

Data sheet

# Pressure transmitter for marine applications

## DST P30M



The compact high temperature pressure transmitter is designed for use in almost all marine applications, and offers a reliable pressure measurement, even under harsh environmental conditions.

The flexible pressure transmitter program covers different output signals, absolute or gauge (relative) versions, measuring ranges from 0 – 1 to 0 – 600 bar and a wide range of pressure and electrical connections.

A robust design, an excellent vibration stability, and a high degree of EMC / EMI protection equip the pressure transmitter to meet the most stringent marine requirements.

Running a powerful ARM-based microcontroller, the DST P30M offers diagnostic functions and performance features.

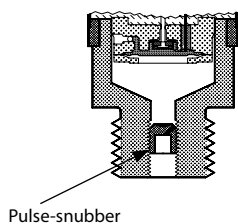
### Features

- Designed for use in severe maritime environments
- Robust electronic platform for harsh electrical environments
- Available output signals:
  - 10 - 90% of supply voltage
  - 4 - 20 mA
  - Absolute voltage
- For media temperatures up to 125 °C
- A wide range of pressure and electrical connections
- Enclosure and wetted parts of AISI 316L
- For use in Zone 2 explosive atmospheres
- Fully digitally compensated
- Diagnostic functions and scalable performance features available
- UL approved

### Approvals

Det Norske Veritas/Germanischer Lloyd, DNV GL  
 Lloyds Register of Shipping, LR  
 Bureau Veritas; BV  
 Registro Italiana Navale, RINA

Nippon Kaiji Kyokai, NKK  
 American Bureau of Shipping, ABS  
 Korean Register of Shipping, KR  
 China Classification Society, CCS  
 Russian Maritime Register of Shipping, RMRS

**Application and media conditions**

**Application**

Cavitation, liquid hammer and pressure peaks may occur in liquid filled hydraulic systems with changes in flow velocity, e.g. fast closing of a valve or pump starts and stops.

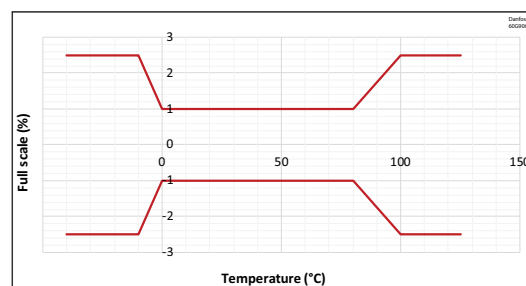
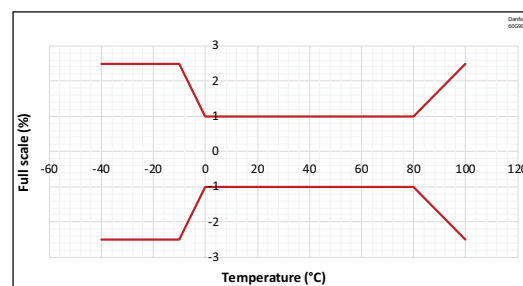
The problem may occur on the inlet and outlet side, even at rather low operating pressures.

**Media condition**

Clogging of the nozzle may occur in liquids containing particles. Mounting the transmitter in an upright position minimizes the risk of clogging, because the flow in the nozzle is limited to the start-up period until the dead volume behind the nozzle orifice is filled. The media viscosity has only little effect on the response time. Even at a viscosities up to 100 cSt, the response time will not exceed 4 ms.

**Technical data**
**Performance (EN 60770)**

Accuracy @ 20 °C	≤ ± 1% FS
Response time	< 2 ms Programmable filtering available
Overload pressure (static)	6 × FS (max. 1500 bar)
Burst pressure	6 × FS (max. 2000 bar)
Power-up time	< 50 ms
Durability, P: 10 – 90% FS	> 10 mil. cycles
Total Error Band (TEB)	Default TEB profile - see graph below

**mA version**

**ratiometric/absolute voltage version**

**Electrical specifications**

Nom. output signal (short-circuit protected)	4 – 20 mA	0–5 V, 1–5 V, 1–6 V	0–10 V	10 – 90% of supply voltage
Supply voltage [U <sub>B</sub> ], polarity protected	9–32 V DC (12 / 24 V DC nom.)	9–32 V DC (12 / 24 V DC nom.)	15–32 V DC (12 / 24 V DC nom.)	4.5 – 5.5 V DC (5 V DC nom.)
Supply – current consumption	–	≤ 5 mA	≤ 8 mA	< 5 mA – 5 V
Supply voltage dependency	< 0.1% FS / 10 V	< 0.05% FS / 10 V		–
Ratiometricity	–	–		< 0.05% FS / 4.5 – 5.5 V
Output limitation	22.4 mA	0-5V: 5.75 V 1-5V: 5.6 V 1-6V: 6.75 V	0-10V: 11.5 V	≈ supply voltage
Sink / Source	–	< 1 mA		
Load [R <sub>L</sub> ] (load connected to 0 V)	R <sub>L</sub> ≥ (U <sub>B</sub> - 9 V)/0.02 A	R <sub>L</sub> ≥ 10 kΩ	R <sub>L</sub> ≥ 15 kΩ	R <sub>L</sub> ≥ 10 kΩ at 5 V

**Technical data**
*(continued)*
**Environmental conditions**

Sensor operating temperature	4 - 20 mA		-40 – 100 °C
	10 - 90% of Vs & abs. voltage		-40 – 125 °C
Media temperature range			-40 – 125 °C
EMC – Emission			EN 61000-6-3
EMC – Immunity (Output > 1 GHz - deviation < 3%)			EN 61000-6-2
Insulation resistance			> 100 MΩ at 500 V DC
Vibration stability	Random	7.5 g <sub>rms</sub> , 5 Hz – 1 kHz	IEC 60068-2-64
Shock resistance	Shock	500 g / 1 ms	IEC 60068-2-27
Enclosure (depending on electrical connection)			See page 6

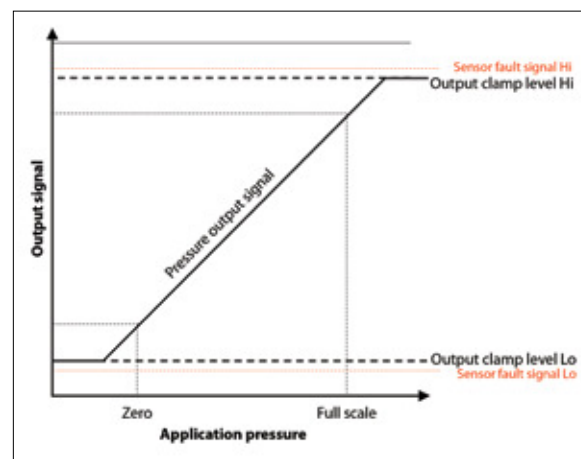
**Explosive atmospheres**

Zone 2 applications	<b>II 3G</b> <b>Ex nA IIA T3 Gc</b> <b>-10 °C &lt; Ta &lt; +85 °C</b>	EN60079-0; EN60079-15
---------------------	---	-----------------------

When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact

**Mechanical characteristics**

Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	See page 6
	Pressure connections	See page 5
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

**Output and diagnostics**

**Pressure output signal**

- Defines the measuring range of the sensor.

**Output clamp levels**

- Limit the pressure output signal if the pressure rises above or falls below the normal range.

**Sensor fault signal**

- Output at this level signals a sensor fault. The fault signal setting can be high or low.

Flexible output clamping and flexible fault signal error level to application fit available.

Contact Danfoss for detailed information and requirements.

**Self-diagnostic default levels**

\* programmable filtering available

	Ratiometric % of supply voltage	4-20mA	0-5V	1-5V	1-6V	0-10V	1-10V
Zero	10%	4mA	0V	1V	1V	0V	1V
FS	90%	20mA	5V	5V	6V	10V	10V
Span	80%	16mA	5V	4V	5V	10V	9V
Output clamp level Lo	4%	3,8mA	NA	0,5V	0,5V	N/A	0,5V
Output clamp level Hi	99%	20,5mA	5,5V	5,5V	6,5V	11V	11V
Fault signal Lo	2%	-	-	-	-	-	-
Fault signal Hi	-	21,5mA	5,8V	5,8V	6,8V	11,5V	11,5V

Ordering standard

**DST P30M**

		-				-				-	
--	--	---	--	--	--	---	--	--	--	---	--

**Gasket / O-ring material**

0	No gasket
1	Gasket, Viton -20 °C – 125 °C
3	O-ring, Viton -20 °C – 125 °C

**Pressure connection**

A B 0 4	G ¼ A (EN 837) (only without pulse-snubber)
G B 0 4	G ¼ (DIN 3852E)
A B 0 8	G ½ A (EN 837)
C D 2 8	G ¼ female with flange <sup>2)</sup>
A C 0 4	¼ - 18NPT

**Electrical connection**

A9	Plug (EN 175301-803-A), Pg 13.5
DG	Cable, screened, 3 m
A1	Plug (EN 175301-803-A), Pg 9
A6	Plug (EN 175301-803-A), Pg 11
C8	Bayonet plug; ISO 15170-A1-3.2-Sn
F4	Cable, screened, 2 m
E3	* EN 60947-5-2, M12 x 1, male excl. female plug

**Output signal**

1	4 – 20 mA
2	0 – 5 V
3	1 – 5 V
4	1 – 6 V
5	0 – 10 V
7	1 – 10 V
6	Ratiometric, 10 – 90%

**Pressure reference**

1	Gauge (relative)
2	Absolute

**Type**

Standard	0M
with pulse-snubber	5M

**Measuring range**

-1 – 4.0 bar <sup>1)</sup>	8 6
-1 – 10 bar <sup>1)</sup>	8 8
0 – 1.0 bar	1 0
0 – 1.6 bar	1 2
0 – 2.5 bar	1 4
0 – 4.0 bar	1 6
0 – 6.0 bar	1 8
0 – 10 bar	2 0
0 – 16 bar	2 2
0 – 25 bar	2 4
0 – 40 bar	2 6
0 – 60 bar	2 8
0 – 100 bar	3 0
0 – 160 bar	3 2
0 – 250 bar	3 4
0 – 400 bar	3 6
0 – 600 bar	3 8

**Pressure reference**

1	Gauge (relative)
2	Absolute

<sup>1)</sup> Sealed gauge only  
<sup>2)</sup> Viton gasket for flange and bolts for mounting included  
 \* Gauge versions only available as sealed gauge versions

■ Preferred versions

Non-standard build-up combinations may be selected. However, minimum order quantities may apply. Please contact your local Danfoss office for further information or request on other versions.

**Dimensions/Combinations**

Type code: A1	A6	A9	F4 / DG	E3	C8
EN 175301-803-A, Pg 9	EN 175301-803-A, Pg 11	EN 175301-803-A, Pg 13.5	Cable screened ship, 2 m / 3 m	EN 60947-5-2, M12 1, male excl. female plug	ISO 15170-A1-3.2-Sn, excl female plug, Bayonet plug
<p>Cartridge design</p>			<p>Block design</p>		
G ¼ A (EN 837)	G ¼ (DIN 3852-E)	G ½ A (EN 837)	¼ - 18 NPT	G ¼ A female with flange	
<b>Type code</b>	<b>AB04</b>	<b>GB04</b>	<b>AB08</b>	<b>AC04</b>	<b>CD28</b>
Recommended torque <sup>1)</sup>	30 – 35 Nm	30 – 35 Nm	30 – 35 Nm	2 - 3 turns after finger tightened	–

<sup>1)</sup> Depends of different parameters such as gasket material, mating material, thread lubrication and pressure level

**Electrical connections**

Type code, See page 5	A1 / A6 / A9	DG	F4	E3	C8
	EN 175301-803-A, Pg 9/11/13.5	Cable screened ship, 3 m	Cable screened ship 2m	EN 60947-5-2 M12 x 1; 4-pin	ISO 15170-A1-3.2-Sn Bayonet
Ambient temperature, 4 – 20 mA output	-40 – 100 °C	-30 – 100 °C	-30 – 100°C	-25 – 90 °C	-40 – 100 °C
Ambient temperature, ratiometric output	-40 – 125 °C	-30 – 125 °C	-30 – 125 °C	-25 – 90 °C	-40 – 125 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP67	IP67	IP67
Material	Glass filled polyamid, PA 6.6	RTFRO with PE shrinkage tubing	Polylefin cable with PE Shrinkage tubing	Nickel plated brass, CuZn/Ni	Glass filled polyester PBT
Electrical connection, 4 – 20 mA output (2 wire)	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used  Earth: Connected to MBS enclosure	Black wire: + supply Blue wire: ÷ supply Brown wire: not used Screen: Connected to MBS enclosure	Brown wire: + supply Black wire: ÷ supply Red wire: not used Orange: not used Screen: not connected to MBS enclosure	Pin 1: + supply Pin 2: not used Pin 3: not used Pin 4: ÷ supply	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used Pin 4: not used
Electrical connection, ratiometric output	Pin 1: + supply Pin 2: ÷ supply <sup>1)</sup> Pin 3: + output  Earth: Connected to MBS enclosure	Black wire: + supply Blue wire: ÷ supply <sup>1)</sup> Brown wire: + output Screen: Connected to MBS enclosure	Red wire: + Supply Black wire: ÷ Supply Brown wire: +Output <sup>1)</sup> Orange: Not used Screen: Not connected to MBS enclosure	Pin 1: + supply Pin 2: not used Pin 3: + output Pin 4: ÷ supply/ common	Pin 1: + supply Pin 2: ÷ supply <sup>1)</sup> Pin 3: <b>not used</b> Pin 4: <b>+output</b>

<sup>1)</sup> Common