

# AC Power Regulators

## Single-phase APR-MX2 series

### Single-phase AC power regulators, APR-MX2 series

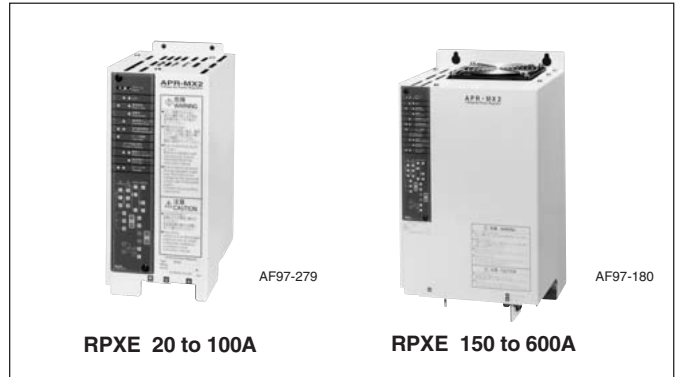
#### ■ Description

The RPXE type is a compact, high-performance single-phase AC power regulator.

The RPXE type is an AC power regulator with superior functions suitable for a wide variety of applications in such fields as plastic molding, drying ovens, thermostatic ovens, and food processing.

#### ■ Features

- Cyclic control of transformer loads
- Linear or functional output characteristic can be selected.
- Easy constant power control with a VT externally connected
- Compensating fluctuation of power supply voltage
- Heater burnout detection
- Flexible adjustments to soft start time



- Cyclic control function to suppress power supply flickering
- Thyristor error detection (optional)

#### ■ Types and ratings

Phase	Input voltage	Output current	Type
Single-phase	100-110V AC	20A	RPXE1020-2 ■ □ -N
		45A	RPXE1045-2 ■ □ -N
		60A	RPXE1060-2 ■ □ -N
		100A	RPXE1100-2 ■ □ -N
		150A	RPXE1150-2 ■ □ -N
		250A	RPXE1250-2 ■ □ -N
		350A	RPXE1350-2 ■ □ -N
		450A	RPXE1450-2 ■ □ -N
		600A	RPXE1600-2 ■ □ -N
	200-220V AC	20A	RPXE2020-2 ■ □ -N
		45A	RPXE2045-2 ■ □ -N
		60A	RPXE2060-2 ■ □ -N
		100A	RPXE2100-2 ■ □ -N
		150A	RPXE2150-2 ■ □ -N
		250A	RPXE2250-2 ■ □ -N
		350A	RPXE2350-2 ■ □ -N
		450A	RPXE2450-2 ■ □ -N
		600A	RPXE2600-2 ■ □ -N
380V 400-440V AC others	20A	RPXE0020-2 ■ □ -N	
	45A	RPXE0045-2 ■ □ -N	
	60A	RPXE0060-2 ■ □ -N	
	100A	RPXE0100-2 ■ □ -N	
	150A	RPXE0150-2 ■ □ -N	
	250A	RPXE0250-2 ■ □ -N	
	350A	RPXE0350-2 ■ □ -N	
	450A	RPXE0450-2 ■ □ -N	

- Notes:
- Replace the ■ mark by the control code shown in the Table on the right.
  - Replace the □ mark by the parameter setting code shown in the Table on the right.

#### ● Control type code (■)

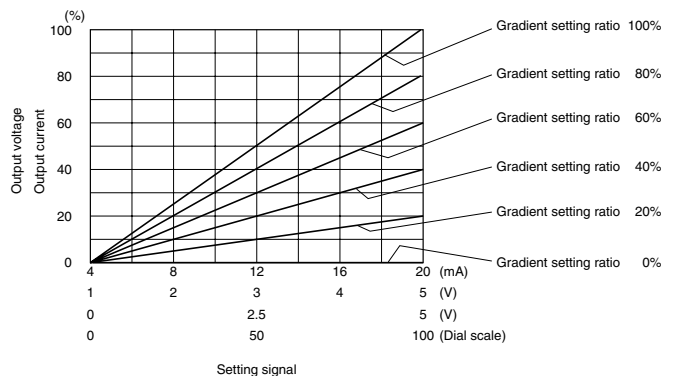
Code	Control type
T	No feedback function (without built-in CT)
A	AC CLR
B	AC ACR + AC CLR
C	AC AVR + AC CLR
G	AC AWR + AC CLR
D	
E	DC AVR + AC CLR
F	DC ACR + AC CLR
P	Single-phase transformer, cyclic control
Z	Special specification

CLR: Current limit control  
ACR: Constant current control  
AVR: Constant voltage control  
AWR: Constant power control

#### ● Parameter setting type code (□)

Code	Parameter setting type
N	Current signal: 4 to 20mA DC, voltage signal: 1 to 5V DC
A	Variable resistor
B	Two-point control
C	Code N + gradient setting
E	Code A or C switchable
F	Code A or N switchable
Z	Non-standard current and voltage signals (custom spec.)

#### ■ Output characteristics for resistive load



■ Specifications

Main circuit power supply	No. of phases	Single-phase											
	Voltage and frequency	100 to 110V, 200 to 220V, 380V, 400 to 440V AC 50/60Hz (automatically determined)											
	Allowable voltage and frequency fluctuation	Voltage: $\pm 10\%$ Frequency: $\pm 1\text{Hz}$											
Control circuit power supply		220/220V $\pm 10\%$											
Rated output current		20A	45A	60A	100A	150A	250A	350A	450A	600A			
Rated input voltage	100 to 110V AC or 200 to 220V AC 380V AC or 400 to 440V AC	●	●	●	●	●	●	●	●	—			
Cooling		Self-cooled				Fan-cooled							
Applicable load	Phase control	Resistive load, inductive load, transformer primary circuit, rectifier primary circuit											
	Cyclic control	Resistive load, transformer primary circuit *1											
Control	Wave control	Phase control, cyclic control (selectable with dip switching)											
	Output voltage adjustment range *2	0% to 100% of input voltage (root-mean-square r.m.s.)											
	Power supply voltage compensation *3	Suppressing fluctuation rate of power supply voltage to 1/3 (set signal is between 10% and 90%)											
	Set signal	Variable resistor: 1k $\Omega$ 1/2W min, Current signal: 4 to 20mA DC (Zin=250 $\Omega$ ) Voltage signal: 0 to 5V DC or 1 to 5V DC (Zin=10k $\Omega$ )											
	Time to soft-startup, soft-increase/ decrease *4	0.5 to 10s or 5 to 100s (selectable with dip switching)											
	Gradient setting range	0% to 100% of output voltage											
	Base load set range	0% to 100% of output voltage (optional)											
	Feedback control (Phase control type only)	● AC CLR control			● AC ACR control + AC CLR control			● AC AVR control + AC CLR control			● DC ACR control + AC CLR control		
	Heater burnout detection level	Approx. 3% to 100% of rated current (in phase control except T-type or P-type control)											
	Thyristor error detection range	20% to 90% of rated current (optional)											
Protection	Short-circuit	Operation stop with built-in super rapid fuse (yellow LED lights up)											
	Overcurrent	Operation stop with overcurrent (approx. 120% of rated current) detection of built-in CT (red LED lights up), T-type control is unavailable.*5											
	Overheat	Operation stop with built-in sensor (yellow LED lights up), optional with 20 to 100A types											
	Heater burnout *6	Detected with built-in CT (green LED lights up), T or P-type control is not possible.											
	Parallel operation error	Operation stop (yellow and green LEDs light up), alarm reset with normal restoration (LEDs remain lighting)											
	Thyristor error *6	Detection with built-in CT (yellow and green LEDs blink), optional											
	Excessive magnetic deflection	Operation stop with the built-in CT (yellow and red LEDs blink), P-type control only											
	Current limit setting over	Detected with built-in CT (red LED blink), P-type control only											
	CPU memory error	Operation stop with CPU detecting error (yellow and red LEDs light up)											
	Power supply error	Operation stop with power supply error detected (red and green LEDs light up) LEDs turned off with normal restoration											
Alarm output	Non-voltage contact with error contact signal output (250V AC 1A), turn off power to reset.												
Environment	Environment	No corrosive gas, dust, or vibration											
	Ambient temperature	Operating	-5°C to +55°C (output current should be derated when used above 40°C.)										
		Storage	-20°C to +60°C										
	Ambient humidity	30% to 90% RH (no condensation)											
Withstand voltage	Dielectric strength	2000V AC, 1 min. between input and grounding terminals (Main circuit: 100 to 110V, 200 to 220V) 2500V AC, 1 min. between input and grounding terminals (Main circuit: 380V, 400 to 440V)											
	Insulation resistance	10M $\Omega$ or more between input and grounding terminals (500V DC megger)											

Notes: \*1 Applicable to P-type control.

\*2 The output voltage adjustment range between 0% and 100% is given without considering the voltage drop of the thyristor.

\*3 Applicable to T- and A-type control.

\*4 The output current in P-type control will be output in a phase control waveform at the time of soft starting.

\*5 T-type control with built-in CT is available on request.

\*6 A detection error may result if the load is not a resistive load.

● Available  
— Not available

# AC Power Regulators

## Single-phase APR-MX2 series

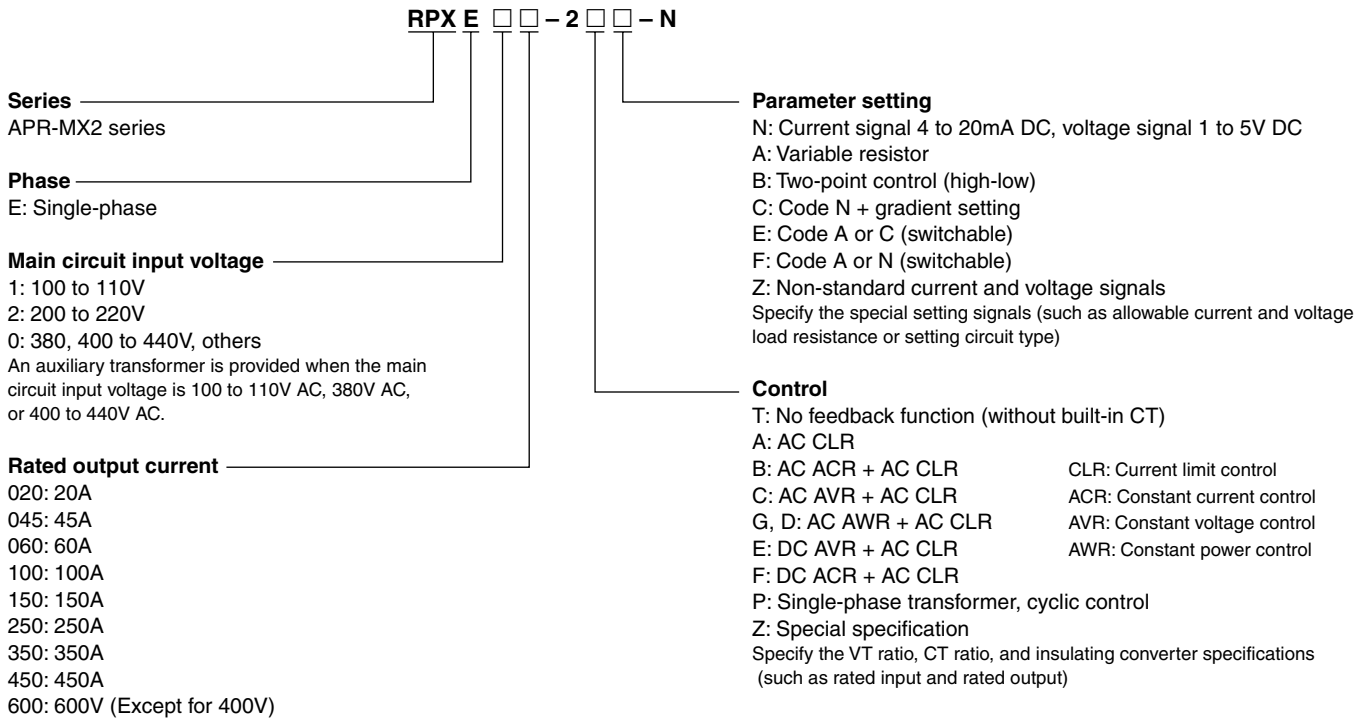
### ■ Alarm detection display

If an error occurs, the corresponding alarm indicator (LED) on the front panel will turn on or blinks while the internal alarm contact will turn on.

	Alarm indicator(LED)			Alarm contact	Operation after error detection
	Green	Yellow	Red		
CPU error		Yellow	Red	ON	Operation stop
Power supply error	Green		Red	—	
Overcurrent			Red	ON	
Overheat or main fuse blowout		Yellow			
Parallel operation error	Green	Yellow			
Heater burnout	Green				
• Blinking					
Excessive magnetic deflection		Yellow	Red	ON	Operation stop
Current limit setting over			Red		Continues
Thyristor error	Green	Yellow			

Note: The red, yellow and green LEDs will be all lit for a moment when the APR is turned on.

### ■ Type number nomenclature



### ■ Required optional devices for feedback control

Code	Control type	Optional device
T	No feedback function	—
A	AC CLR	—
B	AC ACR + AC CLR	—
C	AC AVR + AC CLR	VT
G	AC AWR + AC CLR	VT
D	AC AWR + AC CLR	W converter, VT, CT
E	DC AVR + AC CLR	Insulating converter or VT, RMS converter
F	DC ACR + AC CLR	Insulating converter or VT, RMS converter
P	Single-phase transformer cyclic control	—

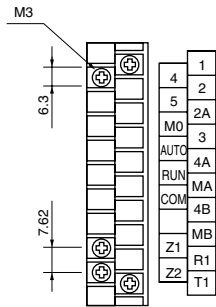
### ■ Ordering information

Specify the following:  
1. Type number  
2. Special specification

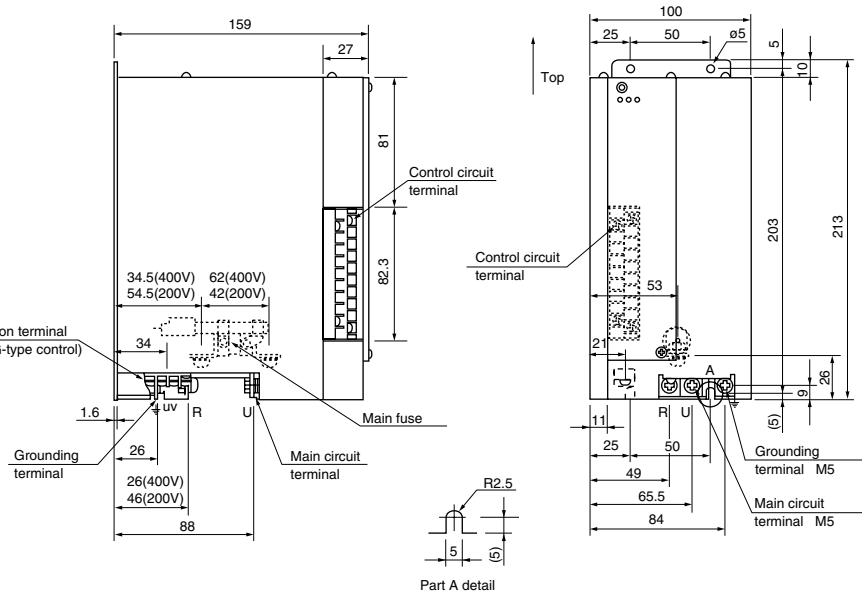
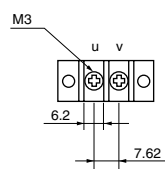
■ Dimensions, mm

● RPXE □ 020-2 ■ □ -N

Control circuit terminal



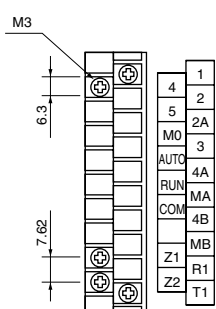
External circuit terminal



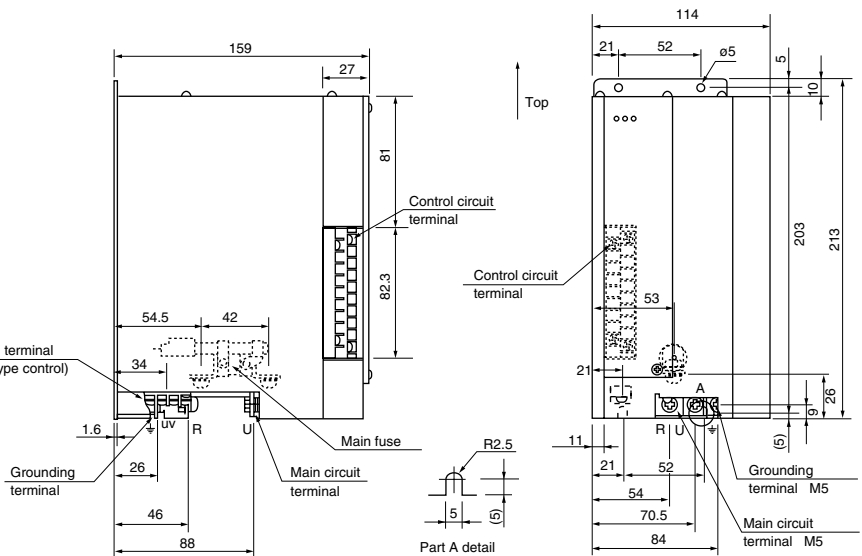
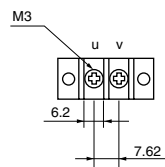
Mass: 2.7kg

● RPXE1045, 2045, 1060, 2060-2 ■ □ -N

Control circuit terminal



External circuit terminal



Mass: 3.3kg

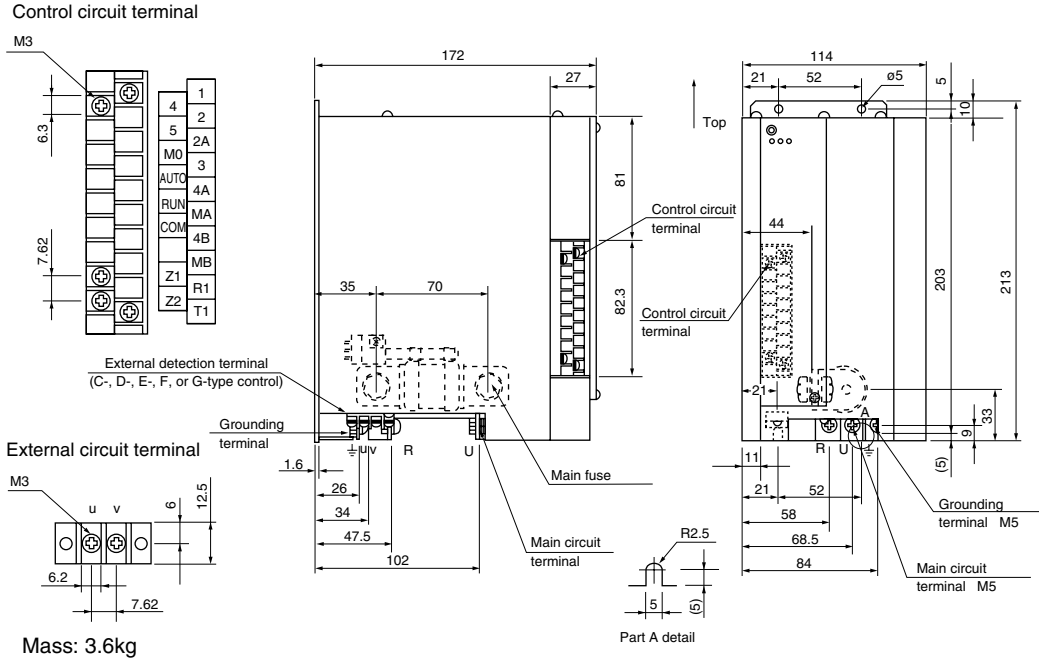
Note: The bottom of the cover is exposed.

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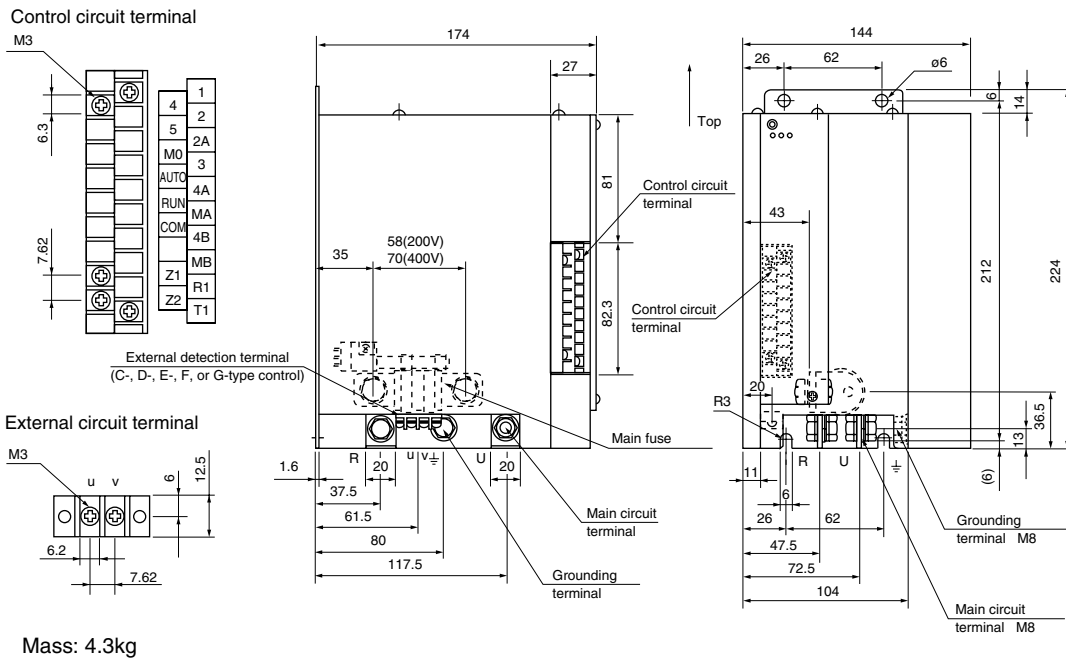
## Single-phase APR-MX2 series

### ■ Dimensions, mm

#### ● RPXE0045, 0060-2 ■ □ -N



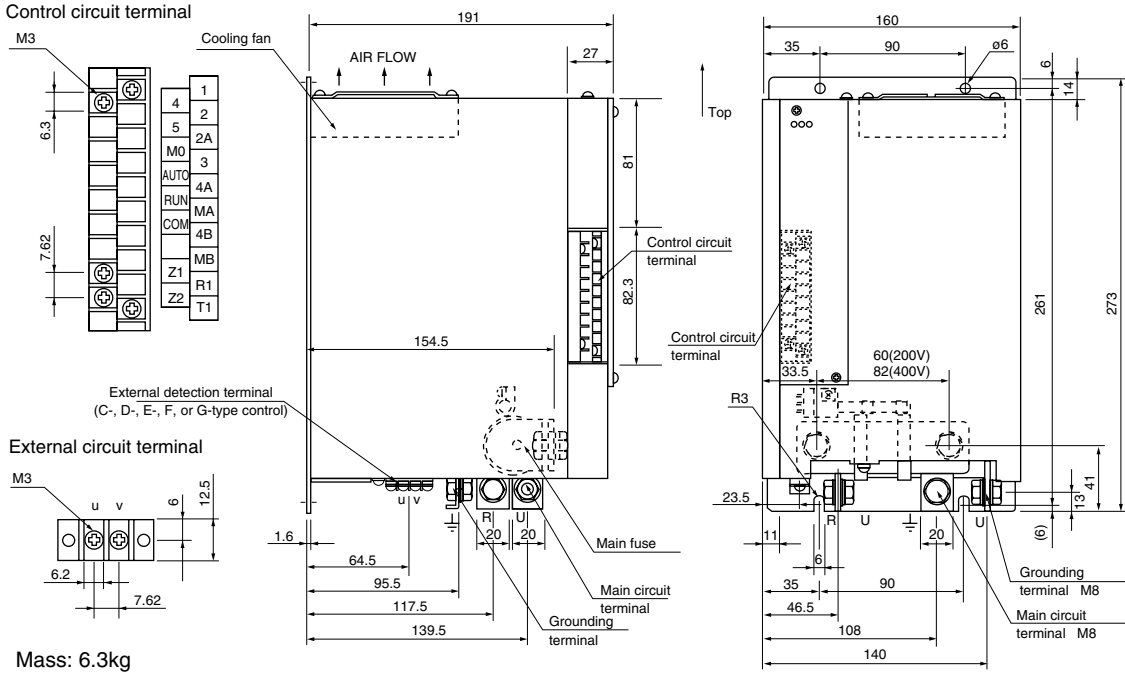
#### ● RPXE □ 100-2 ■ □ -N



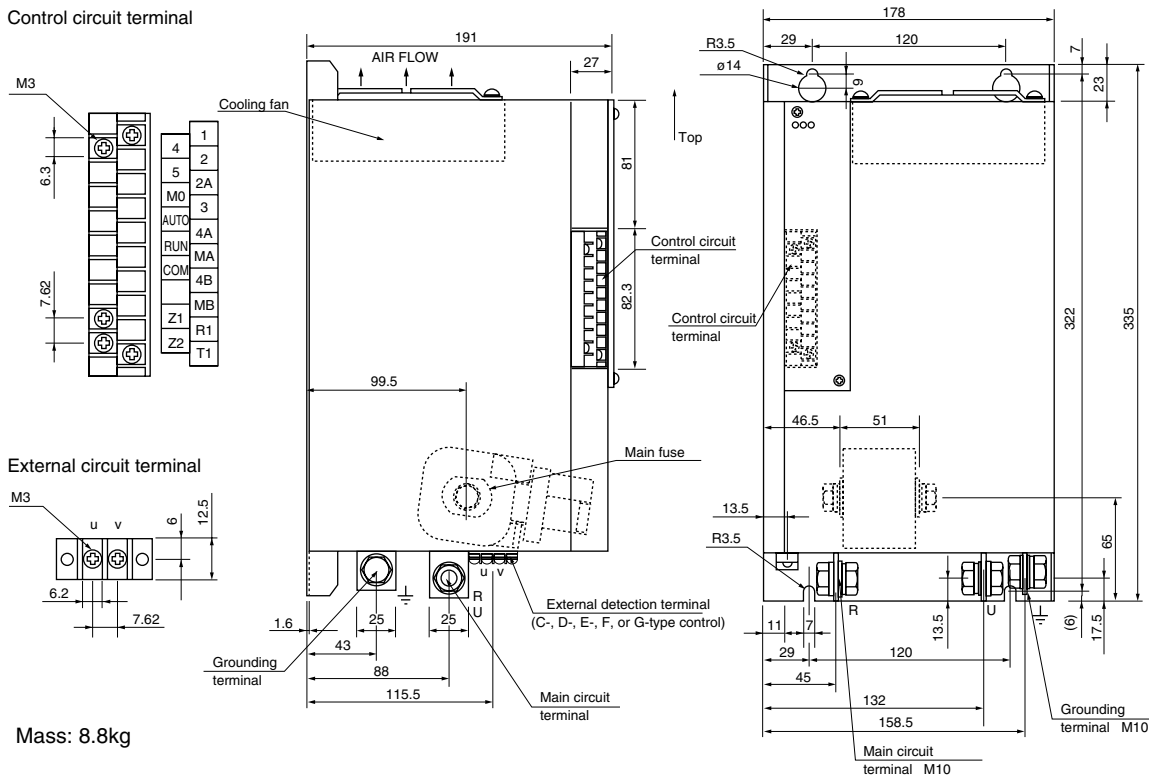
Note: The bottom of the cover is exposed.

■ Dimensions, mm

● RPXE □150-2 ■ □-N



● RPXE □250-2 ■ □-N



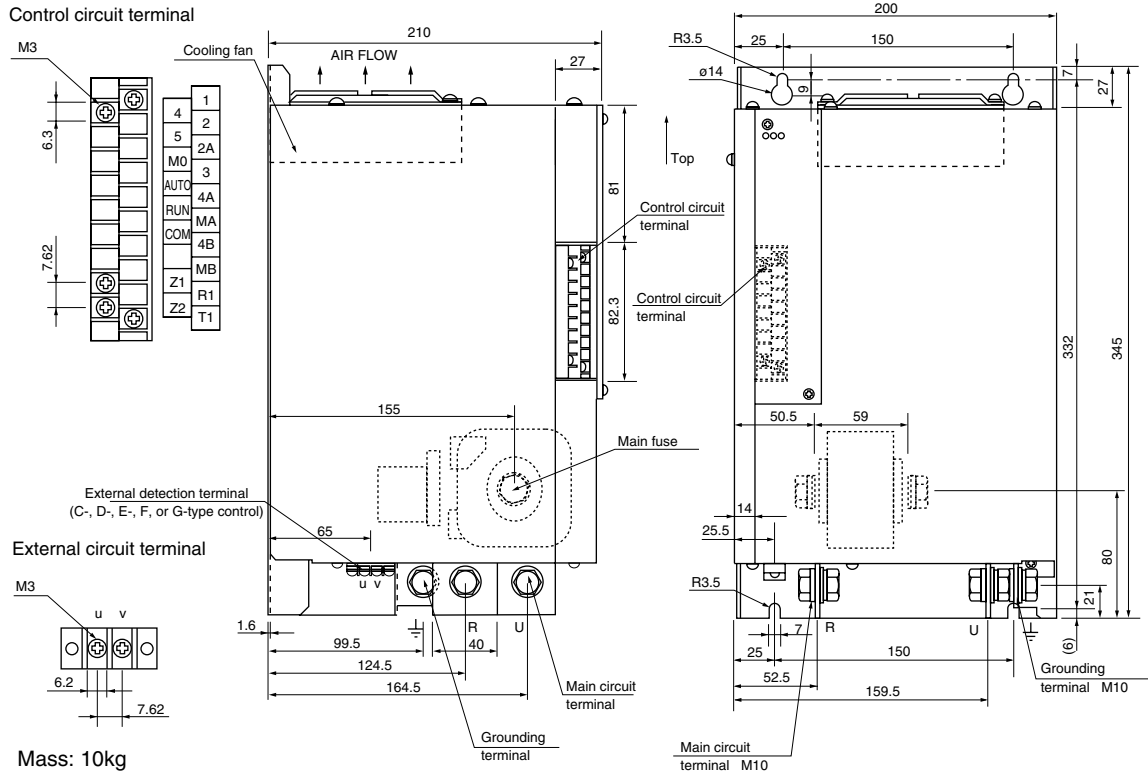
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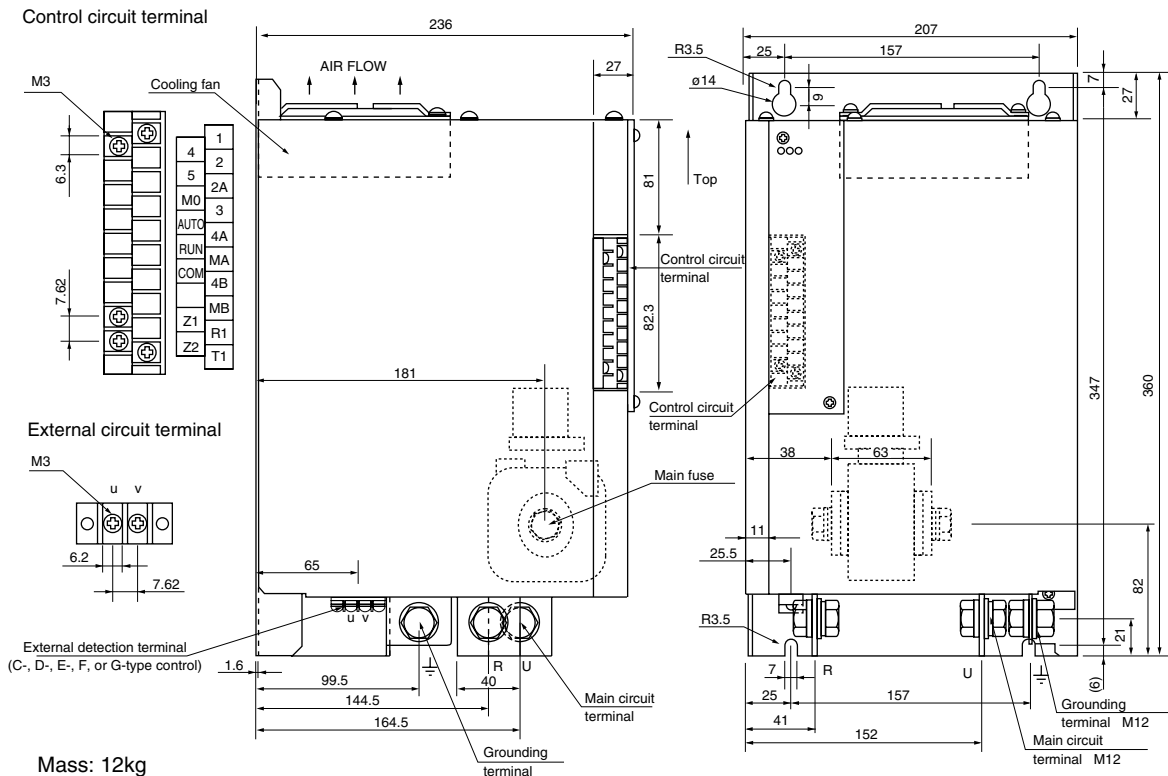
## Single-phase APR-MX2 series

### ■ Dimensions, mm

#### ● RPXE □ 350, □ 450-2 ■ □ -N



#### ● RPXE □ 600-2 ■ □ -N



Note: The bottom of the cover is exposed.