

Product Overview

The AM protection relay has the modular design and it can be optimized to almost all type of feeder protection applications in medium voltage distribution systems.



AM2SE

- ◆ Programmable digital inputs;
- ◆ Suitable for Ring Main Unit;
- ◆ 8 DI and 5 DO.



AM3SE

- ◆ Programmable digital inputs;
- ◆ Suitable for MV switchgear;
- ◆ 11 DI and 5 DO.



AM5SE

- ◆ Programmable tripping output matrix;
- ◆ Trip and close circuit supervision, which can adapt to 0.25~5A trip-and-close current;
- ◆ USB connection for AM5SE setting software;
- ◆ Programmable 4-20mA DC outputs;
- ◆ Powerful CPU supporting Modbus-RTU/TCP, IEC 60870-5-103, 101.

Certificate



Technical Characteristics

2.1 Rated Characteristics

Version Characteristics	AM2SE	AM3SE	AM5SE
Power Supply			
Rated voltage	AC/DC 110V or AC/DC 220V or DC48V or DC24V	AC/DC 110V or AC/DC 220V or DC 48V or DC 24V	AC/DC 110V or AC/DC 220V
Range	Rated voltage × (1±20%)		
Burden	≤10W (DC)	≤10W (DC)	≤15 VA
PT Inputs			
Rated value	AC 100V or 100/√3 V		AC 100V or 100/√3 V AC 380V or 220V(AM5SE-UB/IS/FE/FA/K)
PT rated secondary range	0.1V~120V	0.1V~120V	0.1V~120V 0.1V ~ 456V(AM5SE-UB/IS/FE/FA/K)
Accuracy	0.5		
Burden	≤0.5VA (each phase)		
Voltage withstand	Continuous: 1.2 Un 10s: 2 Un		
Phase CT Inputs (Protection Current)			
CT rated secondary range	AC 5A or 1A		
Dynamic	15 × CT rated current	15 × CT rated current	20 × CT rated current
Accuracy	0.5		
Burden	≤0.5VA (each phase)		
Thermal withstand	Continuous: 2 In 1s: 40 In		
Phase CT Inputs (Measurement Current)			
CT rated secondary range	—	—	AC 5A or 1A
Dynamic	—	—	1.5 × CT rated current
Accuracy	—	—	0.5
Burden	—	—	≤0.5VA (each phase)
Thermal withstand	—	—	Continuous: 1.5 In 1s: 4 In
Frequency			
Rated frequency	50Hz or 60Hz		
Frequency range	45 ~ 65Hz	45 ~ 65Hz	40 ~ 70Hz
Accuracy	±0.1Hz		
Digital Inputs			
Operating nominal voltage	AC/DC 110V or AC/DC 220V or DC48V or DC24V	AC/DC 110V or AC/DC 220V or DC48V or DC24V	AC/DC 110V or AC/DC 220V
Voltage threshold	70% of nominal voltage		
Reset threshold	55% of nominal voltage		
Burden	≤ 1W (each phase) (DC220V)		
Digital Outputs			
Make and carry	≥ 10000 operations		
Making capacity	≥ 1000W, L / R = 40ms		
Continuous current	≥ 5A		
Short duration carry current	≥ 30A for 200ms		
Breaking capacity	≥ 30W, L/R = 40ms		

2.2 Protection Characteristic

Characteristics	Accuracy	Resolution	Disengaging ratio
Voltage	±3%	0.001V	0.95 and 1.05
Current	±3%	0.001A	0.95 and 1.05
Frequency	±0.02Hz	0.001Hz	—
Inverse Time Element Operation delay t>-(IDMT)	40ms or ±5% setting value	0.001s	—
Time Element Operation delay t>-(DT)	≤40ms [delay time within 2 seconds] ≤40ms ±1% setting value [delay time larger than 2 seconds]	0.001s	—

2.3 Environmental Characteristic

Characteristics	Description/Value
Operating Temperature	-10°C~+55°C
Humidity	5%~95% (No condensation and freeze inside)
Altitude	≤2500m
Enclosure	IP20 (local panel)

2.4 Product Safety

Characteristics	Description/Value
Insulation Resistance	>100MΩ, 500Vdc
Dielectric Strength	Between circuits and ground, and between independent circuits: Power frequency withstand voltage 2kV
Impulse Voltage	±5kV (1.2/50μs, 0.5J)

2.5 EMC (Electromagnetic Compatibility)

Characteristics	Standard	Level/Class
Radiated emission	IEC-60255-26:2023—5.1	A
Conducted emission	IEC-60255-26:2023—5.2	A
Radiated radio frequency fields	IEC-60255-26:2023	A
Electrostatic discharge	IEC-60255-26:2023—6.1	B
Conducted radio frequency disturbance	IEC-60255-26:2023—6.2-6.5	A
Fast transient bursts	IEC-60255-26:2023—6.2-6.5	B
Slow damped oscillatory waves	IEC-60255-26:2023—6.2-6.4	B
Surges	IEC-60255-26:2023—6.2-6.4	B
Voltage dips and short interruptions test (AC or DC)	IEC-60255-26:2023—6.2	A/C ¹
Magnetic field at power frequency	IEC-60255-26:2023—6.1	B

¹ AC and DC voltage dips meet the criteria A/C of the IEC60255-26:2023—6.2. AC and DC voltage interruptions meet the criteria C of the IEC60255-26:2023—6.2. Ripple on DC input power port immunity meet the criteria A of the IEC60255-26:2023—6.2. DC auxiliary power supply ports gradually shutdown/start-up meet the criteria C of the IEC60255-26:2023—6.2.

Selection Guide

Note: ■ means with this function, Omeans optional function, —means without this function.

Analogue inputs	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Input current	4	5	0	8	8	8	8	9	9	9	8	6	8	8	8	8	0	-
Input voltage	3	3	3	6	4	4	4	4	4	4	4	8	6	6	6	6	8	-
Digital	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Digital Input	8	11	11	20	20	20	20	20	20	20	20	20	20	20	20	20	20	12
Digital Output	5	5	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	64
Rear port	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
RS485		■			■ (2 ports)													-
Ethernet		-			○ (2 ports)													-
USB		-			■ (1 port)													-
Protocols	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Modbus Serial					■													-
Modbus over Ethernet		-			○													-
IEC 60870-5-103					■													-
TCP IEC 60870-5-103		-			○													-
IEC 60870-5-101		-			■													-
Measurement	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
4-20mA analog output		-			○													-
Electric parameter		U, I, P, Q, PF, Fr, Ep, Eq, Es															U, Fr	-
Logs and Records	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Fault recorder		■	■	-	■													-
Number of circuit breaker trip and close		■	■	-	■													-
Sequence of event record		■															-	
Monitoring function	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Trip-and-Close Circuit Supervision		-			■													-
Remote control		■															-	
Others	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
GPS		■															-	
Protection Function	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
3 stages directional overcurrent (with voltage dependant)[ANSI 67]	-	-	-	■	-	-	-	-	-	-	■	■	-	-	■	-	-	-
3 stages overcurrent (with composite voltage blocking)[ANSI 50/51]	■	■	-	■	■	-	-	-	-	-	■	■	-	-	■	-	-	-
Differential protection with ratio restraining[ANSI 87]	-	-	-	-	-	-	-	■	■	■	-	-	-	-	-	-	-	-
Instantaneous Differential protection[ANSI 87]	-	-	-	-	-	-	-	■	■	■	-	-	-	-	-	-	-	-
Motor overcurrent(motor start,motor run, 2 stages)	-	-	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
Overcurrent (2 stages) [ANSI 50/51]	-	-	-	-	-	-	■	-	-	-	-	-	-	-	-	-	-	-
Overcurrent IDMT [ANSI 51]	■	■		■	■	■	■	■	-	-	■	■	-	-	■	-	-	-
Unbalance current[ANSI 60]	-	-	-	-	-	-	■	■	-	-	-	-	-	-	-	-	-	-
Bus tie protection and standby power automatic switch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	■	-	-	-
2 stages Directional earth fault [ANSI 67N]	-	-	-	■	-	-	-	-	-	-	■	■	-	-	■	-	-	-
2 stages earth fault [ANSI 50N/51N]	■	■	-	-	■	■	■	■	-	-	■	-	-	-	-	-	-	-
Earth fault IDMT[ANSI 50N/51N]	■	■	-	■	■	-	-	-	-	-	■	■	-	-	-	-	-	-

Protection Function	AM2SE	AM3SE		AM5SE														
		-I	-U	-F	-T	-M	-C	-MD	-D2	-D3	-TB	-IS	-FE	-FA	-B	-K	-UB	-FD
Clearance earth fault protection(2 stages)	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-	-
Negative sequence overcurrent (2 stages) [ANSI 46]	■	■	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
Negative sequence overcurrent IDMT[ANSI 46]	■	■	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
Overload [ANSI 49F]	■	■	-	■	■	-	-	-	-	-	■	-	-	-	-	-	-	-
Starting air-cooled water chiller	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-	-
On-load tap charge lock-out	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-	-
Undervoltage (trip)[ANSI 27]	■	■	-	-	-	■	-	■	-	-	-	■	■	■	-	-	-	-
Undervoltage (alarm)[ANSI 27]	■	■	■	-	-	■	-	■	-	-	-	■	■	■	-	-	■	-
Capacitor undervoltage(trip)	-	-	-	-	-	-	■	-	-	-	-	-	-	-	-	-	-	-
Loss of voltage (trip)	-	-	-	■	-	-	-	-	-	-	-	■	-	-	-	-	-	-
Loss of voltage (alarm)	-	-	-	■	-	-	-	-	-	-	-	■	-	-	-	-	-	-
Overvoltage protection[ANSI 59]	■	■	■	■	-	■	■	■	-	-	-	■	■	-	-	-	■	-
Residual voltage protection(trip)[ANSI 59N]	■	■		■	-	-	■	■	-	-	■	■	-	■	-	-	-	-
Residual voltage protection(alarm)[ANSI 59N]	■	■	■	-	-	■	-	-	-	-	-	-	-	■	-	-	■	-
PT supervision[ANSI 60]	■	■	■	■	■	■	■	■	-	-	■	■	■	■	■	-	■	-
Unbalance voltage[ANSI 60]	-	-	-	-	-	■	■	■	-	-	-	-	-	-	-	-	-	-
Unbalance current[ANSI 60]	-	-	-	-	-	-	■	■	-	-	-	-	-	-	-	-	-	-
Motor starting time-out[ANSI 48]	-	-	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
CT supervision[ANSI 60]	-	-	-	■	■	-	-	■	■	■	-	■	-	-	-	-	-	-
Three phase Auto-reclose[ANSI 79]	■	■	-	■	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thermal overload protection[ANSI 49M]	-	-	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
Locked rotor[ANSI 51LR]	-	-	-	-	-	■	-	■	-	-	-	-	-	-	-	-	-	-
FC block[ANSI 86]	■	■	-	■	■	■	-	■	-	-	■	■	-	-	-	-	-	-
Post-accelerated overcurrent	■	■	-	■	-	-	-	-	-	-	-	-	-	-	-	■	-	-
Under frequency[ANSI 81U]	■	■	-	■	-	-	-	-	-	-	-	■	■	■	-	-	-	-
Over frequency[ANSI 81O]	■	■	-	■	-	-	-	-	-	-	-	■	■	■	-	-	-	-
Incorrect phase sequence	-	-	-	-	-	■		■	-	-	-	-	-	-	-	-	-	-
Voltage Phase loss protection	-	-	-	-	-	■		■	-	-	-	-	-	-	-	-	-	-
Directional power protection[ANSI 32]	-	-	-	■	-	-	-	-	-	-	-	■	-	-	-	-	-	-
Power recovery protection	-	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-
Under power protection	-	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-
Non-electricity	■	■	-	■	■	■	■	■	-	-	■	■	-	-	-	-	-	■
PT supervision and parallel connection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	■	-
Synchro-check[ANSI 25]	-	-	-	■	-	-	-	-	-	-	-	■	-	-	■	-	-	-
Rate of change of frequency[ANSI 81R]	-	-	-	-	-	-	-	-	-	-	-	-	■	■	-	-	-	-
Trip-and-Close Circuit Supervision(alarm)	-	-	-	■	■	■	■	■	-	-	■	■	■	■	■	-	-	-
Auto-close with voltage recovery	-	-	-	-	-	-	-	-	-	-	-	■	-	-	-	-	-	-
PT harmonic elimination	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	■	-
Overhaul-lockout[ANSI 86]	■	■	-							■							-	