

AQ 300 series – The high performance protection

AQ 300 relay series integrates a powerful and modern design along with decades of proven relay protection history. AQ 300 provides a long term technology solution for medium-voltage feeder protection and high-voltage line, busbar, generator and transformer protection. AQ 300 series comes with a wide range of protection functions and additional features. The scalability in number of functions and I/O makes it an excellent candidate for any high performance relaying application.

By navigating through AQ 300 series' intuitive colour touch screen HMI users feel comfortable from the very first introduction. Embedded WEB server feature enables use of common web browsers for local or remote setting and data acquisition. Easy to use Windows based engineering tools completes the familiar working experience.

The AQ 300 communicates using variety of standard protocols including IEC 61850 substation communication standard and is certified to comply with 61850-8-1.

AQ 300 - Benefits

Full product range

- Solution for any high performance feeder, transformer, generator, line or busbar protection application
- Integrated protection, control, measurement and monitoring functions

Intuitive HMI

- Easy to use multilingual Touch Screen display
- Fully coloured MIMIC display
- 16 freely configurable multi-colour LEDs with user selectable description texts

Standard or customized configurations

- Factory default configurations provide fast engineering and effective commissioning
- Configurations can be easily customized
- Powerful PLC programming included for the most demanding applications

High recording capacity

- Up to 100 disturbance records in non-volatile memory
- Up to 10 000 events in non-volatile memory

Software Tools

- Embedded WEB server for local or remote access through common web browsers
- Windows based configuration tool for user-friendly engineering

Wide range of standard serial or Ethernet based communication protocols

- Single, dual or redundant IEC 61850 with GOOSE
- IEC 101, IEC 103, IEC 104, Modbus, DNP 3.0



Distributed or centralized busbar protection

- IED intercommunication according to IEC 61850/9 (distributed)
- less than 20ms trip time

ARCTEQ

RELAYABLE POWER

			Feeder protection	Transformer protection		Machine protection	Line protection			Busbar protection
Protection functions	IEC	ANSI	AQ F350	AQ T352	AQ T393	AQ G 357	AQ L350	AQ L357	AQ L359	AQ B398
Three-phase instantaneous overcurrent protection	I >>>	50	✓	✓	✓	✓	✓	✓	✓	
Three-phase time overcurrent protection	I >, I >>	51	✓	✓	✓	✓	✓	✓	✓	
Residual instantaneous overcurrent protection	I0 >>>	50N	✓	✓	✓	✓	✓	✓	✓	
Residual time overcurrent protection	I0 >, I0 >>	51N	✓	✓	✓	✓	✓	✓	✓	
Directional three-phase overcurrent protection	I Dir >, I Dir >>	67	✓			✓	✓	✓	✓	
Directional residual overcurrent protection	I0 Dir >, I0 Dir >>	67N	✓			✓	✓	✓	✓	
Line differential	3I _d L >	87L					✓		✓	
5-zone distance protection	Z <	21						✓	✓	
Teleprotection		85						✓	✓	
Out-of step	ΔZ/Δt	78						✓	✓	
Power swing block	ΔZ/Δt	68						✓	✓	
Inrush detection and blocking	I _{2h} >	68	✓	✓	✓	✓	✓	✓	✓	
Current unbalance protection	I _{ub} >	46	✓	✓	✓	✓	✓	✓	✓	
Thermal protection	T >	49	✓	✓	✓	✓	✓	✓	✓	
Transformer differential	3I _d T >	87T		✓ (2 winding)	✓ (3 winding)					
Generator differential	3I _d T >	87G				✓				
Restricted earth fault	REF	87N		✓	✓					
Definite time overvoltage protection	U >, U >>	59	✓	option	option	✓	✓	✓	✓	
Definite time undervoltage protection	U <, U <<	27	✓	option	option	✓	✓	✓	✓	
Residual voltage protection	U0 >, U0 >>	59N	✓	option	option	✓	✓	✓	✓	
Overfrequency protection	f >, f >>	81O	✓	option	option	✓	✓	✓	✓	
Underfrequency protection	f <, f <<	81U	✓	option	option	✓	✓	✓	✓	
Rate of change of frequency protection	df/dt	81R	✓	option	option	✓	✓	✓	✓	
Overexcitation	V/Hz	24		option	option	✓				
Loss of field	X <	40				✓				
Reverse/under/overpower protection	P	32				✓				
Synchrocheck	SYNC	25	✓			✓	✓	✓	✓	
Auto-reclose	0 -> 1	79	✓				✓	✓	✓	
Fuse failure	VTS	60	✓	option	option	✓	✓	✓	✓	
Switch onto fault logic	SOTF		✓				✓	✓	✓	
Breaker failure protection	CBFP	50BF	✓	✓	✓	✓	✓	✓	✓	✓
Busbar protection main unit	3I _d B >	87B								✓
Distributed busbar protection sub-unit feature	3I _d B >	87B	option	option	option	option	option	option	option	
Current (I1, I2, I3, Io)			✓	✓	✓	✓	✓	✓	✓	✓
Voltage (U1, U2, U3, U12, U23, U31, Uo) and frequency			✓	option	option	✓	✓	✓	✓	✓
Power (P, Q, S, pf) and Energy (E+, E-, Eq+, Eq-)			✓	option	option	✓	✓	✓	✓	✓
Circuit breaker wear			✓	✓	✓	✓	✓	✓	✓	✓
Supervised trip contacts (TCS)			4	4	4	4	4	4	4	8
Controllable objects			6	6	6	6	6	6	6	
Status indications			2	2	2	2	2	2	2	
Automatic voltage regulator (AVR) / tap change control				option	option					
Current inputs			4	8	12	8	4	4	4	Max 24
Voltage inputs			4	4 (optionally)	4	4	4	4	4	Max 8
Digital inputs			12 (24/36)	12 (24/36)	12 (24...168)	12 (16/36)	12 (24/36)	12 (24/36)	12 (24/36)	32
Digital outputs			8 (16/24)	8 (16/24)	8 (16...112)	8 (16/24)	8 (16/24)	8 (16/24)	8 (16/24)	16
Fast trip outputs			4	4	4	4	4	4	4	8
Non-volatile disturbance records			100	100	100	100	100	100	100	100
Non-volatile event records			10000	10000	10000	1000	10000	10000	10000	10000
Ethernet over board (front port)			✓	✓	✓	✓	✓	✓	✓	✓
IEC 61850			option	option	option	option	option	option	option	option
IEC 60870-5-101, 103, 104			✓	✓	✓	✓	✓	✓	✓	✓
Modbus RTU and Modbus TCP/IP			✓	✓	✓	✓	✓	✓	✓	✓
DNP 3.0 and DNP 3.0 over TCP/IP			✓	✓	✓	✓	✓	✓	✓	✓