

Three-phase AC power regulators, APR-MX2 series

■ Description

The RPXD type is an improved multi-functional three-phase AC power regulator that is more compact than the conventional models.

It is used for heater control in fields such as plastic molding, rubber molding, glass processing and food processing, and as a dimmer for incandescent lighting. It also has various applications in the field of industrial equipment, serving, for example, as a DC power source when used in combination with a diode rectifier. It is useful in controlling all types of loads, either by cutting the power-on time of certain parts of the AC voltage sinusoidal wave (phase control), or by cutting the power-on time of each sinusoidal wave (cycle control).

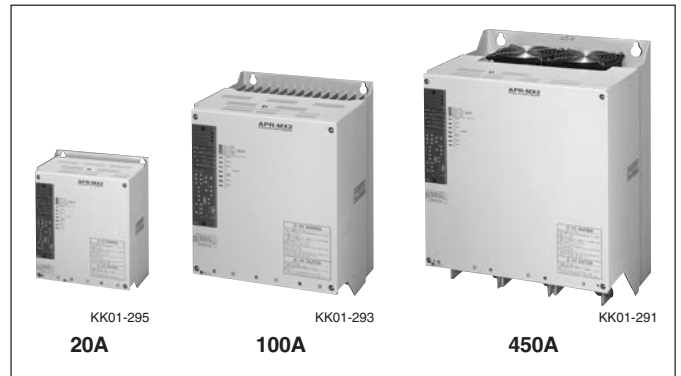
■ Features

- Compact size
- Minimum arc angle of 0 degrees
- Resolution maintained under cycle control even in short duty cycles
- Supply-voltage flicker is reduced in parallel operation under cycle control.
- Up to 50 units can be used in parallel operation.
- Input/output characteristics can be set arbitrarily.
- Compensates for input voltage fluctuation
- Many optional accessories available
- Wide range of soft start, soft up, soft down time settings
- Improved function selection and set up features

■ Types and ratings

| Phase | Input voltage | Output current | Type |
|-------------|----------------------------------|--|--|
| Three-phase | 200-220V AC | 20A | RPXD2020-2 <input type="checkbox"/> -N |
| | | 45A | RPXD2045-2 <input type="checkbox"/> -N |
| | | 60A | RPXD2060-2 <input type="checkbox"/> -N |
| | | 100A | RPXD2100-2 <input type="checkbox"/> -N |
| | | 150A | RPXD2150-2 <input type="checkbox"/> -N |
| | | 250A | RPXD2250-2 <input type="checkbox"/> -N |
| | | 450A | RPXD2450-2 <input type="checkbox"/> -N |
| | 600A | RPXD2600-2 <input type="checkbox"/> -N | |
| | 380V AC 400-440V AC others | 20A | RPXD0020-2 <input type="checkbox"/> -N |
| | | 45A | RPXD0045-2 <input type="checkbox"/> -N |
| | | 60A | RPXD0060-2 <input type="checkbox"/> -N |
| | | 100A | RPXD0100-2 <input type="checkbox"/> -N |
| | | 150A | RPXD0150-2 <input type="checkbox"/> -N |
| | | 250A | RPXD0250-2 <input type="checkbox"/> -N |
| 450A | | RPXD0450-2 <input type="checkbox"/> -N | |

Notes: *1 Replace the mark by the control code shown in the Table at the right.
*2 Replace the mark by the parameter setting code shown in the Table at the right.



● Control type code (■)

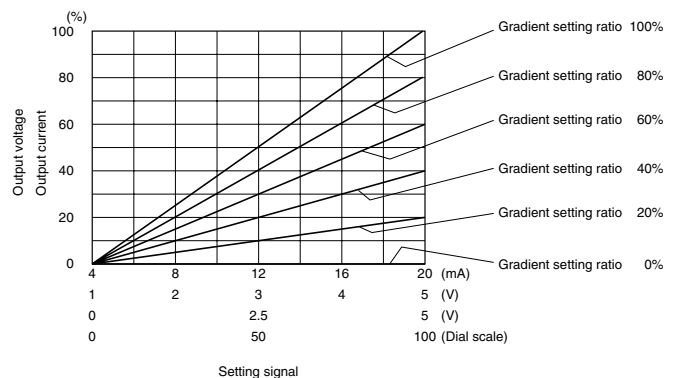
| Code | Control type |
|------|--|
| T | No feedback function (without built-in CT) |
| A | AC CLR |
| B | AC ACR |
| C | AC AVR + AC CLR |
| D | AC AWR + AC CLR |
| E | DC AVR + AC CLR |
| F | DC ACR + AC CLR |
| Z | Special specification |

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/ 0-5V 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.) |

■ Voltage output characteristics for resistive load



AC Power Regulators

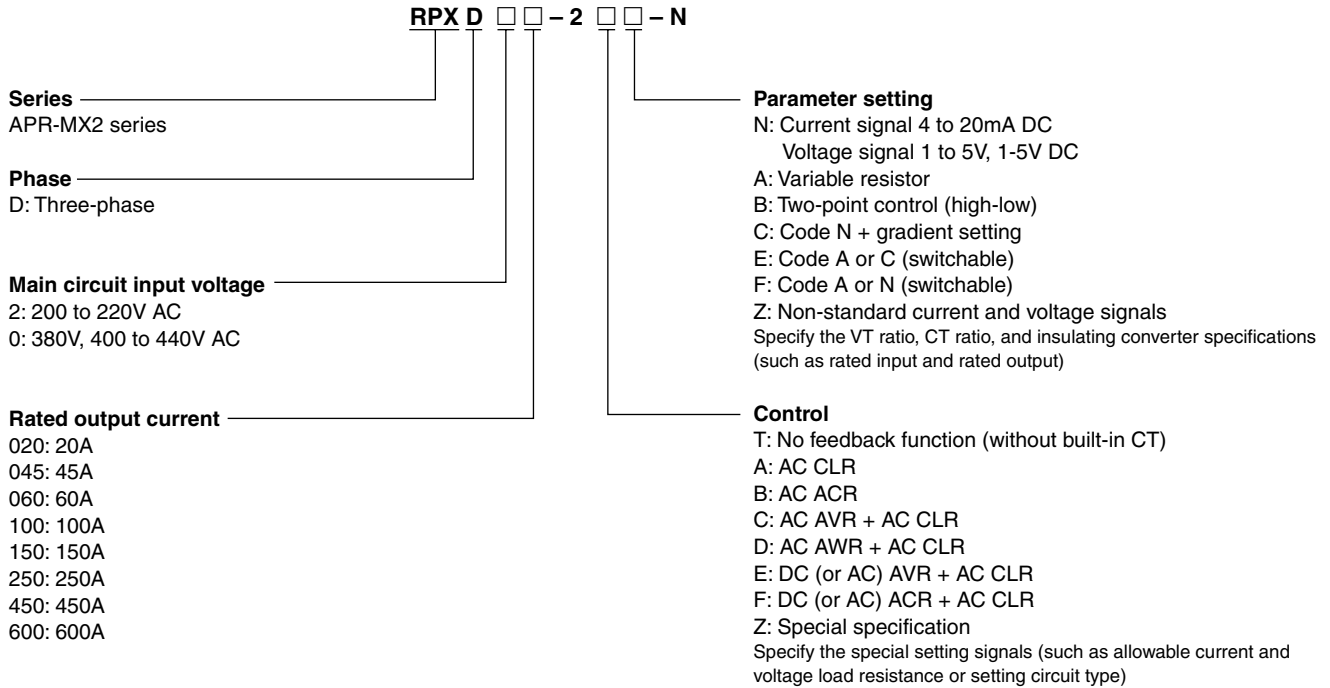
3-phase APR-MX2 series

■ Specifications

| | | | | | | | | | |
|---|---|---|-----|-----|------|------------|------|------|------|
| Input voltage and frequency | | 200–220V AC, 380V AC, 400–440V AC 50/60Hz | | | | | | | |
| Rated output current | 200–220V AC | 20A | 45A | 60A | 100A | 150A | 250A | 450A | 600A |
| | 380V, 400–440V AC | 20A | 45A | 60A | 100A | 150A | 250A | 450A | — |
| Cooling | | Self-cooled | | | | Fan-cooled | | | |
| Applicable load | Phase control | Resistive load, inductive load, transformer primary circuit, rectifier primary circuit | | | | | | | |
| | Cyclic control | Resistive load (temperature coefficient 10% or less) | | | | | | | |
| Output voltage adjustment range | | 0 to 100% of rated input voltage (not include the voltage drop of thyristors and diodes) | | | | | | | |
| Power supply voltage compensation | | One-third or less of input voltage fluctuation | | | | | | | |
| Set signal | Manual setting | Variable resistor: 1k Ω , 1/2W min. | | | | | | | |
| | Automatic setting | Current signal: 4 to 20mA DC (Zin: 250 Ω) | | | | | | | |
| | | Voltage signal: 0 to 5V DC, 1 to 5V DC (Zin: 10k Ω) | | | | | | | |
| Input/output characteristic | | r.m.s value linear characteristics, linearity: $\pm 5\%$ of FS or less | | | | | | | |
| Gradient setting range | | 0 to 100% of output voltages External variable resistor 1k Ω (supplied), built-in variable resistor 1k Ω (optional) | | | | | | | |
| Base load setting range | | 0 to 100% of output voltage | | | | | | | |
| Time of soft-start up, soft-increase/decrease | | 0.5 to 10s or 5 to 100s (selectable by DIP switch) | | | | | | | |
| Feedback control (phase control only) | | AC CLR control, AC ACR control, AC AVR control, AC AWR control DC AVR control, DC ACR control * | | | | | | | |
| Protection | CPU error | Detects CPU memory errors at start-up | | | | | | | |
| | Power supply single-phasing or phase sequence error | Detects single-phasing in the 3-phase control power supply and phase sequence errors in the 3-wire | | | | | | | |
| | Fuse blowout | Interrupts output with the built-in fuse to protect the main element. | | | | | | | |
| | Overcurrent | Detects currents of at least 120% of the rated current with the built-in CT (This function is not provided with T-type control models.) | | | | | | | |
| | Overheating | Detects overheating errors with a temperature sensor (air-cooling type only) | | | | | | | |
| | Parallel operation error | Detects transmission errors between APRs in parallel operation | | | | | | | |
| | Instantaneous power supply failure detection | Detects instantaneous power failures in the control power supply voltage. Soft starts at power recovery. | | | | | | | |
| | Alarm contact output | Relay contact (1NO, 1A at 250V AC) | | | | | | | |
| Ambient temperature | | –5 to +40°C (Output current should be derated when used above 40°C) | | | | | | | |
| Ambient humidity | | 30 to 90% RH (no condensation) | | | | | | | |
| Environment | | Altitude: Up to 1000m. Free from corrosive gases, dust, vibration | | | | | | | |
| Withstand voltage (between input and ground terminals) | | 2000V AC, 1 minute (Main circuit: 200 to 220V) 2500V AC, 1 minute (Main circuit: 380V, 400 to 440V) | | | | | | | |
| Insulation resistance (between input and ground terminals) | | 10M Ω or more (500V DC megger) | | | | | | | |

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

■ 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 |
| 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 |

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

■ Ordering information

Specify the following:

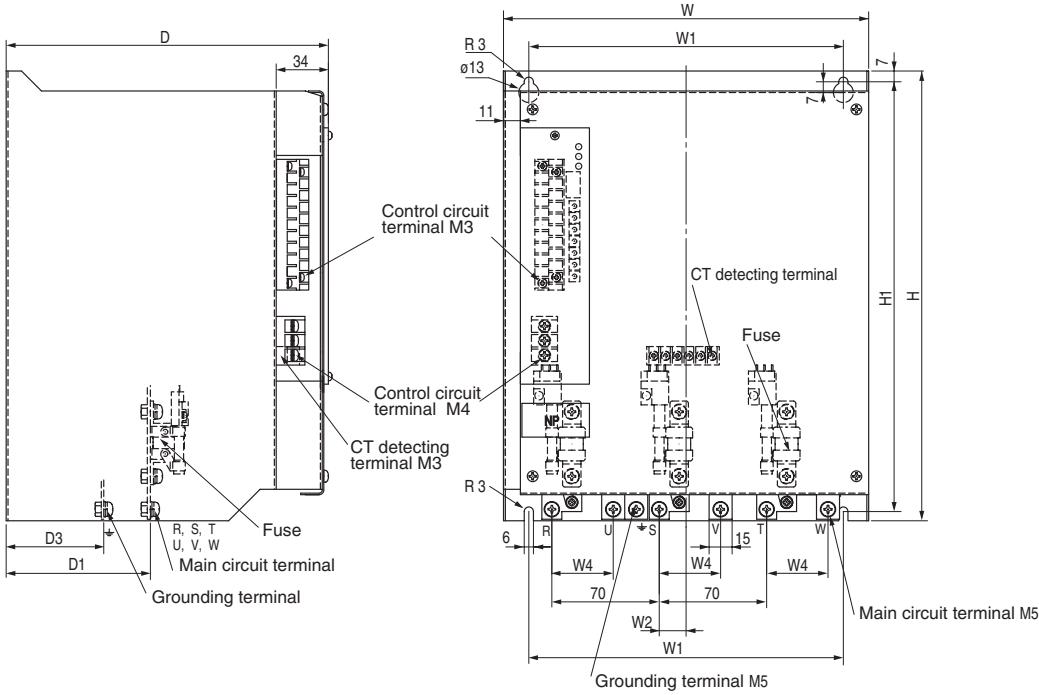
1. Type number
2. Special specification

AC Power Regulators

3-phase APR-MX2 series

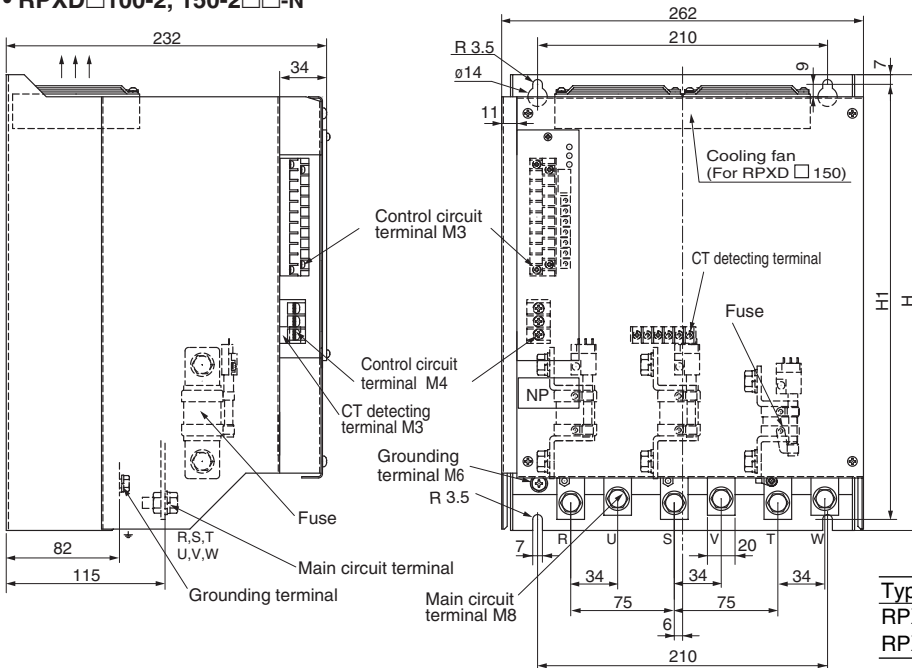
■ Dimensions, mm

• RPXD□020-2, 045-2, 060-2□□-N



| Type | W | W1 | W2 | W4 | H | H1 | D | D1 | D3 | Mass |
|----------------|-----|-----|------|----|-----|-----|-----|----|------|--------|
| RPXD□020-2□□-N | 230 | 200 | 20.5 | 40 | 273 | 260 | 160 | 45 | 13 | 6.9kg |
| RPXD2045-2□□-N | 238 | 205 | 17.5 | 40 | 293 | 280 | 210 | 94 | 63.5 | 10.4kg |
| RPXD0045-2□□-N | 238 | 205 | 4.5 | 27 | 293 | 280 | 210 | 94 | 63.5 | 10.9kg |
| RPXD2060-2□□-N | 238 | 205 | 17.5 | 40 | 293 | 280 | 210 | 94 | 63.5 | 10.4kg |
| RPXD0060-2□□-N | 238 | 205 | 4.5 | 27 | 293 | 280 | 210 | 94 | 63.5 | 10.9kg |

• RPXD□100-2, 150-2□□-N

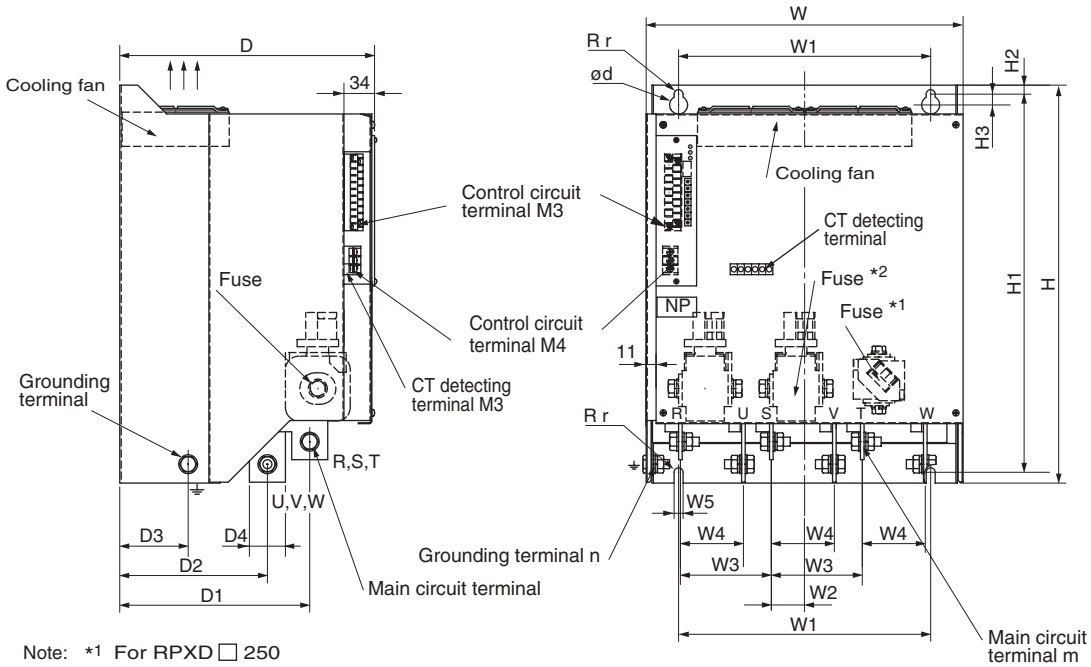


| Type | H | H1 | Mass |
|----------------|-----|-----|--------|
| RPXD□100-2□□-N | 330 | 315 | 14.7kg |
| RPXD□150-2□□-N | 360 | 345 | 16.0kg |

Note: R- and S-phase: For RPXD0100 and RPXD0150
 T-phase : For RPXD2100 and RPXD2150

■ Dimensions, mm

• RPXD□250-2, 450-2, 2600-2□□-N



Note: *1 For RPXD □ 250
*2 For RPXD □ 450, RPXD2600

| Type | W | W1 | W2 | W3 | W4 | W5 | H | H1 | H2 | H3 | D | D1 | D2 | D3 | D4 | r | d | m | n | Mass |
|----------------|-----|-----|------|-----|----|----|-----|-----|----|----|-----|-------|-------|----|----|---|----|-----|-----|--------|
| RPXD□250-2□□-N | 262 | 200 | 26 | 74 | 48 | 10 | 384 | 365 | 10 | 12 | 280 | 185.5 | 136.5 | 80 | 25 | 5 | 20 | M10 | M8 | 18.1kg |
| RPXD□450-2□□-N | 352 | 280 | 37 | 101 | 70 | 10 | 442 | 420 | 10 | 12 | 283 | 211 | 164 | 76 | 40 | 5 | 20 | M10 | M10 | 27.8kg |
| RPXD2600-2□□-N | 352 | 280 | 36.5 | 101 | 70 | 12 | 528 | 505 | 12 | 15 | 293 | 226 | 169 | 76 | 50 | 6 | 24 | M12 | M10 | 35.7kg |

■ Terminal diagrams

