2008

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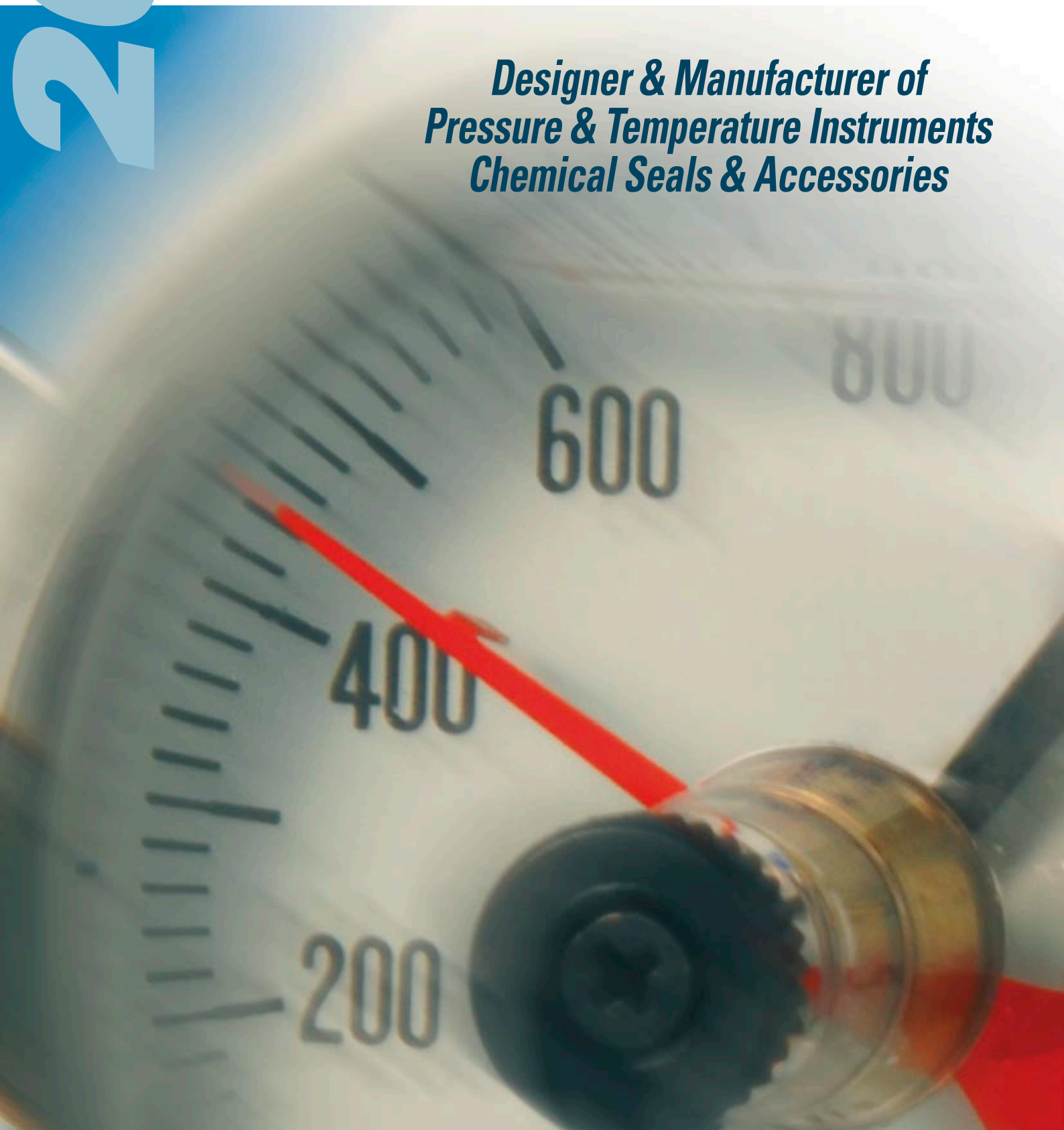
RHOMBERG
INSTRUMENTS

Designer & Manufacturer of
Pressure & Temperature Instruments
Chemical Seals & Accessories



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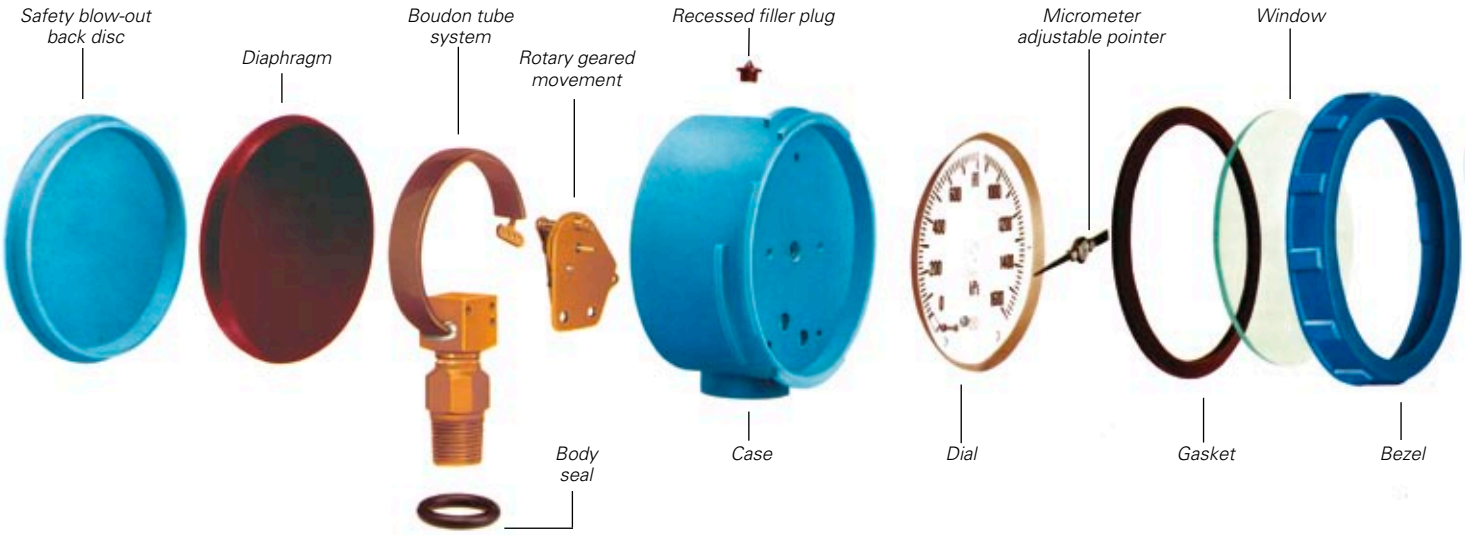

Key Factors for Gauge Selection

Many factors should be evaluated including temperature, vibration, process conditions, pulsation and corrosion, but by carefully considering the 7 key factors outlined below, the chances of correct selection will increase significantly.

Process Medium
The process medium to which the gauge will be exposed is especially important when using a thin walled Bourdon tube because, if the wrong materials are selected, corrosion may occur which could lead to catastrophic failure. Materials which display the essential combination of properties (good spring memory, easy to form, easy to join, reasonably priced) are phosphor bronze, 316 stainless steel and Monel.

Where these materials can't satisfy the application, a diaphragm seal (gauge isolator) can be added to prevent the process media from contacting the Bourdon tube. This protects the gauge from corrosion attack, and also prevents viscous or dirty media from clogging the small bore Bourdon tube. The only limitation in using a diaphragm seal is that it typically degrades the accuracy of the pressure gauge by an additional 0,5% of the full scale deviation.

Pressure Gauge Range
It is important to select a pressure range which accommodates all anticipated pressure swings, and which prevents excessive needle movement. It is recommended to confine normal operating pressure to 25% - 75% of scale. With fluctuating pressures (e.g. pulsation caused by a pump or compressor), the maximum operating pressure should be lower (50% of the full range).

Gauges in severe service should be liquid filled and throttled to reduce Bourdon tube stresses. To minimise sensing element stress and to extend the life of the gauge use internal throttle screws, pulsation dampeners, pressure snubbers, gauge savers or diaphragm seals.

The Environment
Temperature changes affect the elastic modulus of the Bourdon tube to indicate higher pressure than actual as temperature increases, (lower as temperature decreases), except if made with expensive constant modulus materials.

In a liquid filled gauge with an uncompensating case, a temperature increase of as little as 10°C results in internal case pressure build up which causes a downscale pointer shift. An upscale pointer shift can result from a temperature drop of 10°C or more. This potential error most often occurs in pressure ranges of 600kPa or less. In gauges with true case compensation, temperature error from internal case pressure build-up is negligible.

Where ambient conditions are corrosive or contain a large number of particles, specify hermetically sealed and / or liquid filled pressure gauges to prevent foreign elements from entering the case.

Vibration can cause wear to the gears of the rotary movement and can make it difficult to accurately read pressure off an oscillating pointer. Filling a gauge with dampening fluid, such as glycerine, helps prevent these problems.

Accuracy
Accuracy is the conformity of a pressure gauge reading to an accepted standard (e.g. deadweight tester). Inaccuracy is the difference (error) between the true value and the indication, expressed as a percent of the span. It includes the combined errors of method, observer, apparatus and environment. Total accuracy error includes hysteresis and repeatability errors. Accuracy is not a percentage of the gauge reading - for mechanical pressure gauges, accuracy is a percentage of the full range, full scale or span of the gauge.

Guidelines are:
Test Gauges (0,25% up to 25MPa, above 25MPa up to 100MPa. 0,3%);
Critical Processes (0,50%); General Industry Processes (1,0%); Less Critical Commercial Uses (2,0%).

Dial Size
Sizes range from 40mm to 250mm diameters, with the 63mm, 100mm and 150mm being the most popular. The dial size is generally determined by the readability requirements (larger for remote reading and smaller where the gauge is close to the operator). More accurate pressure gauges generally have larger dials as more dial graduations are needed to read the higher degree of accuracy.

Connections
Factors to consider include gauge pressures, size and weight, space limitations, leak integrity and past experience. 150mm and 100mm process gauges usually have $^1/_2$" NPT/BSP connections, especially when direct stern mounted and liquid filled. Smaller dial sizes generally have $^1/_4$" or $^1/_8$" connections.

Mountings
Pressure gauges may be:
Direct stem mount bottom connection;
Remote wall - surface mount bottom connection;
Panel surface mount back connection;
Panel hole U clamp (yoke) flush mount back connection;
Panel hole front flange flush mount back connection.

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Rhomberg Process Gauges

Liquid Fillable Process Gauges with Brass, Stainless Steel or Monel Wetted Parts

PBB - stainless steel case and bezel
PBZ - colour coded case and bezel
PBX - colour coded, solid front safety pattern case
PCB - stainless steel case capsule gauge
PDBH - stainless steel case diaphragm gauge
CBC - aluminium case simplex and duplex gauges
BBR - aluminium case butterfly gauge
PBR - aluminium case gauge
MBB - stainless steel case master gauge
HGZ - stainless steel case homogenizer gauge

Features common to all Rhomberg Process Gauges

Window
Acrylic as standard (safety glass optional)

Seal
Nitrile (natural rubber for silicon fills)

Dampening Fluid
Glycerine, silicon or halocarbon (for oxidising services)

Socket and Bourdon Tube

Code:	SS	BB	MM
Socket:	316L/Ti	brass	Monel 400
Bourdon tube:	316Ti	bronze	K-Monel

Movement

Code:	SS/MM	BB
	300 series stainless steel high impact movement	brass/nickel silver high impact movement

Dial
Dished aluminium, black lettering on white background

Pointer
Black aluminium, micrometer adjustable

Connections
$^1/_4$" + $^3/_8$" + $^1/_2$" (NPT - BSP)
Other connections available on request

Maximum Range
Vacuum through 100 MPa
Higher ranges available on request

Snubbing
Snubbing / throttle screws available in brass and stainless steel

Accuracy

100mm & 150mm	1.0% FSD (SABS 1062)
63mm	1.6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.
Higher temperatures can be accommodated with heat reducing devices.

Approvals
SABS 1062 (1985) for 100mm and 150mm

Feature Highlights

- Adjustable micrometer pointer as standard
- Calibration without removal of dial / pointer / back plate
- All brushed high impact movement (100mm & 150mm)
- Field liquid fillable
- Limited one year warranty on materials and workmanship
- Threaded for retro-fit snubber / throttle screw
- Fully repairable
- Retro-fit electrical contacts
- SABS 1062 (1985) for 100mm and 150mm

SABS 1062 - 1985

SABS ISO 9001

PBB - Stainless Steel Case and Bezel

Welded Construction with Back Blow Out Disc

This gauge is ideally suited to most industrial applications where high accuracy and durability is required.

Gauges are available with either brass / bronze internals, all stainless steel internals, or Monel Bourdon tube and socket with stainless steel movement.

All gauges are retro-fillable and totally repairable. A number of optional accessories are available either as factory fitted or retro-fitted. A Rhomberg manocont movement can be fitted where filling material is not allowed or excessive vibration is present.

(Conforming to military specification) the high impact movement protects against entanglement of the hairspring in the pinion and segment - the most common cause of gauge failure.

Case
Brush finish 304 stainless steel

Bezel
Brush finish 304 stainless steel

Blow-Out Disc
Back blow out

Configuration
A B D E F U V

Mountings
Direct, surface or panel mounting

Nominal Sizes

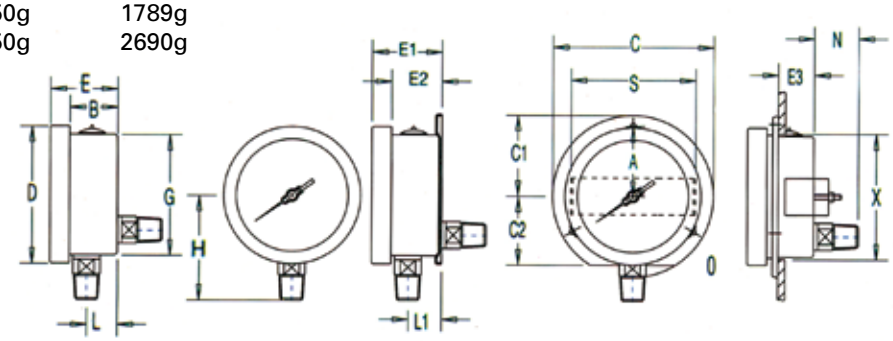
mm	63	100	150	250
Imp	$2^1/_2$"	4"	6"	10"

Nett Mass

	63mm	100mm	150mm	250mm
Dry	155g	556g	850g	1789g
Filled	230g	816g	1 750g	2690g

SABS 1062 - 1985

SABS ISO 9001



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Nominal size

Dimensions (X is panel cut-out diameter)

Metric Imperial	B	C	C1	C2	D	E	E1	E2	E3	G	H	S	L	L1	N	O	X
63mm $2^1/_2$"	22,70 0,89	85,00 3,35	42,50 1,67	36,00 1,42	69,60 2,74	32,50 1,28	35,70 1,41	27,20 1,07	22,00 0,87	62,00 2,44	60,00 2,36	66,50 2,62	9,00 0,35	13,00 0,51	27,00 1,06	3,50 0,14	63,50 2,50
100mm 4"	36,85 1,54	133,00 5,24	66,50 2,62	56,50 2,22	108,00 4,43	47,65 2,17	57,50 2,26	38,55 1,64	29,70 1,17	99,00 3,90	92,60 3,39	106,00 4,17	16,50 0,74	21,90 0,86	38,00 1,49	4,80 0,19	101,00 3,98
150mm 6"	29,00 1,14	196,00 7,72	98,00 3,85	86,00 3,38	155,00 6,10	56,00 2,20	59,00 2,32	32,00 1,26	28,00 1,10	140,00 5,51	108,00 4,25	146,00 5,75	17,00 0,67	18,00 0,71	38,00 1,49	5,80 0,23	142,00 5,60
250 mm 9.8"	34 1.3	285 11.2	N/A N/A	N/A N/A	250 9.8	56 2.2	58 2.3	36 1.4	51 2.0	248 9.8	156 6.1	N/A N/A	19 0.7	22 0.9	41 1.6	N/A N/A	253 10.0

PBZ - Colour Coded Case and Bezel

The PBZ gauge has the same features and internals as the PBB stainless steel gauge, but offers the additional benefits of colour codification and economical pricing.

The innovative polybutyleneterephthalate (P.B.T.) case is injection moulded to form a reinforced, high impact, UV resistant case which will not fade in colour or break down in most corrosive environments.

Safety is always a key issue in industrial applications. The use of either international or in-house colour codification rules to identify gauge materials, range, process fluids and location can help to improve plant management and avoid unsafe conditions.

Case
P.B.T. Polybutyleneterephthalate - colour coded

Bezel
P.B.T. Polybutyleneterephthalate - colour coded

Blow-Out Disc
Top blow out (compensating optional)

Configuration
A B D*
(*centre-back connection - available in brass only)

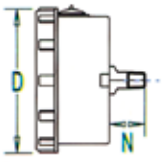
Mountings
Direct, surface or panel mounting

Nominal Sizes

mm	100	150
Imp	4"	6"

Nett Mass

	100mm	150mm
Dry	456g	737g
Glycerine filled	706g	1 593g



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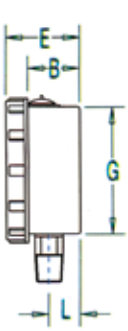

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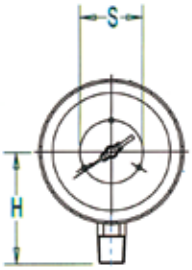
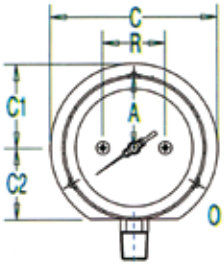


A

B



B

SABS 1062 - 1985

SABS ISO 9001

Nominal size

Dimensions

Metric / Imperial	A	B	C	C1	C2	D	E	E1	E3	G	H	L	N	O	R	S
100mm	57,50	41,00	133,00	66,50	56,50	114,00	58,00	60,70	43,50	100,00	88,00	25,00	30,00	4,80	50,00	
4"	2,26	1,61	5,24	2,62	2,22	4,49	2,28	2,39	1,71	3,94	3,46	0,98	1.18	0,19	1,96	
150mm	84,00	41,00	180,00			162,00	58,00	61,70	44,50	144,40	110,00	27.00	30,00	5,80		100,00
6"	3,31	1,61	7,09			6,38	2,28	2,43	1,75	5,69	4,33	1,06	1,18	0,23		3,94

PBX - Colour Coded Case and Bezel Safety Pattern Design

Ideal for industrial applications where high accuracy and durability is required and where the risk of Bourdon tube failure could compromise the safety of the operator.

Case
P.B.T. Polybutyleneterephthalate - colour coded
Fully open back for maximum area to release pressure in case of major failure
Easy disassembly to allow access for calibration

Bezel
P.B.T. Polybutyleneterephthalate - colour coded

Back Plate
Fitting: non-screw fitting, locating by interface fit when used in conjunction with diaphragm
Back vented: to permit gauge "breathing"

Dual Purpose Diaphragm
Material: natural rubber
Operation: the diaphragm acts as a back plate seal and is stretched over the full diameter of the back plate, allowing for expansion of air or the filling medium in the gauge

Adjustments
Either by removing bezel and window and using micro-adjust pointer or by removing the back plate and diaphragm and adjusting the movement

Dampening Fluid
Holes in the solid front and the dial allow glycerine to flow to the front with minimum loss of time
It is not necessary to vent the plug on installation, therefore the gauge can be transported without spillage

54mm (2") PBX gauge option
Non-fillable, with polycarbonate screw-on window and 'fold-back' blow out safety back
Internals: brass
Connections: 1/8 + 1/4 (BSP - NPT - BSBT)
Maximum Range: 60 MPa
Accuracy: 1,6% FSD
Mass: ± 99 g

Configuration
A

Mountings
Direct mounting only

Nominal Sizes

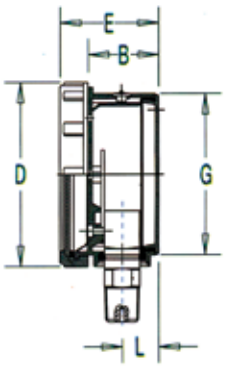
mm	100	150	54 (refer PBK)
Imp	4"	6"	2"

Nett Mass

	100mm	150mm
Dry	±505g	±800g
Glycerine filled	±750g	±1 500g

Approvals
Explosion tests: in line with U.L. 404 which requires a controlled volume explosion bursting the Bourdon tube with the back plate dislodging in preference tot the window
IP 65 tests: approved
SABS 1062: approved

SABS 1062 - 1985
SABS ISO 9001



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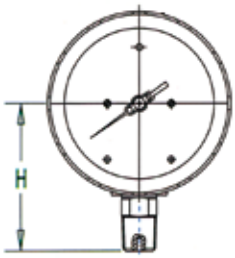

A

Nominal size — *Dimensions*

Metric / Imperial	B	D	E	G	H	L
54mm	22,50	59,00	34,50	55,00	51,00	11,50
2"	0,89	2,32	1,36	2,16	2,01	0,45
100mm	45,00	114,40	62,00	100,00	91,50	22,50
4"	1,77	4,50	2,44	3,94	3,60	0,89
150mm	45,00	163,00	62,00	145,00	117,50	22,50
6"	1,77	6,41	2,44	5,70	4,62	0,89

RHOMBERG INSTRUMENTS

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PBT - Turret Case Gauge

Features
Solid front, full aperture blow-out back
Liquid fillable (on lower entry option only)

Dial
Dished aluminium, black lettering on white background

Dial size
$4^1/_2$"

Case material
Polypropylene compound resistant to the most aggressive chemicals, also ultra violet ray resistant

System materials
Stainless steel, brass or monel

Ranges
-100 kPa to 250 Mpa

Accuracy
1% FSD

Options
Liquid filling. Alternately: anti-vibration manocont movement media exposed surfaces to MR-01-75

Window
Acrylic as standard (safety glass optional)

Seal
Nitrile (natural rubber for silicon fills)

Dampening Fluid
Glycerine, silicon or halocarbon (for oxidising services)

Socket and Bourdon Tube

Code:	SS	BB	MM
Socket:	316L/Ti	brass	Monel 400
Bourdon tube:	316Ti	bronze	K-Monel

Movement

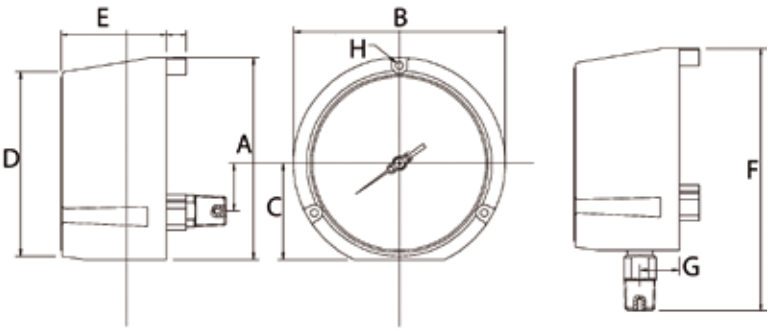
Code:	SS/MM	BB
	300 series stainless steel high impact movement	brass/nickel silver high impact movement

Pointer
Black aluminium, micrometer adjustable

Connections
$^1/_4$" + $^3/_8$" + $^1/_2$" (NPT - BSP)
Bottom entry (fillable) and back entry (non-fillable)

Maximum Range
Vacuum through 100 MPa
Higher ranges available on request

Snubbing
Snubbing / throttle screws available in brass and stainless steel



Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.
Higher temperatures can be accommodated with heat reducing devices.

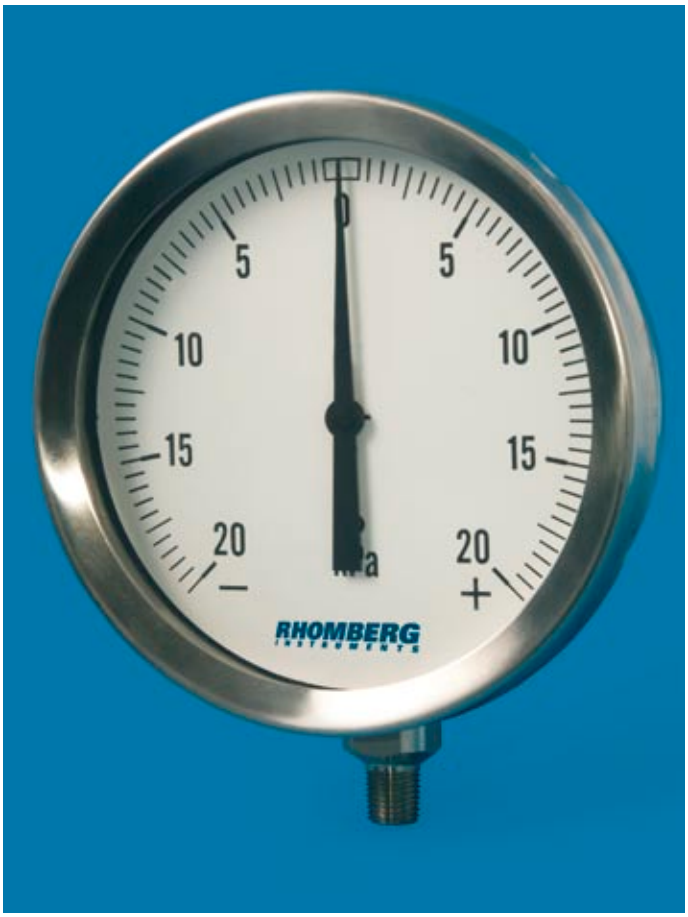
SABS 1062 - 1985

SABS ISO 9001

Nominal size — *Dimensions*

Metric / Imperial	A	B	C	D	E	F	G	H
mm	140	147.5	66.5	127	71	181	27	6.4

PCB - Capsule Gauges



All stainless steel pressure gauge suitable for measuring low pressures in dry, gaseous media.

Case and Bezel
PCB - brush finish 304 stainless steel case and bezel
PCZ - P.B.T. colour coded case and bezel
PCK - black mild steel, bezel integral with threaded window

Window
Acrylic (polycarbonate) as standard

Sealing Ring
Nylon

Mountings
Direct, surface or panel mounting

Nominal Sizes

	black mild steel case	stainless steel case			PBT case	
mm	68	63	100	150	100	150
Imp	2 1/2"	2 1/2"	4"	6"	4"	6"

Socket and Capsule

Code:	SS	BB
Socket:	316L/Ti	brass
Capsule:	316Ti	bronze

Movement

Code:	SS	BB
	300 series stainless steel	brass / nickel silver

Dial
Dished aluminium, black lettering on white background

Pointer
Black aluminium

Zero Adjustment
Through window

Connections
Threaded entry 1/4" + 1/2" (NPT - BSP)
Other connections available on request

Scale Ranges
0-25 mbar to 0-1 000 mbar
or equivalent other units of pressure or vacuum

Working Pressure

Steady:	full scale value
Fluctuating:	0,9 x full scale value

Accuracy

100mm & 150mm	1,6% FSD
63mm & 68mm	1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Medium temperature to 100°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.
Higher temperatures can be accommodated with heat reducing devices

Weather Protection
IP 54

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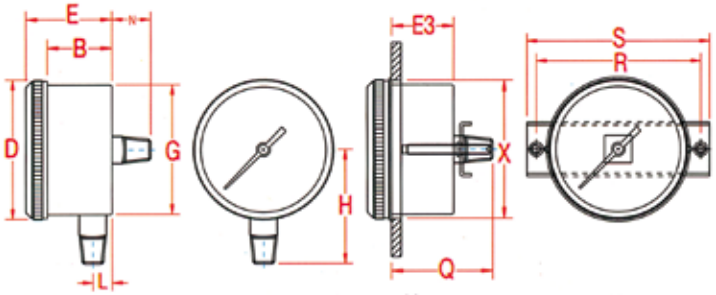

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Nominal size — *Dimensions*

Metric / Imperial	B	D	E	E3	G	H	L	N	Q	R	S	X
68mm	33,50	73,00	45,00	28,50	67,00	56,50	10,00	20,00	51,00	74,00	83,00	68,50
2 1/2"	1,32	2,87	1,77	1,12	2,64	2,22	0,39	0,79	2,00	2,91	3,27	2,70

Dimensions as per selected casing. PCB (as PBB) dimensions page 4; PCZ (as PBZ) dimensions page 5.

RHOMBERG INSTRUMENTS

09

PBR - Aluminium Case Gauges

A uniquely designed gauge for the railways and boiler industry.
Black epoxy coated aluminium case with bezel.

Case and Bezel
Aluminium, black epoxy coated

Back Plate
Removable back plate giving ready access to gauge internals

Window
Glass

Dial
Standard aluminium, white with black scale and numerals

Size
100 mm, 150 mm

Pressure ranges
-100 Kpa to 6 000 Kpa

Accuracy
Class 1,0 to En837

Mounting
Direct vertical or surface

Pointer
Vane, aluminium black, microset

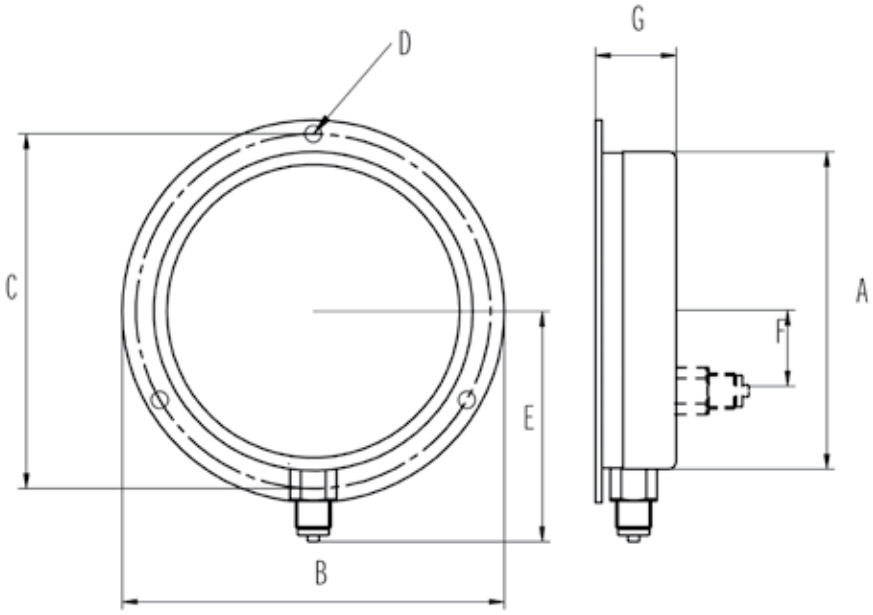
Thread sizes
$^{3}/_{8}$", $^{1}/_{2}$" BSP or NPT

Over pressure limit
30% for brief periods

Operating temperature
Ambient, -25°C to +60

Temperature error
Accurate to within the stated accuracy at 20 DC.
Add or deduct 0,3% for every 10 DC above or below the stated accuracy

Operating Pressure
Steady pressures: Max $^{2}/_{3}$ of scale value
Fluctuating pressures: Mid scale



Size	A	B	C	D	E	F	G
100 mm	102	127	114	Ø8	85	32	40
150 mm	151	179	167	Ø8	110	32	40

SABS 1062 - 1985

SABS ISO 9001

CBC - Aluminium Case Duplex Gauge

A uniquely designed gauge for the railway industry. Dual measurements on the dial with a pressure and vacuum range available in the same housing. Front flange designed with light slots for easier measurement reading.

Case
Aluminium, black epoxy coated
Twin tube - duplex
Single tube - simplex

Back Plate
Removable back plate giving ready access to gauge internals

Window
Glass

Dial
Standard aluminium, white with black scale and numerals or as per customer specification

Size
100 mm

Pressure ranges
-100 Kpa to 6 000 Kpa

Accuracy
Class 1,0 to En837

Mounting
Direct vertical or surface

Pointer
Vane, aluminium black, white or red

Thread sizes
$^{3}/_{8}$", $^{1}/_{2}$" BSP or NPT

Over pressure limit
30% for brief periods

Operating temperature
Ambient, -25°C to +60

Temperature error
Accurate to within the stated accuracy at 20 DC
Add or deduct 0,3% for every 10 DC above or below the stated accuracy

Operating Pressure
Steady pressures: Max $^{2}/_{3}$ of scale value
Fluctuating pressures: Mid scale

SABS 1062 - 1985

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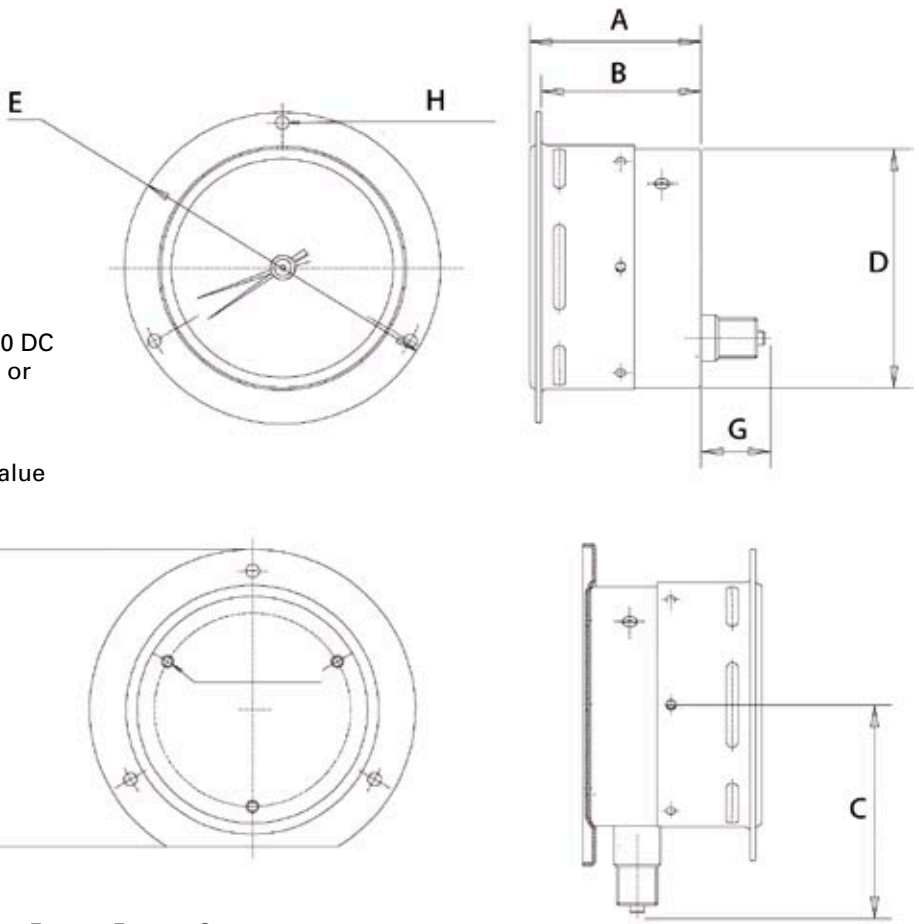

Size	A	B	C	D	E	F	G
100 mm	69.9	65.2	88.4	99.0	129.0	123.0	28.4

RHOMBERG INSTRUMENTS

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BBR - Butterfly Aluminium Case Duplex Gauge

This gauge is designed and manufactured for the diesel, steam and electrical and railways industry. Uniquely designed square front flange with light slots for easy measurement readings.

Case
Aluminium, black epoxy coated
Twin tube - duplex

Back Plate
Removable back plate giving ready access to gauge internals

Window
Glass

Dial
Standard aluminium, white with black scale and numerals

Size
150 mm

Pressure ranges
-100 Kpa to 6 000 Kpa

Accuracy
Class 1,0 to En837

Mounting
Direct vertical or surface

Pointer
Vane, aluminium black, microset

Thread sizes
$^{3}/_{8}$", $^{1}/_{2}$" BSP or NPT

Over pressure limit
30% for brief periods

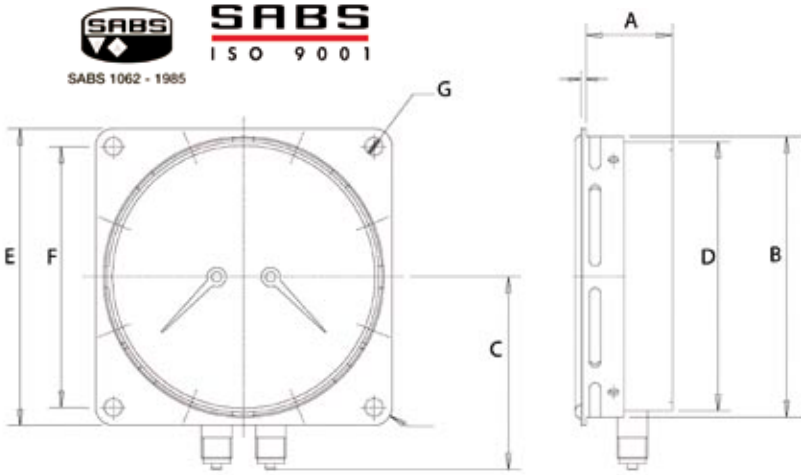
Operating temperature
Ambient, -25°C to +60

Temperature error
Accurate to within the stated accuracy at 20 DC
Add or deduct 0,3% for every 10 DC above or below the stated accuracy

Operating Pressure
Steady pressures: Max $^{2}/_{3}$ of scale value
Fluctuating pressures: Mid scale

SABS 1062 - 1985

SABS ISO 9001



Size	A	B	C	D	E	F	G
150 mm	50	156	107	149.5	165	145	10.0

MBB - Master Gauge

The MBB series is normally used in laboratories for instrument testing where accuracy and repeatability is priority.

Size
Is available in 100mm (4") &150mm (6") dial size only

Case
Case is manufactured of 304 stainless steel

Dial
Mirror segment to eliminate parallax error

Pointer
C/W a balanced Knife edge pointer. High precision jewel movement. For a brass system the tube material is beryllium copper. For a stainless system the tube material is ni-span (high quality spring steel).

Thread sizes
Thread connection can either be 316 stainless steel or brass. C/W bayonet bezel. C/W with a traceable A4 test certificate.

Accuracy
0.25% of full scale (6" only). 0.5% of full scale (4" and 6")

Thread
Thread connection is available in $^{1}/_{8}$", $^{1}/_{4}$", $^{3}/_{8}$", $^{1}/_{2}$" NPT/BSP/BSPT/NPS

Range
Brass (100kPa to 70Mpa), stainless steel (100kPa to 200Mpa)

Please note that the unit is not fillable!

SABS 1062 - 1985

SABS ISO 9001

Ordering code:

Eg: MBB A 15 BB 04Q C3B C01

MBB
denotes master gauge

A
denotes configuration, A for bottom entry and B for back entry

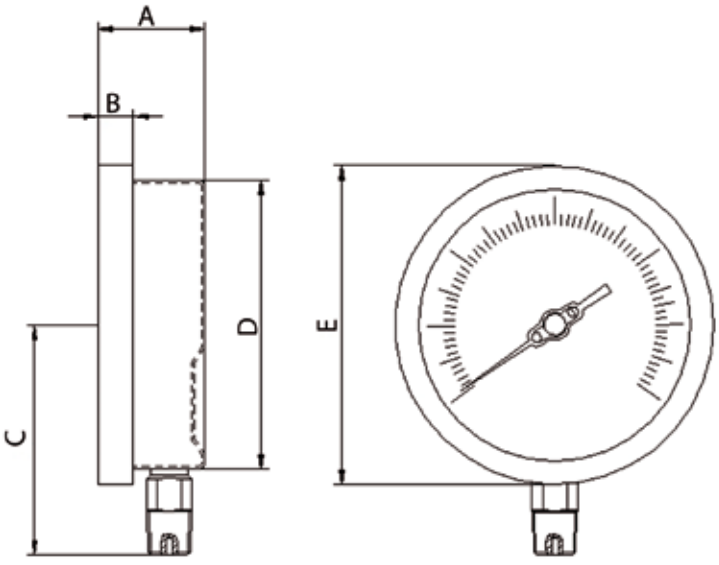
5
denotes gauge size, 15 = 150mm & 10 = 100mm

BB
denotes wetted parts material, BB = brass & SS = stainless steel

04Q
denotes thread size, please see table

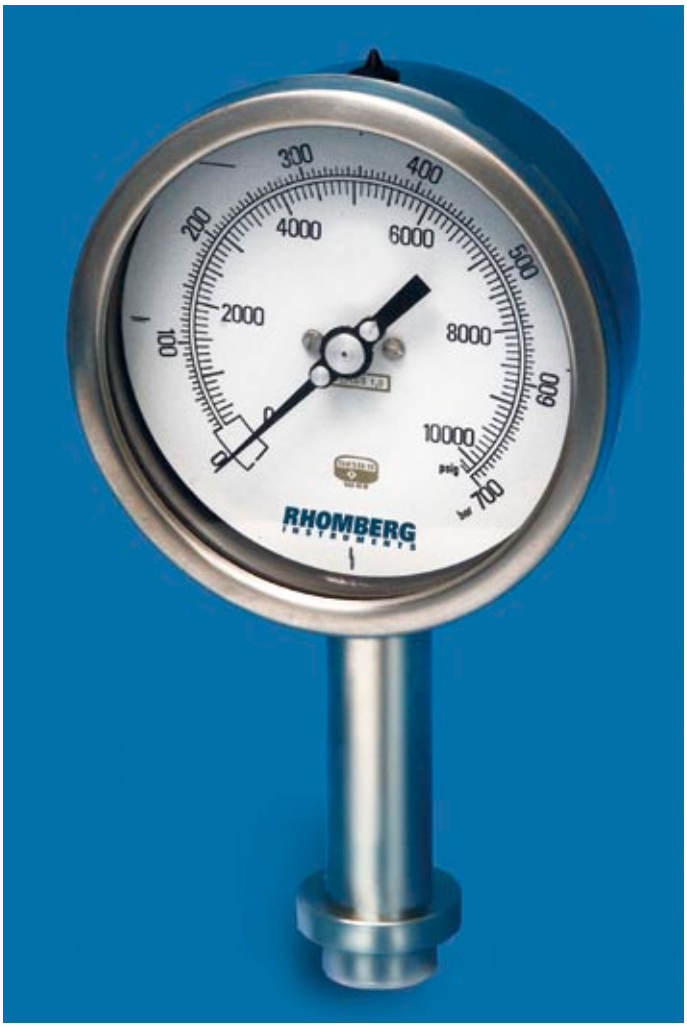
C3B
denotes range, please see range chart

C01
denotes logo on dial



Size	A	B	C	D	E
150 mm (6")	52	17	109	140	155
100 mm (4")	47	11	90	99	107.5

HGZ - Homogeniser Gauge



It is designed specifically for hygienic environments and is mainly used in the food industry. For example, milk in the dairy industry is homogenized and the pressures vary from 40 to 70Mpa.

Case
304 stainless steel

Configuration
bottom entry only

Internals
316 stainless steel

Dial size
100mm (4"), 150mm (6")

Connections
block or Dairy nut
Other connections available on request

Dial material
white aluminium

Accuracy
1.6% of full scale (1% accuracy)

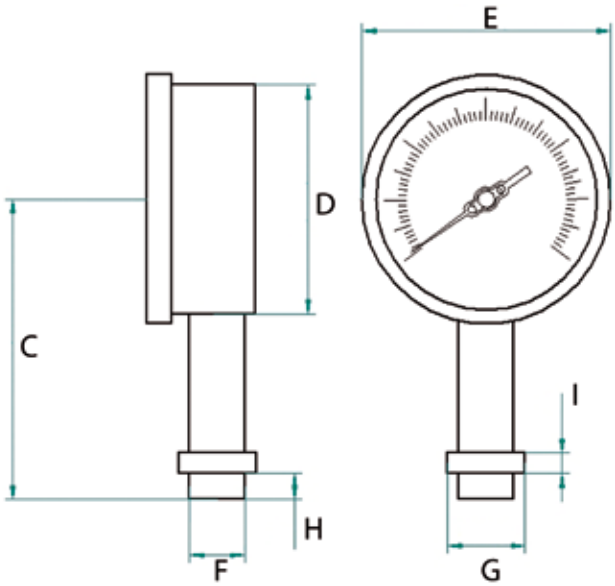
Pointer
micro adjust

Bezel
bayonet

Seal fill fluid
vegetable or mineral oil

Gauge housing fill
glycerine "Optional"

Wetted parts
316 stainless steel



SABS 1062 - 1985

SABS ISO 9001

Ordering code:

Eg: HGZ A 10 SS XXX G4E C01

HGZ
(denotes master gauge)

A
denotes configuration, A for bottom entry and B for back entry

10
denotes gauge size, 15 = 150mm & 10 = 100mm

SS
denotes wetted parts material, SS = stainless steel

XXX
denotes thread size, please see table

G4E
ranges available in 40 and 70 Mpa

C01
denotes logo on dial

Size	A	B	C	D	E	F	G	H	I
150 mm (6")	52	17	109	140	155	23.8	33.5	11	9
100 mm (4")	47	11	90	99	107.5	23.8	33.5	11	9

Rhomberg Utility Gauges

Liquid Filled & Dry Utility Gauges with Brass, Stainless Steel Wetted Parts

PBG - stainless steel case with crimped on bezel

PBJ - injection moulded plastic case with crimped on bezel. External zero adjustment screw

PBU - steel case and bezel (optional stainless steel case)

PBV - steel case with crimped on bezel

PBM - steel case with clip on window

PBN - injection moulded plastic case with clip on window

PBK - steel case with screw on window, internal zero adjustment screw

Features common to Rhomberg Utility Gauges

SABS 1062 - 1985

SABS ISO 9001

Window
Acrylic as standard (safety glass optional)

Seal
Nitrile (natural rubber for silicon fills)

Dampening Fluid
Glycerine, silicon or halocarbon (for oxidising services)

Socket and Bourdon Tube

Code:	SS	BB
Socket:	316L/Ti	brass
Bourdon tube:	316Ti	bronze

Movement

Code:	SS	BB
	300 series stainless steel high impact movement	brass/nickel silver high impact movement

Dial
Aluminium, black lettering on white background

Pointer
Black aluminium, micrometer adjustable

Connections
$^1/_4$" + $^3/_8$" + $^1/_2$" (NPT - BSP)
Other connections available on request

Maximum Range
Vacuum through 25 MPa
Higher ranges available on request

Snubbing
Snubbing / push-in on brass and throttle screws on stainless steel

Accuracy

100mm & 150mm	1.6% FSD (SABS 1062)
63mm	1.6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.
Higher temperatures can be accommodated with heat reducing devices.

PBG - Robust Liquid Filled - Equipment and Industrial Gauges

For heavy duty service where vibration or pulsation of medium would cause excessive wear on a dry gauge or where corrosive ambient conditions prevail. Specific application examples are hydraulic equipment, mining equipment and irrigation equipment.

Case

Case:	304 stainless steel
Bezel:	304 stainless steel
Window:	extruded acrylic sheet
Seal:	neoprene
Dampening fluid:	glycerine, silicone (options available)

Configurations
A B D E F U V

Nominal Sizes

mm	63	100
Imp	$2^1/_2$"	4"

Internals

Socket:	brass or stainless steel
Bourdon tube:	bronze or stainless steel
Movement:	brass or stainless steel
Dial:	aluminium, white with black numerals
Pointer:	aluminium, black anodised

Connections
$^1/_8$" + $^1/_4$" (BSP - NPT - BSPT) Options $^3/_8$" + $^1/_2$" (bottom and lower-back)

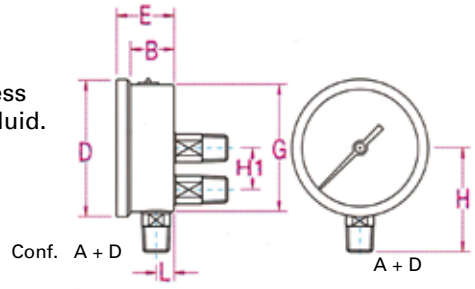
Maximum Range
60 MPa

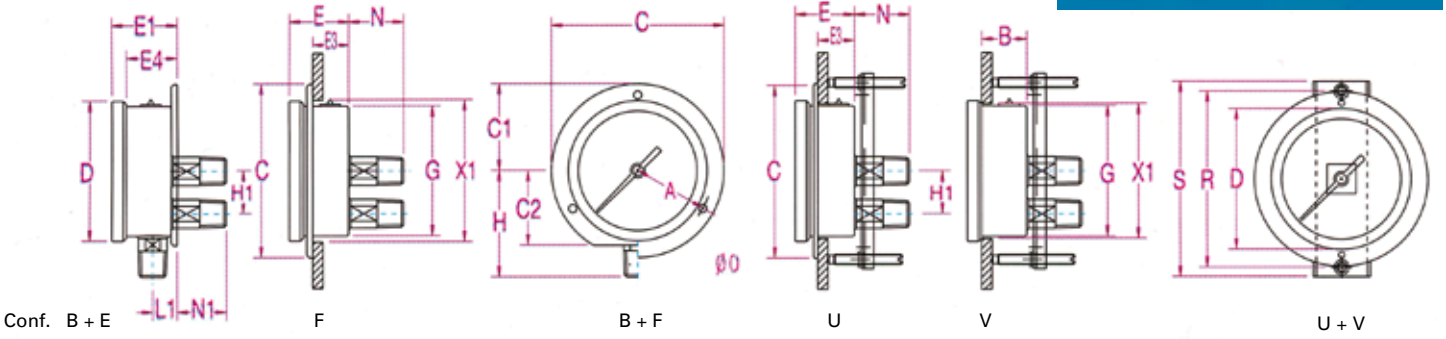
Accuracy
1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.

SABS 1062 - 1985

SABS ISO 9001





Nominal size — *Dimensions (X is panel cut-out diameter)*

Metric / Imperial	A	B	C	C1	C2	D	E	E1	E3	E4	G	H	H1	L	L1	N	N1	O	R	S	X1
63mm	37,00	22,00	85,00	42,50	36,50	69,00	29,00	33,00	22,00	25,50	62,00	60,00	16,50	9,00	13,00	27,00	23,00	3,50	68,00	77,00	63.50
$2^1/_2$"	1,48	0,87	3,35	1,67	1,44	2,72	1,14	1,30	0,87	1,01	2,44	2,36	0,65	0,35	0,51	1,06	0,91	0,14	2,68	3,03	2,50
100mm	58,00	22,00	133,00	66,50	56,00	108,50	29,00	34,00	22,00	24,00	99,50	77,50		9,00	13,00	23,50	23,50	5,00	110,00	122,00	101,00
4"	2,28	0,87	5,24	2,62	2,20	4,27	1,14	1,34	0,87	0,95	3,92	3,05		0,35	0,51	0,93	0,91	0,20	4,33	4,80	3,98

RHOMBERG INSTRUMENTS

PBJ - Liquid Filled Plastic-Cased Industrial Gauges with External Zero Adjustment

For heavy duty service where vibration or pulsation of medium would cause excessive wear on a dry gauge or where corrosive ambient conditions prevail. Specific application examples are hydraulic equipment, irrigation equipment, refrigeration and compressors.

Case

Case:	injection moulded (colour coded)
Bezel:	304 stainless steel
Window:	extruded acrylic sheet
Seal:	neoprene
Dampening fluid:	glycerine (options available)

Configurations
A

Nominal Sizes

mm	63	80
Imp	$2^1/_2$"	$3^1/_8$"

Internals

Socket:	brass
Bourdon tube:	bronze
Movement:	brass
Dial:	aluminium, white with black numerals
Pointer:	aluminium, black anodised

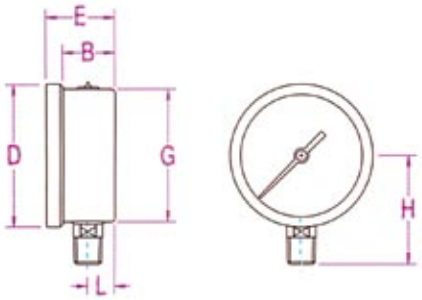
Connections
$^1/_8$" + $^1/_4$" (BSP - NPT - BSPT)
(bottom only)

Options
Colour options available in blue, red, black, white, green

Maximum Range
60 MPa

Accuracy
1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.



Conf. A

SABS 1062 - 1985

SABS ISO 9001

Nominal size	*Dimensions*					
Metric Imperial	B	D	E	G	H	L
63mm $2^1/_2$"	25,00 1,00	68,50 2,70	33,00 1,30	63,50 2,50	52,00 2,05	13,00 0,51
80mm $3^1/_8$"	26,50 1,04	85,00 3,35	34,00 1,34	79,50 3,13	60,50 2,38	14,40 0,57

PBM - Economic Steel Case Gauges

For non-corrosive liquids and gases on light duty service.

Case
Case: steel, black enamel
Lens: clip-in, injection moulded polycarbonate

Configurations
A D V

Nominal Sizes

mm	42	54	68
Imp	1 1/2"	2"	2 1/2"

Internals
Socket: brass
Bourdon tube: brass or bronze, soldered
Movement: brass
Dial: aluminium, white with black numerals
Pointer: aluminium, black anodised

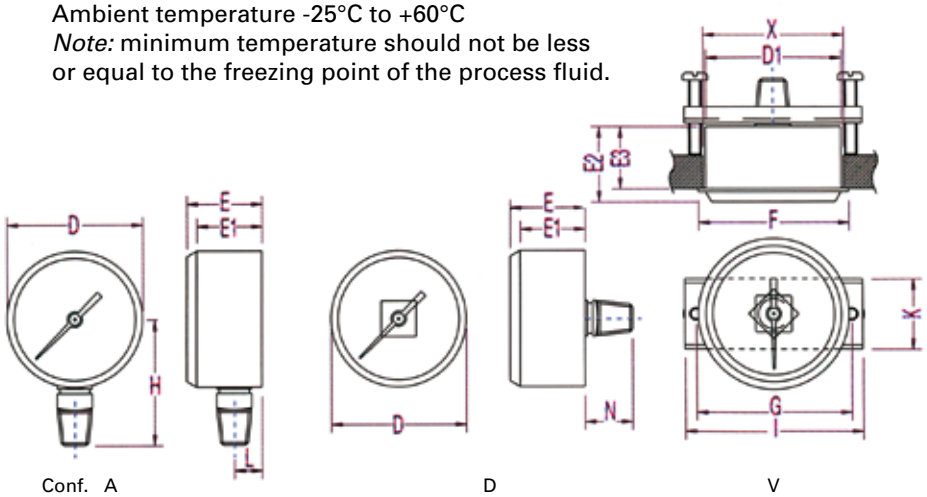
Connections
1/8" + 1/4" (BSP - NPT - BSPT)
(bottom and centre-back)

Options
Integral zero adjustment for sizes 54mm (2") and above on bottom entry only

Maximum Range
6 000 kPa

Accuracy
1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.



Conf. A D V

PBN - Economic Injection Moulded Case Utility Gauges

For non-corrosive liquids and gases on light duty service in more corrosive environments. Specific application examples are coastal application for valve positioner and regulators, swimming pool pumps and stationary irrigation systems.

Case
Case: injection moulded
Lens: clip-in, injection moulded polycarbonate

Configurations
A D

Nominal Sizes

mm	42	54	68
Imp	1 1/2"	2"	2 1/2"

Internals
Socket: brass
Bourdon tube: brass or bronze, soldered
Movement: brass
Dial: aluminium, white with black numerals
Pointer: aluminium, black anodised

Connections
1/8" + 1/4" (BSP - NPT - BSPT)
(bottom and centre-back)

Options
Integral zero adjustment for sizes 54mm (2") and above

SABS 1062 - 1985

SABS ISO 9001

Nominal size — *Dimensions (X is panel cut-out diameter)*

Metric / Imperial	D	D1	E	E1	E2	E3	F	G	H	I	K	L	N	X
42mm	42,00	41,50	28,00	24,00	26,50	22,30	46,50	50,00	41,00	59,00	28,00	11,00	19,00	44,00
1 1/2"	1,65	1,63	1,10	0,95	1,04	0,88	1,83	1,97	1,61	2,32	1,10	0,43	0,75	1,73
54mm	55,00	55,00	30,00	26,00	30,00	26,00	60,00	62,00	50,00	71,00	28,00	11,00	19,00	57,00
2"	2,17	2,17	1,18	1,02	1,18	1,02	2,36	2,44	1,97	2,80	1,10	0,43	0,75	2,24
68mm	68,00	66,00	32,00	28,00	30,00	26,00	72,50	74,00	54,00	83,50	28,00	11,00	19,00	69,00
2 1/2"	2,67	2,60	1,26	1,10	1,18	1,02	2,85	2,91	2,13	3,29	1,10	0,43	0,75	2,72

PBK - Equipment and Light Industrial Gauges (PBX Safety Pattern Option)

For non-corrosive liquids and gases on medium duty service. Specific application examples are oxygen / acetylene regulators, medical regulators and allied equipment. The safety pattern design is especially suitable for welding and medical gas regulators. Solid front baffle and flimsy back blow-out for all bottom entry gauges to meet SABS and U.L. safety requirements as standard.

Case

Case:	steel, black enamel, threaded
Lens:	integral with window
Window:	threaded, injection moulded polycarbonate

Configurations

A D V*

*54 mm (2") and 68mm (2 $^1/_2$")

Nominal Sizes

mm	42	54	68	96*
Imp	1 $^1/_2$"	2"	2 $^1/_2$"	4"*

Internals

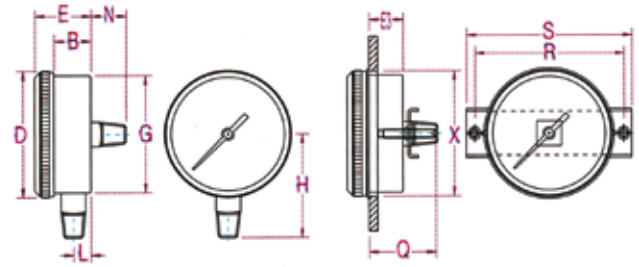
Socket:	brass
Bourdon tube:	brass or bronze, soldered
Movement:	brass
Dial:	aluminium, white with black numerals
Pointer:	aluminium, black anodised

Connections

$^1/_8$" + $^1/_4$" (BSP - NPT - BSPT)
(bottom and centre-back)

Options

Integral zero adjustment for sizes 54mm (2") and above (on bottom entry only). Nickel-plated, brass-plated, stainless steel case



Conf. A + D A + D V V

Maximum Range

60 MPa

Accuracy

1,6% FSD

Temperature Range

Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.

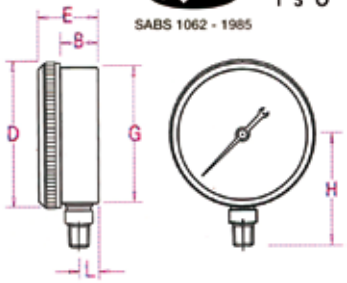
54 mm (2") PBX Safety Pattern Gauge Option

Non-fillable, with polycarbonatescrew-on window, solid front and 'fold-back' blow-out safety back

Internals:	brass
Connections:	$^1/_8$" + $^1/_4$" (BSP - NPT - BSPT) (only Conf. A)
Maximum range:	60 MPa
Accuracy:	1,6% FSD
Mass:	±99g

SABS 1062 - 1985

SABS ISO 9001



Conf. A A

68 mm (2 $^1/_2$") PBS Gauge Option

Case:	glass filled nylon
Window:	polycarbonate screw-on
Internals:	brass
Connections:	$^1/_8$" + $^1/_4$" (BSP - NPT - BSPT)
Maximum range:	6 000 kPa (1 000 PSI)
Accuracy:	1,6% FSD
Mass:	105g

Nominal size

Dimensions (X is panel cut-out diameter)

	Metric / Imperial	B	D	E	E3	G	H	L	N	Q	R	S	X
	42mm	18,20	46,00	29,50		41,50	36,00	9,00	20,00				
	1 $^1/_2$"	0,72	1,81	1,16		1,63	1,42	0,35	0,79				
	54mm	20,00	59,00	30,00	16,50	54,00	51,00	10,00	20,00	34,50	62,00	71,00	55,00
	2"	0,79	2,32	1,18	0,65	2,13	2,01	0,39	0,79	1,36	2,44	2,80	2,19
Safety Pattern	54mm	22,50	59,00	34,50		55,00	51,00	11,50					
	2"	0,89	2,32	1,36		2,16	2,01	0,45					
	68mm	21,00	72,00	32,00	19,50	67,00	59,00	10,00	20,00	38,00	74,00	83,00	68,50
	2 $^1/_2$"	0,83	2,83	1,26	0,77	2,64	2,32	0,39	0,79	1,50	2,91	3,27	2,70
	96mm	22,00	97,00	33,00		93,00	73,00	11,00	20,00				
	4"	0,87	3,81	1,30		3,66	2,87	0,43	0,79				
PBS 68*	68mm	22,00	72,50	34,50		67,50	58,00	12,00					
	2 $^1/_2$"	8,66	2,85	1,36		2,66	2,28	0,47					

PBU - Robust Utility and Light Industrial Gauges

For non-corrosive liquids and gases on light duty service. Specific application examples are valve positioners, regular outputs, D.I.Y. compressors, fire protection systems and light duty pumps.

Case

Case:	steel, black enamel or 304 stainless steel
Lens:	steel, black enamel, friction fit
Window:	extruded acrylic sheet, flat

Configurations

A D F* U* (B** E**)

* available in 63mm ($2^1/_2$") only

** on application available in 100mm (4") and 125mm (5")

Nominal Sizes

mm	42	54	63	100	125
Imp	$1^1/_2$"	2"	$2^1/_2$"	4"	5"

Internals

Socket:	brass or 316L stainless steel
Bourdon tube:	brass bronze, or stainless steel
Movement:	brass or stainless steel
Dial:	aluminium, white with black numerals
Pointer:	aluminium, black anodised

Connections

$^1/_8$" + $^1/_4$" ($^3/_8$" on 100mm) (BSP - NPT - BSPT)
(bottom and centre-back)

Maximum Range

6 000 kPa
(higher pressures available on request)

Options

Integral zero adjustment for sizes 54mm (2") and above
Clip-in window (54mm only) Stainless steel case and bezel ring
63mm available in V configuration with slim line front flange

Accuracy

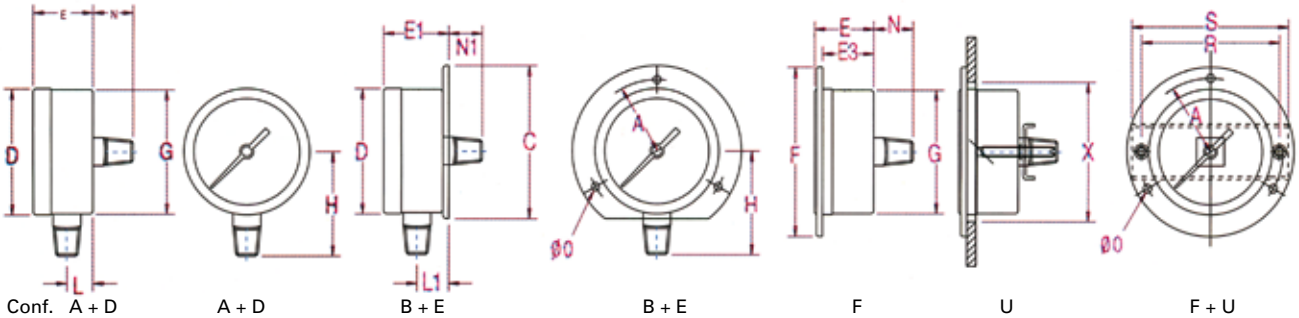
1,6% FSD

SABS 1062 - 1985

SABS ISO 9001

Temperature Range

Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid and for live steam, syphon tubes should be used.



Conf. A + D | A + D | B + E | B + E | F | U | F + U

Nominal size — *Dimensions (X is panel cut-out diameter)*

Metric Imperial	A	C	D	E	E1	E3	F	G	H	L	L1	N	N1	O	R	S	X
42mm $1^1/_2$"			42,50 1,67	27,00 1,06				41,50 1,63	36,00 1,42	9,00 0,35		20,00 0,79					
54mm 2"	31,50 1,24	73,00 2,87	55,00 2,17	29,00 1,14	31,00 1,22		73,00 2,87	54,00 2,13	59,00 2,32	10,00 0,39	12,00 0,47	20,00 0,79	18,00 0,71	4,00 0,16	62,00 2,44	71,00 2,80	55,50 2,19
63mm $2^1/_2$"	37,00 1,46	86,00 3,39	63,00 2,48	30,00 1,18	33,00 1,30	30,00 1,18	85,00 3,35	62,00 2,44	52,00 2,05	13,00 0,51	13,00 0,51	20,00 0,79	17,00 0,67	4,00 0,16	68,00 2,68	77,00 3,03	64,00 2,52
100mm 4"	57,50 2,26	132,00 5,20	100,00 3,94	32,00 1,26	37,00 1,46			99,00 3,90	78,00 3,07	13,00 0,51	18,00 0,71	30,00 1,18	25,00 0,98	5,00 0,20	110,00 4,33	120,00 4,72	103,00 4,06
125mm 5"	68,25 2,69	144,00 5,67	117,00 4,60	29,50 1,16				115,50 4,54	84,00 3,30	120,00 0,39		20,00 0,79					

RHOMBERG INSTRUMENTS

PBV - Panel Mounted Equipment Gauges

For non-corrosive liquids and gases on light duty service. Specific application examples are mobile compressor panels, heavy automotive machinery and medical equipment systems.

Case

Case:	steel, black enamel
Lens:	steel, black enamel or nickel plated crimped
Window:	extruded acrylic plastic

Configurations
V

Nominal Sizes

mm	52
Imp	2″

Internals

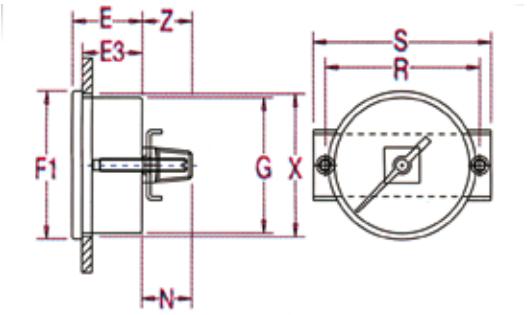
Socket:	brass
Bourdon tube:	brass or bronze, soldered
Movement:	brass
Dial:	aluminium, white with black numerals
Pointer:	aluminium, black anodised

Connections
$^1/_8$″ + $^1/_4$″ (BSP - NPT - BSPT)
(centre-back only)

Maximum Range
6 000 kPa

Accuracy
1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.



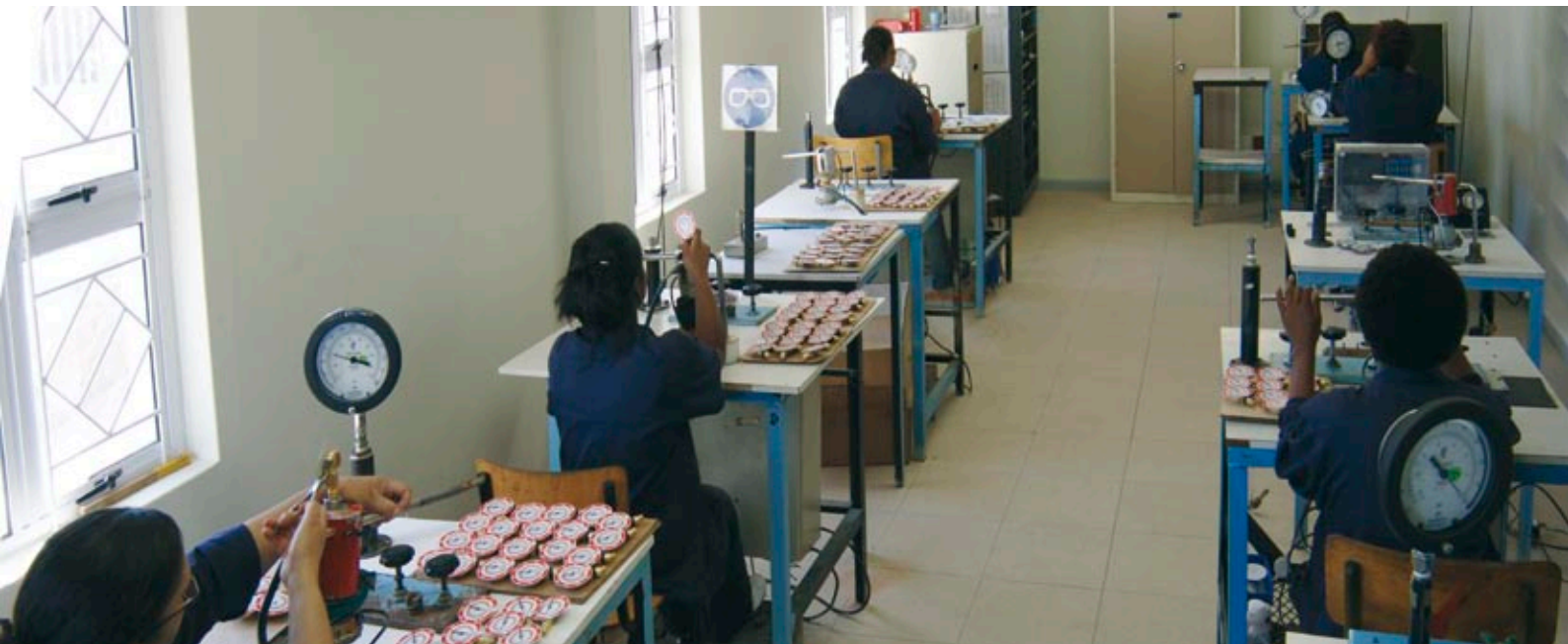
Conf. V

SABS 1062 - 1985

SABS ISO 9001

Nominal size — *Dimensions (X is panel cut-out diameter)*

Metric Imperial	E	E3	F1	G	N	R	S	X	Z
52mm	28,00	24,00	59,00	52,00	20,00	62,00	71,00	53,50	24,50
2″	1,10	0,94	2,32	2,05	0,79	2,44	2,80	2,11	0,96



Accessories and Optional Features

Red Set Pointer ❶
To indicate a specific pressure limit
External key or knob to reset hand

Maximum Drag Pointer
Available for gauges 63mm, 100mm and 150mm
Indicates maximum pressure attained
External key or knob to reset hand

Maximum Stop
To protect movement against overpressure

Minimum Stop
To protect low range gauges against vacuum

Special Dial
Ranges different from standards, or custom artwork, available on application

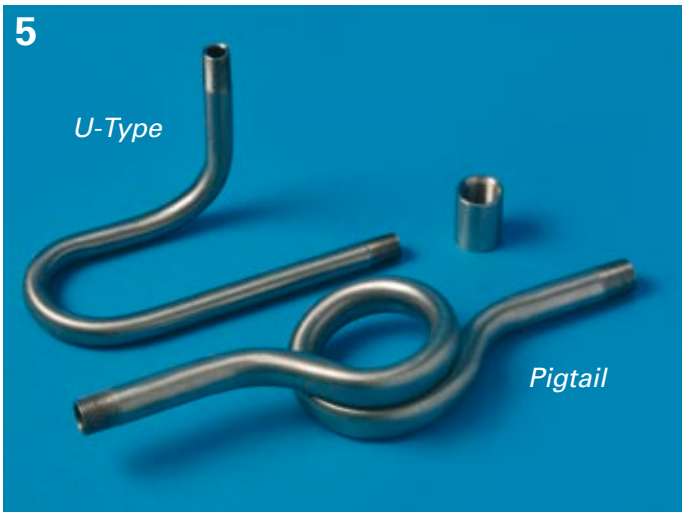
Windows
4mm instrument glass or laminated safety glass

Cooling Element ❷
To protect the gauge from high temperatures of ±400°C encountered on liquid based applications

Isolation Valves and Gauge Cocks ❸
To isolate pressure from gauge. Equipped with a facility to vent the gauge. Suitable for use with gases, liquids and vapour.

Electric Warning Contacts ❹
The contact assembly is available for 100mm & 150mm PBB pressure gauges and for 100mm PBZ.
Indicating accuracy of process gauges, above 250 kPa, with electric contact:
- pointer not carrying contact - 0,5%
- pointer carrying contact - 1,5%

Siphons ❺
Siphons should be installed on all live steam applications to protect the gauge from the high temperatures encountered. Available in either "pigtail' or "U-type" configurations for installation on horizontal or vertical line respectively.



Gauges Ordering Code

Example of how to make up the ordering product code:

PBB	A	63	SS	1	2	Q	C3B	CO1	G	Q

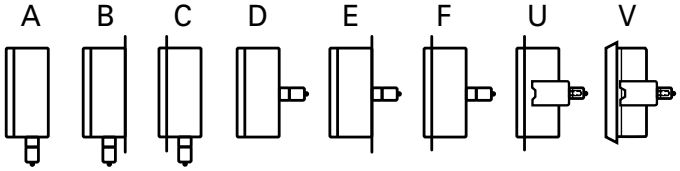
Case design
Configuration
Nominal size
System material
Thread type
Thread size
Case material & Colour
Range
Customer reference
Option 1
Option 2

For the complete part number for Diaphragm and Differential Pressure Gauges, please consult with your sales representative when placing an order.

Case Type and Size

Case	*Case & Bezel Material (Std)*	*Size Code*	*Nom. size mm (inch)*	*Available Configuration*
PBB	polished 304 stainless steel	63 10 15	63 ($2^1/_2$) 100 (4) 150 (6)	A B C* D E F U V *100mm only
PBZ	colour coded *(grey)* PBT polybutylene-terephthalate	10 15	100 (4) 150 (6)	A B D* *centre-back connection available only brass 100mm
PBX	colour coded *(black)* PBT polybutylene-terephthalate	10	100 (4)	A
PCB	polished 304 stainless steel	10 15	100 (4) 150 (6)	A B C* D F U V *100mm only
PCZ	colour coded *(grey)* PBT polybutylene-terephthalate	10 15	100 (4) 150 (6)	A B
PCK	*(black)* mild steel	68	68 ($2^1/_2$)	A D V
PDB	polished 304 stainless steel	10 15	100 (4) 150 (6)	H
PDZ	colour coded *(grey)* PBT polybutylene-terephthalate	10 15	100 (4) 150 (6)	H
DBB	304 stainless steel	15	150 (6)	A B D F
DCB	polished 304 stainless steel	15	150 (6)	A B D F
PBG	304 stainless steel	63 10	63 ($2^1/_2$) 100 (4)	A B D E F U V
PBJ	*(black)* injection moulded, 304 stainless steel bezel	63 80	63 ($2^1/_2$) 80 (3)	A
PBN	*(black)* injection moulded case polycarbonate clip-in lens	42 54 68	42 ($1^1/_2$) 54 (2) 68 ($2^1/_2$)	A D
PBM	*(black)* mild steel polycarbonate clip-in lens	42 54 68	42 ($1^1/_2$) 54 (2) 68 ($2^1/_2$)	A D V
PBK	*(black)* mild steel threaded polycarbonate window	42 54 68 96	42 ($1^1/_2$) 54 (2) 68 ($2^1/_2$) 96 (4)	A* D V* * only option for safety pattern ** 54 mm & 68 mm only
PBU	*(black)* mild steel flat acrylic window	42 54 63 10 12	42 ($1^1/_2$) 54 (2) 63 ($2^1/_2$) 100 (4) 125 (5)	A B**D E**F *U * * 54 mm & 68 mm only ** on application 100 mm, 125 mm
PBV	*(black)* mild steel with nickel plated bezel, flat acrylic window	52	52 (2)	V

Configurations



A bottom connection, stem mounting
B bottom connection, back flange, surface mounting
C bottom connection, front flange, surface mounting
D back connection, stem mounting
E back connection, back flange, surface mounting
F back connection, wide front flange, (drilled) panel mounting
U back connection, wide front flange, (undrilled) panel mounting (yoke)
V back connection, narrow front-ring, panel mounting (yoke)

Bourdon Tube Selection

System code	Socket material	Bourdon tube material	Tube type	Range selection (kPa)
BB	brass brass tip	bronze tube	C-tube	60 / 6 000
	stainless steel tube and tip		spiral / 100 000	10 000
SS	316 L	316 Ti	C-tube 10 000	60 / 6 000
	316 Ti	spiral	/ 100 000	
MM	Monel 400	K-Monel	C-tube 10 000	60 / 6 000
	K-Monel	spiral	/ 60 000	

Utility gauges-ranges above 20 MPa on request

Process gauges-ranges above 100 MPa on request

Capsule Systems Materials Selection

System code	Socket material	Capsule material	Tube type	Range selection (kPa)
SS	316 L	stainless	capsule -10 to -25 kPA (Vac)	2,5 to 100 kPa
BB	brass	copper	capsule -6 to -25 kPA (Vac)	2,5 to 100 kPa

Thread Type and Size

Thread type	*Thread size (size code = number $^1/_8$" 's)*
	1 = $^1/_8$"
O = NPT	2 = $^1/_4$"
1 = BSP	3 = $^3/_8$"
2 = BSPT	4 = $^1/_2$"

Customer Reference

Codes allocated to customers describing their specific requirements
Standard CI gauge code is C01
Where applicable consult with our sales representative for your specific code

Case Material and Case Colour

Q = standard (see Case type & size)
C = nickel plated
P = brass plated
S = stainless steel case (where not standard)

H = white	*R = red*
E = yellow	*2 = gold*
I = pink	*3 = brown*
Z = violet	*4 = olive green*
L = blue	*A = purple*
N = green	*5 = charcoal*
O = orange	*6 = dark brown*
D = dark blue	*B = black*

X = non standard (describe under special instructions)

Standard Metric Ranges (kPa)

Range		*Dial graduation*	
kPa (kilopascal)	*range code*	*figure interval*	*minor graduation*
0/10 Pa	C1A	1	0,1
0/16 Pa	C1B	1	0,2
0/25 Pa	C1C	5	0,2
0/40 Pa	C1D	5	0,5
0/60 Pa	C1E	10	0,5
0/100 Pa	C1F	10	1
0/160 Pa	C1G	10	2
0/250 Pa	C1H	50	5
0/400 Pa	C1J	50	5
0/600 Pa	C1K	100	10
0/1 000 Pa	C1L	100	10
0/1 600 Pa	C1M	100	20
0/2 500 Pa	C2A	500	50
0/4 000 Pa	C2B	500	50
0/6 000 Pa	C2C	1 000	100
0/1	C2D	0,1	0,01
0/1,6	C2E	0,1	0,02
0/2,5	C2F	0,5	0,5
0/4	C2G	0,5	0,5
0/6	C2H	1	0,1
0/10	C2J	1	0,1
0/16	C2K	1	0,2
0/25	C2L	5	0,2
0/40	C2M	5	0,5
0/60	C3A	10	0,5
0/100	C3B	10	1
0/160	C3C	10	2
0/250	C3D	50	5
0/400	C3E	50	5
0/600	C3F	100	10
0/1 000	C3G	100	10
0/1 600	C3H	100	20
0/2 500	C3J	500	50
0/4 000	C3K	500	50
0/6 000	C3L	1 000	100
0/1 MPa	C3M	0,1	0,01
0/1,6 MPa	C4A	0,1	0,02
0/2,5 MPa	C4B	0,5	0,5
0/4 MPa	C4C	0,5	0,5
0/6 MPa	C4D	1	0,1
0/10 MPa	C4E	1	0,1
0/16 MPa	C4F	1	0,2
0/25 MPa	C4G	5	0,2
0/40 MPa	C4H	5	0,5
0/60 MPa	C4J	10	0,5
0/100 MPa	C4K	10	1
0/160 MPa	C4L	10	2
0/250 MPa	C4M	50	5
vacuum			
-100/0	A5B	10	1
compound			
-100/0/150	B5A	50	5
-100/0/300	B5B	50	5
-100/0/500	B5C	100	10
-100/0/900	B5D	100	10
-100/01 500	B5E	100	20
-100/0/2 400	B5F	500	50

Gauges may be ordered with non-standard metric dials (kPa, bar or kg/cm^2). Range in accordance with SABS 1062.
Dual scale dials will be supplied with a standard metric inner scale and equivalent psi outer scale.
psi dominant dual scales are also available.
Please be specific when ordering.

Other Standard Metric Ranges (kg/cm² & Bar)

Range		Dial graduation	
kg/cm²(kilograms per sq.cm²)	*bar*	*figure interval*	*minor graduation*
pressure			
0/1	0/1	0,1	0,01
0/1,6	0/1,6	0,2	0,02
0/2,5	0/2,5	0,5	0,05
0/4	0/4	0,5	0,05
0/6	0/6	0,5	0,1
0/10	0/10	1	0,1
0/16	0/16	1	0,2
0/25	0/25	5	0,5
0/40	0/40	5	0,5
0/60	0/60	5	0,5
0/100	0/100	10	1
0/160	0/160	10	2
0/250	0/250	50	5
0/400	0/400	50	5
0/600	0/600	50	10
0/1 000	0/1 000	100	10
vacuum			
-10/0	-1/0	0,1	0,01
compound			
-10/0/1,5	-1/0/1,5	0,5	0,05
-1/0/3	-1/0/3	0,5	0,05
-1/0/5	-1/0/5	1	0,1
-1/0/9	-1/0/9	1	0,1
-1/0/15	-1/015	2	0,2
-1/0/24	-1/0/24	5	0,5

Note: *Where required range has no code indicated, that range should be clearly specified on ordering.*

Standard Imperial Ranges (psi)

Range		Dial graduation			
psi	*range code*	*figure interval*		*minor graduation*	
0/15	G2D	1		0,2	
0/30	G2F	5		0,5	
0/60	G2G	10		1	
0/100	G3A	10		1	
0/160	G3E	10		2	
0/200	G3C	50		2	
0/300	G3D	50		5	
0/400	G3E	50		5	
0/600	G3G	100		10	
0/800	G3H	100		10	
0/1 000	G3J	100		10	
0/1 500	G3K	500		20	
0/2 000	G3L	500		20	
0/3 000	G4A	500		50	
0/4 000	G4B	500		50	
0/5 000	G4C	1 000		100	
0/6 000	G4D	1 000		100	
0/10 000	G4E	1 000		100	
0/15 000	G4F	5 000		500	
vacuum					
30-0 inches mercury	E1A	5 inches		0,5	
compound		*'Hg*	*psi*	*'Hg*	*psi*
30"Hg Vac/0/15psi	F1A	5	3	1	0,5
30"Hg Vac/0/30psi	F1B	10	5	1	1
30"Hg Vac/0/60psi	F1C	10	10	2	1
30"Hg Vac/0/100psi	F1D	10	10	2	1
30"Hg Vac/0/150psi	F1E	10	25	5	5
30"Hg Vac/0/300psi	F2B	30	25	5	5

Options

Both option digits to be filled in:
No options = QQ; One option = selected digit then Q;
Two options = list from below alpha-numerically

Q = no options
X = special instruction
A = drag pointer
B = blow-out back with baffle (safety)
C = red set pointer
D = micro switch movement single
E = micro switch movement double
F = manocont movement
G = safety glass
H = bar secondary scale
I = kPa secondary scale
J = zero adjuster
K = oil free, oxygen clean logo; gauge bagged in plastic
L = psi secondary scale
M = refrigeration scale
N = retarded scale
P = overload stop internal
R = studs and bracket
S = nickel plated block
T = snubbers
U = adaptor fitted
V = silicon oil filled
W = block welded to case
Y = glycerine filled
Z = opanol oil filled
2 = other filling medium (Siltherm 800, Flurolube, Krytox GPL 100, etc.)
3 = female thread
4 = stainless steel movement in brass system
5 = no aluminium parts
9 = centre back option

Pressure Cross Reference Chart

psi	*atms.*	*Ft.Hd. H_20 at 20°C*	*in H_20*	*kg/cm²*	*meters H_20*	*in.Hg. at 20°C*	*mm.Hg.*	*cm.Hg.*	*bar*	*Milibar (mbar)*	*kPa*
1	0,0680	2,310	27,720	0,0700	0,704	2,043	51,884	5,188	0,0690	68,947	6,895
14,696	1	33,659	407,513	1,0330	10,351	30,019	762,480	76,248	1,0130	1013,0	101,325
0,433	0,0290	1	12,000	0,0300	0,305	0,884	22,452	2,245	0,0300	29,837	2,984
0,036	0,0025	0,833	1	0,0025	0,025	0,074	1,871	0,187	0,0025	2,486	0,249
14,233	0,9680	32,867	394,408	1	10,018	29,054	737,959	73,796	0,9810	980,662	98,066
1,422	00,0970	3,287	39,370	0,0990	1	2,905	73,796	7,379	0,0980	98,066	9,807
0,489	0,0330	1,131	13,575	0,0340	0,345	1	25,400	2,540	0,0340	33,753	3,375
0,019	0,0013	0,045	0,534	0,0014	0,0136	0,039	1	0,100	0,0010	1,329	0,133
0,193	0,0131	0,445	5,340	0,0140	0,1360	0,393	10,000	1	0,0133	13,290	1,328
14,503	0,9870	33,514	402,164	1,0200	10,2110	29,625	752,470	75,247	1	1000,0	100,00
0,014	0,0009	0,033	0,402	0,0010	0,0102	0,029	0,752	0,075	0,001	1	0,100
0,145	0,0098	0,335	4,021	0,0100	0,1020	0,296	7,525	0,752	0,010	10,000	1

PDBH - Diaphragm Type Gauge

All stainless steel pressure gauge suitable for measurement to maximum pressure of 2 500 kPa especially in corrosive environments where a pressure element of exotic materials is required. Also suitable where start up pressures are significantly higher than operating pressures and to measure viscous fluids or fluids with suspended solids.

Case and Upper Diaphragm Housing
PDB - polished 304 stainless steel case and bezel
PDZ - P.B.T. colour coded case and bezel

Window
Acrylic as standard (safety glass optional)

Blow-Out Disc
Top blow out (compensating optional)

Diaphragm Sealing Ring	**Nominal Sizes**		
Neoprene	mm	100	150
	Imp	4"	6"

Pressure Element
< 250 kPa stainless steel 1,4571
> 250 kPa steel cold galvanised

Movement
All stainless steel

Dial
Dished aluminium, black lettering on white background

Pointer
Black aluminium, adjustable

Connections
Process connection $^1/_4$" + $^1/_2$" (NPT - BSP)
Other connections available on request

Scale Ranges
Flange size is determined by the pressure range
0-40 to 0-400 mbar (150mm diaphragm
0-60 to 0-2500 kPa (100mm diaphragm)
or equivalent other units of pressure or vacuum

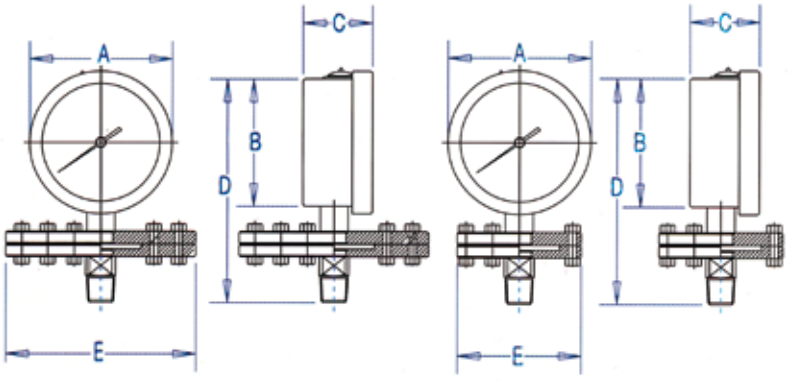
Working Pressure
Steady: full scale value
Fluctuating: 0,9 x full scale value

Accuracy
100mm & 150mm 1,6% FSD

Temperature Range
Ambient temperature -25°C to +60°C
Medium temperature to 100°C
Note: minimum temperature should not be less or equal to the freezing point of the process fluid.
Higher temperatures can be accommodated with heat reducing devices

Weather Protection
IP 54

Options
Diaphragm and wetted parts lined or coated with special materials such as:
PTFE (Teflon) foil, Hastelloy B2, Hastelloy C4, Monel, Inconel, Tantalum, Titanium, Silver



Conf. H 150 dia 100 dia

Range	Dia Case	Dia Flange	A	B	C	D	E
kPa	100mm	100mm	112,60	99,00	55,00	177,00	98,00
60-2 500	4"	4"	4,43	3,90	2,16	6,99	3,86
kPa	150mm	100mm	155,00	140,00	56,00	177,00	98,00
60-2 500	6"	4"	6,10	5,51	2,20	6,99	3,86
mbar	100mm	150mm	122,60	99,00	55,00	177,00	155,00
40-400	4"	6"	4,43	3,90	2,16	6,99	6,10
mbar	150mm	150mm	155,00	140,00	56,00	177,00	98,00
40-400	6"	6"	6,10	5,51	2,20	6,99	6,10

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Chemical Seals

MAXI ❶, ❷

Material: Grade 316SS (Upper & lower flange)
Options: Monel, Hastelloy B, Hastelloy C, Flurador, PTFE
Diaphragm: Grade 316SS Monel, PTFE coated
Seal Diameter: 38 mm & 90 mm
Nutr/Bolts: Grade 316SS A4
Washer: Grade 316SS
Gasket: Viton "O" ring
Thread Option: Gauge Port: ***Female:*** $^1/_4$" BSP
Optional: $^1/_4$", $^3/_8$", $^1/_2$" BSP, BSPT or NPT
Process Connection: ***Male &Female:*** $^1/_2$" BSP, $^1/_4$", 3.8" BSP, BSPT or NPT ***Optional:*** $^1/_4$", $^3/_8$", BSP, BSPT or NPT, flanged type
Minimum Pressure: 15 PSI
Maximum Pressure: 2 500 PSI
Burst Pressure: 50 Mpa

MIDI ❸ 50 mm Midi seal

Material: Grade 316SS
Options: Lower flange: Monel, Hastelloy B, Hastelloy C
Diameter: 50 mm
Diaphragm: 316SS
Gauge Port: Female: $^1/_4$"BSP, BSPT or NPT
Optional: 3.8", ½" BSP, BSPT or NPT
Process Connection: ***Male & Female:*** $^1/_4$" BSP, BSPT or NPT
Optional: 3.8", ½" BSP or NPT
Minimum Pressure: 15 PSI
Maximum Pressure: 2 500 PSI
Burst Pressure: 10 000 PSI

TRI-CLAMP ❹ 2" Tri-clamp, ❺ 1.5" Tri-clamp

Material: Grade 316SS
Diaphragm: 316SS, PTFE coated, Teflon
Gauge Port: Female: $^1/_4$", 3.8", ½" BSP or NPT
Process Connection: 1.5" or 2" Tri-clamp
Minimum Pressure: 15 PSI
Maximum Pressure: 580 PSI
Burst Pressure: 25 000 PSI

MINI ❻ 35 mm Mini seal)

Material: Grade 316SS
Options: Lower flange: Monel, Hastelloy B, Hastelloy C
Diameter: 35 mm
Diaphragm: 316SS
Gauge Port: ***Female:*** $^3/_8$", ½" BSP, BSPT or NPT
Optional: $^1/_4$" BSP or NPT
Process Connection: ***Male & Female:*** $^1/_4$" BSP
Optional: $^3/_8$", ½" BSP, BSPT or NPT
Minimum Pressure: 100 PSI
Maximum Pressure: 6 000 PSI
Burst Pressure: 25 000 PSI

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RHOMBERG INSTRUMENTS

Chemical Seals

DAIRY SEAL ❼ NW40 Dairy seal, ❽ NW50 Dairy seal

Material: Grade 316SS
Diaphragm: 316SS, PTFE coated
Gauge Port: ***Female:*** $^1/_4$" BSP, BSPT or NPT
Optional: $^3/_8$", ½" BSP, BSPT or NPT
Process Connection: NW25, 32, 40, 50, 65, SMS38, DN48 (pulp/paper)
Minimum Pressure: 30 PSI
Maximum Pressure: 40 BAR

CHEMICAL SEAL ❾ NWD4 Chemical seal

The XWD4 is used in applications where the process fluid (medium) is corrosive or viscous (could even contain waste particles) and could clog the instruments internals.
By installing the XWD4 in between the process and the measuring instrument the clogging or solidifying of the process fluid or medium will have no effect on the measuring instrument.

Design: Two piece construction plus diaphragm
Material: Top and bottom housing material, 316 stainless steel/Polypropylene/PVC
Diaphragm material: 316 stainless steel/Tantalum/Teflon
Sealing: o-ring, Viton
Fill screw: 316 stainless steel
Thread ranges: $^1/_8$", $^1/_4$" $^3/_8$", $^1/_2$" 1" (NPT/NPTS/BSP/BSPT)
Male threads are available on request
Assembly: Top and botton housings are screwed together by an M55 thread which has been tested up to 200Mpa (an advantage over the welded version)
Pressure: PVC and Polypropylene housings can only handle up to 2000kPa pressure
316 stainless steel housings can handle up to 150Mpa (can be PTFE coated.

FLANGED SEAL ❿

Flanged seals are for continuous use for safety concerns. Cleanout type for easy cleaning, with flushing connections available.
Material: Grade 316SS (Upper & lower flange)
Options: Monel, Hastelloy B, Hastelloy C, Titanium, Tantalum, PVC, Carbon steel, Teflon, Alloy 20 and more available (nickel plated carbon steel upper housing standard, other material available)
Configurations: 1" (25mm), 1.5" (40mm) and 2" (50mm) Pipe size & #150 and #300 pressure rating standard. (Other configurations available)
Instrument connections: $^1/_4$" & $^1/_2$", NPTF gauge connections standard (other NPTF gauge connections available)
Saddle diaphragm seals available upon request.

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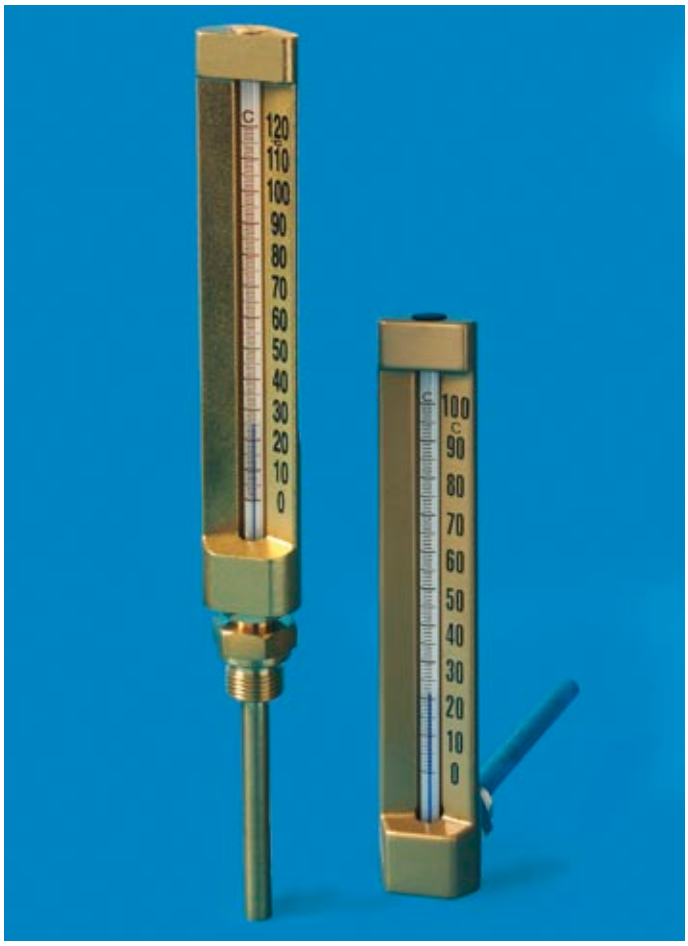
SABS ISO 9001

V-Line Glass Thermometers



The operation of the glass thermometer is similar to that of other thermometers using the liquid or gas expansion principle. The sealed glass capillary contains a small bulb filled with a liquid or mercury. This fluid will expand with the application of temperature and will rise into the capillary. A scale is fixed in a corresponding position next to the capillary. The divisions are etched on to the glass itself and the scale is printed on to the corresponding "V" formed aluminium housing. The assembly of the thermometer is practical and resistant to breakage if correctly installed.

All components are readily disassembled even on pipelines or tanks holding contents. This is made possible as the pocket or thermowell can be left in place without disturbing the contents of the vessel or pipeline. Special elastomers are fitted to render the glass capillary vibration resistant and the"V" formation of the housing protects the glass from external damage. A combination of anodised aluminium and glass with etched numerals and graduations is highly resistant to sea water, acids, alkali and solvents.

V-line thermometers are typically used in diesel engines, refrigeration and heating, chemical and petrochemical plants, compressors, ship yards, turbines and power stations.

Design
Durable design, indicator housing / glass insert / thermowell / pocket / components easily interchangeable

Housing
Die cast aluminium; brass anodised, V-shaped scale section

Thermowell / Pocket
Brass or stainless steel

Glass Thermometer
Vibration resistant with blue spirit or mercury filled columns

Temperature Ranges
-60 up to 600°C

Stem Configurations
Vertical or 90° angle

Insertion Lengths
63 mm, 100 mm, 150 mm

Accuracy
1%

Press Connection
$^1/_2$" BSP or NPT

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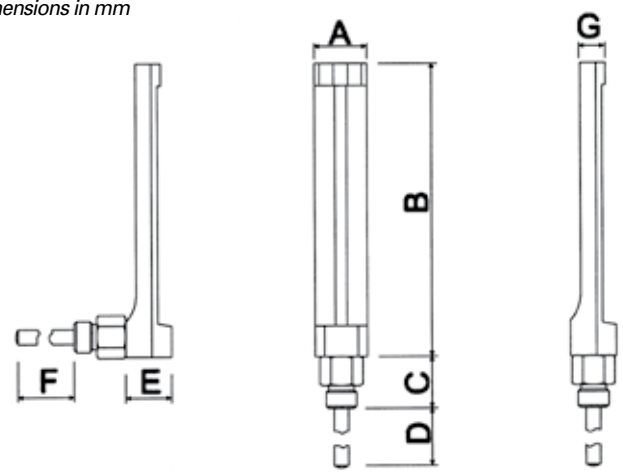
Specs	A	B	C	D	E	F	G
63 mm	34,8	200,0	35,8	95,0	31,2	95,0	17,6
100 mm	34,8	200,0	35,8	135,0	31,2	135,0	17,6

Dimensions in mm



V-LINE Thermometers Ordering code

TGX | **S** | **200** | **63** | **BB** | **14** | **0/100**

TYPE
Denotes V-Line

CASE MOUNTING

Code	Case Mounting
S	Vertical
B	90° back entry

CASE SIZE

Code	Case Size
200	200 mm

BULB LENGTH

Code	Bulb Length
63	63 mm
10	100 mm
15	150 mm

BULB MATERIAL

Code	Bulb Material
BB	Brass (up to 300°C
SS	316L Stainless steel

PROCESS CONNECTION

Code	Process Connect.
04	1/2" NPT
14	1/2" BSP

TEMPERATURE RANGE

Code	Temp. Range
-50/0/30	-50/0/30°C
-30/0/50	-30/0/50°C
0/50	0/50°C
0/100	0/100°C
0/120	0/120°C
0/160	0/160°C
0/200	0/200°C
0/300	0/300°C
0/400	0/400°C
0/500	0/500°C
0/600	0/600°C

TBS - Bi-Metal Thermometers

Unlike most dial indicating instruments, the Bi-Metal thermometer has no pinion and segment movement and the pointer is directly driven by the coiled bimetallic strip. This simple, yet rugged construction ensures long, trouble free service with enduring accuracy.

Bi-Metal thermometers are typically used in heating, ventilation and air conditioning (HVAC), chemical and petroleum plants, pulp and paper industries, food and beverage industries.

Features
Hermetically sealed. Sturdy all stainless steel construction. Crimped on bezel. No geared movement. The pointer is directly driven by the Bi-metallic coil. This sturdy assembly renders the few moving components virtually impervious to shock and the effects of vibration.

Housing
Grade 304SS

Stem and Fitting
Grade 316SS, zero externally adjustable

Dial
Aluminium, white with printing in black

Pointer
Aluminium, llacquered black

Environmental Protection
IP65

Temperature Ranges
Between 40°C and 500°C

SABS 1062 - 1985

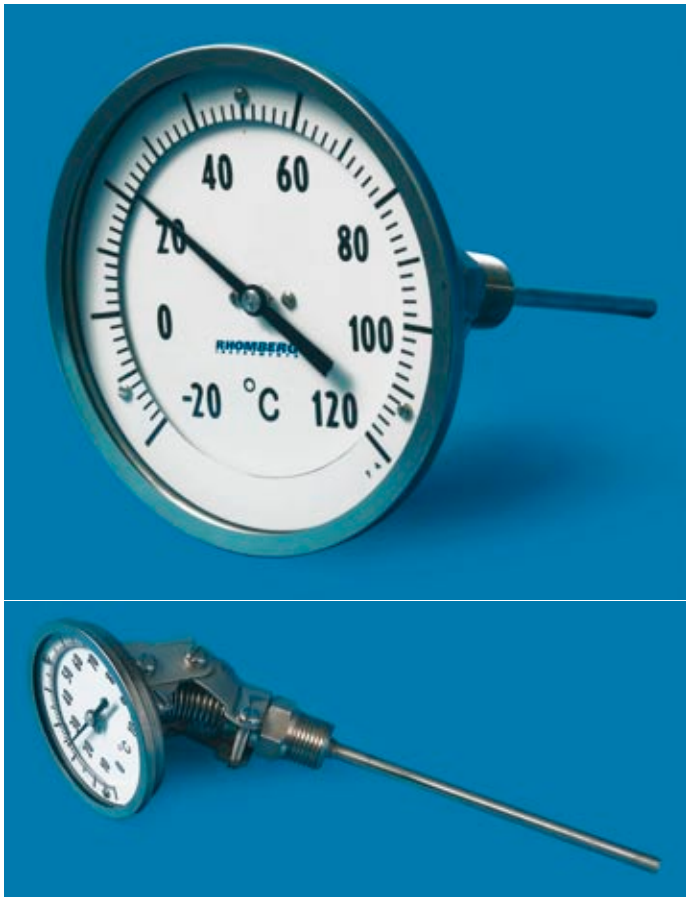
SABS ISO 9001

Accuracy
Class 1,0 dry (DIN) 100 mm, 1% to ASME (3" & 5")

Stem Lengths
From 63 mm up to 600 mm

Stem Diameter
Standard 6 mm (other sizes on application)

Thread Sizes
$^1/_4$", $^3/_8$", and $^1/_2$" (sliding union as an option)

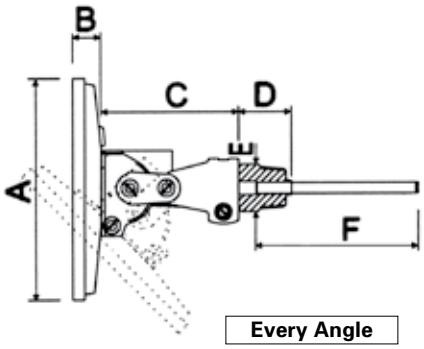


Stem Configurations
Bottom, back, every angle

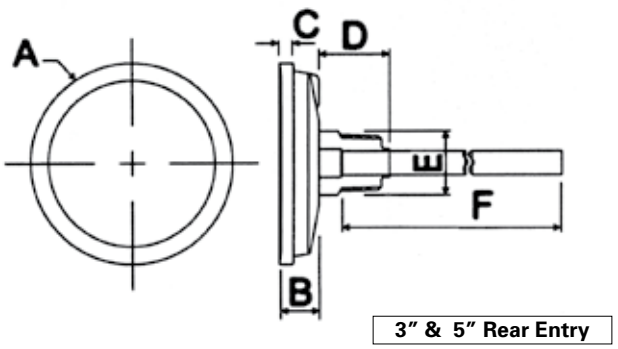
External Zero Adjustment
Standard on all options

Dial Sizes
76 mm (3"), 125 mm (5")

Options	Description	Case Size
Rear entry	Crimp-on bezel	76 & 125 mm
Every angle	Crimp-on baezel	76 & 125 mm



Every Angle



3" & 5" Rear Entry

Every Angle

Specs	A	B	C	D	E	F
3"	80,0	13,8	65,0	23,7	22 HEX	63 - 600
5"	127,8	15,6	65,0	23,7	22 HEX	63 - 600

Dimensions in mm

Rear Entry

Specs	A	B	C	D	E	F
3"	80,0	13,8	5,2	23,7	22 HEX	63 - 600
5"	127,8	14,2	6,4	23,7	22 HEX	63 - 600

Dimensions in mm

See page 31 for Ordering code

All stem lengths are including the thread

TPB - Nitrogen Gas Thermometers

Nitrogen Gas thermometers are designed for the accurate measurement of temperature in a wide variety of industries: Heating, ventilation and air conditioning (HVAC), nuclear, chemical and petrochemical plants, pulp and paper industries, food industries, refrigeration industries, diesel, exhausts and turbines, refineries and compressors. Ideally suited to the nuclear and food industries (where the use of mercury is prohibited). Also more practical in situations where there is no ready access to electricity - necessary for the power supplies of Resistance thermometers as an example.

Case
AISI 304 brush finish stainless steel. Liquid fillable on request

Bezel
Electro polished AISI 304 stainless steel bayonet lock bezel

Bezel Gasket
Neoprene

Pointer
Matt black anodised aluminium

Element & Movement
Helical or "C" shaped coil with AISI 304 stainless steel pendant and segment movements

Probe / Capillary
Grade 316SS
Dry or liquid filled: alternatively retrofillable

Window
Standard polycarbonate - options glass or safety laminated safety glass

Dial Size
100 mm and 150 mm

Temperature Ranges
Standard Celsius or Fahrenheit scales or alternately a combination of both are available for most common temperature measuring applications.

Accuracy
Class 1.0

Environmental Protection
IP65

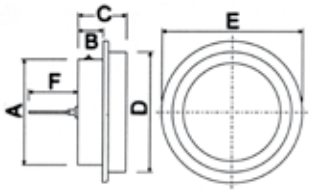
Dial
Aluminium; white with black numerals and scales

Options
Armoured capillary
Electrical contacts - Reed design on 100 mm only
- Microswitch on 100 mm and 150 mm
Drag pointers - minimum or maximum pointer indication

SABS 1062 - 1985

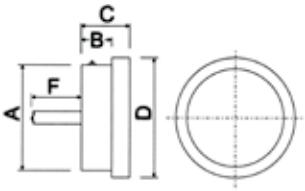
SABS ISO 9001

FC: Remote Mounted Back Connection with Front Flange



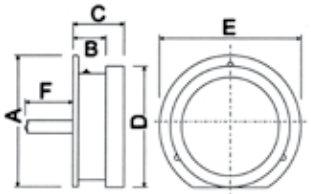
Specs	A	B	C	D	E	F
100 mm	99,5	19,9	44,0	112,9	131,8	Various
150 mm	139,7	139,7	55,0	154,5	196,0	Various

DS: Rigid Back Connection



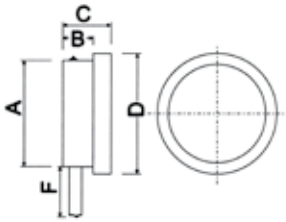
Specs	A	B	C	D	E	F
100 mm	99,5	32,0	49,0	112,9	-	Various
150 mm	139,7	34,7	55,0	154,5	-	Various

ES: Rigid Back Connection with Back Flange



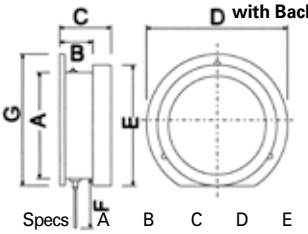
Specs	A	B	C	D	E	F
100 mm	122,5	29,9	45,6	112,6	132,9	Various
150 mm	184,0	36,2	53,2	154,5	190,0	Various

AS: Rigid Lower Connection



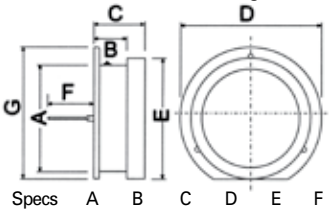
Specs	A	B	C	D	E	F
100 mm	99,5	32,0	49,0	112,9	-	Various
150 mm	139,7	34,7	55,0	154,5	-	Various

BC: Remote Mounted Lower Connection with Back Flange



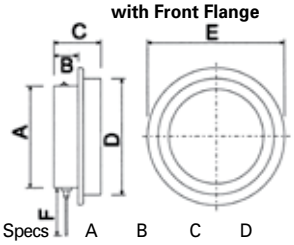
Specs	A	B	C	D	E	F	
100 mm	99,5	29,9	45,6	132,9	112,6	Various	122,5
150 mm	139,7	36,2	53,2	190,0	154,5	Various	184,0

EC: Rigid Back Connection with Back Flange



Specs	A	B	C	D	E	F	
100 mm	99,5	29,9	45,6	132,9	112,6	Various	122,5
150 mm	139,7	36,2	53,2	190,0	154,5	Various	184,0

CC: Remote Mounted Lower Connection with Front Flange



Specs	A	B	C	D	E	F
100 mm	99,5	29,9	45,6	132,9	112,6	Various
150 mm	139,7	36,2	53,2	190,0	154,5	Various

Dimensions in mm

See page 31 for Ordering code

Bi-Metal Thermometer Ordering code

TPS | RS | 30 | SS | 025 x 6 | 04F | 0/100

RANGE

Code	Range
-10/50	-10/0/50°C
-20/120	-20/0/120°C
-40/160	-40/0/160°C
-50/50	-50/0/50°C
0/50	0/50°C
0/60	0/60°C
0/100	0/100°C
0/120	0/120°C
0/150	0/150°C
10/150	10/0/150°C
0/200	0/200°C
0/300	0/300°C
10/450	10/450°C
100/500	100/500°C

PROCESS CONNECTION

Process Connection	
Code	NPT (Thread)
02F	1/4" 6,0 mm OD only
03F	3/8" up to 6,35 mm(1/4") OD only
04F	1/2" up to 9,52 mm(3/8") OD only

PROBE DIAMETER

Code	Length
025	63 mm
040	100 mm
060	150 mm
090	228 mm
120	304 mm
150	381 mm
180	457 mm
240	610 mm

X

Code	Diameter
6	6,0 mm OD
8	8,0 mm OD
9,52	3/8"

SYSTEM MATERIALS

Code	System Material
SS	316 Stainless steel Probe, Capillary & Armouring

DIAL SIZE

Code	Dial Size
30	76 mm diameter
50	125 mm diameter

MOUNTING

Code	Mounting
RS	Rigid back connection
ES	Every angle rigid back connection

TYPE

Denotes Nitrogen

Nitrogen Thermometer Ordering code

TPB | AS | 10 | SS | 015 | 150x12 | 04F | 0/100

RANGE

Code	Range
-10/50	-10/0/50°C
-10/110	-10/0/110°C
-20/120	-20/0/120°C
-20/160	-20/0/160°C
-20/200	-20/0/200°C
-30/50	-30/0/50°C
-40/40	-40/0/40°C
-50/50	-50/0/50°C
0/60	0/60°C
0/100	0/100°C
0/120	0/120°C
0/160	0/160°C
0/200	0/200°C
0/250	0/250°C
0/300	0/300°C
0/400	0/400°C
0/500	0/500°C
0/600	0/600°C
50/600	50/600°C

PROCESS CONNECTION

Code BSP	Code NPT	Process Connection (Thread)
12F	02F	1/4" 6,0 mm OD only
13F	03F	3/8" up to 6,35 mm(1/4") OD only
14F	03F	1/2" up to 9,52 mm(3/8") OD only
15F	03F	3/4"
Adjustable Union		
12U	03F	1/4" up to 6,0 mm OD only
13U	03F	3/8" up to 6,35 mm(1/4") OD only
14U	03F	1/2" up to 9,52 mm(3/8") OD only

PROBE DIAMETER

Code	Length
100	100 mm
150	150 mm
200	200 mm
250	250 mm
300	300 mm
350	350 mm
400	400 mm
450	450 mm

longer lengths available

X

Code	Diameter
6	6,0 mm OD
8	8,0 mm OD
9,52	3/8"
10	10,0 mm OD
12	12,0 mm OD

CAPILLARY LENGTH

Code	Capillary Length
015	1,5 metre
020	2,0 metre
030	3,0 metre
050	5,0 metre

DIAL SIZE

Code	Dial Size
10	100 mm diameter
15	150 mm diameter

MOUNTING

Code	Mounting
AS	Rigid lower connection
DS	Rigid back connection
ES	Rigid back connection with back flange
BC	Remote mounted lower connection with back flange
CC	Remote mounted lower connection with front flange
EC	Remote mounted back connection with back flange
FC	Remote mounted back connection with front flange

SYSTEM MATERIALS

Code	System Material
SS	316 Stainless steel Probe, Capillary & Armouring

TYPE

Denotes Nitrogen

RPT-Pressure & Hygienic Transmitters

Monitoring product, process and hydraulic pressures and triggering safety shutdowns when hazardous conditions are detected.

Mining industries - monitoring of hydraulic pit props to indicate condition of the prop and ground strata. Monitoring of hydraulic pressure on cutting machinery using hydraulic systems.

Oil rigs - monitoring ballast tanks levels and hydraulic pressure on jack-up drilling rigs. Monitoring pressure on platform flowlines; on additive metering pumps; on sub-sea injection valves / well cleanouts.

Refrigeration - monitoring compressor pressure of both low and high pressure sides.

Heavy duty - modern industrial gas turbines use pressure transmitters for control and automatic start-up.

Electrical industry - monitoring of steam pressures and distribution pressures within the generating of steam. Oil and nitrogen gas cooled systems are used on high voltage three phase cables. Local and telemetry monitoring of the coolant pressures are often required.

See page 33 for Ordering code

Features

Accuracy to better than 0.25% FS (including linearity and repeatability).
Transducer rated at 50 million cycles.
Metalwork made of Type 316 stainless steel.
Protected against reverse voltage and overvoltage.
Protected against noise on the supply line.
Wide supply range, 8 to 36V DC - allows a wide range of load resistance. CE approved.
Transducer is temperature compensated by means of laser-trimmed resistors.
Operating temperature range from 0°C to +85°C.

Description of Operation

The RPT-1 series are a range of precision 2-wire pressure transmitters. These units are factory calibrated to deliver an output of 4mA at 0 pressure and 20mA at full scale. If necessary, the units can be calibrated in the field. Pressure ranges are from vacuum (-1 bar) to 600 Bar.

Description of Controls

Connect as shown below and carefully remove the electrical connector, exposing the controls.

Vr1: set pressure to 0 Bar. Adjust for a reading of 4mA. Turning the control counterclockwise increases the reading and clockwise reduces the reading.

Vr2: set pressure to full scale. Adjust for a reading of 20mA. Turning the control counterclockwise reduces the reading and clockwise increases the reading.

RPT3 (FLUSH MOUNT TRANSMITTER)

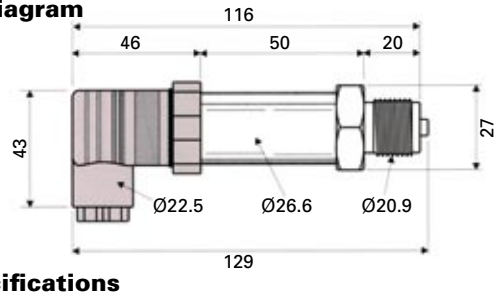
The RPT3 series are a range of precision 2-wire pressure transmitters which can used in applications where the process fluid (medium) is corrosive or viscous (could even contain waste particles) and could clog the instruments internals.
It can also be used in hygienic environments e.g. dairy plants and food industries.

Technical specifications:

- Pressures ranging from 1bar to 200bar
- Accuracy 0.5% of full scale
- Field calibration able
- Thread scope: $^1/_2$",$^3/_4$", 1"(BSP & NPT)
- 4 to 20mAmp (standard)

Dimensional Diagram

Dimensions in mm

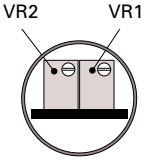


Technical Specifications

General Specifications	
Output	4 - 20 mA
Excitation	8 - 36V DC
Accuracy (BFSL)	<0.25% FS
Compensated temp. range	0° to 85°C
Temperature error zero	<-0,02% FS / K
Temperature error span	<-0,01% FS/K (0-70°C)
Ingress protection	IP65
Burst pressure	2.5 x FS (Except where indicated)
Wetted parts/connection	316 stainless steel, ceramic, Nitrile (specify media where Nitrile is not compatible)

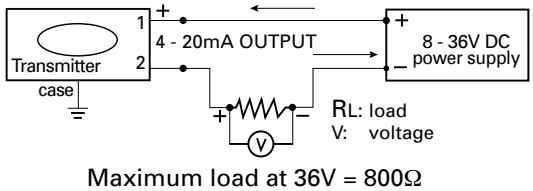
	Ranges (Bar)			( ) = Burst pressure
-1	1.6	2.5	4	6
10	16	25	40	60
100 **(175)**	160 **(280)**	250 **(400)**	400 **(700)**	600 **(1050)**

Wiring connections		
1 red	2 black	⏚yellow
+Us	-Vs	GND



Note: *Precision of calibration is determined by the accuracy of the pressure source and the accuracy of the milliammeter.*

Wiring and Connection



Maximum load at 36V = 800Ω

SABS 1062 - 1985

SABS ISO 9001

RPT Ordering code

RPT 1 - 14 Q J2A C01

CUSTOMER BRANDING

Code	Customer branding
C01	Company logo

TRANSDUCER RANGE

Code	Transducer range
0003	0.3 Bar
0010	1 Bar
0016	1.6 Bar
0025	2.5 Bar
0040	4 Bar
0060	6 Bar
0100	10 Bar
0160	16 Bar

Code	Transducer range
0200	20 Bar
0250	25 Bar
0400	40 Bar
0600	60 Bar
1000	100 Bar
2000	200 Bar
4000	400 Bar
6000	600 Bar

Compound ranges available to 20 bar.
Calibration instructions to be provided.
e.g. -1 to 3 Bar

DIN PLUG

Code	DIN Plug
X	Maxi

FITTING

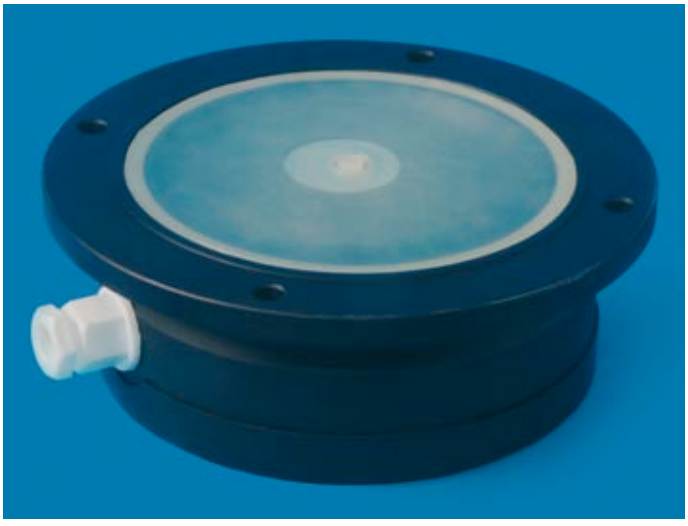
Code	Fitting
01	1/8″ NPT
02	1/4″ NPT
03	3/8″ NPT
04	1/2″ NPT
11	1/8″ BSP
12	1/4″ BSP
13	3/8″ BSP
14	1/2″ BSP
15	3/4″ BSP
16	1″ BSP
21	1/8″ BSPT
22	1/4″ BSPT
23	3/8″ BSPT
24	1/2″ BSPT

FAMILY

1	Standard
2	Voltage output (Under development)
3	Flush connection

TYPE — Denotes Pressure Transducer

LDC - Bin Level Switch



Designed for measuring the levels in silos, storage containers, coal feeders for boilers and dust container levels.

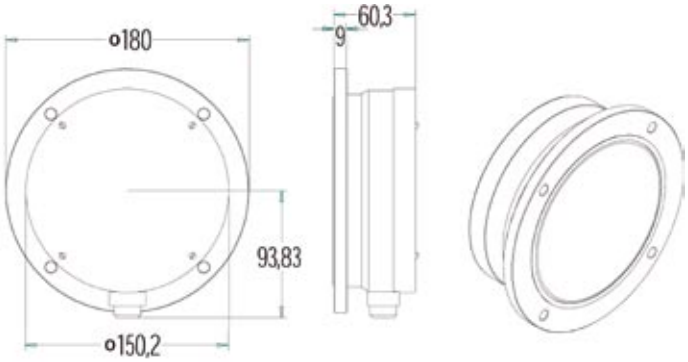
Case
Aluminium, black epoxy coated for corrosion prevention

Diaphragm
Rubber or Teflon diaphragm
150 mm diameter with aluminium centre switch disk

Switch Element
Micro switch. SPDT

SABS 1062 - 1985

SABS ISO 9001



RHOMBERG INSTRUMENTS

Temperature Sensors

All our products are known for their consistent high reliability, cost effectiveness and durability. We are continually examining and improving our engineering, production and service operations to meet constantly changing customer requirements. Our ISO 9001 certification is objective proof of our company wide commitment to quality.

OEM Sensors

Supplying today's manufacturers with temperature sensors that meet their needs.
We can help you develop, then manufacture the sensor that works with your product.
We manufacture temperature sensors for many different types of customers' applications:

- Scientific instruments - storage and measurement
- Food equipment - cooking, storing and cleanup
- Medical equipment - sterilizing, biological storage
- Jet fighters, helicopters

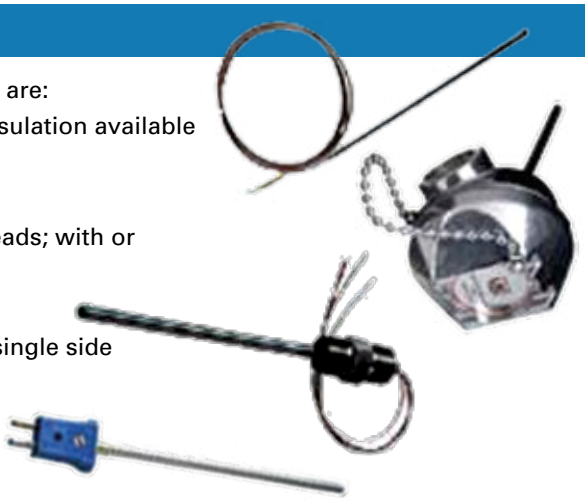
Thermocouple Types

- **Type J** - 0° to 750° C (32° to 1380° F
- **Type T** - 0° to 350° C (32° to 660° F
- **Type K** - 0° to 1250° C (32° to 1380° F
- **Type J** - 0° to 750° C (32° to 2280° F
- **Type E** - 0° to 900° C (32° to 1650° F

Thermocouple Insulation Types

- **GP** - General purpose thermocouples that are comprised of a air of thermocouple wires inside a tube. These are used to measure temperatures of 260° C (500° F) or less
- **MI** - For higher temperature applications, a Mineral Insulation canbe added in the tube. For UE MI thermocouples compressed magnesium oxide is added inside the tube. These are used to measure temperatures of 260° C (500° F) and higher
- **BTC** - Beaded thermocouples are mainly used in furnace appplications.

Temperature Sensor Styles



Temperature Sensors at UE are built in a broad spectrum of styles. They are:

- **Leadwire** - Standard thermocouples with fibreglass, Teflon® or PVC insulation available with a variety of protective coverings including Teflon® sleeves.
- **Terminal Heads** - Configurations including Enclosure Type 4 and 7 heads; with or without NUN (nipple-union-nipple) connections.
- **Process Mount** - Double and single sided process mount styles and single side instrument mounts.
- **Plugs** - Standard and mini male plugs with and without leadwires.
- **Surface Mount** - A variety of monting options including washer styles, mounting lugs and weld pads; with fiberglass or Teflon® or insulation.

UNITED ELECTRIC CONTROLS

RHOMBERG INSTRUMENTS

Hazardous Location Pressure, Differential Pressure and Temperature Switches

12 Series — Vibration-resistant, 316 stainless steel Pressure, Differential Pressure and Temperature Switches

- Class 1, Divisions 1 & 2, Zone 1
- UL listed, cUL certified, ATEX flame-proof & CE (LVD, PED) compliant
- Compact, 316 stainless steel enclosure
- Belleville spring design provides set-point stability and vibration resistance
- SPDT or DPDT hermetically sealed switches
- Variety of pressure sensor materials, including welded stainless steel diaphragm
- Convenient field adjustment through concealed adjustment compartment; optional cover locking ring prevents incidental tampering
- 72" lead-wire with strain relief provided
- Adjustable set-point ranges:
  - Pressure: 1 to 6000psi 0,1 to 413,7 bar
  - Differential Pressure: 0.7 "wcd to 150 psid 1,7 mbar to 10,3 bar
  - Temperature: -130 to 65 °F -90 to 343.3 °C

120 Series — Rugged, Explosion-proof Pressure, Vacuum, Differential Pressure and Temperature Switches

- Class 1, Divisions 1 & 2, Zone 1
- UL listed, cUL certified, ATEX flame-proof & CE (LVD, PED) compliant
- SPDT, DPDT, or dual SPDT switch output
- Variety of pressure sensor materials, including welded stainless steel diaphragms and bellows
- Internal and externral set-point adjustment
- Heat trace & freeze protection temperature models
- Dual electrical conduit openings provide mounting flexibility while terminal block provides ease of wiring
- Adjustable set-point ranges:
  - Pressure & Vacuum: 30 "Hg Vac to 6000psi -1 to 413,7 bar
  - Water Column: 300 "wc Vac to 250 "wc -746,7 to 622,3 mbar
  - Differential Pressure: 0.2 "wcd to 500 psid 0,5 mbar to 34,5 bar
  - Temperature: -180 to 650 °F -117.8 to 343.3 °C

360 Series — Hermetically Sealed Pressure Switch for Oil & Gas Applications

- 316 Stainless steel enclosure
- Hermetically sealed switch
- SPDT or DPDT switch output
- Range adjustability: 2 to 9000psi (0,1 to 620,5 bar)
- 72" Leadwires

117 Series — Pressure & Temperature Switches

- Compact design
- Division 2
- SPDT or DPDT hermetic switch output
- Terminal block wiring
- Adjustable ranges:
  - 30 "Hg Vac to 3500 psi 1 bar Vac to 241 bar
  - -120 to 650 °F -85 to 340 °C
- Approvals: UL, CSA, CENELEC, CE, NACE

UNITED ELECTRIC CONTROLS

RHOMBERG INSTRUMENTS

General Purpose Pressure, Differential Pressure and Temperature Switches

100 Series — Pressure, Differential Pressure & Temperature Switches

- Rugged, NEMA 4x, epoxy coated enclosure
- SPDT or DPDT switch output
- Easy access wiring
- Single switch output
- Internal reference scale and adjustable deadband available
- Adjustable ranges:
  - 30 “Hg Vac to 5000 psi, 1 bar VAc to 344 bar
  - 0.2 “wcd to 500 psid 0,5 mbar d to 34,5 bar d
  - -180 to 650°Cost Effective Switches for OEM 38°C
- Approvals: UL, CSA, CE, TUV

400 Series — Vacuum Pressure, Differential Pressure & Temperature

- Rugged, epoxy coated enclosure type 4x, epoxy coated enclosure
- One, two or three switch outputs
- Available with calibrated dials and local pressure indication
- Adjustable ranges:
  - “WC ranges: 300 “wc vacuum to 250 “wc pressure -746,7 to 622,3 mbar
  - Pressure: 30 “Hg Vac to 6000 psi, -1,0 to 413,7 bar
  - Differential pressure: 1”wcd to 200 psid 2.5 mbar to 13,8 bar
  - Temperature: -180 to 650 °F, -117 to 343.3 °C
- Approvals: UL, FM, CE

J21K Series — Differential Pressure Switch

- Rugged, NEMA 4x, epoxy coated enclosure
- SPDT switch output
- Welded 316 stainless steel or brass sensors
- Unique isolated sensor design
- Adjustable ranges:
  - 30 “Hg Vac to 90 psid, 1 bar Vac to 6,2 bar d
- Approvals: UL, CSA, CE

105 Series — Pressure, Differential Pressure & Temperature Switches

- Rugged, NEMA 4x, epoxy coated enclosure
- SPDT switch output
- External dial with tamper resistant cover
- Terminal block wiring
- Adjustable ranges:
  - 30 “Hg Vac to 200 psi, 1 bar Vac to 13,8 bar
  - 0 to 100 psid, 0 to 6,9 bar d
  - -120 to 640 °F, -85 to 335 °C
- Approvals: UL, CSA, CE

J6 Series — Pressure Switch

- Rugged, NEMA 4x, epoxy coated enclosure
- SPDT switch output, and single switch output
- Adjustable deadband versions available
- Adjustable ranges:
  - 30 “Hg Vac to 6000 psi, 1 bar Vac to 414 bar
- Approvals: UL, CSA, CE

800 Series — Indicating Temperature Switch

- No external power required
- NEMA 4 enclosure
- SPDT or dual switch outputs
- Stainless steel bulb and capillary, optional capillary lengths and materials
- Adjustable ranges: -180 to 650 °F, -117 to 340 °C
- Approvals: UL, CSA, CE

UNITED ELECTRIC CONTROLS

RHOMBERG INSTRUMENTS

Electronic Pressure, Differential Pressure and Temperature Products

One Series — Electronic Pressure Switches & Electronic Temperature Switches

- Digital display
- 100% adjustable set point and deadband
- All solid state design
- Remote and local "I am working®" status signal
- Captures and displays MAX/MIN process extremes
- Continuously stores HI/LO extremes
- Adjustable ranges:
  - 0 to 4500 psig, (310, 3 bar)
  - 0 to 200 psid (13, 8 bar)
  - -300 to 1000 °F -184 to 538 °C
- 4-20 mA output models available
- Division 1 (Intrinsically Safe) + Division 2 models available
- Approvals: UL, cUL, CE, ATEX, GOST

One Series 2 Wire — Electronic Pressure Switch & Electronic Temperature Switch

- 2-wire connection to a PLC, DCS or Relay Coil; NO ADDITIONAL WIRING REQUIRED!
- 24 VDC, 115 VAC or Loop-Powered models now available
- Field scalable 4-20mA models available (2WLP)
- Field adjustable set point and deadband, covering 100% of sensor range
- Temperature, Gauge Pressure and Differential Pressure sensors available with all stainless-steel wetted parts
- Advanced programmable features including MAX/MIN capture, nuisance trip filtering, clogging sensor detection and manual reset
- "I Am Working®" (IAW) self-diagnostics reported locally (on the switch display) and remotely (in the control room)
- Class 1 Division 1 Intrinsically Safe (2W2D models only) and Division 2 Non-incendive all models

One Series 4W — 10 AMP Electronic Pressure Switch & Electronic Temperature Switch

- Accepts 90-130 VAC power; provides high capacity local switching
- Solid-state relay switch output rating: 10 A @ 24-280 VAC
- Fully adjustable Set Point and Deadband; large LCD process display
- Type 4x epoxy-coated aluminium enclosure, polycarbonate faceplate
- Sensor ranges: Gage Pressure 0-4,500 PSI (310,3 bar); Differential Pressure 0-200 PSID (13,8 bar); Temperature -300 to 1000 °F (538 °C)
- Advanced features include IAW self diagnostics, min/max memory, plugged port detection, switch delay and manual reset
- UL listed, Class 1, Division 2 Groups A, B, C & D (Non-incendive)

One Series 8W — Dual Set Point Electronic Switch with 4-20mA output

- All solid-state microprocessor controlled design
- Dual solid-state relay outputs provide independent SPST or SPDT switch action
- Independently programmable set point, deadband, and operating mode for each switch output
- Local LCD digital display of the process variable, indication of trip points, and access to programmed parameters
- Patented I Am Working® (IAW) self diagnostics
- Field-scalable 4-20 mA analog output for process trending
- Class 1, Division 2 rated
- Many switch output and sensor options

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Cost Effective Switches for the OEM

Spectra 10™ Series — Compact Cylindrical Pressure Switch

- Easy on-line pressure adjustment
- NEMA 1 & 4 enclosures
- SPDT switch output
- Variety of electrical termination and pressure connection options available
- O-ring sealed piston or diaphragm sensor
- Adjustable ranges:
  - 4 to 7500 psi, 0,3 to 517,2 bar
- Approvals: UL, CSA, CE

Delta-Pro™ 24 Series — Pressure & Differential Pressure Switch

- Corrosion resistant molded NEMA 4 enclosure
- Brass, Teflon® or polysulfone wetted parts
- Terminal block wiring
- Our lowest cost differential pressure switch
- Adjustable ranges:
  - 30 "Hg Vac to 90 psi, 1 bar Vac to 6,2 bar
  - 1 to 45 psid, 70 mbar d to 3 bar d
- Approvals: UL, CSA, CE

25 Series — Pressure Switch

- External adjustment
- Adjustable deadband
- Compact construction
- All metal enclosure
- Direct control of loads up to 20 amps
- Buna-N, Viton or EPDM diaphragm pressure sensor
- Adjustable ranges:
  - 3 to 475 psi, 0,2 to 32,8 bar
- Approvals: UL, cUL, CE

54 Series — Pressure & Temperature Switches

- NEMA 1 or open frame construction
- SPDT or dual switch outputs
- Reference dial or hex adjustment
- Adjustable ranges:
  - 30 "Hg Vac to 6000 psi, 1 bar Vac to 414 bar
  - -130 to 650ºF, -90 to 340ºC
- Approvals: UL, CSA, CE

55 Series — Temperature Switch

- NEMA 4 or open frame construction
- SPDT or dual switch output
- Panel or surface mount
- Copper or stainless steel bulb and capillary
- Adjustable ranges:
  - -130 to 650ºF, -90 to 340ºC
- Approvals: UL, CSA, CE

J40 Series — Pressure Switch

- Open frame construction
- SPDT switch output
- Sealed metal bellows sensors compact size
- Proven reliability
- Adjustable ranges:
  - 30 "Hg Vac to 300 psi, 1 bar Vac to 20,5 bar
- Approvals: UL, CSA

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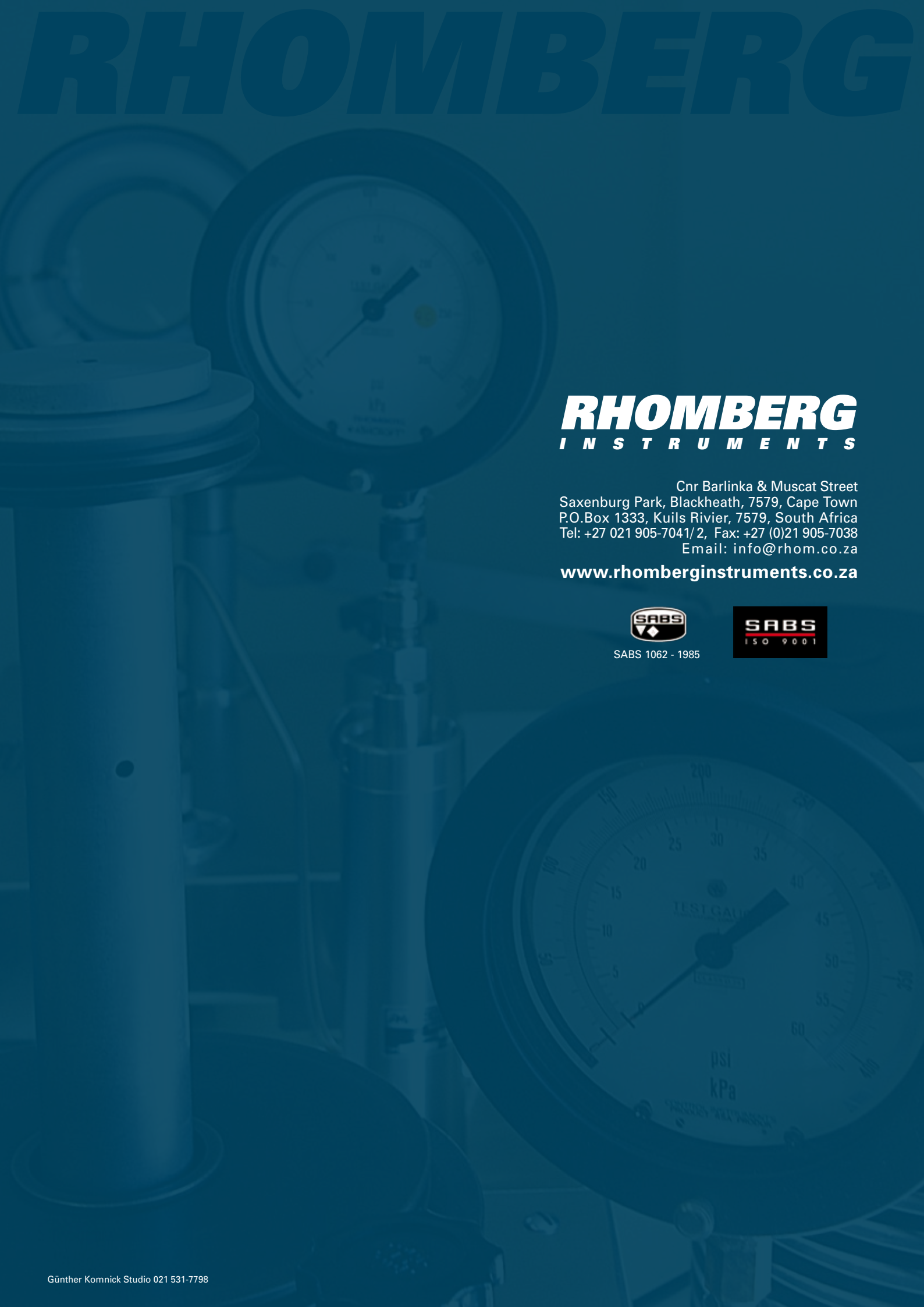

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