



TIWAC PRESSURE GAUGES



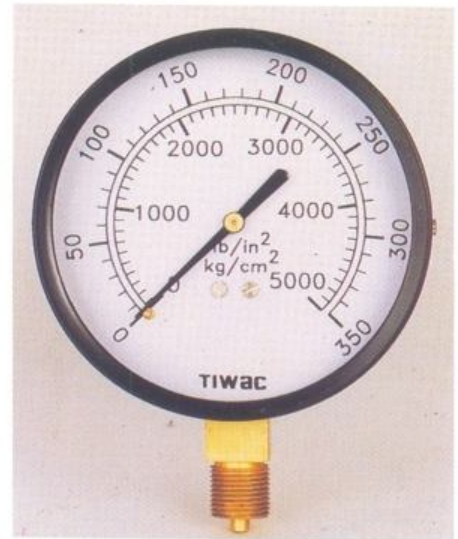
**A Tradition of
Engineering Excellence**

TIWAC PRESSURE GAUGES

Tiwac is a division of Walchandnagar Industries Limited, a multidivisional company catering to the requirements of a number of industries such as cement, sugar, paper, fertilizers, material handling, petrochemicals, defence, nuclear power, space research and others. It has undertaken a number of large turnkey projects in these fields and also manufactures a wide range of industrial boilers, heat exchangers, industrial gearboxes and gears, centrifugals and other hi-tech custom made products.

At Tiwac, in addition to our traditional line of clocks, we produce pressure Gauges to meet world standards. Our man-power consists of some of the best brains from the precision industries perfectly suited to the production of Pressure Gauges. Tiwac's organisational culture centres on "Quality, Precision and time." Our quality consciousness begins at the raw material stage itself, continues till the finished product leaves our factory. Our parent Company being involved in various hi-tech activities, has excellent R & D facilities which are available to us. As a result, innovative product improvement is an on-going process.

All these enable us to offer you a product which guarantees the best return for your money.



TYPE 11
Bottom Connection
Direct Mounting



TYPE 11 OXY (Oxygen)
Bottom Connection
Direct Mounting



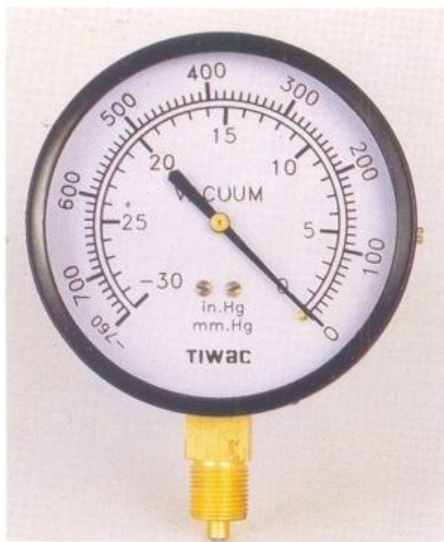
TYPE 11 (Diaphragm Seal Gauge)
Bottom Connection
Direct Mounting



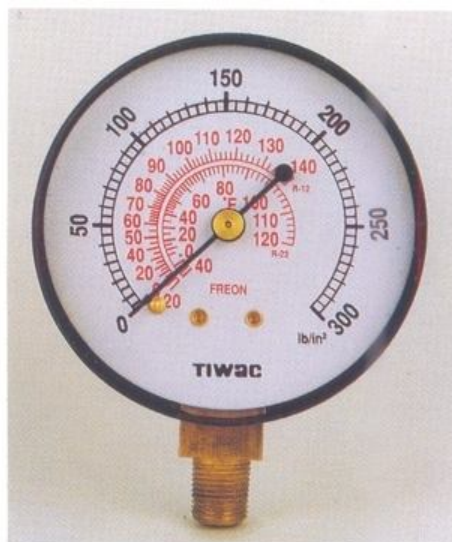
TYPE 13
Back Connection
Direct Mounting



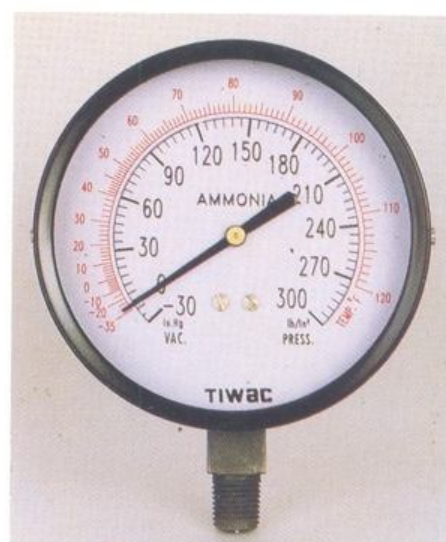
TYPE 14
Back Connection
Panel Mounting



TYPE 11 VAC (Vacuum Gauge)
Bottom Connection
Direct Mounting



TYPE 11 F (Freon)
Bottom Connection
Direct Mounting



TYPE 11 AMN (Ammonia)
Bottom Connection
Direct Mounting



TYPE 11 ACY (Acetylene)
Bottom Connection
Direct Mounting.



TYPE 11 WP GF
(Weather Proof Glycerine Filled)
Bottom Connection Direct Mounting



TYPE 12
Bottom Connection
Surface Mounting



TYPE 14 EC (Electric Contact Gauge)
Back Connection
Panel Mounting



TYPE 15
Back Connection
Clamp Mounting

STANDARD RANGES WITH LEAST COUNT

Range		Least Count		Range		Least Count	
Kg/cm ²	psi	Kg/cm ²	psi	Kg/cm ²	psi	Kg/cm ²	psi
0-1.05	0-15	0.025	0.5	0-42	0-600	1	20
0-2.1	0-30	0.05	1	0-56	0-800	0.8	20
0-3.5	0-50	0.1	1	0-70	0-1000	2	20
0-4.2	0-60	0.1	2	0-105	0-1500	2.5	50
0-7	0-100	0.2	2	0-140	0-2000	2	50
0-10.5	0-150	0.25	5	0-210	0-3000	5	100
0-14	0-200	0.2	5	0-280	0-4000	4	100
0-17.5	0-250	0.5	5	0-350	0-5000	10	100
0-21	0-300	0.5	10	0-420	0-6000	10	200
0-28	0-400	0.4	10	0-560	0-8000	8	200
0-35	0-500	1	10	0-700	0-10000	20	200

Standard pressure gauges are supplied with kg/cm² p.s.i. scales or kg/cm² only. Any non-standard requirement can be met usually with the normal lead time currently in force. Sizes and Pressures other than standard can be manufactured by special order.

Kg/cm ²	Least Count	Kg/cm ²	Least Count
0-1	0.02	0-40	1.0
0-1.6	0.04	0-60	1.0
0-2.5	0.05	0-70	1.0
0-4	0.1	0-100	2.0
0-6	0.1	0-160	4.0
0-7	0.1	0-250	5.0
0-10	0.2	0-400	10.0
0-16	0.4	0-600	10.0
0-25	0.5	0-700	10.0

Compound Ranges in Hg Vac Kg/cm²

Dual Range		Single Range	
-30 to 0	10	0 to -1	0.02
-760 to 0		-1 to 1.5	0.1
-30 to 15	0.25	-1 to 3	0.1
-30 to 30	5	-1 to 5	0.2
-30 to 60	2	-1 to 9	0.5
-30 to 100	2	-1 to 16	0.2
-30 to 150	2.5	-1 to 25	0.5
-30 to 200	4		
-30 to 300	5		

TIWAC PRESSURE GAUGES

SIZES AND FEATURES AVAILABLE :

■ Standard □ Optional □ Not available

GAUGE SIZES IN MILLIMETERS		40	50	63	75	100	150
ACCURACY :	2-1-2	■	■	■	■	■	■
	3-2-3	■	■	■	■	■	■
CASE :	Pressed Steel	■	■	■	■	■	■
	Stainless Steel	■	■	■	■	■	■
	Brass	■	■	■	■	■	■
	Chrome Plating	■	■	■	■	■	■
BEZEL :	Pressed Steel	■	■	■	■	■	■
	Stainless Steel	■	■	■	■	■	■
	Brass	■	■	■	■	■	■
	Chrome Plating	■	■	■	■	■	■
BLOW-OUT DEVICE :	Below 1000 psi	■	■	■	■	■	■
CONNECTION :	1/8" BSP	■	■	■	■	■	■
	1/4" NPT/1/8" NPT 1/8" BSPT	■	■	■	■	■	■
	1/4" BSP	■	■	■	■	■	■
	3/8" BSP	■	■	■	■	■	■
	1/2" BSP	■	■	■	■	■	■
DIAL	Aluminium *	■	■	■	■	■	■
GLYCERINE FILLING :		■	■	■	■	■	■
MOUNTING TYPES :	11 (BCDM)	■	■	■	■	■	■
(See Page No. 3)	12 (BCSM)	■	■	■	■	■	■
	13 (CBCDM)	■	■	■	■	■	■
	14 (CBCPM)	■	■	■	■	■	■
	15 (CBCCM)	■	■	■	■	■	■
	16 (LBCCM)	■	■	■	■	■	■
MOVEMENT :	Brass	■	■	■	■	■	■
	Stainless Steel	■	■	■	■	■	■
OXYGEN SERVICE :	Degreased	■	■	■	■	■	■
POINTER :	Micrometer adjustable	■	■	■	■	■	■
POINTER MTRL. :	Steel	■	■	■	■	■	■
	Aluminium Anodised	■	■	■	■	■	■
RANGES :	Vac to 1000 psi	500 psi	■	■	■	■	■
	1000 - 3000	■	■	■	■	■	■
	4000 - 5000	■	■	■	■	■	■
	5000 - 10000	■	■	■	■	■	■
	Compound upto 300	■	■	■	■	■	■
SERVICES :	Acetylene/Oxygen	■	■	■	■	■	■
	Ammonia	■	■	■	■	■	■
	Freon	■	■	■	■	■	■
SHANK :	Brass	■	■	■	■	■	■
	Stainless Steel **	■	■	■	■	■	■
BOURDON TUBE :	"C" Type upto 1000 psi	■	■	■	■	■	■
	Coiled above 1000 psi	■	■	■	■	■	■
BOURDON TUBE MTRL. :	Brass	■	■	■	■	■	■
	Stainless Steel	■	■	■	■	■	■
WINDOW :	Plastic (Pushfit)	■	■	■	■	■	■
	Glass	■	■	■	■	■	■

Note : * STANDARD FEATURE : White background with black markings as standard. Other optional colours or custom-built can be provided at little extra cost.

** SHANK : Stainless Steel only available for bottom connection for all sizes and lower back connection from size 63 to 150.

Due to our policy of continuous improvement, we reserve the right to alter specifications at any time without prior notice.



Gauge Calibration



Cyclic Test



Factory View



Manufacturers :
**WALCHANDNAGAR
INDUSTRIES LIMITED**

TIWAC DIVISION,

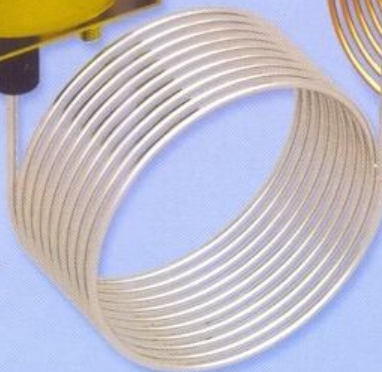
AUTHORISED DEALER



TIWac

INDUSTRIAL THERMOMETERS

- MERCURY -IN STEEL
- GAS FILLED
- BI-METAL
- LIQUID FILLED



WALCHANDNAGAR INDUSTRIES LTD.,

An ISO 9001:2000 Company

A Tradition of Engineering Excellence



MERCURY IN STEEL ■ GAS FILLED (N₂) ■ BI-METAL ■ LIQUID FILLED THERMOMETERS

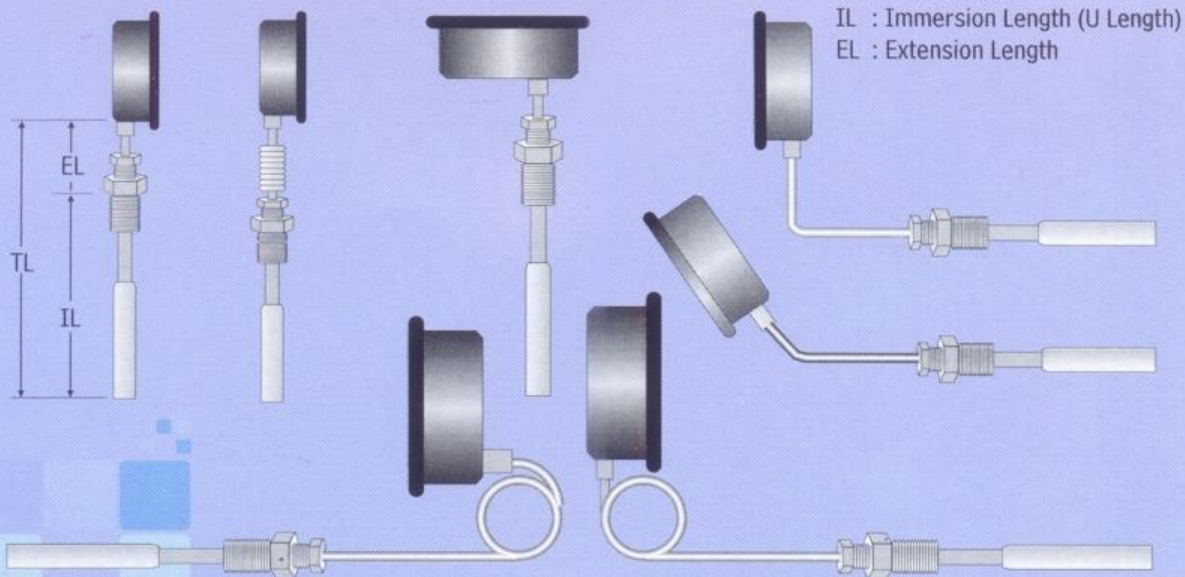
Tiwac is a division of Walchandnagar Industries Limited, a multi divisional company catering to the requirements of a number of industries such as cement, sugar, paper, fertilizers, material handling, petrochemicals, defense, nuclear power, space research and others. It has undertaken a number of large turnkey projects in these fields and also manufactures a wide range of industrial boilers, heat exchanger, industrial gearboxes and gears, centrifugals and other hi-tech custom made products.

At Tiwac, We are manufacturing mercury in steel, Gasfilled, Bi-Metal and Liquid Filled Thermometers along with wide range of Pressure Gauges. Having a long horological back ground our manpower consists of some of the best brains from the Precision Industry perfectly suited for instrumentation line. Tiwac's organizational culture centers on "Quality, Precision and Time". Our Quality Consciousness begins at the raw material stage and continues till the finished product leaves our factory. Our parent company being involved in various hi-tech activities, has excellent R & D facilities which are available to us. As a result, innovative product improvement is an on going process.

All these enable us to offer you a product which guarantees the best return for your money.



MOUNTINGS AVAILABLE



TL : Total Length
IL : Immersion Length (U Length)
EL : Extension Length



TECHNICAL SPECIFICATIONS

Type	: Mercury in Steel / Gas filled (Regid stem / Distant)
Dial Size	: 63mm, 100mm, 150mm, 200mm, 250mm,
Housing	: Die-cast Aluminium, Stove Enamelled Black Finish Weather Proof
	: SS 304 / SS316 (Bayonet type)
Bourdon	: SS 316
Window	: Plain Glass
Connection	: 3/8", 1/2", 3/4" BSP/NPT (Adjustable Gland)
Entry	: Bottom / Back
Mounting	: Direct / Surface / Pannel
Movement	: Brass/SS 304
Pointer	: Zero adjustment type
Joints	: Argon Arc Welding
Protection Class	: IP 65

BULB & STEM

Material of Construction	: SS 304 / SS316
Standard Stem Dia	: 10mm - Other size on request
Standard Stem Length	: 250 mm. (Max. up to 2000 mm length on request)
Standard Dia of Bulb	: 10mm. Std. (6 mm & 9 mm 12 mm on request)

CAPILLARY IN CASE OF DISTANT TYPE

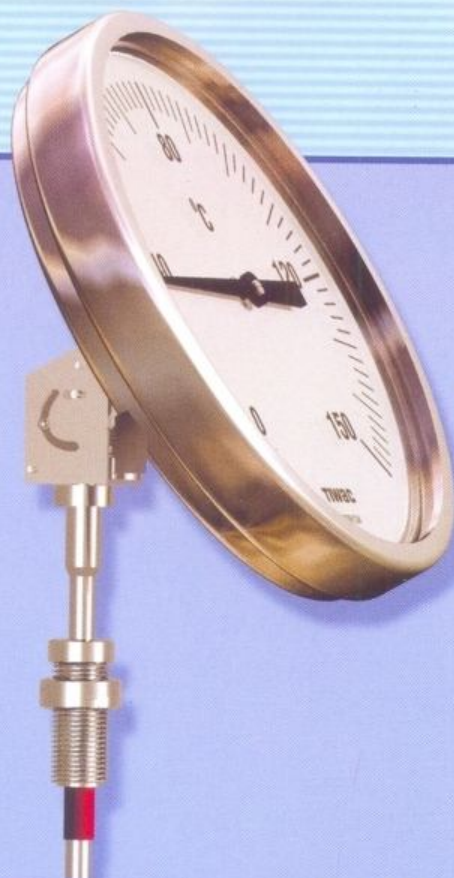
Material of Construction	: MS / SS 316
Armour	: Copper / SS/SS flexible / PVC Sheath
Standard Length	: 3 mtrs. (Max up to 16 mts. on request)

OPTIONAL ACCESSORIES

Window	: Toughened Glass / Shatter proof Glass
Thermowell	: Fabricated / Bar stock SS 304 / SS 316 / Flanged
Antivibration Spring	: For rigid stem type only
Electrical Contact	
Maximum Indicator Pointer	
Every Angle	

STANDARD RANGES

Range in °C	Range in °C
-38° to 50 °C	0 to 250 °C
0 to 50 °C	0 to 300 °C
0 to 100 °C	0 to 350 °C
0 to 120 °C	0 to 400 °C
0 to 150 °C	0 to 500 °C
0 to 200 °C	0 to 600 °C
Accuracy	: + 1% of the Span
Response Time	: 3.5 Seconds



TECHNICAL SPECIFICATIONS

Type	: Bi-Metal
Dial Size	: 63mm, 100mm, 150mm
Housing	: Die cast Aluminium stove enamelled Black Finish Weather Proof
	: SS 304 Bayonet Type
Sensing Element	: Spiral Wound-Bi-Metal strip
Window	: Plain Glass
Connection	: 3/8", 1/2" BSP/NPT
Entry	: Bottom / Back
Mounting	: Direct / Every Angle type
Pointer	: M.S. Black Painted
Accuracy	: + 2% of span
Protection Class	: IP 65

STANDARD RANGES

Range in °C
0 to 50 °C
0 to 100 °C
0 to 120 °C
0 to 150 °C
0 to 200 °C
0 to 250 °C
0 to 300 °C

BULB & STEM

Material of Construction	: Brass / SS 304 / SS316
Standard Stem Dia	: 10mm. (6 mm & 9 mm on request)
Standard Stem Length	: 250 mm. (Other size on request)

TIWac

TECHNICAL SPECIFICATIONS

Type	: Liquid Filled (Vapour Pressure)
Dial Size	: 50mm, 63mm,
Housing	: M.S Zinc plated case /Nickel Plated Bezel
Bourdon	: Brass
Window	: Plain glass
Connection	: Back
Mounting	: Clamp /Pannel
Movement	: Brass
Pointer	: M.S. Black Painted
Accuracy	: + 3%

BULB & STEM

Material of Construction	: Brass
Standard Stem Dia	: 8 mm
Standard Stem Length	: 50 mm , 70 mm
Capillary	: Netted Copper
Standard capillary length	: 1.5 mtrs. (Max up to 5 mtrs)
Thermowell (Pocket)	: Brass 1/2" BSP, NPT (other on request)

STANDARD RANGES

Range in °C

0 to 50 °C

0 to 100 °C

0 to 110 °C

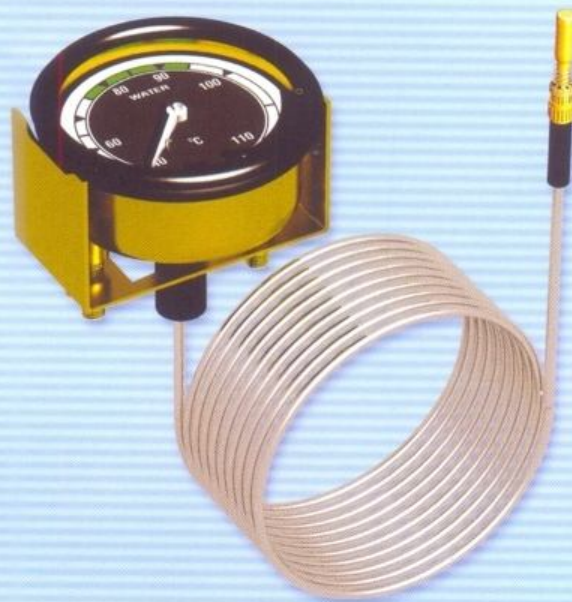
0 to 120 °C

40 to 110 °C

40 to 120 °C

40 to 130 °C

40 to 150 °C



VARIOUS TYPES OF THERMOWELLS

For	: Mercury, Gasfilled and Bi-metal Thermometers
Construction	: Straight, Tapered and stepped Flanged (Flange can be provided as per ANSI B-16.5 standard as per requirement)
Material	: SS 304, 316, 316L, other on request
Bore Dia	: 7mm, 9mm, 11mm, 13mm other on request
Process connection	: 1/2", 3/4", 1" BSP /NPT
Instrument Connection	: 1/2 NPT (F)
Standard 'u' Length	: As per requirement



Manufacturers :



WALCHANDNAGAR INDUSTRIES LTD.,

TIWAC DIVISION

An ISO 9001: 2000 Company

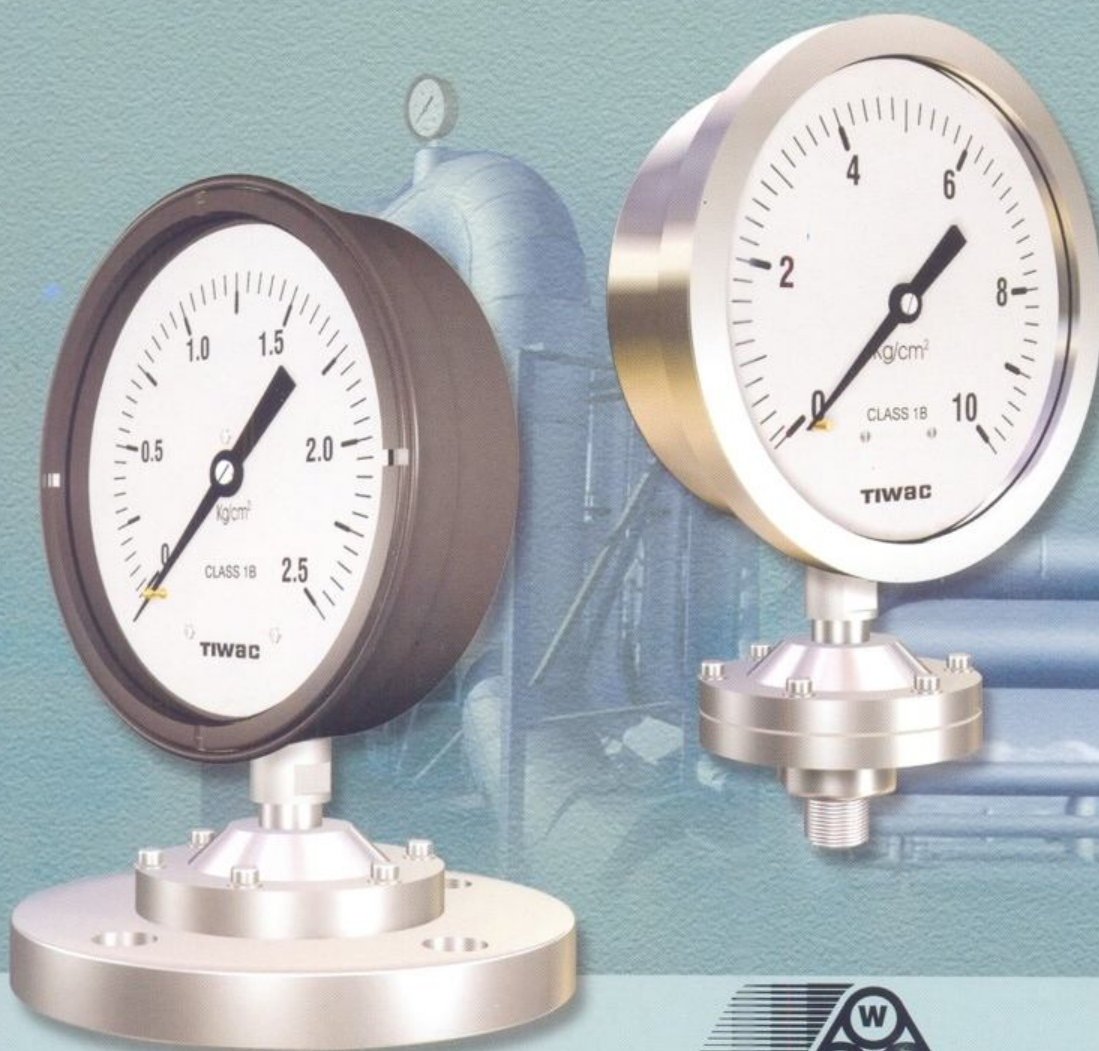
Authorised Dealer

TIWac

Quality Pressure Gauges

An ISO 9001-2000 Company

A Tradition of Engineering Excellence



WALCHANDNAGAR INDUSTRIES LIMITED TIWAC DIVISION

Approved by

- Engineers India Ltd. (EIL) ● Indian Boiler Regulations (IBR)
- Metallurgical Engineering and Consulting and Consultants of India Ltd. (MECON) ● Avant-Garde Engineers
- Director General of Quality Assurance (DGQA) ● Steel Authority of India Ltd. (SAIL) ● Nuclear Power Corporation Ltd. (NPCL)
- Bharat Pumps & compressors Ltd. (BPCL) ● Products & Development India Ltd., (PDIL)
- National Thermal Power Corporation (NTPC) ● Indian Iron and Steel Co. Ltd.
- Indian Farmers Fertilizers Co-operative Ltd. (IFFCO)

TIWAC DIVISION

Tiwac is a Division of Walchandnagar Industries Ltd. This Division, before being amalgamated with Walchandnagar Industries Ltd., in 1982, was known as Tiwac Industries Ltd., This was set up in 1962-63 to manufacture Mechanical Alarm Time Pieces in technical collaboration with Louis Schwab of Switzerland.

Most of the machineries installed are imported from Germany, Switzerland and England and are very much suitable for manufacturing precision components. Till the year 1995-96, One day Alarm Time Piece was the main product and was manufactured in large quantity. Tiwac has the distinction of introducing Centre Second Models in India for the first time.

Tiwac Division has successfully developed many products which are precision in nature viz, Synchronous Multiflex Timer used in Sugar Factories (an import substitution), Sector Mechanism for Dash Board Instruments and Industrial Pressure Gauges, Precision components for Electrical Meters, Timers, Electronic Gadgets, Automobiles Etc.

In keeping with tradition of Walchandnagar Industries Ltd., Tiwac Division, diversified in a big way to manufacture Pressure Gauges and Temperature Gauges in the year 1992-93. Since then it has never looked back.

The Manpower consists of some of the best brains from the Precision Industries perfectly suited for the production of these products.

At present Pressure Gauges in the size 40 mm (1.5") to 300 mm (12") having pressure range 0 to 700 kg/cm² (10000 Psi) and Vacuum are manufactured. The various types of gauges manufactured are liquid filled, diaphragm seal, low pressure diaphragm, all SS gauges, Electrical contact gauges, Master gauges, etc. Pressure Gauges are manufactured as per IS 3624 of 1987 specifications.

Tiwac Pressure Gauges are extensively used in Industrial Boiler, Thermal Power Stations, Nuclear Power Corporations, Petrochemicals, Fertilizers Factories, Sugar Machinery, Industrial and Marine Gear Boxes, etc. At Tiwac Temperature Gauges are manufactured in Mercury in Steel Type and Bimetal Type in the size from 100 mm (4") to 300 mm (12") having temperature range from -38°C to 600°C. Tiwac's Organization culture centres on Quality, Precision and Time.



DRY GAUGE

Sensing Element	Bourdon
Dial Size	63, 100, 150, 200, 250 mm
Case & Bezel	Weather proof Aluminium / SS 304 (up to 150 mm)
Bourdon Material	Brass / SS 316
Socket	Brass / SS 316
Movement	Brass / SS 304
Window	Plain / Toughened / Shatter Proof
Mounting	Direct / Surface / Panel / Clamp
Entry	Bottom / Back
Connection	1/4", 3/8", 1/2"- BSP / NPT (M)
Ranges	1 kg/cm ² to 700 kg/cm ² Vacuum & Compound
Accuracy	± 1% FSD (± 1.6% FSD for 63 mm)
Special Feature	Capillary Connection



DIAPHRAGM GAUGE

Sensing Element	Bourdon
Dial Size	63, 100, 150 mm
Case & Bezel	Weather Proof Aluminium / SS 304
Bourdon Material	SS 316
Socket	Brass / SS 316
Movement	Brass / SS 304
Window	Plain / Toughened / Shatter Proof
Mounting	Bottom entry Direct on Sealed Unit
Connection	3/8", 1/2" BSP / NPT (M)
Ranges	1 kg/cm ² to 700 kg/cm ² Vacuum & Compound
Accuracy	± 1.5 % FSD
Special Feature	Teflon Coating / Capillary Flange / Glycerine

SPECIFICATION FOR SEALED UNIT

Sensing Element	Diaphragm
Diaphragm Material	SS 316 / SS 316 L
Sealing Media	Silicon Oil
Top Chamber	SS 304
Bottom Chamber	SS 316 / SS 316 L

MASTER GAUGE

Sensing Element	Bourdon
Dial Size	150, 200, 250 mm
Case & Bezel	Weather proof Aluminium
Bourdon Material	SS 316
Socket	Brass / SS-316
Movement	SS 304
Window	Toughened / Shatter Proof
Mounting	Direct
Entry	Bottom
Connection	3/8", 1/2"-BSP / NPT (M)
Ranges	1 kg/cm ² to 700 kg/cm ²
Accuracy	± 0.25 % / 0.5% FSD
Special Feature	Jewelled Movement, Anti Parallax Mirrored





DIFFERENTIAL PRESSURE GAUGE

Sensing Element	Diaphragm
Dial Size	150 mm
Case & Bezel	Weather Proof Aluminum
Diaphragm Material	SS 316
Movement	Brass / SS 304
Window	Acrylic
Mounting	Direct / Flush Panel
Entry	Bottom / Back
Connection	1/4" NPT (F) for L.P & H.P
Ranges	100 mm WC to 6000 mm WC, 0.6 kg/cm ² to 16 kg/cm ²
Accuracy	± 1.5% FSD
Diaphragm Chamber	SS 316
Max. Static Pressure	60 kg/cm ²
Standard Fitments	1. Over Range relief Valve 2. External Zero adjustment



DRAUGHT GAUGE

Sensing Element	Capsule
Dial Size	150 x 78 mm, 200 x 104 mm
Case	Fabricated Mild Steel
Capsule Material	Brass / SS 316
Socket	SS 316
Movement	Brass
Window	Acrylic
Mounting	Flash / Panel
Entry	Back
Connection	1/4" BSP (M) / 1/4" NPT (M)
Ranges	Pressure 25 mm WC to 6000 mm WC Suction -25 mm WC to - 6000 mm WC Compound -25 mm WC to+ 300 mm WC
Accuracy	± 1.5% FSD
Dial Orientation	Vertical / Horizontal



LIQUID FILLED GAUGE

Sensing Element	Bourdon
Dial Size	63, 100, 150 mm
Case & Bezel	Weather Proof Aluminium / SS 304
Bourdon Material	Brass / SS 316
Socket	Brass / SS 316
Movement	Brass / SS 304
Window	Toughened / Shatter Proof
Mounting	Direct / Surface / Panel / Clamp
Entry	Bottom / Back
Connection	1/4", 3/8", 1/2" - BSP / NPT (M)
Ranges	1 kg/cm ² to 700 kg/cm ² Vacuum & Compound
Accuracy	± 1.0 % FSD
Special Feature	Glycerine / Silicone



ELECTRIC CONTACT GAUGE

Sensing Element	Bourdon
Dial Size	100 & 150 mm
Case & Bezel	Weather Proof Aluminium / SS 304
Bourdon Material	Brass / SS 316
Socket	Brass / SS 316
Movement	Brass / SS 304
Window	Acrylic
Mounting	Direct / Surface
Entry	Bottom / Back
Connection	3/8", 1/2" BSP / NPT (M)
Accuracy	± 1 % FSD
Electric Contact	1 No, 1 NC, NONC, NCNO Max. 380V, 30W-50V.A, 1 Amp.
Special Feature	Flange



DUAL PRESSURE GAUGE

Sensing Element	Twin Bourdon
Dial Size	100 mm
Case & Bezel	Weather Proof Aluminium / Mild Steel
Bourdon Material	Brass
Socket	Twin
Socket Material	Brass
Movement	Brass
Window	Plain glass
Mounting	Direct Clamp
Entry	Bottom
Connection	1/4" NPT
Ranges	0-10 and 2.5 kg/cm ²
Accuracy	± 2% FSD



LOW PRESSURE DIAPHRAGM GAUGE

Sensing Element	Diaphragm
Dial Size	100 & 150 mm
Case & Bezel	Weather Proof Aluminium / SS 304
Diaphragm Material	SS 316
Movement	Brass / SS 304
Window	Toughened / Shatter Proof
Mounting	Direct
Entry	Bottom / Back
Connection	3/8", 1/2" - BSP / NPT (M)
Ranges	100 mm WC to 8000 mm WC Compound - 100mm WC to + 3000mm WC
Schaffer's Type	1 to 25 kg/cm ²
Accuracy	± 1.5 % FSD
Top Chamber	Weather Proof Aluminium / SS 304
Bottom Chamber	SS 316

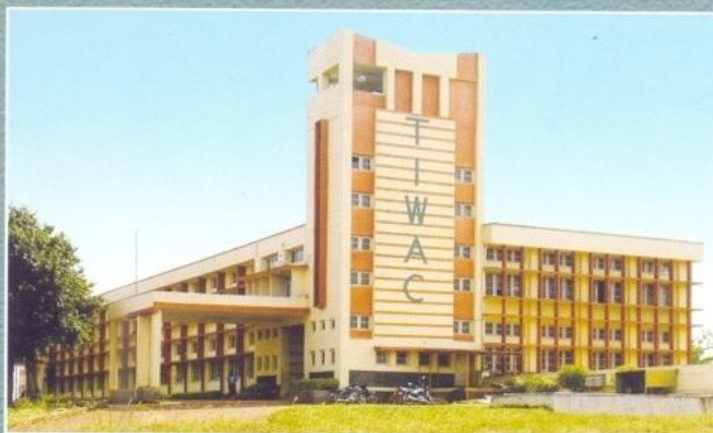


Homogeniser gauge/ SMS Connection

Sensing Element	Bourdon
Dial Size	100, 150 mm
Case & Bezel	Weather Proof Aluminium / SS 304
Bourdon Material	SS 316
Socket	SS 316
Movement	SS 304
Window	Toughened Glass / Shatter Proof
Mounting	Bottom
Connection	Male or Female hygienic connection or clamp (Triclover)
Range	1 kg/cm ² to 600 kg/cm ²
Accuracy	± 1.5 % FSD
Special Feature	Glycerine / Silicon

Specification for sealed unit

Sensing Element	Diaphragm
Diaphragm Material	SS 316
Sealing Media	Silicon Oil
Top Chamber	SS 316



Manufacturers :



WALCHANDNAGAR INDUSTRIES LIMITED TIWAC DIVISION

Authorised Dealer :