

Gas expansion thermometer with switch contact and clip-on bulb Type series FU



Application area

- Chemical and petrochemical industry
- Machinery construction
- General process technology

Features

- Case, measuring system and clip-on bulb of stainless steel
- Simple mounting without thermowell
- Accuracy class 1 or 2 per DIN 16196, depending on range
- Micro adjustment pointer for indication correction
- Design:
 - bulb fixed welded, indicating unit positioning by rotating the bulb
 - with capillary (capillary isolates indicating unit from measuring point)
- Switch contacts (electrical contact devices) per DIN 16196:
 - slow acting contact
 - magnetic snap contact
 - inductive contact

Options

- Case with liquid filling
- Explosion protection
- Classification per SIL 2
- Material certificate per DIN EN 10204

Application

These thermometers with switch function (electrical contact device) are suitable for use outdoors and in aggressive environments. Gas expansion thermometers with clip-on bulb offer some benefits to the user: no change in pipeline cross-section; the line thus remains piggable and retrofitting can be carried out without interfering with the process, simple mounting. If the exact orientation of the indicator is not known before mounting, we recommend using the positionable version. With this version the case may be re-positioned once by $\pm 180^\circ$ with respect to the pipeline.

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) in different lengths, with buckling protection, coated with protective tube upon request

Clip-on temperature detecting element

stainless steel material no. 1.4404 (316L), to fit pipe resp. circular form. Suited for fast installation on pipe diameter approx. 25...150 mm

Case filling

liquid filling Labofin

Process connection

rigid clip-on temperature detecting element, radially protruding at bottom, or centrally at rear for horizontal resp. vertical piping; alternatively with capillary

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, however max. up to 250 °C

Accuracy class

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

nominal 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 contact

Touch contacts or inductive contacts see order code. Further technical details see operating instructions BA_066 and TA_039.

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

⊕ II 2G Ex ia IIC T4/T5/T6 Gb

Reg.-no.: PTB 99 ATEX 2219X

PTB 00 ATEX 2049X

Ex-protection (ATEX) for mechanical measuring devices:

⊕ II 2G Ex h IIC T1...T6 Gb X

⊕ II 2D Ex h IIIC Txx°C Db X

Further details see operating instructions BA_066 and Ex Instructions XA_005, XA_013, XA_014 and XA_021.

Functional safety

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

Mounting

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

Weights

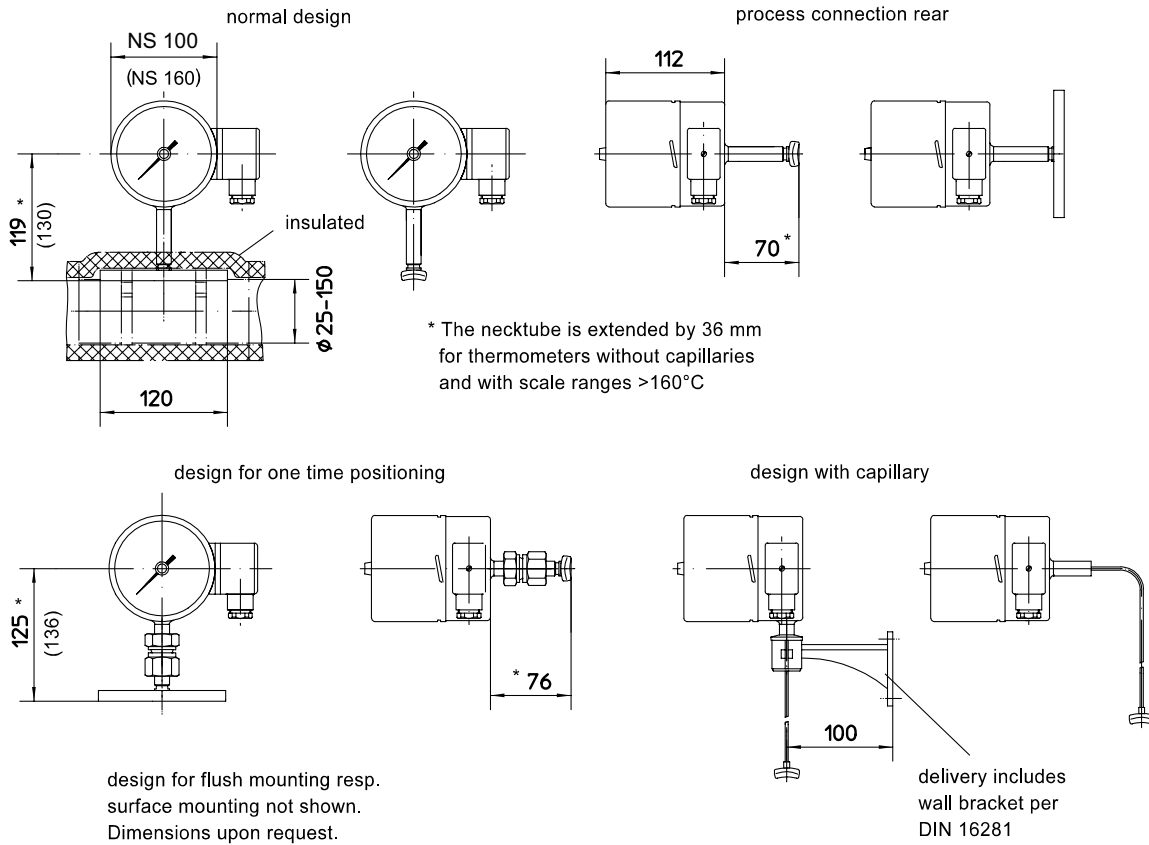
NS 100, without filling: approx. 1.3kg

NS 100, with filling: approx. 2.1kg

NS 160, without filling: approx. 2.1kg

NS 160, with filling: approx. 4.4kg

Dimensions



Order details

Gas expansion thermometer with switch contact and clip-on bulb

case design IP 66	connection bottom rigid	· NS 100	FU246 .	
		· NS 160	FU346 .	
		· NS 100	FU266 .	
		· NS 160	FU366 .	
	connection at back rigid	with liquid filling		
		· NS 100	FU236 .	
		· NS 160	FU336 .	
		· NS 100	FU256 .	
	capillary bottom	with liquid filling		
		· NS 100	FU356 .	
		· NS 160	FU244 .	
		· NS 100	FU344 .	
	capillary at back positioning	with liquid filling		
		· NS 160	FU264 .	
		· NS 100	FU364 .	
		· NS 160	FU242 .	
design	· standard	0		
	· ex-protection	1		
	nominal ranges	per table	A2 . . .	
	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 (N)		N4 . . .		
· safety initiator (SN)		N1 . . .		
· safety initiator invers (S1N) ²		N2 . . .		
· with integrated switching amplifier ¹		N6 . . .		
switch function	· single contact (1st figure per table)	.00		
	· double contact (1st + 2nd figure per table)	. . 0		
additional features (to be indicated in case of need, only):				
alignment of temp. detecting element ³	· parallel to indication (standard)	D1		
	· 90° to indication	D2		
mounting ⁴	· with wall bracket, aluminium, standard	G4		
	· prepared for wall bracket	G1		
	· for surface mounting	G2		
	· for flush mounting	G3		
	· with wall bracket, st. steel	G5		
capillary	· st. steel, length acc. to specification per m	K39 (Xm)		
	· st. steel with protective tube, length acc. to specification	K49 (Xm)		
window	· macrolon	R11		
marking	· on scale (pls. specify)	T2		
functional safety per EN 61508, classification per SIL 2				
Order code (example):				
FU2460 A2524 L4100				

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

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 not for design with capillary