



Pressure and leak test of CO2 switch types.

HB Products A/S
Jegstrupvej 34
8361 Hasselager

Att: Michael Elstrøm

Subject.

Pressure and leak test.
The leak test has been carried out by use of helium.

Sample.

1 unit of HBSC CO2 switch PNP, ½" NPT
1 unit of HBSO oil level switch 3/4" NPT
1 unit of HBSR level switch 3/4" NPT

Applied method.

The pressure and leak test has been carried out in accordance with the information received from the customer.

The helium leak test:

The switch types has been leak tested with helium before and after the pressure test.
The helium leak test has been carried out by a pressure of **40 bar**.

Equipment used.

The pressure test equipment ID: 84878
The helium leak measurement equipment ID: 88015

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The pressure test setup.

The pressure test has been carried by use of water.

The pressure has been raised approx. 2bar/sec until max. pressure level, and kept at max. pressure for 10 minutes. The units has been mounted in a special made test housing.

The units has been exposed to the following max. pressure values:

HBSC CO2 switch Pressure test value 200 bar

HBSO oil level switch Pressure test value 200 bar

HBSR level switch Pressure test value 150 bar

Results:**The pressure test.**

The units has gone through the pressure test without any comments.

The helium leak test.

Before and after the pressure test a leak test with helium has been carried out.

After the pressure test and before the leak test has been carried out, the units has been exposed for 16 hours in a oven by 50°C for drying the water away from the units.

The leak test has not change in the values measured before and to after the pressure test.

Table No: 1 shows the results from the pressure and helium leak test.

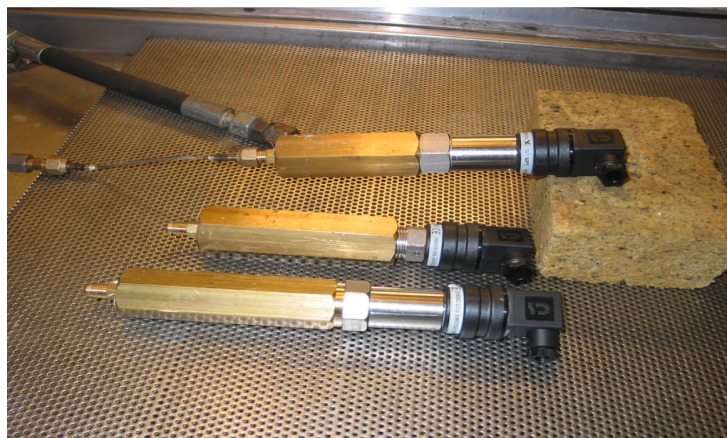
Results from the test			
		Leak test by 40 bar	
Unit type	Pressure test - 10 minutes	Before pres. test	After pres. test
HBSO	200 bar - Ok	< 1x10 ⁻⁷	< 1x10 ⁻⁷
HBSC	200 bar - Ok	< 1x10 ⁻⁷	< 1x10 ⁻⁷
HBSR	150 bar - Ok	< 1x10 ⁻⁷	< 1x10 ⁻⁷

Table 1.

Approvement.

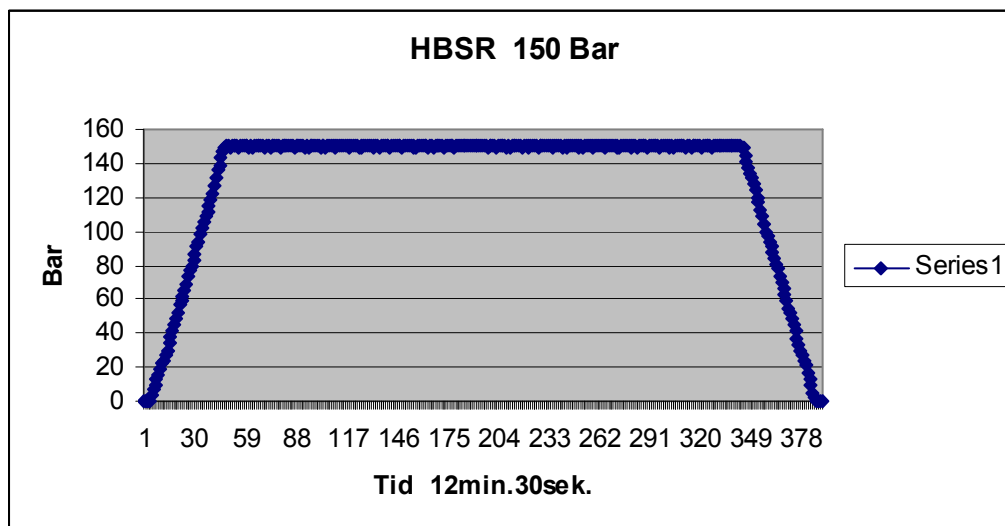
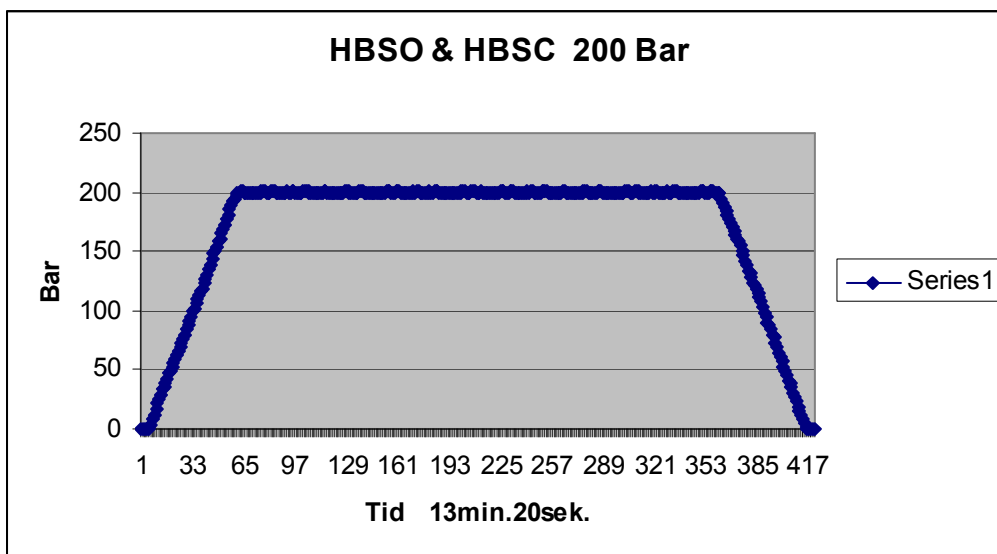
The HBSC, HBSO and HBSR has gone through the pressure and leak test without any comments.

Photo showing the unit in the pressure test chamber.



The switch during the pressure test.-

Data collected during the pressure test.



Calibration report for the pressure transmitter.



IS-TK.		Kalibreringsrapport.		Danfoss A/S Industri Service Teknologi	
Målemiddelnr.	: 90132 / 84878.	Afd.	: 347.	Rekvirent-navn	: Finn Hansen.
Emne	: Tryktransmitter.	Rekvirent-nr.	: 59167.	Adresse	: E35 - S12.
Fabrikat	: Danfoss.	Dato	: 07.12.14.	Resultat	: OK.
Type	: MBS 33-3811-1AB06.	Godkendt	: <i>Holger Ellegaard</i>		
Serie nr.	: 31064174.				
Kalibreringssted	: IS - TK / Afd.625.				
Foretaget af	: Holger Ellegaard.				
Adresse	: L7 - N7.				
Telefon	: 7488 4138.				
Referenceudstyr	: 44211.				

Område : 0 - 600 [bar]

Tolerance : 1 % FS= 6,0 [bar]

Barometer: 1040 [mbar]

Temperatur: 22,0 [°C]

Reference [bar]	Visning [bar]	Afvigelse [bar]
0,0	0,0	0,0
50,1	50,1	0,0
100,1	100,1	0,0
200,2	200,1	-0,1
300,3	300,0	-0,3
400,5	400,0	-0,5
500,6	499,9	-0,7
550,6	549,9	-0,7

Calibration report for the helium leak tester.



DEUTSCHER KALIBRIERDIENST **DKD**

Kalibrierlaboratorium für Meßgeräte der Vakuumtechnik
 Calibration laboratory for measuring instruments of vacuum engineering

Akkreditiert durch die / accredited by the

Akkreditierungsstelle des DKD bei der

PHYSIKALISCH-TECHNISCHEN BUNDESANSTALT (PTB)



DKD-K-02701



LEYBOLD VAKUUM GmbH
 Kalibrierstelle
 Bonner Straße 498 · 50968 Köln
 Telefon (02 21) 347-1011

003609
DKD-K-02701
02-07

Kalibrierschein
 Calibration Certificate

Kalibrierzeichen
 Calibration label

Gegenstand Object	Helium-Testleck
Hersteller Manufacturer	Inficon GmbH
Typ Type	TL8
Fabrikat/Serien-Nr. Serial number	16557 / 90001005450
Auftraggeber Customer	Granzow A/S DK - 2600 Glostrup
Auftragsnummer Order No.	298484 (70017141)
Anzahl der Seiten des Kalibrierscheines Number of pages of the certificate	3
Datum der Kalibrierung Date of calibration	1. Juli 2002

Dieser Kalibrierschein dokumentiert die Rückführung auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).

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Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

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Stempel Seal	Datum Date	Leiter des Kalibrierlaboratoriums Head of the calibration laboratory	Bearbeiter Person in charge
	1. Juli 2002		
		Eichner	Eichner