


Testing laboratory for climatic, mechanical  
and corrosive environmental stress



## QUALITY TEST CERTIFICATE

Test report No. 10995.02 / 14

Client	<b>Baumer Hübner GmbH</b> Max-Dohrn-Str. 2+4 10589 Berlin		
Equipment under test	<b>Incremental Encoder</b> SN Quantity	<b>HOG165C DN 1024 I</b> 700001050790 1 unit	
Purpose	<b>Tests for the certification of the degrees of protection IPX6 and the corrosive resistance</b>		
Test program	<b>Protection against water jets</b> <b>Salt mist, cyclic</b>	<b>IPX6</b> <b>Kb</b>	<i>acc. to IEC 60529</i> <i>acc. to IEC 60068-2-52</i>
Test period	14 January to 24 February 2015		
Execution / results	see pages 2 to 4		
Total number of pages	7 (including 1 appendix)		
<b>Test results</b>	<p><b>The tests were performed according to the specifications of the standards.</b></p> <p><b>No traces of water were detected inside the incremental encoder HOG165C DN 1024 I.</b></p> <p><b>The degrees of protection IPX6 was proven for the incremental encoder HOG165C DN 1024 I.</b></p> <p><b>Corrosive alteration were determined after the cyclic salt mist test.</b></p> <p><b>Further evaluation will be done by the client.</b></p>		

  
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Head of the testing laboratory

Berlin, 10 March 2015

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## 1 Purpose

Certification of the degrees of protection IPX6 and the corrosive resistance for the **incremental encoder HOG165C DN 1024 I** under defined environmental conditions, according to the specifications of the standards and to the demands of the client.

## 2 Equipment under test

<b>Incremental Encoder</b>	<b>HOG165C DN 1024 I</b>
SN	700001050790
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 60068-2-52:1996**    **DIN EN 60068-2-52:1996-10**  
„Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)“

**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 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 water.

#### 4.2 **Salt mist, cyclic – test Kb**

according to the IEC 60068-2-52

EUT	not in operation
EUT position	axle horizontal
severity level	1
test conditions	4 cycles (2 h spraying, 7 d humidity storage at $(+40 \pm 2)^\circ\text{C}$ , 90 – 95 % r. F.))
corrosive atmosphere	5% NaCl-solution
pH-value of salt solution	6.5 – 7.2 at $(+20 \pm 2)^\circ\text{C}$
test temperature	$(+15 \dots +35)^\circ\text{C}$
relative humidity	undefined
test duration	28 d (672 h)

##### **preparation**

The specimen are not pretreated in agreement with the client.

##### **aftertreatment**

The specimen are not treated after exposure in agreement with the client.

##### **visual inspection**

Before and after the complete test, the specimen will be examined for corrosive defects.

## 5 **Execution**

The degrees of protection test IPX6 and the test of the corrosive resistance for the **incremental encoder HOG165C DN 1024 I** 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 test for the degrees of protection IPX6 the specimen were opened and examined for the presence of penetrated water.

##### **Acceptance criteria – IPX6**

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
Standardized nozzle Ø12.5 mm	SD 12,5	-	Gödel
Turn table	-	-	AUCOTEAM
IR thermometer	Fluke 561	14950036	Fluke
DC-controller	3222	1149	Statron
Steel pump	EVMG 5 16N5	BHX230217	EBARA
Salt mist chamber 47	SNK 480	-	Kästernich
Climatic Chamber 3	KPK 600	079/89	Feutron
Sodium chloride for analysis	-	-	Merck
pH-indicator	pHTestr 30	1336555 527/01	Eutech Instr.

## 6 Results

The degrees of protection test IPX6 and the test of the corrosive resistance for the **incremental encoder HOG165C DN 1024 I** was performed according to the test program.

### 6.1 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 HOG165C DN 1024 I** with

- **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.

### 6.2 Salt mist, cyclic – test Kb

according to the IEC 60068-2-52

After the test resistance against corrosion for the **incremental encoder HOG165C DN 1024 I** with

- **Salt mist, cyclic**                                      **Test Kb**                                      according to the IEC 60068-2-52

the following was detected:

- Corrosive alterations were determined.
- Red rust was detected on the bearing.
- Dark spots and white deposits were detected on the surface of the specimen.

Further evaluation will be done by the client.

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

**No traces of water were detected inside the incremental encoder HOG165C DN 1024 I.**

**The degrees of protection IPX6 was proven for the incremental encoder HOG165C DN 1024 I.**

**Corrosive alteration were determined after the cyclic salt mist test.**

**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. 10995.02 / 14 includes 4 pages and 1 appendix – pictures

## Pictures



**Picture 1**  
Incremental encoder HOG165C DN 1024 I  
delivery status  
*before the protection against water jets test IPX6*



**Picture 2**  
Incremental encoder HOG165C DN 1024 I  
mounted on the turn table  
*before the protection against water jets test IPX6*



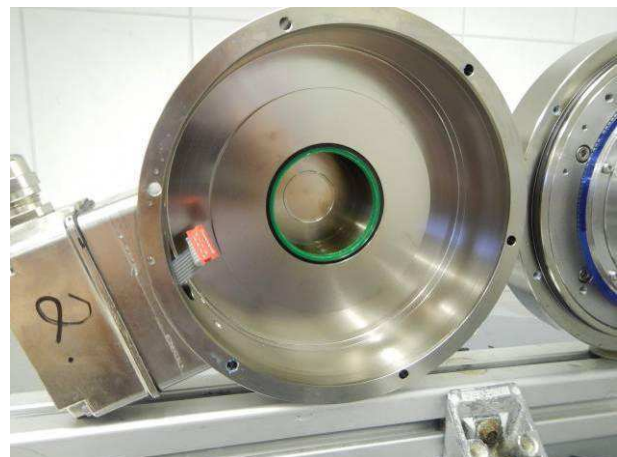
**Picture 3**  
Incremental encoder HOG165C DN 1024 I  
on the turn table with standardized water jet  
*during the protection against water jets test IPX6*



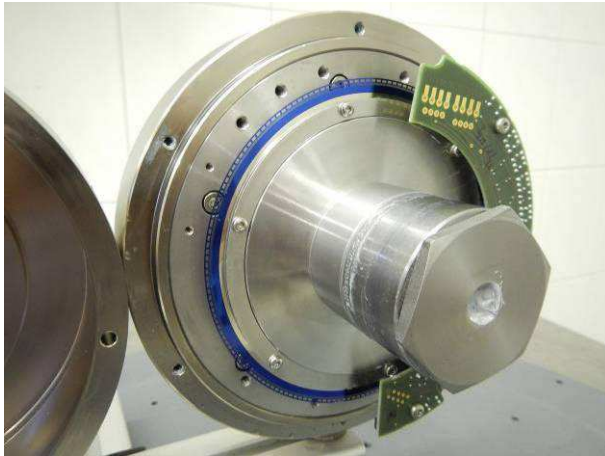
**Picture 4**  
Incremental encoder HOG165C DN 1024 I  
on the turn table with standardized water jet  
*during the protection against water jets test IPX6*



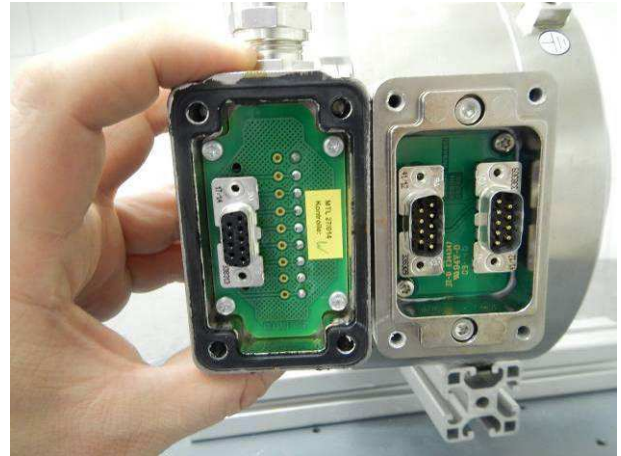
**Picture 5**  
Incremental encoder HOG165C DN 1024 I  
without any alterations  
*after the protection against water jets test IPX6*



**Picture 6**  
Incremental encoder HOG165C DN 1024 I  
without visible traces of water inside  
*after the protection against water jets test IPX6*



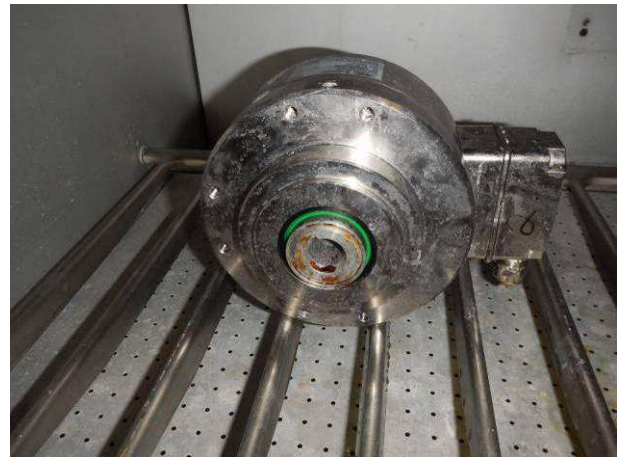
**Picture 7**  
Incremental encoder HOG165C DN 1024 I  
without visible traces of water inside  
after the protection against water jets test IPX6



**Picture 8**  
Incremental encoder HOG165C DN 1024 I  
without visible traces of water inside  
after the protection against water jets test IPX6



**Picture 9**  
Incremental encoder HOG165C DN 1024 I  
in the salt mist chamber 47  
before the salt mist Kb



**Picture 10**  
Incremental encoder HOG165C DN 1024 I  
in the climatic chamber 3  
during the salt mist Kb



**Picture 11**  
Incremental encoder HOG165C DN 1024 I  
with visible corrosive alterations  
after the salt mist Kb



**Picture 12**  
Incremental encoder HOG165C DN 1024 I  
with dark spots and white deposits  
after the salt mist Kb



**Picture 13**  
Incremental encoder HOG165C DN 1024 I  
with dark spots and white deposits  
*after the salt mist Kb*



**Picture 14**  
Incremental encoder HOG165C DN 1024 I  
with red rust on the bearing  
*after the salt mist Kb*



**Picture 15**  
Incremental encoder HOG165C DN 1024 I  
with red rust on the bearing  
*after the salt mist Kb*



**Picture 16**  
Incremental encoder HOG165C DN 1024 I  
with visible corrosive alterations  
*after the salt mist Kb*