

# GT403



KONGSBERG



## PRESSURE TRANSMITTER

The KONGSBERG GT403 is a type approved pressure transmitter, specially designed for maritime applications, and for submerged installations or installations in potentially wet areas. Typical applications is level measurements in tanks, pump and line pressure (suction and discharge side) of submerged pumps, and other submerged equipment. The transmitter is available as an absolute type or a sealed gauge type, with pressure ranges from 0.6 to 40 Bar.

### Principle of operation

The pressure sensing element is a dry, robust ceramic sensor, with an internal strain gauge Wheatstone-bridge. For each sensor, the characteristics of the strain gauge is digitized and stored at known applied pressure and temperature and kept in sensor memory for the sensor's lifetime. This digital calibration enables a possibility to linearize and temperature compensate each sensor uniquely, which again ensures high accuracy and temperature stability of each measurement.

The 96 % alumina membrane is resistant to most chemicals, thus the process medium is in direct contact with the measuring membrane, and there is no need for de-coupling in the form of a filling liquid and second membrane. A filling liquid and a second membrane can be a source of errors. This is why dry capsule sensors have superior specifications compared to wet capsule versions.

### Installation

The transmitter consists of a sensing element together with a signal converter unit encapsulated in the sensor body. The body is made of titanium for submerged installation or AISI316 if mounted in dry areas.

Process connection is ISO228-G1/2A threads, male connector.

The electrical connection is by an appurtenant PUR-cable that shall be flanged to the transmitter body and connected to a KM supplied connection box. Minimum cable requirement from the connection box to monitoring system is 2 x 0.5 mm<sup>2</sup> twisted pair cable with Cu-screen. The PUR-cable screen is grounded in the PUR-cable flange and grounded in the transmitter. The PUR cable screen shall also be grounded in the connection box on deck together with the deck cable. On the monitoring side, the screen shall be grounded as near to the input channel in the monitoring cabinet/system as possible (see Figure 1).

Power supply to the transmitter is 24 VDC nominal, but the transmitter will tolerate a variation from 12 VDC to 32 VDC from the power source. When used in hazardous areas as Intrinsic Safe apparatus, the power supply is restricted to 28VDC. The allowable load is determined by the minimum power supply.

The KONGSBERG DZ-120 Transmitter Barrier matches the GT403 pressure transmitter perfectly, and allows the transmitter to be used in hazardous areas (for connection details, see Figure 2).

Kongsberg Maritime can deliver detailed installation instructions and necessary installation material for various applications.

# DRAWINGS AND INSTALLATION

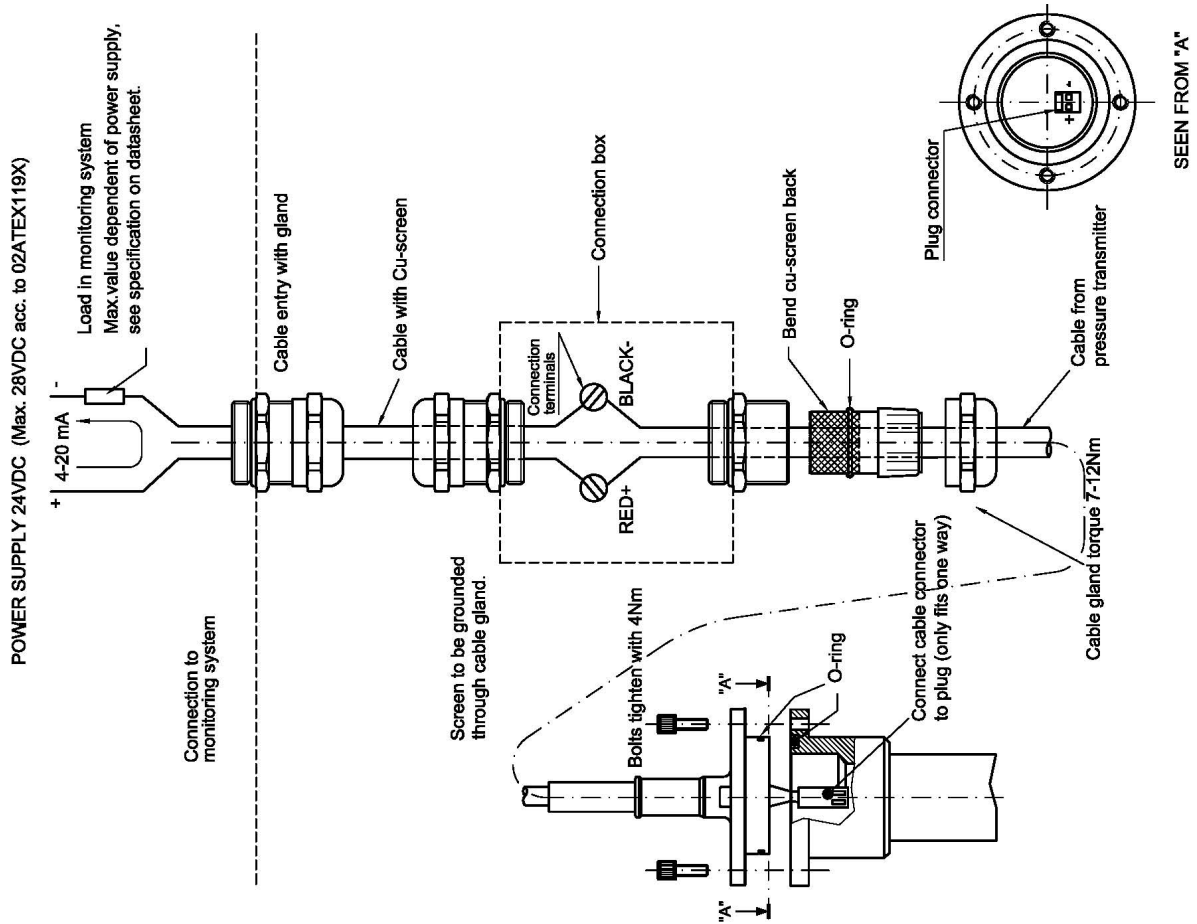


Figure 1: Electrical and mechanical installation of GT403

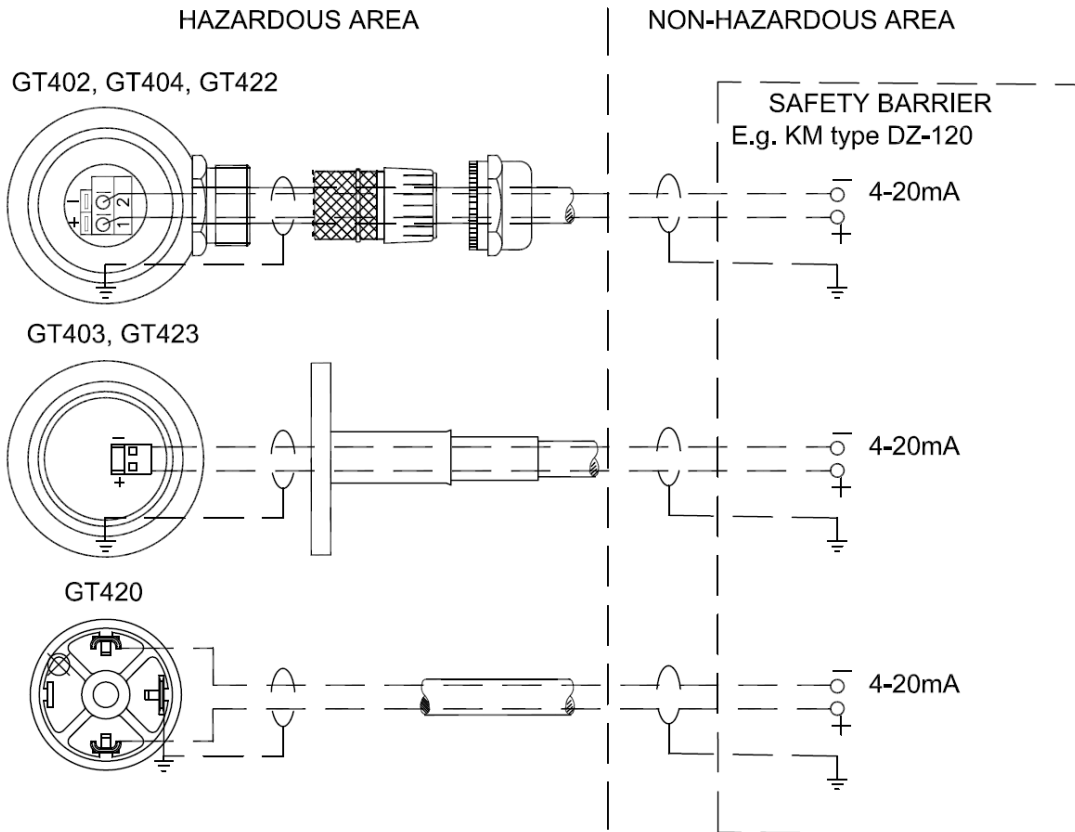


Figure 2: Connection diagram for Ex-area installations

# SPECIAL CONDITIONS FOR SAFE USE

The system must be depressurized before assembly of the pressure transmitters.



Compliance with the Essential Health and Safety Requirements has been assured by compliance with: CENELEC EN 60079-0 : 2012 and CENELEC EN 60079-11 : 2012

- The stated input values  $U_i$ ,  $I_i$  and  $P_i$  are to be regarded as individual maximum values. It is a precondition that the diode safety barrier in the supply circuit has a linear resistive output characteristic.
- When installing titanium sensors, special caution must be taken to avoid ignition hazard due to impact or friction.
- GT403 is delivered with a PUR-cable end up to 60 meters, with up to 102  $\mu$ H inductance and up to 7.2 nF capacitance. The inductance of the cable length that comes with the transmitter shall be added to the  $C_i$  and  $L_i$  of the transmitter.

For details about safe installation and various solutions for different applications, see the GT400 Series Pressure Sensor Applications Guidelines 369048.

## ORDER CODE

GT4 0 3 X X X XXX X X X XXX

OUTPUT SIGNAL  
0 = 4-20mA / HART

DESIGN  
3 = General use submerged, IP68

ACCURACY  
(incl. Linearity, hysteresis and repeatability)  
A = 0,25 % FRO 0,005%FRO/°C 0 to 60°C

ELECTRICAL AND CABLE CONNECTION  
0 = Flanged with 5mm cable

INPUT AND ZERO POINT  
A = Absolute (4mA at 0 Bar Abs.)  
C = Sealed Gauge (4mA at 0,8 Bar Abs.)  
H = Sealed Gauge (4mA at 1,0 Bar Abs.)

PRESSURE RANGE in Bar

			0,6	1
1,6	2,5	4	6	10
16	25	40		

CABLE OR OTHER REQUEST

P05	5m PUR cable, 2-wire with flange
P10	10m PUR cable, 2-wire with flange
P15	15m PUR cable, 2-wire with flange
P20	20m PUR cable, 2-wire with flange
P25	25m PUR cable, 2-wire with flange
P30	30m PUR cable, 2-wire with flange
P35	35m PUR cable, 2-wire with flange
P40	40m PUR cable, 2-wire with flange
P45	45m PUR cable, 2-wire with flange
P50	50m PUR cable, 2-wire with flange
P60	60m PUR cable, 2-wire with flange
000	NA (default if left blank)

Material of flange according to material in sensor.

CALIBRATION CERTIFICATE  
0 = Without calibration certificate (default if left blank)  
C = With calibration certificate

DISPLAY  
0 = Without display (default if left blank)

PROCESS CONNECTION, MATERIAL AND SEALING

Type	Connection	Material	Sealing
D	ISO 228-G1/2A	Titanium gr.2	Viton
K	ISO 228-G1/2A	AISI316	Isolast J9503
L	ISO 228-G1/2A	AISI316	Nitril
N**	ISO 228-G1/2A	Titanium gr.2	Viton
V	ISO 228-G1/2A	AISI316	Viton

\*\* Process connection with drain holes  
Sealing temperature properties:  
Viton (V70G8) -18 to 200°C  
Nitril (N7028) -30 to 100°C  
Isolast (J9503) -25 to 240°C (excellent resistance to high temp. and chemicals)  
Important: Max. ambient temp. transmitter is 85°C

# FEATURES

- Accuracy 0.25 % of FRO
- Temperature drift <0.005 % of FRO\*\*/°C
- HART compatible
- Membrane made of 96 % alumina ceramics
- Body in titanium for seawater applications or AISI 316 L
- Rugged construction

# TECHNICAL SPECIFICATIONS

Measuring range: 0.6 to 40 bar  
Accuracy\*: 0.25 % FRO\*\*  
Temperature drift: < 0.005 % of FRO\*\*/°C

Long term drift: < 0.3 % /year (% of nom. range)

Output signal: 4 to 20 mA / HART  
Output current:  $3.8 \text{ mA} < I_o < 21.6 \text{ mA}$   
Output current at fault:  $I_o \leq 3.6 \text{ mA}$

Power supply: 24 VDC (12 to 32 VDC depending on load resistance)  
Load resistance: 0 to 1150 ohm depending upon power supply

Ex classification: @II 1 G Ex ia IIC T5 Ga  
Ex certification: NEMKO 02ATEX119X  
IECEX NEM 12.0008X

Environmental standards: IACS E10  
CISPR 22

Operating temperature: - 45 °C to + 85 °C  
Storage temperature: - 50 °C to +100 °C

### Materials

Body: AISI 316L / Titanium gr.2  
Membrane: 96 % alumina ceramics  
Gasket: See order key

Protection grade: IP 68, 6 bar  
Weight: 0.3 kg (excl. cable and flange)

### Safety data sensor:

Max. input voltage:  $U_i = 28 \text{ VDC}$   
Max. input power:  $P_i = 0.85 \text{ W}$   
Max. input current:  $I_i = 150 \text{ mA}$   
Max. internal capacitance:  $C_i = 30 \text{ nF}$   
Max. internal inductance:  $L_i = \text{Negligible}$

### Safety data PUR-cable:

Max. internal capacitance:  $C_i = 120 \text{ nF/km}$   
Max. internal inductance:  $L_i = 1.7 \text{ mH/km}$

Type approvals: MR (EU mutual recognition), NK, CCS, ABS

\* Including non-linearity, hysteresis and repeatability at 22 °C.

\*\* FRO = Full Range Output

Specifications subject to change without any further notice.

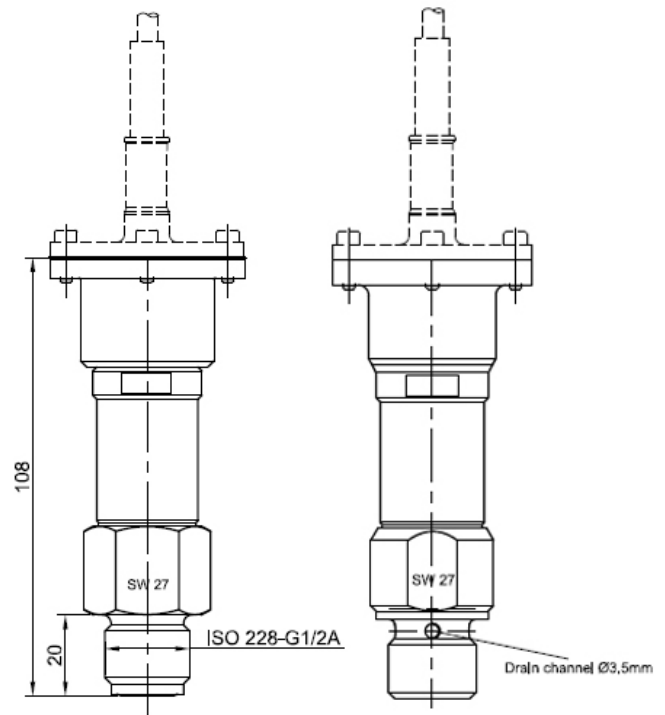


Figure 3: Dimensional sketches of GT403.  
N-version with drain hole to the right