

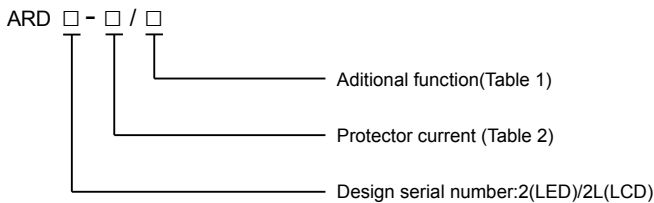
ARD2 Smart Motor Protector



Overview

ARD2 smart motor protector can protect the motor during the running and provide the SOE fault event recorder. It is equipped with the RS485 remote communication interface and the DC4-20mA analog output, which is convenient to form a network system together with control machines like PLC and PC.

Model Description



Technical parameter

| Technical parameter | Value | |
|---|---|--------------------------|
| Auxiliary power supply | AC85~265V/DC100~350V,power consumption 15VA | |
| Rated voltage | AC380V/AC660V,50Hz/60Hz | |
| Rated current | 1A(0.1A-999.9A) | |
| | 5A(0.1A-999.9A) | |
| | 1.6A(0.4A-1.6A) | |
| | 6.3A(1.6A-6.3A) | |
| | 25A (6.3A-25A) | |
| | 100A (25A-100A) | |
| | 250A (63A-250A) | |
| 800A (250A-800A) | Special current transformers | |
| Relay output contactor, rated negative capacity | 4 channels,AC 250V,3A | |
| Switching input | 2 channels,opto-coupler isolation | |
| Communication | RS485(Modbus-RTU) | |
| Environment | Operation temperature | -10 C ~55 C |
| | Storage temperature | -20 C ~60 C |
| | Relative humidity | 5%~95% (No condensation) |
| | Altitude | ≤2000m |
| Class of pollution | Level 2 | |
| Protection level | Main module IP 20 | |
| Installation category | Class III | |

Table 1 Additional function

| Additional features | Code |
|---|------|
| RS485(Modbus-RTU) | C |
| Leakage protection | L |
| 4~20mA analog output | M |
| 2 switch input; 1 relay output (programmable 3) | K |
| SOE record | SR |
| Alarm (programmable 2) | J |

Table 3 Leakage current protection(L) list

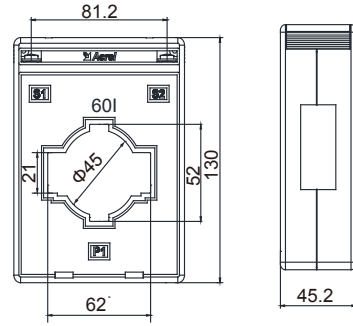
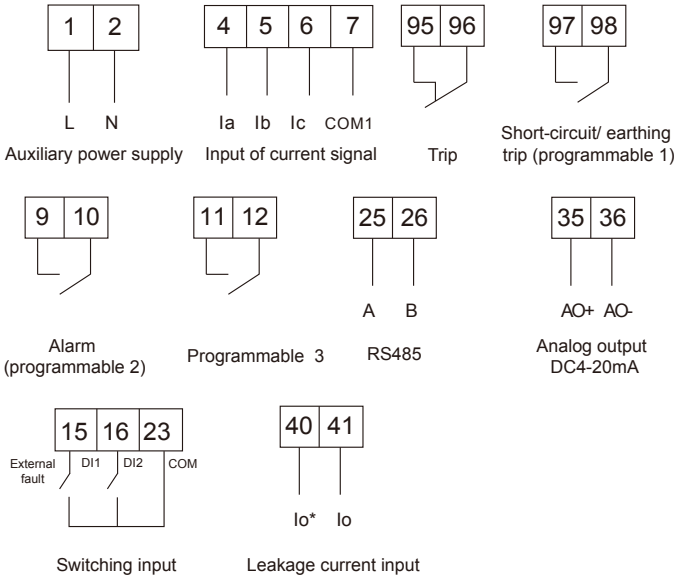
| Rated current(A) | CT type | CT aperture |
|------------------|------------|-------------|
| ≤100A | KB1:5A/5mA | Φ 46mm |
| 100A-250A | KB2:5A/5mA | Φ 81mm |
| 250A-800A | KB3:5A/5mA | Φ 150mm |

Table 2 Rated current

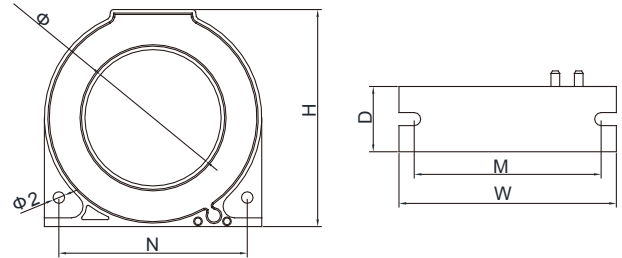
| Rated current (A) | Ratio setting | Transformer primary side turns | Setting current range (A) | Motor Power (kW) |
|-------------------|---------------|--------------------------------|---------------------------|------------------|
| 1 | Need | 5 | 0.1~999.9 | 0.12~440 |
| 5 | | 1 | 0.1~999.9 | 0.12~440 |
| 1.6 | No need | 1 | 0.4~1.6 | 0.12~0.55 |
| 6.3 | | 1 | 1.6~6.3 | 0.75~2.2 |
| 25 | | 1 | 6.3~25 | 3~11 |
| 100 | | 1 | 25~100 | 15~45 |
| 250 | | 1 | 63~250 | 55~132 |
| 800 | | 1 | 250~800 | 160~440 |

Note:When the additional function is equipped with leakage protection'L', it is necessary to purchase leakage current transformer with different apertures according to the actual current.

Wiring



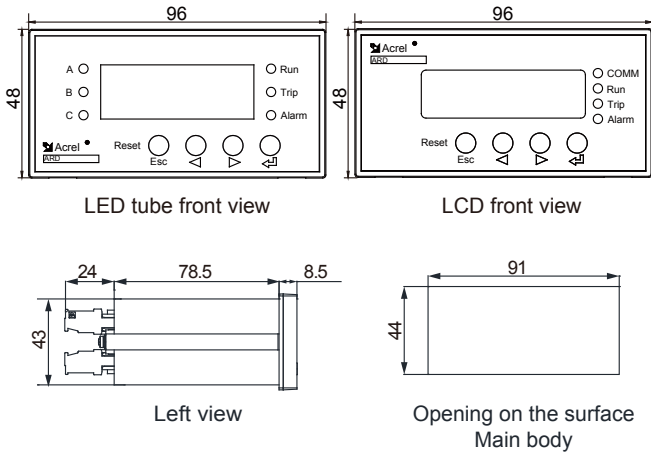
Current transformer (250A-800A)



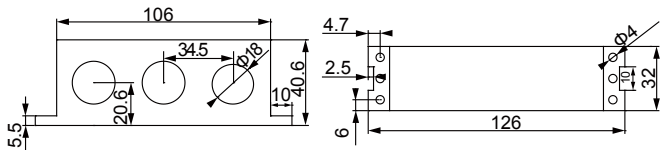
Leakage current transformer

Dimensions and Installation

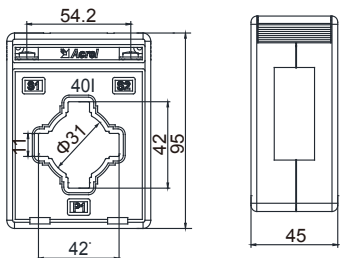
■ Installation dimensions of protector(Unit: mm)



■ Installation dimensions of transformer



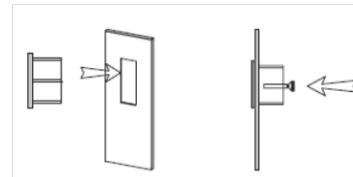
Current transformer (0.1A-100A)



Current transformer (63A-250A)

| Size | Current Specification (A) | Outline Dimension (mm) | | | Perforation Size(mm) | Installation Size (mm) | | | Tolerance (mm) | Weight (g) |
|----------|---------------------------|------------------------|-----|----|----------------------|------------------------|-----|----|----------------|------------|
| | | W | H | D | | M | N | Φ2 | | |
| Standard | | | | | | | | | | |
| L-45 | 16-100 | 75 | 75 | 22 | 46 | 65 | 65 | 4 | ±1 | 200±10 |
| L-80 | 100-250 | 120 | 120 | 23 | 81 | 105 | 105 | 4 | | 380±20 |
| L-150 | 400-800 | 196 | 205 | 24 | 150 | 175 | 180 | 6 | | 850±50 |

■ Installation method



Installation of main body

Operating and Display

■ Description of LED display

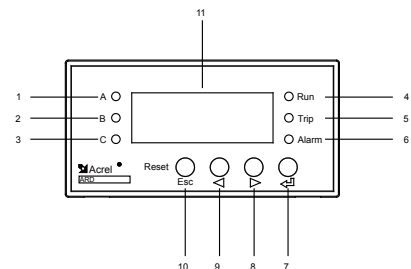





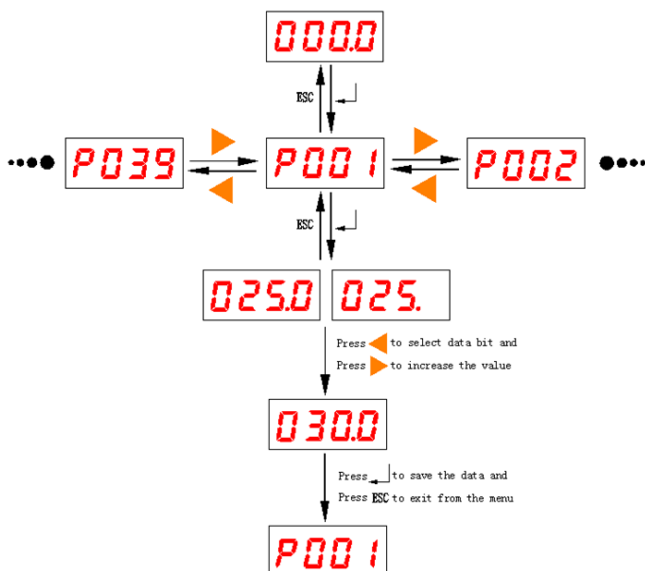
Table 4

| No. | Name | State | Function Description |
|------|---|-------|--|
| 1 | Indicator light | On | When it is on, it indicates that 11 shows the current of phase A. |
| 2 | Indicator light | On | When it is on, it indicates that 11 shows the current of phase B. |
| 3 | Indicator light | On | When it is on, it indicates that 11 shows the current of phase C. |
| 4 | Indicator light | On | When it is on, it indicates that the motor is running. |
| 5 | Indicator light | On | When it is on, it indicates that the trip relay is enabled. |
| 6 | Indicator light | On | When it is on, it indicates that the protector has sent an alarm. |
| 7 |  key | press | Select the operating function or return to the last menu. |
| 8 |  key (left) | press | Review events, reduce the digital value or shift |
| 9 |  key (right) | press | Review the data or increase the digital value |
| 10 | Esc/Reset key | press | Exit from the menu, cancel the operation, reset the protector or test the relay |
| 11 | 4-bit LED | 0000 | Show the measured value |
| Note | Phase A, B & C indicator light | On | When all light are on, it indicates that 11 shows the average current of three phases. |

■ Parameter setting comparison table

| Parameter | Type of Setting | Default Value | Setting Range | Unit |
|-----------|---|---------------|--|------------------------------|
| P001 | Overload/ full-load rated current setting | 1 | 0.1-999 | A |
| | | 5 | 0.1-999 | |
| | | 1.6 | 0.4-1.6 | |
| | | 6.3 | 1.6-6.3 | |
| | | 25 | 6.3-25 | |
| | | 100 | 25-100 | |
| | | 250 | 63-250 | |
| P002 | Trip level setting | 5 | 1, 2, 3, 5, 10, 15, 20, 25, 30, 35, 40 | Level |
| P003 | Starting time | 10 | 0.1-999.9 | Second |
| P004 | Overload alarm threshold setting | 85 | 1-99% | % |
| P005 | Phase failure trip delay | 1 | 0.1-600.0 | s |
| P006 | Leakage fault current setting | 300 | 30-1000 | Milliampere |
| | Earthing percentage setting | 80 | 1-100% | % |
| P007 | Earthing/leakage fault trip delay setting | 0.5 | 0.1-600.0 | Second |
| P008 | Under-load threshold setting | 50 | 10-99% | % |
| P009 | Under-load trip delay setting | 5.0 | 0.1-600.0 | Second |
| P010 | Unbalance threshold setting | 30 | 10-80% | % |
| P011 | Unbalance trip delay setting | 5.0 | 0.1-600.0 | Second |
| P012 | Unbalance alarm threshold setting | 20 | 10-80% | % |
| P013 | Alarm enabling on/off | OFF | OFF/ON | Overload alarm |
| P014 | | OFF | OFF/ON | Unbalance alarm |
| P015 | Trip enabling on/off | ON | OFF/ON | Overload trip |
| P016 | | OFF | OFF/ON | Earthing/leakage trip |
| P017 | | OFF | OFF/ON | Under-load trip |
| P018 | | ON | OFF/ON | Phase failure trip |
| P019 | | ON | OFF/ON | Starting time-out trip |
| P020 | | OFF | OFF/ON | Short-circuit trip |
| P021 | | OFF | OFF/ON | Blocking trip Unbalance trip |
| P022 | OFF | OFF/ON | External fault trip | |
| P023 | OFF | OFF/ON | Second | |

■ User programming



| Parameter | Type of Setting | Default Value | Setting Range | Unit |
|-----------|---|---------------|--|--------|
| P024 | External fault trip delay setting | 5.0 | 0.1-600.0 | Second |
| P025 | Programmable 1 output setting | 11 | 1. alarm 2. trip 3. overload 4. short circuit 5. earthing/ leakage trip 6. phase failure 7. external fault 8. remote starting 9. leakage alarm 10. short circuit and earthing protection 11. short circuit leakage/ earthing 12. short circuit leakage/earthing (pulse: 1s) | |
| P026 | Overload cooling time | 0 | 0: manual reset; 1-30min: automatic reset | Second |
| P027 | Blocking value setting | 250 | 100~700 | % |
| P028 | Delay of blocking trip setting | 5.0 | 0.1~600. 0 | Second |
| P029 | Baud rate of MODBUS setting | 9600 | 2400, 4800, 9600, 19200, 38400 | bps |
| P030 | MODBUS address setting | 1 | 1~247 | |
| P031 | Locked-rotor threshold setting | 600 | 100~700 | % |
| P032 | Locked-rotor trip delay setting | 5.0 | 0.1-600. 0 | Second |
| P033 | Locked-rotor release On/off | ON | OFF/ON | |
| P034 | Short-circuit threshold setting | 400 | 400-720 | % |
| P035 | Short-circuit trip delay | 0.1 | 0.1-600.0 | Second |
| P036 | Enabling of Leakage current transformer | OFF | OFF/ON | |
| P037 | Programmable 2 output setting | 2 | Same as output setting of | |
| P038 | Programmable 3 output setting | 2 | Same as output setting of programmable 1 | |
| P039 | CT transformation ratio | 1 | 1-9999 | |