

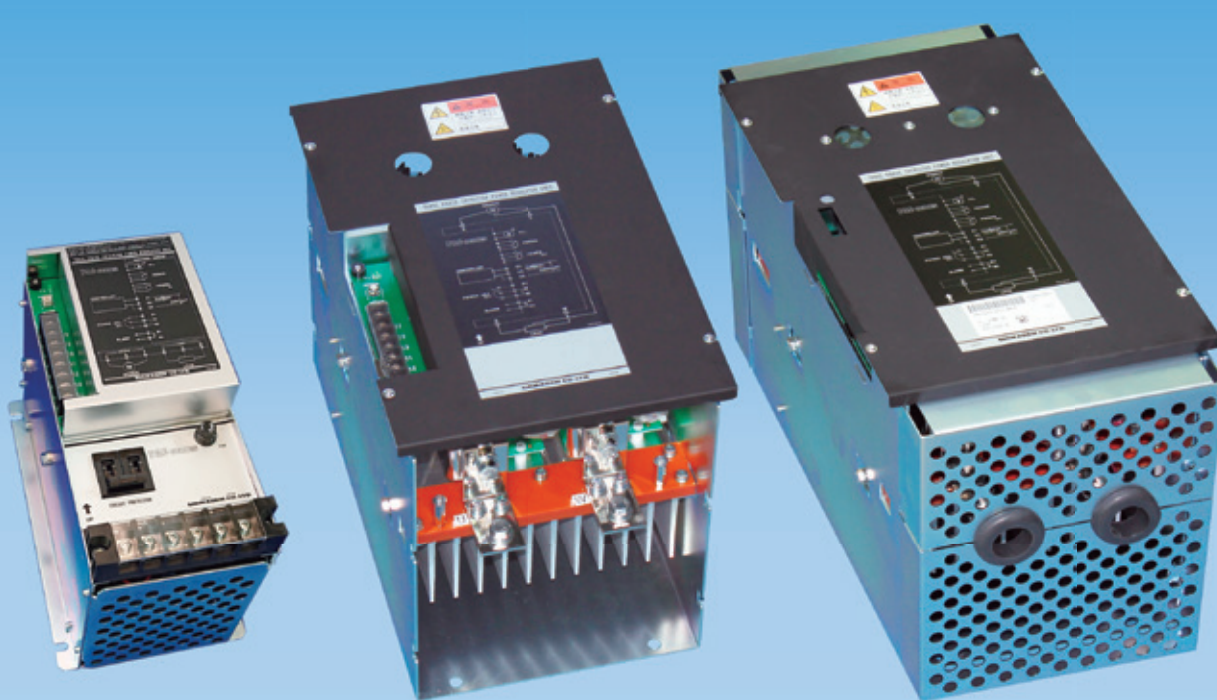
°C

%RH

SHIMADEN

Series PAC30Z

THREE-PHASE POWER REGULATOR



CIRCUIT PROTECTOR TYPE
with ELECTRICAL SHOCK PREVENTION COVER

RAPID FUSE TYPE

RAPID FUSE TYPE
with ELECTRICAL SHOCK PREVENTION COVER

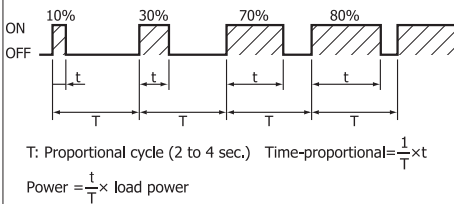
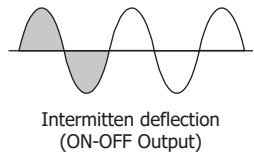
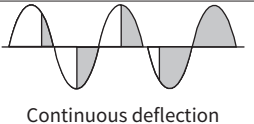
BASIC FEATURES

- ☐ ***Easy Wiring With 2-Phase Control***
- ☐ ***Low-Noise Design***
- ☐ ***Compact and effective use of panel space***
- ☐ ***Wide Capacity Selection (18 to 450A)***
- ☐ ***Alarm Output Standard Feature***
- ☐ ***Thyristor protection is supported by Circuit protectors or Rapid fuses***
- ☐ ***Electrical Shock Prevention Cover (option)***
- ☐ ***RoHS directive supported***

POWER REGULATION PRINCIPLE

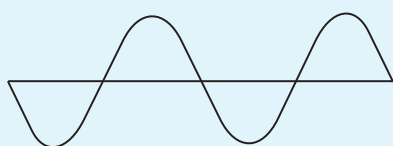
There are phase control method and zero voltage switching control method (fixed period type and cycle operation type) for power adjustment method by thyristor type. PAC30Z series adopts fixed period type zero voltage switching control method.

The differences for each control method are shown below.

Control Mode	Control Sytem	Output Terminal Calculation	Indicator Deflection	Noise
Zero voltage switching	Time proportional control of load power	 <p>T: Proportional cycle (2 to 4 sec.) Time-proportional = $\frac{1}{T} \times t$ Power = $\frac{t}{T} \times$ load power</p>	 <p>Intermittent deflection (ON-OFF Output)</p>	Almost none
Phase angle control	Voltage/Current Control	3-phase power = $\sqrt{3} \times$ voltage x current	 <p>Continuous deflection</p>	Little

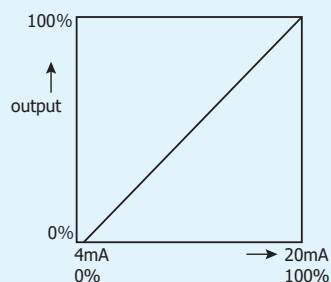
OUTPUT CHARACTERISTICS

Output Wave Form



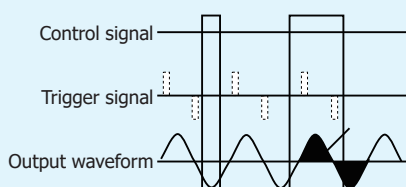
Very small wave form distortion and noise generation

Input / Output Charactersitics (4 to 20mA DC)

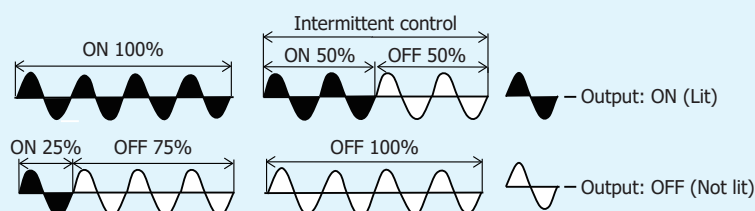


The input/output characteristics are linear as shown above.

Principle diagram of the zero voltage switching method



Output waveform diagram



■ Name	: Thyristor three-phase power regulator
■ Control input	: 4 to 20mA DC and contact common
■ Current capacity	: 18A, 20A, 30A, 45A, 60A, 90A or 135A
■ Power Supply	: 200 to 220V, 220 to 240V, 380 to 400V or 400 to 440V AC (Refer to the model code selection table.)
■ Frequency	: 50/60 Hz
■ Control Mode	: 2-phase type zero voltage switching
■ Proportional period	: 2 to 4 seconds (Factory default: 3 seconds)
■ Applicable Load	: Constant resistance loads
■ Power Control Range	: 0 to 95% min.
■ Connection terminal for operation amount indicator	: With output terminal (Connection indicator: 0 to 1 mA DC) (inside the cover)
■ Output indication	: Green LED
■ Power Adjuster	: Internal installation as standard (External installation available as option)
■ Over-Current Protection:	
Circuit protection	: 20A, 30A, 45A / 200 to 240V AC, 18A / 380 to 440V AC
Rapid fuse type	: 60A, 90A, 135A / 200 to 440V AC, 35A, 45A / 380 to 440V AC
■ Alarm Output	: Output terminals 'ON' during over-current
■ Alarm Output Contact Capacity	: 250V AC 1A / inductive load
■ Cooling Method	: By natural air (18A to 90A), fan cooling (135A)
■ Operating Ambient Temperature Range	: -10 to 50°C
■ Operating Ambient Humidity Range	: 90% RH max. (No dew condensation)
■ Storage temperature	: -20 to 65°C
■ Insulation Resistance	: 500V DC 20MΩ min. between power supply terminals and chassis 500V DC 20MΩ min. between power supply terminals and input terminals
■ Dielectric Strength:	
200 to 240V AC type	: 1 min. at 2000V AC between power supply terminals and chassis
380 to 440V AC type	: 1 min. at 2500V AC between power supply terminals and chassis
■ External Dimensions	: See diagram on pages143.
■ Weight	: 18 to 45A type: Approx. 5.3kg 60 to 135A type: Approx. 12.0kg

OUTPUT ADJUSTMENT FUNCTION

Voltage (0.9to1.3V) is produced between terminals by current flowing to the thyristor. Voltage between terminals and accumulation of current (W) turn into Joule heat resulting in a rise in temperature of the thyristor elements. Take radiation and ventilation into account.

■ PAC30Z Rated current and heat value (Heat value conversion formula: 860kcal=1000W)

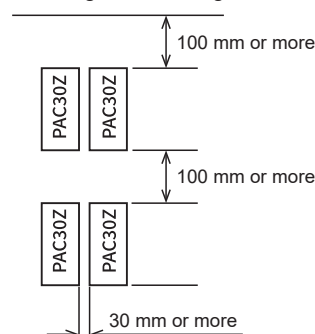
Current capacity	18A	20A	30A	45A	60A	90A	135A	200A	300A	450A
Internal heat value	50W	55W	75W	100W	120W	220W	330W	480W	750W	1240W

(note)

When installing, be sure to install vertically, referring to the installation interval diagram on the right.

If you have no choice but to use it in a position other than vertical, use it at 70% or less of the rated current.

Mounting interval diagram



ORDERING INFORMATION

ITEM	CODE	SPECIFICATIONS				
SERIES	PAC30Z	Periodic zero voltage switching control three-phase power regulator				
CONTROL INPUT	5	4 to 20 mA DC (Receiving resistance: 200 Ω) and contact signal				
	9	Others (Please consult before ordering.)				
CURRENT CAPACITY (kVA values represent the standard rated load capacity.)		CURRENT CAPACITY	200 to 220V	220 to 240V	* 380 to 400V	* 400 to 440V
	018	18A			11.8 to 12.5 kVA	12.5 to 13.7 kVA
	020	20A	6.9 to 7.6 kVA	7.6 to 8.3 kVA		
	030	30A	10.4 to 11.4 kVA	11.4 to 12.5 kVA	19.7 to 20.8 kVA	20.8 to 22.9 kVA
	045	45A	15.6 to 17.1 kVA	17.1 to 18.7 kVA	29.6 to 31.2 kVA	31.2 to 34.3 kVA
	060	60A	20.8 to 22.9 kVA	22.9 to 24.9 kVA	39.5 to 41.6 kVA	41.6 to 45.7 kVA
	090	90A	31.2 to 34.3 kVA	34.3 to 37.4 kVA	59.2 to 62.4 kVA	62.4 to 68.9 kVA
	135	135A	46.8 to 51.4 kVA	51.4 to 56.1 kVA	88.9 to 93.5 kVA	93.5 to 102.9kVA
	200	200A	69.3 to 76.2 kVA	76.2 to 83.1 kVA	131.6 to 138.6kVA	138.6 to 152.4kVA
	* 300	300A	103.9 to 114.3kVA	114.3 to 124.7kVA	197.4 to 207.8kVA	207.8 to 228.6kVA
	* 450	450A	155.9 to 171.5kVA	171.5 to 187.1 kVA	296.2 to 311.8 kVA	311.8 to 342.9kVA
	999	Others (Please consult before ordering.)				
POWER SUPPLY	15-	200 to 220V AC± 10% 50/60Hz				
	16-	220 to 240V AC± 10% 50/60Hz				
	17-	380 to 400V AC± 10% 50/60Hz				
	18-	400 to 440V AC± 10% 50/60Hz				
	99-	Others (Please consult before ordering.)				
ELECTRICAL SHOCK PREVENTION COVER	0	With				
	1	Without				
EXTERNAL POWER ADJUSTER	0	None (Internal power adjuster as standard equipment)				
	3	With (B10kΩ scale plate, knob and 1m lead wire included)				
	9	Others (Please consult before ordering.)				
OPERATION AMOUNT INDICATOR	0	Without				
	1	With (QSM001: °60 mm)				
	2	With (QSM002: °80 mm)				
REMAKRS	0	Without				
	9	With (Please consult before ordering.)				

The 200V series / 300A, 450A and 400V series / 18-450A marked with * are treated as semi-standard products, so please contact us in advance for the delivery date.

Note: When selecting with the electric shock prevention cover, select 1: Yes for the code of [5. Electric shock prevention cover].

Rapid Fuse

Current Capacity	Fuse Capacity	CODE
30A	40A	QSF038
45A	75A	QSF039
60A	100A	QSF040
90A	150A	QSF041
135A	200A	QSF042
200A	250A	QSF043
300A	450A	QSF044
450A	600A	QSF034

External Power Adjuster

CODE	SPECIFICATIONS
QSV002	Resistance Value: B10k ohms Lead Wire Length: 1m Terminal Shape: M4 terminal, 3-Wire Scale: 0-100%

Operating Output Indicator

CODE	SPECIFICATIONS
QSM001	60x60m, Input: 0-1mA DC, Scale: 0-100%
QSM002	80x80m, Input: 0-1mA DC, Scale: 0-100%

Prevention of Electrical Shock Cover

CODE	SPECIFICATIONS	
QSK001	30A	400V Line
	45A	
	60A	200V Line/400V Line
	90A	
	135A	
200A		
QSK002	300A	

Note: Prevention of electrical shock cover does not sell separately for model

20A, 30A, 45A/200-240V, 18A/380-440V, 450A/200-440V.

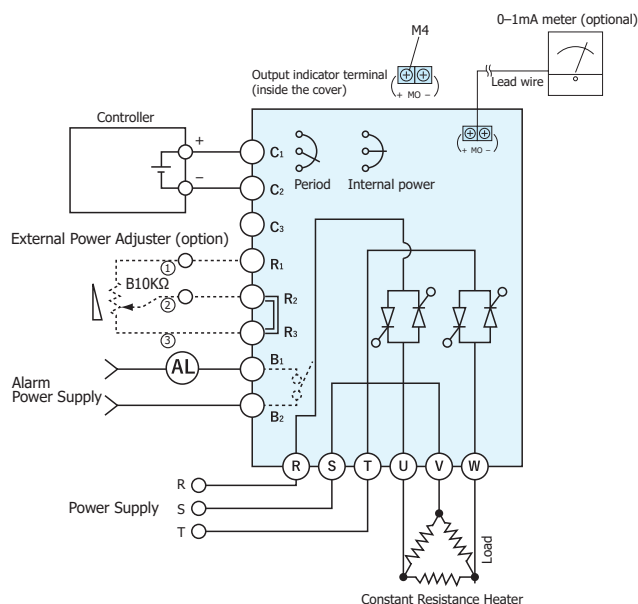
WIRING DIAGRAM, EXTERNAL DIMENSIONS, WEIGHT

CIRCUIT PROTECTOR TYPE

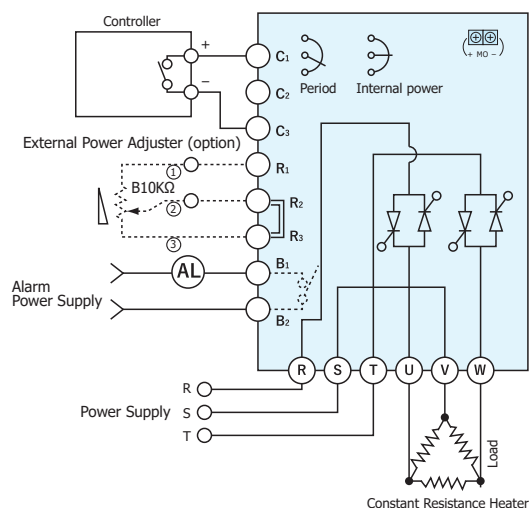
• Wiring diagram

20, 30, 45A / 200 to 240V AC 18A / 380 to 440V

• Current Input Type



• Contact Input Type



Note) When not using an external power adjuster, use a short piece to short R2 and R3 as shown above.

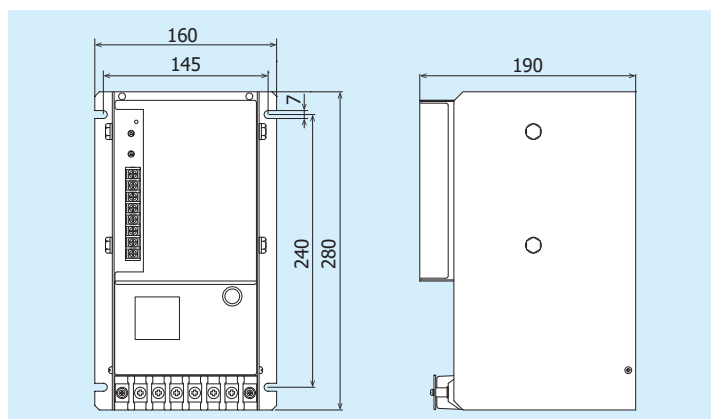
When using an external power adjuster, remove the short piece and connect the power adjuster.

• External dimensions and weight

□ 20, 30, 45A / 200–240V

□ 18A / 380–440V

- Dimensions: H280×W160×D190 mm
- Mounting hole dimensions: H240×W145 mm
- Weight: about 4.9 kg



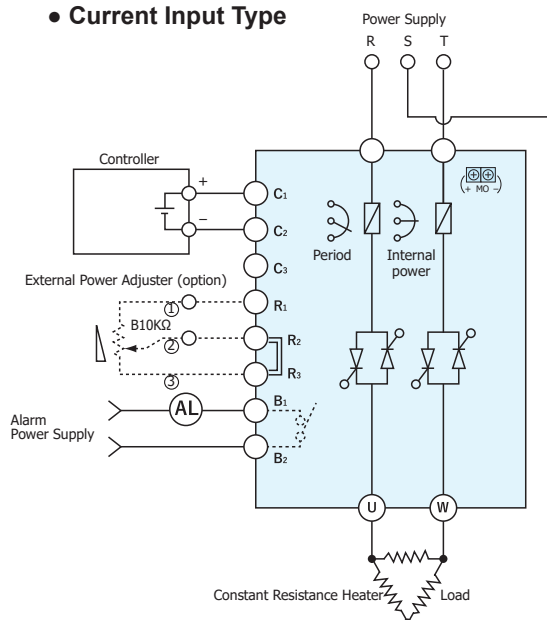
Unit: mm

WIRING DIAGRAM, EXTERNAL DIMENSIONS, WEIGHT

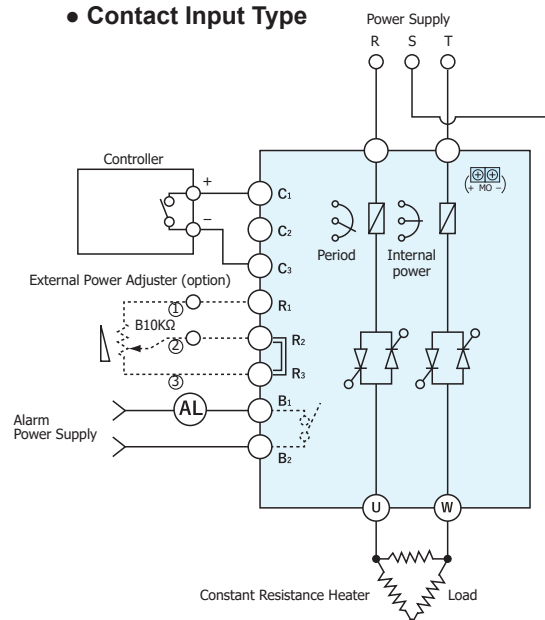
RAPID FUSE TYPE

• Wiring diagram

• Current Input Type



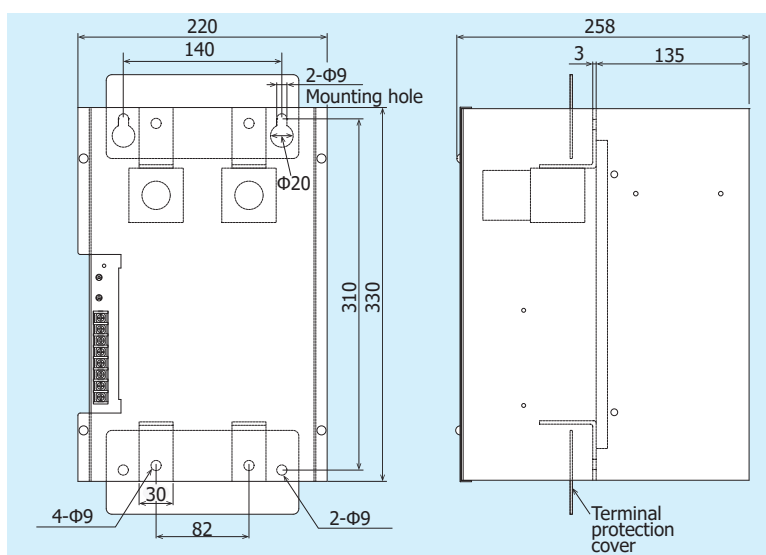
• Contact Input Type



Note) When not using an external power adjuster, use a short piece to short R2 and R3 as shown above.
When using an external power adjuster, remove the short piece and connect the power adjuster.

• External dimensions and weight

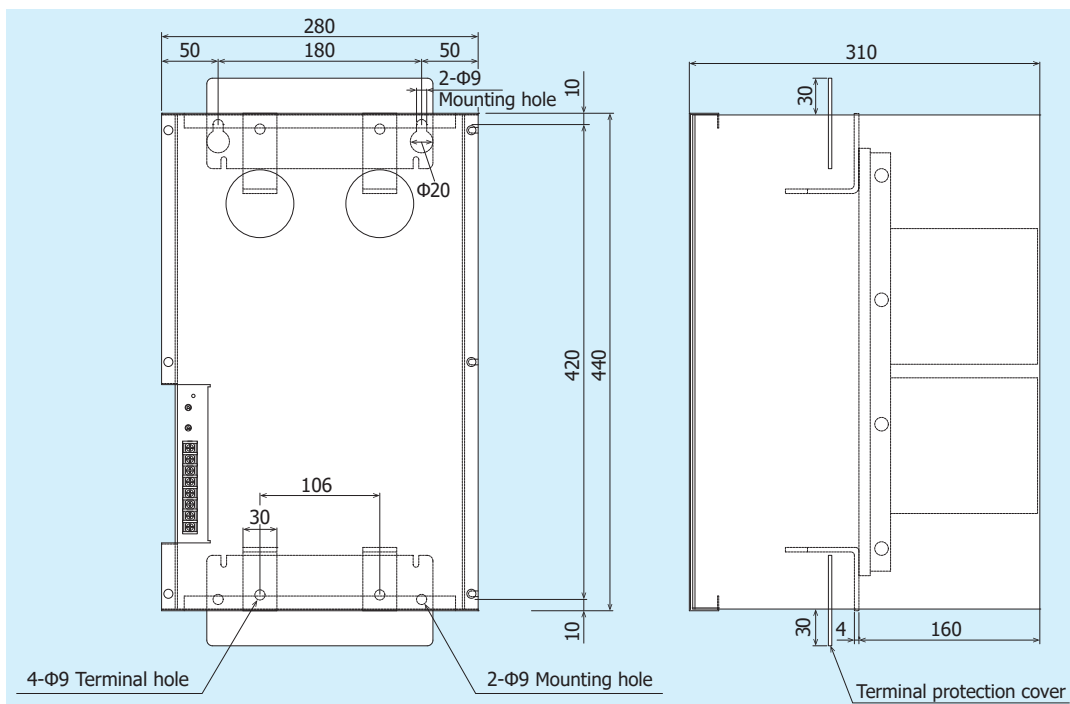
- 60, 90, 135A / 200-240V, 380-440V
- 30, 45A / 380-440V
- Dimensions: H330×W220×D258 mm
- Mounting hole dimensions: H310×W140 mm
- Weight : about 12.0 kg



Unit: mm

□ 200A / 200-240V, 380-440V

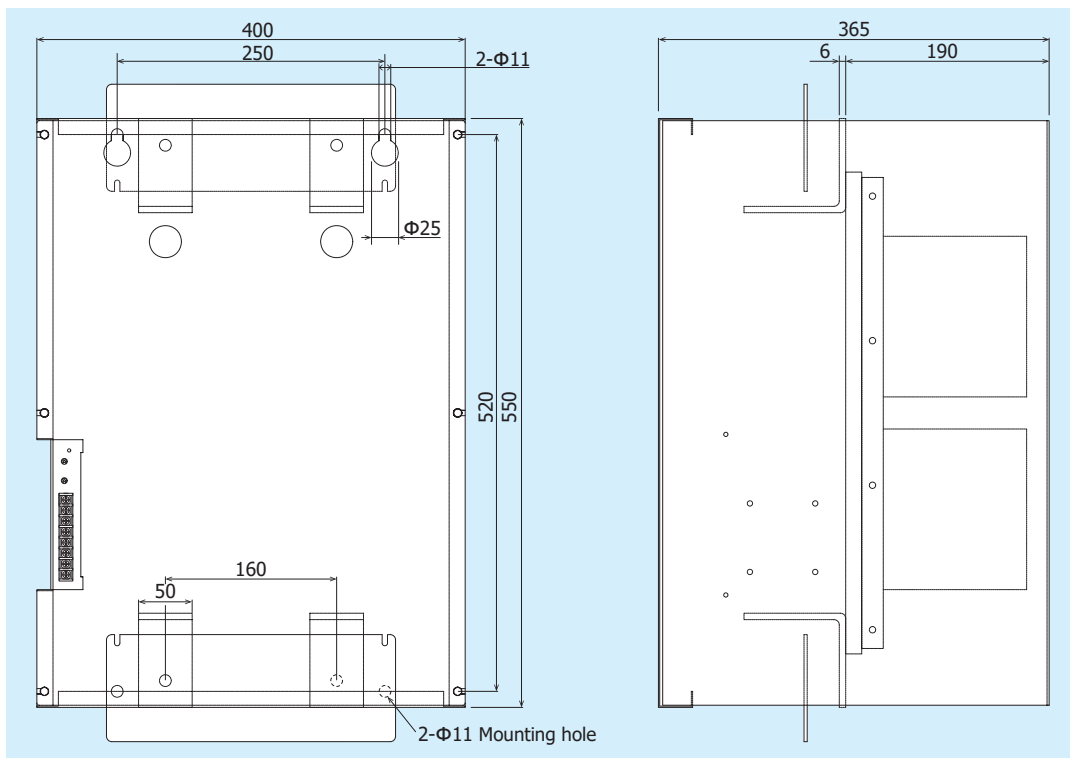
- Dimensions: H440×W280×D310 mm
- Mounting hole dimensions: H420×W180 mm
- Weight : about 22.0 kg



Unit: mm

□ 300A 450A / 200-240V, 380-440V

- Dimensions: H440×W280×D310 mm
- Mounting hole dimensions: H420×W180 mm
- Weight : 350A / about 39.0 kg, 350A / about 39.0 kg



Unit: mm

PREVENTION COVER FOR ELECTRICAL SHOCK (OPTION)

CIRCUIT PROTECTOR TYPE

■ MODEL CODE WHEN ORDERING WITH ELECTRIC SHOCK PROTECTION COVER

PAC30Z □ □ □ □ - 1 □ □ □

PREVENTION COVER FOR ELECTRICAL SHOCK

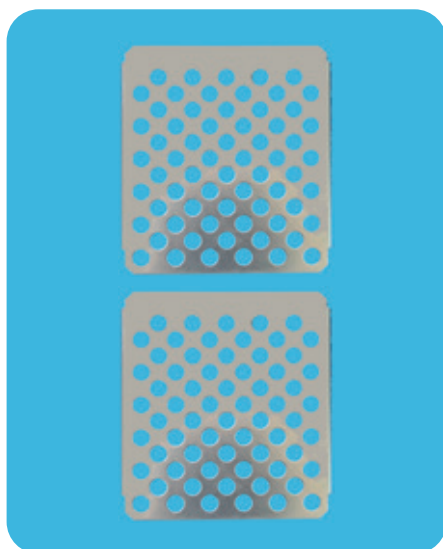
POWER SUPPLY

CURRENT CAPACITY { 20, 30, 45A / 200 ~ 240V
18A / 380 ~ 440 V

- An electric shock prevention cover for strong electric parts.

As for the component configuration... Photo bottom -1, Mounting status... Photo bottom -2

1. Component composition photo



2. Mounting photo



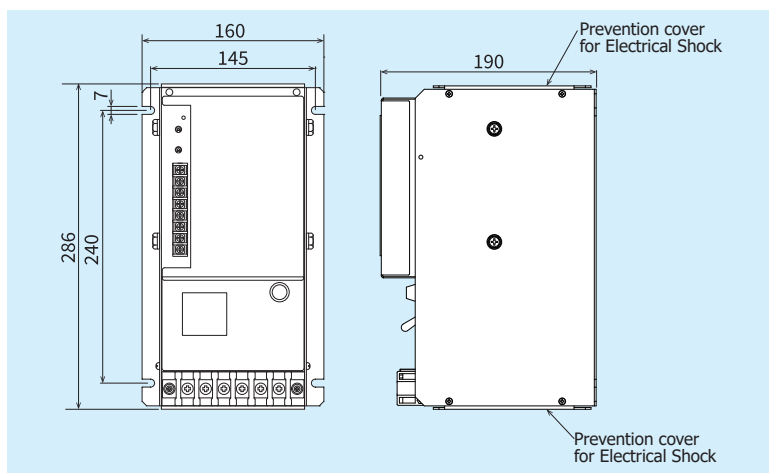
Note) The electric shock prevention cover is installed on the main unit when shipped.

● External dimensions and weight

□ 20, 30, 45A/200-240V

□ 18A/380-440V

- Dimensions: H286×W160×D190 mm
- Mounting hole dimensions: H240×W145 mm
- Weight: about 5.3 kg



Unit: mm

RAPID FUSE TYPE

■ MODEL CODE WHEN ORDERING WITH ELECTRIC SHOCK PROTECTION COVER

PAC30Z □ □ □ □ - 1 □ □ □

PREVENTION COVER FOR ELECTRICAL SHOCK

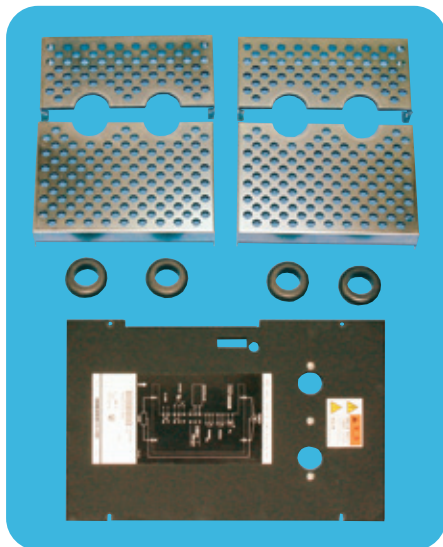
POWER SUPPLY

CURRENT CAPACITY { 60, 90, 135, 200, 300, 450 A / 200 ~ 240 V, 380 ~ 440 V
30, 45 A / 380 ~ 440 V

● A cover to prevent electric shock for the power supply terminals (R, T), output terminals (U, W), control signal terminal block, and fuse peephole.

As for the component configuration... Photo below -1, Mounting status... Photo below -2

1. Component composition photo



2. Mounting photo



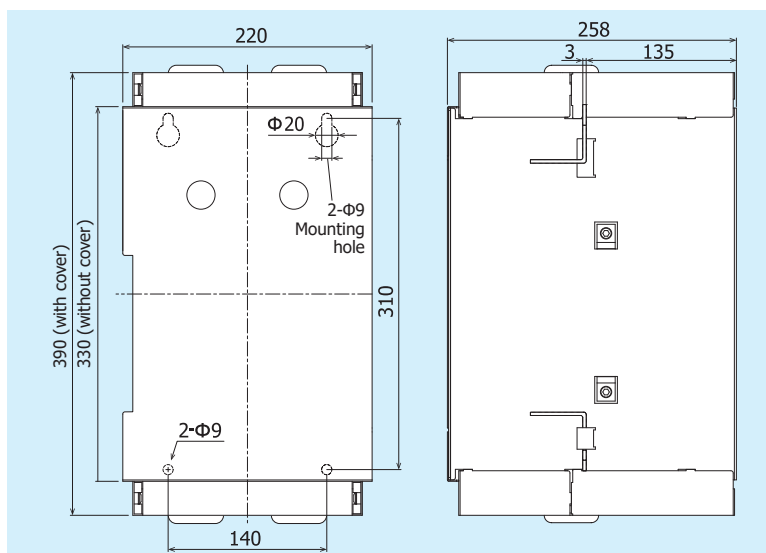
Note) If the electric shock prevention cover is mounted, the acrylic terminal protective cover (R, T, U, W terminals) cannot be attached.

● External dimensions and weight

□ 60, 90, 135A / 200-240V, 380-440V

□ 30, 45A / 380-440V

- Dimensions: H390×W220×D258 mm
- Mounting hole dimensions: H310×W140 mm
- Weight: about 14.0 kg



Unit: mm

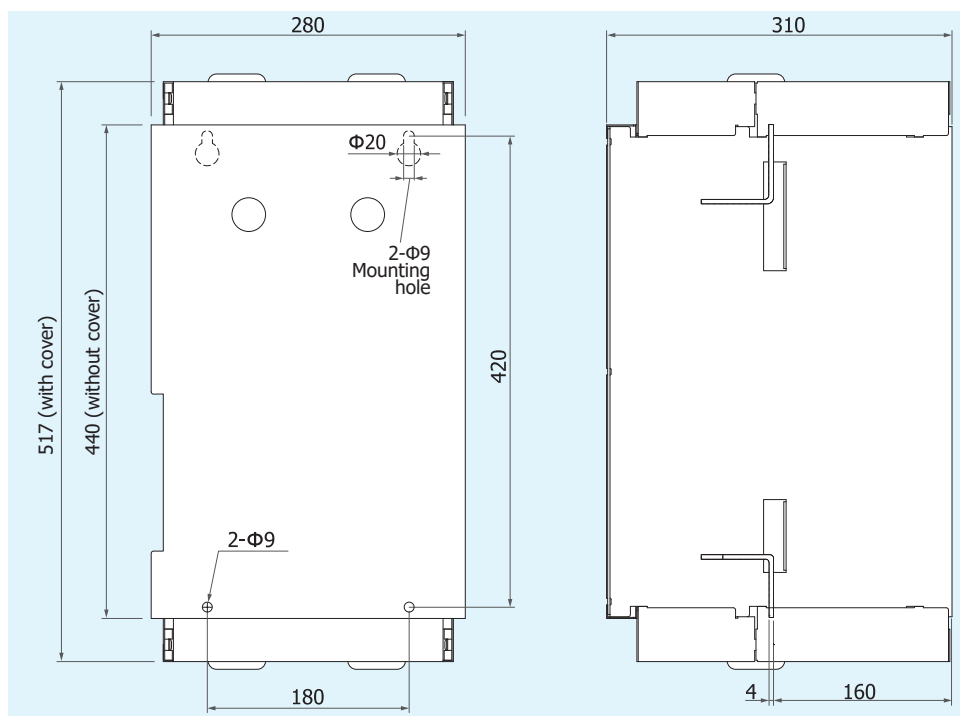
* Mounting dimensions do not include grommets.

PREVENTION COVER FOR ELECTRICAL SHOCK (OPTION)

• External dimensions and weight

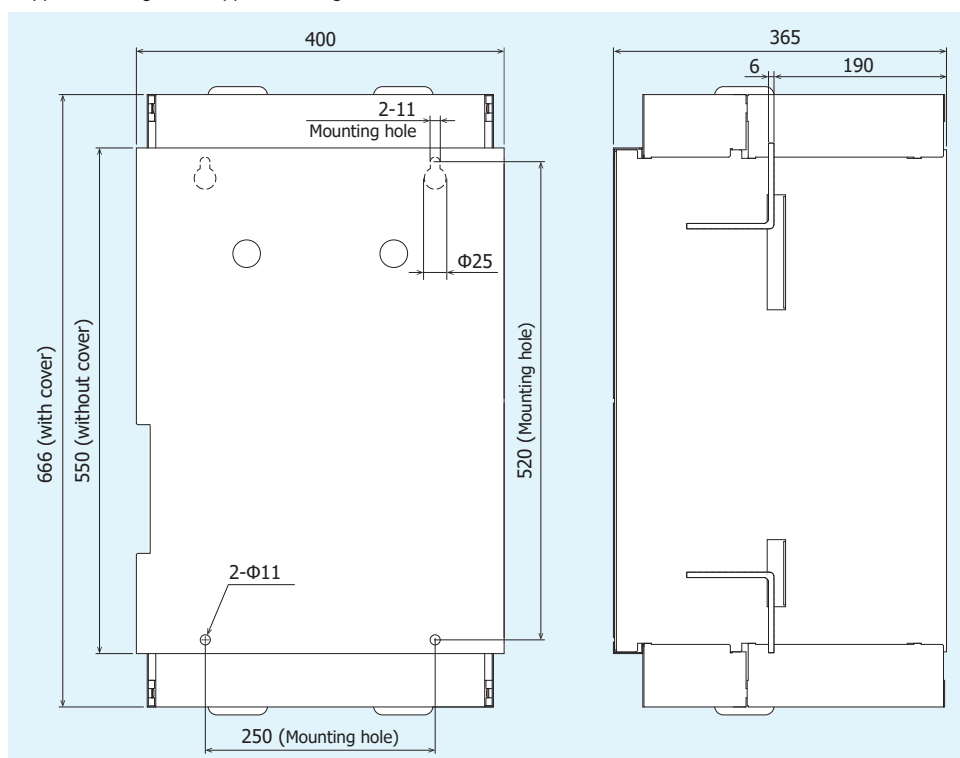
□ 200A / 200-240V, 380-440V

- Dimensions: H517×W280×D310 mm
- Mounting hole dimensions: H420×W180 mm
- Weight: about 24.0 kg



□ 300, 450A / 200-240V, 380-440V

- Dimensions: H666 x W400 x D365 mm
- Mounting hole dimensions: H520×W250 mm
- Weight: 300A/approx. 41.0 kg, 450A/approx. 32.0 kg



* Mounting dimensions do not include grommets.

EXTERNAL EQUIPMENT

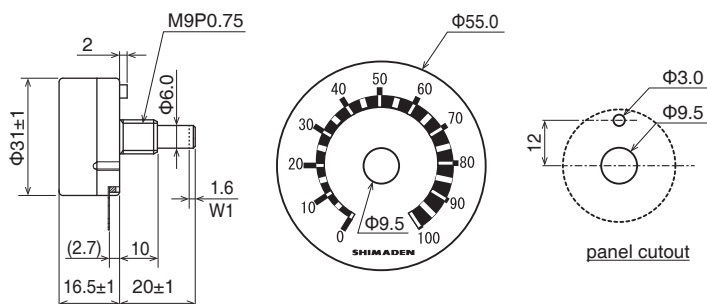
External Power adjuster

This device uses a zero voltage switching control method for cycle calculation. This causes the indicated value to fluctuate when the indicator is connected to the output side because the output is intermittent.

This operating output indicator displays as a percentage the received output signal (0 to 1mA) from the electronic circuit.



External dimensions and panel cutout

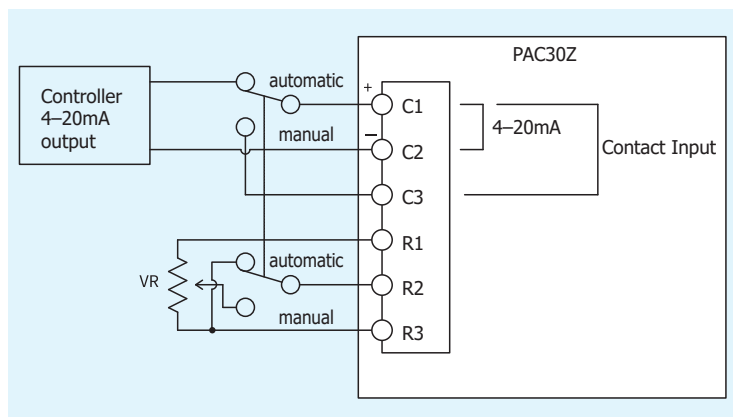


Unit: mm

Operating output indicator

Model	Specifications	External dimensions and panel cutout (Unit: mm)
<p>QSM001</p>	<p>□60 mm Input: 0-1mA Scale: 0-100%</p>	<p>Technical drawings of QSM001 showing front, side, and panel cutout views with dimensions: 60, 60, 29.5, 14.5, 10, 52, 48 ± 0.5, 35, 48 ± 0.5, 2-M3, 2-M4, 2-$\Phi 4$, 48 ± 0.5, $\Phi 5.4$, and panel cutout.</p>
<p>QSM002</p>	<p>□80mm Input: 0-1mA Scale: 0-100%</p>	<p>Technical drawings of QSM002 showing front, side, and panel cutout views with dimensions: 80, 80, 29.5, 14.5, 10, 65, 64 ± 0.5, 35, 64 ± 0.5, 2-M3, 2-M4, 2-$\Phi 4$, 64 ± 0.5, $\Phi 5.7$, and panel cutout.</p>

AUTOMATIC/MANUAL SWITCHING WIRING EXAMPLE



Note) During automatic operation, an operation amount is determined by the output signal of the controller (the external power adjuster does not work).
In manual operation, an operation amount is determined by the setting of the external power adjuster.

■ The contents of this material are subject to change without notice.



- * Be sure to follow the instruction manual when operating this device.
- * This device is designed for industrial use to control temperature, humidity and other physical values. Avoid using it for control of devices upon which human life is dependent.
- * If the possibility of loss or damage to your system or property as a result of failure of any parts of the process exists, proper safety measures must be made before the instrument is put into use so as to prevent the occurrence of trouble.

Head Office & Saitama Factory
ISO 9001/ISO14001 Certification Obtained

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