



Nominal pressure

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

Contacts

1, 2 or 4 independent PNP contacts,
freely configurable

Analogue output

2-wire: 4 ... 20 mA
3-wire: 4 ... 20 mA / 0 ... 10 V
others on request

Special characteristics

- ▶ indication of measured values on a 4-digit LED display
- ▶ rotatable and configurable display module
- ▶ configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)

Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases
- ▶ customer specific versions

DS 200P

Electronic Pressure Switch

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO

The electronic pressure switch **DS 200P** is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and is suitable for the usage with viscous and pasty media.

As standard the **DS 200P** offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e. g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

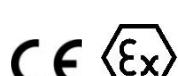
Preferred areas of use are



Food industry



Pharmacy



Input pressure range ¹																
Nominal pressure gauge	[bar]	-1 ... 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		$p_N \geq 1$ bar: unlimited vacuum resistance										$p_N < 1$ bar: on request				

¹ consider the pressure resistance of fitting and clamps

Contact ²														
Standard	1 PNP contact													
Options	2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 8-pin for 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request)													
Max. switching current	4 ... 20 mA / 2- and 3-wire: 0 ... 10 V / 3-wire: contact rating 125 mA, short-circuit resistant; $V_{Switch} = V_S - 2$ V contact rating 125 mA, short-circuit resistant													
Accuracy of contacts ³	standard: $p_N < 0.4$ bar: $\leq \pm 0.5\%$ FSO option: $p_N \geq 0.4$ bar: $\leq \pm 0.25\%$ FSO													
Repeatability	$\leq \pm 0.1\%$ FSO													
Switching frequency	max. 10 Hz													
Switching cycles	> 100 x 10 ⁶													
Delay time	0 ... 100 sec													

² max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with IS-protection
no contact possible with 3-wire in combination with plug ISO 4400³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Analogue output (optionally) / Supply														
2-wire current signal	4 ... 20 mA / $V_S = 13 \dots 36$ V _{DC} permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$													
2-wire current signal with IS-protection	4 ... 20 mA / $V_S = 15 \dots 28$ V _{DC} permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$													
3-wire current signal	4 ... 20 mA / $V_S = 19 \dots 30$ V _{DC} adjustable (turn-down of span 1:5) ⁴ permissible load: $R_{max} = 500 \Omega$													
3-wire voltage signal	0 ... 10 V / $V_S = 15 \dots 36$ V _{DC} permissible load: $R_{min} = 10$ kΩ													
Without analogue output	$V_S = 15 \dots 36$ V _{DC}													
Accuracy ³	standard: $p_N < 0.4$ bar: $\leq \pm 0.5\%$ FSO option: $p_N \geq 0.4$ bar: $\leq \pm 0.25\%$ FSO													

⁴ with turn-down of span the analogue signal is adjusted automatically to the new measuring range

Thermal errors (offset and span) ⁵														
Nominal pressure p_N	[bar]	-1 ... 0	< 0.40			≥ 0.40								
Tolerance band	[% FSO]	$\leq \pm 0.75$	$\leq \pm 1.5$			$\leq \pm 0.75$								
in compensated range	[°C]	-20 ... 85	0 ... 50			-20 ... 85								

⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

Permissible temperatures														
Filling fluid	silicone oil													
Medium ⁶	-40 ... 125 °C													
Medium with cooling element ⁷	overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ⁸													
Electronics / environment	-40 ... 85 °C													
Storage	-40 ... 100 °C													

⁶ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C⁷ max. temperature depends on the used sealing material, type of seal and installation⁸ also for $p_{abs} \leq 1$ bar

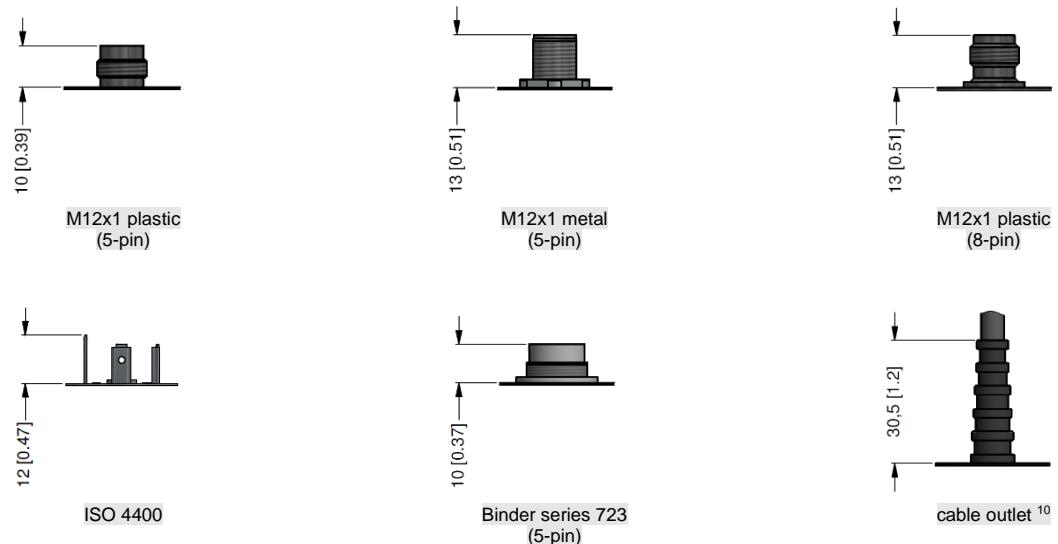
Electrical protection														
Short-circuit protection	permanent													
Reverse polarity protection	no damage, but also no function													
Electromagnetic compatibility	emission and immunity according to EN 61326													

Mechanical stability														
Vibration	5 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6													
Shock	100 g / 11 msec according to DIN EN 60068-2-27													

Filling fluids														
Standard	silicone oil													
Options	food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)													

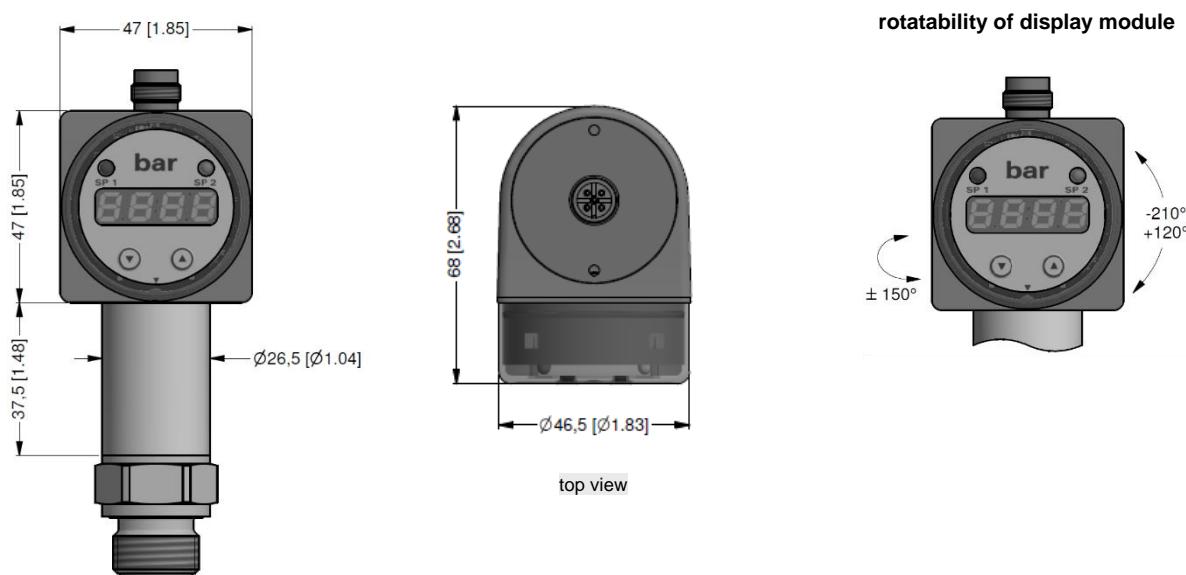
Materials						
Pressure port	inch thread: G1" cone, Clamp, dairy pipe, Varivent®:	stainless steel 1.4404 (316 L) stainless steel 1.4435 (316 L)				
Housing		stainless steel 1.4404 (316 L)				
Display housing		PA 6.6, Polycarbonate				
Seals (media wetted)	standard: FKM option: FFKM	(recommended for medium temperatures ≤ 200 °C) (recommended for medium temperatures < 260 °C)	others on request			
Clamp, dairy pipe, Varivent®: without						
Diaphragm	standard: stainless steel 1.4435 (316 L)	option: Hastelloy® C-276 (2.4819); Tantalum on request				
Media wetted parts	pressure port, seals, diaphragm					
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX14-DS 200P	IBExU06ATEX1050 X	zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)				
Safety technical maximum values	$U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C \approx 0$ nF, $L_i \approx 0$ μ H					
Max. switching current ⁹	70 mA					
Permissible temperatures for environment	-25 ... 70 °C					
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μ H/m					
⁹ the real switching current in the application depends on the power supply unit						
Miscellaneous						
EHEDG certificate	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for					
Type EL Class I	<ul style="list-style-type: none"> - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent® (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH 					
Display	4-digit, red 7-segment-LED display; digit height 7 mm; range of indication -1999 ... +9999; accuracy 0.1 % \pm 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)					
Current consumption (without contacts)	2-wire signal output current: max. 25 mA	3-wire signal output voltage: approx. 45 mA				
Ingress protection	IP 65					
Installation position	any (standard calibration in a vertical position with the pressure port connection down; different installation position for $p_N \leq 2$ bar have to be specified in the order)					
Surface roughness	pressure port $R_a < 0.8$ μ m (media wetted parts)	weld seam $R_a < 0.8$ μ m				
diaphragm $R_a < 0.15$ μ m						
Weight	approx. 160 ... 250 g					
Operational life	100 million load cycles					
CE-conformity	EMC Directive: 2014/30/EU					
ATEX Directive	2014/34/EU					
Wiring diagrams						
<p>2-wire-system (current)</p>			<p>3-wire-system (current/voltage)</p>			
Pin configuration						
Electrical connection	M12x1 plastic (5-pin) 	M12x1 metal (5-pin) 	M12x1 plastic (8-pin) 	ISO 4400 	Binder series 723 (5-pin) 	cable colours (IEC 60757)
Supply +	1	1	1	1	1	WH (white)
Supply -	3	3	3	2	3	BN (brown)
Signal + (only 3-wire)	2	2	2	3	2	GN (green)
Contact 1	4	4	4	3	4	GY (grey)
Contact 2	5	5	5	-	5	PK (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	GNYE (green-yellow)

Electrical connections (dimensions mm / in)

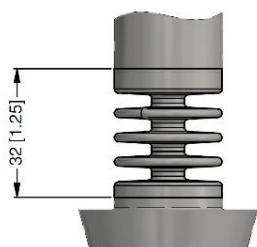


¹⁰ different cable types and lengths available, permissible temperature depends on kind of cable;
standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

Dimensions (mm / in)



Cooling element up to 300 °C ⁷ (optionally)



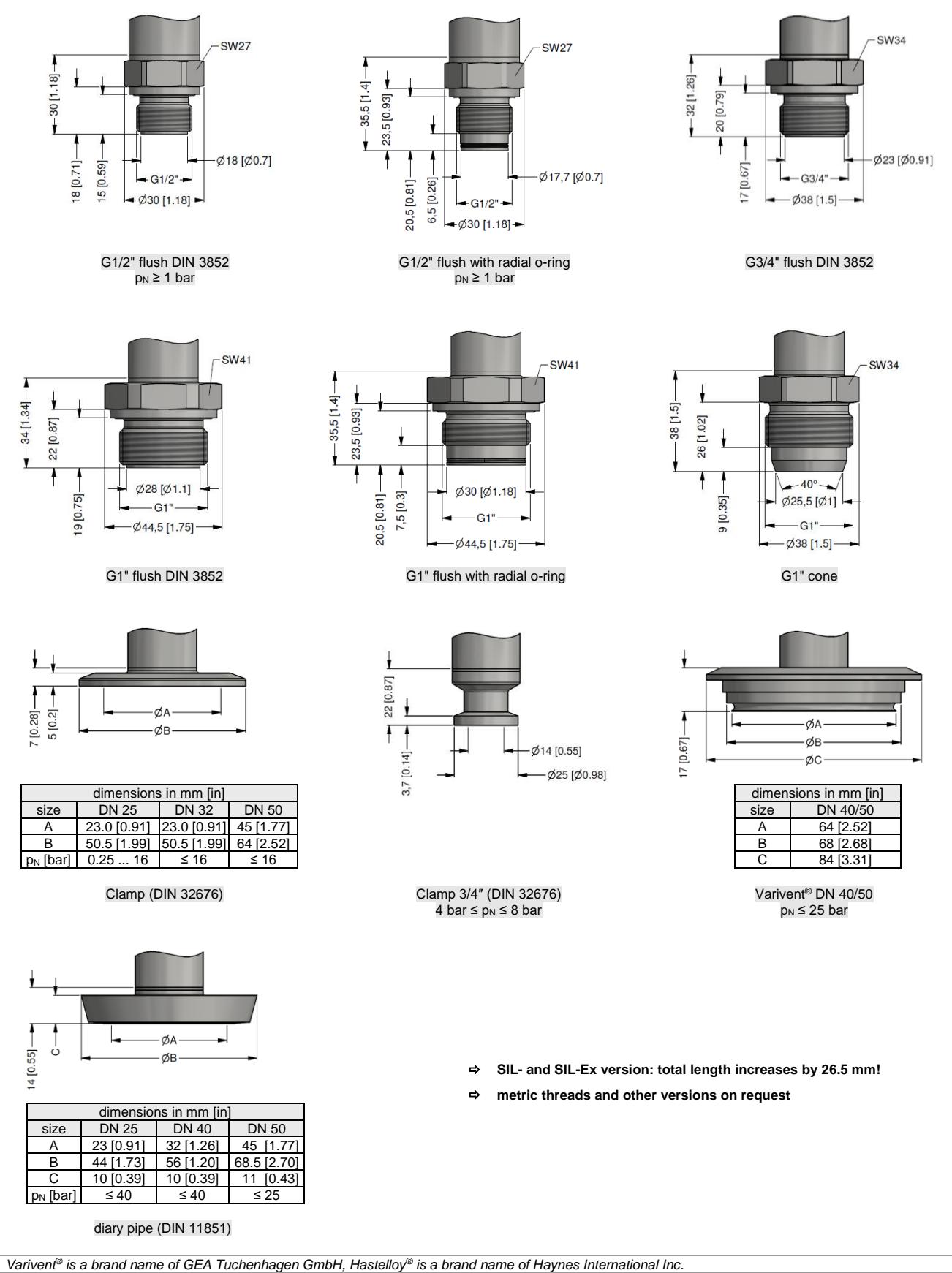
⁷ max. temperature depends on the used sealing material, type of seal and installation

DS 200P

Electronic Pressure Switch

Technical Data

Mechanical connection (dimensions mm / in)



Ordering code **DS 200P**

DS 200P													
Pressure													
gauge absolute		7	8	5									
Input		7	8	6									
[bar]													
0.10		1	0	0	0								
0.16		1	6	0	0								
0.25		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
Analogue output													
without					0								
4 ... 20 mA / 2-wire					1								
0 ... 10 V / 3-wire					3								
4 ... 20 mA / 3-wire, adjustable					7								
intrinsic safety 4 ... 20 mA / 2-wire ¹					E								
customer					9								consult
Contact													
1 contact ^{1,2}					1								
2 contacts ^{1,2}					2								
4 contacts ³					4								consult
Accuracy													
standard for $p_N > 0.4$ bar:					0.35 % FSO								
standard for $p_N \leq 0.4$ bar:					0.50 % FSO								
option for $p_N \geq 0.4$ bar:					0.25 % FSO								
customer					9								consult
Electrical connection													
male plug M12x1 (5-pin) / plastic					N	0	1						
male plug M12x1 (8-pin) / plastic ³					M	5	0						
male plug M12x1 (5-pin) / metal					N	1	1						
male and female plug ISO 4400 ²					1	0	0						
male plug Binder series 723 (5-pin)					2	0	4						
cable outlet with PVC cable ⁴					T	A	0						
customer					9	9	9						consult
Mechanical connection													
G1/2" with flush welded diaphragm (DIN 3852) for $p_n \geq 1$ bar					Z	0	0						
G3/4" with flush welded diaphragm (DIN 3852)					Z	S	0						
G1" with flush welded diaphragm (DIN 3852)					Z	S	1						
G1" DIN 3852 with rad. o-ring and flush diaphragm					Z	S	7						
G1/2" DIN 3852 with rad. o-ring and flush diaphragm (for $p_n \geq 1$ bar)					Z	6	1						
G 1" cone					K	S	1						
Clamp DN 25 / 1" (DIN 32676) / 3A ⁵					C	6	1						
Clamp DN 32 / 1 1/2" (DIN 32676) / 3A ⁵					C	6	2						
Clamp DN 50 / 2" (DIN 32676) / 3A ⁵					C	6	3						
Clamp 3/4" (DIN 32676) / 3A ⁵					C	6	9						
dairy pipe DN 25 (DIN 11851) ⁶					M	7	3						
dairy pipe DN 40 (DIN 11851) ⁶					M	7	5						
dairy pipe DN 50 (DIN 11851) ^{5,6}					M	7	6						
Varivent® DN 40/50 / 3A ⁵					P	4	1						
customer					9	9	9						consult
Diaphragm													
stainless steel 1.4435 (316L)							1						
tantalum							T						consult
Hastelloy® C-276 (2.4819)							H						consult
customer							9						consult
Seals													
for Clamp, dairy pipe, Varivent®:							0						
without													
for inch thread:							1						
FKM													
FFKM							7						
customer							9						consult
Filling fluids													
silicone oil							1						
food compatible oil (FDA) / 3A							2						
customer							9						consult
Special version													
standard								0	0	0			
with cooling element up to 300°C / 3A								2	0	0			
customer								9	9	9			consult

Varivent® is a brand name of GEA Tuchenhausen GmbH. Hastelloy® is a brand name of Haynes International Inc.

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