

Testing laboratory for climatic, mechanical
and corrosive environmental stress



QUALITY TEST CERTIFICATE

Test report No. 10995.03 / 14

Client	Baumer Hübner GmbH Max-Dohrn-Str. 2+4 10589 Berlin		
Equipment under test	Incremental Encoder SN Quantity	HOGS151 DN 5000 700001050791 1 unit	
Purpose	Tests for the certification of the degrees of protection IP54		
Test program	Dust test Protection against splash water IPX4	IP5X	<i>based on IEC 60529</i> <i>based on IEC 60529</i>
Test period	14 January to 12 February 2015		
Execution / results	see pages 2 to 4		
Total number of pages	6 (including 1 appendix)		

Test results


The tests were performed according to the specifications of the standards and to the demands of the client.

No traces of dust were detected inside the incremental encoder HOGS151 DN 5000.


Traces of water were detected inside the housing of the specimen.

In agreement with the client the degrees of protection IP54 was proven for the incremental encoder HOGS151 DN 5000.

Further evaluation will be done by the client.


Dipl.-Ing. R. Lein
Head of the testing laboratory
Berlin, 10 March 2015




M.Eng. M. Sommerfeld
Test engineer

1 Purpose

Certification of the degrees of protection IP54 with overpressure for the **incremental encoder HOGS151 DN 5000** under defined environmental conditions, according to the specifications of the standards and to the demands of the client.

2 Equipment under test

Incremental Encoder	HOGS151 DN 5000
SN	700001050791
Quantity	1 unit
Arrival date of the samples	03 December 2014

3 Basics

3.1 Demands of the client

3.2 Used standards

IEC 60068-1:1988 + Corr. 1988 + A1:1992	DIN EN 60068-1:1995-03
"Environmental testing - Part 1: General and guidance"	
IEC 60529:1989 + A1:1999 + A2:2013	DIN EN 60529; VDE 0470-1:2014-09
„Degrees of protection provided by enclosures (IP Code)“	

4 Test program

4.1 Protection against solid foreign objects – Dust test IP5X *based on the IEC 60529 § 13.4*

EUT	not in operation
EUT position	axle vertical upright

The dust test includes the protection against access to hazardous parts test (protection against access with a wire). This is to be verified using a standardized test wire (Ø 1 mm, force 1 N). This test is to be performed before the dust test.

The EUT shall be exposed to a whirling air flow with finely distributed powder dust in the dust chamber. The test of the **degree of protection IP5X** shall be realized according to the standards:

test dust	talcum powder (composition and particle size according to standard)
test duration	2 - 8 h
enclosure category	deviating from the norm, the housing is pressurized with 0.1 bar overpressure according to the demands of the client

Visual inspection

After the dust test IP5X the specimen will be visually examined for eventual mechanical damage or any other alterations. The opening of the specimen and the examination for penetrated dust will be carried out after the test IPX4.

4.2 Protection against splash water IPX4

based on the IEC 60529 § 14.2.4

For the certification of the **degree of protection IPX4** the following specifications of the standard apply:

EUT	not in operation
EUT position	axle vertical upright
test set-up	standardized spray nozzle
water flow-rate	10.0 l/min ± 5 %
water pressure	according to the specified flow-rate
clearance	approx. 300 mm - 500 mm (spray nozzle to housing)
test duration	5 min
enclosure category	deviating from the norm, the housing is pressurized with 0.1 bar overpressure according to the demands of the client

Visual inspection

After the splash water test IPX4 the specimen will be examined for external damage and for any other alterations. Subsequently, the specimen will be opened and examined for penetrated dust or water.

5 Execution

The degrees of protection test IP54 for the **incremental encoder HOGS151 DN 5000** was performed according to the test program (sections 4.1 to 4.2), in compliance with the specifications of the current standards and with the demands of the client.

Visual inspection

After the respective individual tests (IP5X and IPX4) the specimen were examined for external damage and any other alterations.

After the test for the degrees of protection IPX4 the specimen were opened and examined for the presence of penetrated dust or water.

Acceptance criteria

In the **protection against access to hazardous parts IP5X** the test wire (Ø1 mm, 1N) must not penetrate the housing.

The **dust test IP5X** is satisfactory, if an inspection reveals that the talcum powder has not collected in a quantity or location such, that if it had been any other type of dust, it could have led to impairment in the proper functioning or safety of the equipment.

The **protection against splashing water IPX4** is proven, if at the end of the test no water has penetrated into the sample, or if it has it is in a quantity such that it does not impair the proper functioning or safety of the equipment.

Measurement and test devices

Name	Type	Serial No.	Maker
Rigid IEC steel wire	P 10.27	50 11 594	PTL
Dust chamber	SK 160	-	AUCOTEAM
Talcum powder	-	210410	KSL
Standardized spray nozzle	P 05.24	50 60 183	PTL
Turn table	-	-	AUCOTEAM
IR thermometer	Fluke 561	14950036	Fluke
DC-controller	3222	1149	Statron
Steel pump	EVMG 5 16N5	BHX230217	EBARA
Vacuum pump	N035.3AN.18	1255143	Neuberger
Vacuum regulator	VAR	-	Roth
Air pressure sensor	FDA612MA	01050112	Ahlborn
Data logger	MA 2290-8	H04030040G	Ahlborn

6 Results

The degrees of protection test IP54 for the *incremental encoder HOGS151 DN 5000* was performed according to the test program.

6.1 Protection against solid foreign objects – Dust test IP5X

based on the IEC 60529 § 13.4

After the degrees of protection test IP5X for the *incremental encoder HOGS151 DN 5000*

- **Dust test** **Test IP5X** *based on the IEC 60529*

the following was detected:

- The test wire could not penetrate the housing.
- No external damage or any other alterations
- No traces of dust was inside the specimen.

6.2 Protection against splash water IPX4

based on the IEC 60529 § 14.2.4

After the protection against water jets test IPX4 for the *incremental encoder HOGS151 DN 5000*

- **Protection against splash water** **Test IPX4** *based on the IEC 60529*

the following was detected:

- Without external damage or any other alterations.
- Traces of water were detected inside the housing of the specimen.
- Circuit board without traces of water.
- The client estimates the determined water inside the housing as non-critical.
The degrees of protection IP54 was proven.

Further evaluation will be done by the client.

The tests were performed according to the specifications of the standards and to the demands of the client.

No traces of dust were detected inside the incremental encoder HOGS151 DN 5000.

Traces of water were detected inside the housing of the specimen.

In agreement with the client the degrees of protection IP54 was proven for the incremental encoder HOGS151 DN 5000.

Further evaluation will be done by the client.

The results of the tests refer only to the above mentioned equipment under test. This report, or individual pages of this test report, may only be copied following the written consent of the testing laboratory. This test report No. 10995.03 / 14 includes 4 pages and 1 appendix – pictures

Pictures



Picture 1
Incremental encoder HOGS151 DN 5000
with standardized test wire (Ø 1 mm, 1 N)
before the access to hazardous parts test IP6X



Picture 2
Incremental encoder HOGS151 DN 5000
with standardized test wire (Ø 1 mm, 1 N)
during the access to hazardous parts test IP6X



Picture 3
Incremental encoder HOGS151 DN 5000 in the
dust chamber SK 160 with overpressure hose
before the dust test IP6X



Picture 4
Incremental encoder HOGS151 DN 5000 in the
in the dust chamber SK 160 with overpressure hose
after the dust test IP6X



Picture 5
Incremental encoder HOGS151 DN 5000
without visible traces of dust inside
after the dust test IP6X



Picture 6
Incremental encoder HOGS151 DN 5000
without visible traces of dust inside
after the dust test IP6X



Picture 7
Incremental encoder HOGS151 DN 5000
mounted on the turn table
before the protection against splash water test IPX4



Picture 8
Incremental encoder HOGS151 DN 5000
with equipment for overpressure regulation
before the protection against splash water test IPX4



Picture 9
Incremental encoder HOGS151 DN 5000
with standardized splash water
during the protection against splash water test IPX4



Picture 10
Incremental encoder HOGS151 DN 5000
with visible traces of water inside the housing
after the protection against splash water test IPX4



Picture 11
Incremental encoder HOGS151 DN 5000
with visible traces of water inside the housing
after the protection against splash water test IPX4



Picture 12
Incremental encoder HOGS151 DN 5000
without visible traces of water on the circuit board
after the protection against splash water test IPX4