



Smart Electronic Motor Protection Relay

S-EMPR MMP

Smart **E**lectronic **M**otor **P**rotection **R**elay



Energy



Communication



MotorControl



- **Buildings**

Office, Commercial, Residential, School, Hospital

- **Industrial facilities**

Petrochemical, Electronics, Glass, Iron, Semiconductor, Chemical, Pharmaceuticals, Cement, Paint

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- Power, Voltage & Current Metering (1% Accuracy)
- Power, Voltage, Current & Power Factor Protection
- Harmonic measurement (1–16 th)
- Various motor starting modes
(Full voltage, Y–D, Reverse, Reactor, Inverter)
- ModBus communication, 4~20mA supported



● Public Facilities

Gas, Water and Sewage, Airports, Railways, Seaports

S-EMPR

Smart Electronic Motor Protection Relay

In a Single Device Various Motor Starting Modes Available

S-EMPR provides several starting modes of operation as standard : Full voltage start, Y- Δ start, Reverse start, Reactor start, Inverter start, etc.





A variety of remote monitoring and control according to the sequence configurations

A simple sequence configuration enables the operation at Local Operation Panel or MCC. In addition, it provides the automatic operation using PLC or DCS and the remote monitoring and control via communication



Major Features and Benefits



Comprehensive Digital Motor Protection Relay with the MCU (Microprocessor Control Unit)

Providing real-time processing and high precision



Metering of Current, Voltage and Energy (with 1% accuracy for A & V)

Real-time energy metering with high accuracy to support energy-saving
Current / Voltage THD measurements (16 harmonic)



Carrying out complex relay functions related to Current, Voltage, Energy and Power Factor

Overpower alarm supported for energy monitoring



Wide setting range and Dual protection

Providing Ground fault protection by dual detections -
Zero-phase current and Residual current levels.



One-Body Type and Separate Body Type

The display unit can be separated from the device to mount on the face of the panel, which enables the access to the unit without opening the door. All the functions remain unchanged after the separation.



Applicable to Speed drivers

It can be installed in the downstream of a speed driver where harmonic noise exists. The allowable frequency range is 10 to 400Hz.

A harmonic filter must be used if THD (Total Harmonic Distortion) is over 30%.

* Set the ground fault mode off to avoid the trip due to current unbalance.

* Voltage parameters are not available. Power measurement accuracy is not guaranteed.



Various Motor Starting Modes

In a Single Device several starting modes of operation available :

Full voltage start, Y- Δ start, Reversible start, Reactor start, Inverter start.

Features



Up to 100A the device can be used without external CT to providing convenience and cost-effective solution.



Storage of Fault Events
Up to 5 fault events can be stored for easy fault history management.



Various Reset Modes
Manual, automatic and electric reset modes are provided for customer convenience.



Quick Setup
Same setting for another devices in different panels can be done simply via the display unit.



Self-diagnosis and Sequence monitoring
Providing a self-diagnosis function such as internal memory check in order to check fault conditions quickly



Time stamping
Time-stamping of each fault is provided. When a fault occurs, its date and time are stored for easy checkup.



Power loss and Restarting
Device restarts after the momentary power loss for less than 30 seconds and returns to the former state. Time-delay setting between 0 to 300 sec. is available to prevent overload from all the motors' restarting at the same time.



Running time setting
If the motor running time exceeds the setting value the device can issue a signal for the motor bearing replacement and lubrication.



Frequent-Starting Protection
The number of automatic resets for the set time (20 minutes) is settable to provide frequent-starting protection.



Communication
The device supports universal RS485 / MODBUS which enables communication network with various systems. The model with analogue signals (4~20mA) is compatible with the conventional transducer systems.



Password
The settings can be password protected.



Trip time curves
Thermal-inverse Time, Inverse Time and Definite Time curves are provided.

Ratings

Ratings

Connection		Tunnel type (Passing through CT holes)
Operation characteristic		Thermal-inverse / Inverse / Definite
Rated current		0.5~10A / 5~100A
Display screen		7-SEGMENT, LED
Control Power		AC 100~260V, 50 / 60Hz
Reset	Auto	1~20 minutes
	Manual	ON / OFF selectable
Mounting		Display unit : separately mountable
Accuracy		Current and voltage metering : $\pm 1\%$ of rating or $\pm 2\%$ of minimum rating
		4~20mA output : $\pm 5\%$
Time delay	Start	1~200 seconds
	Operation	1~60 seconds
Auxiliary contacts		6 contacts (3A / 250VAC at resistive load, power type based)
ZCT input		1~200 seconds
		1~60 seconds
Environment	Operation Temp.	-10~55℃
	Storage Temp.	-20~70℃
	Humidity	RH 80% or under (non-condensing)
Insulation resistance		100MΩ / 500VDC
Lightning impulse voltage		1.2 × 50μs 5kV standard waveform applied
Fast transient		2kV / 1Min
Power consumption		5W or under

Protective functions

Product functions

Type	Function	MMP-C (Current type)	MMP-P (Power type)
Currents	Overcurrent	●	●
	Phase loss	●	●
	Imbalance	●	●
	Phase reversal overcurrent	●	●
	Locked Rotor	●	●
	Stall	●	●
	Undercurrent	●	●
	Zero-phase ground current	●	●
	Residual ground current	●	●
	Instantaneous	●	●
Voltages	Overvoltage	-	●
	Undervoltage	-	●
	Phase loss	-	●
	Imbalance	-	●
	Phase reversal overvoltage	-	●
Power	Overpower	-	●
	Underpower	-	●
	Over power factor	-	●
	Under power factor	-	●

Measurement function

Measurement	Range	Accuracy	Remarks
Voltage	0.00V~9999V	± 1.0%	Phase1 : Phase voltage, Phase3 : Line voltage
Current	0.00A~9999A	± 1.0%	Phase current
Zero-phase current (I _n)	0.00A~9999A	± 3.0%	
Reverse current (I ₂)	0.00A~9999A	± 3.0%	
Active power (W)	0.000W~999.9MW	± 1.0%	Forward
Reactive power (VAR)	0.000W~999.9MVAR	± 1.0%	Forward
Active power amount (WH)	0.000W~999.9MWH	± 1.0%	
Reactive power amount (WVARH)	0.000W~999.9MVARH	± 1.0%	
PF	-1.00~1.00	± 0.03	cosθ
Voltage hamonics (%)	0~100%	± 5.0%	2nd~63th harmonics
Current hamonics (%)	0~100%	± 5.0%	2nd~63th harmonics

Current protection

Overcurrent

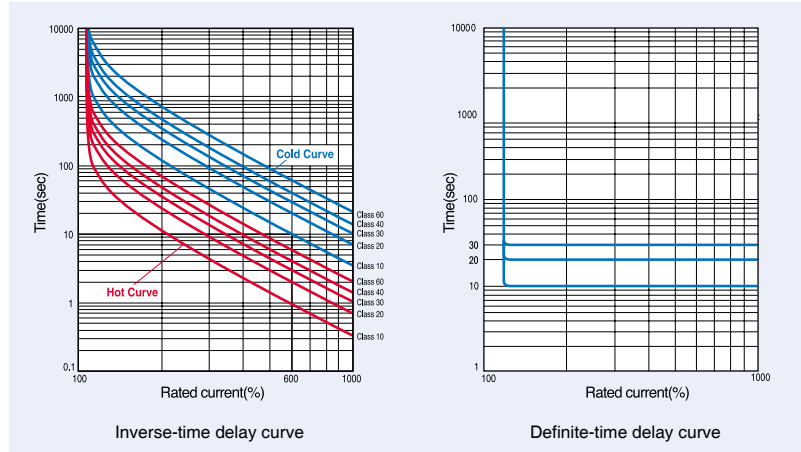
The device provides overcurrent protection either with inverse-time or with definite-time element.

1) Inverse-time delay curve

The trip time decreases as the overcurrent increases in an inverse-time curve.

2) Definite-time delay curve

The operating time is unaffected by the magnitude of the overcurrent.



Undercurrent

If the real load current falls below the warning or trip level for longer than the time-delay setting, the device can issue a warning or trip signal.

Phase loss, Phase unbalance

The motor is unable to start under phase loss. If it occurs while the motor is running it causes motor stopping by lack of torque, or significant rotor heating by reverse current.

The S-EMPR calculates the percent three-phase unbalance current. If it exceeds 70%, which is determined to be phase loss, the device trips within 1.5 sec. If it is between 10 to 70% the device trips within 3 sec. This function is disabled for a single-phase mode.

Phase reversal

This protection is for preventing the motor from reverse rotation. The device detects motor phase rotation and trips within 0.1 sec. if phase sequence is incorrect. It detects when the motor is starting.

* This function is disabled for a single-phase mode.

Stall, Locked Rotor

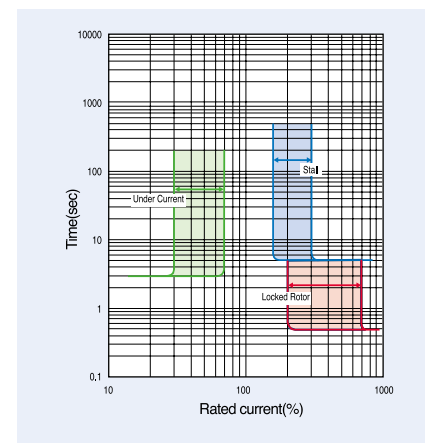
Stall activates when the motor is unable to rotate due to any external mechanical obstruction, and Lock activates due to internal issue of the motor.

Ground fault

Ground fault protection detects the main circuit or winding of the motor and operates when the ground fault occurs.

Instantaneous overcurrent

If the real load current becomes greater than the instantaneous setting while the motor is running, the device can issue a trip signal within 50msec.



Protective functions

Voltage & Power Protection

- **Overvoltage**

Overvoltage protection detects the voltage levels and operates if they are greater than the setting to protect the sensitive loads or circuits against such condition.

- **Undervoltage**

If the voltage levels fall below the setting the Undervoltage protection issues a warning or trip signal to protect the sensitive loads such as a inductive motor.

- **Phase loss, Phase unbalance**

This protection operates if the percent phase-to-phase voltage unbalance is greater than the setting. Used to prevent an excessive vibration of three-phase induction motor and a damage of the stator and rotor windings. This function is disabled under a single-phase mode.

- **Phase reversal**

This protection operates if the percent phase reversal voltage is greater than the setting. It detects when the motor is starting. This function is disabled for a single-phase mode.

- **Overpower**

The overpower element operates if the three-phase active power exceeds the setting level. This element can be used to prevent the power from entering the generator before disconnecting from the system when the generator operation is finished.

- **Underpower**

The underpower element operates if the three-phase active power falls below the setting level.

- **Over Power Factor**

The over power factor element operates if the power factor exceeds the setting level. If the load is very small, especially for no-load the capacitive current may flow due to over-capacity of the capacitor in line, which causes the power loss of the line and transformer, and electric stress on motors. This element can be used to protect against such current.

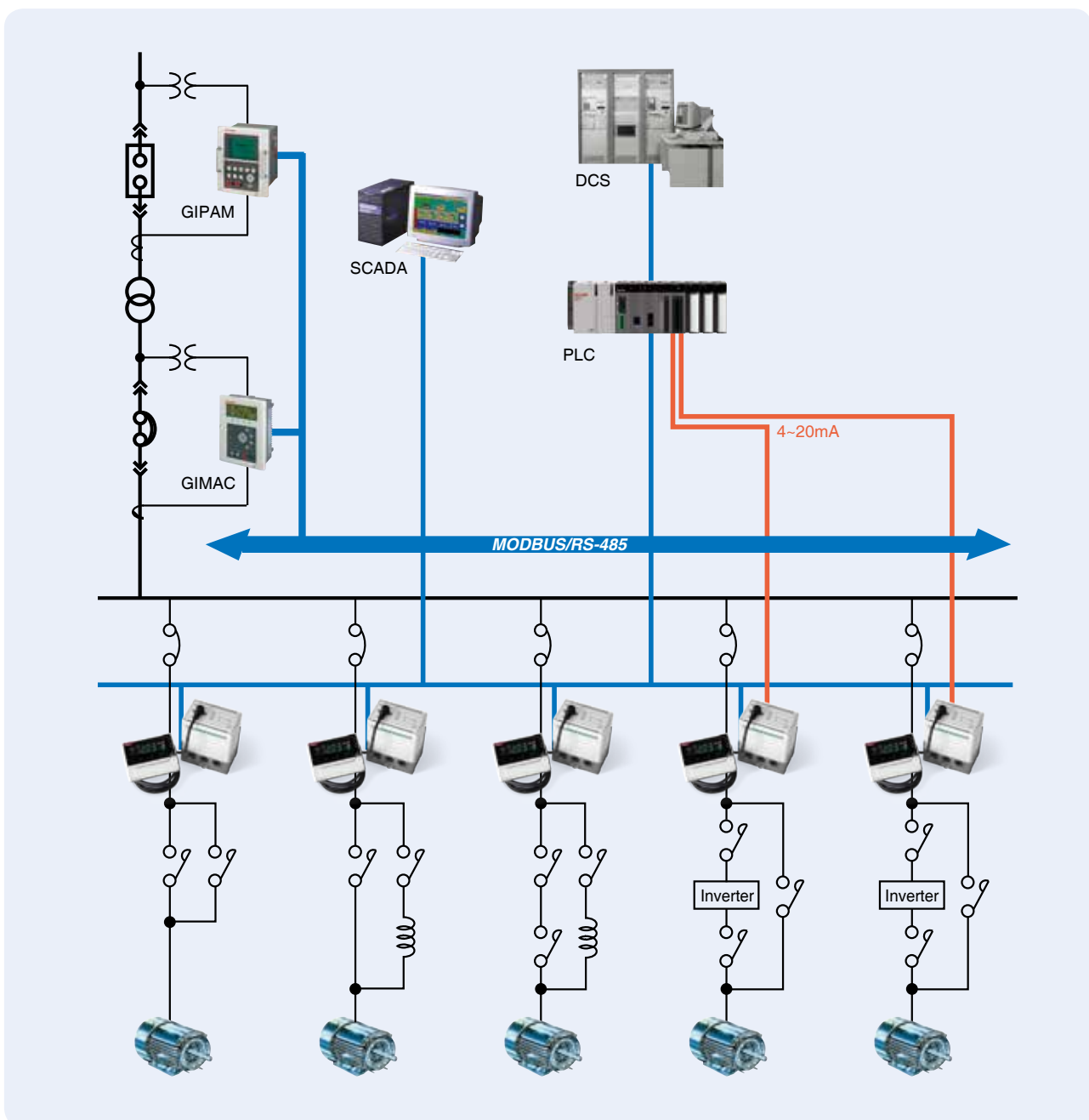
- **Under Power Factor**

The under power factor element operates if the power factor falls below the setting level. If the power factor of a customer falls below that of a generator in a power plant the generator current increases over the rated current or the power output is limited. For this reason, the power factor of a customer is regulated. In addition, the under power factor causes the increase of the input current which prevents the temperature rise in cables, transformers and motors.

Modbus Specification

Communication number	1~247
Baud rate	9600, 19200, 38400 bps
Communication Parity	None, even, odd
Stop bit	1bit (fixed)
Communication data swap	OFF / ON (Limited to float, long data of 0x04 (Read Input Registers))

Communication system configuration



Analog (4~20mA) output function

Specification

- This function measures the maximum out of the 3-phase currents and converts it into DC 4~20mA for output, which can be converted back to the original value by a digital meter.
- 20mA Output Settings : 0.5~10A or 5~100A

Note) 1. In the 0.5~10A setting mode the device starts to measure from 0.15A, which means the current 0.15A or less is measured as 0A and the output becomes 4mA.
(0.15A when one> 4mA is being a real measurement)
2. Accuracy at 25°C : : ± 0.15% / °C

- During stopping : 4mA
- Rated setting value or more : 20mA
- Load : 500Ω or less
- Output : 4mA for no current,
20mA for the rated setting value or more

Note) The allowable burden of cable must be less than 500Ω. Shielded cables are recommended in consideration of the resistance of the receiving meter (typically 250Ω) and the line resistance

$$\begin{aligned}
 \text{*Output current} &= \frac{(I_{\text{upper}} - I_{\text{lower}})}{\text{TD setting}} \times \text{load current} + 4\text{mA} \\
 &= \frac{16\text{mA}}{\text{TD setting}} \times \text{load current} + 4\text{mA}
 \end{aligned}$$



Analog output for 10A (100A) output setting

Before starting the motor, proceed as follows :

1. Connect the display unit to the main unit of the device and then turn on.

Verify that Power LED is switched on and the measurement screen is displayed.

- 1) Verify the operations of ON, REV and STOP keys which are used to control motor starting. Press ON key and then the red LED above the key is switched on and motor on signal is issued. Press STOP key and then the green LED above the key is switched on and motor on signal is stopped.

Note) REV key is activated when the motor control is set to reverse starting mode.

- 2) Verify the operations of a mode control key. Each time pressing L / R key the control mode changes : MCC → AUTO → REMOTE → COM
- 3) When the device is booted up the measurement screen is displayed by default. Pressing Enter key allows to access the modes : Group → Menu → Setting value. Press Esc key to return to the previous mode.
Use Up & Down keys to change values in the screens of Measurement, Group, Menu, Setting. When the relay / alarm operates press Reset key to reset.

Note) refer to a manual for the details.

2. Verify the operations of Test function and Reset key through trip.

- 1) Verify the wiring first. Press Enter key to access Group menu, and use Up / Down keys to access B Group as shown "b-gr" and press Enter to access Menu with displaying "1.Loc". Use Up / Down keys to access "6.r-p" which denotes Phase reversal menu, and press Enter to access "CHEC" which denotes Setting value, and press Enter to view current wiring information.

Note) 1. The phase information is displayed only when current is applied. If there is no current "----" is displayed.

2. Voltage wiring information is available via "c-gr" (C group) → "8.urp" (Voltage phase reversal settings) → "CHEC" → Pressing Enter Key. The phase information is available when a voltage is applied.

- 2) Turn on the motor and access "d-gr" which denotes D group and move to "tEst" menu using Up / Down keys and press Enter to access Fault items. Select the desired Fault item and press Enter to trip the device.
- 3) Press Reset key to reset the device and return to the measurement screen.

Note) In the first access to change a parameter "P-99" for password input is displayed. Press Up key to change it to "P-00" and press Enter and then Setting change is allowed. If there is no input for 2 minutes it returns to the measurement screen.

3. Check the settings.

- 1) At normal state pressing Enter key access mode "A-gr" which enables setting. Select the desired group using the Up / Down keys and press Enter key to enter the desired group. To enter previous mode, press the Esc key.
- 2) The desired group displays from No. 1 menu. Select the desired menu using the Up / Down keys and press Enter key to enter the setting mode. To enter previous mode, press the Esc key.
- 3) Press Up / Down keys in the setting screen and then "P-99" is displayed. Press Up / Down keys to change the password to "P-00" and press Enter to release it. After that select the desired value and press Enter to save the setting.

Note) enter the date exactly when the power is turned on for the first time or recovered after the outage.

Operation and Setting

A-group

Group	Menu	Description	Setting range	Default
A	1PFA	Single-phase / 3-phase	1P / 3P	3P
	25-F	Frequency	50 / 60	60
	3CHA	Characteristics (Over Current Protection)	OFF / DEF / th / n-th	n-th
	40-t	Operating time	1~60초 (5 / 10 / 20 / 30 / 60)	60
	5d-t	Time Delay	1~200s	200
	6r-C	Rated current (10, 100) ^{Note) 2}	0.5~10 / 5~100	10
	7Cr-t	CT ratio	0.25 / 0.5 / 1~200	1
	8drU	Starting mode	dir / y-d / F-r / Ind / lut	dir
	9d-t	Y start time (lut start time)	1~120s (lut : 0.1~1s)	5 (0)
	10Yd	Y-D switching time	0.05 / 0.1 / 0.2	0.2
	11St	Outage compensation time	OFF / 1~30s	OFF
	12Sd	Restart time	0~300s	0

Note) 1. Operating characteristic th denotes inverse-time curve with thermal-memory and n-th denotes inverse-time curve without thermal-memory .

2. For the 100A type there is no CT ratio as it is fixed as 1.

3. Some menu are not disabled depending on the related setting.

4. Phase reversal mode needs to be switched on only during test starting, or verify wiring via wiring CHEC function. it is recommended to turn off during normal running. . (An error on phase reversal may occur due to noise.)

B-group

Group	Menu	Description	Setting range	Default
B	1Loc	LOCK	OFF / 200~800%	OFF
	2StL	STALL	OFF / 150%~500%	OFF
	3P-F	Phase loss (current)	ON / OFF	ON
	4P-U	Phase unbalance (current)	OFF / 30~70%	OFF
	5Pdt	Phase loss / unbalance Time-delay	0~200s	0
	6r-P	Phase reversal (current)	OFF / ON / CHEC ^{Note) 3}	OFF
	7Cr-t	Phase reversal operation time	0.1~1.0	0.1
	8U-C	Undercurrent	OFF / 30~90%	OFF
	9Ect	ZCT selection (PC mV, 1.5mA)	100 / 1.5 ^{Note) 4}	100
	109F	Ground fault (Zero-phase)	OFF / 0.03 / 0.05 / 0.1~3.0	OFF
	119n	Ground fault (Residual current)	OFF / 30~100%	OFF
	129t	Ground fault operation time	0.05~1.0s	1
	139d	Ground fault Time-delay	0~200s	60
	14IC	Instantaneous protection	OFF / 500~5000%	OFF
	15AL	Output contact method	I-tp, Alo, U-C, OrH	I-tp
	16Ar	Current Y / N, Alarm	ON / 60~110%	ON
	17th	THD (Current)	0~100%	단위 : %

Note) 1. Enter the date (5.S-d) exactly when the power is turned on for the first time or recovered after the outage.

2. The automatic reset functions only when the device is tripped by overload.

3. Wiring information is displayed in case of selecting the setting value of CHEC in Phase reversal mode.

4. ZCT selection depends on the product - either a dedicated product or an universal product.

C- group : Menu for Power type activation

Group	Menu	Description	Setting range	Default
C	1r-u	Rated voltage (line to line)	110~480	380
	20-u	Overvoltage	OFF / 105~130%	OFF
	30-t	Overvoltage operation time	1~30s	30
	4U-u	Undervoltage	OFF / 50~95%	OFF
	5U-t	Undervoltage operation time	1~30s	30
	6uPF	Phasee loss (voltage)	OFF / ON	OFF
	7uPU	Unbalance (voltage)	OFF / 5~40%	OFF
	8urP	Phase reversal (voltage)	OFF / ON / CHEC	OFF
	9urt	Phase reversal operation time	0.1~1.0s	1
	10nP	Rated power	0.1~999.9KW	999.9
	110P	Overpower	OFF / 100~800%	OFF
	12Pt	Overpower operation time	1~100s	100
	13UP	Underpower	OFF / 20~100%	OFF
	14Pt	Underpower operation time	1~100s	100
	150F	Over power factor	OFF / 0.20~1.00	OFF
	16Ft	Over power factor operation time	1~30s	30
	17UF	Under power factor	OFF / 0.20~1.00	OFF
	18Ft	Under power factor operation time	1~30s	30
	19rY	Relay output selection	u-AL / u-tP	u-tP
	20 1P	Reactive power (meter)	0~999.9 Mvar	Unit : Kvar

Operation and Setting

D-group

Group	Menu	Description	Setting range	Default
D	1trt	Total running time	0~9999day / 0~23h / 0~59m	—
	2r-t	Running time	0~9999h / 0~59m	—
	35rt	Running time setting	OFF / 10~8760	OFF
	4cch	Contactor check	OFF / ON	OFF
	55-d	Date ^{Note) 2}	2013~2100y / 1~12 (Mon), 1~31 (Day) / 0~23h, 0~59m	2014.01.01. 0 : 00
	6ccc	Contactor counter ^{Note) 1}	—	—
	7FLt	Fault cause check ^{Note) 3}	1. The most recent 2. The 2nd. recent 3. The 3rd. recent 4. The 4th. recent 5. The 5th. recent	—
	8A-r	Automatic reset time	OFF / 1~20m	OFF
	9r-n	Automatic reset number	OFF / 1~5	OFF
	10Ad	Communication address ^{Note) 4}	1~247	247
	11b5	Communication speed ^{Note) 4}	9.6 / 19.2 / 38.4K	9.6K
	12SP	Swap ^{Note) 4}	ON / OFF	OFF
	13Pr	Parity setting ^{Note) 4}	nonE / odd / EUEn	nonE
	14td	20mA setting ^{Note) 4}	0.5~10 / 5~100	10 / 100
	r5t	Stored data deletion	All : for all subparameters A-P : active energy rA-P : reactive energy trt : total running time CCC : contactor counter CALo : calories FALt : fault events	—
	tEst	Operation test	o-L : overcurrent test o-U : overvoltage test g-F : ground fault test I-C : instantaneous test	—

Note) 1.The contactor operation is counted up to 65000cycles and then initialized.
2.The date setting can be stored after filling up month, day, hour and minute.
3.The trip cause can be stored up to 5 recent events and then the oldest event is deleted first.
4.10.Ad, 11.bs, 12.SP, 13.Pr, 14.td are available for communication type products.
5.Data clear and test can be inputted in the normal state, and test items can be viewed while a motor is switched on.

4. Up & downloading of all settings once (Quick setup)

- 1) Press Up and Enter keys at the same time at the status of normal, MCC mode and motor stop, then "UPLd" begins to flash on the screen which denotes the setting values of the device are being uploaded in the display unit and "U.END" is displayed when completed. Press Enter key to return to the measurement screen.
- 2) After installing the uploaded display unit onto the device that is not set yet, press Down and Enter keys at the same time at the status of normal, MCC mode and motor stop, then "dnLd" begins to flash on the screen which denotes the setting values of the display unit are being downloaded in the device and "d.END" is displayed when completed. Press Enter key to return to the measurement screen.

Note) 1. Up & downloading is available between the same models. If the models are different each other an error occurs with "d.Err" message.
2. Up & downloading of date, running time and fault cause are not available.

5. Checking fault history

- 1) Press Esc and Enter keys at the same time in the measurement screen, then the most recent fault cause in #7 menu of D-group is displayed.
Note) If there is no fault history "1.non" is displayed.
- 2) Use Up and Down keys to move to the desired one out of 5 fault events and select by pressing Enter key.
- 3) The fault current of phase R is displayed. Each time pressing the down key following informations are displayed in turn : fault current of phase S / fault current of phase T / overload ratio / date
- 4) To enter the previous mode, press Esc key.
- 5) Press Esc and Enter keys at the same time to return to the measurement screen.

6. Forced reset of thermal memory

Press Esc and Stop keys at the same time to make the tripped motor become a cold state by force when operating characteristic is set to inverse-time curve with thermal-memory (th).
If a motor is tripped due to overcurrent the immediate pressing of reset key at the hot state of the motor causes immediate tripping. To avoid it reset via pressing Esc and Stop keys at the same time which makes the motor cold state.

Operation and Setting

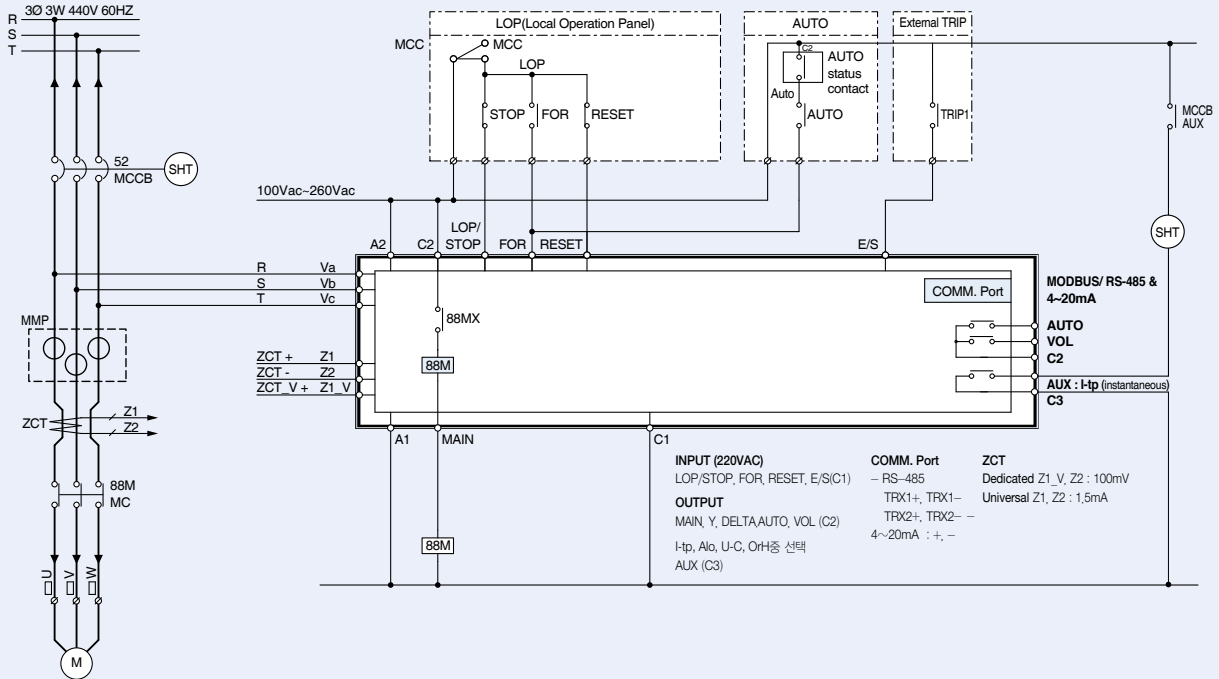
Fault cause information

	Screen	Fault cause	Additional information
Current		Overcurrent	phase, load rate, time
		Lock	phase, load rate, time
		Stall	phase, load rate, time
		Phasee loss	phase, unbalance rate, time
		Phasee unbalance	phase, unbalance rate, time
		Phase reversal	time
		Undercurrent	phase, load rate, time
		Instantaneous	phase, load rate, time
		Ground fault (ZCT)	phase and neutral, time
		Ground fault (Residual)	phase and neutral, time
Voltage		Overvoltage	phase, rate, time
		Undervoltage	phase, rate, time
		Phasee loss	phase, unbalance rate, time
		Phasee unbalance	phase, unbalance rate, time
		Phase reversal	time
Power		Overpower	phase voltage, rate, time
		Underpower	phase voltage, rate, time
		Over power factor	phase voltage, rate, time
		Under power factor	phase voltage, rate, time
Others		External input trip	time
		Error.1 occurred	Current detected after motor off
		Error.2 occurred	No current detected after motor on
		Error.3 occurred	For / Rev starting signal input at the same time in local / auto mode
		Error.4 occurred	External storage memory error
		Running hour over	Alarm occurs when accumulated running hour is over the setting value
		Display comm. error	Comm. error occur between display unit and device. ※ Please contact us.
	Ex) 	Version check	Press Reset+Esc keys in normal state

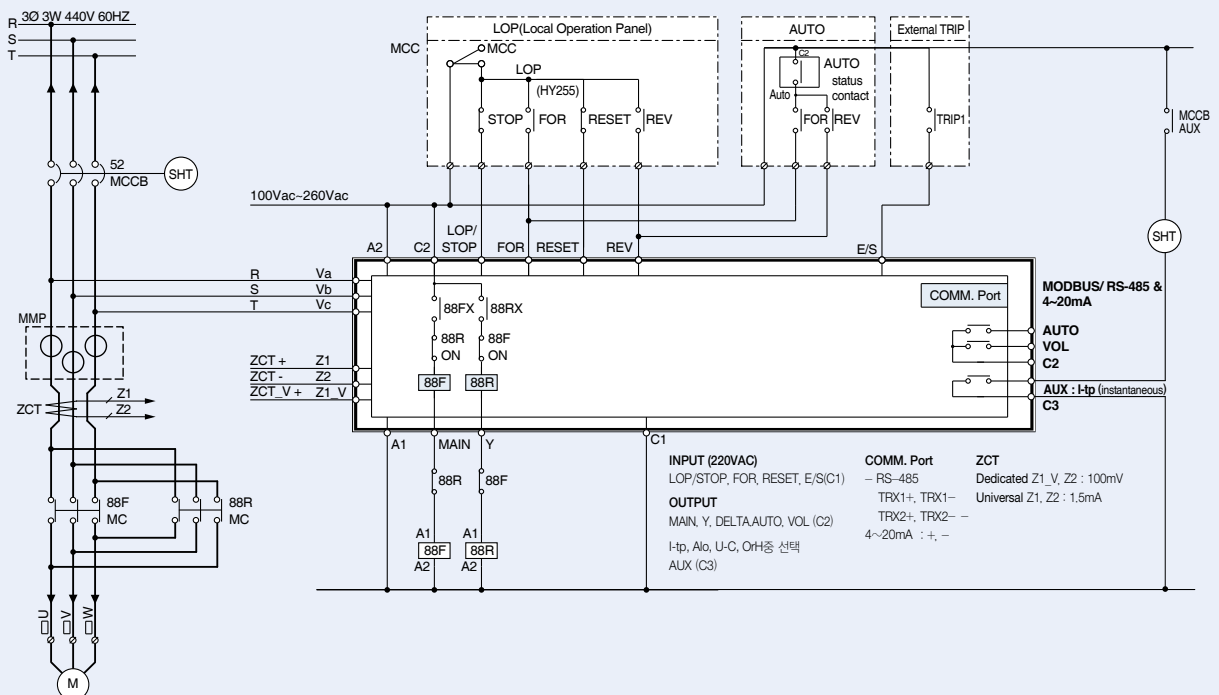
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Wiring Diagram

Full Voltage Start



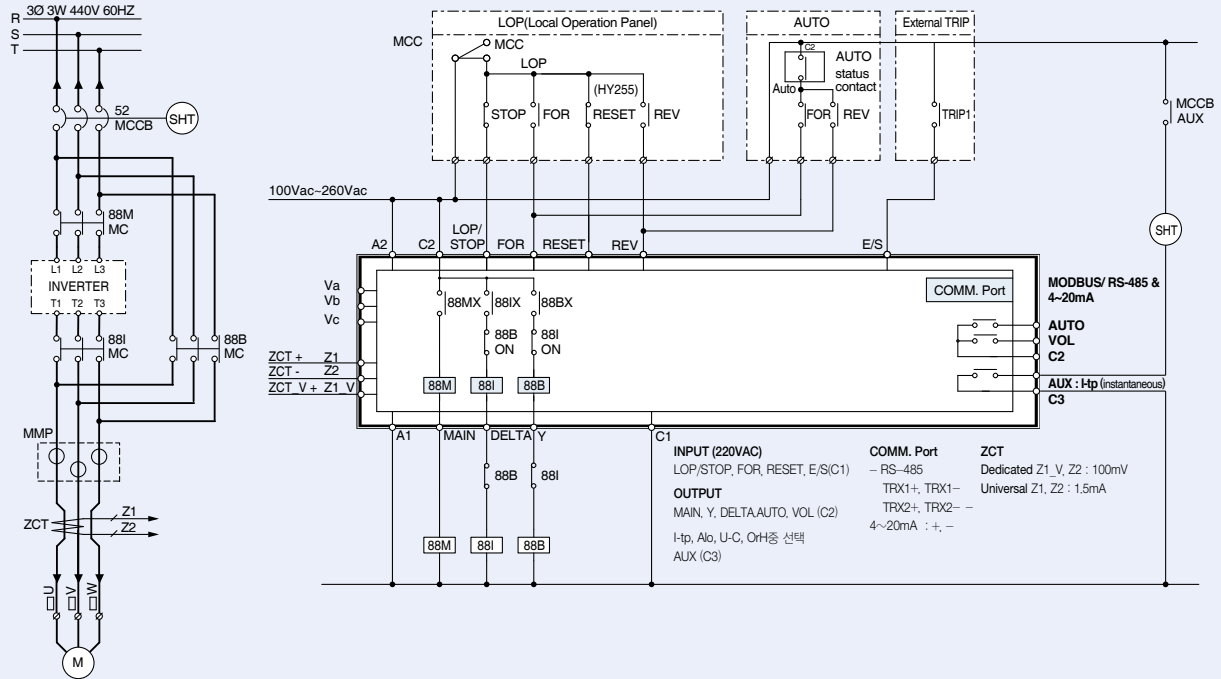
Reversible operation



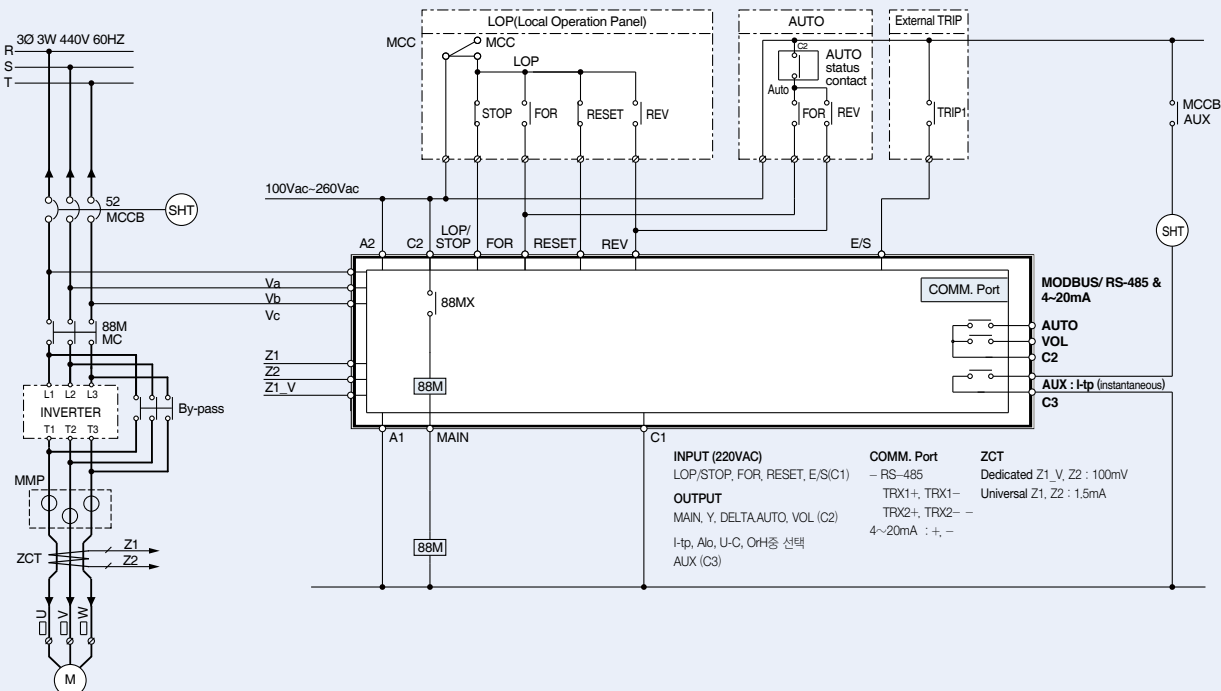
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Wiring Diagram

Inverter Start (Current)



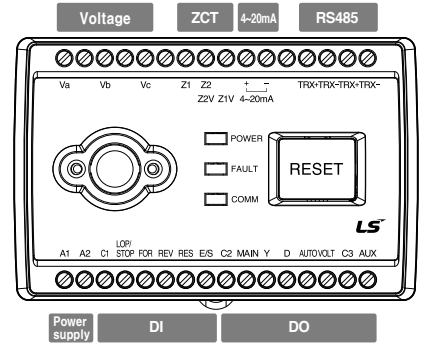
Soft Starter Start



Accessories

Terminal Configuration

Terminals	Description	Remarks
Va, Vb, Vc	Voltage input	Current model Blank
Z1, Z2	ZCT input	Universal (Z1, Z2 : 1.5mA)
Z2V, Z1V		Dedicated (Z2V, Z1V : 100mV)
4~20mA (+), (-)	4~20mA output	
TRX1+, TRX1-	RS485 communication	Modbus
TRX2+, TRX2-		
A1, A2	Control power input	100~260 [Vac] 50 / 60Hz
C1	Contact input Common	
LOP / STOP, For, Rev, Reset, E / S	Contact input	ES : Input for Emergency Stop
C2	Relay output Common	
Main, Y, Delta, Auto, Voltage	Relay output	Voltage : output contacts for voltage & power elements
C3	Relay output Common	AL output
Aux	Relay output	Current element output contacts

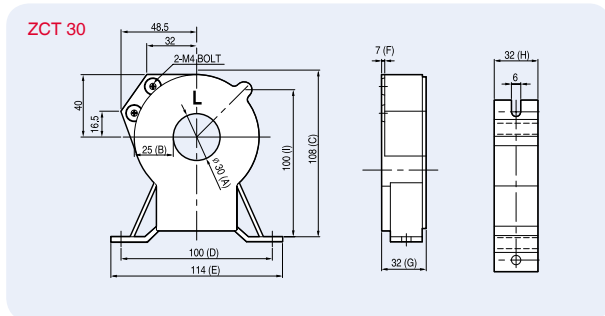


ZCT (Zero-phase Sequence Current Transformer)

• Specification

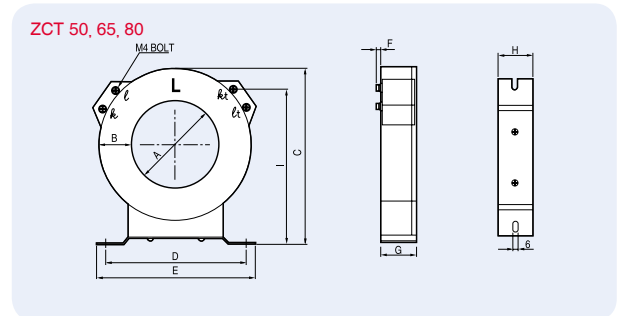
Ordering type	Diameter (mm)	Current ratio	Weight (kg)	Model
ZCT, D30	30	100mA / 40~55mV 200mA / 100mV	0.5	LZT-030
ZCT, D50	50		0.7	LZT-050
ZCT, D65	65		0.9	LZT-065
ZCT, D80	80		1.5	LZT-080

• Dimensions



Unit (mm)

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



Unit (mm)

Model	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

Other accessories

• Cable



For use with	MMP, DMP, IMP series
Length	1m, 1.5m, 2m, 3m, 4m
Application	Connection for the separate mounting of a display unit

S-EMPR MMP

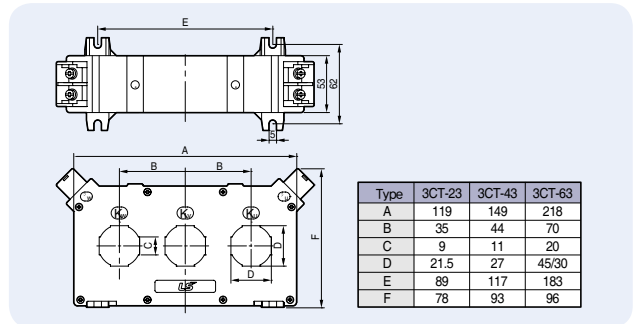
Accessories



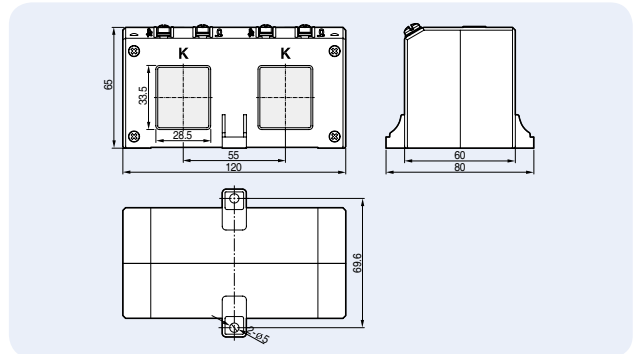
Type	Model	Primary current	Secondary current	Burden (VA)	Hole size [mm]	EMPR for use with	Remarks
3CT	3CT-23	50, 80, 100, 150, 180, 200A	5A	1.5	21 × 21	GMP22 / 40 / 60T	1) Accuracy : Class 1.0 2) Insulation voltage : 690V 3) Dielectric strength : 4kV / lmin 4) Overcurrent strength : 40 × In 5) Insulation resistance : 10MΩ (DC 500V Megger) 6) Frequency : 50 / 60Hz
	3CT-43	100, 150, 200, 250, 300, 350, 400A			27 × 27	MMP / DMP / IMP / 전체 GMP60-3T / 3TN / 3TZ	
	3CT-63	400, 500, 600A			45 × 30	GMP22 / 40 / 60T	
2CT	DCT-100	100A	5A	5	28.5 × 33.5	GMP22 / 40 / 60T	
	DCT-150	150A					
	DCT-200	200A					
	DCT-300	300A					
	DCT-400	400A					
1CT	SCT-100	100A	5A	5	27.5 × 32.5	MMP / DMP / IMP / all GMP60-3T / 3TN / 3TZ GMP22 / 40 / 60T	
	SCT-150	150A					
	SCT-200	200A					
	SCT-300	300A					
	SCT-400	400A					

Note) If the secondary wire size of CT is 2.5㎟ the burden for 3m length is 0.52VA.

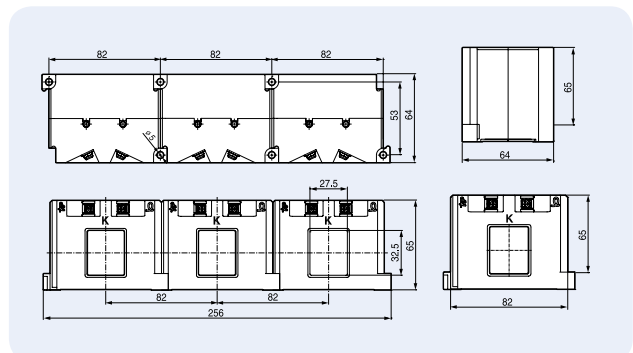
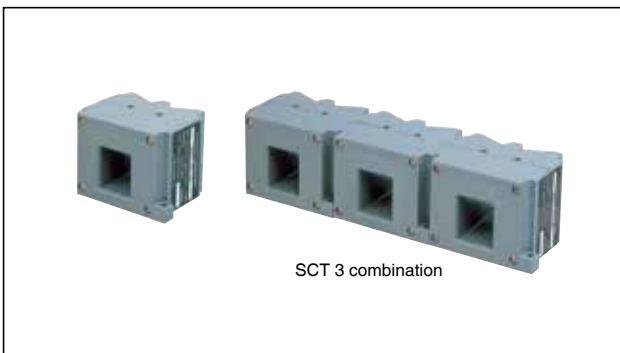
● 3CT



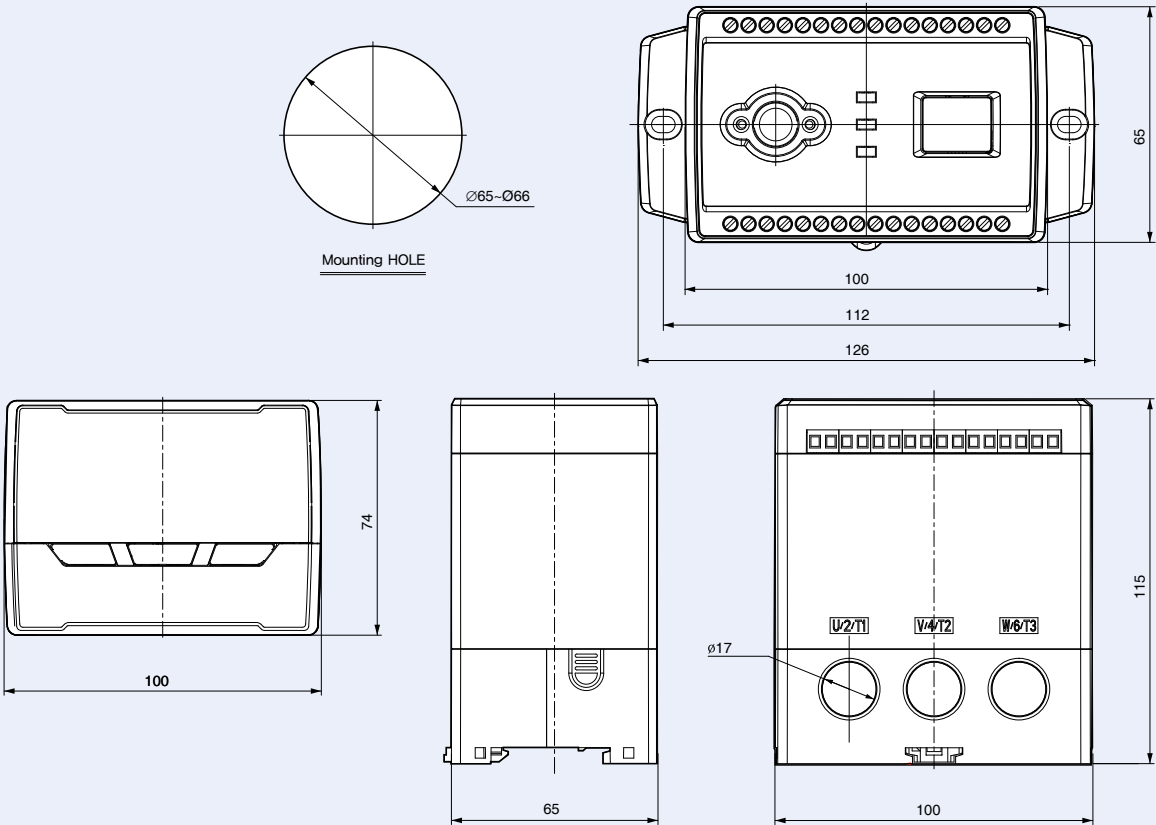
● DCT



● SCT



Dimensions



Ordering information

MMP

C

B

10

Function

C

P

Current

Power

Communication

B

M

None

RS485 & A420

Current Rating

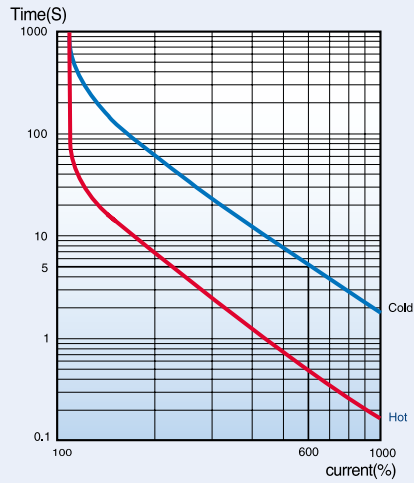
10

100

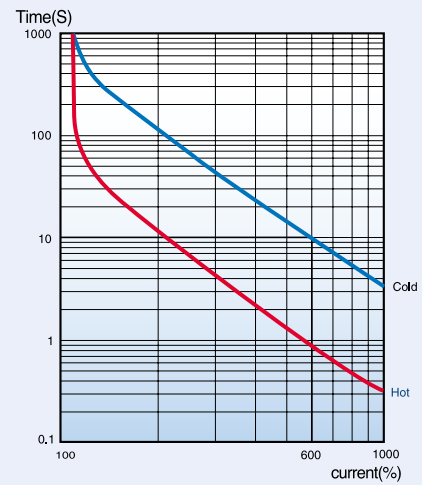
0.5~10A

5~100A

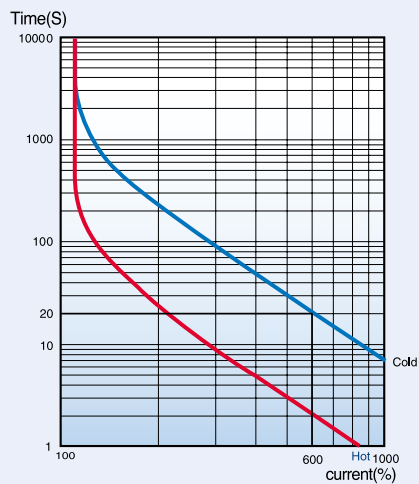
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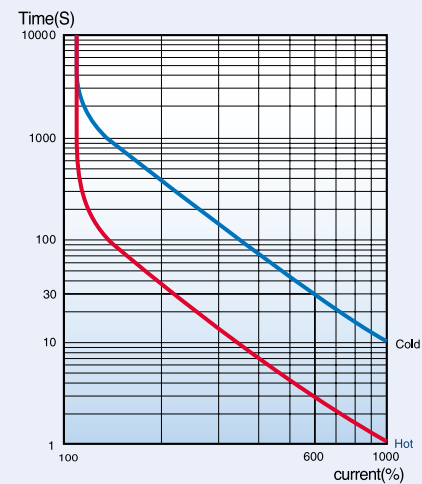
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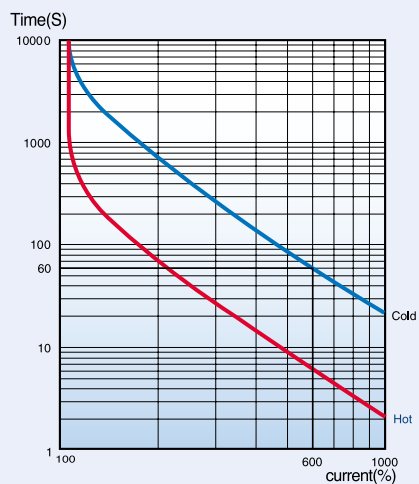
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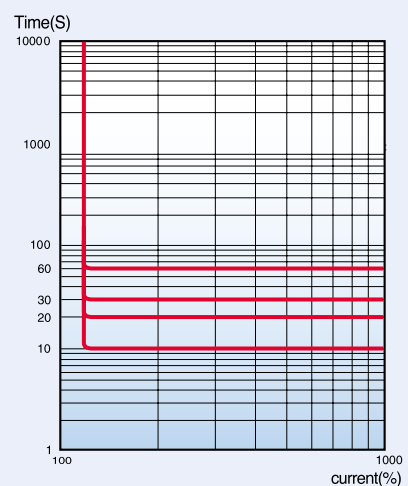
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<Class60>



<Definite Curves>





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.

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www.lsis.com

■ HEAD OFFICE

LS-ro 127 (Hogye-dong) Dongan-gu Anyang-si
Gyeonggi-do Korea
Tel. (82-2)2034-4840, 4911, 4914
Fax. (82-2)2034-4648

■ CHEONG-JU PLANT

Cheong-Ju Plant #1, 95 Baekbong-ro Heungdeok-gu
Cheongju-si Chungcheongbuk-do 361-720 Korea

■ Global Network

- **LSIS USA Inc. » Chicago, America**
Address : 2000 Millbrook Drive, Lincolnshire, Chicago, IL 60069, United States of America
Tel : 847-941-8240 Fax : 847-941-8259 e-mail : seungheonc@lsis.com
- **LSIS (Middle East) FZE » Dubai, U.A.E.**
Address : LOB 19 JAFZA VIEW TOWER Room 205, Jebel Ali Freezone P.O. Box 114216, Dubai, United Arab Emirates
Tel : 971 4 886 5360 Fax : 971 4 886 5361 e-mail : hschoib@lsis.com
- **LSIS Europe B.V. » Schiphol-Rijk, Netherlands**
Address : 1st. Floor, Tupolevlaan 48, 1119NZ, Schiphol-Rijk, The Netherlands
Tel : 31-20-654-1420 Fax : 31-20-654-1429 e-mail : junshickp@lsis.biz
- **LSIS-VINA Co., Ltd. » Hanoi, Vietnam**
Address : Nguyen Khe - Dong Anh - Ha Noi - Viet Nam
Tel : 84-4-882-0222 Fax : 84-4-882-0220 e-mail : sjbaik@lsis.biz
- **LSIS-VINA Co., Ltd. » Hochiminh, Vietnam**
Address : 41 Nguyen Thi Minh Khai Str. Yoco Bldg 4th Floor, Hochiminh City, Vietnam
Tel : 84-8-3822-7941 Fax : 84-8-3822-7942 e-mail : hjchoid@lsis.biz
- **LSIS Gurgaon Office » Gurgaon, India**
Address : 109 First Floor, Park Central, Sector-30, Gurgaon- 122 002, Haryana, India
Tel : +0091-124-493-0070 Fax : 91-1244-930-066 e-mail : hwyim@lsis.biz
- **LSIS Japan Co., Ltd. » Tokyo, Japan**
Address : Toyokurakubu Bldg. 13th floor, 3-2-6, Kasumigaseki, Chiyoda-ku, Tokyo, 100-0013 Japan
TEL : +81-3-6268-8241 FAX : +81-3-6268-8240 e-mail : jschuna@lsis.biz
- **LSIS Shanghai Office » Shanghai, China**
Address : Room 32 floors of the Great Wall Building, No. 3000 North Zhongshan Road, Putuo District, Shanghai, China
Tel : 86-21-5237-9977 Fax : 89-21-5237-7189 e-mail : mkleea@lsis.com
- **LSIS Beijing Office » Beijing, China**
Address : B-Tower 17FL Beijing Global Trade Center B / D. No.36, BeiSanHuanDong-Lu, DongCheng-District, Beijing 100013, P.R. China
Tel : 86-10-5825-6025, 7 Fax : 86-10-5825-6026 e-mail : sunmj@lsis.com.cn
- **LSIS Guangzhou Office » Guangzhou, China**
Address : Room 1403, 14 / F, New Poly Tower, No.2 Zhongshan Liu Road, Guangzhou 510180, P.R. China
Tel : 020-8326-6754 Fax : 020-8326-6287 e-mail : chenxs@lsis.com.cn
- **LSIS Chengdu Office » Chengdu, China**
Address : Room 1701 17Floor, huamin hanjun internationnal Building, No1 Fuxing Road Chengdu, 610016, P.R. China
Tel : 86-28-8670-3201 Fax : 86-28-8670-3203 e-mail : yangcf@lsis.com.cn
- **LSIS Qingdao Office » Qingdao, China**
Address : Room 2001, 20 / F, 7B40, Galaxy Building, No.29 Shandong Road, Shinan District, Qingdao 266071, P.R. China
Tel : 86-532-8501-6058 Fax : 86-532-8501-6057 e-mail : htroh@lsis.biz
- **LSIS (Wuxi) Co., Ltd. » Wuxi, China**
Address : 102-A, National High & New Tech Industrial Development Area, Wuxi, Jiangsu, 214028, P.R.China
Tel : 86-510-8534-6666 Fax : 86-510-522-4078 e-mail : wangzy@lsis.com.cn
- **Dalian LSIS Co., Ltd. » Dalian, China**
Address : No.15, Liaohexi 3-Road, Economic and Technical Development zone, Dalian 116600, China
Tel : 86-411-8273-7777 Fax : 86-411-8730-7560 e-mail : tangyh@lsis.com.cn

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