Differential pressure gauge with electrical contact type
Model: P650 series

Spec. sheet no. PD06-03

Service intended
The P650 series are designed to measure a differential pressure from 25 kPa to 2.0 MPa at Max. working pressure up to 10 MPa, and have electrical contact.
A set of two stainless steel bellows mounted on a force balance allows direct reading of the actual differential pressure. These models are designed to control and alarm for a differential pressure.

Nominal diameter
160 mm

Accuracy
±1.0 % of full scale
±1.6 % of full scale

Scale range (MPa, kPa, bar, mbar)
0 ~ 25 kPa to 0 ~ 0.25 MPa (P651 model)
0 ~ 0.4 MPa to 0 ~ 2.0 MPa (P652 model)

Max. working pressure (Static pressure)
Max. 10 MPa

Working temperature
Ambient : -20 ~ 65 °C
Fluid : Max. 100 °C

Degree of protection
EN60529/IEC529/IP67

Temperature effect
Accuracy at temperature above and below the reference temperature (20 ℃) will be effected by approximately ±0.5 % per 10 ℃ of full scale

Standard features

Pressure connection
Stainless steel (316SS), Monel and Hastelloy-C

Element
Bellows
Stainless steel (316L SS), Monel and Hastelloy-C

Case
Stainless steel (304SS)

Bezel ring
Stainless steel (304SS)
Bayonet type

Window
Polycarbonate

Dial
White aluminium with black graduations

Pointer
Black painted aluminium alloy

Conduit connection
M20 x 1.5

Process connection
¼" NPT(F)
½" NPT(F) at 3-way and 5-way manifold valve

Standard accessories
Mounting bracket for 2" pipe
mounting with silver gray finished steel

Certificates
Pressure equipment directive (2014/68/EU) Annex III Module H

Option
- Remote seal
- Mounting bracket with 316SS for 2" pipe mounting
- 3-way manifold valve (316SS, Monel)
- 5-way manifold valve (316SS, Monel)

Main order — Ordering information

1. Base model

P651	Electrical contact type pressure gauge (0 ~ 25 kPa to 0 ~ 0.25 MPa)
P652	Electrical contact type pressure gauge (0 ~ 0.4 MPa to 0 ~ 2.0 MPa)

2. Type of mounting

D	Bottom connection, mounting bracket for 2" pipe

3. Contact function

X	Refer to contact function table

4. Accuracy

3	±1.0% of full scale (Optional)
4	±1.6% of full scale (Standard)

5. Process connection

C	¼" NPT(F)
E	½" NPT(F) (only at 3-way and 5-way manifold valve)

6. Mounting bracket

D	Standard bracket
E	304SS mounting bracket
F	316SS mounting bracket
W	Wall mounting bracket (316SS)
N	None

7. Unit

H	bar
I	MPa
J	kPa
S	mbar

8. Range

041	0 ~ 0.1 MPa
133	0 ~ 0.16 MPa
134	0 ~ 0.25 MPa
044	0 ~ 0.4 MPa
045	0 ~ 0.6 MPa
047	0 ~ 1 MPa
143	0 ~ 1.6 MPa
051	0 ~ 2.0 MPa
118	0 ~ 25 kPa
121	0 ~ 40 kPa
125	0 ~ 60 kPa

9. Dial color

3	2 colors

10. Option

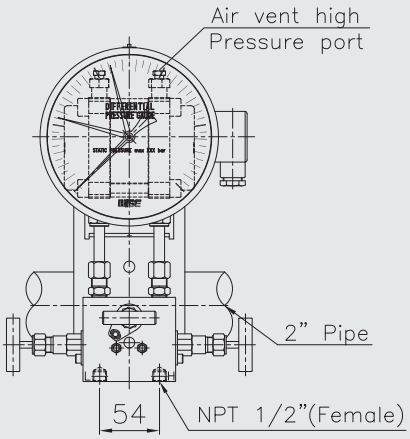
0	None
1	Manifold valve
8	½" or ¾" NPT(F) conduit connection

Sample ordering code

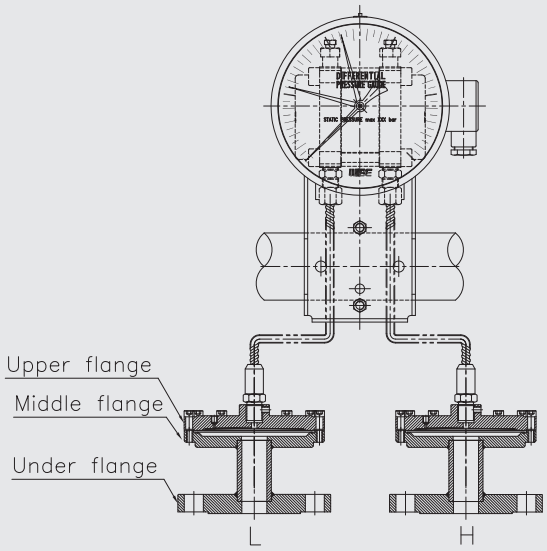
1	2	3	4	5	6	7	8	9	10
P651	**D**	**X**	**3**	**C**	**D**	**H**	**041**	**3**	**1**

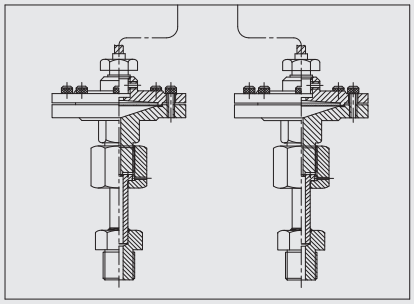
P65X : Type of mounting

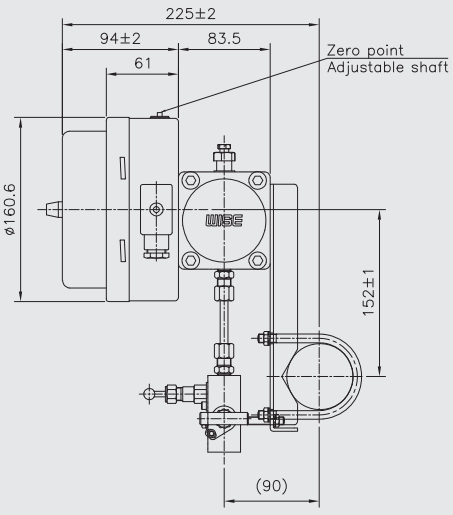
Code:(D) P650

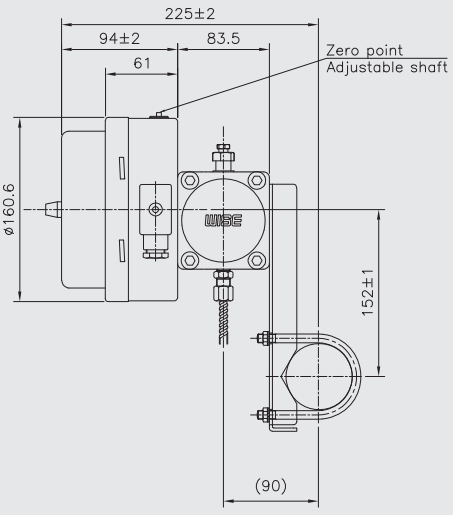


Code:(D) P650(Remote seal)









Snap - action contacts

General

Electromechanical limit switches in pointer type measuring instruments are auxiliary current switches which open or close electrical circuits at set limit values by means of a contact arm which is moved by the actual value pointer.
The snap action contact is a mechanical contact for switching capacities up to 30 W 50 VA max.
Contact making will be delayed and or advanced in relation to the movement of the actual value pointer.
To closed the circuit, the contact pin of the movable contact arm is attracted in a jump by the permanent magnet fastened to the supporting arm shortly before the set value has been reached.
Due to the retention force of the magnet, snap action contacts are more resistant against shock and vibration.
The switching safety is increased by the increased contact pressure.
When the circuit is opened, the magnet keeps the contact arm in its place until the restoring force of the measuring element exceeds the magnetic force, and the contact opens in a jump.

Specifications

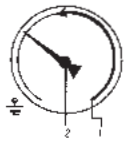
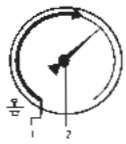
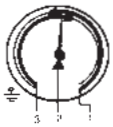
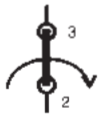
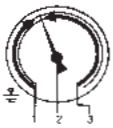
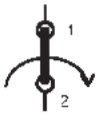
Maximum contact rating with non-inductive (ohmic) load		**Electrical contacts type pressure gauge model P650 series**	
		Dry gauges	**Liquid filled gauges**
Maximum voltage		250 V	250 V
Current ratings	**Make ratings**	1.0 A	1.0 A
	Break ratings	1.0 A	1.0 A
	Continuos load	0.6 A	0.6 A
Maximum load		30 W 50 VA	20 W 20 VA
Material of contact points		Silver-nickel alloy (80 % Ag / 20 %Ni / 10 µm) gold-plated	
Ambient operating temperature		-20 ...+70 °C	
Max. no. of contacts		2	
Voltage test		Circuit / protective earth conductor - 2,000 vac 1 minute	
		Circuit /circuit - 2,000 vac 1 minute	

Recommended contact ratings with ohmic and inductive load

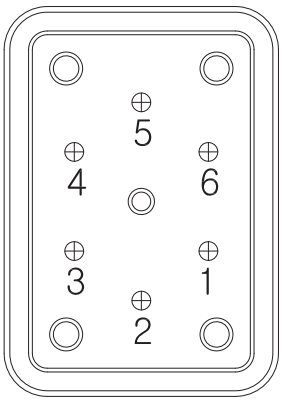
Voltage (DIN IEC 38) DC / AC	**Electrical contacts type pressure gauge model P650 series**					
	Dry gauges			**Liquid filled gauges**		
	Ohmic load		Inductive load	Ohmic load		Inductive load
	DC	AC		DC	AC	
			cosØ > 0.7			cosØ > 0.7
V	mA	mA	mA	mA	mA	mA
220 / 230	100	120	65	65	90	40
110 / 110	200	240	130	130	180	85
48 / 48	300	450	200	190	330	130
24 / 24	400	600	250	250	450	150

In order to ensure a high switching reliability of the contacts the switching voltage should not be below 24 V, also taking environmental influences in the long term into account.

Contact function table

Code	Wiring scheme		Contact function		Wiebrock code no.	Remark
			1st contact	2nd contact		
Single Contact						
1	Contact make when pointer reachse setpoint (Normal open - NO)				S/M-1	Normal use high alarm system
3	Contact break when pointer reachse setpoint (Normal close - NC)				S/M-2	Normal use low alarm system
Double Contact - Common Circuit						
4	1st and 2nd contact make when pointer reaches setpoint				S/M-11	Normal use high and hihigh alarm system
6	1st contact make 2nd contact break when pointer reaches setpoint				S/M-12	Normal use failsafe high and low alarm system
2	1st contact break 2nd contact make when pointer reaches setpoint				S/M-21	Normal use Low and High alarm system
5	1st and 2nd contact break when pointer reaches setpoint				S/M-22	Normal use low and lolow alarm system

Terminal block arrangement



1. High alarm (S/M-1)

① Normal open
② Common
④ Ground

2. Low and high alarm (S/M-21)

Low alarm

① Normal close
② Common
④ Ground

High alarm

② Common
③ Normal open

3. Low alarm (S/M-2)

① Normal close
② Common
④ Ground

4. Two high alarm (S/M-11)

No.1 High alarm

① Normal open
② Common
④ Ground

No.2 High alarm

② Common
③ Normal open

5. Two low alarm (S/M-22)

No.2 Low alarm

① Normal close
② Common
④ Ground

No.1 Low alarm

② Common
③ Normal close

6. Failsafe high and low alarm (S/M-12)

High alarm

② Common
③ Normal close
④ Ground

Low alarm

① Normal open
② Common