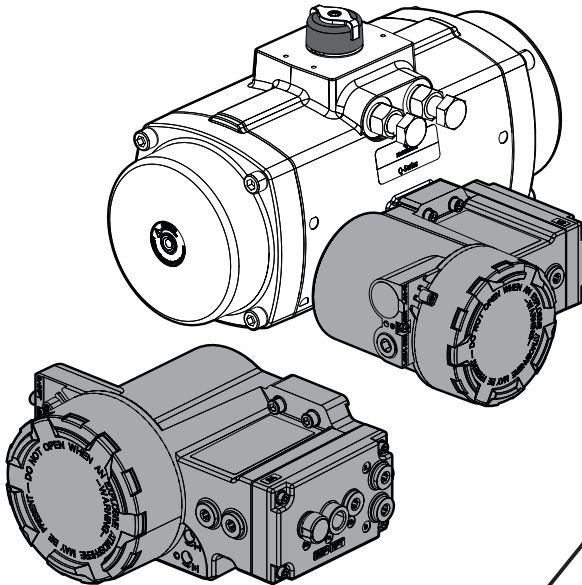


# Bettis Q-Series Control Module QC40 AS-Interface



## 1 Applicable Control Modules

- QC40 - AS-Interface Weather proof IP66/  
NEMA4X
- QC40 - AS-Interface Non-Incendive  
or Non Sparking

### Note:

These variations can be equipped with one or two pilot valves:

- \* One pilot valve is default and suitable for normal operation of double acting or spring return actuators.
  - \* Two pilot valves are required for Fail in Last Position function on double acting actuators.
- The enclosures have a IP66 or NEMA 4X, ingress protected rating.

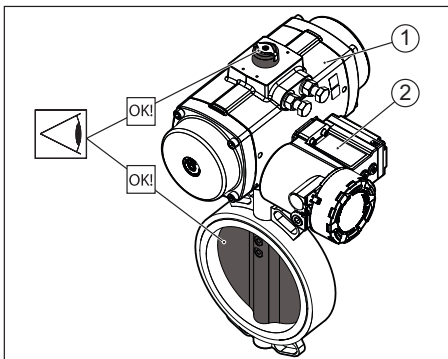


Fig. 2.1 Check proper mounting before connecting air supply and electrical wiring.

## 2 Before starting

- \* Actuator must be isolated both pneumatically and electrically before any (dis)assembly is begun.
- \* Hazards related to the control of external processes under measurement, are beyond the scope of the content described in this document.
- \* Installation, adjustment, putting into service, use, assembly, disassembly and maintenance of the control module must be done by qualified personnel.
- \* Do not install, operate, or maintain a Q-Series control module without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance.
- \* To avoid personal injury or property damage, it is important to carefully read, understand, and follow all of the contents of this manual, including all safety cautions and warnings.
- \* Be sure that the actuator is correctly mounted before connecting air supply and electrical wiring (see Installation and Operation Manual Bettis Q-Series Valve Actuator, DOC.IOM.BQ.E)
- \* Check the module label for the right execution (see Figure 2.2)
- \* Check the type of actuator: single or double acting (see Figure 2.2).
- \* For mechanical installation of the module see installation instruction leaflet DOC.QC4.MTI.1, as shipped with the module.
- \* If you have any questions regarding these instructions, contact your Emerson sales office before proceeding as shipped with the module.

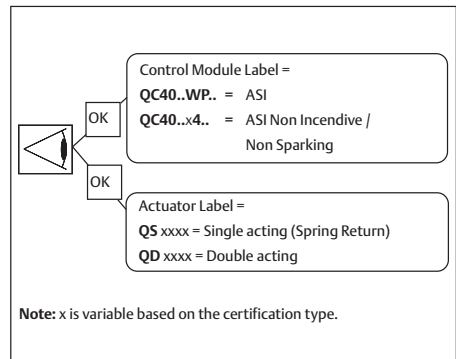


Fig. 2.2 Identification

Note: x is variable based on the certification type.

## 2.1 Mechanical alignment and mounting of the control module

The control module is equipped with an alignment-edge on top of the module.

This allows easy alignment and mounting of the control module on to the actuator housing.

### Procedure: (see Figure 2.3)

1. First take care that both mating faces from the actuator and control module are clean and free of dirt.
2. Check if the module has the required function
3. Remove the transparent film from the control module.
4. Ensure seals are placed correctly.
5. Level the screws with the surface.
6. Place the alignment-edge (1) of the control module at the top of the pneumatic interface.
7. Flip the module down taking care that the IPT Probe (2) on the actuator fits in the mating hole on the control module and loosely place the screws.
8. Tighten screws according force in sequence.

### Tightening moments

The Control Module should be fastened by using an Allen key and applying the following tightening moments:

- Allen Key: No 5
- Torque: 6.1 to 6.6 Nm (54 - 58.4 in.lb)

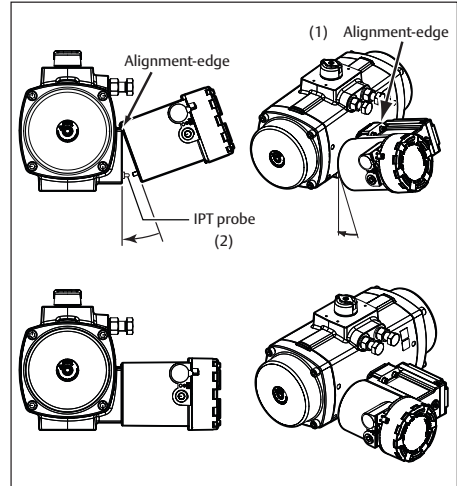


Fig. 2.3 Alignment and mounting of control module to actuator

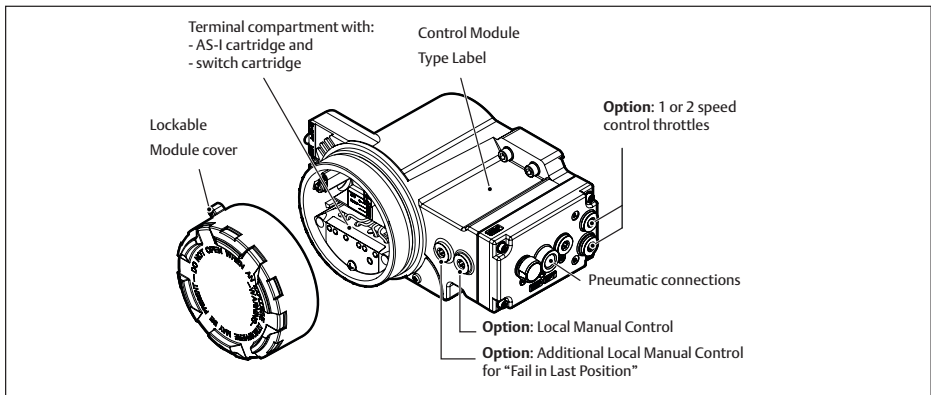


Fig 2.4 Control module overview

### 3 Pneumatic connections



#### IMPORTANT

- 1 The actuator/valve combination can move after connecting the air supply.
  - 2 Ensure that the QC40 control modules are mounted properly to the actuator to achieve good functioning and the required ingress protection, before connecting the air supply.
  - 3 Check that the maximum supply pressure  $P_{max} = 8 \text{ bar}/116 \text{ psi}$
  - 4 Be sure that the minimum required supply pressure for the application is available at the actuator.
  - 5 Take appropriate measures to prevent condensation or moisture to entering the actuator or the control module. Condensation or moisture can damage these components and can result in failures.
  - 6 The exhaust ports Ra and Rb on the module (see Figure 3.1) are shipped from the factory with transport protection.
- \* If ingress protection IP66 or NEMA 4X is required, appropriate connections must be used in exhaust ports Ra and Rb.

#### 3.1 Operating media :

- \* Air or inert gasses.
- \* Air filtered at  $50 \mu\text{m}$ .
- \* Dew point 10 K below operating temperature.
- \* For subzero applications take appropriate measures.

#### 3.2 Single acting (spring return) or Double acting actuator:

- 1 Remove the transport sticker from the air supply (Ps).
- 2 Connect air supply to port (Ps).

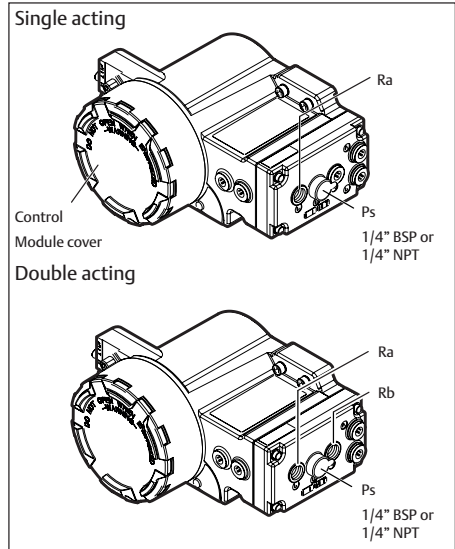


Fig. 3.1 Pneumatic connections

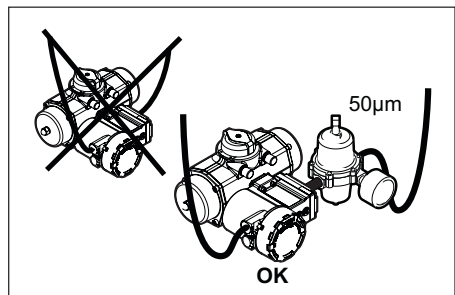


Fig 3.2 Install drip loops

## 4 Electric Connections

Table 4.1 Electrical data QC40 - ASI

Protocol	AS-Interface Spec3.0
Maximum Voltage	31.6 V
Minimum Current (pilot valves off)	34 mA at 26.5 V
Nominal Current (one pilot valve activated)	85 mA at 26.5 V
Maximum Current Consumption (one pilot valve application)	125 mA at 26.5 V
Maximum Current Consumption (two pilot valves application)	140 mA at 26.5 V
Protection	Short circuit detection
<b>Note:</b>	The current consumption of feedback switches is included. Check the product data sheet for one or two pilot valves application.
<b>Environmental conditions :</b>	
Temperature *	Ambient: -25°C to +60°C (-4°F to +140°F) Maximum Surface: 80°C (176°F)
Humidity	0 to 85% at 25°C(+77°F) derate to 50% above 40°C (104°F) (non-condensing).
Altitude	Operating full power available up to 2000 meter (6000 feet).
Use	In- and outdoor.

- \* The current restricted power supply meets NEC Class 2, as described by the National Electrical Code® (ANSI/NFPA 70 (NEC®))
- \* In case the Control module is used in Hazardous locations, check the Control Drawings as per chapter 10 for the applicable temperature range.

Table 4.2 Wiring dimensions

Wire type:	Dimensions:
Cable range	0.33 - 2.5 mm <sup>2</sup> or 22 - 12 AWG

Please check [www.as-interface.net](http://www.as-interface.net) for various application guides like installation and wiring guidelines.

Table 4.3 Tools

Screw:	Tool:
Terminals	Screw driver: 0.6 x 3.5
Earth screws	Screw driver for cross slotted Phillips screws nr. 2.

### WARNING:

- \* If the Control Module is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- \* If required, mount earth wire (1) between top (2) and bottom (3) ring of earth wire connection (see Figure 4.1).

### 4.1 Electrical data for hazardous area executions

Please check chapter 10 for electrical data and instructions in case an "Non Incendive/Non Sparking" Control Module is used in hazardous locations (Zone 2 or Class I Div.2).

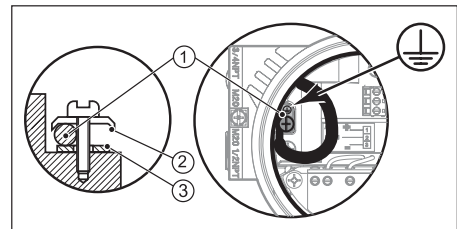


Fig. 4.1 Earth wire connections

**4.2 Procedure**

- 1 Remove Control Module cover (see Figure 4.2).
- 2 Guide the cable(s) through the electrical entry(ies).
  - Use and mount cable glands as required by national or local legislation.
  - When IP66/NEMA4X ingress protection is required, the electrical entries must be fitted with glands rated IP66/NEMA4X or higher.
- 3 Make the electrical connections as shown in Figure 4.3.
  - For hazardous area connections, see the instructions in chapter 10
  - Quick connectors, as shown below, are allowed to be used only for non-explosion safety product application
- 4 Mount the function module cover to the housing (see Figure 4.2) or continue with chapter 5. Take care that the cover seal is in place to comply to dust and water tightness according to IP66 / NEMA4X.

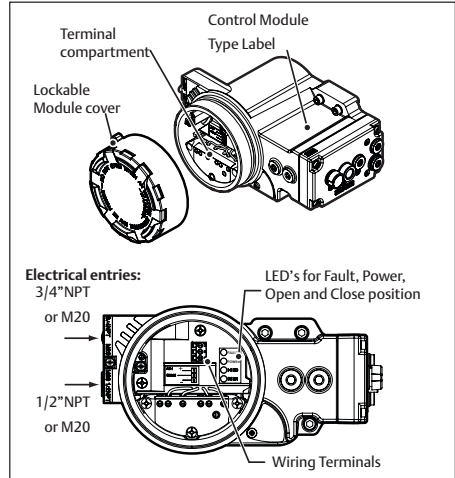


Fig. 4.2 Terminal connections behind cover.

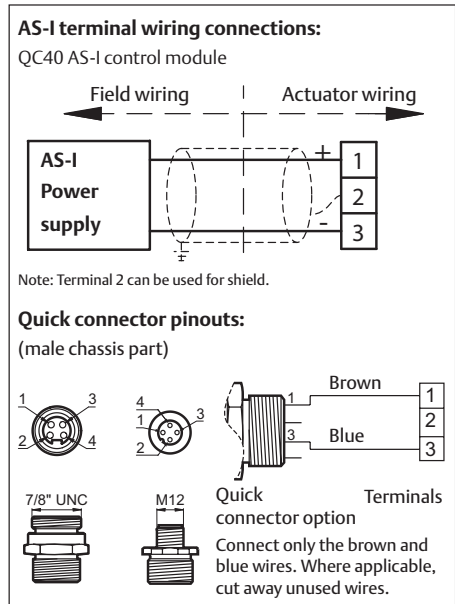


Fig. 4.3 Terminal connections and quick connector pinouts

## 5 Commissioning

In order to commission the QC40 ASI Control Module, the following actions must be considered or done:

- 1 Re-adjustment of the limit switch points if the factory setting do not meet the application requirements
- 2 Addressing of the QC40 ASI Control Module

### 5.1 Re-adjustment of the limit switch points

#### 5.1.1 Factory switch point settings

Mechanical stroke:  $90^{\circ} \pm 0.5^{\circ}$  (Actuator setting)

Switch points:  $\pm 15^{\circ}$  before each end of stroke (open and closed position, see Figure 5.1).

Adjustable range:  $-20^{\circ}$  to  $+3^{\circ}$  at each end.

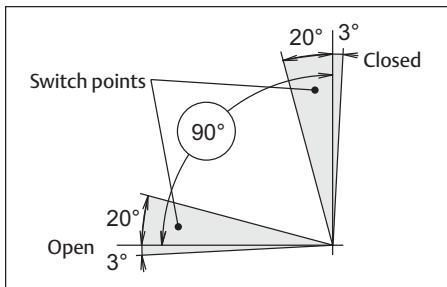


Fig. 5.1 Adjustable range

If required the mechanical stroke and the limit switch setting can be re-adjusted.

- For mechanical stroke adjustment of the actuator, please see document DOC.IOM.BQ.E, available from [www.emerson.com/bettis](http://www.emerson.com/bettis).
- For re-adjusting the limit switches, see procedure below.

#### 5.1.2 Before re-adjusting the limit switch points

##### IMPORTANT

- \* Before mounting the actuator on the valve, be sure that both the actuator and the valve have the same “open” or “closed” position.
- \* Set the Mechanical stroke before setting the limit switches.

#### 5.1.3 Pneumatic and electrical connections

Make pneumatic and electrical connections before adjusting the limit switch setting. See chapter 3 and 4.

#### 5.1.4 Switch point setting and valve rotation direction.

The QC40 ASI Control Module is equipped with non-intrusive switch point adjustment. The adjustment screws are accessible behind a shield in the front of the module (see fig 5.2).

This means that the switch point adjustment can be done without opening the module.

Normally valves are “Closed” after a clock wise rotation.

- In this case the top adjustment screw (see Figure 5.2), sets the switch point of the “Closed” position and bottom adjustment screw sets the switch point of the “Open” position.
- For a valve that is “Open” after a clock wise rotation, the position feedback will be reversed.

The Table below indicates which re-adjustment screw is related to the “Open” or “Closed” switch point setting.

Table 5.1 Re-adjustment screws

Re-adjustment screw :	Valve movement	
	“Close” after a clock wise rotation	“Open” after a clock wise rotation
Bottom	Open position	Close position
Top	Close position	Open position

### 5.1.5 Working principles Switch Operating Mechanism (see Figure 5.2)

The Switch Operating Mechanism is intended to operate the position feedback switches and allows adjustment of the switch points in the open and closed end positions. Factory setting is that the switches are activated 15° before the end of the open and closed stroke.

#### Switch Operation

The rotation of the actuators pinion operates the IPT device (1) which results in a linear movement. The linear movement of the IPT device operates lever (3). The lever amplifies the linear movement of the IPT device and operates the switch operating rod (5). Dowel pin (6) in the rod operated the levers of the open and closed switch elements (8 and 9).

The lever is of the “floating” type. When the IPT device operates the lever, it moves completely upwards until it meets the upper pivot block (4). At this point the lever will tip over and pull down the switch operating rod (5) and operates the bottom switch (7). When the IPT device moves back the springs cause the lever to move completely downwards until it meets the lower pivot block (2). At this point the lever will tip over and push up the switch operating rod (5) and operates the top switch (8).

#### Switch point adjustment

The position of the lower pivot block (2) can be changed by adjustment screw (10) and the position of the upper pivot block (4) can be changed by adjustment screw (9).

By adjusting the position of these pivot blocks the switch points will be changed.

The adjustment screws (9 and 10) can be found behind the shield (12) in front of the module. To access the adjustment screws loosen the screw (11) and rotate the shield (12) as shown.

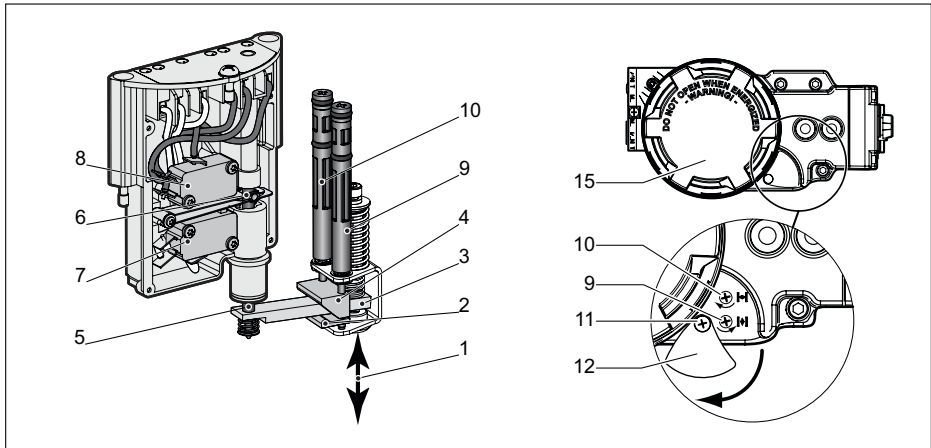


Fig. 5.2 Working principles Switch Operating Mechanism



### 5.1.6 Re-adjustment of switch points



#### IMPORTANT

The procedure below assumes:

- That the actuator and control modules are according the factory settings.
- If the switch setting is somehow lost or forgotten, then consult paragraph 6.3 to set the switch point setting back to factory setting.
- That the actuator / valve assembly is closed after a clock wise rotation (see chapter 5.1.4).

Below procedure assures that the position feedback complies more accurately with the valve position and will set the switch point at approximately 4° before the end of the stroke.

To set and detect the Open or Closed switch points, the QC40 ASI module has two LED's that light up if the Open or Closed position limit switch is activated.

#### Procedure (see fig 5.3):

1. Loosen the screw (1) of the shield (2) and turn the shield down.

#### Closed Position:

2. Send an "Close" command to the ASI module, wait and make sure the valve has moved to closed position.
3. Turn top screw (3) counter clock wise (**do not force the adjustment screw**) until the switch trips and the corresponding LED (5) goes out.
4. Turn top screw (3) clock wise (**do not force the adjustment screw**) until the switch trips and the corresponding LED (5) goes on. This position represents the actual, mechanical "closed" position of the valve.
5. Turn the screw minimal a 1/2 turn clock wise. The "closed" position switch point is now set.

#### Open Position:

5. Send an "Open" command to the ASI module, wait and make sure the valve has moved to open position.
6. Turn bottom screw (4) clock wise (**do not force the adjustment screw**) until the switch trips and the corresponding LED (6) goes out.

7. Turn bottom screw (4) counter clock wise (**do not force the adjustment screw**) until the switch trips and the corresponding LED (6) goes on. This position represents the actual "open" position of the valve.
8. Turn the screw minimal a 1/2 turn counter clock wise. The "open" position switch point is now set.
9. Turn the shield (2) back over the adjustment screws and fasten it with the screw (1).

#### Important:

During switch point adjustment, do not force the adjustment screws when you feel an obstruction. Forcing the adjustment screws can damage the cross head of the adjustment screw.

#### Table 5.2 Tool table

Shield screw	Cross slotted Phillips nr. PH2
Adjustment screws	0,6 x 3,5 or Cross slotted Phillips nr. PH2

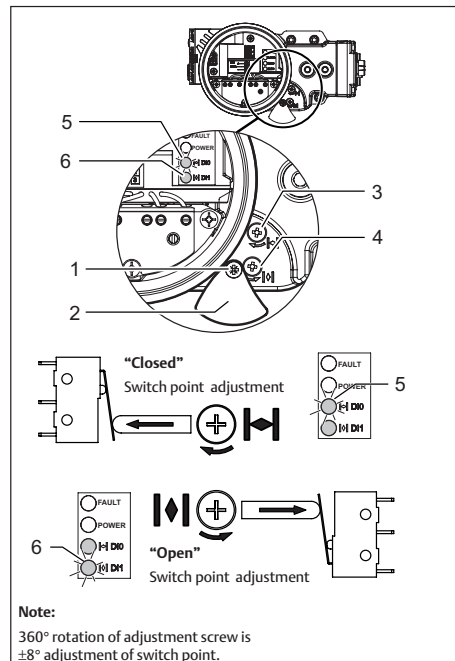


Fig. 5.3 Re-adjustment screws for "Open" and "Closed" position feedback

## 5.2 Addressing

The QC40 ASI module supports the ASI-3 profile. When a module ships from the factory, it has the slave address “0”.

The slave address can be changed using a master device. Please check the applicable sections of the documentation supplied with these devices.

**Table 5.2.1 Programming notes:**

Factory address	00	EID1	7
IO-Code	6	EID2	E
ID-Code	A	Parameter	00

Q-Series data bits		Functions	
Type		DI's	DO's
D0	Bi-directional	Feedback “Closed”	Solenoid 2 Control
D1	Bi-directional	Feedback “Open”	Solenoid 1 Control
D2	Bi-directional	Not used	
D3	Bi-directional	Not used	

## 5.2.2 Diagnostics

- The ASI communications watchdog is activated.
- The control electronics in the module are monitored for short circuit.
- Diagnostics information is communicated via ASI slave status LEDs and Master (see Table 3)

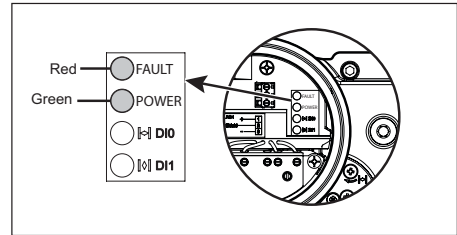


Fig. 5.4 ASI slave status LEDs

Table 5.2.2 ASI slave status LEDs (see Figure 5.4)

Symptom	Indication at the slave LEDs		Flags in the master		Possible reason	Suggested action
	<i>Green</i>	<i>Red</i>	<i>Config. Error</i>	<i>Periphery Fault</i>		
Normal operation	On	Off	reset	reset	Everything OK	-/-
No data exchanges	On	On	set	reset	Master in STOP Mode	Check master configuration
					“Slave not in LPS Slave with wrong IO/ID Reset at Slave active Slave address = 0”	Check slave configuration
Serious peripheral error with reset	On	Blinking	set	undefined	Short circuit or line break	Contact Emerson Actuation Technologies

### 5.3 Check operation

#### 5.3.1 Default (single) pilot valve operation

1. For function test, the unit must be connected to an ASI master device or an ASI gateway.
2. Connect pressure according chapter 3 and the ASI bus signal according chapter 4.
3. For sending the “Open” or “Closed” command, check the applicable sections of the documentation supplied with the ASI master device or the ASI gateway.
4. Send an “Open” command to the Solenoid 1 DO (Data bit D1) of the ASI module.
5. Actuator moves to “Open” position.
6. Send an “Close” command to the Solenoid 1 DO (Data bit D1) of the ASI module.
7. Actuator moves to “Closed” position.
8. Mount the Control Module cover to the housing (see Figure 3.1).

#### 5.3.2 Dual pilot valve (Fail in Last Position) operation

##### Important:

The QC40 ASI Control module with Dual Pilot valves has only the Fail-in-Last-Position function when the module is mouted to a double acting actuator.

1. For function test, the unit must be connected to an ASI master device or an ASI gateway.
2. Connect pressure according chapter 3 and the ASI bus signal according chapter 4.
3. For sending the “Open” or “Closed” command, check the applicable sections of the documentation supplied with the ASI master device or the ASI gateway.
4. Send an “Open” command to the Solenoid 1 DO (Data bit D1) of the ASI module while “Close” command to Solenoid 2 DO (Data bit D0).
5. Actuator moves to “Open” position.
6. Remove the ASI wiring from the module terminals.
7. The double acting actuator should not rotate.
8. Re-connect the ASI bus signal according chapter 4.
9. Send an “Open” command to the Solenoid 2 DO (Data bit D0) of the ASI module while “Close” command to Solenoid 1DO (Data bit D1).
10. Actuator moves to “Closed” position.
11. Remove the ASI wiring from the module terminals.
12. The double acting actuator should not rotate.
13. Mount the Control Module cover to the housing (see Figure 3.1).

## 6 Trouble shooting

### 6.1 The “Open” and “Closed” position feedback signals are reversed from the actual valve positions.

- 1 Check if the actuator is correctly mounted to the valve.  
Before mounting the actuator on the valve, the actuator and the valve should have the same “open” or ‘closed” position (see **Installation and Operation Manual Bettis Q-Series Valve Actuator DOC.IOM.BQ.E**).
- 2 Some valves may be operated in such a way that they are:
  - “Open” after a clock wise rotation and
  - “Closed” after a clock wise rotation.
- 3 Please see § 5.1 for setting the “Open” and “Closed” position feedback signals

### 6.2 The actuator does not give (good) position feedback signals.

- 1 Check if the actuator is correctly mounted to the valve.
- 2 Re-adjust the limit switch setting as per chapter § 5.1

### 6.3 Factory setting of the switch points.

#### IMPORTANT

The procedure below assumes:

- **That the actuator / valve assembly is closed after a clock wise rotation (see also § 5.1).**
- **The control module is pneumatically and electrically connected according chapter 3 and 4.**

This procedure sets the switch point settings of the switches, back to the factory settings ( $\pm 15^\circ$  before each end of stroke), assuming a mechanical stroke of  $90^\circ \pm 0.5^\circ$  of the actuator.

To set and detect the Open or Closed switch points, the QC40 AS-I module has two LED's that light up if the Open or Closed position limit switch is activated.

#### Procedure (see fig 5.3):

1. Loosen the screw (1) of the shield (2) and turn the shield down.

#### Closed Position:

2. Send an “Close” command to the ASI module.
3. Turn top screw (3) counter clock wise maximum 20 turns, (**do not force the adjustment screw**) until the switch trips and the corresponding LED (5) goes out.
4. Turn top screw (3) clock wise  $1 \frac{3}{4}$  turn (**do not force the adjustment screw**). The “closed” position switch point is now set to factory setting.

#### Open Position:

5. Send an “Open” command to the ASI module.
6. Turn bottom screw (4) clock wise maximum 20 turns, (**do not force the adjustment screw**) until the switch trips and the corresponding LED (6) goes out.
7. Turn bottom screw (4) counter clock wise  $1 \frac{3}{4}$  turn (**do not force the adjustment screw**) The “open” position switch point is now set to factory setting.
8. Turn the shield (2) back over the adjustment screws and fasten it with the screw (1).

#### Important: Do not force the adjustment screws

During switch point adjustment, do not force the adjustment screws when you feel an obstruction. Forcing the adjustment screws can damage the cross head of the adjustment screw.

## 7 Maintenance

The Bettis Q-Series control modules are designed to operate without maintenance. For any further maintenance to the actuator see Installation and Operation Manual Bettis Q-Series Valve Actuator, DOC.IOM.BQ.E or contact your local Bettis Q-Series representative.

Installation, adjustment, putting into service, use, assembly, disassembly, maintenance and repair of the control module must be done by qualified personnel.

For any further maintenance to the control module see Maintenance Manual, DOC.MM.QC40.E or contact your local Bettis Q-Series representative.

Installation, adjustment, putting into service, use, assembly, disassembly, maintenance and repair of the control module must be done by the qualified personnel.

### **▲ WARNING**

- Substitution of components may impair suitability of the equipment

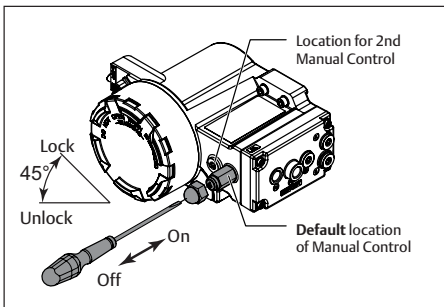


Fig. 8.1 Local Manual Control options

## 8 Optional Controls

### 8.1 Manual Control options

(see Figure 8.1)

For commissioning, emergency or maintenance purposes, the Bettis Q-Series can be supplied with one or two Manual Control options. These can operate the spool valve(s) inside the module and as such operate the actuator, when there is air pressure available, but no control signal or power supply.

#### 8.1.1 Mounting Manual Control

- 1 To add a Manual Control, remove the plug(s) in front of the module and turn in the Manual Control.
  - For normal operation the module should be fitted with one Manual Control.
  - For Double Acting with a Fail-in-Last-Position function, two Manual Control can be fitted.

#### 8.1.2 Manual Control operation

- 1 The Manual Control has a “Push and Lock” function:
  - To operate the Manual Control, use a screw driver, push to activate and release to de-activate the pilot valves.
  - If required turn it 45°, to lock it in position and keep the actuator in its operated state.
- 2 In case of a Fail in Last Position configuration with two manual controls:
  - The manual control on the right side (default location) will pressurize the central air chamber and cause the actuator to rotate counter clock wise. For reverse acting Bettis Q-Series actuators (Assembly code CC) the actuator will rotate clock wise.
  - The manual control on the left side (Location for 2nd Manual Control) will pressurize the end cap air chambers and cause the actuator to rotate clock wise. For reverse acting Bettis Q-Series actuators (Assembly code CC) the actuator will rotate counter clock wise.
  - In order to operate one of the manual control, be sure the opposite manual control is de-activated and unlocked.

## 8.2 Speed control option

### (see Figure 8.2)

The Bettis Q-Series can be supplied with a Speed Control option. One throttle is required for Spring Return actuators and up to two for Double Acting actuators.

The speed control throttle controls the air flow in and out of an air chamber and as such limits the speed of the "Opening" and "Closing" stroke simultaneously.

#### 8.2.1 Mounting Speed Control throttle(s):

- 1 Remove the plug(s) at the side of the module and turn in the throttle (1).
- 2 Spring Return actuators: Use the top entry only.
- 3 Double acting actuators: Use both bottom and top entries.
  - For standard actuators, the top entry will throttle the closing stroke.
  - For standard actuators, the bottom entry will throttle the opening stroke.
  - For reverse acting actuators, the opposite strokes will be throttled.

#### 8.2.2 Adjusting Speed Control throttle(s):

- 1 Remove the nut cap (2).
- 2 Clockwise rotation of the adjustment screw reduces the speed.
- 3 Counter clockwise rotation of the adjustment screw increases the speed.
- 4 Replace the nut cap.

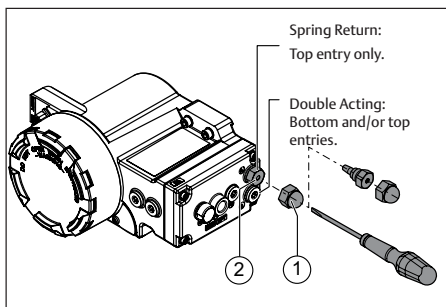


Fig. 8.2 Speed control operation

## 9 Related Information

Other documents containing information related to the Bettis Q-Series Module include:

- 1.604.13: QC40 AS-I Control Module data sheets
- DOC.IOM.BQ.E: Installation Operation and Maintenance Manual.

These documents are available, in multiple languages, for download go to [www.emerson.com/bettis](http://www.emerson.com/bettis)

### 9.1 Applied IECEx standards





The following standards are applied:

- For Bettis Q-Series Control Module **QC40...P4...**,  
IEC 60079-0 Ed. 6.0 : 2011  
IEC 60079-15 Ed. 4.0 : 2010  
IEC 60079-31 Ed. 2.0 : 2013

### 9.2 RoHS Directive

This product is only intended for use in large scale fixed installation excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

## 10 EU Declaration of Conformity

	Legal representative entity for the European Union: Emerson Automation Solutions, Actuation Technologies Holland Fasor 6, 8000 Székesfehérvár, Hungary	ROC nr 11100 Rev. 1  
<p><b>EU DECLARATION OF CONFORMITY</b> Issued in accordance with the <b>EMC Directive 2014/30/EU, Appendix 1</b> <b>ATEX Directive 2014/34/EU</b></p>		
We hereby declare, that the products specified below meet the basic health and safety requirements of the above mentioned European Directives.		
Product description: Serial number: Year of Construction: Manufacturer:	<p><b>QC40 AS-I Control module</b> Each Control module has an identifiable serial number Each Control module has an identifiable Year of Construction Emerson Process Management Valve Automation (M) Sdn. Bhd. Lot 13112, Mukim Labu, Kawasan Perindustrian Nilai, 71807 Nilai, Negeri Sembilan Malaysia</p>	
<p><b>EMC Directive 2014/30/EU</b> <b>Types:</b> <b>QC40...</b> Applicable standards: IEC61326-1 : 2012      NAMUR Recommendations : NE21: 2004</p>		
<p><b>ATEX Directive 2014/34/EU</b> <b>Types:</b> <b>QC40...P4...</b> ATEX Certificate No.: DEKRA 16ATEX0100 X Marking:  II 3 G Ex nA IIC T4 Gc  II 2 D Ex tb IIIC T80°C Db Ta = -25°C ... +60°C Applicable standards: EN 60079-0 : 2012 + A11:2013      EN 60079-15:2010      EN 60079-31:2014 Notified body: DEKRA Certification B.V., Notified body no : 0344 Meander 1051, 6825 MJ Arnhem, The Netherlands</p>		
		Signed: _____ Name: S. Jones Position: Director, Rack and Pinion SBU Emerson Automation Solutions Actuation Technologies  Date: 2020-04-07 Place: Houston TX, U.S.A.
VCCAQ-15299-EN		



## 11 QC40 ASI Smart Modules Non Incendive / Non sparking

### 11.1 Product marking

**IECEX Hazardous or Classified Location**  
**Non-Sparking**  
Ex nA IIC T4 Gc  
Ex tb IIIC T80°C Db  
Certificate: IECEX DEK 16.0061 X

**ATEX Hazardous or Classified Location**  
**Non-Sparking**  
CE 0518  
Ex II 3 G Ex nA IIC T4 Gc  
Ex II 2 D Ex tb IIIC T80°C Db  
Certificate: DEKRA 16ATEX0100 X

**FM Hazardous or Classified Location**  
**Non Incendive**  
Class I, II, III, Division 2,  
Groups ABCDEFG, T4  
Class 1, Zone 2, Group IIC T4  
Certificate: FM16US0367X

**CSA Hazardous or Classified Location**  
Class I, Division, 2 Group A,B,C and D, T4  
Class II, Division 1, Group E, F and G, T80°C  
Class III, Division 1, T80°C  
Ex nA nC IIC T4 Gc  
Ex tb IIIC T80°C Db  
Type 4X / IP66  
Certificate: CSA 17CA70125362X

**Inmetro Hazardous or Classified Location:**  
**Non-Sparking**  
Ex nA IIC T4 Gc IP66  
Ex tb IIIC T80 °C Db IP66  
Certificate: IEx 17.0084X

### Ambient temperature:

T4 @ Ta = -25°C...+60°C IP66/NEMA 4X

### 11.2 ATEX / IECEx Intended use

- The Control Module QC40..P4.. of the Bettis Q-Series pneumatic actuator is a Group II category 3G (ATEX) equipment with protection level Gc (IECEX).
- The Bettis Q-Series pneumatic actuators is a Group II category 2 equipment.
- Both are intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapors, mists or by air/dusts are likely to occur.
- Therefore the assembly may be used in hazardous area classified Zones 2 (Gasses) and/or 21, 22 (Dust).

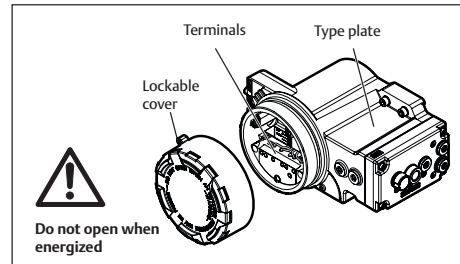


Fig 11.1 Product marking

### 11.3 Safety instructions

#### WARNING

- Personal injury or property damage caused by fire or explosion may occur if the module is opened in any area which contains a potentially explosive atmosphere or has been classified as hazardous.
- Do not open when module is energized.
- Prevent any kind ignition during installation, adjustment, putting into service and use.
- Assembly, disassembly and maintenance must be done in safe area's without a potential explosion hazard.
- Installation, adjustment, putting into service, use, assembly, disassembly and maintenance or repair, shall be carried out in accordance with the applicable code of practice by suitably-trained personnel.
- Provisions must be made to prevent the rated supply voltage being exceeded by more than 40%.
- Potential electrostatic charging hazard, clean only with a damp cloth - danger of propagating discharge.
- The apparatus shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust is avoided.
- Precaution shall be taken to avoid danger of ignition due to electrostatic charges on the marking plate of the enclosure.
- Substitution of electronics cartridge, switch cartridge, pilot valve cartridge, pneumatic cartridge, enclosure and seals must be with parts from Emerson else the suitability for Division 2 will be impaired.

### 11.4 CSA safety instructions

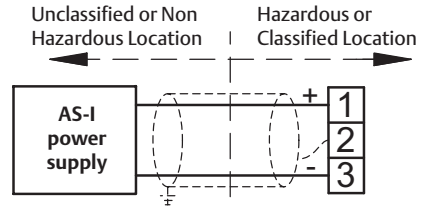
- The equipment may be used in zones 2 with flammable gases and vapours with apparatus groups IIA, IIB and IIC and with temperature classes T1, T2, T3, T4.
- The equipment may be used in zones 21 and 22 with flammable dusts, fibres and flyings in groups IIIA, IIB and IIC, with a layer auto-ignition temperature of not less than 75 K above the maximum surface temperature marked in the dust coding.
- There are no special checking or maintenance conditions other than a periodic check.
- With regard to explosion safety, it is not necessary to check for correct operation.
- If the equipment is likely to come into contact with aggressive substances, e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected thus ensuring that the type of protection is not compromised.

### 11.5 Wiring instructions QC40 - Non Incendive / Non Sparking

Protocol	AS-Interface Spec3.0
Maximum Voltage	31.6 V
Minimum Current (pilot valves off)	34 mA at 26.5 V
Nominal Current (one pilot valve activated)	85 mA at 26.5 V
Maximum Current Consumption (one pilot valve application)	125 mA at 26.5 V
Maximum Current Consumption (two pilot valves application)	140 mA at 26.5 V
Protection	Short circuit detection

\* The current restricted power supply meets NEC Class 2, as described by the National Electrical Code® (ANSI/NFPA 70 (NEC®))

### Terminal connections



#### Warning

- \* Explosion hazard. Do not disconnect equipment when a flammable or combustible atmosphere is present.
- \* Use installation wiring connections with admitted maximum operating temperature of at least 20 °C (68 °F) higher than maximum ambient.

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