working for a safer tommorow

KARANDIKAR LABORATORIES PVT. LTD. BOISAR

Format: F#07 b.1 Rev 10

TYPE TEST REPORT

IEC 60529:2013

Degrees of Protection Provided by Enclosures (IP Code)

TC-6311

Report No. ..... : **KLPL/BTG/19/09-38**

ULR No. .....: TC631119000000517F

Discipline .....: Electrical Discipline

Group/Category .....: Environmental Test Facility

Sub-category .....: Ingress protection test

Date of issue..... : **12.10.2020**

No. of pages ..... : 09 PAGES + Annexure

Compiled by (+ signature)..... : Rohit Patil

Designation: Testing Engineer

Approved by (+ signature)..... : Javed Shaikh

Designation: Dy. Laboratory Manager

Item Received On ..... : 12.09.2019 in Good Condition

Test Completion Date ..... : 30.09.2019

Client

Name ..... : **M/s. Rotork Controls (India) Limited**
: 28 B, Ambattur Industrial estate (North),
Ambattur, Chennai-600098.

Test Specification

Standard ..... : **IEC 60529:2013**

Specified IP-Code .....: **IP68**

Equipment Under Test

Type of Test Object ..... : **Q650/F14 Type Actuator**

Model No. ..... : Q650

Sr. No..... : 1C63490701

Manufacturer .....: **M/s. Rotork Controls (India) Limited**

Annexure :

Drawing No.....: BR/MISC-10950/01, Rev.No.00, Dated:06.05.2019, (01 Page)

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

NOTE : 1) This refers only to the particular item(s) submitted for testing.
2) If necessary, this report shall be reproduced ONLY in full.

Possible test case verdicts:

Test case does not apply to the test object ..... : N (Not Applicable)

Test object does meet the requirement..... : P (Pass)

Test item does not meet the requirement ..... : F (Fail)

Test case has not been checked ..... : _____

General remarks:

"(See remark #)" refers to a remark appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This test report shall not be reproduced except in full without the written approval of the testing Laboratory.

Note: - MAJOR EQUIPMENTS USED

Tests	Required Instruments	Id. No.	Cal Due Date	Used Y/N
1X	Accessibility probe 50 mm Dia.	K&A 405/1A	18.03.2020	N
2X	Accessibility Probe 12.5 mm Dia.	K&A 405 / 3B	18.03.2020	N
3X	Accessibility Probe 2.5mm Dia.	K&A 405 / 5A	18.03.2020	N
4X	Accessibility Probe 1mm Dia.	K&A 405 / 6B	18.03.2020	Y
5X / 6X	Manometer	K&A 071-04	27.04.2020	Y
	Rotameter 1.2 LPM	K&A 425	04.01.2020	Y
	DTC with sensor	K&A 581/2-12	01.04.2020	Y
	Timer	K&A 581/1-12	06.04.2020	Y
X3	Stop Watch	K&A 1171-18	11.09.2020	N
	Pressure Gauge	K&A 383/1	07.02.2020	N
X4	Stop Watch	K&A 1171-18	11.09.2020	N
	Pressure Gauge	K&A 384/1	07.02.2020	N
X5	Nozzle 6.3 mm dia.	K&A 381-16	14.04.2020	N
	Rotameter	K&A 419/2	04.01.2020	N
	Stop Watch	K&A 1171-18	11.09.2020	N
X6	Nozzle 12.5 mm dia.	K&A 382	14.04.2020	N
	Rotameter	K&A 1102-17	08.05.2020	N
	Stop Watch	K&A 1171-18	11.09.2020	N
X7 /X8	Scale	K&A 107	One time calibration	Y
	Stop watch	K&A 1171-18	11.09.2020	Y

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

IEC 60529:2013					
Clause	**Requirement - Test**			**Result- Remark**	**Verdict**
10	**Marking.**				N
11	**General requirement for tests.**				
11.1	Tests should be carried out under the standard atmospheric conditions described in IEC 60068-1				**P**
11.2	Test samples shall be in a clean and new condition.				**P**
	The relevant product standard shall specify details such as: The number of samples to be tested;				N
	-conditions for mounting, assembling and positioning of the samples;				**P**
	-the pre-conditioning, if any, which is to be used;				N
	-whether to be tested energized or not;				N
	-whether to be tested with its parts in motion or not;				N
11.5	**Empty enclosures**				
	If the enclosure is tested without equipment inside, the manufacturer shall ensure that after the electrical equipment is enclosed the enclosure meets the declared degree of Protection of the final product.				N

12	**Tests for protection against access to hazardous parts indicated by the first characteristic numeral.**				
First, characteristic Numeral.	Test means (Access probes)	Test force	Test Conditions Refer IEC 60529:2013		N
0	No test required	-	-		N
1	The access probe, sphere of 50 mm Ø shall not fully penetrate and adequate clearance shall be kept.	50N ±10%	Cls.12.2		N
2	The jointed test finger may penetrate up to 80 mm length but adequate clearance shall be kept.	30N ±10%	Cls.12.2		N
3	The access probe, sphere of 2.5 mm Ø shall not penetrate and adequate clearance shall be kept.	3N± 10%	Cls.12.2		N
4	The access probe of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept.	1N± 10%	Cls.12.2		N
5	Test conditions for IP 5X: Same As Above	1N± 10%	Cls.12.2		N
6	Test conditions for IP 6X: Same As Above	1N± 10%	Cls.12.2	Test wire does not penetrate inside the UUT.	**P**

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

IEC 60529:2013					
Clause	**Requirement – Test**			**Result-Remark**	**Verdict**
13	**Tests for protection against solid foreign objects indicated by the First characteristic numeral.**				
First, characteristic Numeral.	Test means (object probes and dust chamber)	Test force	Test Conditions Refer IEC 60529:2013		N
0	No test required	-	-		N
1	Rigid sphere without handle or guard 50 mm diameter.	50N ±10%	Cls.13.2		N
2	Rigid sphere without or guard 12, 5 mm diameter.	30N ±10%	Cls.13.2		N
3	Rigid steel rod 2,5mm diameter with edges free from burrs	3N± 10%	Cls.13.2		N
4	Rigid steel wire 1, mm diameter with edges free from burrs.	1N± 10%	Cls.13.2		N
5	Dust chamber, with under pressure	NA	Cls.13.4+13.5		N
6	Dust chamber, The enclosure is maintained below the Surrounding atmospheric pressure by a vacuum pump.	NA	Cls.13.4+13.6	For 8 Hrs, As extraction rate is less than 40 volumes per hour and max depression of 20 mbar.	**P**
13.6.2	**Acceptance conditions for the first characteristic numeral 6X.** The protection is satisfactory if no hazardous deposit of dust is observable inside the UUT at the end of test.			Before dust test. (i) IR test was conducted between all terminals are shorted together and the body of UUT, applied voltage 500 V.d.c for 1 minute. Observation: IR observed >10GΩ. Before dust test. (ii) HV test was conducted between all terminals are shorted together and the body of	**P**

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

		UUT, applied voltage 2KV a.c for 1 minute. Observation: No flash occurred. After dust test, (i) No ingress of powder found inside the UUT. (ii) IR test was conducted between all terminals are shorted together and the body of UUT, applied voltage 500 V.d.c for 1 minute. Observation: IR observed >10GΩ. (iii) HV test was conducted between all terminals are shorted together and the body of UUT, applied voltage 2KV a.c for 1 minute. Observation: No flash occurred.	

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

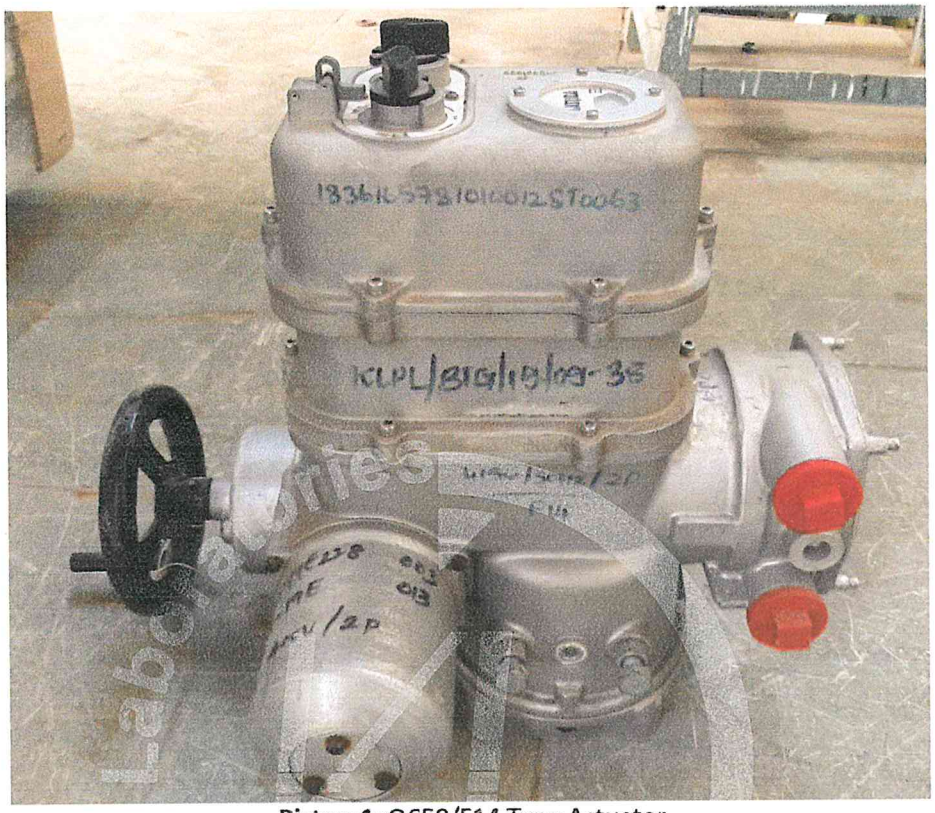
IEC 60529:2013				
Clause	**Requirement – Test**		**Result-Remark**	**Verdict**
14	**Tests for protection against water indicated by the second characteristic numeral.**			
Second, characteristic Numeral.	Test means	Test Conditions Refer IEC 60529:2013		N
0	No test required	Cls.14.2.0		N
1	Drip box, Enclosure on turntable	Cls.14.2.1		N
2	Drip box, Enclosure in 4 fixed positions of 15 ° tilt	Cls.14.2.2		N
3	oscillating tube or spray nozzle, 60° from vertical	Cls.14.2.3		N
4	oscillating tube or spray nozzle, 180° from vertical	Cls.14.2.4		N
5	6.3-mm nozzle, tested with a spraying nozzle, distance 2.5 m to 3 m, water flow rate 12.5 l/min	Cls.14.2.5		N
6	12.5-mm nozzle, tested with a spraying nozzle, distance 2.5 m to 3 m, water flow rate 100 l/min	Cls.14.2.6		N
7	Immersion tank, Temporary immersion in water in service position, Water temperature does not differ from that of equipment by more than 5K.	Cls.14.2.7		N
8	Immersion tank, Continuous immersion subject to agreement. Water temperature does not differ from that of equipment by more than 5K. **Test Duration:** 48 Hour.	Cls.14.2.8	Immersion depth: The UUT is located 3 meter below the surface of water.	**P**
-	**Acceptance conditions for IPX8:** The protection is satisfactory if no water has accumulated near the insulation, cable end or entered cables or interferes with the correct operation of the equipment.	Cls.14.3	Before dust test. (i) IR test was conducted between all terminals are shorted together and the body of UUT, applied voltage 500 V.d.c for 1 minute. Observation: IR observed >10GΩ. Before dust test. (ii) HV test was conducted	**P**

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

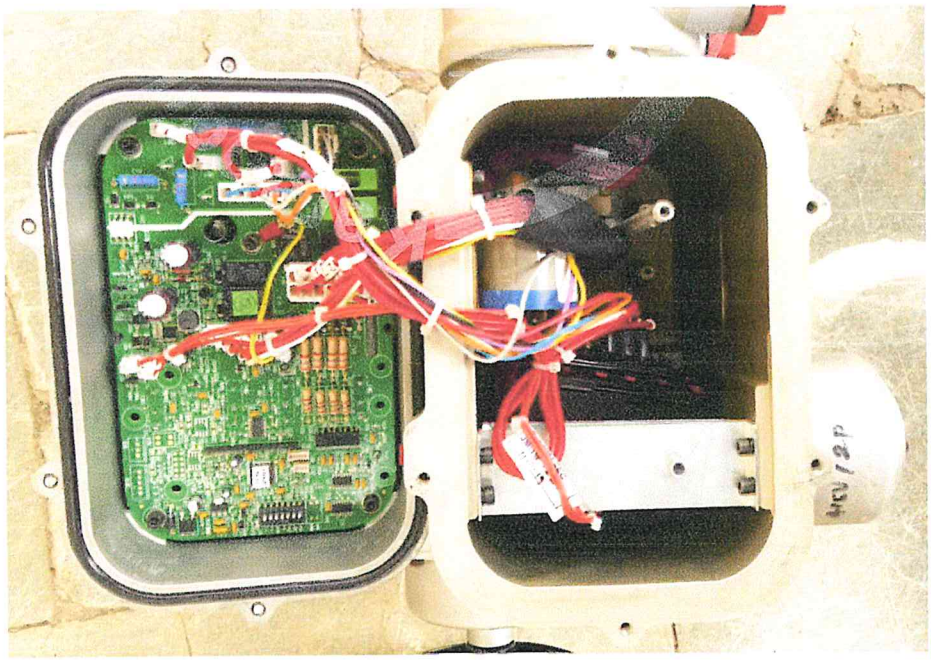
			between all terminals are shorted together and the body of UUT, applied voltage 2KV a.c for 1 minute. Observation: No flash occurred. After dust test, (iv) No ingress of powder found inside the UUT. (v) IR test was conducted between all terminals are shorted together and the body of UUT, applied voltage 500 V.d.c for 1 minute. Observation: IR observed >10GΩ. (vi) HV test was conducted between all terminals are shorted together and the body of UUT, applied voltage 2KV a.c for 1 minute. Observation: No flash occurred.	
-	Tests for protection against access to hazardous parts indicated by the additional letter.	Cls.15		N

SUMMARY OF INGRESS PROTECTION TESTS ACCORDING TO IEC 60529:2013
Conclusion of the IP68 test: PASS.
The results of the tests were in compliance with the requirements in the standard IEC 60529:2013
UUT=Unit Under Test

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

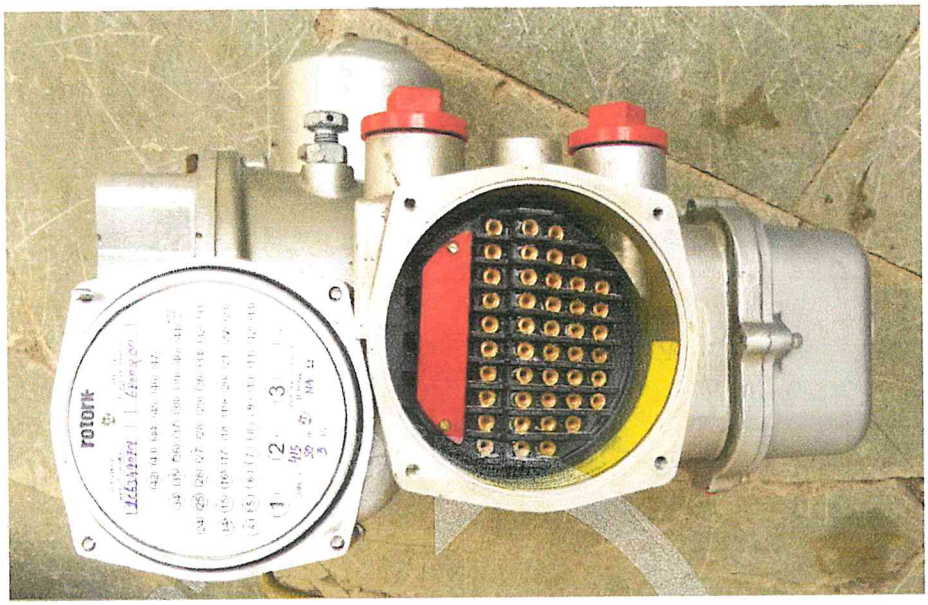


Picture1: Q650/F14 Type Actuator



Pictute2: No ingress of powder & water observed

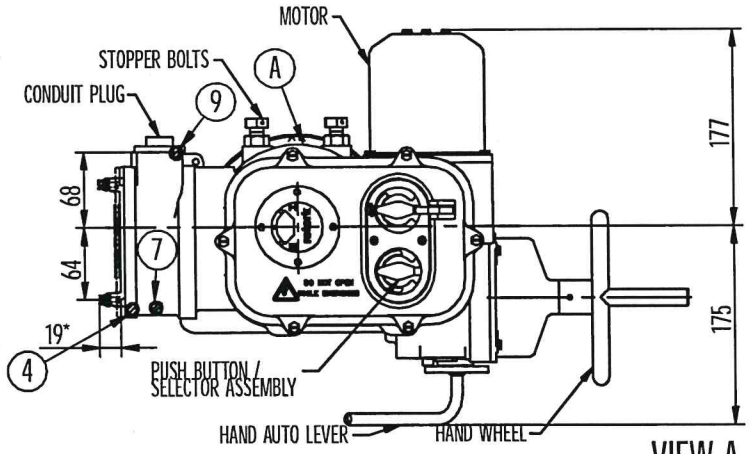
KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.



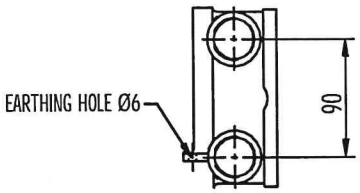
Pictute3: No ingress of powder & water observed

END OF REPORT

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.



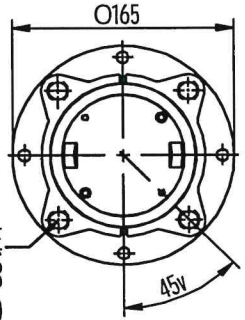
CONDUIT ENTRIES
TAPPED 2 X M32
STANDARD ALTERNATIVES
IF SPECIFIED
2 X 1 ¼" NPT
2 X PG 12

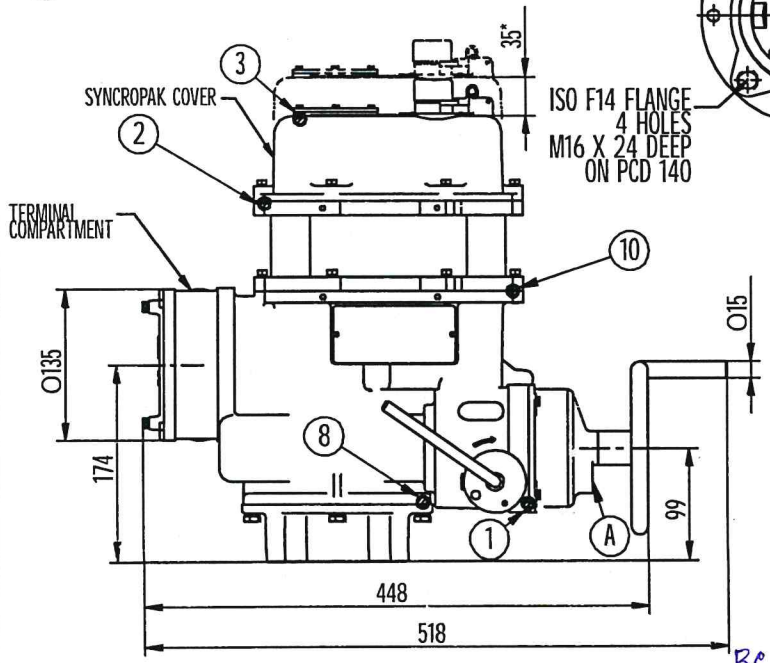


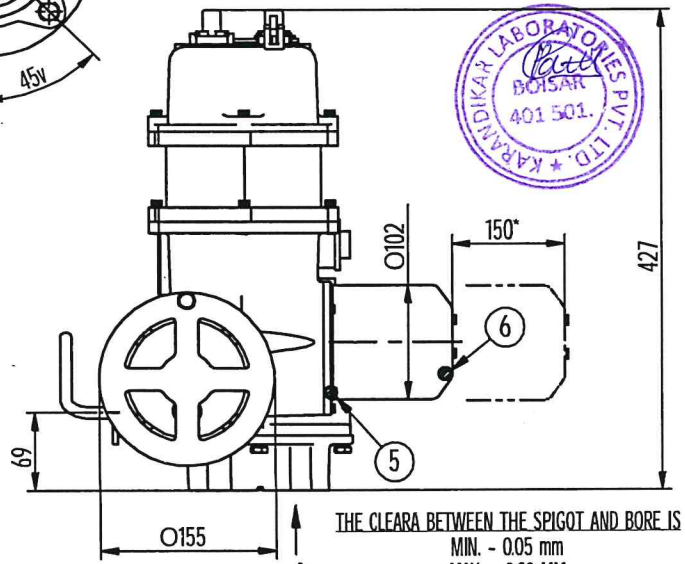
"O" RING LOCATION	DMENSIONS	MATERIAL
HAND WHEEL COVER (1)	104.4 X 1.78	NITRILE
SYNCROPAK COVER (2)	143.5 X 212.5(RECT) X 3.4	NITRILE
INDICATOR WINDOW (3)	47.37 X 1.78	NITRILE
TERMINAL COVER (4)	120.37 X 1.78	NITRILE
MOTOR HOUSING (5)	95 X 1.78	NITRILE
MOTOR END CAP (6)	26.7 X 1.78	NITRILE
TERMINAL BUNG (7)	120.65 X 5.34	NITRILE
BASE (8)	125 X 3	NITRILE
CONDUIT ENTRY (9)	31.42 X 2.62	NITRILE
INTERMEADIEATE ADAPTOR (10)	143.5 X 212.5(RECT) X 3.4	NITRILE

NOTES:
1. * COVER REMOVABLE ALLOWANCE
2. APPROX. WEIGHT OF THE ACTUATOR IS 25 kgs
3. ALL CONDUIT THREADS ARE PLUGGED WITH PLASTIC PLUGS WITH 'O' RINGS
4. ALL 'O' RINGS ARE ASSEMBLED AFTER APPLYING GREASE
5. (A) OIL FILLER/DRAIN PLUGS

VIEW A







THE CLEARA BETWEEN THE SPIGOT AND BORE IS
MIN. - 0.05 mm
MAX. - 0.30 MM

REPORT NO:- KLPL/BTG/20109-38

Annexure

Drawing Number	BR/MISC-10950 / 01
	Manufacturing dimensions specified in millimeters. Precise inch conversions for reference
Third angle projection	Sheet A4 / Scale NTS

Issue	Modifications
01	FIRST ISSUE

Title	Q650 3 PHASE F14
	IP68 APPROVAL DRAWING
Drawn	DAB 06.05.2019
Checked	DAB 06.05.2019
Approved	
Used on	No. off 1
sheet no.	1 OF 1
Drawing Number	BR/MISC-10950 / 01

rotork
Rotork Controls (India) Pvt. Ltd.
288 Ambattur Industrial Estate
(North Phase)
Chennai 600 098.