

AQ-F210 Feeder protection device



Description

The AQ-F210 feeder protection device offers a modular feeder protection and control solution, with non-directional overcurrent and earth fault protections with an automatic recloser. You can add up to four (4) I/O or communication cards into the device for more comprehensive monitoring and control applications. The AQ-F210 feeder protection device communicates using various protocols, including the IEC 61850 substation communication standard.

Highlights:

- Cable-end differential protection.
- Low-impedance restricted earth fault protection.
- Harmonics protection and control.
- A 5-shot scheme-controlled auto-recloser.

Technical data

PROTECTION

- Non-directional overcurrent ($I_{>}$; 50/51) - 4 stages (INST, DT or IDMT)
- Non-directional earth fault ($I_{0>}$; 50N/51N) - 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 ($I_{0d>}$; 87N)
- Resistance temperature detectors (RTD)
- Line thermal overload (TF $>$; 49F)
- Programmable stage (PGx $>/<$; 99)
- Arc protection ($I_{Arc>}/I_{0Arc>}$; 50Arc/50NArc) (optional)

CONTROL

- Number of objects to control and monitor: 5
- Number of indicators to monitor: 5
- Number of setting groups: 8
- Cold load pick-up
- Switch-on-to-fault
- Auto-recloser (0 → 1; 79)

MEASURING AND MONITORING

- Phase, sequence and residual currents (I_{L1} , I_{L2} , I_{L3} , I_{01} , I_{02})
- Current transformer supervision
- Circuit breaker wear monitoring
- Total harmonic distortion (current)
- 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
- Digital inputs (fixed): 3
- Digital outputs (fixed): 5
- Number of empty slots: 4
- Digital inputs: +8/16/24/32 (optional)
- Digital outputs: +5/10 (optional)
- Milliampere I/O module (4 mA outputs + 1 mA input)
- Arc protection module (4 sensors + 2 HSO + 1 BI)
- 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)
- 2 x RJ-45 100 Mbps Ethernet with an IRIG-B input (optional)
- 2 x ST 100 Mbps Ethernet with an IRIG-B input (optional)
- 2 x LC 100 Mbps Ethernet (PRP/HSR) (optional)
- RS-232 serial fiber (PP/PG/GP/GG) (optional)

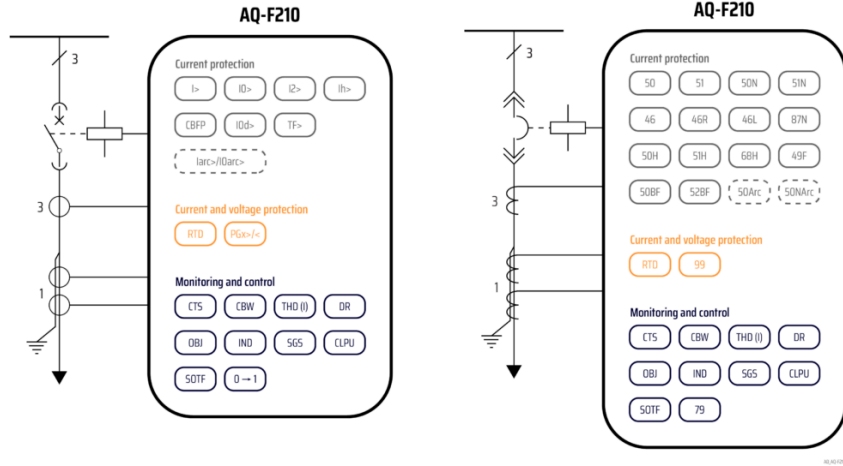
Communication protocols

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

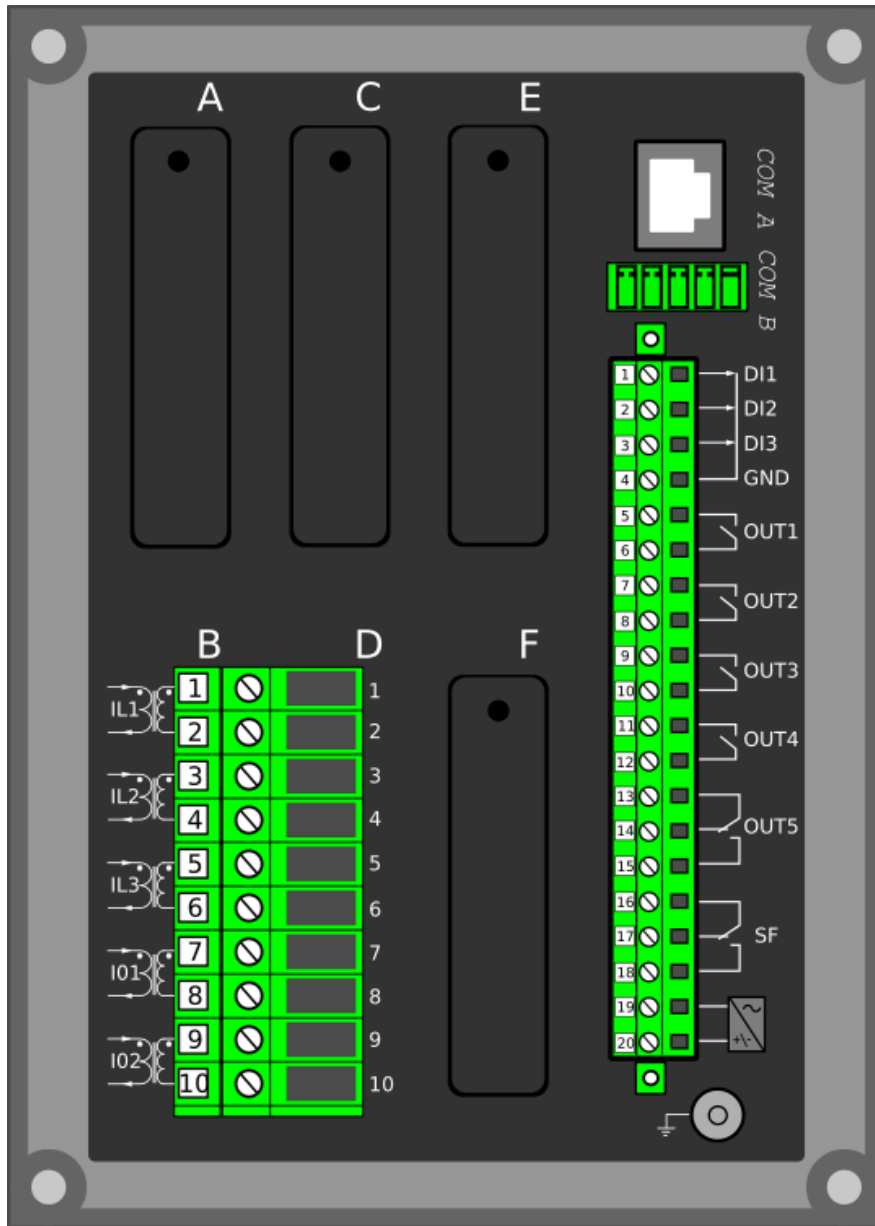
ACCESSORIES

- AX007 External 6-channel 2-/3-wire RTD input module (pre-configured)
- AX008 External 8-channel thermocouple and mA input module (pre-configured)
- AX009 Raising frame (87 mm)
- AX010 Raising frame (40 mm)
- AX011 Combiflex frame
- AX012 Wall mounting bracket

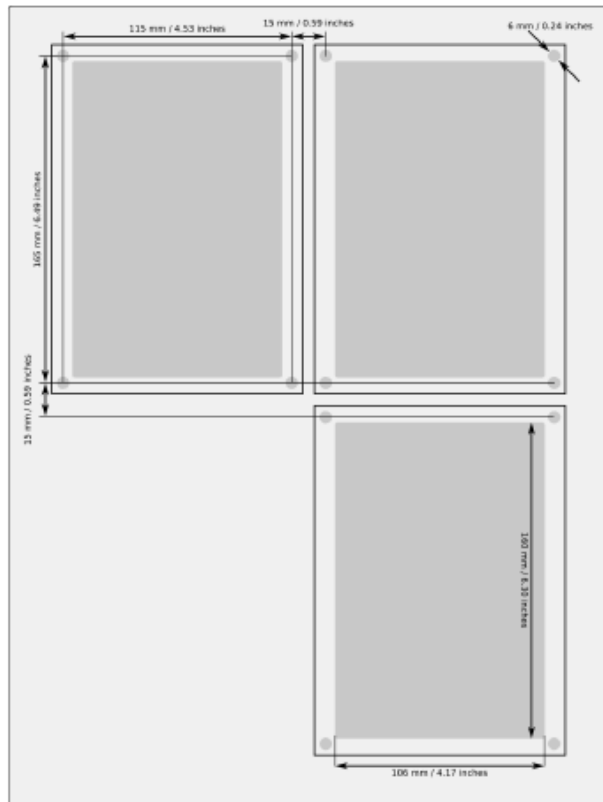
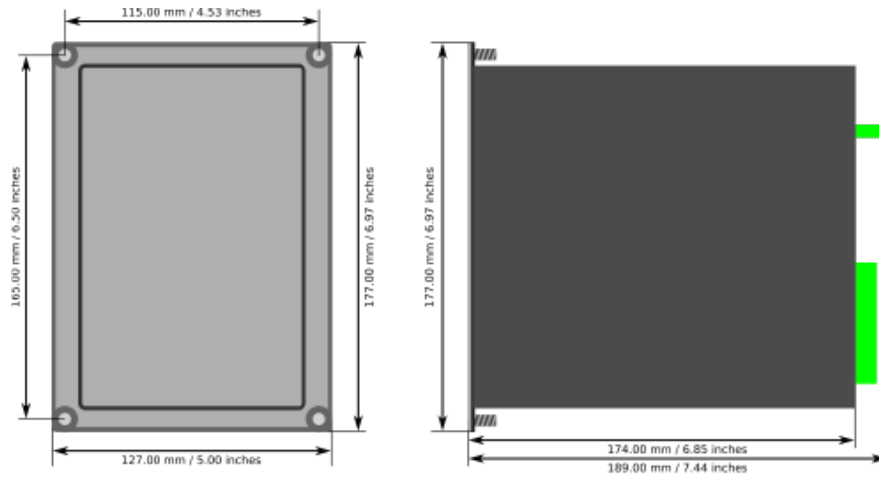
Application Drawing



Device Rear Image



Device and Cut-out Image



Order Code

	AQ - F 2 1 0 - P X 8 X A X A - X X X X
Model	
F Feeder protection	
Device size	
1 1/4 of 19" rack	
Analog measurement	
0 5 Current measurement channels	
Mounting	
P Panel mounting	
Auxiliary voltage	
H 80...265 VAC/DC	
L 18...72 VDC	
Measurement accuracy class	
8 N/A	
Terminals	
A Standard	
B Ring lug terminals	
Reserved for future use	
A N/A	
Digital inputs on power supply module	
A 3 Digital inputs, 24 V nominal threshold	
B 3 Digital inputs, 110 V nominal threshold	
C 3 Digital inputs, 220 V nominal threshold	
D 2 Digital inputs, 24 V nominal threshold	
E 2 Digital inputs, 110 V nominal threshold	
F 2 Digital inputs, 220 V nominal threshold	
Reserved for future use	
A N/A	
Slots A, C, E, F (4 pcs)	
A Empty	
B 8 Digital inputs	
C 5 Output relays **	
D Arc protection with 4 point sensors or channels, 2 x HSO, 1 x BI *	
F 8 x RTD input **	
G 2 x RJ-45 100Mb Ethernet & IRIG-B * / ***	
H 2 x ST 100Mb Ethernet & IRIG-B * / ***	
I 4 x mA outputs - 1 x mA input **	
J Double LC 100Mb Ethernet (HSR, PRP redundant protocols) * / *** / ****	
K Double RJ45 100Mb Ethernet (HSR, PRP redundant protocols) * / ***	
L RS-232 - Serial fiber (Plastic-Plastic) * / ***	
M RS-232 - Serial fiber (Plastic-Glass) * / ***	
N RS-232 - Serial fiber (Glass-Plastic) * / ***	
O RS-232 - Serial fiber (Glass-Glass) * / ***	

* One card at most per IED

** Two cards at most per IED

*** Can only be applied to the last slot

**** Can't be applied when type "L" (18...72 VDC) auxiliary voltage is selected