

- Solid Front / Blow - Out Back
- Threaded or Flanged Process Connection
- Better Performance in Low Pressure and Vacuum System
- Lower Temperature Effect than Liquid Filled Actuated System
- Heavy Duty Bourdon Tube / Rotary Geared Movement

HAWK Diaphragm Pressure Gauge use a diaphragm as its sensing element which can be welded or bonded or clamped to the upper and lower housing. The diaphragm deflects upward or downward when subjecting or releasing to pressure. This variation is converted into the rotary motion of the pointer by a movement and a

connecting rod. It is a alternative to a liquid filled actuated system (pressure gauge and diaphragm seal assembly). **HAWK type 81L** diaphragm process gauges with phenolic case are widely used for petrochemical and chemical processing industries. There is a solid wall between pressure sensing element and the window. This design provides better safety for monitoring the gauges in the event of the gauge failure.

81L Series



Typical Applications

- ✓ Petrochemical and chemical processing
- ✓ Offshore oil platforms & gas industries
- ✓ Industrial OEM equipment
- ✓ Power generating stations
- ✓ Food processing plants
- ✓ Energy and water treatment plants

Specifications

Pressure Limit

Steady: 100%*full scale value
Pulsation: 90%*full scale value
Sudden: 130%*full scale value

The appropriate operating range falls in the middle half of the gauge (25% to 75% of full scale). If you choose the unsuitable range, the fatigue of bourdon tube may be resulted. HAWK Supplies a wide selection of range from vacuum to 25 bar including compound range. Special design for high over-pressure (5 times), but max 25 bar is available on request.

Temperature limit

Ambient: -40 to 80°C (Dry)
-10 to 65°C (Liquid Filled)
Media: max 125°C-SS (Standard),
300°C (Optional)

Temperature effect

Accuracy of measurement will be effected by the temperature change. This inaccuracy may as high as $\pm 0.8\%$ for 10°C temperature change.

Liquid Filled

Liquid filling of the diaphragm gauge is available. Please note that the influence of the fluid column is significant, especially for low pressure.

Dial Size

4 1/2"(115mm).

Case&Ring

Phenol, bezel ring threaded with a gasket.

Socket

316 Stainless Steel.

Movement

Stainless steel movement with overload and underload stops - Standard, Dampened movement on request.

Sensing Element

Diaphragm.

Window

Tempered safety glass - Standard,
Polycarbonate or Laminated safety glass - Option.

Bolts

Stainless Steel.

Upper Housing Material

SS316, SS304, SS316L, SS316 with PTFE Coating, SS316 with Titanium Coating.

Diaphragm Material

SS316L, SS316L with Hastelloy C Foil, SS316L with Monel Foil, SS316L with Tantalum Foil, SS316L with PTFE Coating, SS316L with PTFE Coating/Tantalum Foil, SS316L with Titanium Coating, SS316L with PTFE Lining (Foil), SS316L with Titanium Coating and PTFE Foil, Steel, Steel with Nickel Plated.

Lower Housing Material

SS316, SS316L, SS304, Inconel, Monel, Titanium, Tantalum, SS316 with PTFE Coating, SS316 with Titanium Coating, SS316 with PTFE Lining, Hastelloy C/PTFE(ETFE) Coating.

Gasket

Telfon - Standard, Viton, Buna N.

Pointer

Anodized aluminum with black finish.

Accuracy

$\pm 1.5\%$ of span - Standard,
 $\pm 1.0\%$ of span - Option.

Zero-Adjustment

Micro-adjustable pointer.

Scale

PSI, kPa, Mpa, bar, kg/cm², inHg, cmHg, torr, mmHg, mmH₂O, mbar, inH₂O, oz./in² (single or dual scale).

Connection

Thread or Flange/Double Flange.

Mounting

Stem and surface mounting.

Weatherproof

NEMA 3/3X(IP54) - Standard,
NEMA 4/4X(IP65) - Option.

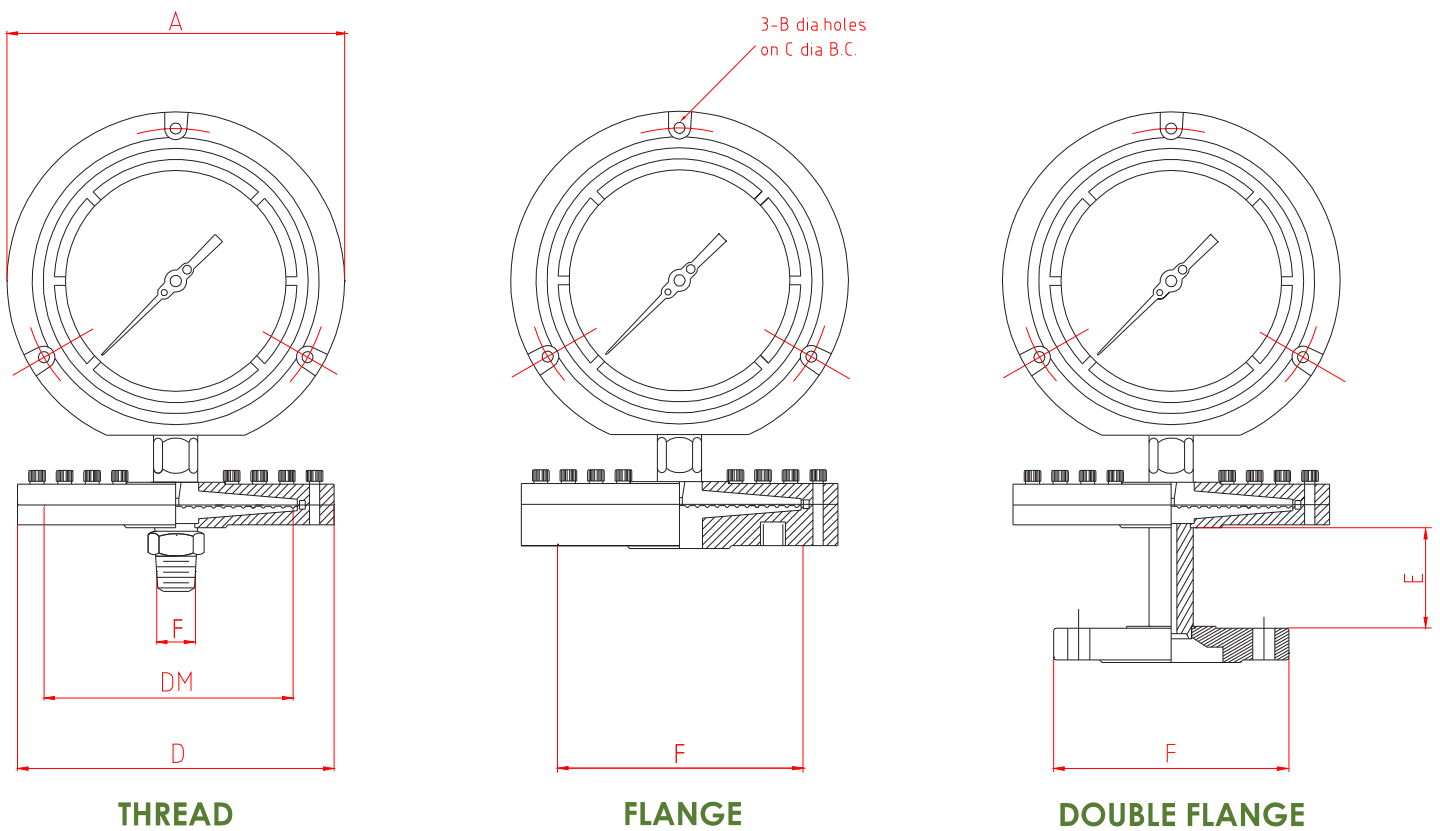
Features

Solid front with pressure relief back to ASME B40.1 standard that will reduce the possibility of window failure and projection of parts outward through the front of the gauge.

The stainless steel rotary geared movement reduces friction and corrosion which assures a smooth-moving pointer. Max and Min stop pin can be offered to protect against damage caused by sudden vacuum and over-pressure.

Type 81L is equipped with a pressure compensating diaphragm installed in the casing back and connected to the outer atmosphere by compensated hole.

Dimensions



Dimensions, in.(mm)

Type No	Dial Size	Range	DM	A	B	C	D	E	F
81L	4.5"	16...400 mbar	5.11" (130)	5.81" (148)	0.24" (6)	5.36" (137)	3.94" (100)	2.36" (60)	Thread, Flange, Double Flange
81L	4.5"	0.6...25 bar	2.95" (75)	5.81" (148)	0.24" (6)	5.36" (137)	6.30" (160)	2.36" (60)	

Thread

1/4"NPT, 3/8"NPT, 1/2"NPT, 3/4"NPT, 1"NPT, G1/2", G3/8", G1/4", R1/4", M20*1.5, M14*1.0 Male or Female

Flange

ANS1-1/2".....5", Rating-150, 300, 400, 600

DIN-DN15.....100, Rating-PN2.5-6, 10-40

JIS-10A.....100A, Rating-JIS10K, 16K, 20K, 30K, 40K

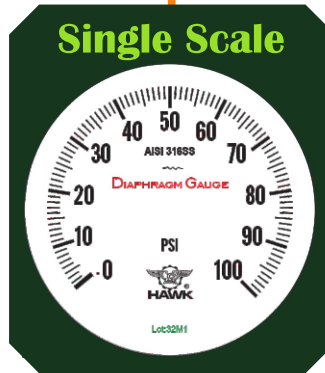
Pressure Range

- The other scales and ranges (DIN) are available in request.
- Not all listed ranges and scales are in stock, consult your distributors for available.

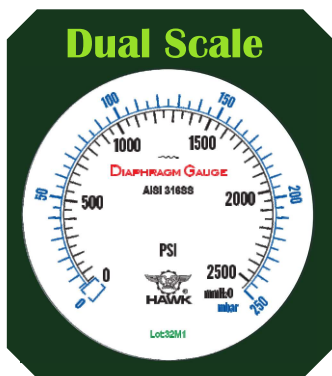
Code Range

PRESSURE RANGES																	
Psi		kPa		inH2O													
P21	1	P35	30	P43A	180	K13	1.0	K24	16	K35	200	K42B	1400	J3	0.5	J15	15
P23	2	P37	40	P44	200	K14	1.6	K25	20	K36	250	K43	1600	J5	1.0	J16	20
P25	3	P38	50	P45	250	K15	2.0	K26	25	K37	300	K44	2000	J7	2.0	J19	30
P28	5	P39	60	P46	300	K16	2.5	K27	30	K38	400	K44A	2100	J9	3.0	J20	40
P29	6	P40	80	P47	350	K17	3.0	K29	40	K39	500	K45	2500	J10	4.0	J21	50
P30	8	P40A	85	P48	400	K19	4.0	K30	50	K40	600	K45A	2800	J11	5.0	J22	60
P31	10	P41	100	P48A	450	K20	5.0	K31	60	K41	700	K46	3000	J12	6.0	J24	100
P32	15	P42	150	P49	500	K21	6.0	K33	100	K42	1000	K47	3500	J13	8.0	J25A	160
P33	20	P43	160	P50	600	K23	10	K34	160	K42A	1100	K48	4000	J14	10	J26	200

VACUUM RANGES											
kPa		inH2O									
KV1	-0.04	KVK	-5	KVT	-40	JV3	-0.5	JVC	-6.0	JVM	-60
KVD	-1.0	KVL	-6	KVU	-50	JV5	-1.0	JVD	-8.0	JVN	-80
KVE	-1.6	KVN	-10	KVV	-60	JV7	-2.0	JVE	-10	JVO	-100
KVF	-2	KVO	-16	KVW1	-80	JV9	-3.0	JVF	-15	JVP	-150
KVG	-2.5	KVP	-20	KVX	-100	JVA	-4.0	JVG	-20	JVQ	-200
KVH	-3	KVQ	-25			JVB	-5.0	JVJ	-30	JVR	-250
KVJ	-4	KVR	-30								



COMPOUND RANGES							
Kpa		inH2O					
KCL1	-0.6/+1	KOD	-8/+8	JCE	-0.5/+0.5	JCN	-15/+15
KCM	-0.5/+0.5	KOE	-10/+10	JCF	-1/+1	JCO	-20/+20
KCO	-1/+1	KOI	-16/+25	JCG	-1.5/+1.5	JCP	-30/+30
KCQ	-1.25/+1.25	KOK	-20/+20	JCH	-2/+2	JCQ	-50/+50
KCR	-1.5/+1.5	KOL	-25/+25	JCI	-2.5/+2.5	JCR	-100/+100
KCU	-2/+2	KOM	-25/+40	JCJ	-3/+3	JCS	-150/+150
KCV	-2.5/+2.5	KON	-30/+30	JCK	-4/+4	JCT	-200/+200
KOB	-5/+5	KOP	-50/+50	JCL	-5/+5	JCU	-250/+250
				JCM	-10/+10		



PRESSURE RANGES					
mbar/mmH2O		oz./in2./inH2O			
Q22	16	Q37	600	F27	6
Q23	20	Q39	1000	F271	9
Q24	25	Q40	1600	F28	12
Q26	40	Q41	2000	F29	20
Q28	60	Q42	2500	F30	30
Q30	100	Q43	4000	F301	35
Q31A	160	Q44	6000	F31	60
Q32	200	Q45	10000	F32	100
Q33	250			F33	160
Q35	400			F34	250

COMPOUND RANGES							
mbar/mmH2O		oz./in2./inH2O					
QCP	-5/+5	QOG	-100/+100	FVR	-6	FVU1	-35
QCQ	-6/+10	QOK	-200/+200	FVR1	-9	FVV	-60
QCS	-10/+10	QOL	-250/+250	FVS	-12	FVW	-100
QCU	-12.5/+12.5	QON	-300/+300	FVT	-20	FVX	-160
QCW	-20/+20	QOO	-400/+400	FVU	-30	FVY	-250
QCY	-25/+20	QOQ	-500/+500				
QOD	-50/+50						

VACUUM RANGES									
mbar/mmH2O		oz./in2./inH2O							
QVH	-16	QVN	-60	QVU	-400	FVR	-6	FVU1	-35
QVI	-20	QVO	-100	QVV	-500	FVR1	-9	FVV	-60
QVJ	-25	QVQ	-160	QVW	-600	FVS	-12	FVW	-100
QVB	-30	QVR	-200	QWX	-1000	FVT	-20	FVX	-160
QVL	-40	QVS	-250			FVU	-30	FVY	-250
QVM	-50	QVT	-300						



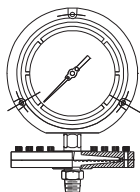
Diaphragm Process Gauge

Phenol Case (Safety Case)

P-1E

Order Information

Example: For Thread



Dial Size		Diaphragm Material	Upper Housing Material	Lower Housing Material	Connection Mounting	Process Connection	Range	Option
45		W	S	S	A	M 2	P41	H-ZT
45-4 1/2"(115mm)		W-SS316L H-SS316L with Hastelloy C Foil M-SS316L with Monel Foil U-SS316L with Tantalum Foil C-Steel N-Steel with Nickel Plated	1-SS316L with PTFE Coating 3-SS316L with PTFE Coating/Tantalum Foil 6-SS316L with Titanium Coating 7-SS316L with PTFE Lining (Foil) 8-SS316L with Titanium Coating and PTFE Foil					
S-SS316 1-SS316 with PTFE Coating	A-SS304 6-SS316 with Titanium Coating	W-SS316L						
S-SS316 A-SS304 O-Inconel M-Monel	W-SS316L T-Titanium U-Tantalum	1-SS316 with PTFE Coating 2-Hastelloy C/PTFE(ETFE) Coating 6-SS316 with Titanium Coating 7-SS316 with PTFE Lining						
A-Thread								
F-Female		M-Male						
2-1/2"NPT	4-1/4"NPT	D-G 1/2"	E-G 1/4"	J-M20*1.5	K-M14*1.5			
P41-0-100PSI	P44-0-200PSI	P46-0-300PSI	Please refer to the range table and write down the code you need. Vacuum Compound Pressure					
ZT-Tempered Safety Glass Lens		ZG-Glycerine Filled	Z3-316SS Case	Other options please check the next page				

Catch All You Need



Catch All You Need

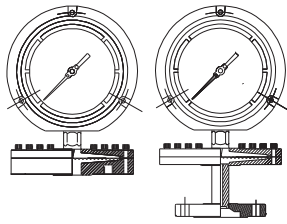


Catch All You Need



Order Information

Example: For **Flange** and **Double Flange**



P - 1E - 81L

Dial Size **45** Diaphragm Material **W** Upper Housing Material **S** Lower Housing Material **S** Mounting **F** Rate **A** Size **3** Face **R** Range **P41** Option **H-ZT**

45-4 1/2"(115mm)

W-SS316L 1-SS316L with PTFE Coating
H-SS316L with Hastelloy C Foil 3-SS316L with PTFE Coating/Tantalum Foil
M-SS316L with Monel Foil 6-SS316L with Titanium Coating
U-SS316L with Tantalum Foil 7-SS316L with PTFE Lining (Foil)
C-Steel 8-SS316L with Titanium Coating and PTFE Foil
N-Steel with Nickel Plated

S-SS316 **A-SS304** **W-SS316L**
1-SS316 with PTFE Coating **6-SS316 with Titanium Coating**

S-SS316 **W-SS316L** **1-SS316 with PTFE Coating**
A-SS304 **T-Titanium** **2-Hastelloy C/PTFE(ETFE) Coating**
O-Inconel **U-Tantalum** **6-SS316 with Titanium Coating**
M-Monel **7-SS316 with PTFE Lining**

F-Flange **D-Double Flange**

ANSI	A-150LB	B-300LB	C-400LB	D-600LB	E-900LB	F-1500LB	G-2500LB
DIN	H-PN2.5 O-PN64	I-PN4.0 P-PN100	K-PN10 Q-PN160	L-PN16 R-PN250	M-PN25 S-PN320	N-PN40 T-PN400	
JIS	U-PN 5K	V-PN 10K	W-PN 20K	X-PN 40K	Y-PN 63K		

ANSI, DIN, HG20615, JIS	2-3/4"(DN20) 7-2 1/2"(DN65)	3-1"(DN25) 8-3"(DN80)	4-1 1/4"(DN32) 9-4"(DN100)	5-1 1/2"(DN40) 0-5"(DN125)	6-2"(DN50)
HG20592, PN0.25, 0.6, 1.02.5, 6.3, 10, 16	B-DN20 G-DN65	C-DN25 H-DN80	D-DN32 I-DN100	E-DN40 J-DN125	F-DN50
PN0.4, 1.6, 4.0	L-DN20 Q-DN65	M-DN25 R-DN80	N-DN32 S-DN100	O-DN40 T-DN125	P-DN50

R-RF(Raise Face) **O-SMF**(Small Male Face) **G-LGF**(Large Groove Face) **F-FF**(Flat Face)
M-LMF(Large Male Face) **P-SFF**(Small Female Face) **A-STF**(Small Tongue Face) **J-RJ**(Ring Joint Face)
N-LFF(Large Female Face) **L-LTF**(Large Tongue Face) **B-SGF**(Small Groove Face)

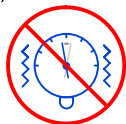
P41-0-100PSI **P44-0-200PSI** **P46-0-300PSI** Please refer to the range table and write down the code you need. Vacuum Compound Pressure

ZT-Tempered Safety Glass Lens **ZG-Glycerine Filled** **Z3-316SS Case** Other options please check the next page

Option



- ZC** Certificate of Accuracy (Factory)
- Z1** Improved Accuracy 1% (Grade A-ASME B40.1)
- ZI** Certificate of Accuracy (NIST)
- ZE** Certificate of Accuracy (TAF)



- ZG** Glycerine Filled
- ZH** Halocarbon Filled
- ZS** Silicone Filled
- ZO** Fluorolube Filled
- ZM** Dampened Movement



- ZX** Cleaned for Oxygen Service (Use No Oil)



- ZN** Complied to NACE

Stainless Steel Tag Plate

ZY



0Q

Customized Laser Mark

Green Set Hand (Window)

07



06

Red Set Hand (Window)



ZQ

Movement with PTFE or Titanium Coated Gear



Green Set Hand (Dial)

04



0A

Red Set Hand (Dial)

FCFC Painting

0J



1

PTFE Coating



Electrical Alarm Contract

ZW



ZJ

Maximum Pointer



Stop Pin at 6 O'clock

0M



0P

Stop Pin



Polycarbonate Lens

ZP



ZT

Tempered Safety Glass Lens

ZL

Laminated Safety Glass Lens

Limited Warranty and Liability

HAWK GAUGE CO.,LTD warrants all its mechanical instruments to be free from defects in materials and workmanship. HAWK agrees to repair or replace any pressure gauges if returned to our factory, transportation charges prepaid, and after which examination reveals is to be defective due to faculty workmanship or material.

This warrant should not apply to subject to the following terms and conditions:

- A.** The product has not been subjected to misuse, neglect, abuse , accident, incorrect mounting, improper use or misapplication such as negligence, accident, vandalism, shock or vibration.
- B.** The performance of any system of which HAWK's products are a component part.
- C.** The product has not been exposed to any other service, range or environment of greater severity than that for which the products were designed.
- D.** The product has not been altered or repaired by anyone except HAWK GAUGE or its authorized service agencies.
- E.** The serial number or date code has not been removed, defaced or changed.
- F.** The actual pressure&temperature occurring exceed the values specified for HAWK Process gauge.

Unless otherwise specified in a manual or warranty card, or agree to in a writing signed by HAWK GAUGE office, HAWK Process gauge products shall be warranted for one years from the date of sale.

This warranty is in lieu of all other warranties expressed or implied, and of all obligations or liabilities on its part for damages including but not limited to consequential damages, following the use of misuse of instruments sold by it.

No agent is authorized to assume for it any liability except as set forth above.

Note

HAWK GAUGE CO.,LTD reserves the right to make product improvements and change its specifications at any time stated throughout this brochure without notification. Please contact the factory on all critical dimensions and specifications for verification.

HAWK GAUGE is not expert in the customer's technical field and therefore doesn't warrant suitability of it's product for the application selected by customer.



Data Sheet No: MKDP1E81A2-E