AQ-G257 Generator Protection Device

Description

AQ-G257 is well-suited for large machines that require complete generator protection and differential protection. You can add up to nine (9) I/O or communication modules 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-G257 communicates using various protocols, including communication according to the IEC 61850 standard.

AQ-G257 has two software options: the “A” variant (AQ-G257A) includes all the standard generator protection functions, while the “B” variant (AQ-G257B) also includes the synchronizer function. For more details on the software options, please see the order code below.

CONFIGURE AQ-GS257A IN THE PRODUCT CONFIGURATOR

CONFIGURE AQ-G257B IN THE PRODUCT CONFIGURATOR

Highlights:

- Complete synchronous machine protection
- Integrated differential protection
- Power measurement accuracy of up to 0.2 %

Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

Technical data

PROTECTION

- Non-directional overcurrent (I>; 50/51) - 4 stages
- Non-directional earth fault (IO>; 50N/51N) - 4 stages
- Directional overcurrent (Idir>; 67) - 4 stages
- Directional earth fault (IOdir>; 67N/32N) - 4 stages
- Negative sequence overcurrent/ Phase current reversal/ Current unbalance (I2>; 46/46R/46L) - 4 stages
- Harmonic overcurrent (Ih>; 50H/51H/68H) - 4 stages
- Circuit breaker failure protection (CBFP; 50BF/52BF)
- High-impedance or low-impedance restricted earth fault/ Cable end differential (IOd>; 87N)
- Overvoltage (U>; 59) - 4 stages
- Undervoltage (U<; 27) - 4 stages
- Neutral overvoltage (UO>; 59N) - 4 stages
- Low-voltage ride-through (LVRT; 27T)
- Sequence voltage (U1/U2>/<; 47/27P/59PN) - 4 stages
- Overfrequency and underfrequency (f>/<; 81O/81U) - 8 stages
- Rate-of-change of frequency (df/dt>/<; 81R) - 8 stages
- Power protection (P, Q, S>/<; 32) - 4 stages
- Generator/motor/transformer differential (Idx>; 87T/87G/87M/87N)
- 100 % stator earth fault (U03rd>; 64S)
- Underexcitation (Q<; 40)
- Underimpedance (Z<; 21U)
- Underreactance (X<; 21/40)
- Voltage-restrained overcurrent (Iv>; 51V)
- Inadvertent energizing (I>U<I.A.E.; 50/27)
- Volts-per-hertz overexcitation (V/Hz>; 24)
- Power factor protection (PF<; 55)
- Pole slip/Out-of-step protection (78)
- Machine thermal overload (TM>; 49M)
- Resistance temperature detectors (RTD)
- Programmable stage (PSx>/<; 99)
- Arc protection (IArc>/IOArc>; 50Arc/50NArc) (optional)

Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

CONTROL (AQ-G257A)

- Number of objects to control and monitor: 10
- Number of indicators to monitor: 10
- Number of setting groups: 8
- Vector jump (Δφ; 78)
- Synchrocheck (ΔV/Δa/Δf; 25)

CONTROL (AQ-G257B)

- Number of objects to control and monitor: 10
- Number of indicators to monitor: 10
- Number of setting groups: 8
- Vector jump (Δφ; 78)
- Synchrocheck (ΔV/Δa/Δf; 25)
- Synchronizer (ΔV/Δa/Δf; 25)

MONITORING

- Current transformer supervision - 2 instances
- Voltage transformer supervision (VTS; 60)
- Circuit breaker wear monitoring
- Total harmonic distortion (current)
- Total harmonic distortion (voltage)
- 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)

MEASUREMENTS

- Phase, sequence and residual currents (IL1, IL2, IL3, I01, I02)
- 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 measurement accuracy of 0.5 %
- Power and energy measurement accuracy of up to 0.2 % (optional)

Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

HARDWARE

Standard hardware

- Current inputs: 10
- Voltage inputs: 4
- Digital inputs: 3
- Digital outputs: 5
- Number of empty slots: 9

Optional hardware modules

- Digital input module (8 x DI)
- Digital output module (5 x DO)
- High-speed high-current output module (3 x out)
- Milliampere input module (4 x mA in, 1 x mA out)
- Milliampere output module (4 x mA out, 1 x mA in)
- RTD input module (8 RTD inputs)
- Arc protection module (4 x channels, 2 x HSO, 1 x BI)
- Communication media (see "Communication" below)
- External I/O modules (see "Accessories" below)

Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

COMMUNICATION

Standard communication ports

- RJ-45 100 Mbps Ethernet (front panel)
- RJ-45 100 Mbps Ethernet and RS-485 (rear panel)

Optional communication modules

- Double RJ-45 Ethernet & IRIG-B communication module
- Double ST Ethernet & IRIG-B communication module
- Double SFP Ethernet & IRIG-B communication module
- Double LC (HSR/PRP) Ethernet communication module
- Double RJ-45 (HSR/PRP) Ethernet communication module
- RS-232 & serial fiber communication module

Communication protocols

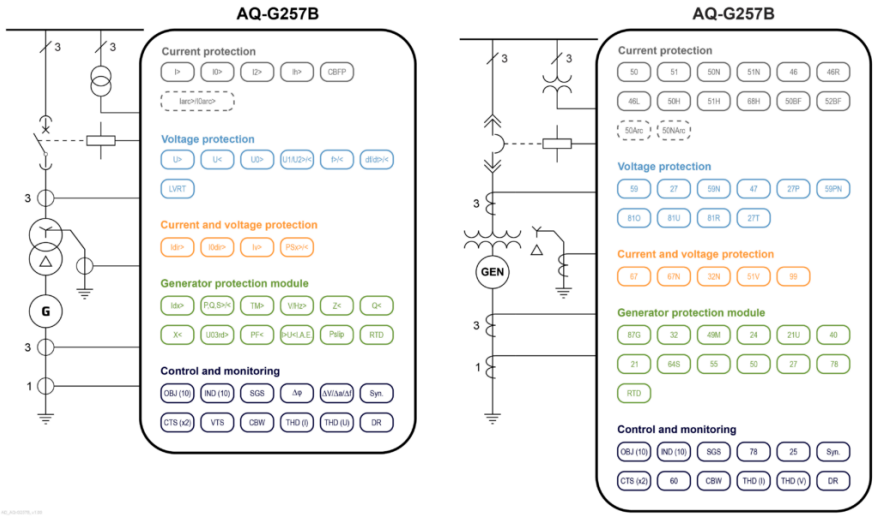
- IEC 61850 (edition 1)
- IEC 61850 (edition 2)
- IEC 60870-5-101/104
- IEC 60870-5-103
- Modbus/RTU and Modbus/TCP
- DNP3
- SPA

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
- AX020 SFP module (2 km, MM)
- AX021 SFP module (40 km, SM)
- AX022 SFP module (120 km, SM)

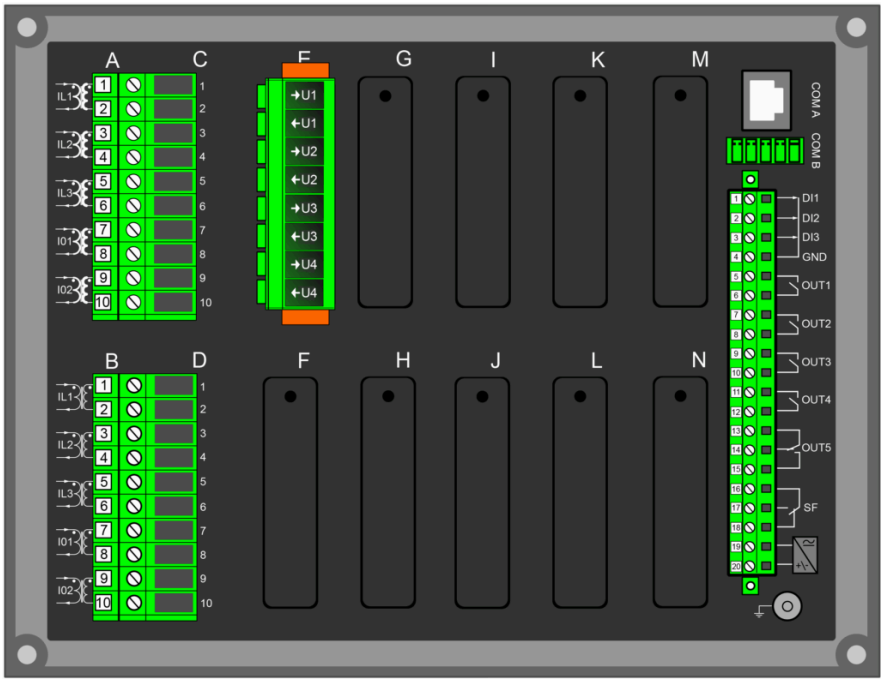
Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

Application Drawing



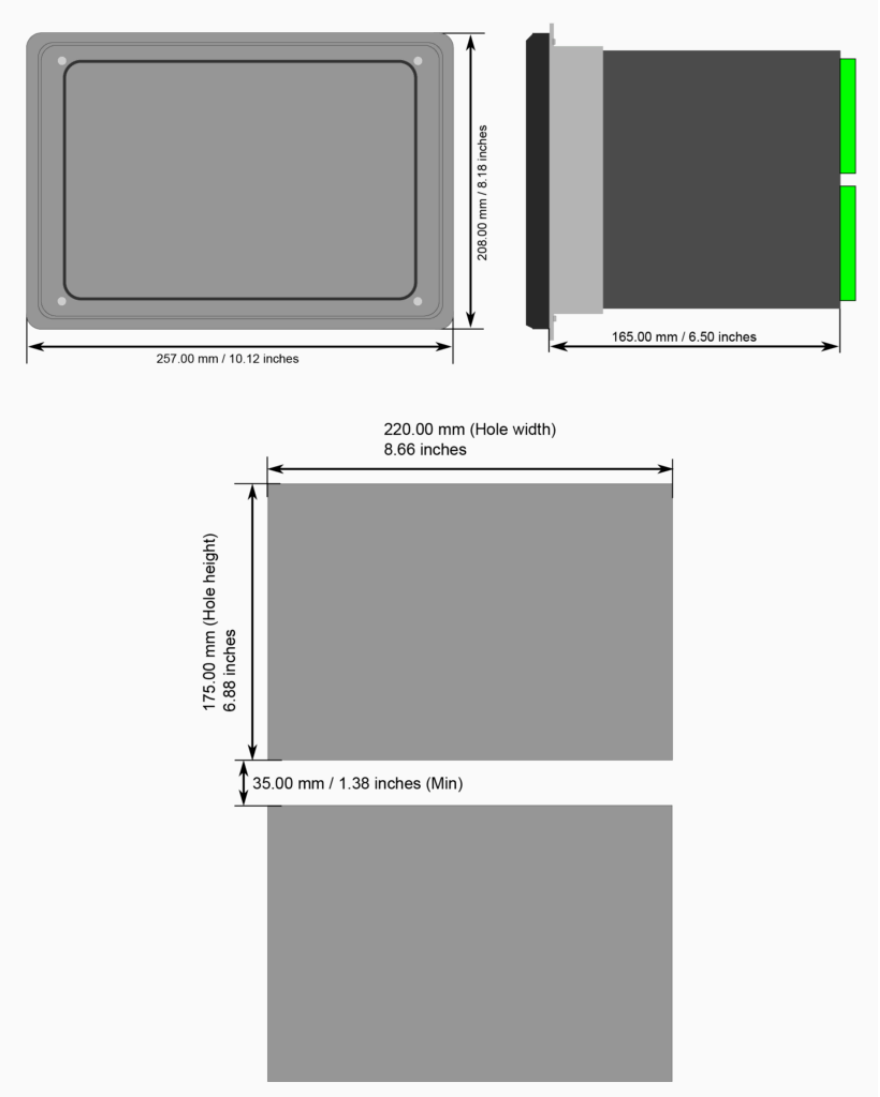
Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

Device Rear Image



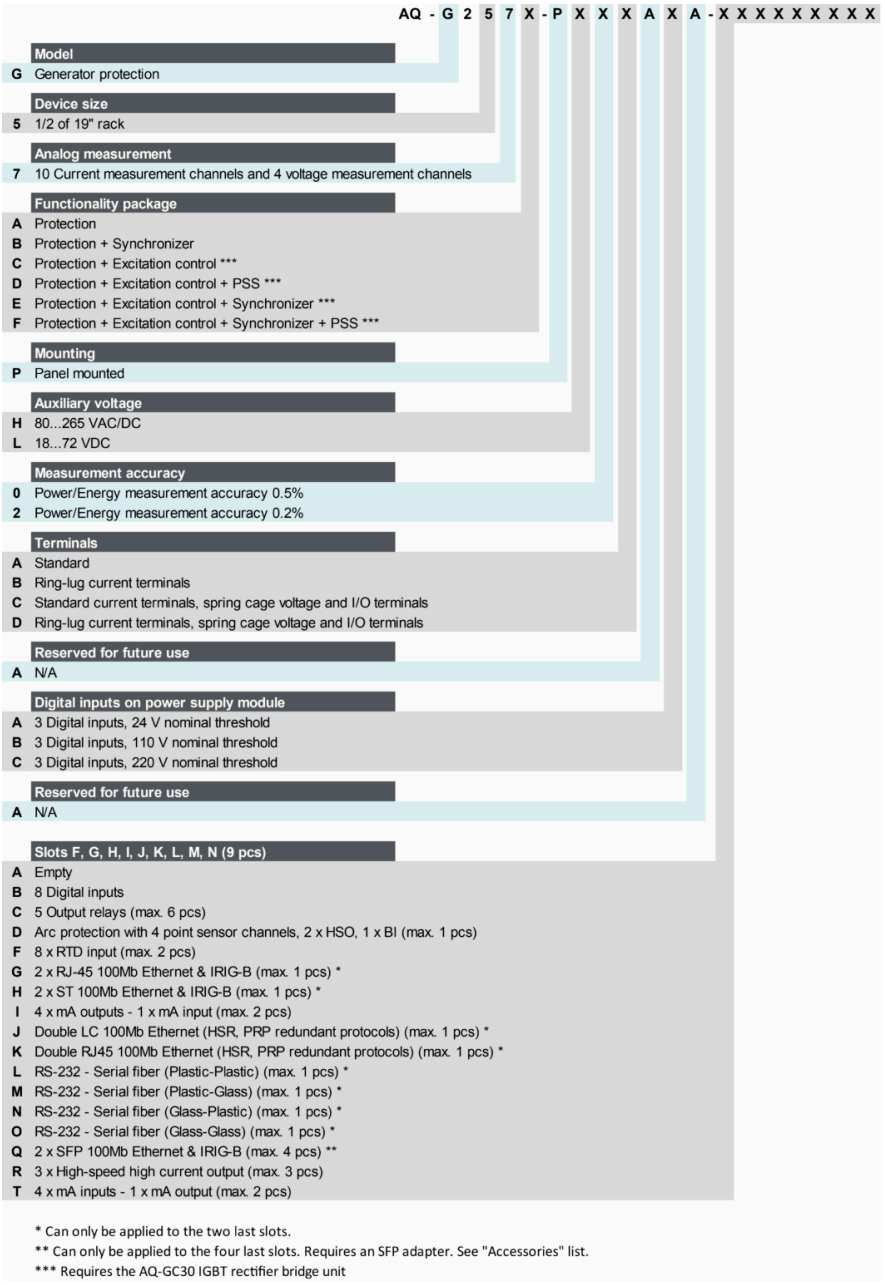
Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

Device and Cut-out Image



Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370

Order Code



Arcteq Relays Ltd
Kvartsikatu 2 A 1
65300 Vaasa, Finland
tel: +358 10 3221 370