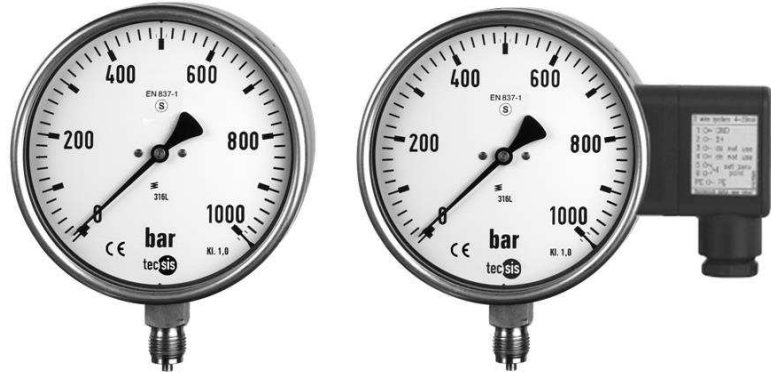


# All stainless steel safety pressure gauges according to EN 837-1/S3 with or without glycerine filling

## New: as multifunctional pressure instrument

and ANSI/ASME B 40.1

Nominal sizes ND 160



### Description

The all stainless steel pressure gauges are ideal for the hard conditions and the resulting high demands on pressure measurement in production facilities in chemical industry and other comparable branches. Resistance to aggressive media and environments is achieved by using high-grade materials such as stainless steel both for the measuring system and the case.

The glycerine filling provides wear-protection for the measuring system through damping, should pulsating pressures and mechanical vibrations occur. The measuring system is of accuracy class 1.0, has over range protection amounting to 1.3 times the max. rating and can be loaded up to the full scale value.

The safety execution of the pressure gauges comprises a burst-proof solid front between bourdon tube and window, a laminated safety glass as well as a blow-out back (according to EN 837-1/S3).

Pressure gauges with glycerine filling are equipped with a compensation diaphragm. This diaphragm avoids a pressure rise in the case that is due to temperature bound volume expansion of the liquid filling, thus avoiding indicated errors.

If an output signal is expected by the measuring point, „the multifunctional instrument“ **P2117 NS 160** can be used.

It connects the pressure measurement without auxiliary energy with the possibility of a sensor signal for the remote transmission of the upcoming pressure values.

This instrument is particularly suitable for pressure control rather regulation.

### Features

- o Stainless steel measuring system
- o Resistant to chemicals
- o Rugged construction
- o Fulfills highest safety requirements
- o Solid front between measuring system and window
- o Case with and without glycerine filling

### Measuring ranges



0 ... 0.6 bar to 0 ... 1600 bar

### Applications

Chemical and petrochemical industry;  
 Plastics and paper industry;  
 Food and beverages industry; Plant construction;  
 Machine and apparatus construction;  
 Research and development;  
 High pressure test benches; Burst test benches,  
 Compressors

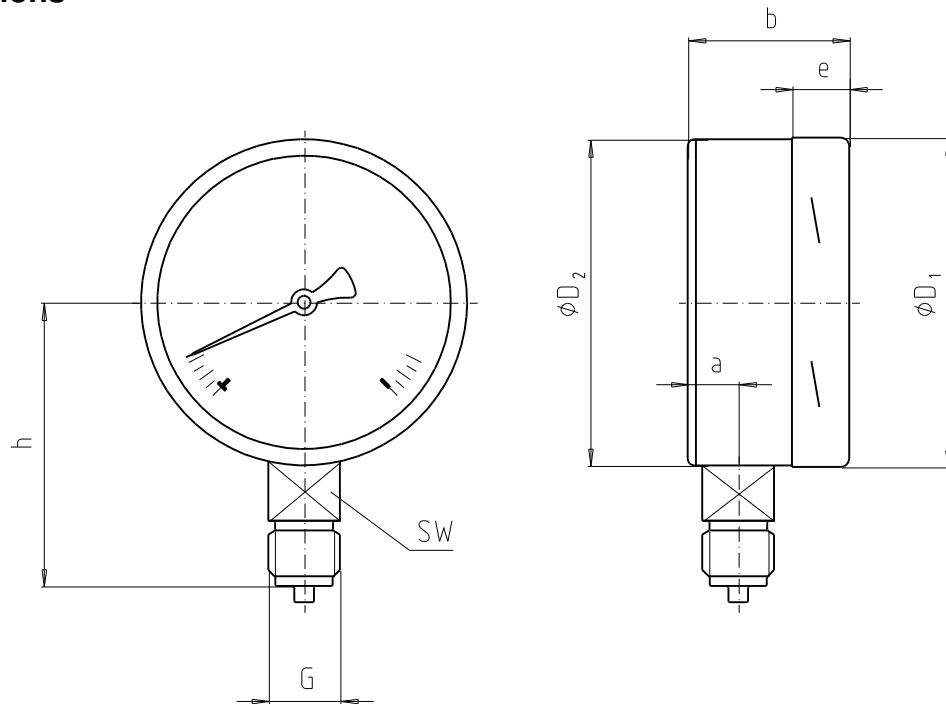
**Models: P2115, P2116, P2117**

## Technical data

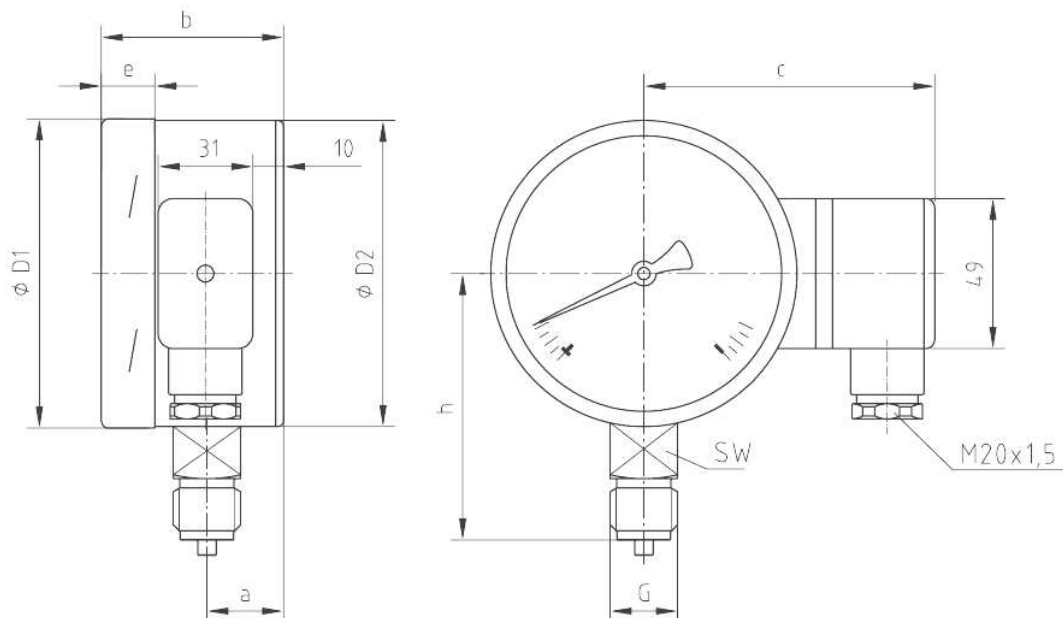
| Models                           | P2115  | P2116   | P2117   | Option   |
|----------------------------------|--|---|---|--|
| Nominal size                     | 160  |   |   |  |
| Symbol                           |   |   |    |  |
| Accuracy                         | 1,0 acc. to EN 837-1   |   |   |  |
| Measuring ranges                 | 0 ... 0,6 bar to 0 ... 1600 bar<br>negative or positive / negative and positive gauge pressure   |   |   |  |
| Application                      | Constant load: up to full scale value<br>Alternating load: up to 0,9 x full scale value<br>Short-time: overload capacity 1.3                                   |   |   | <i>Model P2115/16:</i> 1.5 to 2 x  |
| Überdrucksicherheit              |  |   |   | <i>Model P2117:</i>  |
| Case                             | Stainless steel, 1.4301 with blow-out back, solid front  |   |   | Rear mounting bracket, stainless steel   |
| - Underground cap                | Scale ranges ≤ 0 ... 16 bar, with compensating valve to vent case  |   |   |  |
| Bezel                            | Stainless steel, 1.4301 bayonet ring   |   |   |  |
| Surface mounting flange          | without  |   |   | Front flange, VA<br>Front flange, VA polished .  |
| Window                           | Laminated safety glass   |   | Polycarbonate   | Laminated safety glass   |
| Dial                             | Al. white, scale and imprint black   |   |   | Dual scale   |
| Pointer                          | Al. black  |   | Aluminium, black, adjustable  | Marker pointer on dial   |
| Movement                         | Stainless Steel  |   | Brass   | <i>Model P2117:</i> Monel or ss. 1.4571  |
| Measuring element                | Stainless steel 316L<br>Bourdon tube up to 60 bar , helical tube above 100 bar   |   |   |  |
| Connection                       | Stainless Steel 316L   |   |   |  |
| - position                       | Radial bottom  |   |   |  |
| - thread                         | G1/2 B   |   |   | 9/16-18 UNF 3B; G 3/8 B; 1/2 NPT;<br>Protection cape for connection thread<br>Other on request |
| Temperature                      |  |   |   |  |
| - Medium                         | Tmin. -20°C...Tmax. 200°C - for unfilled instruments   |   |   |  |
| - Ambient                        | Tmin. -20°C...Tmax. 100°C - for filled instruments<br>Tmin. -40°C...Tmax. 60°C - for unfilled instruments<br>Tmin. -20°C...Tmax. 60°C - for filled instruments |   |   |  |
| Temperature drift                | 0,4%/10K if deviation from normal temperature 20°C   |   |   |  |
| Liquid filling                   | without  | Glycerine / ≤ 6 bar<br>with inside pressure<br>compensation | without   | field fillable<br><i>Model P2117:</i> Silicone M50   |
| Protection to                    | IP 65 EN 60 529/IEC 529  |   |   |  |
| Throttle                         | without  |   |   | ∅ 0,8 at standard connector  |
| CE-Konformität                   | ATEX: 94/9   |   |   | <i>Model P2117:</i> acc. to ATEX<br>Ex ia IIC T4/T5/T6 rather Ex I M2 Ex ia I                  |
| Weight approx.                   | 1.5 kg   | 2.5 kg  | 1.45 kg   |  |
| Accessories                      | without  |   |   | Label of measuring point (1.4301)  |
| Elektrical connection            | -----  |   | L-plug connector, 180 °C rotatable,<br>max. 1.5 mm <sup>2</sup> , wire protector,<br>cable gland M20 x 1.5, external cable diameter<br>7-13 mm, incl. strain relief |  |
| Power supply UB                  | -----  |   | 12 < UB ≤ 30  |  |
| - Supply voltage effect          | -----  |   | ≤ 0,1 % fsv/10 V <sup>1)</sup>  |  |
| - Permissible residual ripple    | -----  |   | ≤ 10 % ss   |  |
| Output signal                    | -----  |   | 4 ... 20 mA, 2-wire, passiv,<br>acc. to NAMUR NE 43   |  |
| Permissible max. load RA         | -----  |   | RA ≤ (UB - 12 V)/0.02 A mit RA in Ohm and<br>UB in Volt, however max. 600 Ω   |  |
| Effect of load                   | -----  |   | ≤ 0,1 % fsv <sup>1)</sup>   |  |
| Electrical zero point            | -----  |   | through a jumper across terminals<br>5 and 6 (see operating instructions)   |  |
| - Long-term stability of Electr. | -----  |   | < 0,3 % fsv /a <sup>1)</sup>  |  |
| - Electr. output signal          | -----  |   | ≤ 1 % of measuring span   |  |
| Linearity                        | -----  |   | ≤ 1,0 % of span (limit point calibration)   |  |
| Conformity specifications        | -----  |   | Ex - Variant  |  |
| Power supply                     | -----  |   | 14 ... 30 DC V  |  |
| Short circuit rating             | -----  |   | 100 mA  |  |
| Rating                           | -----  |   | 1000 mW   |  |
| internal capacitance             | -----  |   | Ci ≤ 12 nF  |  |
| internal inductance              | -----  |   | mH - negligible   |  |
| EMC- directive                   | 2004/108/EG EC Interference emission<br>(Limit Class B) and immunity to EN 61 326-1  |   |   |  |

<sup>1)</sup> fsv = full scale value

## Dimensions



| Model        | Dimensions in mm |    |     |     |      |       |      |    |
|--------------|------------------|----|-----|-----|------|-------|------|----|
|              | a                | b  | D1  | D2  | e    | G     | h ±1 | SW |
| P2115, P2116 | 24               | 58 | 161 | 160 | 17.5 | G1/2B | 118  | 22 |



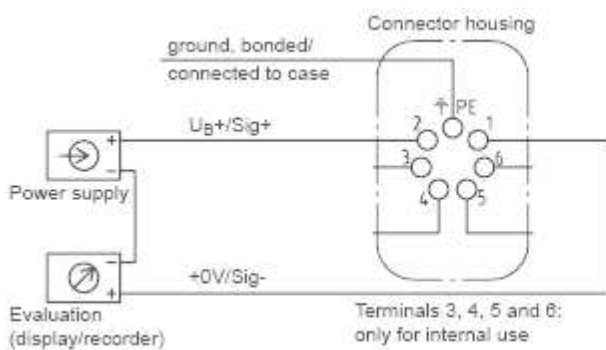
| Model | Dimensions in mm |      |       |     |     |      |        |      |    |
|-------|------------------|------|-------|-----|-----|------|--------|------|----|
|       | a                | b    | c     | D1  | D2  | e    | G      | h ±1 | SW |
| P2117 | 27               | 59.5 | 123.5 | 161 | 159 | 17.5 | G1/2 B | 118  | 22 |

## Terminal assignment

Terminals 1 and 2 are the terminals for the signal output and for the power supply. The terminal marked with PE (protective earth) is connected internally to the housing. The connections 3 to 6 or 4 to 6 (for the 3-wire version), must remain free and must not be used as connection points (also see Chapter 10 "Technical data").

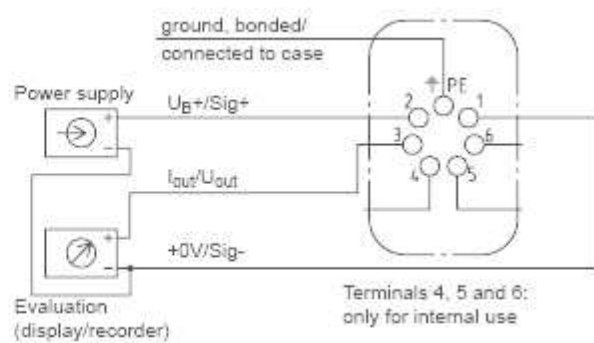
### 2-wire-design

i.e. 4 ... 20 mA



### 3-wire-design

i.e. 0 ... 20 mA / 0 ... 10 V



An unstabilised DC voltage, with a residual ripple of max. 10 % peak-to-peak in the range of the indicated supply voltage limits, is sufficient as a power supply. Make sure that the supply voltage applied exceeds the maximum required voltage by at least the value of the voltage drop across the external display or evaluation devices; i.e. the transmitter can operate using a non-stabilised supply voltage within the given limits, so long as the voltage available to the transmitter does not fall below 12 V, or below 14 V for the Ex-version.