

AQ-F213E Feeder Protection IED



The AQ-F213 IED provides optimal performance for medium-voltage (main) or high-voltage (back-up) protection, control and monitoring applications. AQ-F213 integrates protection, control, monitoring, measuring, communication and extensive diagnostics information in one compact package. Its fully modular hardware construction gives the unit a high level of flexibility; additional I/O or communication cards can simply be plugged in according to application needs.

AQ-F213 is developed using the latest available technologies which provides protection engineers with more options and a completely new dimension to protection. The maximum usability of the IED is guaranteed by its many features, such as the graphical interface, the highly customizable HMI, the storage of PDF and other supportive documents as well as extensive user log information. Additionally, the powerful configuration and setting software tools are easy to configure and free of charge.

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)

Directional overcurrent ($I_{dir}>$; 67) - 4 stages (INST, DT or IDMT)

Directional earth fault ($I0_{dir}>$; 67N/32N) - 4 stages (INST, DT or IDMT)

Harmonic overcurrent ($I_h>$; 50H/51H/68H) - 4 stages (INST, DT or IDMT)

Negative sequence overcurrent/ Phase current reversal/ Current unbalance ($I2>$; 46/46R/46L) - 4 stages (INST, DT or IDMT)

High-impedance or low-impedance restricted earth fault/ Cable end differential ($I0d>$; 87N)

Overvoltage ($U>$; 59) - 4 stages (INST, DT or IDMT)

Undervoltage ($U<$; 27) - 4 stages (INST, DT or IDMT)

Neutral overvoltage ($U_{0>}$; 59N) - 4 stages (INST, DT or IDMT)

Sequence voltage ($U_{1/U2>/<}$; 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, DT or IDMT)

Overpower ($P>$; 32O)

Underpower ($P<$; 32U)

Reverse power (P_r ; 32R)

Line thermal overload ($TF>$; 49F)

Circuit breaker failure protection (CBFP; 50BF/52BF)

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

Auto-recloser ($0 \rightarrow 1$; 79)

Vector jump ($\Delta\phi$; 78)

Switch-on-to-fault

MEASURING & MONITORING

Phase, sequence and residual currents ($I_{L1}, I_{L2}, I_{L3}, I_{01}, I_{02}$)

Phase, sequence and residual voltages ($U_{L1}, U_{L2}, U_{L3}, U_{12}, U_{23}, U_{31}, U_0$)

Frequency (f)

Power (P, Q, S, pf) and Energy ($E+, E-, E_{q+}, E_{q-}$)

Current transformer supervision

Voltage transformer supervision (60)

Circuit breaker wear monitoring

Total harmonic distortion

Fault locator (21FL)

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: 3

Digital inputs (fixed): 6

Digital outputs (fixed): 5

Options (3 slots)

Digital inputs: +8/16/24

Digital outputs: +5/10/15

Milliampere I/O module (4 mA outputs + 1 mA input)

Arc protection module (4 sensors + 2 HSO + 1 BI)

External I/O modules (see "Accessories" tab)

Communication media (specified in the "Communication" tab)

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

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

