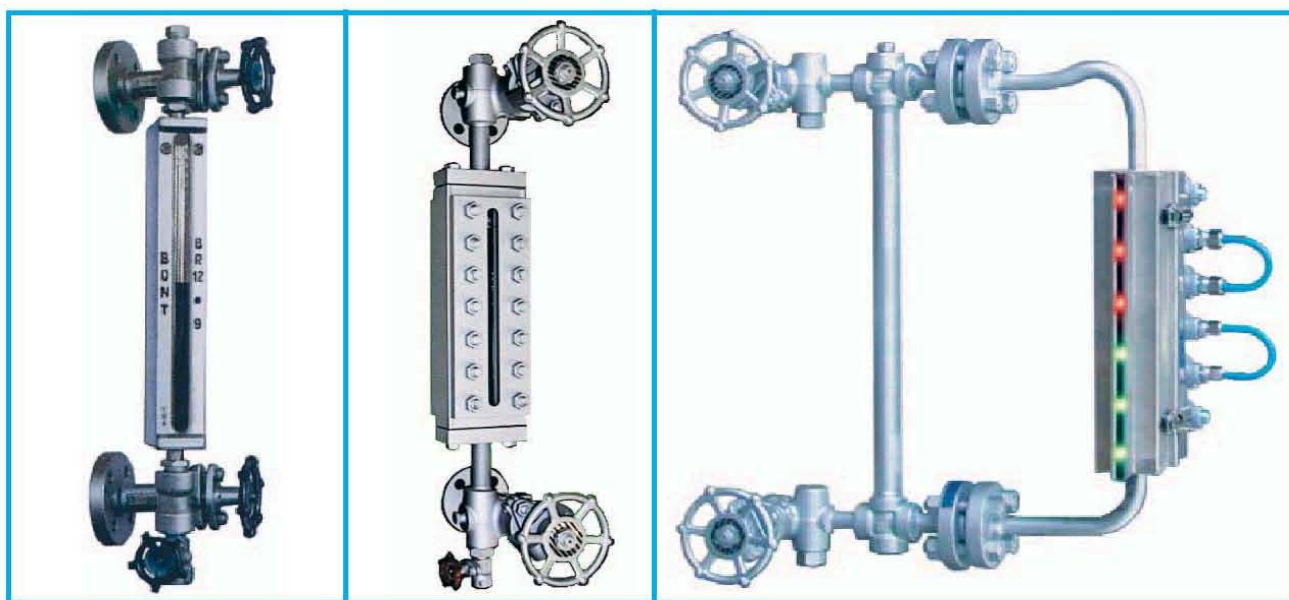


BONETTI®



BONT® GLASS LEVEL GAUGES

- Reflex
- Transparent
- Bicolour

BONT® Glass Level Gauges **Types, Material Schedules, Applications**

In this Bulletin we give the description of our level gauges made of metallic materials and omit that ones of non-metallic materials (Ebonite, Polypropylene, PTFE, etc.): information on request.

Fig. 864	Type	Page	Material Schedule	Max operating conditions		Rating ▲		Fluid
				Press. bar	Temp. °C	ASME Class	PN bar	
REFLEX	BR14 - GP11 BR 14 - G11	6 6	52	20	211		25	Water steam, other fluids
	BR12 - GP11	7	52	32	236		40	Water steam
	BR12 - G11	7	52, 64	64 40	120 300★			Other fluids (Remark 14)
	BR22 - GP11	8	52	12	187		16	Water steam
	BR22 - GP12	8	52, 64	28 10	38 300★			Other fluids (Remark 14)
	BR23 - GP11	9	52	22	216			Water steam
	BR23 - GP12	9	52, 63, 64	105 80	38 300★	600	100	Other fluids (Remark 14)
	BR24 - GP11	10	52	32	236			Water steam
	BR24 - GP12	10	52, 63, 64	165 105	38 300★	900	100	Other fluids (Remark 14)
	BR28 - G41	11	51, 52 63, 64	200 160	38 300★	1500	250	Any fluids, water steam excepted (Remark 14)
	BR28 - GP12	11	52, 63, 64	165 105	38 300★			Any fluids, water steam excepted (Remark 14)
	BR25 - GP12	12	52, 63, 64	105 62	38 300★	900	100	Any fluids, water steam excepted (Remark 14)
	BR13 - G51	13	52	400	120	(2500)	(400)	Any fluids (Remark 9)
	BR26 & BR27	14	52, 55, 61 62, 63, 64 }			(600)		Any fluids, water steam excepted (Remark 10)
TRANSPARENT	BTv - GP11	15	52 52, 63, 64	6 12	158 38			Water steam (Remark 11) Not dangerous fluids
	BT23 - GP11	16	52	12	187			Water steam (Remark 12)
	BT23 - GP12	16	52, 63, 64	51 30	38 300★	300		Other fluids (Remark 14)
	BT24 - GP11	17	52	20	211			Water steam (Remark 12)
	BT24 - GP12	17	52, 63, 64	105 62	38 300★	600	100	Other fluids (Remark 14)
	BT25 - GP12	18	52, 63, 64	105 62	38 300★	600	100	Any fluids, water steam excepted (Remark 14)
	BT28 - GP11	19	52	50	264			Water steam (Remark 12)
	BT28 - GP12	19	52, 63, 64	120 80	38 300★	600	100	Other fluids (Remark 14)
	BT29 - G41	20	52, 63, 64	165 100	38 300★	900	160	Any fluids, water steam excepted (Remark 14)
	BT33 - G52	22	51	90	302			Water steam
	BT32 - G52	23	51	103	313			Water steam
	BT26 & BT27	26	52, 55, 61 62, 63, 64 }			(600)		Any fluids, water steam excepted (Remark 10)
BICOLOUR	BC24 - GP11	24	52	20	211	See also table at page 24		Water steam
	BC28 - GP11	24	52	40	249			Water steam
	BC33 - G52	24	52	90	302			Water steam
	BC32 - G52	24	51	103	313			Water steam
	BC1 - G55	25	51	210	368			Water steam

NOTE: ★ Maximum allowable temperature according to DIN 7081 / 1999-05.

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

▲ The shown rating is an indication only: level gauge rating can change according the level gauge valve fitted on it.
See also notes on page 5 and apply to us for further information

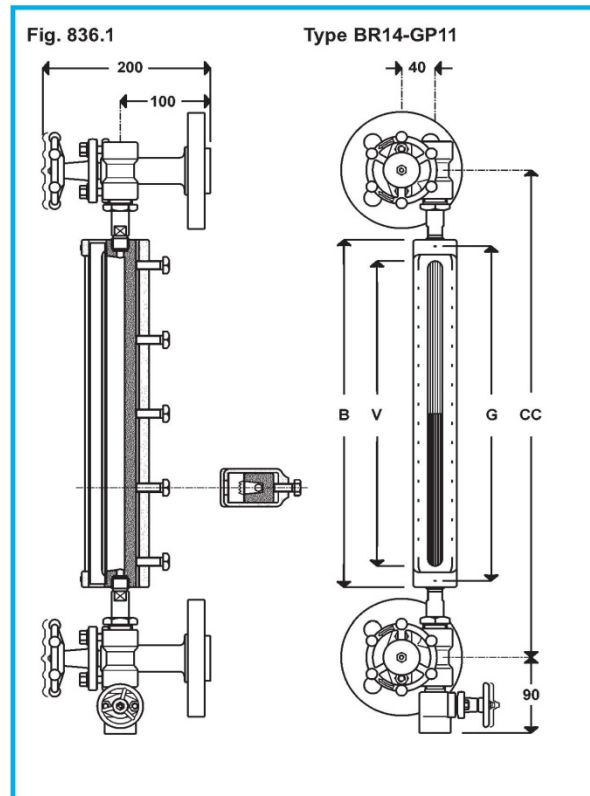


Fig. 706 Material Schedule	Body and wetted pieces	Trim of shut-off valves (Remark 8)	Remarks	Application
51	Forged carbon steel	Stainless steel		
52	Forged carbon steel	Stainless steel	Exclusion of copper, silver and their alloys	General purpose
55	Forged carbon steel ASTM A350 LF2	Stainless steel AISI 316	Exclusion of copper, silver and their alloys	Non corrosive fluids at low temperature up to -45,6 °C (-50 °F)
61	Forged stainless steel AISI 304	Stainless steel AISI 316	External not wetted parts of stainless steel AISI 304	Corrosive fluids and/or fluids at temperature lower than -45,6 °C (-50 °F)
62	Forged stainless steel AISI 304	Stainless steel AISI 316	External not wetted parts of carbon steel. Exclusion of copper, silver and their alloys.	Corrosive fluids
63	Forged stainless steel AISI 316	Stainless steel AISI 316	External not wetted parts of stainless steel AISI 304	Corrosive fluids and/or fluids at temperature lower than -45,6 °C (-50 °F)
64	Forged stainless steel AISI 316	Stainless steel AISI 316	External not wetted parts of carbon steel. Exclusion of copper, silver and their alloys.	Corrosive fluids
SPECIAL	For some types of level gauges we have normally available components made of different nuances of AISI 316, Monel 400 (ASTM B164 - Class A), Hastelloy B, Hastelloy C, Incoloy 825, Carpenter 20 CB 3, Nickel, Titanium, Ebonite, PVC, Polypropylene, PTFE. Apply to us for other materials.			

- The tag indicating the type of the level gauge consists of two parts that define:
 - the type of the level gauge body
 - the type of the set of valves.
- The level gauges having their tag followed by a "Z" are special constructions. They are suitable for operating conditions different than the ones shown in Fig. 864 for the corresponding standard type.
- The nominal passage diameter in the BONT level gauges is 10 mm, if not otherwise indicated. Only the gauge bodies type BR25 and BT25 have a "large chamber" with 40 mm inside diameter and are usually used where the medium boils or surges.
- The ASME ratings and the operating conditions shown in Fig. 864 refer to size 9. For smaller sizes the operating conditions can be higher. See diagrams on each description page or apply to us.
- The classification shown in the column «ASME ratings» could be modified by temperature operating condition, due to the maximum limit temperature suitable for the glass according DIN 7081/199-05. As shown in the Table of Fig. 864 the maximum operating conditions are generally higher than those of ASME rating. Apply to us for further information.
- The ASME ratings and the operating conditions shown in Fig. 864 refer to standard materials as carbon steel, stainless steel, Hastelloy and to standard glass joints. When special materials (Monel, Nickel, Ebonite, PVC, etc.) and/or special joints (pure PTFE, Kel-F, etc.) are required, the maximum operating conditions have to be verified.
- In Fig. 706 are indicated the main Material schedules currently manufactured.
Boldface are given the ones of major diffusion.

- In Fig. 706 is indicated the material of the piston for the set of valves type GP11 and GP12.
For a detailed list of material currently employed on shut-off valves, refer to tables shown on the pages illustrating the level gauges valves (from page 27 to page 33)
- For type BR13-G51, the ASME rating is an indication only.
- Types BR26, BR27, BT26, BT27 are manufactured for ASME 600 rating. Anyway the operating conditions must take into consideration the vessel project, the welding difficulties on the vessel of the level gauge body and especially that there are no shut-off fittings.
- The type BTV-GP11 is equipped with a glass transparent tube. Because of its brittleness this level gauge can be used with dangerless fluids only, although in presence of glass protector.
- In case the level gauge must be fitted directly on a steam boiler drum, please state it clearly.
- Most of Figures show the level gauges fitted with the Sets type GP11, GP12 (Fig. 834 page 29). They can also be fitted with Sets G41, G42, GS41, GS42 (see pages 30 and 31). In the latter case the level gauges identification tag changes after the hyphen, e.g. from BR24-GP11 to BR24-G41. The maximum operating conditions, ratings and applications are a function of the gauge body, therefore Fig. 864 and 706 are still valid.**
- In case of fluid corrosive for the glass, please refer to our Technical department to define maximum allowable temperature and glass protection.

Reflex **BONT**® Level Gauges type BR14 with GP11 and G11 valves

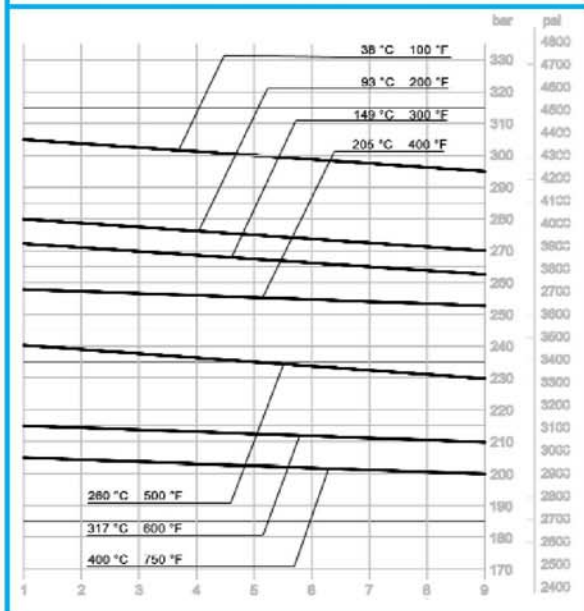
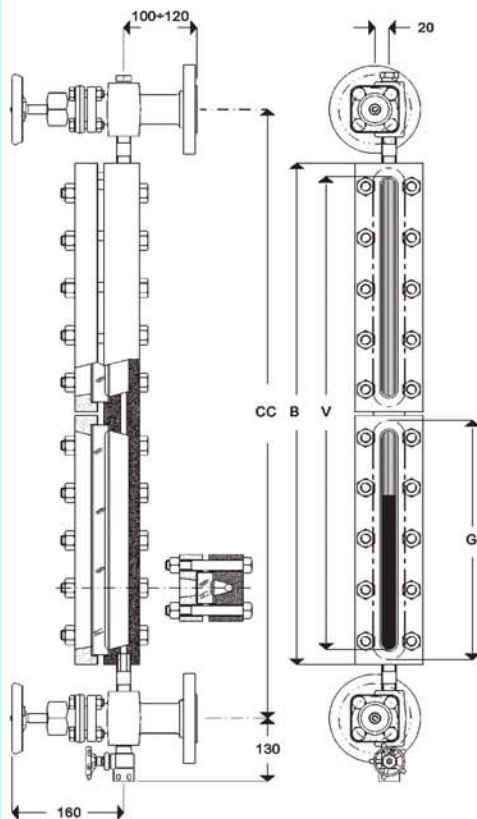


Size	Length of glass G	length of body B	Visible length V	CC min with GP11 G	CC min. with G11 kg	Weight
3	165	178	145	291	279	9,0
4	190	203	170	316	304	9,4
5	220	233	200	346	334	9,8
6	250	263	230	376	364	10,3
7	280	293	260	406	394	10,8
8	320	333	300	446	434	11,3
9	340	353	320	466	454	11,7

- Connections between gauge and valves are made by end tubes and stuffing boxes.
- According to the position of the shut-off valves compared with the gauge body, the level gauge is named "right-handed" or "left-handed". Fig. 836.1 shows a left-handed gauge. Each level gauge can be assembled right-handed or left-handed. Usually two level gauges (1 right and 1 left) are installed on steam vessels.
- According to some Steam Boiler Regulations, the visible length of the level gauges installed on steam boilers must be not shorter than a fixed length. Therefore the suitability of the smaller sizes must be checked.
- When ordering a level gauge please state:
 - Centre to centre distance between connections (CC)
 - Standard, Size and Finishing of connections
 - Whether right-handed or left-handed.
- Flanges are finished to customer prescriptions. Please state:
 - Standard
 - Size
 - Pressure class
 - Finishing
 The inside passage through the gauge is 10 mm.
- Instead of flanges, connections can be delivered with threaded ends. Standard is 3/4" NPT, union. Other Standard and size on request.
- BR14 gauges are fitted with reflex glasses type A (see page 38).
- Operating conditions and material schedules on pages 4 and 5.
- Applicable optionals and bolting torques on pages 27, 36, 37.

Reflex **BONT® Level Gauges**
type BR28 with GP12, G41/42 and GS41/42 valves

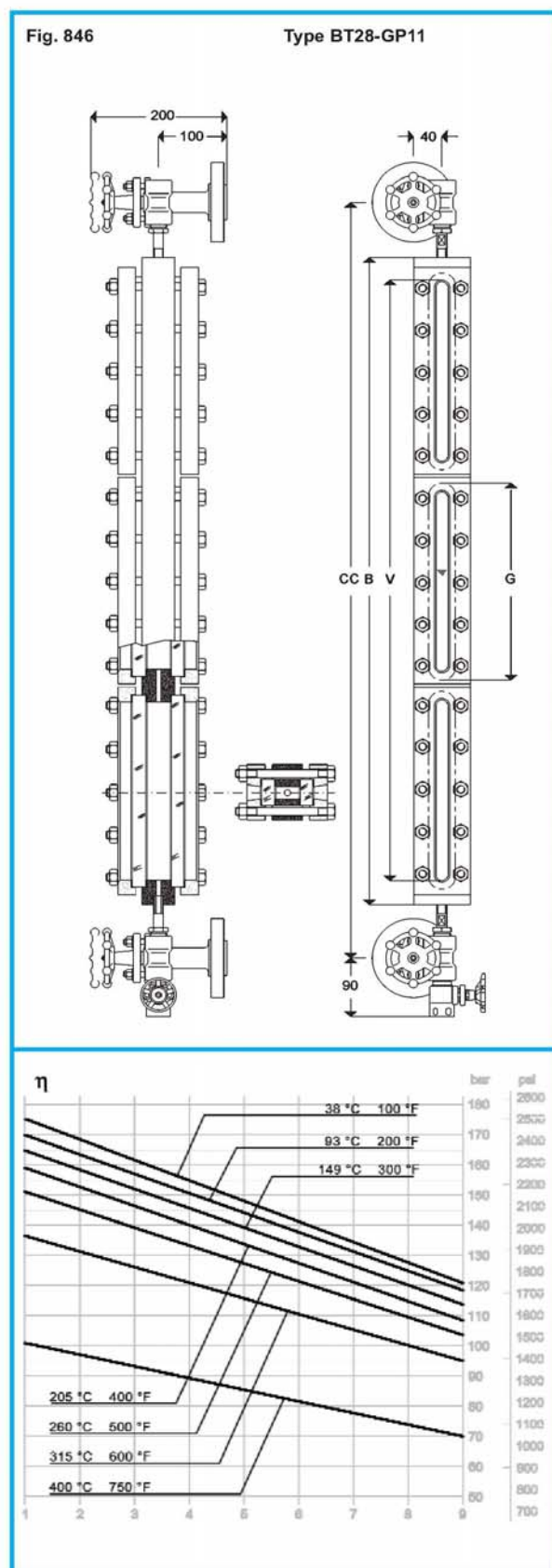
Fig. 856
Type BR28-G41



Size	length of glass	length of body	Visible length	CC min. with	Weight kg	CC min. Weight G & GS	
	G	B	V	GP12		41 & 42	kg
1	115	165	95	246	18,8	255	24,2
2	140	190	120	271	19,6	280	25,0
3	165	215	145	296	20,5	305	25,9
4	190	240	170	321	21,5	330	26,9
5	220	270	200	351	22,7	360	28,1
6	250	300	230	381	24,1	390	29,5
7	280	330	260	411	25,4	420	30,8
8	320	370	300	451	26,8	460	32,2
9	340	390	320	471	27,7	480	33,1
2x4	190	450	380	531	38,9	540	44,3
2x5	220	510	440	591	41,3	600	46,7
2x6	250	570	500	651	44,1	660	49,5
2x7	280	630	560	711	46,7	720	52,1
2x8	320	710	640	791	49,5	800	54,9
2x9	340	750	680	831	51,3	840	56,5
3x6	250	840	770	921	64,1	930	69,7
3x7	280	930	860	1011	68,0	1020	73,4
3x8	320	1050	980	1131	72,2	1140	77,6
3x9	340	1110	1040	1191	74,9	1200	80,3
4x7	280	1230	1160	1311	89,3	1320	94,7
4x8	320	1390	1320	1471	94,9	1480	100,3
4x9	340	1470	1400	1551	98,5	1560	103,9
5x7	280	1530	1460	1611	110,6	1620	116,0
5x8	320	1730	1660	1811	117,6	1820	123,0
5x9	340	1830	1760	1911	122,1	1920	127,5
6x8	320	2070	2000	2151	140,3	2160	145,7
6x9	340	2190	2120	2271	145,7	2280	151,1
7x9	340	2550	2480	2631	169,3	2640	174,7

- 1 Connections between gauges and valves are made
 - for **BR28-GP11**, by end tubes and stuffing boxes
 - for **BR28-GP12**, by NPT screwed nipples
 - for **BR28-G41/42 & GS41/42**, by NPT screwed nipples.Gauge/valve standard NPT connection is 1/2".
On request 3/4" NPT connection can be supplied.
- 2 According to the right of left position of the stop valves handle of the gauge body, the level gauges are named right handed or left-handed. Fig. 856 shows a left-handed level gauges.
- 3 When ordering a level gauge please state:
 - Centre to centre distance between connections (CC)
 - Standard, Size and Finishing of connections
 - Whether right-handed or left-handed.
- 4 Flanges are finished to customer prescriptions. Please state:
 - Standard – Size
 - Pressure class – FinishingThe inside passage through the gauge is 12,5 mm.
- 5 Instead of flanges, connections can be delivered with threaded ends. It is standard 3/4" NPT union.
- 6 BR28 gauges are fitted with reflex glasses type B (see page 38).
- 7 Operating conditions and material schedules on pages 4 and 5. Graph below shows rating for size 9 and smaller, combined included.
- 8 Applicable optionals and bolting torques on pages 27, 36, 37.
- 9 Gauge bodies without valves can be supplied:
 - end connected (threaded or flanged)
 - side connected (threaded or flanged)
 - back connected (threaded or flanged).Please state connecting dimensions and Standard.
- 10 For level gauges type **BR28-G42**, **BR28-GS41**, **BR28-GS42**, see page 30-31.

Transparent **BONT**® Level Gauges
type BT28 with GP11, GP12, G41/42 and GS41/42 valves



Size	length of glass G	length of body B	Visible length V	CC min. with GP11	CC min. with GP12	Weight kg	CC min. G & GS 41 & 42	Weight kg
1	115	165	95	278	246	17,1	255	22,5
2	140	190	120	303	271	18,8	280	24,2
3	165	215	145	328	296	20,5	305	25,9
4	190	240	170	353	321	22,0	330	27,4
5	220	270	200	383	351	24,1	360	29,5
6	250	300	230	413	381	26,3	390	31,7
7	280	330	260	443	411	28,3	420	33,7
8	320	370	300	483	451	31,0	460	36,4
9	340	390	320	503	471	32,3	480	37,7
2x4	190	450	380	563	531	34,5	540	39,9
2x5	220	510	440	623	591	38,7	600	44,1
2x6	250	570	500	683	651	43,1	660	48,5
2x7	280	630	560	743	711	47,1	720	52,5
2x8	320	710	640	823	791	52,5	800	57,9
2x9	340	750	680	863	831	55,1	840	60,5
3x6	250	840	770	953	921	59,9	930	65,3
3x7	280	930	860	1043	1011	65,9	1020	71,3
3x8	320	1050	980	1163	1131	74,0	1140	79,4
3x9	340	1110	1040	1223	1191	77,9	1200	83,3
4x7	280	1230	1160	1343	1311	84,7	1320	90,1
4x8	320	1390	1320	1503	1471	95,5	1480	100,9
4x9	340	1470	1400	1583	1551	100,7	1560	106,1
5x7	280	1530	1460	1643	1611	103,5	1620	108,9
5x8	320	1730	1660	1843	1811	117,0	1820	122,4
5x9	340	1830	1760	1943	1911	123,5	1920	128,9
6x8	320	2070	2000	2183	2151	138,5	2160	143,9
6x9	340	2190	2120	2303	2271	146,3	2280	151,7
7x9	340	2550	2480	2663	2631	169,1	2640	174,5

- Connections between gauge and valves are made
 - for **BT28-GP11**, by end tubes and stuffing boxes
 - for **BT28-GP12**, by NPT screwed nipples
 - for **BT28-G41/42 & GS41/42**, by NPT screwed nipples.
 Gauge/valve standard NPT connection is 1/2".
On request 3/4" NPT connection can be supplied.
- According to the position of the shut-off valves compared with the gauge body, the level gauge is named "right-handed" or "left-handed". Fig. 846 shows a left-handed gauge. Each level gauge can be assembled right-handed or left-handed. Usually two level gauges (1 right and 1 left) are installed on steam vessels.
- According to some Steam Boiler Regulations, the visible length of the level gauges installed on steam boilers must be not shorter than a fixed length. Therefore the suitability of the smaller sizes must be checked.
- When ordering a level gauge please state:
 - Centre to centre distance between connections (CC)
 - Standard, Size and Finishing of connections
 - Whether right-handed or left-handed.
- Flanges are finished to customer prescriptions. Please state:
 - Standard
 - Size
 - Pressure class
 - Finishing
 The inside passage through the gauge is 10 mm.
- Instead of flanges, connections can be delivered with threaded ends. Standard is 3/4" NPT, union. Other Standard and size on request.
- BT28 gauges are fitted with transparent glasses type B (see page 38).
- Operating conditions and material schedules on pages 4 and 5. Graph below shows rating for size 9 and smaller, combined included.
- Applicable optionals and bolting torques on pages 27, 36, 37.
- Gauge bodies without valves can be supplied:
 - end connected (threaded or flanged)
 - side connected (threaded or flanged)
 - back connected (threaded or flanged).
 Please state connecting dimensions and Standard.
- For level gauges type **BT28-G41**, **BT28-G42**, **BT28-GS41**, **BT28-GS42**, see page 30-31.
- The BT28 gauge body can be fitted with set of valves G42: this level gauge is called type **BT28-G42** and is suitable for water steam up to 50 bar and 263 °C.

BONT® Level Gauges Optionals for Sets of Valves

Fig. 865		Valve				Plug		Top and bottom ball-check	handwheel	Operated by			Heating	
Type	Fig.	top	bottom	drain	vent	drain	vent			chain handwheel	double lever	weighted lever	external	internal
G11	737	S	S	S	A	A	A	A	S	NA	A	NA	A	NA
G12	738	S	S	S	A	A	A	A	S	NA	A	NA	A	NA
GP11	831	S	S	S	A	A	A	A	S	NA	NA	NA	A	NA
GP12	832	S	S	S	A	A	S	A	S	NA	NA	NA	A	NA
G41	747	S	S	A	A	A	A	S	S	NA	A	A	A	A
G42	748	S	S	A	A	A	A	S	S	A	A	A	A	A
GS41	854	S	S	A	A	A	A	S	S	NA	A	A	A	NA
GS42	855	S	S	A	A	A	A	S	S	A	A	A	A	NA
G51	861	S	S	S	A	NR	NR	A	S	A	NA	NA	A	NA
G52	862	S	S	S	A	NR	NR	A	S	A	NA	NA	A	NA
G55	863	S	S	S	A	NR	NR	A	S	A	NA	NA	A	NA

Keys and Remarks to Fig. 865

S – Standard Equipment
NA – Not applicable
A – Applicable
NR – Possible, but not recommended

1 We mean by **Set** the assembly of two valves (1 top and 1 bottom) for the connection of the gauge body to the vessel. The set stops fluid between vessel and level gauge in case of servicing.

2 This bulletin shows steel level gauges only; the sets fitted on the level gauges include the following patterns:
- type **G11** and **G12**, top and bottom: sleeve packed cocks; (see page 27)
- type **GP11** and **GP12**, top and bottom: piston valves; (see pages 28 and 29)
- type **G41** and **G42**, "Offset" metallic seating valves, with stainless steel screwed-in seat and stainless steel disk (see pages 30 and 31).
- type **GS41** and **GS42**, "Straight" metallic seating valves, with stainless steel screwed-in seat and stainless steel disk (see pages 30 and 31). type
- **G51**, **G52**, **G55**, metallic seating valves, with Stellite faced trim (see pages

32 and 33).

3 Each set is usually supplied with or without some optionals according to its original design and its main application.

4 **EXTERNAL HEATING** has electrical or steam tracing, installed on job site. By **INTERNAL HEATING** gauge body is inside traced for heating fluid.

5 All sets can be supplied with **INTERMEDIATE SUPPORT** fitted on the vessel in the middle between top and bottom valve in case of very large C. to C. distance. Intermediate support usually clamps the gauge bodies only and is not in connection with the vessel inside.

6 Optionals for gauge bodies on pages 36 and 37.

BONT® Gauge Valves

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 and G12 suitable for ASME 300 and PN 40 (type G11) ASME 900 and PN 160 (type G12)

These set are suitable for:

- **type G11** (connection to gauge by stuffing box) Fig. 737;

ASME Class 300 and PN 40

- **type G12** (connection to gauge by screwed nipples) Fig. 738

ASME Class 900 and PN 160

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 are chosen 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 + 101 mm

(CC min. = B + 101 mm) exceptionally CC min = B + 92 mm

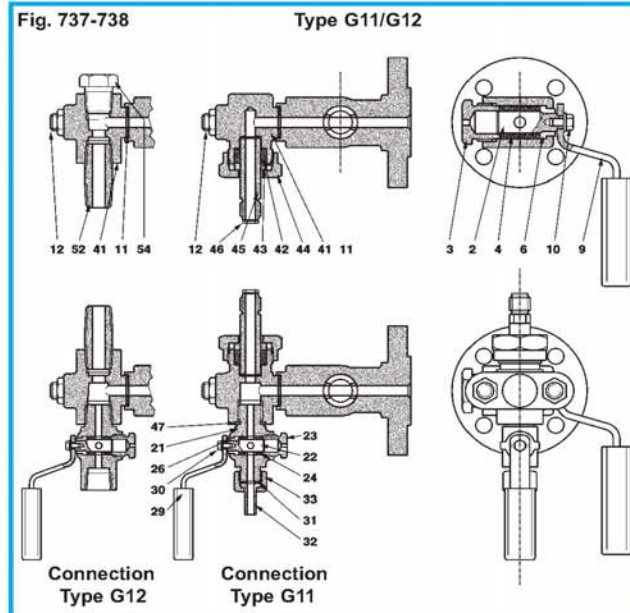
- **type G12**: min. C. to C. with 1/2" NPT nipples = Length of body + 50 mm

(CC min = B + 50 mm)

Optionals

- Double ended handle for chain operating;
- Automatic safety ball check with removal device for bottom ball

Please apply to our sales organisation for more details and technical information.



Top and bottom cock	Drain cock	
1 Body	21 Body	41 Connecting head
2 Plug	22 Plug	42 P16 packing ring (16/23, 5/10)
3 Tightening nut	23 Tightening nut	43 Stuffing box ring
4 Packing sleeve with 2 eyelets, type M2.2	24 Packing sleeve with 2 eyelets, type M1.2	44 Stuffing box nut
6 Ring	26 Ring	45 End tube
9 Handle	29 Handle	46 Tube joint ring
10 Screw and washer	30 Screw and washer	47 Drain joint ring
11 Head joint	31 Tailpipe joint	52 NPT nipple
12 Stud and nut	32 Tailpipe	54 NPT plug
	33 Union nut	

♦ Items No. 9, 10, 29 and 30 are in Carbon steel also for Material Schedule 63

