



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

New

Weatherproof
Quarter-turn Actuators
AQ RANGE

> AQ range

The essentials

for quarter-turn electric actuation



AQ5 - AQ10 - AQ15 - AQ25 - AQ30 - AQ50 - AQ80 - AQ100
AQ150 - AQ280 - AQ430 - AQ610 - AQ830 - AQ1000
SWITCH version



AQ5 - AQ10 - AQ15 - AQ25 - AQ30 - AQ50 - AQ80 - AQ100
AQ150 - AQ280 - AQ430 - AQ610 - AQ830 - AQ1000
LOGIC version

Product overview



Product benefits

- **Compact & optimized design**
 - > Super compact design (including integrated controls)
 - > Product architecture & torque range adapted to customers' requirements: 14 models from 50 to 10000 Nm
 - > Multi-voltage (AC/DC) : suitable whatever your location on the globe
 - > Optimized logistics: short delivery time
- **Easy to use**
 - > Easy commissioning: pre-wired version (1-phase only), set up of travel limitation system with a standard screwdriver...
 - > Large LCD display on LOGIC version for user-friendly commissioning and local command. Easily orientable (4-way direction) in few clicks
 - > Declutch-free manual override: essential for quick intervention on site
 - > BC APP: Bernard Controls new mobile application for setting, operating, troubleshooting and easy access to documentation
- **Reliable design**
 - > BERNARD CONTROLS design methodology built-up on the nuclear market highly demanding requirements
 - > 80+ years of continuous experience and BC inventor of the compact quarter-turn electric actuator
 - > Heavy duty design: full aluminium enclosure protected by durable powder coating, IP68, low temperature option
 - > 100% of delivered products are tested with automatic process before delivery
 - > S4 Motor Service Duty on all models
 - > Suitable for modulating applications (BC Class III complying with EN15714-2 Class C)
- **The main functions of SMART control with the new LOGIC control (v2)**
 - > Turn-key, time & cost-saving solution
 - > User-friendly & intuitive
 - > Non-intrusive setting for enhanced safety and reliability
 - > Compatible with common fieldbus protocols: Modbus RTU, Profibus DPV1.
 - > Bluetooth communication (as standard) to communicate with Bernard Controls' BC App

> AQ RANGE

Weatherproof Quarter-turn Actuators



The essentials



AQ SWITCH

AQ5-AQ10-AQ15-AQ25-AQ30-AQ50 - AQ80
AQ100 - AQ150-AQ280-AQ430-AQ610-
AQ830-AQ1000

- 1x115/220/230V AC 50/60Hz
- 3x380-415V AC 50Hz
- 3x440-480V AC 60Hz
- 24V DC (up to AQ80)

On-Off Class A as standard

> OPTIONS

- + Low temp. -40°
- + Position potentiometer (1000 Ω)
 - > Class B (POT)
- + Analog Transmitter (output signal)
 - > Class B (TAM)
- + Analog Positioner (input + output signals) (1-phase only)
 - > Class B and Class III
- + Stainless steel name plate
- + Varistor



AQ LOGIC

AQ5-AQ10-AQ15-AQ25-AQ30-AQ50-AQ80-AQ100
AQ150-AQ280-AQ430-AQ610-AQ830-AQ1000

- 1x115/220/230V AC 50/60Hz
- 3x380-415V AC 50Hz
- 3x440-480V AC 60Hz
- 24V DC (up to AQ80)

On-Off Class A as standard

> OPTIONS

- + Low temp. -40°
- + Class B (Analog Positioner (input + output signals)
- + Class III (Analog Positioner (input + output signals)
- + 4 additional signaling relays
- + Profibus DPV1
- + Modbus RTU
- + Stainless steel name plate
- + Varistor



Contents

Product specifications - AQ SWITCH	3
Product specifications AQ LOGIC	5
Product selection	9

AQ SWITCH

PRODUCT SPECIFICATIONS

GENERAL	Description	All AQ actuators include motor with thermal protection, gear case, emergency handwheel, travel limit switches, torque switches (for torque >150Nm), output drive with removable socket and anti-condensation heater.
	Torque range	Direct: 50 to 1000 N.m Up to 10 000 N.m with Gearbox
	Duty Classification	Adapted to process requirements: • On-Off: Class A actuators complying with EN15714-2 • Inching/Positioning: Class B actuators complying with EN15714-2
ENCLOSURE - PROTECTION	Casing	• Aluminium die casting • Cover fastened by captive and stainless screws
	External Protection	• Type: Epoxy powder coating as standard • Protection: C4 according to ISO 12944 • For colors and finishes, please consult us
	Weatherproofness	IP68 NEMA 4X as standard <i>Relative humidity: 0 to 95%.</i>
	Ambient temperature range	• -20...+70°C / -4 ... +158°F • -40°C (-40°F) as an option Other temperatures, please consult us
	Vibration resistance	1g (9.8 m/s ²) at 10-200 Hz. (Contact our sales teams for higher vibration levels)
MOTOR	Motor technology	• 3-phase or single-phase asynchronous motor, Class F insulation with integral thermal overload protection. • DC motors
	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. S4-50% as an option. • 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. (Voltage ±10%, frequency ±2%)
MECHANICAL SPECIFICATIONS	Gear design	Actuator is mechanically self-locking
	Manual emergency operation	Manual override handwheel Automatic declutch
	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 power supplies: • 3-phase, single-phase or DC (<i>except AQ150 to AQ1000</i>) • 50 or 60 Hz ...
	Prewired (option)	Prewired available as an option for AQ5 to AQ80 : single- phase 230V 50/60Hz, single-phase 115-120V 50/60Hz and DC.
	Terminal compartment	Screw-type terminals for controls and power supply. Internal earth grounding post.
	Conduit entries	2 x M20 as standard (or 2 x 3/4")
POSITION & TORQUE SENSORS	Travel limit systems	• Limit switches actuated by adjustable camblock • 2 SPDT switches as standard (Open and Close) + 2 auxiliary switches (for signaling)
	Torque limiting system	• Torque limitation available from AQ25 • The torque limiting system is calibrated at the factory • 2 switches 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)
	Analog Transmitter (option)	ANALOG TRANSMITTER OPTION: • 2 wires for 4-20mA Analog Transmitter • POT 1000Ω

AQ SWITCH

PRODUCT SPECIFICATIONS

CONTROLS	Visual position indication	Mechanical position indicator
	Inching/Positioning control	ANALOG POSITIONER OPTION: (1-phase only) <ul style="list-style-type: none"> Input (setpoint) and output (feedback) signals are fully isolated from each other Input signal: 4-20 mA - output signal: 4-20mA (4=closed; 20=open)
SETTINGS	Actuator on valve settings	Easy and quick setting of position and torque comblocks with a standard screwdriver
	Application for mobile device	BERNARD CONTROLS new mobile application is available as standard. BERNARD CONTROLS mobile interface allows the user to: <ul style="list-style-type: none"> Access to the documentation relative to the selected actuator (enter the Serial number) or scan the QR code on the nameplate of the actuator Access to BERNARD CONTROLS contact information according to the area concerned
CONFORMITY TO EC DIRECTIVES	Compliance with EC Directives	AQ actuators comply with: <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)

2/2



AQ LOGIC

PRODUCT SPECIFICATIONS

GENERAL	Description	<p>All AQ actuators include motor with thermal protection, gear case, emergency handwheel, position sensor, torque sensor (for torque > 150 Nm), output drive with removable socket and anti-condensation heater.</p> <p>AQ LOGIC models also include:</p> <ul style="list-style-type: none"> integrated controls built-in motor reversing starters local commands with large LCD display
	Torque range	<p>Direct: 50 to 1000 N.m</p> <p>Up to 10 000 N.m with Gearbox</p>
	Duty Classification	<p>Adapted to process requirements:</p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Aluminium die casting Cover fastened by captive and stainless screws
	External Protection	<ul style="list-style-type: none"> Type: Epoxy powder coating as standard Protection: C4 according to ISO 12944 For colors and finishes, please consult us
	Weatherproofness	<p>IP68</p> <p>NEMA 4X as standard</p> <p>Hygrométrie: 0 to 95%.</p>
	Ambient temperature range	<ul style="list-style-type: none"> -20...+70°C / -4 ... +158°F -40°C (-40°F) as an option <p>Other temperatures, please consult us</p>
	Vibration resistance	<p>1g (9.8 m/s²) at 10-200 Hz.</p> <p>Contact our sales teams for higher vibration levels</p>
MOTOR	Motor technology	<ul style="list-style-type: none"> 3-phase or single-phase asynchronous motor, Class F insulation with integral thermal overload protection DC motors
	Motor duty rating	<ul style="list-style-type: none"> 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. S4-50% as an option. 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. (Voltage ±10%, frequency ±2%)
MECHANICAL SPECIFICATIONS	Gear design	The gear are mechanically self-locking
	Manual emergency operation	<ul style="list-style-type: none"> Manual override handwheel Automatic declutch
	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	<p>The actuators can operate on a wide variety of power supplies:</p> <ul style="list-style-type: none"> 3-phase, single-phase or DC (except AQ80 to AQ1000) 50 or 60 Hz ...
	Terminal compartment	Screw-type terminals for controls and power supply. Internal earth grounding post
	Fuse protection	<p>Primary: 0,5A-500V</p> <p>Secondary: Two automatic resettable fuses</p>
	Conduit entries	3 x M20 + 2 x M16 (or 3 x 3/4" NPT + 2 x 1/2" NPT)
POSITION & TORQUE SENSORS	Travel limit systems	<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 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 rated torque

AQ LOGIC

PRODUCT SPECIFICATIONS

POSITION & TORQUE SENSORS	Analog Transmitter (option)	In current: maximum acceptable load of 600 Ohms (24VDC), must be supplied (12 to 32VDC) 2-wire or 3-wire connection
CONTROLS	Remote Command	<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	Mechanical position indicator
	Local command description	<ul style="list-style-type: none"> 2 buttons + 1 padlockable selector A large LCD screen to display the position, the torque and alarms and to perform the settings Green/Red: Configurable LED for CLOSED/OPEN
	Power circuit	Motor reversing starters
	Auxiliary power supply	With external 24VDC supply
	Signaling relay	<ul style="list-style-type: none"> 3 latching relays Contact configuration: normally open or normally closed Minimum current 10mA at 5V Maximum current 5A at 250V or 5A at 30VDC (resistive load) Relay 1: Valve open Relay 2: Valve closed Relay 3: Configurable relay <ul style="list-style-type: none"> Additional 4 relays board as an option
	Fault relay	<ul style="list-style-type: none"> SPDT non-latching 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)	LOGIC Analog 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
	Timer	This function enables an increase in the operating time of the actuator, i.e. to avoid water-hammer effect in a pipe. Travel time can be programmed independently in both opening and closing directions.
SETTINGS	Settings	Non-Intrusive settings All actuator settings and parameters are stored in a non-volatile EEPROM memory. Protection by password. Configurable via Local control; Bluetooth available as standard (to keep a high level of security, Bluetooth range is limited to 10m. With BC App, communication is encrypted and access is restricted with password.)
	Local settings	The LOGIC can be fully set via its local display and selectors. Does not require any specific setting tool. Optionnal padlockable protection against sandy winds & vandalism.
	Application for mobile device	New BERNARD CONTROLS mobile application is available as standard, with its bluetooth secured communication interface, and allows the user to: <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 Customize the actuator display Log the Systems Alarms and Warnings ...

AQ LOGIC
PRODUCT SPECIFICATIONS

SETTINGS	Application for mobile device	<ul style="list-style-type: none"> • Duplicate one actuator configuration to another actuator • Check the actuator life operation • Select the suitable language among 14 available languages • Identify the actuator operated valve by its valve tag and location process • Track the last user connexions for traceability and safety reasons
FIELDBUS	Available Fieldbus protocols (option)	<ul style="list-style-type: none"> • PROFIBUS-DPV1 • MODBUS RTU
CONFORMITY 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)

3/3

> Notes

>Product selection

AQ0050 DE 035 S A 0 0 0 E 0 M

Connection Type

M=Metric
I=Imperial NPT

Output Flange

0=Standard Flange
A=Optional F05
B=Optional F10
C=Optional F12
D=Optional F14
E=Optional F16
F=Optional F20
G=Optional F25

Certification

E=EC Standard
L=EC Low Temperature
C=CSA (Low Temperature)
R=EAC (Low Temperature)

Fieldbus Options

0=Without; P=Profibus DP Single;
M=Modbus RTU

LOGIC Options

0=Without; 1=RS4

Analog Signals Options

0=Without; 1=Analog Transmitter (Output Signal);
2=Analog Positioner; 3= POT

Duty & Modulating Classification

A=Class A; B=Class B; 3=Class III

Control Type

S=SWITCH, P=SWITCH Prewired, L=LOGIC

Operating time (sec)

Voltage

DE=Direct Current 24V ; FB=1Ph 220-230V 50/60Hz ; FC=1Ph 115-120V 50/60Hz ;
TA=3Ph 380-415V 50Hz ; UJ=3Ph 440-480V 60Hz

Actuator Type



Solutions Overview



NEW RANGES OF ACTUATORS AQ, AQL, AQXL, AT & BT



NEW MOBILE APPLICATION BC APP

The only application that allows not only to set up your actuator in a few clicks, but also to improve the reliability of your process thanks to key features and data for preventive maintenance. Compatible with our new controls: **LOGIC (v2)** & **INTELLI+® (v3)**

WEATHERPROOF RANGES

WEATHERPROOF RANGES

EXPLOSIONPROOF RANGES

FIRST BC

BC PREMIUM

FLEXIBLE & MODULAR

Quarter-turn AQL RANGE

- 15 to 70 Nm (direct mount)
- Type of Controls: > **Electromechanical SWITCH**
- BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B**

- Environment:
 - > IP68 / C4 (High paint protection option C5)
 - > T: -20°C ...+60°C

The essentials



Quarter-turn AQ RANGE

- 50 to 10,000 Nm (up to 1000 Nm direct mount) Up to 1,000,000 Nm on request
- Type of Controls: > **Electromechanical SWITCH** > **Smart LOGIC (v2)**
- BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B** Modulating **III**

- Environment:
 - > IP68 / C4 (High paint protection option C5)
 - > T: -20°C ...+70°C (Low T° option -40°C)



Multi-turn AT RANGE

- 30 to 500 Nm (direct mount) | Up to 32,000 Nm on request
- 10 to 127 rpm (direct mount)
- Type of Controls: > **Electromechanical SWITCH** > **Smart LOGIC (v2)**
- Wiring: > Screw Type Terminal
- BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B** Modulating **III**

- Environment: > IP68 / C4 (High paint protection option C5)
 - > T: -20°C ...+70°C (Low T° option -40°C)
- Linear applications

FLEXIBLE & MODULAR



The dedicated solutions

Multi-turn BT RANGE

- 30 to 500 Nm (direct mount) | Up to 32,000 Nm on request
- 10 to 127 rpm (direct mount) & **high speed: up to 180 rpm (direct)**
- Type of Controls: > **Smart INTELLI+® (v3)**
- Wiring: **Double-sealing as standard**
 - > New terminal plate with pins for easy wiring
 - > Quick Connector

Advanced BC Duty & Modulating Classification

On-Off **A+** Inching Positioning **B+** Modulating **III+**

- Environment: > IP68 / C4 (High paint protection option C5)
 - > T: -20°C ...+70°C Low T° (Low T° option -40°C)
- Linear applications



SPECIAL REQUESTS

Quarter-turn SQ RANGE

- 45 to 10,000 Nm (up to 800 Nm direct mount) | Up to 1,000,000 Nm on request
- With type of Controls: > **Smart INTELLI+® (v2)** With Fieldbus Redundant ... > SIL2
- Wiring: Double-sealing with INTELLI+



Multi-turn ST RANGE

- 60 to 2,200 Nm (direct mount) | up to 20,000 Nm on request
- 10 to 120 rpm (direct mount) | High speed: up to 190 rpm (direct & <300Nm)
- With type of Controls: > **Smart INTELLI+® (v2)** With Fieldbus Redundant ... > SIL2



Quarter-turn & Multi-turn SQX & STX RANGES

- **SQX**: 80 to 800 Nm (direct) & up to 1,000,000 Nm on request
- **STX**: 25 to 2,200 Nm (direct) & up to 20,000 Nm on request
- Compliance with international explosionproof standards: ATEX, INMETRO, IEC-Ex, EAC-Ex, NEMA 7 & 9...
- Type of Controls:
 - > **Electromechanical SWITCH**
 - > **Hardwired**
 - > **Smart INTELLI+® (v2)**
 - > **SIL2**

BC Duty & Modulating Classification

On-Off **A+** Inching Positioning **B+** Modulating **III**

- Environment: IP68 / C3 up to C5-M / T: -20°C ...+70°C (low T° option: -60°C)
- Special configurations: Corrosion protection, Fire proofing, Extreme temperatures



FAILSAFE RANGES

Quarter-turn Failsafe Actuators FQ RANGE

Fast and shock-free reliable spring-return technology during emergency operation

BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B** Modulating **III**

- Environment: IP67 / C3 / T: -20°C ...+70°C (low T° option -40°C)

Failsafe Actuators FQX RANGE

- Explosionproof versions ATEX-NEMA



Quarter-turn & Linear Failsafe FSeX RANGE

The complete combination of modern electronics and power of hydraulics

BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B** Modulating **III**

- Environment: IP67 / C4 / T: -20°C ...+60°C
- ATEX-NEMA, SIL3



NUCLEAR RANGES

Nuclear classified Actuators

- SQN & ST & SN & SD Nuclear qualified electric actuators
- Full range of other Qualified Solutions: Quarter-turn, Multi-turn and Linear for inside & outside containment applications; Failsafe actuators



EXPLOSIONPROOF RANGES

Quarter-turn AQXL RANGE

- 40 Nm and 70 Nm
- Compliance with international explosionproof standards: ATEX, IEC-Ex, NEMA 7...
- Type of Controls: > **Electromechanical SWITCH**
- BC Duty & Modulating Classification

On-Off **A** Inching Positioning **B**

- Environment: IP68 / C4 (C5 on request) / T: -20°C ...+60°C
- Linear applications



CUSTOMIZED DESIGN & PROJECTS:

At any time and anywhere on the globe, BERNARD CONTROLS teams are available for dedicated support. From the design stage to installation, commissioning, maintenance and training, our experts help you to define and implement the most appropriate solution to your specific needs thanks to our local R&D centers, test labs, calculation tools and training center.



STRONG CUSTOMER SUPPORT

NEW GENERATION OF SMART CONTROLS



LOGIC (v2)

The main functions you expect from modern integrated controls

INTELLI+® (v3)

Advanced control solution for your critical applications!