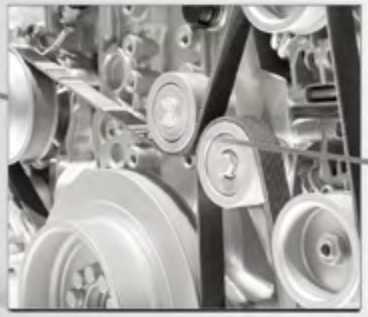
DMPi Series

Intelligent Digital Motor Protection Relays

LSIS

Revolutionary development of motor protection relays

Complete motor protection is realized
with real time data processing and high precision.



DMPi Series

Intelligent Digital Motor Protection Relays

- Display of current and accident cause load factor
- Separated display part using cables
- Definite / Inver se time option
  and various protection methods
- Operating time displayed for each model
- Storage of failure causes
- MODBUS communication, 4~20mA DC output

Contents

Product characteristics

Easy to use & convenience

Date information display

When a failure occurs, the date and time of failure occurrence are saved in the system to accurately identify the date of motor failure.

Total operating time and operating time setting

When the predefined operating time has elapsed, related information is displayed so that operators may replace the motor bearing and check the refueling cycle.

Various protection elements and additional functions

Single/3-phase is optional, and output contact as well as the operating time can be set. Free Voltage power connection (AC/D85~260V) is possible with ZCT built-in option.

Integrated system for user convenience

The display part is separated and attached to the front panel, so that information on current/operating time and setup can be viewed without taking out the unit. With the separated display, motor protection can be performed.

A wide range of reset functions

Manual/Automatic/Electrical reset functions are provided for user convenience.

Communication function

General-purpose RS485/MODBUS communication mode is offered for various system and communication network configurations. Models with analog current signal (4~20mA DC) output are compatible with systems that uses the existing TD (Transducer).

Terminal/Penetrated types are shared for application in various installation environments

Terminal blocks are detachable, which makes them applied to various installation environments.

Various protection functions

With 3-element (CT) EMPR, overcurrent, low current, stall/locked rotor, phase fail, reverse phase and phase unbalance protection are realized by default, and we offer products with ground fault protection and instance.

Reliability

Integrated Digital Motor Protection Relay using MCU (Microprocessor Control Unit)

It offers real time data processing and high precision.

Applicable to invertor circuits

It may be applied to the secondary inverter control circuit with its outstanding resistance to harmonic noise. Permissible frequency range is 10~200Hz. When the percentage of harmonic is more than 30%, a harmonic filter is installed. (However, the ground fault protection function should be switched off.)

Password setting

When changing the set values, a password must be inserted.

Thermal heat build-up inverse time/ Inverse time/Definite time options

2 different inverse time characteristics and a definite time characteristic may be chosen, if needed for complete motor protection.

Function to store the cause(s) of failure/Fault

Up to 5 motor failure events may be saved in the system, so that the failure history can be easily identified.

Three-phase digital ampere-meter

Three-phase current is displayed in cycle at intervals of 2 seconds for operators to check the motor state.

High reliability

The current relay error is reduced from 5% to 3% and the minimum sensible current is lowered from 70% to 30% of the minimum rating. Phase fail/phase unbalance protection relay correction and delay time can be set.

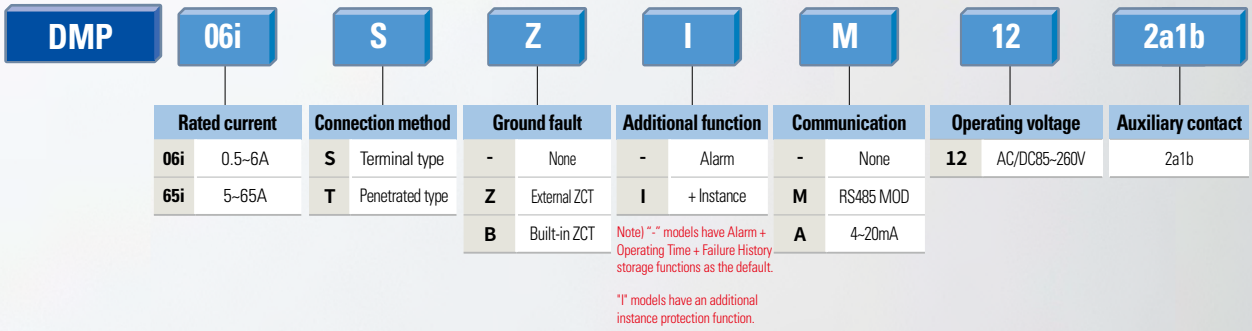
A list of standard models/Model numbering system

A list of standard models

Rated current	Connection method	Model No.	Over-current	Phase fail current	Stall/ Locked rotor	Phase un-balance	Reverse phase	Under current	Ground fault	Instant short circuit	Remarks
0.5~6A	Terminal type	DMP06i-S	●	●	●	●	●	●	–	–	• When RS485 communication function is installed, 'M' is added to the model number. When 4~20mA DC output function is included, 'A' is added to the model number. • RS485 communication function and 4~20mA DC output function are not supported simultaneously.
		DMP06i-SZ, SB	●	●	●	●	●	●	●	–	
		DMP06i-SI	●	●	●	●	●	●	–	●	
		DMP06i-SZI, SBI Note1)	●	●	●	●	●	●	●	●	
	Penetrated type	DMP06i-T	●	●	●	●	●	●	–	–	
		DMP06i-TZ, TB	●	●	●	●	●	●	●	–	
		DMP06i-TI	●	●	●	●	●	●	–	●	
		DMP06i-TZI, TBI Note1)	●	●	●	●	●	●	●	●	
5~65A	Terminal type	DMP65i-S	●	●	●	●	●	●	–	–	
		DMP65i-SZ, SB	●	●	●	●	●	●	●	–	
		DMP65i-SI	●	●	●	●	●	●	–	●	
		DMP65i-SZI, SBI Note1)	●	●	●	●	●	●	●	●	
	Penetrated type	DMP65i-T	●	●	●	●	●	●	–	–	
		DMP65i-TZ, TB	●	●	●	●	●	●	●	–	
		DMP65i-TI	●	●	●	●	●	●	–	●	
		DMP65i-TZI, TBI Note1)	●	●	●	●	●	●	●	●	

Note) 1. Setting of the ground fault and instantaneous trip contacts is optional. (refer to page 13)

Model numbering system



Rated rated specifications/Functions by product

Rated specifications

Connection method		Penetrated / Terminal type
Protection functions		Overcurrent, phase fail, phase unbalance, stall, locked rotor,reverse phase, ground fault (Type option)Instance (Type option)
Connection method		Penetrated / Terminaltype
Operating time characteristics		Thermal heat build-up inverse time / Non-thermal heat build-up inverse time / Definite time
Rated current		0.5~6A/5~65A(Rating option upon placing an order)
Operating power		AC/DC 85~260V(50Hz/60Hz)
Reset method	Automatic	1~20min (only for overcurrent)
	Manual	(Electrical reset)
Installation / Mounting method		Display can be installed separately, 35mm DIN rail / Screw installation
Allowable error	Current	±3%
	Time	±5%
	4~20mA output	±5%
Time setting	Startup delay	1~200sec
	Operation delay	1~60sec
Auxiliary contact	Composition	3-SPST(Power supply 1a1b, i nstantaneous operation 1a) Note1)
	Capacity	3A/250VAC Resistive Load
ZCT Input	External	200mA/100mV(Exclusive ZCT) Note2)
	Built-in	Support (Separate connection unnecessary) Note2)
Service environment	Service temperature	-20℃ ~ 60℃
	Storage temperature	-30℃ ~ 70℃
	Relative humidity	Below 50% RH (Without condensation)
Insulation resistance		100MΩ/500DC
Lightning impulse voltage		1.2X50us 5kV Prototype waveform supply
Fast transient		2kV/1Min
Power consumption		2W or less

Note 1. Refer to Article 21~23 of the Setting menu A-group
2. It is used to select the method for detecting image current.
3. The product is for protecting low-voltage motors (1000V or less).

Functions by product

Classification	Functional item	DMPi	DMPi-I
Relay elements	Overcurrent	●	●
	Phase fail	●	●
	Phase unbalance	●	●
	Reverse phase	●	●
	Stall	●	●
	Locked rotor	●	●
	Low current	●	●
	Ground fault	○ Note1)	○
	Instance		●
Additional functions	Automatic reset	●	●
	Total operating time	●	●
	Operating time	●	●
	Current time setting	●	●
	Storage of failure history	●	●

Note) 1. "O" supports ground fault protection with built-in/external ZCT according to the selected ZCT type. (Refer to page 5 on the model numbering system for further details)

Protection functions

Overload

Considering the start-up time of a motor and based on 600% of the rated current, operating time is set by 1sec unit ranging from 1 to 60 seconds to establish an overload characteristic curve (Class 1~60). When a definite time characteristic is chosen, overcurrent is detected from the set operating delay time (D-Time) regardless of the quantity of heat generated from the motor. Then, Trip is generated when overcurrent continues, exceeding the operating time (O-Time).

Stall/Locked rotor

It is a function to prevent burning caused by locked rotor, startup failure and startup delay. When the level of load current increases due to overheating and overcurrent during operation or when the load torque exceeds the motor torque, such failure is detected to break the related circuits.

Under current

It is mainly used to monitor the no-load state caused by deviation or damages of the motor's driving shaft, or to prevent idle running (no load state) of a pump. It can be set up to 30~70% of the rated current and operates at 3sec.

Phase fail/Phase unbalance

When phase fail occurs, a motor may not start to operate and the motor under operation will stop owing to the lack of torque or reverse phase current will continue to flow, generating heat. DMPi calculates the unbalance of three-phase current and when it reaches 100%, it operates at 3sec as phase fail. It can be set for tripping at 5sec when the phase unbalance in within 10~90%.

*Delay time may be set within the range of 0~200sec so that it does not function upon startup.

Reverse phase

It is a function to prevent reversing of a motor. The phase difference of three-phase current is compared for operation within 0.1~1.0sec when the phase sequence has changed. Reverse phase is checked only upon motor startup.

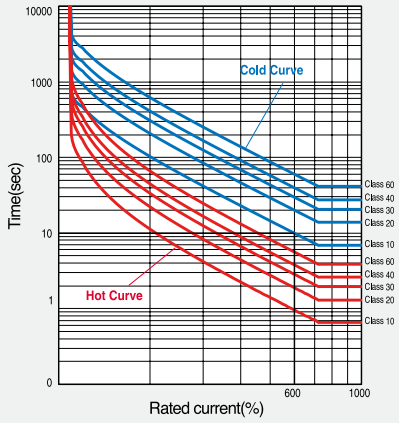
Ground fault

Ground fault leakage current is detected to prevent ground faults arising from electric leakage and secondary accidents (Phase faults and electric shock accidents). Current sensitivity and operating time are set differently according to the grounded system or purpose of protection. Current sensitivity can be set within the range of 30mA~3A and the operating time within the range of 0.05~5.0sec.

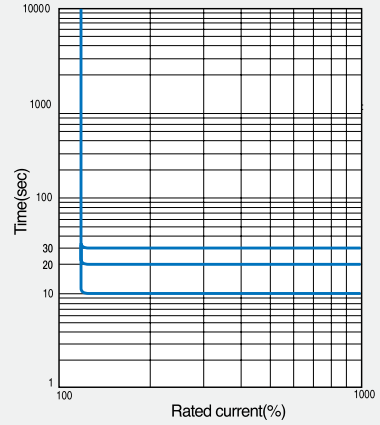
*Delay time may be set within the range of 0~200sec so that it does not function upon startup, and built-in ZCT is provided according to the Type.

Instance

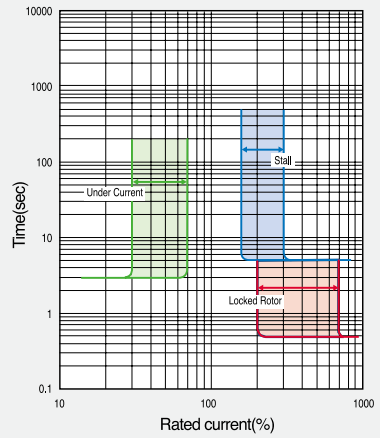
It is a function to protect a motor from short-circuit current. It operates within 50ms when fault current of more than 500~1500% is generated. Delay time may be set within the range of 0~200sec so that it does not function upon startup.



〈Inverse time characteristic〉



〈Definite time characteristic〉

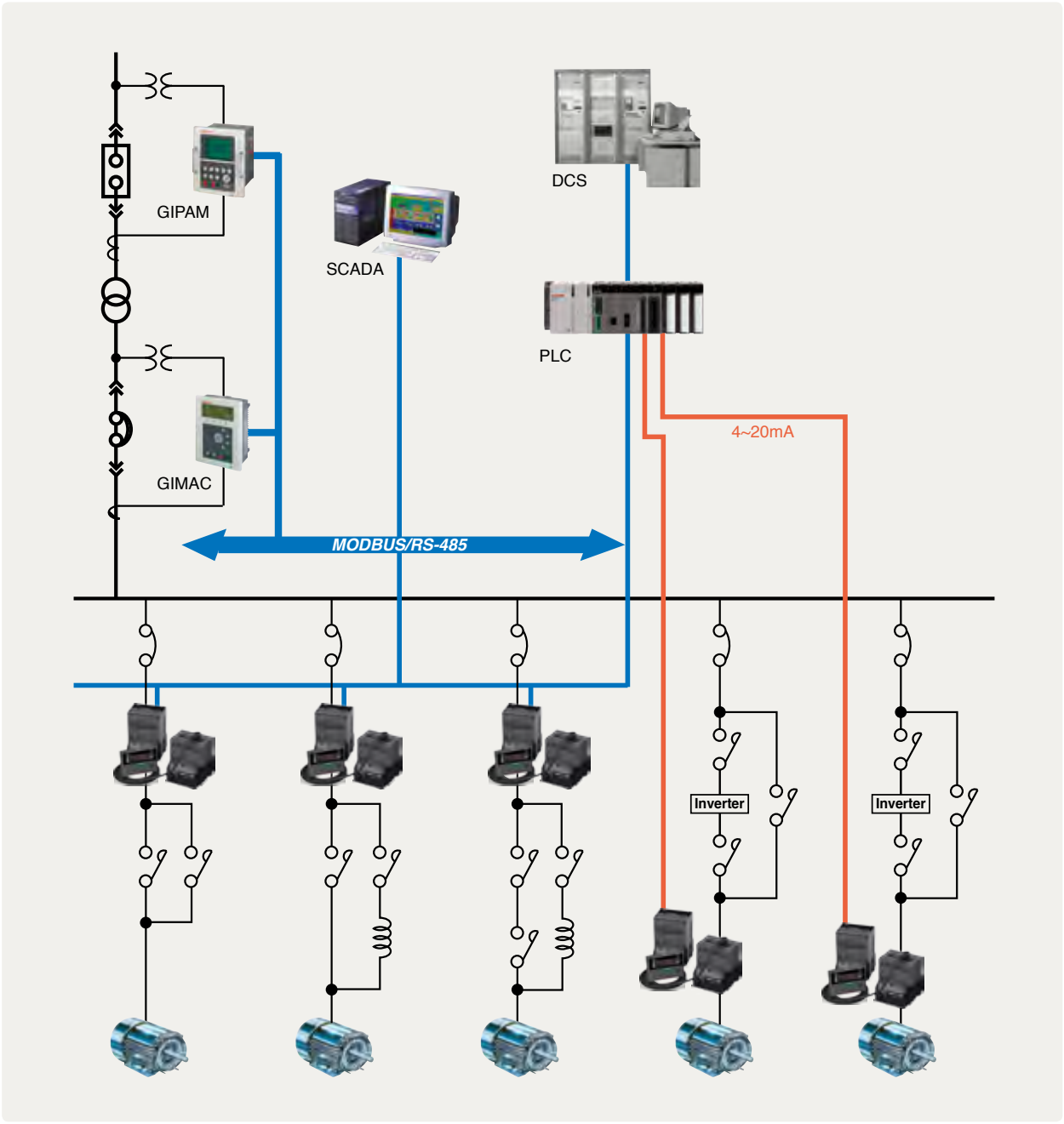


Communication function

MODBUS specifications

Communication code	1 ~ 247
Communication speed	9600, 19200, 38400, 57600 bps
Communication parity	None, Even, Odd
Fixed to 1bit	1bit
Communication data swap	Limited to float, long data of Off / On (0x04 (Read input registers))

Block diagram of communication system



Analog (4~20mA) output function

Specifications

- The measured values of current for the maximum phase among the measured values of three-phase current are converted into DC 4~20mA and the measured values of current can be displayed with a digital meter in the distance.
- 20mA output setting: 0.5~6A or 5~65A

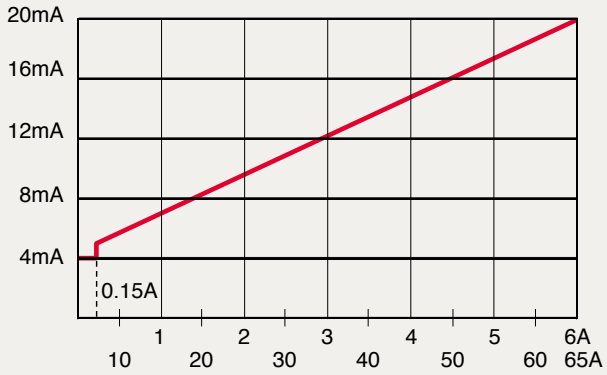
Note) 1. At the setting mode of 0.5~6A, the level of current is measured from 0.15A, so 0A is measured when less than 0.15A and the output value becomes 4mA. (When it is 0.15A, >4mA is actually measured.)
2. Measurement error based on temperature changes: ±0.15%/°C (Based on the room temperature of 25°C)

- Motor stop state: 4mA
- Setting value exceeding the rating: 20mA
- Load: Within 500Ω

Note) The allowable load of cables should be within 500Ω and the cables for shielding should be used considering the resistance of the received meta (Generally 250 Ω) and line resistance.

$$\text{Output current} = \frac{(\text{I Upper Limit} - (\text{I Lower limit})}{\text{TD Setting value}} \times \text{Load current} + 4\text{mA}$$

$$= \frac{16\text{mA}}{\text{TD setting value}} \times \text{Load current} + 4\text{mA}$$



Analog output when output setting is 6A (65A)

Operation & setting method

Before starting the motor, the following setting should be completed.

1 Check the test/Reset button.

1) First, check whether the connection method is appropriate. (Refer to the section on the connection method.)
2) Press the Test/Reset button once. 'Test' will be shown on the display and the device will be tripped.
3) When the Test/Reset button is pressed one more time during the device Trip, the display will be switched to the operating mode and the device will be reset for normal operation.

Note) To prevent trip failures, the system is designed to prevent operation of the Test/Reset button when the motor is running.

Note) Setup and setting values may change during the motor operation. Thus, please be cautious.

2 Setting method

1) Press Enter from the current display screen, and A-gr will appear on the screen. Use the Up or Down button to choose a group that you want and press Enter to display a menu on the chosen group. Press the Test/Reset button again to return to the current display screen.

2) The first menu will be displayed in relation to the selected group. Use the Up or Down button to choose a menu that you want and press Enter. The screen on setting values will be displayed. Press the Test/Reset button to display the group selection mode.

Note) Start menu may vary according to the model specifications.

3) If you press the Up or Down button from the screen on setting values, P-99 will appear on the screen. Here, use the Up or Down button to change the value to P-00 and press Enter to return to the screen on setting values. The setting value will flicker and can be changed with the Up or Down button.
After setting the value, press Enter. The value will be saved and the flicking values will be switched off.

4) With it switched on, press Enter to proceed to the next menu or press the Test/Reset button to go back to the previous menu. Related menus can be set with the same procedure.

Note) Password insertion (P-00) is performed only once when changing the setting values. When no changes are made for 10 minutes, it can be re-inserted and changed.

Note) With it switched on, press Enter to proceed to the next menu or press the Test/Reset button to go back to the previous menu. Related menus can be set with the same procedure.

Note) When power is supplied for the first time or after power failure, the date information must be inserted at b-gr 4,S-d.

3 How to check the failure history

1) Press the "Down + Up" buttons at the same time and the latest cause of a failure will be displayed on the screen. 1- -

Note) When there is no failure history, it will be displayed as "non".

2) When saving more than 2 failure cases, use the Up or Down button to check any Event that you want. Then press Enter from the Event display to view the details on the failure causes.

Note) There may be differences in details displayed according to the failure cause.

Note) 5 causes of Trip in total are saved and when it exceeds 5 cases, the previous data are deleted for storage.

4 Operating time setting

1) B group 3.5rt is used for time setting (10~8,760). After the set operating time has elapsed, Trip state will be displayed with OrH.
When A group 22AL is set with OrH, 07-08 contact will be output.

5 Total operating time and operating time check

1) Total operating time can be checked from B group ltrt, which is displayed in the following order: day/hour/minute.

2) Operating time can be checked from B group 2.r-t, which is displayed in the following order: hour/minute.

Note) When no current flows in the motor, the operating time will be displayed as 0.

Note) The total operating time is saved every 10 minutes. When turned off, any value less than 10 minutes will be reset.

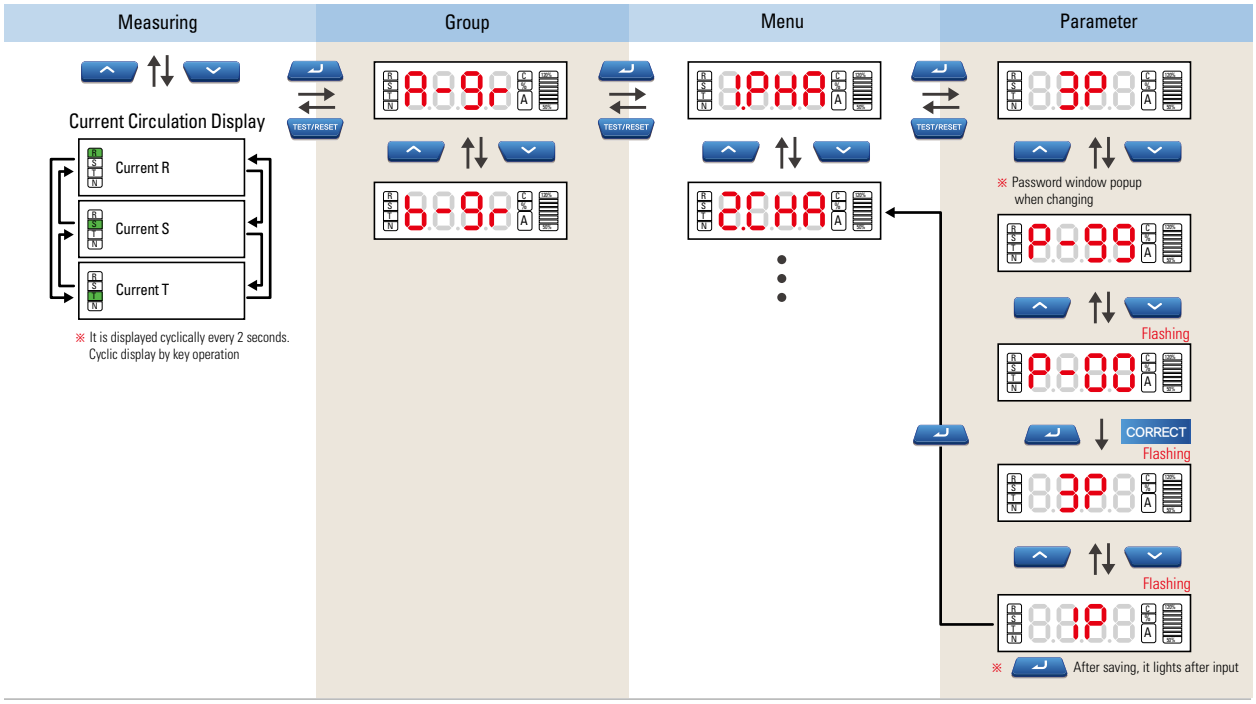
6 Heat quantity reset (The motor's heat quantity is reset by force to switch to the cold mode.)

1) When the operating characteristics of A Group 2.CHA are set in the thermal heat build-up mode (th)
2) When the Test/Reset key is pressed under overload trip to return and then a motor is driven right away, the motor will be hot. Thus, trip is immediately performed.
3) On the other hand, when the Enter + Test/Reset keys are pressed simultaneously under overcurrent trip to return and then a motor is driven right away, the motor will be cold. Thus, trip will be executed after the set time.

7 Three-phase current circulation display

1) Three-phase operating current that automatically circulates is displayed at intervals of 2 seconds.
2) To view a specific phase on the circulation display, press Enter in relation to such phase for 2 seconds.
   The phase will flicker and be displayed.
3) If you want to display the circulating three-phase current again, use the Up or Down key to cancel the state for circulation display.

Menu configuration



Information display

Display information		Failure state	Additional display information	Remarks
Failure information	O-L	Overcurrent	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operates at the set time
	Loc	Lock	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operates within 0.5sec
	StL	Stall	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operates in 3sec
	P-F	Phase fail	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operates in 3sec (Delay time setting needed)
	P-U	Phase unbalance	R-phase, S-phase and T-phase, Unbalance factor, time	Ooperates in 5 sec (Delay time setting needed)
	r-P	Reverse phase	Time	Operates at the set time
	U-C	Under current	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operates in 3sec
	Sho	Instance	Fault current (R-phase, S-phase and T-phase) Load factor, time	Operate within 50ms (Delay time setting needed)
	G-F	Ground fault (ZCT)	Fault current (R-phase, S-phase and T-phase) N-phase, time	Operates at the set time (Delay time setting needed)
Alarm information	OrH	Set operating time has elapsed	Alarm is displayed when the operating time defined with the accumulated operating time has exceeded.	
Self-diagnosis information	LInE	Display communication error	When a communication error occurs between the display and body, please contact our office with the alarm maintained.	
	EErr	External memory error	When there is an error in the backup memory, please contact our office with the alarm maintained.	

Operation & setting method

A-Group

Group	Display	Setting item	Setting value(Display value)	Single phase Note1)	Default	Remarks Note4)
A	1.PHA	Single phase/Three-phase	1P/3P	1P	3P	
	2.CHA	Operating characteristic (Overcurrent protection)	dEF/n-th/th Note2)	O	n-th	
	3.0-t	Operating time	1~60sec	O	60	
	4.d-t	Delay time	1~200sec	O	200	Displayed upon 2.CHA dEFT setting
	5.r-C	Rated current(6, 65)	0.5~6A/5~65A	O	6/65	Maximum rated current display (06i: 6A, 65i: 65A)
	6.CTr	CT Ratio	0.25/0.5/1~200 Note3)	O	1	
	7.Loc	LOCK	Off/200~800%	O	Off	
	8.StL	STALL	Off/150~500%	O	Off	
	9.P-F	Phase fail(100%)	On/Off	-	On	
	10.Pd	Phase fail delay time	0~200	-	0	Displayed upon 9.P-F setting
	11.PU	Phase unbalance	Off/10~90%	-	Off	
	12.Ud	Phase unbalance delay time	0~200	-	0	Displayed upon 10.PU setting
	13.rP	Reverse phase	Off/On Note5)	-	Off	
	14.rt	Reverse phase operating time	0.1~1.0	-	0.1	Displayed upon 13.rP setting
	15.UC	Under current	Off/30~90%	O	Off	
	16.gF	Ground fault	Off/0.03/0.05/0.1~3.0A	O	Off	
	17.gt	Ground fault operating time	0.05, 0.1~5.0sec	O	1	Displayed upon 16.gF setting
	18.gd	Ground fault delay time	0~200sec	O	200	Displayed upon 16.gF setting
	19.IC	Instance protection	Off/500~1500% Note6)	O	Off	
	20.Id	Instance protection delay Time	0~200	O	0	Displayed upon 19.IC setting
	21.cS	Output contact composition	2a, 1a1b, 2b	O	1a1b	
	22.AL	Alarm output conditions	I-tp, I-AL, ALo, U-C, OrH, g-F Note7)	O	I-tp	
	23.Ar	Current flow or not, alarm setting	On/60~110%	O	On	Displayed upon 22.AL Alo setting

Note) 1. When setting A group 1.PHA menu with 1P, restricted setting with limited functions can be made.
2. Operating characteristic th refers to the thermal heat build-up inverse time characteristic and n-th refers to the non-thermal heat build-up inverse time characteristic. When th is used, the quantity of heat generated will be reset as power is turned off. Thus, please pay attention to it.
3. CT Ratio is fixed to 1 for 65A Type model.
4. Some menus will not be displayed depending on the function setting for each model.
5. Reverse phase will be detected for only 1.5 seconds after load is activated. It is recommended to set as Off for a motor not in normal-reverse operation.
6. In case of 'Instance', the maximum setting value may change according to the rated current setting.
7. For models with ground fault and instance protection functions, the ground fault and instantaneous trip contacts may be separately set for use.

The output conditions of 95-96, 97-98 output contacts depending on the setting of A group 21.cS are as described below.

21.cS Setting		Output conditions	Contact output type	
			95–96	97–98
	1a1b	Normal operation	NC Note)	NO Note)
		Ground fault / Short circuit	O Note)	C Note)
		Other failures, such as overcurrent, phase fail and reverse phase other than the ground fault	O	C
	2a	Normal operation	NO	NO
		Ground fault/Short circuit	O	C
		Other failures, such as overcurrent, phase fail and reverse phase other than the ground fault	C	O
	2b	Normal operation	NC	NC
		Ground fault/Short circuit	C	O
		Other failures, such as overcurrent, phase fail and reverse phase other than the ground fault	O	C

Note) NC: Normal Close, NO: Normal Open, O: Open, C: Close

The output conditions of 07-08 output contacts depending on the setting of A group 22.AL are as described below.

23.Ar setting		Output conditions	Alarm output type	
			Motor operation	07–08
	I-tp	Momentary current detected	Motor stop	C
	I-AL	Momentary current detected	State maintained	C
	U-C	Current flow below the set low current detected	State maintained	C
	OrH	Output exceeding the set operating time	State maintained	C
	g-F	Ground fault detection	Motor stop	C
	ALo	Conforming to the 23.Ar setting described below		
23.Ar setting		ALo setting from menu No.22	Motor operation	07– 08
	On	Current flow exceeding the measured minimun current value detected Note)	State maintained	C
	60~110%	Current flow exceeding the setting value	State maintained	C

Note) The measured minimum current value is 30% of the minimum rated current value (0.15A for 0.6i type; 1.5A for 65i type)

B-Group

Group	Display	Setting item	Setting value(Display value)	Single phase Note1)	Default	Remarks Note4)
B	1.trt	Total operating time	0~9999day/0~23Time/0~59min	O	-	
	2.r-t	Operating time	0~9999 Time/0~59min	O	-	
	3.Srt	Operating time setting	Off/10~8760	O	Off	
	4.S-d	Date setting Note2)	2017~2100yea/1~12month/1~31day/ 0~23hour/0~59min	O	2017.07.01 00:00	
	5.A-r	Automatic reset Note3)	Off/1~20min	O	Off	
	6.Adr	Communication network address	1~247	O	247	Displayed only for M485 model
	7.bPS	Communication speed	9.6k/19.2k/38.4k/56.7k	O	9.6k	
	8.S-P	Swap On/Off	On/Off	O	Off	
	9.P-r	Parity setting	nonE/odd/EUEn	O	nonE	
	6.t-d	20mA setting	0.5~6/5~65	O	6/65	Displayed only for A420 model

Note) 1. It can be set even when A group 1.PHA is set with the single phase (1P).
2. When power is supplied for the first time or after power failure, date must be set. For date setting, month, day, hour and minute should be respectively set for complete setting. (After date setting, it is saved every 10 minutes. When power is supplied again after power failure, the date before such power failure will be saved.)
3. Automatic reset is restricted for overcurrent trip.
4. Menus vary according to the model. (refer to the remarks)

Operation & setting method

Phase setting

This is a function tdo set current input either as single or three-phase.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press Enter from the PHR screen and the initial value 3P will be displayed.

4. Here, use the Up/Down key to display P-99 from the screen. Change it into P-00 with the Up/Down key and press Enter. You are now ready for setting. (Only required for initial setting)

5. The set value flickers. Use the Up/Down key to display 'phase' that is applicable depending on the motor specifications (1P: single-phase; 3P: three-phase). Then, press Enter to save the setting. (1P)
   ① Choose either 1P or 3P; the default is 3P
   ② When 1P is selected, A group items such as "9.P-F", "10.Pd", "11.PU", "12.Ud", "13.rP" and "14.rt" are excluded from the setting menu.

6. Press Test/Reset to return to the display screen.

Rated current setting

This is a function to set a rated current.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu 3 or 4 times from the PHR screen. (5.r-C)

4. Press Enter from the 5.r-C screen and the initial value 6.0A will be displayed.

5. Here, use the Up/Down key to set the value as 0.5~6.0A. Then, press Enter to save the setting. Note1) (6.0 → 5.4A)
   ① 6A model: Set by 0.1A unit ranging from 0.5A to 6A (the default is 6.0A)
   ② 65A model: Set by 1A unit ranging from 5A to 65A (the default is 65A)

6. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.

Overcurrent operating characteristic setting

This is a function to set the operating characteristic of the overcurrent element.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu once from the PHR screen. (2.CHA)

4. Press Enter from the 2.CHA screen to display 'n-th' (initial value).

5. The set value flickers. Use the Up/Down key to display the set value. Note1)

6. Press Enter for dEF setting.
   ① dEF (definite time), n-th (non-thermal heat build-up inverse time) or th (thermal heat build-up inverse time)
   ② When set as 'n-th' or 'th', "4.d-t" of the A group items is excluded from the setting menu.

7. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.

Overcurrent operating time setting

This is a function to set the operating time of the overcurrent element.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu twice from the PHR screen. (3.0-t)

4. Press Enter and the initial value 60sec will be displayed.

5. Use the Up/Down key to display the set value on the screen. Note1)

6. Press Enter to set as 30sec. (60->30 sec)

7. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.

Operation & setting method

Overcurrent delay time setting

This menu is displayed only when the overcurrent operating characteristic is set as dEF (definite time).

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu 3 times from the 1.PHR screen. (4.d-t)

4. Press Enter from the 4.d-t screen and the initial value 200 will be displayed.

5. Use the Up/Down key to display the set value on the screen. Note1)

6. Press Enter to set as 100sec. (200->100sec)
   ① Set by 1sec unit ranging from 1 sec to 200sec; the default is 200sec.
   ② When the overcurrent operating characteristic is set as 'n-th' or 'th', it is excluded from the setting menu.

7. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.

Ground fault operating value setting

This is a function to set the operating value of ground fault.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu from the 1.PHR screen to proceed to 16.gF.

4. Press Enter from the 16.gF screen and the initial value OFF will be displayed.

5. Here, use the Up/Down key to set the value. Press Enter to save the setting. Note1) (OFF -> 0.1A)
   ① Set by 0.1A unit ranging from 0.1A to 3.0A; or OFF, 0.03A, or 0.05A. (the default is OFF)

6. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.

Ground fault operating time setting

This is a function to set the operating time of ground fault.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu from the 1.PHR screen to proceed to 17.gt

4. Press Enter from the 17.gt screen and the initial value 1.0sec will be displayed.

5. Here, use the Up/Down key to set the value. Press Enter to save the setting. Note1) (1.0 -> 0.1sec)
   ① Set by 0.1sec unit ranging from 0.1sec to 5.0sec; the default value is 1.0sec.

6. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.
Note 2) When the operating value of ground fault protection (16.gF) is set as OFF, it is excluded from the setting menu.

Ground fault delay time setting

This is a function to set time for blocking operation of the ground fault element upon motor activation.

The DMPi main screen display (0.00A)

1. Press Enter from the main screen. (A-gr)

2. Press Enter from the A-gr screen. (1. PHR)

3. Press the Up-key menu from the 1.PHR screen to proceed to 18.gd.

4. Press Enter from the 18.gd screen and the initial value 200sec will be displayed.

5. Here, use the Up/Down key to set the value. Press Enter to save the setting. Note1) (200 -> 100sec)
   ① Set by 1sec unit ranging from 0sec to 200sec; the default value is 200sec.

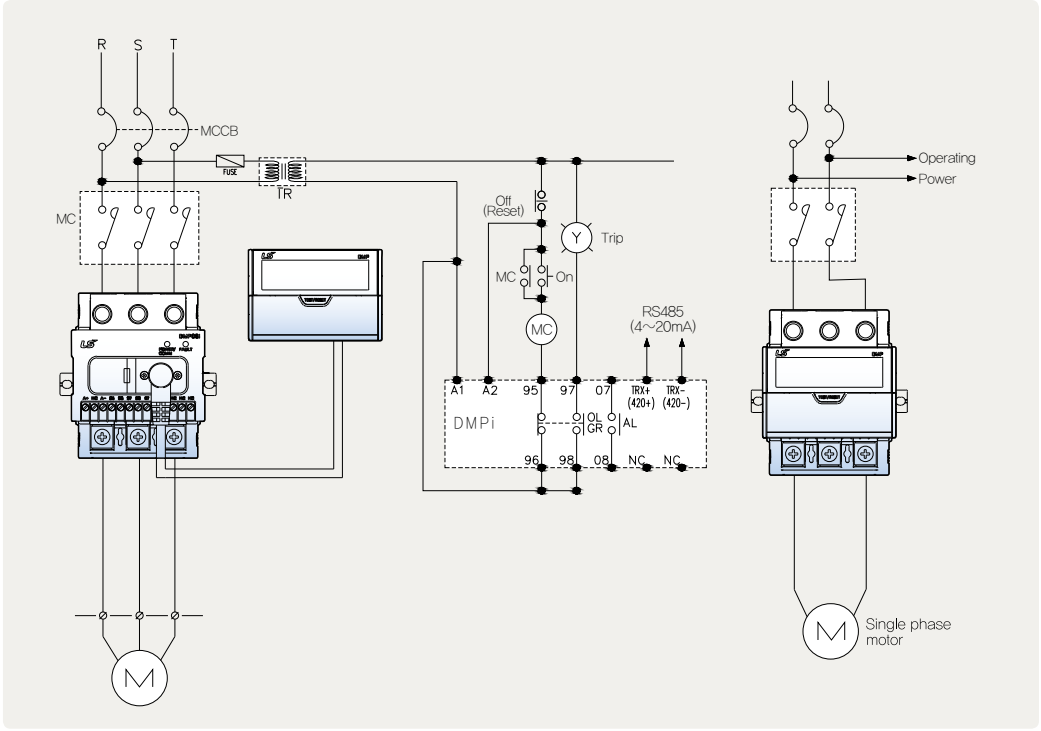
6. Press Test/Reset to return to the display screen.

Note 1) Upon initial setting, P-99 is displayed on the screen. Here, use the Up/Down key to change it into P-00 and press Enter. You are now ready for setting.
Note 2) When the operating value of ground fault protection (16.gF) is set as OFF, it is excluded from the setting menu.

Wiring & cable connection

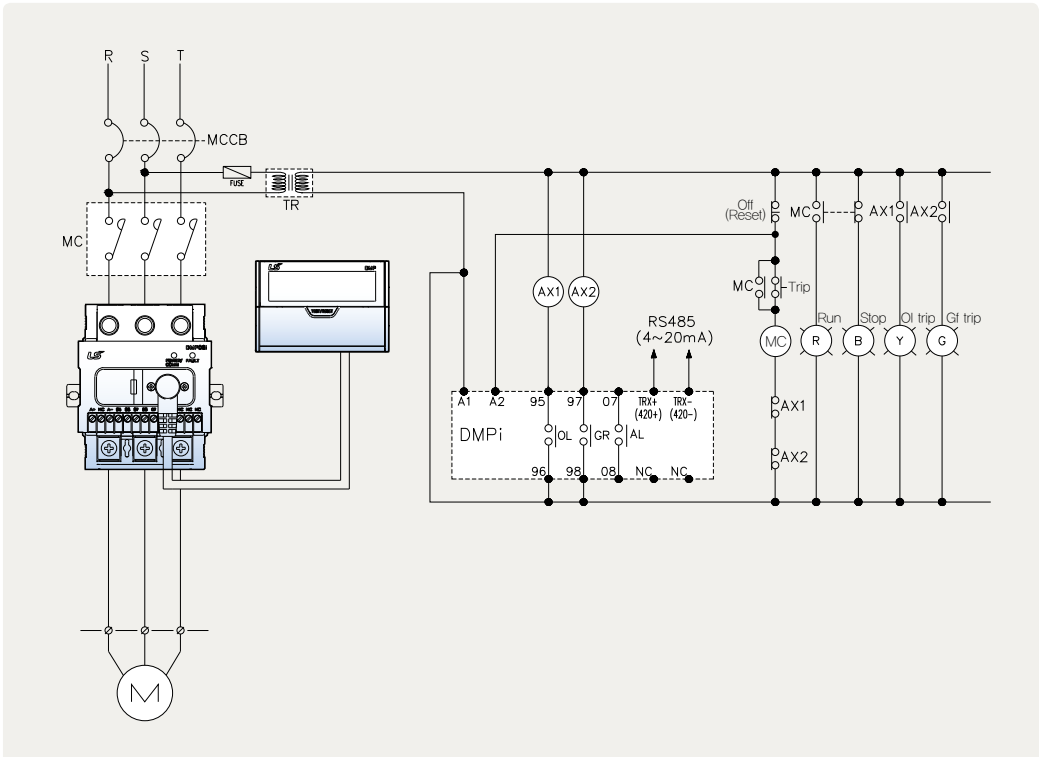
DMPi-B built-in ground fault protection type

DMPi-SB / TB



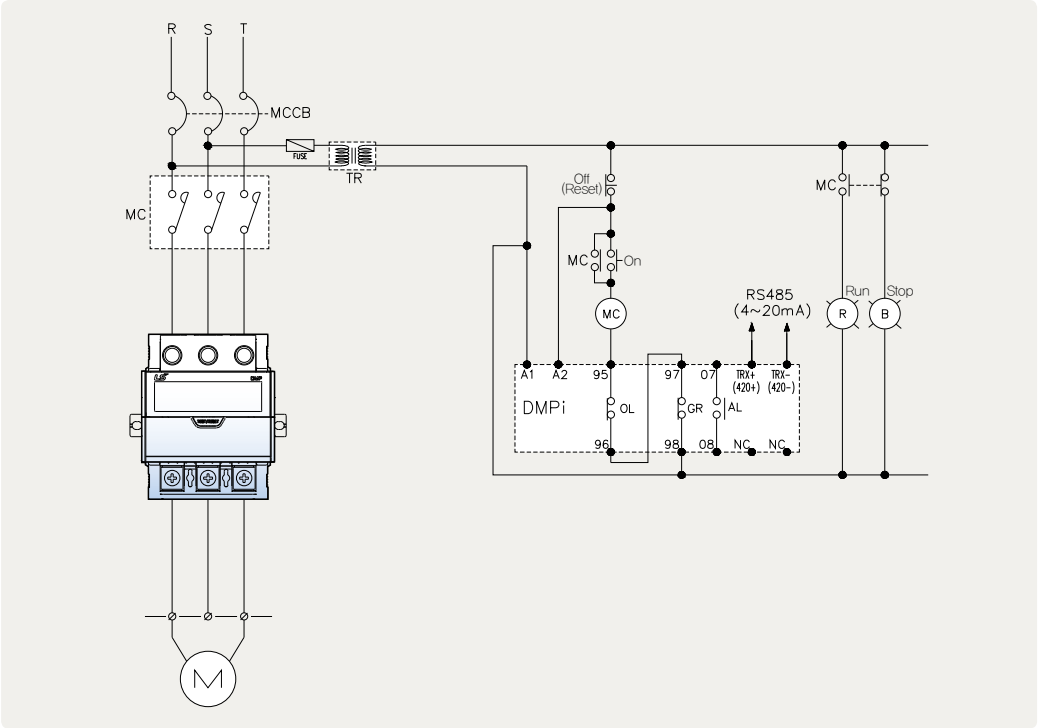
DMPi-B built-in ground fault protection type

DMPi-SB/TB



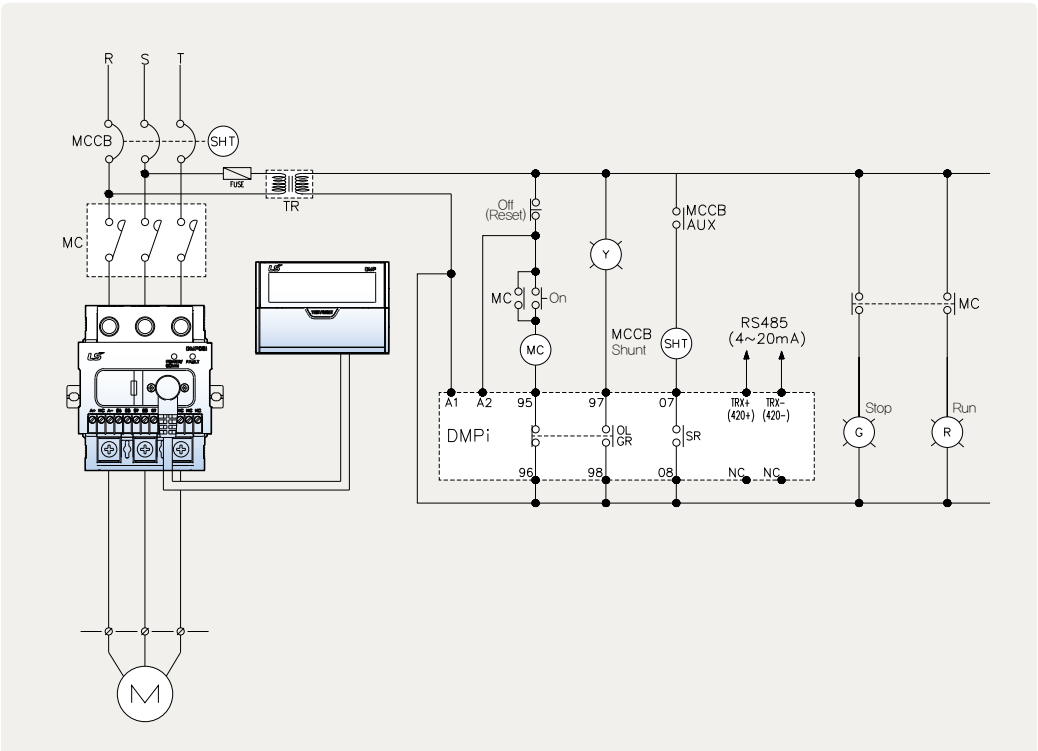
DMPi-B built-it ground fault protection type

DMPi-SB / TB



DMPi-SBI/TBI, SI/TI built-in instant short-circuit protection type (1a1b)

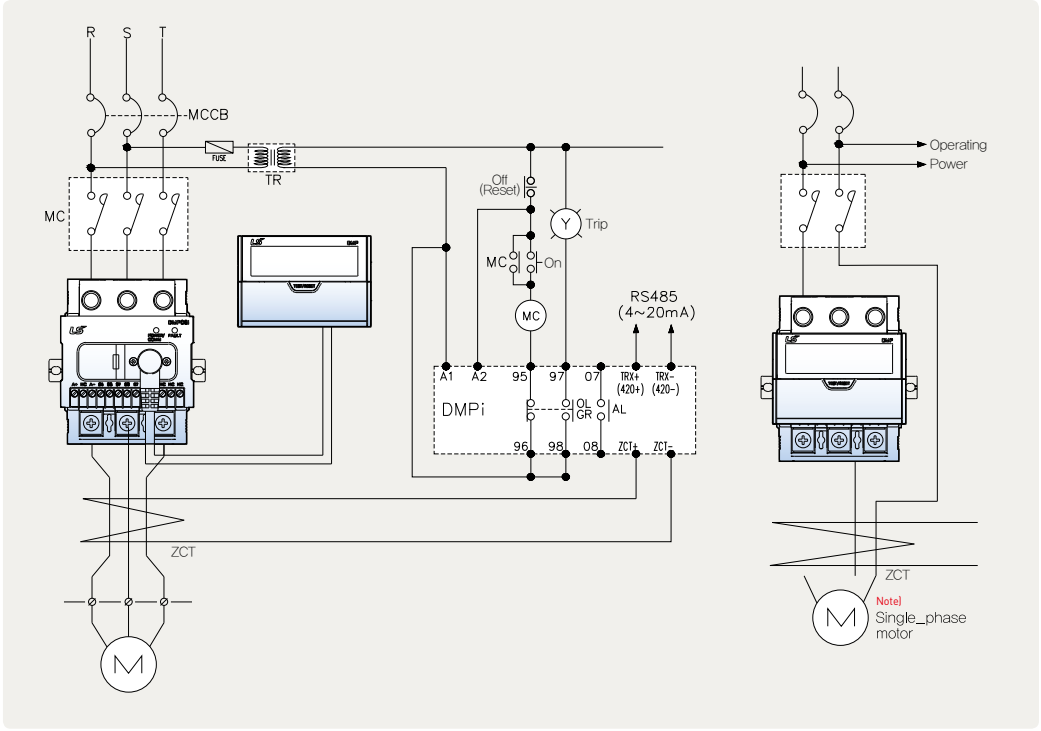
DMPi-SBI/TBI
DMPi-SI/TI



Wiring & cable connection

DMPi-SZ/TZ external ground fault protection type (1a1b)

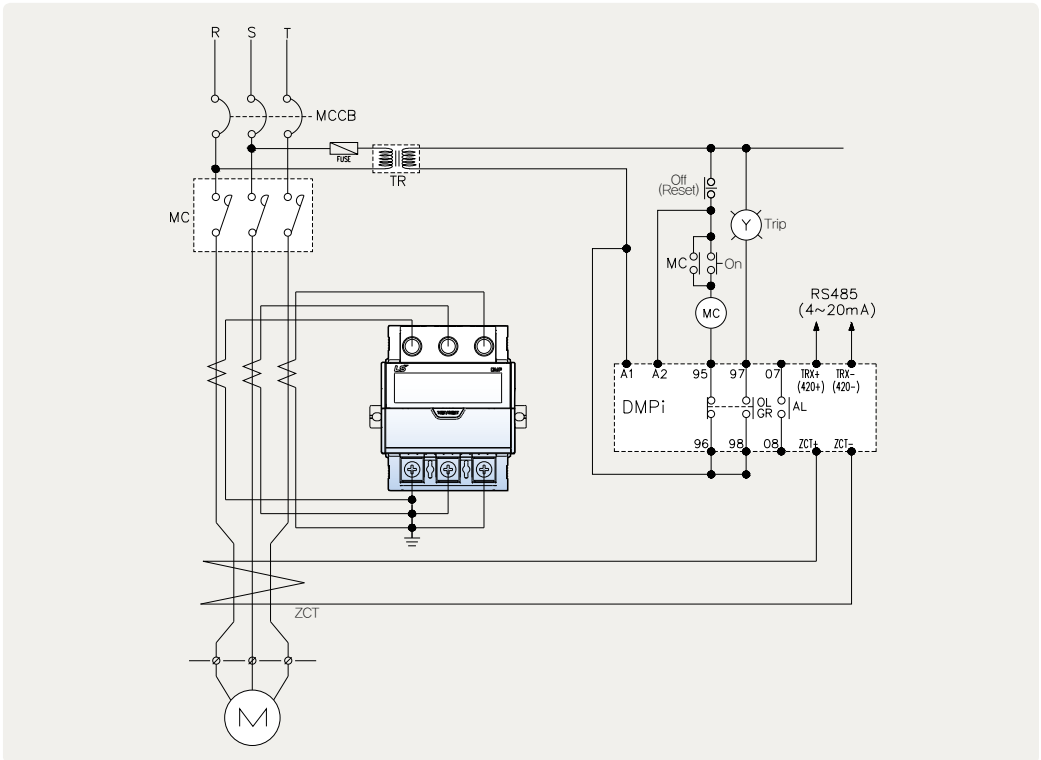
DMPi-SZ/TZ



Note) 1. R-phase must be penetrated when connecting a single-phase motor. (Although there are S, T-phase CT in the product, values are measured based on R-phase.)

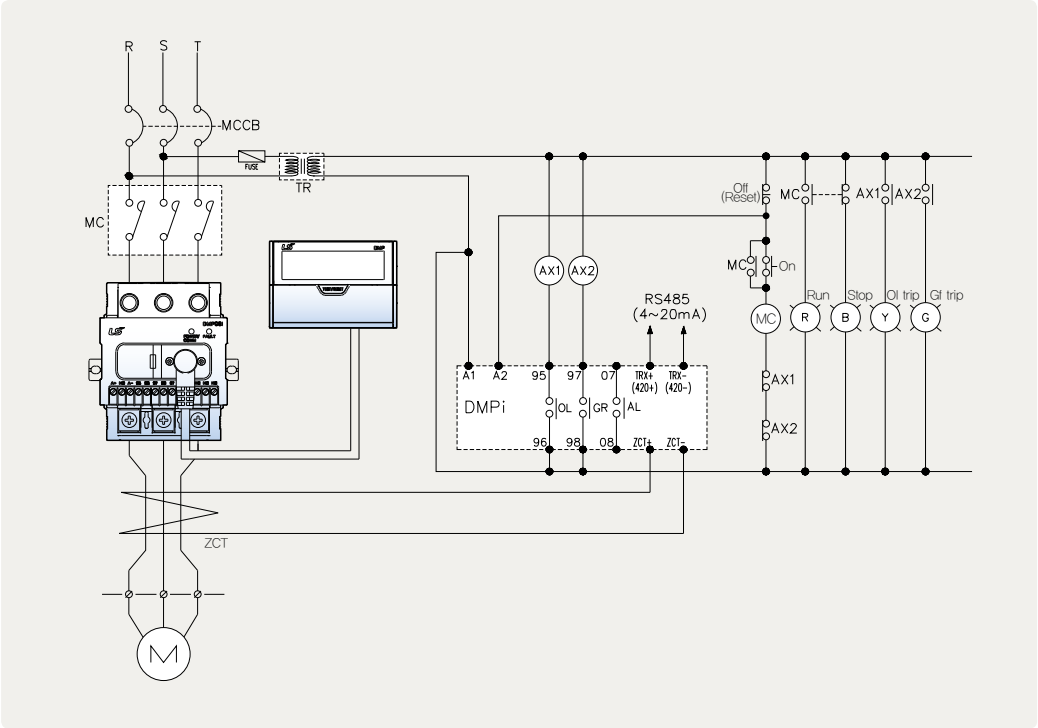
DMPi-SZ / TZ external ground fault protection type (1a1b large-capacity motor applied with external CT)

DMPi-SZ / TZ



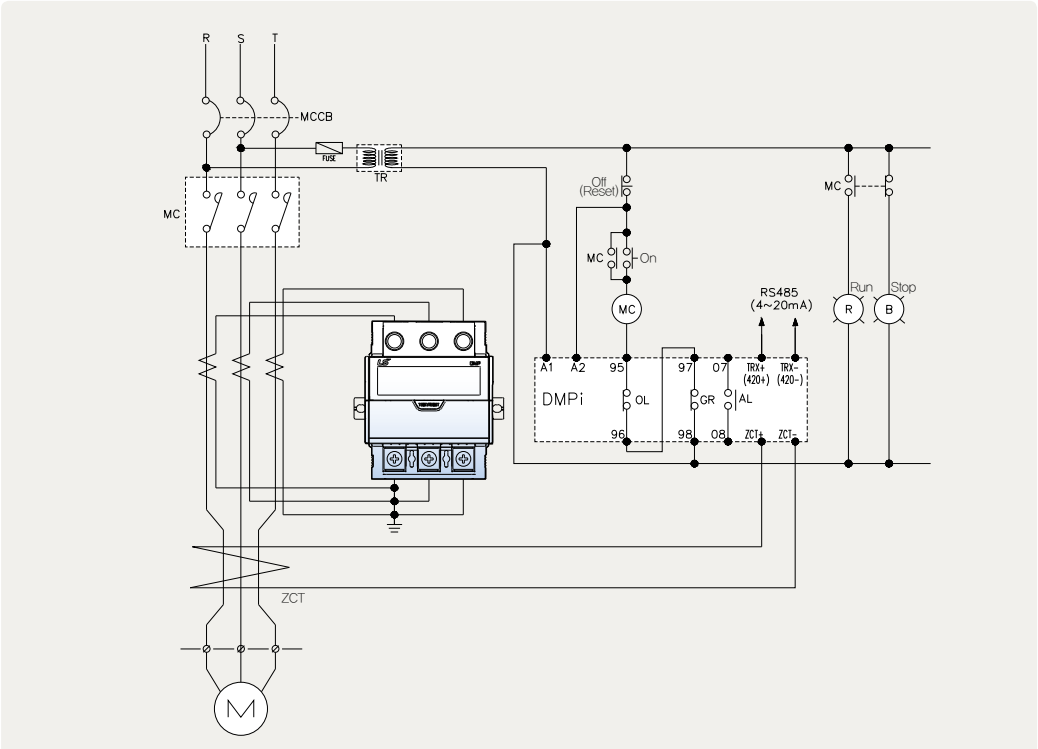
DMPi-SZ / TZ external ground fault protection type (2a)

DMPi-SZ / TZ



DMPi-SZ/TZ external ground fault protection type (2b)

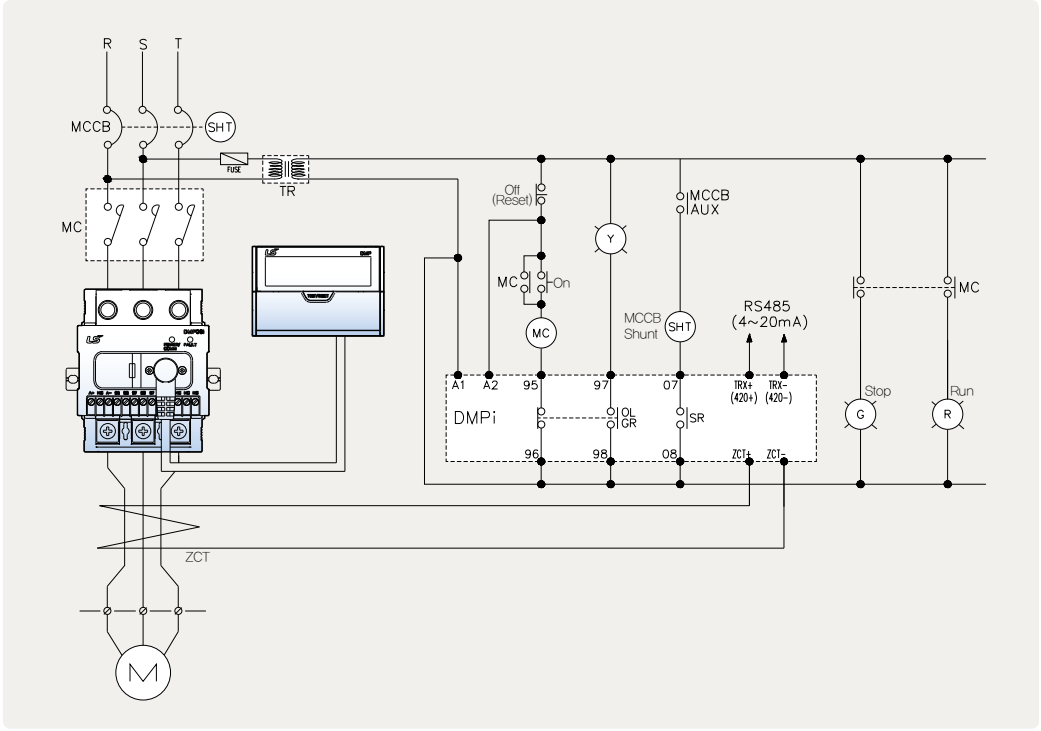
DMPi-SZ/TZ



Wiring & cable connection

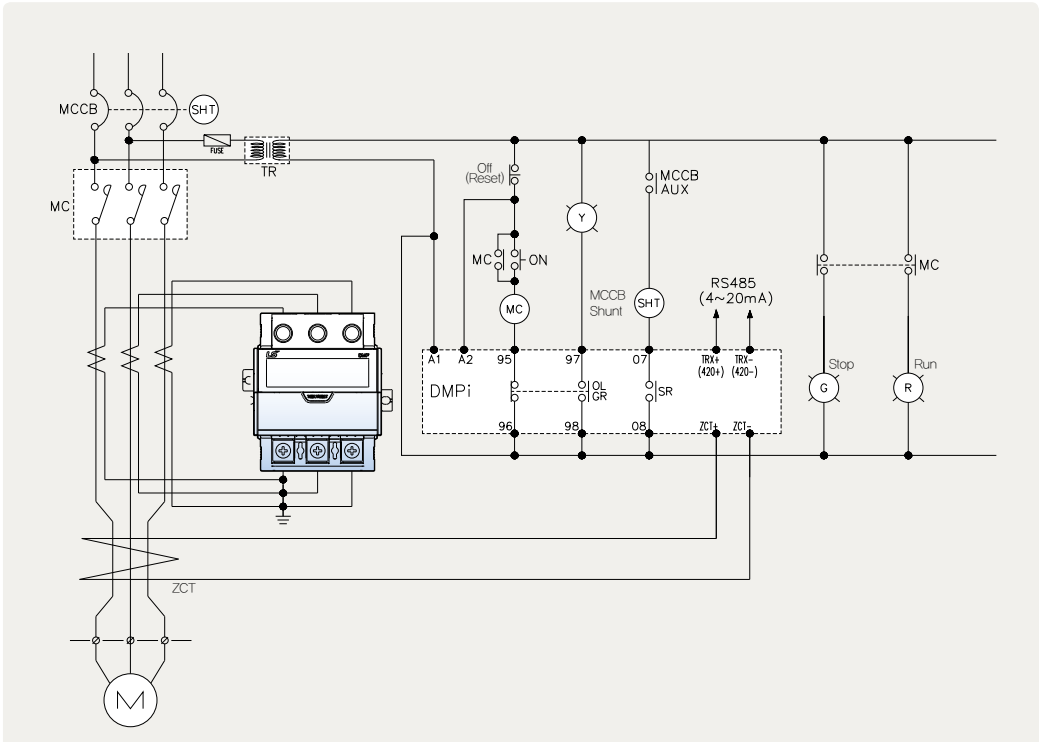
DMPi-SZI, TZI instant short-circuit protection and external ground fault protection type (1a1b)

DMPi-SZ/TZI



DMPi-SZI, TZI instant short-circuit protection and external ground fault protection type (1a1b large-capacity motor applied with external CT)

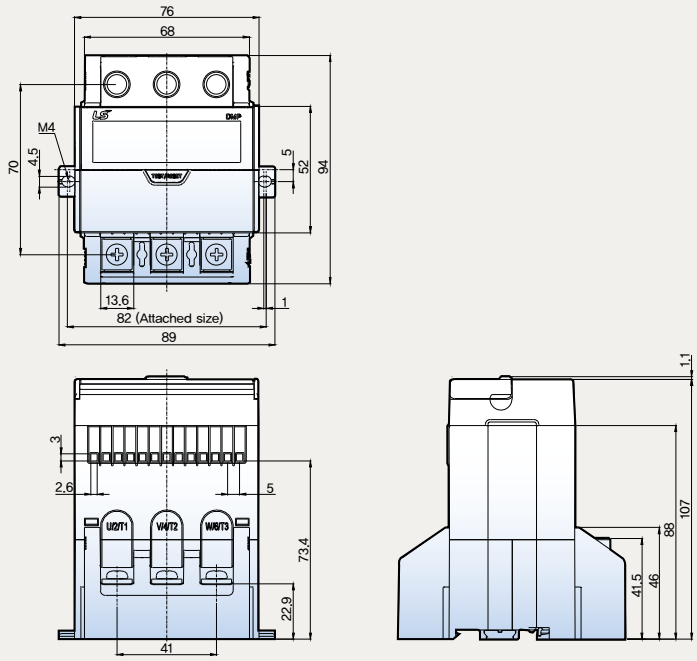
DMPi-SZ/TZI



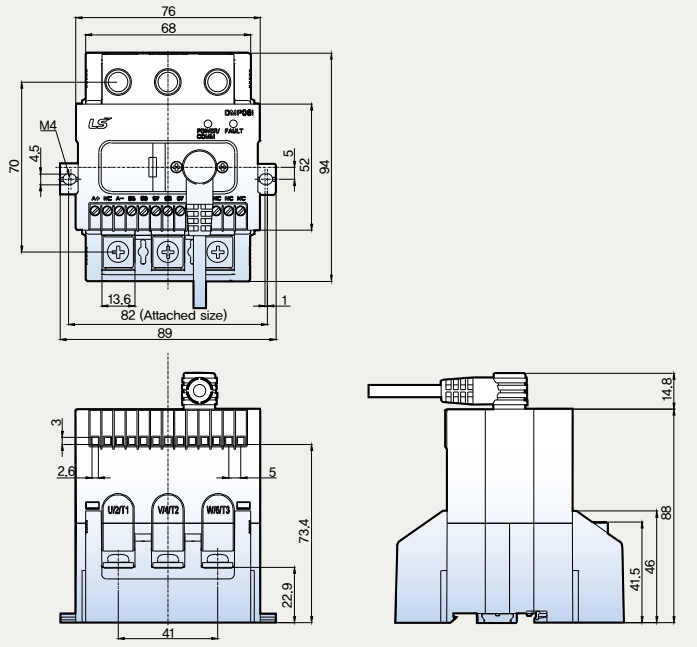
Dimensions

Unit : mm

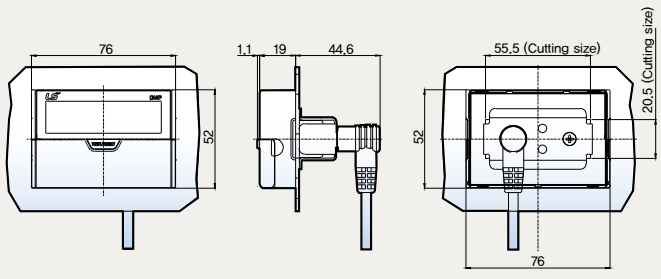
Integrated terminal type



Separated terminal type



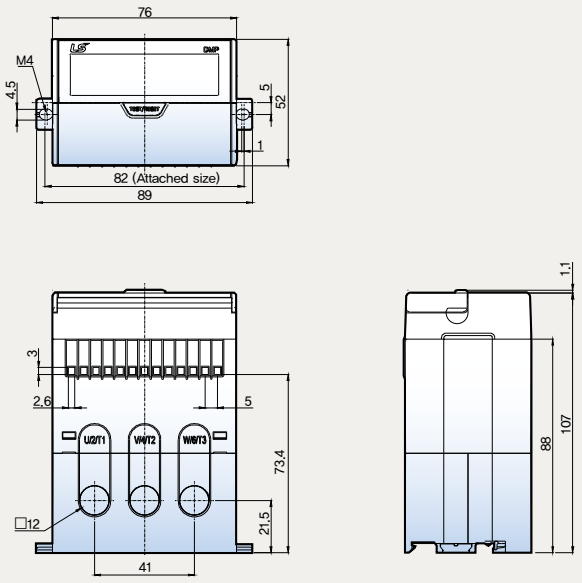
Panel insertion



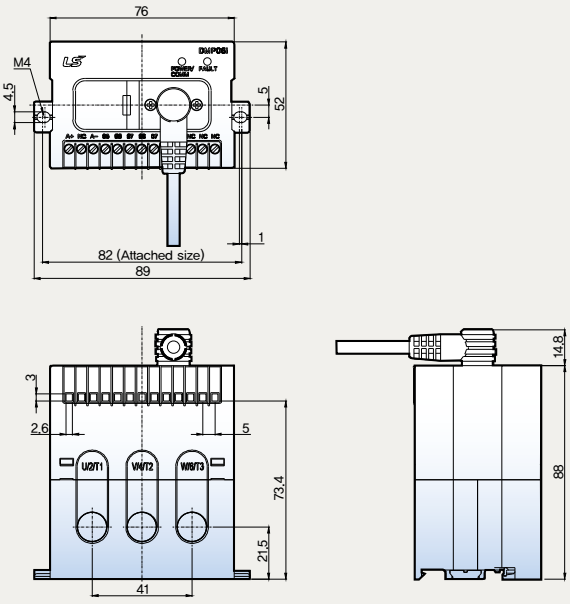
Dimensions

Unit : mm

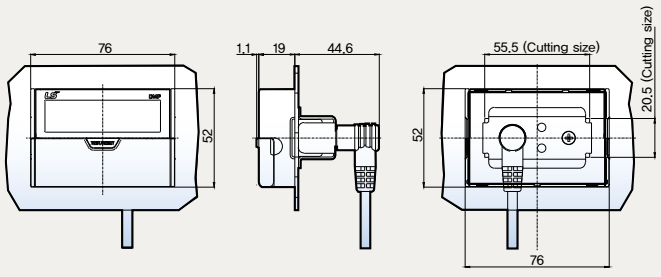
Integrated penetration type



Separated penetration type



Panel insertion



Optional accessories / CT (Current Transformer)

1) ZCT compact type (4 types)

Rated specifications

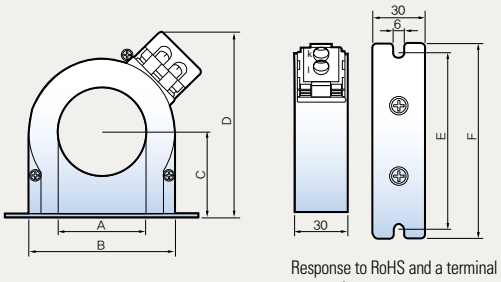
Unit : mm

Code	Model name	Inside diameter	Zero phase current transformer ratio	Weight
76512123030	LZT-030(V)	30	200mA/100mV LS-exclusive	0.5
76512123050	LZT-050(V)	50		0.7
76512123065	LZT-065(V)	65		0.9
76512123080	LZT-080 (V)	80		1.5

Dimensions

Unit : mm

ZCT 30, 50, 65, 80 (V)



Response to RoHS and a terminal cover exists

Model name	A	B	C	D	E	F
LZT-030(V)	30	59	36	78	80	90
LZT-050(V)	50	84	48	105	100	110
LZT-065(V)	65	101	57	120	100	110
LZT-080(V)	80	120	68	136	120	130

2) ZCT basic type (4 types)

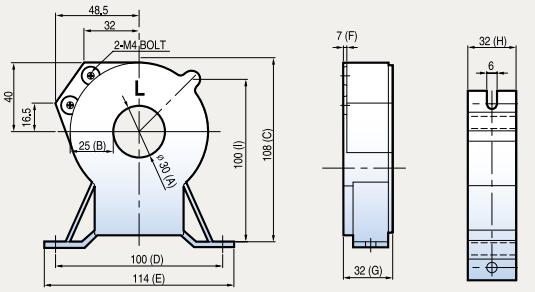
Rated specifications

Unit : mm

Code	Model name	Inside diameter(mm)	Zero phase current transformer ratio	Weight
76512121001	LZT-030	30	200mA/100mV (LS-exclusive]	0.5
76512121002	LZT-050	50		0.7
76512121003	LZT-065	65		0.9
76512121004	LZT-080	80		1.5

Dimensions

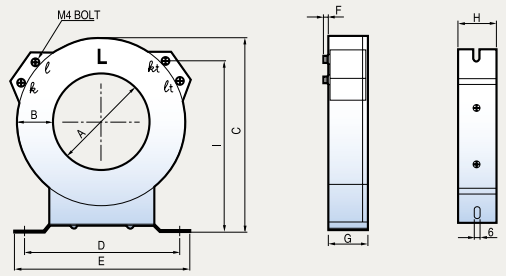
ZCT 30



Unit : mm

Model name	A	B	C	D	E	F	G	H	I	Ø
LZT-030	30	25	108	100	114	7	32	32	110	6

ZCT 50, 65, 80



Unit : mm

Model name	A	B	C	D	E	F	G	H	I	Ø
LZT-050	50	25	131	100	122	7	32	36	114	6
LZT-065	65	26	143	114	133	7	39	37	126	6
LZT-080	80	34	174	160	180	7	40	40	151	6

Optional accessories/CT (Current Transformer)

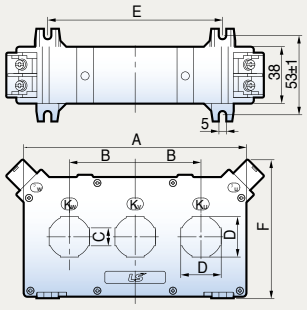
Rated specifications

Classification	Code	Model name	Primary current	Secondary current	Load(VA)	Penetrating hole [mm]	Upper installation EMPR	Remarks
3CT type	76012116026	3CT-23	50A	5A	1.5	21×21	GMP22/40/60T	1) Error class: Class 1.0 2) Insulation voltage: 690V 3) Withstanding voltage: 4kV/min 4) Overcurrent strength: 40 x 1n 5) Insulation resistance: 10MΩ (DC 500V Megger) 6) Frequency: 50/60Hz
	76012116011	3CT-23	80A					
	76012116012	3CT-23	100A					
	76012116013	3CT-23	150A					
	76012116014	3CT-23	180A					
	76012116015	3CT-23	200A					
	76012116016	3CT-43	100A			27×27	DMP/IMP/DMPi entire series GMP60-3T/3TN/3TZ GMP22/40/60T	
	76012116017	3CT-43	150A					
	76012116018	3CT-43	200A					
	76012116019	3CT-43	250A					
	76012116020	3CT-43	300A					
	76012116021	3CT-43	350A					
	76012116022	3CT-43	400A					
	76012116023	3CT-63	400A			45×30		
	76012116024	3CT-63	500A					
	76012116025	3CT-63	600A					
2CT type	76012116001	DCT-100	100A	5A	5	28.5×33.5	GMP22/40/60T	
	76012116002	DCT-150	150A					
	76012116003	DCT-200	200A					
	76012116004	DCT-300	300A					
	76012116005	DCT-400	400A					
1CT type	76012116006	SCT-100	100A	5A	5	27.5×32.5	DMP/IMP/DMPi entire series GMP60-3T/3TN/3TZ GMP22/40/60T	
	76012116007	SCT-150	150A					
	76012116008	SCT-200	200A					
	76012116009	SCT-300	300A					
	76012116010	SCT-400	400A					

*Note: If the CT secondary cable thickness is 2.5mm2, the load of 3m is 0.52VA.

Dimensions

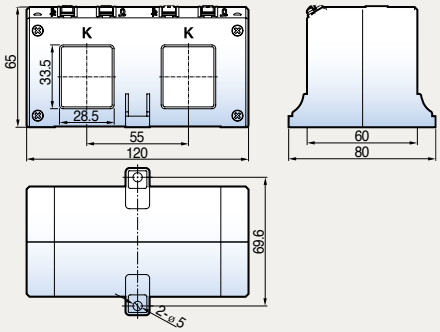
3CT type (3CT-□□)



Type	3CT-23	3CT-43	3CT-63
A	119	149	218
B	35	44	70
C	9	12	20
D	21.5	27	45/30
E	89	117	183
F	76	91	94

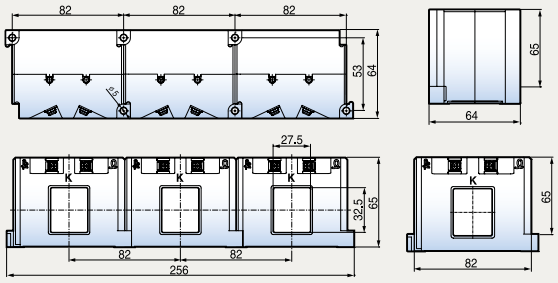
Dimensions

2CT type (DCT-□□□)



1CT type (SCT-□□□)

3 SCTs combined



Other options

Cable

Applied products	IMP, DMP, DMPi series
Specifications	1m, 1.5m, 2m, 3m
Use	For separated display installation

Cable code

Code	Model name
72312121063	TOTAL ASS'Y, ACCESSORY(1M), DMP
72312121064	TOTAL ASS'Y, ACCESSORY(2M), 2M, DMP
72312121073	TOTAL ASS'Y, ACCESSORY(1.5M), DMP
72312121074	TOTAL ASS'Y, ACCESSORY(3M), DMP

Terminal block

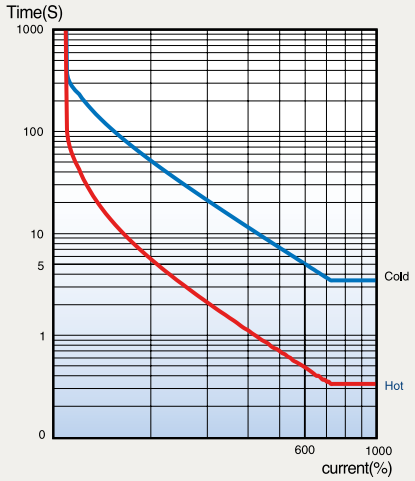
Applied products	DMPi series
Specifications	Less than 65A

Terminal block code

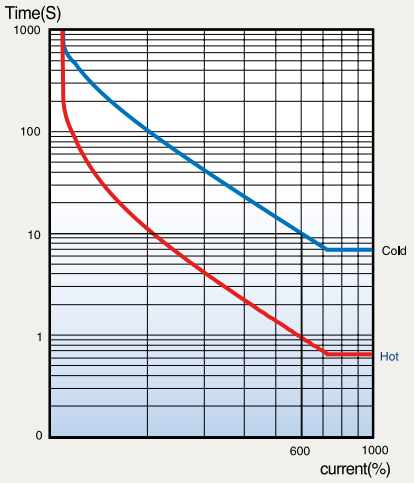
Code	Model name
62772121002	TERMINAL BLOCK ASS'Y, MAIN, DMP

Operating characteristic curve

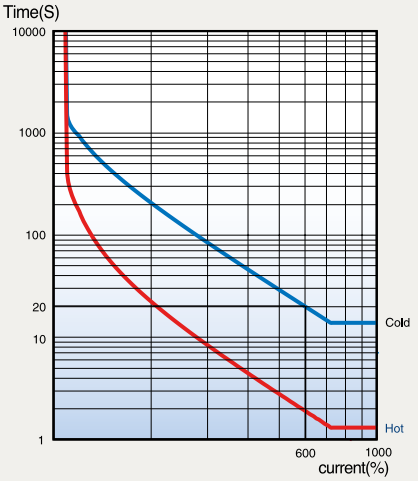
Class5



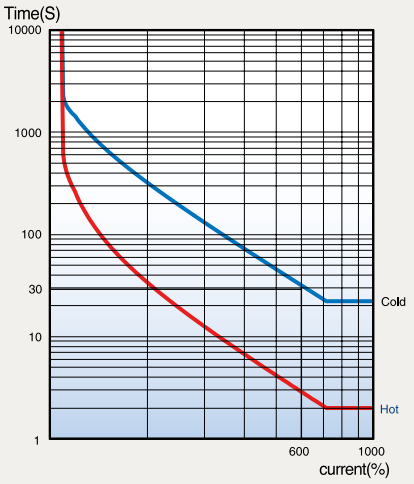
Class10



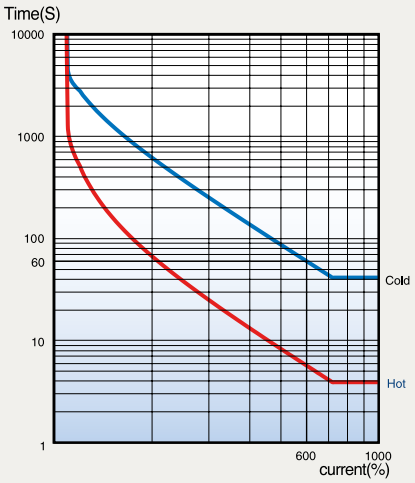
Class20



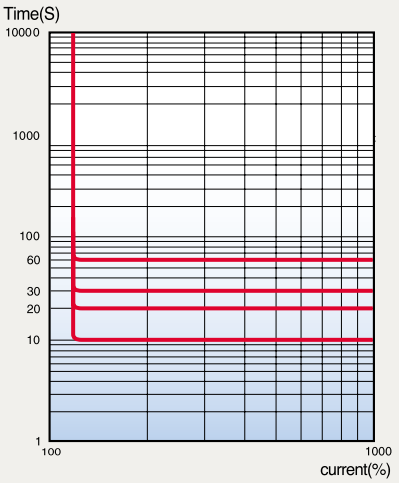
Class30



Class60



Definite time characteristic



Global Network

LSIS is engaged in business all over the world.
LSIS global network includes 7 overseas corporations,
12 overseas branches, and 224 clients in 77 countries.

▶ R&D

R&D campus

Focuses on gaining competitive advantages through development of next generation platforms

Power device R&D center

Leading technology in electric industry and continuously developing future-growth dynamic engines

Automation R&D Center

Serves as the main research institute for LSIS

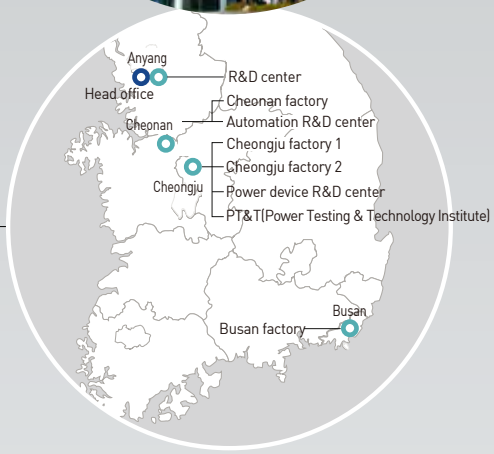
PT&T (Testing laboratory)

Internationally-renowned testing center that has formed partnerships with the UL, CE, KEMA and CESI

▶ Factory

Cheongju factory (Korea)

Electric products, mold TR, MV/LV switchgear, HV GIS



Cheonan factory (Korea)
PLC, AC drive, HMI, DCS, PV module

Busan factory (Korea)
HV TR, HVDC, FACTS

Wuxi factory (China)
Electric products

Dalian factory (China)
MV/LV switchgear, MV contactor

Hanoi factory (Vietnam)
MV/LV switchgear, Mold TR

FUTURING SMART ENERGY

We open up a brighter future through
efficient and convenient energy solutions.

Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

- According to The WEEE Directive, please do not discard the device with your household waste.

LS IS

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