



**Features**

- Case, measuring system and wetted parts of stainless steel
- Case NS 100/160, degree of protection IP 66
- Stem diameter 6, 8 and ≥ 10 mm
- Short immersion lengths of the stem may be used
- Accuracy class 1 or 2 per DIN 16196, depending on range
- Micro adjustment pointer for indication correction
- Switch functions (electrical contact device) per DIN 16196:
  - slow acting contact
  - magnetic snap contact
  - inductive contact devices

**Options**

- Case with liquid filling
- Explosion protection
- Classification per SIL 2
- Material certificate per DIN EN 10204
- Connection to Zone 0 with thermowells upon request

**Application area**

- Chemical and petrochemical industry
- Machinery construction
- Shipping

**Technical Data**

**Case**

high quality bayonet ring case NS 100/160 material: st. steel mat.-no. 1.4301 (304)

**Degree of protection** (EN 60529)  
IP 66

**Measuring element**

bourdon tube dead zone free with inert gas filling

**Capillary**

stainless steel material no. 1.4571 (316Ti) resp. 1.4404 (316L) in different lengths with buckling protection, coated with protective tube upon request, alternatively with sliding screwing

**Temperature detecting element**

stainless steel material no. 1.4404 (316L), diameter 6, 8 and ≥ 10 mm, can be supplied in standard lengths. Active lengths depend on temperature detecting element diameter, see order details, other values upon request

**Case filling**

liquid filling Labofin

**Process connection**

rigid temperature detecting element, connected via capillary radially protruding at bottom resp. at rear. Different connections can be supplied, see order details

**Movement**

stainless steel with compensation

**Scale**

pure aluminium, white with black inscription. Option: with marking

**Pointer**

pure aluminium, black with micro adjusting device for zero-point correction

**Window**

non splintering laminated glass. Option: non splintering plastic (Macrolon) with contact lock

**Case seal**

sealing ring: Perbunan  
filling plug: Desmopan

**Nominal ranges**

per EN 13190, max. -100...700 °C, measuring spans ≥ 60 °C

**Accuracy class**

data per DIN 16196 (depending on range) for all temperature detecting elements with diameter d5 and standard immersion length l1

no- minal size	switch function	type of contact	
		inductive	touch contact
100	1 times	class 1	≤ class 2
	2 times	class 1	≤ class 2
160	1 times	class 2	class 2
	2 times	class 2	-

**Ambient temperature**

per EN 13190  
ambient temperatures that deviate from EN are to be specified

**For measuring devices with inductive contact type SJ2-S1N (NS 100, double contact): For safe operation refer to TA\_044!**

**Storage and transport temperature**

per EN 13190, max. -20...+60 °C

**Electrical connection**

connection plug with cable gland M 20 x 1.5 and removable test cover, mat. Macrolon

**Switch function**

Touch contacts or inductive contact devices see order code. Further technical details see operating instructions BA\_066 and TA\_039.

**Application**

These thermometers are suitable for use outdoors and in aggressive environments. The devices can also be supplied with additional liquid damping for use in extreme conditions. Further information on mounting see operating instructions BA\_066. See data sheets T5-... for suitable thermowells per DIN 43772.

**Explosion protection**

magnetic snap contact

Simple electrical apparatus per IEC/DIN EN 60079-11 suitable for intrinsically safe circuits Ex IIC TX.

inductive contact

contact device suitable for intrinsically safe circuits

Ex II 2G Ex ia IIC T4/T5/T6 Gb  
Reg.-no.: PTB 99 ATEX 2219X  
PTB 00 ATEX 2049X

Further details see operating instructions BA\_066.

**Functional safety**

EN 61508, classification per SIL 2 for gauges with inductive contact device only.

**Mounting**

stand-alone mounting with wall bracket ; alternatively with flange for surface mounting or for flush mounting with DIN mounting flange

**Weights**

NS 100, without filling: approx. 1.1 kg  
NS 100, with filling: approx. 2.0 kg  
NS 160, without filling: approx. 2.0 kg  
NS 160, with filling: approx. 4.3 kg

**Instructions for use**

the loading capacity of the temperature detecting element depends on the following parameters:

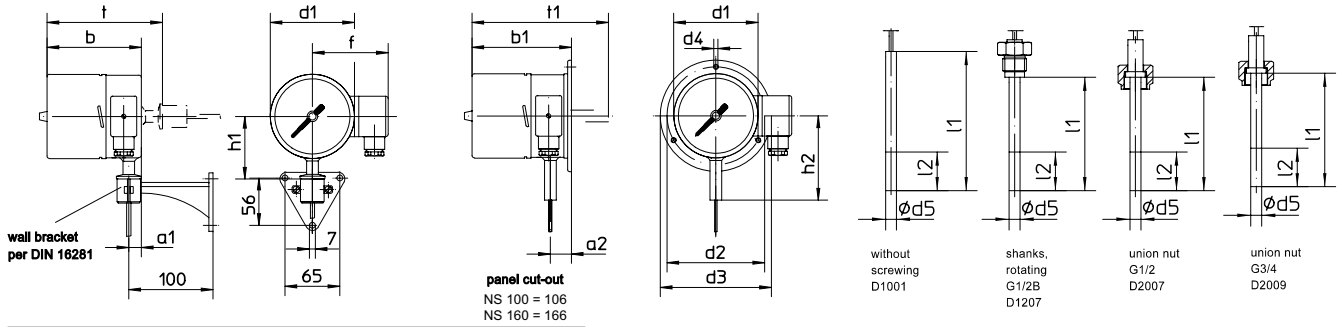
1. measured medium
2. measured medium pressure
3. measured medium temperature
4. flow velocity
5. immersion length
6. material

A technical test is necessary where required.

**Dimensions**

normal design

for surface mounting



dimensions (mm)												
case	d1	a1	b	h1	l	a2	b1	h2	l1	d2	d3	d4
NS 100	100	15	112	78	140	21	118	103	165	116	132	4.8
NS 160	160	15	112	108	140	21	118	133	165	178	196	5.8

**Order Details**

- please give additional specifications for models not listed -

Gas expansion thermometer with switch function and capillary												
case design IP 66	capillary bottom	· NS 100		FU243 .								
		· NS 160		FU343 .								
		with liquid filling		FU263 .								
	capillary at back	· NS 100		FU233 .								
		· NS 160		FU333 .								
		with liquid filling		FU253 .								
design	· standard		0									
	· ex-protection		1									
nominal ranges	· per table		A2 ...									
process connection	· without screwing		· OV		D1001							
	· shanks rotating		· G 1/2 B		D1207							
	· union nut		· G 1/2		D2007							
			· G 3/4		D2009							
temperature detecting element Ø d5	· 6 mm (l2 ≥ 180 mm)³		F6 ...									
	· 8 mm (l2 ≥ 80 mm)³		F8 ...									
	· 10 mm (l2 ≥ 50 mm)³		F10 ...									
immersion length l1 (mm)⁴	D 1001	D 1207	D 2007	D 2009								
	without screwing	shanks rotating G 1/2 B	union nut G 1/2	union nut G 3/4								
	100	080	089	093								
	160	140	126	130								
	250	230	186	190								
	400	380	276	280								
	--	--	426	430								
	deviating length: pls specify		999									
mounting	· with wall bracket, aluminium		G4									
	· prepared for wall bracket		G1									
	· for surface mounting		G2									
	· für flush mounting		G3									
	· with wall bracket, st. steel		G5									
capillary	· st. steel, length acc. to specification per m		K39									
	· st. steel with protective tube, length acc. to specification		K49									
contact	touch contact											
	· slow acting contact		L2 ...									
	· magnetic snap contact		L4 ...									
	· slow acting contact, separated circuits		M2 ...									
	· magnetic snap contact, separated circuits		M4 ...									
	inductive contact											
	· standard initiator		N4 ...									
	· safety initiator SJ2 - SN / SJ3.5 - SN		N1 ...									
· safety initiator invers SJ2 - S1N / SJ 3.5 - S1N²		N2 ...										
· with integrated switching amplifier¹		N6 ...										
switch function	· single contact (1st figure per table)		.00									
	· double contact (1st + 2nd figure per table)⁶		.0									
additional features (to be indicated in case of need, only):												
window	· macrolon		R11									
marking	· on scale (pls. specify)		T2									
sliding screwing on capillary⁵	· G 1/2 B		V10									
	· G 3/4 B		V11									
	· 1/2" NPT		V20									
functional safety per EN 61508, classification per SIL 2												W2605
Order code (example):												
FU2430 A2540 D1207 F8100 G1 K39 N4200												

standard measuring and nominal ranges °C per EN 13190		
nominal range °C	meas. range °C	order code
-20...+40	-10...+30	340
-20...+60	-10...+50	346
-30...+50	-20...+40	322
-40...+40	-30...+30	220
-40...+60	-30...+50	222
0...60	10...50	520
0...80	10...70	522
0...100	10...90	524
0...120	20...100	540
0...160	20...140	544
0...200	20...180	548
0...250	30...220	560
0...300	30...270	565
0...400	50...350	627
0...500	50...450	630
0...600	100...500	640
0...700	100...600	650

switch function	fig.
· increasing temperature makes contact	1
· increasing temperature breaks contact	2
· decreasing temperature makes contact	4
· decreasing temperature breaks contact	5
· change-over elements increasing temperature makes or breaks contact	3
· change-over elements decreasing temperature makes or breaks contact	6

¹ not with ex-protection

² with NS 100: one contact device, only

³ the active length l2 must completely reach the process temperature that is to be measured. The depth of immersion length l1 should be increased accordingly.

⁴ standard immersion length to be specified in order code, e.g. l1 100 mm: order code 100

⁵ operating temperature max. 250 °C, but not with coated capillary

⁶ for NS 100, type SJ2-S1N: for safe operation refer to TA\_044!