IQT Battery Failsafe

Introduction.

The IQT battery failsafe actuator provides electrical operation after loss of main AC electrical supply, allowing the valve to be controlled to a process, mains fail safe position. On loss of AC supply, power is provided from integral batteries located in a extended version of the terminal cover. With AC power applied to the actuator, the batteries are charged from the actuator.

There are three possible failsafe actions that can be customer configured:

Failsafe Close - Close valve on loss of AC supply
Failsafe Open - Open valve on loss of AC supply
Stayput waiting for command - the actuator can then be directed to operate via local or standard remote control signals***** within 30 minutes of AC power being removed.

*****Remote signals must be applied to standard remote control inputs, close on terminal 33, open on terminal 35 or ESD on terminal 3 of battery pack connector. On loss of AC supply remote control via Folomatic proportional control or serial digital network signals are not available.

*On loss of AC supply the IQT battery failsafe does not support customer nominal 24V DC supply on terminals 4 (-ve) and 5 (+ve) and therefore control signal supply must be externally powered. Refer to wiring diagram.

On loss of AC supply the IQT battery failsafe does not support analogue current position transmitter (CPT) position feedback or serial network communication. The IQT monitor relay will de-energise on loss of AC supply.

WARNING—CONTAINS BATTERIES:
FIRE, EXPLOSION AND SEVERE BURN HAZARD. DO NOT SHORT CIRCUIT. DO NOT INCINERATE. DO NOT DISASSEMBLE BATTERY PACK. RECHARGE ONLY AS PART OF THE IQT. DO NOT EXPOSE BATTERIES TO AMBIENT TEMPERATURES ABOVE 60°C
THE IQT BATTERY FAILSAFE ACTUATOR CONTAINS HIGH CAPACITY BATTERIES WHICH ARE CONNECTED TO ACTUATOR TERMINALS 14 (+) AND 21 (-). DC BATTERY POWER MAY BE SUPPLIED TO THESE TERMINALS WHEN THE AC ELECTRICAL SUPPLY IS SWITCHED ON AND SWITCHED OFF.

For safety the IQT Failsafe battery pack is shipped with DC power fuses FS3 and FS4 removed. It is essential that the fuses are removed before any maintenance work is carried out on the actuator or the battery assembly.
Before fitting Fuses FS3 and FS4 the IQT actuator must be commissioned in accordance with Publication no. E175E.

Battery Failsafe Specification

Environmental

Operating temperature **-**30°C to + 60°C
Enclosure (IQT battery Failsafe actuator): Watertight IP68 — 7m / 72 Hrs

Failsafe Operation Performance: Number of operations at 75% rated torque.

Temperature °C	IQT125	IQT250	IQT500	IQT1000	IQT2000
-30	15	12	6	3	1
-20	50	40	20	10	5
-0	63	50	25	12	6
20	75	60	30	15	7
40	75	60	30	15	7
60	75	60	30	15	7

Battery Pack:

Type: Sealed lead–acid batteries located in a vented enclosure
Voltage & Capacity: 28V— 2.5Ah
Float life: 8 Years at 20°C, 3 years at 40° C
Storage Life**:** 2 years at 23°C, 2 months at 60° C
Battery pack assembly weight: 5.5Kg. For total IQT battery failsafe weight, add 5.5Kg to the actuator weights listed in E175E, page 71.

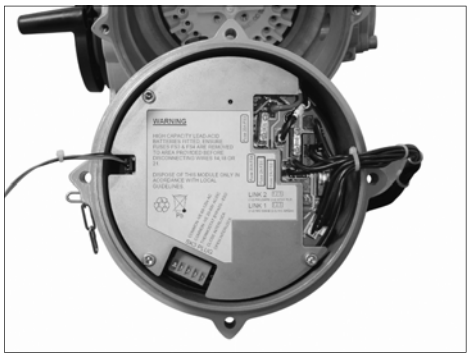
Charger

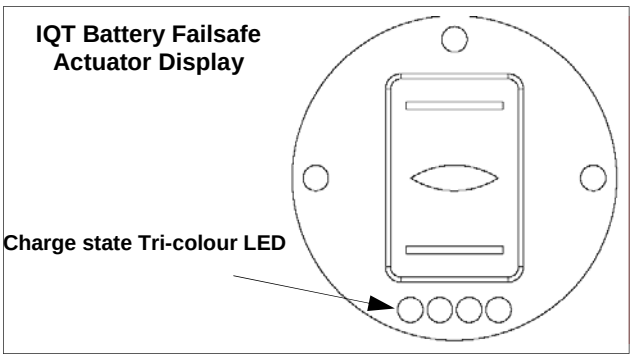
The IQT battery failsafe is despatched with the batteries in a charged state, however once the IQT is connected to AC power the batteries will automatically begin charging to bring them to the float charge state. For correct battery charging, the IQT supply voltage must not be less than 90% of nominal.

Charging Time—typically 4 hours from a discharged state (depending on ambient temperature).
Charge state - Tri-colour LED indication in IQT main display* fig 2

- Red—Battery charge depleted < 80%—Boost charge
- Amber—Battery charge low 80% to 100%—Overcharge charge
- Green—Battery fully charged—Float charge

* AC Power ON indication. When AC supply is OFF, LED status indication is approximate due to termination of battery charging.





Protection

DC power supply—Fuses FS 3 and FS4 are rated at 20A, automobile type ATO Fast acting.
Charge/control— Fuses FS1 and FS2 are rated 2A, 20mm quick blow.
The battery supply will auto disconnect at 20V or 30 minutes after AC supply is removed from the actuator to prevent damage caused by deep discharge of batteries.

Maintenance

Ensure the two vents located in the battery pack cover are not removed, plugged or covered. The batteries are sealed lead acid type and require no maintenance. Refer to E175E for IQT range maintenance.

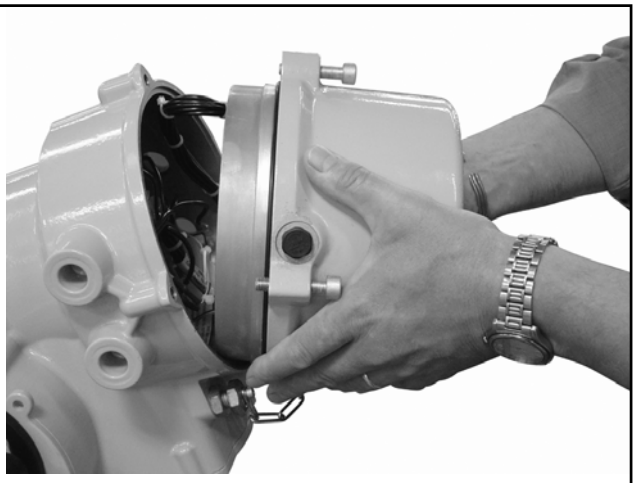
Failsafe Commissioning Instructions

Before commissioning the failsafe operation it is essential that the IQT actuator has first been commissioned in accordance with publication E175E - IQT Range Installation and Commissioning Instructions.

1. Remove cover.
Ensure the AC power supply to the actuator is switched OFF.
Using a 6mm allen key remove the four screws securing the IQT battery failsafe cover and remove cover from actuator housing. The cover houses the battery pack and charging/control circuitry and care must be taken that it does not drop.

Ensure the two 20A fuses located in a plastic bag are kept safely - **DO NOT FIT**

The cover is restrained with an external chain to support its weight (5.5 Kg approx) and prevent interconnecting cables being damaged. The battery failsafe cover assembly is supported by the restraining chain during commissioning.



2. Set control Links
Referring to the label, locate PCB links LK1 and LK2. Links determine required action on loss of AC supply to the actuator.
Using pliers, fit links LK1 and LK2 in required positions. Links bridge between pins 1-2 or 2-3 and must be set for the desired action as detailed in table the below:
***The direction required for failsafe operation and ESD**

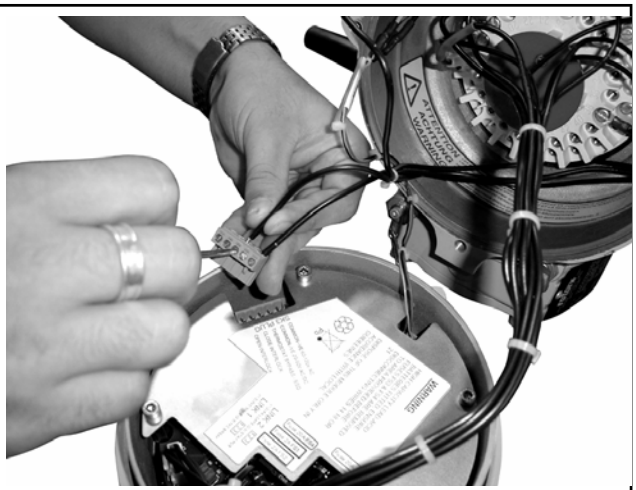
LK1	LK2	Required action
1-2	1-2	Failsafe on loss of supply , ESD [A2] set [NO]*
2-3	1-2	Failsafe on loss of supply , ESD [A2] set [NC]*
1-2	2-3	Stayput waiting for command (30 Min max)

contact form (if being used) is set with the IQT setting tool. Refer to 6, page 4.

3. Connect ESD/Interlock control wiring
If the control of the IQT actuator with AC supply switched ON requires emergency shut down and/or interlocks, ESD and/or interlock field wiring must be connected to the green terminal plug located on the battery pack assembly. If ESD and/or interlocks do not form part of the IQT control scheme then no wiring is necessary.

Remove plug by pulling it straight up and connect field wiring for ESD and/or interlocks as indicated on the label and actuator wiring diagram.

Once connected, re-fit the wired plug into its socket. The plug and socket are polarised, ensuring they cannot be mated incorrectly.



4. Fit Battery Fuses

Referring to the label, locate 20A fuses FS3 and FS4 holders located on the battery pack assembly.
Remove 20A fuses from the plastic bag and fit into fuse holders FS3 and FS4 as shown.

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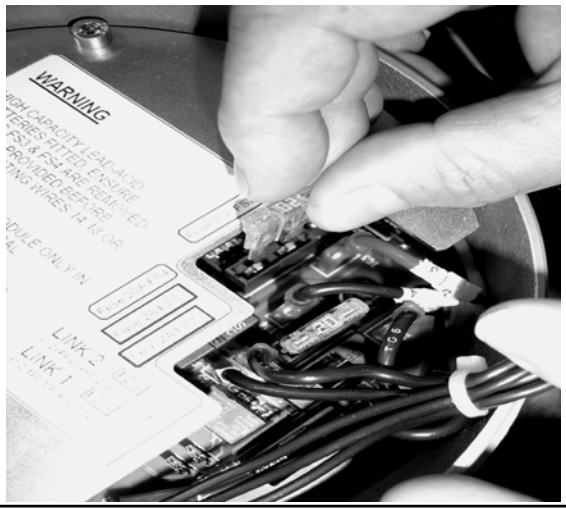


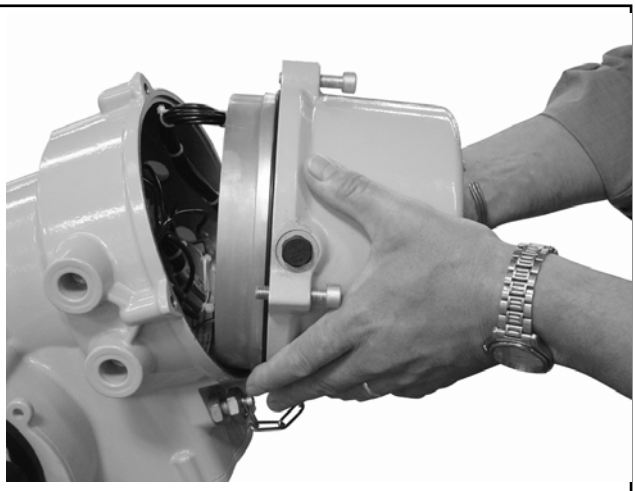
5. Refit Cover

Make sure cover O ring is fitted and the cover spigot is lightly greased.

Refit cover making sure no field or interconnecting wires are trapped between cover and gearcase.

Tighten the 4 fixing bolts using a 6mm allen key.

Set up of the battery pack is now complete.
To enable failsafe operation, settings within the IQT actuator must now be made.



6. IQT Actuator Failsafe Settings.

The actuator can be operated by standard remote control signals (open/close/interlocks/ESD) under AC supply control. On AC supply loss, the actuator will automatically perform an ESD using battery power.
For the required failsafe operation, using the supplied Infra-red Setting Tool, set secondary settings [A1], [A2] and [A4] for the desired failsafe action. Refer to publication E175E IQT Range Installation instructions, page 30, [A1] ESD Action, [A2] ESD contact type and [A4] ESD override interlocks actuator settings must be checked and/or set .

Switch ON AC supply power to the IQT actuator. Refer to table below for settings

Failsafe action on loss of AC supply	LK1*	LK2*	[A1]	[A2]	[A4]
Close (no user ESD)	1-2	1-2	[CL]	[NO]	[OF]
Open (no user ESD)	1-2	1-2	[OP]	[NO]	[OF]
Close ESD = N/O contact, "makes" for ESD	1-2	1-2	[CL]	[NO]	[OF]
Open ESD = N/O contact, "makes" for ESD	1-2	1-2	[OP]	[NO]	[OF]
Close ESD = N/C contact, "breaks" for ESD	2-3	1-2	[CL]	[NC]	[OF]
Open ESD = N/C contact, "breaks" for ESD	2-3	1-2	[OP]	[NC]	[OF]

NOTE. If ESD is being used for AC supply control the user must decide if ESD is to override local stop. If ESD override local stop is required set [A5] to [NO].

Testing
To test the failsafe function, switch off AC supply to IQT actuator. Actuator will perform the set failsafe function.

*Refer to section 2, page 3