A list of standard models

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Rated current	Connection method	Model No.	Over-current	Stall/ Locked rotor	Phase fail current	Phase un-balance	Reverse phase	Under current	Ground fault	Instant short circuit	Remarks
0.5~6A	Terminal type	DMP06i-S	●	●	●	●	●	●	-	-	• If there is the function of RS485 communication, 'M' is appended to its type name. If there is the function of 4~20mA DC output, 'A' is appended to its type name. • RS485 communication function and 4~20mA DC output function are not supported at the same time.
		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. It is possible to set up ground fault and instantaenous trip contacts separately.

Convenience

Integrated Digital Motor Protection Relay based on MCU(Microprocessor Control Unit)
Real Time Processing and High Precision are implemented.

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.)

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.

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. The display part is controlled by a separate MCU(Microprocessor Control Unit), so it can be used for all DMPi types.

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).

A wide range of reset functions
Manual/Automatic/Electrical reset functions are provided for user 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.

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

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.

Terminal/Penetrated types are shared for application in various installation environments
Terminal blocks are detachable, which makes them applied to various installation environments.

Reliability

Thermal Inverse Time, Inverse Time and Definite Time Modes
According to user's needs, the motor can be protected in the inverse time mode or definite time mode.

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

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.

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.

Inverse time characteristic good for motor protection
Thanks to the inverse time characteristic in which a running time is determined by a size of overcurrent, the equipment is excellent at motor protection.

Protection functions

Over current. 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.

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.

Under current protection

This equipment is mainly used to monitor no-load status caused by the separation or damage of the drive shaft of a motor, or to protect the idle rotation (no-load) status of pump. It is possible to set up 30~70% of rated current. At the time of third second, it runs.

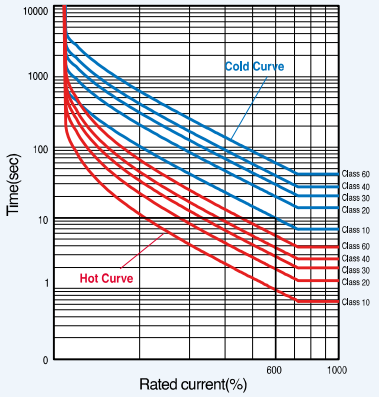
Ground fault

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.

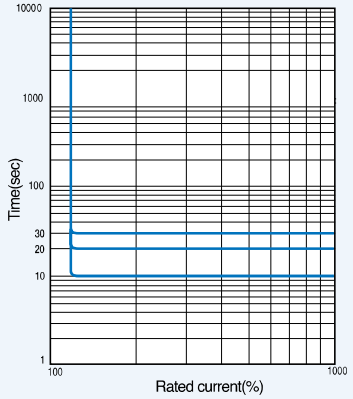
* Delay time may be set within the range of 0~200sec so that it does not function upon startup, and built-in ZCT is provided according to the Type.

Instance

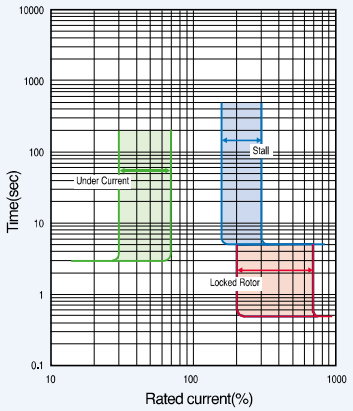
It is a function to protect a motor from short-circuit current. It operates within 50ms when fault current of more than 500~1500% is generated. Delay time may be set within the range of 0~200sec so that it does not function upon startup.



<Inverse time characteristic>



<Definite time characteristic>

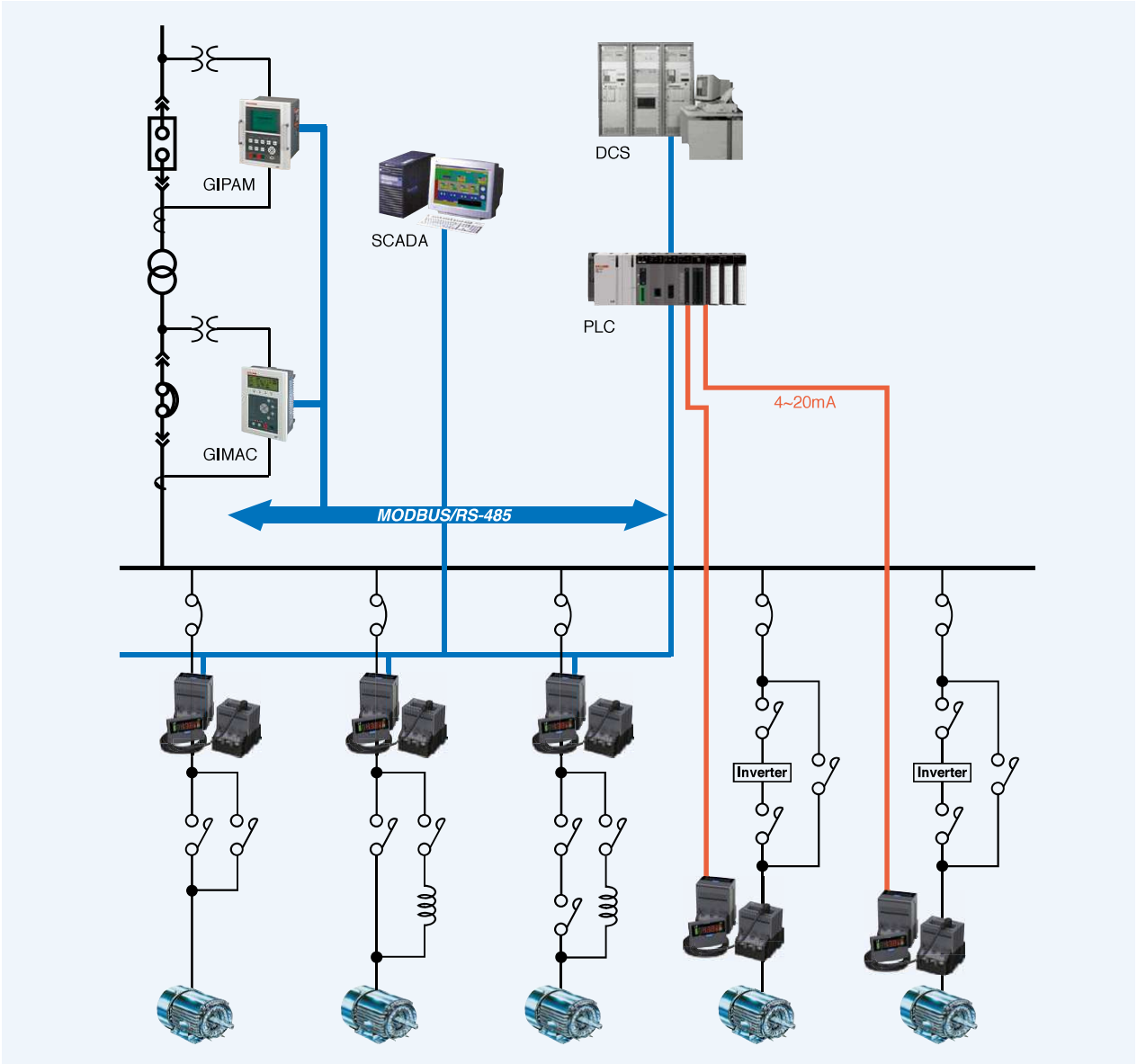


Communication function

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

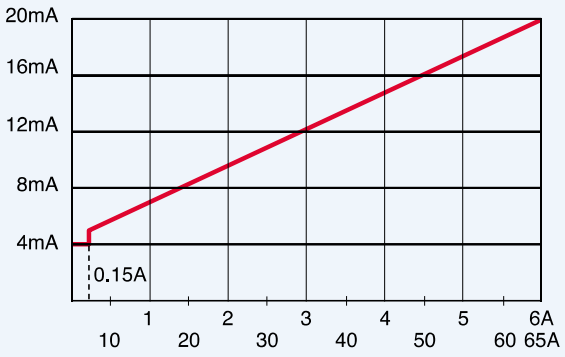
Note) 1. At the setting mode of 0.5~6A, the level of current is measured from 0.15A, so 0A is measured when less than 0.15A and the output value becomes 4mA. (When it is 0.15A, >4mA is actually measured.)
2. Measurement error based on temperature changes: ±0.15%/°C (Based on the room temperature of 25°C)

- 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)

Rated specifications & model numbering system

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)
Display		4 digit, 7-Segment
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
Tolerance	Current	±3%
	Time	±5%
	4~20mA output	±5%
Time setting	Startup delay	1~200sec
	Operation delay	1~60sec
Aux. contact	Composition	3-SPST(Power supply 1a1b, i nstantaneous operation 1a) Note1)
	Capacity	3A/250VAC Resistive Load
	Contact minimum load	100mA / 6VDC : (95-996, 97-98)
		10mA / 5VDC (07-08)
ZCT Input	External	200mA/100mV(Exclusive ZCT) Note2)
	Built-in	Support (Separate connection unnecessary Note2)
Service environment	Service temperature	-20°C ~ 60°C
	Storage temperature	-30°C ~ 70°C
	Relative humidity	within 80% RH, no condensation
Insulation resistance		100MΩ/500VDC
Lightning impulse voltage		1.2X50us 5kV Prototype waveform supply
Fast transient		2kV/1Min
Power consumption		Below 2W

Note 1. See No. 21 to 23 of A-Group in Setting menu If single phase is set, the device measures R/S/T phase. In HMI, the maximum phase of three phases is displayed without any indication of phase.
2. It is used when zero current detection type is selected.
3. This product is used to protect a low-voltage motor with 1000V or less

Model numbering system