Special-Sensors

for

Automation

EGE

Pressure-Level

- ■ Compact model
- ■ Programmable
- ■ Analog output
- ■ Two switching points
- ■ Level measuring

ISO 9001 certified

Pressure Sensors

Technology and application

Usage

This high performance device monitors pressure levels in pipes and containers. However, the high accuracy of its capacitive ceramic gauge head makes it an effective fill level monitor as well. It can record fill levels with an accuracy of one centimeter in containers that stand five meters tall. Measurement instruments with a 1000 mbar measurement range have proven to be very useful for these types of applications. When measuring the fill level of water, 10 mbar of pressure corresponds to 10 cm water height. The instrument displays the pressure value digitally. The fill level measurement is not effected by foam on the liquid's surface. Suspended matter inside the container will not effect the measurement either - as long as the matter does not disturb the pressure distribution in the area surrounding the sensor membrane. The pressure sensor is a compact device that contains all the measurement and evaluation electronics. It is designed for use with 24 V DC. In addition to many programmable features, it also provides two PNP switch outputs and a 4 to 20 mA current output. Additionally we offer a model with 2 switching points and a rapid programming feature which can be used, for example, for minimum and maximum detection in a container. A model with one analog output only is also availble.

Functionality

The pressure sensor is designed to be screwed into the wall of a pressure container or a pipe. The medium contacts the sensor's ceramic gauge head directly. A pressure mediating fluid is not used. The dry capacitive gauge head provides a high level of overload stability. The medium pressure will cause the measurement membrane to deflect by a maximum of 0.03 mm. At maximum deflection, the membrane lies against the ceramic carrier, thereby enabling an instrument designed for a pressure range of 0 to 16 bar to withstand an overload or pressure spike of up to 64 bar without being damaged. When the overload passes, the membrane returns to its neutral position without exhibiting any hysteresis.
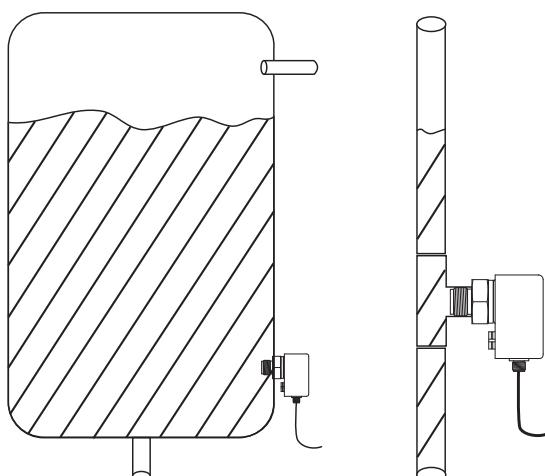
Installation of the pressure sensor

Deflection of the membrane against the ceramic carrier effects a capacity change that the integrated microprocessor-controlled evaluating electronics convert into a pressure-proportional DC signal of 4 to 20 mA. The measurement value is displayed on the four-digit LED display, whereby all values can be freely scaled to four digits with up to three decimal places.

The signal can be processed internally with buffering of up to 30 seconds, thereby making it possible to diminish pressure spikes in pipes.

Three buttons and a four-digit LED display enable the user to calibrate the sensor measurement range and to program the PNP switch outputs, and the buffering. Only a few button combinations are required to rapidly complete configuration.

Both integrated PNP switch outputs are freely programmable, allowing the user to adjust the limit value, hysteresis, and functionality type (normally closed or normally open) as needed. A LED signals the switching condition of the PNP switch outputs. The programmed data is stored in an EEPROM, providing security even in the event of power failure.

The sensors DN 752 GPP and DN 752 GA have a three-digit LED display and they allow a fast and easy programming for either two switchpoints or one analog output.

Sealing materials

The sensor membrane must be resistant to the medium in which the sensor will be used. A fluoroelastomer (FPM) gasket is standard equipment.

Resistance characteristics

Sign	FPM	EPDM	NBR	Kalrez
Trade name	Viton	Keltan	Perbunan	Kalrez
Water	++	++	++	++
Aromatic hydrocarbons	++	-	-	++
Halogenated solvents	+	-	-	+
Acid	++	+	-	++
Lye	-	++	+	++
Vegetable oil Animal fat	++	-	++	++
Fuel Lubricating oil Hydraulic oil	++	-	+	++

Pressure Sensors

Two switching points

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Series DN 752

Monitoring sensor for gases and fluids

Fast and easy programming

Two independent switching points

7-segment display
Display rotatable

Design	DC PNP • G3/4	
Dimensions		
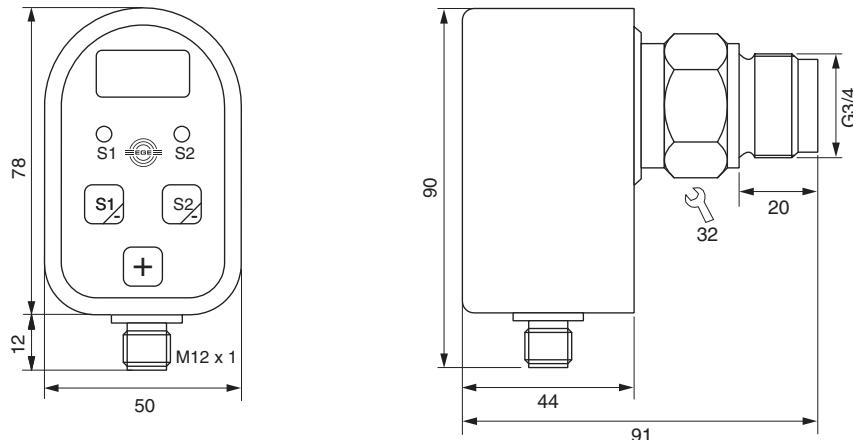
Sensing range	[bar]	0...1 relative	0...16 relative
Output		2x ⎯⁄⎯ PNP NO	
ID-No.		**P72014**	**P72015**
Type		DN 752 GPP-01	DN 752 GPP-16
Supply voltage	[V]	24 DC ±20%	
Switching current	[mA]	200	
Current consumption	[mA]	<50	
Ambient temperature	[°C]	−20...+70	
Medium temperature	[°C]	−20...+80	
Compressive strength	[bar]	5	48
Sensor material		AISI 316 Ti	
Material gauge head		Ceramic	
Sealing material		FPM	
Housing material		PBT	
Protection	[EN 60529]	IP 65	
Connection		M12 connector	

1: BN
2: WH
3: BU
4: BK

(1) BN — L+
(4) BK
(2) WH
(3) BU — L-

Accessories	Connecting cable Type SLG 4-2 (Z00445)

Pressure Sensors

Analog output

Series DN 752

Monitoring sensor for gases and fluids

Fast and easy programming

Analog output model

7-segment display
Display rotatable
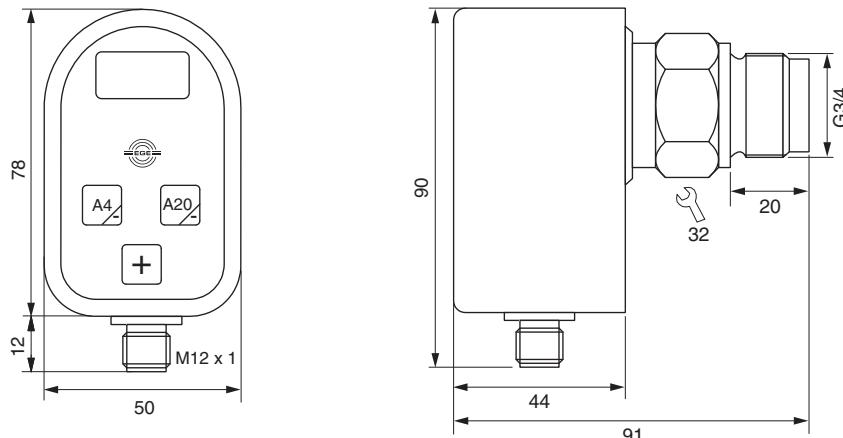
Design	DC • G3/4	
Dimensions		
Sensing range [bar]	0...1 relative	0...16 relative
Output	4...20 mA	
ID-No.	P72016	P72017
Type	DN 752 GA-01	DN 752 GA-16
Supply voltage [V]	24 DC ±20%	
Current ouput [mA]	4...20 linear	
Load R$_L$ [Ω]	200...500	
Current consumption [mA]	<50	
Ambient temperature [°C]	−20...+70	
Medium temperature [°C]	−20...+80	
Compressive strength [bar]	5	48
Sensor material	AISI 316 Ti	
Material gauge head	Ceramic	
Sealing material	FPM	
Housing material	PBT	
Protection [EN 60529]	IP 65	
Connection	M12 connector	

1: BN
2: -
3: BU
4: BK

(1) BN L+
(4) BK
4...20mA
R$_L$
(3) BU
L-
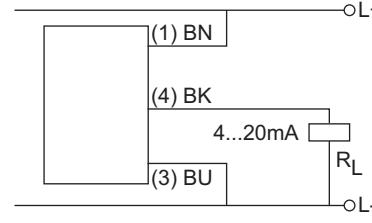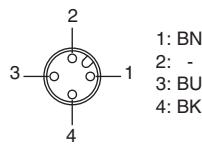
Accessories	Connecting cable Type SLG 3-2 (Z01076)

Series DN 752

**Monitoring sensor for gases and fluids**

**Linear current output 4...20 mA**
Two programmable switching points

NC/NO programmable

Display rotatable

Design	DC • G3/4	
Dimensions		
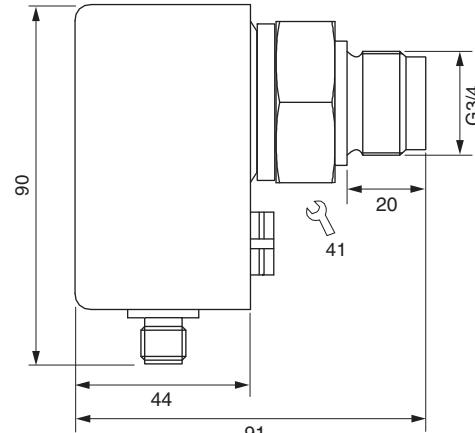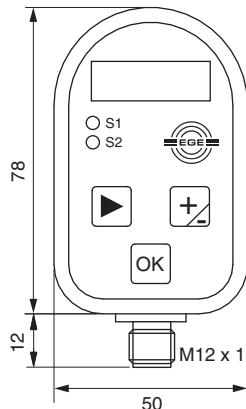
		DC • G3/4	
Sensing range	[bar]	0...1 relative	0...16 relative
Output		2x ⎍ PNP NC/NO + ⊘ 4...20 mA	
ID-No.		**P72012**	**P72013**
Type		DN 752 GAPP-01	DN 752 GAPP-16
Supply voltage	[V]	24 DC ±10%	
Current output	[mA]	4...20	
Switching current	[mA]	200	
Load R_L	[Ω]	0...400	
Current consumption	[mA]	20	
Ambient temperature	[°C]	−20...+70	
Medium temperature	[°C]	−20...+80	
Compressive strength	[bar]	16	64
Sensor material		AISI 316 Ti	
Material gauge head		Ceramic	
Sealing material		FPM	
Housing material		PBT	
Protection	[EN 60529]	IP 67	
Connection		M12 connector	

1: BN
2: WH
3: BU
4: BK

(1) BN — L+
(2) WH
(4) BK — S1 S2
(3) BU — R_L — L−
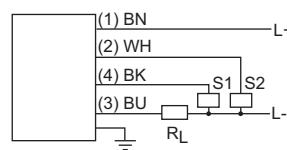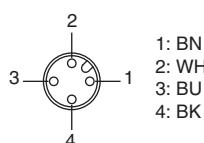
Accessories	Connection cable Type SLG 4-2 (Z00445)

Pressure Sensors

Switching points and analog output

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Additional technical data   DN 752 GAPP...

Output analog	4...20 mA	
Linearity	$\leq 0.2\%$	of maximum value
Temperature drift	$\leq 0.1\% / 10\ K$	of maximum value
Long time drift	$\leq 0.1\% / Year$	of maximum value
Influence of supply voltage	$\leq 0.5\% / 10\ V$	of maximum value
Input/output resolution	16 Bit	
Alignment range	zero point 0% - 95% / final point 3,3% - 100%	
Adjustment range of damping	0...30 seconds	

Switching output	
S1 / S2	PNP NO/NC programmable
Output voltage	$+U_B -1.5\ V$
Time delay	$< 8\ ms$
Rise time	$< 400\ \mu s$ with R_L $< 400\ \Omega$ or I_L $> 4.5\ mA$, respectively

Characteristics
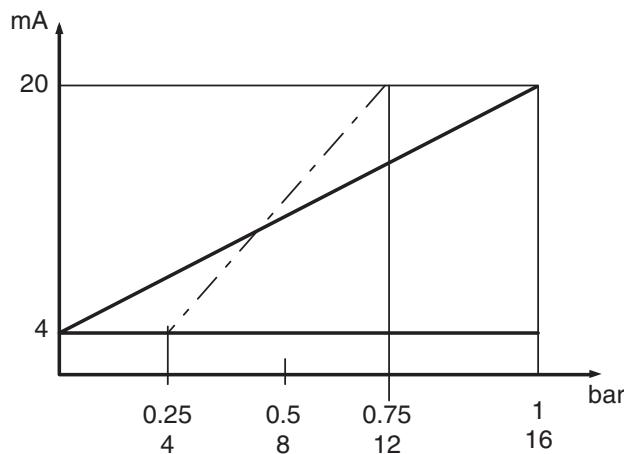
Notice

Install signal and measurement wires separate from power-carrying wires. Use only shielded wires for signals and measurement. Ground the shield only on one side. Operate inductive loads like relays or auxiliary contactors (used to avoid voltage spikes) only with a recovery diode or a RC module.

Before installation, make sure that the sensor membrane's gasket is suitable for the medium you will use. Our factory provides a fluoroelastomer (FPM) gasket.
The sensor is delivered with pre-programmed default settings. You must first enter an access code if you wish to change the programmed parameters to meet your requirements. Please refer to the operating instructions manual for this code.

Default setting

The pressure sensor is programmed at the factory to enable immediate use with a default setting for the analogue output. The digital display shows the current pressure value.

Operational and display elements

The display has four digits and shows the current pressure during operation. The LEDs for the S1 (SP1) and S2 (SP2) switching points illuminate when the respective switch output is activated.
During the programming procedure, the LED display will show (alpha-numerically) either the numeral value just entered or the respective program step.

Front view

7 segment Display
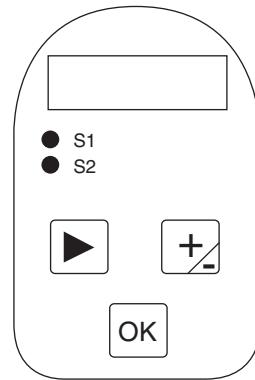
LED for each switching point

Keypad for programming

Program the sensor by means of the programming buttons:

OK button: Enter the submenu and accept the selected values.

Arrow button: Jumps from one spot in the menu to another. Changes the +/- button's direction of action. Changes the setting in a selection menu.

+/- button: Adjusts the displayed value. Hold this button depressed to run quickly through the values.

The operating instructions describe how to program the operational parameters.

Process Sensors

A selection

Flow sensors

- ■ Electronical monitoring of flow
- ■ Lubrication monitoring
- ■ Measuring range 0.1 ml/min...100 l/min
- ■ Detection range 1...300 cm/s
- ■ Reaction time 0.5 s

Level sensors for Ex-applications

- ■ For level monitoring in Ex areas
- ■ For temperatures –35...+200 °C
- ■ With PTFE connector cable
- ■ Sensors for connection to amplifiers

Level sensors

- ■ For level monitoring –230...+230 °C
- ■ Steam proof at a pressure of up to 30 bar
- ■ For hot motor oil
- ■ For liquid nitrogen
- ■ For chemically aggressive media

Ultrasonic sensors

- ■ Switching distance up to 5000 mm
- ■ Level monitoring
- ■ Watertight housing
- ■ Teach-in functions

Temperature sensors

- ■ Compact model with digital display
- ■ Monitoring in pipes and containers
- ■ Temperature –40...+120 °C (±0,3 °C)
- ■ Pressure up to 100 bar
- ■ Multi use output NO/NC + analog

Infrared detectors

- ■ Measurement of temperature
- ■ Monitoring of hot media
- ■ Position control

Headquarters
EGE-Elektronik
Spezial-Sensoren GmbH

Ravensberg 34
D-24214 Gettorf
Tel. +49 (0) 4346 / 41580
Fax +49 (0) 4346 / 5658

Internet: www.ege-elektronik.com

EGE-Elektronik ApS
Forstallé 79
DK-6200 Aabenraa
Tel. +45 70207271
Fax +45 70207272

EGE-Specialsensorer AB
Stationsgatan 4
S-51250 Svenljunga
Tel. +46 32512060
Fax +46 32512064

Stork AS
Brynsveien 100
N-1352 Kolsås
Tel. +47 67176400
Fax +47 67176401

Vision Systems OY
PL353
FI-40101 Jyväskylä
Tel. +358 (0)10 322 7100
Fax +358 (0)10 322 7119

Molex France
18 Parc Burospace
F-91571 Bièvres Cedex
Tel. +33 2 32 96 04 28
Fax +33 2 32 96 04 21

Cematic-Electric B.V.
Postbus 777
NL-7550 AT Hengelo
Tel. +31 742433422
Fax +31 742913333

ICM Ital Control Meters Srl
Via della Valle 67
I-20048 Carate Brianza (Mi)
Tel. +39 0362 8052 00
Fax +39 0362 8052 01

Bibus Spain, S. L.
Rua do Arroncal, Vial C – Nave 4A
ES-36350 Nigran
Tel. +34 986 247286
Fax +34 986 209247

Powelectrics Limited
Sandy Hill Park, Sandy Way
Amington, Tamworth
GB-Staffordshire B77 4DU
Tel. +44 1827310666
Fax +44 1827310999

Bachofen AG
Ackerstraße 42
CH-8610 Uster
Tel. +41 449441111
Fax +41 449441233

VWR International GmbH
Graumanngasse 7
A-1150 Wien
Tel. +43 1 97 002 - 0
Fax +43 1 97 002 - 600

**Countapulse Controls
(PTY) LTD.**
P.O.B. 40393
ZA-2022 Cleveland
Tel. +27 116157556
Fax +27 116157513

HITECH Ltd.
1-35-2 Simouma, Setagaya,
JPN-Tokyo 154-0002
Tel. +81 35430 2301
Fax +81 35430 2302

Micromax S&A P/L
Unit 2 106-110 Beaconsfield Street
AUS-Silverwater NSW 2128
Tel. +61 1300 362626
Fax +61 1300 017100

**PROTEK TEKNIK ELEKTRIK
TIC. SAN. LTD. ŞTI.**
Okçumusa Cad. Kismet Han
No: 36/2 P.K.
TR-34420 Karaköy-Istanbul
Tel. +90 212 237 20 00
Fax +90 212 235 46 09

IAC & Associates
2180 Fasan Drive
Oldcastle
CDN-Ontario N0R 1L0
Tel. +1 519 7370311
Fax +1 519 7370314
TF +1 800 711 1900

Yuden-Tech Co., Ltd.
5F., No. 121, Lide St.,
Zhonghe City, Taipei County 235,
Taiwan (R.O.C.)
Tel. +886 2 8221 2958
Fax +886 2 8221 2492

**Shanghai Beishidetian
Business Trade Co., Ltd.**
4F, No. 88-1, Lane 7039,
Zhongchun Rd., Minhang Area
Shanghai City
Tel. +86 21 54887307
Fax +86 21 54887305

CSE-W. Arthur Fischer Ltd.
15 Polaris Place, Greenmount
NZ-East Tamaki, Auckland
Tel. +64 9 271 3810
Fax +64 9 265 1362

KOLEKTOR SISTEH d.o.o.
Šlandrova ulica 10
SI-1231 Ljubljana - Črnuče
Slovenija
Tel. +386 1 5636 300
Fax +386 1 7227 930

Introl Sp. z. o.o.
ul. Kościuszki 112
40-519 Katowice
Tel. +48 32 789 00 00
Fax +48 32 205 33 77

Bibus Portugal, LDA
Centro Empresarial AAA
Rua Ponte da Pedra, 240 - C4
4470-108 Gueifães - Maia
Porto
Tel. +351 22 906 50 50
Fax +351 22 906 50 53

Futron Electronics PTE Ltd.
1004 Toa Payoh North
#04-08/09/10
Singapore 318995
Tel. +65 6250 2456
Fax +65 6250 6592

Useong Electrade Co.,
D-1006, Technopark
No.1345, Soha-dong,Gwangmyeong-si
Gyeonggi-do,
Korea
Tel. +82 (0) 2 2686 7314
Fax +82 (0) 2 2686 7316