SCHNEIDER
MESSTECHNIK

IDCT 531P

Industrial Pressure Transmitter with RS485 Modbus RTU

Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:
standard: ≤ ± 0.25 % FSO
option: ≤ ± 0.1 % 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 IDCT 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

CE RoHS REACH EHEDG 3A Modbus®

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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

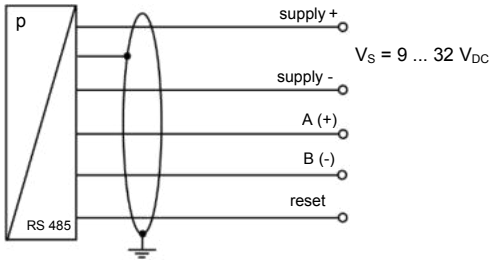
Nominal pressure gauge / absolute	[bar]	2.5	4	6	10	16	25	40
Overpressure	[bar]	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	15	25	50	50	120	120	210
Vacuum resistance		p_N > 1 bar: unlimited vacuum resistance p_N ≤ 1 bar: on request						

[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]	standard ≤ ± 0.25 % FSO option ≤ ± 0.10 % 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]			
Nominal pressure p_N [bar]	-1 … 0	< 0.40	≥ 0.40
Tolerance band [% FSO]	≤ ± 0.75	≤ ± 1.5	≤ ± 0.75
In compensated range [4] [°C]	-20 ... 85	0 ... 50	-20 … 85
[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		

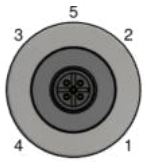
Materials	
Housing / electrical connection	stainless steel 1.4404 (316 L)
Pressure port	stainless steel 1.4435 (316 L)
Diaphragm	stainless steel 1.4435 (316 L)
Seal	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) Clamp, Varivent®: 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 µm (media wetted parts) diaphragm R_a < 0.15 µm weld seam R_a < 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 ≤ 2 bar have to be specified in the order)
CE-conformity	EMC Directive: 2014/30/EU
Wiring diagram	

RS 485 / Modbus RTU

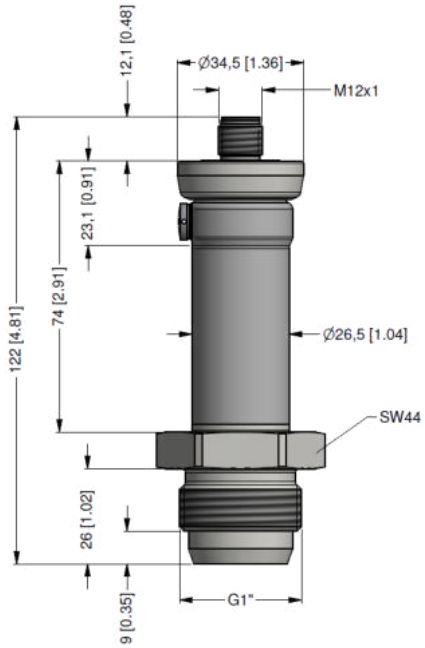


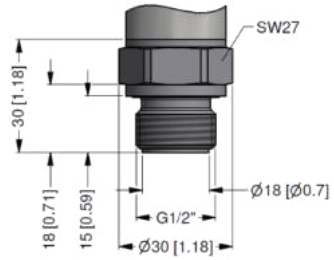
Pin configuration / electrical connection

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

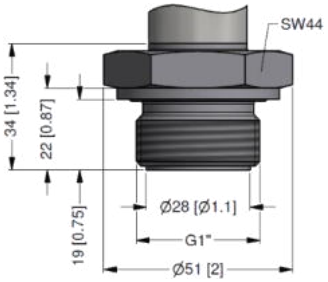


Dimensions / mechanical connection (mm / in)

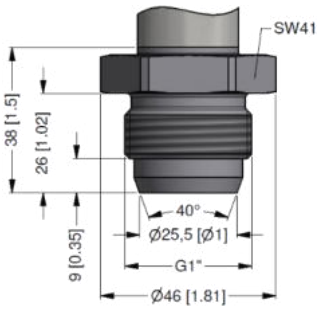




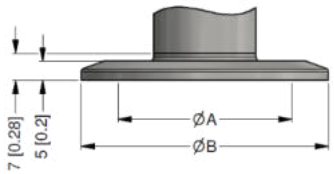
G1/2" DIN 3852 flush, $p_N \geq 1$ bar



G1" DIN 3852 flush



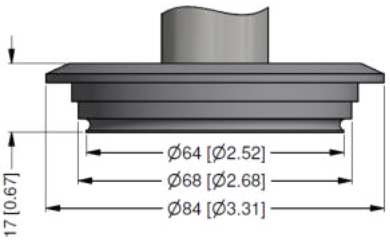
G1" cone



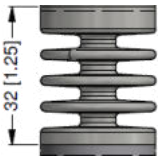
Clamp (DIN 32676)

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



cooling element up to 300 °C [6]

⇨ 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)		-		-	

Ordering code IDCT 531P

IDCT 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																													
Standard:	0.25 % FSO										2																		
Option:	0.10 % FSO										1																		
customer											9																		consult
Electrical connection																													
male plug M12x1 (5-pin) / metal												N	1	1															
customer												9	9	9															consult
Mechanical connection																													
G1/2" DIN 3852 flush ($p_N \geq 1$ bar)															Z	0	0												
G1" DIN 3852 flush															Z	S	1												
G 1" cone															K	S	1												
Clamp DN 25 DIN 32676 ($p_N \leq 16$ bar)															C	6	1												
Clamp DN 32 DIN 32676 ($p_N \leq 16$ bar)															C	6	2												
Varivent® DN 40/50															P	4	1												
customer															9	9	9												consult
Diaphragm																													
stainless steel 1.4435 (316L)																		1											
customer																		9											consult
Seal																													
for clamp, Varivent®:	without																		0										
for inch thread - standard:	FKM																		1										
for inch thread - option:	FFKM																		7										
customer																			9										consult
Filling fluid																													
silicone oil																				1									
food compatible oil (FDA)																				2									
customer																				9									consult
Special version																													
standard																											0	3	P
with cooling element up to 300°C																											2	3	P
customer																											9	9	9	consult

[1] absolute pressure possible from 0.4 bar

Varivent® is a brand name of GEA Tuchenhagen GmbH

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