



# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

- ✔ Extensive line of bourdon tube mechanical pressure gauges, in case sizes 40mm - 160mm
- ✔ Wetted parts from 316L stainless steel, other alloys optional
- ✔ Variety of pressure ranges, from vacuum to 1000 bar or 15,000 psi



## HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

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## HAM-LET PRESSURE GAUGES PROCESS CONNECTIONS



BSP-P Thread



NPT Thread



HAM-LET  
Tube Adapter



HAM-LET Face Seal Male  
Swivel



HAM-LET Face Seal  
Female Swivel

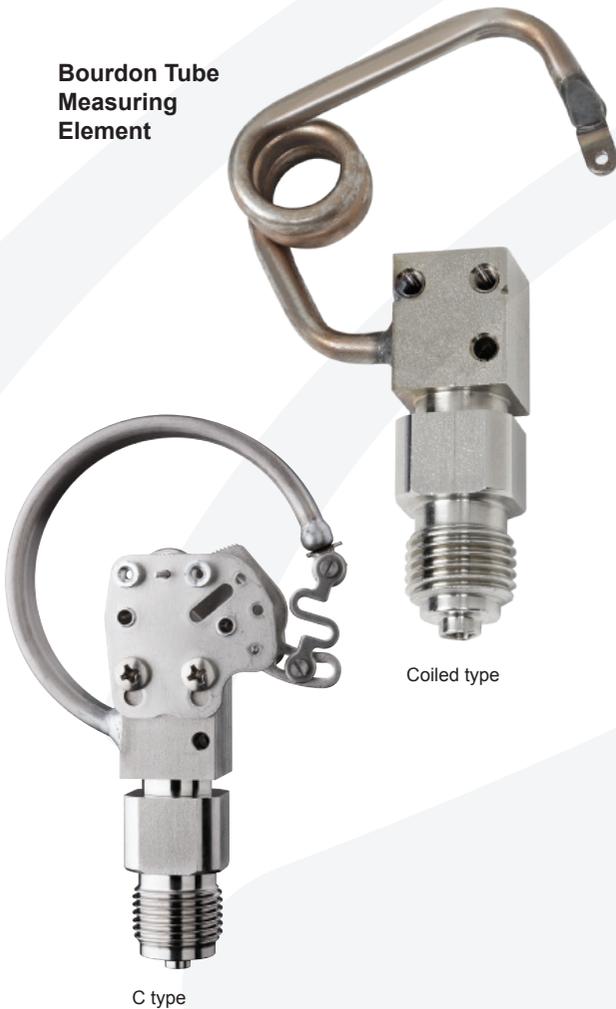
# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

## HAM-LET PRESSURE GAUGES SELECTION GUIDE

Series	Type	Configuration			Liquid Fillable	Solid Front	Safety Glass Window	Adjustable Pointer	Accuracy	Case Size	Measurement Range
		C	B	L						mm (inch)	
Heavy Duty	H	Yes	Yes	Yes	Yes	-	Yes	Yes	1.6% ± EN 837 Class 1.6 (Class 2.5 for 0-600 & 0-1000 bar range)	63 (2.5)	Vacuum: -1 - 0 bar Pressure: 0 - 1000 bar
		-	Yes	Yes	Yes	-	Yes	Yes	1.0% ± EN 837 Class 1.0	100 (4)	
		-	Yes	Yes	Yes	-	Yes	Yes		160 (6)	
General Use	G	Yes	-	Yes	Yes	-	Yes	-	± 1.6% EN 837 Class 1.6 (Class 2.5 for 0- & 0-1000 bar range)	40 (1.5)	Vacuum: -1 - 0 bar Pressure: 0 - 600 bar
		Yes	-	Yes	Yes	-	-	-		50 (2)	
		Yes	Yes	Yes	Yes	-	Yes	-		63 (2.5)	
		-	Yes	Yes	Yes	-	Yes	-	± 1.0% EN 837 Class 1.0	100 (4)	Vacuum: -1 - 0 bar Pressure: 0 - 1000 bar
		-	Yes	Yes	Yes	-	Yes	-	± 1.0% EN 837 Class 1.0	160 (6)	
Safety Pattern / Solid Front	S	-	Yes	Yes	Yes	Yes	Yes	Yes	± 1.6% EN 837 Class 1.6 (Class 2.5 for 0-600 & 0-1000 bar range)	63 (2.5)	Vacuum: -1 - 0 bar Pressure: 0 - 1000 bar
		-	Yes	Yes	Yes	Yes	Yes	Yes	± 1.0% EN 837 Class 1.0	100 (4)	
		-	-	Yes	Yes	Yes	Yes	Yes		160 (6)	
Process	P	-	-	Yes	Yes	Yes	Yes	Yes	± 0.5% ASME B40.1 Grade 2A	115 (4.5)	Vacuum: -1 - 0 bar Pressure: 0 - 1000 bar
Low Pressure	L	Yes	-	Yes	Yes	-	Yes	-	± 1.6% EN 837 Class 1.6	63 (2.5)	Vacuum: -25 - 0 mbar Pressure: 0 - 600 mbar
		Yes	-	Yes	Yes	-	Yes	Yes		100 (4)	
										160 (6.3)	

# INDUSTRIAL MECHANICAL PRESSURE GAUGES

## Bourdon Tube Measuring Element



Coiled type

C type

## GENERAL

Our Industrial Mechanical Pressure (IMP) Gauges are measuring devices constructed from high quality materials that adhere to strict quality standards.

The IMP gauge guarantees long life with durability for indoor and outdoor industrial, process and instrumentation applications.

The IMP product variety in the catalog covers standard gauges and extensive options are available.



## FEATURES

- Nominal case sizes: 40, 50, 63, 100, 115, 160 mm (1½", 2", 2½", 4", 4½", 6")
- Pressure, vacuum and compound measuring ranges. Pressure ranges of:  
0-1 inH<sub>2</sub>O up to 0-250 inH<sub>2</sub>O (0-2.5 mbar up to 0-600 mbar),  
0-10 up to 0-15,000 psi (0-0.6 up to 0-1000 bar) and above
- Accuracy of ± 0.5/1/1.6/2.5 % of span (EN 837-1 Class 1/1.6/2.5, ASME B40.1 Grade 1A/2A /B/C)
- Manufactured in accordance to EN 837 and ASME B40.1 standards
- All wetted parts are made of 316L stainless steel (Alloy 400 as an option)
- Connections include threaded, tube adapter and face seal

# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

## CLEANING

Special cleaning of wetted parts is available upon request

- Lubricant free
- Silicon free
- Cleaned for oxygen service

## TESTING & CALIBRATION

All IMP gauges are factory calibrated and bubble tested for leakage. Helium leak test is available.

## SELECTING PRESSURE GAUGE FOR YOUR APPLICATION

Selecting the proper gauge to withstand application pressures, temperature, and environmental conditions is a prime concern for the system engineer. The EN 837-2 or ASME B40.1 standard should be considered as a guideline for proper selection.

For assistance in matching the proper pressure gauge for your application, please consult a UCT local representative.

## FILLING

Gauge cases are often filled with liquid to protect the internals against damage caused by severe vibrations or pressure pulsations and prevent condensation in outdoor installations. All IMP gauges can be filled or unfilled as ordered, and the gauges are always fillable.

- Standard filling is 99% glycerin
- Glycerin (86%) for low ambient temperatures
- Silicon oil, and other fillings available upon request

### Warning!

Glycerin and Silicon oil must be avoided where Oxygen or and other strong oxidizing agents are present.

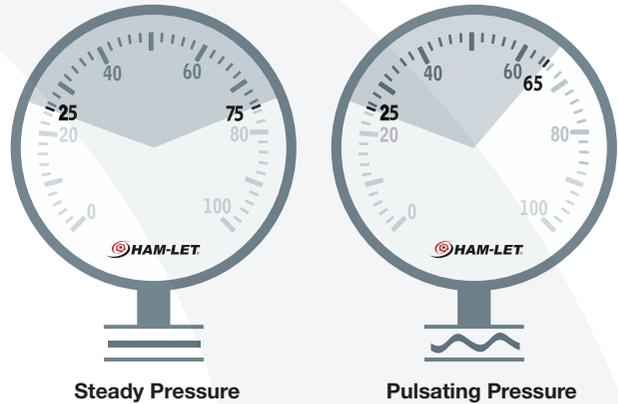
## HANDLING AND TRANSPORT

This device contains sensitive components and must be handled with due care. To prevent any impairment of the gauge, it is essential to protect the device from mechanical shocks or impacts during transport, installation, and operation.

## SCALE SELECTION AND LOAD LIMITS

The general recommendation for working measured pressure should be in the range of 25-65% for pulsating pressures and 25-75% for steady pressures out of the maximal dial range.

### RECOMMENDED WORKING PRESSURE RANGE



### MAXIMAL PRESSURE LOAD LIMITS FOR OPERATION WITHOUT LOSS OF ACCURACY

Case size: 100, 115, 160 mm (4", 4½", 6")	
Type of load	Pressure load limit out of full scale
Steady	100%
Pulsating (cyclic)	90%
Over pressure (temporary)	130%

Case size: 40, 50, 63 mm (1½", 2", 2½")	
Type of load	Pressure load limit out of full scale
Steady	75%
Pulsating (cyclic)	65%
Over pressure (temporary)	100%

💡 The IMP gauges are constructed to withstand up to 300% over full-scale pressure without system failure.

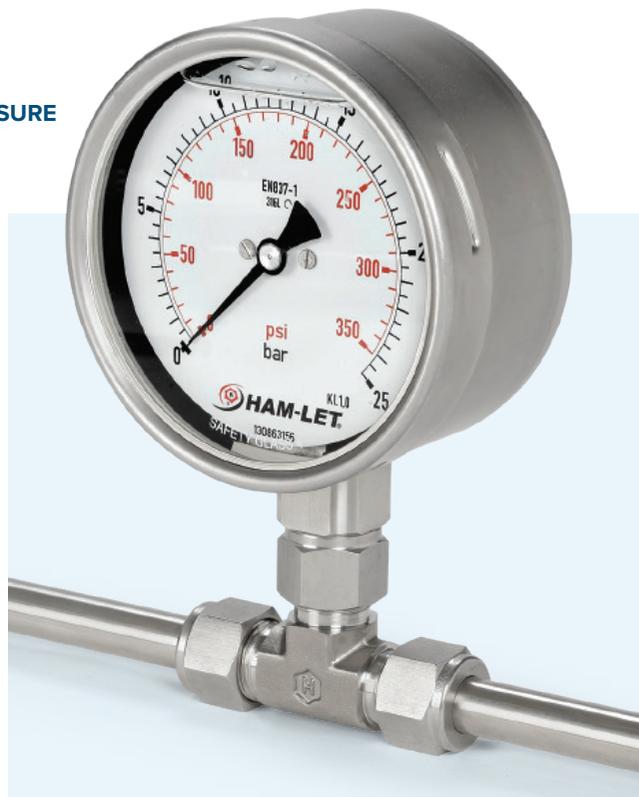
💡 With low pressure gauges (L series), up to 1,000% over full-scale pressure protection can be supplied as an option.

## HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

### PROCESS CONNECTIONS

#### STAINLESS STEEL PROCESS CONNECTIONS MAXIMAL PRESSURE

Connection		Maximal Pressure
Type	Size	
BSP-P	1/8"	6,000 psi (400 bar)
NPT		
BSP-P	1/4"	15,000 psi (1000 bar)
NPT		
Face seal	1/4"	5,200 psi (359 bar)
NPT	1/2"	15,000 psi (1000 bar)
BSP-P	1/2"	20,000 psi (1600 bar)
HP		
Tube adapter	1/4", 6mm	6,000 psi (400 bar)
	3/8", 1/2", 10mm, 12mm	6,000 psi (400 bar)



### TEMPERATURE LIMITATIONS

Temperature Limitations	Unfilled	Glycerin (99%) Filled	Glycerin (86%) Low Temperature Filled
<b>Storage</b>	-40 to +158 °F	-4 to +158 °F	-4 to +158 °F
	(-40 to +70 °C)	(-20 to +70 °C)	(-20 to +70 °C)
<b>Ambient</b>	-40 to +140 °F	-4 to +140 °F	-40 to +140 °F
	(-40 to +60 °C)	(-20 to +60 °C)	(-40 to +60 °C)
<b>Media Max. H,G,S Series</b>	+392 °F	+212 °F	+212 °F
	(+200 °C)	(+100 °C)	(+100 °C)
<b>Media Max. P,L Series</b>	+212 °F	+158 °F	+158 °F
	(+100 °C)	(+70 °C)	(+70 °C)

### REFERENCE TEMPERATURE

The measuring device is calibrated for working temperature of +68°F (+20°C). A 0.4% deviation in the measured pressure for each +18 °F (+10 °C) temperature change should be expected.



**For extreme ambient or media temperatures, please consult a UCT local representative.**

#### Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance.



**HEAVY DUTY  
PRESSURE GAUGES**

**IMPH  
SERIES**



HAM-LET IMP GAUGES H SERIES

# IMPH series

## Data Sheet

### GENERAL

The mechanical H-Heavy Duty Pressure Gauge series is designed for industrial instrumentation and process applications that require durability and accuracy with easy maintenance for indoor, outdoor and harsh environments.

The H series are bourdon tube mechanical devices. Case sizes 63, 100, 160mm ( 2½", 4", 6") are suitable for vacuum with pressures up to 1,000 bar (15,000 psi).

### FEATURES

- Stainless steel case and wetted parts
- Bayonet ring and adjustable pointer for easy adjustment
- Safety laminated glass front
- Case is filled or fillable dry
- Case protection: IP 65 (IP 54 for 160mm (6") case with range 30 psi (2.5bar) and below
- Safety category (EN 837-1) S1 for IMPH10/IMPH16, S2 for IMPH63
- Measuring Ranges
  - Vacuum: 30" Hg Vac. to 0 psi (-1 to 0 bar)
  - Compound: 30" Hg Vac. through 0 to 300 psi (-1 through 0 to 15 bar)
  - Pressure: 0 to 15,000 psi (0 to 1,000 bar)

### MATERIALS

Part		Material
Wetted Parts	Process Connection	SST 316L
	Bourdon Tube	
Case		SST 304
Window		Laminated safety glass
Movement		Stainless steel
Dial		Aluminum (black figures, white background)
Pointer		Aluminum (black)

## HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES



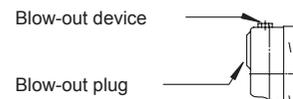
### TECHNICAL DATA

Case Size		63mm (2½")	100mm (4")	160mm (6")
Accuracy	Up to 6,000 psi (400 bar)	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade B	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A
	10,000 psi (600 bar) and above <sup>2</sup>	±2.5% of span EN 837-1 Class 2.5 ASME B40.1 Grade C	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A
Case Configurations	Process connection position			
	Mounting device (optional)			
Process Connection	1/2", 12 mm tube adapter		+	
	3/8", 10 mm tube adapter	+		
	1/4", 6 mm tube adapter	+		
	1/2", BSP-P/NPT		+	+
	1/4", BSP-P/NPT	+	+	+
	1/8", BSP-P/NPT	+		
	M20x1.5		+	+
	M12x1.5	+	+	+
1/4", face seal male/female swivel <sup>3</sup>	+			
Blow-Out Device	Blow-out device at the top of the case			+
	Blow-out plug at the back of the case, Ø 40mm (1½")		+	
	Blow-out plug at the top of the case	+		
Case Ventilation	By blow-out device/Plug	+		+
	Internal pressure compensation by pressure equalizing membrane		+	
Weight <sup>1</sup> Pound (Kg.)	Unfilled	0.40 (0.18)	1.33 (0.60)	2.43 (1.10)
	Filled	0.55 (0.25)	2.10 (0.95)	4.30 (1.95)

<sup>1</sup> Approx. without mounting device

<sup>2</sup> See maximal pressure per connection type, page 3

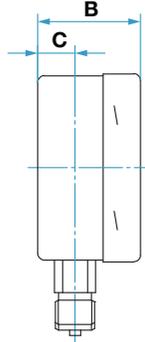
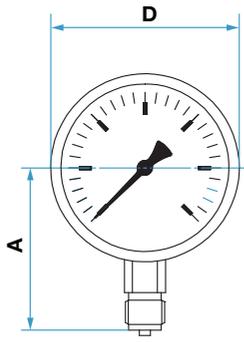
<sup>3</sup> Up to 250 bar (4000 psi)



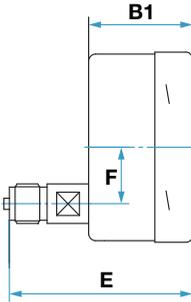


CONFIGURATION AND MOUNTING DIMENSIONS

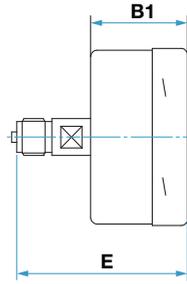
Lower Mount



Lower Back Mount

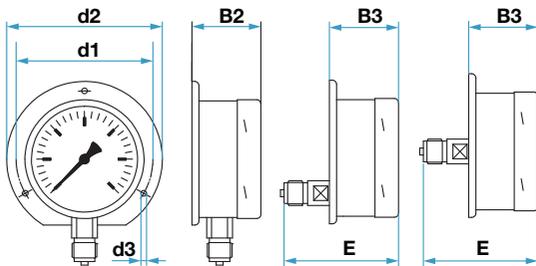


Center Back Mount

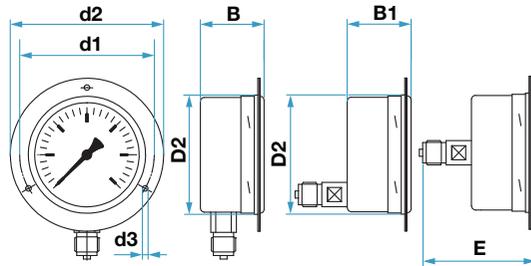


Case Size		A		B		B1		C		D		E		F	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	54	2.13	33	1.3	37	1.46	10	0.39	64	2.52	59	2.32	18	0.71
100	4	87	3.43	55	2.17	55	2.17	20	0.79	101	3.98	97	3.82	30	1.18
160	6	115	4.53	51	2.01	51	2.01	15.5	0.61	161	6.34	92.5	3.64	30	1.18

Back Flange Mounting



Front Flange Mounting



Case Size		B2		B3		D2		d1		d2		d3	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	36	1.42	40	1.57	66	2.6	75	2.95	85	3.35	3.6	0.14
100	4	58.5	2.3	58.5	2.3	103	4.06	116	4.57	132	5.2	4.8	0.19
160	6	54	2.13	54	2.13	163	6.42	178	7.01	196	7.72	5.8	0.23



**GENERAL USE  
PRESSURE GAUGES**

**IMPG  
SERIES**



# IMP G series

## Data Sheet

### GENERAL

The Industrial G—General Use Pressure Gauge series guarantee long life and durability for indoor, outdoor and harsh surroundings in industrial, instrumentation and process applications.

The G series pressure gauge is a bourdon tube mechanical device, case sizes 50, 63, 100, 160mm (2", 2½", 4", 6") suitable for vacuum in pressures up to 1,000 bar (15,000 psi).

### FEATURES

- Stainless steel case and wetted parts
- Polished crimped-on ring for firm window sealing
- Safety laminated glass front
- Case is filled or fillable dry
- Case protection: IP 65 (IP 54 for 160mm (6") case with range 30 psi (2.5 bar) and below)
- Safety category (EN 837-1) S1 for pressure gauges with blow-out device
- Measuring Ranges
  - Vacuum: 30" Hg Vac. to 0 psi (-1 to 0 bar)
  - Compound: 30" Hg Vac. through 0 to 300 psi (-1 through 0 to 15 bar)
  - Pressure: 0 to 15,000 psi (0 to 1,000 bar), 40mm (1 1/2") case up to 10,000 psi (600 bar)

### MATERIALS

Part		Material
Wetted Parts	Process Connection	SST 316L
	Bourdon Tube	
Case		SST 304
Window		Laminated safety glass
Movement		Stainless steel
Dial		Aluminum (black figures, white background)
Pointer		Aluminum (black)

# HAM-LET IMP GAUGES G SERIES



## TECHNICAL DATA

Case Size		40mm (1½") 50mm (2")	63mm (2½")	100mm (4")	160mm (6")	
Accuracy	Up to 6,000psi (400 bar)	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade B	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade B	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	
	10,000 psi (600 bar) and above <sup>2</sup>	±2.5% of span EN 837-1 Class 2.5 ASME B40.1 Grade C	±2.5% of span EN 837-1 Class 2.5 ASME B40.1 Grade C	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	
Case Configurations	Process connection position					
	Mounting device (optional)					
Process Connection	1/2", 12 mm tube adapter			+		
	3/8", 10 mm tube adapter		+	+		
	1/4", 6 mm tube adapter		+	+		
	1/2", BSP-P/NPT			+	+	
	1/4", BSP-P/NPT	+ <sup>4</sup>	+	+	+	
	1/8", BSP-P/NPT <sup>7</sup>	+	+	+		
	M20x1.5			+	+	
	M12x1.5	+ <sup>4</sup>	+	+	+	
1/4", Face seal male/female swivel <sup>5</sup>	+ <sup>5</sup>	+ <sup>5</sup>	+ <sup>3</sup>			
Blow-Out Device	Blow-out device at the top of the case				+	
	Blow-out plug in the back of the case, Ø 40mm (1½")			+		
	Blow-out plug at the top of the case			+		
Case Ventilation	By blow-out device/Plug		+	+	+	
	Internal pressure compensation by pressure equalizing membrane	+ <sup>6</sup>		+		
Weight <sup>1</sup> Pound (Kg.)	Unfilled	0.15 (0.07)	0.198 (0.09)	0.40 (0.18)	1.33 (0.60)	2.43 (1.10)
	Filled	0.22 (0.10)	0.286 (0.13)	0.55 (0.25)	1.98 (0.90)	3.75 (1.70)

<sup>1</sup>Approx. without mounting device

<sup>2</sup>See maximal pressure per connection type, page 3

<sup>3</sup>Up to 250 bar (4,000 psi), female face seal only with "B" option

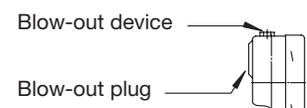
<sup>4</sup>Center back only

<sup>5</sup>Up to 100 bar (1,450 psi)

<sup>6</sup>For pressure ranges up to 0-16 bar (0-200 psi)

<sup>7</sup>1/8 BSPP is available with front flange / U-clamp only with "C" center mount option

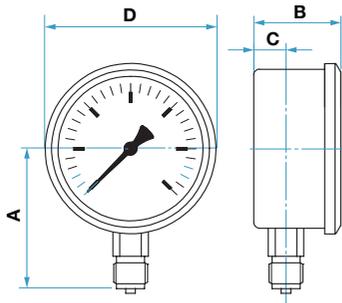
back



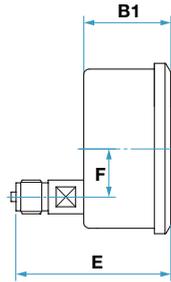


CONFIGURATION AND MOUNTING DIMENSIONS

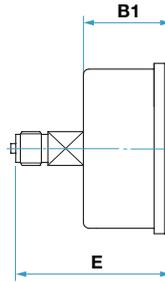
Lower Mount



Lower Back Mount

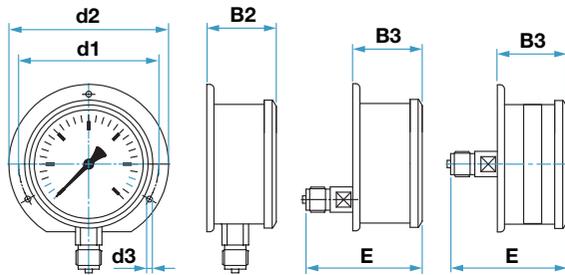


Center Back Mount

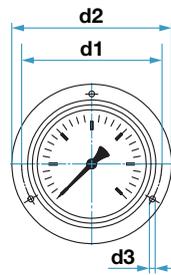


Case Size		A		B		B1		C		D		E		F	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
40	1 1/2	34.5	1.36	28	1.1	30	1.18	10	0.4	40	1.57	47	1.85	-	-
50	2	45	1.77	29	1.14	31	1.22	10	0.4	54	2.13	50	1.97	-	-
63	2 1/2	54	2.13	33	1.3	37	1.46	10	0.40	67	2.63	60	2.36	18	0.71
100	4	87	3.43	54	2.13	54	2.13	20	0.79	106	4.17	96	3.78	30	1.18
160	6	115	4.53	50	1.97	55	2.17	15	0.59	167	6.57	97	3.82	30	1.18

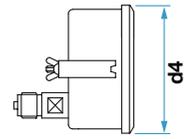
Back Flange Mounting



Front Flange Mounting



U-Clamp



Case Size		B2		B3		D2		d1		d2		d3		d4	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
40	1 1/2	-	-	-	-	41.8	1.64	51	2.01	61	2.4	3.6	0.14	46	1.81
50	2	-	-	-	-	51	2.01	60	2.36	71	2.8	3.6	0.14	71	2.8
63	2 1/2	36	1.42	40	1.57	64	2.52	75	2.95	85	3.35	3.6	0.14	-	-
100	4	57.5	2.26	57.5	2.26	101	3.98	116	4.57	132	5.2	4.8	0.19	-	-
160	6	53	2.09	58	2.28	-	-	178	7.01	196	7.72	5.8	0.23	-	-



## **SAFETY PATTERN/SOLID FRONT PRESSURE GAUGES**

# **IMPS**

**SERIES**



# IMPS series

## Data Sheet

### GENERAL

The Industrial S–Safety Pattern/Solid Front Pressure Gauge series is a heavy duty pressure gauge with a special case and a laminated safety glass window, allowing safer usage for the system user. The IMPS series offers long usability and durability for indoor, outdoor and harsh surroundings in the industrial instrumentation and process applications.

The Safety Pattern/Solid Front case has a break-proof solid front (a firm partition between the pressure element and the window) and a pressure relief back (blow-out back).

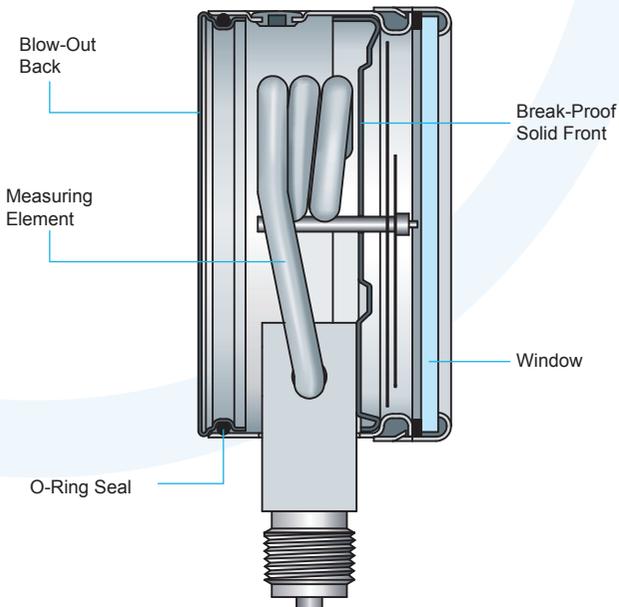
The S series is marked with the  $\text{\textcircled{S}}$  symbol on the dial. The S series pressure gauge is a bourdon tube mechanical device with case sizes 63, 100, 160mm (2½", 4", 6") suitable for vacuum in pressures up to 1,000 bar (15,000 psi).

### FEATURES

- Stainless steel case and wetted parts
- Bayonet ring and adjustable pointer for easy adjustment
- Break-proof solid front case with blow-out back
- Safety laminated glass front
- Case is filled or fillable dry
- Case Protection: IP 65
- Safety Category (EN 837-1) S3
- Measuring Ranges
  - Vacuum: 30" Hg Vac. to 0 psi (-1 to 0 bar)
  - Compound: 30" Hg Vac. through 0 to 300 psi (-1 through 0 to 15 bar)
  - Pressure: 0 to 15,000 psi (0 to 1,000 bar)

### MATERIALS

Part		Material
Wetted Parts	Process Connection	SST 316L
	Bourdon Tube	
Case		SST 304
Window		Laminated safety glass
Movement		Stainless steel
Dial		Aluminum (black figures, white background)
Pointer		Aluminum (black)



# HAM-LET IMP GAUGES S SERIES



## TECHNICAL DATA S SERIES

Case Size		63mm (2½")	100mm (4")	160mm (6")
Accuracy	Up to 6,000 psi (400 bar)	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade B	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A
	10,000 psi (600 bar) and above <sup>2</sup>	±2.5% of span EN 837-1 Class 2.5 ASME B40.1 Grade c	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A	±1.0% of span EN 837-1 Class 1.0 ASME B40.1 Grade 1A
Case Configurations	Process connection position			
	Mounting device (optional)			
Process Connection	1/2", 12 mm tube adapter		+	
	3/8", 10 mm tube adapter	+	+	
	1/4", 6 mm tube adapter	+	+	
	1/2", BSP-P/NPT		+	+
	1/4", BSP-P/NPT	+	+	+
	1/8", BSP-P/NPT	+		
	M20x1.5		+	+
	M12x1.5	+	+	+
1/4" face seal swivel	+			
Blow-Out Device	Blow-out back	+	+	+
Case Ventilation	Screw with ventilation bore	+	+	+
	Internal pressure compensation by pressure equalizing membrane	+	+	
Weight <sup>1</sup> Pound (Kg.)	Unfilled	0.39 (0.18)	1.40 (0.65)	3.30 (1.50)
	Filled	0.55 (0.25)	2.20 (1.00)	6.5 (2.95)

<sup>1</sup>Approx. without mounting device

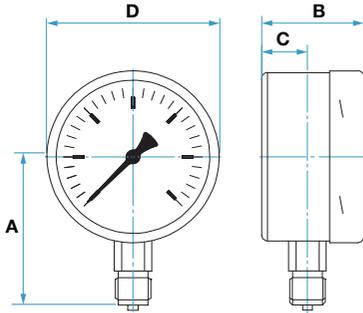
<sup>2</sup>See Maximal pressure per connection type, page 3

\*Lower back connection available only for dry option 63mm and 100mm

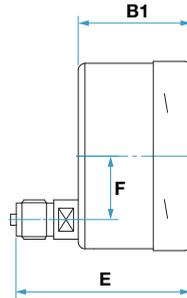


CONFIGURATION AND MOUNTING DIMENSIONS

Lower Mount

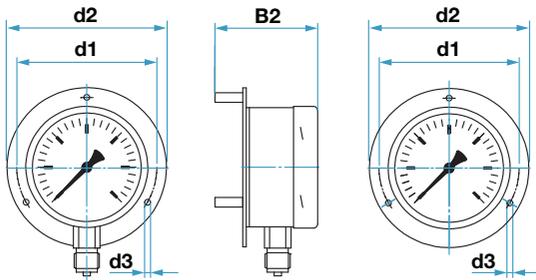


Lower Back Mount

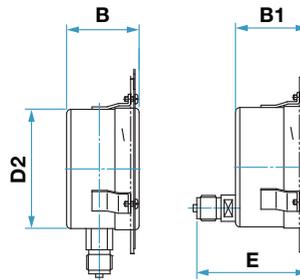


Case Size		A		B		B1		C		D		E		F	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	54	2.13	41	1.61	41	1.61	18	0.71	64	2.52	63	2.48	18	0.71
100	4	87	3.43	60	2.36	60	2.36	27	1.06	101	3.98	93	3.66	34	1.34
160	6	115	4.53	78	3.07	78	3.07	40	1.57	161	6.34	-	-	-	-

Back Flange Mounting



Front Flange Mounting



Case Size		B2		d1		d2		d3	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	61	2.4	75	2.95	85	3.35	3.6	0.14
100	4	85	3.35	116	4.57	132	5.2	4.8	0.19
160	6	108	4.25	178	7.01	196	7.72	5.8	0.23



**PROCESS  
PRESSURE GAUGES**

**IMPP  
SERIES**



# IMPP series

## Data Sheet

### GENERAL

The Industrial P – Process Pressure Gauge is a heavy-duty pressure gauge with a special thermoplastic safety case for process industries, chemical, petro-chemical, oil & gas, and power plant applications with accordance to the ASME B40.1 standard.

The reinforced thermoplastic case and stainless steel wetted parts make the P pressure gauge suitable for service in corrosive areas and with aggressive media while maintaining a long life and durability for indoor and outdoor process applications.

The safety pattern case has a break-proof solid front (a firm partition between the pressure element and the window) and pressure relief back (blow-out back).

The P series pressure gauge is a bourdon tube mechanical device, of case sizes 4½" (115 mm). Suitable for vacuum in pressures up to 1,000 bar (15,000 psi).

### FEATURES

- Thermoplastic case with back mounting design
- Stainless steel wetted parts
- Adjustable pointer (micro pointer) for easy adjustment
- Break-proof solid front case with blow-out back
- Safety laminated glass front
- Case is filled or fillable
- Case protection: IP 65
- Compliance to ASME B40.1 standard grade 2A
- Fire retardant and impact resistance according UL 94 VO

### Measuring ranges

- Vacuum: 30" Hg Vac. to 0 psi (-1 to 0 bar)
- Compound: 30" Hg Vac. through 0 to 300 psi (-1 through 0 to 15 bar)
- Pressure: 0 to 15,000 psi (0 to 1,000 bar).

# HAM-LET IMP GAUGES P SERIES



## MATERIALS OF CONSTRUCTION

Part		Material
Wetted Parts:	Process Connection	SS 316L
	Bourdon tube	
Case		Thermoplastic PBTP Black
Window		Laminated safety glass
Movement		Stainless Steel
Dial		Aluminum (black figures, white background)
Pointer		Aluminum (black)

## TECHNICAL DATA P SERIES

Case Size	4½" (115 mm)	
Accuracy	Up to 15,000 psi (1000 bar) <sup>2</sup>	±0.5% of span EN 837-1 Class 1.0 ASME B40.1 Grade 2A
Case Configurations	Process connection position	
	Built-in mounting	
Process Connection	½", 12mm Tube adapter	+
	½" BSP-P/NPT	+
	¼" BSP-P/NPT	+
Blow-Out Device	Blow-out back	+
Compensation Diaphragm	By blow-out device / Plug	+
	Internal Elastomer	+
Weight <sup>1</sup> Pound (Kg.)	Unfilled	1.88 (0.85)
	Filled	2.76 (1.25)

<sup>1</sup>Approx. without mounting device

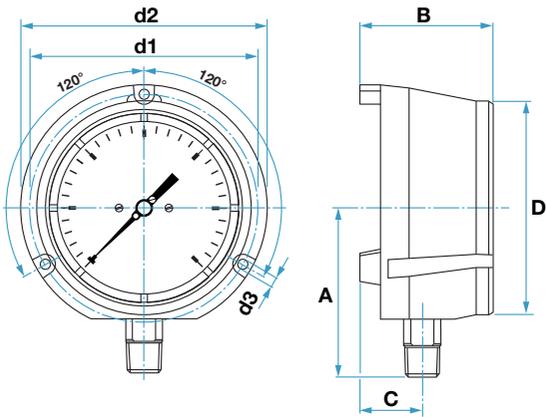
<sup>2</sup>See maximal pressure per connection type, page 3

<sup>3</sup>Available in filled or fillable version only



CONFIGURATION AND MOUNTING DIMENSIONS

Lower Mount



Case Size		A		B		C		D		d1		d2		d3	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
115	4 1/2	102	4.02	80	3.15	37.5	1.48	129	5.08	137	5.39	148	5.83	6.1	0.24



## LOW PRESSURES PRESSURE GAUGES

# IMPL SERIES



# IMPL series

## Data Sheet

### GENERAL

The Industrial L – Low Pressure Gauge series are gaseous media positive and negative low pressure measurement devices with long usability and durability for indoor, outdoor and harsh surroundings in industrial, instrumentation and process applications.

The L series pressure gauge is a capsule mechanical device, case sizes 63, 100, 160mm (2½", 4", 6") are suitable for vacuum to for pressures up to 250inchH2O (600 mbar).

### FEATURES

- Stainless steel case and wetted parts
- Bayonet ring
- Front-sided screw for zero point adjustment with an adjusting range of ±5%
- Case is filled or dry
- Case protection: IP 54
- Measuring ranges:
  - Vacuum/ Pressure: 0-1inchH2O up to 0-250inchH2O (0-2.5mbar up to 0-600mbar)  
For case size 63mm (2½") 0-25inchH2O (0-25mbar) and up.
  - Compound: -0.4-06inchH2O up to -150-100inchH2O (-1-1.5mbar up to -400-200mbar)  
For case size 63mm (2½") -4-6inchH2O (-10-15mbar) and up.
- Only for dry and filled case.

### MATERIALS

Part		Material
Wetted Parts	Process Connection	SST 316L
	Bourdon Tube	
Case		SST 304
Window		Laminated safety glass
Movement		Stainless steel
Dial		Aluminum (black figures, white background)
Pointer		Aluminum (black)

# HAM-LET IMP GAUGES L SERIES

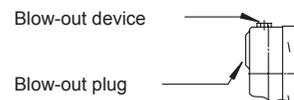


## TECHNICAL DATA L SERIES

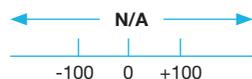
Case Size		63mm (2½")	100mm (4")	160mm (6")
Accuracy		±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade B	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade 1A	±1.6% of span EN 837-1 Class 1.6 ASME B40.1 Grade 1A
Case Configurations	Process connection position			
	Mounting device (optional)			
Process Connection	1/2", 12 mm tube adapter		+	
	3/8", 10 mm tube adapter	+		
	1/4", 6 mm tube adapter	+		
	1/2", BSP-P/NPT		+	+
	1/4", BSP-P/NPT	+	+	+
	1/8", BSP-P/NPT	+		
	M20x1.5		+	+
M12x1.5	+	+	+	
Case Ventilation Filled Only	By blow-out device		+	
Weight <sup>1</sup> Pound (Kg.)	Unfilled	0.44 (0.20)	1.32 (0.60)	2.20 (1.00) <sup>2</sup>
	Filled	0.57 (0.26)	2.09 (0.95)	3.97 (1.80) <sup>2</sup>

<sup>1</sup>Approx. without mounting device

<sup>2</sup>For 160mm (6") ≥ 25mbar - Unfilled 2.09 (0.95), Filled 3.97 (1.80)



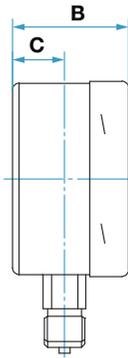
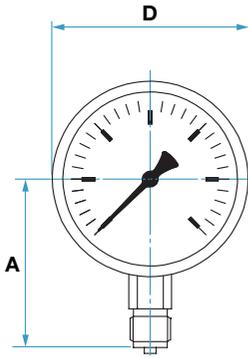
For filled case, only in range below -100 mbar OR above 100 mbar



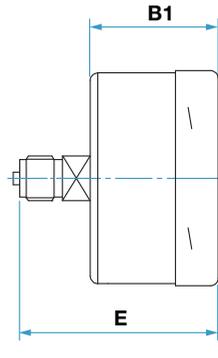


CONFIGURATION AND MOUNTING DIMENSIONS

Lower Mount

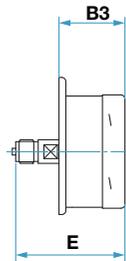
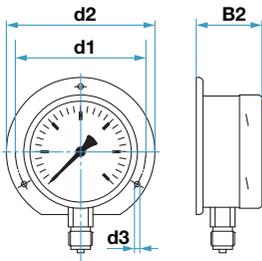


Lower Back Mount

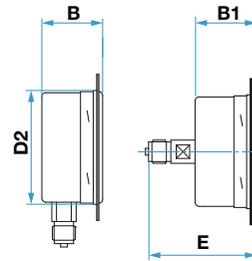
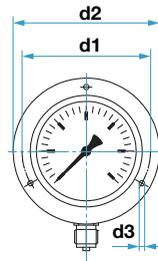


Case Size		A		B		B1		C		D		E	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	54	2.13	38 (1)	1.5(1)	37	1.46	10	0.4	64	2.52	60	2.36
100	4	87	3.43	55	2.17	55	2.17	20 (2)	0.79 (2)	101	3.98	85	3.35
160	6	115	4.53	55	2.17	55	2.17	15	0.59	161	6.34	85	3.35
≤6 inCH <sub>2</sub> O (16mbar)													
160	6	115	4.53	51	2.01	51	2.01	15	0.59	161	6.34	81	3.18
≥10 inCH <sub>2</sub> O (25 mbar)													

Back Flange Mounting



Front Flange Mounting



Case Size		B2		B3		D2		d1		d2		d3	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
63	2 1/2	41 <sup>1</sup>	1.61 <sup>1</sup>	40	1.57	66	2.6	75	2.95	85	3.35	3.6	0.14
100	4	59	2.32	59	2.32	103	4.06	116	4.57	132	5.20	4.8	0.19
160	6	58	2.28	58	2.28	163	6.42	178	7.01	196	7.72	5.8	0.23
≤6 inCH <sub>2</sub> O (16mbar)													
160	6	54	2.13	54	2.13	163	6.42	178	7.01	196	7.72	5.8	0.23
≥10 inCH <sub>2</sub> O (25mbar)													

<sup>1</sup>For case size 63 filled: B=47 mm (1.85 inch), B2=50 mm (1.97 inch)

<sup>2</sup>For range ≤ 6 inCH<sub>2</sub>O (16mbar): C=15.5 mm (0.61 inch)

# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

## ORDERING INFORMATION FOR INDUSTRIAL MECHANICAL PRESSURE GAUGES

**OPTIONAL**

See following pages

**IMP**

**Industrial Mechanical Pressure Gauge**

**Series<sup>1</sup>**

<b>H</b>	Heavy Duty
<b>G</b>	General Use
<b>S<sup>3</sup></b>	Safety Pattern
<b>L<sup>1</sup></b>	Low Pressures
<b>P<sup>2</sup></b>	Process

**Gauge Size**

	mm	inch
<b>40</b>	40	1 1/2
<b>50</b>	50	2
<b>63</b>	63	2 1/2
<b>10</b>	100	4
<b>11<sup>6</sup></b>	115	4 1/2
<b>16</b>	160	6

**10** - **L** **P** **1/4**

**Process Connection Type**

Connection Type	Connection Size
<b>P</b> BSP-P	1/8", 1/4", 1/2"
<b>N</b> NPT	1/8", 1/4", 1/2"
<b>M</b> Metric (Mx1.5)	12 mm, 20 mm
<b>T<sup>4</sup></b> Tube adapter	06 mm, 10 mm, 12 mm 1/4", 3/8", 1/2"
<b>V<sup>5</sup></b> Face seal male swivel	1/4"
<b>F<sup>5</sup></b> Face seal female swivel	1/4"
<b>H</b> High pressure male	9/16"
High pressure female	1/4" 16 mm

**Process Connection Location\***

<b>L</b>	Lower Mount	
<b>B</b>	Lower Back Mount	
<b>C</b>	Center Back Mount	

**N** - **B** **PO25**

**Mounting Device\***

<b>N</b>	None
<b>R</b>	Rear Flange
<b>F</b>	Front Flange
<b>U</b>	U-Clamp

\*Please check mounting options availability in series' chapter

**Dial Range Units**

<b>B</b>	bar
<b>P</b>	psi
<b>M</b>	milibar
<b>K</b>	kPa
<b>I</b>	MPa
<b>H</b>	inH <sub>2</sub> O
<b>A</b>	psi/bar
<b>C</b>	psi/kPa
<b>D</b>	psi/kgf/cm <sup>2</sup>
<b>E</b>	bar/psi
<b>F</b>	MPa/bar
<b>G</b>	kPa/H <sub>2</sub> O
<b>T</b>	Meter
<b>L</b>	kgf/cm <sup>2</sup>
<b>O</b>	mm H <sub>2</sub> O
<b>S</b>	Atmosphere

**E** - 

**Case**

<b>D</b>	Dry
<b>E</b>	Fillable (empty)
<b>G</b>	Glycerin (99%)
<b>L</b>	Low temperature glycerin (86%)
<b>S</b>	Silicon oil

**Dial Range**

See table in next page

<sup>1</sup>Fillable case not available  
<sup>2</sup>Dry case not available  
<sup>3</sup>Lower back connection available only for dry case  
<sup>4</sup>T option available for 50mm and up  
<sup>5</sup>Face Seal options available for dry case only  
<sup>6</sup>Available for IMPP only

## ORDERING INFORMATION FOR CERTIFICATION

Accuracy, material and various standard conformance certifications are available for ordering

**IMP** **C** **31** **M** **BLANK**

**Industrial Mechanical Pressure Gauge**

**Certificate**

Class <sup>1,3</sup>	Category	Type
<b>21</b> 2.1 - Pass/Fail	<b>A</b> Accuracy <sup>4</sup>	<b>Blank</b> General
<b>22</b> 2.2- Inspection	<b>M</b> Material	<b>R</b> GOST - (Russia)
<b>31</b> 3.1 <sup>2</sup> -Test Results, Item Approval	<b>S</b> Standard Conformance <sup>5</sup>	<b>U</b> GOST - (Ukraine)
	<b>T</b> Quality Test	<b>K</b> GOST - (Kazakhstan)
		<b>RANGE BP600 BP600</b> Up to 600 bar (10,000 psi) scale
		<b>RANGE BP01KBP01K</b> Up to 1000 bar (15,000 psi) scale

<sup>1</sup>According EN10204  
<sup>2</sup>Test certificate 3.1 for the material is per qty of gauge and type of gauge  
<sup>3</sup>Category per class: 21-S | 22-A,M,T | 31-A,M  
<sup>4</sup>Inspection certification for accuracy 2.2 depends on class accuracy, certification 3.1 depends on range and qty. of gauge  
<sup>5</sup>Per order.

### Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance.

# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

## DIAL RANGE ORDERING CODES

H,G,S,P Series								
bar			psi			MPa		
Code	Min.	Max.	Code	Min.	Max.	Code	Min.	Max.
V001	-1	0	V001	30" Hg vac.	0	V000	-0.1	0.00
VP60	-0.6	0	C015	30" Hg vac.	15			
CP60	-1	0.6	C030	30" Hg vac.	30	CP06	-0.1	0.06
C1P5	-1	1.5	C060	30" Hg vac.	60	CP15	-0.1	0.15
C003	-1	3	C100	30" Hg vac.	100	CP30	-0.1	0.30
C005	-1	5	C160	30" Hg vac.	160	CP50	-0.1	0.50
C009	-1	9	C200	30" Hg vac.	200	CP90	-0.1	0.90
C015	-1	15				C1P5	-0.1	1.50
			P315	3	15			
PP21	0.2	1	P010	0	10			
PP60	0	0.6	P015	0	15			
P001	0	1				PP10	0	0.1
P1P6	0	1.6	P030	0	30	PP16	0	0.16
P2P5	0	2.5	P060	0	60	PP25	0	0.25
P004	0	4	P100	0	100	PP40	0	0.40
P006	0	6	P160	0	160	PP60	0	0.60
P010	0	10	P200	0	200	P001	0	1
P016	0	16	P300	0	300	P1P6	0	1.6
P025	0	25	P600	0	600	P2P5	0	2.5
P040	0	40	P800	0	800	P004	0	4
P060	0	60	P01k	0	1,000	P006	0	6
			P1k5	0	1,500			
P100	0	100	P02k	0	2,000	P010	0	10
P160	0	160	P03k	0	3,000	P016	0	16
P250	0	250	P04k	0	4,000	P025	0	25
			P05k	0	5,000			
P400	0	400	P06k	0	6,000	P040	0	40
			P10k	0	10,000			
P600	0	600				P060	0	60
P01k	0	1,000	P15k	0	15,000	P100	0	100

L Series								
Milibar			kPa			in H2O		
Code	Min.	Max.	Code	Min.	Max.	Code	Min.	Max.
V600	-600	0						
			V050	-50	0			
V400	-400	0						
V250	-250	0				V100	-100	0
			V020	-20	0			
V160	-160	0						
			V015	-15	0	V060	-60	0
V100	-100	0						
			V007	-7	0			
V060	-60	0						
			V005	-5	0			
V040	-40	0	V004	-4	0			
V025	-25	0						
V016	-16	0						
V010	-10	0						
V006	-6	0						
V004	-4.0	0						
V2P5	-2.5	0						
C200	-400	200						
C400	-200	400						
C150	-250	150						
C250	-150	250						
C100	-150	100						
C115	-100	150						
C160	-100	60						
C610	-60	100						
C040	-60	40						
C060	-40	60						
C020	-40	20						
C240	-20	40						
C015	-25	15						
C025	-15	25						
C010	-15	10						
C105	-10	15						
P004	0	4						
P006	0	6						
P010	0	10						
P016	0	16						
P025	0	25						
P040	0	40	P004	0	4			
			P005	0	5			
P060	0	60						
			P007	0	7			
P100	0	100						
			P015	0	15	P060	0	60
P160	0	160						
			P020	0	20			
P250	0	250				P100	0	100
P400	0	400						
			P050	0	50			
P600	0	600						

# HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

## OPTIONS ORDERING CODES

P	L	N	E	Y	6	X	R
Pointer selection	Specials				Restriction screw <sup>6</sup>	Variations <sup>1</sup>	Special Compatibility
<b>P</b> <sup>1</sup> Fix pointer pointer	<b>L</b> <sup>2,4</sup> Lubricant free	<b>N</b> Alloy 400 Wetted Parts	<b>E</b> Helium Leak Test	<b>Y</b> <sup>5</sup> Vibration Resistant Movement	<b>0</b> Ø 0.0mm	<b>w</b> <sup>7</sup> Pure gases	<b>R</b> GOST-T - Russia <b>U</b> GOST-T - Ukraine <b>K</b> GOST-T - Kazakhstan
<b>M</b> <sup>1</sup> Min/Max pointer pointer	<b>S</b> Silicon free		<b>v</b> <sup>1</sup> ATEX		<b>3</b> Ø 0.3mm		
	<b>X</b> <sup>3</sup> Oxygen cleaning*			<b>6</b> Ø 0.6mm	<b>Z</b> Grade 3A (ASME)		
					<b>8</b> Ø 0.8mm		

<sup>1</sup>Many options available; contact technical support team.  
<sup>2</sup>For dry and fillable cases only  
<sup>3</sup>Only in "D", for Ø160mm only for IMPS.  
<sup>4</sup>Not available for IMPP.  
<sup>5</sup>Available only for IMPH+IMPG dry (above 63mm)  
<sup>6</sup>Not available for cases 40mm,50mm  
<sup>7</sup>IMPG50 / IMPH63 dry cases only. end connection 1/4" NPT / Face seal

### ADDITIONAL ELEMENTS

**Fixed Pointer:** Additional red which points to a designated pressure on the dial. The fixed pointer does not move with the measured pressure changes and it is used to mark a fixed measure on the dial.

**Min/Max Pointer:** Additional red pointer which points to the minimal or maximal pressure that was pointed to by the gauge main pointer. The min/max pointer includes a mechanism to reset its position to the initial read ("0" read). The min/max pointer moves with the main gauge pointer to the minimal or maximal pointing position and remains in this position when the pressure read raises/drops respectively and is used to point to the minimal/maximal pressure read over time.

**Material Heat Stamp:** This is required whenever a material certificate level 3.1 is requested to be supplied with the gauge. (See "Certification" for more information on material certificate).

### SPECIALS

**Lubricant Free:** The gauge is specially cleaned to have no oil left on its internals. The Lubricant Free gauge is marked with a  icon on its dial.

**Silicon Free:** The gauge is specially cleaned to have no silicon left on its internals.

**Alloy 400 Wetted Parts:** The gauge wetted parts are made of Alloy 400 which is frequently used for measuring highly corrosive media. Other special wetted parts materials: are available

**Helium Leak Test** The gauge is tested for leakage of up to 10-9 mbar l/s using pressurized helium.

### RESTRICTION SCREW

A restriction screw with the designated bore is installed at the gauge media inlet, and the restriction screw installation is done at the manufacturing plant. The restriction screw is meant to protect the gauge from pulsation and temporary high pressure and it slows down the gauge pointer reaction to pressure changes.

A gauge with a restriction screw should be carefully checked for inlet particle blockage, viscous media or other obstacles.

### VARIATIONS

Oxygen version: The gauge is specially made to be used for oxygen measurement.

### SPECIAL COMPATIBILITY

The gauge is manufactured to be compatible with the designated standard or regulation. A special compatible gauge is marked as required by the designated standard.

### MOUNTING DEVICE

**Rear Flange:** The metal flange on the back of the gauge case is used to firmly mount the gauge on a panel/wall or any other fixing. The back flange is a firmly welded part of the gauge case and it guarantees the best support for the gauge.

**Front Flange:** The metal flange on the front of the gauge case is used to firmly mount the gauge on a panel or any other fixing with a hole to host the gauge. The front flange is a firmly welded part of the gauge case and it guarantees the best support for the gauge.

**U-Clamp:** The metal U shaped clamp with two fixing bolts supports the gauge from the back side of the panel hosting the gauge.





ACCESSORIES

**FLAME ARRESTER  
(ATEX APPROVED)**

Flame Penetration Protection

**Function**

The flame arrester avoids flame penetration at deflagrations of potentially explosive vapor-air-resp. gas-air mixtures of explosion hazardous IIA, IIB and IIC in an upstreamed volume (e.g. pressure measuring instruments, chemical seals or similar).

**Explosion Protection**

The deflagration volume protection device corresponds as non-electrical equipment for potentially explosive areas with the harmonized norm DIN EN ISO 16852 "Flame Penetration Protection."

It is examined and approved as flame penetration protected at deflagration of flammable gases and liquids, according to EC-Type Examination Certificate / Approval PTB 12 ATEX 4001 X Explosion Protection Class IIG IIC. The corresponding marking according to ATEX 94/9/EG is made at a suitable position of the instrument.

**Construction**

Screw-adapter  
1/2" BSP-P internal x 1/2" BSP-P  
(others upon request)



See  
HAM-LET Manifolds  
catalog

**PRESSURE GAUGE COCKS**

**COCK MODELS**

Class	DIN 16262		DIN 16263	
Type	M20x1.5	1/2" BSP-P	Test Flange 60x25x10mm (2.36x0.98x0.39 inch)	Test Connection Male Thread M 20x1.5
Process Connection	Male thread M 20x1.5	Male thread 1/2" BSP-P		
Instrument Connection	Clamping sleeve female M20x1.5	Clamping sleeve female 1/2" BSP-P		
Nominal Pressure	PN 16			
Handle	Plastic			
Material	- Brass (Clamping sleeve alloy steel phosphatized) - Alloy steel - Stainless steel 316 (1.4571)			

**APPLICATIONS**

Fluid or gaseous media resp. steam at temperatures between -10 °C to +50 °C ( 14 °F to 122 °F).  
For connecting to a pressure gauge with flat sealing ring EN 837 (DIN 16 258).

**OVER-RANGE PROTECTOR**

The Over-Range Protector is a piston valve. The piston will remain in an "open" position as long as the pressure of the medium is lower than the back pressure imposed on the piston by the spring. As medium pressure exceeds the spring back pressure, the piston will move towards the spring and the piston valve will close. After the medium pressure decreases by approximately 25% below the set closing pressure, the valve opens and the spring force causes the piston to return to its original "open" position.

The over range protector has been designed to protect pressure gauges against pressure overload higher than the measuring range. It allows input of several gauges with different ascending pressure ranges and makes it possible to read even low ranges in a precise way, when the total range is much higher.  
The valves are not suitable for use as regulators.

**Models: Brass, stainless steel**

Available Ranges:	
PSI	BAR
3-35	0.4-2.5
30-85	2-6
75-350	5-25
300-850	20-30
750-3600	50-250
3500-5800	240-400

## HAM-LET INDUSTRIAL MECHANICAL PRESSURE GAUGES

### ACCESSORIES

#### PRESSURE GAUGE VALVES

According to DIN 16270, DIN 16271 with Male Test Connection, and with Test Flange

#### VALVES MODELS

Versions	Type	Process Connection	Gauge Connection	Test Connections
<b>DIN 16 270</b>	BSP-P	½" BSP-P male	Adjusting nut ½" BSP-P female	M 20x1,5
	Metric	M20x1,5 male	Adjusting nut M20x1,5 female	
<b>DIN 16 270</b> with fitting for gauge holder bracket	BSP-P	½" BSP-P male	Turnable nut ½" BSP-P female	
<b>DIN 16 271</b>	BSP-P	½" BSP-P male	Adjusting nut ½" BSP-P female	
	Metric	M20x1,5 male	Adjusting nut M20x1,5 female	
<b>DIN 16 271</b> with fitting for gauge holder bracket	BSP-P	½" BSP-P male	Turnable nut ½" BSP-P female	
<b>Similar to DIN 16 271</b> with test flange	BSP-P	½" BSP-P male	Adjusting nut ½" BSP-P female	Flange 60 x 25 x 10 mm

#### MATERIALS OF CONSTRUCTION

Versions	Brass	Alloy Steel	SST
<b>Components:</b>	Material (DIN material numbers)		
<b>Body</b>	Brass	SS (1.0460)	SST (1.4571)
<b>Valve spindle</b>	Ss (1.4104)		
<b>Valve cone</b>	Ss (1.4034 Hardened)		
<b>Packing</b>	Ptfe	Graphite	PTFE
<b>Union nut</b>	Alloy Steel		SST (1.4571)
<b>Adjusting nut</b>			
<b>Turnable nut</b>	Brass	Alloy steel	
<b>Vent screw</b>	Ss (1.4104)		
<b>Hand wheel</b>	Plastic		
<b>Temperature rating</b>	-10 / + 120 °C (14 / 248 °F)		-40 / +200 °C (-40 / +392 °F)

#### BALL SHOCK ABSORBER

Ball shock absorbers are designed to protect pressure instruments against re-impacts.

In case of pressure drops or pressure peaks, the media moves the stainless steel ball within the inlet port and damps the appropriate bore.

The counter direction has free flow.

In case of order it must be clarified if the ball shock absorber is used for pressure peaks (marked with+on the body) or pressure drops (marked with on the body).

#### Construction:

Made of 316L stainless steel or brass with male and female thread 1/2" BSP or NPT.

#### Applications:

Material test machines, hydraulic accumulators, hydraulic clamping devices.



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Single Ferrule Fitting | January 2025