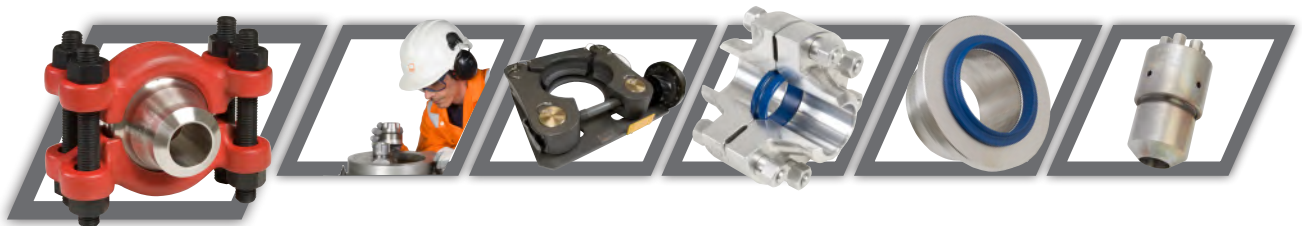


G-RANGE

PIPE CONNECTIONS



Making and maintaining the Right Connection





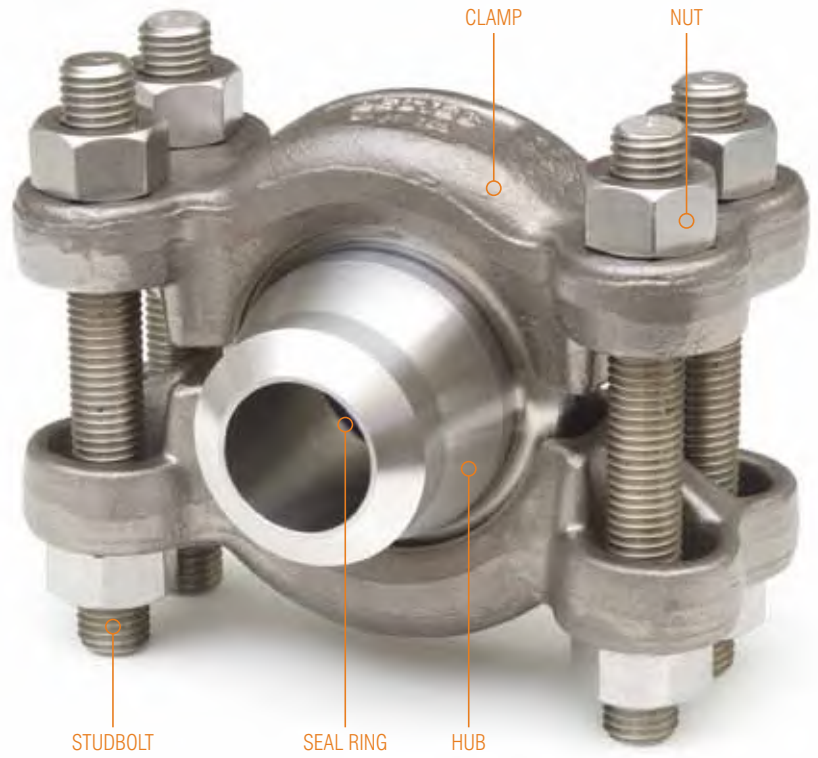
G-RANGE PIPE CONNECTIONS

Designed to meet the requirements of plant operators.

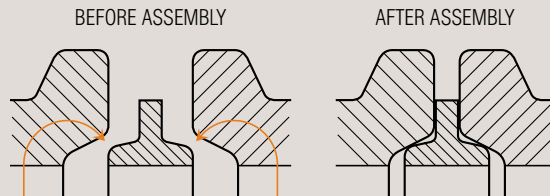
Due to their efficiency, lightness and reliability, together with extreme qualities of leak tightness, the G-Range pipe connection offers significant benefits for use in industrial plant in a wide variety of applications. Although designed primarily for adverse pressure and temperature conditions, more modest applications can be considered due to ease-of-installation and assembly, particularly when compared with the alignment and tightening of standard flanges.

The G-Range pipe connection comprises: a pair of hubs for welding to the pipe (similar to a flange); a clamp set, which can be rotated around the hubs to suit the most practical positions; and a seal ring.

The seal ring is a modified cone ring giving excellent leak tightness properties under the most severe conditions of pressure and/or thermal shock.

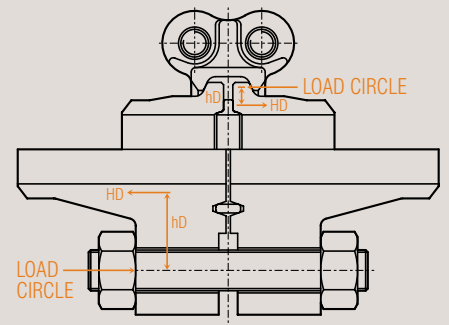


On assembly the taper joint faces compress the seal ring radially. The sealing force is provided by the stored energy in the stressed seal ring, any internal pressure intensifies the sealing action.



Weight Saving

Using high strength alloy clamps and flush bore seal rings, minimum fluid seals areas and low make up loads are achieved allowing smaller and more compact units than flanges of equivalent pressure ratings.



Standard Destec G-Range Connection

- **SIZE:** G2-14 BW SCHXXS
- **PRESSURE RATING:** 12541lb/in² (865 bars)
- **WEIGHT:** 21lb (10kg)

Standard ANSI 2in 2,500lb Flange

- **PRESSURE RATING:** 6,000lb/in² (at ambient temperature)
- **WEIGHT:** 97lb (44kg)



High Pressure Containment

The higher the pressure, the more effective the G-Range connection becomes, as internal pressure intensifies the seal.

High Temperatures

The standard 'all-metal' seal ring is suitable for most applications - maximum temperatures are limited only by the connection materials selected.

Extreme Leak Tightness

The seals remain leak tight under the most arduous conditions of pressure, temperature and vacuum conditions, even after many thousand hours of operation.

Resistance to Pressure and Thermal Shock

Cold quench conditions and thermal cycling are the cause of most leakage problems, where conventional compressible type joints and seal materials are used. The flexibility of the seal ring compensates for this during thermal transient conditions.

Making and maintaining the Right Connection

Materials

Destec G-Range connections are supplied in these standard materials. Destec Seal Rings are supplied coated with either PTFE, Molybdenum Disulphide or Graphite, depending on the application. Special G-Range connections are manufactured in many materials including Duplex steels and Nickel-based alloys.

(For chemical analysis and mechanical properties refer to pages 14 & 15).

Pipe Material	Carbon Steel / Carbon Manganese Steel	Stainless Steel 316 Type	
		up to 300 °C	over 300 °C
HUBS	A350-LF2 (modified)	A182-F316	A182-F316
CLAMPS	A29-4140	A29-4140	A182-F304
STUDBOLTS	A29-4140	A29-4140	A193-B8
NUTS	A194-2H	A194-2H	A194-GR8
SEAL RINGS	AISI 4140	A564-630	A638-660

Special Connections and Fittings.

Many special connections, in a variety of materials, are manufactured to enhance the standard range, for example:

- SHROUDED BORE
- JACKETED
- FLOW THROUGH JACKETED
- EXTREME PRESSURE
- QUICK RELEASE
- REMOTELY OPERATED
- HINGED VESSEL CLOSURES
- ORIFICES CONNECTIONS

Individual components can be supplied in the following forms:

Seal Rings -

Orifice, transition, blind.

Clamp Sets -

Heavy duty, quick release.

Hubs -

Heavy Duty. Tees and Elbows.
Nozzles. Adaptors.
Threaded.
Socket weld.
Reducing.
Enlarging.

Destec will design special G-Range connections to meet customers' requirements.

Re-Usable Seal Rings

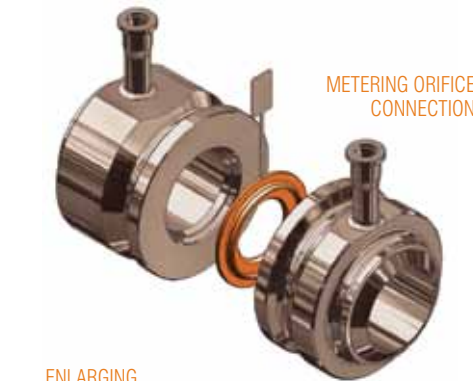
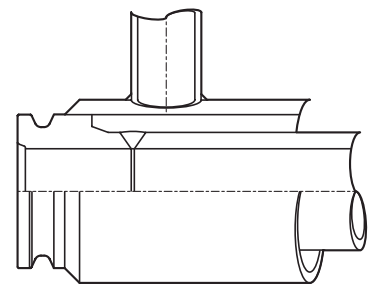
The 'all-metal' seal ring is elastic in design, and, on dismantling, reverts to its original form, ready for re-use. All seals of given size are interchangeable without any pre-fitting.

Special Connections

Existing troublesome flange joints can usually be converted on site to incorporate the Destec seal ring, as can vessel and heat exchanger closures. Destec seal rings are currently in use up to 2m diameter (2000mm).

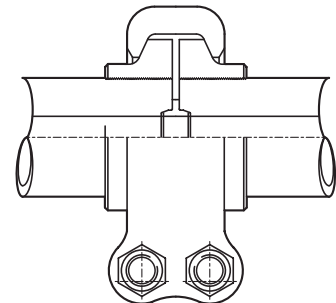


JACKETED CONNECTION

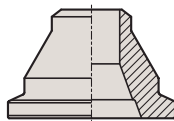


METERING ORIFICE CONNECTION

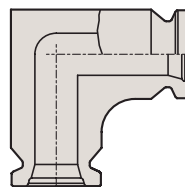
EXTREME PRESSURE CONNECTION



ENLARGING



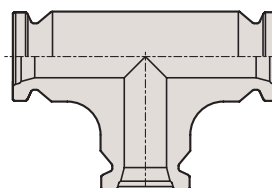
ELBOW



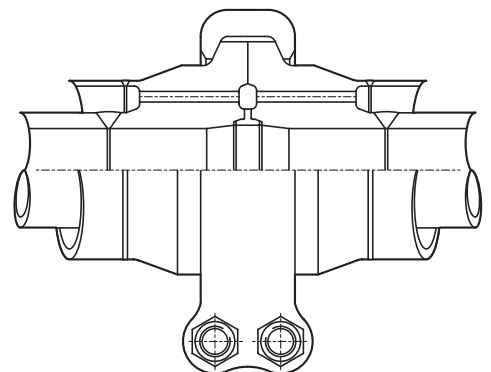
ADAPTOR



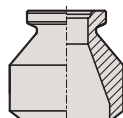
TEE



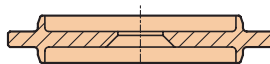
JACKET FLOW THROUGH CONNECTION



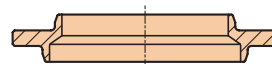
REDUCING



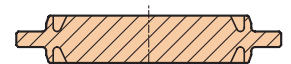
ORIFICE



TRANSITION

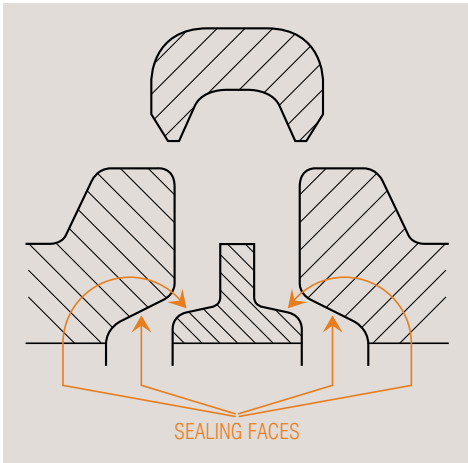


BLIND





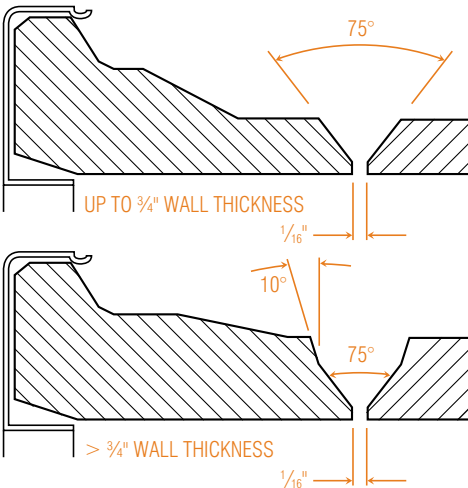
INSTALLATION & ASSEMBLY



1.

Welding of Hubs to Pipe Ends

The standard hub is provided with a weld preparation for welding from outside only. Protect the hub seat with the metal guards provided, and against oxidation, by using Berkatect No.12 or equivalent. If hubs welded to pipe lengths are not to be assembled immediately, remove the metal guards and coat hubs with grease or lanolin preservative. Replace metal guard for storage.



2.

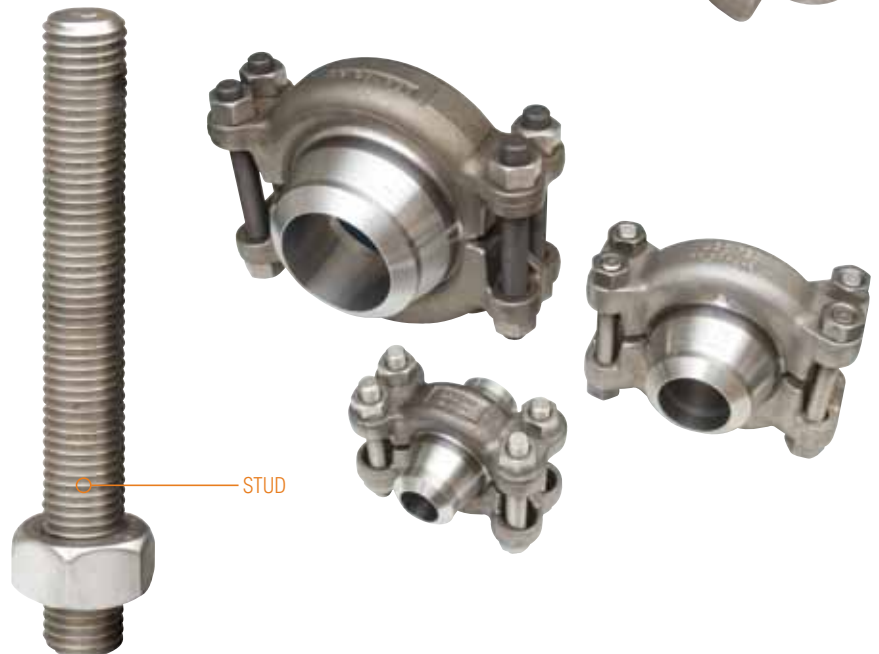
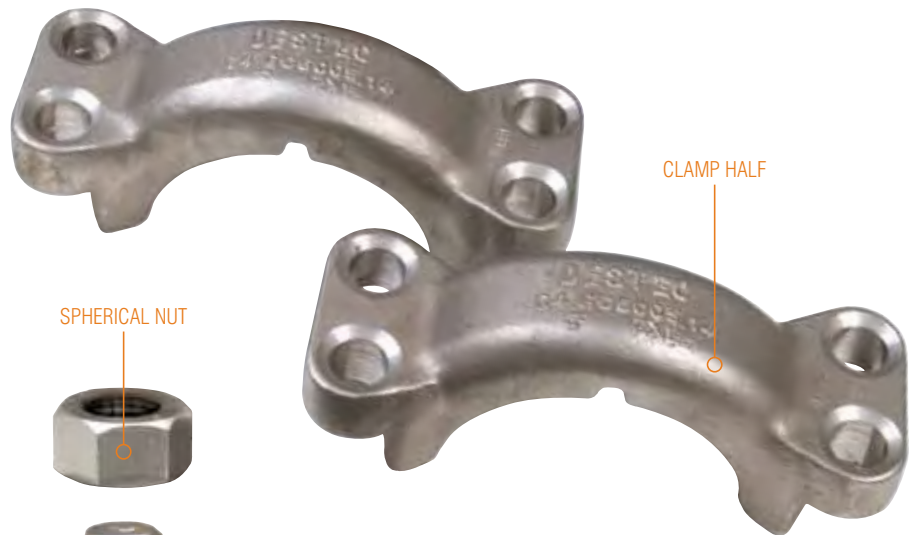
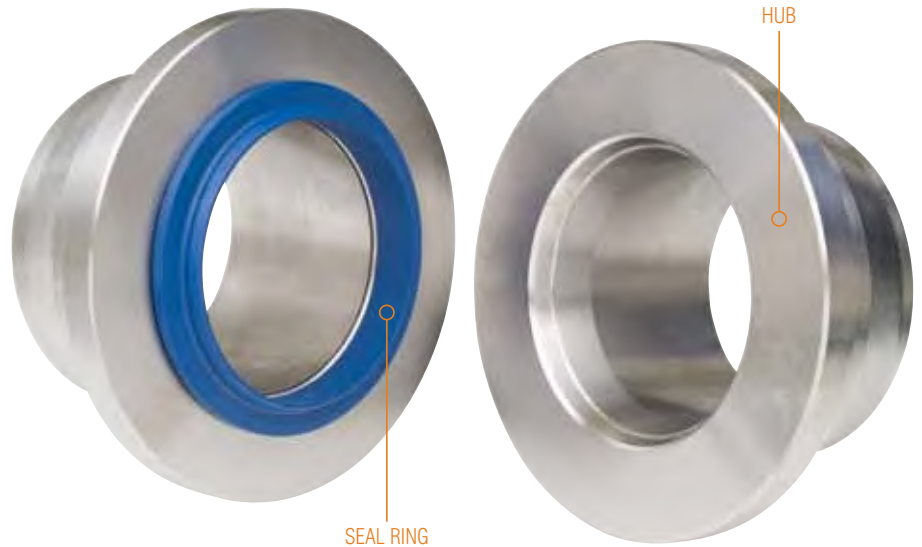
Clean

Remove grease and preservative from hub and seat faces. If faces are tarnished, the hub seat should be polished in a circumferential motion to a bright finish with fine emery cloth.

3.

Inspect

Check all sealing surfaces for mechanical damage and rust. Small scratches should be removed by polishing, more serious defects may require on-site machining or component replacement. Contact us for further advice and information.

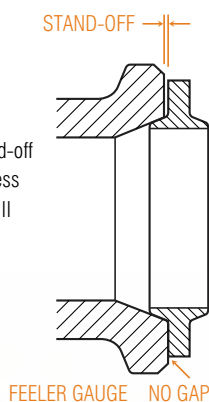


Making and maintaining the Right Connection

4.

Check for Stand-Off

When a seal ring is placed in the seat by hand there should be stand-off as illustrated. If the stand-off is less than given in the table the seal will need replacing.



5.

Lubricate

PTFE coated seal rings should be assembled into clean bright hub seats. Remove preservative from uncoated seal rings before spraying with molybdenum disulphide lubricant and assembly - the spray coating may also be applied to the hub seat. Some seal rings may be supplied with molybdenum disulphide lubricant pre applied. This will appear as a dull mid grey colour and should not be removed. The bolting and clamp / hub mating surfaces should be lubricated with clean light oil or grease.

6.

Fitting

Fit the clamps with the spherical faces of the nuts located in the special seating on the clamps. Tighten the bolting evenly to the torques recommended, ensure the gaps between the clamps are similar.



Seal Ring SIZE	Stand-Off (")		Seal Ring SIZE	Stand-Off (")	
	New Seal Rings	Minimum for Re-Use		New Seal Rings	Minimum for Re-Use
4	0.016	0.008	91	0.127	0.063
5	0.012	0.006	94	0.127	0.063
7	0.015	0.008	97	0.130	0.065
11	0.012	0.006	102	0.134	0.067
14	0.021	0.010	106	0.142	0.071
16	0.017	0.009	110	0.142	0.071
20	0.022	0.011	112	0.145	0.073
23	0.022	0.011	120	0.153	0.076
25	0.028	0.014	122	0.157	0.078
27	0.030	0.015	125	0.157	0.078
31	0.030	0.015	130	0.164	0.082
34	0.036	0.018	134	0.172	0.086
40	0.037	0.018	137	0.175	0.088
42	0.057	0.029	140	0.175	0.088
44	0.038	0.019	144	0.179	0.089
46	0.042	0.021	152	0.179	0.089
52	0.047	0.023	154	0.190	0.095
54	0.053	0.027	160	0.254	0.127
62	0.090	0.045	170	0.211	0.105
64	0.093	0.047	180	0.222	0.111
66	0.089	0.045	184	0.226	0.113
67	0.078	0.039	192	0.237	0.119
72	0.101	0.050	210	0.252	0.126
76	0.108	0.054	232	0.256	0.128
82	0.108	0.054	244	0.293	0.147
84	0.116	0.058	264	0.315	0.158
87	0.119	0.060	292	0.289	0.145

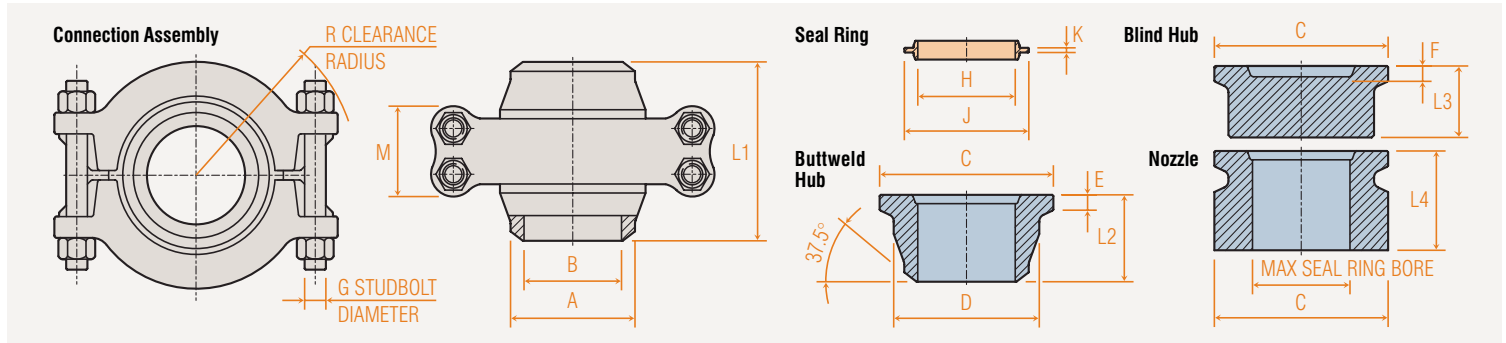
Recommended Studbolt Tightening Torques

Studbolt Material		Low Alloy A193-B7	Low Alloy A193-B7 PTFE Coated	Stainless Steel A193-B8	Stainless Steel A193-B8 PTFE Coated
Clamp SIZE	Studbolt SIZE	Nm (lb. ft.)	Nm (lb. ft.)	Nm (lb. ft.)	Nm (lb. ft.)
G1	½" UNC	16 (12)	11 (8)	16 (12)	11 (8)
G1 ½	⅝" UNC	31 (23)	22 (16)	31 (23)	22 (16)
G2, G3	¾" UNC	54 (40)	38 (28)	54 (40)	38 (28)
G4, C, B	⅞" UNC	139 (102)	98 (72)	130 (96)	92 (68)
G5, D, E	1" UNC	207 (153)	146 (108)	194 (143)	137 (101)
G6, GX6, F	1 ⅛" -8UN	303 (223)	213 (157)	285 (210)	200 (147)
G8	1 ¼" -8UN	530 (391)	371 (274)	399 (294)	279 (206)
GX8, GG	1 ⅜" -8UN	718 (530)	500 (369)	540 (398)	376 (277)
G10, GZ14	1 ⅝" -8UN	1216 (897)	842 (621)	914 (674)	633 (467)
GX10, G12	1 ¾" -8UN	1533 (1131)	1059 (781)	1153 (851)	796 (587)
GZ16, G18, GZ18	1 ⅞" -8UN	1902 (1403)	1310 (967)	1430 (1055)	985 (727)
GX12, GP, GZ20	2" -8UN	2324 (1715)	1599 (1179)	1748 (1289)	1202 (887)
G3V, G30	2 ¼" -8UN	3348 (2470)	2295 (1693)	2518 (1857)	1726 (1273)
GS, GU, G5P, G24S	2 ½" -8UN	4635 (3419)	3169 (2338)	3486 (2571)	2383 (1758)
GY	2 ¾" -8UN	5718 (4218)	3901 (2878)	4674 (3448)	3189 (2352)
G3Y	3 ¼" -8UN	9544 (7040)	6490 (4788)	7801 (5755)	5305 (3913)

Tightened properly the connection will remain tight and leak-proof under the most severe conditions of vibration and temperature change. Periodic retightening may be necessary on connections operating at elevated temperatures.



INTEGRATED SPECIFICATIONS



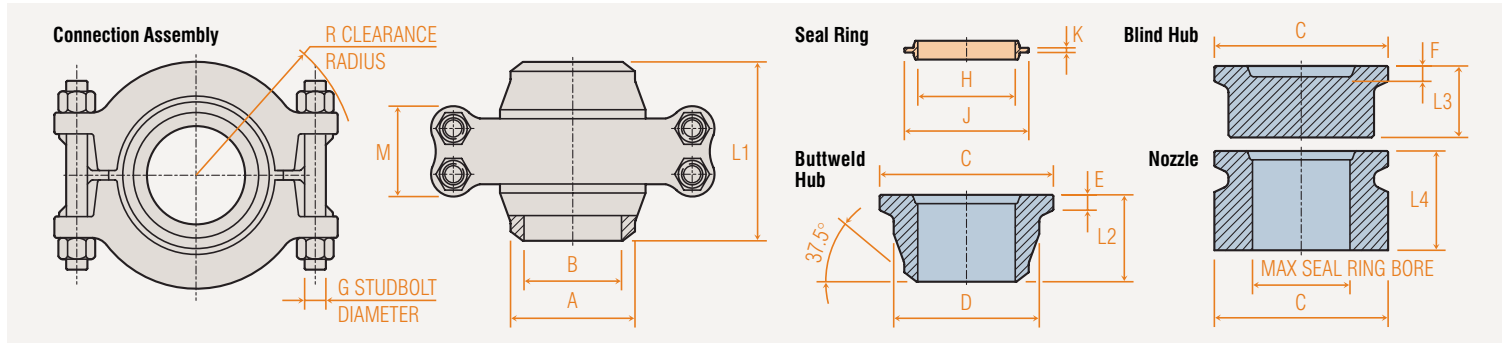
NOM. SIZE	Pipe Size			G-Range Connection ³	Connection Assembly					Seal Ring			Hub				Hub Lengths														
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Butt Weld L2	Blind L3	Nozzle L4												
1/2"	40	0.840 (21.3)	0.622 (15.8)	G1-5	3.625 (92.1)	2.625 (66.7)	2.313 (58.8)	1/2" UNC	2.14	0.625 (15.9)	1.094 (27.8)	0.125 (3.18)	2.000 (50.8)	1.500 (38.1)	0.313 (8)	0.219 (5.6)	1.750 (44.4)	1.750 (44.4)	9.000 (229)												
	80		0.546 (13.9)																	G1-4	2.17	0.500 (12.7)	1.000 (25.4)								
	160		0.466 (11.8)	G1-4																				2.21	0.500 (12.7)	1.000 (25.4)					
	XXS		0.252 (6.4)																	G1-4											
3/4"	40	1.050 (26.7)	0.824 (20.9)	G1-7	3.625 (92.1)	2.625 (66.7)	2.313 (58.8)	1/2" UNC	2.02	0.905 (23)	1.375 (34.9)	0.125 (3.18)	2.000 (50.8)	1.500 (38.1)	0.313 (8)	0.219 (5.6)	1.750 (44.4)	1.750 (44.4)	9.000 (229)												
	80		0.742 (18.8)																		G1-5	2.10	0.625 (15.9)				1.094 (27.8)				
	160		0.614 (15.6)	G1-4																				2.16	0.625 (15.9)	1.094 (27.8)					
	XXS		0.434 (11)																	G1-4	2.23							0.500 (12.7)	1.000 (25.4)		
1"	40	1.315 (33.4)	1.049 (26.6)	G1-11	3.625 (92.1)	2.625 (66.7)	2.313 (58.8)	1/2" UNC	2.01	1.125 (28.6)	1.750 (44.4)	0.125 (3.18)	2.000 (50.8)	1.500 (38.1)	0.313 (8)	0.219 (5.6)	1.750 (44.4)	1.750 (44.4)	9.000 (229)												
	80		0.957 (24.3)																			G1-7	2.07				0.905 (23)			1.375 (34.9)	
	160		0.815 (20.7)	G1-5																				2.14	0.905 (23)	1.375 (34.9)					
	XXS		0.599 (15.2)																	G1-5	2.28	0.625 (15.9)						1.094 (27.8)			
1 1/2"	40	1.900 (48.3)	1.610 (40.9)	G1 1/2-14	5.000 (127)	4.000 (102)	3.125 (79.4)	5/8" UNC	3.83	1.610 (40.9)	2.625 (66.7)	0.250 (6.4)	3.125 (79.4)	2.375 (60.3)	0.437 (11.1)	0.437 (11.1)	2.375 (60.3)	2.125 (54)	9.000 (229)												
	80		1.500 (38.1)																				G1 1/2-11				4.21		1.125 (28.6)	1.750 (44.4)	0.125 (3.18)
	160		1.338 (34)	G1 1/2-11																				4.47	1.125 (28.6)	1.750 (44.4)					
	XXS		1.100 (27.9)																	G1 1/2-11	4.53	1.125 (28.6)	1.750 (44.4)					0.125 (3.18)			
				G1 1/2-11																											
		G1 1/2-11	4.53		1.125 (28.6)	1.750 (44.4)	0.125 (3.18)																								

Making and maintaining the Right Connection

NOM. SIZE	Pipe Size			G-Range Connection ³	Connection Assembly					Seal Ring			Hub				Hub Lengths		
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Buttweld L2	Blind L3	Nozzle L4
2"	40	2.375 (60.3)	2.063 (52.4)	G2-20	5.750 (146)	4.500 (114)	3.500 (88.9)	3/4" UNC	8.17	2.063 (52.4)	3.250 (82.5)	0.250 (6.4)	3.625 (92.1)	2.875 (73)	0.437 (11.1)	0.500 (12.7)	2.750 (69.8)	2.000 (50.8)	9.000 (229)
	80		1.939 (49.3)						8.45										
	160		1.689 (42.9)	G2-16					8.79	1.870 (47.5)	2.688 (68.3)								
	XXS		1.503 (38.2)	G2-14					9.09	1.610 (40.9)	2.625 (66.7)								
				G2-11R					9.95	1.125 (28.6)	1.750 (44.4)								
2 1/2"	40	2.875 (73)	2.469 (62.7)	G3-25	6.750 (171)	5.250 (133)	3.500 (88.9)	3/4" UNC	14.5	2.672 (67.9)	4.000 (102)	0.250 (6.4)	5.000 (127)	4.000 (102)	0.500 (12.7)	0.500 (12.7)	3.250 (82.5)	2.500 (63.5)	9.000 (229)
	80		2.323 (59)						14.8										
	160		2.125 (54)	G3-20					15.5	2.063 (52.4)	3.250 (82.5)								
	XXS		1.771 (45)						16.0										
3"	40	3.500 (88.9)	3.063 (77.8)	G3-27	6.750 (171)	5.250 (133)	3.500 (88.9)	3/4" UNC	12.9	3.065 (77.9)	4.250 (108)	0.25 (6.4)	5.000 (127)	4.000 (102)	0.500 (12.7)	0.500 (12.7)	3.250 (82.5)	2.500 (63.5)	9.000 (229)
	80		2.900 (73.7)						13.9										
	160		2.626 (66.7)	G3-25					14.9	2.672 (67.9)	4.000 (102)								
	XXS		2.300 (58.4)	G3-23					15.2	2.375 (60.3)	3.500 (88.9)								
4"	40	4.500 (114)	4.026 (102)	G4-40	7.500 (191)	6.000 (152)	3.813 (96.9)	7/8" UNC	18.6	4.057 (103)	5.500 (140)	0.250 (6.4)	6.000 (152)	5.000 (127)	0.500 (12.7)	0.688 (17.5)	3.625 (92.1)	2.875 (73)	12.000 (305)
	80		3.826 (97.2)						19.7										
	160		3.438 (87.3)	G4-34					21.6	3.688 (93.7)	5.000 (127)								
	XXS		3.152 (80.1)	G4-31					23.1	3.250 (82.5)	4.500 (114)								
				G4-27					23.1	3.065 (77.9)	4.250 (108)								
		G4-25	24.9	2.672 (67.9)	4.000 (102)														



INTEGRATED SPECIFICATIONS



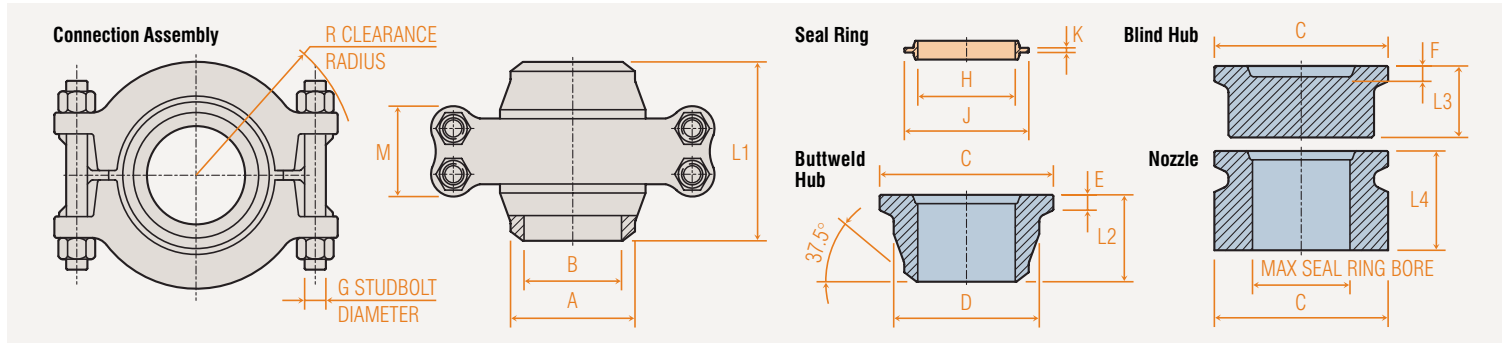
NOM. SIZE	Pipe Size			G-Range Connection ³	Connection Assembly					Seal Ring			Hub				Hub Lengths		
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Butt Weld L2	Blind L3	Nozzle L4
5"	40	5.563 (141)	5.047 (128)	9.000 (229)	7.375 (187)	4.437 (113)	1" UNC	31.9	5.313 (135)	6.625 (168)	0.250 (6.4)	7.500 (191)	6.500 (165)	0.625 (15.9)	0.688 (17.5)	4.375 (111)	2.875 (73)	12.000 (305)	
	80		4.813 (122)						33.3	4.745 (121)									6.188 (157)
	160		4.313 (110)						37.3	4.057 (103)									5.500 (140)
	XXS		4.063 (103)						39.4	3.688 (93.7)									5.000 (127)
									41.6	3.250 (82.5)									4.500 (114)
6"	40	6.625 (168)	6.063 (154)	9.500 (241)	8.750 (222)	4.813 (122)	1 1/8" 8UN	50.3	6.063 (154)	7.875 (200)	0.375 (9.5)	9.250 (235)	7.750 (197)	0.750 (19.1)	0.813 (20.7)	4.625 (118)	3.500 (88.9)	12.000 (305)	
	80		5.761 (146)						52.6	5.500 (140)									6.813 (173)
	120		5.500 (140)						54.4	5.313 (135)									6.625 (168)
	160		5.189 (132)						58.5	4.745 (121)									6.188 (157)
	XXS		4.897 (124)						60.8	4.187 (106)									6.625 (168)
									62.9	4.057 (103)									5.500 (140)
									66.8	4.187 (106)									6.625 (168)
									78.5	4.057 (103)									5.500 (140)
8"	40	8.625 (219)	7.981 (203)	11.125 (283)	9.875 (251)	5.875 (149)	1 1/4" 8UN	80.3	8.250 (210)	10.125 (257)	0.375 (9.5)	11.500 (292)	10.000 (254)	0.750 (19.1)	0.875 (22.2)	5.375 (137)	3.500 (88.9)	12.000 (305)	
	80		7.625 (194)						85.8	7.750 (197)									10.000 (254)
	160		6.813 (173)						97.4	7.250 (184)									9.500 (241)
	XXS		6.875 (175)						99.1	6.875 (175)									8.750 (222)
									105	6.063 (154)									7.875 (200)
									118	6.063 (154)									7.875 (200)
									118	6.063 (154)									7.875 (200)
									135	5.313 (135)									6.625 (168)
			11.000 (279)	10.500 (267)	6.437 (164)	1 3/8" 8UN		5.313 (135)	6.625 (168)	0.250 (6.4)		0.938 (23.8)		5.500 (140)	3.875 (98.4)				

Making and maintaining the Right Connection

NOM. SIZE	Pipe Size			G-Range Connection ⁹	Connection Assembly					Seal Ring			Hub				Hub Lengths				
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Buttweld L2	Blind L3	Nozzle L4		
10"	40	10.750 (273)	10.020 (255)	G10-102	12.375 (314)	12.625 (321)	6.750 (171)	1 5/8" 8UN	149	10.250 (260)	12.000 (305)	0.375 (9.5)	13.625 (346)	11.625 (295)	1.250 (31.8)	0.875 (22.2)	6.000 (152)	4.250 (108)	14.000 (356)		
	60		9.750 (248)	G10-97					156	9.875 (251)	12.000 (305)									3.500 (88.9)	
	80		9.560 (243)						159	9.125 (232)	12.000 (305)									4.000 (102)	
	120		9.064 (230)	G10-91					171	8.500 (216)	11.125 (283)									4.250 (108)	
	160		8.500 (216)	G10-84					182	7.250 (184)	9.500 (241)									5.000 (127)	
				G10-72					203	8.250 (210)	10.125 (257)									4.750 (121)	
				GX10-82					201	7.250 (184)	9.500 (241)									5.000 (127)	
				GX10-72					229	6.063 (154)	7.875 (200)									4.500 (114)	
		GX10-62R	296	16.000 (406)								1.437 (36.5)		8.000 (203)	4.500 (114)						
12"	STD	12.750 (324)	12.000 (305)	G12-120	13.625 (346)	14.500 (368)	7.250 (184)	1 3/4" 8UN	195	12.000 (305)	13.875 (352)	0.375 (9.5)	16.000 (406)	14.000 (356)	1.375 (34.9)	0.875 (22.2)	6.625 (168)	3.875 (98.4)	14.000 (356)		
	XS		11.750 (298)						199	11.250 (286)	14.125 (359)									0.625 (15.9)	4.250 (108)
	80		11.375 (289)	G12-112					207	10.750 (273)	12.625 (321)									5.250 (133)	
	120		10.750 (273)	G12-106					223	10.250 (260)	12.000 (305)									1.375 (34.9)	
	160		10.125 (257)	G12-102					246	9.500 (241)										5.000 (127)	
				G12-94					291	8.250 (210)	10.125 (257)									8.000 (203)	
				GX12-82R					401	15.250 (387)	8.250 (210)									1.062 (27)	5.000 (127)
14"	40	14.000 (356)	13.124 (333)	GZ14-132	14.500 (368)	14.250 (362)	7.375 (187)	1 5/8" 8UN	223	13.250 (337)	15.250 (387)	0.500 (12.7)	17.250 (438)	15.750 (400)	0.750 (19.1)	0.633 (16.1)	7.000 (178)	4.250 (108)	AS SPECIFIED		
	80		12.500 (318)	GZ14-130					246	13.000 (330)	15.000 (381)									7.063 (179)	
	120		11.812 (300)	GZ14-120					269	12.000 (305)	13.875 (352)									0.813 (20.7)	4.500 (114)
	160		11.188 (284)	GZ14-112R					302	11.250 (286)	14.125 (359)									1.000 (25.4)	5.500 (140)
16"	40	16.000 (406)	15.000 (381)	GZ16-152R	16.000 (406)	15.750 (400)	7.750 (197)	1 7/8" 8UN	294	15.250 (387)	17.750 (451)	0.500 (12.7)	19.500 (495)	18.000 (457)	1.000 (25.4)	0.875 (22.2)	8.000 (203)	6.000 (152)	AS SPECIFIED		
	80		14.314 (364)	GZ16-144R					327	14.500 (368)	17.000 (432)									1.000 (25.4)	6.000 (152)
	120		13.562 (345)	GZ16-137R					359	13.875 (352)	16.500 (419)									1.125 (28.6)	6.000 (152)
	160		12.814 (326)	GZ16-130R					393	13.000 (330)	15.000 (381)									1.000 (25.4)	6.500 (165)



INTEGRATED SPECIFICATIONS



NOM. SIZE	Pipe Size			G-Range Connection ³	Connection Assembly					Seal Ring			Hub				Hub Lengths			AS SPECIFIED
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Butt Weld L2	Blind L3	Nozzle L4	
18"	30		17.125 (435)	GZ18-180					355	18.000 (457)	20.500 (521)				0.750 (19.1)		4.750 (121)			
	60	18.000 (457)	16.500 (419)	GZ18-164	17.000 (432)	16.125 (410)	9.250 (235)	1 7/8" 8UN	395	16.500 (419)	19.000 (483)	0.500 (12.7)	21.750 (552)	20.250 (514)	0.750 (19.1)	1.000 (25.4)	8.250 (210)	5.750 (146)		
	120		15.250 (387)	GZ18-152R					468	15.250 (387)	17.750 (451)				1.000 (25.4)	0.875 (22.2)	8.500 (216)	6.625 (168)		
20"	30		19.000 (483)	GZ20-192					457	19.250 (489)	22.000 (559)				0.750 (19.1)	1.125 (28.6)	8.750 (222)	6.000 (152)		
	60	20.000 (508)	18.375 (467)	GZ20-184	18.000 (457)	18.000 (457)	8.375 (213)	2" 8UN	498	18.500 (470)	21.000 (533)	0.500 (12.7)	24.500 (622)	23.000 (584)	0.750 (19.1)	1.375 (34.9)	9.000 (229)	7.000 (178)	6.000 (152)	
	120		17.000 (432)	GZ20-170R					595	17.000 (432)	19.500 (495)				1.000 (25.4)	1.375 (34.9)	9.000 (229)	7.000 (178)		
24"	30		22.876 (581)	G24S-232					707	23.250 (591)	26.375 (670)				1.250 (31.8)	1.000 (25.4)	10.000 (254)	6.000 (152)		
	60	24.000 (610)	22.062 (560)	G24S-222	20.500 (521)	22.000 (559)	13.250 (337)	2 1/2" 8UN	781	22.250 (565)	26.375 (670)	0.500 (12.7)	29.500 (749)	27.500 (699)	1.250 (31.8)	1.250 (31.8)	10.250 (260)	6.500 (165)	6.000 (152)	
	120		20.376 (518)	G24S-206R					935	20.750 (527)	24.250 (616)				1.500 (38.1)	1.250 (31.8)	10.250 (260)	6.500 (165)		

HEAVY DUTY CONNECTORS

NOM. SIZE	Pipe Size			G-Range Connection ³	Connection Assembly					Seal Ring			Hub				Hub Lengths		
	SCH.	O.D. A	Bore B		Length L1	Clearance R	M	Bolt G	Weight kg	Bore H	O.D. J	Rib K	C	D	E	F	Buttweld L2	Blind L3	Nozzle L4
2"			2.063 (52.4)	GB-20	6.750 (171)	5.500 (140)	3.750 (95.2)	7/8" UNC		2.063 (52.4)	3.250 (82.5)	0.250 (6.4)	4.750 (121)	3.750 (95.2)	0.625 (15.9)	0.500 (12.7)	3.250 (82.5)		2.750 (69.8)
			1.870 (47.5)	GB-16						1.870 (47.5)	2.688 (68.3)								2.938 (74.6)
3"			2.672 (67.9)	GC-25	7.250 (184)	6.000 (152)	4.062 (103)	7/8" UNC		2.672 (67.9)	4.000 (102)	0.250 (6.4)	5.500 (140)	4.500 (114)	0.625 (15.9)	0.500 (12.7)	3.500 (88.9)		2.500 (63.5)
			2.063 (67.9)	GC-20						2.063 (67.9)	3.250 (82.5)								2.500 (63.5)
4"			3.688 (93.7)	GD-34	8.250 (210)	7.000 (178)	4.437 (113)	1" UNC		3.688 (93.7)	5.000 (127)	0.250 (6.4)	6.750 (171)	5.750 (146)	0.625 (15.9)	0.625 (15.9)	4.000 (102)		3.250 (82.5)
			3.250 (82.5)	GD-31						3.250 (82.5)	4.500 (114)								
6"	AS SPECIFIED	AS SPECIFIED	6.063 (154)	GG-62	11.125 (283)	10.000 (254)	6.000 (152)	1 3/8" 8UN		6.063 (154)	7.875 (200)	0.375 (9.5)	11.500 (292)	9.500 (241)	1.000 (25.4)	0.813 (20.7)	5.375 (137)	3.500 (88.9)	
			4.057 (103)	GG-40R						4.057 (103)	5.500 (140)	0.250 (6.4)							1.188 (30.2)
14"			12.250 (311)	GP-122	14.500 (368)	14.800 (376)	8.250 (210)	2" 8UN		12.250 (311)	14.125 (359)	0.375 (9.5)	18.500 (470)	16.500 (419)	1.250 (31.8)	0.875 (22.2)	7.063 (179)	6.000 (152)	
			11.250 (286)	GP-112R						11.250 (286)	14.125 (359)	0.625 (15.9)			1.437 (36.5)	1.187 (30.1)	7.250 (184)		
16"			15.250 (387)	GS-152	15.750 (400)	19.000 (483)	10.500 (267)	2 1/2" 8UN		15.250 (387)	17.750 (451)	0.500 (12.7)	21.000 (533)	19.000 (483)	1.438 (36.5)	0.875 (22.2)	7.625 (194)	5.750 (146)	
			13.500 (343)	GS-134R						13.500 (343)	15.500 (394)				1.688 (42.9)	1.000 (25.4)	7.875 (200)	6.625 (168)	
20"			17.000 (432)	GU-170	18.000 (457)	21.000 (533)	11.000 (279)	2 1/2" 8UN		17.000 (432)	19.500 (495)	0.500 (12.7)	25.000 (635)	23.000 (584)	1.625 (41.3)	1.125 (28.6)	9.250 (235)	7.000 (178)	
			16.000 (406)	GU-160R						16.000 (406)	18.500 (470)				1.875 (47.6)	1.000 (25.4)	9.000 (229)	7.625 (194)	

Note:

- Hub length and blind thickness are for reference only and may vary with material and pressure rating.
- The following sizes are identical:

Heavy Duty

GE
GF
GH
GM

Standard Size

G5
G6
G10
G12

- The 'R' designation indicates that the Rib of the Seal Ring is RECESSED INTO the Hub Face. e.g. GX8-52R
- Other bore sizes are available on request.



Ⓢ PRESSURE TEMPERATURE RATINGS bars

Hubs: Carbon Steel A350-LF2 (Modified) Clamps: Low Alloy Steel A29-4140								Hubs: Stainless Steel A182-F316 Clamps: Low Steel Alloy A29-4140			
SIZE	-46 to 20°C	100°C	200°C	250°C	300°C	350°C	400°C	SIZE	-46 to 20°C	100°C	200°C
G1-4	1324	1237	1172	1113	1035	986	816	G1-4	1103	1103	1068
G1-5	1165	1089	1032	979	911	868	719	G1-5	971	971	940
G1-7	770	720	682	647	602	573	475	G1-7	642	642	621
G1-11	381	356	337	320	298	284	235	G1-11	317	317	307
G1½-11	1048	980	928	881	820	781	646	G1½-11	874	874	845
G1½-14	447	417	395	375	349	333	275	G1½-14	372	372	360
G2-11R	1215	1136	1076	1021	950	905	749	G2-11R	1013	1013	980
G2-14	865	808	766	727	676	644	533	G2-14	721	721	697
G2-20	309	289	273	259	241	230	190	G2-20	257	257	249
G3-20	959	897	849	806	750	714	592	G3-20	799	799	774
G3-25	468	437	414	393	366	348	288	G3-25	390	390	377
G3-27	254	237	225	213	198	189	156	G3-27	211	211	204
G4-25	920	859	814	773	719	685	567	G4-25	766	766	742
G4-27	708	662	627	595	554	527	437	G4-27	590	590	571
G4-31	571	534	505	480	446	425	352	G4-31	476	476	460
G4-34	330	308	292	277	258	246	203	G4-34	275	275	266
G4-40	164	153	145	138	128	122	101	G4-40	137	137	132
G5-31	993	928	879	834	776	739	612	G5-31	827	827	801
G5-34	849	793	752	713	664	632	523	G5-34	707	707	685
G5-40	693	656	622	590	549	523	433	G5-40	585	585	566
G5-46	378	353	334	317	295	281	233	G5-46	315	315	305
G5-52	201	188	178	169	158	150	124	G5-52	168	168	162
G6-40R	865	846	828	791	736	701	580	G6-40R	784	784	759
G6-42	792	775	758	750	709	675	559	G6-42	756	756	732
G6-46R	647	633	619	613	587	559	463	G6-46R	626	626	606
G6-52	508	474	449	427	397	378	313	G6-52	423	423	409
G6-54	439	411	389	369	344	327	271	G6-54	366	366	354
G6-62	238	223	211	200	186	178	147	G6-62	199	199	192
GX6-40R	941	880	833	791	736	701	580	GX6-40R	784	784	759
G8-62	584	571	559	553	547	541	469	G8-62	584	571	559
G8-72	384	359	340	323	300	286	237	G8-72	320	320	310
G8-76	271	254	240	228	212	202	167	G8-76	226	226	219
G8-82	181	169	160	152	142	135	112	G8-82	151	151	146
GX8-52R	926	866	820	778	724	690	571	GX8-52R	772	772	747
GX8-62	744	715	677	643	598	569	472	GX8-62	637	637	617
G10-72	599	586	573	567	561	542	449	G10-72	599	586	573
G10-84	432	404	382	363	338	322	266	G10-84	360	360	348
G10-91	299	280	265	252	234	223	185	G10-91	249	249	241
G10-97	180	168	159	151	141	134	111	G10-97	150	150	145
G10-102	132	123	117	111	103	98	81	G10-102	110	110	106
GX10-72	728	680	645	612	569	542	449	GX10-72	607	607	587
GX10-82	497	464	440	417	388	370	306	GX10-82	414	414	401
G12-94	478	467	457	452	447	441	377	G12-94	478	467	457
G12-102	417	408	399	383	356	339	281	G12-102	380	380	367
G12-106	361	336	318	301	279	265	218	G12-106	298	298	288
G12-112	259	242	229	218	202	193	160	G12-112	216	216	209
G12-120	178	167	158	150	139	133	110	G12-120	149	149	144
GX12-82R	802	749	710	674	627	597	494	GX12-82R	668	668	647
GZ14-130	203	189	179	169	157	149	121	GZ14-130	159	159	153
GZ14-112R	449	447	422	399	370	351	287	GZ14-112R	396	396	382

Making and maintaining the Right Connection

Note:

Ratings have been calculated using the following:

1. Allowable stresses taken from ASME B31-3.

2. Zero corrosion allowance.

3. Maximum bore through the hub.

4. Stress analysis based on ASME VIII, Appendix 24.

5. Pipe O/D taken as dimension D.

40		Hubs: Stainless Steel A182-F316 Clamps: Stainless Steel A182-F304										
250°C	300°C	SIZE	-46 to 20°C	100°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C
1001	952	G1-4	1103	1103	1068	1001	952	916	888	868	851	825
881	838	G1-5	943	943	887	835	788	762	735	705	682	617
582	554	G1-7	518	518	487	459	433	418	403	387	375	339
288	274	G1-11	317	317	307	288	274	264	255	247	239	216
793	754	G1 1/2 -11	874	874	845	793	754	725	703	687	674	653
338	321	G1 1/2-14	372	372	360	338	321	309	299	293	287	264
919	874	G2-11R	1013	1013	980	919	874	841	815	797	782	757
654	622	G2-14	586	586	551	519	490	473	457	438	424	384
233	222	G2-20	257	257	249	233	222	214	207	202	199	189
726	690	G3-20	673	673	633	596	562	544	524	503	487	257
354	336	G3-25	390	390	377	354	335	324	312	299	290	262
192	182	G3-27	211	211	204	192	182	175	170	166	163	158
695	661	G4-25	654	654	615	580	547	529	510	489	474	429
535	509	G4-27	520	520	489	460	434	420	405	388	376	340
432	410	G4-31	460	460	433	408	385	372	359	344	333	301
249	237	G4-34	275	275	266	249	237	228	221	216	212	205
124	118	G4-40	137	137	132	124	118	113	110	107	105	102
751	714	G5-31	666	666	626	590	557	538	519	498	482	436
642	610	G5-34	530	530	498	469	443	428	413	396	383	347
531	505	G5-40	416	416	391	369	348	336	324	311	301	272
286	271	G5-46	303	303	285	268	253	244	236	226	219	198
152	145	G5-52	168	168	162	152	145	139	135	132	130	125
712	677	G6-40R	519	519	488	460	434	419	405	388	376	340
686	652	G6-42	475	475	447	421	397	384	370	355	344	311
568	540	G6-46R	388	388	365	344	324	314	303	290	281	254
384	365	G6-52	317	317	298	281	265	256	247	237	229	207
332	316	G6-54	296	296	279	262	248	239	231	221	214	194
180	171	G6-62	199	199	192	180	171	165	160	156	153	144
712	677	GX6-40R	784	784	759	712	677	651	631	617	599	542
553	547	G8-62	351	351	330	310	293	283	273	262	254	230
291	276	G8-72	249	249	234	220	208	201	194	186	180	163
205	195	G8-76	216	216	203	191	180	174	168	161	156	141
137	130	G8-82	151	151	146	137	130	125	121	119	116	113
701	666	GX8-52R	602	602	566	533	503	486	469	450	436	394
578	550	GX8-62	446	446	420	396	373	361	348	334	323	292
551	523	G10-72	360	360	338	318	300	290	280	269	260	235
327	310	G10-84	266	266	250	235	222	214	207	198	192	174
226	215	G10-91	227	227	214	202	190	184	177	170	165	149
136	129	G10-97	150	150	145	136	129	125	121	118	116	112
100	95	G10-102	110	110	106	100	95	91	88	86	85	82
551	523	GX10-72	508	508	477	450	424	410	396	380	367	333
376	357	GX10-82	398	398	374	352	332	321	310	297	288	261
452	439	G12-94	280	280	262	246	230	222	214	204	197	177
345	328	G12-102	250	250	235	222	209	202	195	187	181	164
270	256	G12-106	222	222	208	195	184	177	170	163	157	141
196	186	G12-112	200	200	188	177	167	162	156	149	145	131
135	128	G12-120	149	149	144	135	128	123	120	117	115	111
606	576	GX12-82R	581	581	546	515	485	469	453	434	420	380
143	136	GZ14-130	145	145	145	143	136	130	126	123	121	117
357	338	GZ14-112R	201	201	201	201	201	201	201	190	184	117



⊕ PRESSURE TEMPERATURE RATINGS bars

Hubs: Carbon Steel A350-LF2 (Modified) Clamps: Low Alloy Steel A29-4140								Hubs: Stainless Steel A182-F316 Clamps: Low Steel Alloy A29-4140			
SIZE	-46 to 20°C	100°C	200°C	250°C	300°C	350°C	400°C	SIZE	-46 to 20°C	100°C	200°C
GZ16-144R	352	328	311	294	273	260	213	GZ16-144R	256	256	248
GZ16-130R	437	407	386	365	339	323	265	GZ16-130R	362	362	350
GZ18-164	250	233	220	209	194	184	151	GZ18-164	207	207	200
GZ18-152R	346	339	320	304	282	268	221	GZ18-152R	301	301	291
GZ20-184	236	221	209	198	184	174	143	GZ20-184	196	196	189
GZ20-170R	319	319	303	287	267	254	209	GZ20-170R	285	285	275
Heavy Duty Connectors								Heavy Duty Connectors			
GB-20	886	828	784	744	693	660	546	GB-20	738	738	714
GC-25	792	740	701	664	611	577	462	GC-25	657	657	633
GD-31	853	798	756	717	667	635	526	GD-31	711	711	688
GG-62	597	583	570	552	511	485	395	GG-62	547	547	528
GP-112R	548	535	524	508	473	450	372	GP-112R	504	504	488
GS-134R	544	509	482	458	426	405	336	GS-134R	454	454	439
GU-160R	508	474	449	426	396	376	310	GU-160R	422	422	408

⊕ MATERIAL ANALYSIS & MECHANICAL PROPERTIES

Component	Hubs			Seal Rings				Clamps	
	A350 LF2 Modified	A182-F316	A182-F51 S31803	AISI 4140	A564-630 (17.4ph)	A638-660 (A286)	INC X750 ASTM B637	A29-4140	A182-F304
Chemical Analysis									
C	0.18 max	0.08 max	0.03 max	0.38/0.43	0.07 max	0.08 max	0.08 max	0.38/0.43	0.08 max
Si	0.50 max	1.0 max	1.0 max	0.15/0.35	1.0 max	0.4/1.0	0.5 max	0.15/0.35	1.0 max
Mn	1.55 max	2.0 max	2.0 max	0.75/1.0	1.0 max	1.0/2.0	1.0 max	0.75/1.00	2.0 max
Ni		10.0/14.0	4.5/6.5		3.0/5.0	24.0/27.0	70 min	0.50 max	8.0/11.0
Cr		16.0/18.0	21.0/23.0	0.80/1.10	15.0/17.5	13.5/16.0	14.0/17.0	0.80/1.10	18.0/20.0
Mo		2.0/3.0	2.5/3.5	0.15/0.25		1.0/1.75		0.15/0.25	
S	0.010 max	0.030 max	0.02 max	0.040 max	0.030 max	0.030 max	0.01 max	0.025 max	0.030 max
P	0.025 max	0.040 max	0.03 max	0.035 max	0.040 max	0.040 max		0.025 max	0.040 max
Cu					3.0/5.0		0.50 max		
V	0.05 max					0.10/0.50		0.05 max	
Al						0.35 max	0.40/1.0		
Ti						1.9/2.3	2.25/2.75		
Co							1.0 max		
B						0.003/0.010			
Fe	Balance	Balance	Balance	Balance	Balance	Balance	5.0/9.0	Balance	Balance
Other	C.E. 0.43 max		N. 0.08/0.2		Ta. 0.15/0.45		Cb. 0.7/1.2		

Making and maintaining the Right Connection

		Hubs: Stainless Steel A182-F316 Clamps: Stainless Steel A182-F304										
250°C	300°C	SIZE	-46 to 20°C	100°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C
232	220	GZ16-144R	173	173	173	173	173	173	173	164	159	153
328	311	GZ16-130R	215	215	215	215	215	215	215	204	198	191
187	177	GZ18-164	136	136	136	136	136	136	136	129	125	120
272	258	GZ18-152R	158	158	158	158	158	158	158	150	146	140
177	168	GZ20-184	124	124	124	124	124	124	124	118	114	110
258	245	GZ20-170R	146	146	146	146	146	146	146	139	135	129
Heavy Duty Connectors												
670	637	GB-20	738	738	698	650	606	581	556	528	507	447
588	544	GC-25	619	619	577	538	502	483	642	440	423	374
645	613	GD-31	572	572	534	499	468	450	432	412	397	353
493	467	GG-62	344	344	322	301	282	272	261	249	240	214
457	435	GP-112R	321	321	301	282	265	255	246	235	227	203
412	391	GS-134R	376	376	376	376	370	358	345	330	320	288
382	363	GU-160R	270	270	270	270	270	270	270	257	249	226

Component	Hubs			Seal Rings				Clamps	
	A350 LF2 Modified	A182-F316	A182-F51 S31803	AISI 4140	A564-630 (17.4ph)	A638-660 (A286)	INC X750 ASTM B637	A29-4140	A182-F304
Mechanical Properties									
Tensile (Rm) N/mm ² (lb/in ²)	496 min (72000)	517 min (75000)	620 min (90000)	689 min (100000)	724 min (105000)	896 min (130000)	965 min (140000)	690 min (100000)	517 min (75000)
Yield (Re) N/mm ² (lb/in ²)	358 min (52000)	207 min (30000)	450 min (65000)	517 min (75000)	655 min (95000)	585 min (85000)	655 min (95000)	552 min (80000)	207 min (30000)
Elongation %	22 min	30 min	25 min	15 min	16 min	15 min	8 min	18 min	30 min
Red of Area %	30 min		45 min	40 min	50 min	18 min	12 min	50 min	
Impact Charpy V	27 J-46°C		70 J- 40°C			86 J	50 J	47 J-50°C 20 J-101°C	
HRB HRC	235 max 22 max		286/332 30/35	235 max 22 max	277/311 29/33	248 min	286/332 30/35	235 max 22 max	



Quality Assured.

Destec Engineering operate a Quality System approved by Lloyds Register of Quality Assurance to ISO 9001: 2015.

Full traceability of all materials and conformance with exacting standards is ensured by a system operated by dedicated personnel backed up with the latest high technology equipment.



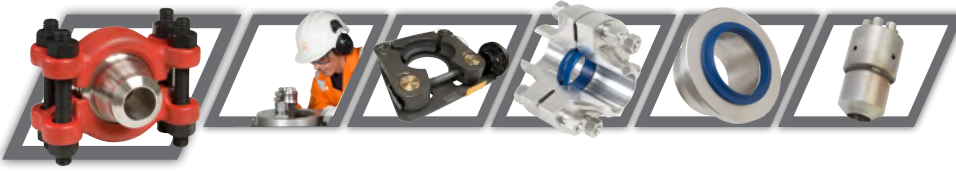
After Sales Service

Destec Engineering Ltd. have a team of technicians available to assist clients with site supervision or assembly and repair of G-Range connections and flanges.

By using our extensive range of portable machines we are able to re-cut any joint face on site and, if required, stainless steel weld overlay joint faces and re-machine.



Making and maintaining the Right Connection



Ordering Procedure.

If standard pipe is being used select connection size from integrated specification table.

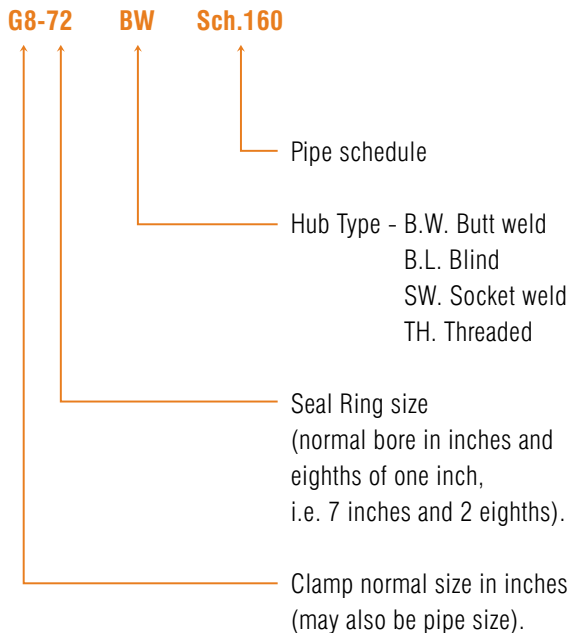
Check pressure/temperature ratings for the materials required from tables.

Destec Engineering manufacture an extensive range of connections and should sizing be required, please supply the following information:

- DESIGN PRESSURE AND TEMPERATURE
- EXTERNAL PIPE FORCES
- PIPE MATERIALS AND CONTAINED FLUID
- PIPE OR PRESSURE VESSEL CODE
- PIPE BORE AND OUTSIDE DIAMETER
- QUANTITY INVOLVED
- ANY OTHER INFORMATION CONSIDERED RELEVANT TO DESIGN eg. CORROSION ALLOWANCE

Designation

Example



Contact us on **01522 791 721**
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