



# **DCT 531P**

# Industrial Pressure Transmitter with RS485 Modbus RTU

Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: ≤ ± 0.25 % FSO

#### **Nominal pressure**

from 0 ... 100 mbar up to 0 ... 40 bar

#### **Output signal**

RS485 with Modbus RTU protocol

#### **Special characteristics**

- hygienic version
- diaphragm with low surface roughness
- CIP / SIP-cleaning up to 150 °C
- ingress protection IP 67 / IP 69
- reset function

#### **Optional versions**

- different process connections
- cooling element for media temperatures up to 300 °C

The pressure transmitter DCT 531P was designed for use in the food / beverage and pharmaceutical industry. The compact design with hygienic version guarantees an outstanding performance in terms of accuracy, thermal behaviour and long term stability.

The integrated RS485 interface is characterized by a robust and reliable data transmission that works failure-free even over long distances.

Additionally, the modular construction concept of the device allows to combine different electrical and mechanical connections, so it is easy to adapt the pressure transmitter to different conditions on-site.

#### Preferred areas of use are



Food and beverage



Pharmaceutical industry

#### Material and test certificates

- Inspection certificate 3.1 according to EN 10204
- ► Test report 2.2 according to EN 10204











**Modbus**<sup>®</sup>

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Input pressure range 1									
Nominal pressure gauge	[bar]	-10	0.10	0.16	0.25	0.40	0.60	1	1.6
Nominal pressure absolute	[bar]	-	-	-	-	0.40	0.60	1	1.6
Overpressure	[bar]	5	0.5	1	1	2	5	5	10
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15
Nominal pressure gauge / absolute	[bar]	2.5	4	6	1	10	16	25	40
Overpressure	[bar]	10	20	40	4	10	80	80	105
Burst pressure ≥	[bar]	15	25	50		50	120	120	210
Vacuum resistance		$p_N > 1$ bar: unlimited vacuum resistance $p_N \le 1$ bar: on request							
<sup>1</sup> consider the pressure resistance	of fitting a	nd clamps							

consider the pressure resistance of fitting	g and clamps				
Output signal / Supply					
Standard	RS485 with Modbus RTU protocol / $V_S = 9 \dots 32 V_{DC}$				
Performance					
Accuracy <sup>2</sup>	≤ ± 0.25 % FSO				
Long term stability	≤ ± 0.1 % FSO / year at reference conditions				
Measuring rate	500 Hz				
Delay time	500 msec				
	point adjustment (non-linearity, hysteresis, repeatability)				
Thermal effects (offset and span)					
Tolerance band	≤ ± 0.75 % FSO				
in compensated range <sup>4</sup>	-20 85 °C				
<ul> <li><sup>3</sup> an optional cooling element can influence</li> <li><sup>4</sup> the minimum compensation temperature</li> </ul>	e thermal effects for offset and span depending on installation depends on the filling fluid used	on position and filling conditions			
Permissible temperatures					
Filling fluid	silicone oil	food compatible oil			
Medium <sup>5</sup>	-40 125 °C -10 125 °C				
Medium with cooling element <sup>6</sup>	overpressure: -40 300 °C vacuum: -40 150 °C <sup>7</sup>	overpressure: -10 250 °C vacuum: -10 150 °C 7			
Electronics / environment	-40 85 °C				
Storage	-40 100 °C				
	ninal pressure gauge > 0 bar: 150 °C for 60 minutes with a n sealing material, type of seal and installation	nax. environmental temperature of 50 °C			
Electrical protection					
Short-circuit protection	permanent				
Reverse polarity protection	on supply connection no damage, but also no function				
Electromagnetic compatibility	emission and immunity according to EN 61326				
Mechanical stability					
Vibration	according to DIN EN 60068-2-6 G 1/2":	20 g RMS (252000 Hz)			

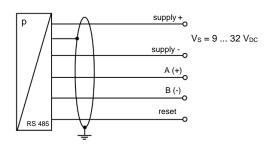
Electrical protection						
Short-circuit protection	permanent					
Reverse polarity protection	on supply connection no damage, b	on supply connection no damage, but also no function				
Electromagnetic compatibility	emission and immunity according to	emission and immunity according to EN 61326				
Mechanical stability						
Vibration	according to DIN EN 60068-2-6	G 1/2":	20 g RMS (252000 Hz)			
		others:	10 g RMS (252000 Hz)			
Shock	according to DIN EN 60068-2-27	G 1/2":	500 g / 1 msec			
		others:	100 g / 1 msec			
Filling fluids						
Standard silicone oil						
Option	food compatible oil according to 21CFR178.3570					
	(Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)					
	others on request					

## Industrial Pressure Transmitter with RS485 Modbus RTU

Materials					
Housing / electrical connection	stainless steel 1.4404 (316 L)				
Pressure port	stainless steel 1.4435 (316 L)				
Diaphragm	stainless steel 1.4435 (316 L)				
Seal	standard: FKM (recommended for medium temperatures ≤ 200 °C)				
	option: FFKM (recommended for medium temperatures < 260 °C)				
	Clamp, Varivent®: without				
	others on request				
Media wetted parts	pressure port, seal, diaphragm				
Miscellaneous					
EHEDG certificate	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for				
Type EL Class I	- Clamp (C61, C62): T-ring-seal from Combifit International B.V.				
	- Varivent® (P41): EPDM-O-ring which is FDA-listed				
Weight	approx. 200 g				
Current consumption	max. 10 mA				
Surface roughness	pressure port R <sub>a</sub> < 0.8 µm (media wetted parts)				
	diaphragm $R_a < 0.15 \mu m$				
	weld seam R <sub>a</sub> < 0.8 μm				
Operational life	100 million load cycles				
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position for $p_N \le 2$ bar have to be specified in the order)				
CE-conformity	EMC Directive: 2014/30/EU				

### Wiring diagram

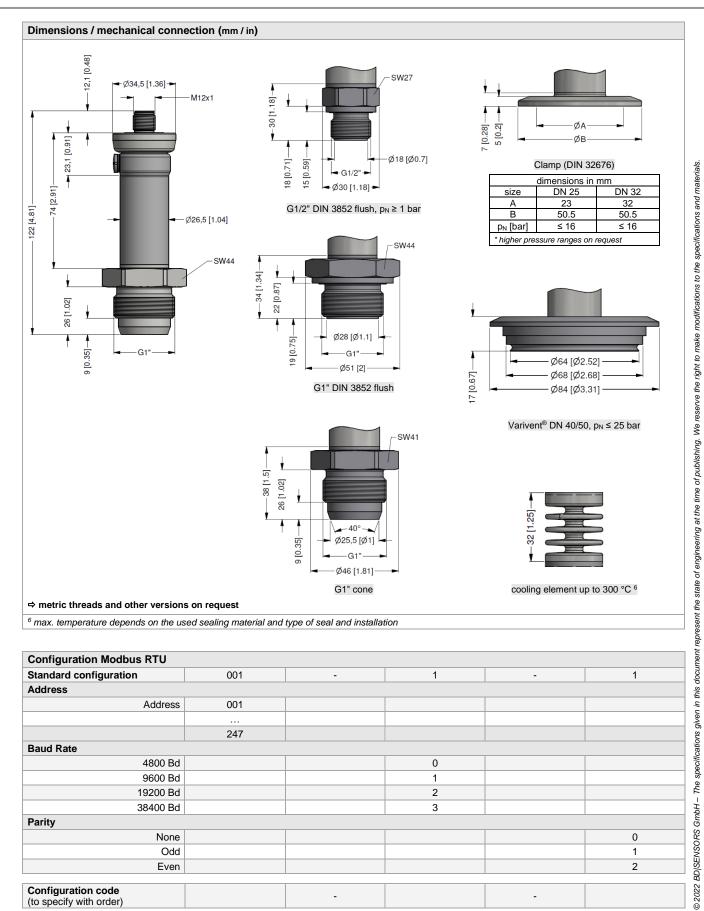
RS 485 / Modbus RTU



Pin configuration	/ electrical	connection
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Electrical connection	M12x1 / metal (5-pin), IP 67
Supply +	1
Supply + Supply - A (+)	3
A (+)	2
B (–)	4
Reset	5
Shield	plug housing





Configuration Modbus RTU						
Standard configuration	001	-	1	-	1	
Address						
Address	001					
	•••					
	247					
Baud Rate						
4800 Bd			0			
9600 Bd			1			
19200 Bd			2			
38400 Bd			3			
Parity						
None					0	
Odd					1	
Even					2	
	·					
Configuration code (to specify with order)		-		-		

DCT531P\_E\_040422 pressure measurement

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#### Ordering code DCT 531P **DCT 531P** Pressure 5 0 1 5 0 2 absolute gauge Input 0.10 0 0 0 1 6 0 0 2 5 0 0 4 0 0 0 0.16 0.25 0.40 6 0 0 0 1 0 0 1 0.60 1.0 1.6 6 0 1 2.5 2 5 0 1 4.0 4 0 0 6.0 6 0 0 1 0 0 2 1 6 0 2 2 5 0 2 4 0 0 2 X 1 0 2 9 9 9 9 10 16 25 40 -1 ... 0 customer consult RS485 Modbus RTU L 5 Accuracy 0.25 % FSO 2 9 customer consult Electrical connection male plug M12x1 (5-pin) / metal N 1 1 9 9 9 Mechanical connection G1/2" DIN 3852 flush (p<sub>N</sub> ≥ 1 bar) G1" DIN 3852 flush G 1" cone consult Z 0 0 Z S 1 K S 1 C 6 1 C 6 2 P 4 1 9 9 9 G 1" cone Clamp DN 25 DIN 32676 (p<sub>N</sub> ≤ 16 bar) Clamp DN 32 DIN 32676 (p<sub>N</sub> ≤ 16 bar) Varivent<sup>®</sup> DN 40/50 (p<sub>N</sub> ≤ 25 bar) customer consult Diaphragm stainless steel 1.4435 (316L) 1 customer consult Seal for clamp, Varivent<sup>®</sup>: without 0 for inch thread - standard: for inch thread - option: **FFKM** customer 9 consult Filling fluid silicone oil food compatible oil (FDA) customer consult Special version 0 3 P 2 3 P 9 9 9 standard with cooling element up to 300°C consult customer

the right to make modifications to the specifications and materials

reserve

We

<sup>&</sup>lt;sup>1</sup> absolute pressure possible from 0.4 bar Varivent<sup>®</sup> is a brand name of GEA Tuchenhagen GmbH