

General Specifications

Model AR-SA, AR-HA, AR-TC, AR-RT, AR-LP, AR-HP, AR-SP, AR-SY, AR-PS, AR-PH, AR-PW, AR1-B2, AR1-D6

GS 77M02A01-01EN

Arrester

General

This high quality arrester protects electronic instruments by absorbing induced lightning surge voltage. Arrester (SPD*) should be set between lines through which surges are entered and serves to protect instruments such as transmitters or receivers safely from thunder inducement.

*SPD: Surge Protective Device

Cautionary Notes for Safe Use of the Product

The arrester may deteriorate or break if it receives surges. Arresters that have deteriorated below a specific level or are broken, may fail to meet their protection performance level and must therefore be replaced. When replacing such arresters, replace both the main unit and the terminal block. It should be noted that the arrester may fail to safeguard the equipment under protection if it receives any surges exceeding its tolerance limit, such as direct lightning strokes.

Model and Suffix Codes

| Model | Suffix code | Description |
|---------|----------------------------------|------------------------------------------------------------------------------------------------------------|
| AR | -□□ | Arrester |
| Use | -SA | for Current Signal (12 to 30 V DC signal line) (BRAIN communication and HART communication are available.) |
| | -HA | for Current Signal (48 to 65 V DC signal line) |
| | -TC | for Thermocouple (mV signal line) |
| | -RT | for RTD/Potentiometer |
| | -LP | for 2-wire System Pulse Signal (50 V DC or less) |
| | -HP | for 2-wire System Pulse Signal (90 V DC or less) |
| | -SP | for 3-wire System Pulse Signal (50 V DC or less) |
| | -SY | for Selsyn (90 V AC) |
| | -PS | for Power Supply (100 V AC) |
| | -PH | for Power Supply (200 V AC) |
| -PW | for Power Supply (100 V AC/20 A) | |
| Options | /D | With an adapter for DIN rail mounting (AR8-01) |
| | /D2 | With 2 adapters for DIN rail mounting (AR8-01) |
| | Blank | Without an adapter for DIN rail mounting |

JIS compliant



| Model | Suffix code | Description |
|---------|-------------|---------------------------------------------------|
| AR1 | -□□ | Arrester |
| Use | -B2 | for Communication Line (DC to 300 kHz) |
| | -D6 | for Communication Line (DC to 2 MHz) |
| Options | /D | With an adapter for DIN rail mounting (AR8-01) |
| | /D2 | With 2 adapters for DIN rail mounting (AR8-01) |
| | Blank | Without an adapter for DIN rail mounting (AR8-01) |

Ordering Information

Specify the following when ordering.
 (e.g.) Model and suffix codes: AR-SA or AR-SA/D
 (e.g.) Model and suffix codes: AR-PW or AR-PW/D

- If not using a DIN rail for the mounting, the options do not need to be specified.
- When mounting the AR-PW or AR1-D6 to a DIN rail, two pieces of AR8-01 are necessary. Specify the option code "/D2."
- Do not specify the option code "/D" or "/D2" if mounting to YOKOGAWA's outdoor-installed waterproof box.

■ Specifications

● SPD for signal

| Model and Suffix Codes | | AR-SA ^(Note) | AR-HA | AR-TC | AR-RT |
|-----------------------------------------------------------------------|--------------------|-----------------------------------------------|-----------------------------------------------|----------------------------------------------------------|------------------------------|
| Use | | 0 to 100 mA DC (12 to 30 V DC signal line) | 0 to 100 mA DC (48 to 65 V DC signal line) | Thermocouple (mV signal line) 1-5 V DC signal line | RTD/Potentiometer |
| *1 Maximum continuous operating voltage (U _c) | Between lines | 30 V DC | 70 V DC | 8 V DC | 8 V DC |
| | Between ground: | 50 V DC | 90 V DC | 50 V DC | 40 V DC |
| Permissible current leakage | Between lines | 5 μA or less (at 30 V DC) | 5 μA or less (at 70 V DC) | 2 μA or less (at 8 V DC) | 2 μA or less (at 8 V DC) |
| | Between ground: | 10 μA or less (at 50 V DC) | 10 μA or less (at 90 V DC) | 10 μA or less (at 50 V DC) | 2 μA or less (at 40 V DC) |
| Instrument side voltage limit (10 kV, 1.2/50 μA) | Between lines | 50 V or less | 90 V or less | 30 V or less | 30 V or less |
| | Between ground: | 250 V or less | 380 V or less | 250V or less | 250 V or less |
| *1 Voltage protection level (Up) | Between lines | 100 V or less | 200 V or less | 150 V or less | 150 V or less |
| | Between ground: | 350 V or less | 500 V or less | 350 V or less | 350 V or less |
| *1 Impulse durability (8/20 μA) | Category C1 | 500 A | 500 A | 500 A | 500 A |
| | Category C2 | 5000 A | 1000 A | 5000 A | 5000 A |
| Discharge starting voltage | Between lines | 35 V DC or more | 75 V DC or more | 20 V DC or more | 20 V DC or more |
| | Between ground: | 74 V DC or more | 135 V DC or more | 74 V DC or more | 74 V DC or more |
| Series resistance | | 33 Ω ±10% | 33 Ω ±10% | | |
| *1 Rated current | | 100 mA DC | 100 mA DC | 2 A DC | 2 A DC |
| Response time | | 3 ns | 3 ns | 3 ns | 3 ns |
| JIS compliant | | JIS C 5381-21 (Category: C1, C2) | | | |

Note: Select AR-HA in case of the combination with signal conditioners (DC0, FC0A, WC0A, HC0, EC0, and CC0) having Load-open detection function.

| Model and Suffix Codes | | AR-LP | AR-HP | AR-SP | AR-SY |
|-----------------------------------------------------------------------|--------------------|----------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Use | | 2-wire System Pulse Signal | 2-wire System Pulse Signal | 3-wire System Pulse Signal | Selsyn |
| *1 Maximum continuous operating voltage (U _c) | Between lines | 50 V DC | 90 V DC | 50 V DC | 110 V AC |
| | Between ground: | 50 V DC | 90 V DC | 50 V DC | 110 V AC |
| Permissible current leakage | Between lines | 10 μA or less (at 50 V DC) | 10 μA or less (at 90 V DC) | 10 μA or less (at 50 V DC) | 1 mA or less (at 200 V DC) |
| | Between ground: | 10 μA or less (at 50 V DC) | 10 μA or less (at 90 V DC) | 10 μA or less (at 50 V DC) | 1 mA or less (at 400 V DC) |
| Instrument side voltage limit (10 kV, 1.2/50 μA) | Between lines | 90 V or less | 170 V or less | 90 V or less | 500 V or less |
| | Between ground: | 250 V or less | 380 V or less | 250 V or less | 1000 V or less |
| *1 Voltage protection level (Up) | Between lines | 350 V or less | 500 V or less | 350 V or less | 800 V or less |
| | Between ground: | 350 V or less | 500 V or less | 350 V or less | 1500 V or less |
| *1 Impulse durability (8/20 μA) | Category C1 | 500 A | 500 A | 500 A | 500 A |
| | Category C2 | 5000 A | 5000 A | 5000 A | 1000 A |
| Discharge starting voltage | Between lines | 74 V DC or more | 135 V DC or more | 74 V DC or more | 240 V DC or more |
| | Between ground: | 74 V DC or more | 135 V DC or more | 74 V DC or more | 420 V DC or more |
| *1 Rated current | | 2 A DC | 2 A DC | 2 A DC | 2 A AC |
| Response time | | 3 ns | 3 ns | 3 ns | 3 ns |
| JIS compliant | | JIS C 5381-21 (Category: C1, C2) | | | |

*1: Description compliant with JIS C 5381-21.

●SPD for power

| Model and Suffix Codes | AR-PS | AR-PH | AR-PW |
|--------------------------------------------------|-------------------------|----------------------------|----------------------------|
| Use | Power Supply (100 V AC) | Power Supply (200 V AC) | Power Supply (100 V AC) |
| *2 Maximum continuous operating voltage (Uc) | 140 V AC | 280 V AC | 140 V AC |
| Permissible current leakage | Between lines | 1 mA or less (at 200 V DC) | 1 mA or less (at 200 V DC) |
| | Between ground: | 1 mA or less (at 400 V DC) | 1 mA or less (at 400 V DC) |
| Instrument side voltage limit (10 kV, 1.2/50 μA) | Between lines | 500 V or less | 500 V or less |
| | Between ground: | 1000 V or less | 1000 V or less |
| *2 Voltage protection level (Up) | 1500 V or less | 1500 V or less | 1500 V or less |
| *2 Nominal discharge current (In) (8/20 μA) | 2500 A | 2500 A | 500 A |
| *2 Maximum discharge current (Imax) (8/20 μA) | 5000 A | 5000 A | 1000 A |
| Discharge starting voltage | Between lines | 240 V DC or more | 240 V DC or more |
| | Between ground: | 420 V DC or more | 420 V DC or more |
| *2 Rated load current | 2 A AC | 2 A AC | 20 A AC |
| Response time | 3 ns | 3 ns | 3 ns |
| JIS compliant | JIS C 5381-1 (Class II) | | |

*2: Description compliant with JIS C 5381-1.

● SPD for communication

| Model and Suffix Codes | AR1-B2 | AR1-D6 |
|--------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------|
| Use | Communication Line (AC, DC communication, Telemeter) | Communication Line (Telephone lines, Telemeter, Data transmit) |
| *1 Transmit frequency area | DC to 300 kHz | DC to 2 MHz |
| *1 Insertion loss | 0.5 dB | 1.0 dB |
| *1 Maximum continuous operating voltage (Uc) | Between lines | 25 V DC |
| | Between ground: | 25 V DC |
| Transmit Level | 24 V DC | 150 V DC |
| Permissible current leakage | Between lines | 5 μA or less (at 25 V DC) |
| | Between ground: | 5 μA or less (at 25 V DC) |
| *1 Voltage protection level (Up) | Between ground: | 150 V or less |
| Instrument side voltage limit (10 kV, 1.2/50 μA) | Between lines | 50V or less (initial maximum value), 10V or less (maximum value during operation) |
| | Between ground: | 100V or less(initial maximum value), 20V or less(maximum value during operation) |
| *1 Impulse durability (8/20 μA) | Category C1 | 500 A |
| | Category C2 | 5000 A |
| Discharge starting voltage | Between ground: | 30 V DC or more |
| Series resistance | 5 Ω ±10% (One line) | 0 Ω |
| *1 Rated current | 100 mA DC | 2 A DC |
| Response time | 3 ns | 5 ns |
| JIS compliant | JIS C 5381-21 (Category: C1, C2) | |

*1: Description compliant with JIS C 5381-21.

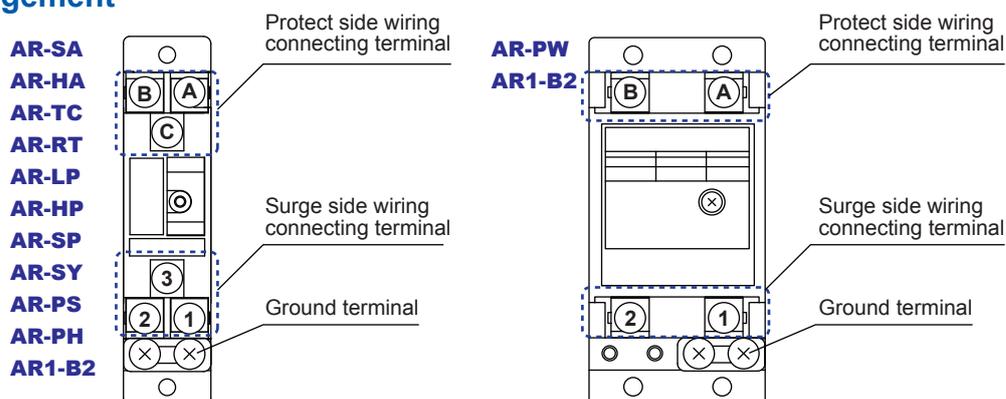
■ Environmental Conditions, Mounting and Appearance

| | | | |
|------------------------------------|-----------------|------------------------------------------------------------------------------|-----------------------------------------------|
| Model and Suffix Codes | | AR-SA, AR-HA, AR-TC, AR-RT, AR-LP, AR-HP, AR-SP, AR-SY, AR-PS, AR-PH, AR1-B2 | AR-PW, AR1-D6 |
| Operating temperature range | | -10 to +60°C | |
| Operating humidity range | | 5 to 90% RH (no condensation) | |
| Construction | | 2 sections construction of main body and terminal base: plug-in screw | |
| Material | | Black, flame deterrent ABS resin (Case body and Terminal base) | |
| Grounding | | JIS Class D grounding [100 Ω or less] (with grounding bar) | |
| Mounting Method | Wall | M4 screw | |
| | DIN rail | DIN rail adapter: AR8-01 (sold separately), 1 | DIN rail adapter: AR8-01 (sold separately), 2 |
| Connection method | | M4 screw terminal connection (fastening torque 1.2 N·m or less) | |
| External Dimensions | | 100 (H) × 23.5(W) × 55(D) mm | 100 (H) × 47.5(W) × 55(D) mm |
| Weight | | Approx. 110 g | Approx. 220 g |

■ Accessories

Terminal cover: 2
Tag number label: 1

■ Terminal Arrangement



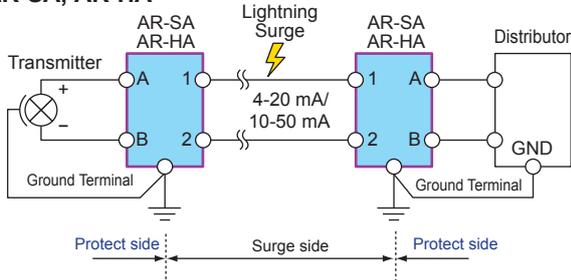
| Model and suffix Terminal | | AR-SA AR-HA AR-TC AR-LP AR-HP | AR-RT | AR-SP | AR-SY | AR1-B2 AR1-D6 AR-PS AR-PH AR-PW |
|------------------------------|---|-------------------------------------------|-------|-------|-------|---------------------------------------------|
| | | Protect side | A | + | A | V+ |
| | B | - | B | + | S2 | L2 |
| | C | Not Connected | B | - | S3 | Not Connected |
| Surge side | 1 | + | A | V+ | S1 | L1 |
| | 2 | - | B | + | S2 | L2 |
| | 3 | Not Connected | B | - | S3 | Not Connected |

Wiring

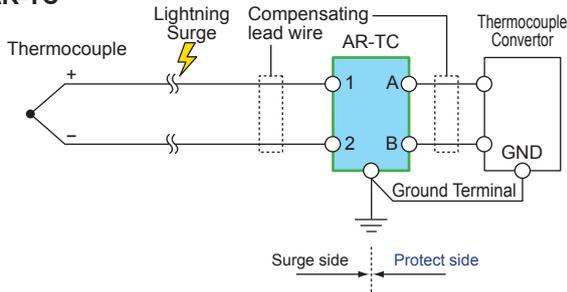
Note: Directly connect the lead from the ground terminal of arrester to the ground.

For the devices to be protected, connect the lead wire to the ground terminal of arrester.

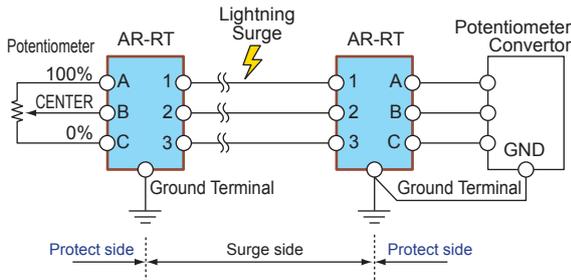
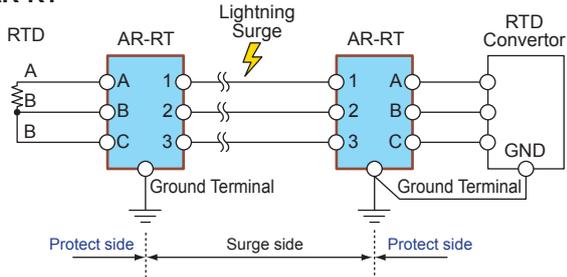
AR-SA, AR-HA



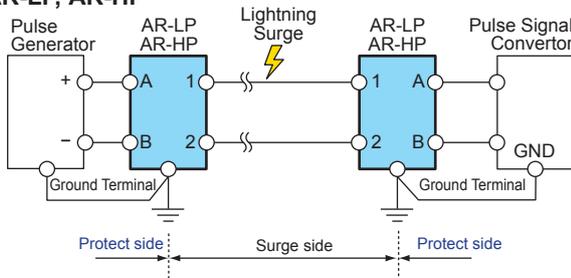
AR-TC



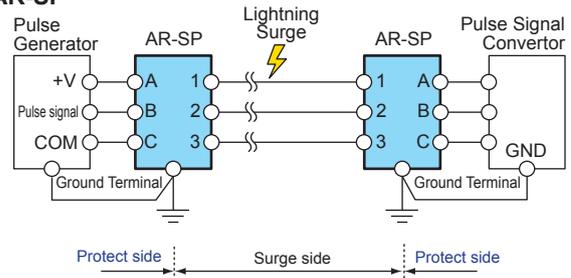
AR-RT



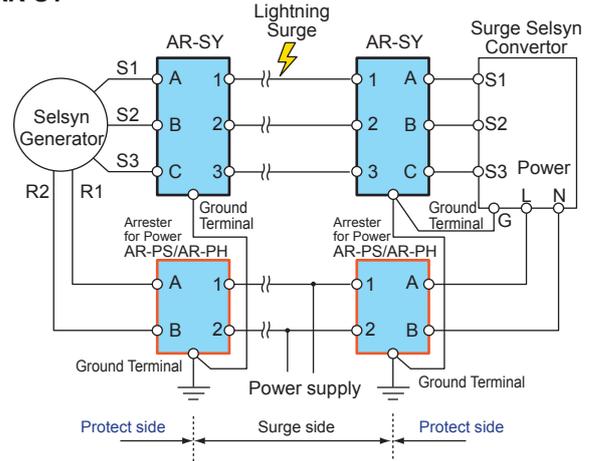
AR-LP, AR-HP



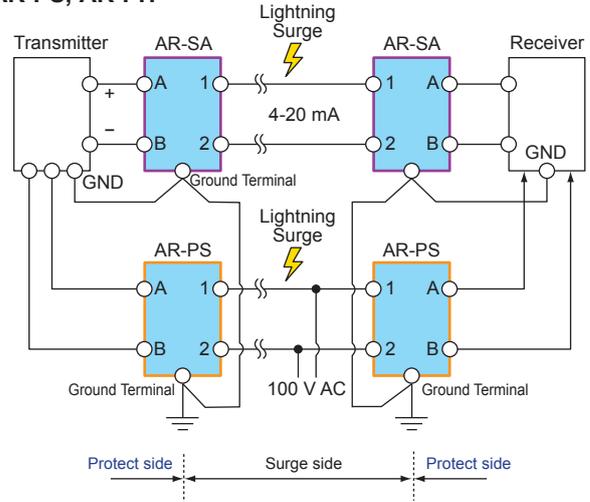
AR-SP



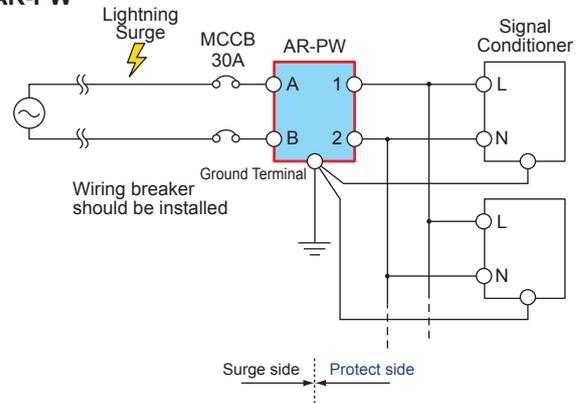
AR-SY



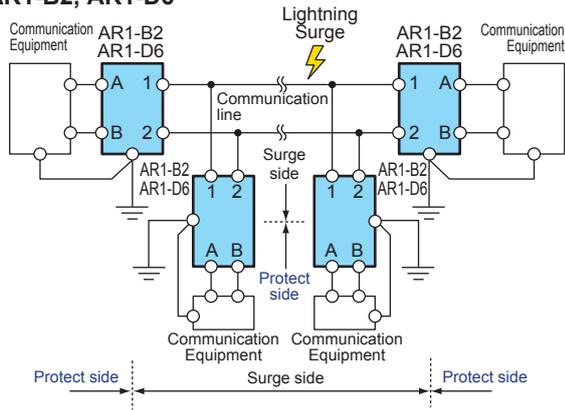
AR-PS, AR-PH



AR-PW

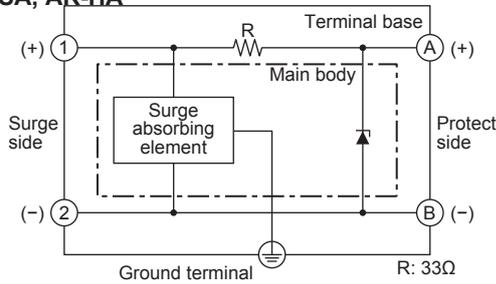


AR1-B2, AR1-D6

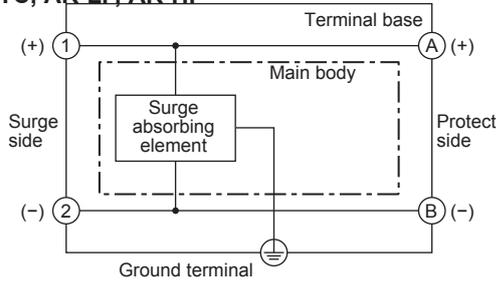


■ Block Diagram

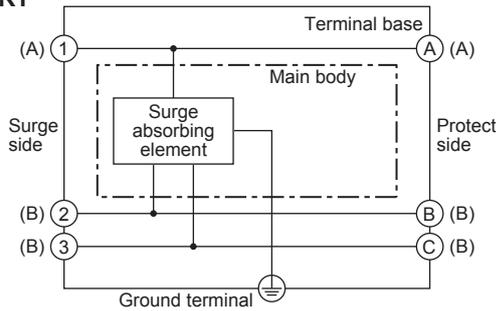
AR-SA, AR-HA



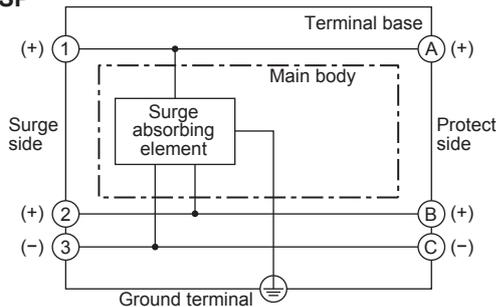
AR-TC, AR-LP, AR-HP



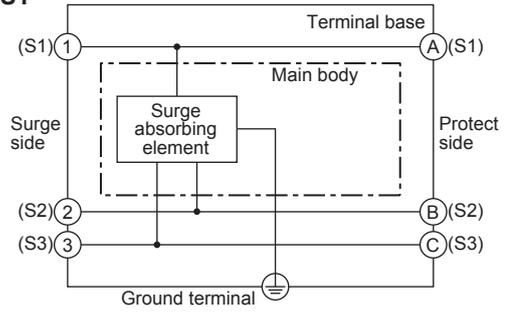
AR-RT



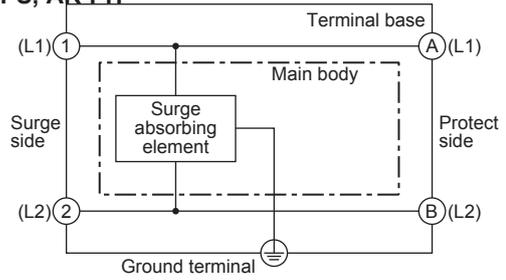
AR-SP



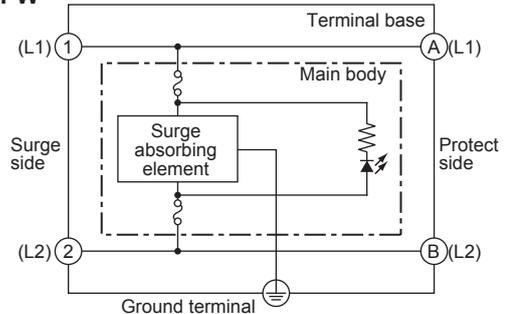
AR-SY



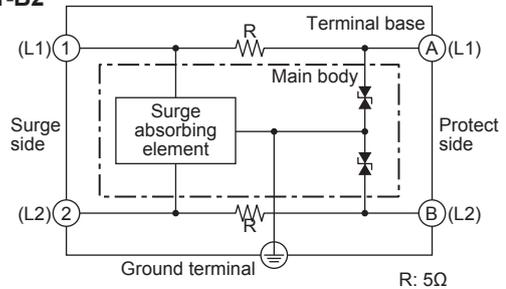
AR-PS, AR-PH



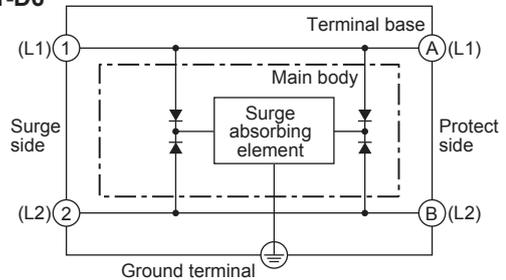
AR-PW



AR1-B2



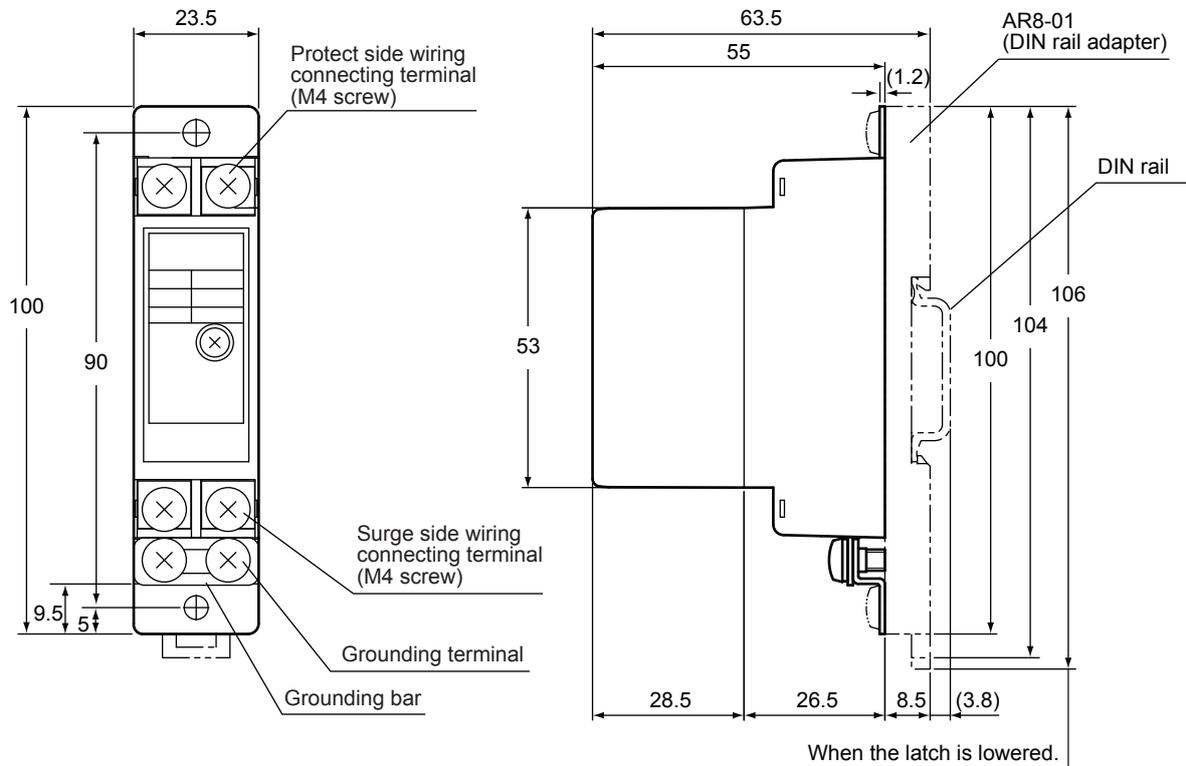
AR1-D6



External Dimension

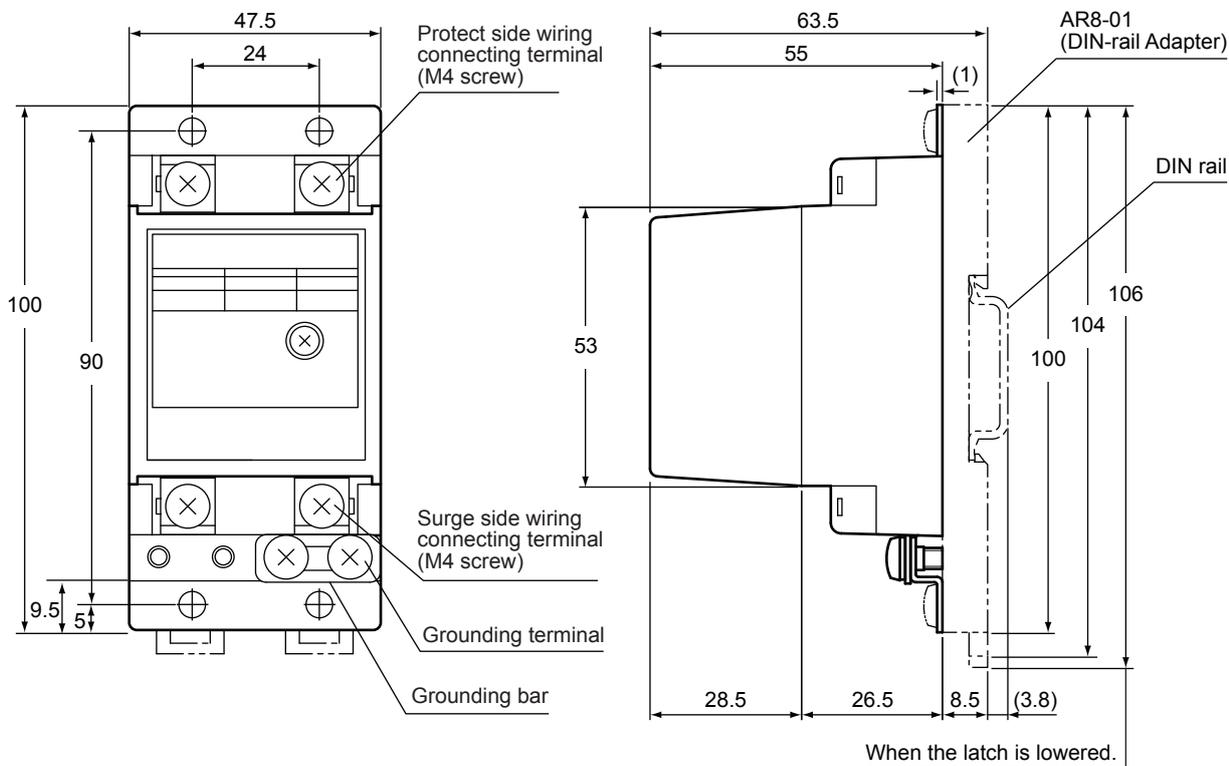
AR-SA, AR-HA, AR-TC, AR-RT, AR-LP, AR-HP, AR-SP, AR-SY, AR-PS, AR-PH, AR1-B2

Unit: mm



AR-PW, AR1-D6

Unit: mm



Note: The model AR8-01 (DIN rail adapter) is recommended for insulation between the DIN rail and the surge arrester.

■ Model AR8-01 DIN rail Adapter

■ General

The Model AR8-01 is mounted on the AR Series Arresters, enabling "one-touch" mounting of arresters on a DIN-rail.

Use one or two AR8-01 Adapters depending on the type of arrester.

■ Model and Suffix Codes

| Model and Suffix | Description |
|------------------|------------------|
| AR8-01 | DIN-rail Adapter |

■ Ordering Information

Specify the following when ordering.
 (e.g.) Model and suffix codes: AR-SA or AR-SA/D
 (e.g.) Model and suffix codes: AR-PW or AR-PW/D

Note 1: When ordering the AR8-01 separately, the minimum order quantity is 10 pieces. Specify the order unit in multiples of 10.

Note 2: When ordering with arresters, specify the option code for the arrester "/D" or "/D2."
 (e.g.) AR-SA/D
 (e.g.) AR1-D6/D2

■ Mounting and Appearance

External Dimension: H 104×W 23×D 8.5 (mm)
 Material: ABS resin
 Mounting to an arrester: Fix with the provided two M4 screws.
 DIN-rail mounting: DIN-rail (35 mm wide)

■ Accessories

Mounting screws: M4, 2

■ Necessary Quantity of AR8-01 for Each Arrester

| Model and suffix | Option Code | AR8-01 Qty. |
|------------------|-------------|-------------|
| AR-SA | /D | 1 |
| AR-HA | /D | 1 |
| AR-TC | /D | 1 |
| AR-RT | /D | 1 |
| AR-LP | /D | 1 |
| AR-HP | /D | 1 |
| AR-SP | /D | 1 |
| AR-SY | /D | 1 |
| AR-PS | /D | 1 |
| AR-PH | /D | 1 |
| AR-PW | /D2 | 2 |
| AR1-B2 | /D | 1 |
| AR1-D6 | /D2 | 2 |

■ External Dimension

Unit: mm

