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## TESTS UNDERTAKEN AND REPORT PREPARED BY SIRA TEST & CERTIFICATION LIMITED

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15<sup>th</sup> February 2013

**Ingress Protection tests on an  
Electric Valve Actuator  
for Rotork Controls Ltd  
Report No: R15000-062A/00A  
Commercially in confidence**

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# TEST REPORT

ISSUED BY SIRA TEST & CERTIFICATION LIMITED

Carried out by ST&C on behalf of:

Rotork Controls Ltd  
Brassmill Lane  
Bath  
BA1 3JQ

Project No: 15000-062

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## 1 INTRODUCTION

This report refers to the performance of the test sample when tested against the agreed programme. Whilst this report maybe freely reproduced as a complete document it may not be abstracted.

<b>Manufacturer:</b>	Rotork Controls Ltd
<b>Type Identification (Serial Nos.):</b>	IQIII Size 1 Actuator 15000-051 #56 IQIII Size 1 Actuator 15000-051 #103 IQIII Size 1 Electrical cover 15000-051 #105 IQIII Size 1 Actuator 15000-062 #1
<b>Standard:</b>	BS EN 60529:1992
<b>Deviations from Standard:</b>	None
<b>Aim:</b>	IP66 IPX8, Depth 7 m, 72 h with the terminal lid fitted IPX8, Depth 7 m, 72 h without the terminal lid fitted
<b>ST&amp;C Test Procedure:</b>	LOP 220.08 IP6X LOP 220.16 IPX6 LOP 220.18 IPX8
<b>ST&amp;C Internal Test Reports:</b>	IP6X 12/0200 IPX8 12/0482 - Terminal lid in place IPX6 12/0483 IPX8 12/1032 - Terminal lid removed

**Sample Delivery Dates:** 15000-051 #56 24<sup>th</sup> February 2012  
15000-051 #103 21<sup>st</sup> May 2012  
15000-051 #105 13<sup>th</sup> June 2012  
15000-062 #1 30<sup>th</sup> November 2012

**Tests Conducted Between:** 8<sup>th</sup> May and 14<sup>th</sup> December 2012

## 2 DESCRIPTION OF TEST SAMPLES

The IQ range of Electric Valve Actuator comprises an oil filled worm gearcase with handwheel and de-clutch mechanism to which is attached a motor enclosure, an electrical control enclosure and a terminal enclosure.

The motor cover connects to the gearcase by means of a spigoted joint and is secured by four M8 capscrews.

The electrical cover connects to the gearcase by means of a spigoted joint and is secured by four M8 capscrews. At one end of the electrical enclosure a window is provided to allow the external observation of an internal LCD device. The window is manufactured from polycarbonate.

The terminal enclosure connects to the electrical enclosure via the gearcase, their volumes being separated by a terminal bung. The terminal bung comprises of moulded plastic main body through which passes a number of moulded in terminals. The terminal bung is secured in position by means of a circlip. The terminal enclosure provides all electrical field-wiring terminations at the terminal bung. Cable entry facilities are provided in the form of three or four threaded entries. The terminal enclosure is closed by means of a lid, which connects to the gearcase by means of a tapered spigot joint and is secured by four M8 capscrews.

In all cases environmental sealing is provided by elastomeric seals. All enclosures are manufactured in aluminium alloy

### **3 TESTS FOR FIRST CHARACTERISTIC NUMERAL 6**

Test performed on sample 15000-051 #56.

#### **3.1 Test for protection against access to hazardous parts**

Reference BS EN 60529:1992 clause 12.

A rigid test wire Ø 1 mm and length to a stop face of 100 mm was pushed against all openings of the test sample with a force of 1 N ± 10%.

##### **3.1.1 Result**

The test wire did not come into contact with any hazardous parts.

#### **3.2 Test for protection against solid foreign objects**

Reference BS EN 60529:1992 clause 13.

The test sample was supported in its normal operating orientation inside a chamber containing approximately 2 kg of test dust per cubic metre, with maximum particle size 75 µm maintained in suspension. As the normal working cycle of the test sample may cause a reduction in its internal air pressure below that of the surrounding atmosphere (which was not verified by Sira Test & Certification Ltd) connection was made to a vacuum pump to maintain an under-pressure inside the test sample which did not exceed 20 mbar.

The extraction rate measured was such that the test duration was 8 hours.

##### **3.2.1 Result**

On internal inspection of the test sample no dust was found.

### **4 TEST FOR SECOND CHARACTERISTIC NUMERAL: 6**

Tests performed on samples 15000-051 #105 and 15000-051 #103. Two tests were performed; initial test was carried out on sample #103 (excluding the electrical compartment) with the second test being carried out #103 fitted with the electrical cover from #105 (just the electrical compartment under test).

The test method was the same for both tests.

#### **4.1 Test for protection against water**

Reference BS EN 60529:1992 clause 14.

The test sample was supported in its normal operating orientation. Water from a standard water jet hose test nozzle with internal Ø 12.5 mm was directed at the test sample from all practicable directions at a rate of 100 L/min from a distance between 2.5 to 3 metres. The test duration was 3 minutes.

##### **4.1.1 Result**

For both tests, on internal inspection of the area tested no water was found.

## 5 TESTS FOR SECOND CHARACTERISTIC NUMERAL: 8

Test performed on sample 15000-051 #103 (terminal lid fitted) and 15000-062 #1 (terminal lid removed).

The test method was the same for both tests.

### 5.1 Test for protection against water

Reference BS EN 60529:1992 clause 14.

#### 5.1.1 With the terminal lid fitted

The test sample was completely immersed in water. A pressure was applied to the water surface so that the lowest point of the sample was subjected to a water level equivalent to at least 7 m. The test duration was 72 hours.

##### 5.1.1.1 Result

Upon internal inspection no water was found within the motor or electrical compartments.

There was evidence of water ingress into the terminal compartment. However subsequent inspections revealed that the ingress was due to badly secured cable entry adaptors and blanking elements, which were not themselves part of the testing requirement.

#### 5.2.1 Without the terminal lid fitted

The test sample was completely immersed in water. A pressure was applied to the water surface so that the lowest point of the sample was subjected to a water level equivalent to at least 7 m. The test duration was 72 hours.

##### 5.2.1.1 Result

On internal inspection of the test sample no water was found.

## 6 CONCLUSION

The test samples described in sections 1 and 2, when tested in the manner described in sections 3 and 4, satisfied the requirements of BS EN 60529:1992 Amendments Nos. 1 and 2 as detailed below:

IP66, complete device

IPX8 at a water depth of 7 metres for 72 hours, complete device.

IPX8 at a water depth of 7 metres for 72 hours, with the terminal lid removed.

The other sizes in the IQ Range employ similar environmental sealing arrangements and materials of construction. Although not tested as part of the above programme the IQ Range can be considered as maintaining the above levels of ingress protection.