AUCOTEAM GMBH BERLIN

Testing laboratory for climatic, mechanical
and corrosive environmental stress

DAkkS Deutsche Akkreditierungsstelle D-PL-19102-01-00

QUALITY TEST CERTIFICATE

Test report No. 10995.01 / 14

Client	**Baumer Hübner GmbH** Max-Dohrn-Str. 2+4 10589 Berlin		
Equipment under test	**Incremental Encoder** SN Quantity	**FOG9 DN 1024 TTL** 700001050788 1 unit	
Purpose	***Tests for the certification of the degrees of protection IP66***		
Test program	***Dust test*** ***Protection against water jets***	***IP6X*** ***IPX6***	*acc. to IEC 60529* *acc. to IEC 60529*
Test period	29 December 2014 to 14 January 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.

No traces of dust or water were detected inside the incremental encoder FOG9 DN 1024 TTL.

The degrees of protection IP66 was proven for the incremental encoder FOG9 DN 1024 TTL.

Further evaluation will be done by the client.

AUCOTEAM GmbH Berlin QUALITÄTSPRÜFUNG

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Berlin, 10 March 2015

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1 Purpose

Certification of the degrees of protection IP66 for the ***incremental encoder FOG9 DN 1024 TTL*** under defined environmental conditions, according to the specifications of the standards and to the demands of the client.

2 Equipment under test

Incremental Encoder	**FOG9 DN 1024 TTL**
SN	700001050788
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 (dust proof) IP6X*

according to 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 certification of the ***degrees of protection IP6X*** is to be performed according to the specifications of the standards.
The sample will be placed in the dust chamber inside a whirling airflow with finely distributed test dust. For the test IP6X with vacuum, a vacuum hose will be led inside the housing. Using vacuum, a volume equivalent to 80X that of the sample will be removed from the housing without exceeding a flow rate of 60 Volumes/h. Under no circumstance shall the vacuum exceed 2 kPa. Once a flow rate of 40 - 60 volumes /h has been achieved, the test duration shall be at least 2 h. Talcum powder will be used as test dust (composition and grain size distribution according to specifications).

Visual inspection
After the dust test IP6X 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 IPX6.

4.2 Protection against water jets test IPX6 (powerful water jets)

according to the IEC 60529 § 14.2.6

The certification of the ***degrees of protection IPX6*** is to be carried out according to the specifications of the standards.

EUT	not in operation
EUT position	axle horizontal
Test device	water jets from a standardized jet nozzle with 12.5 mm inner diameter
Water flow rate	100 l/min ± 5 %
Water pressure	according to the specified flow rate
Water temperature	must not differ by more than 5 K from that of the samples
Clearance	approx. 2.5 m (jet nozzle to housing)
Test duration	at least 3 min

Visual inspection

After the water jets test IPX6 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 IP66 for the ***incremental encoder FOG9 DN 1024 TTL*** 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 (IP6X and IPX6) the specimen were examined for external damage and any other alterations.
After the test for the degrees of protection IPX6 the specimen were opened and examined for the presence of penetrated dust or water.

Acceptance criteria

- The ***protection against access to hazardous parts IP6X*** is proven if a test wire (Ø 1 mm, force 1 N) does not penetrate the housing.
- The ***protection against solid foreign objects IP6X (dust proof)*** is satisfactory if after the test no dust deposits are detected inside the housing.
- The ***protection against water jets IPX6*** is considered proven if after the completion of the test no water has penetrated into the sample, or if it has it is in a quantity such that the proper function and safety of the equipment are not compromised.

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 nozzle Ø12.5 mm	SD 12,5	-	Gödel
Turn table	-	-	AUCOTEAM
IR thermometer	Fluke 561	14950036	Fluke
DC-controler	3222	1149	Statron
Steel pump	EVMG 5 16N5	BHX230217	EBARA

6 Results

The degrees of protection test IP66 for the ***incremental encoder FOG9 DN 1024 TTL*** was performed according to the test program.

6.1 ***Protection against solid foreign objects - Dust test (dust proof) IP6X***

according to the IEC 60529 § 13.4

After the degrees of protection test IP6X for the ***incremental encoder FOG9 DN 1024 TTL***

- Dust test ***Test IP6X*** *according to 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 detected inside the specimen.

6.2 Protection against water jets test IPX6 (powerful water jets)

according to the IEC 60529 § 14.2.6

After the protection against water jets test IPX6 for the ***incremental encoder FOG9 DN 1024 TTL***

- Protection against water jets ***Test IPX6*** *according to the IEC 60529*

the following was detected:

- Without external damage or any other alterations.
- No traces of water was detected inside the specimen.

Further evaluation will be done by the client.

The tests were performed according to the specifications of the standards.

No traces of dust or water were detected inside the incremental encoder FOG9 DN 1024 TTL.

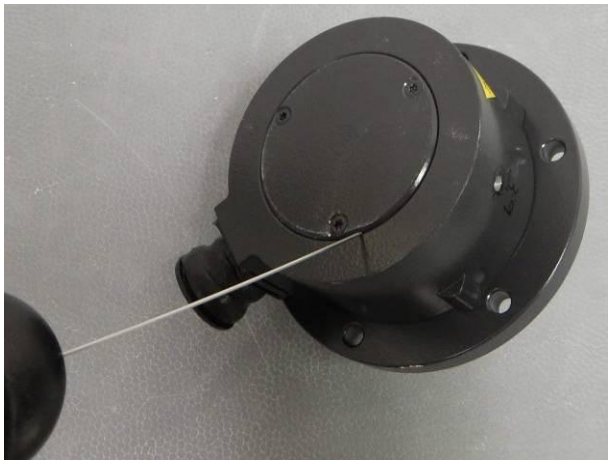
The degrees of protection IP66 was proven for the incremental encoder FOG9 DN 1024 TTL.

Further evaluation will be done by the client.

This test report No. 10995.01 / 14 includes 4 pages and 1 appendix – pictures

Pictures

Picture 1
Incremental encoder FOG9 DN 1024 TTL
with standardized test wire (Ø 1 mm, 1 N)
before the access to hazardous parts test IP6X



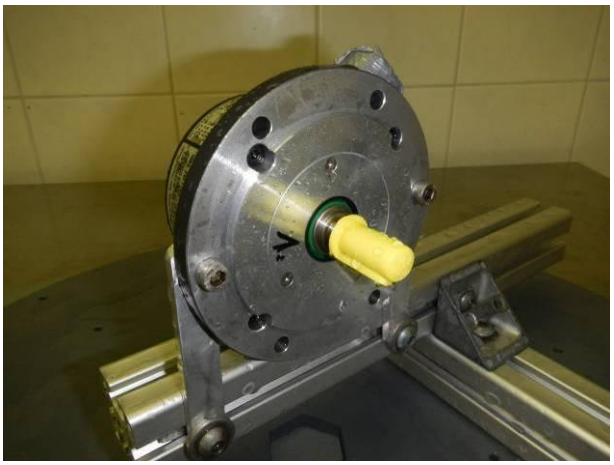
Picture 2
Incremental encoder FOG9 DN 1024 TTL
with standardized test wire (Ø 1 mm, 1 N)
during the access to hazardous parts test IP6X

Picture 3
Incremental encoder FOG9 DN 1024 TTL
in the dust chamber SK 160
before the dust test IP6X

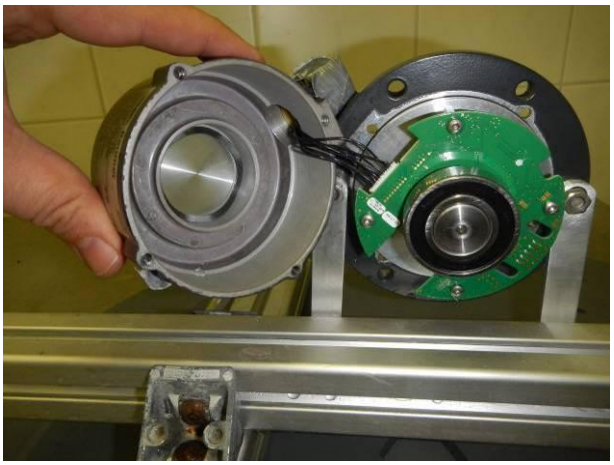
Picture 4
Incremental encoder FOG9 DN 1024 TTL
in the dust chamber SK 160
after the dust test IP6X

Picture 5
Incremental encoder FOG9 DN 1024 TTL
on the turn table with standardized water jet
during the protection against water jets test IPX6

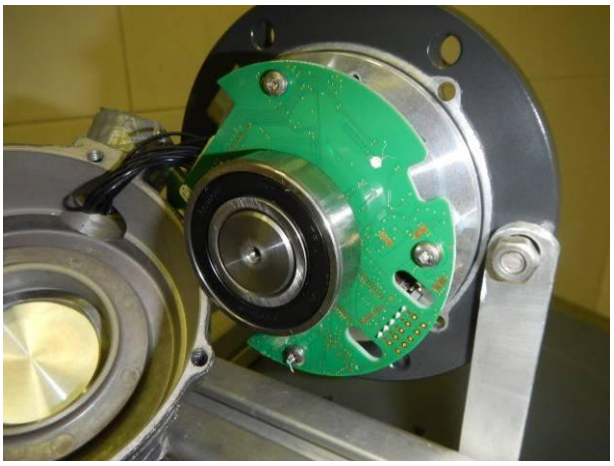
Picture 6
Incremental encoder FOG9 DN 1024 TTL
on the turn table with standardized water jet
during the protection against water jets test IPX6



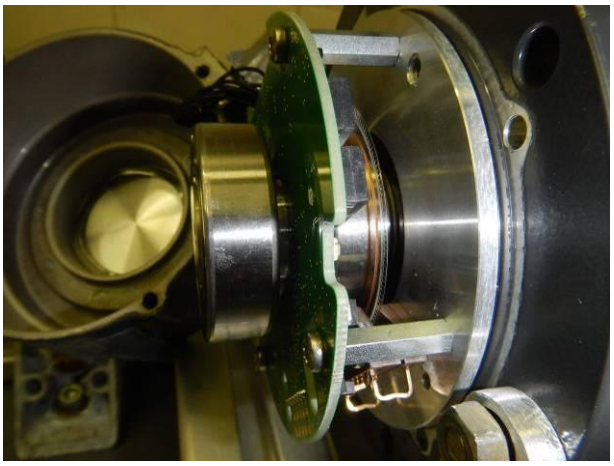
Picture 7
Incremental encoder FOG9 DN 1024 TTL without any alterations
after the protection against water jets test IPX6



Picture 8
Incremental encoder FOG9 DN 1024 TTL without visible traces of dust or water inside
after the protection against water jets test IPX6



Picture 9
Incremental encoder FOG9 DN 1024 TTL without visible traces of dust or water inside
after the protection against water jets test IPX6



Picture 10
Incremental encoder FOG9 DN 1024 TTL without visible traces of dust or water inside
after the protection against water jets test IPX6