

# 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 ( $I0>$ ; 50N/51N) - 4 stages (INST, DT or IDMT)
- Negative sequence overcurrent/ Phase current reversal/ Current unbalance ( $I2>$ ; 46/46R/46L) - 4 stages (INST, DT or IDMT)
- Harmonic overcurrent ( $Ih>$ ; 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 ( $I0d>$ ; 87N)
- Resistance temperature detectors (RTD)
- Line thermal overload (TF>; 49F)
- Programmable stage ( $PGx>/<$ ; 99)
- Arc protection ( $I_{Arc}>/I0_{Arc}>$ ; 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 ( $0 \rightarrow 1$ ; 79)

### MEASURING AND MONITORING

- Phase, sequence and residual currents ( $IL1, IL2, IL3, I01, I02$ )
- 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)

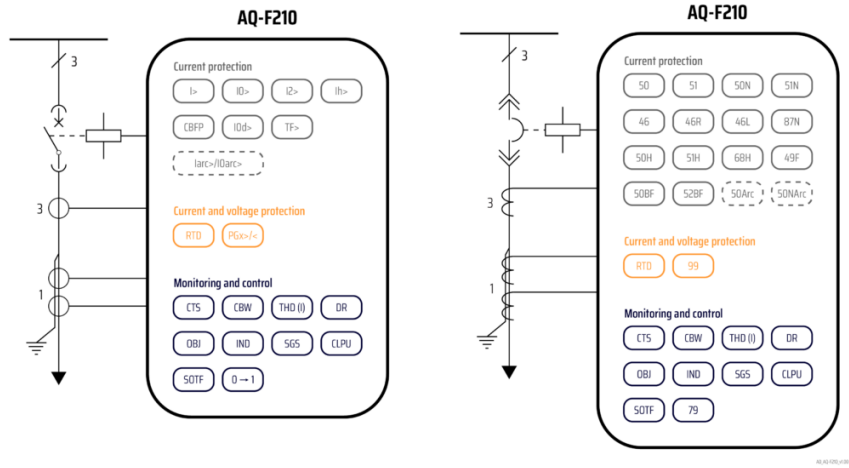
### Communication protocols

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

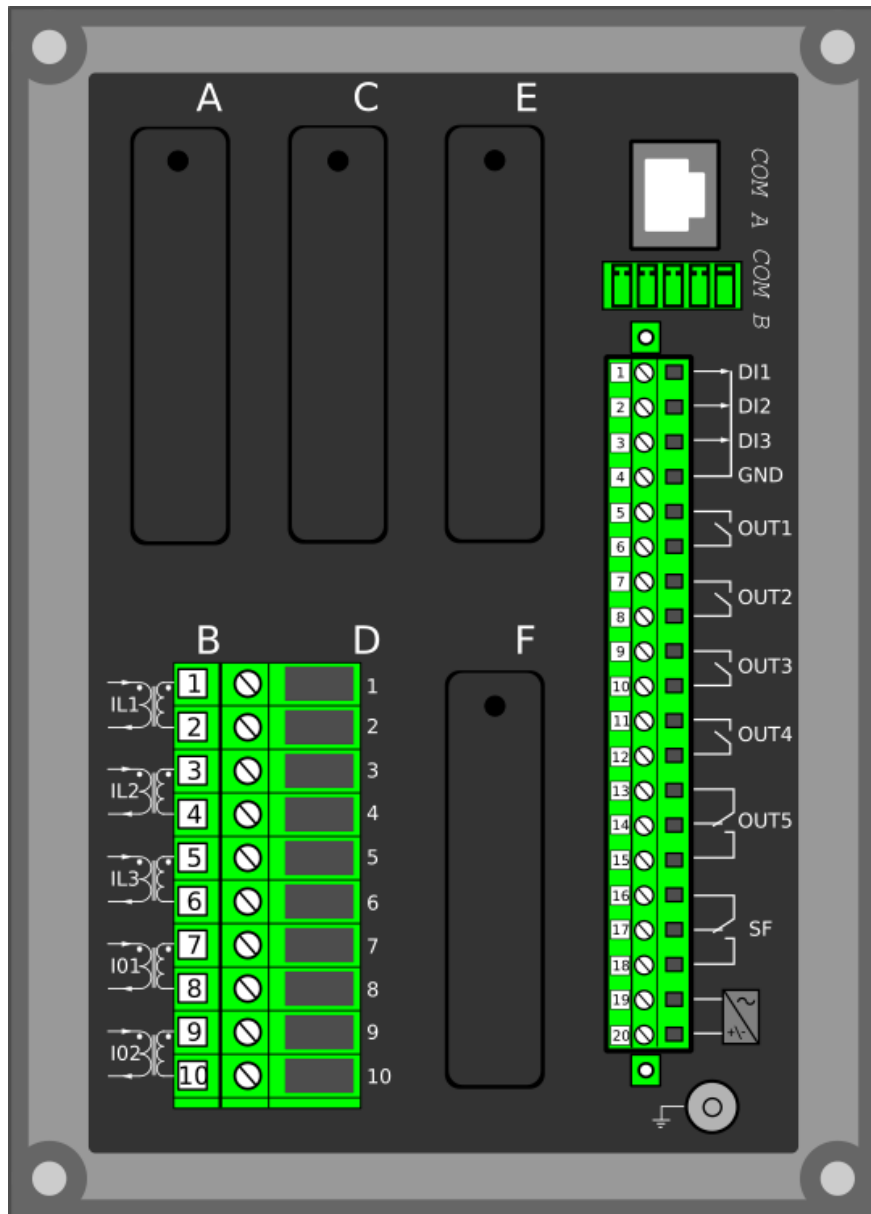
## ACCESSORIES

- 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

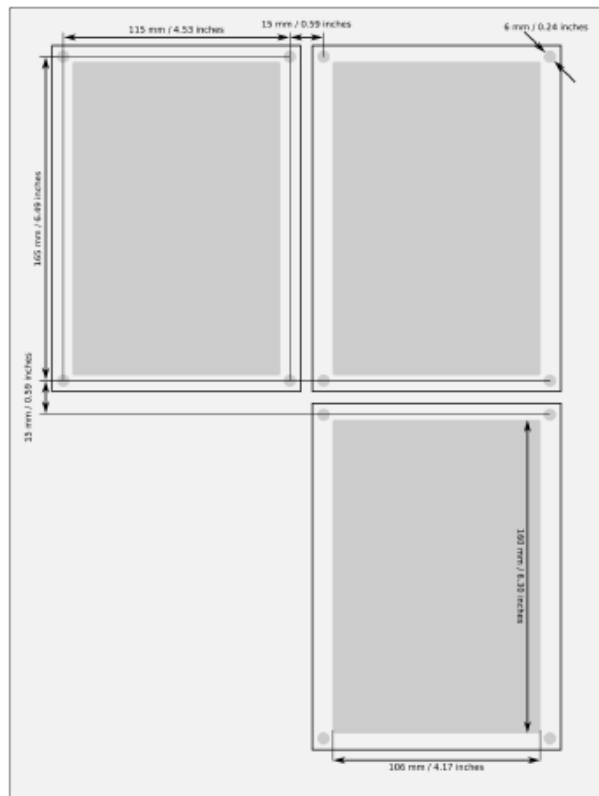
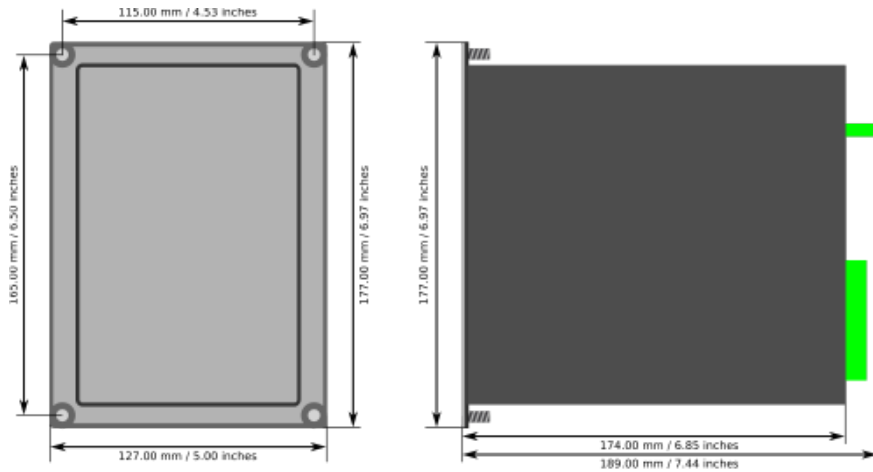
# Application Drawing



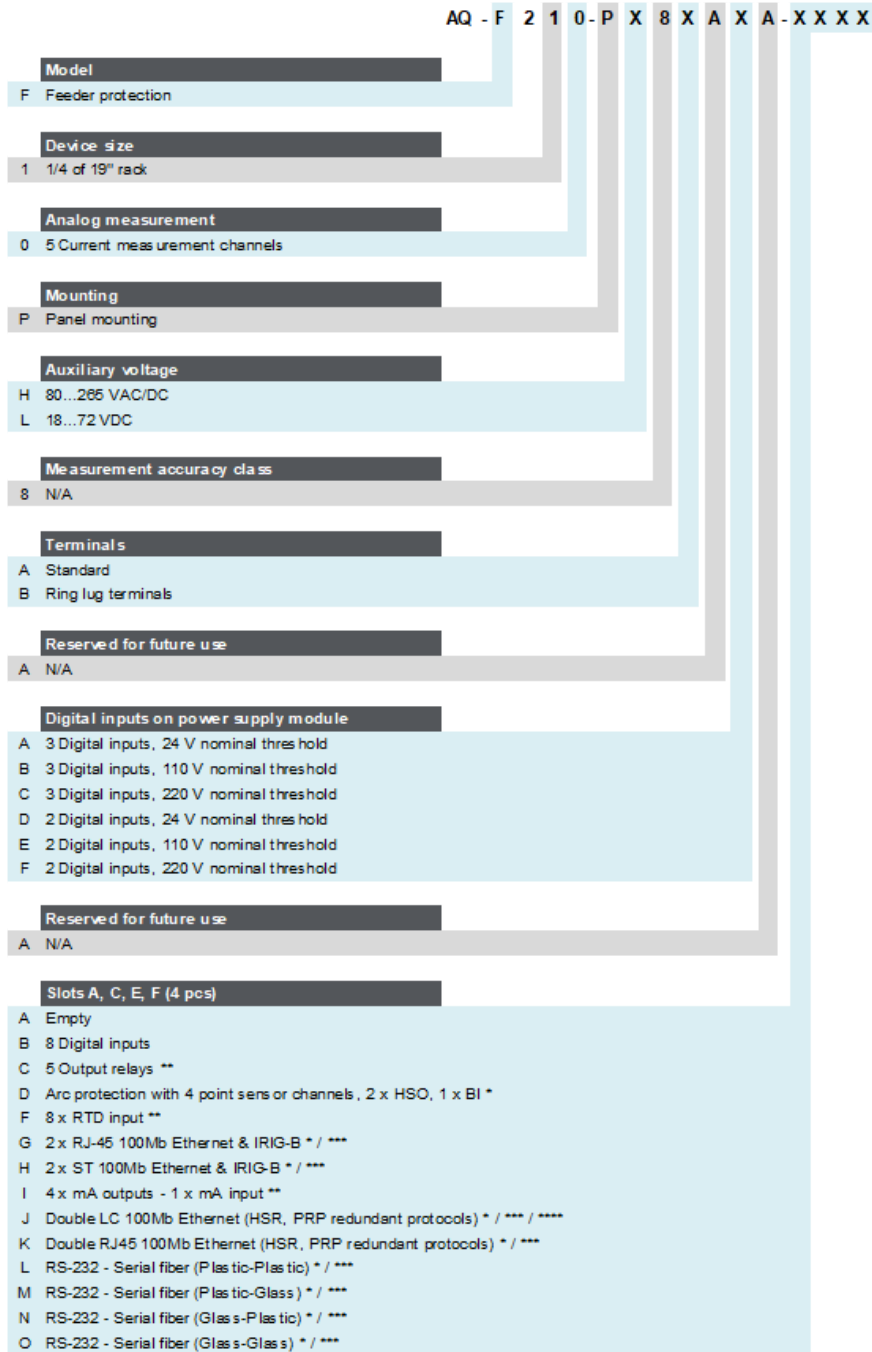
## Device Rear Image



# Device and Cut-out Image



# Order Code



\* 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