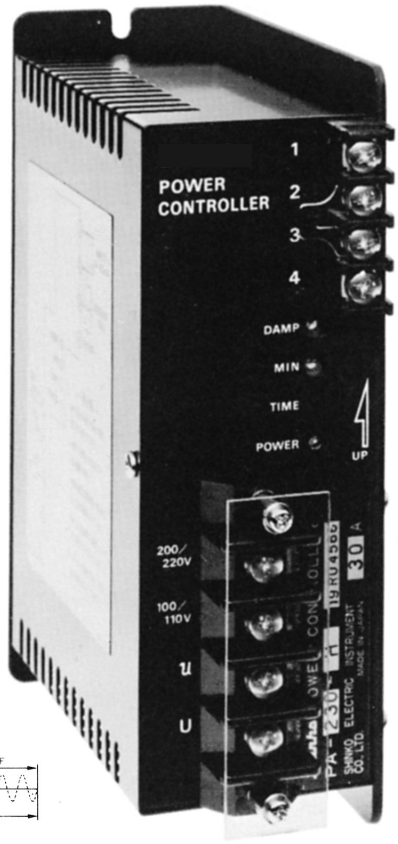
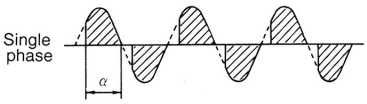
POWER CONTROLLER

PA-200 SERIES



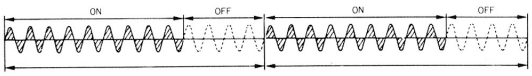
H series is applicable to precise control as well as inductive load

● H series
Resolution: Very excellent
Conductive angle (α) is changed in proportion to the input signal, and AC power to a load is adjustable smoothly.



Z series noiseless type is applicable to a computer line.

● Z series
Noise generation: 55dB or less
ON/OFF time ratio in dividing frequency period is varied in proportion to the input signal, and AC power to a load can be adjusted.



Dividing frequency period (Sampling time) approx. 0.2sec.

PA-200 series is a thyristor type of AC Power Controller.The control systems for single phase are the Phase control system (H type) and the Zero-cross dividing frequency control system (Z type), and for 3-phase, it is the Phase control system (H3 type). Soft up time setting function is equipped as standard.
With the Phase control system, it allows the smooth control because it adjusts the phase.
With the Zero-cross dividing frequency control, it cannot reduce the power voltage, however, the system generates little noise. Both systems have the excellent features respectively, therefore, select suitable are reterring to model code shown below.

■ Model name

H series		Z series
single phase	3-phase	single phase
PA- 215-H	PA- 215-H3	PA- 215-Z
PA- 230-H	PA- 230-H3	PA- 230-Z
PA- 260-H	PA- 260-H3	PA- 260-Z
PA-2100-H	PA-2100-H3	PA-2100-Z
PA-2150-H	PA-2150-H3	PA-2150-Z

■ Model code

PA-230-H, CC

- Series name
- Rated current
- Control system
- Option

15 : 15A, 100 : 100A
30 : 30A, 150 : 150A
60 : 60A

H : Phase control (Single phase)
Z : Zero-cross dividing frequency control (single phase)
H3 : Phase control (3-phase)
CC : Constant current, with voltage imiter
CV : Constant voltage, with current limiter
SP : FAN Provided for 100A
AL : Peak exceeding current alarm output (Addition to CC or CV)

■ Standard specifications

Model name	PA-215-H	PA-230-H	PA-260-H	PA-2100-H	PA-2150-H	PA-215-Z	PA-230-Z	PA-260-Z	PA-2100-Z	PA-2150-Z	PA-215-H3	PA-230-H3	PA-260-H3	PA-2100-H3	PA-2150-H3
Rated current	15A	30A	60A	100A	150A	15A	30A	60A	100A	150A	15A	30A	60A	100A	150A
Capacity	3kVA	6kVA	12kVA	20kVA	30kVA	3kVA	6kVA	12kVA	20kVA	30kVA	5.2kVA	10.4kVA	20.8kVA	34.6kVA	52.0kVA
Power consumption	22W	36W	61W	100W	175W	22W	36W	61W	100W	175W	75W	114W	186W	300W	430W
Weight	1.0kg	1.1kg	3.0kg	3.5kg	6.0kg	1.0kg	1.1kg	3.0kg	3.5kg	6.0kg	2.5kg	3.0kg	6.0kg	9.0kg	12.0kg
Input signal	4 to 20mAdc (200Ω), 0.8 to 4Vdc, Manual setting, Non-voltage contact														
Phase	Single										3-phase				
Rated Voltage	110/220Vac (Option: 380Vac, 415Vac, 440Vac, 480Vac)										220V (Option: 380Vac, 415Vac, 440Vac, 480Vac)				
Frequency	50/60Hz										50/60Hz				
Voltage fluctuation	±10% of rated value														
Output setting range	0 to 98%														
Gain setting range	0 to 100%														
Insulation resistance	50MΩ or greater at 500Vdc														
Dielectric strength	1.5kVac for 1min														
Ambient temperture	0 to 60℃														

The rated current values are described when the ambient temperature is 40℃ or less.
When the temperature exceeds 40℃, refer to Fig. 2 [Ambient temperature and allowable current].

■ Applicable load and the type selection

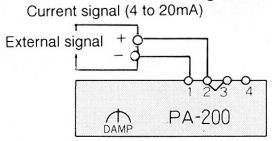
Series	Primary contorol with transformer	Applicable load	Type selection
H series	Available	Load of which resistance is not changed (Nichrome, Iron-chrome, Kanthal,etc.)	Standard or CV [Option]
		Load of which resistance is changed by temperature (Tungsten, Molybdenum, Kanthal super, etc.)	CC [Option]
		Load of which resistance is changed by temperture (Silicon carbide SILICONIT,EREMA,etc.)	CC [Option] Use voltage limiter
		Load of which power-factor is changed (Motor, Solenoid, etc.)	CV [option]
Z series	Not available	Load of which resistance is not changed (Nichrome, Iron-chrome, Kanthal, etc.)	Standard

■ Options

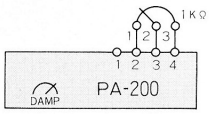
Control mode	Main specification	Detector
Constant current control (CC)	Output current is kept within ±3% to power variation ±10%. (at constant load) Output current is kept within ±3% to 5times as much as the load variation. (at constant supply voltage) Voltage limiter built-in, with over current protective action indicator.	CT, PT built-in (15, 30A) CT attached (60, 100, 150A)
Constant voltage control (CV)	Output voltage is kept within ±3% to power variation ±10%. (at constant load) Output voltage is kept within ±3% to 5 times as much as the load. variation (at constant supply voltage) Current limiter built-in, with over current protective action indicater.	CT, PT built-in (15, 30A) CT attached (60, 100, 150A)
Peak exceeding current alarm out put (AL)	When acted peak over current protection (gate off), it gives the alarm (This option can be added to CC or CV option.) Output is a phototriac output, and the connector lead wire (equivalent to AWG 22, 300mm) is attached. Rating of phototriac: 220Vac or less, 5 to 50mA. Peak 60Hz sine half-wave 1.3A nonrepetitive.	

■ Scheme of connection for setting circuit (When using, the short-bar between ① and ③ must be removed if unnecessary.)

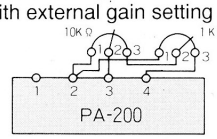
● Manual setting (Using built-in DAMP)
Current signal (4 to 20mA)



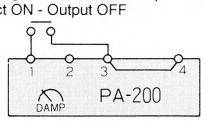
● Manual setting
(With external setting unit)



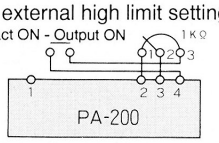
● Manual setting
(With external gain setting unit)



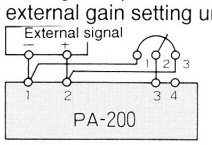
● ON/OFF non-voltage contact input
(Using built-in DAMP)
Contact ON - Output OFF



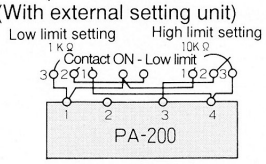
● ON/OFF non-voltage contact input
(With external high limit setting unit)
Contact ON - Output ON



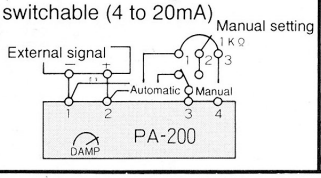
● Current signal input 4 to 20mA
(With external gain setting unit)



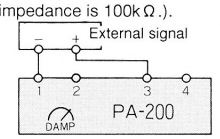
● Two position control
(With external setting unit)
Low limit setting High limit setting



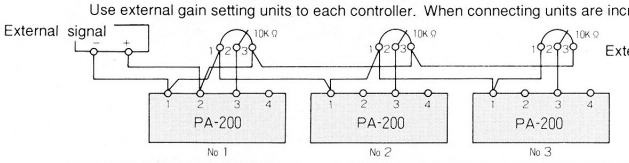
● Manual-Current signal
switchable (4 to 20mA)



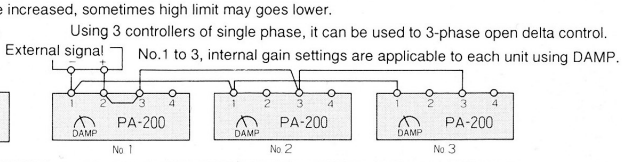
● Voltage signal input (0.8 to 4V)
Adjust the voltage so as to be maximum 4V between ① and ③ (inner impedance is 100kΩ.).



● Current signal input (4 to 20mA) plural control ..... Connectable maximum12 controllers
Use external gain setting units to each controller. When connecting units are increased, sometimes high limit may goes lower.

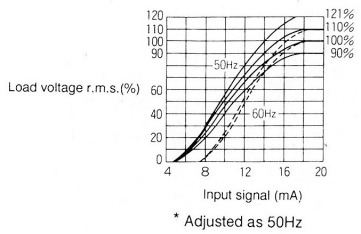


Using 3 controllers of single phase, it can be used to 3-phase open delta control.
No.1 to 3, internal gain settings are applicable to each unit using DAMP.



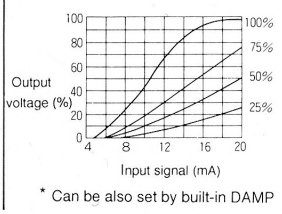
■ Characteristics

● Circuit voltage characteristic
(H, H3 series)



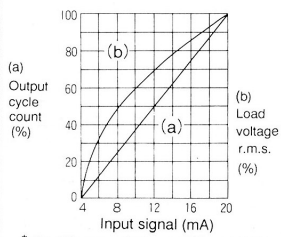
* Adjusted as 50Hz

● Gain setting characteristic
(H,H3 series)



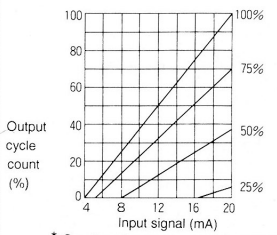
* Can be also set by built-in DAMP

● Output characteristic (Z series)



* No difference between 50 and 60Hz

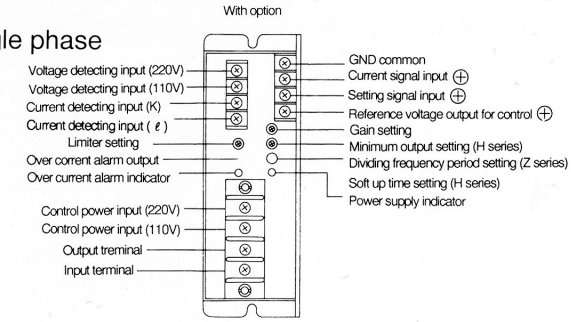
● Gain setting characteristic
(Z series)

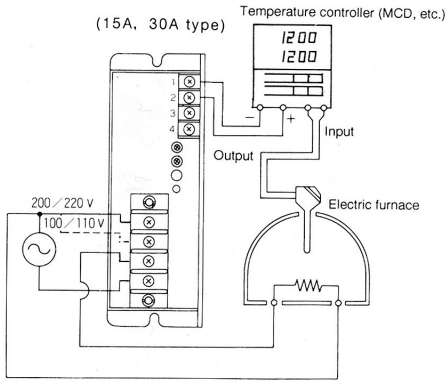


* Can be also set by built-in DAMP

■ Terminal arrangements・Wiring connection examples

● Single phase

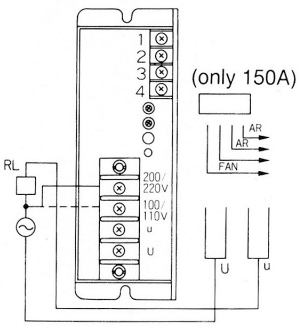




- Terminals between ② and ③ are connected with the short-bar.
- Gain setting is set with built-in DAMP.
- With Z series, the dividing frequency period can be changed from approx. 0.2 to 0.5sec. by TIME.

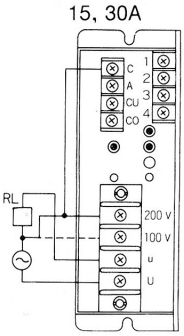
Main circuit

60, 100, 150A

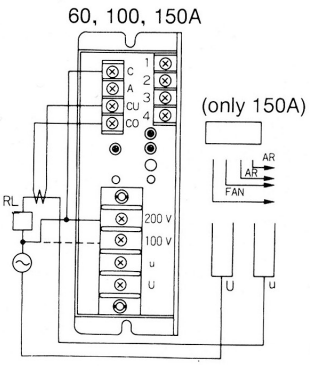


Option unit

15, 30A

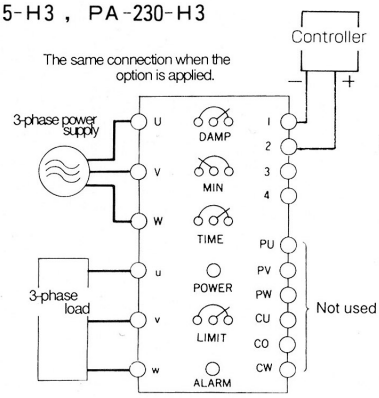


60, 100, 150A

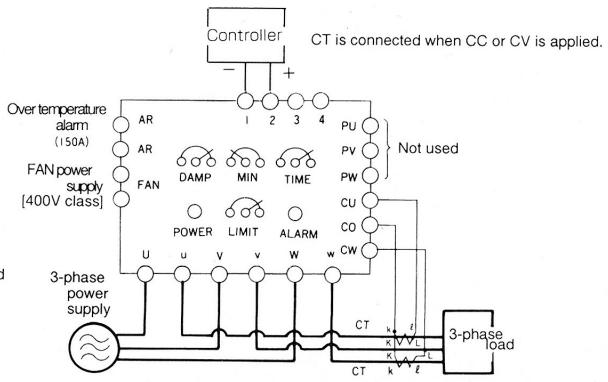


● 3-phase

PA-215-H3 , PA-230-H3



PA-260-H3 , PA-2100H3, PA-2150-H3



The load can be connected by both Y or △.
(Take care so as not to exceed the rated current of the power controller.)
[POWER] : Power receiving indicator.
[TIME] : Soft up time setting approx. 0.2 to 5 seconds available by built-in- timer.
[LIMIT] : Voltage limiter (CC) or Current limiter (CV) setting when the option is applied.
[ALARM] : It lights when the peak over current protection is worked.

■ Notices when using

- When there is no input signal, load current does not flow, however, take care that the voltage is applied to the circuit by slight leakage current.
- In case of no load, the output cannot be adjusted. Regardless of input signal, voltmeter will indicate some voltage. Load 100mA or greater should be connected.
- Approximately 10mA of slight current flows through the contact when using non-voltage contact or two-position control.Use the contact not to cause improper connection.
- Use the control wire twisted or shielded, and when wiring, avoid parallel wiring to AC power supply circuit.
- When excuting the phase control, the difference of indicating value between effective value indicating voltmeter (moving-iron type, etc.) and mean value indicating voltmeter (rectifier type, tester, etc.) is shown as Fig. 1.
- As for mounting location, give a clearance for upper and lower sides for better ventilation, not obstruct by such as cable conduit. Considering each of generated heat, refer to Fig.2 for ambient temperature and allowable current.
- For the types 60A or greater, quick blowing fuse can be provided as built-in type. Further, allowable surge current of each type is as shown on Fig.3, use the controller with sufficient allowance.
- Potentiometer for low limit setting has been adjusted as 4 to 20mA input at 50Hz. When using the controller at 60Hz, and if necessary to adjust the low limit, it can be adjusted by potentiometer, however, do not turn it if possible.

● Difference between effective value and mean value

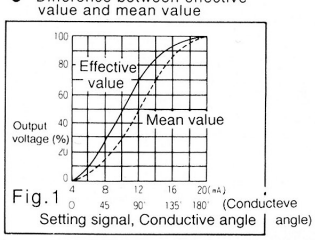


Fig.1 (H series, in case of phase control output)

● Ambient temperature and allowable current

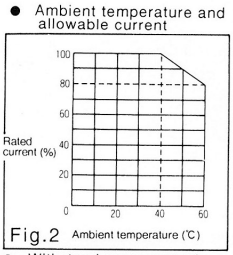


Fig.2

● Withstand surge current (nonrepetitive) 50Hz

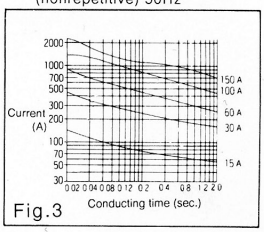
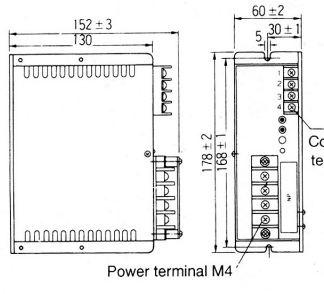


Fig.3

■ External dimensions (The same dimensions for the type option is applied.)

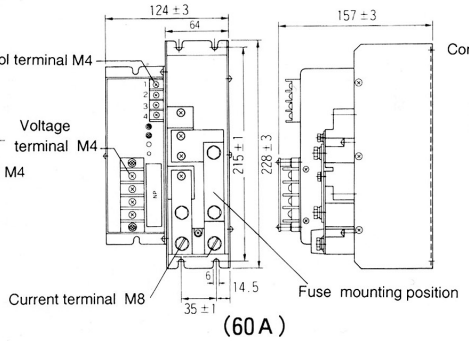
● Single phase (□ for model name: Control system, H or Z)

PA-215-□, PA-230-□



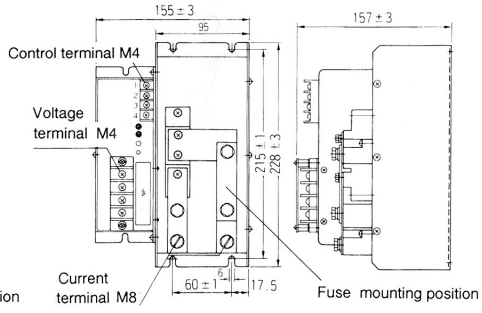
(15A, 30A)

PA-260-□



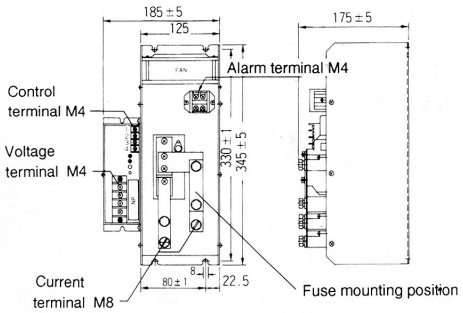
(60A)

PA-2100-□



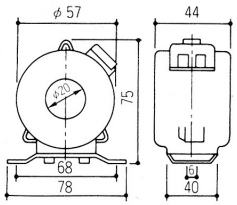
(100A)

PA-2150-□



(150A)

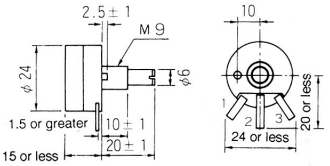
● CT (Attached to CC/CV option)



60A : CT-025 120A 2T
100A : CT-025 100A 1T
150A : CT-025 150A 1T

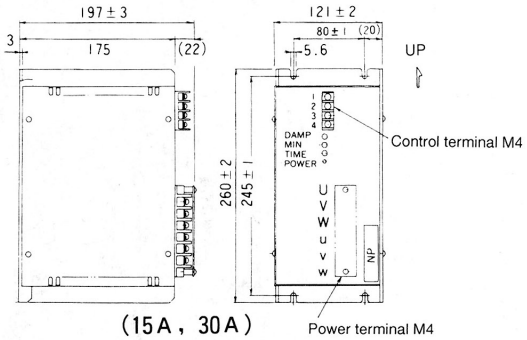
● Option (Separately sold)

■External setting unit
For output setting 1kΩ (Main setting unit)
For gain setting 10kΩ (gain setting unit)



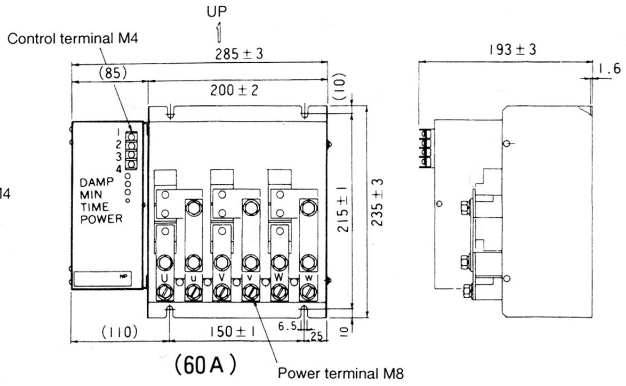
● 3-phase

PA-215-H3, PA-230-H3



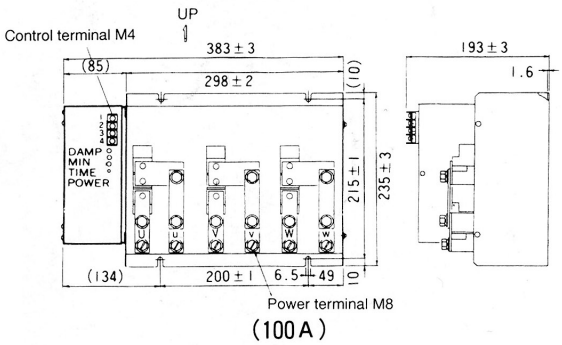
(15A, 30A)

PA-260-H3



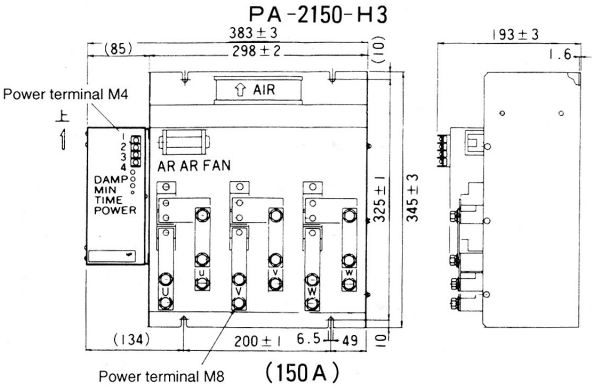
(60A)

PA-2100-H3



(100A)

PA-2150-H3



(150A)

Specificaitions are sdubject to change without notice.