IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx BVS 15.0036X issue No.:2	Certificate history: Issue No. 2 (2017-4-27) Issue No. 1 (2016-12-22) Issue No. 0 (2015-6-8)
Status:	**Current**	
Date of Issue:	**2017-04-27** Page 1 of 5	
Applicant:	**KROHNE Pressure Solutions GmbH** Gewerbepark Meißen 14 32423 Minden **Germany**	
Equipment: *Optional accessory:*	**Differential pressure transmitter type OPTIBAR DP 7060 C...**	
Type of Protection:	**Equipment protection by intrinsic safety "i", Equipment with Equipment Protection Level (EPL) Ga**	
Marking:	Ex ia IIC T6/T4 Ga Ex ia IIC T6/T4 Ga/Gb Ex ia IIC T6/T4 Gb	
Approved for issue on behalf of the IECEx Certification Body:	Jörg Koch	
Position:	Head of Certification Body	
Signature: *(for printed version)*		
Date:	27.4.17	

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

DEKRA
On the safe side.

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Manufacturer: **KROHNE Pressure Solutions GmbH**
Gewerbepark Meißen 14
32423 Minden
Germany

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2014-10 Edition: 3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
DE/BVS/ExTR15.0047/01

Quality Assessment Report:

DE/BVS/QAR13.0005/03

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Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Subject and Type

See Annex

Parameters

See Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

See Annex

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EQUIPMENT(continued):

Description of the apparatus

The differential pressure transmitter type OPTIBAR DP 7060 C... is designed to measure pressure differences in various pressure ranges.
It consists of a differential pressure meter body type OPTIBAR DP7000 resp. DP7000.1 resp. DP71.***__ (certified under IECEx BVS 13.0103U) and a converter-unit. Depending of the variant, the differential pressure meter body and the converter-unit are directly screwed together or connected via a connection cable with up to 180 m length.
All circuits are intrinsically safe, level of protection "ia".
Depending on the variant, the converter-unit has an enclosure with one or two chambers.
The 1-chamber-enclosures contain an electronic insert, on which an operation and indication module can be plugged.
The 2-chamber-enclosures contain two connected electronic inserts. An operation and indication module may be plugged to one of the electronic inserts.
At the variant with connection cable between converter-unit and meter body, the enclosure is fixed to a socket. In this socket, the connection cable is connected via spring-terminals. The other end of the connection cable is permanently connected to the differential pressure meter body.
Depending on the variation, the differential pressure transmitter is supplied via terminals at the electronic insert, via plug or a permanently connected cable.
In the converter-unit, a galvanic separation between supply circuit and measuring circuit is made. The measuring circuit is earthed.
The differential pressure meter body consists of a differential pressure cell (measuring element) and pressure flanges. Depending on the variant, the pressure flanges may have side vents which have to be closed by blind plugs or venting plugs. Additionally, pressure flanges with filling holes and capillary connections for connection to diaphragm seals with capillaries exist.
The differential pressure transmitter is suitable for applications, where only the medium-contacted areas are Zone 0, while the non-medium-contacted areas are classified as Zone 1 (depending on the variant, the separation to Zone 0 represents the separation to the process medium or the separation to the fill fluid in the connected diaphragm seal. Diaphragm seal and capillary are not subject of this Certificate).

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Alternatively to the differential pressure meter bodies type OPTIBAR DP7000 resp. DP7000.1, the differential pressure meter body type OPTIBAR DP71.*** may be used. (All differential pressure meter bodies are certified under IECEx BVS 13.0103U)
- Alternative variants of the electronic inserts are used

Annex: BVS_15_0036X_KROHNE_Annex_issue2.docx

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Annex

Subject and type

Differential pressure transmitter type DP 7060 C...

The complete type designation
OPTIBAR DP 7060 C VGK7 * *C ********* ...

- Additional electronics
  X: none
  Z: 2nd current output
- Included electronic assembly
  Z, H, A, P oder F
- Type characteristics for IECEx-Variant
  WC or VC

includes further letters and numerals to indicate different variations of the differential pressure transmitter.
The asterisks which are not explained here denote type characteristics which have no influence on explosion protection or are otherwise marked on the apparatus.
Instead of the dots, further characteristics without Ex-relevance are included in the complete type key.

Note:
Compared to the first edition of this Certificate – the type key was extended to be able to distinguish between variants with different parameters.

Parameters

1 Electrical Data

1.1 **For variants with electronics Z, H or A:**
(Types OPTIBAR DP 7060 C VGK7 * *C ******* Z X ... resp.
Types OPTIBAR DP 7060 C VGK7 * *C ******* H X... resp.
Types OPTIBAR DP 7060 C VGK7 * *C ******* A X ...)

Supply and signal circuit

Depending on the variant:
Connection via terminals 1 [+], 2 [-] resp.
Connection via plug resp.
Connection via permanently connected cable (red (+), black (-))

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		131	mA
Maximum input power	P_i		983	mW
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i			
For variants with 1-chamber-enclosure			5	µH
For variants with 2-chamber-enclosure			10	µH

For variants with permanently connected cable, the following values have to be additionally regarded:

Cable inductance	0,62	µH/m
Cable capacitance		
wire-wire	150	pF/m
wire-shield	270	pF/m

1.2 **For variants with electronics P/F:**
(Types OPTIBAR DP 7060 C VGK7 * *C ** * * * * * P X ... resp.
Types OPTIBAR DP 7060 C VGK7 * *C ** * * * * * F X ...)

Supply and signal circuit

Depending on the variant:
Connection via terminals 1 [+], 2 [-] resp.
Connection via plug resp.
Connection via permanently connected cable (red (+), black (-))

For connection to a Fieldbus system in accordance with the FISCO-Model

Maximum input voltage	U_i	DC	17.5	V
Maximum input current	I_i		500	mA
Maximum input power	P_i		5.5	W

Or

Maximum input voltage	U_i	DC	24	V
Maximum input current	I_i		250	mA
Maximum input power	P_i		1.2	mW
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i			
For variants with 1-chamber-enclosure			negligible	
For variants with 2-chamber-enclosure			5	µH

For variants with permanently connected cable, the following values have to be additionally regarded:

Cable inductance	0.62	µH/m
Cable capacitance		
wire-wire	150	pF/m
wire-shield	270	pF/m

1.3 **For variants with electronics H/A with 2nd current output:**
(Types OPTIBAR DP 7060 C VGK7 * *C ** * * * * * H Z ... resp.
Types OPTIBAR DP 7060 C VGK7 * *C ** * * * * * A Z ...)

1.3.1 Supply and signal circuit I
Connection via terminals 1 [+], 2 [-]
resp. connection plug

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		131	mA
Maximum input power	P_i		983	mW
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		5	µH

1.3.2 Supply and signal circuit II
Connection via terminals 7 [+], 8 [-]
resp. connection plug

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		131	mA
Maximum input power	P_i		983	mW
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		5	µH

2 Ambient and medium temperature range

2.1 For the compact variant
(meter body screwed to converter-unit)

For T4-classification:

Ambient temperature range	T_a	-40 °C ... 80 °C *)
Medium temperature range		-40 °C ... 85 °C *)

For T6-classification:

Ambient temperature range	T_a	-40 °C ... 46 °C *)
Medium temperature range = Ambient temperature range		

2.2 For the remote variant
(connection cable between meter body and converter-unit)

For T4-classification:

Ambient temperature range	T_a	-40 °C ... 80 °C *)
Medium temperature range		-40 °C ... 85 °C *)

For T6-classification:

Ambient temperature range	T_a	-40 °C ... 46 °C *)
Medium temperature range		-40 °C ... 55 °C *)

For medium temperatures above 46 °C, a sufficient thermal decoupling between medium and converter-unit has to be ensured.

*) The limits of the permissible temperature ranges may be restricted by the used O-ring material.
The used O-ring material is included in the marking. The permissible temperature ranges in dependence of the material are included in the manufacturer's instructions.

For plug-variants, restrictions of the permissible temperature ranges have to be considered as well. The limits of the permissible temperature ranges are included in the manufacturer's instructions.

For use with explosive atmospheres, the medium pressure has to be between 0.8 bar and 1.1 bar. The operation conditions for use outside explosive atmospheres have to be taken from the manufacturer's instructions.

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Annex

"Conditions of Use" for Ex Equipment:

1 The permissible ambient resp. medium temperature range depends on the variant of the apparatus and on the temperature class, in which the apparatus shall be used.

The limits of the permissible temperature ranges may be restricted by the used O-ring material. The used O-ring material is included in the marking. The permissible temperature ranges in dependence of the material are included in the manufacturer's instructions.
For plug-variants, a restriction of the temperature ranges has to be considered, as well. The limits of the permissible temperature ranges are included in the manufacturer's instructions.

2 For remote variants (connection cable between meter body and converter-unit):
The intrinsically safe circuit between converter-unit and meter body is earthed.
Along this circuit, potential equalization has to be ensured.

3 For use as Ga / Gb-apparatus:
For functional reasons, the partition wall (membrane) to the wetted area has a wall thickness < 1 mm. In the application, it has to be ensured, that an impairment of the separation wall e.g. by aggressive media or mechanical hazards is excluded.

For variants with standard process connections:
The installation of the meter bodies shall provide as a minimum degree of protection IP67 according to IEC 60529 for the process connections and vents.

For variants with capillary connections:
The capillary connections are designed to be connected to a capillary with diaphragm seal. The filling holes are intended to bring in a fill fluid.
To prevent a zone entrainment from Zone 0, the diaphragm seal resp. the diaphragm seal and capillary have to be suitably designed. The pressure transfer system has to be technically tight. The filling hole has to be tightly sealed.

4 For variants with accessible metallic parts:
The apparatus has to be installed in such a way, that ignition hazards caused by impact or friction can be excluded.

5 For variants with accessible non-metallic parts
(e.g. for apparatus with plastic enclosure or apparatus with metallic enclosure and window, connection cable, non-metallic cable glands, ...):
The apparatus has to be installed and used in such a way, that electrostatic charging by operation, maintenance and cleaning is excluded.
The apparatus has to be installed in such a way, that process-related electrostatic charging, e.g. by passing media, is excluded.