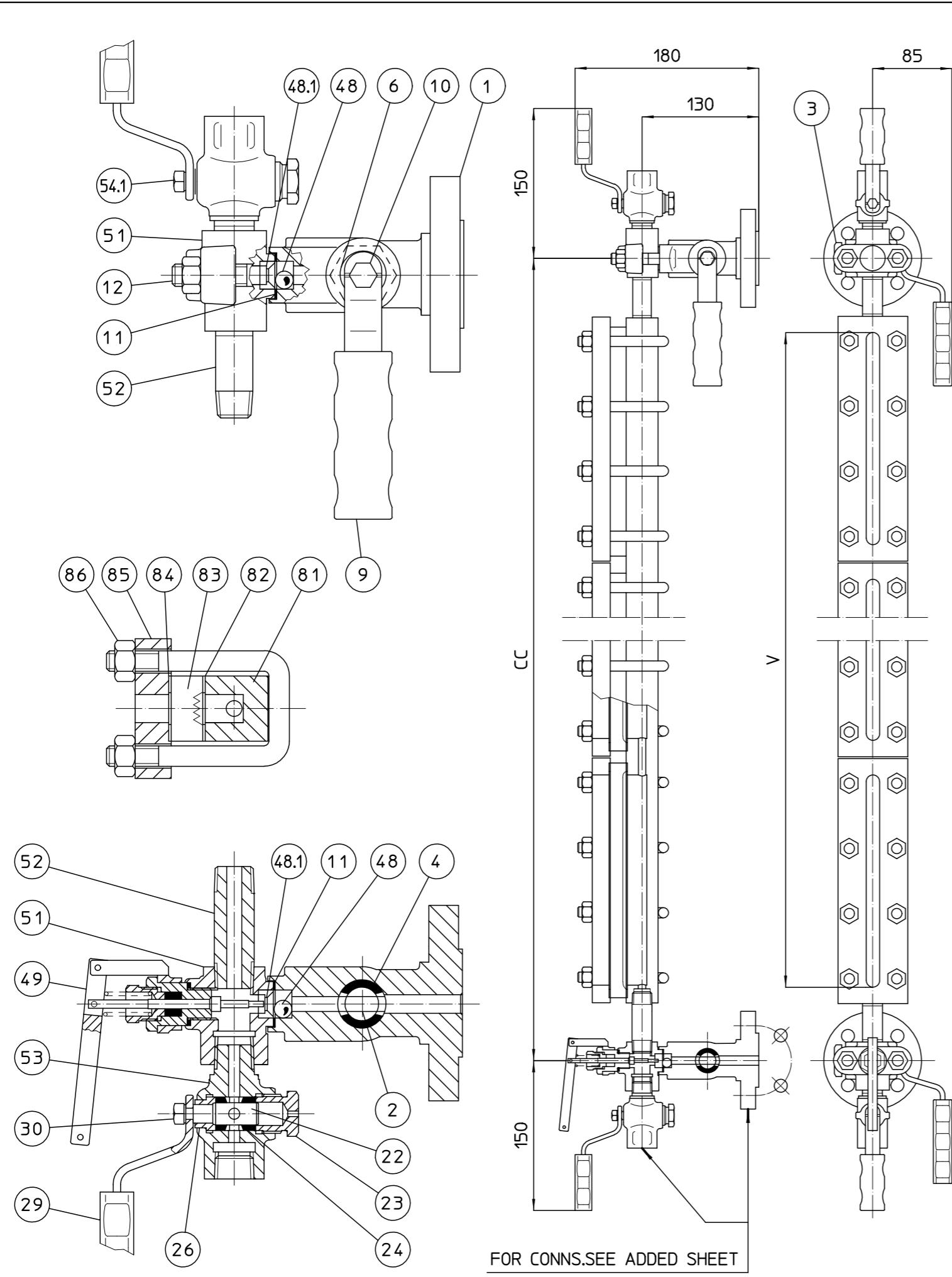


RIFERIMENTO R231263FGRR5



POS ITEM	DENOMINAZIONE	DENOMINATION	MATERIALE MATERIAL
1	CORPO	BODY	ASTM A182 316/316L
2	MASCHIO	PLUG	ASTM A479 316/316L
3	TAPPO	TIGHTENING NUT	ASTM A479 304/304L
4	BOSSOLO	PACKING SLEEVE	GRAPHITE
6	VERETTA	RING	ASTM A479 304/304L
9	MANIGLIA	HANDLE	CARBON STEEL
10	VITE E ROSETTA	SCREW AND WASHER	5.8 - CARBON STEEL
11	GUARNIZIONE PIANA	HEAD JOINT	GRAPHITE
12	PRIGIONIERO E DADO	STUD AND NUT	ASTM A193 B8 - A194 Gr.8
22	MASCHIO	PLUG	ASTM A479 316/316L
23	TAPPO	TIGHTENING NUT	ASTM A479 316/316L
24	BOSSOLO	PACKING SLEEVE	GRAPHITE
26	VERETTA	RING	ASTM A479 304/304L
29	MANIGLIA	HANDLE	CARBON STEEL
30	VITE E ROSETTA	SCREW AND WASHER	5.8 - CARBON STEEL
48	SFERA	BALL	TYPE 316
48.1	SEDE	SEAT	TYPE 316
49	ALLONTANATORE	REMOVAL DEVICE	ASTM A479 316/316L
51	PARTE ANTERIORE NPT	NPT HEAD	ASTM A182 316/316L
52	NIPPLE NPT	NIPPLE NPT	ASTM A312 316/316L
53	CORPO RUBINETTO SCARICO	DRAIN COCK BODY	ASTM A182 316/316L
54.1	RUBIN. DI SFATO	VENT COCK	ASTM A182 316/316L
81	PEZZO CENTRALE	CENTRE PIECE	ASTM A479 316/316L
82	GUARNIZIONE TENUTA	SEALING JOINT	GRAPHITE
83	CRISTALLO A RIFLESSIONE	REFLEX GLASS	BOROSILICATE
84	GUARNIZIONE APPOGGIO	CUSHION JOINT	GRAPHITE
85	PIASTRA	COVER PLATE	ASTM A479 304/304L
86	TIRANTE A U CON DADI	U BOLT WITH NUTS	ASTM A193 B8 - A194 Gr.8

FOR TAGS SEE SHEET:
PER SIGLE VEDI FOGLIO:

DENOM. INDICATORE DI LIVELLO A RIFLESSIONE BONT TIPO BR23-G12 C/SFERA E RUB.DI SFATO ESEC.63/GR
REFLEX BONT LEVEL GAUGE TYPE BR23-G12 WITH SAFETY BALL AND VENT COCK MAT.SCH.63/GR



BONETTI
Quality Valves & Level Gauges

DRAWN	CHECKED	APPR.	DATE	SCALE	DWGN.
ML	MT	TM	29/2/2009	//	R231263FGRR5

CESARE BONETTI S.p.A. - GARBAGNATE MILANESE - ITALY



BONETTI
Cesare Bonetti S.p.A.
Via Cesare Bonetti, 17
I - 20024 Garbagnate Milanese (Italy)
Telef.: 02995462 / 029957261 / 029958313 / 0299072.1
Telex: 330080 BONETT I - Telefax: 029952483
Internet: <http://www.cesare-bonetti.it>
E-mail: bont.post@cesare-bonetti.it

CERT.n°LRC 0271605

CERTIFICATO DI CONFORMITA'

CERTIFICATE OF CONFORMITY

UNI-EN 10204 2.1

CLIENTE
CUSTOMER

DESMET BALLESTRA S.p.A.

ORDINE CLIENTE
CUSTOMER P.O.

121269

NOSTRA COMMESSA 397455
OUR JOB

No. CERT. 397455/01

DEL . 14/09/2012
ON

Pos. Item	Q.tà Q.ty	Descrizione Description
10	1	IND.LIV.BR23-G12 MOD.3x7 ES.63/GR ATT.3/4"ANSI 150RF C/RUB.SF./SC., SFERE+ CC=1000 mm V=860 mmSIGLA: LG 63.1
20	3	IND.LIV.BR23-G12 MOD.3x9 ES.63/GR ATT.3/4"ANSI 150RF C/RUB.SF./SC., SFERE+ CC=1170 mm V=1040 mmSIGLE: LG 65.15 , LG 65.6 , LG 65.5

NOTE REMARKS	Certifichiamo che tutti i materiali sono conformi a quanto previsto nell'ordine. We certify that all materials comply with order.	COLLAUDI IN PRESSIONE PRESSURE TEST	RISULTATO: POSITIVO RESULT: SATISFACTORY
		TEST IDROSTATICO/PNEUMATICO HYDROSTATIC/PNEUMATIC TEST	RISULTATO: POSITIVO RESULT: SATISFACTORY
		ALTRI CONTROLLI OTHER TESTS	RISULTATO: POSITIVO RESULT: SATISFACTORY
		ESAME VISIVO DIMENSIONALE VISUAL AND DIMENSIONAL TEST RESULT	RISULTATO: POSITIVO RESULT: SATISFACTORY
		PROVA FUNZIONALE FUNCTIONAL TEST RESULT	RISULTATO: POSITIVO RESULT: SATISFACTORY
		BONETTI QUALITY CONTROL DEPARTMENT 	ISPETTORE CLIENTE O TERZA PARTE CUSTOMER INSPECTOR OR THIRD INSPECTION AUTHORITY



BONETTI®
Cesare Bonetti S.p.A.
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I - 20024 Garbagnate Milanese (Italy)
Telef.: 029956462 / 029957261 / 029958313 / 0299072.1
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Internet: http://www.cesare-bonetti.it
E-mail: bont.post@cesare-bonetti.it

CERT.n°LRC 0271605

CERTIFICATO DI COLLAUDO

INSPECTION CERTIFICATE

UNI - EN 10204 3.1

**CLIENTE
CUSTOMER**

DESMET BALLESTRA S.p.A.

No. CERT. 397455/01

**DEL . 14/09/2012
ON**

**ORDINE CLIENTE
CUSTOMER P.O.**

121269

**NOSTRA COMMESSA 397455
OUR JOB**

Posizione Item	Q.tà Q.ty	Descrizione Description	Collaudo Idrostatico Hydro. Test		Colata Heat	Descrizione Colata Heat Description	Cod.	Fornitore/Certificato Supplier/Certificate
			Corpo Body bar	Assieme Assembly bar				
10	1	IND.LIV.BR23-G12 MOD.3x7 ES.63/GR ATT.3/4"ANSI 150RF C/RUB.SF./SC., SF CC=1000 mm V=860 mmSIGLA: LG 63.1		21	.	See below		
20	3	IND.LIV.BR23-G12 MOD.3x9 ES.63/GR ATT.3/4"ANSI 150RF C/RUB.SF./SC., SF CC=1170 mm V=1040 mmSIGLE: LG 65.15 , LG 65.6 , LG 65.5		21	329706	Centre pieceQ 40 F316/L	.COFERINOX	96/2012
				872939		Cover Plate ASTM A182 F304/L	I9A ITALFORGE	0193/09
				319061		Cover Plate ASTM A182 F304/L	.COFERINOX	46/2012
				30		Body G12 AISI 316L	30 WUXI	TYE004
				67		Body (rm) drain AISI 316L	67 WUXI	TYF001

COLLAUDI IN PRESSIONE

PRESSURE TEST

IN ACCORDO: ASME B16.34

ACCORDING TO: MSS-SP-61

TEST IDROSTATICO/PNEUMATICO

HYDROSTATIC/PNEUMATIC TEST

RISULTATO: POSITIVO

RESULT: SATISFACTORY

ALTRI CONTROLLI

OTHER TESTS

ESAME VISIVO DIMENSIONALE

VISUAL AND DIMENSIONAL TEST RESULT

RISULTATO: POSITIVO

RESULT: SATISFACTORY

PROVA FUNZIONALE

FUNCTIONAL TEST RESULT

RISULTATO: POSITIVO

RESULT: SATISFACTORY

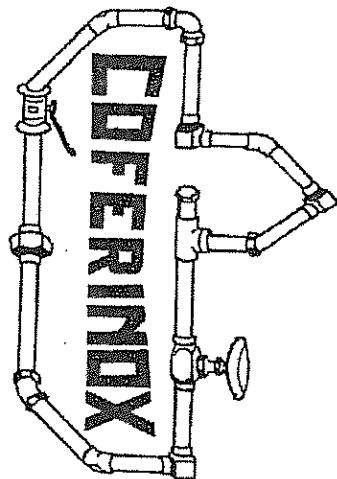
BONETTI QUALITY CONTROL DEPARTMENT

CESARE BONETTI S.p.A.
Qualità Controllata

ISPETTORE CLIENTE O TERZA PARTE
CUSTOMER INSPECTOR OR THIRD INSPECTION AUTHORITY

**NOTE
REMARKS**

**Certifichiamo che tutti i materiali sono conformi a quanto previsto nell'ordine.
We certify that all materials comply with order.**



Coferinox S.a.s. di Andrea Noè & C.

Via Copernico, 54

20090 Trezzano sul Naviglio (MI)

Tel 024459096 - 024453013 - Fax 024456251

**CERTIFICATO DI COLLAUDO
INSPECTION CERTIFICATE
EN 10204/3.1**

Nr. 96/2012

CLIENTE / Customer CESARE BONETTI SPA ORDINE DEL CLIENTE / Customer Order N° ACCOUNTO ORDINE N° 196462 DEL 10 APRILE 2012										NORMA DI COLLAUDO / Specification ASTM A182/TA276/A479 ORDINE COFERINOX / Order N° DDT 340 dal 29.05.2012			DATA / DATE 31-mag-12	
POS Item	QUANTITÀ Quantity	DESCRIZIONE Description										COLATA Hast	MATERIALE Material	ACQUAERIA Steel plant
1 KG	597	QUADRO LAMINATO 40 X 40										560192	TP 316L	BOLLINGHAUS
2 KG	465	QUADRO LAMINATO 40 X 40										329706	TP 316L	OLARRA

ANALISI CHIMICA / Chemical Analysis

POS Item	COLATA Hast	% C	% Mn	% Si	% P	% S	% Ni	% Cr	% Mo	% Ti	% N	% Cu	Co	%
1 560192	0,020	1,580	0,577	0,037	0,025	10,14	16,760	2,050	0,003	0,047	0,575	0,186		
2 329706	0,020	1,61	0,38	0,033	0,025	10,05	16,50	2,00		0,0320		0,14		

CARATTERISTICHE MECCANICHE / Mechanical Test (result of testing)

POS Item	COLATA Hast	ROTTURA Yield point Neutrl. Nominal Strength	SPIRAV.M. Yield point Nominal Strength	ALL.NEGAM. Bending	C Rupture of Bending Test	PIEGA Bending Test	SC+HAC.C. Flattening Test	PR. IDRAULICA Hydraulic test	CUREZZA Hydraulic test	TRATT. TERMICO Heat treatment	TEMP C	
1 560192	633	285	66,1	80,0						HB 145	S	1050
2 329706	556	256	53	74						HB 140	S	1060

NATURA DEL MATERIALE - NOTE / Kind of material. Remarks

COPIA CONFORME ALL'ORIGINALE

MATERIALE ESENTE DA CONTAMINAZIONI RADIOATTIVE

COLLAUDATO IN FABBRICA / Work inspection

COLLAUDATO IN FABBRICA / Work inspection

Coferinox S.a.s.
Quality Control System

[Handwritten signature]
COFERINOX S.a.s.

Autodesk CFI - VICK - VV11 Espa^ña
P.I. Box 133 Burgos (Bilbao)
Tel. 34-44-071138
Fax 34-44-1551636



Quality Management System
Approved
Certified
SIN 9901

ACEROS INOXIDABLES **OLARRA**

Trade Mark - Zeichen des Lieferwurkes	
Works Inspector Stamp - Werkssachverständiger	3

Certificate Type - APZ Nach EN 10204/3.1	Certificate n°. Prüf-Nr. 110217	Date-Datum-Fachh
Our order N°	Heat	Your order N°

Werks - Nr. 493444	Schmelze 329706	Bestell-Nr.
Nºde Referencia	Colada	Pedido N°

Steel Grade	X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX	According to
Werkstoff	Calidad	Entspricht

Shape and Size - Gegenstand	Tolerance - Toleranz	Bundles	Bars	Weight
Part/ Y dimension	Tolerancia	Bunde	Stäbe	Gewicht
SQUARE 40 mm	DIN 1014 / EN 10059	Bullos	1	660 Kg

EN 10.088-3:2005.
ASTM A 479 / A 479M-11.
ASTM A 276-10.

NACE MR-0175-2003/ISO 15156-3:2009.
AD-2000-W2 /ADW-10.

TP.316-TP.316L.

Conformity letter/Zulässungsschreiben TUV BADEN 28.01.1969
Waiving of Countersign/Gegenzeichnungsverzicht: 01.03.1977

PED 97/23/EC, Annex I, Parag. 4.3/DGR 97/23/EG
Anhang I Bspat 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

Melting process / Erschmelzungsart / Proceso de Fusión
Heat treatment / Wärmebehandlung / Tratamiento térmico

E.A.F. / A.O.D.

Solución annealed/Abgeschreckt/Hipertemperado/Decapado.

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Dimension of Specimen	Rp0,2%	Rp 1%	Rm	A	A	Z	Hardness	Impact test / Kersbschlag / Resiliencia
Abmessungsgenauigkeit Probestabes	N/mm2	N/mm2	N/mm2	%L 5D	%L 4D	%	Härte	ISO V Jules
Medida de las probetas	MPa	MPa	MPa				HBW	
RD. 10,00 mm.	200	235	500	40				100
Min.								
Max.								

Temperature °C	Spec. N°	256	286	556	53	74	140	255/252/258
20	Probe N°							

C	Si	Mn	P	S	Cr	Mo	Ni	N	Co
Min.					16,50	2,00	10,00		
Max.	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000	
	0,020	0,38	1,61	0,033	0,025	16,50	2,00	10,05	0,0320 0,14

Visual and dimensional inspection Radiotractividad inspección Control visual y dimensional	Radiotractividad inspección Control de Radiotractividad	Antirradiation test Antirradiación	Grain Size Korngrösse Tamaño de grano
O.K.	O.K.	O.K.	O.K.

IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK

Remarks - Bemerkungen - Observaciones	EDV / EDV Acc. EN 10.104 Alfredo Molina Certification Min.
	Works Inspection Der Werkstatt übernahm Inspección de fábrica Sociedad de Inspección Inspector UOCA 9

STAMPERIA ITALFORGE

Via Dell'Industria, n° 8

卷之三

**SCHEDA DI REGISTRAZIONE
E CONTROLLO FINALE**

CERTIFICATO N° 0193 /095

Mod01B
Rev 0

ACCIAIERIA COGNE		CERTIFICA CHIMICA.	LOTTO M.PRIMA	COD. COL.
		872939	11-09	I9A
DATA		9/3/2009		
N° PEZZI		592		
N° P. CONTROL.		30		
Pos.	Dimensioni	VALORI RILEVATI	VALORI RILEVATI	VALORI RILEVATI
A	3,0	2,8		
B	25+1	25,3		
C				
D				
E				
F				
G				
H				
I				
L				
<i>Impronte estrattori</i>	C			
Marcatura	C			
Sabbiatura	C			
Centratura	C			
C. Non Distrettivi	C			
Coniatura	C			
Selezionateli	C			
Magnafux - campionatura p.z. -				
Trattamento Termico				
N.° Documento				
Normalizzato °C				
Ricottura °C				
Bonifica Max. HB				
Bonifica Max. HRB				
Bonifica Max. HRC				
Temperatura °C	Rinv.			
N° Pezzi control.				
HRC Rilevate				
Diagrammi				
Estado finale	OK			
D.D.T.	241			
FIRMA C.Q.	R.			

Controllo Qualità, Sign.
Franco Rusconi
Alfredo Careni
Gaspare Sacco

E-Mail:
quasimallaforge@virgilio.it

11/03/2008 Gesprek Sappo

PIEMONTE
2009/4

CERTIFICAZIONE DI COLLAUDO 3.1 (N° 2024/2009)

Lotto 11/09 13/09



COGME S.p.A.
UNI - IACQ

(A06) COMMUTATORI : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(A07) COMMUTATORI : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(B01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(B02) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(C01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(D01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(E01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(F01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(G01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(H01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :

(I01) SPECIFICHE : STAMPERIA ITALPAGGE DI SPINELLA SRL 2009/4 AVVISO DI SPECIFICHE :



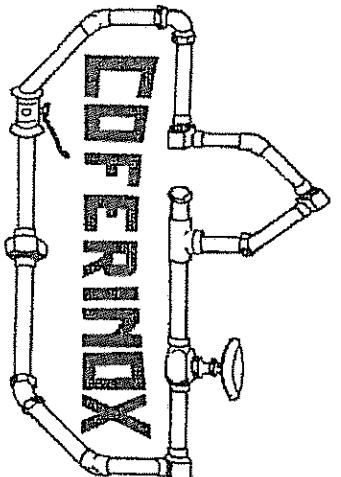
(CQD) CONTINUITÀ DELL'PROVE: L

EN 10062
030003031287PROVA DI TRASIZIONE ALLO STATO DI SORVETTA
(400) NORMA DEL DOCUMENTO 2006/06/06

OGNI PROVA DI TRASIZIONE DEVE ESSERE ACCORDATA CON UN CERTIFICATO DA I.G.D.
UN CERTIFICATO DA I.G.D. È UN DOCUMENTO CHE CERTIFICA IL CORRETTO ECONOMICO E TECNICO CONFERIMENTO DI UNA MISURA DI DISTANZA O DI ANGOLAZIONE.



AL2	AL1	RPT1	RPT2	RPT3	RPT4	RPT5	RPT6	RPT7	RPT8	RPT9	RPT10	RPT11	RPT12	RPT13	RPT14	RPT15	RPT16	RPT17	RPT18	RPT19	RPT20	RPT21	RPT22	RPT23	RPT24	RPT25	RPT26	RPT27	RPT28	RPT29	RPT30	RPT31	RPT32	RPT33	RPT34	RPT35	RPT36	RPT37	RPT38	RPT39	RPT40	RPT41	RPT42	RPT43	RPT44	RPT45	RPT46	RPT47	RPT48	RPT49	RPT50	RPT51	RPT52	RPT53	RPT54	RPT55	RPT56	RPT57	RPT58	RPT59	RPT60	RPT61	RPT62	RPT63	RPT64	RPT65	RPT66	RPT67	RPT68	RPT69	RPT70	RPT71	RPT72	RPT73	RPT74	RPT75	RPT76	RPT77	RPT78	RPT79	RPT80	RPT81	RPT82	RPT83	RPT84	RPT85	RPT86	RPT87	RPT88	RPT89	RPT90	RPT91	RPT92	RPT93	RPT94	RPT95	RPT96	RPT97	RPT98	RPT99	RPT100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
603,00	616,00	619,00	622,00	625,00	628,00	631,00	634,00	637,00	640,00	643,00	646,00	649,00	652,00	655,00	658,00	661,00	664,00	667,00	670,00	673,00	676,00	679,00	682,00	685,00	688,00	691,00	694,00	697,00	700,00	703,00	706,00	709,00	712,00	715,00	718,00	721,00	724,00	727,00	730,00	733,00	736,00	739,00	742,00	745,00	748,00	751,00	754,00	757,00	760,00	763,00	766,00	769,00	772,00	775,00	778,00	781,00	784,00	787,00	790,00	793,00	796,00	799,00	802,00	805,00	808,00	811,00	814,00	817,00	820,00	823,00	826,00	829,00	832,00	835,00	838,00	841,00	844,00	847,00	850,00	853,00	856,00	859,00	862,00	865,00	868,00	871,00	874,00	877,00	880,00	883,00	886,00	889,00	892,00	895,00	898,00	901,00	904,00	907,00	910,00	913,00	916,00	919,00	922,00	925,00	928,00	931,00	934,00	937,00	940,00	943,00	946,00	949,00	952,00	955,00	958,00	961,00	964,00	967,00	970,00	973,00	976,00	979,00	982,00	985,00	988,00	991,00	994,00	997,00	999,00	1002,00	1005,00	1008,00	1011,00	1014,00	1017,00	1020,00	1023,00	1026,00	1029,00	1032,00	1035,00	1038,00	1041,00	1044,00	1047,00	1050,00	1053,00	1056,00	1059,00	1062,00	1065,00	1068,00	1071,00	1074,00	1077,00	1080,00	1083,00	1086,00	1089,00	1092,00	1095,00	1098,00	1101,00	1104,00	1107,00	1110,00	1113,00	1116,00	1119,00	1122,00	1125,00	1128,00	1131,00	1134,00	1137,00	1140,00	1143,00	1146,00	1149,00	1152,00	1155,00	1158,00	1161,00	1164,00	1167,00	1170,00	1173,00	1176,00	1179,00	1182,00	1185,00	1188,00	1191,00	1194,00	1197,00	1200,00	1203,00	1206,00	1209,00	1212,00	1215,00	1218,00	1221,00	1224,00	1227,00	1230,00	1233,00	1236,00	1239,00	1242,00	1245,00	1248,00	1251,00	1254,00	1257,00	1260,00	1263,00	1266,00	1269,00	1272,00	1275,00	1278,00	1281,00	1284,00	1287,00	1290,00	1293,00	1296,00	1299,00	1302,00	1305,00	1308,00	1311,00	1314,00	1317,00	1320,00	1323,00	1326,00	1329,00	1332,00	1335,00	1338,00	1341,00	1344,00	1347,00	1350,00	1353,00	1356,00	1359,00	1362,00	1365,00	1368,00	1371,00	1374,00	1377,00	1380,00	1383,00	1386,00	1389,00	1392,00	1395,00	1398,00	1401,00	1404,00	1407,00	1410,00	1413,00	1416,00	1419,00	1422,00	1425,00	1428,00	1431,00	1434,00	1437,00	1440,00	1443,00	1446,00	1449,00	1452,00	1455,00	1458,00	1461,00	1464,00	1467,00	1470,00	1473,00	1476,00	1479,00	1482,00	1485,00	1488,00	1491,00	1494,00	1497,00	1500,00	1503,00	1506,00	1509,00	1512,00	1515,00	1518,00	1521,00	1524,00	1527,00	1530,00	1533,00	1536,00	1539,00	1542,00	1545,00	1548,00	1551,00	1554,00	1557,00	1560,00	1563,00	1566,00	1569,00	1572,00	1575,00	1578,00	1581,00	1584,00	1587,00	1590,00	1593,00	1596,00	1599,00	1602,00	1605,00	1608,00	1611,00	1614,00	1617,00	1620,00	1623,00	1626,00	1629,00	1632,00	1635,00	1638,00	1641,00	1644,00	1647,00	1650,00	1653,00	1656,00	1659,00	1662,00	1665,00	1668,00	1671,00	1674,00	1677,00	1680,00	1683,00	1686,00	1689,00	1692,00	1695,00	1698,00	1701,00	1704,00	1707,00	1710,00	1713,00	1716,00	1719,00	1722,00	1725,00	1728,00	1731,00	1734,00	1737,00	1740,00	1743,00	1746,00	1749,00	1752,00	1755,00	1758,00	1761,00	1764,00	1767,00	1770,00	1773,00	1776,00	1779,00	1782,00	1785,00	1788,00	1791,00	1794,00	1797,00	1800,00	1803,00	1806,00	1809,00	1812,00	1815,00	1818,00	1821,00	1824,00	1827,00	1830,00	1833,00	1836,00	1839,00	1842,00	1845,00	1848,00	1851,00	1854,00	1857,00	1860,00	1863,00	1866,00	1869,00	1872,00	1875,00	1878,00	1881,00	1884,00	1887,00	1890,00	1893,00	1896,00	1899,00	1902,00	1905,00	1908,00	1911,00	1914,00	1917,00	1920,00	1923,00	1926,00	1929,00	1932,00	1935,00	1938,00	1941,00	1944,00	1947,00	1950,00	1953,00	1956,00	1959,00	1962,00	1965,00	1968,00	1971,00	1974,00	1977,00	1980,00	1983,00	1986,00	1989,00	1992,00	1995,00	1998,00	2001,00	2004,00	2007,00	2010,00	2013,00	2016,00	2019,00	2022,00	2025,00	2028,00	2031,00	2034,00	2037,00	2040,00	2043,00	2046,00	2049,00	2052,00	2055,00	2058,00	2061,00	2064,00	2067,00	2070,00	2073,00	2076,00	2079,00	2082,00	2085,00	2088,00	2091,00	2094,00	2097,00	2100,00	2103,00	2106,00	2109,00	2112,00	2115,00	2118,00	2121,00	2124,00	2127,00	2130,00	2133,00	2136,00	2139,00	2142,00	2145,00	2148,00	2151,00	2154,00	2157,00	2160,00	2163,00	2166,00	2169,00	2172,00	2175,00	2178,00	2181,00	2184,00	2187,00	2190,00	2193,00	2196,00	2199,00	2202,00	2205,00	2208,00	2211,00	2214,00	2217,00	2220,00	2223,00	2226,00	2229,00	2232,00	2235,00	2238,00	2241,00	2244,00	2247,00	2250,00	2253,00	2256,00	2259,00	2262,00	2265,00	2268,00	2271,00	2274,00	2277,00	2280,00	2283,00	2286,00	2289,00	2292,00	2295,00	2298,00	2301,00	2304,00	2307,00	2310,00	2313,00	2316,00	2319,00	2322,00	2325,00	2328,00	2331,00	2334,00	2337,00	2340,00	2343,00	2346,00	2349,00	2352,00	2355,00	2358,00	2361,00	2364,00	2367,00	2370,00	2373,00	2376,00	2379,00	2382,00	2385,00	2388,00	2391,00	2394,00	2397,00	2400,00	2403,00	2406,00	2409,00	2412,00	2415,00	2418,00	2421,00	2424,00	2427,00	2430,00	2433,00	2436,00	2439,00	2442,00	2445,00	2448,00	2451,00	2454,00	2457,00	2460,00	2463,00	2466,00	2469,00	2472,00	2475,00	2478,00	2481,00	2484,00	2487,00	2490,00	2493,00	2496,00	2499,00	2502,00	2505,00	2508,00	2511,00	2514,00	2517,00	2520,00	2523,00	2526,00	2529,00	2532,00	2535,00	2538,00	2541,00	2544,00	2547,00	2550,00	2553,00	2556,00	2559,00	2562,00	2565,00	2568,00	2571,00	2574,00	2577,00	2580,00	2583,00	2586,00	2589,00	2592,00	2595,00	2598,00	2601,00	2604,00	2607,00	2610,00	2613,00	2616,00	2619,00	2622,00	2625,00	2628,00	2631,00	2634,00	2637,00	2640,00	2643,00	2646,00	2649,00	2652,00	2655,00	2658,00	2661,00	2664,00	2667,00	2670,00	2673,00	2676,00	2679,00	2682,00	2685,00	2688,00	2691,00	2694,00	2697,00	2700,00	2703,00	2706,00	2709,00	2712,00	2715,00	2718,00	2721,00	2724,00	2727,00	2730,00	2733,00	2736,00	2739,00	2742,00	2745,00	2748,00	2751,00	2754,00	2757,00	2760,00	2763,00	2766,00	2769,00	2772,00	2775,00	2778,00	2781,00	2784,00	2787,00	2790,00	2793,00	2796,00	2799,00	2802,00	2805,00	2808,00	2811,00	2814,00	2817,00	2820,00	2823,00	2826,00



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CERTIFICATO DI COLLAUDO / INSPECTION CERTIFICATE | Nr. 46/2012
EN 10204/3.1

POS Item	QUANTITÀ Quantity	DESCRIZIONE Description	COLATA Heat	MATERIALE Material	ACCIAIERIA Steel plate
1	KG 736	PIATTO LAMINATO 80 X 20	319061	TP 304/304L	

ANALISI CHIMICA / Chemical Analysis														
POS Item	COLATA Heat	% C	% Mn	% Si	% P	% S	% Ni	% Cr	% Mo	% Ti	% N	% Cu	Co	%
1	319061	0,017	1,47	0,36	0,035	0,028	8,00	18,00		0,0875		0,10		

CARATTERISTICHE MECCANICHE / Meccanical Test (Result of testing)

POS Item	COLATA Heat	ROTTURA Tensile Strength Yield point Rumppi Norme	SNERVAM. BENDING Yield point Norme	ALLINGAM. Bending Elongation	C Reduction of area %	PIEGA Bending Test	SCHIACC. Flattening Test	PR. IDRAULICA Hydraulic test	DUREZZA Hardness test	TRATT. TERMICO Heat treatment	TEMP °C
1	319061										
1 ^a PROVA	601	278	52	74							
2 ^a PROVA	609	287	51	73					156		

NATURE DEL MATERIALE - NOTE / Kind of material - Remarks

COPIA CONFORME ALL'ORIGINALE

MATERIALE ESENTE DA CONTAMINAZIONI RADIAZIVE

DOLLARDO INTERNO / Work inspection

COFERINOX 3.0.5
U.C.O. 9
Inspector

COFERINOX 3.0.5

Coferinox S.a.s

Quality Control System

MATERIAL TEST REPORT (材质报告)

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Tel(电话): 0086-0510-85994330 Fax(传真): 0086-0510-85992904 Email(邮箱): sales@ty-tcrtine.com Page(页码): 1/1

ASTM A182/A182M-08
Material (材質): 316L
Specification (規格番号):

CESARE BONETTI S.p.A. GARBAGNATE MILANESE		PIANO CONTROLLO QUALITÀ QUALITY CONTROL PLAN					PAGINA 1 DI 1 SHEET OF
DESCRIZIONE : <i>DESCRIPTION</i>		INDICATORI DI LIVELLO LEVEL GAUGES		CLIENTE : <i>CUSTOMER</i>	DESMET BALLESTRA		DOC. Nr.: PCQ
IMPIANTO : <i>PLANT</i>		ORDER: 121269					
Nr.	OPERAZIONE <i>OPERATION</i>	DOCUMENTI APPLICABILI <i>APPLICABLE DOCUMENTS</i>	INTERVENTI <i>INTERVIEW</i>			EMISSIONE CERTIFICATI <i>CERTIFICATE ISSUE</i>	NOTE <i>NOTES</i>
			BONETTI				
1	ANALISI CHIMICA E MECCANICA <i>CHEMICAL AND MECHANICAL ANALYSIS</i>	ASTM - DIN - UNI	H			C	
2	PROVA IDROSTATICA <i>HYDROSTATIC TEST</i>	PROCEDURA BONETTI N°CB 1602 (Indicatori di livello a vetro) <i>Bonetti procedure no. CB. 1602 (Glass level gauge)</i>	H			C	
3	CONTROLLO VISIVO E DIMENSIONALE <i>VISUAL AND DIMENSIONAL CHECK</i>	DISEGNI APPLICABILI <i>APPLICABLE DRAWINGS</i>	H			C	
4	CONTROLLO DOCUMENTAZIONE <i>DOCUMENTATION CHECK</i>		H			C	
ESTENSIONE CONTROLLO : <i>CHECK EXTENSION</i>		X = 100% Y = test sample Z = 10% subject to result	H = HOLD POINT W = WITNESS POINT C = CERTIFICATION ISSUE R = REVIEW		NOTE GENERALI : <i>GENERAL NOTES</i>		



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DICHIARAZIONE
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Gli indicatori di livello a vetro elencati nella **TABELLA 1** rientrano nelle prescrizioni di cui all'articolo 3.3 della Direttiva 97/23/CE in materia di attrezzature in pressione, pertanto non devono recare la marcatura CE.

Indicatori dello stesso tipo, di modelli più lunghi o di modelli multipli con $PS \leq 200$ bar, $V \leq 1L$ o $PSxV \leq 25$ barL (art. 3.1.1a per fluidi di gruppo 1 allegato II tabella 1), o $PS \leq 1000$ bar, $V \leq 1L$ o $PSxV \leq 50$ barL (art. 3.1.1a per fluidi di gruppo 2 allegato II tabella 2) benché non rappresentati sul presente certificato, rientrano anch'essi nei requisiti dell'articolo 3.3 e non devono essere marcati CE.

Il dimensionamento degli indicatori di livello è stato eseguito secondo la corretta prassi di ingegneria.

I carichi presi in considerazione sono quelli riportati nella Tabella 1.

NOTA BENE:

Gli indicatori di livello a vetro non devono essere utilizzati per "Lethal Service". La definizione di "Lethal substances" riportata dall'ASME VIII Part. UW è:

"By "lethal substances" are meant poisonous gases or liquids of such a nature that a very small amount of the gas or of the vapor of the liquid mixed or unmixed with air is dangerous to life when inhaled. For purpose of this Division, this class includes substances of this nature which are stored under pressure or may generate a pressure if stored in a closed vessel".

Glass level gauges, listed in TABLE 1, comply with art. 3.3 of the Pressure Equipment Directive 97/23/EC, therefore they must not be marked CE.

Level gauges of same type of longer sizes or combined having $PS \leq 200$ bar, $V \leq 1L$ or $PSxV \leq 25$ barL (art. 3.1.1a for fluids of group 1 attachment II table 1), or $PS \leq 1000$ bar, $V \leq 1L$ $PSxV \leq 50$ barL (art. 3.1.1a for fluids of group 2 attachment II table 2), although not shown on the present certificate, also comply with art. 3.3 and must not be marked CE.

The design of the level gauges is performed in accordance with the sound engineering practice (SEP).

Considered loads are those listed in the attached table I

REMARK:

Glass level gauges are not suitable for "Lethal Service". The meaning of "Lethal substances" quoted from ASME VIII Part. UW follows:

"By "lethal substances" are meant poisonous gases or liquids of such a nature that a very small amount of the gas or of the vapor of the liquid mixed or unmixed with air is dangerous to life when inhaled. For purpose of this Division, this class includes substances of this nature which are stored under pressure or may generate a pressure if stored in a closed vessel".

CESARE BONETTI S.P.A. Amministratore Delegato Managing Director Giuseppe Dalmasso	26/03/2002
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**DICHIARAZIONE
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TABELLA 1 / TABLE 1

TIPO TYPE	DISEGNO DRAWING	P S (bar)	T. MAX (°C)	FLUIDO FLUID	GRUPPO GROUP	MODELLO /SIZE MAX (L)
BR 12	Fig. 837	32	236	VAP. ACQUA/ WATER STEAM	2	7X9=0,6 L
		64 40	120 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BR 14	Fig. 836	20	211	VAP. ACQUA/ WATER STEAM	2	MOD.9=0,085L
BR 22	Fig. 838	12	187	VAP. ACQUA/ WATER STEAM	2	7X9=0,6L
		28 10	38 400	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BR 23	Fig. 839	22	216	VAP. ACQUA/ WATER STEAM	2	7X9=0,6L
		105 80	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BR 24	Fig. 840	32	236	VAP. ACQUA/ WATER STEAM	2	7X9=0,6L
		165 115	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BR 25	Fig. 841 Øi 40mm Fig. 841 Øi 50mm	105 62	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	B<=2X9(40)=0,92L B<=2X5(50)=0,98L
BR 28	Fig. 856	200 160	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	7X9=0,6L
BT1	Fig. 860 BT1	210	368	VAP. ACQUA/ WATER STEAM	2	MOD. 21=0,525 L
BT 23	Fig. 843	12	187	VAP. ACQUA/ WATER STEAM	2	6X9=0,932L
		51 30	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BT 24	Fig. 844	20	211	VAP. ACQUA/ WATER STEAM	2	6X9=0,932L
		105 62	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BT 25	Fig. 845 Øi 40mm Fig. 845 Øi 50mm	105 62	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	B<=2X9(40)=0,92L B<=2X5(50)=0,98L
BT 28	Fig. 846	50	264	VAP. ACQUA/ WATER STEAM	2	7X9=0,7L
		120 80	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BT 29	Fig. 868	165 100	38 300	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	7X9=0,7L
BT 32	Fig. 859	103	313	VAP. ACQUA/ WATER STEAM	2	7X9=0,7L
BT 33	Fig. 858	90	302	VAP. ACQUA/ WATER STEAM	2	7X9=0,7L
BTV	Fig. 842	6	158	VAP. ACQUA/ WATER STEAM	2	L MAX. TUBO/TUBE ≤ 12 m
		12	38	FLUIDI IN GEN./ GENERIC FLUIDS	1,2 (*)	
BC1	Fig. 860	210	368	VAP. ACQUA/ WATER STEAM	2	MOD. 21=0,525 L
BC 23	Fig. 824 BC 23	12	187	VAP. ACQUA/ WATER STEAM	2	7X9=0,785L
BC 24	Fig. 824 BC 24	20	211	VAP. ACQUA/ WATER STEAM	2	7X9=0,785L
BC 28	Fig. 824 BC 28	40	249	VAP. ACQUA/ WATER STEAM	2	7X9=0,785L
BC 32	Fig. 825 BC 32	100	310	VAP. ACQUA/ WATER STEAM	2	7X9=0,785L
BC 33	Fig. 825 BC 33	90	302	VAP. ACQUA/ WATER STEAM	2	7X9=0,785L

(*) = I carichi di Pressione e Temperatura indicati non sono applicabili con acqua/vapore o con fluidi corrosivi che attaccano i cristalli / Pressure and Temperature loads shown are not applicable with water/steam or fluids corrosive for the glasses.



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DICHIARAZIONE
STATEMENT
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Certifichiamo che le valvole e i rubinetti elencati nella **TABELLA 1** con $DN \leq 25$ (art. 3.1.3a per fluidi di gruppo 1 allegato II tabella 6), $DN \leq 32$ o $PS \times DN \leq 1000$ bar (art. 3.1.3a per fluidi di gruppo 2 allegato II tabella 7) rientrano nelle prescrizioni di cui all'articolo 3.3 della Direttiva 97/23/CE in materia di attrezzature in pressione, pertanto non devono recare la marcatura CE.
Il dimensionamento delle valvole e rubinetti è stato eseguito secondo la corretta prassi di ingegneria e per lo spessore del corpo nel rispetto della normativa ASME B16.34.
I carichi presi in considerazione sono quelli rappresentati dai ratings riportati in Tabella 1.

*We hereby certify that the valves and cocks listed on **TABLE 1** with $DN \leq 25$, (art. 3.1.3a for fluids of group 1 attachment II table 6), $DN \leq 32$ or $PS \times DN \leq 1000$ bar (art. 3.1.3a for fluids of group 2 attachment II table 7), comply with art. 3.3 of the Pressure Equipment Directive 97/23/EC, therefore they must not be marked CE.*

The design of valves and cocks is performed in accordance with the sound engineering practice (SEP) and the thickness of body in accordance with ASME B16.34 standard.

Considered loads are represented by the ratings shown on the attached Table I.

CESARE BONETTI S.P.A.
Amministratore Delegato
Managing Director
Giuseppe Dalmasso

03/11/2004



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**DICHIARAZIONE
STATEMENT
PED 007G Rev.4**

TABELLA 1 / TABLE 1

TIPO TYPE	DISEGNO DRAWING	RATING MAX	FLUIDO FLUID	GRUPPO GROUP	DN
G11	Fig. 737	ASME 300	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
G12	Fig. 738	ASME 900	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
GP11	Fig. 831	ASME 300	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
GP12	Fig. 832	ASME 900	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
G21	Fig. 6001	ASME 150÷4500	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
G41/42 GS41/42	Fig. 745/746 Fig. 747/748	ASME 1500	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
G50	Fig. 861/862/863	ASME 150÷2700	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
VS3	Fig. 550 rev.0	3000 psi	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
VS6	Fig. 551 rev.0	6000 psi	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
RM 1	Fig. 416	ASME 900	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
RM 2	Fig. 404	ASME 900	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
RM 4	Fig. 404	ASME 600	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
RM 5	Fig. 405	ASME 600	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25
RM 6	Fig. 405	ASME 600	VAP. ACQUA/WATER STEAM FLUIDI IN GEN./GENERIC FLUIDS	1,2	≤DN 25



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PED 97/23/EC

Art. 3.3

USE AND MAINTENANCE MANUAL OF LEVEL GAUGES INTERCEPTING VALVES BONETTI® TYPE G11-G12 & GP11-GP12

SAFETY GENERAL INFORMATION

FOREWORD

To have proper working of Cesare Bonetti S.p.A. products, any installation, start up, control and maintenance must be performed by qualified and duly instructed personnel, following prescription stated by maintenance manual.

To minimize any risk for people, goods and environment, those general instruction must be respected.

Cesare Bonetti S.p.A. is not responsible for damages outcome from:

- use of product by non qualified personnel;
- incorrect installation;
- incorrect maintenance;
- product alteration or tampering;
- use of spares not original by Bonetti;
- non-performance of instruction stated in maintenance manual;
- extraordinary occurrence.

Any responsibility regarding correct selection of product and its proper material, depending on technical characteristic, application and purchasing standards and rules, belong to the system or plant engineer.

PRESSURE

Before starting maintenance operation be sure that pressure inside product is reduced to atmospheric value and be sure that product connection piping has been correctly isolated.

Do not trust on the Pressure Gage only to assume that pressure has been discharged.

TEMPERATURE

To avoid burning, wait until product temperature cools down completely, and use protecting gloves, eye glasses and dressing, if necessary.

DISPOSAL

Product can be recycled. No environment pollution risk occurs if proper procedure has been respected.

Warning: if product contains residue of process fluid, disposal and/or recycling prescribed procedures for such fluid must be respected.

In case PTFE sealing or gaskets is fitted on product, such material must be recycled separately, according to proper and/or prescribed procedures.

DANGEROUS GAS OR FLUID INSIDE PIPING

Be sure that any dangerous or flammable or explosive gas or fluid has been discharged from product and connected piping, to avoid any danger to maintenance people due to contact or inhalation

ENVIRONMENT DANGER

Evaluate carefully: explosion risk, oxygen leakages, dangerous gas leakages, fire risk due to maintenance operation or welding.

SEALING GASKETS

Graphite sealing gaskets to be removed or handled during maintenance, as spares, could contain thin steel layers able to injure, if non handled with care.

MAINTENANCE WORK

Maintenance work must be performed or supervised by qualified, duly instructed and skilled people. Personnel in charge of products maintenance, installation or exercise must be trained to carry out procedures according to use and maintenance manual.

Verify that tools to be used for maintenance are within their scope and that they are in good condition.

If special tools are requested, verify their availability and condition.

STORAGE

If products that are non self-draining are stored in low temperature, be careful to avoid or protect them from inside fluid freezing.

Good condition of stored products must be periodically verified.

PRODUCTS SENT BACK TO BONETTI COMPANY

According to laws and rules for safety, health and environment preservation, if any product is sent back to Cesare Bonetti S.p.A. for maintenance or any other reason, the sender must inform by written notice about risk and warning to be used depending on product mechanical damages, or inside and/or outside product fluid residue and/or contamination, that could be dangerous for health, safety or environment.

Such information must be completed with any useful safety instruction and safety data sheet regarding substances classified as dangerous or potentially dangerous.

This manual is exclusive property Cesare Bonetti S.p.A., under Copyright and any not authorized reproduction, in part or in total, shall be prosecuted.

Showed products are according the current production.

Cesare Bonetti S.p.A. reserves to modify product characteristics according technical evolution or customer special request.

Verify if manual comply with used product.

GENERAL USE AND MAINTENANCE PRESCRIPTION

1.0 SCOPE

This manual states safety criteria, check and controls, installation instruction, use and maintenance instruction for BONETTI® intercepting valves for level gauges type Bonetti G11/G12 and GP11/GP12 manufactured by Cesare Bonetti S.p.A.

This manual must be used together with use and maintenance manual of level gauge on which valves are fitted.

2.0 PRODUCT DESCRIPTION

The BONETTI level gauge intercepting valve is a device useful to intercept a fluid, liquid or gas.

Standard materials normally used for pressure containing part are forged or cast Carbon Steel, Low Alloy Steel, Austenitic Stainless Steel.

If those materials are not suitable for the fluid, please note that Cesare Bonetti S.p.A. can provide same type of valves in forged or cast special materials according to Customer specification.

3.0 RATING

Max rating condition (pressure and temperature) and group fluid classification is stated by 97/23/CE Directive (PED), annex II, and are shown in following Table 1.

TABLE 1

Type	Material	Rating ASME B16.34 DIN 2401	Group	Tab	
G11	Steel	ASME 600 / PN 100	1	6	Art. 3.3
G11	Steel	ASME 600 / PN 100	2	7	Art. 3.3
G12	Steel	ASME 900 / PN 160	1	6	Art. 3.3
G12	Steel	ASME 900 / PN 160	2	7	Art. 3.3
GP11	Steel	ASME 300 / PN 40	1	6	Art. 3.3
GP11	Steel	ASME 300 / PN 40	2	7	Art. 3.3
GP12	Steel	ASME 600 / PN 100	1	6	Art. 3.3
GP12	Steel	ASME 600 / PN 100	2	7	Art. 3.3I

WARNING: For valves equipped with PTFE rings, maximum allowable temperature is limited to 200 °C.

For rating of pressure containing parts (body and bonnet) refer, for any material, to ASME B16.34.

4.0 SAFETY CRITERIA

Proper working of valves can be obtained if all steps regarding installation, start up, control and maintenance are managed by duly instructed, qualified and skilled personnel.

Therefore this use and maintenance manual, together with the use and maintenance manual of the level gauge, must be deeply considered by such personnel.

If use and/or maintenance instruction are not applied, product may be damaged or work badly, generating risk of damage to people, plant or environment.

Prescription stated in section "SAFETY GENERAL INFORMATION" must be respected.

5.0 INSPECTION AT RECEIPT

When receiving goods, check carefully to verify that no damage has been suffered during transportation.

Check also that valve type, rating pressure/temperature as shown on Table 1 and valve material, as indicated on body, bonnet and/or label, comply with application.

Never exceed limits stated by such rating.

Verify and be sure that valve material is suitable for process fluid and surrounding atmosphere.

6.0 STORAGE

Valves must be stored protected from weather or contamination arising from dirt, mud and so on. If valves have to be stored for a while, we suggest to maintain them in the original packing. If storage is very long, check valves periodically (not less than twice a year) and verify surface and internal condition, removing any dirt, rust and/or corrosion from inside and outside.

7.0 INSTALLATION

Installation must be done by qualified and skilled personnel.

Before installing, to avoid structure deformation or any other damage that could cause leakage or bad valve working, check carefully to:

- remove protection caps from valve end connections;
- verify absence of dirt inside valve;
- be sure that upstream and downstream piping is clean and without any dirt coming from drilling or welding (as metal shaving or slag) or corrosion and so on;
- install single way valves according arrows indication on body;
- install valve so that it does not sustain piping weight, and sustain valve if its weight could stress or danger flanges or piping, also considering vibrations, seismic stress or wind, if any. Cesare Bonetti S.p.A., on request, can provide you technical data to calculate, at your care, such stress
- avoid misalignment between piping and valve ends. Check if face to face valve dimension fits correctly with distance between piping ends.
- avoid valve or piping thermal expansion able to stress the structure. To minimize thermal expansion effect insert an expansion joint or use other systems able to minimize such deformation. for flanged valves check correct position and dimension of gaskets between valve flange and piping flange, apply the proper bolting torque to stay bolts. For screwed valves verify compatibility between valve and piping screw thread;
- for connections with welding ends as BW as SW, see par. 11.0
- in the sketch assembly always install systems able to section and interrupt upstream and downstream flow, with a draining system for said sectioned plant parts. Those section and draining systems give also a good help when maintaining valves in safety conditions.
- Always verify, using a torque wrench, body/bonnet bolting torque restoring torque as indicated in Fig. 1065 - Bolting Torque section. This check must be performed as bolting torque could be lower after a while, due to sealing material settlement.

8.0 BEFORE MAINTENANCE OR DISMANTLING

Valve maintenance or dismantling must be always performed by qualified and skilled personnel, aware of all safety prescription as stated in this manual or stated by plant regulation or by law.

WARNING:

Do not perform any valve maintenance or dismantling of valves from piping unless:

- valve and piping has been isolated, intercepted, pressure discharged and drained. Do not trust on the pressure gauge only to assume that pressure has been discharged;
- valve and piping temperature cools down to ambient temperature to avoid burning;
- previous check that valve and piping upstream and downstream has been isolated and does not contain any process fluid;
- use protective gloves and eyeglasses, if useful or necessary;

User must generate inspection and maintenance charts.

Such charts can be properly generated only with a perfect knowledge of plant, service, process fluid, pressure and temperature, ambient and environment atmosphere.

Before starting maintenance, be sure to have any useful tools, checking tools good condition, and needed any spare part, checking their suitability.

8.1 INTERCEPTING VALVES TYPE G11 & G12

8.1.1 Service

- After the cocks are first put into service, or after change of packing sleeves, when the cocks have attained their working pressure and temperature, OPEN THE COCKS AND TIGHTEN THE TIGHTENING NUTS (3 and 23). Repeat operation during the first hours of service and if leakage occurs.
- Follow up all joints (11, 31, 42).

8.1.2 Dismantling

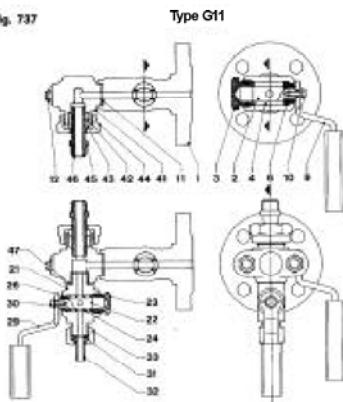
When tightness cannot be obtained this way, the packing sleeve must be changed.

Make sure that vessel is not under pressure.

- Unscrew handle screw (10 or 30) and remove washer and handle.
- Tap top of plug with a wooden drift until all internal pieces are clear of the cock body.
- Examine the plug and inside the cock body, for scoring, signs of damage, corrosion, etc. Carefully clean all component pieces.

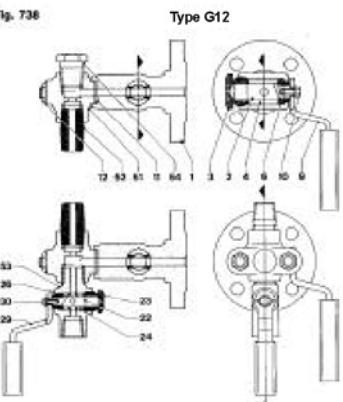
Item Part	Item Part
1 Body	30 Screw an washer
2 Plug	31 Tailpipe joint
3 Tightening nut	32 Tailpipe
4 Packing sleeve -2 eyelets (type M2.2)	33 Union nut
6 Ring	41 Stuffing box head
9 Handle	42 P16 packing ring (16/23,5/10 mm)
10 Screw and washer	43 Stuffing box ring
11 Head joint	44 Stuffing box nut
12 Stud bolt and nut	45 End tube
21 Body	46 Tube joint ring
22 Plug	47 Drain joint ring
23 Tappo	51 NPT head
24 Packing sleeve -2 eyelets (type M1.2)	52 NPT nipple
26 Ring	53 NPT drain cock body
29 Handle	54 NPT vent plug

Fig. 737

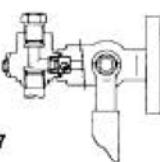


Type G11

Fig. 736

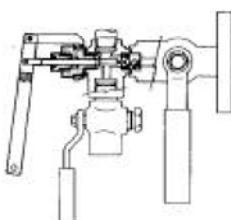


Type G12



Level gauges with safety ball check and removal device

Fig. 797



- Open bottom cock and simultaneously push lever of removal device until the fluid in the gauge column becomes stable.
- Release lever.
- Open top cock.

8.1.3 Reassembling

- Insert into the body the ring (6 or 26) and the new packing sleeve with eyelets (4 or 24), ensuring that the ridge of the sleeve enters the corresponding groove of the cock body.
- Insert plug and push it without damage.
- Slightly grease thread of tightening nut (3 or 23) and insert into the body.
- Replace handle with washer and screw. OPEN THE COCK AND

- TIGHTEN THE TIGHTENING NUT (3 or 23).

8.1.4 Spare parts

One complete set of sealing elements for 1 level 'gauge consists of:

- 2 Packing sleeves type M2.2 (item 4),
- 1 Packing sleeve type M1.2 (item 24),
- 2 P16 packing rings (item 42), for type Gil only,
- 2 Head joints (item 11).

Kit of tools to facilitate the reassembling are available on request.

8.2 INTERCEPTING VALVES TYPE GP 11 & GP 12

8.2.1 Service

Before the valves are put in service:

- shut off the upper and lower valve and lightly follow up the bonnet Nuts (10)
- open the drain valve and lightly follow up the bonnet Screws (25)
- follow up the Gaskets (14) by the Nuts (12).

WARNING: The piston stop during closing operation is obtained by means of the handwheel. Therefore during service never remove handwheel from its position.

8.2.2 Preparation to dismantling

Valve can be dismantled and inspected on process line.

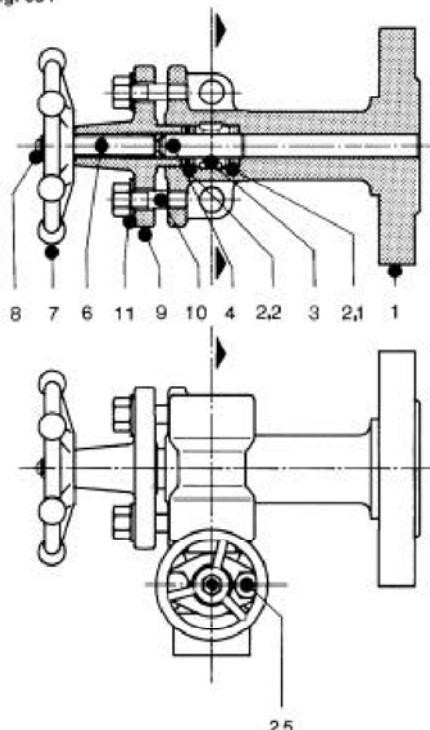
- Ensure that process line is not under pressure;
- Ensure that - with valve in open/closed position - fluid of pipe does not overflow from valve, when dismantled.

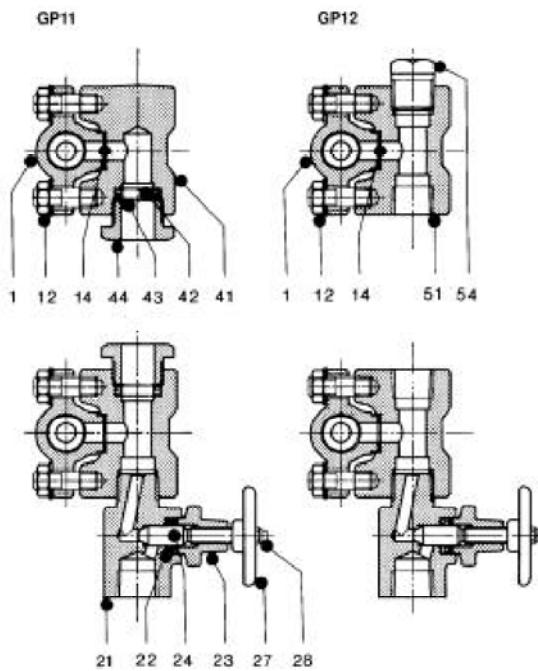
8.2.3 Dismantling

- Open valve fully.
- Remove bonnet nuts.
- Turn handwheel in closing direction to lift bonnet.
- Rotate cover in order that flange holes are misaligned with stud

Item Part	Item Part
Upper and lower valve	Drain valve
1 Body	21 Body
2.1 Lower valve ring	22 Valve ring
2.2 Upper valve ring	23 Bonnet
3 Lantern bush	24 Needle
4 Piston	25 Screw
6 Stem	27 Handwheel
7 Handwheel	28 Handwheel nut
8 Handwheel nut	41 GP11 head
9 Bonnet	42 Packing ring
10 Stud bolt and nut	43 Stuffing box ring
11 Washer	44 Stuffing box nut
12 Stud bolt and nut	51 GP12 head
14 Gasket	52 NPT vent plug

Fig. 834





bolts.

- Turn handwheel in opening direction; in this way piston comes out of the valve rings and releases the valve top.
- Examine piston for signs of scoring, corrosion etc. which could affect perfect tightness of valve.
- Check and replace worn/damaged pieces, if any.

8.2.4 Repacking

- With the valve dismantled remove the two valve rings and the lantern bush by means of hook.
 - Clean carefully valve rings housing and all internals.
 - Fit new valve rings and lantern bush in the following order (lower valve ring - lantern bush - upper valve ring), and ensure that they fit perfectly.
- Do not grease internals, valve rings and piston. Smear threads with a thin layer af graphitized grease.

8.2.5 Reassembling

- Turn handwheel in opening direction up to the stop.
- Insert piston into the top valve ring until you can screw down the bonnet nuts.
- Close handwheel fully, then open it until bonnet bottom comes down and reaches top valve ring. Tighten bonnet nuts manually.
- Shut valve fully, tighten bonnet nuts gradually and ensure that bonnet is driven down straight.

8.2.6 Spare parts

- One complete set of sealing elements for 1 level gauge consists of:
- 5 Valve Rings (item 2.1 -2.2-22)010 xO 18 x 6
- 2 Gasket (item 14)020 x 010,5 xl
- 2 Packing Rings (item 42) 0 16 x 023,5 x 5, for GP11 only.

Tools to facilitate servicing available on request.

9.0 WORKING LIFE

Valve has been designed, tested and is granted for a long cycle operating life provided that rating condition (pressure and temperature) of the valve have been respected.

Valve contains items that are subject to fair and normal wear.

Therefore valve must be periodically inspected by user.

Inspection time scheduling and interval must be performed by user according plant working condition, process fluid and plant knowledge and/or experience.

Always avoid any valve improper use able to generate unfair valve wear as:

- do not use a stop valve or a on-off valve as regulating valve
- avoid in process fluid abrasive particles, or piping sandblasting residual, or swarf, or welding dross;
- avoid water freezing inside valves;

10.0 MAXIMUM ADMITTABLE WORKING TEMPERATURE

If valve must be used in temperature condition exceeding material creep temperature, Cesare Bonetti S.p.A. can give, under Customer request, technical data suitable for residual working life calculation, to be performed by Customer or by end user.

If valve has to be used in low temperature working condition, Customer or end user must verify valve material fitness.

11.0 WELDING AND QUALITY CONTROL

Any welding must be performed by qualified personnel and using qualified procedures according EN 288/287 or ASME IX standard. Any non destructive test must be performed by qualified personnel according to EN 473 o SNT-TC-1A.

12.0 FINAL WARNINGS

Preserve valve specific maintenance manual together with this manual and let them consultable by maintenance personnel.

Be sure that maintenance personnel read any part of those manuals before any use or maintenance operation.

If you have lost the manuals, please contact Cesare Bonetti S.p.A. to obtain a copy.

Cesare Bonetti S.p.A. shall be happy to give you any further technical information.



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EC/97/23 - PED - Art. 3.3 (SEP)

BONETTI® GLASS LEVEL GAUGES USE AND MAINTENANCE MANUAL

SAFETY GENERAL INFORMATION

FOREWORD

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- incorrect installation;
- incorrect maintenance;
- product alteration or tampering;
- use of spares not original by Bonetti;
- non-performance of instruction stated in maintenance manual;
- extraordinary occurrence.

Any responsibility regarding correct selection of product and its proper material, depending on technical characteristic, application and purchasing standards and rules, belong to the system or plant engineer.

PRESSURE

Before starting maintenance operation be sure that pressure inside product is reduced to atmospheric value and be sure that product connection piping has been correctly isolated.

Do not trust on the Pressure Gage only to assume that pressure has been discharged.

TEMPERATURE

To avoid burning, wait until product temperature cools down completely, and use protecting gloves, eye glasses and dressing, if necessary.

DISPOSAL

Product can be recycled. No environment pollution risk occurs if proper procedure has been respected.

Warning: if product contains residue of process fluid, disposal and/or recycling prescribed procedures for such fluid must be respected.

In case PTFE sealing or gaskets is fitted on product, such material must be recycled separately, according to proper and/or prescribed procedures.

DANGEROUS GAS OR FLUID INSIDE PIPING

Be sure that any dangerous or flammable or explosive gas or fluid has been discharged from product and connected piping, to avoid any danger to maintenance people due to contact or inhalation

ENVIRONMENT DANGER

Evaluate carefully: explosion risk, oxygen leakages, dangerous gas leakages, fire risk due to maintenance operation or welding.

SEALING GASKETS

Graphite sealing gaskets to be removed or handled during maintenance, as spares, could contain thin steel layers able to injure, if not handled with care.

MAINTENANCE WORK

Maintenance work must be performed or supervised by qualified, duly instructed and skilled people. Personnel in charge of products maintenance, installation or exercise must be trained to carry out procedures according to use and maintenance manual.

Verify that tools to be used for maintenance are within their scope and that they are in good condition.

If special tools are requested, verify their availability and condition.

STORAGE

If products that are non self-draining are stored in low temperature, be careful to avoid or protect them from inside fluid freezing.

Good condition of stored products must be periodically verified.

PRODUCTS SENT BACK TO BONETTI COMPANY

According to laws and rules for safety, health and environment preservation, if any product is sent back to Cesare Bonetti S.p.A. for maintenance or any other reason, the sender must inform by written notice about risk and warning to be used depending on product mechanical damages, or inside and/or outside product fluid residue and/or contamination, that could be dangerous for health, safety or environment.

Such information must be completed with any useful safety instruction and safety data sheet regarding substances classified as dangerous or potentially dangerous.

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Showed products are according the current production. Cesare Bonetti S.p.A. reserves to modify product characteristics according technical evolution or customer special request.

Verify if manual comply with used product.

GENERAL USE AND MAINTENANCE PRESCRIPTION

1.0 SCOPE

This manual states safety criteria, check and controls, installation instruction, use and maintenance instruction for glass level gauges shown in Table 1.

If the level gauge has intercepting valves, this manual must be used together with the specific intercepting valve type manual.

2.0 PRODUCT DESCRIPTION

A glass level gauge is an instrument suitable to give a direct level reading of a fluid contained in a vessel.

Level gauges are reflex type (BR), transparent type (BT) or bicolour type (BC).

Standard materials normally used for pressure containing parts are Carbon Steel, Low Alloy Steel, Austenitic Stainless Steel.

If those materials are not suitable for the fluid, Cesare Bonetti S.p.A. can provide special materials according to Customer specification.

3.0 RATING

Max rating condition (pressure and temperature) and group fluid classification is stated by 97/23/CE Directive (PED), annex II, and are shown in following Table 1.

TIPO TYPE	DISEGNO DRAWING	PS (bar)	T. MAX (°C)	FLUIDO FLUID	GRUPPO GROUP
BR 12	Fig. 837	32	236	VAP. ACQUA/ WATER STEAM	2
		64	120	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		40	300		
BR 14	Fig. 836	20	211	VAP. ACQUA/ WATER STEAM	2
		12	187	VAP. ACQUA/ WATER STEAM	2
BR 22	Fig. 838	28	38		
		10	300	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		22	216	VAP. ACQUA/ WATER STEAM	2
BR 23	Fig. 839	105	38		
		80	300	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		32	236	VAP. ACQUA/ WATER STEAM	2
BR 24	Fig. 840	165	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		115	300		
		105	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
BR 25	Fig. 841	62	300	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
Øi 40mm Mod. ≤ 2 x 9					
Øi 50mm Mod ≤ 2 x 5					
BR 28	Fig. 856	200	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		100	300		
BT 23	Fig. 843	12	187	VAP. ACQUA/ WATER STEAM	2
		51	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		30	300		
BT 24	Fig. 844	20	211	VAP. ACQUA/ WATER STEAM	2
		105	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		62	300		
BT 25	Fig. 845	105	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		62	300		
BT 28	Fig. 846	50	264	VAP. ACQUA/ WATER STEAM	2
		120	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		80	300		
BT 29	Fig. 868	165	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2(*)
		100	300		
BT 32	Fig. 859	103	313	VAP. ACQUA/ WATER STEAM	2
BT 33	Fig. 858	90	302	VAP. ACQUA/ WATER STEAM	2
BTV	Fig. 842	6	158	VAP. ACQUA/ WATER STEAM	2
		12	38	FLUIDI IN GEN./ GENERIC FLUIDS	1.2
BC 23	Fig. 824 BC 23	12	187	VAP. ACQUA/ WATER STEAM	2
BC 24	Fig. 824 BC 24	20	211	VAP. ACQUA/ WATER STEAM	2
BC 28	Fig. 824 BC 28	40	249	VAP. ACQUA/ WATER STEAM	2
BC 32	Fig. 825 BC 32	100	310	VAP. ACQUA/ WATER STEAM	2
BC 33	Fig. 825 BC 33	90	302	VAP. ACQUA/ WATER STEAM	2

(*) NOTE: Pressure and Temperature loads are not applicable with water/steam or fluids corrosive for the glasses.

4.0 SAFETY CRITERIA

Proper working of level gauges can be obtained if all steps regarding installation, start up, control and maintenance are managed by duly instructed, qualified and skilled personnel.

Therefore this use and maintenance manual, together with the use and maintenance manual of each intercepting valve type, must be fully considered by such personnel.

If use and/or maintenance instruction are not applied, product may

be damaged or work badly, generating risk of damage to people, plant or environment.

Prescription stated in section "SAFETY GENERAL INFORMATION" must be respected.

5.0 INSPECTION AT RECEIPT

When receiving goods, check carefully to verify that no damage has been suffered during transportation.

Check also that level gauge and valve type, rating pressure/temperature as shown on Table 1 and material, as indicated on body, bonnet and/or label, comply with application.

Never exceed limits stated by such rating.

Verify and be sure that level gauge and valve material is suitable for process fluid and surrounding atmosphere.

WARNING:

Glass level gauges can not be used for "Lethal service". Lethal service is the use of the instrument with "Lethal Substances" as defined in ASME Section VIII Part UW:

By "lethal substances" are meant poisonous gases or liquids of such a nature that very small amount of the gas or of the vapour of the liquid mixed or unmixed with air is dangerous to life when inhaled. For purpose of this Division, this class includes substances of this nature which are stored under pressure or may generate a pressure if stored in a closed vessel.

6.0 STORAGE

Level gauges must be stored protected from weather or contamination arising from dirt, mud and so on. If goods have to be stored for a while, we suggest to maintain them in the original packing. If storage is very long, check goods periodically (not less than twice a year) and verify surface and internal condition, removing any dirt, rust and/or corrosion from inside and outside.

7.0 INSTALLATION

Installation must be done by qualified and skilled personnel.

Before installing, to avoid structure deformation or any other damage that could cause leakage or bad working or glass breakage, check carefully to:

- remove protection caps from end connections;
- verify absence of dirt inside level gauge and intercepting valves (if any);
- be sure that upstream and downstream piping is clean and without any dirt coming from drilling or welding (as metal shaving or slag) or corrosion and so on;
- install the level gauge according the proper working sense (look to the upper and lower part);
- install the level gauge so that it does not sustain piping weight, and sustain the level gauge if its weight could stress or danger flanges or piping, also considering vibrations, seismic stress or wind, if any. Cesare Bonetti S.p.A., on request, can provide you technical data to calculate, at your care, such stress
- avoid misalignment between piping and instrument ends. Check if face to face connecting dimension(CC) fits correctly with distance between piping ends.
- avoid instrument or piping thermal expansion able to stress the structure. To minimize thermal expansion effect insert an expansion joint or use other systems able to minimize such deformation.
- for flanged connections check correct position and dimension of gaskets between instrument (or intercepting valve) flange and piping flange, apply the proper bolting torque to stay bolts. For screwed connections verify compatibility between instrument (or intercepting valves) and piping screw thread.
- for connections with welding ends as BW as SW, see par. 15.0
- if possible, always use intercepting and draining valves between piping and level gauge, or, in the sketch assembly, always install systems able to section and interrupt upstream and downstream flow, with a draining system for said sectioned plant parts. Those section and draining systems give also a good help when maintaining instruments in safety conditions.
- using a torque wrench, check level gauge bolting torque as indicated in Fig. 2 and in Table 5.
- check carefully glasses must not have any scratch, corrosion, small etching or other defect. To better check, use a light with a 45° angle to the glass surface. Glass resistance is deeply reduced also by small defects and ratings shown in Table 1 are

no longer applicable. So any damaged glass must be changed immediately.

- any abrasive particle in the fluid can damage glass surface or glass protecting sheets (as mica or other).

8.0 START UP AND OPERATION

Level gauge start up must be performed slowly to avoid any thermal shock or mechanical stress due to different temperature in different level gauge items.

Cesare Bonetti level gauges are equipped with borosilicate tempered glasses able to absorb a thermal shock up to $\Delta T = 255^\circ\text{C}$. Nevertheless additional stresses, not easily manifest in start up, could reduce such resistance.

To minimise thermal shock in start up, intercepting valves must be slowly and only partially open to allow a slow heating gradient to the instrument. When the instrument temperature reaches the vessel temperature, valves must be regulated in totally open position.

In start up check closed position of vent and drain valves (if any).

In operation intercepting valves must work in totally open position.

To minimise leakage risk, periodically isolate level gauges and, when the gauges temperature drops down to the ambient temperature, check that bolting torque is as indicated in table 5. This check is mandatory if level gauges are used in discontinuous operation or in variable operating condition.

WARNING: if intercepting valves are equipped with safety check ball, while in operation valves must be in totally open position to permit the proper automatic ball intervention.

Safety check ball are an automatic safety device, able to interrupt fluid leak to environment in case of glass breakage. Safety check ball are purchased under Customer request, but we strongly suggest such protecting device.

During plant shut down, leave open level gauge valves to allow a slow temperature and pressure decreasing on level gauge an to avoid any fluid trap inside the instrument.

8.1 REFLEX LEVEL GAUGES

Reflex level gauges are equipped with reflex glasses. Such glasses, due to their shape, cannot be shielded, therefore they must not be used with corrosive fluid; do not use reflex level gauges with water/steam in operating condition exceeding as indicated in Table 1.

As operating condition in boiler vessels requires water/steam with basic pH, glass is corroded according Fig. 1. Therefore reflex level gauges used with water/steam according operating conditions stated in Table 1 must be periodically and carefully checked and maintained to avoid glass breakage due to glass corrosion.

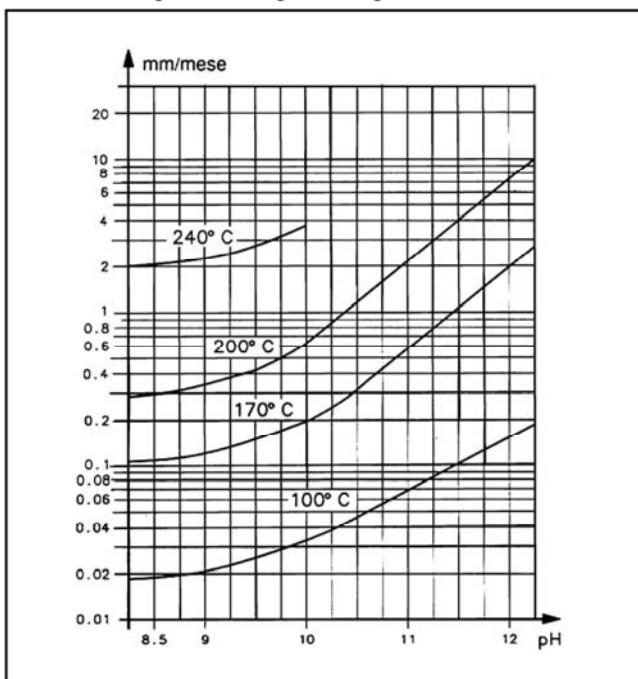


Fig. 1 - Corrosion diagram (mm/month) depending on pH and temperature ($^\circ\text{C}$) of boiler water, for a glass without mica shielding.

8.2 TRANSPARENT LEVEL GAUGES

Transparent level gauges are equipped with transparent glasses. Transparent glasses (flat on both sides) must be protected, depending on process fluid with mica shields or with Kel-F (PCTFE polychlorotrifluoroethylene), if operating with corrosive fluids able to chemically corrode glasses.

9.0 MAINTENANCE

Glass level gauges maintenance must be performed by skilled and qualified people, after complete reading of this maintenance manual.

WARNING:

Do not proceed with maintenance service unless:

- level gauge has been properly isolated from the pressurized part of plant;
- level gauge inside pressure has been totally discharged and safely vented to atmospheric pressure. Do not assume that the system has depressurised even when the pressure gauge indicates zero.
- level gauge temperature decrease until ambient temperature, to avoid burning. Protective gloves, eyeglasses or other safety devices must be used, if necessary;

Level gauge maintenance must be performed immediately, isolating the level gauge, when:

- glass is loosing its original transparency, or it looks, also partially, opaque;
- if any roughness appears on the internal surface of glass, due to erosion or to corrosion;
- if, on reflex glasses, the original prismatic shape of internal surface is lost and level visibility becomes difficult;
- if mica shields or Kel-F shields of transparent glasses look damaged and fluid is in contact with glass;
- if leakages from glass gaskets
- if leakages from connections between level gauge and intercepting valves
- if any corrosion is observed inside or outside any part of the level gauge

WARNING:

Proper inspection and maintenance schedules must be generated by end user according his plant knowledge and experience.

Such schedules must consider service, operating conditions, fluids and any internal and external media able to influence material used on instrument.

9.1 REMOVING

Warning: do not remove level gauge from connecting piping unless all internal pressure has been discharged and safety vented to the atmospheric pressure; wait until the temperature of level gauge falls down to the ambient temperature; carefully check that any process fluid has been discharged and drained out.

10.0 DISASSEMBLY

first of all close intercepting valves and isolate level gauge from the vessel pressure; check carefully valve perfect sealing. Than remove the level gauge (leaving intercepting valves on site) and fix it on a workbench to avoid any injury to maintenance people

- Unscrew nuts starting from external ones to central ones of any section as shown in Fig. 2 (2.4, 2.5 o 2.6)
- Remove plates, using a rubber hammer if necessary.

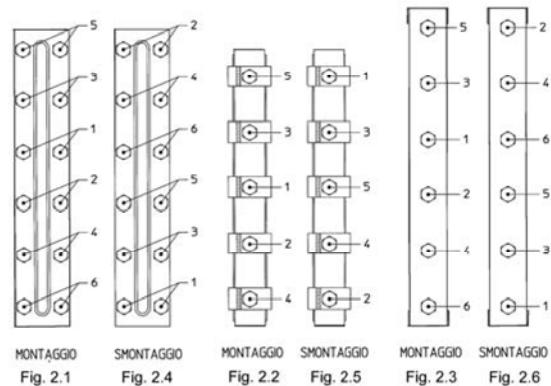


Fig. 2 - Bolt disassembly and assembly sequence

- Remove stainless steel L bars (if any), cushion gasket, glass, glass mica or Kel-F shield (if any), and sealing gasket.
- WARNING: Cushion gasket, glass, glass mica or Kel-F shield (if any), and sealing gasket must be destroyed and disposed by approved methods.**
- Never use again same gaskets: residual deformation can generate leakages or glass breakage.
- A used glass can hide defects or stresses due to past use under pressure and temperature: if reassembled on the gauge it could break under pressure, with danger and injury for people or environment.

Level gauge sealing surface check:

- Carefully clean sealing surfaces on glass, on gauge body and on gauge plates. Use a soft metallic scraper (as a brass scraper). Check that any bur, rust and gasket residual has been removed.
- WARNING: avoid any scrape or damage on sealing surfaces. A bad cleaning or any residual dirty can generate a critical stress point able to break the glass.**
- Check flatness between glass and centre piece and between glass and cover plate. Use a glass mock-up with known flatness. Sealing surface flatness must be less than 0.05 mm.
- If flatness value is wrong, metallic sealing surfaces must be machined to recover requested value.

11.0 ASSEMBLING

Following spares must be available and checked:

- New original BONETTI glasses (check any transportation or handling damage);
- Sealing and cushion joints.
- New protecting shields (mica or Kel-F), if necessary.

The following assembling instruction refer to a single window level gauge. For multiple windows gauges repeat operation steps.

11.1 REFLEX GLASS GAUGES ASSEMBLING

TYPE BR14

1. Refer to proper level gauge type to identify items (Table 2 and assembling Dwg. Fig. 817 and Fig. 3)
2. Clean tightening bolt thread to remove paint, rust or dirt. Apply some grease on thread.
3. Insert wedge piece (9) inside gauge body (8).

TABLE 2	
N°	ITEM
1	CENTER PIECE
2	SEALING JOINT
3	REFLEX GLASS
4	CUSHION JOINT
5	COVER PLATE
6	"U" STUD BOLT AND NUT
7	"O" STUD BOLT AND NUT
8	GAUGE BODY
9	WEDGE PIECE
10	TIGHTENING BOLT
11	BOLT AND NUT
12	CLAMP
13	ANGULAR PIECE ("L" BAR)

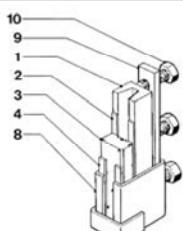


Fig. 817 - BR14

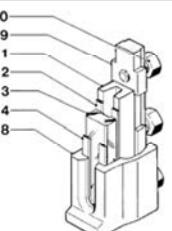


Fig. 816 - BR12

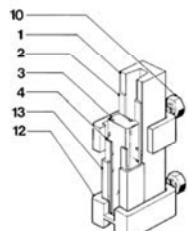


Fig. 760 - BR22

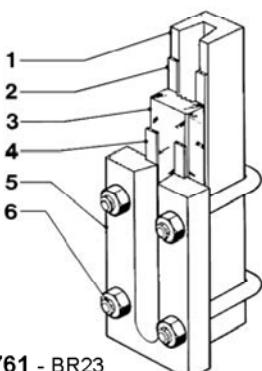


Fig. 761 - BR23

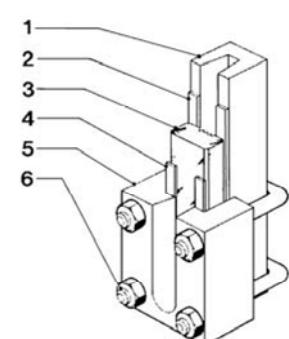


Fig. 762 - BR24

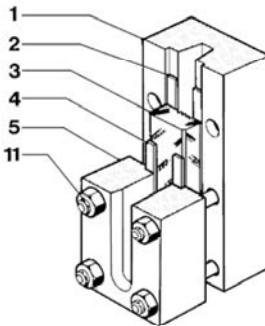


Fig. 819 - BR28

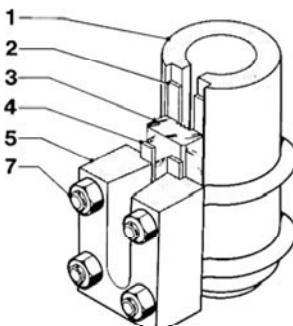


Fig. 763 - BR25

4. Screw tightening bolts (10) on wedge piece (9).
5. Insert centre piece (1) inside gauge body (8).
6. Place sealing joint (2).
7. Insert reflex glass (3) inside gauge body, with prismatic shape surface faced to sealing joint, be careful to avoid contact with metallic items.
8. Place cushion joint (4).
9. Manually screw tightening bolts until the bolts are in contact with the centre piece, following sequence shown in Fig. 2 (2.3). With a torque wrench screw bolts up to 10 Nm, always following same sequence (Fig. 2 - 2.3). Repeat 3 times, increasing the bolting torque until proper torque (as shown in Table 5) has been reached.

TYPE BR 12

1. Refer to proper level gauge type to identify items (Table 2 and assembling Dwg. Fig. 816 and Fig. 3)
2. Clean tightening bolt thread to remove paint, rust or dirt. Apply some grease on thread.
3. Place cushion joint (4) inside gauge body (8)
4. Insert reflex glass (3) inside gauge body, with prismatic shape surface faced to upper part (opposed side respect to cushion joint); be careful to avoid contact with metallic items. Screw tightening bolts (10) on wedge piece (9).
5. Place sealing joint (2).
6. Insert centre piece (1) inside gauge body (8), carefully checking that sealing joint stay in the correct position between glass and centre piece.
7. Insert wedge piece (9) on gauge body (8).
8. Manually screw tightening bolts until the bolts are in contact with the centre piece, following sequence shown in Fig. 2 (2.3). With a torque wrench screw bolts up to 10 Nm, always following same sequence (Fig. 2 - 2.3). Repeat 3 times, increasing the bolting torque until proper torque (as shown in Table 5) has been reached.

TYPE BR 22

1. Refer to proper level gauge type to identify items (Table 2 and assembling Dwg. Fig. 760 and Fig. 3)
2. Clean tightening bolt thread to remove paint, rust or dirt. Apply some grease on thread.
3. Insert clamps (12) around centre piece (1) equally spaced.
4. Place sealing joint (2).
5. Place reflex glass (3) over centre piece, with prismatic shape surface faced to sealing joint; be careful to avoid contact with metallic items.
6. Place cushion joint (4).
7. Place angular pieces (13).
8. Manually screw tightening bolts until the bolts are in contact with the centre piece, following sequence shown in Fig. 2 (2.2). With a torque wrench screw bolts up to 10 Nm, always following the same sequence (Fig. 2 - 2.2). Repeat 3 times, increasing the bolting torque until proper torque (as shown in Table 5) has been reached.

TYPE BR 23/24/25/28

1. Refer to proper level gauge type to identify items (Table 4 and assembling Dwg. Fig. 4 and Fig. 761, 762, 763, 819)
2. Clean tightening bolt thread to remove paint, rust or dirt. Apply some grease on thread.
3. Depending on gauge type, couple centre piece (1) with "U" bolts (6), or "O" bolts (7) or standard bolts (11). "O" bolts (7) must be inserted around centre piece from one end, then slid to the right

- position.
4. Place sealing joint (2) on the centre piece.
 5. Insert reflex glass (3) inside gauge body, with prismatic shape surface faced to sealing joint; be careful to avoid contact with metallic items or damages to sealing joint.
 6. Place cushion joint (4).
 7. Place cover plate (5); be careful to avoid contact with metallic items that can scrape glass or damage cushion joint..
 8. Grease the nut part contacting the cover plate and manually screw the nuts until they touch cover plate, following sequence shown in Fig. 2 - 2.1. With a torque wrench screw bolts up to 10 Nm, always following the same sequence (Fig. 2 - 2.3). Repeat 3 times, increasing the bolting torque until proper torque (as shown in Table 5) has been reached.

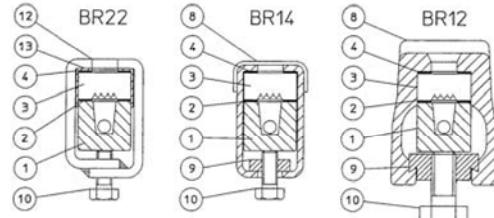


Fig. 3 - BR22, BR14 e BR12

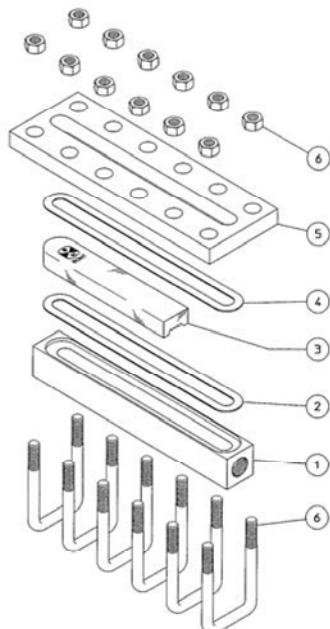


Fig. 4 - Reflex level gauge typical assembly Dwg.

11.2 ASSEMBLING TUBULAR GLASS LEVEL GAUGES TYPE BTV-GP11

Refer to typical assembly Dwg Fig. 5 to identify items.

1. Check the tubular glass whose external diameter must be 16 mm. Check the correct length: to find correct length follow this calculation:
Tubular glass length without plexiglass or metal protection:
Length = CC (centre to centre) less 28 mm;
Tubular glass length with plexiglass or metal protection:
Length = CC (centre to centre) less 92 mm;
2. Metal or plexiglass protection is recommended for safety. Its length can be calculated as follow:
Plexiglass or metal protection length:
Length = CC (centre to centre) less 92 mm;
If both protections are used together, the plexiglass protection length can be calculated as follow:
Plexiglass protection length:
Length = CC (centre to centre) less 116 mm;
3. Fit gauge valves type GP11 on vessel, without tubular glass or protections, checking valve axis alignment
4. Unscrew nuts (12) of GP11 connecting part and remove these parts from valve body
5. Unscrew the joint packing ring (44) and fit tubular glass and plex-

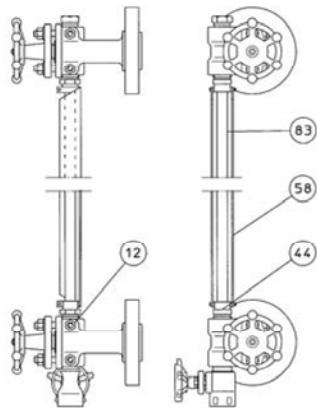


Fig. 5 - Type BTV-GP11 tubular glass level gauge

glass protection on one of connecting part, then fit such assembly tubular glass/plexiglass protection on the other connecting part.

6. Screw the joint packing ring (44).
7. Fit both connecting part on GP11 valve bodies and screw nuts (12).
8. Fit the metallic protection, if any.

11.3 TRANSPARENT GLASS GAUGES ASSEMBLING

Note: To perform the best result in reassembling transparent level gauges, we suggest to operate with the gage fixex on a bench, in horizontal position.

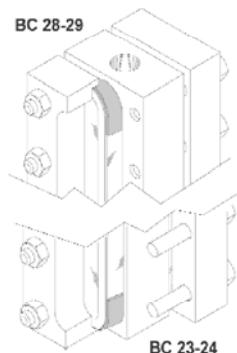


Fig. 824.1

In any case, but mainly if the gage has to be reassembled in vertical position, we suggest the use of spacers of gasket material (approx mm 15 x 100 x 0.75 thickness) to be fitted on the upper and lower part of each glass, as shown in Fig. 824.1, to avoid any dangerous contact between glass and metal as in assembling as well in operation.

Type BT (all) and type BC23, BC24, BC28

1. Refer to proper level gauge type to identify items (Table 3 and typical assembly Dwg Fig. 6 and Fig. 764, 765, 766, 767, 814.1, 815.1, 824-BC23/BC24/BC28).
2. Clean tightening bolt (or stud) and nuts thread to remove paint, rust or dirt. Apply some grease on thread and on nut side contacting cover plate .
3. Depending on gauge type, fit cover plate (6) with bolts (7), stud bolts (8) or studs (9) for Type BC level gauges.
4. Only for BT 32/33 fit angular pieces (13). Place cushion joint (5).
5. Place transparent glass (4) into its housing on cover plate so that glass side with the BONT® trade mark must be faced to the cushion joint. Be careful to avoid damages to glass (as scrapes) made by metal items. Insert mica shield (or Kel-F shield), if any (3). Mica shield has a side with printed the word "WASSER". Such side must be placed faced to the observer (internal side of level gauge).
6. Place sealing joint (2).
7. Place centre piece (1) so that it is correctly matching over sealing joint and glass. Be careful to avoid damages to glass or to sealing joint or to mica shield.
8. Place sealing joint (2) matching it on the centre body housing. Insert . Insert mica shield (or Kel-F shield), if any (3). Mica shield has a side with printed the word "WASSER". Such side must be placed faced to the centre piece (internal side of level gauge).
9. Place transparent glass (4) on its housing . Place transparent glass (4) into its housing on centre piece so that glass side with the BONT® trade mark must be faced to the observer (outside of the level gauge). Be careful to avoid damages to glass (as scrapes) made by metal items.
10. Place cushion joint (5). Only for BT32 / BT33 insert angular pieces ("L" bars) (13).
11. Fit the cover plate (6); be very careful to avoid scrapes or dam-

TABLE 3

N°	ITEM	N°	ITEM
1	CENTRE PIECE	7	BOLT AND NUT
2	SEALING JOINT	8	STUD BOLT AND NUT
3	PROTECTION SHIELD (IF ANY)	9	STUD AND NUT
4	TRANSPARENT GLASS	13	ANGULAR PIECE ("L" BAR)
5	CUSHION JOINT	14	BELLEVILLE WASHER
6	COVER PLATE		

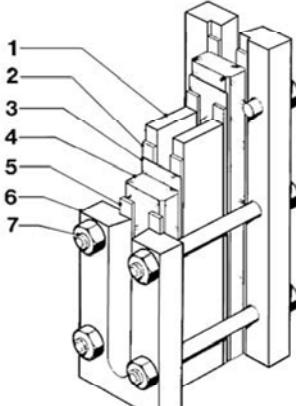


Fig. 764 - BT23

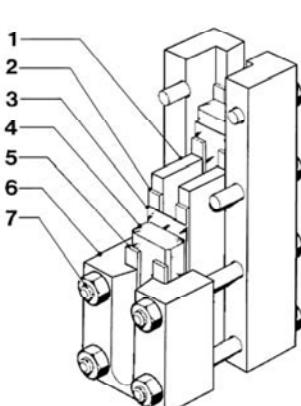


Fig. 765 - BT24

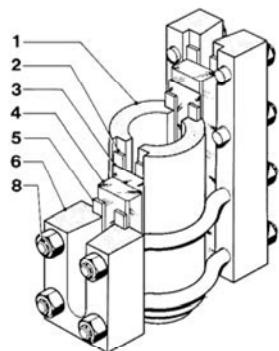


Fig. 766 - BT25

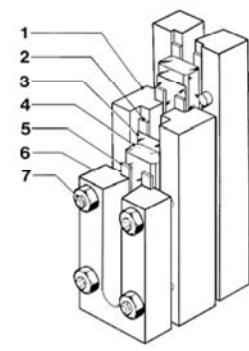


Fig. 767 - BT28 & BT29

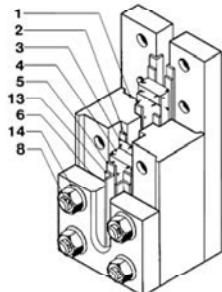


Fig. 814.1 - BT33

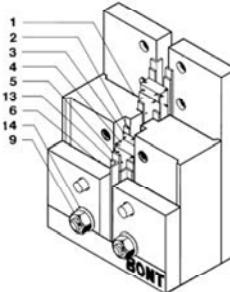


Fig. 815.1 - BT32

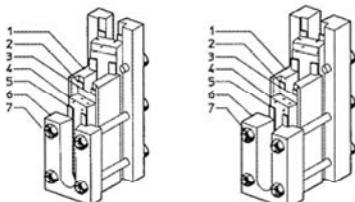


Fig. 824 - BC23

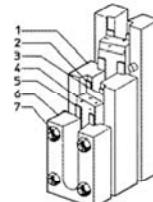


Fig. 824 - BC24

Fig. 824 - BC28

ages to glasses surfaces or damages to the joints.

12. Only for BT32 / BT33, insert belleville washers (14) on studs. Apply some grease on thread and on nut side contacting cover plate. Manually screw nut until they are in contact with cover plate, following the sequence shown in Fig. 2. For level gauges with bolts (7) or stud bolts (8), fix on the opposite side of the level gauge using a wrench and, using a torque wrench, screw nuts until a 10 Nm bolting torque is reached, following the nut sequence shown in Fig. 2. Repeat the operation 3 times increasing the bolting torque until bolting torque shown in Table 5 have been reached.

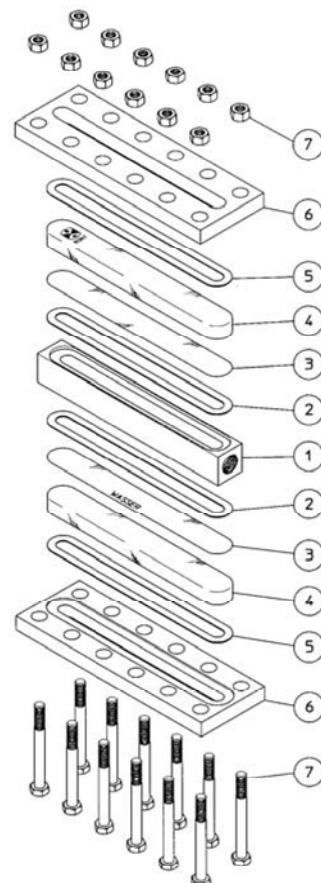


Fig. 6 - Transparent level gauge typical assembly dwg

Type BC32-33

- Refer to proper level gauge type to identify items (Table 3 and typical assembly Dwg. Fig. 6 e Fig. 7).
- Clean tightening stud and nuts thread to remove paint, rust or dirt. Apply some grease on thread and on nut side contacting cover plate .
- Screw studs (9) in the centre piece (1).
- Place sealing joint (2) centering it in its centre piece housing. Insert mica shield (3) if any. Mica shield has a side with printed the word "WASSER". Such side must be placed faced to the sealing joint (internal side of level gauge) .
- Place transparent glass (4) into its housing on centre piece so that glass side with the BONT® trade mark must be faced to the cushion joint. Be careful to avoid damages to glass (as scrapes) or to mica shield made by metal items.
- Place cushion joint (5) and insert angular pieces ("L" bars).
- Place cover plate (6) so that it is correctly matching over cushion joint and glass. Be careful to avoid damages to glass or to joints or to mica shield.

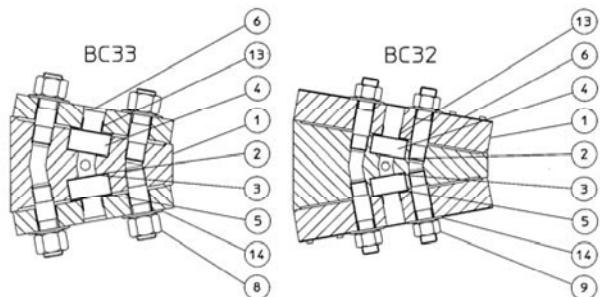


Fig. 7 - BC33 e BC32 typical assembl Dwg.

- Insert belleville washers (14) on studs. Apply some grease on thread and on nut side contacting cover plate. Manually screw nuts until they are in contact with cover plate, following the sequence shown in Fig. 2. Using a torque wrench, screw all nuts until a 10 Nm bolting torque is reached, following the nut sequence shown in Fig. 2. Repeat the operation 3 times increasing the bolting torque until bolting torque shown in Table 5 have been reached.

9. Rotate the level gauge 180°.
10. Repeat all operation from point 3 to point 8.

12.0 LOW TEMPERATURE OPERATING CONDITION

If the level gauge must operate in contact with process fluids having

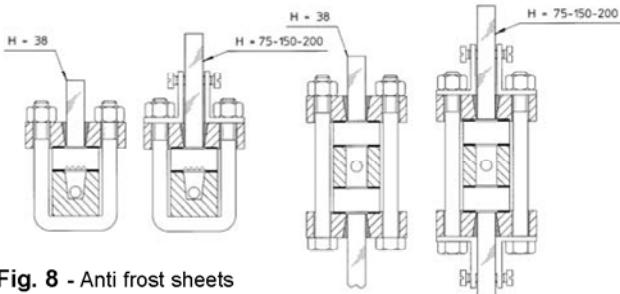


Fig. 8 - Anti frost sheets

temperature under 0 °C, to allow level visibility notwithstanding frost, a plexiglass sheet contacting reflex or transparent glass must be fitted and sealed on level gauge, as shown in Fig. 8.

To seal the plexiglass sheet a mastic must be used able to maintain softness and elasticity up to operating temperature. Apply the mastic avoiding to dirty glass surface.

Plexiglass height depends on process fluid temperature (see Table 4).

TABLE 4 OPERATING TEMPERATURE NO FROST SHEET HEIGHT	
From 0 °C to -19 °C	38 mm
From -20 °C to -49 °C	75 mm
From -50 °C to -99 °C	150 mm
Less than -100 °C	200 mm

WARNING: Check point 13.0 of this manual if level gauge must operate at low temperature.

13.0 WORKING LIFE

Glass level gauge contains items that are subject to fair and normal wear.

Such items are glasses, joint and, if any, protection shield (mica or Kel-F). Therefore glass level gauges and its parts must be periodically inspected by user.

Inspection time scheduling and interval must be performed by user according to plant working condition, process fluid and plant knowledge and/or experience. For new application inspection interval must be shortened, up to daily inspection, before establishing the proper inspection interval.

Always avoid any improper use of level gauge and intercepting valves able to generate unfair valve wear as:

- do not use an on-off valve as regulating valve
- avoid in process fluid abrasive particles, or piping sandblasting residual, or swarf, or welding dross;
- avoid water freezing inside level gauges.

If level gauge must be used in temperature condition exceeding material creep temperature, Cesare Bonetti S.p.A. can give, under Customer request, technical data suitable for residual working life calculation, to be performed by Customer or by end user.

14.0 MAXIMUM ALLOWABLE WORKING TEMPERATURE

If glass level gauge has to be used in low temperature working condition, Customer or end user must verify level gauge and intercepting valves material fitness.

If glass level gauge has to be used in operating condition Temperature higher than temperature shown in Table 1, according the DIN 7081 procedure, temperature could be extended up to 430 °C, with a maximum operation pressure of 10 bar. If level gauges has to be used in such condition, ask Cesare Bonetti S.p.A. to know the proper bolting torque to apply to cover plate nuts, indicating operating temperature and pressure values. Incorrect bolting torques could generate stress able to reduce glass resistance or to break glasses.

WARNING: If Kel-F (PCTFE Politrifluorocloroetilene) shield are used, maximum temperature must be limited to 150° C.

15.0 WELDING AND QUALITY CONTROL

Any welding must be performed by qualified personnel and using qualified procedures according EN 288/287 or ASME IX standard. Any non destructive control must be performed by qualified personnel and using qualified procedures according EN 473 o SNT-TC-1A standard.

Intercepting valve welding must be performed with valve in semi-opened position, to avoid damages to sealing part.

16.0 FINAL WARNINGS

Preserve level gauge and intercepting valve specific maintenance manual together with this manual and let them consultable by maintenance personnel.

Be sure that maintenance personnel read any part of those manuals before any use or maintenance operation.

If you have lost the manuals, please contact Cesare Bonetti S.p.A. to obtain a copy.

Cesare Bonetti S.p.A. shall be happy to give you any further technical information.

IMPORTANT WARNING: Level gauges use, to be safe against glass ejection due to breakage while operating, must be fitted with a proper protection, not hindering level gauge visibility.

Note: Table 1 rating apply to level gauges with standard graphite joints. If special joint are used (PTFE, Kel-F, Viton, etc.), maximum and minimum operating condition could change. In such case refer to rating limitation stated by joint manufacturers.

Compatibility of such materials with process fluid must be checked by the end user.

In Table 6 are listed dangers and stresses able to facilitate glass breakage and useful skills to avoid such danger.

TABLE 5

LEVEL GAUGE TYPE	BOLTING TORQUE Nm
BR12	50
BR14	30
BR22	30
BR23	40
BR24	40
BR25	40
BR28	50
BT23 - BC23	40
BT24 - BC24	40
BT25	40
BT28	60
BC28	60
BT29	70
BT32 - BC32	90
BT33 - BC33	80

TABLE 6

DANGER OR STRESS	CURE
Shock	To be avoided by user.
Bolts and nuts incorrect torque	Follow bolting torque as stated in the maintenance manual
Uniformity of bolting torque	Follow bolting torque as stated in the maintenance manual
Internal overpressure	To be avoided by user.
Thermal shock termico due to temperature sudden changes (DTmax.= 255°C)	To be avoided by user.
Process fluid chemical etching	Perform level gauge monitoring and change glasses immediately as any scrape, rugosity or opacity is checked. For transparent level gauges glasses apply, depending on process fluid, mica or Kel-F shields to protect internal glasses surfaces
Chemical etching generated by plant washing fluid	When washing the plant avoid to use level gauge, intercepting the gauge. If this is not possible, schedule a complete level gauge maintenance, as in this manual, before to start with the exercise
Structure deformation due to incorrect stress (absence of sustain); installation stretched by incorrect CC or by flanges not in the same plane	To be avoided by user.
Fire	To be avoided by user.