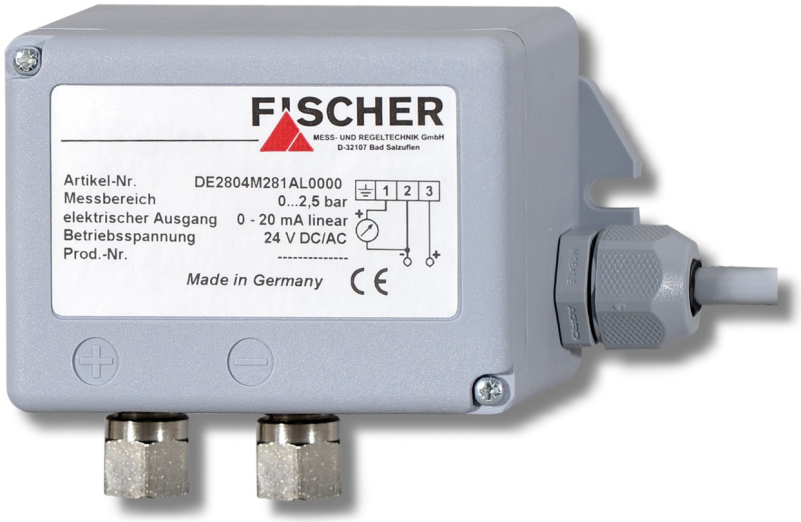
developing solutions

FISCHER
MESS- UND REGELTECHNIK

TYPE APPROVED PRODUCT
DNV
DNV.COM/AF

CE
RoHS II
COMPLIANT



Operating manual

DE28

Differential pressure transmitter

09005612 • BA_EN_DE28 • Rev. ST4-C • 02/22

Masthead

Manufacturer:

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Version history

Rev. ST4-A 09/16	Version 1 (first edition)
Rev. ST4-B 05/20	Version 2 (correction of technical data)
Rev. ST4-C 02/22	Version 3 (DNV certificate extended)

Table of Contents

1 Safety guidelines

1.1 General

This operating manual contains basic instructions for the installation, operation and maintenance of the device that must be followed without fail. It must be read by the installer, the operator and the responsible specialist personnel before installing and commissioning the device.

This operating manual is an integral part of the product and therefore needs to be kept close to the instrument in a place that is accessible at all times to the responsible personnel.

The following sections, in particular instructions about the assembly, commissioning and maintenance, contain important information, non-observance of which could pose a threat to humans, animals, the environment and property.

The instrument described in these operating instructions is designed and manufactured in line with the state of the art and good engineering practice.

1.2 Personnel Qualification

The instrument may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the pertinent standards.

1.3 Risks due to Non-Observance of Safety Instructions

Non-observance of these safety instructions, the intended use of the device or the limit values given in the technical specifications can be hazardous or cause harm to persons, the environment or the plant itself.

The supplier of the equipment will not be liable for damage claims if this should happen.

1.4 Safety Instructions for the Operating Company and the Operator

The safety instructions governing correct operation of the instrument must be observed. The operating company must make them available to the installation, maintenance, inspection and operating personnel.

Dangers arising from electrical components, energy discharged by the medium, escaping medium and incorrect installation of the device must be eliminated. See the information in the applicable national and international regulations.

Please observe the information about certification and approvals in the Technical Data section.

1.5 Unauthorised Modification

Modifications of or other technical alterations to the instrument by the customer are not permitted. This also applies to replacement parts. Only the manufacturer is authorised to make any modifications or changes.

1.6 Inadmissible Modes of Operation

The operational safety of this instrument can only be guaranteed if it is used as intended. The instrument model must be suitable for the medium used in the system. The limit values given in the technical data may not be exceeded.

The manufacturer is not liable for damage resulting from improper or incorrect use.

1.7 Safe working practices for maintenance and installation work

The safety instructions given in this operating manual, any nationally applicable regulations on accident prevention and any of the operating company's internal work, operating and safety guidelines must be observed.

The operating company is responsible for ensuring that all required maintenance, inspection and installation work is carried out by qualified specialized personnel.

1.8 Pictogram explanation

⚠ DANGER

Type and source of danger

This indicates a **direct** dangerous situation that could lead to death or **serious injury** (highest danger level).

a) Avoid danger by observing the valid safety regulations.

⚠ WARNING

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to death or **serious injury** (medium danger level).

a) Avoid danger by observing the valid safety regulations.

⚠ CAUTION

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to slight or serious injury, damage or **environmental pollution** (low danger level).

a) Avoid danger by observing the valid safety regulations.

NOTICE

Note / advice

This indicates useful information of advice for efficient and smooth operation.

2 Product and functional description

2.1 Delivery scope

- Differential pressure transmitter DE28 incl. connection cable
- Operating Instructions

2.2 Equipment versions

Devices with IP54

- Standard version
- DNV Version only with cable connection

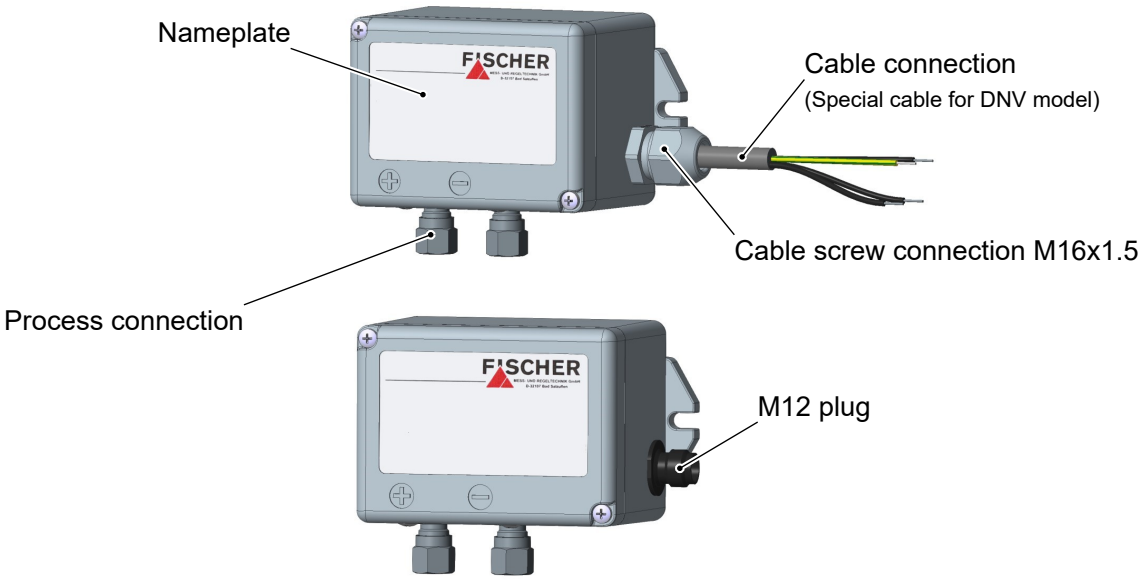


Fig. 1: Product Overview IP54

Devices with IP65

- DNV model not possible

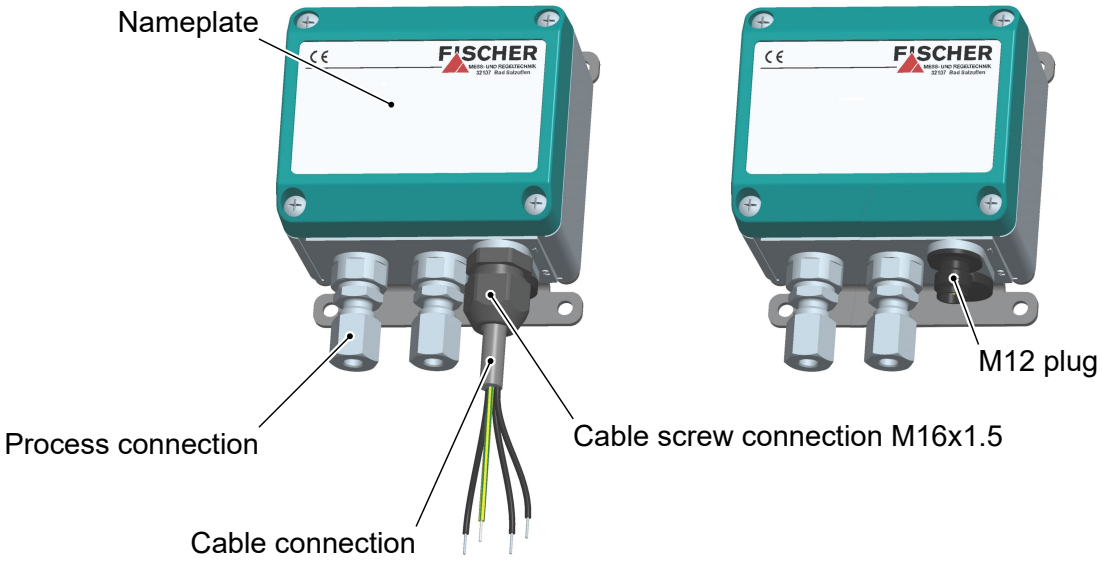


Fig. 2: Product Overview IP65

Nameplate

The presented type plates serve to show an example of the information shown. The data shown is purely fictive, but does correspond to the actual conditions. For more information, please see the order code at the end of these instructions.

The following shows the type plates of the model in the IP54 casing. The type plates of the model in the IP65 casing bear identical information. Please note that the DNV model is not available in the IP65 casing.

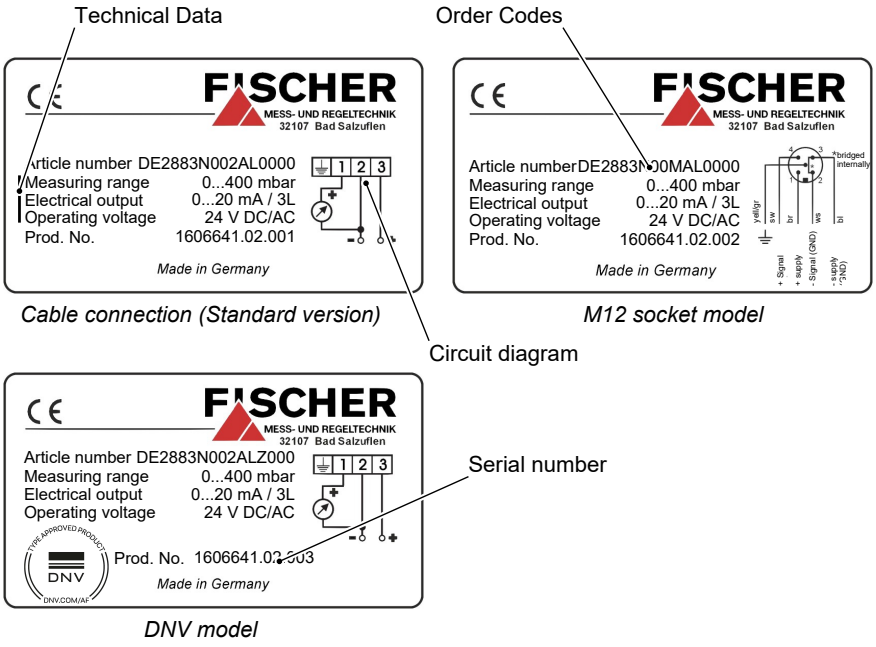


Fig. 3: Nameplate

2.3 Function diagram

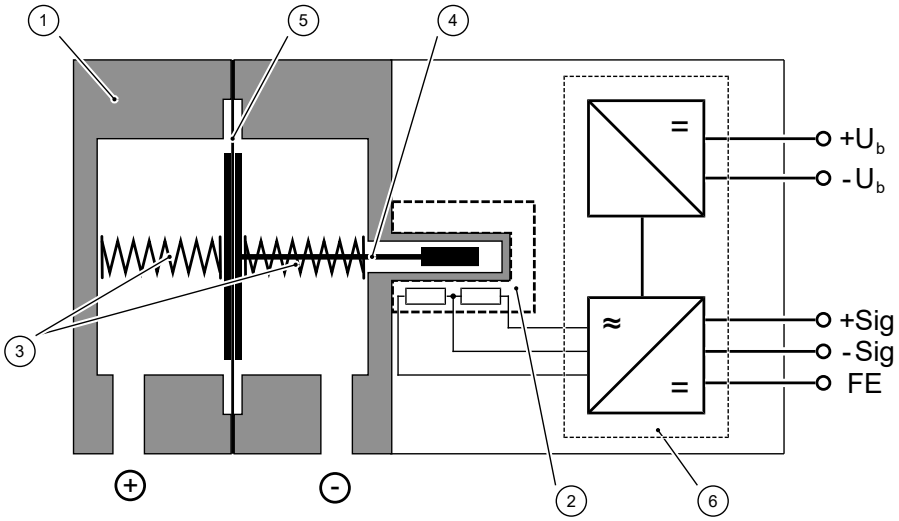


Fig. 4: Function diagram

1	Pressure chamber	2	Inductive displacement transducer
3	Measuring springs	4	Tappet
5	Measuring diaphragm	6	Measuring electronics

2.4 Design and mode of operation

All devices of this type series have a sturdy and non-sensitive membrane measuring unit with an inductive path sensor. All devices work based on the same measuring principle and are suitable for measuring over-pressure, under-pressure and differential pressure.

In the idle position, the spring forces are equalised on both sides of the measuring diaphragm. When pressure is exerted, force is exerted on one side of the membrane and this moves the membrane system against the measuring range springs until the spring forces are compensated.

The movement of the measuring diaphragm is transferred via a tappet into the core of the inductive displacement sensor. The downstream measuring electronics convert the signal of the path sensor into a pressure-proportional unit signal (0…20 mA, 4…20 mA or 0…10 V).

2.5 Intended use

The DE28 is a measuring transducer for measuring non-aggressive gas-like and fluid media that is neutral to over-pressure, under-pressure and differential pressure. Always check the media compatibility with the manufacturer if used with potentially aggressive media.

In the standard model, the device is suitable for many measuring tasks in all industrial or sanitary sectors.

The DNV type-tested models are suitable for use on ships in machine rooms, control rooms and pump rooms. Please see the following table for details about the application place.

Location classes acc. to DNV-CG-0339	
Temperature	B
Humidity	B
Vibration	A
EMC	B
Housing	B

3 Assembly and Starting Operation

3.1 Generalities

The device is designed for installation onto flat assembly plates or walls. The pressure connections must point downwards.

At the factory, the device is calibrated for vertical installation, but the installation position is arbitrary. For any installation positions that are not vertical, the zero-point signal can be corrected via the installed offset correction.

3.2 Process connection

- By authorized and qualified specialized personnel only.
- The pipes need to be depressurized when the instrument is being connected.
- Appropriate steps must be taken to protect the device from pressure surges.
- Check that the device is suitable for the medium being measured.
- Maximum pressures must be observed (cf. Tech. data)

The pressure connections are marked with (+) and (-) symbols on the device.

The pressure lines must be installed at an inclination so that when fluids are measured no air pockets are created or when measuring gases, no water pockets are created. If the required inclination is not reached, water or air filters must be installed at suitable places.

The pressure lines must be kept as short as possible and installed without any tight bends to avoid delays.

If water is used as a measuring medium, the unit must be protected against frost.

Pulsating pressure on the system side can lead to wear and functional problems. To safeguard this, we recommend installing absorption elements in the pressure line.

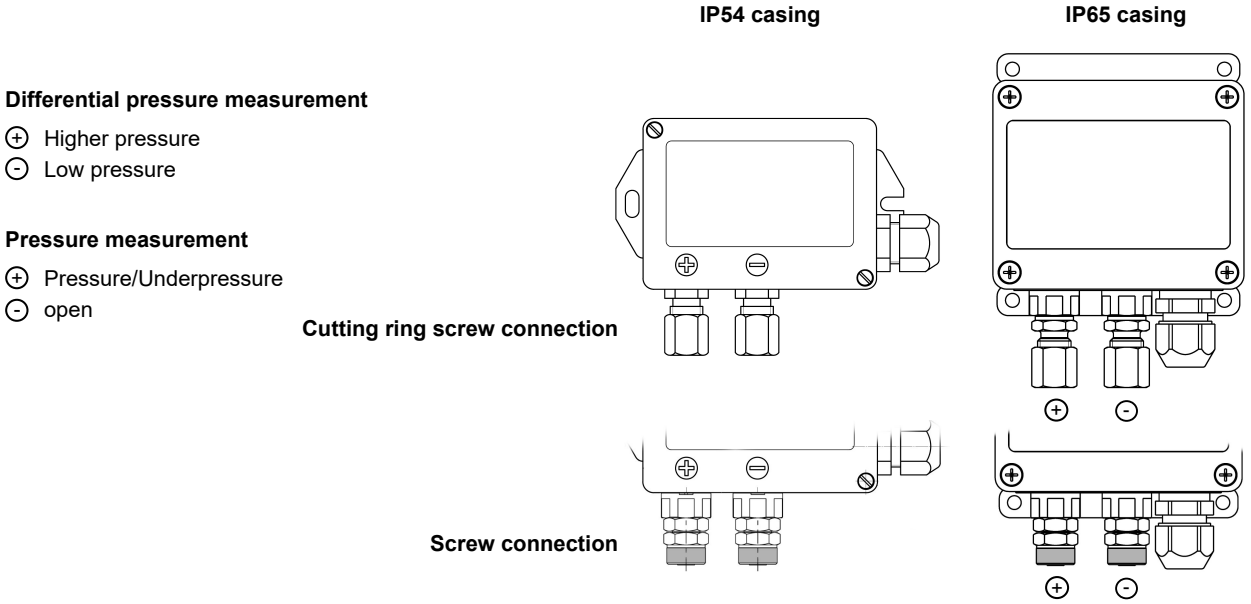


Fig. 5: Process connection

3.3 Electrical connections

- By authorized and qualified specialized personnel only.
- When connecting the unit, the national and international electro-technical regulations must be observed.
- Disconnect the system from the mains, before electrically connecting the device.
- Install the consumer-adapted fuses.
- Do not connect the connector if strained.

3-conductor circuit

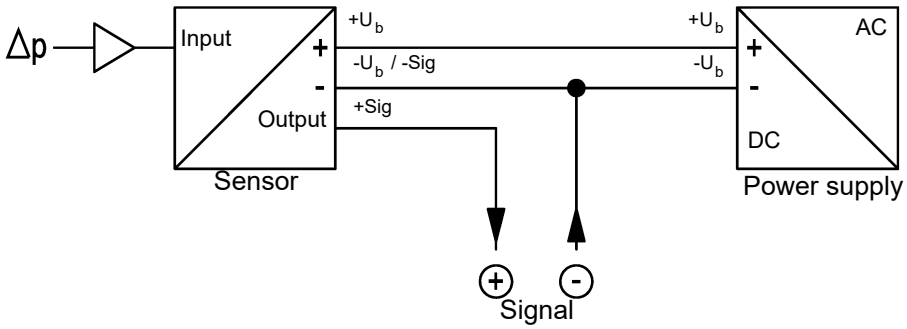


Fig. 6: 3-conductor circuit

3.3.1 Cable connection

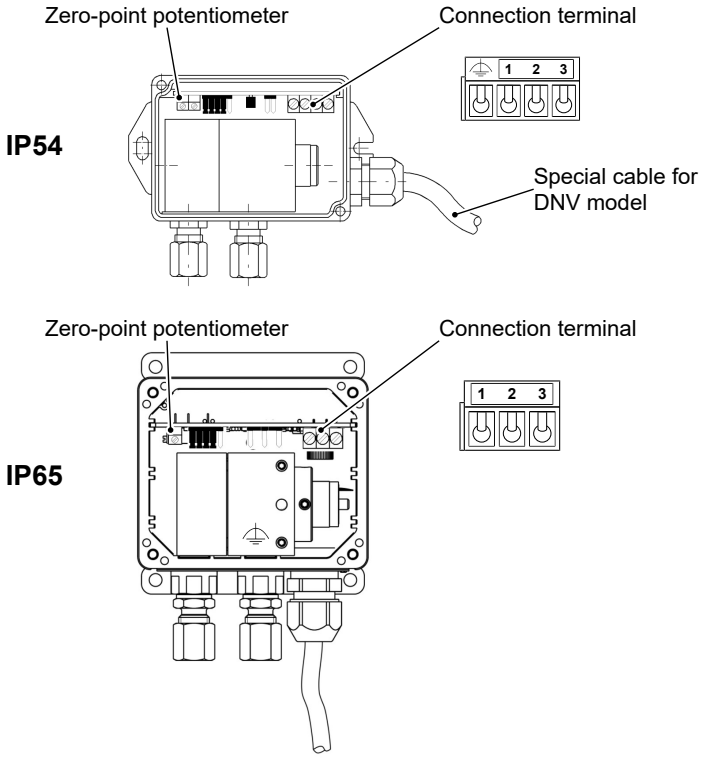


Fig. 7: Cable connection

Terminal	Signal			Cable number
⏚	Functional earth			green/yellow
1	Output (+)		+Sig	1
2	Supply (-) / output (-)	$-U_b$	-Sig	2
3	Supply (+)	$+U_b$		3

3.3.2 M12 plug connection

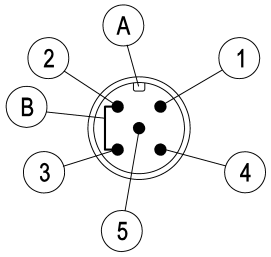


Fig. 8: M12 plug 5-pin+bridge

Pin	Signal name			Cable colour
1	Supply (+)	$+U_b$		brown
2	Output (-)	-Sig		white
3	Supply (-)	$-U_b$		blue
4	Output (+)	+Sig		Black
5	Functional earth	⏚		green/yellow
A	Coding A			
B	internal bridge			

3.4 Commissioning

A prerequisite for commissioning is correct installation of all electrical supply lines and the pressure lines. All connections are arranged so that there are no mechanical forces acting on the device.

⚠ CAUTION

Leakage test

The pressurized lines need to be checked for leaks before commissioning.

3.4.1 Zeropoint setting

It is not usually necessary to set the zero-point. However, if the zero-point does need to be set, proceed as follows:

▷ The zero-point may only be set within a range of ± 5% of the measuring range because the zero-point also impacts on the measuring span.

1. Open the casing by releasing the screws in the lid and removing the lid of the casing.
2. The setting potentiometer for the zero-point is located in the left upper corner of the casing (s. figure in the cable connection section [▶ 10]).
3. Turn the setting screw of the potentiometer to the right to increase the zero-point, to the left to reduce it.

⇨ This means that the zero-point is adjusted. Close the casing.

4 Servicing

4.1 Maintenance

The instrument is maintenance-free. We recommend the following regular inspection to guarantee reliable operation and a long service life:

- Check the function in combination with downstream components.
- Check the leak-tightness of the pressure connection lines.
- Check the electrical connections.

The exact test cycles need to be adapted to the operating and environmental conditions. In combination with other devices, the operating instructions for the other devices also need to be observed.

4.2 Transport

The measuring device must be protected against impacts. It should be transported in the original packaging or a suitable transport container.

4.3 Service

All defective or faulty devices should be sent directly to our repair department. Please coordinate all shipments with our sales department.

⚠ WARNING

Process media residues

Process media residues in and on dismantled devices can be a hazard to people, animals and the environment. Take adequate preventive measures. If required, the devices must be cleaned thoroughly.

Return the device in the original packaging or a suitable transport container.

4.4 Accessories

- Settable damping reactor MZ410#
  (s. data sheet MZ http://www.fischermesstechnik.de/...)
- Connection cable

4.5 Disposal

Please help to protect the environment by always disposing of the work pieces and packaging materials in compliance with the valid national waste and recycling guidelines or reuse them.

5 Technical Data

5.1 General Information

Reference conditions (acc. to IEC 61298-1)		
Temperature error	+15 … +25 °C	
Relative humidity	45 … 75 %	
Air pressure	86 … 106 kPa	860 … 1060 mbar
Installation position	User-defined	

5.2 Input variables

Measuring variable

Non-aggressive gas-like and fluid media that is neutral to over-pressure, under-pressure and differential pressure.

Measuring ranges

mbar	bar	kPa
0 … 400	---	0 … 40
---	0 … 0.6	0 … 60
---	0 … 1	0 … 100
---	0 … 1.6	0 … 160
---	0 … 2.5	0 … 250
---	0 … 4	0 … 400
---	0 … 6	0 … 600

System pressure	stat. pressure	16 bar
Overload capability	Maximum pressure	16 bar on one side
	min. pressure	Vacuum-proof on both sides
Design pressure		±25 bar on both sides

5.3 Output sizes

	Current output	Voltage output
Output signal	0 … 20 mA 4 … 20 mA	0 … 10 V
Jump response time	approx. 200 ms	approx. 200 ms
Apparent ohmic resistance *)	≤ 380 Ω	≥ 2 kΩ
Characteristic curve	linear	linear
Connection type	3-Wire	3-Wire

*) regardless of the operating voltage

5.4 Measurement accuracy

Linearity	±2 % of the measuring range span
Hysteresis	
0 … 400 mbar (0 … 40 kPa)	±2 % of the measuring range span
0 … 0,6 bar (0 … 60 kPa)	±1.5 % of the measuring range
All other measuring ranges	±1 % of the measuring range span

5.5 Auxiliary energy

	Current output	Voltage output
Rated Voltage	24 V AC/DC	24 V AC/DC
Admissible operating voltage	20 … 28 V AC/DC	20 … 28 V AC/DC
Power consumption	max. 1 W (VA)	max. 0.5 W (VA)

5.6 Application conditions

5.6.1 Devices with IP54 (standard model)

Ambient temperature range	0 °C … +70 °C
Storage temperature range	0 °C … +70 °C
Medium temperature range	0 °C … +70 °C
EMC	EN 61326-1:2013 EN 61326-2-3:2013
EMC-ILA	Version 01-03d
RoHS	EN 50581:2012
Protection class (acc. to EN 60529)	IP54

Materials of the parts that come into contact with the measuring medium

Cutting ring screw connection	Nickel-plated brass
or screw connection	Aluminium anodised
Measuring system	Brass 2.0401 Stainless steel 1.4310 Mumetall
Membrane	NBR
	Viton®

Materials of the parts that come into contact with the surroundings

Housing	PA6 GB30
Cable screw connection	PA6
Cable outer jacket	PVC
alternative M12 plug flange casing	PA66

5.6.2 Devices with IP54 (DNV model)

Ambient temperature range		+5 °C … +70 °C
Storage temperature range		0 °C … +70 °C
Medium temperature range		+5 °C … +70 °C
DNV type testing		acc. to DNV-CG-0339
EMC	acc. to DNV-CG-0339, Section 3	Class: EMC-B
RoHS		EN 50581:2012
Protection class	in accordance with EN 60529	IP54
	acc. to DNV-CG-0339	Class B (IP44)

Materials of the parts that come into contact with the measuring medium

Cutting ring screw connection	Nickel-plated brass
Screw connection	Aluminium anodised
Measuring system	Brass 2.0401 Stainless steel 1.4310 Mumetall
Membrane	NBR
	Viton®

Materials of the parts that come into contact with the surroundings

Housing	PA6 GB30
Cable screw connection	PA6
Cable outer jacket	Special SABIX SHF 1 mix acc. to IEC 60092-359

5.6.3 Devices with IP65

Ambient temperature range	0°C … +70 °C
Storage temperature range	0 °C … +70 °C
Medium temperature range	0°C … +70 °C
EMC	EN 61326-1:2013 EN 61326-2-3:2013
EMC-ILA	Version 01-03d
RoHS	EN 50581:2012
Protection class (acc. to EN 60529)	IP65

Materials of the parts that come into contact with the measuring medium

Cutting ring screw connection	Nickel-plated brass
Screw connection	Aluminium anodised
Measuring system	Brass 2.0401 Stainless steel 1.4310 Mumetall
Membrane	NBR
	Viton®

Materials of the parts that come into contact with the surroundings

Housing	Grilon® B GK 30 H PA6 glass fibre/glass bead reinforced, heat-stabilised
Wall mounting plate	Aluminium vibration polished
Cable screw connection	PA6
Cable outer jacket	PVC
M12 plug flange casing	PA66

5.7 Construction design

5.7.1 Process connection

All device models are available with the following process connections:

Inner thread	G⅛
Cutting ring connection (brass galvanised)	for 3 mm tube
	for 6 mm tube
	for 8 mm tube
Hose screw connection (aluminium anodised)	for 6/4 mm hose
	for 8/6 mm hose

5.7.2 Electrical connection

Devices with IP54 (standard model)

Cable screw connection	M16 x 1.5 mm
Cable diameter	4.5…10 mm
Connection terminal	Screw terminal with wire protection
Connection cross-section	0.5 … 1.5 mm^2 fire-wire with/without ferrules
Option	
Number cable YSLY-JZ 4 x 0.75 mm^2 (permanently wired)	1 m
	2.5 m
	5 m
Option	
M12 socket	5-pin male, M12 x 1
M12 connection cable	see accessories

Devices with IP54 (DNV model)

Cable screw connection	**M16 x 1.5 mm**
Number cable SABIX BL 400 FRNC 4 x 0.75 mm^2 (permanently wired)	1 m
	2.5 m
	5 m

Devices with IP65

Cable screw connection	M16 x 1.5 mm
Connection terminal	Screw terminal with wire protection
Connection cross-section	0.5 … 1.5 mm^2 fire-wire with/without ferrules
Option	
Number cable YSLY-JZ 4 x 0.75 mm^2 (permanently wired)	1 m
	2.5 m
	5 m
Option	
M12 socket	5-pin male, M12 x 1
M12 connection cable	see accessories

5.7.3 Dimensional drawings

All dimensions in mm unless otherwise stated

5.7.3.1 IP54 casing

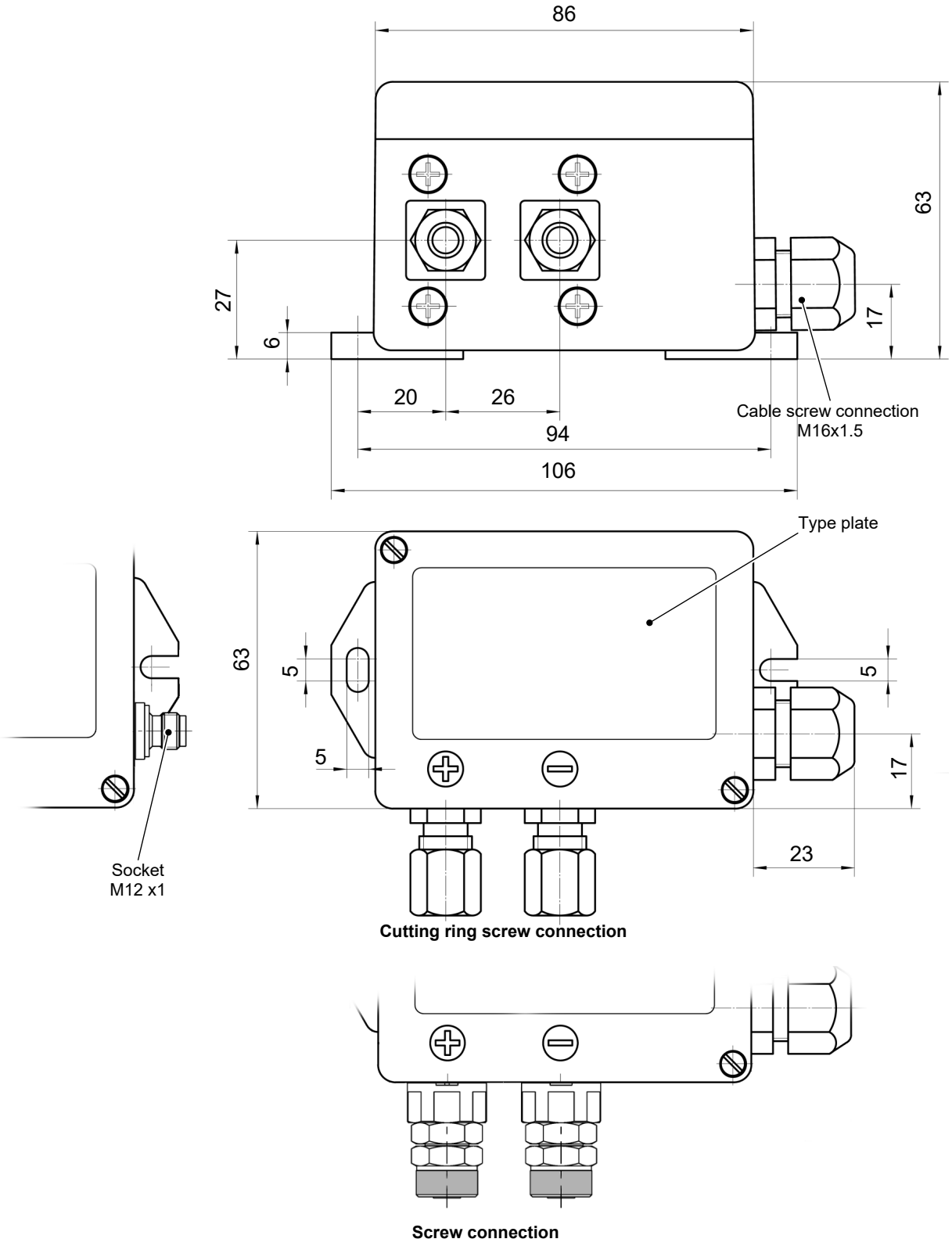


Fig. 9: Dimensional picture IP54 casing

5.7.3.2 IP65 casing

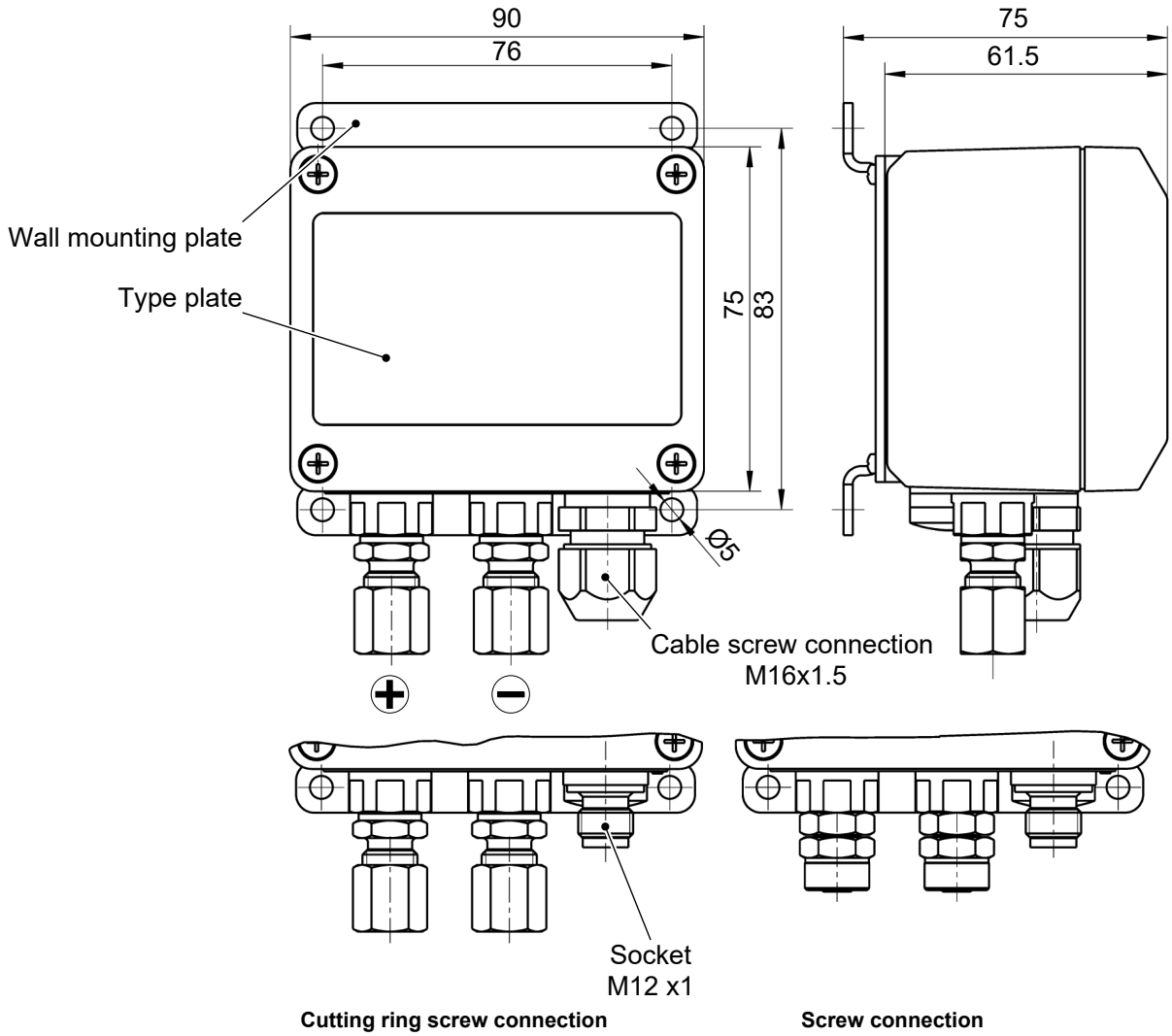
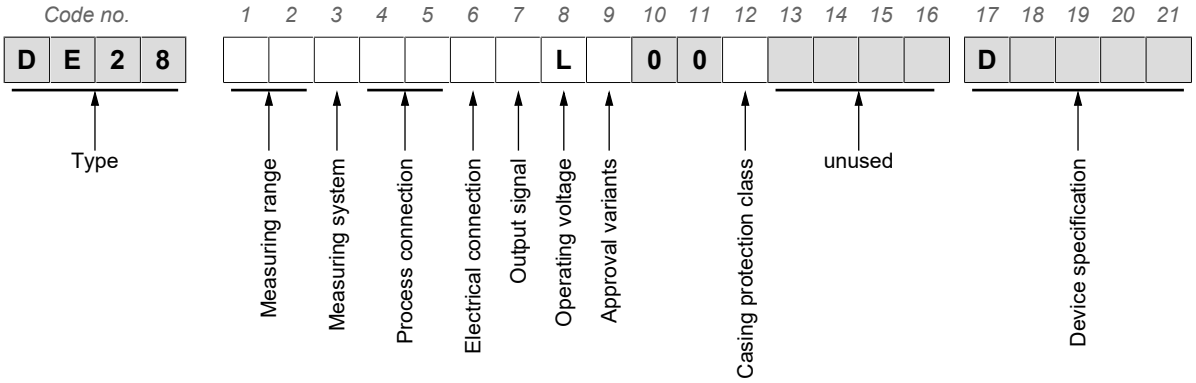


Fig. 10: Dimensional picture IP65 casing

6 Order Codes



Measurement range:

[1.2]	*(Code no.)*	[1.2]	*(Code no.)*
83	0 … 400 mbar	**8E**	0 … 40 kPa
01	0…0.6 bar	**F1**	0 … 60 kPa
02	0…1 bar	**F2**	0 … 100 kPa
03	0…1.6 bar	**F3**	0 … 160 kPa
04	0…2.5 bar	**F4**	0 … 250 kPa
05	0…4 bar	**F5**	0 … 400 kPa
06	0…6 bar	**F6**	0 … 600 kPa

Measuring system:

[3]	*(Code no.)*
M	Pressure chamber, membrane, seals: Brass/NBR
N	Pressure chamber, membrane, seals: Brass/Viton®

Process connection:

[4.5]	*(Code no.)*
00	Inner thread G ⅛
34	Cutting ring connection brass galvanised for 3 mm pipe
28	Cutting ring connection brass galvanised for 6 mm pipe
29	Cutting ring connection brass galvanised for 8 mm pipe
40	Aluminium hose screw connection anodised for 6/4 mm hose
41	Aluminium hose screw connection anodised for 8/6 mm hose

Electrical connection

[6]	*(Code no.)*
0	Standard model: Cable screw connection M16 x 1.5*)
1	1 m numbered cable, permanently wired
2	2.5 m numbered cable, permanently wired
5	5 m numbered cable, permanently wired
M	Socket M12 x 1*)

*) not possible with DNV model

Output signal:

[7]	*(Code no.)*	
A	0 … 20 mA	3-wire connection
P	4 … 20 mA	
C	0 … 10 V DC	

Operating voltage:

[8]	*(Code no.)*
L	24 V AC/DC

Approval variants:

[9]	*(Code no.)*
0	Standard version
S	DNV model

Casing protection class

[12]	*(Code no.)*
0	IP54
P	IP 65*)

*) not possible with DNV model

Device specification:

[17-21]	*(Code no.)*
D####	Model based on customer specification

6.1 Accessories

Order no.	Planned measures	No. of Poles	Length
06401995	Connection cable for supply/signal with M12 connector	5-pin	2 m
06401996	Connection cable for supply/signal with M12 connector	5-pin	5 m
06401564	Connection cable for supply/signal with M12 connector	5-pin	7 m
06401573	Connection cable for supply/signal with M12 connector	5-pin	10 m
064001567	Connection cable for supply/signal with M12 connector	5-pin	15 m
MZ410#	Settable damping reactor		

7 Annex

7.1 EU Declarations of conformity

FISCHER MESS- UND REGELTECHNIK

CE

EU Declaration of Conformity

(Translation)

For the product described as follows

Product designation **Differential Pressure Transmitter**

Type designation **DE28**

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/30/EU	*EMC Directive*
2011/65/EU	*RoHS Directive*

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

EN 61326-1:2013	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements*
EN 61326-2-3:2013	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*

RoHS

EN 50581:2012	*Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

Also they were subjected to the conformity assessment procedure „**Internal production control**".

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

Manufacturer **FISCHER Mess- und Regeltechnik GmbH**

Bielefelder Str. 37a
32107 Bad Salzuflen, Germany

Tel. +49 5222 974 0

Documentation representative Mr. Stefan Richter
Dipl. Ing.
General Manager R & D

The devices bear the following marking: CE

Bad Salzuflen, 2017-02-01

S. Richter
General Manager R & D

09010234 CE_EN_DE28 Rev.A 02/17

Seite **1** von **1**

Fig. 11: CE_DE_DE28

7.2 DNV Type Examination Certificate

You can download the certificate here: https://approvalfinder.dnvg

DNV

TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00000X8
Revision No:
1

This is to certify:

That the Pressure Transmitter

with type designation(s)
DE28

Issued to
FISCHER Mess- und Regeltechnik GmbH
Bad Salzuflen, Nordrhein-Westfalen, Germany

is found to comply with
DNV rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	**B (Cold test with 0°C/16h)**
Humidity	**B**
Vibration	**A**
EMC	**B**
Enclosure	**B (IP 54 tested)**

Issued at **Hamburg** on **2021-12-01**

This Certificate is valid until **2026-12-06**.
DNV local station: **Essen**

Approval Engineer: **Holger Jansen**

for **DNV**
Digitally Signed By: Papanuskas, Joannis
Location: DNV GL SE Hamburg, Germany

Joannis Papanuskas
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Fig. 12: 2017-02-06_TAA00000X8_Certificate_external_page_1

Job Id: **262.1-022928-2**
Certificate No: **TAA00000X8**
Revision No: **1**

Product description

Differential pressure transmitter

Measuring ranges	0 … 400mbar 0 … 0.6bar 0 … 1bar 0 … 1.6bar 0 … 2.5bar 0 … 4bar 0 … 6bar
Output signal	Current output : 0 … 20mA 4 … 20mA Voltage output : 0 … 10V
Auxiliary energy	Rated voltage current output: 24V AC/DC Rated voltage voltage output: 24V AC/DC
Cable screw connection	M16 x 1.5mm
Cable	SABIX BL 400 FRNC 4x0.75mm² 1 m numbered cable, permanently wired 2.5 m numbered cable, permanently wired 5 m numbered cable, permanently wired
Material housing	PA6 GB30
Material Cable screw connection	PA6
Material Cable outer jacket	Special SABIX SHF 1 mix acc. to IEC 60092-359

Place of manufacture

FISCHER Mess- und Regeltechnik GmbH
Bielefelder Straße 37a
32107 Bad Salzuflen
Germany

Application/Limitation

The Type Approval covers hardware listed under Product description.
When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case.
Reference is made to DNV SHIP Pt.4 Ch.9 Sec. 1.

Type Approval documentation

Data Sheet DB_EN_DE28 Rev. ST4-A 09/16
DNVGL Prüffolgeplan DE28 Rev. 7
Prüffolgeplan zur DNVGL Prüfung und Nachprüfung DE28 Rev.8 (29.11.2021)
Fischer Test Protocol no. 4966 to 4971 (08.08.2016)
Fischer Test Protocol no. 4972 (09.08.2016)
Paconsult no. 16-7986A (09.09.2016)
Paconsult no. 16-7986B (12.09.2016)
Paconsult no. 16-7986C (14.09.2016)
Test report RS Schwarze no. 2016102K1 (20.10.2016)
Test report RS Schwarze no. 2016102 (22.09.2016)
Test report RS Schwarze no. 2016103 (26.09.2016)
Test report RS Schwarze no. 2021145 (19.11.2021)
Test report RS Schwarze no. 2021146 (19.11.2021)
Drawing 02.028.00.04612.3 Rev. o (06.09.2016)
Part list 02.028.00.04612.V Rev. AH (07.09.2016)
Drawing 02.028.03.07323.V (24.09.2018)
Drawings 046719.** (28.02.2019)
Type Approval Assessment Report (02.11.2021)

Tests carried out

Applicable tests according to Class Guideline DNV-CG-0339, Edition August 2021.

Fig. 13: 2017-02-06_TAA00000X8_Certificate_external_page_2

Job Id: **262.1-022928-2**
Certificate No: **TAA00000X8**
Revision No: **1**

Marking of product

The products to be marked with:
- manufacturer name
- Article number
- Measuring range, output signal, voltage
- Production number.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE

Fig. 14: 2017-02-06_TAA00000X8_Certificate_external_page_3