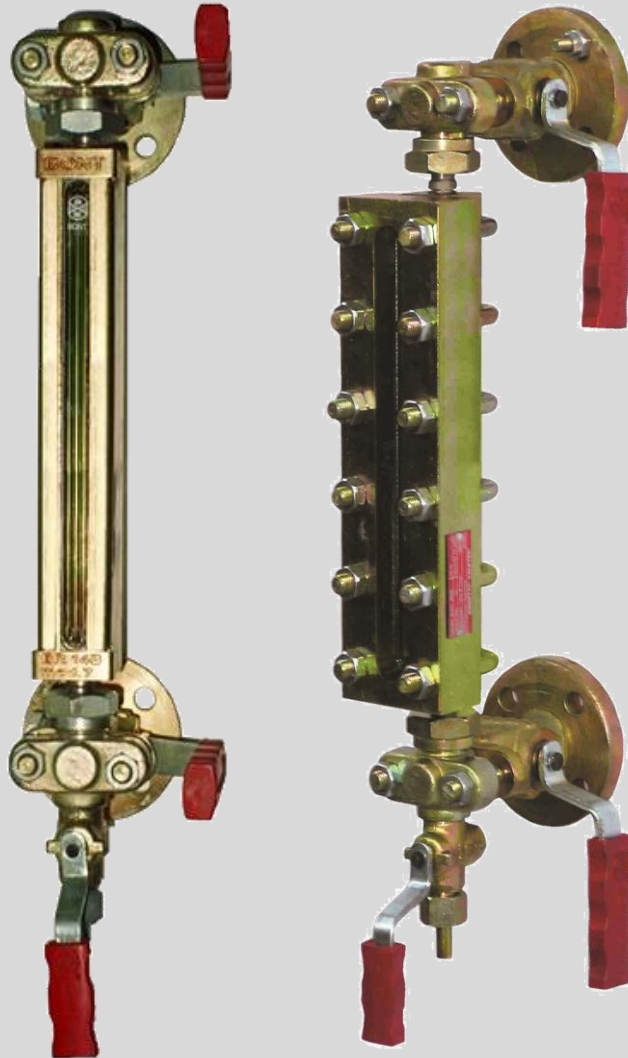


 **VALFTEK**®



BONETTI®

BONT® GLASS LEVEL GAUGES

BONETTI®

GLASS LEVEL GAUGES

General information

VALFTEK manufactures glass and magnetic level gauges under Bonetti license. This catalogue describes glass level gauges.

When you only state the operating conditions, namely :

- Fluid
- Working pressure
- Working temperature

We are able to supply the most suitable level gauge from both the points of view functionality and price.

There are three basic types of glass level gauges :

- Reflex
- Transparent
- Bicolour

BONT® Reflex Level Gauges (Fig.1)

Working principle :

The liquid level is distinguished by the different brightness of the reflex glass in the water or in the steam space. In fact, where there is liquid in contact with the glass, the incidental light is refracted to the inside of the gauge and absorbed; in the steam space, the incidental light is reflected against the glass grooves and the glass appears very bright (Fig.1).

Applications :

Reflex level gauges can be used in most of applications and offer great advantages in terms of :

- low initial cost
- low operating cost
- easy level reading

Reflex level gauges can not be used in certain cases as for example :

- when the separation level between two liquids has to be read (interface),
- when besides the level indication, the observation of the liquid colour is required,
- when the process fluid is high-pressure water steam, since in this case the glass must be protected from the solvent action of the boiler water by using mica shields
- when the process fluid is such that can corrode the glass (e.g. high temperature alkaline solutions or hydrofluoric acid), since mica shields or polytrifluorochloroethylene shields must be used to protect the glass.

BONT® Transparent Level Gauges (Fig.2 and 3)

Working principle :

Apart from glass tube level gauges, transparent level gauges are always fitted with two plate transparent glasses between which the fluid is contained. The fluid level is indicated as the result of the different transparency of the two media (Fig.2) and in some cases

(for water steam), by conveying upwards on to the surface of separation (between liquid and gaseous substances) a source of light (Fig.3) located at the back of the gauge, the rays of which are totally reflected down to the observer.

Applications :

Transparent level gauges are suitable for almost all installations.

In fact they permit :

- the use of mica shields or polytrifluorochloroethylene shields to protect the glass from the corrosive action of the process fluid,
- the observation of interface,
- the observation of the liquid colour.

BONT® Bicolour Level Gauges (Fig.4)

Working principle :

The opposite glasses fitted into these bicolour level gauges are not parallel to each other. By means of a suitable illuminator into which a red and a green screens are fitted.

The portion of visible length occupied by steam appears red whereas the portion of visible length occupied by water appears green.

The level reading is very easy even at a considerable distance. The reading of the bicolour level gauges is not affected by the blind spaces between one port hole and the successive one (Fig.4).

Applications :

Their main application is on high pressure steam boilers.

BONT® Bicolour Level Gauges with parallel glasses (Fig.5)

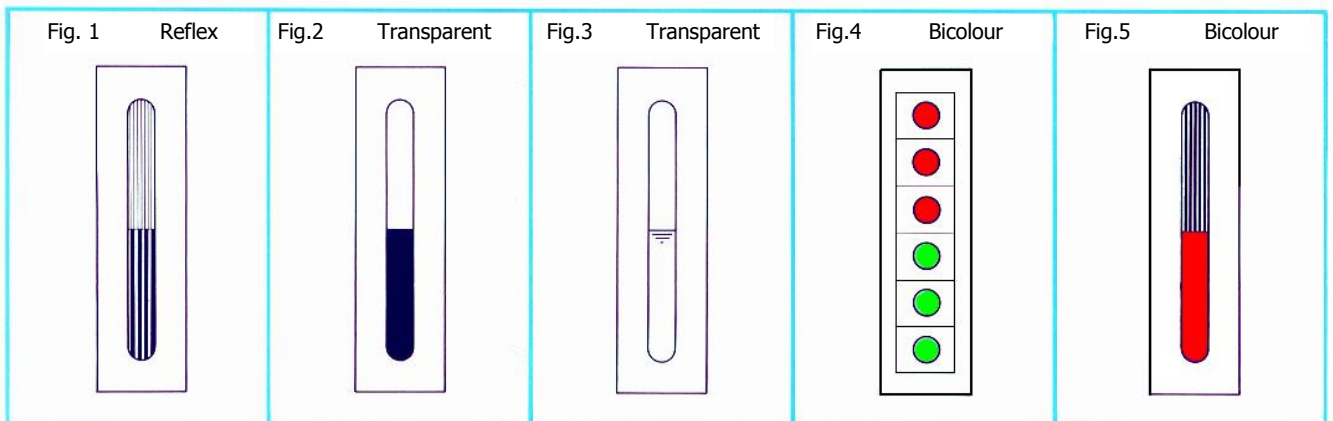
Working principle :

It is a variation of transparent level gauges, however equipped with two reflex glasses and a back illuminator, fitted with suitable coloured filters. The sharp reading is given by the contrast between the bright colour (usually red) of filters in the lower part containing liquid and the colour of upper part of visible window (Fig.5).

Applications :

These level gauges are particularly suitable for liquids :

- colourless,
- very fluid,
- non-corrosive for glasses (e.g. ammoniacal solutions, trichloroethylene, water steam up to 32 bar, etc.)



GLASS LEVEL GAUGES

Type, Material and Applications

| Type | Material Code | Max. operating Conditions | | Pressure Rating | | Fluids | | |
|------------------|----------------------|---------------------------|----------|-----------------|--------------|------------------------------|------------------------------|--------------------------------|
| | | Pressure bar | Temp. °C | ANSI Class | DIN PN (bar) | | | |
| REFLEX TYPE | BR14B - G11 | 52 | 12 | 187 | | 16 | Water steam, other fluids | |
| | BR12 - GP11 | 52 | 32 | 236 | | 40 | Water steam | |
| | BR12 - G11 | 52,64 | 64 | 120 | | | Other fluids | |
| | | | 40 | 300 * | | | | |
| | BR22 - GP11 | 52 | 12 | 187 | | 16 | Water steam | |
| | BR22 - GP12 | 52,64 | 28 | 38 | | | Other fluids | |
| | | | 10 | 300 * | | | | |
| | BR23 - GP11 | 52 | 22 | 216 | | | Water steam | |
| | BR23 - GP12 | 52,63,64 | 105 | 38 | | 600 | 100 | Other fluids |
| | | | 80 | 300 * | | | | |
| | BR24 - GP11 | 52 | 32 | 236 | | | Water steam | |
| | BR24 - GP12 | 52,63,64 | 165 | 38 | | 900 | 100 | Other fluids |
| | | | 105 | 300 * | | | | |
| | BR28 - G41 | 51,52,63,64 | 200 | 38 | | 1500 | 250 | Other fluids w. steam excepted |
| 160 | | | 300 * | | | | | |
| BR28 - GP12 | 52,63,64 | 165 | 38 | | | | Any fluids w. steam excepted | |
| | | 105 | 300 * | | | | | |
| BR25 - GP12 | 52,63,64 | 105 | 38 | | 900 | 100 | Any fluids w. steam excepted | |
| | | 62 | 300 * | | | | | |
| BR13 - G51 | 52 | 400 | 120 | (2500) | (400) | Any fluids | | |
| BR26 & BR27 | 52,55,61 62,63,64 | | | | (600) | Any fluids w. steam excepted | | |
| TRANSPARENT TYPE | BTV - GP11 | 52 | 6 | 158 | | | Water steam | |
| | | 52,63,64 | 12 | 38 | | | Non dangerous fluids | |
| | BT23 - GP11 | 52 | 12 | 187 | | | Water steam | |
| | BT23 - GP12 | 52,63,64 | 51 | 38 | | 300 | | Other fluids |
| | | | 30 | 300 * | | | | |
| | BT24 - GP11 | 52 | 20 | 211 | | | Water steam | |
| | BT24 - GP12 | 52,63,64 | 105 | 38 | | 600 | 100 | Other fluids |
| | | | 62 | 400 | | | | |
| | BT25 - GP12 | 52,63,64 | 105 | 38 | | 600 | 100 | Any fluids w. steam excepted |
| | | | 62 | 300 * | | | | |
| | BT28 - GP11 | 52 | 50 | 264 | | | Water steam | |
| | BT28 - GP12 | 52,63,64 | 120 | 38 | | 600 | 100 | Other fluids |
| 80 | | | 300 * | | | | | |
| BT29 - G41 | 52,63,64 | 165 | 38 | | 900 | 160 | Any fluids w. steam excepted | |
| | | 100 | 300 * | | | | | |
| BT33 - G52 | 51 | 90 | 302 | | | Water steam | | |
| BT32 - G52 | 51 | 103 | 313 | | | Water steam | | |
| BT26 & BT27 | 52,55,61 62,63,64 | | | | (600) | Any fluids w. steam excepted | | |
| BICOLOUR | BC24 - GP11 | 52 | 20 | 211 | | | Water steam | |
| | BC28 - GP11 | 52 | 40 | 249 | | | | |
| | BC33 - G52 | 52 | 90 | 302 | | | | |
| | BC32 - G52 | 51 | 103 | 313 | | | | |
| | BC1 - G55 | 51 | 210 | 368 | | | | |

Note : * Maximum allowable temperature according to DIN 7081/1999-05 .

For operating condition with temperature over 300 °C , please apply to our sales department.

The shown rating is an indication only : level gauge rating can change according to the level gauge valve fitted on it.

| Material code | Body & Wetted parts | Trim of shut-off valves | Remarks | Application |
|---------------|----------------------------------|---------------------------|---|------------------|
| 52 | Forged carbon steel | Stainless steel | Exclusion of copper, silver and their alloys | General purpose |
| 64 | Forged stainless steel (AISI316) | Stainless steel (AISI316) | External not wetted parts of carbon steel. Exclusion of copper, silver and their alloys | Corrosive fluids |

Reflex Glass Level Gauges

Model : BR14B

Shut-off & drain valve : G11

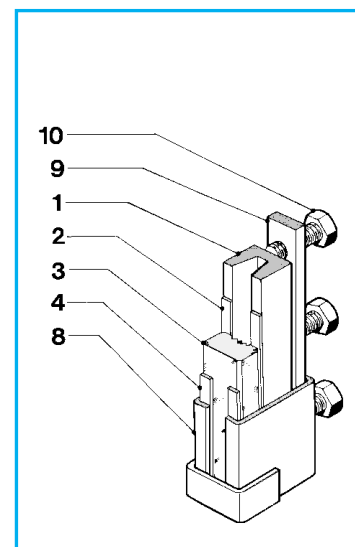
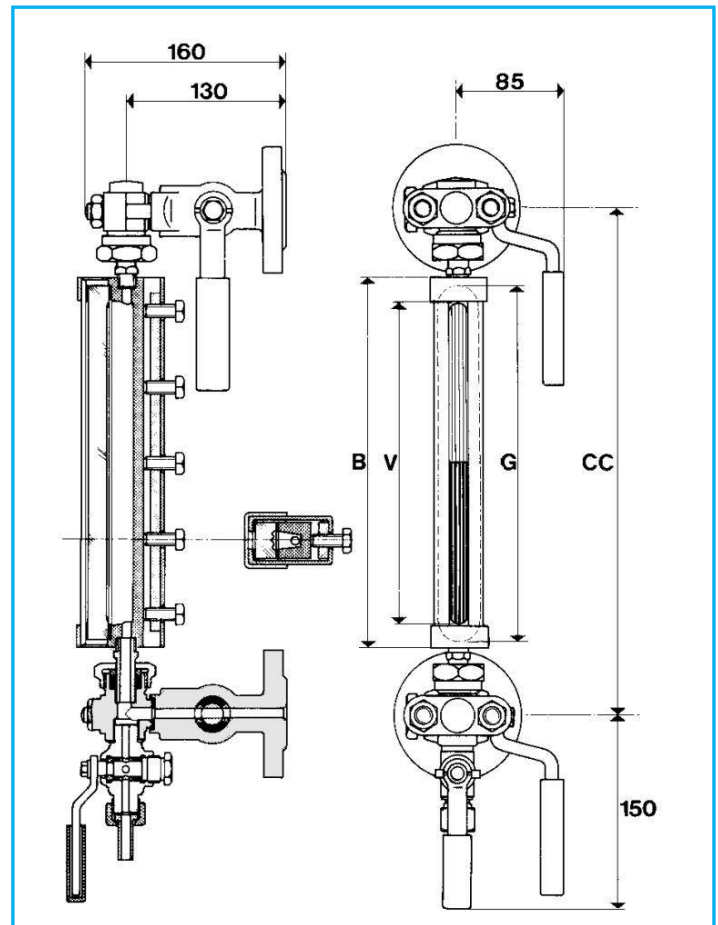
Pressure rating : PN16

Technical features :

- Connections between gauge and valves are made by end tubes and stuffing boxes.
- Inside passage through the gauge is 10mm
- Operating conditions and material schedules on page 3.
- BR14B gauges are fitted with reflex glasses type B.
- Standard connections to vessel are PN40 DN20 flanges and other ratings and sizes may be supplied on request.
- Bolting torque of BR14B is 30 Nm .

| Sizes | Centre to centre distances | Length of Body | Visible Length | Glass Length | Weight |
|--------|----------------------------|----------------|----------------|--------------|--------|
| | CC | B | V | G | Kg |
| I | 235 | 128 | 93 | 115 | 10,05 |
| II | 260 | 153 | 118 | 140 | 10,30 |
| III | 285 | 178 | 143 | 165 | 10,80 |
| IV | 310 | 203 | 168 | 190 | 11,10 |
| V | 340 | 233 | 198 | 220 | 11,35 |
| VI | 370 | 263 | 228 | 250 | 12,00 |
| VII | 400 | 293 | 258 | 280 | 12,20 |
| VIII | 440 | 333 | 298 | 320 | 12,85 |
| IX | 460 | 353 | 318 | 340 | 13,05 |
| 2xIV | 515 | 408 | 373 | 190 | 13,90 |
| 2xV | 575 | 468 | 433 | 220 | 14,40 |
| 2xVI | 635 | 528 | 493 | 250 | 15,70 |
| 2xVII | 695 | 588 | 553 | 280 | 16,10 |
| 2xVIII | 775 | 668 | 633 | 320 | 17,40 |
| 2xIX | 815 | 708 | 673 | 340 | 17,80 |
| 3xVI | 900 | 793 | 758 | 250 | 19,40 |
| 3xVII | 990 | 883 | 848 | 280 | 20,00 |
| 3xVIII | 1110 | 1003 | 968 | 320 | 21,95 |
| 3xIX | 1170 | 1063 | 1028 | 340 | 22,55 |
| 4xVII | 1285 | 1178 | 1143 | 280 | 23,90 |
| 4xVIII | 1445 | 1338 | 1303 | 320 | 26,50 |
| 4xIX | 1525 | 1418 | 1383 | 340 | 27,30 |
| 5xVII | 1580 | 1473 | 1438 | 280 | 27,80 |
| 5xVIII | 1780 | 1673 | 1638 | 320 | 31,05 |
| 5xIX | 1880 | 1773 | 1738 | 340 | 32,05 |
| 6xVIII | 2115 | 2008 | 1973 | 320 | 35,60 |
| 6xIX | 2235 | 2128 | 2093 | 340 | 36,80 |
| 7xIX | 2590 | 2483 | 2448 | 340 | 41,55 |

| | |
|-----|--------------------------|
| 1- | Centre Piece |
| 2- | Sealing Joint (Graphite) |
| 3- | Reflex Glasses |
| 4- | Cushion Joint (Graphite) |
| 8- | Gauge Body |
| 9- | Wedge Piece |
| 10- | Tightening Bolt |



Reflex Glass Level Gauges

Model : BR24

Shut-off & drain valve : G11

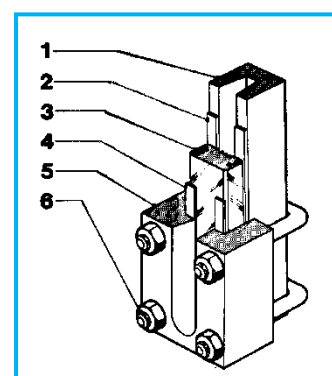
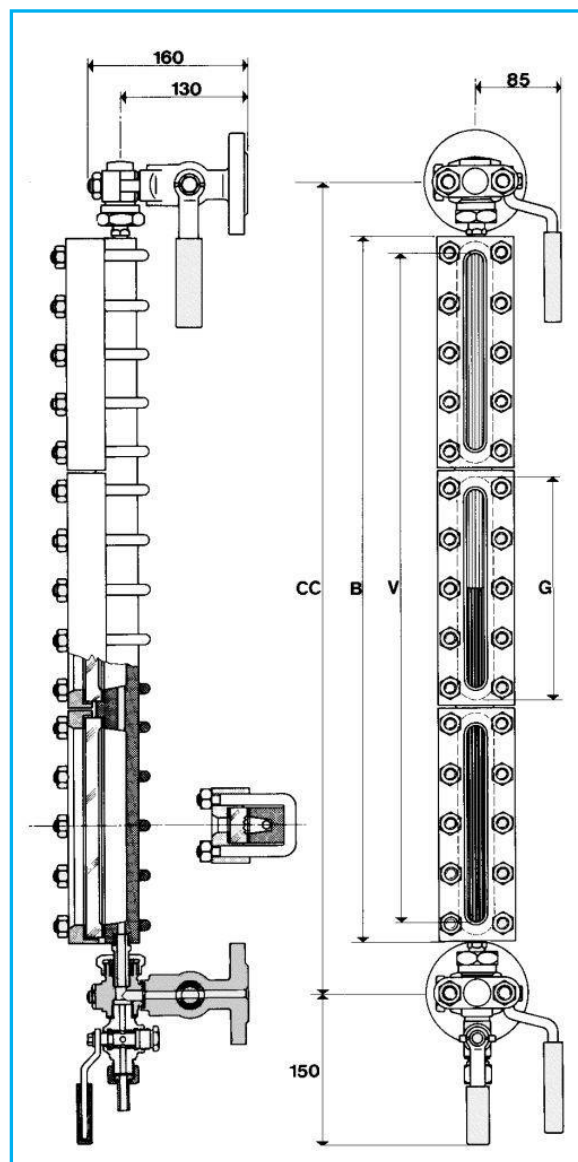
Pressure rating : PN40

Technical features :

- Connections between gauge and valves are made by end tubes and stuffing boxes.
- Inside passage through the gauge is 10mm
- Operating conditions and material schedules on page 3.
- BR24 gauges are fitted with reflex glasses type B.
- Standard connections to vessel are PN40 DN20 flanges and other ratings and sizes may be supplied on request.
- Bolting torque of BR24 is 50 Nm .

| Sizes | Centre to centre distances | Length of Body | Visible Length | Glass Length | Weight |
|--------|----------------------------|----------------|----------------|--------------|--------|
| | CC | B | V | G | Kg |
| I | 235 | 128 | 93 | 115 | 12,85 |
| II | 260 | 153 | 118 | 140 | 13,45 |
| III | 285 | 178 | 143 | 165 | 14,55 |
| IV | 310 | 203 | 168 | 190 | 15,15 |
| V | 340 | 233 | 198 | 220 | 16,25 |
| VI | 370 | 263 | 228 | 250 | 17,35 |
| VII | 400 | 293 | 258 | 280 | 17,95 |
| VIII | 440 | 333 | 298 | 320 | 19,20 |
| IX | 460 | 353 | 318 | 340 | 20,15 |
| 2xIV | 515 | 408 | 373 | 190 | 21,85 |
| 2xV | 575 | 468 | 433 | 220 | 24,15 |
| 2xVI | 635 | 528 | 493 | 250 | 26,30 |
| 2xVII | 695 | 588 | 553 | 280 | 27,75 |
| 2xVIII | 775 | 668 | 633 | 320 | 29,90 |
| 2xIX | 815 | 708 | 673 | 340 | 31,70 |
| 3xVI | 900 | 793 | 758 | 250 | 35,25 |
| 3xVII | 990 | 883 | 848 | 280 | 37,55 |
| 3xVIII | 1110 | 1003 | 968 | 320 | 40,60 |
| 3xIX | 1170 | 1063 | 1028 | 340 | 43,25 |
| 4xVII | 1285 | 1178 | 1143 | 280 | 47,35 |
| 4xVIII | 1445 | 1338 | 1303 | 320 | 51,30 |
| 4xIX | 1525 | 1418 | 1383 | 340 | 54,80 |
| 5xVII | 1580 | 1473 | 1438 | 280 | 57,15 |
| 5xVIII | 1780 | 1673 | 1638 | 320 | 62,00 |
| 5xIX | 1880 | 1773 | 1738 | 340 | 66,35 |
| 6xVIII | 2115 | 2008 | 1973 | 320 | 72,70 |
| 6xIX | 2235 | 2128 | 2093 | 340 | 77,90 |
| 7xIX | 2590 | 2483 | 2448 | 340 | 89,45 |

| | |
|----|--------------------------|
| 1- | Centre Piece |
| 2- | Sealing Joint (Graphite) |
| 3- | Reflex Glasses |
| 4- | Cushion Joint (Graphite) |
| 5- | Cover Plate |
| 6- | U Stud bolts with nuts |



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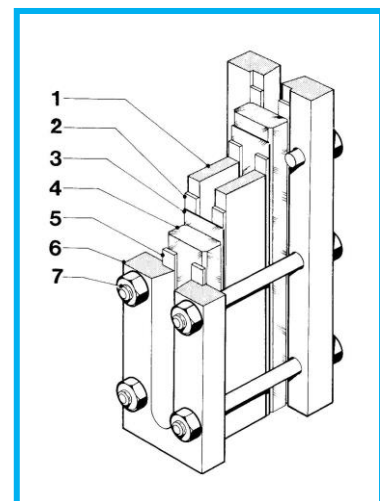
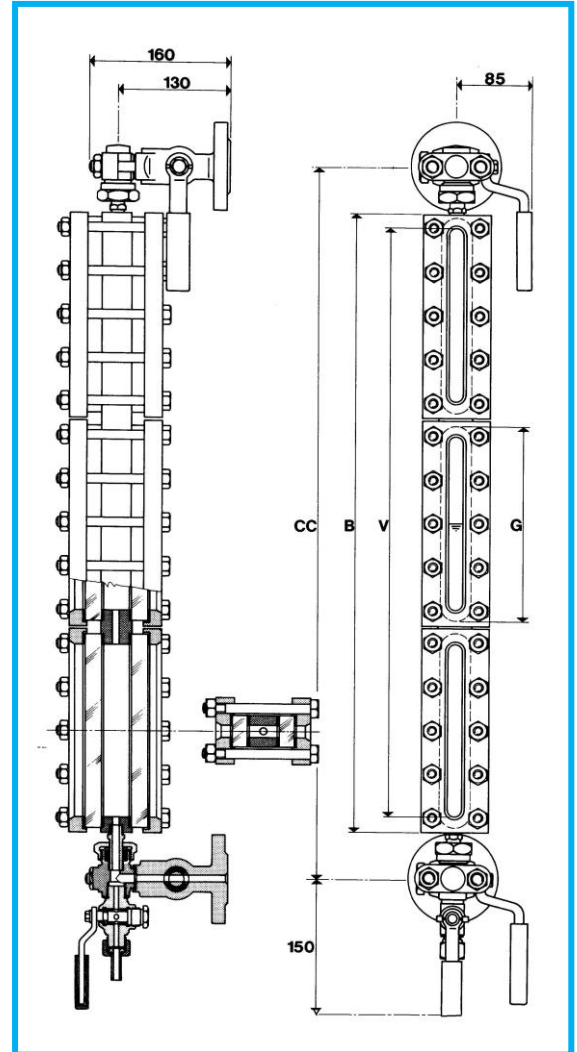
Transparent Level Gauges

Model : BT23
Shut-off & drain valve : G11
Pressure rating : PN16

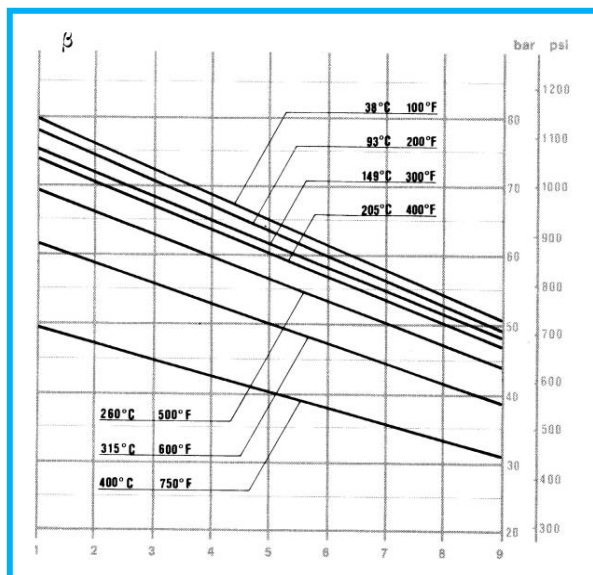
Technical features :

- Connections between gauge and valves are made by end tubes and stuffing boxes.
- Inside passage through the gauge is 10mm
- Operating conditions and material schedules on page 3.
- BT23 gauges are fitted with transparent glasses type B.
- Standard connections to vessel are PN40 DN20 flanges and other ratings and sizes may be supplied on request.
- Bolting torque of BT23 is 50 Nm .

| Sizes | Centre to centre distances | Length of Body | Visible Length | Glass Length | Weight |
|--------|----------------------------|----------------|----------------|--------------|--------|
| | CC | | | | |
| I | 235 | 128 | 93 | 115 | 10,80 |
| II | 260 | 153 | 118 | 140 | 11,90 |
| III | 285 | 178 | 143 | 165 | 12,30 |
| IV | 310 | 203 | 168 | 190 | 12,90 |
| V | 340 | 233 | 198 | 220 | 13,90 |
| VI | 370 | 263 | 228 | 250 | 14,65 |
| VII | 400 | 293 | 258 | 280 | 15,60 |
| VIII | 440 | 333 | 298 | 320 | 16,70 |
| IX | 460 | 353 | 318 | 340 | 17,40 |
| 2xIV | 515 | 408 | 373 | 190 | 18,90 |
| 2xV | 575 | 468 | 433 | 220 | 20,85 |
| 2xVI | 635 | 528 | 493 | 250 | 22,40 |
| 2xVII | 695 | 588 | 553 | 280 | 24,50 |
| 2xVIII | 775 | 668 | 633 | 320 | 26,70 |
| 2xIX | 815 | 708 | 673 | 340 | 27,70 |
| 3xVI | 900 | 793 | 758 | 250 | 30,30 |
| 3xVII | 990 | 883 | 848 | 280 | 33,20 |
| 3xVIII | 1110 | 1003 | 968 | 320 | 36,45 |
| 3xIX | 1170 | 1063 | 1028 | 340 | 38,60 |
| 4xVII | 1285 | 1178 | 1143 | 280 | 41,95 |
| 4xVIII | 1445 | 1338 | 1303 | 320 | 46,30 |
| 4xIX | 1525 | 1418 | 1383 | 340 | 49,20 |
| 5xVII | 1580 | 1473 | 1438 | 280 | 50,75 |
| 5xVIII | 1780 | 1673 | 1638 | 320 | 56,20 |
| 5xIX | 1880 | 1773 | 1738 | 340 | 59,80 |
| 6xVIII | 2115 | 2008 | 1973 | 320 | 66,10 |
| 6xIX | 2235 | 2128 | 2093 | 340 | 70,40 |
| 7xIX | 2590 | 2483 | 2448 | 340 | 80,85 |



| | |
|----|--------------------------------|
| 1- | Centre Piece |
| 2- | Sealing Joint (Graphite) |
| 3- | Mica Shield (where applicable) |
| 4- | Transparent Glasses |
| 5- | Cushion Joint (Graphite) |
| 6- | Cover Plate |
| 7- | Bolt with nut |



Dimensions are in mm. We reserve the right to carry out any necessary modifications on materials & construction without notice.

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Transparent Level Gauges

Model : BT24

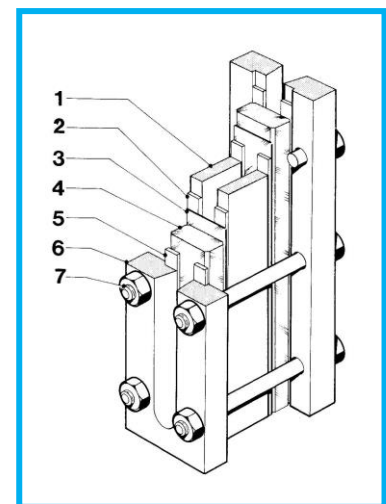
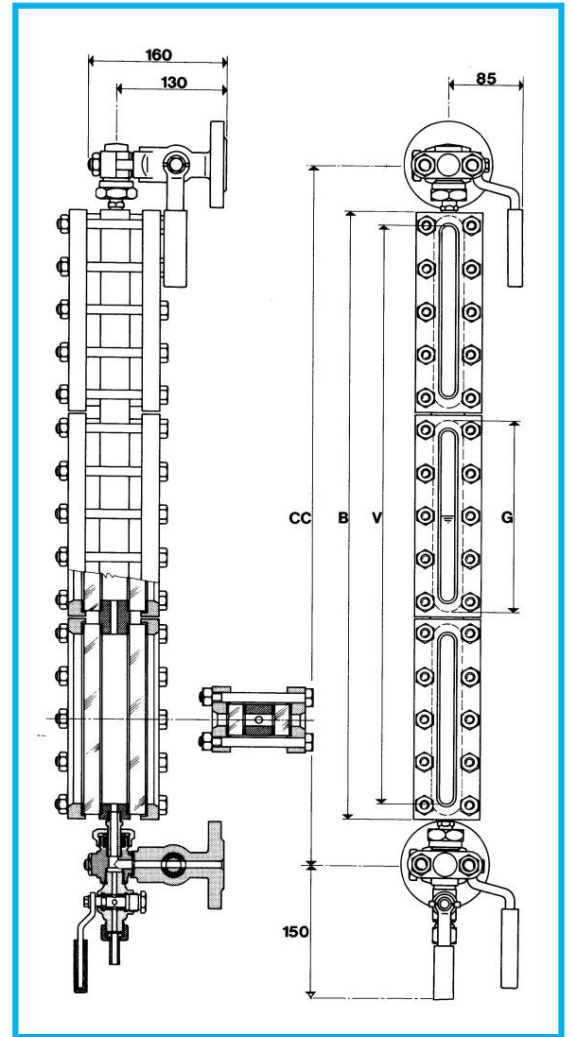
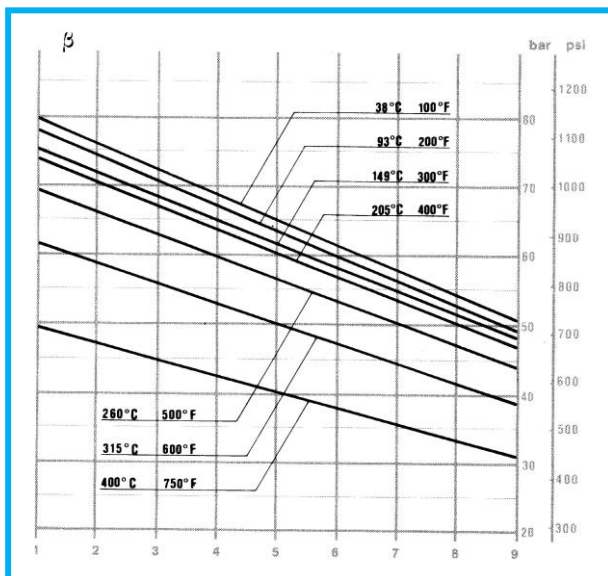
Shut-off & drain valve : G11

Pressure rating : PN40

Technical features :

- Connections between gauge and valves are made by end tubes and stuffing boxes.
- Inside passage through the gauge is 10mm
- Operating conditions and material schedules on page 3.
- BT24 gauges are fitted with transparent glasses type B.
- Standard connections to vessel are PN40 DN20 flanges and other ratings and sizes may be supplied on request.
- Bolting torque of BT24 is 50 Nm .

| Sizes | Centre to centre distances | Length of Body | Visible Length | Glass Length | Weight |
|--------|----------------------------|----------------|----------------|--------------|--------|
| | CC | B | V | G | Kg |
| I | 235 | 128 | 93 | 115 | 10,80 |
| II | 260 | 153 | 118 | 140 | 11,90 |
| III | 285 | 178 | 143 | 165 | 12,30 |
| IV | 310 | 203 | 168 | 190 | 12,90 |
| V | 340 | 233 | 198 | 220 | 13,90 |
| VI | 370 | 263 | 228 | 250 | 14,65 |
| VII | 400 | 293 | 258 | 280 | 15,60 |
| VIII | 440 | 333 | 298 | 320 | 16,70 |
| IX | 460 | 353 | 318 | 340 | 17,40 |
| 2xIV | 515 | 408 | 373 | 190 | 18,90 |
| 2xV | 575 | 468 | 433 | 220 | 20,85 |
| 2xVI | 635 | 528 | 493 | 250 | 22,40 |
| 2xVII | 695 | 588 | 553 | 280 | 24,50 |
| 2xVIII | 775 | 668 | 633 | 320 | 26,70 |
| 2xIX | 815 | 708 | 673 | 340 | 27,70 |
| 3xVI | 900 | 793 | 758 | 250 | 30,30 |
| 3xVII | 990 | 883 | 848 | 280 | 33,20 |
| 3xVIII | 1110 | 1003 | 968 | 320 | 36,45 |
| 3xIX | 1170 | 1063 | 1028 | 340 | 38,60 |
| 4xVII | 1285 | 1178 | 1143 | 280 | 41,95 |
| 4xVIII | 1445 | 1338 | 1303 | 320 | 46,30 |
| 4xIX | 1525 | 1418 | 1383 | 340 | 49,20 |
| 5xVII | 1580 | 1473 | 1438 | 280 | 50,75 |
| 5xVIII | 1780 | 1673 | 1638 | 320 | 56,20 |
| 5xIX | 1880 | 1773 | 1738 | 340 | 59,80 |
| 6xVIII | 2115 | 2008 | 1973 | 320 | 66,10 |
| 6xIX | 2235 | 2128 | 2093 | 340 | 70,40 |
| 7xIX | 2590 | 2483 | 2448 | 340 | 80,85 |



| | |
|----|--------------------------------|
| 1- | Centre Piece |
| 2- | Sealing Joint (Graphite) |
| 3- | Mica Shield (where applicable) |
| 4- | Transparent Glasses |
| 5- | Cushion Joint (Graphite) |
| 6- | Cover Plate |
| 7- | Bolt with nut |

General information :

These are the classical cocks for level gauges having a cylindrical plug with soft tightening packing sleeve.

The advantages of this design are :

- circular through flow passage,
- very long life of body and plug since the elastic packing sleeve is interposed between this two pieces,
- no sensitivity to changes of temperature,
- no possible plug seizure,
- best performance at high temperature,
- possibility to restore tightness during service by compressing packing sleeve,
- complete interchangeability of worn pieces.

Offset Valves type : G11

Pressure rating : PN40 / ANSI 300

These set are suitable for :

- Type : G11 (connection to gauge by stuffing box)
- ASME Class 300 and PN40

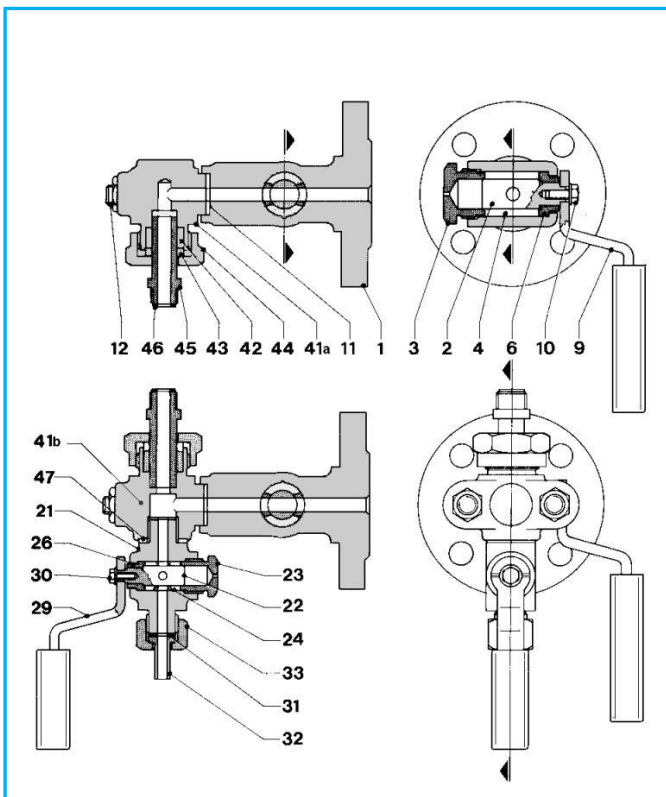
Handles and plug are made so that each handle face downward when the gauge is in service that is when shut-off (top and bottom) are open and drain cock is closed.

According to the right or the left position of the shut-off cocks handle, the set (and therefore the level gauge) is named right handed or left handed.

Centre to centre distance :

When these sets of cocks for the level gauge, the value of the minimum vessel C. to C. distance is given from the formula :

type G11: min. C. to C.= Length of body + 101mm



| Part name | Material code |
|---|------------------------|
| | 52 |
| Drain cock | |
| 21-Body | ASTM A105 Forged steel |
| 22-Plug | 1.4301 |
| 23-Tightening nut | Galvanized steel |
| 24-Packing sleeve with 2 eyelets, type M1.2 | Grafit |
| 26-Ring | Galvanized steel |
| 29-Handle | Galvanized steel |
| 30- Screw and washer | Galvanized steel |
| 31-Tailpipe joint | Copper |
| 32-Tailpipe | Galvanized steel |
| 33- Union nut | Galvanized steel |

| Part name | Material code |
|--|------------------------|
| | 52 |
| Top and bottom cock | |
| 1-Body | ASTM A105 Forged steel |
| 2-Plug | 1.4301 |
| 3-Tightening nut | Galvanized steel |
| 4-Packing sleeve with 2 eyelets, type M2.2 | Graphite |
| 6-Ring | Galvanized steel |
| 9-Handle | Galvanized steel |
| 10-Screw and washer | Galvanized steel |
| 11-Head joint | Copper |
| 12- Stud and nut | Galvanized steel |

| Part name | Material code |
|----------------------------|------------------------|
| | 52 |
| Top and bottom cock | |
| 41a-Top connecting head | ASTM A105 Forged steel |
| 41b- Bottom conencing head | ASTM A105 Forged steel |
| 42-Packing ring (Ø16) | Graphite |
| 43-Stuffing box ring | Galvanized steel |
| 44-Stuffing box nut | Galvanized steel |
| 45-End tube (Ø16) | 1.4301 |
| 46-Tube joint ring | Graphite |
| 47-Drain joint ring | Graphite |

Sleeve Packed Cock / Drain valve

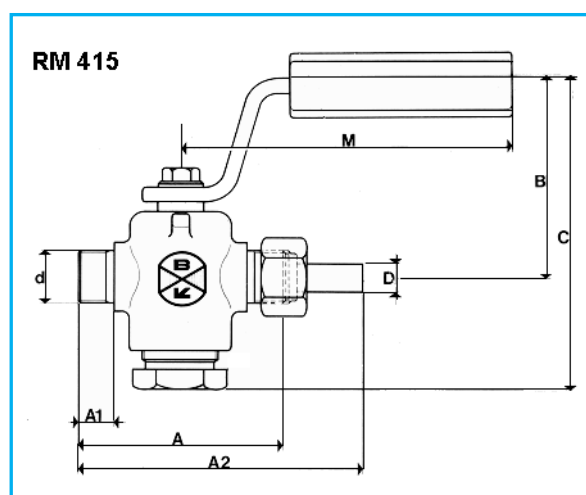
Model : RM 1.415

Connection : Male screwed TS EN ISO 228-1

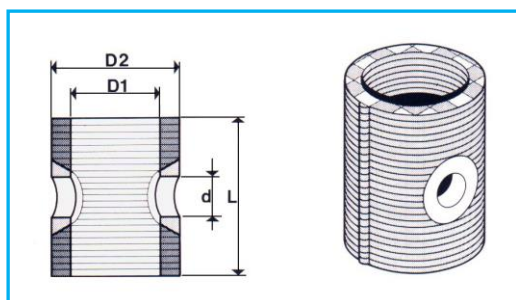
Pressure rating : PN160 (AISI 900)

Technical features :

- It is used as drain shut-off valve .
- Soft sealing is achieved by non-asbestos graphite packing sleeve between body and plug .
- It may be supplied in 3-way design for use as shut-off valve with pressure gauge .
- It is suitable for almost all fluids, up to 400 °C .
- Connections are male screwed acc. to DIN259, BSP2779 and UNI 338 and equipped with union nut and tailpipe.



| Type | DN | | | Thread d BSP | Dimensions | | | | | | | Material Schedules | Weight Approx. Kg |
|---------|--------------|------------|--------------------|--------------------|------------|---------|---------|----------|---------|---------|---------|-----------------------|-------------------------|
| | Ring type | Bore mm | Plug dia. mm | | A1 mm | D mm | A mm | A2 mm | B mm | C mm | M mm | | |
| RM1.415 | M1.2 | 5 | 12 | 1/2" | 12 | 9 | 60 | 85 | 45 | 76 | 100 | 52,63,64 | 0,40 |
| RM2.415 | M2.2 | 8 | 18 | 1/2" | 16 | 11 | 80 | 110 | 54 | 95 | 130 | 52,63,64 | 1,00 |



| Type | Passage nominal bore | | Dimensions | | |
|------|-------------------------|-----------|------------|----------|---------|
| | d mm | d inch | D1 mm | D2 mm | L mm |
| M1.2 | 6 | 1/4" | 12 | 18 | 23 |
| M2.2 | 8 | 5/16" | 18 | 26 | 32 |

Max. operating temperature for continuous service 400°C

Sight Glasses for Level Gauges

Standard and Quality :

Glasses fitted in our level gauges and spare glasses comply with the following standards :

-DIN7081 -ÖNORM M7354 -MIL G18498B
-TGL7210 -OMV H2009 -Esso Eng.Spec.123
-BS3463 -JIS B8211 -S.O.D. Spec.123

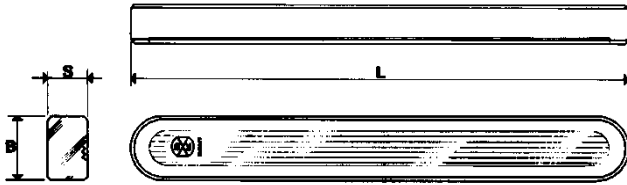
Material is always borosilicate glass pre-stressed and optically tested. Pre-stressed , "hardened", "extra hard" and similar definitions are perfectly equivalent.

We never use "soda lime" glasses since they have quite insufficient features.

Special attention shall be paid to length, width, thickness and especially flatness tolerances. From the latter point of view Bonetti sight glasses have very strict tolerance values, definitely lower than most of the ones on the market. What above ensures less stress and longer life of glass and joints.

Reflex glasses

These glasses have one smooth face (external face) and the other face provided with moulded prismatic grooves (internal face).

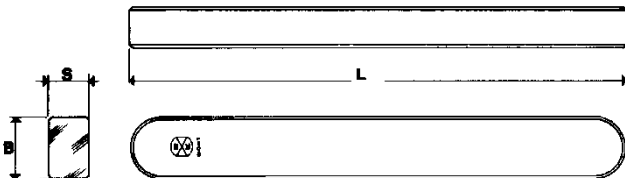


Reflex glasses have following dimensions :

| Size | Type A | | | Type B | | | Type A-BR13 | | |
|----------|--------|----|----|--------|----|----|-------------|----|----|
| | L | B | S | L | B | S | L | B | S |
| I (1) | 115 | 30 | 17 | 115 | 34 | 17 | 115 | 30 | 17 |
| II (2) | 140 | 30 | 17 | 140 | 34 | 17 | 140 | 30 | 17 |
| III (3) | 165 | 30 | 17 | 165 | 34 | 17 | 165 | 30 | 17 |
| IV (4) | 190 | 30 | 17 | 190 | 34 | 17 | 190 | 30 | 17 |
| V (5) | 220 | 30 | 17 | 220 | 34 | 17 | 220 | 30 | 17 |
| VI (6) | 250 | 30 | 17 | 250 | 34 | 17 | 250 | 30 | 17 |
| VII (7) | 280 | 30 | 17 | 280 | 34 | 17 | 280 | 30 | 17 |
| VIII (8) | 320 | 30 | 17 | 320 | 34 | 17 | 320 | 30 | 17 |
| IX (9) | 340 | 30 | 17 | 340 | 34 | 17 | 340 | 30 | 17 |

Transparent glasses

These glasses have both smooth faces.

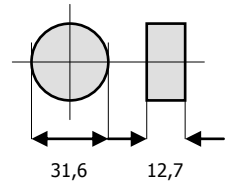


Transparent glasses have following dimensions :

| Size | Type A | | | Type B | | | Type A-BR13 | | |
|----------|--------|----|----|--------|----|----|-------------|------|------|
| | L | B | S | L | B | S | L | B | S |
| I (1) | 115 | 30 | 17 | 115 | 34 | 17 | | | |
| II (2) | 140 | 30 | 17 | 140 | 34 | 17 | | | |
| III (3) | 165 | 30 | 17 | 165 | 34 | 17 | 163 | 27,6 | 16,8 |
| IV (4) | 190 | 30 | 17 | 190 | 34 | 17 | 188 | 27,6 | 16,8 |
| V (5) | 220 | 30 | 17 | 220 | 34 | 17 | 218 | 27,6 | 16,8 |
| VI (6) | 250 | 30 | 17 | 250 | 34 | 17 | 248 | 27,6 | 16,8 |
| VII (7) | 280 | 30 | 17 | 280 | 34 | 17 | 278 | 27,6 | 16,8 |
| VIII (8) | 320 | 30 | 17 | 320 | 34 | 17 | 318 | 27,6 | 16,8 |
| IX (9) | 340 | 30 | 17 | 340 | 34 | 17 | 338 | 27,6 | 16,8 |

Round transparent glasses

A special transparent glass is the round glass for application with high pressure (usually bicolor) level gauges. This glass is a small disc with very strict tolerances.



Joints for glasses

Each sight glass is usually supplied with 2 joints (1 sealing joint + 1 cushion joint).

Length and width of joint are the same as those of the respective glass. Standard thickness is 0,75mm

Protection for glasses

When glass protection against corrosive fluids is to be taken in consideration (inc. boiler water pressured over 35 bar), you must remember that only smooth surfaces can be shielded by smooth sheets having same length and width as sight glass.

Therefore :

-reflex glasses : only external face can be shielded by mica sheets or other materials against corrosive environmental agents,

-transparent glasses : both faces can be shielded by mica or transparent Kel-F sheets.

Protection of the internal glass face in contact with fluid is usually sufficient.

Mica sheets inside level gauges are always recommended for application with water steam :

Thickness of mica sheets is usually 0,15 to 0,20mm

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