

AVM25

Advanced Power and Energy Meter



REVENUE METERING

- IEC 62053-22 0.2S and ANSI C12.20 0.2
- 4th CT Input Measure Neutral Current
- TOU, Four Tariffs, 12 Seasons, 14 Schedules
- Four Quadrant Power and Energy

WAVEFORM CAPTURE

- Simultaneous Capture of Voltage and Current Waveforms
- 64 or 128 Samples with Programmable Per Cycle
- Record 10 Cycles Before and After the Triggering Point Every Group Waveform
- Record 100 or 200 Groups Waveform

STATISTICS/ALARM

- Max/Min Values with Time Stamp
- Historical Data Logs with Large Capacity Storage
- Power Quality Event Record
- Over/Under Limit Alarm

COMMUNICATION

- Modbus RTU and DNP Protocol Via RS485 Port
- PROFIBUS DP
- Dual RS485 Ports
- Ethernet Port: Modbus-TCP/IP, DNP3.0, FTP, SNMP/NTP, etc



APPLICATIONS

- Medium and Low Voltage Systems
- Factory Automation Systems
- Industrial Equipment
- Intelligent Building
- Energy Management System
- Industrial Facility Metering
- Energy Management and Power Quality Monitoring

FEATURES

Metering

- Phase-to-Neutral Voltage, Line-to-Line Voltage, Current
- Active Power, Reactive Power, Apparent Power, Power Factor
- Frequency

Power Quality

- THD, TOHD, TEHD, Crest Factor, THFF, K Factor
- Individual Harmonics to 63rd
- Individual Harmonic Phase Angle to 63rd
- Individual Harmonic Amplitude to 63rd
- Voltage Unbalance, Current Unbalance
- Voltage and Current Phase Angles

Data Logging

- Four Groups Historical Data Logs Available in 16 MB
- Record Metering Parameter with Time Stamp
- Metering Parameter and Log Size with Programmable

Energy

- Bi-Directional and Four Quadrant Total Energy
- Single-Phase Energy
- Energy Record

Power Quality Record

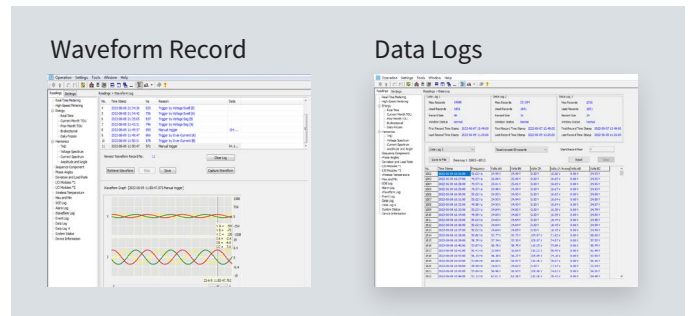
- Voltage Sags, Voltage Swells can Trigger Power Quality Event Records
- Up to 50,000 PQ Event Records can be Saved

Time of Use (TOU)

- Four Tariffs, 12 Seasons, 14 Schedules
- Weekends and 10-Year Holiday Settings
- Sharp, Peak, Valley, Normal Energy and Max Demand

Waveform Capture

- Simultaneous Capture of Voltage and Current Waveforms
- 64 or 128 Samples with Programmable Per Cycle



- Record 10 Cycles Before and After the Triggering Point Every Group Waveform
- Record 100 or 200 Groups Waveform

Max/Min Record

- Max/Min Parameter Value and Time Stamp
- Parameter Sources: Voltage, Current, Power, Frequency, Power Factor, etc
- Max/Min Data Record
- Max/Min Parameter Value can be Reset

Alarms

- Over or Under Setting Limit
- Up to 80 Power Measurement Parameters, DI Status or Temperature can be Set
- Alarm can Trigger the Relay Output, Digital Output, Screen Flashing and Alarm Record

Multiple I/O Functions

- Digital Output: Energy Pulse Output
- Digital Input: Monitor Switch Status or Pulse Count; SOE Record
- Relay Output: Relay Command Control Output ON/OFF; Limit Alarm Control Output
- Analog Output
- Analog Input

Multiple Temperature Functions

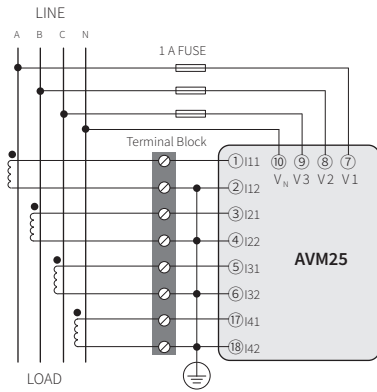
- Five Temperature Measurement (Wired)
- Eighteen Temperature Measurement (Wireless)

Communication

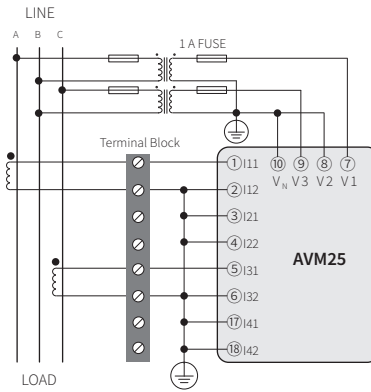
- Modbus RTU Protocol and DNP Via RS485 Port
- PROFIBUS DP
- Dual RS485 Ports
- Ethernet Port: Modbus-TCP/IP, DNP3.0, FTP, SNTP/NTP, etc

TYPICAL WIRING

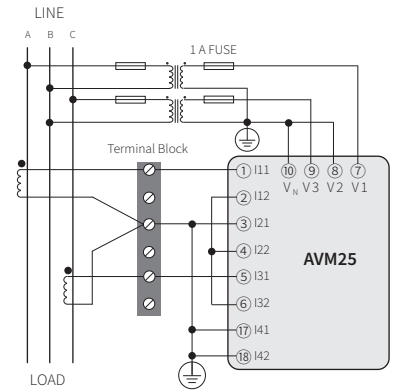
3LN, 3CT



2LL, 2CT

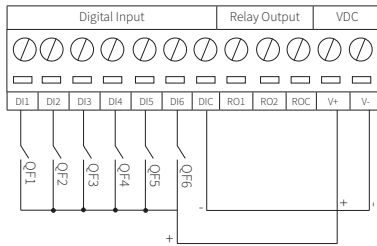


2LL, 3CT

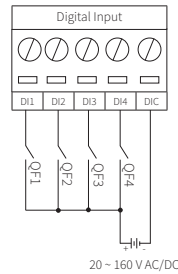


Note:
When 3LN, 3CT, if the 4th current is not connected to the meter, I41, I42 and I12/I22/I32 can be grounded. It won't affect the other three-phase currents measurement.

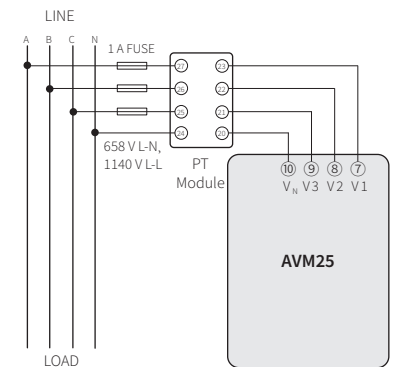
AVM2-IO1



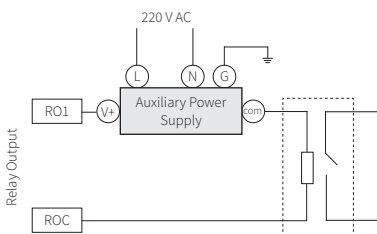
AVM2-IO2/IO3



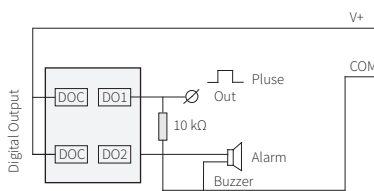
PT Module Wiring Diagram



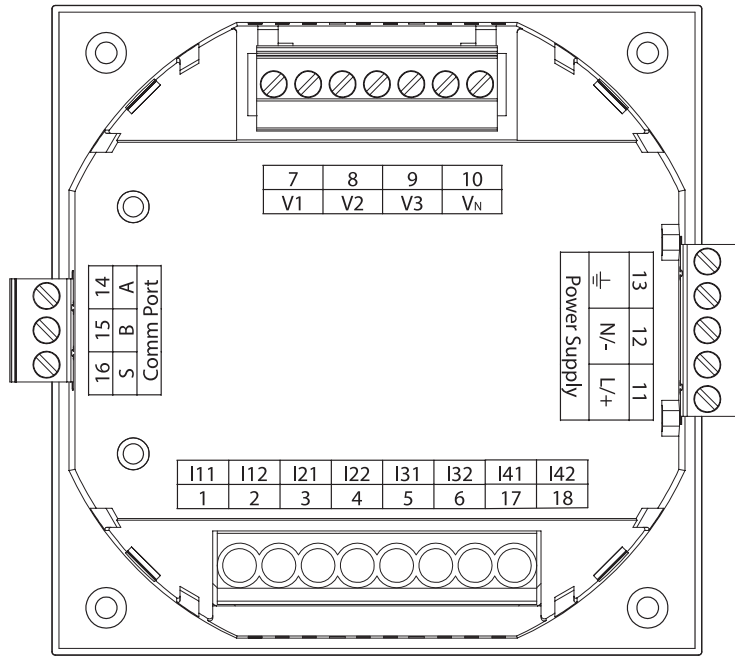
Relay Output (RO)



Digital Output (DO)

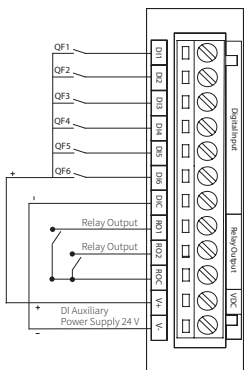


TERMINAL DIAGRAM *AVM25 Terminal Wiring Diagram*

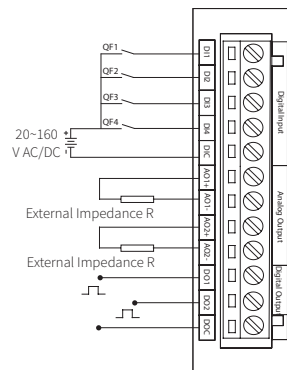


AVM2 IO MODULE WIRING DIAGRAM

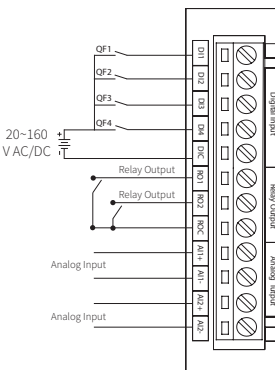
AVM2-IO1



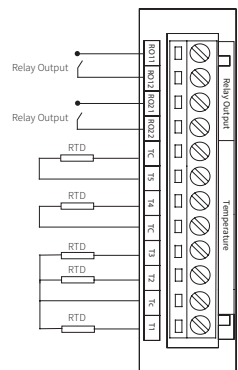
AVM2-IO2

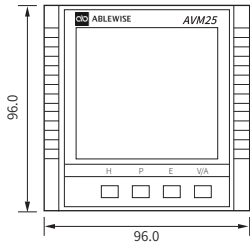


AVM2-IO3

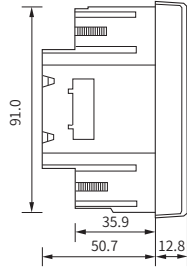


AVM2-T

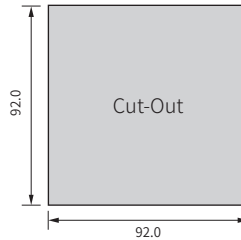




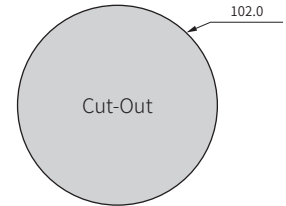
Front View



Side View

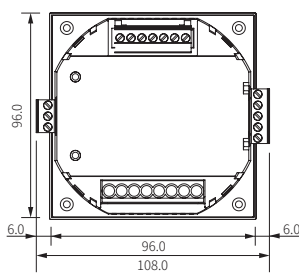


Cut Out

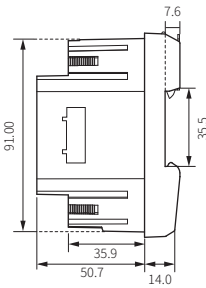


Cut Out

DIN-Rail Mount Meter Dimensions

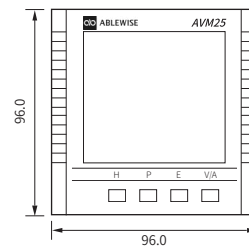


Rear View

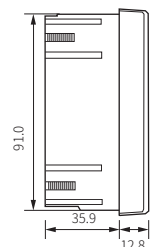


Side View

External Display Module Dimensions



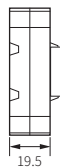
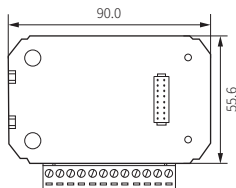
Front View



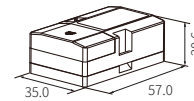
Side View

Note: 1. Display module is connected with 2 meters cable, if you need a longer cable please specify that in the ordering statement.
2. Display module opening size and AVM25 body openings are exactly the same size.

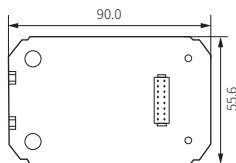
IO Module/Temperature Module Dimensions



Wireless Temperature Detectors AVM2-SRT Dimensions



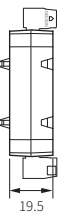
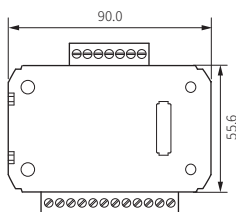
Communication/Wireless Temperature Module Dimensions

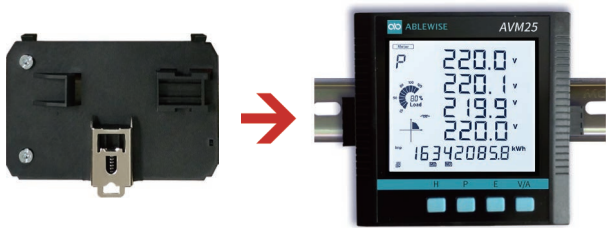
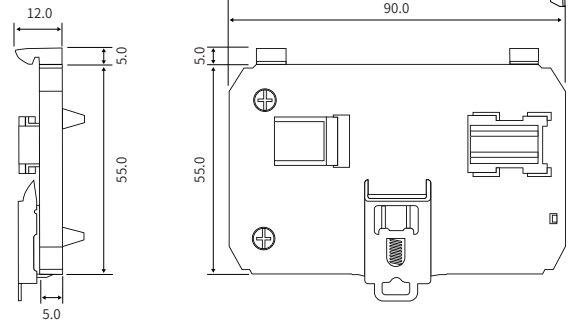
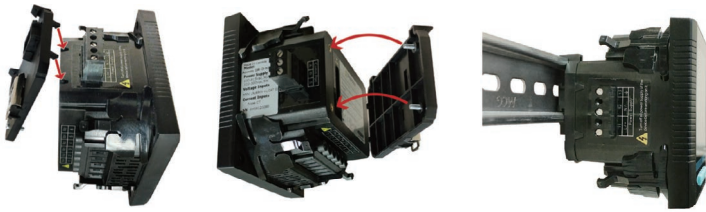


Display Modules and DIN-Rail Meters



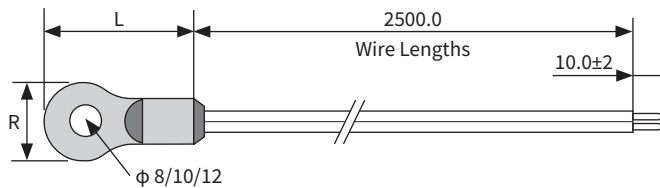
PT Module Dimensions





RESISTANCE TEMPERATURE DETECTORS (RTD)

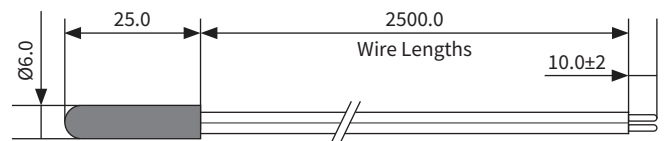
Switch Contact Dimensions (M8/M10/M12)



Note: Customized wire lengths are available.

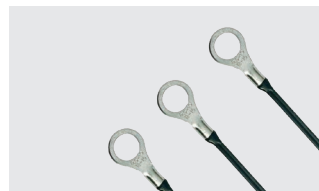
Cable Mode Dimensions (M0)

Unit: mm



Hole Diameter Φ (mm)	External Diameter R (mm)	Lengths L (mm)	Circuit Breaker Rated Current
8	15	28	100 A/125 A/160 A/250 A
10	20	33.8	400 A
12	24	38.8	630 A/800 A

Switch Contact



Cable Mode



SPECIFICATION

Parameters	Accuracy	Resolution	Range
Voltage	0.1%	0.1 V	10 V ~ 1000 kV
Current	0.1%	0.001 A	5 mA ~ 50000 A
Active Power	0.2%	1 W	-9999 MW ~ 9999 MW
Reactive Power	0.2%	1 var	-9999 Mvar ~ 9999 Mvar
Apparent Power	0.2%	1 VA	0 ~ 9999 MVA
Power Demand	0.2%	1 W	-9999 MW ~ 9999 MW
Reactive Power Demand	0.2%	1 var	-9999 Mvar ~ 9999 Mvar
Apparent Power Demand	0.2%	1 VA	0 ~ 9999 MVA
Power Factor	0.2%	0.001	-1.000 ~ 1.000
Frequency	±0.01 Hz	0.01 Hz	45.00 ~ 65.00 Hz
Active Energy	Primary	0.2S	0.1 kWh
	Secondary	0.2S	0.001 kWh
Reactive Energy	Primary	0.5S	0.1 kvarh
	Secondary	0.5S	0.001 kvarh
Apparent Energy	Primary	0.2%	0.1 kVAh
	Secondary	0.2%	0.001 kVAh
Harmonics	1.0%	0.01%	
Phase Angle	2.0%	0.1°	0.0° ~ 359.9°
Unbalance	2.0%	0.1%	0.0% ~ 100.0%
Running Time	< 1 sec/day	0.01 h	0 ~ 9999999.99 h
Temperature (Wired)	±2 °C	0.1 °C	-20 ~ 150 °C
Temperature (Wireless)	±1 °C	0.1 °C	-25 ~ 125 °C

Current Input	
Nominal Current	① 5 A, ② 1 A
Range	① 0 ~ 10 A, ② 0 ~ 2 A
Starting Current	① 5 mA, ② 1 mA
Burden	0.05 VA (Typical) @5 A rms
Withstand	100 A rms for 1 second, Non-Recurring
Accuracy	0.1%
Voltage Input	
Nominal Voltage	400 V AC L-N , 690 V AC L-L (+20%) CAT III
Withstand	1500 V AC Continuous, 2500 V AC, 50/60 Hz for 1 minute
Input Impedance	≥4 MΩ/Phase
Metering Frequency	45 Hz ~ 65 Hz
Accuracy	0.1%
Voltage Input (PT Option)	
Nominal Voltage	658 V AC L-N , 1140 V AC L-L
Withstand	2500 V AC Continuous, 3250 V AC, 50/60 Hz for 1 minute
Input Impedance	≥8 MΩ/Phase
Metering Frequency	45 Hz ~ 65 Hz
Accuracy	0.2%
Energy Accuracy	
Active Energy	IEC 62053-22 Class 0.2S; ANSI C12.20 0.2
Reactive Energy	IEC 62053-24 Class 0.5S
Harmonics	
Metered Value	2nd ~ 63rd Harmonics

Communication	
RS485 (Standard)	
Modbus RTU and DNP3.0 Communication Protocols	
Baud Rate: 1200 ~ 38400, 115200 bps	
Second RS485 Port (Optional AVM2-RS485 Module)	
Modbus RTU Protocol	
Baud Rate: 4800 ~ 38400, 115200 bps	
PROFIBUS (Optional AVM2-PROFI Module)	
PROFIBUS-DP/V0 Protocol	
Work as PROFIBUS Slave, Baud Rate Adaptive, Up to 12 M	
Model 1: Input Bytes: 32, Output Bytes: 32	
Model 2: Input Bytes: 64, Output Bytes: 2	
PROFIBUS Standard According to EN 50170 Vol. 2	
Ethernet (Option AVM2-WEB Module)	
Modbus-TCP/IP, DNP3.0, FTP, SNTP/NTP, etc	

I/O Module Option	
Digital Input (DI)	
Input Voltage Range	20 ~ 160 V AC/DC
Input Current (Max)	2 mA
Start Voltage	15 V
Stop Voltage	5 V
Pulse Frequency (Max)	100 Hz, 50% Duty Ratio
SOE Resolution	2 ms
Digital Output (DO) (Photo-MOS)	
Voltage Range	0 ~ 250 V AC/DC
Load Current	100 mA (Max)
Output Frequency	25 Hz, 50% Duty Ratio
Isolation Voltage	2500 V AC
Relay Output (RO)	
Switching Voltage	250 V AC, 30 V DC
Switching Current	5 A (R), 2 A (L)
Set Time	10 ms (Max)
Contact Resistance	30 mΩ (Max)
Isolation Voltage	2500 V AC
Mechanical Life	1.5×10 ⁷
Analog Output (AO)	
Output Range	4 ~ 20 mA
Accuracy	0.5%
Temperature Drift	50 ppm/°C Typical
Isolation Voltage	500 V
Open Circuit Voltage	15 V
Analog Input (AI)	
Input Range	4 ~ 20 mA
Accuracy	0.2%
Temperature Drift	50 ppm/°C Typical
Isolation Voltage	500 V DC
Power Supply for DI (24 V DC)	
Output Voltage	24 V DC
Output Current	42 mA
Load (Max)	21 Digital Inputs

Operating Environment	
Operating Temperature	-25 ~ 70 °C
Storage Temperature	-40 ~ 85 °C
Relative Humidity	5% ~ 95% (Non-Condensing)

Power Supply	
AC/DC Power Supply	
Operating Range	100 ~ 415 V AC, 50/60 Hz, 100 ~ 300 V DC
Power Consumption	5 W
Withstand	3250 V AC, 50/60 Hz for 1 minute
Low Voltage DC Power Supply (Optional)	
Operating Range	20 ~ 60 V DC
Power Consumption	5 W

Standards Compliance	
Product Standard	
Product Standard	IEC 61557-12
Safety Standard	
Safety Standard	IEC 61010-1 ed.3; IEC 61010-2-30 ed.2; CAT III
Electromagnetic Compatibility	
Electrostatic Discharge Immunity	IEC 61000-4-2
Radiated Field Immunity	IEC 61000-4-3
Fast Transients Immunity	IEC 61000-4-4
Surge Immunity	IEC 61000-4-5
Conducted Disturbances Immunity	IEC 61000-4-6
Power Frequency Magnetic Field Immunity	IEC 61000-4-8
Radio-Frequency and Radio Disturbance	CISPR 11/CISPR 22; EN 55011/EN 55022
Outlines Standard	DIN 43700, ANSI C39.1

ORDERING INFORMATION

Model	Mounting Options	Voltage Input	Current Input	Power Supply
AVM25	- D: LCD Display	- Blank: 400 V AC L-N, 690 V AC L-L	- 5A: 5 A	- P1: 100 ~ 415 V AC , 50/60 Hz; 100 ~ 300 V DC
	- M: DIN-Rail Mounting without Display	- PT: 658 V AC L-N, 1140 V AC L-L	- 1A: 1 A	- P2: 20 ~ 60 V DC

Ordering Example: AVM25-D-PT-5A-P1

Communication Module	Protocols
AVM2	- RS485: Modbus RTU
	- PROFI: PROFIBUS
	- WEB: MODBUS-TCP/IP, DNP3.0, FTP, SNTP/NTP, etc

I/O Module	Logic Module
AVM2-IO1	- 1: 6 DI, 2 RO
	- 2: 6 DI, 2 RO
AVM2-IO2	- 1: 4 DI, 2 DO, 2 AO
	- 2: 4 DI, 2 DO, 2 AO
AVM2-IO3	- 1: 4 DI, 2 RO, 2 AI
	- 2: 4 DI, 2 RO, 2 AI

Temperature Module (Wireless)	
Temperature Module (Wireless Acquisition)	AVM2-RT

Temperature Module (Wired)	RTDs Mode
AVM2-T	- M0 - Cable Mode
	- M8 - ϕ 8 Switch Contact
	- M10 - ϕ 10 Switch Contact
	- M12 - ϕ 12 Switch Contact

Accessories (Optional)	
AVM2-DIN	- DIN-Rail Adapter
AVM2-IP66/NEMA4X	- Environmental Protection Cover
AVM2-DS2	- Remote Display (Only for DIN-Rail Mounting "M")

Temperature Module (Wireless Sensors) - Number	
AVM2-SRT	N1~N18

Note:

1. No more than 2 of the same I/O modules may be attached to the meter (e.g. two AVM2-IO2). The same two I/O modules must have a different logic number.
2. A maximum of 3 modules may be attached to the meter. If a communication module is used (e.g. AVM2-RS485), it must be installed on the back FIRST before the I/O modules are attached.
3. If AVM25 uses DI to trigger a waveform capture, the I/O module logic number must be Module 1.
4. AVM2-RT can support 1~18 channels AVM2-SRT. AVM2-RT and AVM2-SRT must be used together.

Revision Date: Apr., 2024 V1.02

