motralec Danfoss Pressure transmitter Type DST P310 Pressure transmitter· DEMANDE DE PRIX >
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ENGINEERING TOMORROW

Data Sheet

Pressure transmitter Type DST **P310**

Pressure transmitter for cooling applications



The DST P310 pressure sensor is equipped with a powerful ARM processor enabling enhanced calibration accuracy and self diagnostic features. This hermetically sealed sensor is suitable for use with all refrigerants and can be applied to the most demanding of applications, such as :

- Chillers
- Transport refrigeration
- Commercial refrigeration
- Variable speed HVAC
- Heat pumps
- Food Retail

This flexible pressure transmitter program covers different output signals, absolute or gauge (relative) versions, measuring ranges and a wide range of pressure and electrical connections.

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

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Features

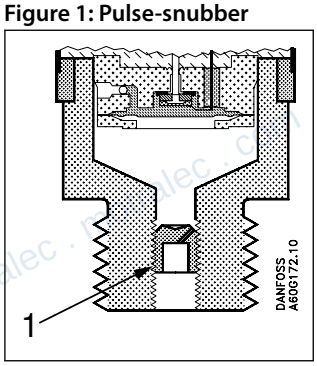
- Robust and reliable Piezo Silicon MEMS technology
- Fully welded, hermetically-tight media interface & stainless steel design for improved long-term reliability & use with known and future refrigerants
- ATEX Zone 2 (depending upon operating temperature)
- High default accuracy (typically ±1% TEB) enabling precise system control.
- Self-diagnostic feature allows for sensor failure detection and improved machine up-time.
- Excellent long-term stability and reliability of sensor signal over lifetime
- Flexible product platform allowing user defined configurations (i.e. output signal, connections, cables) & custom sensor calibration

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Applications

Figure 1: Pulse-snubber



1	Pulse-snubber

Cavitation, liquid hammer and pressure peaks may occur in liquid filled systems when valves either open or close and compressors start and stop. This is especially the case in high pressure applications, such as when using CO_2 as a refrigerant. Selection of the pulse snubber protects the pressure sensor diaphragm from these high pressure peaks. A pulse snubber should be considered for pressure sensor ranges above 50 bar when used in liquid applications. Where possible the sensor should be mounted vertically to prevent particulate contamination of the pulse snubber.

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Product specification

Technical data

Table 1: Performance (EN 60770)

Accuracy @ 20ºC	≤ ± 1% FS (max), ≤0,5%FS (typ.)
Total Error Band (see graph below) (1)	Default TEB profile - see ordering
Response time (1)	< 2 ms
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

(1) Programmable filtering available

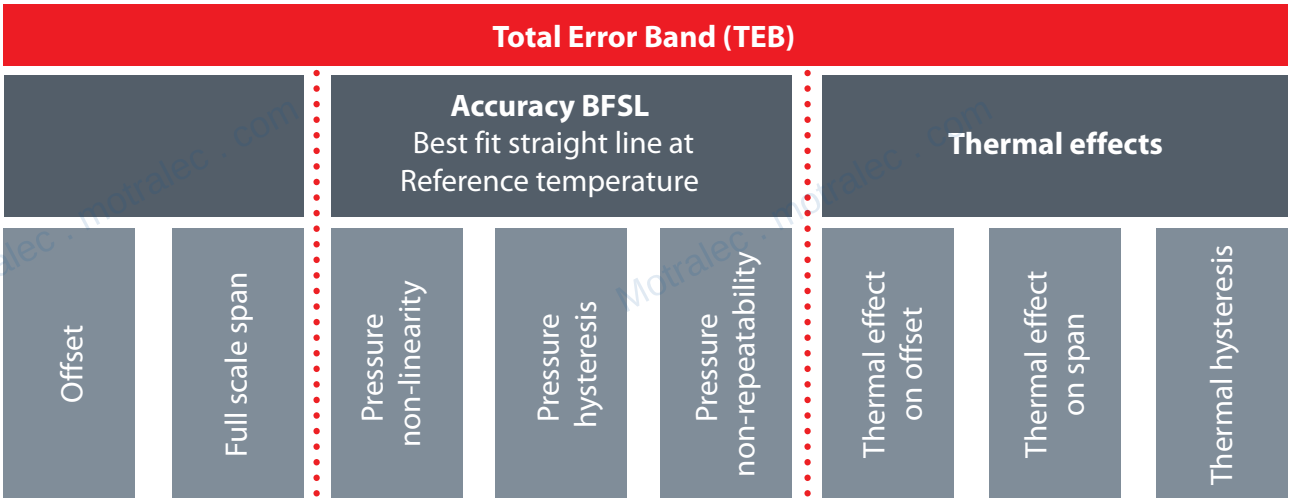


Table 2: Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA	0 – 5, 1 – 5, 1– 6 V	0 – 10 V, 1 – 10 V	Ratiometric 10 – 90% of [U_B]
Supply voltage [U_B], polarity protected	9 – 32 V DC	9 – 32 V DC	15 – 32 V DC	4.5 – 5.5 V DC
Supply – current consumption	–	≤ 5 mA	≤ 8 mA	≤ 5 mA at 5 V DC
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_L] (load connected to 0 V)	$R_L \leq (U_B - 9V) / 0.02$ A	$R_L \geq 10$ kΩ	$R_L \geq 15$ kΩ	$R_L \geq 10$ kΩ at 5 V DC

Table 3: Environmental conditions

Sensor operating temperature (1)		4 - 20 mA	-40 – 100 °C
		10 - 90% of Vs and abs. voltage	-40 – 125 °C
Media temperature range			-40 – 125 °C
Ambient temperature			-40 – 85 °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 grms , 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 Electrical connections

(1) Operating temperature is a result of influence from media temperature, ambient temperature and self-heating contribution from the internal electronics.

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Table 4: Explosive atmospheres

Zone 2 applications[1]	CE Ex II 3G Ex nA IIA T3 Gc -10°C < Ta < + 85 °C	EN60079-0; EN60079-15

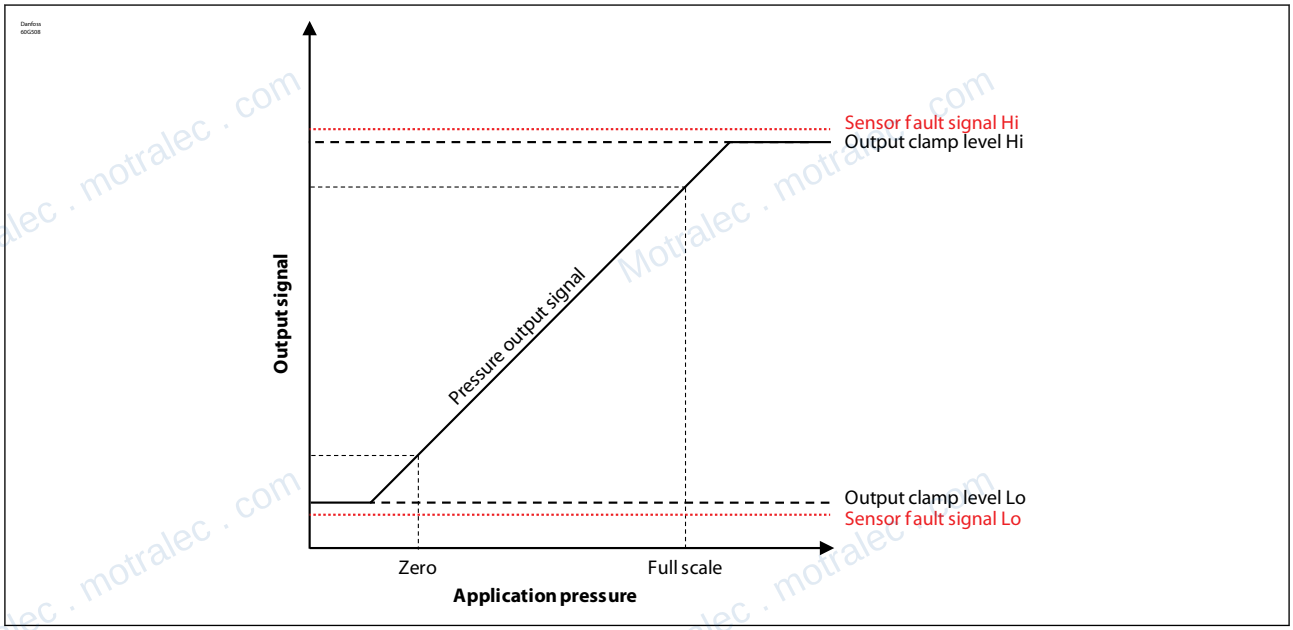
[1] When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact.

Table 5: Mechanical characteristics

Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	Glass filled polyamid, PA 6.6
	Pressure connections	EN 10088-1; 1.4404 (AISI 316 L)
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

Output and diagnostics

Figure 2: Self-diagnostic default levels (*programmable filtering available)



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.

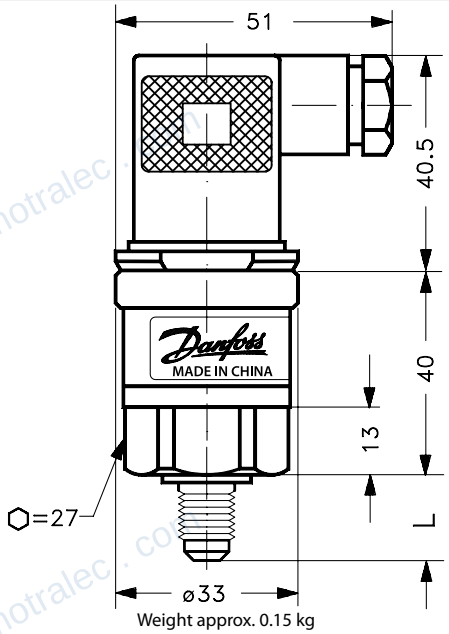
Table 6: Self-diagnostic default levels

Feature	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

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Dimensions

Table 7: Dimensions for DST P310



Weight approx. 0.15 kg

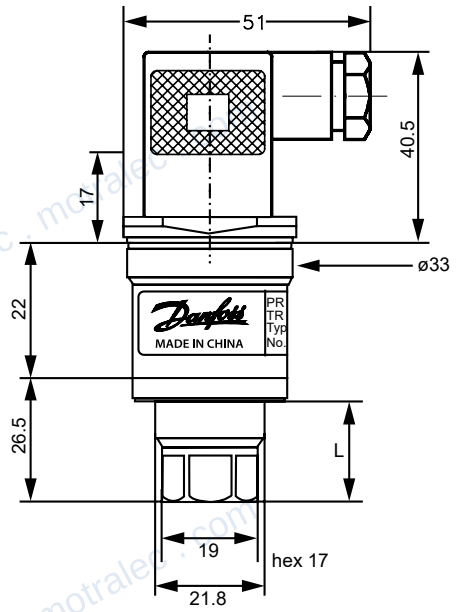
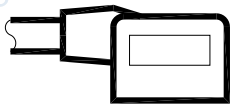
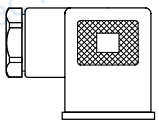


Table 8: Dimensions for pressure connection

Pressure connection	L [mm]
NPT	16
G ½ A ISO 228/1	21
¼ in. flare 7/16 - 20 UNF	16.5
⅜ solder	30
7/16 UNF flare female with valve deflator	21.5

Electrical connections

Table 9: Plug connections (EN 175301-803-A)

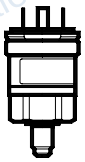
Cable (IP67)	Description	PG9 (IP65)	Description
	Black: + Blue: - / common Brown: Signal Yellow/Green: Ground		1: + 2: - / common 3: Signal  connected to transmitter enclosure

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Ordering

Table 10: Ordering (Ratio metric 10-90 % output)

	Type	Operating range [bar]	Permissible working pressure PB [bar]	Compensated temperature range °C +/- 1% Total Error Band	Code no.					Supply voltage [UB]	Output Signal
					1/4-18 NPT ANSI B1.20.1	G 3/8A EN837	7/16-20 UNF SAE J513 45° flare	3/8 solder	7/16-20 \ UNF, Female flare with depressor		
	DST P310	-1 – 12	33	-30 – 40	-	-	-	-	-	4.5 – 5.5 V DC	Ratiometric 10 – 90% of [UB]
		-1 – 12	33	-30 – 40	–	–	076G1016 (1)	–	-		
		-1 – 34	55	0 – 80	–	–	-	-	-		
		-1 – 34	55	0 – 80	–	–	076G1017 (1)	–	–		
		-1 – 59	100	-30 – 40	-	076G1014 (2)	–	076G1018 (2)	–		
		-1 – 99	150	-30 – 40	-	-	–	–	–		
		-1 – 159	250	0 – 80	-	076G1015 (2)	–	–	–		
	Connecting plug with 5 m cable (mounted on pressure transmitter obtains IP67)				060G1034				–		
	Plug Pg 9				060G0008				–		

(1) Incl. Plug Pg9
(2) incl. pulse snubber

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Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 11: Certificates, declarations and approvals

File name	Document type	Document topic	Approval Authority
E227388	Explosive - Safety Certificate	HazLoc Refrigeration	UL
E31024	Electrical - Safety Certificate		UL
064G9615	EU Declaration	ATEX/EMCD/RoHS	Danfoss
060R3160	Manufacturers Declaration	China RoHS	Danfoss
E494625	Electrical - Safety Certificate		UL

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