BERNARD CONTROLS

Invest in Confidence

FIRST BC

AQ Logic 150 - 1000
RANGE

Start Up Guide

SUG_19011_EN - Ind. B
Art : 5100731

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DEFINITIONS

ⓘ	Tip or info.
☝	Warning requiring a check and/or a compulsory action.
!	Warning requiring a check and/or a compulsory action on the device because of risks of damages for the device or danger for the staff working on the device.

1 SAFETY

This device complies with current applicable safety standards.

Installation, maintenance, and use of this unit require a skilled and trained staff.

Please carefully read this whole document before mounting and starting-up the actuator.

2 PACKAGING, STORAGE AND MAINTENANCE

2.1 Packaging

AQ actuators packaging is comprised of a dual-layer carton strapped on a pallet. For certain non-EU countries or on request, the pallets are heat treated to standard NIMP 15 and IPPC-stamped.

This packaging is identical for shipping by road, air or sea, unless otherwise provided in the contract.

2.1.1 Check identification sticker

Information on the nameplate sticker on the side of the actuator should match those on your order.

QR Code on this sticker can be used to identify the actuator.

2.2 Storage

Actuators should be stored under a shelter, in a clean and dry place and at a stable ambient temperature.

☝

> - Avoid placing the actuator directly on the floor
> - Check that plugs of cable entries are correctly tightened.
> - Check that cover screws are correctly tightened to ensure weatherproof sealing of the cover.

AQ actuators include electrical components and lubricated gear stages. Even with a weatherproof enclosure, oxidation, seizing and other alterations may occur if actuator is not correctly stored.

☝

> Heating resistor should be connected to power supply especially if the storage place is located outdoors.

What to check after storage

1. Visually check the electrical equipment.
2. Manually operate buttons, selectors, etc., to ensure their proper mechanical functionality.
3. Manually operate the actuator for a few travels.

What to check on pre-installed actuators

If you expect a long period between actuator mounting and electrical wiring: visually check that cable entries and cover are tightly closed.

2.3 Maintenance

All AQ actuators feature lifetime lubrication and therefore require no specific maintenance, if they were correctly commissioned and used in conditions foreseen by design.

2.4 Actuator protection

Protection scale is defined according to the IEC529 standard.

AQ 150-1000 actuators fulfill the following requirements:

IP68 (Standard): full protection against dust and water in case of underwater continuous use with standard conditions of pressure and duration.
Manufacturer and user must acknowledge on a test to set-up.

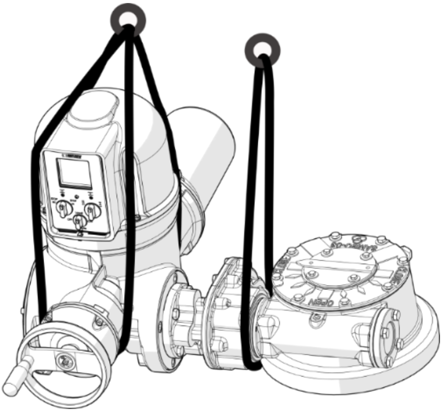
Higher protection is necessary if the actuator is likely to be repeatedly immerged.

3 ACTUATOR INSTALLATION

3.1 Lifting

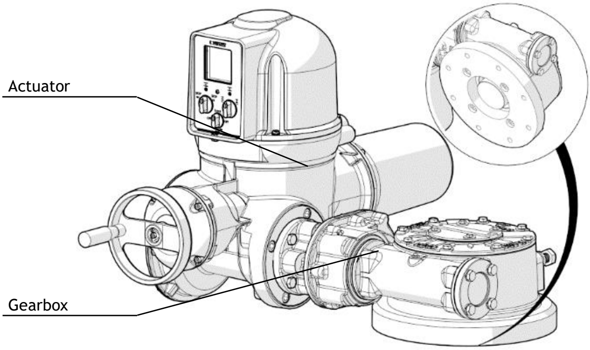
The actuators are lifted using slings (see figure below).

The specifications for these slings must be suitable for the weight of the actuators (allow for an additional 50%).

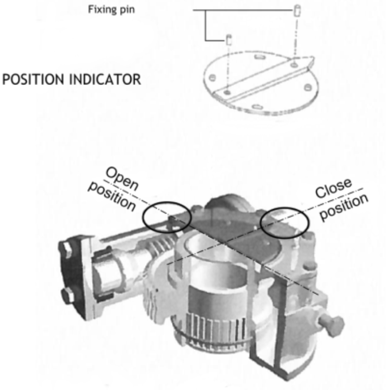


> !
>
> Never lift the valve by the actuator.
>
> Never lift an actuator by its handwheel: it may be twisted or broken by its own weight, and its shaft damaged.
>
> When an actuator is installed on a valve, the slings must be mounted on the valve and not on the actuator.

According to the weight of the valve, ensure that the new centre of gravity does not tilt the unit.

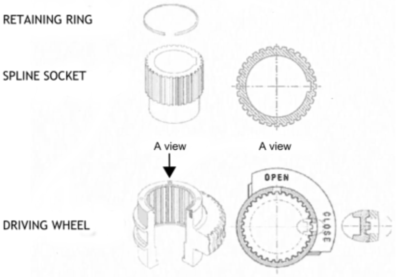


3.2 Mounting / Unmounting of the socket


Fixing pin
POSITION INDICATOR
Open position
Close position

All AQ 150-1000 are delivered with removable spline socket. It inserts into the wheel and allows a precise positioning between the actuator and valve shaft.

Indicator position shows if default position of the actuator is opened (OPEN) or closed (CLOSE).


RETAINING RING
SPLINE SOCKET
A view
A view
OPEN
DRIVING WHEEL
CLOSE

How to mount socket on valve

1. Turn over the actuator to see underneath the gearbox side.
2. To get the largest length of spline engaged, check end to insert first in the gearbox: smooth end or splined end.
3. Bring closer this end of the socket to the gearbox.
4. Position the keyway of the socket to match the corresponding keyway of the wheel (OPEN or CLOSE according to default position).
5. Insert the socket into the wheel splines.
6. Put the circlip in place to hold the socket in place.

How to remove socket

1. Remove the circlip with the circlip pliers.
2. Remove the spline socket.

> If alignment cannot be obtained, it could result from a wrong positioning.

3.3 Fastening actuator on the valve

Actuator should be secured directly to the valve using proper bolts or via a proper interface.

After assembly, the actuator can operate in any position.

However:

- Do not handle the actuator by handwheel to avoid damage on actuator gearing.
- Cable glands must not be oriented upwards (loss of water tightness).
- It is recommended not to position motor downwards.

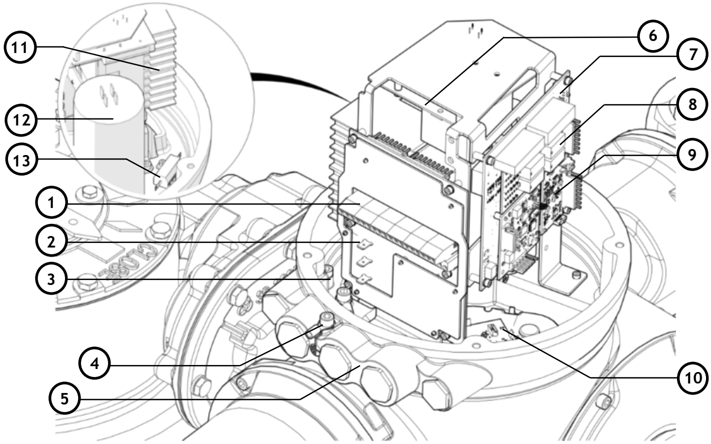
You can modify your display orientation to keep normal reading orientation.

➔ To set display orientation, see §**6.3**.

4 ELECTRICAL COMMISSIONING

> !
>
> Ensure power wires are not supplied with electric power before wiring is finished and the control compartment is closed.
>
> If you need to open control compartment, previously cut off power supply to the actuator.

4.1 Components (with cover open)



1 – Control terminal block
2 – Power terminal block
3 – Internal ground terminal
4 – External earth terminal
5 – Cable entries
6 - Power supply board
7 – Main board
8 – 4-Relay board (option)
9 – AI/AO board (option)
10 – Modular reduction gear
11 – Contactor
12 – Capacitor
13 – Thermal resistor

Control panel board is attached on the actuator cover.

4.2 Before wiring

!

- The electrical connection of the appliance must be carried out by a qualified professional. All interventions inside the appliance must be carried out by a qualified professional.
- In case of incorrect installation, there is a risk of electric shock and damage to the device.

To proceed to the electrical commissioning, you need :

1. **to open the cover**
2. **to install cable glands**
3. **to wire the actuator**

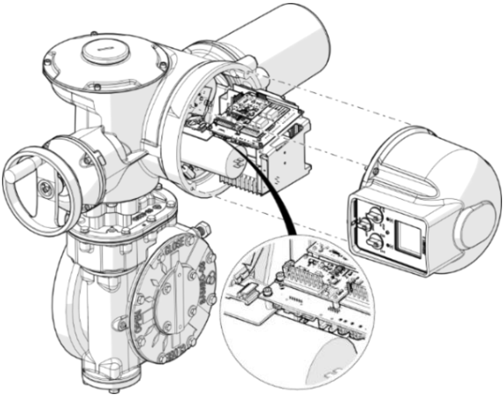
➔ **See Appendix for more information on the wiring.**

4.2.1 Opening and closing the control compartment

You need to open the control compartment in order to wire actuator.

How to open the cover

1. With 10mm angled socket wrench or flat blade screwdriver, unscrew the 4 screws from the housing.
2. Pull out the cover along its axis.
3. Remove the cover completely.



How to close the cover

1. Plug the HMI cable to the mainboard.
2. Put back the cover, with the screen accurately oriented for operation and lean it on the housing.
3. With 10mm angled socket wrench or flat blade screwdriver, tighten the cover on the housing with its 4 screws.

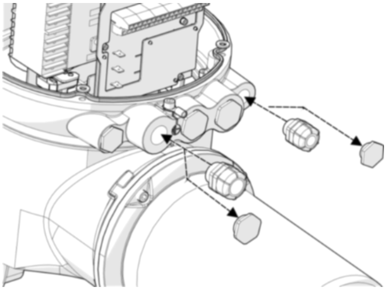
4.2.2 Installing cable glands

AQ Logic 150-1000 actuators are fitted with 2×M16 and 3×M20 cable entries.

Cable glands must not be oriented upwards (loss of water tightness).

How to install cable glands

For each cable entry used

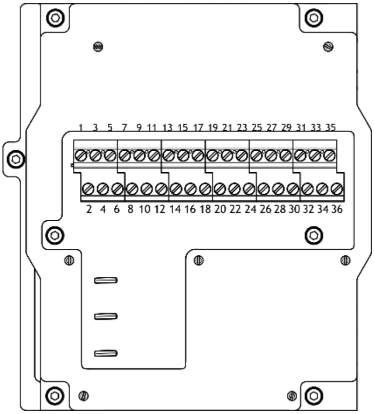


1. Remove plug from the cable entry with 19mm (M16 entry) or 23mm (M20 entry) open-end wrench.
2. Separate sealing nut from its cable gland.
3. Screw and tighten cable gland in the cable entry.
4. Thread the sealing nut on the cable and pass the cable through the cable gland.

Unused entries must be kept closed by their plugs as they are part of the components allowing actuator IP68 protection setting.

4.3 Wiring

4.3.1 Wiring power and control cables



➔ **Terminal blocks**

Terminal blocks are located on a side of the electronic assembly and consists of screwed terminals. There are 2 main blocks: 1st is to connect power supply, 2nd to connect command and signaling.

Control terminals are 1-35 & 2-36

Power terminals (3Ph/1Ph)

- **3Ph: L1, L2, L3** with phase correction
- **1Ph: L** (Live), **N** (Neutral)

➔ Internal ground terminal

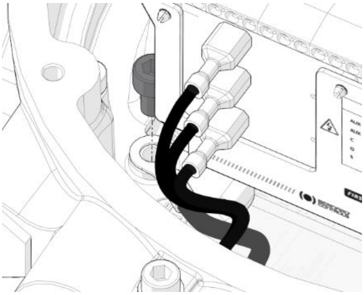
The ground terminal is a tapered hole in the plate, located under the terminal blocks board at its left (see following picture).

How to wire actuator

The wiring must be done according to the wiring diagram of your actuator.

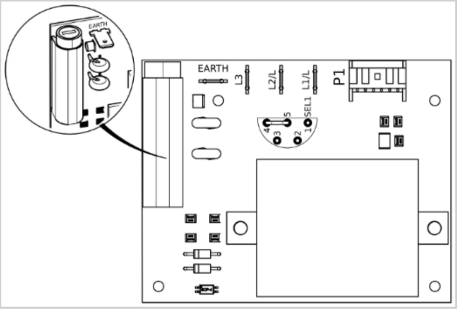
1. Make sure that power supply voltage matches information on the label on the side of the actuator.

Using a 3×0.5mm flat blade screwdriver and a 4 mm Allen key



2. Connect power supply on terminals marked L1, L2 & L3 (3Ph) or L, N (1Ph) according to your supply type.
3. Fix the ground cable on the ground terminal.
4. Connect control and signaling wires on uneven (marked 1 to 35) and even (marked 2 to 36) upper terminals.
5. Tighten sealing nut on the cable gland when you have finished wiring.
6. Ensure whole cable glands are correctly tightened.

4.3.2 Power supply board



Power supply board supplies actuator with electrical power.

Power characteristics are factory set according to your order.

➔ **Fuse**

You have a fuse at the upper left angle of the board (see picture).

Its characteristics are the following:

Fuse current	500 mA	Fuse size (mm) (inches)	6.3×32 ¼’’×1-¼’’
Voltage rating VAC	500 V	Blow characteristic	Fast acting
Breaking current capacity current AC			1 kA

4.3.3 Relays

AQ Logic is equipped with a Default relay and customizable relays.

This list of alarms cannot be modified.

- **See list of Fault relay Alarms in Appendix III.**

➔ **Customizable relays**

AQ Logic actuator is equipped with 3 customizable relays, to which you can add a 4-Relays board as an option.

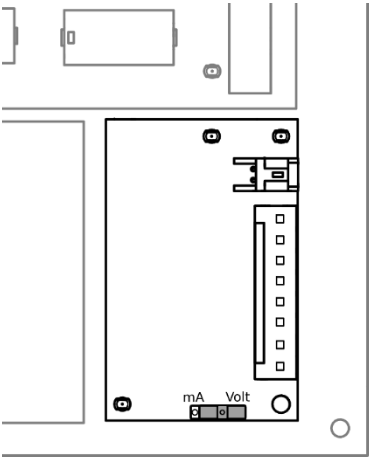
Function of each relay can be set.

- **To see possible settings and set relays, see §6.12.**

4.3.4 Positioner board (OPTION)

Positioner board is assembled on the main board.

You can switch between **mA** and **V** using the small switch at the base of the board according to your needs.



4.4 After wiring

What to check after wiring

Once actuator wiring is completed, please check the following:

1. Make sure that power supply voltage matches information on the sticker on the side of the actuator.
2. Check that all connectors or cable glands are correctly tightened.

> If any fault is detected at this stage, please check that your wiring is correct.

4.5 Heating resistor

Each actuator includes a heating resistor.

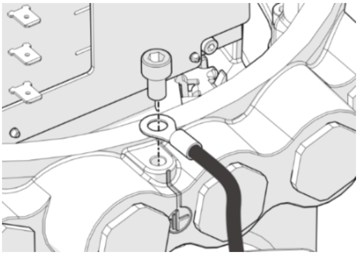
As soon as the actuator is installed in the field and power off, it is recommended to supply the resistor to prevent condensation.

> - Immediately put the cover back in place after installation while ensuring its seal is clean. Never leave actuator electrical components without their protection cover.
>
> In case of water intrusion:
>
> - Dry electrical components before putting back the cover.
> - Check electrical insulation.

4.6 Wiring the external ground terminal

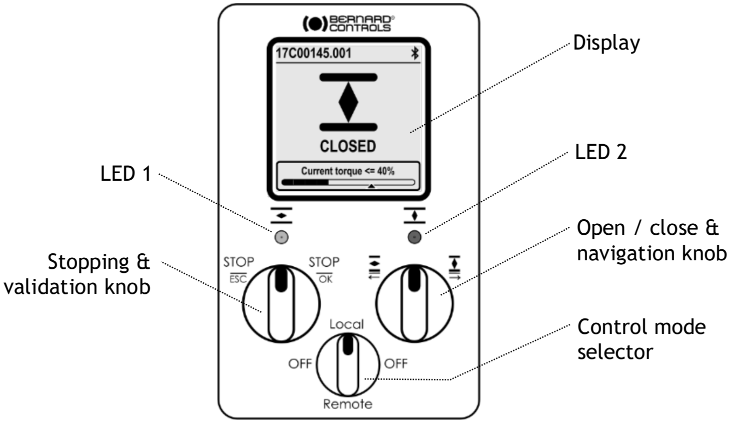
How to wire the external ground terminal

1. Crimp the end of the earth cable with a 6mm ring lug.
2. Fix it on the housing using a 5mm Allen key, at its location next to the cable entries.



5 ACTUATOR CONTROLS

5.1 Control panel


17C00145.001
CLOSED
Current torque <= 40%
Display
LED 1
LED 2
Stopping &
validation knob
Open / close &
navigation knob
Control mode
selector
STOP
ESC
STOP
OK
Local
OFF
OFF
Remote

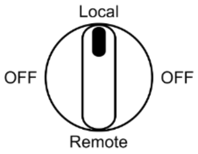
AQ Logic control panel consists of a **screen**, **2 control knobs**, **1 control selector** and 2 configurable **LEDs**.

Screen	Screen displays operating status or Logic menu
Control selector	Control selector allows to choose the control mode: **Local**: actuator is controlled using this Control panel or Smartphone via Bluetooth® **Remote**: actuator is controlled remotely **OFF**: controls are desactivated Your actuator is set on **Local** at startup. You can lock the control mode with an optional padlock at the bottom of the control panel.
Knobs	Knobs are used for **operation** (upper mention) or **menu navigation** (lower mention). Once released, these knobs return to center position.
LEDs	LEDs indicate actuator status (CLOSED ⤓ or OPEN ⤒). Default colors are red for CLOSED and green for OPEN, and can be set (see §0), according to your country. One will blinking during operation according to travel direction, and both at Bluetooth® connection.

5.2 Control modes

AQ Logic can be controlled locally or remotely.

Mode is set using **Control selector** on the control panel. It can be locked using a padlock located at the bottom of control panel.

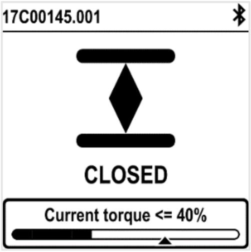


Modes are:

- Local mode with control panel or Smartphone via Bluetooth® connection
- Remote mode
- Forced local mode when in Remote mode using the Application
  - ➔ **This mode requires first to be authorized, see §6.13.**

5.3 Local control with Control panel

5.3.1 Operation



17C00145.001

CLOSED

Current torque <= 40%

Operation screen indicates…

- **Top**: actuator id and status icons

⚠: warning / ⊗: alarm

ᛒ: Bluetooth® activated

ᛒ: Bluetooth® activated with device connected

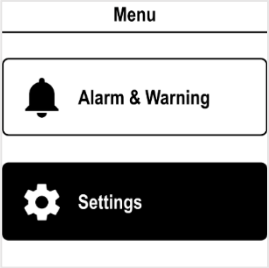
🔒: Control panel locked

- **Center**: current position of the valve, either CLOSED, current percentage between 0 and 100% depending on the travel direction, or OPEN
- **Bottom**: torque level with a torque gauge and an arrow marker to indicate torque limit set

Knobs use

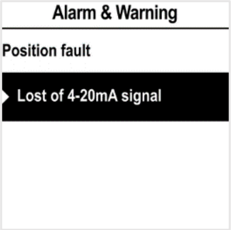
Left knob	↺ STOP ↻ STOP	↺ Opening ↻ Closing	Right knob

5.3.2 Settings



Menu screen has 2 main sections…

- **Alarm and warnings**



Position fault

Lost of 4-20mA signal

Messages are of 2 types identified by icon ⚠ for warnings or icon ⊗ for alarms.

➔ **See complete list in appendix III.**

- **Settings** that allows you to check or change the settings of the actuator: valve tag, password, torque limits, Bluetooth®, etc.

➔ **See Alarms and Settings menu in appendix II.**

Knobs use

	Left knob	Right knob
Menu navigation	↺ ESC ↻ OK	↺ ↑ (up) ↻ ↓ (down)
Edition	↺ ← (1 digit left) ↻ → (1 digit right)	↺ − (decrease values) ↻ + (increase values)

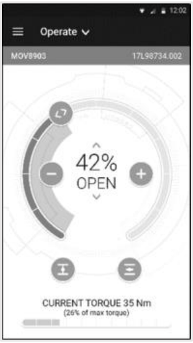
5.5 Local control with Smartphone application

Using the Bluetooth® connection of your actuator, you can operate it with Bernard Control smartphone application (**BC App**).

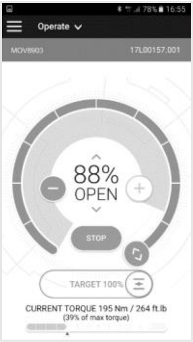
> - Bluetooth® is active on the actuator at delivery.
> - Using the Local control with BC App requires to have Bluetooth® activated on your smartphone

You need first to download the application, install it on your phone, then connect to your actuator by entering an access code. See Appendix for preliminary steps.

5.5.1 Operation screen


12:02
Operate
MOV8903
17L98734.002
42%
OPEN
CURRENT TORQUE 35 Nm
(26% of max torque)

Before operation


78% 16:55
Operate
MOV8903
17L00157.001
88%
OPEN
STOP
TARGET 100%
CURRENT TORQUE 195 Nm / 264 ft.lb
(39% of max torque)

During operation

Status screen indicates…

- **Top:**
  - access to main menu
  - alternately valve tag and mainboard reference, or control mode
  - warnings or alarms if any
- **Center:** current position of the valve, either CLOSED, opening percentage between 0 and 100%, or OPEN.

You got the following commands to operate the valve:

< > defines target position on the dial with a swipe

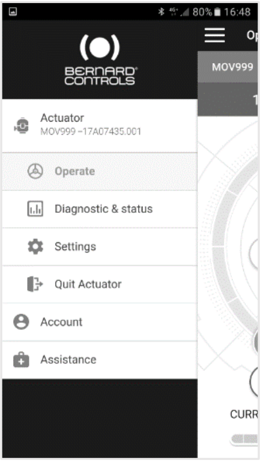
− decreases / + increases the opening target with one or several taps

⤓ closes / ⤒ opens the valve

- **Bottom:** torque level with a torque gauge

5.5.2 Main menu

You can access the main menu anytime by tapping on ☰.

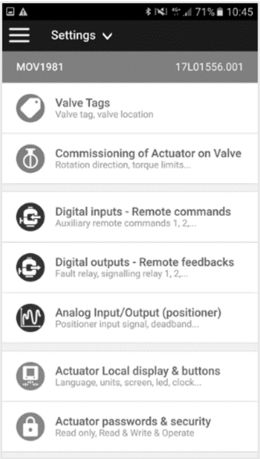

80% 16:48
BERNARD CONTROLS
MOV999
Actuator
MOV999 –17A07435.001
Operate
Diagnostic & status
Settings
Quit Actuator
Account
Assistance
CURR

From main menu, you can access…

- Actuator
  - Operation
  - Diagnostic & status
  - Actuator settings
  - Quit
- Account data
- Assistance info

5.5.3 Settings screen

From the main menu, you can access the settings.


71% 10:45
Settings
MOV1981
17L01556.001
Valve Tags
Valve tag, valve location
Commissioning of Actuator on Valve
Rotation direction, torque limits...
Digital inputs - Remote commands
Auxiliary remote commands 1, 2,...
Digital outputs - Remote feedbacks
Fault relay, signalling relay 1, 2,...
Analog Input/Output (positioner)
Positioner input signal, deadband...
Actuator Local display & buttons
Language, units, screen, led, clock...
Actuator passwords & security
Read only, Read & Write & Operate

Menu screen has 2 main sections…

- **Top:** access to main menu, then valve tag and mainboard reference
- **Settings list:**
  - Valve identification
  - Commissioning of valve
  - Inputs / Outputs / Bus
  - Actuator local settings
  - Access code definition
  - Reset to factory data

5.6 Remote control

The AQ Logic remote control system can be operated using an external or an internal voltage supply.

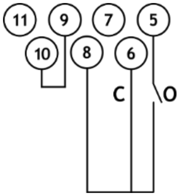
The input circuits are fully opto-isolated. The self-hold pulse command system requires 4 connecting wires on the client terminal strip: Common, STOP, OPEN and CLOSE. If the STOP push-button is not used, do not connect the STOP wire, OPEN (or CLOSE) contact must be maintained to operate the actuator.

> These commands are self-holding (pulse commands) as a standard.
> To remove self-holding, remove wire to terminal 7.

5.6.1 Single switch control

The actuator can be controlled via a single external switch.

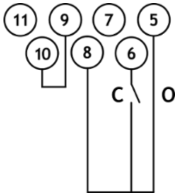
Opening



O : Open
C : Close

- Switch closed: valve opens
- Switch open: valve closes

Closing



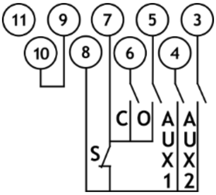
O : Open
C : Close

- Switch closed: valve closes
- Switch open: valve opens

➔ **The actuator has to be configured for the priority type required (open or close). See §6.10)**

5.6.2 Auxiliary remote controls

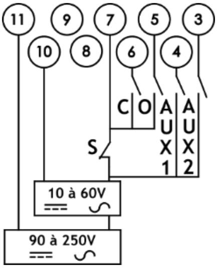
Dry contact control


11
9
7
5
3
10
8
6
4
C
O
AUX1
AUX2
S

S - Stop
C - Close
O - Open

A jumper must be fitted across customer terminal 9-10.

Voltage control


11
9
7
5
3
10
8
6
4
C
O
AUX1
AUX2
S
10 à 60V
90 à 250V

S - Stop
C - Close
O - Open

Remote control can use either in AC or DC voltage :

- Use terminal **10** for voltage from 10 to 60V
- Use terminal **11** for voltage from 90 to 250V

> ! It is imperative to comply with voltage ranges mentioned above, otherwise component will not function or will be damaged.

5.7 Analog Input / Output (OPTION)

5.7.1 Analog signal types

Some actuator configurations can perform control functions in response to a control signal.

Possible signals	Input impedance (ohms)
4-20 mA **0-20 mA** **4-12 mA**	160
12-20 mA	160
0-10V	11000

Positioner board switch setting (see §4.3.4):

- for signals in mA, the switch must be on mA
- for signals in V, the switch must be on V

5.7.2 Positioner configuration

To use this function, Positioner mode has to be activated:

- using Logic menu - see §6.11.1
- using Auxiliary Commands set with Proportional/ON-OFF - see §6.10.1

The input signal is automatically calibrated on the stroke of the actuator (0 - 100%), so there is no need to adjust the operating range of the actuator.

The input signal is isolated from the ON/OFF commands and from the remote position signal.

The actuator can still be operated in ON/OFF mode with the Open, Close and Stop commands or using Proportional control. One of the auxiliary commands must be used to select between these 2 control modes.

In the standard configuration, Auxiliary Command is set on Proportional/ON-OFF to allow the control mode to be selected remotely:

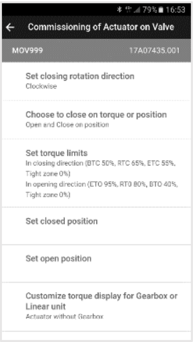
- Proportional = Analog control
- ON/OFF = ON/OFF control.

➔ **For Analog Input/Output settings (e.g. Deadband), see §6.11.**

6 COMMISSIONNING

This section describes the commissioning with the Control panel, except otherwise mentioned.

You can set the same settings with App from the menu **Settings** > **Commissioning of Actuator on valve**.



Commissioning of Actuator on Valve

MOV999 17A07435.001

Set closing rotation direction
Clockwise

Choose to close on torque or position
Open and Close on position

Set torque limits
In closing direction (BTC 50%, RTC 65%, ETC 55%, Tight zone 0%)
In opening direction (ETO 95%, RT0 80%, BTO 40%, Tight zone 0%)

Set closed position

Set open position

Customize torque display for Gearbox or Linear unit
Actuator without Gearbox

> In order to access the actuator settings, control mode must be set to **Local mode**.

6.1 Accessing the actuator menu

To be able to set the actuator software or check the warnings or alarms, you need to access the actuator menu, either with Control panel or BC App depending on which Local control you use.

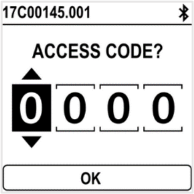
> **It is your responsibility to set the security of the Local Commands (Control Panel or Smartphone Application) for your process:**
>
> - The default position of the **Control selector** button should be on **Remote**
> - The **Access Code** of the actuator should have been changed
> - The remote command "Local Command Inhibition" (from DCS) should be active

To enter the actuator menu, you need first to enter the access code.

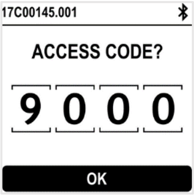
> **If you are the end-user:**
>
> At the first on-site start, we strongly advise you to modify the default **Bluetooth®** access codes. To proceed to these changes, please follow the 2 following procedures.
>
> **Initial access codes are 0000 to check settings or 9000 to modify them.**

How to enter the access code with Control panel

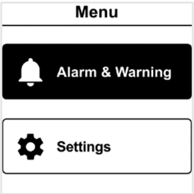
1. Hold the left knob on the right and turn left then right the right knob. Menu access screen appears.


17C00145.001
ACCESS CODE?
0 0 0 0
OK

2. Enter the access code:
   a. Set the digit value with ↓ and ↑.
   b. Validate with **OK** when value is right.
   c. Set the following digit.
      If you validate a wrong value, choose **ESC** and reset it.
   d. Once you have set all digits, validate with **OK**.


17C00145.001
ACCESS CODE?
9 0 0 0
OK

The actuator menu appears.

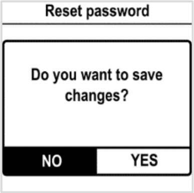

Menu
Alarm & Warning
Settings

How to reset the access codes

1. If the actuator is ON for more than 10 minutes, switch it OFF then switch it ON.

   When on the operation display,

2. Hold both left knob ⦸ and right knob ⊘ during 10s.
3. Reset password screen appears.



Reset password

Do you want to save changes?

4. Select **YES** then validate with **OK**.

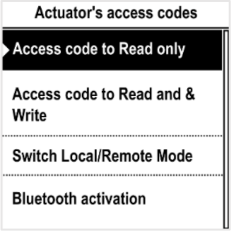
   Access codes are now reset to 0000 and 9000. You can now set again your own access codes.

How to change the Bluetooth® access codes with Control panel

Bluetooth® access codes can only be changed using **Read & Write mode.**

1. Go to Settings > Actuator's access code.

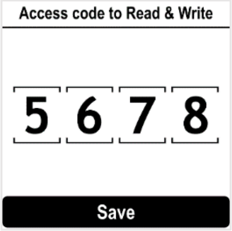
   Actuator's access codes screen appears.



Actuator's access codes

Access code to Read only
Access code to Read and & Write
Switch Local/Remote Mode
Bluetooth activation

2. Depending on the access code you need to change:
   - choose **Access code to Read & Write**
   - else choose **Access code to Read only**
3. Set each digit value with ↓ or ↑, and validate with OK.



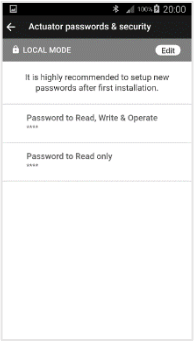
Access code to Read & Write

5 6 7 8

4. When all digits are set, select **Save** and validate with **OK**.
5. Go back to the root menu or quit the settings with several **ESC**.

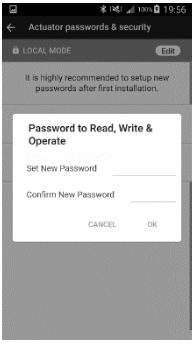
How to change the Bluetooth® Access codes with BC App

1. Go to Main Menu
2. Select **Settings** > **Actuator passwords and security.**
3. The **Actuator passwords & security** menu appears.


20:00
Actuator passwords & security
LOCAL MODE
Edit
Password to Read, Write & Operate
****
Password to Read only
****

It is highly recommended to setup new passwords after first installation.

4. Select the Password you want to change.


19:56
Actuator passwords & security
LOCAL MODE
Edit
Password to Read, Write & Operate
Set New Password
Confirm New Password
CANCEL
OK

It is highly recommended to setup new passwords after first installation.

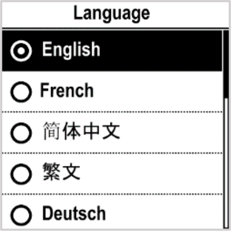
5. Enter your new password and confirm it.
6. Tap on **OK** to validate.

6.2 Set display language

How to change language of your display

1. Enter the menu, then go to **Settings** > **Language**.

   The following screen appears.

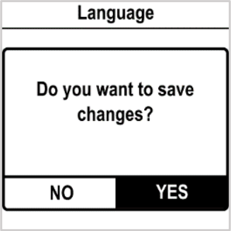


Language

- ◉ English
- ○ French
- ○ 简体中文
- ○ 繁文
- ○ Deutsch

2. Select language desired with ↓ and ↑. then validate with **OK.**
3. Go to **Save** and validate with **OK**.

   The confirmation screen appears.



Language

Do you want to save changes?

4. Select **YES** then validate with **OK**.

   Display language changes accordingly.

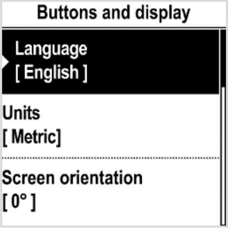
6.3 Set display orientation

Your display orientation can be modified according to the physical orientation of your actuator.

How to change orientation of your display

1. Enter the menu, then go to **Settings** > **Buttons & Display**.

   The following screen appears.



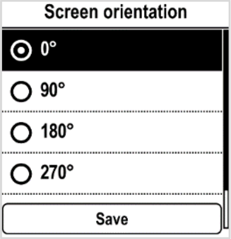
Buttons and display

Language
[English]

Units
[Metric]

Screen orientation
[0°]

2. Select **Screen orientation** then validate with **OK.** The following screen appears.

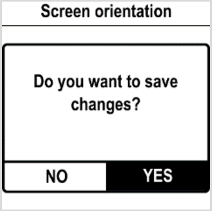


Screen orientation

3. Select rotation angle matching your actuator orientation, and validate with **OK**, then go to **Save** and validate it.

> ⓘ Angle values are counter-clockwise.

The confirmation screen appears.



Screen orientation

Do you want to save changes?

4. Select **YES** then validate with **OK**.

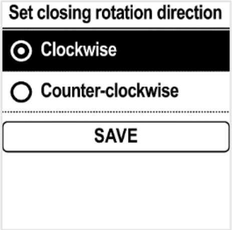
   The display turns accordingly.

6.4 Set closing rotation direction

Default setting for closing direction is clockwise. According to your needs, you may have to change your closing direction.

How to change closing direction

1. Enter the menu, then go to **Settings** > **Actuator commissioning** > **Set closing rotation direction**.



Set closing rotation direction

- ◉ Clockwise
- ○ Counter-clockwise

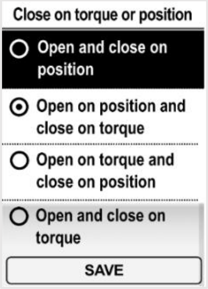
2. Choose the closing rotation direction required, **Clockwise** or **Counter-clockwise** with ↓ or ↑ then confirm with **OK**.
3. Go to **SAVE** with ↓ or ↑ then validate with **OK**.

6.5 Set closing and opening on torque or position

This section allows you to define the way you want to stop actuator travel in both directions. You can choose either **Position** or **Torque**.

How to set opening and closing type of end of travel

1. Enter the menu, then go to **Settings** > **Actuator commissioning** > **Choose to close on torque or position**.



Close on torque or position

○ Open and close on position

⦿ Open on position and close on torque

○ Open on torque and close on position

○ Open and close on torque

SAVE

2. Select your option with ↓ or ↑ then confirm with **OK**.
3. Select **Save** then validate with **OK**.

6.6 Set torque limits

This setting allows to set torque limits at main steps of the travel: at the beginning (**Break**), during the travel (**Run**) and at the end of the travel (**End**).

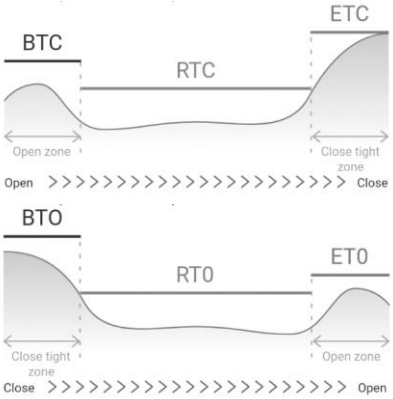
Limits are:

- In closing direction:

Break to Close (**BTC**), Run to Close (**RTC**), End to Close (**ETC**), Tight zone

- In opening direction:

Break to Open (**BTO**), Run to Open (**RTO**), End to Open (**ETO**), Tight zone

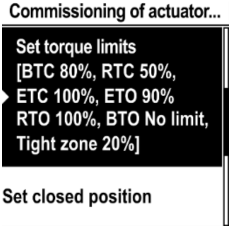


BTO must be higher than ETC and BTC higher than ETO.

> In order to ensure unsitting, Break value should be upper to Tight zone one.

How to set torque limits

1. Enter the menu, then go to **Settings** > **Commissioning**
2. Select **Set torque limits** and validate with **OK.**



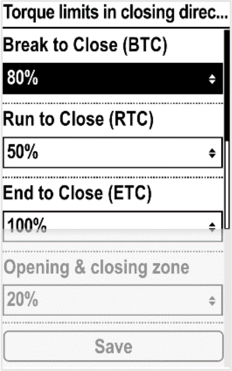
Commissioning of actuator...

Set torque limits [BTC 80%, RTC 50%, ETC 100%, ETO 90% RTO 100%, BTO No limit, Tight zone 20%]

Set closed position

3. Select closing or opening direction and validate with **OK.**

Torque limits screen appears.



Torque limits in closing direc...

Break to Close (BTC): 80%

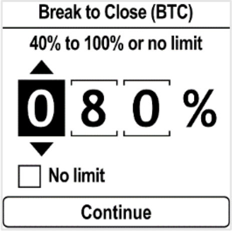
Run to Close (RTC): 50%

End to Close (ETC): 100%

Opening & closing zone: 20%

4. Select the limit to modify with ↓ or ↑ then validate with **OK.**

The torque limits setting screen appears.



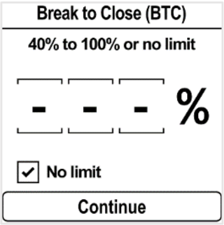
Break to Close (BTC)

40% to 100% or no limit

0 8 0 %

☐ No limit

5. To set **Break** limits:
   - To set No limit, use ↑ or ↑ on 1st digit, then ESC.



Break to Close (BTC)

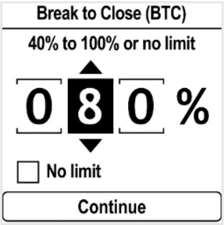
40% to 100% or no limit

- - - %

☑ No limit

Continue

- To set another value, validate 1st digit with **OK,** set the 2nd & the 3rd with ↓ or ↑ then validate each with **OK.**



Break to Close (BTC)

40% to 100% or no limit

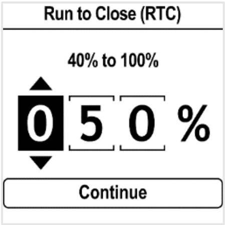
0 8 0 %

☐ No limit

Continue

6. When 3rd digit is validated with **OK**, go to **Continue** with ↓ and validate with **OK.**

   You get back to the list of torque limit settings.
7. To set **Run**, **End** limits and **Tight zone**

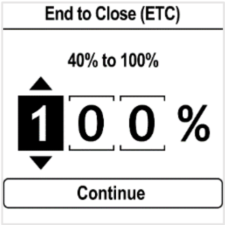


Run to Close (RTC)

40% to 100%

0 5 0 %

Continue

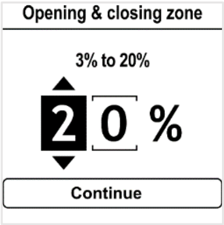


End to Close (ETC)

40% to 100%

1 0 0 %

Continue



Opening & closing zone

3% to 20%

2 0 %

Continue

8. Set each digit value with ↓ or ↑ then validate with **OK** and **continue** with **OK.**
9. When you set all limits required, select **Save** and validate with **OK.**

6.7 Setting open and closed positions

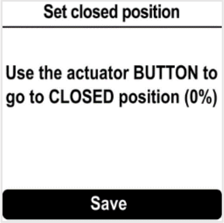
6.7.1 Setting end positions

AQ Logic features position sensor. To set end positions, you have first to record OPEN and CLOSED positions one after the other, depending on the first one set.

How to set CLOSED and OPEN position

1. Enter the menu, then go to **Settings** > **Commissioning** > **Set closed position** (depending on your needs).

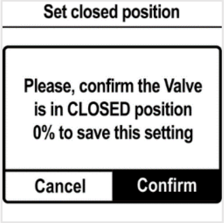
   The setting screen appears.


Set closed position
Save

Use the actuator BUTTON to go to CLOSED position (0%)

2. Close your valve using the closing knob ↧.
3. When the valve is closed, validate **Save** with **OK**.

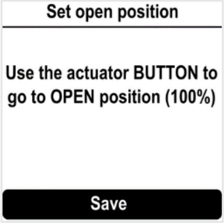
   The confirmation window appears.


Set closed position
Cancel
Confirm

Please, confirm the Valve is in CLOSED position 0% to save this setting

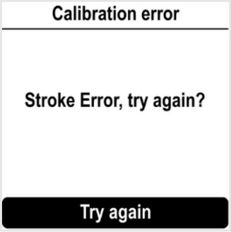
4. Validate **Confirm** with **OK**.

   The setting screen for the opposite setting appears.


Set open position
Save

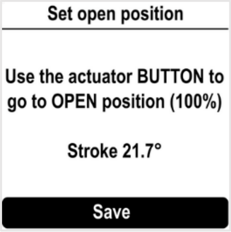
Use the actuator BUTTON to go to OPEN position (100%)

5. Open your valve using the opening knob ⏶.
   An indication of stroke angle appears.
   You can validate with **OK** at any moment; however, if the stroke you set is too small, the following error screen appears.


Calibration error

Stroke Error, try again?

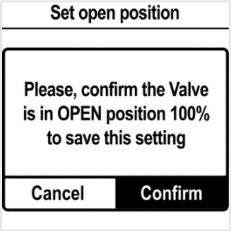
6. Validate **Try again** with **OK** and continue to open your valve.


Set open position

Use the actuator BUTTON to go to OPEN position (100%)

Stroke 21.7°

7. When you reach the correct position, validate **Save** with **OK.**
   The open position confirmation screen appears.


Set open position

Please, confirm the Valve is in OPEN position 100% to save this setting

8. Validate **Confirm** with **OK.**
   Closing and opening positions are set.

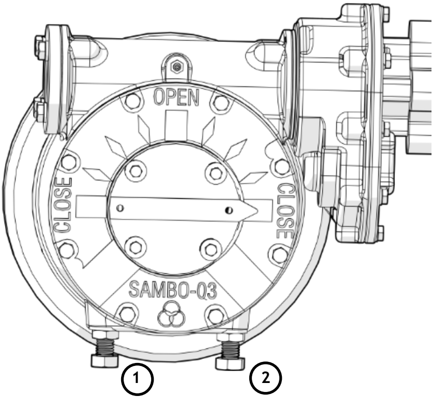
Once end positions are set, proceed to an operation in each direction to check the settings.

6.7.2 Setting mechanical stops

The actuator is factory-set for a 90° travel.

Mechanical stops (**1**: counter-clockwise – **2**: clockwise) mechanically block rotation to protect the valve in case of over-travel in case of handwheel operation. They are factory-set.

They can be set on the lower part of the gearbox.



How to adjust mechanical stops for both directions

Clockwise mechanical stop setting

1. Untighten the nut corresponding to clockwise mechanical stop (**2**) and untighten the mechanical stop for two complete turns.
2. Drive the actuator to clockwise travel limit position.
3. Get the clockwise mechanical stop (**2**) in contact with output sleeve then untighten it for one complete turn.
4. Retighten nut to keep mechanical stop in position.

Counter-clockwise mechanical stop settings

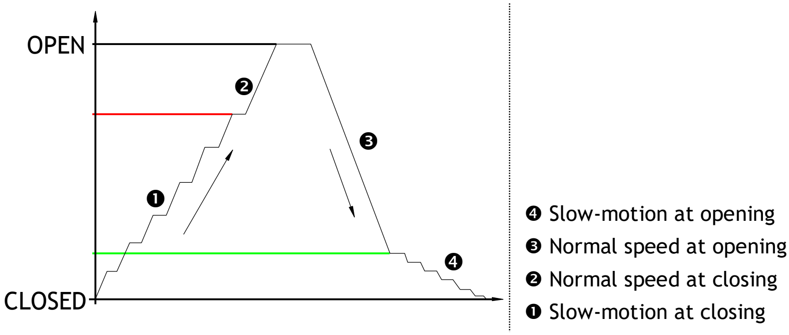
5. Untighten the nut corresponding to counter-clockwise mechanical stop (**1**) and untighten the mechanical stop for two complete turns.
6. Drive the actuator to the counter-clockwise travel limit position.
7. Get the counter-clockwise mechanical stop (**1**) in contact with output sleeve then untighten it for one complete turn.
8. Retighten nut to keep mechanical stop in position.

Perform complete electrical valve opening and closing operations. The motor must stop on the positions set in the software and not on the mechanical stops.

6.8 Setting speed control (Timer) (OPTION)

Speed control allows to reduce speed of operation of actuator, for instance to protect a pipe from water hammer.

You can set travel sections with reduced opening or closing speed.



The following options are available.

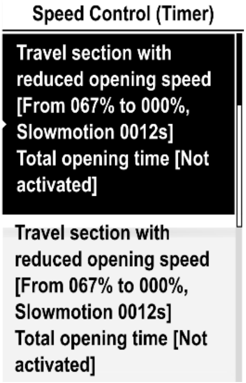
- Beginning of slow-motion zone (opening/closing direction)
- End of slow-motion zone (opening/closing direction)
- Slow-motion duration

Total opening/closing time are results of slow-motion duration and normal speed duration.

How to set timer

1. Enter the menu, then go to **Settings** > **Actuator Commissioning** > **Speed Control (Timer).**

   The setting screen appears.



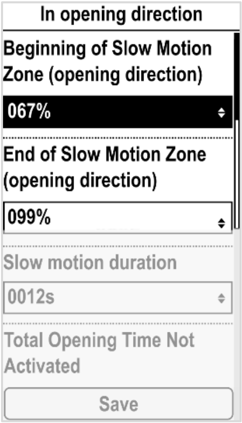
Speed Control (Timer)

Travel section with reduced opening speed [From 067% to 000%, Slowmotion 0012s] Total opening time [Not activated]

Travel section with reduced opening speed [From 067% to 000%, Slowmotion 0012s] Total opening time [Not activated]

2. Either you select opening or closing direction, select it then confirm with **OK**.

   Following screen is displayed.



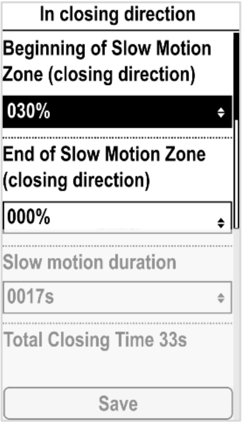
In opening direction

Beginning of Slow Motion Zone (opening direction): 067%

End of Slow Motion Zone (opening direction): 099%

Slow motion duration: 0012s

Total Opening Time Not Activated



In closing direction

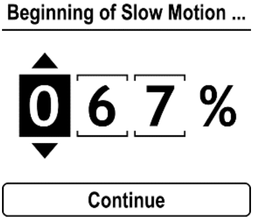
Beginning of Slow Motion Zone (closing direction): 030%

End of Slow Motion Zone (closing direction): 000%

Slow motion duration: 0017s

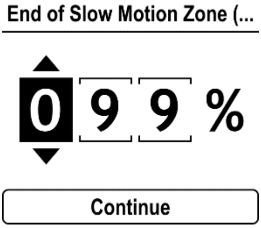
Total Closing Time 33s

3. Select **Beginning of Slow Motion Zone**.
   The following screen is displayed.


Beginning of Slow Motion ...

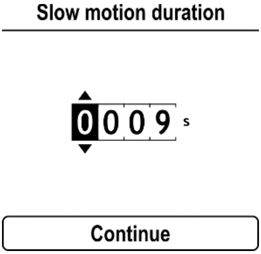
067 %

4. Set the position in % between Closing (0%) and Opening (100%) and confirm with **Continue**.
5. Select **End of Slow Motion Zone**.
   The following display is displayed.


End of Slow Motion Zone (...

099 %

6. Set the position in % between Closing (0%) and Opening (100%) and confirm with **Continue**.
7. Select **Slow motion duration**.
8. The following screen is displayed.


Slow motion duration

0009 s

9. Set the duration then confirm with **Continue**.
10. Go to **Save** with ↓ or ↑ then validate with **OK**.

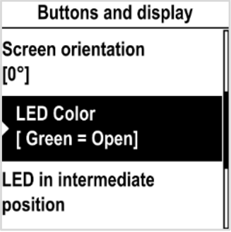
- The maximum duration that can be entered is 9999s.
- The maximum number of steps depends on many factors and cannot be guaranteed by Bernard Controls.

6.9 Set LEDs configuration

Your LEDs configuration can be adjusted according to the standard of your country.

How to set LEDs configuration

1. Enter the menu, then go to **Settings** > **Buttons & Display.**
   The **Buttons & Display** screen appears. Go down in the menu to **LED color**.



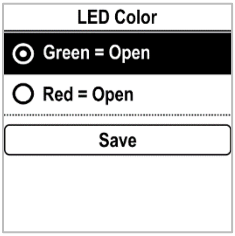
Buttons and display

Screen orientation
[0°]

LED Color
[Green = Open]

LED in intermediate position

2. Validate with **OK**. The LED color screen appears.



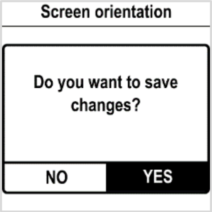
LED Color

● Green = Open

○ Red = Open

Save

3. Select corresponding setting then validate with **OK**.
4. Go to **Save** and validate it. The confirmation screen appears.



Screen orientation

Do you want to save changes?

NO YES

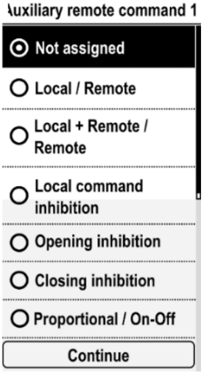
5. Select **YES** and validate.

6.10 Set Remote commands inputs

6.10.1 Set Auxiliary Remote commands

To set Auxiliary Remote commands, go to **Settings** > **Digital inputs - Remote Commands**.

The following settings are available:



uxiliary remote command 1

● Not assigned

○ Local / Remote

○ Local + Remote / Remote

○ Local command inhibition

○ Opening inhibition

○ Closing inhibition

○ Proportional / On-Off

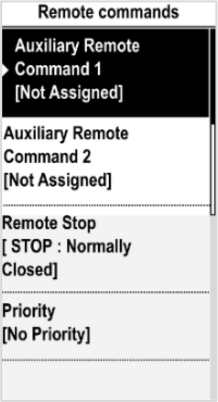
6.10.2 Set Priority for remote commands

Priority allows to reverse the direction of travel when an operation is in progress without having to stop actuator.

How to set priority for remote command

1. Enter the menu then go to **Settings** > **Remote commands**.

   The **Remote Commands** screen appears.



Remote commands

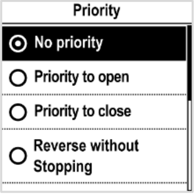
Auxiliary Remote Command 1 [Not Assigned]

Auxiliary Remote Command 2 [Not Assigned]

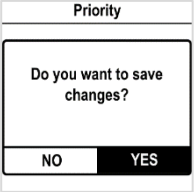
Remote Stop [STOP : Normally Closed]

Priority [No Priority]

2. Go down in the menu list, then select **Priority** with **OK**.
3. Select the priority action in the list then validate it with **OK**.


Priority
◉ No priority
○ Priority to open
○ Priority to close
○ Reverse without Stopping

4. Go down to **Save** and validate with **OK**. The confirmation screen appears.

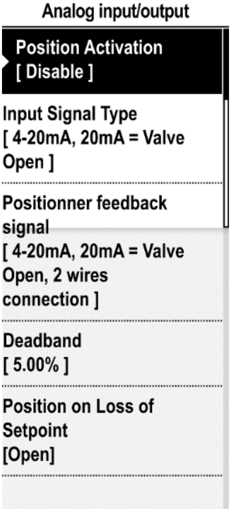

Priority
NO
YES

Do you want to save changes?

5. Select **YES** and validate.

6.11 Set Analog Input / Output (OPTION)

To set analog input/ouput, go to **Settings** > **Analog input/output** and set the different options necessary.


Analog input/output

Position Activation [Disable]

Input Signal Type [4-20mA, 20mA = Valve Open]

Positionner feedback signal [4-20mA, 20mA = Valve Open, 2 wires connection]

Deadband [5.00%]

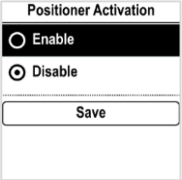
Position on Loss of Setpoint [Open]

6.11.1 Activate positioner

If present, the actuator can operate as a positioner using a proportional command, such as a 4-20 mA analogue signal.

How to activate positioner

1. From **Analog Input/Output** menu, enter Positioner Activation.
2. The **Positioner Activation** screen appears.

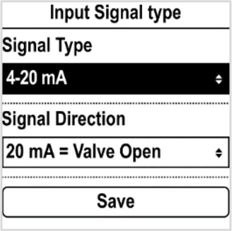

Positioner Activation
○ Enable
◉ Disable
Save

3. Select Enable then validate with **OK**.
4. Go to **Save** then validate with **OK**. The **Positioner Activation** confirmation screen appears.
5. Select **YES** then validate with **OK**. You go back to **Analog Input/Output** menu.

6.11.2 Set Input signal

How to set Input Signal

1. From **Analog Input/Output** menu, enter **Input Signal Type**. The **Input Signal type** screen appears.

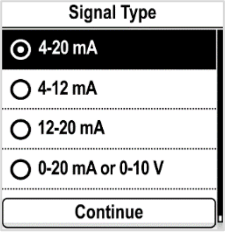


Input Signal type

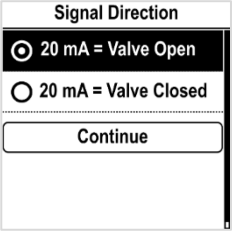
Signal Type: 4-20 mA

Signal Direction: 20 mA = Valve Open

2. For **Signal Type** and **Signal Direction** settings:
   a. Select the setting to adjust and validate with OK.
   The corresponding setting screen appears.



Signal Type



Signal Direction

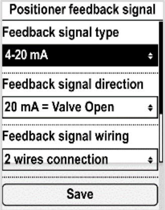
   b. Select the desired value and validate with OK.
   c. **Continue** button is highlighted, validate with **OK**.
   d. The display goes back to **Input signal type** screen.
3. Go to **Save** then validate with **OK**. The **Input Signal Type** confirmation screen appears.
4. Select **YES** then validate with **OK**. You go back to **Analog Input/Output** menu.

6.11.3 Set Positioner feedback signal

How to set Positioner Feedback signal

1. From **Analog Input/Output** menu, enter **Positioner feedback signal.**

   The Positioner feedback signal screen appears.



Positioner feedback signal

Feedback signal type: 4-20 mA

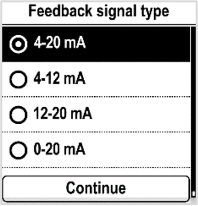
Feedback signal direction: 20 mA = Valve Open

Feedback signal wiring: 2 wires connection

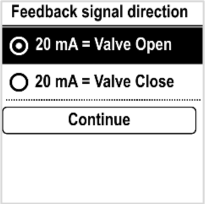
2. For **Feedback Signal Type, Feedback Signal Direction** and **Feedback Signal Wiring** settings:

   a. Select the setting to adjust and validate with OK.

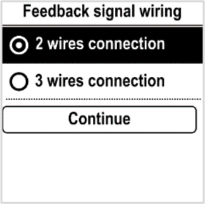
   The corresponding setting screen appears.



Feedback signal type
● 4-20 mA
○ 4-12 mA
○ 12-20 mA
○ 0-20 mA
Continue



Feedback signal direction
● 20 mA = Valve Open
○ 20 mA = Valve Close
Continue



Feedback signal wiring
● 2 wires connection
○ 3 wires connection
Continue

   b. Select the desired value and validate with **OK.**

   c. **Continue** button is highlighted, validate with **OK.**

   The display goes back to **Input signal type** screen.

3. Go to **Save** then validate with **OK.**

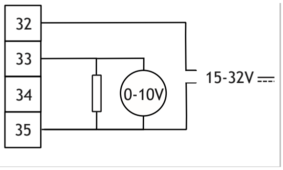
   The **Input Signal Type** confirmation screen appears.

4. Select **YES** then validate with **OK.**

   You go back to **Analog Input/Output** menu.

The 0-10V signal can be obtained using a 0-20mA combined with a 500 ohm (or 499 ohm 1%) resistor.

The power supply will be 15 to 32V.



32
33
34
35
0-10V
15-32V ⎓

6.11.4 Set Deadband

The deadband value is the maximum allowable difference between the signal and the actuator position when no action occurs. This setting is made at the factory, but it is possible to adjust it.

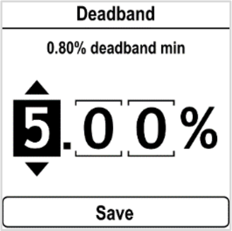
- If the deadband is too narrow, the actuator could hunt, moving back and forth around the expected position without stabilizing;
- If the deadband is too wide, positioning operations are less precise.

Default deadband is 1%.

How to set Deadband

1. From **Analog Input/Output** menu, enter **Deadband**.

   The **Input Signal type** screen appears.



Deadband

0.80% deadband min

5.00%

2. For each digit
   a. Select the digit to adjust.
   b. Adjust the digit with ↓ or ↑.
   c. Validate with **OK**.

   When the last digit is validated, **Save** is highlighted.
3. Validate with **OK**.

   The **Deadband** confirmation screen appears.
4. Select **YES** then validate with **OK**.

   You go back to **Analog Input/Output** menu.

6.11.5 Fail-Safe position

When a 4-20 mA input signal is used, it is possible to set up a fail-safe position for use if the control signal is lost.

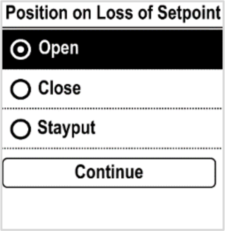
> This function cannot be used with 0-20 mA signals, as the system cannot discern a lost signal and a 0 mA value.

This function is active in the standard configuration, and the actuator remains in position if the signal is lost.

How to set Position on Loss of Setpoint

1. From **Analog Input/Output** menu, enter **Deadband**.

   The **Input Signal type** screen appears.



2. For each digit

   a. Select the digit to adjust.

   b. Adjust the digit with ↓ or ↑.

   c. Validate with **OK**.

   When the last digit is validated, **Save** is highlighted.

3. Validate with **OK**.

   The **Deadband** confirmation screen appears.

4. Select **YES** then validate with **OK**.

   You go back to **Analog Input/Output** menu.

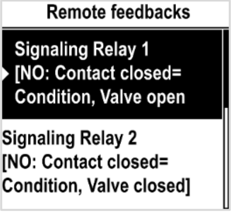
6.12 Set Relays configuration

Available relays can be configured for specific functions.

How to set Relays

> ⓘ Following procedure runs through the procedure with the 3 default relays installed. Procedure is the same for optional relays.

1. Enter the menu then go to **Settings** > **Remote feedbacks**. The **Remote Feedbacks** screen appears.

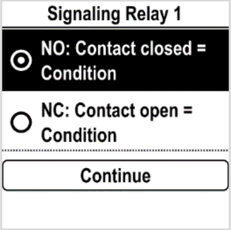


Remote feedbacks

Signaling Relay 1 [NO: Contact closed= Condition, Valve open

Signaling Relay 2 [NO: Contact closed= Condition, Valve closed]

2. To set a signaling relay, select it and validate with **OK.**
3. The **Signaling Relay** screen appears.
4. To set the condition, select **Contact closed** or **Contact open** option then validate with **OK.**



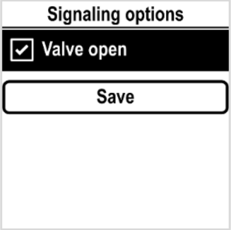
Signaling Relay 1

● NO: Contact closed = Condition

○ NC: Contact open = Condition

Continue

5. Validate **Continue** with **OK**. **Signaling options** screen appears.



Signaling options

☑ Valve open

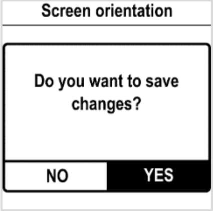
Save

6. Select an option in the list.

   For default relays, options are:

Relay 1	Relay 3	
• Valve open	*Information*	*Faults*
Relay 2	• Valve open • Valve closed • Torque limiter opening direction • Torque limiter closing direction • Actuator is opening • Actuator is closing • Actuator is running • Intermediate position indication • OFF mode • Local mode • Remote mode	• Stopped in intermediate position • Motor thermal overload • Jammed valve • Phase loss • Power on • Handwheel action • Relay operated by Fieldbus
• Valve closed		

7. You can select several option by navigating to the option then ticking it with **OK**.
8. Go to **Save** and validate it. The confirmation screen appears.



Do you want to save changes?

9. Select **YES** and validate.

6.13 Setting Forced local mode in Remote mode

You need 2 steps to be able to use Forced local mode:

1. Allowing switch to Local mode with Local control
2. Switch to Local mode with App

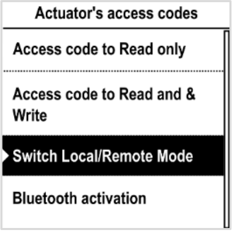
6.13.1 Allowing / Inhibit switch to Local control

How to allow or inhibit switch to Local control

1. Enter the menu with **Access code to Read and Write**
2. Go to **Settings** > **Actuator’s access codes**

   The Actuator’s access codes screen appears.

   Go down in the menu to Switch Local/Remote Mode.



Actuator's access codes

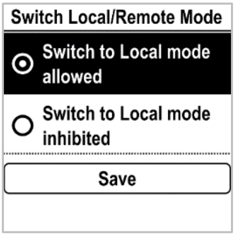
Access code to Read only

Access code to Read and & Write

Switch Local/Remote Mode

Bluetooth activation

3. Validate with **OK**. The Switch Local/Remote Mode screen appears.



Switch Local/Remote Mode

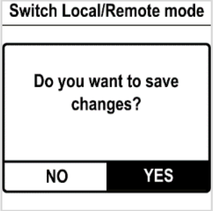
● Switch to Local mode allowed

○ Switch to Local mode inhibited

Save

4. To allow switch to Local control, select **Switch to Local mode allowed** else select **Switch to Local mode inhibited**, then validate with **OK**.

5. Go to **Save** and validate it. The confirmation screen appears.


Switch Local/Remote mode

Do you want to save changes?

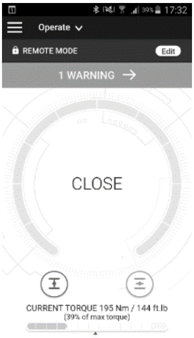
6. Select **YES** and validate.

6.13.2 Switching to Local control with App

You can only proceed to this operation if **Control selector** is on **Remote** on the actuator and actuator set on **Switch to local mode allowed**.

How to switch to Local control with App

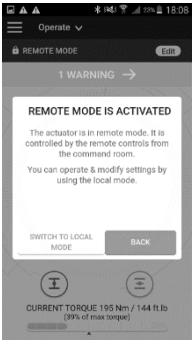
1. Ensure you are on **Operate** screen.



CURRENT TORQUE 195 Nm / 144 ft.lb
(39% of max torque)

If the switch is inhibited, an **Info** button replaces the **Edit** button.

2. Tap on **Edit**. The App asks for confirmation.


18:08
Operate
REMOTE MODE
Edit
1 WARNING
SWITCH TO LOCAL MODE
BACK

REMOTE MODE IS ACTIVATED

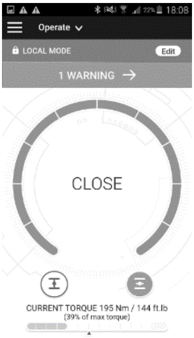
The actuator is in remote mode. It is controlled by the remote controls from the command room.

You can operate & modify settings by using the local mode.

CURRENT TORQUE 195 Nm / 144 ft.lb
(39% of max torque)

3. Tap on **Switch to Local Mode**.

   Remote mode becomes **Local mode**.


18:08
Operate
LOCAL MODE
Edit
1 WARNING
CLOSE

CURRENT TORQUE 195 Nm / 144 ft.lb
(39% of max torque)

You can now operate your actuator as if it is set on **Local mode**.

ⓘ To get back to **Remote mode**, simply tap again on the **Edit** button.

7 OPERATION

7.1 Emergency Manual Command

AQ 150-1000 actuators feature a handwheel for emergency operation.

To avoid potentially harmful turning protruding parts during electrical operation, AQ 150-1000 handwheels feature a foldable handle: you can fold it during electrical operation and unfold it if you need to operate the actuator manually.

> ! Beware, automatic clutch. Use the Manual Command only when electric motor commands are inactive or local knob on OFF.

7.2 Local control operation

To use:

- Local control mode with Control panel
  - ➔ **see §5.3**
- Local control mode with Smartphone
  - ➔ **see §5.4**
- Forced Local control mode from Remote mode, with Smartphone:
  - ➔ **see §6.13 - how to allow modes switch then switch modes, and §5.4 to use Local mode with Smartphone**

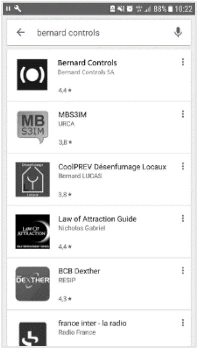
APPENDIX

I. Starting with BC App

Installing the application

> An Internet connection is required on your smartphone.

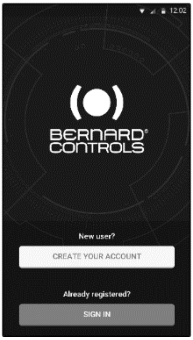
1. Go to your app store and search for “**Bernard Controls**”.


10:22
bernard controls
Bernard Controls
Bernard Controls SA
4,4 ★
MBS3IM
URCA
3,8 ★
CoolPREV Désenfumage Locaux
Bernard LUCAS
3,8 ★
Law of Attraction Guide
Nicholas Gabriel
4,4 ★
BCB Dexther
RESIP
4,3 ★
france inter - la radio
Radio France

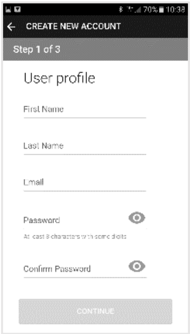
2. Once retrieved, download and install **BC App**.
   Once installed, start the App. Log in or follow free account creation screen sequence if it is your first start.

12:02
BERNARD CONTROLS

>


12:02
BERNARD CONTROLS
New user?
CREATE YOUR ACCOUNT
Already registered?
SIGN IN

>


70% 10:38
CREATE NEW ACCOUNT
Step 1 of 3
User profile
First Name
Last Name
Email
Password
At least 8 characters with some digits
Confirm Password
CONTINUE

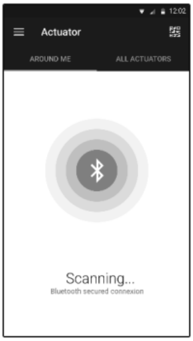
>…

Connecting to your actuator

Once account is confirmed, your smartphone is ready to connect to your actuators. Connection to actuators is achieved with Bluetooth®.

1. Start the App and log in your account.
2. Once logged, App will start to scan for actuators nearby.
3. If the desired actuator is found, select it.

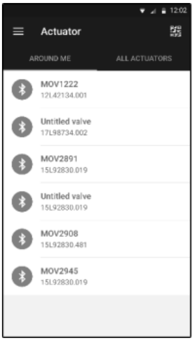
   If not, retry or scan the actuator QR code on the sticker or enter its serial number.


12:02
Actuator
AROUND ME
ALL ACTUATORS

Scanning...

Bluetooth secured connexion

>


12:02
Actuator
AROUND ME
ALL ACTUATORS

MOV1222 12L42134.001

Untitled valve 17L98734.002

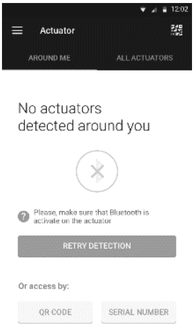
MOV2891 15L92830.019

Untitled valve 15L92830.019

MOV2908 15L92830.481

MOV2945 15L92830.019

or

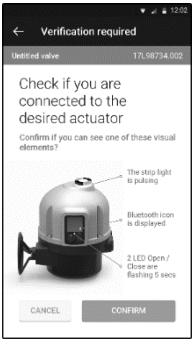

12:02
Actuator
AROUND ME
ALL ACTUATORS

No actuators detected around you

Please, make sure that Bluetooth is activate on the actuator

RETRY DETECTION
Or access by:
QR CODE
SERIAL NUMBER

4. Check that you are connected to the correct actuator (the 2 LEDs in front of the actuator should blink and the Bluetooth icon on the screen has between +), then enter Access code.

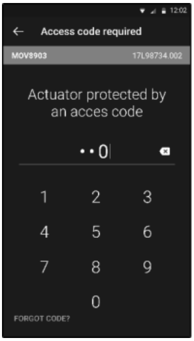

12:02
Verification required
Untitled valve
17L98734.002

Check if you are connected to the desired actuator

Confirm if you can see one of these visual elements?

The strip light is pulsing
Bluetooth icon is displayed
2 LED Open / Close are flashing 5 secs
CANCEL
CONFIRM

>


12:02
Access code required
MOV8903
17L98734.002

Actuator protected by an acces code

••0
1
2
3
4
5
6
7
8
9
0
FORGOT CODE?

II. Alarm and Settings menu tree (options not detailed)

Level 1	Level 2	Level 3
Alarm & Warnings		
Settings	Language	(list of languages)
	Valve tags	Valve tag Location and process
	Actuator commissioning	Set closing direction Closing & Opening Type Set torque limits Set closed position Set open position
	Remote commands	Auxiliary remote commands 1 Auxiliary remote commands 2 Remote stop
	Remote feedbacks	Signaling relay 1 Signaling relay 2 Signaling relay 3
OPTIONAL	Analog input/output	
	Profibus	
	Modbus	
	Devicenet	
	Hart	
	Foundation fieldbus	
	Buttons and display	Language Units Screen orientation LED Color LED in intermediate position Button mode
	Actuator's Passwords	Password to Read only Password to Read & Write Bluetooth Local/Remote security Bluetooth activation
	Factory data	Actuator type Mechanical features Motor features Electrical features Firmware

III. Alarms and warnings list

System alarms (Fault Relay)	Warnings
Locked motor in open direction	Overtravel
Locked motor in close direction	Activity memory fault
Torque sensor fault	Excessive number of starts
Position sensor fault	Auxiliary power supply fault for external circuits
Abnormal rotation direction in Opening	Local Button fault
Abnormal rotation direction in Closing	Selector Off activated
Configuration memory fault	Selector Local activated
Lost phase (3-phase motor)	Position fault (<-10% and >110%)
Thermal overload	Auxiliary command 2 internal error
Valve jammed	Actuator hunting action detected
Lost signal 4-20mA	Handwheel action
Communication fault between main board and HMI	
Communication Fieldbus fault	
Loss of main power	
Communication between the Main board and the Fieldbus board	

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