developing solutions

FISCHER
MESS- UND REGELTECHNIK

Operating manual

DE41

Digital differential pressure transmitter

09015463 • BA_EN_DE41_LCD • Rev. ST4-A • 02/25

Masthead

Manufacturer: **FISCHER Mess- und Regeltechnik GmbH**

Bielefelderstr. 37a
D-32107 Bad Salzuflen

Telephone: +49 5222 974 0
Telefax: +49 5222 7170

eMail: info@fischermesstechnik.de
web: www.fischermesstechnik.de

Technical editorial team: Technical editor: R. Kleemann

Version history

Rev. ST4-A 02/25	Version 1 (first edition)

Table of contents

1 Safety instructions

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).

1. 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).

1. 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).

1. 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 DE41
- Operating Manual

2.2 Use as intended

The DE41 differential pressure transmitter is suitable for measuring positive, negative and differential pressures in gaseous and liquid media.

Please contact the manufacturer before using this unit with dirty or aggressive media because the media compatibility of the unit needs to be checked.

2.3 Function diagram

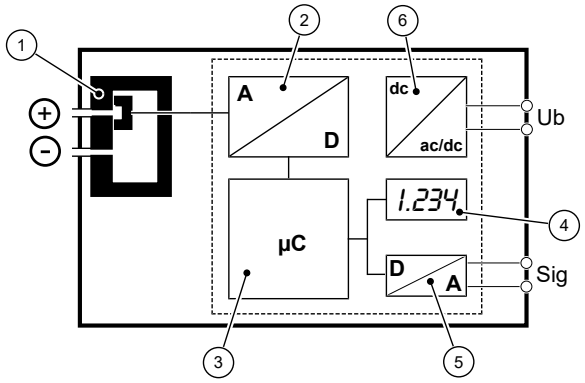


Fig. 1: Function diagram

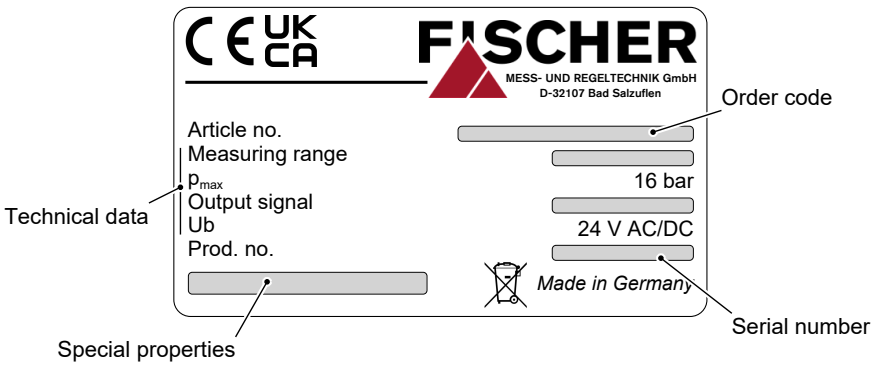
1	Ceramic sensor	2	Signal converter
3	Micro-controller	4	LCD
5	Analogue output	6	Auxiliary energy

2.4 Design and mode of operation

This switching device is based on a ceramic sensor element that is suitable for measuring positive, negative and differential pressures.

The pressures to be measured act directly on a ceramic diaphragm fitted with resistors. Changes in pressure generate changes in resistance, which are evaluated by the device's electronics and transformed into a display and output signal.

2.5 Nameplate



3 Installation

3.1 General

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.

Ex-works, the device is set for vertical installation. Any installation position is possible.

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)

If the pressure sensing lines are already pressurised at the time of commissioning, zero-point control and adjustment cannot be performed. In such cases, the device should be only connected to the mains without the pressure sensing lines.

The pressure connections are marked with (+) and (-) symbols on the device. When the differential pressure is measured, the higher pressure is connected to the (+) side and the lower pressure to the (-) side.

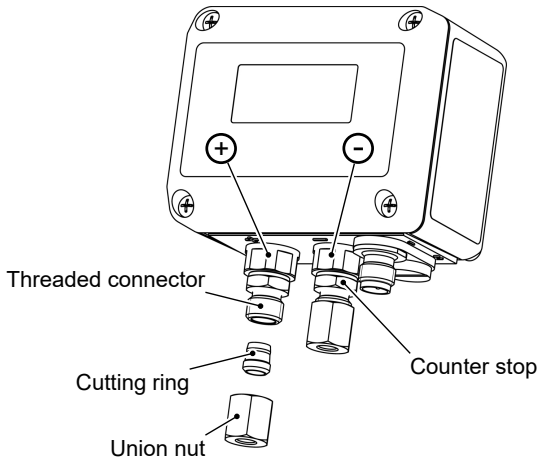


Fig. 2: Process connection

⚠ CAUTION

No assembly of the cutting ring screw connection on the device

Mounting the cutting ring screw connection directly to the device can destroy the pressure connection. We recommend carrying out assembly in two steps:

1. Pre-assembly in the pre-assembly connector
2. Final assembly in the threaded connector
   Always mount the threaded fitting with a counter stop!

All supply lines are arranged so that there are no mechanical forces acting on the device.

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

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 need to be vented for fluid measuring media.

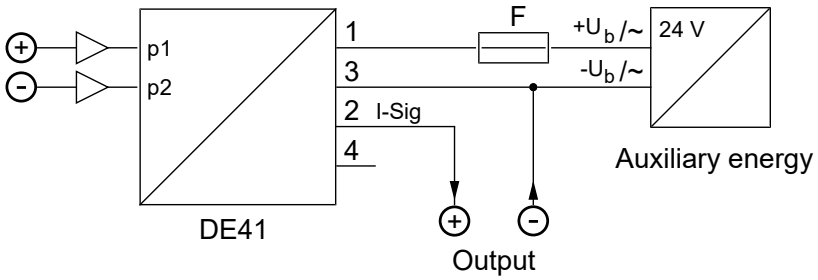
If water is used as a measuring medium, the unit must be protected against frost.

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.

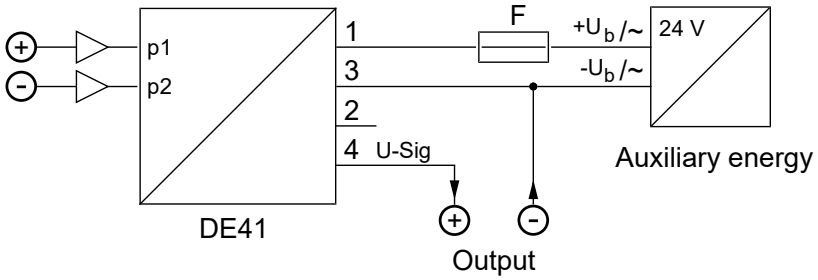
3-wire current output

Selector switch in position I



3-wire voltage output

Selector switch in position U



Pin assignment

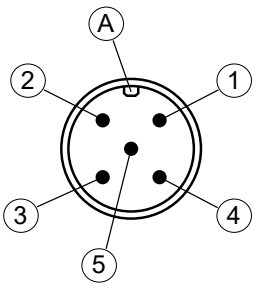


Fig. 3: 5-pin M12 connector

PIN	Signal name	DC	AC	Cable colour
1	Supply	$+U_b$	~	Brown
2	Current output (4 ... 20 mA)	I-Sig		White
3	Supply	$-U_b$	~	Blue
4	Voltage output (0 ... 10 V)	U-Sig		Black
A	Coding			

4 Start-up

4.1 General

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.

4.2 Control elements

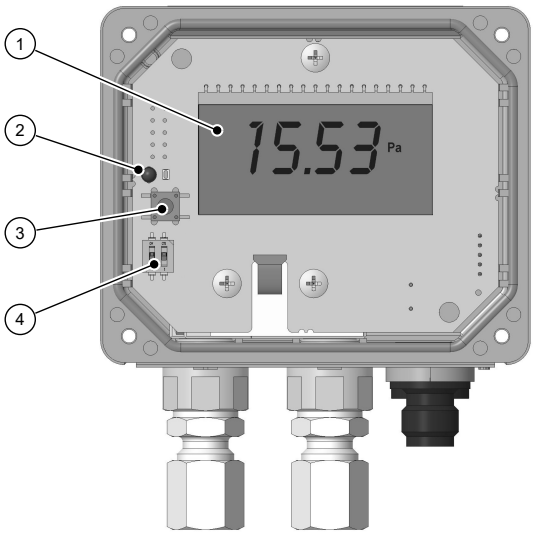


Fig. 4: Control elements

1	Meas. data display
2	Status LED (zeroing)
3	Zero point button
4	Selector switch: Analogue output/measuring range

4.3 Measuring range and output signal

The selector switch is used to select both the output signal and the measuring range of the DE41 as follows.

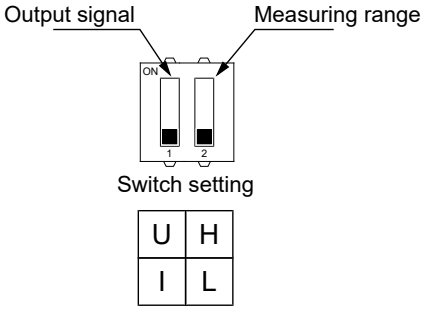
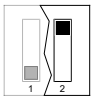
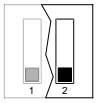
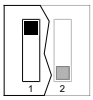
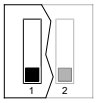


Fig. 5: Selector switch

Measuring range		DE41 W1 ...	DE41 W2 ...
	H	0 ... 2.5 bar	0 ... 6.0 bar
	L	0 ... 1.0 bar	0 ... 4.0 bar

Analogue output		Signal	M12 connector
	U	0 ... 10V	Pin 2
	I	4 ... 20 mA	Pin 4

4.4 Setting the zero point

The device is set ex-works for vertical installation, however any installation position is possible. If the installation position deviates from the vertical, the zero point signal can be corrected using the "Zero point" button.

Press and hold the button in a depressurised state until the yellow "Zeroing" status LED lights up. This indicates that the meas.data display has been set to zero.

The zero point adjustment is now complete.

5 Servicing

5.1 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.

5.2 Transport

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

5.3 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.

5.4 Disposal

WEEE-Reg.-No. DE 31751293

Please help to protect our environment and dispose of the workpieces and packaging materials used in an environmentally friendly manner. Observe the country-specific waste treatment and disposal regulations.

The year of production can be found in the production number (serial number):

P# **23** 03618.03.123

Production year 2023

Further information on disposal can be found on our website [www.fischermesstechnik.de]

6 Technical data

6.1 General

General information		
Type designation	DE41	
Pressure type	Relative pressure	
Measurement principle	Piezoresistive, Wheatstone bridge	

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

6.2 Input variables

Order codes	W1		W2	
Measuring ranges [bar]	0...1.0	0...2.5	0...4.0	0...6.0
Jumper position	L	H	L	H
One-sided load limit	5 bar		12 bar	
Static overpressure	16 bar		16 bar	

6.3 Output variables

Output signal	4 … 20 mA	0 … 10 V
Jumper position	U	I
Working resistance	$R_L \leq 500\ \Omega$	$R_L \geq 2700\ \Omega$
Type of connection	3-conductor	

6.4 Measuring accuracy

Measurement deviation	2.5 % FS

- Incl. linearity and hysteresis at 25 °C
- FS:= Full Scale

6.5 Auxiliary energy

Rated voltage	24 V AC/DC
Permitted op. voltage	15 … 32 V AC/DC
Power consumption	2 W/VA

6.6 Operating conditions

Ambient temperature range	-20 to 70 °C
Storage temperature range	-20 to 70 °C
Medium temperature range	-20 to 100 °C
IP protection class	IP 65 acc. to DIN EN 60529
EMC	DIN EN IEC 61326-1:2022-11 EN IEC 61326-1:2021
	DIN EN IEC 61326-2-3:2022-11 EN IEC 61326-2-3:2021
RoHS	DIN EN IEC 63000:2019-05 EN IEC 63000:2018
REACH	The article DE41 does not contain any SVHC substances.

6.7 Construction design

Process connection	Cutting ring screw connection in brass for 6 or 8 mm pipe
Electrical connection	M12 round plug connector for supply and analogue output signal (5-pin, male)
Installation position	User-defined
Dimensions	90 x 120 mm
Weight	<todo>

6.7.1 Materials

Materials of parts in contact with medium	
Sensor element	Ceramic, Parylene
Seal	FKM
Sensor housing	Brass
Process connection	Aluminium, nickel-plated brass

Materials of parts in contact with surroundings	
Housing	Polyamide PA 6.6
Process connection	Aluminium, nickel-plated brass

6.7.2 Dimension drawings

All dimensions in mm unless otherwise stated

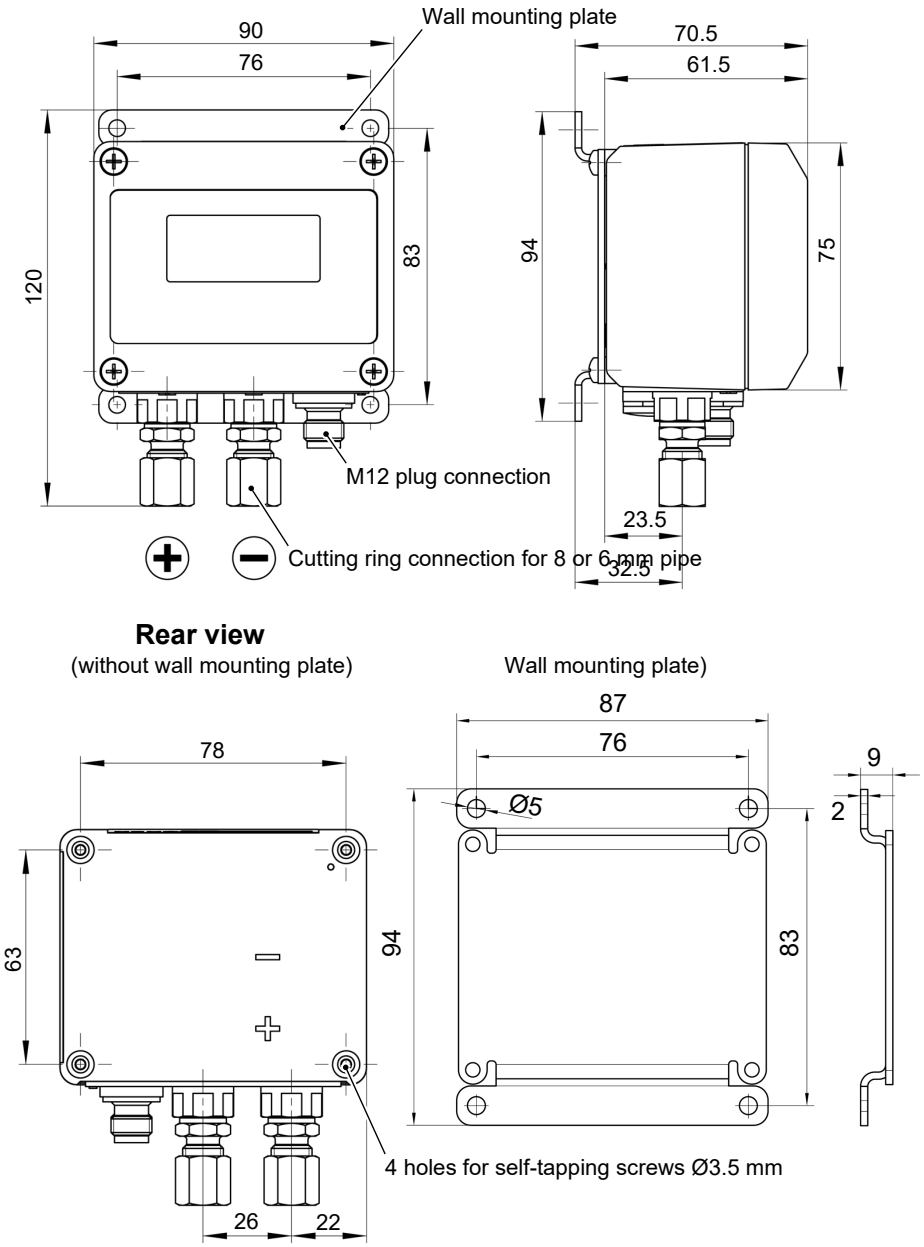
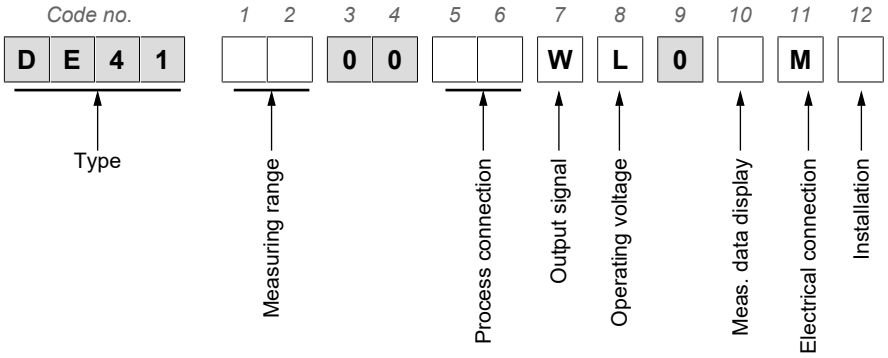


Fig. 6: Dimension drawing

Assembly of the mounting rails

7 Order codes



[1.2]	Measuring range *)
W1	0 ... 1.0 bar or 0 ... 2.5 bar
W2	0 ... 4.0 bar or 0 ... 6.0 bar

*) The measuring range can be selected using the coding switch.

[5.6]	Process connection
28	Cutting ring screw connection in brass for 6 mm pipe
29	Cutting ring screw connection in brass for 8 mm pipe

[7]	Analogue output *)
W	0 ... 10 V or 4 ... 20 mA

*) The output signal can be selected using the coding switch.

[8]	Operating voltage
L	24 V AC/DC

[10]	Meas. data display
0	without display
F	LC display

[11]	Electrical connection
M	M12 plug connection

[12]	Installation
0	Attachment boreholes on rear side (default)
W	Wall mounting

7.1 Zubehör

Best. No.	Designation	Number of poles	Length
06401995	M12 connection cable for supply/signal	5-pin	2 m
06401996	M12 connection cable for supply/signal	5-pin	5 m
06401564	M12 connection cable for supply/signal	5-pin	7 m
06401573	M12 connection cable for supply/signal	5-pin	10 m

8 Annex

FISCHER MESS- UND REGELTECHNIK

(Translation) CE

EU Declaration of Conformity

For the product described as follows

Product designation **Digital differential pressure transmitter**

Type designation **DE41**

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*
(EU) 2015/863	*Delegated Directive amending Annex II to Directive 2011/65/EU*

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

DIN EN IEC 61326-1:2022-11 *EN IEC 61326-1:2021*	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirement*
DIN EN IEC 61326-2-3:2022-11 *EN IEC 61326-2-3:2021*	*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 Directive (RoHS3)

DIN EN IEC 63000:2019-05 *EN IEC 63000:2018*	*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**".

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 (0)5222 974 0

The devices bear the following marking: CE

Bad Salzuflen
13 Feb 2025

T. Malischewski
Managing Director

09010935 • CE_EN_DE41 • Rev. ST4-A • 02/25

1 / 1

Fig. 7: CE_DE_DE41

FISCHER MESS- UND REGELTECHNIK

(Translation) UK CA

UKCA Declaration of Conformity

For the product described as follows

Product designation **Digital differential pressure transmitter**

Type designation **DE41**

is hereby declared to comply with the essential requirements, specified in the following UK regulations:

Statutory regulation No.	***Description***
2016 No. 1091	*The Electromagnetic Compatibility Regulations 2016*
2021 No. 422	*The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Amendment) Regulations 2021*
2022 No. 1647	*The Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020*

The products have been tested according to the following standards.

Electromagnetic compatibility (EMC):

BS EN IEC 61326-1:2021-06-07	*Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements*
BS EN IEC 61326-2-3:2021-06-10	*Electrical equipment for measurement, control and laboratory use. EMC requirements. Particular requirements. Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*

Restriction of Hazardous Substances (RoHS):

BS EN IEC 63000:2018-12-10	*Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

The sole responsibility for drawing up this declaration of conformity in relation to the fulfilment of the essential requirements and the preparation of the technical documentation lies with the manufacturer.

Manufacturer

FISCHER Mess- und Regeltechnik GmbH
Bielefelder Str. 37a
32107 Bad Salzuflen, Germany
Tel. +49 (0)5222 974 0

The devices bear the following marking: UK CA

Bad Salzuflen
13 Feb 2025

T. Malischewski
Managing Director

09010937 • UKCA_EN_DE41 • Rev. ST4-A • 02/25 1 / 1

Fig. 8: UKCA_DE_DE41

Notes

Notes

FISCHER Mess- und Regeltechnik GmbH
Bielefelder Str. 37a
D-32107 Bad Salzuflen

Tel. +49 5222 974-0
Fax +49 5222 7170
www.fischermesstechnik.de
info@fischermesstechnik.de