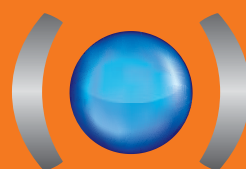




LABEL

The essentials



BERNARD[®]
CONTROLS

//////////////////// Invest in Confidence //////////////////////



Weatherproof
Quarter-turn Actuators
AQ RANGE



.....
LABEL

The essentials

Be it for common flow control in a thermal power plant, in a water treatment plant, for ventilation systems or for any other kind of industrial applications, you need a compact, simple and reliable electric actuation solution. As the end user of our product, you want to be sure that these standard applications will be handled easily and properly. The fact that your need is standard does not mean that it is not specific. You are looking for a solution that perfectly fits to your requirements.

You are looking for The Essentials.

In case of **moderate environmental and operational constraints**, BERNARD CONTROLS has created the **FIRST BC label** to identify **products and solutions which offer to users The Essentials**: the key functions to **operate your valve safely and efficiently in case of standard applications**.

In 2017, the FIRST BC label turns over a new leaf with the launch of new product ranges with a brand new design - compact and optimized for their use. The quarter-turn applications can now be addressed with the AQ range. Learn more about these new products and how these can meet your requirements in the next pages.

Contents

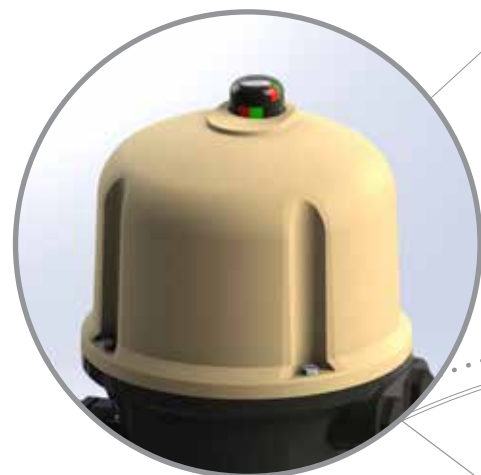
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AQ range overview

Weatherproof Quarter-turn Actuators

- **Adaptation to all quarter-turn valves**
 - > 15 - 500 N.m (direct)
- **Type of Controls:**
 - > Electromechanical SWITCH
 - > Integrated control: new LOGIC (v2)
- **BC Duty & Modulating Classification:**
 - > On-Off: Class A
 - > Inching/Positioning: Class B
 - > Modulating: Class III (except AQL)
- **Environment:**
 - > IP68 / NEMA4X
 - > Corrosive environment: C3
 - > T: -20°C ... +60°C



> SWITCH models



AQ1L to AQ7L



AQ5 to AQ50

> LOGIC models



AQ5 to AQ50

Main features

COMPACT & OPTIMIZED DESIGN

- > Product architecture & torque range adapted to customers' requirements
- > Multi-voltage & multi-frequency products (A01L to A07L): suitable whatever your location on the globe
- > Optimized logistics: short delivery time.

RELIABLE DESIGN

- > BERNARD CONTROLS design methodology built-up on the nuclear market highly demanding requirements
- > 75+ years of continuous experience: BC inventor of the first compact quarter-turn electric actuator
- > 100% of products tested with automatic process before delivery

INTEGRATED CONTROLS

LOGIC VERSION:

- > Turn-key, time & cost-saving solution
- > Non-intrusive setting for enhanced safety and reliability
- > New LOGIC (v2), compatible with common fieldbus protocols
- > Bluetooth communication (as standard)

ELECTRONIC OPTIONS (Local command & Local command + Positioner) available on SWITCH version

EASY TO USE

- > **Easy commissioning:** pre-wired products (1-phase only), set up of travel limitation system with a simple screwdriver...
- > **LCD Display** for user-friendly commissioning and local command on LOGIC version
- > BERNARD CONTROLS new mobile application for commissioning, troubleshooting, documentation...
- > **Declutch-free manual override:** essential for quick intervention on site

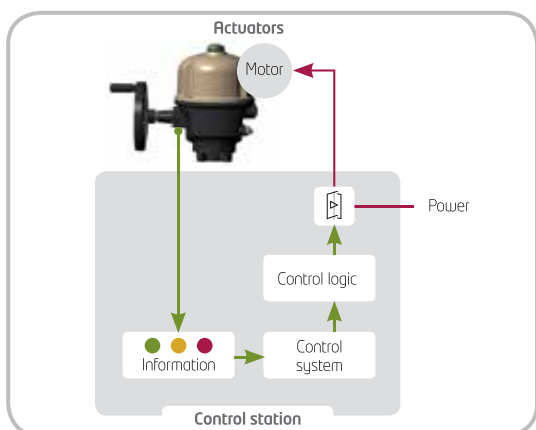


Choose your control ...

... according to your need

➤ Electromechanical SWITCH

In this configuration, the control unit is designed by the customer and located in a remote cabinet. All information sent by the actuator sensors (travel limit, torque limit, thermal overload, position feedback, ...) have to be processed by user's control logic. Power reversing starters are also housed in the remote cabinet.



As far as travel limitation adjustment is concerned, **BERNARD CONTROLS new camblock system** allows to quickly set the cams' positions with a standard flat head screwdriver. Each single cam can be set independently from the others. The cams are automatically locked in their respective positions, once adjusted, and unaffected by vibrations.



BERNARD CONTROLS camblock system

SWITCH models are also available with electronic control options:

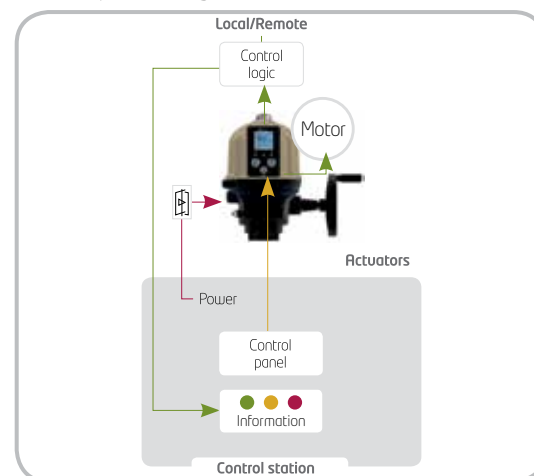
- a Positionner option on AQL models for Positioning (Class B) operations
- a local command option on AQ5 to AQ50, available for On-Off (Class A), Positioning (Class B) and Modulating (Class III).



➤ Integrated LOGIC

The AQ range is also available with integrated control for improved user-friendliness and extended control features:

- Turn-key time & cost-saving solution design by an electric actuator specialist
- Non-intrusive settings and local command (quick controls & adjustment on site)
- Information for maintenance
- Bus compatible
- Compact design



The AQ range is equipped with a brand new version of BERNARD CONTROLS LOGIC control (specifications on p.10), which can be used for On-Off, Positioning, but also Modulating applications.

➤ Focus on new LOGIC control by BERNARD CONTROLS



Local LDC Display for intuitive and non-intrusive settings

Position signaling by 2 leds (green/red: configurable LED)

User-friendly local commands through 2 buttons + 1 padlockable selector

Bluetooth as standard

New mobile application BC App
"Set up your actuator and more in a few clicks!,"

- > support: documentation, troubleshooting
- > feedbacks: position, alarms, ...
- > commands

FIRST BC



Product specifications

➤ AQ1L to AQ7L

GENERAL	Description	AQL actuators include a multi-voltage board to supply a 24VDC motor, compact gear case, emergency manual output and standard output with a square
	Torque range	15N.m to 70N.m
	Duty Classification	Adapted to process requirements: <ul style="list-style-type: none"> On-Off : Class A actuators complying with EN15714-2 Inching/Positioning: Class B actuators complying with EN15714-2
ENCLOSURE - PROTECTION	Casing	<ul style="list-style-type: none"> Aluminium die casting Cover fastened by captive and stainless steel screws
	External Protection	<ul style="list-style-type: none"> Type : powder painting as standard (RAL1014). Other colors on request. Protection: C3 according to ISO 12944
	Weatherproof	<ul style="list-style-type: none"> IP68 (2m/24h) / NEMA 4X as standard
	Ambient temperature range	-20 ... +60°C / -4 ... +140°F
MOTOR	Motor technology	DC motors with 2-wire connection
	Motor duty rating	On/Off operation (complying with EN15714-2 Class A) and Inching/Positioning (complying with EN15714-2 Class B): S4-30% motor duty rating. Up to 120 starts per hour at peak of operation.
MECHANICAL SPECIFICATIONS	Gear design	Actuator is mechanically self-locking and lubricated for product lifetime
	Manual emergency operation	Manual emergency operation via manual output square 10mm
	Output flange	Actuator flanges comply with ISO 5211
	Lubrication	The actuators are lubricated for the product lifetime and do not require any special service
ELECTRICAL SPECIFICATIONS	Power supply	The actuators can operate on a wide variety of single phase power supply from 85VAC to 260VAC. A 24VDC power supply is also possible with same power board. AQL actuators include both power supply on different terminals
	Terminal compartment	Screw-type terminals for controls and power supply. Internal earth grounding post
	Conduit entries	2 x M20 as standard
POSITION SENSORS	Travel limit systems	<ul style="list-style-type: none"> Limit switches actuated by adjustable camblock. 2 SPDT switches as standard (Open and Close) + 2 auxiliary switches (for signaling); 250VAC-5A/ 48VDC-2.5A (resistive load)
CONTROLS	Control	Pre-wired version as standard Positioner Option available
	Visual position indication	Mechanical position indicator (as standard)
	Inching/Positioning control (option)	Positioner available as an option: Input (setpoint) and output (feedback) signals are fully isolated from each other <ul style="list-style-type: none"> Input signal: 4-20 mA - output signal : 4-20mA (4=closed; 20=open)

CONTROLS	Position Transmitter (option)	<ul style="list-style-type: none"> • 2 wires for 4-20mA
SETTINGS	Application for mobile device	<p>BERNARD CONTROLS new mobile application is available as standard. BERNARD CONTROLS mobile interface allows the user to:</p> <ul style="list-style-type: none"> • do an easy and quick commissioning on valve • access to the documentation relative to the selected actuator (enter the Serial number) or scan the QR code on the nameplate of the actuator • do the curative maintenance with a simple and efficient troubleshooting • access to BERNARD CONTROLS contact information according to the area concerned
COMFORMITY TO EC DIRECTIVES	Compliance with EC Directives	<p>AQL actuators comply with:</p> <ul style="list-style-type: none"> • directive 2004/108/EC Electromagnetic compatibility • directive 2006/95/EC Low voltage • the following harmonised standards: EN 61000-6-4: Generic emissions standard for industrial environments; EN 61000-6-2: Generic immunity standard for industrial environments; EN 60034-1: Rotating electrical machines; EN 60529: Degrees of protection provided by enclosures (IP ratings code)





Product specifications

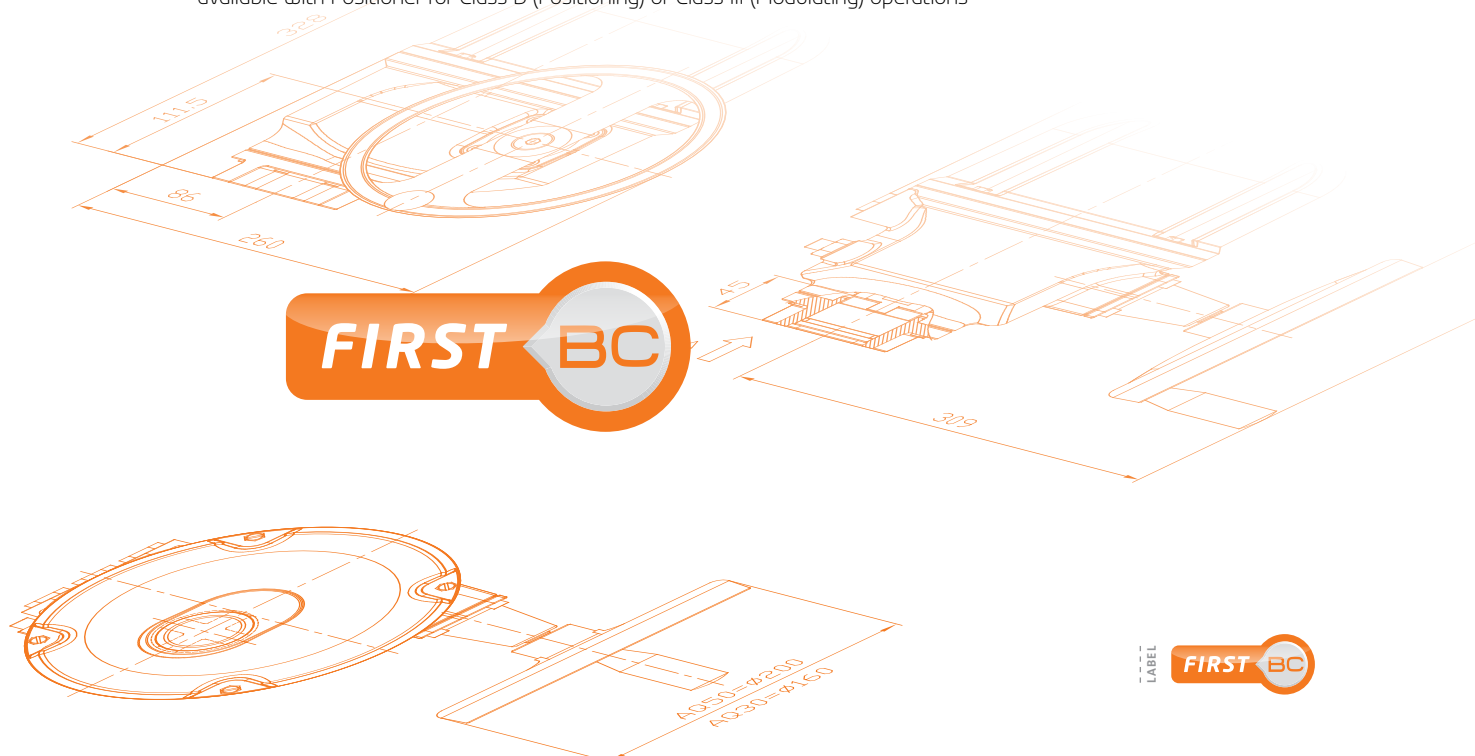
> AQ5 to AQ50

		SWITCH	LOGIC
GENERAL	Description	All AQ actuators include motor with thermal protection, gear case, emergency handwheel, travel limit switches, torque switches (for torque >150Nm) and output drive with removable socket.	All AQ actuators include motor with thermal protection, gear case, emergency handwheel, position sensor, torque sensor (for torque >150Nm) and output drive with removable socket.
	Torque range	• 50 to 500 N.m	• 50 to 500 N.m
	Duty Classification	Adapted to process requirements: • On-Off : Class A actuators complying with EN15714-2 • Inching/Positioning: Class B actuators complying with EN15714-2 LOCAL COMMAND OPTION*: • On-Off : Class A actuators complying with EN15714-2 • Inching/Positioning: Class B actuators complying with EN15714-2 • Modulating: Class III actuators with higher duty performance and specification of additional performance criteria compared to EN15714-2 Class C basic design requirements	Adapted to process requirements: • On-Off : Class A actuators complying with EN15714-2 • Inching/Positioning: Class B actuators complying with EN15714-2 • Modulating: Class III actuators with higher duty performance and specification of additional performance criteria compared to EN15714-2 Class C basic design requirements
ENCLOSURE - PROTECTION	Casing	• Aluminium die casting • Cover fastened by captive and stainless screws	• Aluminium die casting • Cover fastened by captive and stainless screws
	External Protection	• Type : powder painting as standard (RAL1014). Other colors on request. Protection: C3 according to ISO 12944	• Type : powder painting as standard (RAL1014). Other colors on request. Protection: C3 according to ISO 12944
	Weatherproofness	• IP68 (2m/24h) / NEMA 4X as standard	• IP68 (2m/24h) / NEMA 4X as standard
	Ambient temperature range	-20...+60°C / -4 ... +140°F	-20...+60°C / -4 ... +140°F
MOTOR	Motor technology	• 3-phase or single-phase asynchronous motor, class F insulation with integral thermal overload protection. • DC motors with 2-wire connection available for some references	• 3-phase or single-phase asynchronous motor, class F insulation with integral thermal overload protection • DC motors with 2-wire connection available for some references
	Motor duty rating	• On/Off operation (complying with EN15714-2 Class A) and Inching/ Positioning (complying with EN15714-2 Class B): S4-30% motor duty rating. Up to 360 starts per hour at peak of operation LOCAL COMMAND OPTION*: • On/Off operation (complying with EN15714-2 Class A) and Inching/ Positioning (complying with EN15714-2 Class B): S4-30% motor duty rating. Up to 360 starts per hour at peak of operation • BC Modulating Class III (complying with EN15714- 2 Class C) : S4-50% motor duty rating. Up to 1 200 starts per hour at peak of operation.	• On/Off operation (complying with EN15714-2 Class A) and Inching/ Positioning (complying with EN15714-2 Class B): S4-30% motor duty rating. Up to 360 starts per hour at peak of operation • BC Modulating Class III (complying with EN15714- 2 Class C) : S4-50% motor duty rating. Up to 1 200 starts per hour at peak of operation.

* available with Positioner for Class B (Positioning) or Class III (Modulating) operations

		SWITCH	LOGIC
MECHANICAL SPECIFICATIONS	Gear design	Actuator is mechanically self-locking and lubricated for product lifetime	Actuator is mechanically self-locking and lubricated for product lifetime
	Manual emergency operation	Manual override handwheel Automatic declutch	Manual override handwheel Automatic declutch
	Output flange	Actuator flanges comply with ISO 5211	Actuator flanges comply with ISO 5211
	Lubrication	The actuators are lubricated for the product lifetime and do not require any special service.	The actuators are lubricated for the product lifetime and do not require any special service.
ELECTRICAL SPECIFICATIONS	Power supply	The actuators can operate on a wide variety of power supplies: • 3-phase , single-phase or DC • 50 or 60 Hz ...	The actuators can operate on a wide variety of power supplies: • 3-phase , single-phase or DC • 50 or 60 Hz ...
	Terminal compartment	Screw-type terminals for controls and power supply. Internal earth grounding post	Screw-type terminals for controls and power supply. Internal earth grounding post
	Fuse protection	LOCAL COMMAND OPTION*: Primary: 0,5A-500V Secondary: Two resettable fuses	Primary: 0,5A-500V Secondary: Two resettable fuses
	Conduit entries	2 x M20 as standard (or 2 x 3/4") LOCAL COMMAND OPTION*: 3 x M20 as standard (3 x 3/4")	3 x M20 as standard (3 x 3/4")
POSITION & TORQUE SENSORS	Travel limit systems	<ul style="list-style-type: none"> • Limit switches actuated by adjustable camblock. • 2 SPDT switches as standard (Open and Close) + 2 auxiliary switches (for signaling) 	<ul style="list-style-type: none"> • Position: reading on the output shaft • Position sensor : Absolute encoder (Hall effect sensor)
	Torque limiting system	<ul style="list-style-type: none"> • Torque limitation available from AQ25 • The torque limiting system is calibrated at the factory • 2 contacts as standard (1 in opening and 1 in closing); SPDT ; 250VAC-5Amax (resistive load) • Adjustable torque from 40 to 100% of max torque (intrusive setting) 	<ul style="list-style-type: none"> • Torque limitation available from AQ25 • Torque: Absolute encoder sensor (Hall effect sensor) • The torque limiting system is calibrated in factory. It remains adjustable via LOGIC (non intrusive setting) • Non intrusive setting : Adjustable torque from 40 to 100% of max torque

* available with Positioner for Class B (Positioning) or Class III (Modulating) operations



		SWITCH	LOGIC
CONTROLS	Remote Command	LOCAL COMMAND OPTION*: <ul style="list-style-type: none"> • Maintained command only • Command by dry contacts • Command by voltage from 10 to 60 VDC • Isolated by opto-couplers 	<ul style="list-style-type: none"> • Maintained or pulse command (minimum pulse duration: 100ms) • Command by dry contacts • Command by voltage from 10 to 250 VDC • Isolated by opto-couplers
	Visual position indication	<ul style="list-style-type: none"> • Mechanical position indicator 	<ul style="list-style-type: none"> • Mechanical position indicator
	Local command description	LOCAL COMMAND OPTION*: <ul style="list-style-type: none"> • 4 buttons (pulse command) • Green/Red LED for CLOSED/OPEN • 1 LED for power supply • 1 LED for alarm 	<ul style="list-style-type: none"> • 2 buttons + 1 padlockable selector • A white LCD screen to display the position, the torque and alarms. • Green/Red: Configurable LED for CLOSED/ OPEN
	Power circuit	LOCAL COMMAND OPTION*: Motor reversing starters (Solidstate controls)	Motor reversing starters (Solidstate controls)
	Signaling continuity	-	With external 24VDC supply
	Signaling	LOCAL COMMAND OPTION*: 2 SPDT switches Switch 1: Valve open Switch 2: Valve closed - Minimum current 10mA at 5V. 250VAC-5A/ 48VDC-2.5A (resistive load)	3 latching relays Relay 1: Valve open Relay 2: Valve closed Relay 3: Configurable relay - Contact configuration: normally open or normally closed - Minimum current 10mA at 5V - Maximum current 5A at 250V or 5A at 30VDC (resistive load) Additional 4 relays board as an option.
	Fault relay	LOCAL COMMAND OPTION*: <ul style="list-style-type: none"> • SPDT monostable relay, in fault position when not supplied. • Minimum current 10mA at 5V • Maximum current 5A at 250VAC or 5A at 30VDC (resistive load) 	<ul style="list-style-type: none"> • SPDT monostable relay, in fault position when not supplied. • Minimum current 10mA at 5V • Maximum current 5A at 250VAC or 5A at 30VDC (resistive load)
	Inching/Positioning & Modulating control (option)	LOCAL COMMAND OPTION*: Signal configurations (with integrated analogue output): <ul style="list-style-type: none"> • Standard input signal: 4-20 mA - output signal: 4-20mA Analogue Input: <ul style="list-style-type: none"> - in current: impedance of 260 Ohms Analogue Output: <ul style="list-style-type: none"> - In current: maximum acceptable load of 600 Ohms (24VDC), must be supplied (12 to 32V) 2 wire 	LOGIC Positioner : Signal configurations (with integrated analogue output): <ul style="list-style-type: none"> • Standard input signal: 4-20 mA - output signal: 4-20mA • Input signal: 0-20 mA - output signal: 0-20 mA • Input signal: 0-10 V - output signal: 0-20 mA Analogue Input: <ul style="list-style-type: none"> - in current: impedance of 260 Ohms - In voltage: impedance of 10 kOhms Analogue Output: <ul style="list-style-type: none"> - In current: maximum acceptable load of 600 Ohms (24VDC), must be supplied (12 to 32VDC) 2-wire or 3-wire connection
	Position Transmitter (option)	2 wires for 4-20mA <ul style="list-style-type: none"> • POT 1000Ω 	In current: maximum acceptable load of 600 Ohms (24VDC), must be supplied (12 to 32VDC) 2-wire or 3-wire connection

* available with Positioner for Class B (Positioning) or Class III (Modulating) operations

		SWITCH	LOGIC
SETTINGS	Settings	-	<p>Non-Intrusive settings</p> <p>All actuator settings and parameters are stored in a non-volatile EEPROM memory. Protection by password.</p> <p>Configurable via Local control; Bluetooth available as standard (to keep an high level of security, Bluetooth range is limited to 10m).</p>
	Local settings	Easy and quick setting with a standard tool on the camblock	<p>The LOGIC can be fully set via its local display and selectors</p> <p>Does not require any specific setting tool</p> <p>The access to the local control is padlockable</p>
	Application for mobile device	<p>BERNARD CONTROLS new mobile application is available as standard. BERNARD CONTROLS mobile interface allows the user to:</p> <ul style="list-style-type: none"> • assistance to commissioning on valve • access to the documentation relative to the selected actuator (enter the Serial number) or scan the QR code on the nameplate of the actuator • assistance to curative maintenance with a simple and efficient troubleshooting • access to BERNARD CONTROLS contact information according to the area concerned 	<p>New BERNARD CONTROLS mobile application is available as standard, with its bluetooth secured communication interface, and allows the user to:</p> <ul style="list-style-type: none"> • assistance to commissioning on valve • simply set every parameters of the actuator (non-intrusive setting) • command the actuator (open/close/stop) as a local controls • check at a glance an overview of the feedbacks information which are displayed on a large color screen of the mobile • assistance to curative maintenance with a simple and efficient troubleshooting • access to BERNARD CONTROLS contact information according to the area concerned • access to the documentation relative to the selected and scanned actuator

		SWITCH	LOGIC
COMFORMITY TO EC DIRECTIVES	Compliance with EC Directives	<p>AQ actuators comply with:</p> <ul style="list-style-type: none"> • directive 2004/108/EC Electromagnetic compatibility • directive 2006/95/EC Low voltage • the following harmonised standards: EN 61000-6-4: Generic emissions standard for industrial environments; EN 61000-6-2: Generic immunity standard for industrial environments; EN 60034-1: Rotating electrical machines; EN 60529: Degrees of protection provided by enclosures (IP ratings code) 	<p>AQ actuators comply with:</p> <ul style="list-style-type: none"> • directive 2004/108/EC Electromagnetic compatibility • directive 2006/95/EC Low voltage • the following harmonised standards: EN 61000-6-4: Generic emissions standard for industrial environments; EN 61000-6-2: Generic immunity standard for industrial environments; EN 60034-1: Rotating electrical machines; EN 60529: Degrees of protection provided by enclosures (IP ratings code)
FIELD BUS	Available Fieldbus protocols (option)	-	<ul style="list-style-type: none"> • PROFIBUS-DPV1 • MODBUS RTU • DEVICENET



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