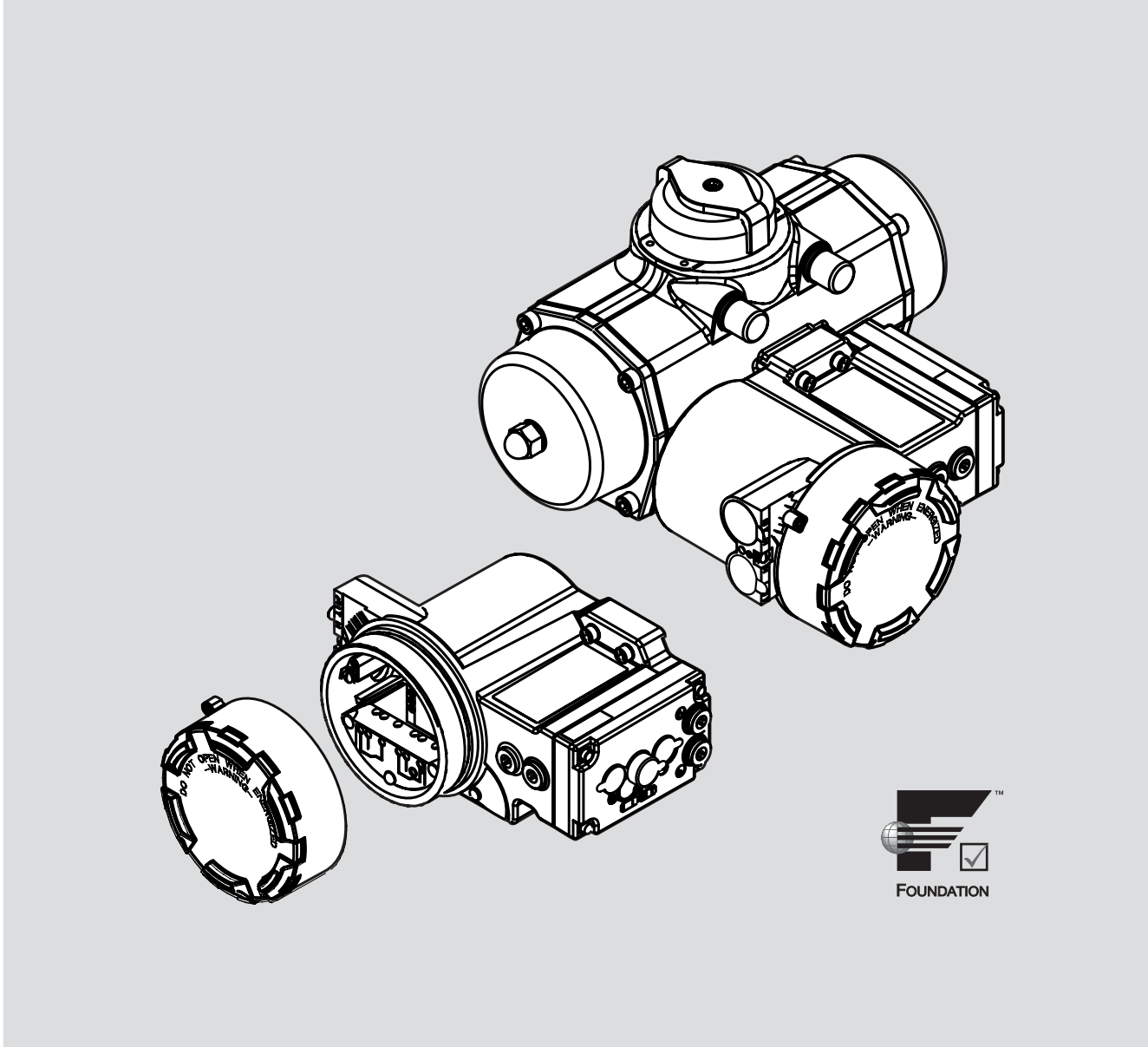


FieldQ

QC54 Control Module Foundation Fieldbus



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1 Before you start

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance procedures on the QC54 Control Module:

- Always wear protective clothing, gloves, and eye wear when performing any maintenance procedures to avoid personal injury or property damage.
- Do not remove the actuator from the valve while the valve is still pressurized.
- Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the control valve from process pressure. Relieve process pressure from both sides of the valve.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
- Vent the pneumatic actuator loading pressure and relieve any actuator spring pre-compression so the actuator is not applying force to the valve stem; this will allow for the safe removal of the stem connector.
- Do not remove or replace while circuit is live when a flammable or combustible atmosphere is present.
- Substitution of electronics cartridge, switch cartridge, pilot valve cartridge, pneumatic cartridge, enclosure and seals must be with parts from Emerson else the suitability for Zones 0, 1, 2, 20, 21, or 22 or Division 1 or 2 will be impaired.
- Always use proper component replacement techniques, as presented in this manual. Improper techniques or component selection may invalidate the approvals and the product specifications, as indicated in Installation Guide DOC.IG.QC54.1 and may also impair operations and the intended function of the device.

IMPORTANT

When replacing any of the components of the QC54 Control Module, the maintenance should be performed in an instrument shop whenever possible. Make sure that the electrical wiring and pneumatic tubing is disconnected prior to disassembling the instrument.

2 Trouble shooting QC54 Control module

2.1 Mechanical problems

Problem	Possible error	Solution	Where to find
Feedback position and actual position are not the same. Valve is in "Closed" position, actuator is in "Open" position and will not move anymore.	Actuator and valve are mounted 90° rotated in relation to each other.	Remove actuator from valve. Check assembly code of actuator. Put both valve and actuator in "Closed" position. Mount actuator on valve.	Chapter 1 and 2 of DOC.IOM.Q.E
Valve does not reach the completely "Closed" or "Open" position.	Limit stop screws are not set correctly.	Readjust the limit stop screws	Chapter 3 of DOC.IOM.Q.E Chapter 2, §2.5 of DOC.IOM.Q.E
	Insert is not mounted properly	Mount the insert in the right position. Remark: Rotate insert for one cam = 22.5°	
	Pressure too low Sizing is wrong	Apply pressure as per sizing Check valve torque data with actuator torque data	Data sheets DA = 1.602.01. SR = 1.602.02 or 1.602.03
Actuator rotates, valve does not.	No coupling between actuator shaft and valve spindle.	Install a coupling between actuator shaft and valve spindle.	Chapter 2 of DOC.IOM.Q.E

2.2 Pneumatic problems

Problem	Possible error	Solution	Where to find
Actuator does not react to electrical control signal.	There is no supply pressure at the actuator.	Supply the right pressure to the actuator.	See Installation guide as shipped with module: DOC.IG.QC54.1, chapter 3
	Supply pressure is connected to one to the exhausts.	Connect supply pressure to port "Ps".	
	Pilot valve (piëzo valve) fails	Replace pilot valve	See this document, chapter 4
	Pneumatic cartridge fails	Replace Pneumatic cartridge	
Actuator does not react good to electrical control signal.	There is sufficient supply air pressure but insufficient supply air capacity.	Take care the supply air tubing has the right dimensions.	See manual DOC.IOM.Q.E, chapter 2, §2.6
	Control Module is not mounted properly.	Mount the "Control Module" in the right way to the actuator.	See Installation guide as shipped with module: DOC.IG.QC54.1, chapter 2
	Speed control (if present) blocks air flow.	Turn the speed control more open.	See Installation guide as shipped with module: DOC.IG.QC54.1, chapter 8
	Manual override (if present) on the Control Module is locked	Unlock manual override on the Control Module.	
	Pneumatic cartridge does not match the base actuator function.	Make sure the module is equipped with the correct pneumatic cartridge - Single acting pneumatic cartridge for spring return actuators or - Double acting pneumatic cartridge for double acting actuators - Fail-In-Last-Position pneumatic cartridge for double acting actuators requiring a Fail-In-Last-Position	Either order the correct control module or replace pneumatic cartridge. See this document, chapter 3.
Air leakage out of main exhaust or out of the Control Module	Pneumatic cartridge sealing is not air tight	Check and replace the seals in pneumatic cartridge OR replace pneumatic cartridge	See this document, chapter 3.
	Pilot Valve cartridge sealing is not air tight	Replace Pilot valve cartridge.	See this document, chapter 4
Double acting actuator will only move to "open" position.	Pneumatic cartridge has wrong pneumatic configuration.	Mount a Pneumatic cartridge suitable for double acting actuators	See this document, chapter 3.

2.3 Electrical problems

Problem	Possible error	Solution	Where to find
Actuator does not react to control signals	Control wiring is not right connected	Connect all wiring in the right way.	See documentation shipped with the Control Module, DOC.IG.QC54.1 chapter 4
	The power supply voltage is not the same as the voltage of the applicable Control Module	Connect the right power supply voltage.	
	Communication electronics fail	Replace Foundation Fieldbus cartridge	See this document chapter 4
	Pilot valve is not connected in the right way or pilot valve failed (Pilot valve alert activated on AMS)	Check pilot valve wiring or replace pilot valve cartridge	
Actuator does not react consistent	Initialization was not completed in the right way.	Execute the initialization procedure or set feedback signal manual	See Reference manual DOC.RM.QC54.1 chapter 3
	Sizing is wrong	Re-size the actuator to the valve	Data sheets DA = 1.602.01. SR = 1.602.02 or 1.602.03
	Communication electronic work inconsistent	Replace Foundation Fieldbus cartridge	See this document, chapter 4
	Pilot valve failed (Pilot valve alert activated on AMS)	Replace pilot valve cartridge	
There are problems with position feedback after sending the actuator to either the "Open" or "Closed" position	Initialization was not completed in the right way.	Execute the initialization procedure or set feedback signal manual	See Reference manual DOC.RM.QC54.1 chapter 3
	The feedback signals may be re-assigned.	Re-assign the open/close position	See documentation shipped with the Control Module, DOC.IG.QC54.1 chapter 5.3 or Reference manual DOC.RM.QC54.1 chapter 4.2.3.2
	Sensor assembly is not right connected	Connect the sensor wiring to the FF cartridge	See this document, chapter 4
	Electronics fail (Current consumption is not in range of 16~18 mA)	Replace Foundation Fieldbus cartridge	See this document, chapter 4

3 Replacing pneumatic cartridge

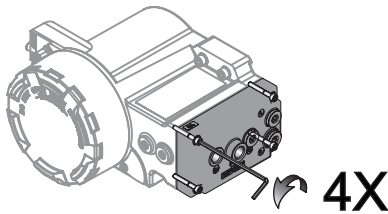
- The SA and DA pneumatic cartridges can be exchanged for re-configuration purposes (from SA to DA and vice versa) as well as for repair.
- The DA-FILP pneumatic cartridge can only be exchanged by an identical cartridge for repair purposes, otherwise it will not function properly.
- See Installation guide DOC.IG.QC54.1 for further installation instructions.

Replacement procedure:

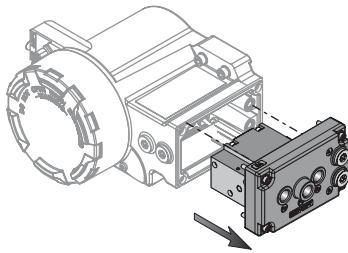
- Before starting check that all the required parts are included.

Kit contents:				
Pos.	Qty.	Part nr.	Description	Entry
1	1x	VAGG15026	Pneumatic cartridge SR	BSP
		VAGG15027	Pneumatic cartridge SR	NPT
		VAGG15028	Pneumatic cartridge DA	BSP
		VAGG15029	Pneumatic cartridge DA	NPT
		VAGG15030	Pneumatic cartridge DA/FILP	BSP
		VAGG15031	Pneumatic cartridge DA/FILP	NPT
2	2x		O-ring	
3	3X or 4X		Pneumatic connector	
4	4x		M4 washer	
5	4x		M4X30 hex.Socket screw	

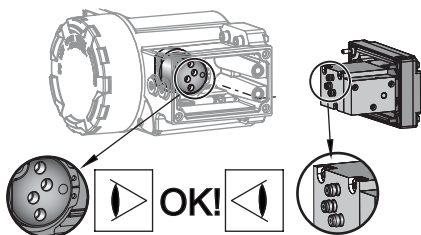
- 1 Turn off and disconnect any operating lines providing air pressure, electric power, or a control signal to the control module/actuator.
- 2 Loosen the fasteners with a 3 mm Allen key.



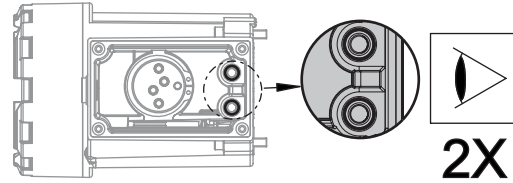
- 3 Pull the cartridge out of the module.



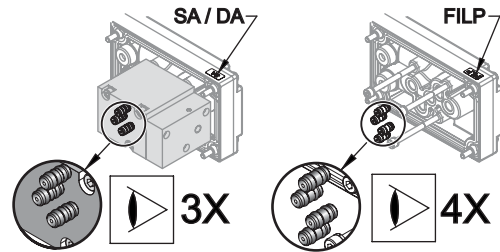
- 4 Before replacing the pneumatic cartridge, check that the pneumatic connectors are not captured in the housing.



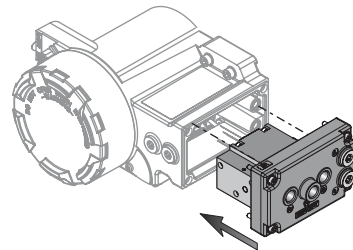
- 5 Before replacing the pneumatic cartridge, check the O-rings are in place.



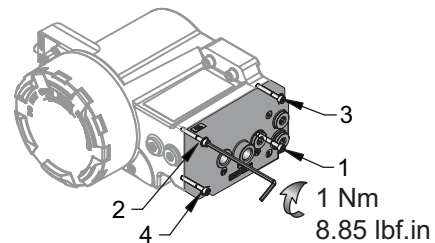
- 6 Check if all holes contain connectors with O-rings.



- 7 Gently place the cartridge into the module.



- 8 Fasten the screws according to the sequence below, with a 3 mm Allen key.



- 9 Re-connect operating lines providing air pressure, electric power, or a control signal to the control module/actuator as per Installation guide DOC.IG.QC54.1.

4 Replacing Foundation Fieldbus Cartridge and/or piëzo pilot vlave

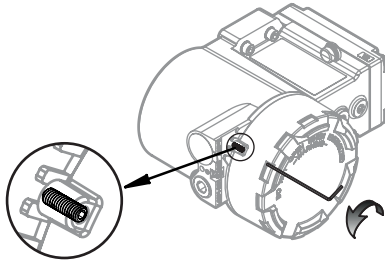
- The Foundation Fieldbus cartridge or the (piëzo) pilot valve can be exchanged for repair purposes only.
- See Installation guide DOC.IG.QC54.1 for further installation instructions.

Replacement procedure:

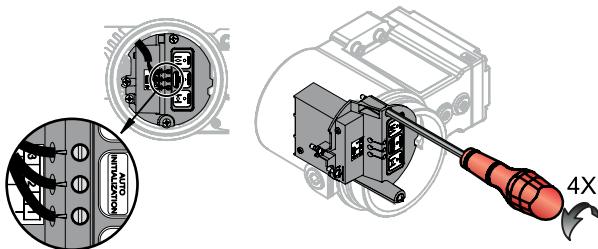
Before starting verify part number for correct replacement kit:

Kit overview:	
Part nr.	Description
VA001-651-34	FF main electronics cartridge One Pilot
VA001-651-35	FF main electronics cartridge, Two Pilots for FILP
VA001-651-36	Piezo Pilot Valve Assembly, One Pilot
VA001-651-37	Piezo Pilot Valve Assembly, Two Pilots

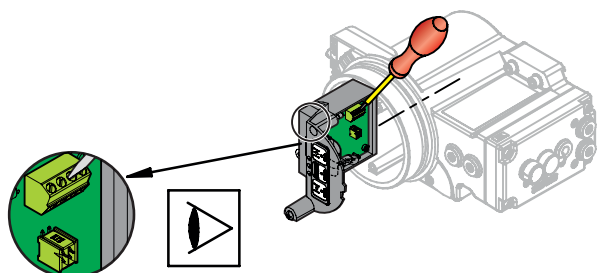
- 1 Turn off and disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator.
- 2 Loosen the set screw before opening the Cover.



- 3 Disconnect the bus wiring. Loosen the screws with a phillips head no.2 Screw driver.

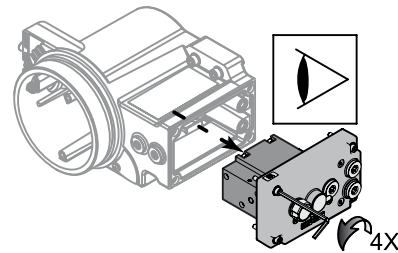


- 4 Gently remove the cartridge from the module compartment. Disconnect the pilot wiring and disconnect the sensor connector.

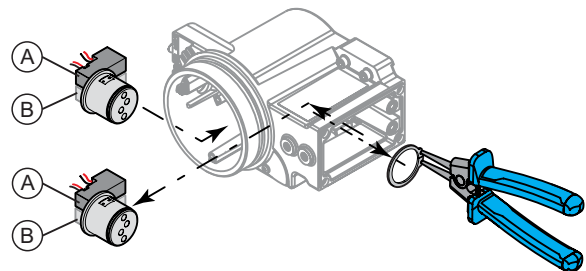


In case of pilot valve replacement follow steps 5 to 9, for replacing only the main electronics cartridge, continue with step 10.

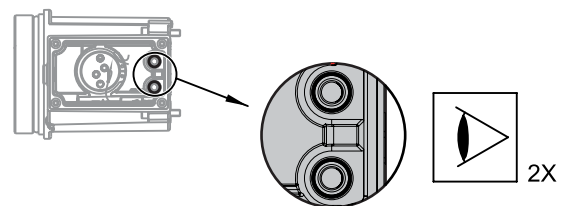
- 5 Loosen the screws with a 3 mm allen key. Pull the cartridge out of the module. Prevent any seal from falling away.



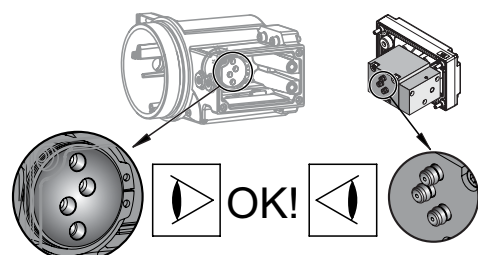
- 6 Remove the 38mm circlip using a circlip pliers. Replace the pilot cartridge with one (A) or two (A + B) pilot valves in the module. Mount the circlip using a circlip pliers.



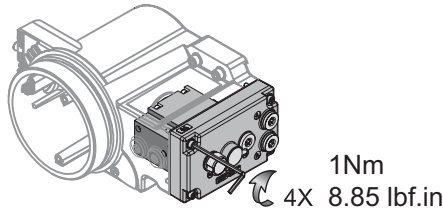
- 7 Before placing the pneumatic cartridge. Check the o-rings are in position.



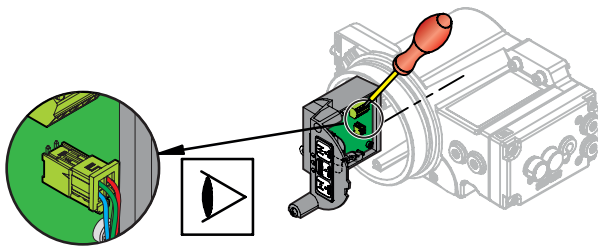
- 8 Before placing the cartridge, check if the pneumatic connectors are not captured in the housing and all are placed in the pneumatic cartridge.



9 Gently place the cartridge into the module. Fasten the screws according sequence with a 3 mm allen key.

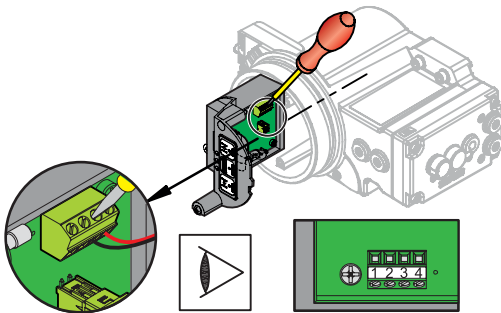


10 Partly place the cartridge in the module compartment. Connect the sensor connector.

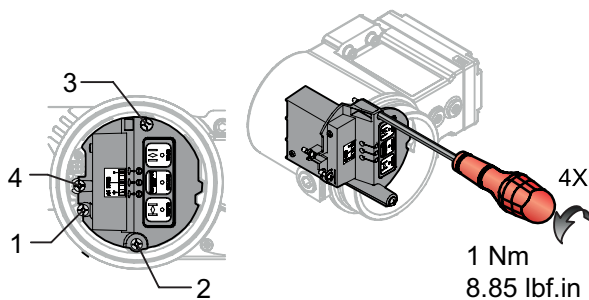


11 Connect the pilot wiring.

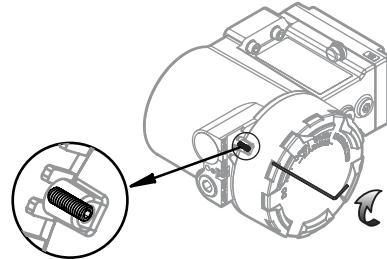
For one pilot (A): 1=red 2= black.
For second pilot (B): 3=red 4= black.
Carefully guide the wires when placing the cartridge into the module.



12 Fully insert the cartridge and fasten the screws according sequence with a Phillip head no.2 screwdriver.



13 Place the cover on the module with threads fully engaged. Engage the the set screw for fixing the cover.



14 Follow all applicable chapters of the Installation Guide DOC.IG.QC54.1 to:

- Mechanical assemble the QC54 control module to the actuator.
- Re-connect operating lines providing air pressure and electric power/control signal.
- Initial setup/calibration of the QC54 control module.
- Setting or adjusting of optional module controls.

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