



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



4 rue d'Arsonval - CS 70091 - 95505 Gonesse CEDEX France - Tel. : +33 (0)1 34 07 71 00 - Fax : +33 (0)1 07 71 01 - mail@bernardcontrols.com - www.bernardcontrols.com

4 rue d'Arsonval - CS 70091 - 95505 Gonesse CEDEX France - Tel. : +33 (0)1 34 07 71 00 - Fax : +33 (0)1 07 71 01 - mail@bernardcontrols.com - www.bernardcontrols.com



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

## **Product benefits**

### Compact & optimized

- > Super compact design (including > Product architecture & torque
- adapted to customers' requirements: 14 models from > Multi-voltage (AC/DC) : suitable whatever your location on the
- > Optimized logistics: short

- > 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 > Heavy duty design: full
- enclosure protected by durable powder coating, IP68, low
- > 100% of delivered products are
- tested with automatic process
- > Suitable for modulating
- (BC Class III complying with

#### • 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 (4way 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
- 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





#### **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

(e)2589228

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BERNERB



### **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

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4 rue d'Arsonval - CS 70091 - 95505 Gonesse CEDEX France - Tel. : +33 (0)1 34 07 71 00 - Fax : +33 (0)1 07 71 01 - mail@bernardcontrols.com - www.bernardcontrols.com

	PRODUCT	SPECIFICATIONS
	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.
GENERAL	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
	Casing	<ul> <li>Aluminium die casting</li> <li>Cover fastened by captive and stainless screws</li> </ul>
	External Protection	<ul> <li>Type: Epoxy powder coating as standard</li> <li>Protection: C4 according to ISO 12944</li> <li>For colors and finishes, please consult us</li> </ul>
ENCLOSURE - PROTECTION	Weatherproofness	IP68 NEMA 4X as standard Relative humidity: 0 to 95%.
	Ambient temperature range	<ul> <li>-20+70°C / -4 +158°F</li> <li>-40°C (-40°F) as an option</li> <li>Other temperatures, please consult us</li> </ul>
	Vibration resistance	1g (9.8 m/s²) at 10-200 Hz. (Contact our sales teams for higher vibration levels)
	Motor technology	<ul> <li>3-phase or single-phase asynchronous motor, Class F insulation with integral thermal overload protection.</li> <li>DC motors</li> </ul>
MOTOR	Motor duty rating	<ul> <li>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.</li> <li>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. (<i>Voltage</i> ±10%, frequency ±2%)</li> </ul>
	Gear design	Actuator is mechanically self-locking
MECHANICAL	Manual emergency operation	Manual override handwheel Automatic declutch
SPECIFICATIONS	Output flange	Actuator flanges comply with ISO 5211
_	Lubrication	The actuators are lubricated for the product lifetime and do not require any special service.
	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
ELECTRICAL	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	<ul> <li>Limit switches actuated by adjustable camblock</li> <li>2 SPDT switches as standard (Open and Close) + 2 auxiliary switches (for signaling)</li> </ul>
	Torque limiting system	<ul> <li>Torque limitation available from AQ25</li> <li>The torque limiting system is calibrated at the factory</li> <li>2 switches as standard (1 in opening and 1 in closing); SPDT; 250VAC- 5Rmax (resistive load)</li> <li>Adjustable torque from 40 to 100% of max torque (intrusive setting)</li> </ul>
	Analog Transmitter (option)	ANALOG TRANSMITTER OPTION: • 2 wires for 4-20mA Analog Transmitter • POT 1000Ω

4 rue d'Arsonval - CS 70091 - 95505 Gonesse CEDEX France - Tel. : +33 (0)1 34 07 71 00 - Fax : +33 (0)1 07 71 01 - mail@bernardcontrols.com - www.bernardcontrols.com

<b>AQ SWITCH</b> PRODUCT SPECIFICATIONS		
	Visual position indication	Mechanical position indicator
CONTROLS	Inching/Positioning control	ANALOG POSITIONER OPTION: (1-phase only) • 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 camblocks with a standard screwdriver
	Application for mobile device	<ul> <li>BERNARD CONTROLS new mobile application is available as standard.</li> <li>BERNARD CONTROLS mobile interface allows the user to:</li> <li>Access to the documentation relative to the selected actuator (enter the Serial number) or scan the QR code on the nameplate of the actuator</li> <li>Access to BERNARD CONTROLS contact information according to the are concerned</li> </ul>
CONFORMITY TO EC DIRECTIVES	Compliance with EC Directives	AQ actuators comply with: • 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)



	AÒ	LOGIC
	PRODUCT S	PECIFICATIONS
	Description	All AQ actuators include motor with thermal protection, gear case, emergency handwheel, position sensor, torque sensor (for torque>150Nm output drive with removable socket and anti-condensation heater. AQ LOGIC models also include: • integrated controls • built-in motor reversing starters • local commands with large LCD display
GENERAL	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 • Modulating: Class III actuators with higheR duty performance and specification of additional performance criteria compared to EN15714-2 Class C basic design requirements
	Casing	<ul> <li>Aluminium die casting</li> <li>Cover fastened by captive and stainless screws</li> </ul>
ENCLOSURE - PROTECTION	External Protection	<ul> <li>Type: Epoxy powder coating as standard</li> <li>Protection: C4 according to ISO 12944</li> <li>For colors and finishes, please consult us</li> </ul>
	Weatherproofness	IP68 NEMA 4X as standard Hygrométrie: 0 to 95%.
	Ambient temperature range	<ul> <li>-20+70°C / -4 +158°F</li> <li>-40°C (-40°F) as an option</li> <li>Other temperatures, please consult us</li> </ul>
	Vibration resistance	1g (9.8 m/s²) at 10-200 Hz. Contact our sales teams for higher vibration levels
MOTOR	Motor technology	<ul> <li>3-phase or single-phase asynchronous motor, Class F insulation with integral thermal overload protection</li> <li>DC motors</li> </ul>
	Motor duty rating	<ul> <li>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.</li> <li>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. (<i>Voltage</i> ±10%, frequency ±2%)</li> </ul>
	Gear design	The gear are mechanically self-locking
MECHANICAL	Manual emergency operation	Manual override handwheel     Automatic declutch
SPECIFICATIONS	Output flange	Actuator flanges comply with ISO 5211.
	Lubrication	The actuators are lubricated for the product lifetime and do not require any special service.
	Power supply	The actuators can operate on a wide variety of power supplies: • 3-phase , single-phase or DC <i>(except AQ80 to AQ1000)</i> • 50 or 60 Hz
ELECTRICAL	Terminal compartment	Screw-type terminals for controls and power supply. Internal earth grounding post
	Fuse protection	Primary: 0,5A-500V Secondary: Two automatic resettable fuses
	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> <li>Position: reading on the output shaft</li> <li>Position sensor: Absolute encoder (Hall effect sensor)</li> </ul>
	Torque limiting system	<ul> <li>Torque limitation available from AQ25</li> <li>Absolute encoder sensor (Hall effect sensor)</li> <li>The torque limiting system is calibrated in factory. It remains adjustabl via LOGIC (non intrusive setting)</li> <li>Non intrusive setting: Adjustable torque from 40 to 100% of rated torque</li> </ul>

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	AO	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
	Remote Command	<ul> <li>Maintained or pulse command (minimum pulse duration: 100ms)</li> <li>Command by dry contacts</li> <li>Command by voltage from 10 to 250 VDC</li> <li>Isolated by opto-couplers</li> </ul>
	Visual position indication	Mechanical position indicator
	Local command description	<ul> <li>2 buttons + 1 padlockable selector</li> <li>A large LCD screen to display the position, the torque and alarms and to perform the settings</li> <li>Green/Red: Configurable LED for CLOSED/OPEN</li> </ul>
	Power circuit	Motor reversing starters
	Auxiliory power supply	With external 24VDC supply
CONTROLS	Signaling relay	<ul> <li>3 latching relays</li> <li>Contact configuration: normally open or normally closed</li> <li>Minimum current 10mA at 5V</li> <li>Maximum current 5A at 250V or 5A at 30VDC (resistive load)</li> <li>Relay 1: Valve open</li> <li>Relay 2: Valve closed</li> <li>Relay 3: Configurable relay</li> <li>Additional 4 relays board as an option</li> </ul>
	Fault relay	<ul> <li>SPDT non-latching relay, in fault position when not supplied.</li> <li>Minimum current 10mA at 5V</li> <li>Maximum current 5A at 250VAC or 5A at 30VDC (resistive load)</li> </ul>
	Inching/Positioning & Modulating control (option)	LOGIC Analog Positioner: Signal configurations (with integrated analogue output): • 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: • in current: impedance of 260 0hms - In voltage: impedance of 10 k0hms Analogue Output: • In current: maximum acceptable load of 600 0hms (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	<ul> <li>New BERNARD CONTROLS mobile application is available as standard, with its bluetooth secured communication interface, and allows the user to:</li> <li>Assistance to commissioning on valve</li> <li>Simply set every parameters of the actuator (non-intrusive setting)</li> <li>Command the actuator (open/close/stop) as a local controls</li> <li>Check at a glance an overview of the feedbacks information which are displayed on a large color screen of the mobile</li> <li>Assistance to curative maintenance with a simple and efficient troubleshoating</li> <li>Access to BERNARD CONTROLS contact information according to the area concerned</li> <li>Access to the documentation relative to the selected and scanned actuator</li> <li>Customize the actuator display</li> <li>Log the Systems Alarms and Warnings</li> </ul>

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<b>AQ LOGIC</b> PRODUCT SPECIFICATIONS		
SETTINGS	Application for mobile device	<ul> <li>Duplicate one actuator configuration to another actuator</li> <li>Check the actuator life operation</li> <li>Select the suitable language among 14 available languages</li> <li>Identify the actuator operated valve by its valve tag and location process</li> <li>Track the last user connexions for traceability and safety reasons</li> </ul>
FIELDBUS	Available Fieldbus protocols (option)	PROFIBUS-DPV1     MODBUS RTU
CONFORMITY TO EC DIRECTIVES	Compliance with EC Directives	AQ actuators comply with: • 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)

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## > Notes


4 rue d'Arsonval - CS 70091 - 95505 Gonesse CEDEX France - Tel. : +33 (0)1 34 07 71 00 - Fax : +33 (0)1 07 71 01 - mail@bernardcontrols.com - www.bernardcontrols.com

## >Product selection

	35 S A O O O E O M
	<b>Connection Type</b> <b>M</b> =Metric I=Imperial NPT
	Output Flange O=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)
	<b>Fieldbus Options</b> <b>0</b> =Without; <b>P</b> =Profibus DP Single; <b>M</b> =Modbus RTU
	<b>LOGIC Options</b> <b>0</b> =Without; <b>1</b> =RS4
	<b>Analog Signals Options</b> <b>0</b> =Without; <b>1</b> =Analog Transmitter (Output Signal); <b>2</b> =Analog Positioner <sup>1</sup> ; <b>3</b> = 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)
• •	<b>e</b> rect Current 24V ; <b>FB=</b> 1Ph 220-230V 50/60Hz ; <b>FC=</b> 1Ph 115-120V 50/60Hz ; n 380-415V 50Hz ; <b>UJ=</b> 3Ph 440-480V 60Hz
Actuator Type	

<sup>1</sup> : single-phase only

AO, AOL, AOXL, AT & BT

## **Solutions Overview**

**EIRST** 

The essentials

СОПРАСТ

COMPLETE

#### WEATHERPROOF RANGES

## Quarter-turn AOL RANGE

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



Inching B On-Off Positioning Environment:

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



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COMPACT

SMART

### Quarter-turn AO 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



Modulating Positionina

 Environment > IP 68 / C4 (High paint protection option C5) > T: -20°C ...+70°C (Low T° option -40°C)

## **Multi-turn AT RANGE**



SMART

ULTRA

СОПРАСТ

• 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



• Environment: > IP 68 / C4 (High paint protection option C5) > T: -20°C ...+70°C (Low T° option -40°C) Linear applications

#### EXPLOSION PROOF RANGES



#### • 40 Nm and 70 Nm

On-Off

 Compliance with international explosion proof standards: ATEX, IEC-Ex, NEMA 7...

• Type of Controls: > Electromechanical SWITCH • BC Duty & Modulating Classification



FLEXIBLE

6 MODULAR



Inching B

## WEATHERPROOF RANGES



### 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)

Advanced BC Duty & Modulating Classification

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

#### SPECIAL REOUESTS

#### **Ouarter-turn SO 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 ...



• 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



STRONG CUSTOMER

SUPPORT

#### **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.



FLEXIBLE

6 MODULAR

## 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)



#### EXPLOSION PROOF RANGES 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 explosion proof standards: ATEX, INMETRO, IEC-Ex, EAC-Ex, NEMA 7 & 9... Type of Controls: > Electromechanical SWITCH > Hardwired



 BC Duty & Modulating Classification On-Off

Inching Positioning

 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

#### **Ouarter-turn Failsafe Actuators FO RANGE**

Fast and shock-free reliable spring-return technology during emergency operation BC Duty & Modulating Classification

On-Off A Inching B Modulating III

• Environment: IP 67 / C3 / T: -20°C ...+70°C (low T° option -40°C)

Failsafe Actuators FQX RANGE Explosionproof versions ATEX-NEMA

#### **Ouarter-turn & Linear Failsafe FSeX RANGE**

The complete combination of modern electrics and power of hydraulics BC Duty & Modulating Classification

On-Off Inching B Modulating Positioning Environment: IP67 / C4 / T: -20°C ...+60°C ATEX-NEMA, SIL3



#### **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





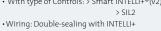


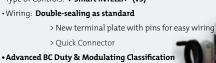
The main functions you expect from modern integrated controls

Advanced control solution for your critical applications!

> SIL2







On-Off 🗛 Inching B+ Modulating III+ Positioning

## BERNARD CONTROLS GROUP

#### **CORPORATE HEADQUARTERS**

4 rue d'Arsonval - CS 70091 / 95505 Gonesse CEDEX France / Tel. : +33 (0)1 34 07 71 00 / Fax : +33 (0)1 34 07 71 01 / mail@bernardcontrols.com

#### CONTACT BY OPERATING AREAS

#### >AMERICAS

#### **NORTH AMERICA**

BERNARD CONTROLS UNITED STATES HOUSTON inquiry.usa@bernardcontrols.com Tel. +1 281 578 66 66

#### SOUTH AMERICA

BERNARD CONTROLS LATIN AMERICA inquiry.southamerica@bernardcontrols.com Tel. +1 281 578 66 66

#### >ASIA

CHINA BERNARD CONTROLS CHINA & BERNARD CONTROLS CHINA NUCLEAR BEIJING inquiry.china@bernardcontrols.com Tel. +86 (0) 10 6789 2861

#### KOREA

BERNARD CONTROLS KOREA SEOUL inquiry.korea@bernardcontrols.com Tel. +82 (0)2 2183 6226

#### SINGAPORE

BERNARD CONTROLS SINGAPORE SINGAPORE inquiry.singapore@bernardcontrols.cor Tel. +65 65 654 227

#### >EUROPE

#### BELGIUM BERNARD CONTROLS BENELUX NIVELLES (BRUSSELS) inquiry.belgium@bernardcontrols.com inquiry.holland@bernardcontrols.com Tel, +32 (0)2 343 41 22

FRANCE BERNARD CONTROLS FRANCE & BERNARD CONTROLS NUCLEAR FRANCE GONESSE (PARIS) inquiry.france@bernardcontrols.com Tel. +33 (0)1 34 07 71 00

GERMANY BERNARD CONTROLS DEUFRA TROISDORF (KÖLN) inquiry.germany@bernardcontrols.com Tel. +49 2241 9834 0

#### ITALY BERNARD CONTROLS ITALIA RHO (MILANO) inquiry.italy@bernardcontrols.com Tel. +39 02 931 85 233

RUSSIA BERNARD CONTROLS RUSSIA inquiry.russia@bernardcontrols.com Tel. +33 (0)1 34 07 71 00

SPAIN BERNARD CONTROLS SPAIN MADRID inquiry.spain@bernardcontrols.com Tel. +34 91 30 41 139

## 

BERNARD CONTROLS UNITED KINGDOM inquiry.uk@bernardcontrols.com Tel. +44 (0)7435 266310

#### >INDIA, MIDDLE EAST & AFRICA

**AFRICA** BERNARD CONTROLS AFRICA ABIDJAN - IVORY COAST inquiry.africa@bernardcontrols.com Tel. + 225 21 34 07 82

INDIA BERNARD CONTROLS INDIA inquiry.india@bernardcontrols.com Tel. +971 4 880 0660

MIDDLE-EAST BERNARD CONTROLS MIDDLE-EAST DUBAI - U.A.E. inquiry.middleeast@bernardcontrols.com Tel. +971 4 880 0660

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