

AQ-M255 Motor protection device

Description



The AQ-M255 motor protection device offers a modular protection and control solution for larger and more important motors that require a large I/O capacity. You can add up to eleven (11) I/O or communication cards into the device for extensive monitoring and control applications. You can also connect up to sixteen (16) RTD signals for thermal alarming and tripping. AQ-M255 communicates using various protocols, including the IEC 61850 substation communication standard.

Highlights:

- Powerful motor management with a large I/O capacity.
- Five (5) thermal models (time constant accurate).
- Soft start protection beginning from 6 Hz.
- Wye-delta started motor supervision.
- Two-speed motor protection.
- Optional power and energy measurement accuracy of up to 0.2 %.
- Asynchronous and synchronous motors.

Technical data

PROTECTION

- Non-directional overcurrent ($I_{>}$; 50/51) - 4 stages (INST, DT or IDMT)
- Non-directional earth fault ($I_{O>}$; 50N/51N) - 4 stages (INST, DT or IDMT)
- Directional overcurrent ($I_{dir>}$; 67) - 4 stages (INST, DT or IDMT)
- Directional earth fault ($I_{Odir>}$; 67N/32N) - 4 stages (INST, DT or IDMT)
- Negative sequence overcurrent/ Phase current reversal/ Current unbalance ($I_{2>}$; 46/46R/46L) - 4 stages (INST, DT or IDMT)
- Harmonic overcurrent ($I_{h>}$; 50H/51H/68H) - 4 stages (INST, DT or IDMT)
- Circuit breaker failure protection (CBFP; 50BF/52BF)
- High-impedance or low-impedance restricted earth fault/ Cable end differential ($I_{Od>}$; 87N)
- Overvoltage ($U_{>}$; 59) - 4 stages (INST, DT or IDMT)
- Undervoltage ($U_{<}$; 27) - 4 stages (INST, DT or IDMT)
- Neutral overvoltage ($U_{O>}$; 59N) - 4 stages (INST, DT or IDMT)
- Sequence voltage ($U_1/U_2>/<$; 47/27P/59PN) - 4 stages (INST, DT or IDMT)
- Overfrequency and underfrequency ($f>/<$; 81O/81U) - 8 stages (INST or DT)
- Rate-of-change of frequency ($df/dt>/<$; 81R) - 8 stages (INST or DT)
- Power protection (P, Q, S>/<; 32) - 4 stages (DT)
- Motor status monitoring
- Machine thermal overload ($TM_{>}$; 49M)
- Motor start/ Locked rotor monitoring ($I_{st>}$; 48/14)
- Frequent start ($N_{>}$; 66)
- Non-directional undercurrent ($I_{<}$; 37)
- Mechanical jam ($I_{m>}$; 51M)
- Power factor protection ($PF_{<}$; 55)
- Voltage memory
- Resistance temperature detectors (RTD)
- Programmable stage ($PGx>/<$; 99)
- Arc protection ($I_{Arc>}/I_{OArc>}$; 50Arc/50NArc) (optional)

CONTROL

- Number of objects to control and monitor: 10
- Number of indicators to monitor: 10
- Number of setting groups: 8

MEASURING AND MONITORING

- Phase, sequence and residual currents (IL1, IL2, IL3, IO1, IO2)
- Phase, sequence and residual voltages (UL1, UL2, UL3, UL12, UL23, UL31, U0)
- Frequency (f)
- Power (P, Q, S, pf) and Energy (E+, E-, Eq+, Eq-)
- Power and energy class 0.5
- Power and energy measurement accuracy of up to 0.2 % (optional)
- Current transformer supervision
- Voltage transformer supervision (60)
- Circuit breaker wear monitoring
- Total harmonic distortion (current)
- Total harmonic distortion (voltage)
- Running hour counter
- Measurement recorder
- Measurement value recorder
- Event recorder (max. 15 000 permanent event records)
- Disturbance recorder (max. 100 records á 5 seconds at 3.2 kHz sampling)

HARDWARE

- Current inputs: 5
- Voltage inputs: 4
- Digital inputs (fixed): 3
- Digital outputs (fixed): 5
- Number of empty slots: 11
- Digital inputs: +8/16/24/32/40/48/56/64/72/80/88 (optional)
- Digital outputs: +5/10/15/20/25/30 (optional)
- High-speed high-current output module (optional)
- Milliampere I/O module (4 mA inputs + 1 mA output) (optional)
- Milliampere I/O module (4 mA outputs + 1 mA input) (optional)
- RTD input module (8 RTD inputs) (optional)
- Arc protection module (4 sensors + 2 HSO + 1 BI) (optional)
- Communication media (see "Communication" below)
- External I/O modules (see "Accessories" below)

COMMUNICATION

Communication inputs

- RJ-45 100 Mbps Ethernet (front panel, fixed)
- RJ-45 100 Mbps Ethernet and RS-485 (rear panel, fixed)
- Double RJ-45 Ethernet & IRIG-B communication module (optional)
- Double ST Ethernet & IRIG-B communication module (optional)
- Double SFP Ethernet & IRIG-B communication module (optional)
- Double LC (HSR/PRP) Ethernet communication module (optional)
- Double RJ-45 (HSR/PRP) Ethernet communication module (optional)
- RS-232 & serial fiber communication module (optional)

Communication protocols

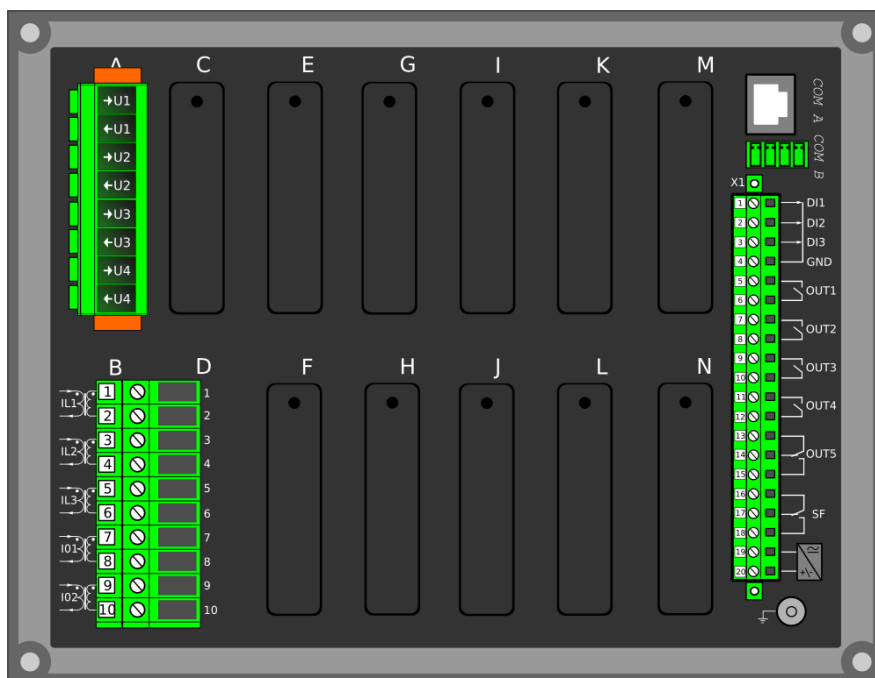
- IEC 61850 (edition 1)
- IEC 61850 (edition 2)
- IEC 60870-5-101/104
- IEC 60870-5-103
- Modbus/RTU and Modbus/TCP
- DNP3
- SPA

ACCESSORIES

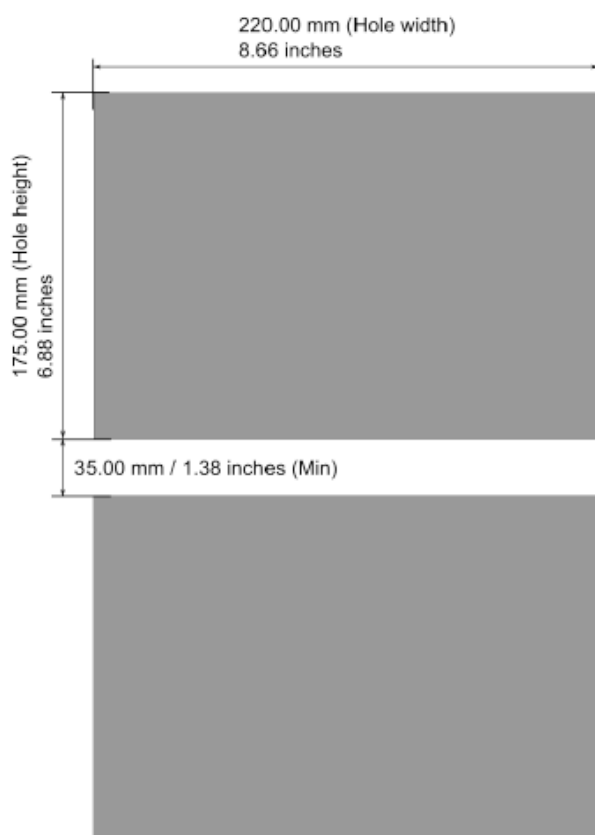
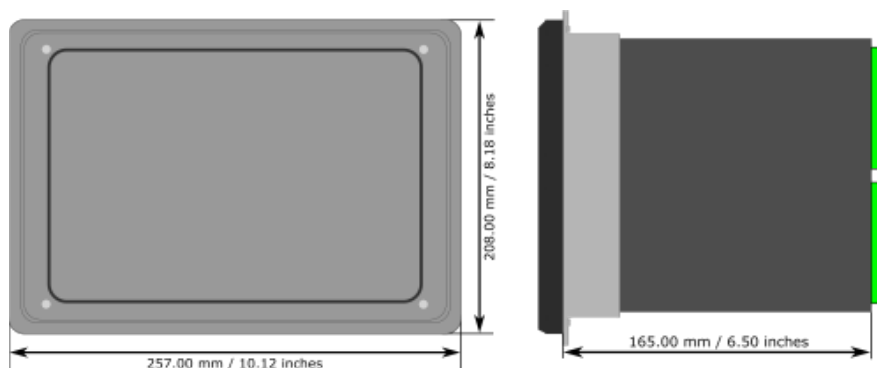
- AX007 External 6-channel 2-/3-wire RTD input module (pre-configured)
- AX008 External 8-channel thermocouple and mA input module (pre-configured)
- AX013 Raising frame (120 mm)
- AX014 Raising frame (40 mm)
- AX015 Wall mounting bracket

Application Drawing

Device Rear Image



Device and Cut-out Image



AQ - M 2 5 5 A - P X X X A X A - XXXXXXXXXXXX

- * One card at most per IED
- ** Two cards at most per IED
- *** Can only be applied to the two last slots
- **** Five cards at most per IED