ELECTRIC ACTUATOR HQ004

INSTALLATION AND OPERATION MANUAL

Convergent Water Controls Pty Ltd

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QAD#610124.08.11

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HQ 004 INTRODUCTION

This installation and operating manual explains how to install, operate and maintain HQ-004 electric actuators.

Safety notices in this manual detail precautions the user must take to reduce the risk of personal injury and damage to the equipment. User must read these instructions before installation, operating, or maintenance.

DANGER: Refers to personal safety. Alerts the user to potential danger or harm. The hazard or unsafe practice will result in severe injury or death.

WARNING: Refers to personal safety. Alerts the user to potential danger. Failure to follow warning notices could result in personal injury or death.

CAUTION: Directs the user's attention to general precautions that, if not followed could result in personal injury and/or equipment damage.

Note: Highlights information critical to the user's understanding of the actuators' installation and operation.

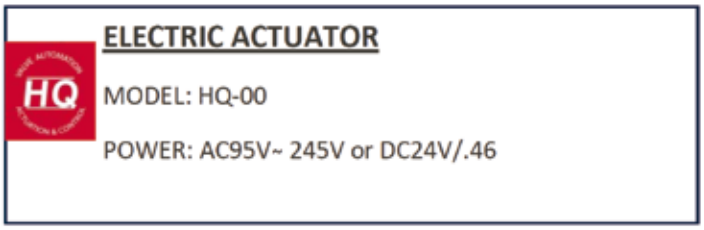
PRODUCT IDENTIFICATION

The actuator name plate is located on the side opposite the conduit entry.

The name plate contains the following:

- HQ logo (trade mark)
- Electrical power supply
- Model
- Type
- Rated current
- Operating time (seconds)
- Serial No.
- Option

Name Plate



Initial Inspection

Upon receipt of the actuator, inspect the condition of the product and ensure the name plate compares with the order sheet.

- Remove packing wrap or wooden box carefully. Inspect the product for any physical damage that may have occurred during shipment.
- Check the product specification with the product ordered. If the wrong product has been shipped immediately report to the coordinator.

Storage

Actuators must be stored in a clean, cool and dry area. The unit shall be stored with the cover installed and the conduit openings sealed. Storage must be off the floor, covered with a seal dust protector.

When actuators are stored outdoor, they must be stored off the ground, high enough to prevent being immersed in water or buried in snow.

GENERAL INFORMATION AND FEATURES

HQ series actuators are designed to provide reliable and efficient operation of 90 degree quarter turn valves , dampers, etc.

Performance

Type	Max output torque	Operating Time (sec)	Duty cycle IEC 34 - 1	Mounting size	Power 1 Phase	Rated current (A) 50/60Hz 1 Phase			Weight
	Kgf.m	50/60HZ	S4(%)	ISO 5210	AC,DC	110V AC	220V AC	24V DC	Kg
HQ004	4	~12	70	F03, F04, F05	AC85V~265V DC24V	0.12A	0.06A	0.46A	1.2

HQ004 Standard Technical Data (optional)

Enclosure Rated	Weatherproof IP67, NEMA 4 & 6
Enclosure	High grade aluminium alloy, corrosion coated
Power Supply	95~245VAC 1 Ph, 24VDC 50/60Hz
Duty Type	S4 50% / S2 30 min (IEC 60034)
Motor	Electric Sensor (MAX 2A)
Limit Switches	2 x open/close SPDT, 250 VAC 5A rating
Auxiliary Limit Switches	2 x open/close SPDT, 250 VAC 5A rating
Torque Switches	Electronic Sensor (MAX 2A)
Indicator	Continuous position indicator & Full position LED lamp
Manual	Manual push button & Manual lever
Space Heater	1W
Conduit Entries	1 x PG11 & Long (1.2m) Wire Type
Lubrication	Grease moly EP
Ambient Temperature	-20°C~ + 80 °C
External Coating	Dry powder polyester

HQ Option Technical Data (optional)

WTA	Watertight enclosure (IP68 10m / 24hr)

Duty Cycle

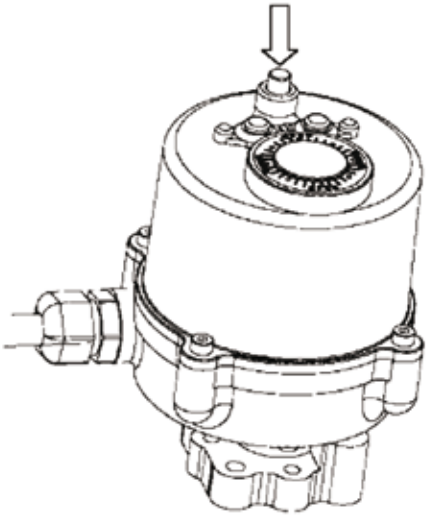
Duty cycle is rated IEC60034 - S4 50% / S2 30 min
Exceeding the actuators rated duty cycle may cause thermal overload.
Type of duty according to VDE 0530 / IEC 60034-1

Short - time duty S2	**Intermittent duty S4**
The operation time at a constant load is short, so that thermal equilibrium is not reached. The pause is long enough for the machine to cool down to ambient temperature. The duration of the short - time operation is limited to 15 min (10 min, 30 min).	The duty is a sequence of identical cycles which consist of starting time, operation time with constant load and rest period. The rest period allows the machine to cool down so that so that thermal equilibrium is not reached. The relative on-time at S4-25% or S4-50% is limited to 25% and 50% respectively

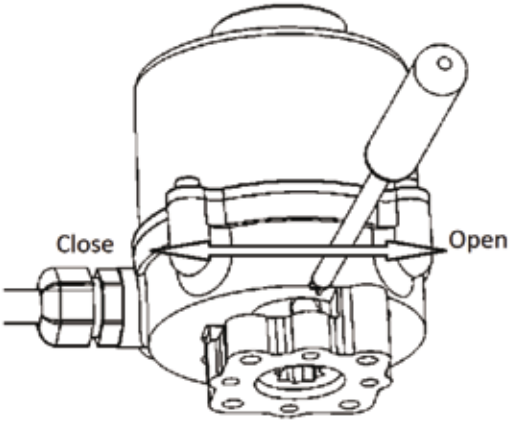
Heater

Condensation in the actuator is possible due to wide fluctuation of the ambient temperature. The heater integrated in the control unit prevents this in general.

(1) Manual push button



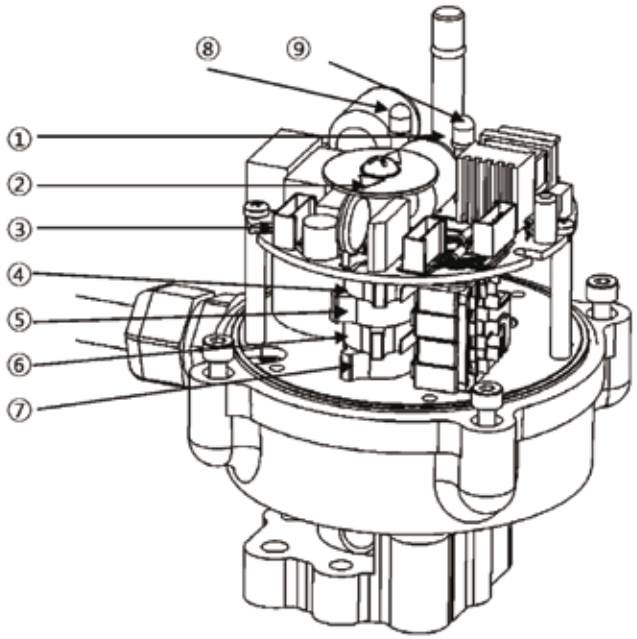
(2) Manual lever



Lubrication

HQ is a totally enclosed unit with a permanently lubricated gear train (Moly EP Grease). Once installed lubrication should not be required. However, periodic preventative maintenance will extend the operating life of the actuator.

Internal Parts



Internal Parts

1. Manual Push Shaft
2. Indicator
3. On/Off PCB & Heater
4. Additional Close Limit Switch Set
5. Additional Open Limit Switch Set
6. Close Limit Switch Set
7. Open Limit Switch Set
8. Full Close LED Lamp (blue)
9. Full Open LED Lamp (red)

INSTALLATION INSTRUCTION

Pre-Installation (for use in General Services)

Verify the actuators name plate to ensure correct model number, force, operating speed, voltage and enclosure type before installation and use.

It is important to verify that the output force of the actuator is appropriate for the force requirements of the valve and that the actuator duty cycle is appropriate for the intended application.

WARNING:

Read this installation and maintenance manual carefully and completely before attempting to install , operate or trouble shoot the HKC actuator.

Actuator Mounting

Note:

- Prior to mounting the part-turn actuator it must be checked for damage.
- Damaged parts must be replaced by original spare parts.

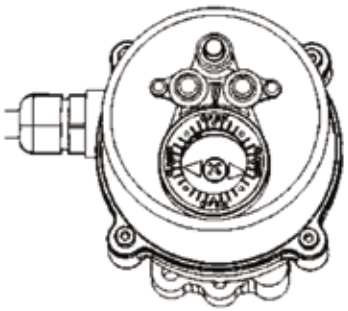
Mounting is most effectively carried out with the valve shafting pointing vertically upwards, however mounting is also possible in any other position.

The HQ series actuators are supplied with a Union Joint and nut which is removable for ease of machining.

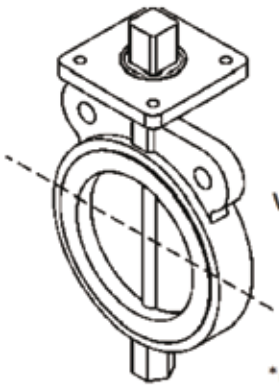
CAUTION:

- Do not attempt to work on your HKC actuator without first shutting off Incoming power.
- Do not attach ropes or hooks to the hand wheel for the purpose of lifting by hoist.

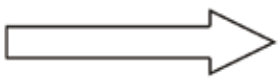
ACTUATOR MOUNTING DETAILS

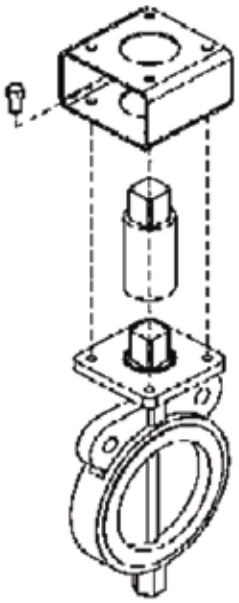


Actuator: Closed

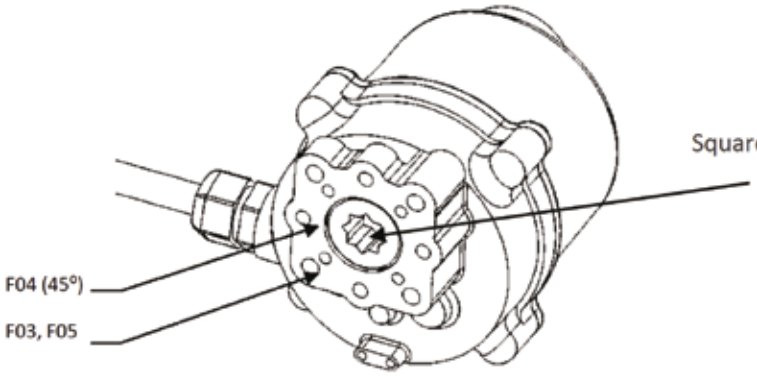


Valve: Closed





*Make sure that both valve and actuator are closed.



Star Adapter 11 x 9mm

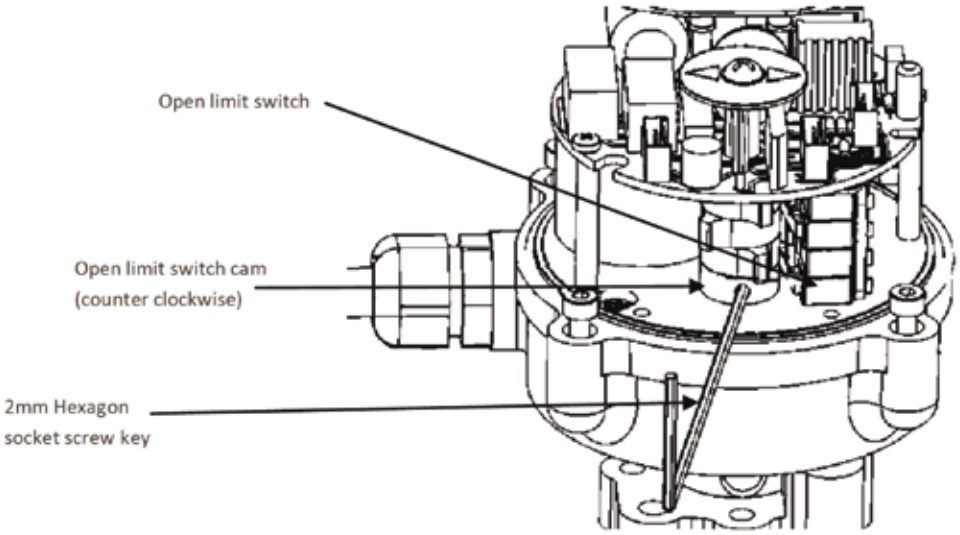
Square adapter 11 x 9mm

Danger: HAZARDOUS VOLTAGE (Make sure all power is disconnected before prior to mounting)

Limit Switch Setting

- Rotate the actuator hand wheel manually to closed position
- Using hex wrench, loosen the set screw on the CLOSE limit switch cam
- Rotate the CLOSE cam towards CW limit switch lever until the switch "clicks" Tighten the set screw with hex wrench
- Rotate the actuator hand wheel manually to open position
- Using hex wrench, loosen the set screw in the "open" limit switch cam
- Rotate to "open" cam towards CCW limit switch lever until the switch "clicks" (fig 2)
- Tighten set screw with hex wrench

Danger: HAZARDOUS VOLTAGE (Make sure all power is disconnected before prior to mounting)



Open cam setting

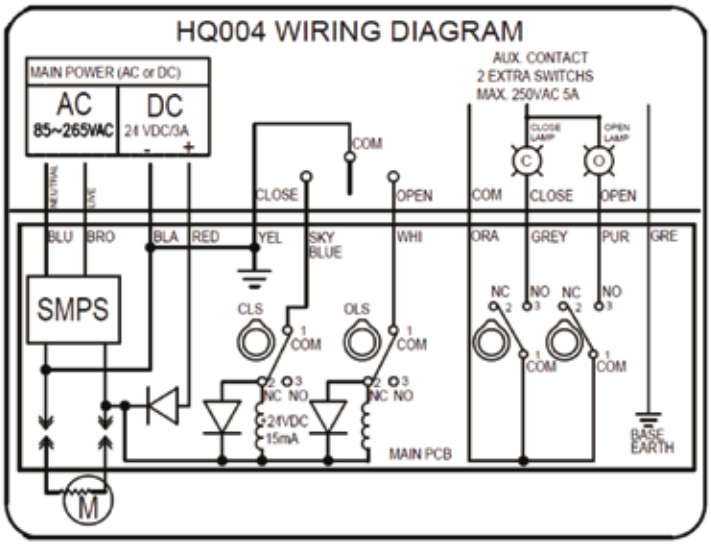
Add close L/M S/W

Add open L/M S/W

Close L/M S/W

Open L/M S/W

HQ004 Wiring Diagram



Danger: HAZARDOUS VOLTAGE No electrical power should be connected until all wiring and limit switch adjustments have been completed. Once power is supplied to the unit exercise caution if cover is not installed.

INSTALLATION INSTRUCTION

Caution: Turn off all power services before attempting to perform a service on the actuator. POTENTIAL HIGH PRESSURE VESSEL. Before removing or disassembling the actuator ensure the valve or other actuated device is isolated and not under pressure.

Maintenance under normal conditions at six month intervals, however when conditions are more severe, more frequent inspections may be advisable.

- Ensure valve actuator alignment
- Ensure wiring is insulated, connected and terminated properly
- Ensure all screws are present and tight
- Ensure cleanliness of internal electrical devices
- Ensure conduit connections are installed properly and are dry
- Check internal devices for condensation
- Check power to internal heater
- Check enclosure O-ring seals and verify the O-ring is not pinched between flange
- Verify declutch mechanism
- Visually inspect during open /close cycle
- Inspect identification labels for ware and replace if necessary

Warning: Treat cover with care. Gap surfaces must not be damaged or dirtied in any way. Do not jam cover during fitting.

Tools

- 1 Metric Allen Key (Hex Wrench)
- 1 Screw Driver
- 1 Spanner
- 1 Wrench 200mm
- 1 Wrench 300mm
- 1 Wire Stripper Long Nose
- 1 Multi Meter (AC, DC, Resistance)

TROUBLE SHOOTING

The following instructions are offered for the most common difficulties encountered during installation and start up.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Motor not running	Open in control unit	Refer to appropriate wiring diagram and check for continuity
	Insulation resistance breakdown in motor	Perform megger test
No power available to actuator	Tripped circuit breaker	Reset circuit breaker
Manual override nut hard to turn	Valve stem improperly lubricated. Actuator lubricant has broken down	Lubricate with grease Clean out old grease and replace with recommended lubricant
	Valve packing gland too tight	Loosen gland nuts as necessary
	Jammed valve	Refer to valve maintenance
Valve only opens or closes partially with motor	Limit switch improperly set	Check setting and reset if necessary
Manual override nut will not operate valve	Stripped gearing	Replace as necessary
	Broken hand wheel shaft	Replace as necessary
	Broken valve stem	Repair or replace as necessary
Motor runs but will not operate valve	Stripped gearing	Replace as necessary

Actuator does not respond

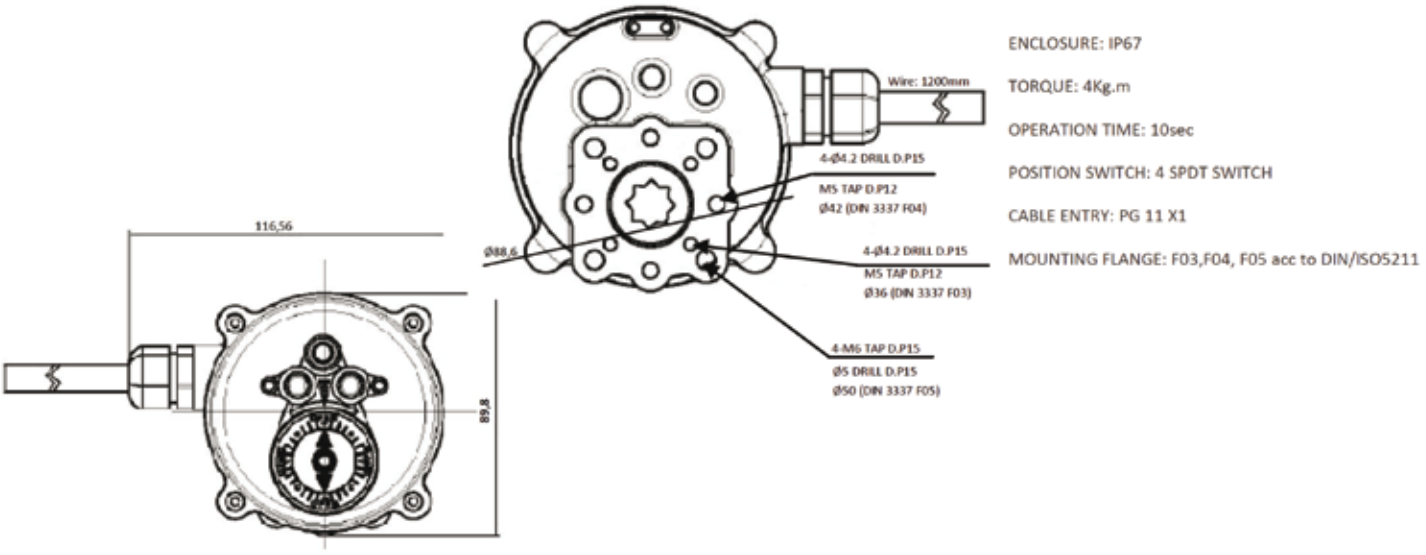
- Verify the line voltage to the actuator
- Check that the voltage matches the rating on the actuator nameplate
- Check internal wiring against actuator wiring diagram
- Check limit switch cams

Actuator is receiving power but does not operate

- Verify the line voltage to the actuator
- Check actuator force to see if it's greater than the valve force
- Check limit switches and cams
- Check that the force switches have not tripped
- Check mechanical travel stop adjustment
- Verify the actuator against valve rotation (standard units are anti-clockwise open)
- Check internal wiring
- Check for corrosion and condensation
- Verify coupler/bracket are correctly installed and is not causing binding

Actuator runs erratically

- Check ambient temperature
- Verify that the duty cycle has not been exceeded



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