

DCT 531P



Industrial Pressure Transmitter with RS485 Modbus RTU

Process Connections with Flush Welded
Stainless Steel Diaphragm

accuracy according to IEC 60770:
 $\leq \pm 0.25 \% \text{ FSO}$

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®

DCT 531P

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Technical Data

Input pressure range ¹									
Nominal pressure gauge	[bar]	-1...0	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	10	16	25	40	
Overpressure	[bar]	10	20	40	40	80	80	105	
Burst pressure ≥	[bar]	15	25	50	50	120	120	210	
Vacuum resistance		p _N > 1 bar: unlimited vacuum resistance p _N ≤ 1 bar: on request							

¹ consider the pressure resistance of fitting and clamps

Output signal / Supply	
Standard	RS485 with Modbus RTU protocol / V _S = 9 ... 32 V _{DC}
Performance	
Accuracy ²	≤ ± 0.25 % FSO
Long term stability	≤ ± 0.1 % FSO / year at reference conditions
Measuring rate	500 Hz
Delay time	500 msec
² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)	
Thermal effects (offset and span) ³	
Tolerance band	≤ ± 0.75 % FSO
in compensated range ⁴	-20 ... 85 °C
³ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions	
⁴ the minimum compensation temperature depends on the filling fluid used	

Permissible temperatures		
Filling fluid	silicone oil	food compatible oil
Medium ⁵	-40 ... 125 °C	-10 ... 125 °C
Medium with cooling element ⁶	overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ⁷	overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ⁷
Electronics / environment	-40 ... 85 °C	
Storage	-40 ... 100 °C	
⁵ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C		
⁶ max. temperature depends on the used sealing material, type of seal and installation		
⁷ also for p _{abs} ≤ 1 bar		

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 (25...2000 Hz) others: 10 g RMS (25...2000 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

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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 Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - 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 $R_a < 0.8 \mu\text{m}$ (media wetted parts) diaphragm $R_a < 0.15 \mu\text{m}$ weld seam $R_a < 0.8 \mu\text{m}$	
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 $p_N \leq 2$ 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		
Electrical connection	M12x1 / metal (5-pin), IP 67	
Supply +	1	
Supply -	3	
A (+)	2	
B (-)	4	
Reset	5	
Shield	plug housing	

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Dimensions / mechanical connection (mm / in)

G1/2" DIN 3852 flush, p_N ≥ 1 bar

G1" DIN 3852 flush

G1" cone

Clamp (DIN 32676)

dimensions in mm		
size	DN 25	DN 32
A	23	32
B	50.5	50.5
p _N [bar]	≤ 16	≤ 16

* higher pressure ranges on request

Varivent® DN 40/50, p_N ≤ 25 bar

cooling element up to 300 °C⁶

⇒ metric threads and other versions on request

⁶ max. temperature depends on the used sealing material and type of seal and installation

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)		-		-	

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pressure measurement

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Ordering code DCT 531P

DCT 531P



Pressure										
	absolute	5	0	1						
	gauge	5	0	2						
Input										
	[bar]									
	0.10	¹			1	0	0	0		
	0.16	¹			1	6	0	0		
	0.25	¹			2	5	0	0		
	0.40				4	0	0	0		
	0.60				6	0	0	0		
	1.0				1	0	0	1		
	1.6				1	6	0	1		
	2.5				2	5	0	1		
	4.0				4	0	0	1		
	6.0				6	0	0	1		
	10				1	0	0	2		
	16				1	6	0	2		
	25				2	5	0	2		
	40				4	0	0	2		
	-1 ... 0				X	1	0	2		
	customer				9	9	9	9		consult
Output										
	RS485 Modbus RTU					L	5			
Accuracy										
	0.25 % FSO							2		
	customer							9		consult
Electrical connection										
	male plug M12x1 (5-pin) / metal							N	1	1
	customer							9	9	9
Mechanical connection										
	G1/2" DIN 3852 flush (p _N ≥ 1 bar)							Z	0	0
	G1" DIN 3852 flush							Z	S	1
	G 1" cone							K	S	1
	Clamp DN 25 DIN 32676 (p _N ≤ 16 bar)							C	6	1
	Clamp DN 32 DIN 32676 (p _N ≤ 16 bar)							C	6	2
	Varivent® DN 40/50 (p _N ≤ 25 bar)							P	4	1
	customer							9	9	9
Diaphragm										
	stainless steel 1.4435 (316L)								1	
	customer								9	consult
Seal										
	for clamp, Varivent®:								0	
	for inch thread - standard:								1	
	for inch thread - option:								7	
	customer								9	consult
Filling fluid										
	silicone oil								1	
	food compatible oil (FDA)								2	
	customer								9	consult
Special version										
	standard								0	3
	with cooling element up to 300°C								2	3
	customer								9	9
										consult

¹ absolute pressure possible from 0.4 bar

Varivent® is a brand name of GEA Tuchenhagen GmbH