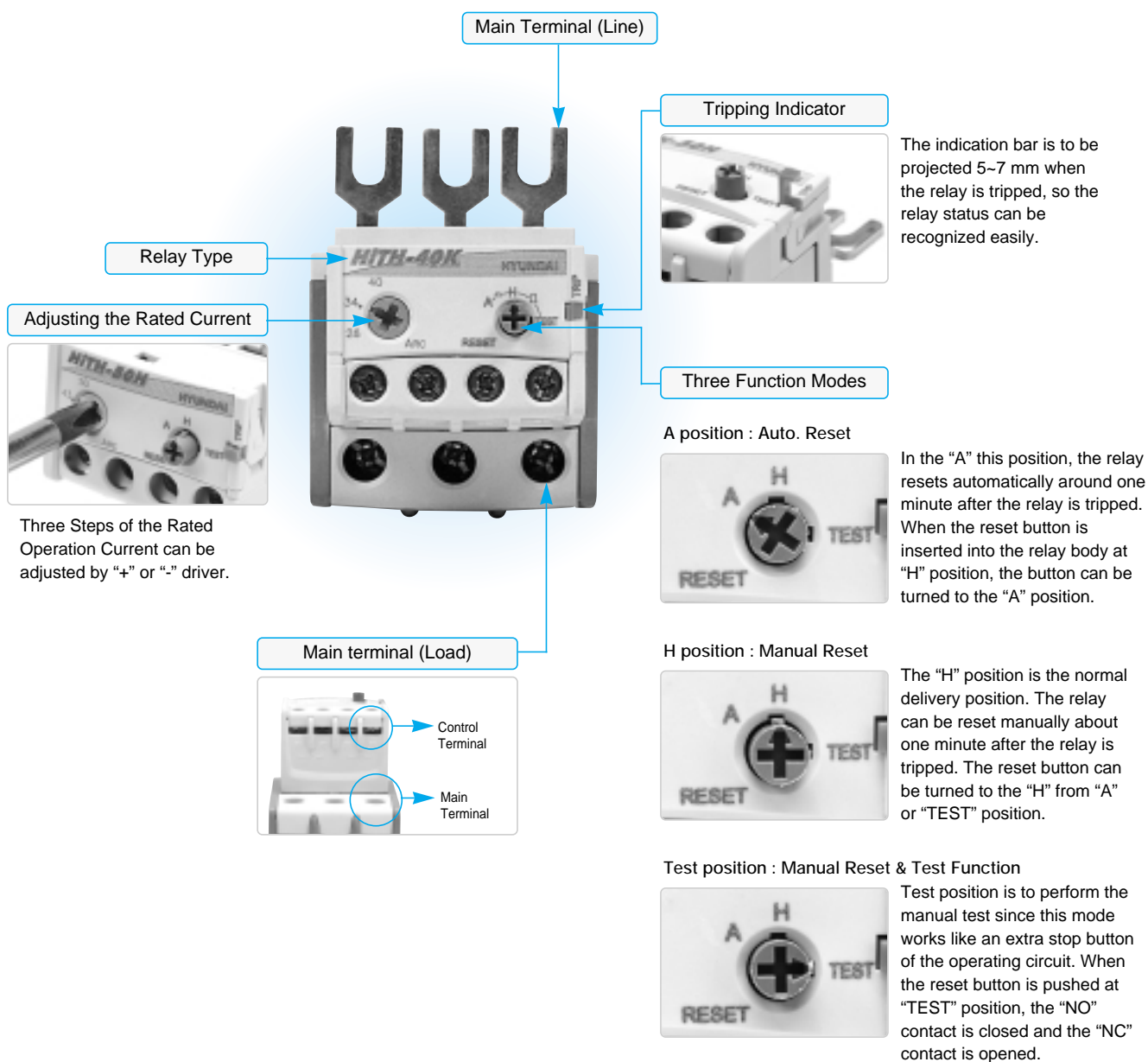
These relays have 1NO and 1NC aux. contact with the galvanic isolation.

The HiTH 130~800 are Current Transformer(CT) type relays. HiTH 800 is able to transmit Max. 800 ampere.

The Protection cover for the main and control terminal meets IP 20.(HiTH 22, 40, 50 & 90)

The HiTH series is pin type relays, so it can be connected to the magnetic contactor directly. (HiTH 22, 40, 50 & 90)

Both screw and 35 mm Din rail mounting are available through the separate mounting units.



Selection of Thermal Overload Relay

Motors of short starting time

For motors of normal starting time within a few seconds, the relays can be selected by the table of page 56 & 58.

The full load current(FLC) of the motor must be within the setting range of the thermal overload relay.

The starting time of high-inertia motor is an important factor at the selection of thermal overload relays.

The tripping time of the motors, whose starting current is 6~7 times of the rated current, can be obtained from the HiTH tripping curves, page 62 & 63. This time should be longer than around 25% of the motor starting time.

Motors of long starting time

If the starting time of the motor is longer than the tripping time of HiTH 22~90, the current transformer type shall be used.

The current transformer type relays include the Non-Tripping features during the motor starting time.

The rated current can be decreased by looping the primary cable several times on the transformer according to the following table.

Current range(Example: 130 A)

Number of Primary Loops	Current Range (A)	Current Ratio
1	78~130	130 / 5
2	39~65	65 / 5
3	26~26.7	26.7 / 5
4	19.5~43.3	43.3 / 5
5	15.6~26	26 / 5
6	13~21.7	21.7 / 5
7	11.14~18.5	18.5 / 5
8	9.75~16.25	16.25 / 5

The second rated current of current transformer is 5 A, the overload relay is able to control the current between 3 A and 5 A.

The corresponding setting value for the relay can be calculated by using the following formula.

$$\text{Setting current(A)} = \frac{\text{Rated current of motor}}{\text{Current ratio}}$$

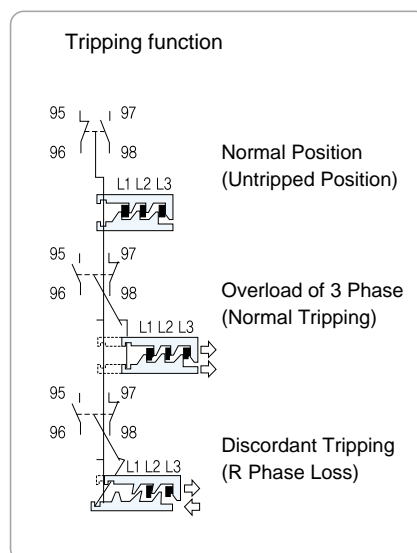
Protection of Phase Loss

Discordant tripping unit

When R phase becomes phase loss, the bimetal of R phase remains and the other bimetals of S & T phase are bended.

The bottom slide of the Discordant Tripping Unit keeps the original position due to the bimetal of R phase; whereas, the top slide moves because of the bending bimetals of S & T phase.

The difference moving ratio of top and bottom slides make the Discordant Tripping time to be shorter than normal tripping time; please refer to the figure.



Making and breaking capacities of auxiliary contacts

Grade	AC 15 ¹⁾		Grade	DC 13 ²⁾	
	Aux. Contact 95-96	Alarm. Contact 97-98		Aux. Contact 95-96	Alarm. Contact 97-98
U/V	I _e (A)	I _e (A)	U/V	I _e (A)	I _e (A)
110	2.0	1.2	24	1.0	1.0
220	1.5	1.0	110	0.4	0.4
500	1.0	0.6	220	0.15	0.15
660	0.5	0.3	440	0.07	0.07

1) AC 15 duty - Making/Breaking Current = I_e × 10

2) DC 13 duty - Making/Breaking Current = I_e × 1.1

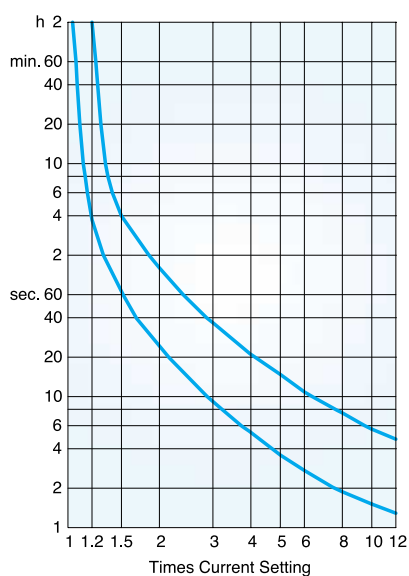
Tripping Curve

Tripping curve of 3 phase thermal overload relay shows the average tripping time of the cold starting condition at +20 °C ambient temperature.

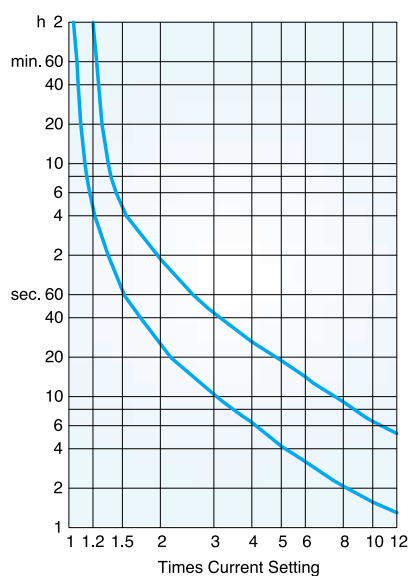
Tripping time of hot start : 20~40 % of cold start

Average tripping time of single phase is 40~60 % of three phase tripping time based on cold start.

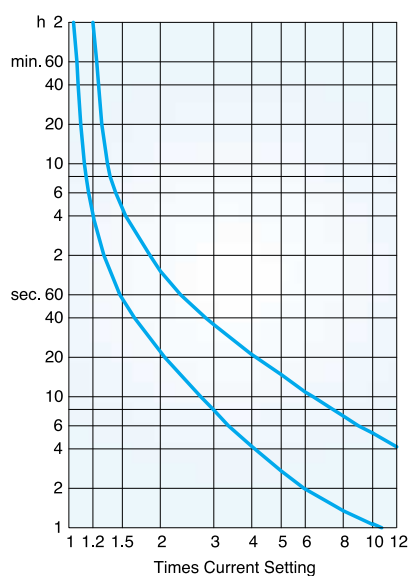
HiTH 22, 0.18-3.0



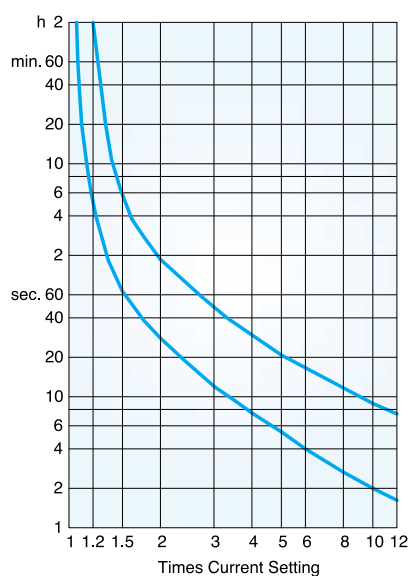
HiTH 22, 4.2-6.0

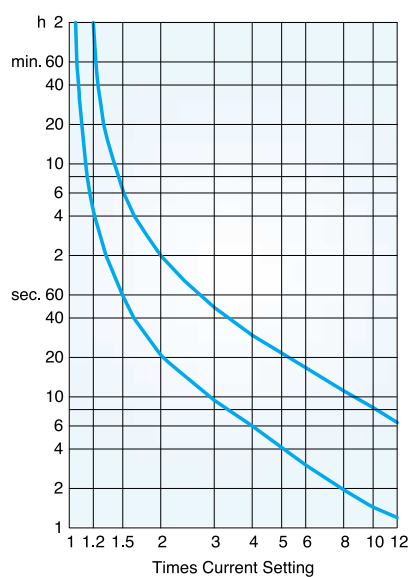
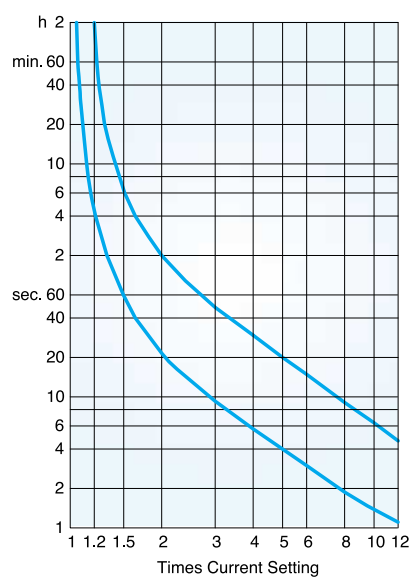
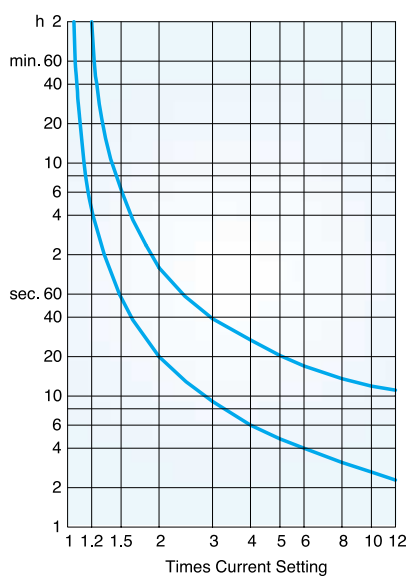
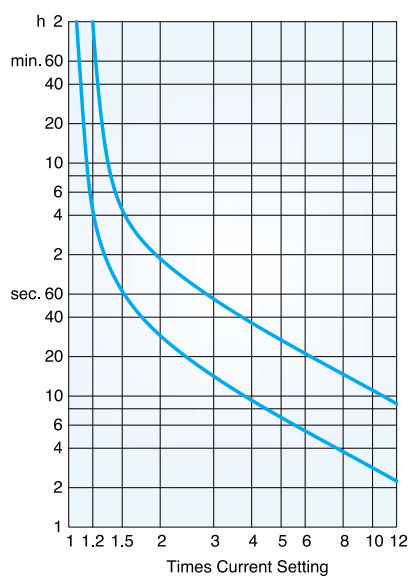


HiTH 22/40, 8.0-22



HiTH 40/50/90, 26-40



HiTH 50/90, 50**HiTH 90, 65-90****HiTH 130 - 300****HiTH 500 - 800**

Separate Mounting Unit

Separate mounting unit(HiTHMB) is for mounting the thermal overload relay separately with screws or DIN rail.

Type	For use with Overload Relay Type	Mounting
HiTHMB 22	HiTH 22	DIN Rail Screw
HiTHMB 40	HiTH 40	
HiTHMB 50	HiTH 50	
HiTHMB 90	HiTH 90	



Saparate Mounting Unit (HiTHMB)

Surrounding & Installation

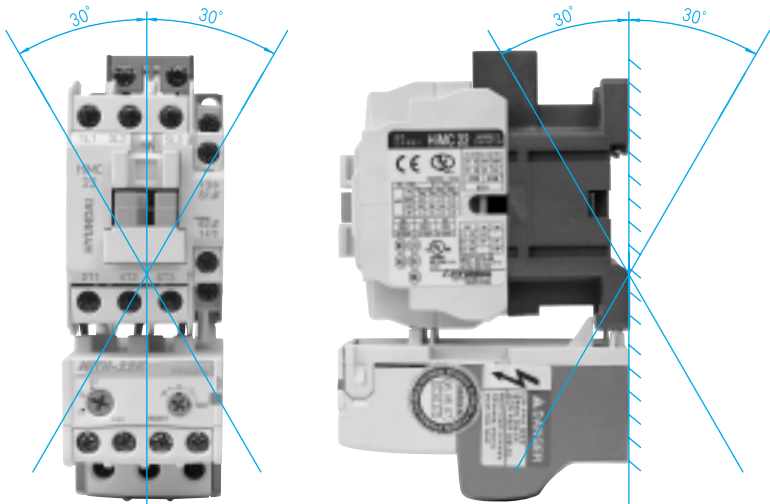
Surrounding

Ambient Temperature	20 (Standard), -25~40
Average Temperature (24 hours)	below 35
Storage Temperature	-30~65 , Non Freezing Site.
Relative Humidity	45~85 % RH
Altitude	below 2000 m
Vibration-proof	10~55 Hz 2g
Impact-proof	5g

Installation

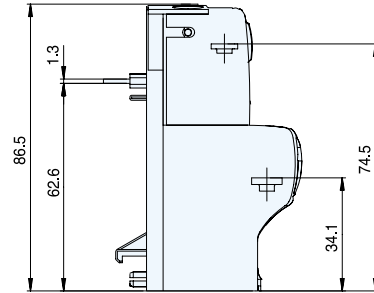
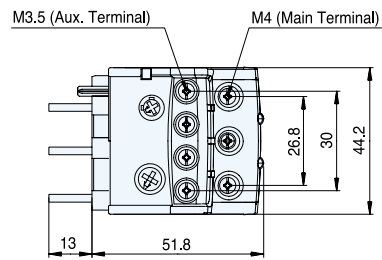
1. Please Install in a dry & vibration-free location.
2. Perpendicular installation is recommended, but $\pm 30^{\circ}$ slant is acceptable.
3. Over 30° slant and horizonal installation may shorten life-time, and may effect on the other characteristics.

Perpendicular Installation

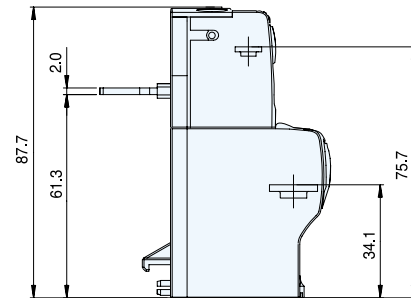
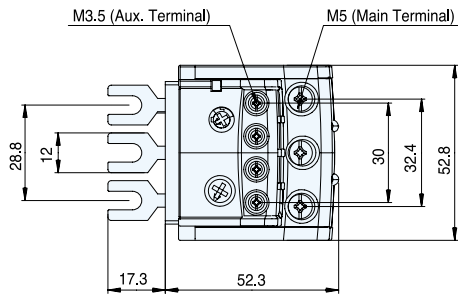


Dimension

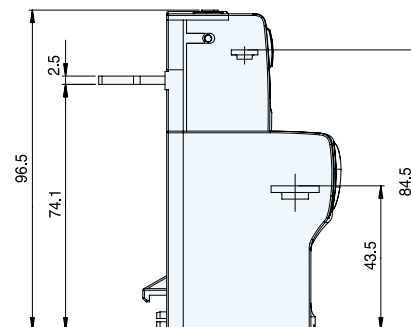
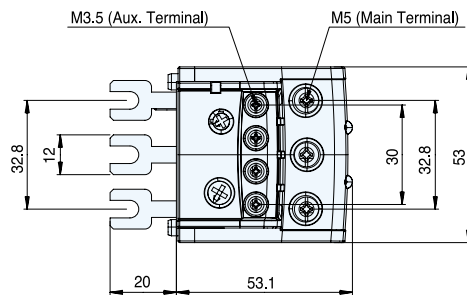
HiTH 22



HiTH 40

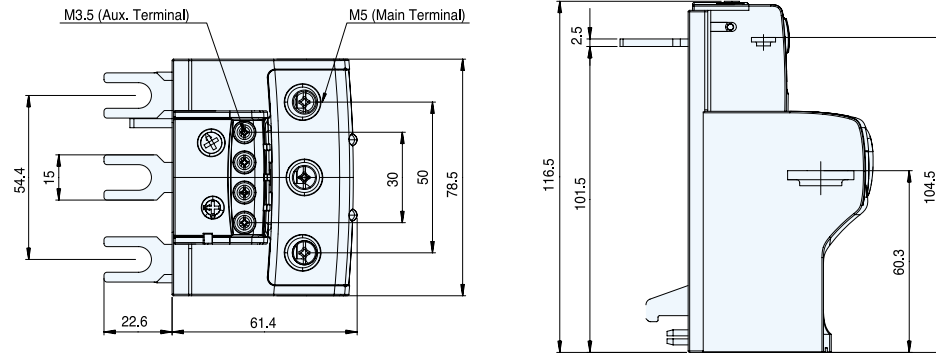


HiTH 50

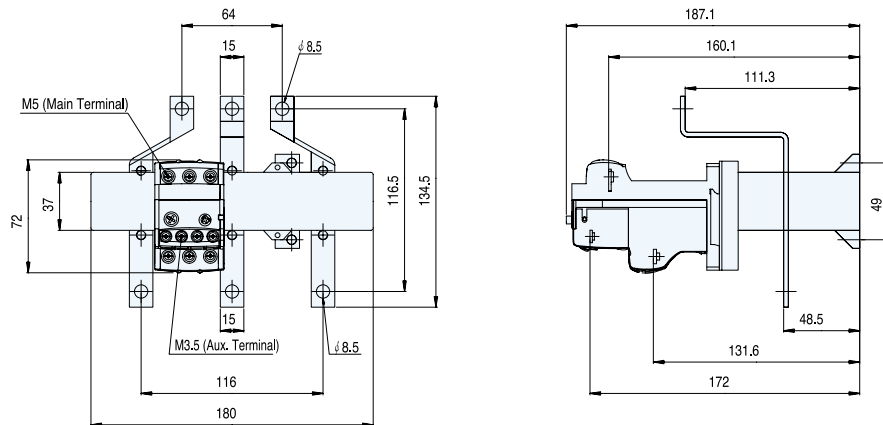


Dimension

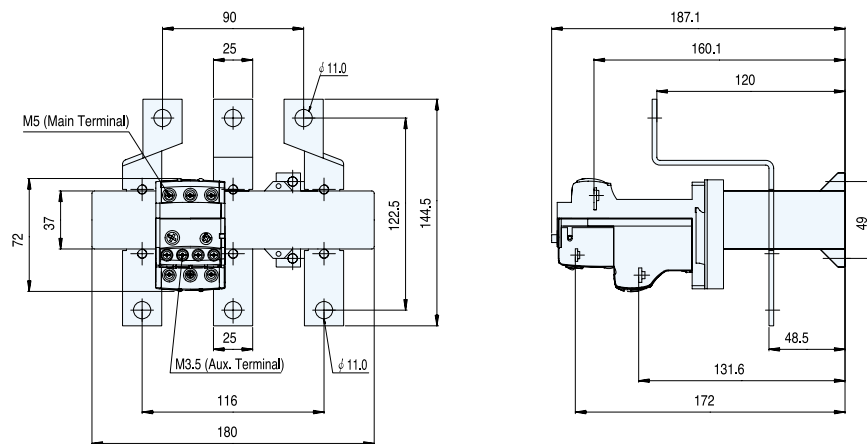
HiTH 90



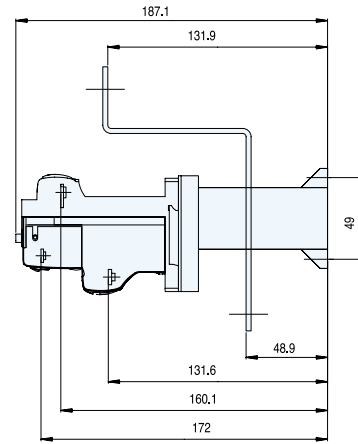
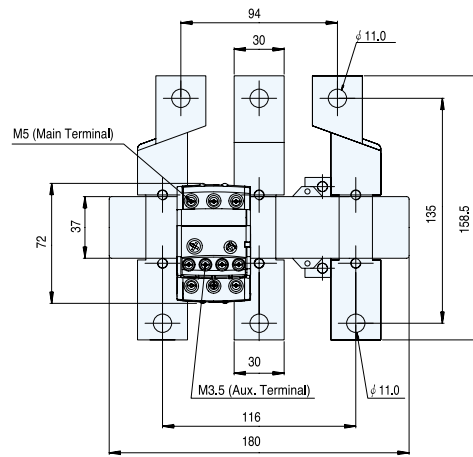
HiTH 130



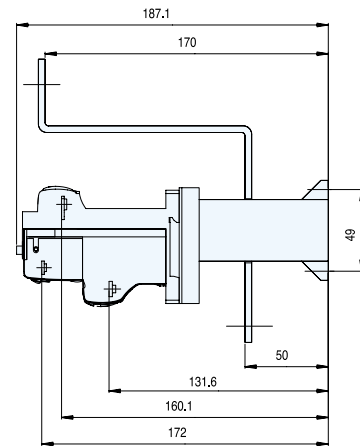
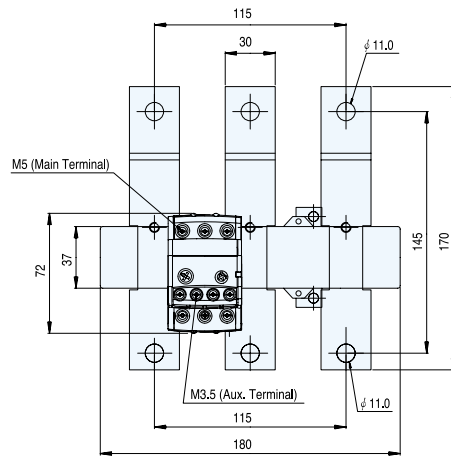
HiTH 220



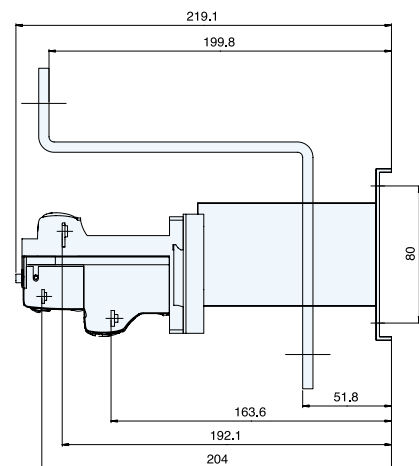
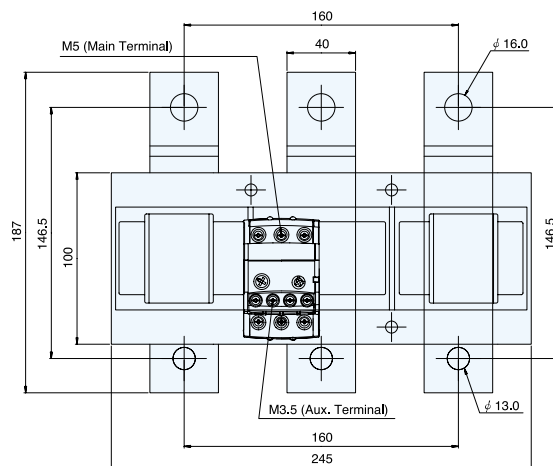
HiTH 300



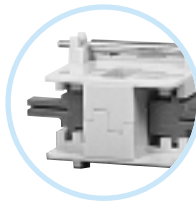
HiTH 500



HiTH 800



Accessory



Contents













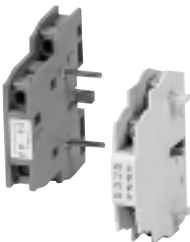





















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Ratings

Type	IEC Ratings (Rated Thermal Current, I _{th} =16 A, Rated Insulation Voltage 750VAC)											
	AC-15, Coil Load						DC-13, Coil Load					
	Operation Current						Operation Current					
	120 V A	240 V A	380 V A	440 V A	500 V A	690 V A	24 V A	48 V A	120 V A	240 V A	480 V A	690 V A
HiAB HiAC	6	4	3	3	3	2	6	2.8	1.1	0.55	0.31	0.2






Type	IEC Ratings (Rated Thermal Current, I _{th} =16 A, Rated Insulation Voltage 750VAC)												UL Ratings (Rated Thermal Current, I _{th} =16 A)			
	AC-12, Resistive Load				AC-15, Coil Load				DC-12, Resistive Load				DC-13, Coil Load			
	Operational Current				Operational Current				Operational Current				Operational Current			
	110 V A	220 V A	440 V A	690 V A	110 V A	220 V A	440 V A	690 V A	24 V A	48 V A	110 V A	220 V A	24 V A	48 V A	110 V A	220 V A
HiAL HiAR	10	8	6	2	6	6	3	2	5	3	2.5	1	3	2	1	0.6

Auxiliary Contact Block

	Pole	Contacts		Type	For use with	Mounting Position	Contact Arrangement
		Composition					
		NO	NC		Contactors or Control Relays		
		(a) EA	(b) EA				
	4 Pole	2NO	2NC	HiAB 22	Contactors HiMC 9~50	 Front	
		1NO	3NC	HiAB 13			
		3NO	1NC	HiAB 31			
		-	4NC	HiAB 04			
		4NO	-	HiAB 40			
	2 Pole	-	2NC	HiAB 02	Contactors HiMC 9~50	 Front	
		1NO	1NC	HiAB 11			
		2NO	-	HiAB 20			
	2 Pole	1NO	1NC	HiAL 11	Contactors HiMC 9~22	Left → 	
	2 Pole	1NO	1NC	HiAL 5S	Contactors HiMC 65~130	Left → 	
	2 Pole	1NO	1NC	HiAR 6S		 ← Right	
	2 Pole	1NO	1NC	HiAL 7S	Contactors HiMC 150~800	Left → 	
	2 Pole	1NO	1NC	HiAR 8S		 ← Right	
	4 Pole	3NO	1NC	HiAC 22	Control Relays HMX, HMT	 Front	
		1NO	3NC	HiAC 13			
		3NO	1NC	HiAC 31			
		4NO	-	HiAC 40			
	2 Pole	-	2NC	HiAC 02	Control Relays HMX, HMT	 Front	
		1NO	1NC	HiAC 11			
		2NO	-	HiAC 20			

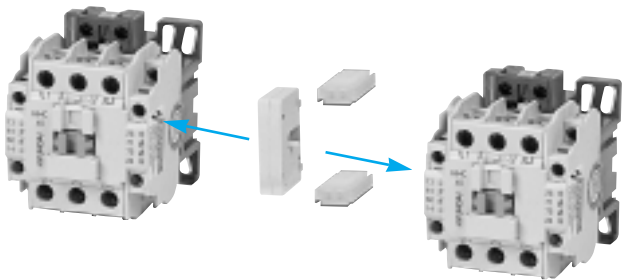
Mechanical Interlock Unit

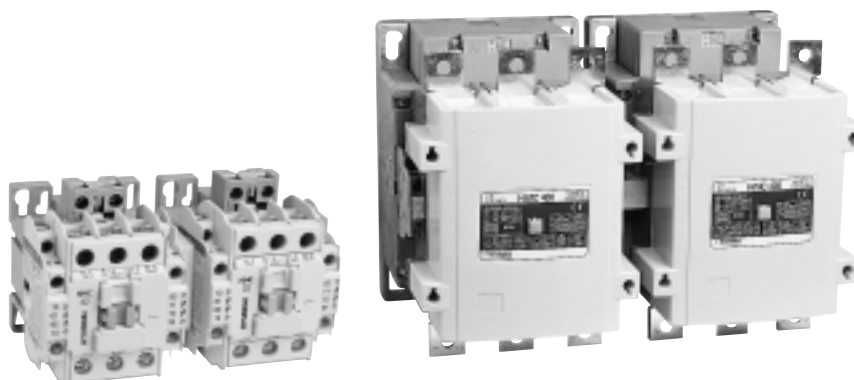
The mechanical interlocking of two contactors for reversing contactors is available with interlock unit. A simultaneous closing of two contactors is prevented.

	Type	For use with Contactor Type	
 3 pcs.	HiTL 40	HiMC 9 HiMC 12 HiMC 18	HiMC 22 HiMC 32 HiMC 40
	HiTL 50	HiMC 50	
 White	HiTL 130	HiMC 65 HiMC 80 HiMC 90 HiMC 110B	HiMC 110 HiMC 130 HiMC 150B
 Red	HiTL 220	HiMC 150 HiMC 180 HiMC 220	
 Black	HiTL 300	HiMC 260 HiMC 300	
 Steel	HiTL 800	HiMC 400 HiMC 500 HiMC 630	HiMC 800

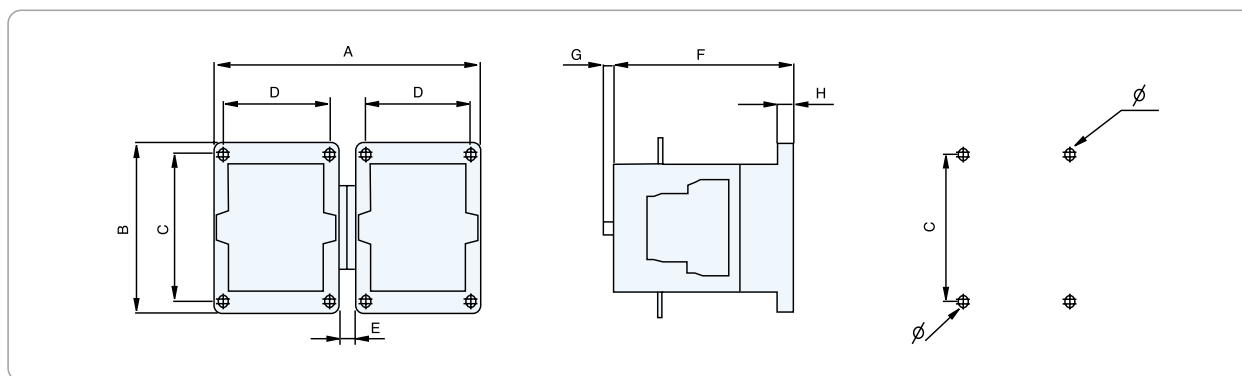
Handling

The electrical interlock should be applied via the “NC” contact when mechanical interlock is used. Horizontal installation is not allowed. Mechanical interlock shall be installed on HiMC 150-800 after removing auxiliary contact blocks between two magnetic contactors.





Dimensions



Type	A	B	C	D	E	F	G	H	Ø
HiMC 9, 12, 15, 18, 22	98	83	50~66	32~35	10	86.2	-	7.5	4.8
HiMC 32, 40	136	83	50~66	33.5~53.5	10	86.7	-	8	4.8
HiMC 50	149.2	85.8	57.6~70	53.8~60.8	10	99.2	-	8	4.8
HiMC 65, 80, 90	201.6	130	110~116	80	14	135.7	7.5	12	5.5
HiMC 110, 130	220	142	120~130	90	14	150.3	3.5	12	6.2
HiMC 150, 180, 220	316	189	161~171	120	40	168	3	15	9
HiMC 260, 300	340	202	180	120~130	40	187.4	3	15	11
HiMC 400, 500	398	251	196~225	154	40	235.5	3	20	11
HiMC 630, 800	592	280	230~250	226~250	40	272.3	3	24	12

Detail Dimensions : Page 46~48


Mounting Base

The mounting bases are available from HiMC 65 to HiMC 800.
These are supplied on request.



Mechanical Latching Block

Mechanical latching block keeps the contactor mechanically latched.
Fast & Easy mounting to contactors and control relays.

	Type	For use with Contactor Type	
	HLB 2	HiMC 9	HiMC 32
		HiMC 12	HiMC 40
		HiMC 18	HiMC 50
		HiMC 22	

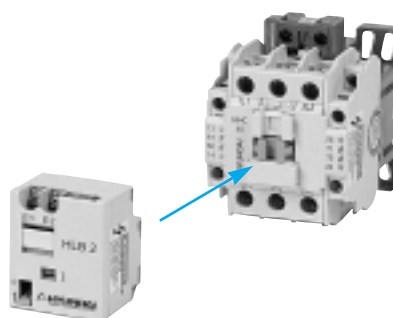
Handling

How to OFF contactors or control relays

- Manually : Push the lever to the "O" position.
- Electrically : Put power to the coil.

Caution

- Do not excite the contactors (or control relays) and mechanical latching blocks simultaneously.
- Refer to the diagram for the control circuit.

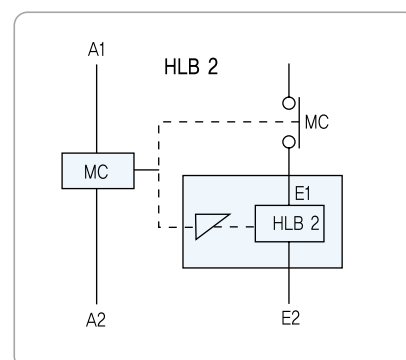


Ratings and Characteristics

Power Consumption	VA	25
	W	30
Pick-up Voltage	V	$(0.85 - 1.1) \times UC$
Operating Cycles	Cycle/h	1,200
Mechanical Lifetime	1,000 times	500
AC and DC Operation Voltage	AC	24, 48, 100~125, 200~240, 440, 600 V
	DC	24, 48, 100~125, 200~240 V


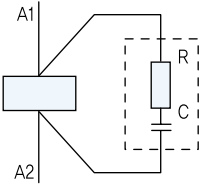

ex) HLB 2 / 220 (AC/DC)

Different voltage range shall be informed in advance.




Surge Absorber

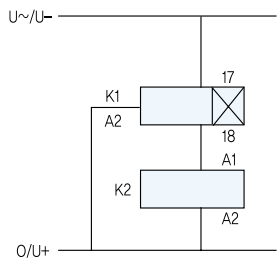
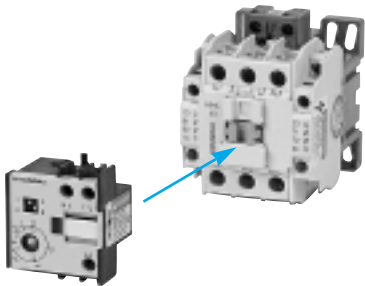
Surge absorber drops surge voltage, which is 10~20 times of the rated voltage occurred at the operation of the contactor or auxiliary switch, to below 3 times of rated voltage.
 It is suitable for PLC control circuit.
 Damage to electronic parts from high surge voltage is prevented by the use of surge absorber.
 Applicable to 50 Hz and 60 Hz.

	Type	Rated Voltage	For use with Contactor / Relay Types		
RC-Unit for AC Operated Contactors 	HRC 40/48	28~48 V AC	HiMC 9W	HiMC 22W	HiMX (Relay)
	HRC 40/220	110~220 V AC	HiMC 12W	HiMC 32W	
	HRC 40/380	240~380 V AC	HiMC 18W	HiMC 40W	
	HRC 90/48	28~48 V AC	HiMC 50W	HiMC 90W	
	HRC 90/220	110~220 V AC	HiMC 65W	HiMC 110BW	
	HRC 90/380	240~380 V AC	HiMC 80W		
	HRC 300/48	28~48 V AC	HiMC 110W	HiMC 150W	HiMC 260W
	HRC 300/220	110~220 V AC	HiMC 130W	HiMC 180W	HiMC 300W
	HRC 300/380	240~380 V AC	HiMC 150BW	HiMC 220W	
	Diagram 				
Clamping Diode for DC Operated Contactors 	HOKYZX 38	DC	HiMC 9G~50G	HMT (Relay)	

Electronic Timer Block

On-delay and Interval functions are furnished on the timer block at once.
Accurate and multi function through electronic method.
Wide voltage range is realized, and both AC & DC are applicable on the block.
Fast & Easy mounting.

	Type	Operation Voltage	For use with Contactor Type
	HOKZE1	90~240 V	HiMC 9 HiMC 12 HiMC 18 HiMC 22
	HOKZE2	24~60 V	HiMC 32 HiMC 40 HiMC 50

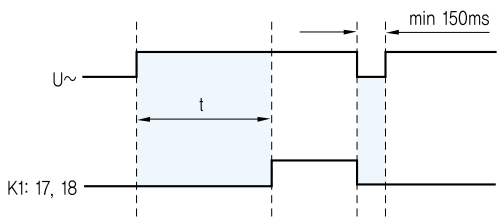


Ratings

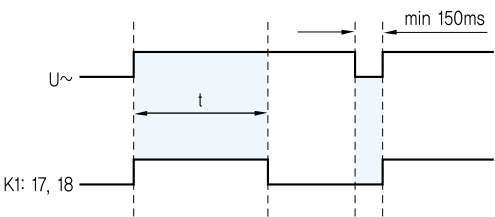
Operation Voltage		(0.85~1.1) x Rated Voltage
Making Capacity		90 VA
Maximum Load		15 VA
Delay Time	Position A	10~220 sec.
	Position B	0.15~15 sec.
Precision		± 5%
Repeat Accuracy		0.10%
		50ms

Function Charts

Position A : ON-DELAY / t : adjustable delay time 0.15...220S



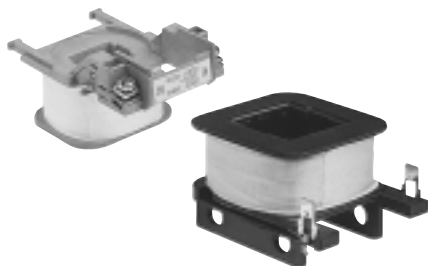
Position B : Interval Timer



The timer needs a recovery time of at least 150ms between operations to be reset for the next operation.

Spare Part

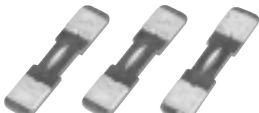

Control Coils





Ordering Method :
ex) HiMCOL 40W / 220 X (Blank : 60 Hz, X : 50 Hz)

Applicable Contactor or Relay	Voltage Type	Type
HMX	AC	HMCOL 22X
HMT	DC	HMCOL 22T
HiMC 9~40	AC	HiMCOL 40W
	DC	HiMCOL 40G
HiMC 50	AC	HiMCOL 50W
	DC	HiMCOL 50G
HiMC 65~110B	AC	HiMCOL 90W
	DC	HiMCOL 90G
	AC/DC Common	HiMCOL 90F
HiMC 110~150B	AC	HiMCOL 130W
	DC	HiMCOL 130G
	AC/DC Common	HiMCOL 130F
HiMC 150~220	AC	HiMCOL 220W
	DC	HiMCOL 220G
	AC/DC Common	HiMCOL 220F
HiMC 260 ~300	AC	HiMCOL 300W
	DC	HiMCOL 300G
	AC/DC Common	HiMCOL 300F
HiMC 400~500	AC	HiMCOL 500W
	DC	HiMCOL 500G
	AC/DC Common	HiMCOL 500F
HiMC 630~800	AC	HiMCOL 800W
	DC	HiMCOL 800G
	AC/DC Common	HiMCOL 800F

Spare Part

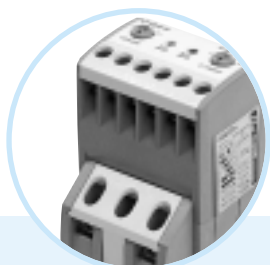
Main Contact	Applicable Contactor	Type	Pack (One Set)
 <p>Moving Contacts</p>  <p>Fixed Contacts</p>	HiMC 9	HiMCTIP 9	3 moving contacts +6 fixed contacts
	HiMC 12	HiMCTIP 12	
	HiMC 18	HiMCTIP 18	
	HiMC 22	HiMCTIP 22	
	HiMC 32	HiMCTIP 32	
	HiMC 40	HiMCTIP 40	
	HiMC 50	HiMCTIP 50	
	HiMC 65	HiMCTIP 65	
	HiMC 80	HiMCTIP 80	
	HiMC 90	HiMCTIP 90	
	HiMC 110B	HiMCTIP 110	
	HiMC 110	HiMCTIP 110	
	HiMC 130	HiMCTIP 130	
	HiMC 150B	HiMCTIP 130	
	HiMC 150	HiMCTIP 150	
	HiMC 180	HiMCTIP 180	
	HiMC 220	HiMCTIP 220	
	HiMC 260	HiMCTIP 260	
	HiMC 300	HiMCTIP 300	
	HiMC 400	HiMCTIP 400	
	HiMC 500	HiMCTIP 500	
	HiMC 630	HiMCTIP 630	6 moving contacts +12 fixed contacts (Two contact elements make one contact set).
	HiMC 800	HiMCTIP 800	

Arc Chute	Applicable Contactor	Type
	HiMC 65~110B	HiMCHT 90
	HiMC 110~150B	HiMCHT 130
	HiMC 150~220	HiMCHT 220
	HiMC 260~300	HiMCHT 300
	HiMC 400~500	HiMCHT 500
	HiMC 630~800	HiMCHT 800

Insulation Barrier Unit	Applicable Contactor	Type
	HiMC 65~150B	HiMCIB 130
	HiMC 150~300	HiMCIB 300
	HiMC 400~500	HiMCIB 500
	HiMC 630~800	HiMCIB 800



Digital Motor Protection Relay



Contents

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Technical Description

Deluxe Type	
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Dimension

Economic/Standard Type	96
Deluxe Type	100




Wiring Diagram

Economic/Standard Type	99
Deluxe Type	102

Ratings Overview

Type	Characteristic Curve	Current Range	Relay Selection		
			Economic Type	Standard Type	Deluxe Type
HiMP 22	Definite	0.3~3.0 A			
		0.6~6.0 A			
		2.2~22 A			
	Inverse	0.3~1.5 A			
		1.0~5.0 A			
		4.4~22 A			
HiMP 40	Definite	4.0~40 A			
	Inverse	8.0~40 A			
HiMP 50	Definite	5.0~50 A			
		6.0~50 A			
	Inverse	10~50 A			
HiMP-D	Definite/ Inverse	0.5~6.0 A			
		5.0~60 A			

Selection of Economic Type

Type (Basic)	Number of CTs	Characteristic Curve	Current Range	Auxiliary Contact ¹⁾	Connection Type	Ordering Type
 Pin Type  Screw Type  Tunnel Type	HiMP 22	Definite	0.6~6.0 A	1SPDT	Pin	HiMP 22H-PE-06
					Screw	HiMP 22H-SE-06
					Tunnel	HiMP 22H-TE-06
				2SPST	Pin	HiMP 22H-PS-06
					Screw	HiMP 22H-SS-06
					Tunnel	HiMP 22H-TS-06
			2.2~22 A	1SPDT	Pin	HiMP 22H-PE-22
					Screw	HiMP 22H-SE-22
					Tunnel	HiMP 22H-TE-22
				2SPST	Pin	HiMP 22H-PS-22
					Screw	HiMP 22H-SS-22
					Tunnel	HiMP 22H-TS-22
	HiMP 40	Definite	4.0~40 A	1SPDT	Pin	HiMP 40H-PE-40
					Screw	HiMP 40H-SE-40
					Tunnel	HiMP 40H-TE-40
				2SPST	Pin	HiMP 40H-PS-40
					Screw	HiMP 40H-SS-40
					Tunnel	HiMP 40H-TS-40
	HiMP 50	Definite	6.0~50 A	1SPDT	Pin	HiMP 50H-PE-50
					Screw	HiMP 50H-SE-50
					Tunnel	HiMP 50H-TE-50
				2SPST	Pin	HiMP 50H-PS-50
					Screw	HiMP 50H-SS-50
					Tunnel	HiMP 50H-TS-50

1) 2SPST becomes 1a1b when control power is on.
1SPDT becomes 1c when control power is on.

High Reliability

HiMP series provides superior reliability by the Micro Controller Unit (MCU)

Applicable to the Inverter Control Circuit

HiMP series have high performance under the harmonic noise, so they can be used for the inverter control circuit under 20~200 Hz range.

Electron Wave and Noise Tolerance

- Completed to EMS test.
- Secured from the magnetic field as using troidal CT.

Various Wiring Methods

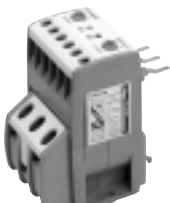




- Pin type : Directly mountable to HiMC series Contactors
- Screw type : Connectable to other devices with screws and cables
- Tunnel type : Cables go through Ø12mm cable holes



Protective Functions					Contactor Type for Direct Mounting
Over Current	Phase Failure	Phase Unbalance	Restriction	Reverse Phase	
		-		-	HiMC 9~22
		-		-	HiMC 9~22
		-		-	HiMC 9~22
		-		-	HiMC 32~40
		-		-	HiMC 50

Operation Voltage (50/60 Hz)	
110 V : 75~120 %	
220 V : 75~120 %	
Protective Functions	
Over Current	Pick-up over 115 % \pm 5 % (Definite)
Delay Time	Delay time setting
Operating Time	0.5~30 sec
Phase Failure	
Pick-up	Phase unbalance over 70 %
Operating Time	2 sec
Restriction	Operates by characteristic curve
Reset Method	
Manual : by RESET button manually (Not working during operation)	
Electrical : by Control power off	
Test Method	
By TEST Button (Not working during operation)	
Aux. Contact	
Number	1SPDT or 2SPST (at Power on)
Capacity	3 A / 250 VAC (Resistance load)
Over Current Capacity	
Over 20 Times / 2 sec of Max. Operating Current	
Insulation Resistance	
Over 100 M Ω / 500 VDC	
Fast Transient Burst	
Between Circuit and Frame	2000 VAC / 1 min.
Between Circuit	2000 VAC / 1 min.
Between Contacts	1000 VAC / 1 min.
Enviromental Influences	
Ambient Temperature	Operation : -25~70 Storage : -30~80
Relative Humidity	45~85 %

Selection of Standard Type

Type (Basic)	Number of CTs	Characteristic Curve	Current Range	Auxiliary Contact ¹⁾	Connection Type	Ordering Type
 <p>Pin Type</p>  <p>Screw Type</p>  <p>Tunnel Type</p>	HiMP 22	Definite	0.3~3.0 A	2SPST	Pin	HiMP 22H-PD-03
					Screw	HiMP 22H-SD-03
					Tunnel	HiMP 22H-TD-03
			2.2~22 A	2SPST	Pin	HiMP 22H-PD-22
					Screw	HiMP 22H-SD-22
					Tunnel	HiMP 22H-TD-22
		Inverse	0.3~1.5 A	2SPST	Pin	HiMP 22H-PI-01
						HiMP 22K-PI-01
					Screw	HiMP 22H-SI-01
						HiMP 22K-SI-01
					Tunnel	HiMP 22H-TI-01
						HiMP 22K-TI-01
			1.0~5.0 A	2SPST	Pin	HiMP 22H-PI-05
						HiMP 22K-PI-05
					Screw	HiMP 22H-SI-05
						HiMP 22K-SI-05
					Tunnel	HiMP 22H-TI-05
						HiMP 22K-TI-05
			4.4~22 A	2SPST	Pin	HiMP 22H-PI-22
						HiMP 22K-PI-22
					Screw	HiMP 22H-SI-22
						HiMP 22K-SI-22
					Tunnel	HiMP 22H-TI-22
						HiMP 22K-TI-22
		Inverse (with Reverse Protection)	0.3~1.5 A	2SPST	Pin	HiMP 22K-PN-01
					Screw	HiMP 22K-SN-01
					Tunnel	HiMP 22K-TN-01
			1.0~5.0 A	2SPST	Pin	HiMP 22K-PN-05
					Screw	HiMP 22K-SN-05
					Tunnel	HiMP 22K-TN-05
			4.4~22 A	2SPST	Pin	HiMP 22K-PN-22
					Screw	HiMP 22K-SN-22
					Tunnel	HiMP 22K-TN-22
	HiMP 40	Definite	4.0~40 A	2SPST	Pin	HiMP 40H-PD-40
					Screw	HiMP 40H-SD-40
					Tunnel	HiMP 40H-TD-40
		Inverse	8.0~40 A	2SPST	Pin	HiMP 40H-PI-40
						HiMP 40K-PI-40
					Screw	HiMP 40H-SI-40
						HiMP 40K-SI-40
					Tunnel	HiMP 40H-TI-40
						HiMP 40K-TI-40
		Inverse (with Reverse Protection)	8.0~40 A	2SPST	Pin	HiMP 40K-PN-40
					Screw	HiMP 40K-SN-40
					Tunnel	HiMP 40K-TN-40
	HiMP 50	Definite	5.0~50 A	2SPST	Pin	HiMP 50H-PD-50
					Screw	HiMP 50H-SD-50
					Tunnel	HiMP 50H-TD-50
		Inverse	10~50 A	2SPST	Pin	HiMP 50H-PI-50
						HiMP 50K-PI-50
					Screw	HiMP 50H-SI-50
						HiMP 50K-SI-50
					Tunnel	HiMP 50H-TI-50
						HiMP 50K-TI-50
		Inverse (with Reverse Protection)	10~50 A	2SPST	Pin	HiMP 50K-PN-50
					Screw	HiMP 50K-SN-50
					Tunnel	HiMP 50K-TN-50

1) 2SPST becomes 1a1b when control power is on.

2) For 2CT type, just R and T phase protection is applicable.

Protective Functions					Contactor Type for direct Mounting
Over Current	Phase Failure	Phase Unbalance ²⁾	Restriction	Reverse Phase	
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 9~22
				-	HiMC 32~40
				-	HiMC 32~40
					HiMC 32~40
				-	HiMC 50
				-	HiMC 50
					HiMC 50

Operation Voltage (50/60 Hz)

220 V : 90~250 V

Protective Functions

Over Current Delay time setting

Operating Time

Definite Curve 0.2~30 sec

Inverse Curve 0.2~30 sec (Based on 600 %)

Phase Failure 2 sec

Phase Unbalance 5 sec

Restriction

Definite Curve After starting time

Inverse Curve Characteristic curve

Reverse Phase Within 150 msec

Reset Method

Manual : by RESET button manually (Not working during operation)

Electrical : by Control power off

Test Method

By TEST Button (Not working during operation)

Aux. Contact

Number 2SPST (1a1b at power on)

Capacity 3 A / 250 VAC (Resistance load)

Over Current Capacity

Over 20 Times / 2 sec of Max. Operating Current

Insulation Resistance

Over 100 MΩ / 500 VDC

Fast Transient Burst

Between Circuit and Frame 2000 VAC / 1 min.

Between Circuit 2000 VAC / 1 min.

Between Contacts 1000 VAC / 1 min.

Environmental Influences

Ambient Temperature Operation : -25~70

Storage : -30~80

Relative Humidity 45~85 %

High Reliability

HiMP series provides superior reliability by the Micro Controller Unit (MCU)

Applicable to the Inverter Control Circuit

HiMP series have high performance under the harmonic noise, so they can be used for the inverter control circuit under 20~200 Hz range.





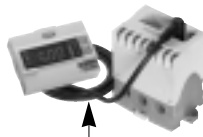
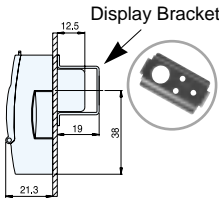
Electron Wave and Noise Tolerance

- Completed to EMS test.
- Secured from the magnetic field as using toroidal CT.

Various Wiring Methods

- Pin Type : Directly mountable to HiMC series Contactors
- Screw Type : Connectable to other devices with screws and cables
- Tunnel Type : Cables go through Ø12 mm cable holes

Selection of Deluxe Type

Basic Type	Protection	Connection Type	Current Range	Ordering Type	Remarks
 Screw Unit  Screw Extension  Tunnel Unit  Tunnel Extension	Over-current Under-current Phase Failure Phase Unbalance Restriction	Screw	0.5~6.0 A	HiMP-D06S	When extension type is selected connecting cable and display bracket should be ordered separately
			5.0~60 A	HiMP-D60S	
		Tunnel	0.5~6.0 A	HiMP-D06T	
			5.0~60 A	HiMP-D60T	
	Over-current Under-current Phase Failure Phase Unbalance Restriction Short Circuit	Screw	0.5~6.0 A	HiMP-D06SI	 Connecting Cable  Display Bracket
			5.0~60 A	HiMP-D60SI	
		Tunnel	0.5~6.0 A	HiMP-D06TI	
			5.0~60 A	HiMP-D60TI	
	Over-current Under-current Phase Failure Phase Unbalance Restriction Leakage Current	Screw	0.5~6.0 A	HiMP-D06SZ	
			5.0~60 A	HiMP-D60SZ	
		Tunnel	0.5~6.0 A	HiMP-D06TZ	
			5.0~60 A	HiMP-D60TZ	

High-trust Realization

The micro controller unit of HiMP series provides superior reliability.
Real time processing and high precision.

Various Protective Features

Basic functions

- Over-current / Under-current
- Stall / Lock
- Phase Loss / Phase unbalance / Reverse phase

Optional functions

- Earth leakage current
- Short circuit current

Preliminary Alert Function

HiMP series can prevent the sudden over-current trip through the preliminary alert function.
HiMP series can be inspected easily due to displaying load ratio by bar-graph during operation.

Operating Time Function

Accumulated motor operation time can be displayed.
Certain operating time can be set to alert, so oil exchange point can be checked conveniently.



Digital Ampere Meter Function

HiMP series are able to check the three phase ampere without additional ampere meter.

Display the Cause of Fault

Easy maintenance and repair

Selectable Inverse and Definite Curve

Applicable to the Inverter Control Circuit

Rating & Specification

Type			HiMP-D Series	
			HiMP-D S	HiMP-D T
Panel Mount			Unit or Extension ³⁾	
Wiring of Main Circuit			Screw	Tunnel
Allowable Current Partition			• 06: 0.5~6 A • 60: 5~60 A	
Current Setting Range			• Min. current~Max. current X 105%	
Operating Voltage (50 Hz/60 Hz)			• 110 V: 75~120% • 220 V: 75~120% • Special order	
Features & Setting Range	Over-current		• Over 112.5% ± 5% - Inverse(cold/hot curve), Definite	
	Under-current		• User setting (30%~70% of operating current/ Min. setting value shall be over 70% of Min. rated current.)	
	Phase Failure		• Over 70% of unbalance rate	
	Phase Unbalance		• Over 50% of unbalance rate	
	Restriction	Stall	• Over 180% of setting current - Definite only	
		Lock	• User setting (300%~1800%) - Definite only	
	Reverse Phase		• Reverse phase perception at the beginning.	
	Short Circuit ¹⁾		• User setting (200%~1000% of rated current)	
Leakage Current ²⁾			• User setting (100~2500 mA)	
Time Setting Range	Over-current	Inverse	• Delay time: OFF/1~30 sec, Operation time: 1~30 sec (600% basis)	
		Definite	• Delay time: OFF/1~30 sec, Operation time: 1~30 sec	
	Under-current		• 1~30 sec	
	Phase Failure		• 2 sec	
	Phase Unbalance		• 5 sec	
	Restriction	Stall	• 5 sec	
		Lock	• Within 500 msec	
	Reverse Phase		• Within 500 msec	
	Leakage Current ¹⁾		• 0.1~ 10 sec	
	Short Circuit ²⁾		• Within 50 msec	
Preliminary Alert Function			• 60%~110% of rated current	
Operating Time Function			• OFF / 0~9990 hour	
Reset Method	Manual		• By RESET button manually (Not working during operation)	
	Electrical		• By control power off.	
	Automatic		• After setting time.	
Test Method			• Tripping by the TEST button (Not working during operation)	
Aux. Contact	Number		• Trip contact: 1a1b • Alert contact: 1a ⁴⁾	
	Capacity		• 3A/250 VAC (Resistance load)	
Over-current Capacity			• Over 20 times/2 sec of Max. operating current	
Insulation Resistance			• Over 100M /500VDC	
Fast Transient Burst	Between Circuit and Frame		• 2000 VAC/1 min.	
	Between Circuits		• 2000 VAC/1 min.	
	Between Contacts		• 1000 VAC/1 min.	
Environment	Temperature	Operation	• -25~70	
		Storage	• -30~80	
	Humidity		• 45~85% RH	

1) 2) Leakage and Short Circuit function can not be selected at the same time.

3) Connecting cable and display bracket should be ordered when extension type is required.

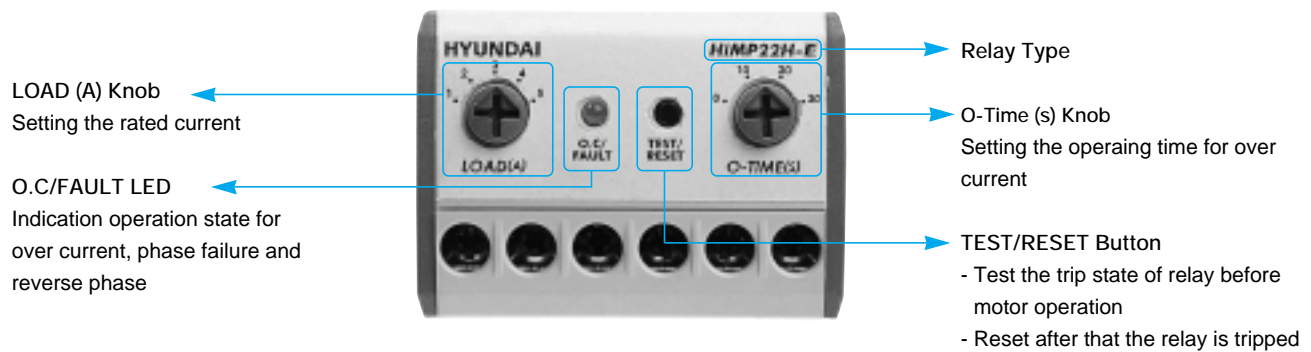
4) When the leakage function is selected, alert contact is used as ZCT input terminal

5) Class 5 (Time 1, 2, 3), Class 10 (Time 4, 5, 6, 7, 8),
Class 15 (Time 9, 10, 11, 12, 13), ...

Control & Setting Method | Economic Type

Definite Characteristics

Front Plate Description



Setting Method

1. Cut the up stream power supply for safety
2. Check the rated voltage and apply the control power to A1 and A2 terminal
3. Check the TEST/RESET button operation
 - 1) Check of the wiring is correct (Refer to the wiring diagram)
 - 2) When you press the TEST/RESET button, the O.C LED is turned on and the HiMP is tripped.
 - 3) When you press the TEST/RESET button under HiMP is tripped, the O.C LED is turned off and HiMP is reset.

Caution) For safety, when the motor is operating the TEST/RESET button do not work.

4. Set the operating time

The operating time is operated to the starting time and normal operation.

- 1) Starting : After the operation is automatically delayed by over current setting time, start operating the over current protection
- 2) Normal : The HiMP is tripped after the selected operation time.
- 3) Set the operation time by considering starting current and starting time according to the load.
EX.) Set the operation time between 6 sec and 8 sec

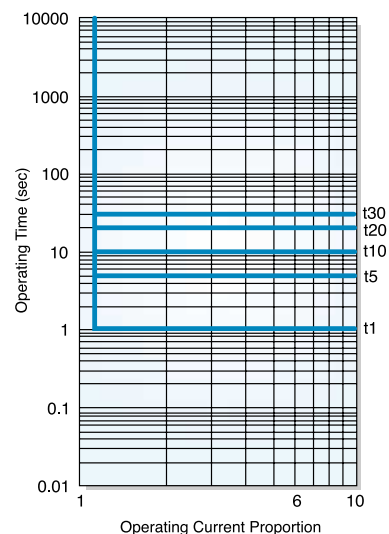
Caution) The restriction operates, if the motor starting time comes to exceed the setting time at over 300 % of full load current. Therefore excessive setting time could result in the failure of the motor.

5. Set the operating current

Set the current by considering the rated current of a motor to protect from the over current.

- 1) Check if the rated current of a motor is within the current setting range of an HiMP
- 2) Set the LOAD (Rated current) knob to the maximum value and then start a motor.
- 3) Under normal motor operation, rotate the LOAD knob to the counterclockwise until the O.C LED turned on and off. The current at this point is over 105 % rated current.
- 4) At this point, rotate the LOAD knob to the clockwise until the O.C LED turned off. The current at this point is rated current of motor.

Definite Condition



6. LED Indication of Economic Type (E & S Type)

- Definite 2CT : Protection for over current, phase failure, and phase unbalance

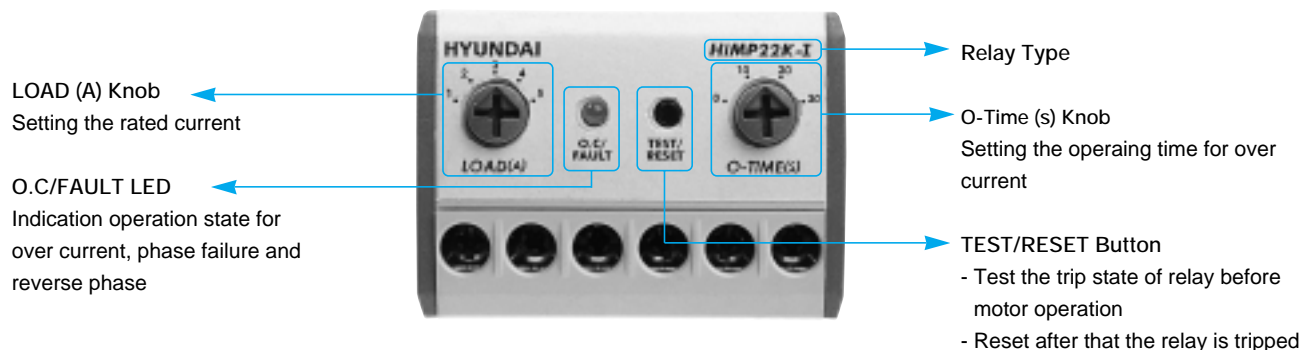
Condition			LED Signal				Remark
			Red		Green		
Operation	Normal		OFF		ON		
	Phase Failure/ Progress of Phase Unbalance.		OFF		ON and OFF		1 sec interval
	Alert ¹⁾ of Over Current		ON and OFF		OFF		1 sec interval
Trip	Over Current		ON		ON		
	Phase Failure/ Phase Unbalance	R-phase	Irregular ON and OFF				2 sec cycle
		T-phase	Irregular ON and OFF				2 sec cycle

1) When the current reaches the setting value (113 %) over current alert operate; giving a signal without trip.

Control & Setting Method | Standard Type

Inverse Characteristics

Front Plate Description



Setting Method

1. Cut the up stream power supply for safety
2. Check the rated voltage and apply the control power to A1 and A2 terminal
3. Check the TEST/RESET button operation
 - 1) Check of the wiring is correct (Refer to the wiring diagram)
 - 2) When you press the TEST/RESET button, the O.C LED is turned on and the HiMP is tripped.
 - 3) When you press the TEST/RESET button under HiMP is tripped, the O.C LED is turned off and HiMP is reset.

Caution) For safety, when the motor is operating the TEST/RESET button do not work.

4. Set the operating time

The operating time is set on the based on 600 % of the rated current in the characteristic curve by O-time (Operating time) knob.

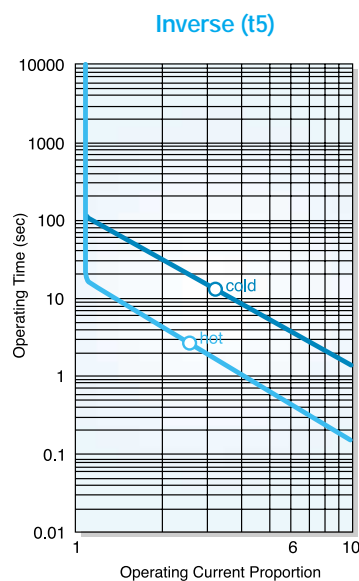
- 1) Set the operating time by considering the operating time and start current according to the types of the load.
(EX: If the start current is 600 % of the normal operation current and the starting is 10 sec, set the time knob around 11~12 sec. with 10~20 % margin)
- 2) Operate by cold curve at the first operating condition after that operate by hot curve.

Caution) The HiMP can be tripped to protect the motor when the motor is started a few times continuously. When a motor is frequently changing the rotating direction (forward and reverse), set the operating time longer.

5. Set the operating current

Set the current by considering the rated current of a motor to protect from the over current.















- 1) Check if the rated current of a motor is within the current setting range of an HiMP
- 2) Set the LOAD (Rated current) knob to the maximum value and then start a motor.
- 3) Under normal motor operation, rotate the LOAD knob to the counterclockwise until the O.C LED turned on and off. The current at this point is over 105 % rated current.
- 4) At this point, rotate the LOAD knob to the clockwise until the O.C LED turned off. The current at this point is rated current of motor.



Please refer to definite setting method (page 84) for D type (Definite characteristics)

6. LED Indication of Standard Type (D, I, & N Type)

- Definite 2CT (D Type) : Protection for over current, phase failure, and phase unbalance
- Inverse 2CT/3CT (I Type) : Protection for over current, phase failure, and phase unbalance
- Inverse 3CT (N Type) : Protection for over current, phase failure, phase unbalance, and reverse phase

Condition			LED Signal				Remark
			Red		Green		
Operation	Normal		OFF		ON		
	Over Current Preliminary Alert ¹⁾		ON and OFF		OFF		0.3 sec interval
	Phase Failure/ Progress of Phase Unbalance.		OFF		ON and OFF		0.3 sec interval
	Progress of Over Current ²⁾		ON and OFF		OFF		0.6 sec interval
Trip	Over Current Trip		ON		OFF		
	Phase Failure/ Phase Unbalance	R-phase	Irregular ON and OFF				2 sec cycle
		S-phase (Except 2CT)	Irregular ON and OFF				2 sec cycle
		T-phase	Irregular ON and OFF				2 sec cycle
	Reverse Phase (Only N-Type)		Irregular ON and OFF				1 sec cycle

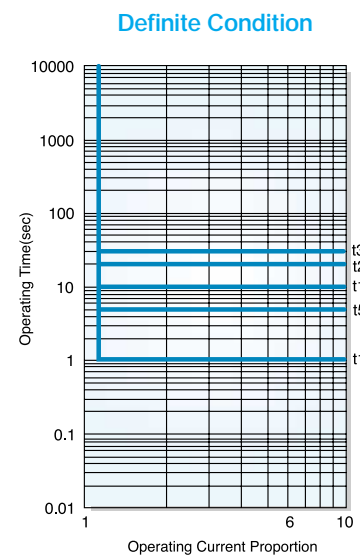
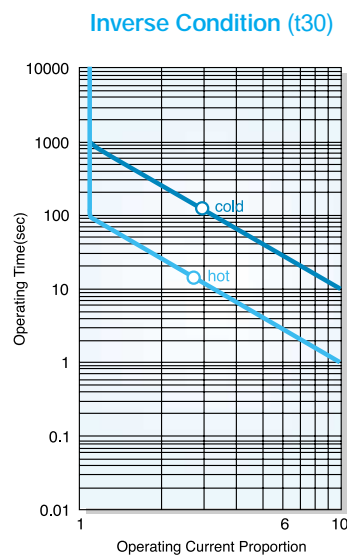
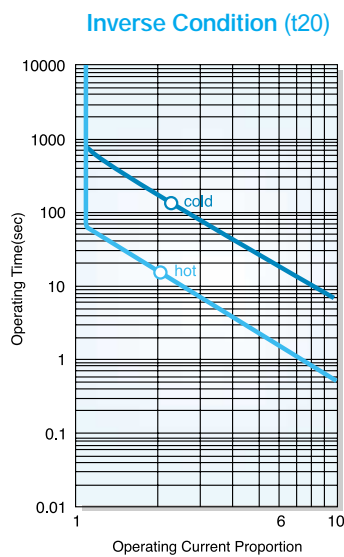
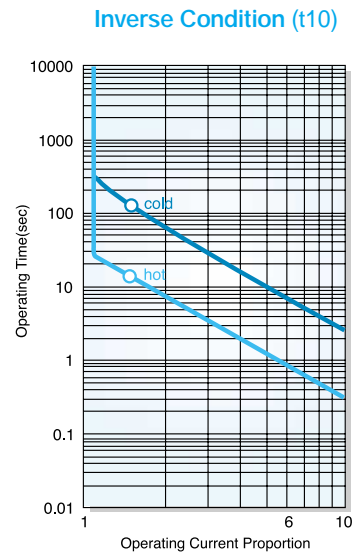
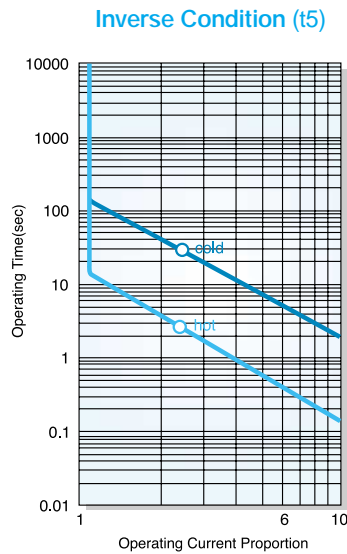
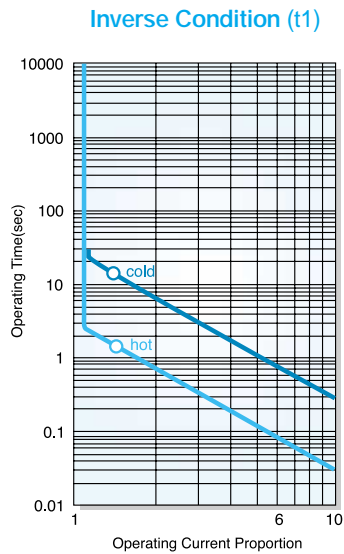
¹⁾ When the current reaches the setting value (105 %), over current preliminary alert operates; giving a signal without trip.

²⁾ When the current reaches the setting value (112.5%), progress of over current operates; giving a signal without trip.

Function | Economic/Standard Type

Function		Description	Remark
Protection	Over Current	<ul style="list-style-type: none"> Prevent the motor from over current. Trip it over 112.5 % of setting current and time. 	Ref. Cold/Hot curve
	Phase Failure	<ul style="list-style-type: none"> Prevent the phase failure from line fault and touch. Trip 2sec when deviation is over 70 % among three phase. (2CT model is perceived only R and T phase) 	
	Phase Unbalance	<ul style="list-style-type: none"> Prevent the phase unbalance from fault of insulation/wiring. Trip 5sec when deviation is over 50 % among three phase. (2CT model is perceived only R and T phase) 	
	Restriction	<ul style="list-style-type: none"> Prevent damage of motor from rapid load increase of restriction. The definite is tripped by the rated current over 300 % after delay time at the starting time. 	
	Reverse Phase	<ul style="list-style-type: none"> Prevent the reverse rotation from wiring fault. Trip within 150 sec at the starting time. 	Only for N type
Delay Time		<ul style="list-style-type: none"> Immovable time of over current protection The definite, delayed over current operation at the motor starting time. Ex) Trip time of the 150 % over current <ul style="list-style-type: none"> - Starting : over current operating time X 2 - Normal : trip after over current operating time 	Only for definite characteristics
TEST		<ul style="list-style-type: none"> Check of relay and sequence without supplying power. Change to the trip state when you press the test button. 	Non trip for load operation
RESET		<ul style="list-style-type: none"> Decide the reset method after trip. <ul style="list-style-type: none"> - Manual reset is by button. - Electrical reset is by power off. 	Non trip for load operation
Cold/Hot Curve		<ul style="list-style-type: none"> Curve of over current protection on the inverse. <ul style="list-style-type: none"> - Cold : First operating condition after enough rest. - Hot : Consecutive operating condition. Operate according to hot curve after setting time. 	On the Inverse only

Characteristic Curve | Economic/Standard Type



Function | Deluxe Type

Separable Display Part

The display part can be installed separately from the body ; therefore, the values and cause of the fault can be checked without opening the panel door.

Ring-Terminal

Ring-terminal type can be applied to the main and control circuit.

Various Wiring Methods

Both terminal screw type and tunnel type are available.



Digital Ampere Meter Function

HiMP series are able to check the three phase ampere without additional ampere meter.



R Phase Current



S Phase Current



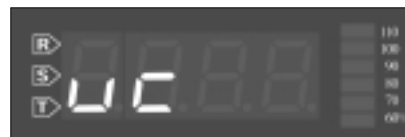
T Phase Current

Display the Cause of Fault

Easy maintenance and repair



Over-Current

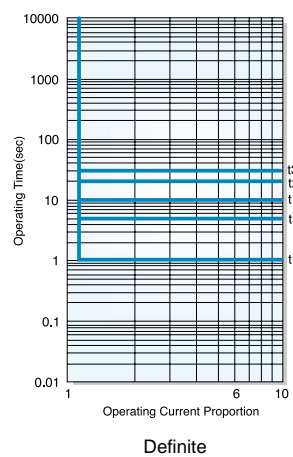
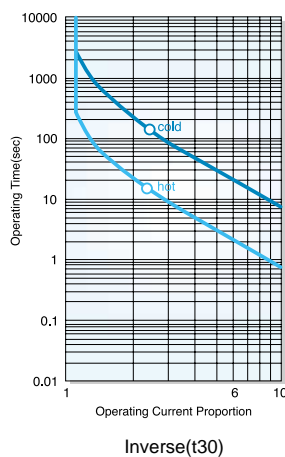


Under-Current



Phase Failure

Selectable Inverse and Definite



Applicable to the Inverter Control Circuit

Deluxe type relays have high performance under the harmonic noise, so they can be used for the inverter control circuit under 20~240 Hz range.

Function	Description	Remark
Protective Function	Over-current <ul style="list-style-type: none"> Prevent the motor from over-current. Trip it over 112.5 % of setting current and time. 	<ul style="list-style-type: none"> Standard Ref. cold/hot curve
	Under-current <ul style="list-style-type: none"> Prevent the vain rotation from power fault. Trip it by setting rate of under-current and time. 	Selective function
	Phase Failure <ul style="list-style-type: none"> Prevent the phase failure from line fault and touch. Trip 2 sec when deviation is over 70 % among three phases. 	Selective function
	Phase Unbalance <ul style="list-style-type: none"> Prevent the phase unbalance from fault of insulation/wring. Trip 5 sec when deviation is over 50 % among three phases. 	Selective function
	Stall <ul style="list-style-type: none"> Prevent drop-voltage or restriction from rising load. Current is over 180 % of setting current, trip it 5 sec on definite condition 	Selective function Definite only
	Lock <ul style="list-style-type: none"> Prevent damage of motor from rapid load increase. Current is over setting current, trip it within 2 sec on definite condition 	Selective function Definite only
	Reverse Phase <ul style="list-style-type: none"> Prevent the reverse rotation from wiring fault. Trip within 500 msec at the starting time. 	Selective function
	Leakage Current <ul style="list-style-type: none"> Prevent the leakage current from insulation fault. Current is over setting leakage current, trip at the setting time 	Optional function
	Short Circuit <ul style="list-style-type: none"> Prevent the short circuit from insulation fault of motor and wiring failure. Current is over setting rate of operating current, trip within 50 msec. 	Optional function
Preliminary Alert ⁴⁾	<ul style="list-style-type: none"> Prevent trip from sudden over-currents. Current is over setting rate of operating current, operate the alarm and alert contact until trip. 	Selective function
Accumulated Operating Time	<ul style="list-style-type: none"> Display accumulated time over 50 % of rated current. Display unit: day 	RESET is NOT allowed.
Operating Time Alert ⁴⁾	<ul style="list-style-type: none"> Certain operating time can be set for motor oil exchange. At set time, display and alert contact operate. 	Optional function
CT Ratio	<ul style="list-style-type: none"> Compensate the tolerance of current between motor and relay. Increase the number of tunnel on the low-current and use the outer CT on the high-current. Compensate the setting current and indication value by CT ratio. ex) CT ratio should be 20 when 100:5 CT is used. 	0.2/0.5/1/2/5/10/15/ 20/24/26/30/32/36/ 40/44/48/50/60/80/ 100/120/126/150/ 160/200/240
Delay Time	<ul style="list-style-type: none"> Immovable time of over-current protection. 	Selective function
TEST	<ul style="list-style-type: none"> Check of relay and sequence without supplying power. On the same condition of 600 % current. 	
RESET	<ul style="list-style-type: none"> Decide the reset method after trip Manual(non)/Electrical(Pr)/Automatic(0~20 min) reset can be selected <ul style="list-style-type: none"> Manual reset is by button Electrical reset is by power off Automatic reset is by setting time 	Manual reset is basic on the reset condition of electric and auto.
Cold/Hot Curve	<ul style="list-style-type: none"> Curve of over-current protection on the Inverse <ul style="list-style-type: none"> Cold : First operating condition after enough rest Hot : Consecutive operating condition Delay time is over 1 : operate for hot curve after delay time Delay time off : operate according to hot curve after setting time 	On the inverse only

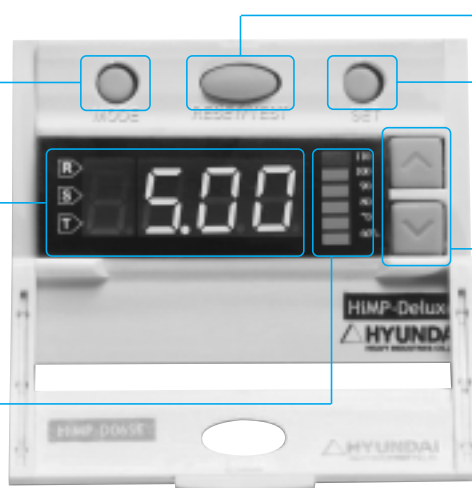
Control & Setting Method | Deluxe Type

Front Plate Description

MODE button
Change the mode of function set, current display and operating time.

Display window
Information indicator shows Current Value, Cause of Trip and Setting Value

Bar-graph
Displays the load rate



TEST / RESET button

- 1) Check the trip condition of relay before operating the motor
- 2) Reset the relay after trip operation

SET button
Records the setting condition

- SELECT button**
- 1) Mode of current indication:
Displays the current of each phase and rated setting current.
 - 2) Mode of function setting:
Changes the function/setting values
 - 3) Trip condition shows the trip cause and displays the failure current value.

Before Operating Motor, Set the Function

Check the relay and circuit through TEST & RESET button

- 1) Check the wiring condition carefully before testing.
- 2) After pressing the TEST & RESET button, test is displayed on the indicator.
If the current is over 600 % of set current, the tripping operation is executed.
- 3) Press the TEST & RESET button again to reset to the normal condition.

Change the function through the mode button before setting the function.

Set the function by using SELECT and SET button.

No	Key	Function	Default	Operating Scope
1	rc	Operating Current	6.3/63	06 Type : 0.5~6.3 A 60 Type : 5.0 ~63 A
2	chR	Over-current Operating Feature	Inv	Inv : Inverse, dEF : Definite
3	oc-t	Over-current Operating Time	30	1~30 sec
4	dELt	Delay Time	30	oFF / 1~30 sec
5	uc	Under-current Proportion	oFF	oFF / 30~70 %
6	uc-t	Under-current Operating Time	30	1~30 sec
7	StL	Stall	oFF	oFF / on
8	Lok	Lock	oFF	oFF / 200~1000 %
9	nP	Negative Phase	oFF	oFF / on
10	PF	Phase Fault	oFF	oFF / on
11 ¹⁾	EL	Electric Leakage Current (optional function)	oFF ³⁾	100~2500 mA
	EL-t	Electric Leakage Operating Time (optional function)	0.1	0.1~10 sec
	Sc	Short Current Operating Proportion (optional function)	oFF	oFF / 300~1800 %
12	RLt ²⁾	Pre-alarm Function	110	oFF / 60~110 %
13	ct	CT Ratio	1/10 ⁴⁾	0.2~240
14	rh	Operating Time Alarm	oFF	oFF / 10~9990 hour
15	rSEt	Reset	oFF	oFF / Pr / 0~1200 sec (Manual/Electric/Auto)

1) Leakage and Short Circuit function can not be selected at the same time.

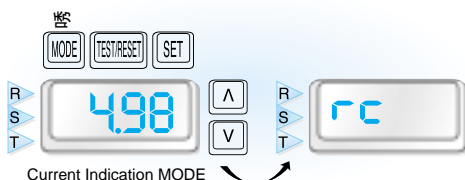
2) Pre-alarm function does not work when Leakage or Short Circuit function is selected.

3) Dip switch setting.

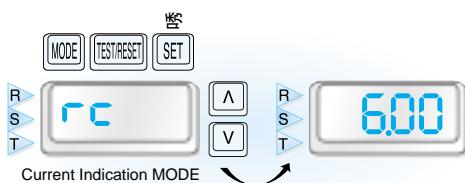
4) The CT ratio of 60 type shall not be changed.(06 type default is 1, and 60 type default is 10.)

CT ratio step: 0.2, 0.5, 1, 2, 5, 10, 15, 20, 24, 26, 30, 32, 36, 40, 44, 48, 50, 60, 80, 100, 120, 126, 150, 160, 200 and 240

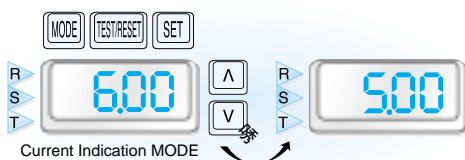
- 1) Display the **rc** by pressing the MODE button
User can be change the function by pressing the SELECT button.
To return to the current mode, press the MODE button.



- 2) To change the setting value, display the set value by pressing the SET button.
Setting value is displayed for the rated current (**rc**).



- 3) Setting value is changed by pressing the SELECT button

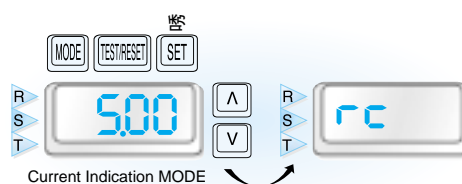


- 4) Setting value is recorded by pressing the 'SET' button, and then the selected function is displayed.

When value of rated current is set-up, **rc** is displayed after setting values recoding.

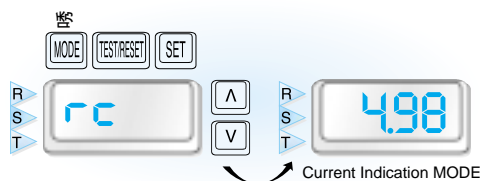
If users do not need to store the setting value, do not press the SET button.

Push the MODE button without recording.



- 5) If you want to set another function, repeat the above sequence from 2) to 4) section.

Finish the setting by pressing the MODE button 2 times.

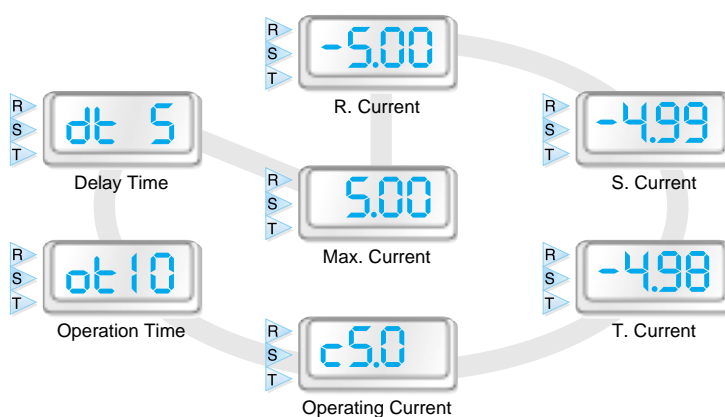


Indication on the Current MODE

The max. current is displayed among the three phases in the normal condition.

When the SELECT button is pressed, the value is displayed according to the order of the diagram.

If any button is not pressed for 5 seconds, it returns to the normal condition.

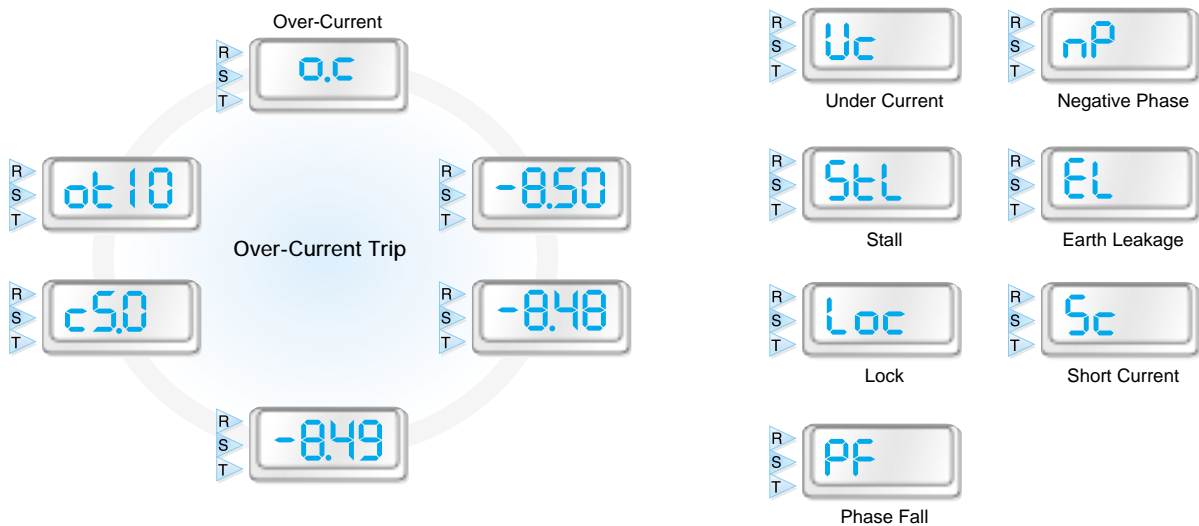


Control & Setting Method | Deluxe Type

Information Indication under the Trip Condition

The cause of trip is displayed on the LED.

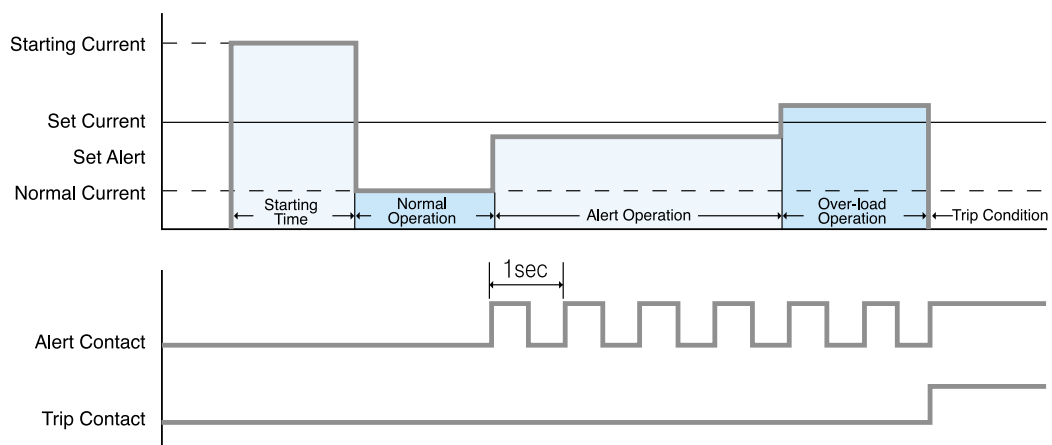
By pressing the button, user can see the fault current as the sequence below indicates.



Contact Operation Condition

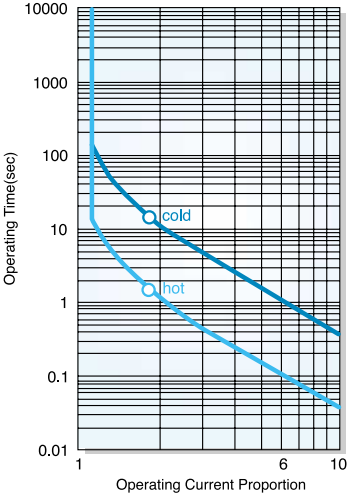
Alert and trip contact operate simultaneously under the off condition.

If electric leakage current function is included, alert contact is used as the input terminal for ZCT.

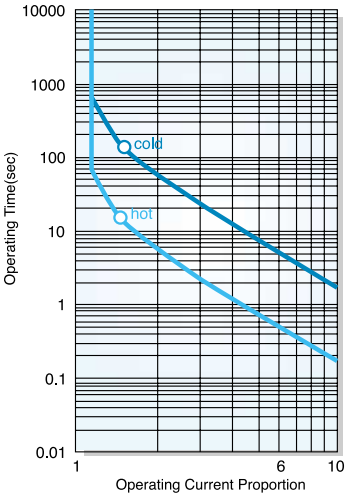


Characteristic Curve | Deluxe Type

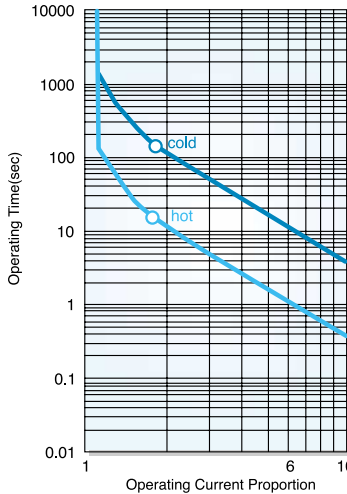
Inverse Condition (t1)



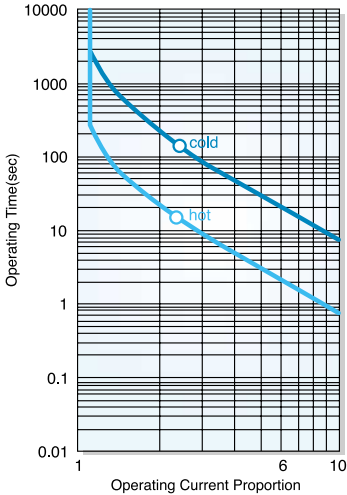
Inverse Condition (t5)



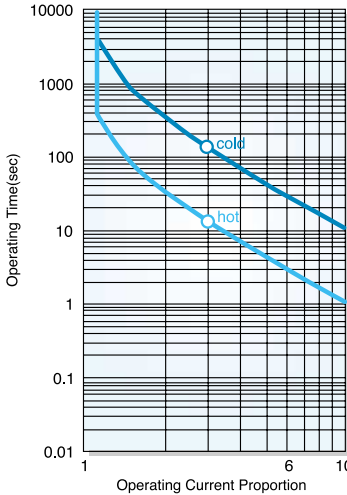
Inverse Condition (t10)



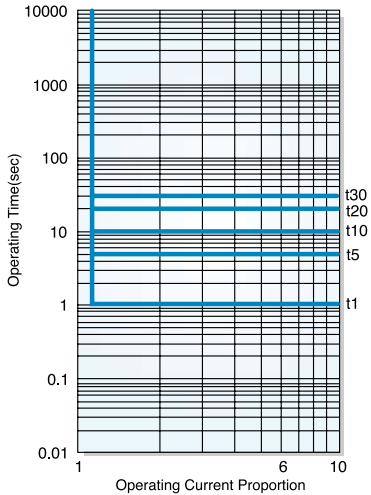
Inverse Condition (t20)



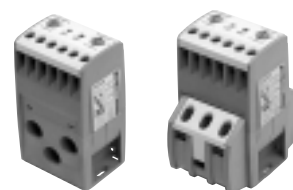
Inverse Condition (t30)



Definite Condition

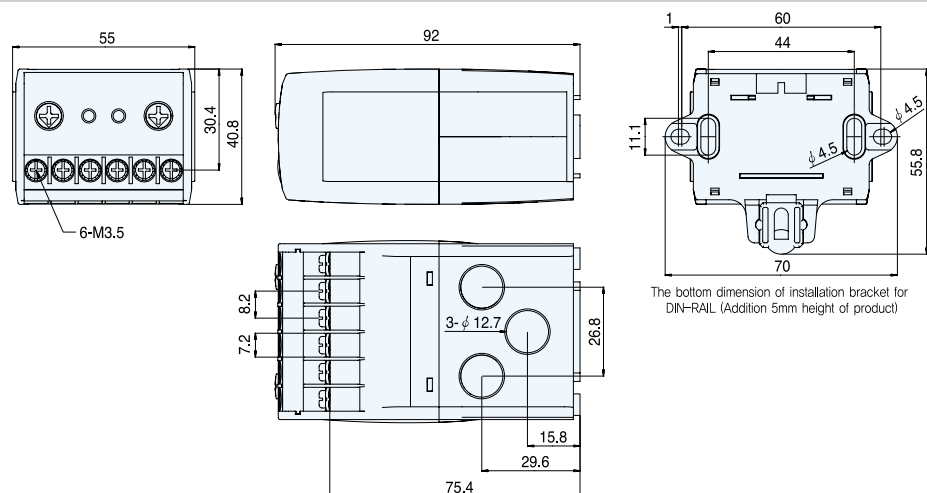


Dimension | Economic/Standard Type



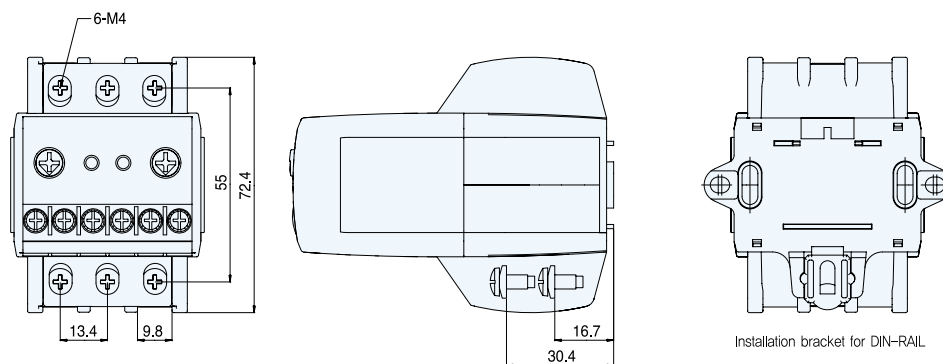
Tunnel Types

HiMP22K(H)-T/HiMP40K(H)-T/HiMP50K(H)-T

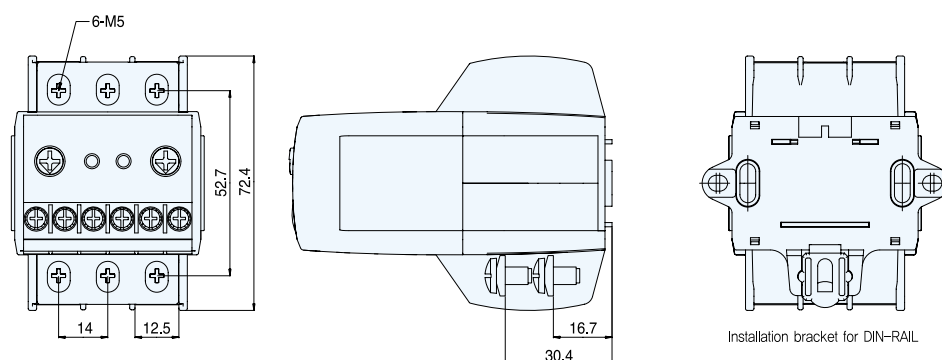


Screw Types

HiMP22K(H)-S



HiMP40K(H)-S/HiMP50K(H)-S



Pin Types



HiMP22K(H)-P

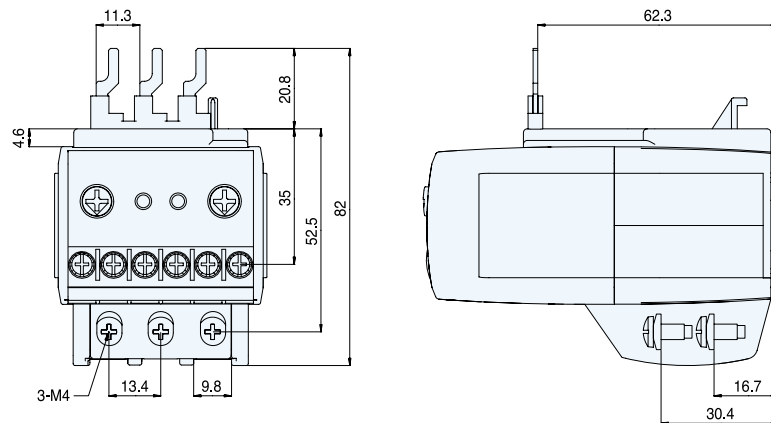


Fig.4 (Refer to Fig.1 about the dimension not included)

HiMP40K(H)-P

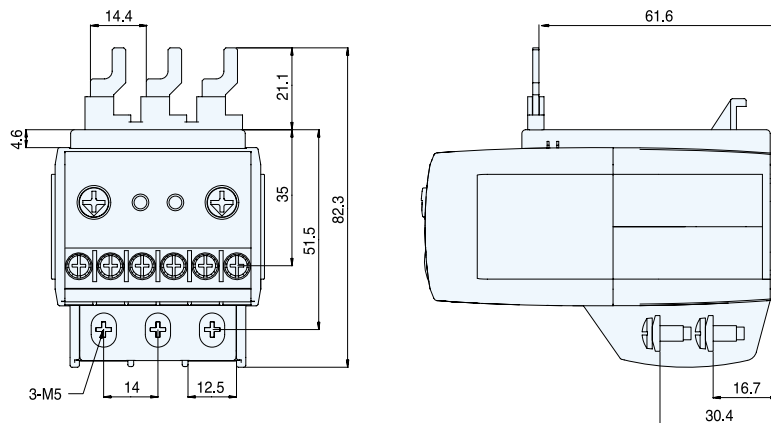


Fig.5 (Refer to Fig.1 about the dimension not included)

HiMP50K(H)-P

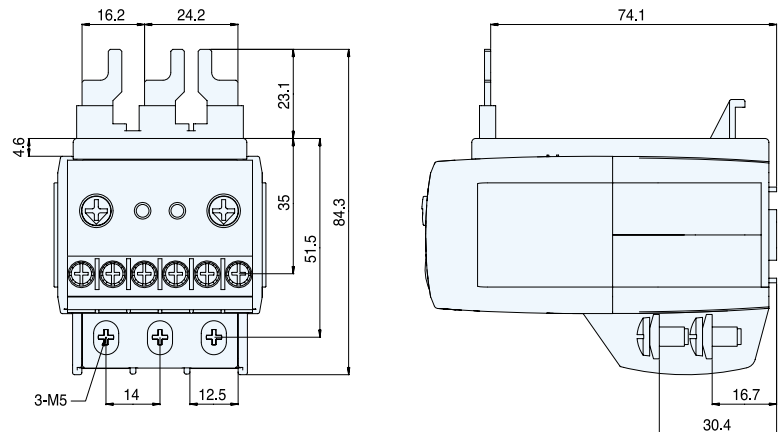


Fig.6 (Refer to Fig.1 about the dimension not included)

Dimension | Economic/Standard Type

Current Transformers

HiMP-CT80~CT500

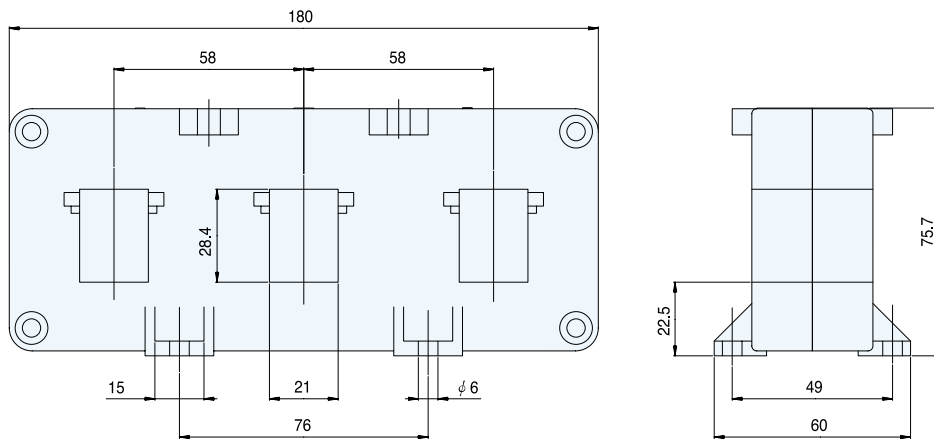


Fig.7

HiMP-CT630~CT800

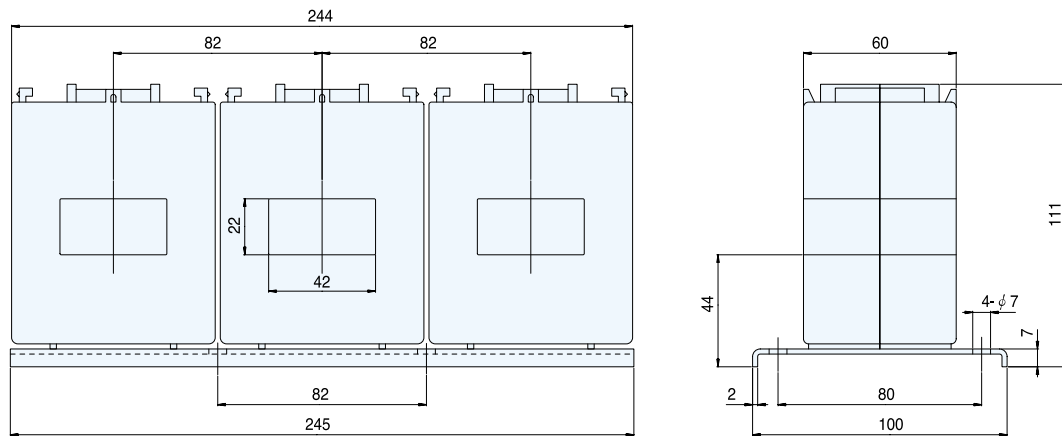
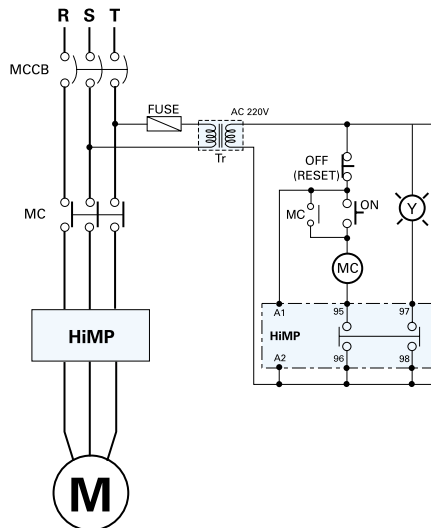


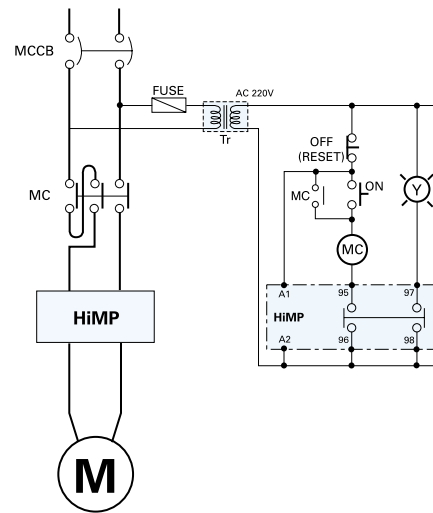
Fig.8

Wiring Diagram | Economic/Standard Type

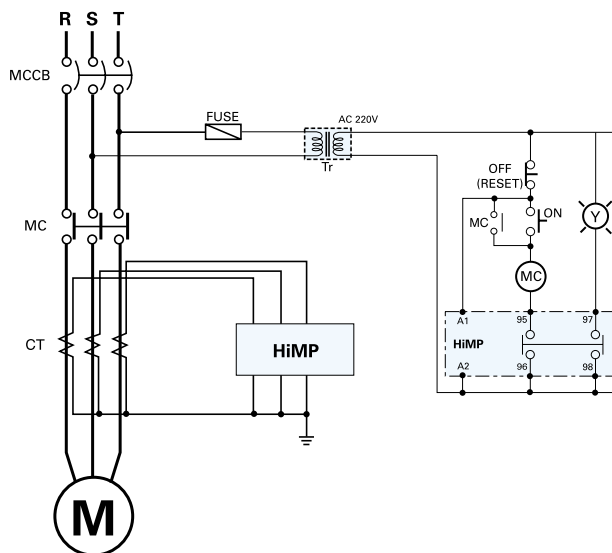
Three Phase Wiring



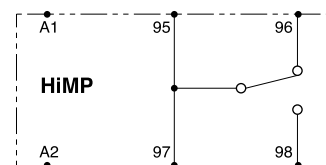
Single Phase Wiring¹⁾



Including Outer CT



HiMP- E (1c Type) Aux. Contact



The 95 and 97 of Aux. contact is common contact

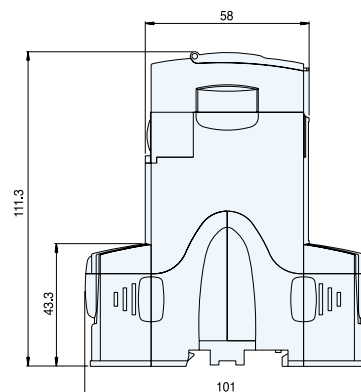
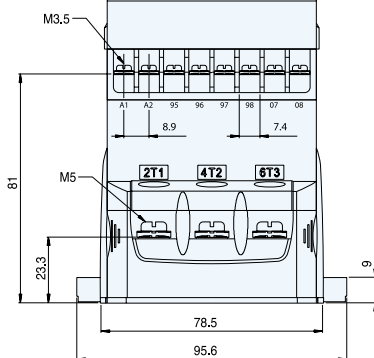
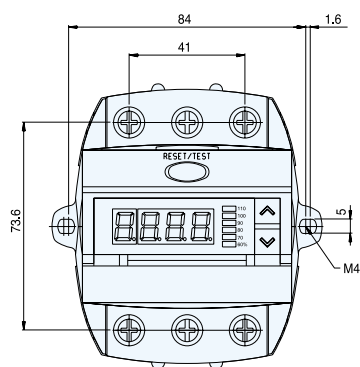
¹⁾ 3CT Type (Reverse phase) HiMP can not be used to the single phase motor.

Dimension | Deluxe Type

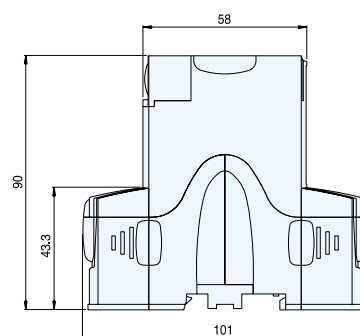
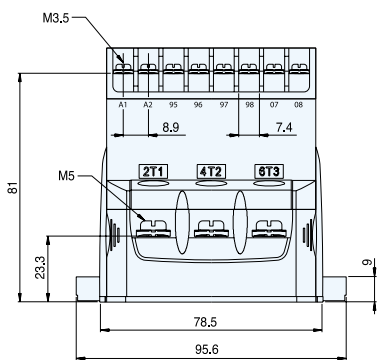
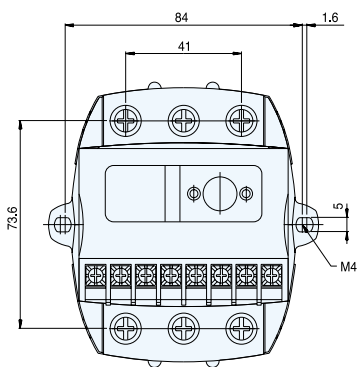


Screw Types

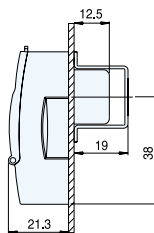
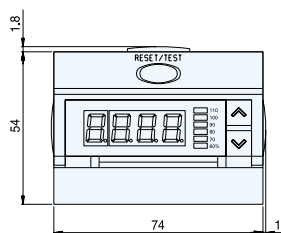
HiMP-D S / HiMP-D SZ / HiMP-D SI Units



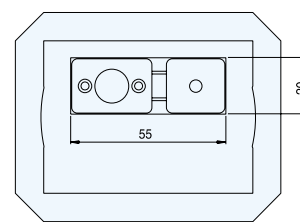
HiMP-D S / HiMP-D SZ / HiMP-D SI Extension Type



Panel Mounting



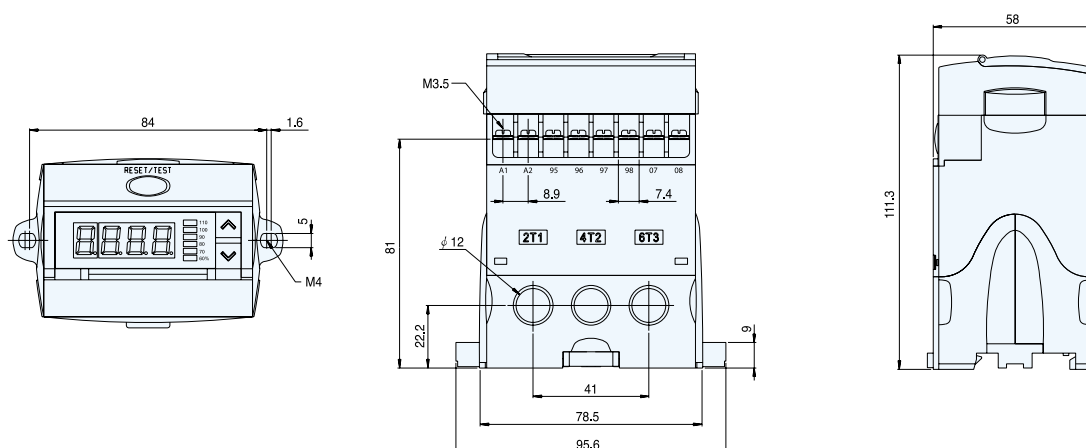
< Cutting Size of Panel >



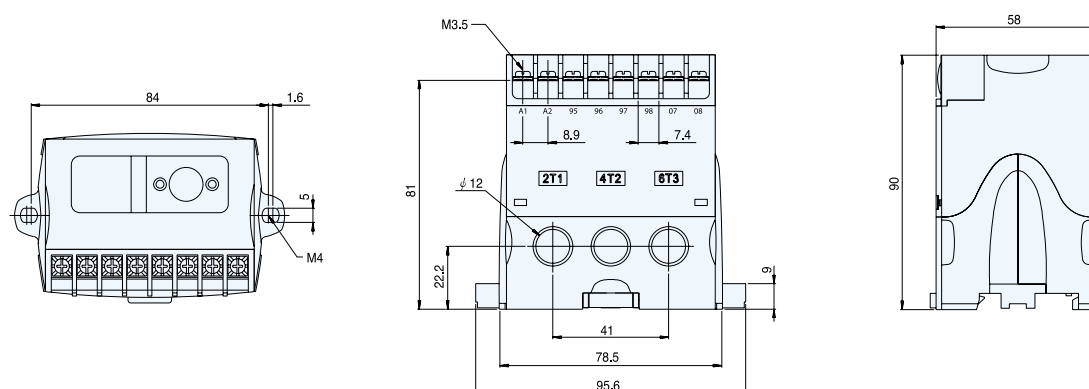


Tunnel Types

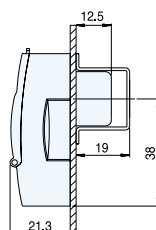
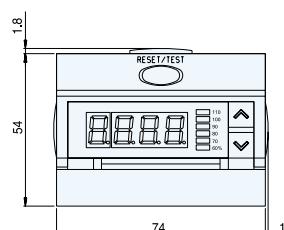
HiMP-D T / HiMP-D TZ / HiMP-D TI Units



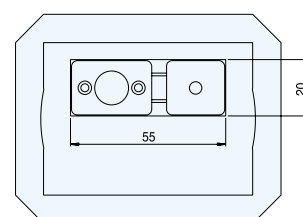
HiMP-D T / HiMP-D TZ / HiMP-D TI Extension Type



Panel Mounting



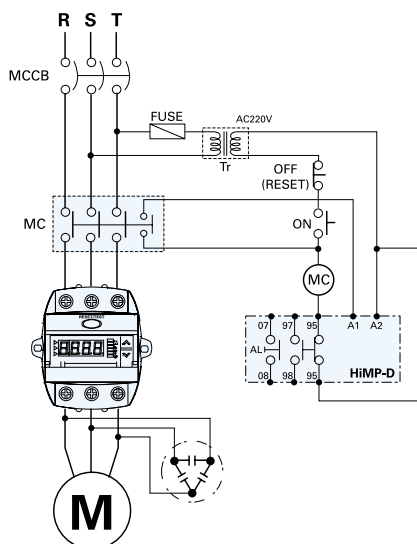
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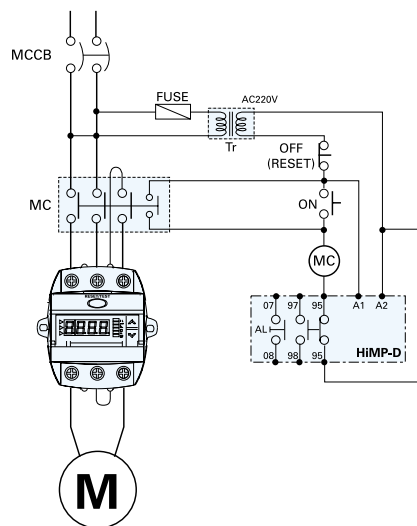
Wiring Diagram | Deluxe Type



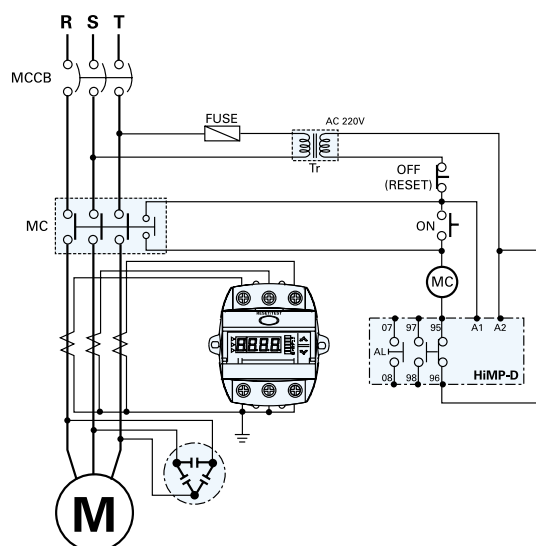
Three Phase Wiring



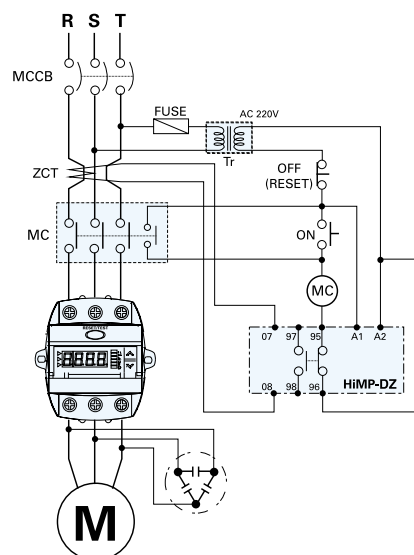
Single Phase Wiring



Including Outer CT



Including Outer CT

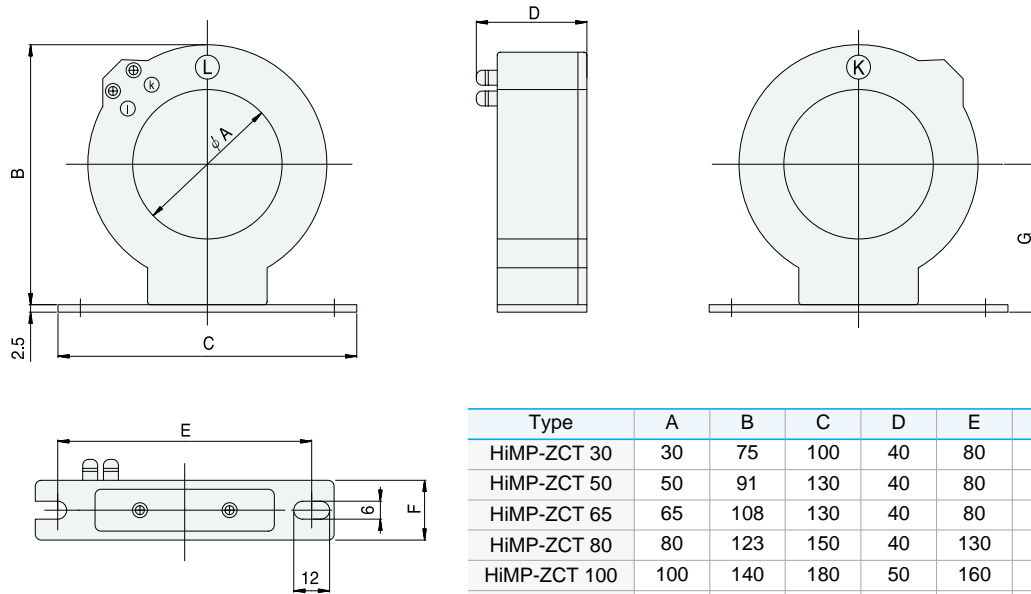


It is recommended to install capacitor near the motor side rather than the line side.

Please turn off the reverse phase function when it is used for single phase motor

When the electrical leakage current function is included, the AL(07 - 08) contact shall be used as the input terminal for ZCT.

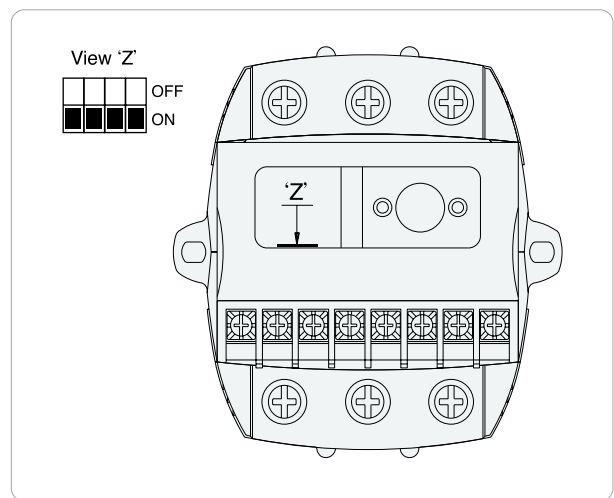
Zero Current Transformer



Setting Method of Earth Leakage Current

User can be changed the value of earth leakage current by Dip switch.

(mA)		Dip S/W (View 'Z')			
		4	3	2	1
100	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
200	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
500	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1000	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1500	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2000	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2500	(OFF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



To set the value of earth leakage current, check the position of Dip switch.

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