

THYRISTOR SINGLE-PHASE POWER REGULATOR

MPI SERIES



Special Features

- Control Method Phase Control • Zero-Cross Switching Cycle Operation Control
- Multi-Input Current Voltage Contact Voltage Pulse (SSR Drive Voltage)
- You can choose either a phase control or zero-cross switching cycle operation control in both cases of contact proportion input and voltage pulse (SSR drive voltage) input
- Input/output values and many kinds of parameters are displayed
- Output soft-start / slow-up / slow-down function is equipped as a standard function. (0.00~25.0s)
- Free Voltage (100~240V AC)
- Automatic Distinction of Power Supply Frequency Range : 45~65Hz

Specification

Display

- (1) **Display Type** : Digital display 7-segment red LED
1+3 digits(character height 10mm)
Key function on the front panel displays values and settings.
- (2) **Kinds of Display** : Output value・Control input value・
Higher limit(grade)value to be set via an external device・
Lower limit value to be set via an external device

Setting

- (1) **How to Set** : By using keys on the front panel or an external variable resistor
- (2) **Setting Parameter** : Options of setting method
Phase control angle / Phase control voltage square / Zero-cross
switching cycle operation control
- : Higher limit(grade)setting 0~100%
 - : Lower limit setting 0~100%
 - : Soft-start timer setting 0~25.0s
 - : Slow-up timer setting 0~25.0s
 - : Slow-down timer setting 0~25.0s
 - : Options of input method
Voltage / Current / Contact / Voltage pulse
 - : Input sampling cycle setting 0 or 1~120s
(In the case of contact or voltage pulse input, 0s-setting
responds to two-position control and 1s-or-more-setting
responds to proportional control with the setting value
double the time of proportional cycle of the regulator.)

Power Supply

- (1) **Rated Voltage** : 90~264V AC (free voltage)
- (2) **Rated Frequency** : 45~65Hz

Control Input

- (1) **Types of Input** : I 1—Current 1 4~20mA DC
(Multi-input) Receiving impedance approx. 100Ω
I 2—Current 2 0~20mA DC
Receiving impedance approx. 100Ω
V 1—Voltage 1 1~5V DC
Input impedance approx. 500kΩ
V 2—Voltage 2 0~5V DC
Input impedance approx. 500kΩ
C 1—Contact No-voltage contact or open collector
Sink load 5V 3mA DC
S 1—Voltage pulse(SSR drive)
12V 3mA DC
- (the other input) : V3—Voltage 3 0~10V DC
Input impedance approx. 370kΩ
- ※In the case of C1 or S1 input, the regulator responds to both two-position and proportional control.

(2) Sampling Cycle

- Contact or voltage pulse input : Two-position control 2ms
Proportional control 1~120s
- Current or voltage input : 2 / control power supply frequency

Output

- (1) **Current-carrying Capacity**
5 types : 20A, 30A, 50A, 70A, 100A
- (2) **Output Range** : 0~98% or more of an input voltage
- (3) **Control Method** 3 types : Phase control angle / Phase control voltage square /
Zero-cross switching cycle operation control
- (4) **Lowest Load Current** : 0.5A(in the case of output 98%)
- (5) **Applicable Load** Phase Control : Resistive load
Zero-cross switching cycle operation control
: Fixed resistive load

Accessory

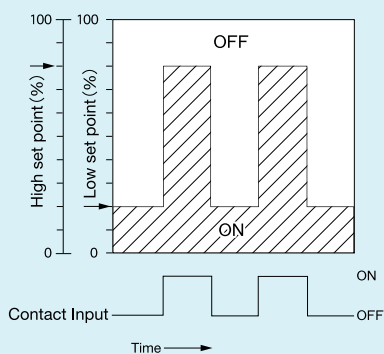
- (1) **External Variable Resistor**
Higher Limit(grade) : 0~100%(B10kΩ)
Lower Limit : 0~100%(B10kΩ)
- (2) **Immediately-cut Fuse** : External Installation

General Specification

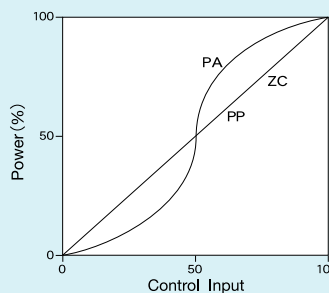
- (1) **Data Storage** : Non-volatile memory(EEPROM)
- (2) **Use Environment** Temperature : 0~55°C(Guaranteed range for operation)
0~40°C(Guaranteed range for efficiency)
- Humidity : Below 90%Rh(No condensation)
- Altitude : 2000m above sea level max.
- Category : II
- Pollution degree : 2
- (3) **Input Noise** Normal : 50dB min.
Ratio of rejection Common : 100dB min.
- (4) **Insulation Resistance**
Between input and power supply : 20MΩ min. 500V DC per minute
Between input and chassis : 20MΩ min. 500V DC per minute
- (5) **Dielectric Strength**
Between input and output : 2300V AC per minute
Between input and chassis : 1500V AC per minute
- (6) **Storage Temperature** : -20~65°C
- (7) **External Dimension** : Refer to External dimension drawing
- (8) **Weight** : 20A approx. 0.6kg • 30A approx. 0.7kg
50A approx. 1.2kg
70A approx. 1.8kg • 100A approx. 2.3kg

Performance Characteristics

- **Output characteristics of higher/lower limit setting and contact input**
(An example of HIGH 80% and LOW 20% setting)



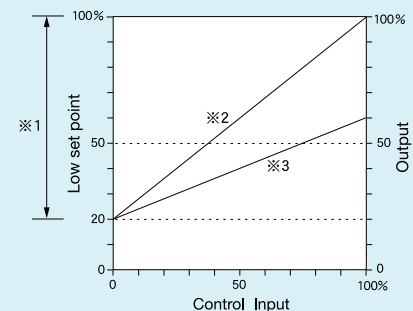
- **Output characteristics according to control types**



Z C Zero-cross switching cycle operation : Straight line
P P Phase control voltage square : Mostly straight line
P A Phase control angle : S curve

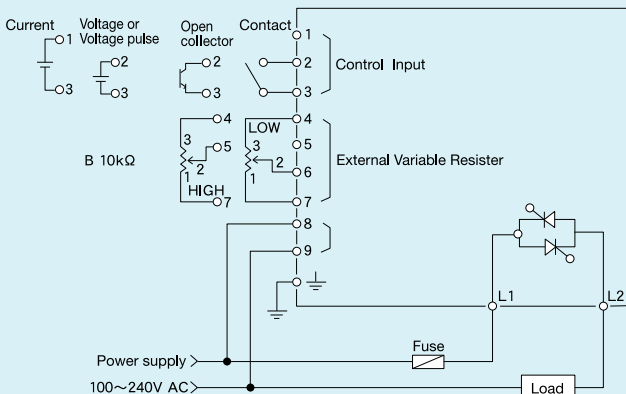
In the case of fixed impedance load

- **Characteristics of higher limit(grade)・lower limit setting**



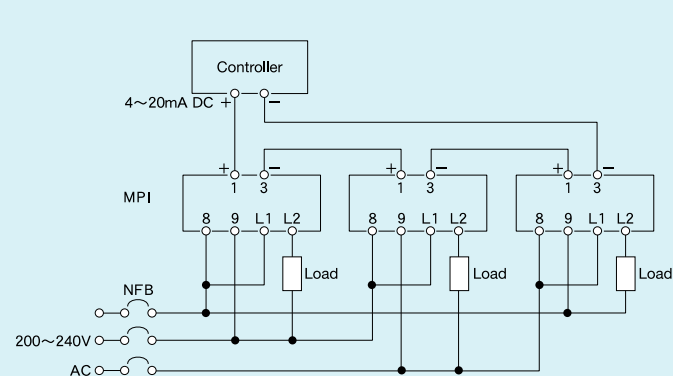
※1 Setting range of HIGH SET in the case of lower limit setting 20%
※2 Output characteristics in the case of HIGH SET(grade) setting 100%
※3 Output characteristics in the case of HIGH SET(grade) setting 50%

- **Standard wiring**



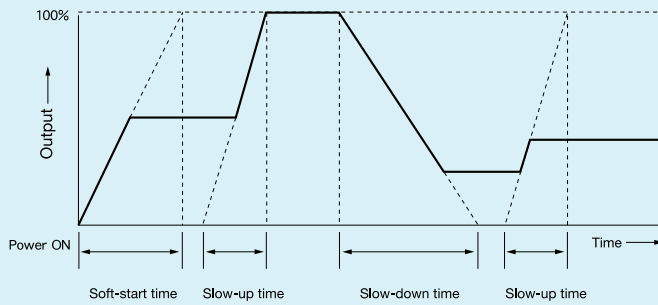
Higher limit(HIGH) and lower limit(LOW) can be set by key operation even when an external variable resistor is not installed.

- **An example of three MP1s interlocked to one controller**

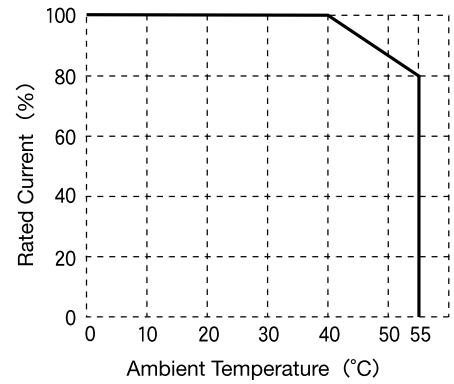


● Soft-start/Slow-up/Slow-down function

This function restrains a sudden change of output to the load when there is a sudden change of control input or setting happening, and makes the output flow gradually.
Soft-start/Slow-up/Slow-down time is set to output 0~100%.



■ Ambient Temperature Characteristic Chart



Internal heating value of MP1 is approximately as follows. Follow the set-up space and use environment.
Keep in mind that the set-up site needs to be ventilated and the radiated heat needs to be relieved.

Current-carrying capacity	2 0 A	3 0 A	5 0 A	7 0 A	1 0 0 A
Heating value	2 4 W	4 0 W	5 6 W	7 9 W	1 0 9 W

■ Order Code Table

Item	Code	Specification	
1. Series	MP1-		
2. Control Input	M	Multi-Input	• 4—20mA DC Input Impedance approx.100Ω • 0—20mA DC Input Impedance approx.100Ω • 1—5V DC Input Impedance approx. 500kΩ • 0—5V DC Input Impedance approx. 500kΩ • No-voltage Contact or Open Collector 5V 3mA DC • Voltage Pulse (SSR Drive Voltage) 12V 3mA DC
	V	Voltage	0—10V DC Input Impedance approx. 370kΩ
3. Current-carrying Capacity	020	20A	
	030	30A	
	050	50A	
	070	70A	
	100	100A	
4. Remarks	0	Without	
	9	With (Please consult before ordernig)	

If you need accessories, chose what you need from the code table below.

(Example) MP1-M0300-A021 (As an accessory, one set of external variable resistor comes with the body.)

● Accessory Code Table

5. Accessory	—A	When you want to order an accessory, put the code (-A) before an accessory code you need	
6. A set of immediately-cut fuse (holder + fuse)	01A	Responding to 20A (250GH-32 (32A))	
	01B	Responding to 30A (250GH-40 (40A))	
	01C	Responding to 50A (250GH-63 (63A))	
	01D	Responding to 70A (250GH-100 (100A))	
	01E	Responding to 100A (250GH-125 (125A))	
7. A set of external variable resistor (variable resistor + scale + knob)	021	1 Set A set for setting a hagher (grade) or lower limit	
	022	2 Set A set for setting a hagher (grade) and lower limit	

If you need parts, chose what you need from the code table below.

● Parts Code Table

Item	Code	Specification
1. Fuse Holder	250HL-17	Responding to Body 20A~100A
2. Immediately-cut Fuse	250GH-32	Responding to Body 20A (32A)
	250GH-40	Responding to Body 30A (40A)
	250GH-63	Responding to Body 50A (63A)
	250GH-100	Responding to Body 70A (100A)
	250GH-125	Responding to Body 100A (125A)

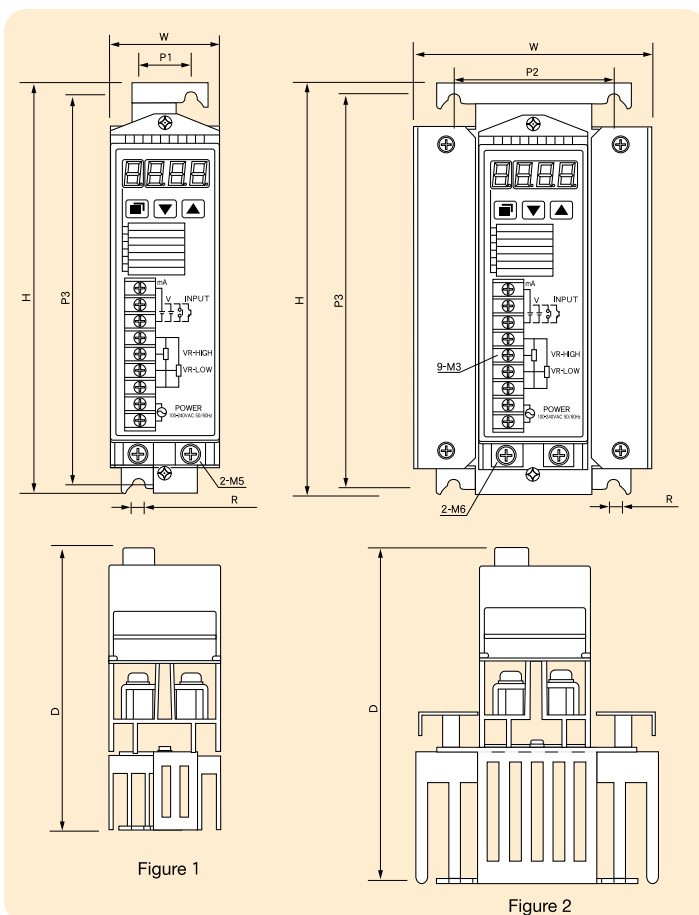
External Dimension Drawing

Body

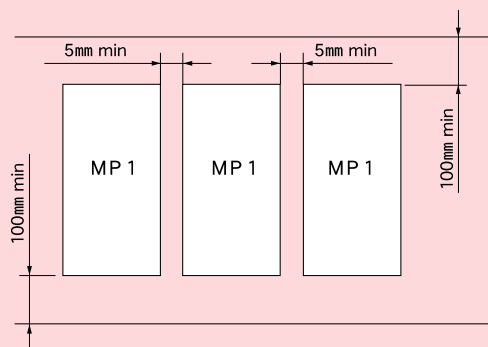
Dimension Table

unit : mm

	Exterior View	H	W	D	P1	P2	P3	R
20A	Figure 1	192.5 ± 1	50 ± 0.5	128 ± 1	24 ± 0.5		181 ± 1	5.5 ± 0.2
30A			50 ± 0.5	128 ± 1	24 ± 0.5			
50A			60 ± 0.5	154 ± 1	28 ± 0.5			
70A	Figure 2	192.5 ± 1	110 ± 0.5	154 ± 1		75 ± 0.3	181 ± 1	5.5 ± 0.2
100A			155 ± 0.5	154 ± 1		75 ± 0.3		



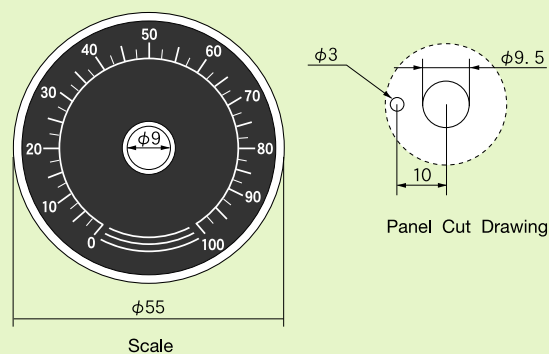
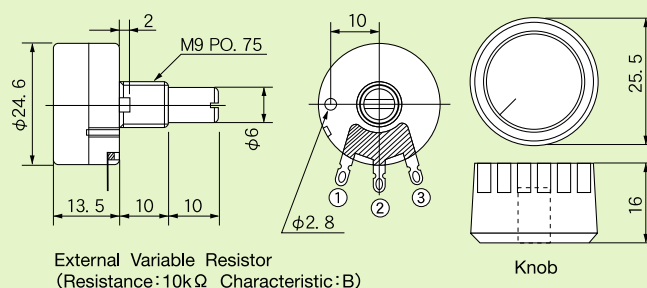
Set-up Space Drawing



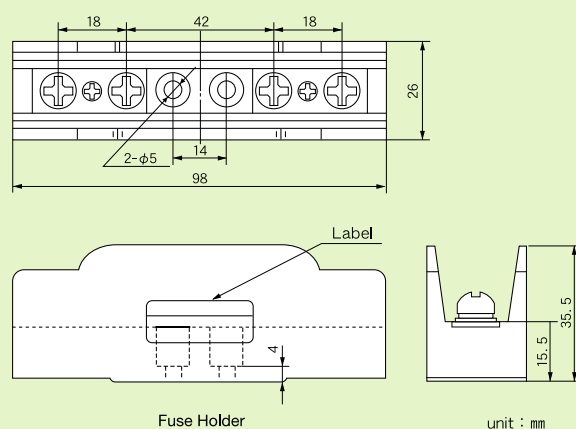
Accessory

External Variable Resistor

unit : mm



Fuse Holder



The contents of this instruction are subject to change without notice.

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