



POWERFULLOK

SUS316 Tube Fittings



Tube Fittings

- Double Ferrule Compression Fitting
- Material: SUS316
SUSF316



Fujikin Incorporated

We welcome customer feedback for all of our products and services.



Overview

The POWERFULLOK is a tube fitting with excellent performance and quality. It is manufactured utilizing the design expertise and production technology that we have accumulated through our many years of experience as a precision fitting manufacturer. The POWERFULLOK is flareless double ferrule compression fitting that does not require tube thread cutting. Its parts consist of a stainless steel (SUS316, SUSF316) body, front ferrule, back ferrule, and nut.

Reliability

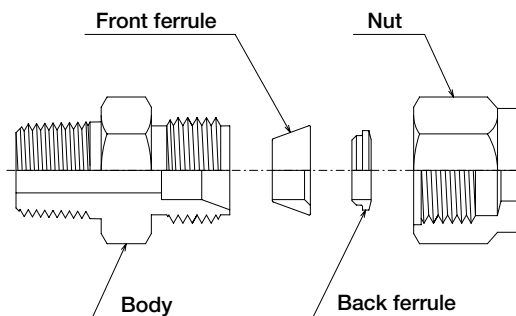
To assure total product performance, we also offer related products such as high-quality tubes and specialized tools that were developed based on our extensive experience as a precision fitting manufacturer.

Product performance and reliability are dependent on proper assembly. Before installing the product, please read the Installation Guide on page 38 carefully. Contact Fujikin if you have any questions about assembly procedures.

Features / Applications

- A gap inspection gauge may be used to verify that the fitting was tightened sufficiently after initial assembly.
- This flareless fitting is easy to install; simply insert the tube into the fitting and tight the nut. No welding is required.
- The double-ferrule connection creates a strong bond. By applying a compressive force to the tube, it achieves extremely high pressure resistance.
- The metal sealing parts, which undergo precision finishing, ensure an airtight seal.
- This compact, lightweight fitting requires low tightening torque, and is easy to disassemble and retighten.
- The nut's threads are silver-plated to prevent galling.
- These fittings have a wide variety of applications. They may be used in a wide range of conditions, from high pressures to vacuums, and from high temperatures to low temperatures.
- The tube size is stamped on the body for quick and easy identification.
- We offer government certification for high-pressure gas products (excluding products with tapered threads).

Parts



Cross-section after Assembly

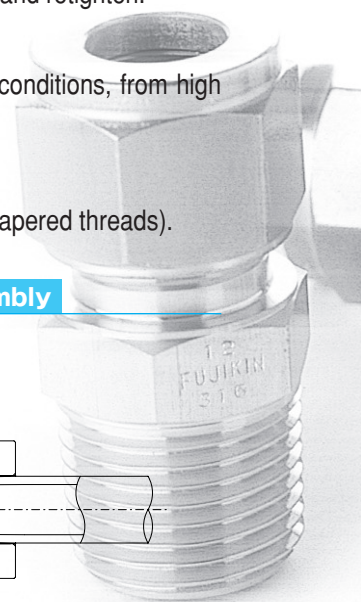
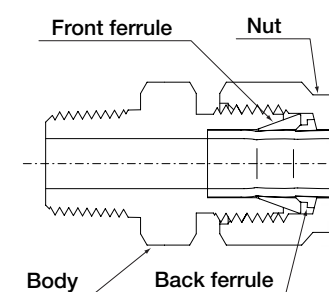


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Do not clean this product before or during use. If you require specialty ultra high-purity products, please consult with Fujikin about other product lines or custom orders.

- Please note that the materials used and product dimensions are subject to change without notice.
- In order to avoid potential problems, repeat customers of the same product should contact Fujikin in advance before changing the conditions or methods of use.

Part Number Designation

Please use the part number designations below when placing an order or making an inquiry.

P

Product Series:

POWERFULLOK tube fittings

U

Material:

Stainless steel

W

Fitting Type:

Double-Ferrule Compression Fitting

H

Connection Type:

Male Connector

-

6

Nominal Diameter:


















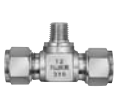









Outer Diameter of Tube (mm)

B

Thread Size:

R 1/4"

Connector Type

H		Male connector (Rc thread)	4 page	G		Female connector (Rc thread)	11 page	L		Male elbow (R thread)	18 page
H		Male connector (NPT thread)	5 page	G		Female connector (NPT thread)	12 page	L		Male elbow (NPT thread)	19 page
H		Thermocouple male connector (R thread)	6 page	G		Female connector (G thread)	13 page	LG		Female elbow (Rc thread)	20 page
HP		Bulkhead male connector (R thread)	6,7 page	GP		Bulkhead female connector (Rc thread)	14 page	T		Tee union	21 page
HP		Bulkhead male connector (NPT thread)	7 page	GP		Bulkhead female connector (NPT thread)	14,15 page	T		Reducing tee union	21 page
H		O-ring male connector (UNF)	8 page	R		Reducer	15 page	TS		Male branch tee (R thread)	22 page
F		Straight union	9 page	R		Welding reducer	16 page	TL		Male run tee (R thread)	23 page
F		Reducing union	9,10 page	LR		Welding elbow reducer	16 page	TG		Female branch tee (Rc thread)	24 page
P		Bulkhead union	10 page	L		Elbow union	17 page	TG		Female branch tee (G thread)	24,25 page

Nominal Diameter

Size in mm

3 = 3mm OD
4 = 4mm OD
6 = 6mm OD
8 = 8mm OD
10 = 10mm OD
12 = 12mm OD
14 = 14mm OD
16 = 16mm OD
18 = 18mm OD
20 = 20mm OD
25 = 25mm OD

Size in fractional inches

1.6 = 1.6mm (1/16") OD
3.2 = 3.2mm (1/8") OD
6.35 = 6.35mm (1/4") OD
9.52 = 9.52mm (3/8") OD
12.7 = 12.7mm (1/2") OD
15.88 = 15.88mm (5/8") OD
19.05 = 19.05mm (3/4") OD
25.4 = 25.4mm (1") OD

Thread Size

Taper Pipe Thread (JIS)










Designation	A	B	C	D	E	F	
JIS B0203 (1982)	Male thread	R 1/8	R 1/4	R 3/8	R 1/2	R 3/4	R 1
	Female thread	Rc1/8	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1







Parallel Pipe Thread (JIS)







Designation	AF	BF	CF	DF
JIS B0203 (1982)	G1/8	G1/4	G3/8	G1/2

National Pipe Taper Thread (ANSI)

Designation	AN	BN	CN	DN	EN	FN
ANSI B2.1	1/8NPT	1/4NPT	3/8NPT	1/2NPT	3/4NPT	1NPT

TLG		Female run tee (Rc thread)	25 page
PL		Positionable elbow union (UNF)	26 page
X		Cross union	26 page
H		Orifice male connector (Rc thread)	27 page
H		Orifice male connector (NPT thread)	27 page
R		Orifice reducer	27 page
JC		Cap union	28 page
JP		Plug union	28 page
A		Tube adapter	29 page

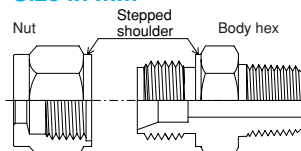
GA		Tube gauge adapter	30 page
PC		Port connector	31 page
IN		Insert bush	31 page
S		Front ferrule	32 page
R		Back ferrule	32 page
N		Nut	33 page

		Vent plug with POWERFULLOK connector	34 page
		Branch tee vent plug	34 page
		Branch tee vent plug	34 page
		Vent plug (R thread / NPT thread)	35 page
		Vent plug (Rc thread / NPT thread)	35 page
		Flange union (JIS/JPI/ASME)	36,37 page

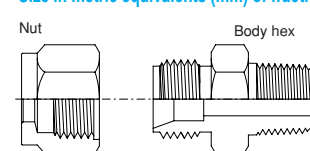
Identification of sizes in mm and metric equivalents (mm) of fractional inches

For easy size identification, fitting diameters (expressed in millimeters) are stamped on the body hex and the nut. In addition, metric fittings have stepped shoulders to distinguish them from fractional fittings.

Size in mm

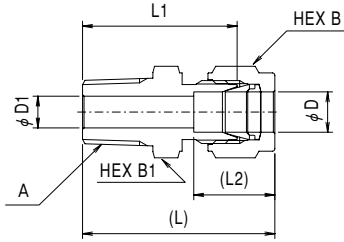


Size in metric equivalents (mm) of fractional inches



POWERFULL Series

Male Connectors (R thread)



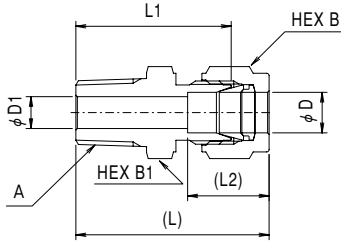
Size in mm

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWH-3A	3	R1/8	2.3	10	12	30.5	23.9	12.9
PUWH-3B	3	R1/4	2.3	10	14	35.6	29	12.9
PUWH-4A	4	R1/8	2.4	12	12	31.2	24.6	13.7
PUWH-4B	4	R1/4	2.4	12	14	36.3	29.7	13.7
PUWH-6A	6	R1/8	4.8	14	14	32.8	25.4	15.2
PUWH-6B	6	R1/4	4.8	14	14	37.9	30.5	15.2
PUWH-6C	6	R3/8	4.8	14	17	38.4	31	15.2
PUWH-6D	6	R1/2	4.8	14	22	44.7	37.3	15.2
PUWH-8A	8	R1/8	4.8	16	16	34.2	26.7	16.2
PUWH-8B	8	R1/4	6.4	16	16	38.7	31.2	16.2
PUWH-8C	8	R3/8	6.4	16	17	39.3	31.8	16.2
PUWH-8D	8	R1/2	6.4	16	22	45.6	38.1	16.2
PUWH-10A	10	R1/8	4.8	19	19	36.3	28.7	17.2
PUWH-10B	10	R1/4	7.9	19	19	40.9	33.3	17.2
PUWH-10C	10	R3/8	7.9	19	19	40.9	33.3	17.2
PUWH-10D	10	R1/2	7.9	19	22	46.5	38.9	17.2
PUWH-12A	12	R1/8	4.8	22	22	38.8	28.7	22.8
PUWH-12B	12	R1/4	7.1	22	22	43.4	33.3	22.8
PUWH-12C	12	R3/8	9.5	22	22	43.4	33.3	22.8
PUWH-12D	12	R1/2	9.5	22	22	49	38.9	22.8
PUWH-14D	14	R1/2	11.1	26	24	49	38.9	24.4
PUWH-16D	16	R1/2	11.9	26	24	49	38.9	24.4
PUWH-18D	18	R1/2	11.9	30	27	50.5	40.4	24.4
PUWH-20D	20	R1/2	11.9	32	30	52.3	42.2	26
PUWH-20E	20	R3/4	15.9	32	30	52.3	42.2	26
PUWH-25E	25	R3/4	15.9	38	35	57.4	45.2	31.2
PUWH-25F	25	R1	21.8	38	35	62.2	50	31.2

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWH-1.6A	1.6	R1/8	1.3	8	12	26.2	22.4	8.6
PUWH-1.6B	1.6	R1/4	1.3	8	14	31	27.2	8.6
PUWH-3.2A	3.2	R1/8	2.3	10	12	30.5	23.9	12.7
PUWH-3.2B	3.2	R1/4	2.3	10	14	35.6	29	12.7
PUWH-6.35A	6.35	R1/8	4.8	14	14	32.8	25.4	15.2
PUWH-6.35B	6.35	R1/4	4.8	14	14	37.9	30.5	15.2
PUWH-6.35C	6.35	R3/8	4.8	14	17	38.4	31	15.2
PUWH-6.35D	6.35	R1/2	4.8	14	22	44.7	37.3	15.2
PUWH-9.52A	9.52	R1/8	4.8	17	17	35.3	27.9	16.8
PUWH-9.52B	9.52	R1/4	7.1	17	17	39.9	32.5	16.8
PUWH-9.52C	9.52	R3/8	7.1	17	17	39.9	32.5	16.8
PUWH-9.52D	9.52	R1/2	7.1	17	22	46.3	38.9	16.8
PUWH-12.7A	12.7	R1/8	4.8	22	22	38.8	28.7	22.8
PUWH-12.7B	12.7	R1/4	7.1	22	22	43.4	33.3	22.8
PUWH-12.7C	12.7	R3/8	9.7	22	22	43.4	33.3	22.8
PUWH-12.7D	12.7	R1/2	10.4	22	22	49	38.9	22.8
PUWH-15.88D	15.88	R1/2	11.9	26	24	49	38.9	24.4
PUWH-15.88E	15.88	R3/4	12.7	26	27	50.5	40.4	24.4
PUWH-15.88F	15.88	R1	12.7	26	35	57.1	47	24.4
PUWH-19.05D	19.05	R1/2	11.9	29	27	50.5	40.4	24.4
PUWH-19.05E	19.05	R3/4	15.7	29	27	50.5	40.4	24.4
PUWH-19.05F	19.05	R1	15.7	29	35	57.1	47	24.4
PUWH-25.4E	25.4	R3/4	15.7	38	35	57.4	45.2	31.2
PUWH-25.4F	25.4	R1	22.4	38	35	62.2	50	31.2

Male Connectors (NPT thread)



Size in mm

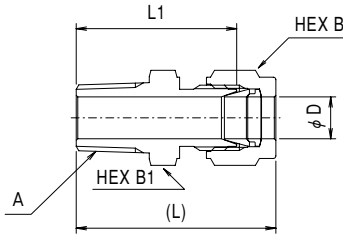
Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWH-3AN	3	1/8NPT	2.3	10	12	30.5	23.9	12.9
PUWH-3BN	3	1/4NPT	2.3	10	14	35.6	29	12.9
PUWH-4AN	4	1/8NPT	2.4	12	12	31.2	24.6	13.7
PUWH-4BN	4	1/4NPT	2.4	12	14	36.3	29.7	13.7
PUWH-6AN	6	1/8NPT	4.8	14	14	32.8	25.4	15.2
PUWH-6BN	6	1/4NPT	4.8	14	14	37.9	30.5	15.2
PUWH-6CN	6	3/8NPT	4.8	14	17	38.4	31	15.2
PUWH-6DN	6	1/2NPT	4.8	14	22	44.7	37.3	15.2
PUWH-8AN	8	1/8NPT	4.8	16	16	34.2	26.7	16.2
PUWH-8BN	8	1/4NPT	6.4	16	16	38.7	31.2	16.2
PUWH-8CN	8	3/8NPT	6.4	16	17	39.3	31.8	16.2
PUWH-8DN	8	1/2NPT	6.4	16	22	45.6	38.1	16.2
PUWH-10AN	10	1/8NPT	4.8	19	19	36.3	28.7	17.2
PUWH-10BN	10	1/4NPT	7.9	19	19	40.9	33.3	17.2
PUWH-10CN	10	3/8NPT	7.9	19	19	40.9	33.3	17.2
PUWH-10DN	10	1/2NPT	7.9	19	22	46.5	38.9	17.2
PUWH-12AN	12	1/8NPT	4.8	22	22	38.8	28.7	22.8
PUWH-12BN	12	1/4NPT	7.1	22	22	43.4	33.3	22.8
PUWH-12CN	12	3/8NPT	9.5	22	22	43.4	33.3	22.8
PUWH-12DN	12	1/2NPT	9.5	22	22	49	38.9	22.8
PUWH-14DN	14	1/2NPT	11.1	26	24	49	38.9	24.4
PUWH-16DN	16	1/2NPT	11.9	26	24	49	38.9	24.4
PUWH-18DN	18	1/2NPT	11.9	30	27	50.5	40.4	24.4
PUWH-20DN	20	1/2NPT	11.9	32	30	52.3	42.2	26
PUWH-20EN	20	3/4NPT	15.9	32	30	52.3	42.2	26
PUWH-25EN	25	3/4NPT	15.9	38	35	57.4	45.2	31.2
PUWH-25FN	25	1NPT	21.8	38	35	62.2	50	31.2

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWH-1.6AN	1.6	1/8NPT	1.3	8	12	26.2	22.4	8.6
PUWH-1.6BN	1.6	1/4NPT	1.3	8	14	31	27.2	8.6
PUWH-3.2AN	3.2	1/8NPT	2.3	10	12	30.5	23.9	12.7
PUWH-3.2BN	3.2	1/4NPT	2.3	10	14	35.6	29	12.7
PUWH-6.35AN	6.35	1/8NPT	4.8	14	14	32.8	25.4	15.2
PUWH-6.35BN	6.35	1/4NPT	4.8	14	14	37.9	30.5	15.2
PUWH-6.35CN	6.35	3/8NPT	4.8	14	17	38.4	31	15.2
PUWH-6.35DN	6.35	1/2NPT	4.8	14	22	44.7	37.3	15.2
PUWH-9.52AN	9.52	1/8NPT	4.8	17	17	35.3	27.9	16.8
PUWH-9.52BN	9.52	1/4NPT	7.1	17	17	39.9	32.5	16.8
PUWH-9.52CN	9.52	3/8NPT	7.1	17	17	39.9	32.5	16.8
PUWH-9.52DN	9.52	1/2NPT	7.1	17	22	46.3	38.9	16.8
PUWH-12.7AN	12.7	1/8NPT	4.8	22	22	38.8	28.7	22.8
PUWH-12.7BN	12.7	1/4NPT	7.1	22	22	43.4	33.3	22.8
PUWH-12.7CN	12.7	3/8NPT	9.7	22	22	43.4	33.3	22.8
PUWH-12.7DN	12.7	1/2NPT	10.4	22	22	49	38.9	22.8
PUWH-15.88DN	15.88	1/2NPT	11.9	26	24	49	38.9	24.4
PUWH-15.88EN	15.88	3/4NPT	12.7	26	27	50.5	40.4	24.4
PUWH-15.88FN	15.88	1NPT	12.7	26	35	57.1	47	24.4
PUWH-19.05DN	19.05	1/2NPT	11.9	29	27	50.5	40.4	24.4
PUWH-19.05EN	19.05	3/4NPT	15.7	29	27	50.5	40.4	24.4
PUWH-19.05FN	19.05	1NPT	15.7	29	35	57.1	47	24.4
PUWH-25.4EN	25.4	3/4NPT	15.7	38	35	57.4	45.2	31.2
PUWH-25.4FN	25.4	1NPT	22.4	38	35	62.2	50	31.2

POWERFULL Series

Thermocouple Male Connectors (R thread)



Size in mm

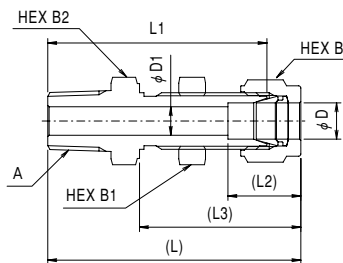
Part number	Nominal diameter D	A	B	B1	L	L1
PUWH-3A-T/C	3	R1/8	10	12	30.5	23.9
PUWH-3B-T/C	3	R1/4	10	14	35.6	29
PUWH-4A-T/C	4	R1/8	12	12	31.2	24.6
PUWH-4B-T/C	4	R1/4	12	14	36.3	29.7
PUWH-6A-T/C	6	R1/8	14	14	32.8	25.4
PUWH-6B-T/C	6	R1/4	14	14	37.9	30.5
PUWH-6C-T/C	6	R3/8	14	17	38.4	31
PUWH-6D-T/C	6	R1/2	14	22	44.7	37.3
PUWH-8B-T/C	8	R1/4	16	16	38.7	31.2
PUWH-8C-T/C	8	R3/8	16	17	39.3	31.8
PUWH-8D-T/C	8	R1/2	16	22	45.6	38.1
PUWH-10C-T/C	10	R3/8	19	19	40.9	33.3
PUWH-10D-T/C	10	R1/2	19	22	46.5	38.9
PUWH-12D-T/C	12	R1/2	22	22	49	38.9

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	B	B1	L	L1
PUWH-3.2A-T/C	3.2	R1/8	10	12	30.5	23.9
PUWH-3.2B-T/C	3.2	R1/4	10	14	35.6	29
PUWH-6.35B-T/C	6.35	R1/4	14	14	37.9	30.5
PUWH-6.35C-T/C	6.35	R3/8	14	17	38.4	31
PUWH-6.35D-T/C	6.35	R1/2	14	22	44.7	37.3
PUWH-9.52C-T/C	9.52	R3/8	17	17	39.9	32.5
PUWH-9.52D-T/C	9.52	R1/2	17	22	46.3	38.9
PUWH-12.7D-T/C	12.7	R1/2	22	22	49	38.9

Also available with NPT (ANSI) threads.

Bulkhead Male Connectors (R thread)

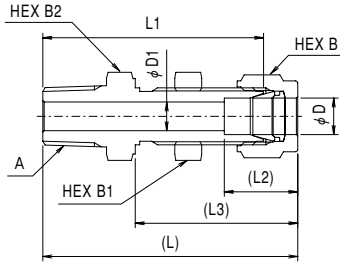


Size in mm

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWHP-3A	3	R1/8	8	10.5	2.3	10	12	12	46.4	39.8	12.9	31.2
PUWHP-3B	3	R1/4	8	10.5	2.3	10	12	14	51.5	44.9	12.9	31.2
PUWHP-6A	6	R1/8	11.2	12	4.8	14	14	14	49.6	42.2	15.2	33.6
PUWHP-6B	6	R1/4	11.2	12	4.8	14	14	14	54.1	46.7	15.2	33.6
PUWHP-6C	6	R3/8	11.2	12	4.8	14	14	17	54.1	46.7	15.2	33.6
PUWHP-6D	6	R1/2	11.2	12	4.8	14	14	22	60.6	53.2	15.2	33.6
PUWHP-8A	8	R1/8	12.8	12.5	4.8	16	17	17	52.2	44.7	16.2	36.1
PUWHP-8B	8	R1/4	12.8	12.5	6.4	16	17	17	56.7	49.2	16.2	36.1
PUWHP-8C	8	R3/8	12.8	12.5	6.4	16	17	17	56.7	49.2	16.2	36.1
PUWHP-8D	8	R1/2	12.8	12.5	6.4	16	17	22	63.1	55.6	16.2	36.1
PUWHP-10A	10	R1/8	16	12.5	4.8	19	22	22	53.9	46.3	17.2	37
PUWHP-10B	10	R1/4	16	12.5	7.9	19	22	22	58.4	50.8	17.2	37
PUWHP-10C	10	R3/8	16	12.5	7.9	19	22	22	58.4	50.8	17.2	37
PUWHP-10D	10	R1/2	16	12.5	7.9	19	22	22	63.2	55.6	17.2	37
PUWHP-12A	12	R1/8	19.1	12.5	4.8	22	23	23	58.7	48.6	22.8	41.9
PUWHP-12B	12	R1/4	19.1	12.5	7.1	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12C	12	R3/8	19.1	12.5	9.5	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12D	12	R1/2	19.1	12.5	9.5	22	23	23	68	57.9	22.8	41.9

Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

Bulkhead Male Connectors (R thread)

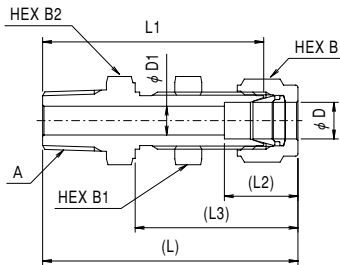


Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWHP-3.2A	3.2	R1/8	8	10.5	2.3	10	12	12	45.7	39.1	12.7	31.2
PUWHP-3.2B	3.2	R1/4	8	10.5	2.3	10	12	14	50.2	43.6	12.7	31.2
PUWHP-6.35A	6.35	R1/8	11.2	12	4.8	14	14	14	49.6	42.2	15.2	33.5
PUWHP-6.35B	6.35	R1/4	11.2	12	4.8	14	14	14	54.1	46.7	15.2	33.5
PUWHP-6.35C	6.35	R3/8	11.2	12	4.8	14	14	17	54.1	46.7	15.2	33.5
PUWHP-6.35D	6.35	R1/2	11.2	12	4.8	14	14	22	60.6	53.2	15.2	33.5
PUWHP-9.52A	9.52	R1/8	14.3	12.5	4.8	17	19	19	52	44.6	16.8	36.8
PUWHP-9.52B	9.52	R1/4	14.3	12.5	7.1	17	19	19	57.4	50	16.8	36.8
PUWHP-9.52C	9.52	R3/8	14.3	12.5	7.1	17	19	19	57.4	50	16.8	36.8
PUWHP-9.52D	9.52	R1/2	14.3	12.5	7.1	17	19	22	63.8	56.4	16.8	36.8
PUWHP-12.7A	12.7	R1/8	19.1	12.5	4.8	22	23	23	58.7	48.6	22.8	41.9
PUWHP-12.7B	12.7	R1/4	19.1	12.5	7.1	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12.7C	12.7	R3/8	19.1	12.5	9.7	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12.7D	12.7	R1/2	19.1	12.5	10.4	22	23	23	68.8	58.7	22.8	41.9

Bulkhead Male Connectors (NPT thread)



Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

Size in mm

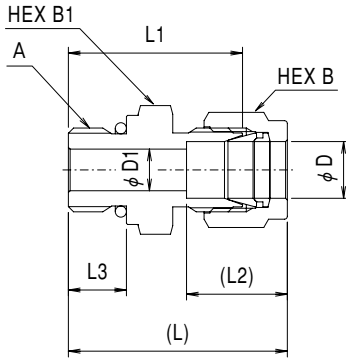
Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWHP-3AN	3	1/8NPT	8	10.5	2.3	10	12	12	46.4	39.8	12.9	31.2
PUWHP-3BN	3	1/4NPT	8	10.5	2.3	10	12	14	51.5	44.9	12.9	31.2
PUWHP-6AN	6	1/8NPT	11.2	12	4.8	14	14	14	49.6	42.2	15.2	33.6
PUWHP-6BN	6	1/4NPT	11.2	12	4.8	14	14	14	54.1	46.7	15.2	33.6
PUWHP-6CN	6	3/8NPT	11.2	12	4.8	14	14	17	54.1	46.7	15.2	33.6
PUWHP-6DN	6	1/2NPT	11.2	12	4.8	14	14	22	60.6	53.2	15.2	33.6
PUWHP-8AN	8	1/8NPT	12.8	12.5	4.8	16	17	17	52.2	44.7	16.2	36.1
PUWHP-8BN	8	1/4NPT	12.8	12.5	6.4	16	17	17	56.7	49.2	16.2	36.1
PUWHP-8CN	8	3/8NPT	12.8	12.5	6.4	16	17	17	56.7	49.2	16.2	36.1
PUWHP-8DN	8	1/2NPT	12.8	12.5	6.4	16	17	22	63.1	55.6	16.2	36.1
PUWHP-10AN	10	1/8NPT	16	12.5	4.8	19	22	22	53.9	46.3	17.2	37
PUWHP-10BN	10	1/4NPT	16	12.5	7.9	19	22	22	58.4	50.8	17.2	37
PUWHP-10CN	10	3/8NPT	16	12.5	7.9	19	22	22	58.4	50.8	17.2	37
PUWHP-10DN	10	1/2NPT	16	12.5	7.9	19	22	22	63.2	55.6	17.2	37
PUWHP-12AN	12	1/8NPT	19.1	12.5	4.8	22	23	23	58.7	48.6	22.8	41.9
PUWHP-12BN	12	1/4NPT	19.1	12.5	7.1	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12CN	12	3/8NPT	19.1	12.5	9.5	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12DN	12	1/2NPT	19.1	12.5	9.5	22	23	23	68	57.9	22.8	41.9

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWHP-3.2AN	3.2	1/8NPT	8	10.5	2.3	10	12	12	45.7	39.1	12.7	31.2
PUWHP-3.2BN	3.2	1/4NPT	8	10.5	2.3	10	12	14	50.2	43.6	12.7	31.2
PUWHP-6.35AN	6.35	1/8NPT	11.2	12	4.8	14	14	14	49.6	42.2	15.2	33.5
PUWHP-6.35BN	6.36	1/4NPT	11.2	12	4.8	14	14	14	54.1	46.7	15.2	33.5
PUWHP-6.35CN	6.35	3/8NPT	11.2	12	4.8	14	14	17	54.1	46.7	15.2	33.5
PUWHP-6.35DN	6.35	1/2NPT	11.2	12	4.8	14	14	22	60.6	53.2	15.2	33.5
PUWHP-9.52AN	9.52	1/8NPT	14.3	12.5	4.8	17	19	19	52	44.6	16.8	36.8
PUWHP-9.52BN	9.52	1/4NPT	14.3	12.5	7.1	17	19	19	57.4	50	16.8	36.8
PUWHP-9.52CN	9.52	3/8NPT	14.3	12.5	7.1	17	19	19	57.4	50	16.8	36.8
PUWHP-9.52DN	9.52	1/2NPT	14.3	12.5	7.1	17	19	22	63.8	56.4	16.8	36.8
PUWHP-12.7AN	12.7	1/8NPT	19.1	12.5	4.8	22	23	23	58.7	48.6	22.8	41.9
PUWHP-12.7BN	12.7	1/4NPT	19.1	12.5	7.1	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12.7CN	12.7	3/8NPT	19.1	12.5	9.7	22	23	23	63.2	53.1	22.8	41.9
PUWHP-12.7DN	12.7	1/2NPT	19.1	12.5	10.4	22	23	23	68.8	58.7	22.8	41.9

POWERFULL Series

O-ring Male Connectors (UNF)

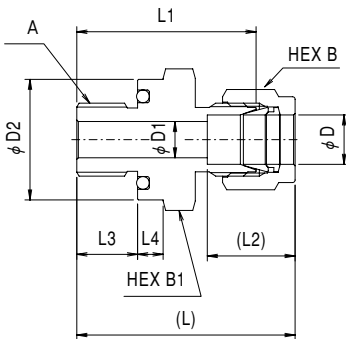


Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2	L3	O-ring Size AS568
PUWH-3.2X7/16	3.2	7/16-20UNF	2.3	10	16	31.5	24.9	12.7	9.1	904
PUWH-6.35X7/16	6.35	7/16-20UNF	4.8	14	16	34.1	26.7	15.2	9.1	904
PUWH-6.35X9/16	6.35	9/16-18UNF	4.8	14	19	35.6	28.2	15.2	9.9	906
PUWH-6.35X3/4	6.35	3/4-16UNF	4.8	14	23	37.6	30.2	15.2	11.2	908
PUWH-9.52X7/16	9.52	7/16-20UNF	5.1	17	17	35.6	28.2	16.8	9.1	904
PUWH-9.52X9/16	9.52	9/16-18UNF	7.1	17	19	37.1	29.7	16.8	9.9	906
PUWH-9.52X3/4	9.52	3/4-16UNF	7.1	17	23	39.2	31.8	16.8	11.2	908
PUWH-12.7X9/16	12.7	9/16-18UNF	7.1	22	22	39.1	29	22.8	9.9	906
PUWH-12.7X3/4	12.7	3/4-16UNF	10.4	22	23	41.9	31.8	22.8	11.2	908

For interfacing with SAE J1926 ports, O-rings are made of fluororubber with a Shore A hardness of 90. The maximum operating temperature is 200°C.

O-ring Male Connectors (UNF)

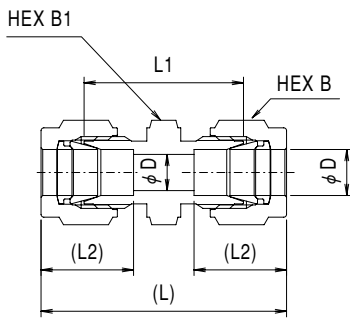


Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	B1	L	L1	L2	L3	L4	O-ring Size AS568
PUWH-3.2X5/16-OR	3.2	5/16-24UNF	2.3	13.8	10	14	32.8	26.2	12.7	8.6	3	011
PUWH-6.35X7/16-OR	6.35	7/16-20UNF	4.8	18.8	14	19	38.4	31	15.2	10.4	5	013
PUWH-9.52X9/16-OR	9.52	9/16-18UNF	7.1	23.6	17	24	42.5	35.1	16.8	11.9	5	113
PUWH-12.7X3/4-OR	12.7	3/4-16UNF	10.4	28.4	22	29	45.9	35.8	22.8	11.9	5	116

O-rings are made of nitrile rubber with a Shore A hardness of 70. The maximum operating temperature is 80°C.

Straight Unions



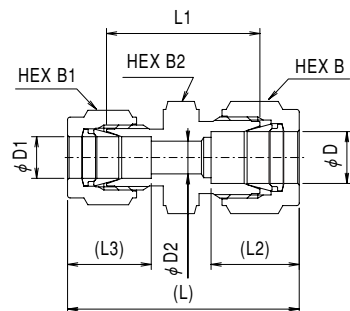
Size in mm

Part number	Nominal diameter D	D1	B	B1	L	L1	L2
PUWF-3	3	2.3	10	10	35.6	22.4	12.9
PUWF-4	4	2.4	12	12	37.3	24.1	13.7
PUWF-6	6	4.8	14	14	41	26.2	15.2
PUWF-8	8	6.4	16	16	43.2	28.2	16.2
PUWF-10	10	7.9	19	19	46.2	31	17.2
PUWF-12	12	9.5	22	22	51.2	31	22.8
PUWF-14	14	11.1	26	24	52	31.8	24.4
PUWF-16	16	12.7	26	24	52	31.8	24.4
PUWF-18	18	15.1	30	27	53.5	33.3	24.4
PUWF-20	20	15.9	32	30	55	34.8	26
PUWF-25	25	21.8	38	35	64.8	40.4	31.2

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	B	B1	L	L1	L2
PUWF-1.6	1.6	1.3	8	8	25.1	17.5	8.6
PUWF-3.2	3.2	2.3	10	10	35.6	22.4	12.7
PUWF-6.35	6.35	4.8	14	14	41	26.2	15.2
PUWF-9.52	9.52	7.1	17	17	45	30.2	16.8
PUWF-12.7	12.7	10.4	22	22	51.2	31	22.8
PUWF-15.88	15.88	12.7	26	24	52	31.8	24.4
PUWF-19.05	19.05	15.7	29	27	53.5	33.3	24.4
PUWF-25.4	25.4	22.4	38	35	64.8	40.4	31.2

Reducing Unions



Size in mm x mm

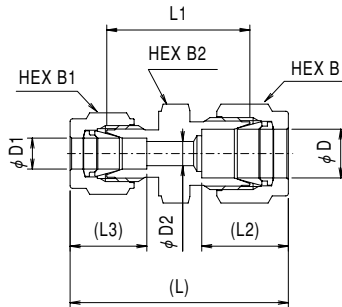
Part number	Nominal diameter D	Nominal diameter D1	D2	B	B1	B2	L	L1	L2	L3
PUWF-4X3	4	3	2.3	12	10	12	36.6	23.4	13.7	12.9
PUWF-6X3	6	3	2.3	14	10	14	38.6	24.6	15.2	12.9
PUWF-6X4	6	4	2.4	14	12	14	39.4	25.4	15.2	13.7
PUWF-8X6	8	6	4.8	16	14	16	42.3	27.4	16.2	15.2
PUWF-10X6	10	6	4.8	19	14	19	44.5	29.5	17.2	15.2
PUWF-10X8	10	8	6.4	19	16	19	45.1	30	17.2	16.2
PUWF-12X6	12	6	4.8	22	14	22	47	29.5	22.8	15.2
PUWF-12X8	12	8	6.4	22	16	22	47.8	30.2	22.8	16.2
PUWF-12X10	12	10	7.9	22	19	22	48.7	31	22.8	17.2

Size in metric equivalents (mm) of fractional inches x metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	Nominal diameter D1	D2	B	B1	B2	L	L1	L2	L3
PUWF-3.2X1.6	3.2	1.6	1.3	10	8	10	31	20.6	12.7	8.6
PUWF-6.35X3.2	6.35	3.2	2.3	14	10	14	38.6	24.6	15.2	12.7
PUWF-9.52X3.2	9.52	3.2	2.3	17	10	17	40.9	26.9	16.8	12.7
PUWF-9.52X6.35	9.52	6.35	4.8	17	14	17	43.2	28.4	16.8	15.2
PUWF-12.7X6.35	12.7	6.35	4.8	22	14	22	47	29.5	22.8	15.2
PUWF-12.7X9.52	12.7	9.52	7.1	22	17	22	48.5	31	22.8	16.8
PUWF-15.88X12.7	15.88	12.7	10.4	26	22	24	52	31.8	24.4	22.8
PUWF-19.05X12.7	19.05	12.7	10.4	29	22	27	53.5	33.3	24.4	22.8
PUWF-19.05X15.88	19.05	15.88	12.7	29	26	27	53.5	33.3	24.4	24.4
PUWF-25.4X12.7	25.4	12.7	10.4	38	22	35	60.4	38.1	31.2	22.8
PUWF-25.4X19.05	25.4	19.05	15.7	38	29	35	60.4	38.1	31.2	24.4

POWERFULL Series

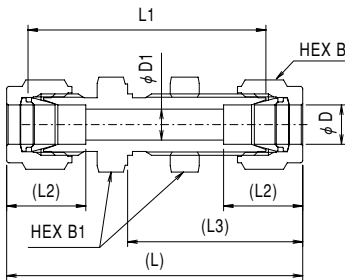
Reducing Unions



Size in metric equivalents (mm) of fractional inches x mm

Part number	Nominal diameter D	Nominal diameter D1	D2	B	B1	B2	L	L1	L2	L3
PUWF-3.2X3	3.2	3	2.3	10	10	10	35.6	22.4	12.7	12.9
PUWF-6.35X6	6.35	6	4.8	14	14	14	41	26.2	15.2	15.2
PUWF-9.52X6	9.52	6	4.8	17	14	17	43.2	28.4	16.8	15.2
PUWF-9.52X8	9.52	8	6.4	17	16	17	44.4	29.5	16.8	16.2
PUWF-12.7X8	12.7	8	6.4	22	16	22	47.8	30.2	22.8	16.2
PUWF-12.7X10	12.7	10	7.9	22	19	22	47.9	31	22.8	17.8
PUWF-12.7X12	12.7	12	9.5	22	22	22	50.4	31	22.8	22.8

Bulkhead Unions



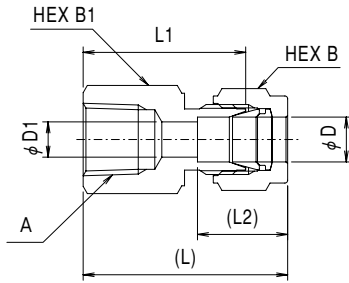
Size in mm

Part number	Nominal diameter D	Panel hole diameter	Max. panel thickness	D1	B	B1	L	L1	L2	L3
PUWP-3	3	8	10.5	2.3	10	12	51.3	38.1	12.9	31.2
PUWP-4	4	9.6	12	2.4	12	14	53.6	40.4	13.7	32
PUWP-6	6	11.2	12	4.8	14	14	57.7	42.9	15.2	33.6
PUWP-8	8	12.8	12.5	6.4	16	17	61	46	16.2	36.1
PUWP-10	10	16	12.5	7.9	19	22	63.7	48.5	17.2	37
PUWP-12	12	19.1	12.5	9.5	22	23	71	50.8	22.8	41.9

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	Panel hole diameter	Max. panel thickness	D1	B	B1	L	L1	L2	L3
PUWP-3.2	3.2	8	10.5	2.3	10	12	51.3	38.1	12.7	31.2
PUWP-6.35	6.35	11.2	12	4.8	14	14	57.7	42.9	15.2	33.6
PUWP-9.52	9.52	14.3	12.5	7.1	17	19	62.3	47.5	16.8	36.9
PUWP-12.7	12.7	19.1	12.5	10.4	22	23	71	50.8	22.8	41.9
PUWP-15.88	15.88	22.6	12.5	12.7	26	27	72.5	52.3	24.4	42.6
PUWP-19.05	19.05	25.8	17	15.7	29	30	78.9	58.7	24.4	47.4
PUWP-25.4	25.4	33.7	19	22.4	38	41	95.8	71.4	31.2	57.4

Female Connectors (Rc thread)



Size in mm

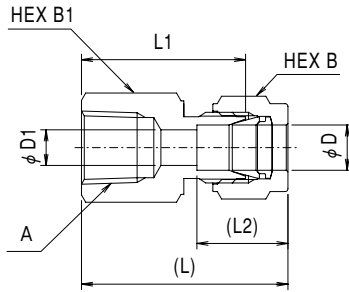
Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-3A	3	Rc1/8	2.3	10	14	28.7	22.1	12.9
PUWG-3B	3	Rc1/4	2.3	10	17	33.5	26.9	12.9
PUWG-4A	4	Rc1/8	2.4	12	14	29.7	23.1	13.7
PUWG-4B	4	Rc1/4	2.4	12	17	34.2	27.6	13.7
PUWG-6A	6	Rc1/8	4.8	14	14	31.3	23.9	15.2
PUWG-6B	6	Rc1/4	4.8	14	17	35.8	28.4	15.2
PUWG-6C	6	Rc3/8	4.8	14	21	37.6	30.2	15.2
PUWG-6D	6	Rc1/2	4.8	14	26	42.5	35.1	15.2
PUWG-8A	8	Rc1/8	6.4	16	16	32.1	24.6	16.2
PUWG-8B	8	Rc1/4	6.4	16	17	37	29.5	16.2
PUWG-8C	8	Rc3/8	6.4	16	21	38.5	31	16.2
PUWG-8D	8	Rc1/2	6.4	16	26	43.3	35.8	16.2
PUWG-10A	10	Rc1/8	7	19	19	33	25.4	17.2
PUWG-10B	10	Rc1/4	7.9	19	19	37.8	30.2	17.2
PUWG-10C	10	Rc3/8	7.9	19	21	39.4	31.8	17.2
PUWG-10D	10	Rc1/2	7.9	19	26	44.2	36.6	17.2
PUWG-12A	12	Rc1/8	7	22	22	35.5	25.4	22.8
PUWG-12B	12	Rc1/4	9.5	22	22	40.3	30.2	22.8
PUWG-12C	12	Rc3/8	9.5	22	22	41.9	31.8	22.8
PUWG-12D	12	Rc1/2	9.5	22	26	46.7	36.6	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-1.6A	1.6	Rc1/8	1.3	8	14	24.4	20.6	8.6
PUWG-3.2A	3.2	Rc1/8	2.3	10	14	28.7	22.1	12.7
PUWG-3.2B	3.2	Rc1/4	2.3	10	17	33.5	26.9	12.7
PUWG-6.35A	6.35	Rc1/8	4.8	14	14	31.3	23.9	15.2
PUWG-6.35B	6.35	Rc1/4	4.8	14	17	35.8	28.4	15.2
PUWG-6.35C	6.35	Rc3/8	4.8	14	21	37.6	30.2	15.2
PUWG-6.35D	6.35	Rc1/2	4.8	14	26	42.5	35.1	15.2
PUWG-9.52A	9.52	Rc1/8	7.1	17	17	32.8	25.4	16.8
PUWG-9.52B	9.52	Rc1/4	7.1	17	17	37.6	30.2	16.8
PUWG-9.52C	9.52	Rc3/8	7.1	17	21	39.2	31.8	16.8
PUWG-9.52D	9.52	Rc1/2	7.1	17	26	44	36.6	16.8
PUWG-12.7A	12.7	Rc1/8	7	22	22	35.5	25.4	22.8
PUWG-12.7B	12.7	Rc1/4	10.4	22	22	40.3	30.2	22.8
PUWG-12.7C	12.7	Rc3/8	10.4	22	22	41.9	31.8	22.8
PUWG-12.7D	12.7	Rc1/2	10.4	22	26	46.7	36.6	22.8
PUWG-15.88D	15.88	Rc1/2	12.7	26	26	46.8	36.6	24.4
PUWG-19.05D	19.05	Rc1/2	15.7	29	27	46.7	36.6	24.4
PUWG-19.05E	19.05	Rc3/4	15.7	29	32	48.2	38.1	24.4
PUWG-19.05F	19.05	Rc1	15.7	29	41	57.7	47.6	24.4
PUWG-25.4E	25.4	Rc3/4	22.4	38	35	53.3	41.1	31.2
PUWG-25.4F	25.4	Rc1	22.4	38	41	62.2	50	31.2

POWERFULL Series

Female Connectors (NPT thread)



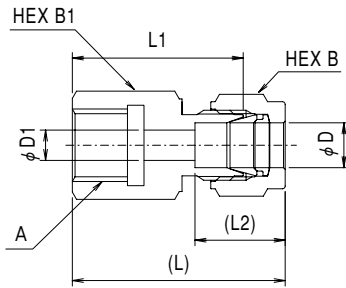
Size in mm

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-3AN	3	1/8NPT	2.3	10	14	28.7	22.1	12.9
PUWG-3BN	3	1/4NPT	2.3	10	17	33.5	26.9	12.9
PUWG-4AN	4	1/8NPT	2.4	12	14	29.7	23.1	13.7
PUWG-4BN	4	1/4NPT	2.4	12	17	34.2	27.6	13.7
PUWG-6AN	6	1/8NPT	4.8	14	14	31.3	23.9	15.2
PUWG-6BN	6	1/4NPT	4.8	14	17	35.8	28.4	15.2
PUWG-6CN	6	3/8NPT	4.8	14	21	37.6	30.2	15.2
PUWG-6DN	6	1/2NPT	4.8	14	26	42.5	35.1	15.2
PUWG-8AN	8	1/8NPT	6.4	16	16	32.1	24.6	16.2
PUWG-8BN	8	1/4NPT	6.4	16	17	37	29.5	16.2
PUWG-8CN	8	3/8NPT	6.4	16	21	38.5	31	16.2
PUWG-8DN	8	1/2NPT	6.4	16	26	43.3	35.8	16.2
PUWG-10AN	10	1/8NPT	7	19	19	33	25.4	17.2
PUWG-10BN	10	1/4NPT	7.9	19	19	37.8	30.2	17.2
PUWG-10CN	10	3/8NPT	7.9	19	21	39.4	31.8	17.2
PUWG-10DN	10	1/2NPT	7.9	19	26	44.2	36.6	17.2
PUWG-12AN	12	1/8NPT	7	22	22	35.5	25.4	22.8
PUWG-12BN	12	1/4NPT	9.5	22	22	40.3	30.2	22.8
PUWG-12CN	12	3/8NPT	9.5	22	22	41.9	31.8	22.8
PUWG-12DN	12	1/2NPT	9.5	22	26	46.7	36.6	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-3.2AN	3.2	1/8NPT	2.3	10	14	28.7	22.1	12.7
PUWG-3.2BN	3.2	1/4NPT	2.3	10	17	33.5	26.9	12.7
PUWG-6.35AN	6.35	1/8NPT	4.8	14	14	31.3	23.9	15.2
PUWG-6.35BN	6.35	1/4NPT	4.8	14	17	35.8	28.4	15.2
PUWG-6.35CN	6.35	3/8NPT	4.8	14	21	37.6	30.2	15.2
PUWG-6.35DN	6.35	1/2NPT	4.8	14	26	42.5	35.1	15.2
PUWG-9.52AN	9.52	1/8NPT	7.1	17	17	32.8	25.4	16.8
PUWG-9.52BN	9.52	1/4NPT	7.1	17	17	37.6	30.2	16.8
PUWG-9.52CN	9.52	3/8NPT	7.1	17	21	39.2	31.8	16.8
PUWG-9.52DN	9.52	1/2NPT	7.1	17	26	44	36.6	16.8
PUWG-12.7AN	12.7	1/8NPT	7	22	22	35.5	25.4	22.8
PUWG-12.7BN	12.7	1/4NPT	10.4	22	22	40.3	30.2	22.8
PUWG-12.7CN	12.7	3/8NPT	10.4	22	22	41.9	31.8	22.8
PUWG-12.7DN	12.7	1/2NPT	10.4	22	26	46.7	36.6	22.8
PUWG-15.88DN	15.88	1/2NPT	12.7	26	26	46.8	36.6	24.4
PUWG-19.05DN	19.05	1/2NPT	15.7	29	27	46.7	36.6	24.4
PUWG-19.05EN	19.05	3/4NPT	15.7	29	32	48.2	38.1	24.4
PUWG-19.05FN	19.05	1NPT	15.7	29	41	57.7	47.6	24.4
PUWG-25.4EN	25.4	3/4NPT	22.4	38	35	53.3	41.1	31.2
PUWG-25.4FN	25.4	1NPT	22.4	38	41	62.2	50	31.2

Female Connectors (G thread)



Size in mm

Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-3AF	3	G1/8	5.5※	10	14	29.3	22.7	12.9
PUWG-3BF	3	G1/4	5.5※	10	17	35.3	28.7	12.9
PUWG-4AF	4	G1/8	5.5※	12	14	30.3	23.7	13.7
PUWG-4BF	4	G1/4	5.5※	12	17	36.3	29.7	13.7
PUWG-6AF	6	G1/8	5.5	14	14	31.3	23.9	15.2
PUWG-6BF	6	G1/4	5.5	14	17	37.6	30.2	15.2
PUWG-6CF	6	G3/8	5.5	14	21	37.6	30.2	15.2
PUWG-6DF	6	G1/2	5.5	14	26	43.5	36.1	15.2
PUWG-8AF	8	G1/8	5.5	16	16	32.2	24.7	16.2
PUWG-8BF	8	G1/4	5.5	16	17	38.5	31	16.2
PUWG-8CF	8	G3/8	5.5	16	21	36.2	28.7	16.2
PUWG-8DF	8	G1/2	5.5	16	26	41	33.5	16.2
PUWG-10AF	10	G1/8	5.5	19	19	33	25.4	17.2
PUWG-10BF	10	G1/4	5.5	19	19	39.4	31.8	17.2
PUWG-10CF	10	G3/8	5.5	19	21	38.8	31.2	17.2
PUWG-10DF	10	G1/2	5.5	19	26	42.1	34.5	17.2
PUWG-12AF	12	G1/8	5.5	22	22	35.5	25.4	22.8
PUWG-12BF	12	G1/4	5.5	22	22	41.9	31.8	22.8
PUWG-12CF	12	G3/8	5.5	22	22	44.4	34.3	22.8
PUWG-12DF	12	G1/2	5.5	22	26	48.2	38.1	22.8

Size in metric equivalents (mm) of fractional inches

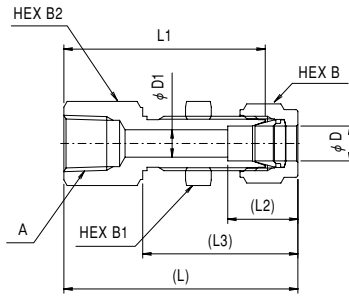
Part number	Nominal diameter D	A	D1	B	B1	L	L1	L2
PUWG-3.2AF	3.2	G1/8	5.5※	10	14	29.3	22.7	12.7
PUWG-3.2BF	3.2	G1/4	5.5※	10	17	35.3	28.7	12.7
PUWG-6.35AF	6.35	G1/8	5.5	14	14	31.3	23.9	15.2
PUWG-6.35BF	6.35	G1/4	5.5	14	17	37.6	30.2	15.2
PUWG-6.35CF	6.35	G3/8	5.5	14	21	37.6	30.2	15.2
PUWG-6.35DF	6.35	G1/2	5.5	14	26	43.5	36.1	15.2
PUWG-9.52AF	9.52	G1/8	5.5	17	17	32.8	25.4	16.8
PUWG-9.52BF	9.52	G1/4	5.5	17	17	39.2	31.8	16.8
PUWG-9.52CF	9.52	G3/8	5.5	17	21	38.6	31.2	16.8
PUWG-9.52DF	9.52	G1/2	5.5	17	26	41.9	34.5	16.8
PUWG-12.7AF	12.7	G1/8	5.5	22	22	35.5	25.4	22.8
PUWG-12.7BF	12.7	G1/4	5.5	22	22	41.9	31.8	22.8
PUWG-12.7CF	12.7	G3/8	5.5	22	22	44.4	34.3	22.8
PUWG-12.7DF	12.7	G1/2	5.5	22	26	48.2	38.1	22.8

For fittings with a nominal diameter of 3mm, 3.2mm (1/8"), 4mm, and 6mm, the inner diameter of the gasket ($\phi D1$) is 5.5mm. However, the interior of the fitting's body is stepped such that the portion directly behind the gasket and in front of the tube is as follows:

Tube OD (mm)	Fitting ID (mm)
3, 4	2.4
3.2	2.3
6	4.8

POWERFULL Series

Bulkhead Female Connectors (Rc thread)



Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

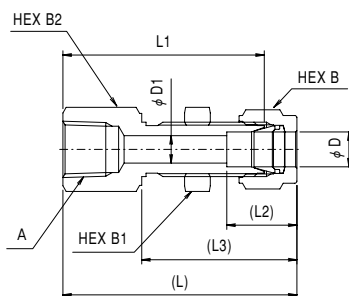
Size in mm

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWGP-3A	3	Rc1/8	8	10.5	2.3	10	12	14	44.7	38.1	12.9	31.2
PUWGP-3B	3	Rc1/4	8	10.5	2.3	10	12	17	49.4	42.8	12.9	31.2
PUWGP-4A	4	Rc1/8	9.6	12	2.4	12	14	14	45.7	39.1	13.7	32
PUWGP-6A	6	Rc1/8	11.2	12	4.8	14	14	14	47.2	39.8	15.2	33.6
PUWGP-6B	6	Rc1/4	11.2	12	4.8	14	14	17	51.8	44.4	15.2	33.6
PUWGP-6C	6	Rc3/8	11.2	12	4.8	14	14	21	53.5	46.1	15.2	33.6
PUWGP-6D	6	Rc1/2	11.2	12	4.8	14	14	26	58.4	51	15.2	33.6
PUWGP-8A	8	Rc1/8	12.8	12.5	6.4	16	17	17	49.6	42.1	16.2	36.1
PUWGP-8B	8	Rc1/4	12.8	12.5	6.4	16	17	17	54.5	47	16.2	36.1
PUWGP-8C	8	Rc3/8	12.8	12.5	6.4	16	17	21	56	48.5	16.2	36.1
PUWGP-10A	10	Rc1/8	16	12.5	7	19	22	22	50.5	42.9	17.2	37
PUWGP-10B	10	Rc1/4	16	12.5	7.9	19	22	22	55.3	47.7	17.2	37
PUWGP-10C	10	Rc3/8	16	12.5	7.9	19	22	22	56.9	49.3	17.2	37
PUWGP-10D	10	Rc1/2	16	12.5	7.9	19	22	26	61.7	54.1	17.2	37
PUWGP-12A	12	Rc1/8	19.1	12.5	7	22	23	23	55.4	45.3	22.8	41.9
PUWGP-12B	12	Rc1/4	19.1	12.5	9.5	22	23	23	60.2	50.1	22.8	41.9
PUWGP-12C	12	Rc3/8	19.1	12.5	9.5	22	23	23	61.8	51.7	22.8	41.9
PUWGP-12D	12	Rc1/2	19.1	12.5	9.5	22	23	26	66.6	56.5	22.8	41.9

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWGP-3.2A	3.2	Rc1/8	8	10.5	2.3	10	12	14	44.7	38.1	12.7	31.2
PUWGP-3.2B	3.2	Rc1/4	8	10.5	2.3	10	12	17	49.4	42.8	12.7	31.2
PUWGP-6.35A	6.35	Rc1/8	11.2	12	4.8	14	14	14	47	39.6	15.2	33.6
PUWGP-6.35B	6.35	Rc1/4	11.2	12	4.8	14	14	17	51.9	44.5	15.2	33.6
PUWGP-6.35C	6.35	Rc3/8	11.2	12	4.8	14	14	21	53.5	46.1	15.2	33.6
PUWGP-9.52A	9.52	Rc1/8	14.3	12.5	7.1	17	19	19	50.4	43	16.8	36.9
PUWGP-9.52B	9.52	Rc1/4	14.3	12.5	7.1	17	19	19	55.2	47.8	16.8	36.9
PUWGP-9.52C	9.52	Rc3/8	14.3	12.5	7.1	17	19	21	56.8	49.4	16.8	36.9
PUWGP-9.52D	9.52	Rc1/2	14.3	12.5	7.1	17	19	26	61.6	54.2	16.8	36.9
PUWGP-12.7A	12.7	Rc1/8	19.1	12.5	7.1	22	23	23	55.4	45.3	22.8	41.9
PUWGP-12.7B	12.7	Rc1/4	19.1	12.5	10.4	22	23	23	60.1	50	22.8	41.9
PUWGP-12.7C	12.7	Rc3/8	19.1	12.5	10.4	22	23	23	61.8	51.7	22.8	41.9
PUWGP-12.7D	12.7	Rc1/2	19.1	12.5	10.4	22	23	26	66.6	56.5	22.8	41.9

Bulkhead Female Connectors (NPT thread)

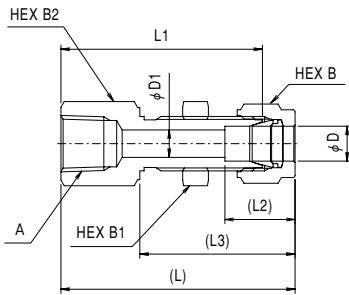


Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

Size in mm

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWGP-3AN	3	1/8NPT	8	10.5	2.3	10	12	14	44.7	38.1	12.9	31.2
PUWGP-3BN	3	1/4NPT	8	10.5	2.3	10	12	17	49.4	42.8	12.9	31.2
PUWGP-4AN	4	1/8NPT	9.6	12	2.4	12	14	14	45.7	39.1	13.7	32
PUWGP-6AN	6	1/8NPT	11.2	12	4.8	14	14	14	47.2	39.8	15.2	33.6
PUWGP-6BN	6	1/4NPT	11.2	12	4.8	14	14	17	51.8	44.4	15.2	33.6
PUWGP-6CN	6	3/8NPT	11.2	12	4.8	14	14	21	53.5	46.1	15.2	33.6
PUWGP-6DN	6	1/2NPT	11.2	12	4.8	14	14	26	58.4	51	15.2	33.6
PUWGP-8AN	8	1/8NPT	12.8	12.5	6.4	16	17	17	49.6	42.1	16.2	36.1
PUWGP-8BN	8	1/4NPT	12.8	12.5	6.4	16	17	17	54.5	47	16.2	36.1
PUWGP-8CN	8	3/8NPT	12.8	12.5	6.4	16	17	21	56	48.5	16.2	36.1
PUWGP-10AN	10	1/8NPT	16	12.5	7	19	22	22	50.5	42.9	17.2	37
PUWGP-10BN	10	1/4NPT	16	12.5	7.9	19	22	22	55.3	47.7	17.2	37
PUWGP-10CN	10	3/8NPT	16	12.5	7.9	19	22	22	56.9	49.3	17.2	37
PUWGP-10DN	10	1/2NPT	16	12.5	7.9	19	22	26	61.7	54.1	17.2	37
PUWGP-12AN	12	1/8NPT	19.1	12.5	7	22	23	23	55.4	45.3	22.8	41.9
PUWGP-12BN	12	1/4NPT	19.1	12.5	9.5	22	23	23	60.2	50.1	22.8	41.9
PUWGP-12CN	12	3/8NPT	19.1	12.5	9.5	22	23	23	61.8	51.7	22.8	41.9
PUWGP-12DN	12	1/2NPT	19.1	12.5	9.5	22	23	26	66.6	56.5	22.8	41.9

Bulkhead Female Connectors (NPT thread)

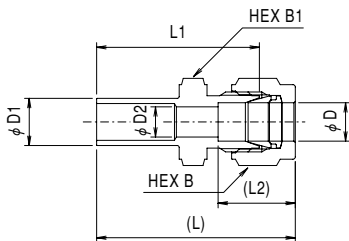


Note: The maximum operating pressures for this fitting differ from the values shown on p. 42. Keep this in mind before using this fitting.

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	Panel hole diameter	Max. panel thickness	D1	B	B1	B2	L	L1	L2	L3
PUWGP-3.2AN	3.2	1/8NPT	8	10.5	2.3	10	12	14	44.7	38.1	12.7	31.2
PUWGP-3.2BN	3.2	1/4NPT	8	10.5	2.3	10	12	17	49.4	42.8	12.7	31.2
PUWGP-6.35AN	6.35	1/8NPT	11.2	12	4.8	14	14	14	47	39.6	15.2	33.6
PUWGP-6.35BN	6.35	1/4NPT	11.2	12	4.8	14	14	17	51.9	44.5	15.2	33.6
PUWGP-6.35CN	6.35	3/8NPT	11.2	12	4.8	14	14	21	53.5	46.1	15.2	33.6
PUWGP-9.52AN	9.52	1/8NPT	14.3	12.5	7.1	17	19	19	50.4	43	16.8	36.9
PUWGP-9.52BN	9.52	1/4NPT	14.3	12.5	7.1	17	19	19	55.2	47.8	16.8	36.9
PUWGP-9.52CN	9.52	3/8NPT	14.3	12.5	7.1	17	19	21	56.8	49.4	16.8	36.9
PUWGP-12.7AN	12.7	1/8NPT	19.1	12.5	7.1	22	23	23	55.4	45.3	22.8	41.9
PUWGP-12.7BN	12.7	1/4NPT	19.1	12.5	10.4	22	23	23	60.1	50	22.8	41.9
PUWGP-12.7CN	12.7	3/8NPT	19.1	12.5	10.4	22	23	23	61.8	51.7	22.8	41.9
PUWGP-12.7DN	12.7	1/2NPT	19.1	12.5	10.4	22	23	26	66.6	56.5	22.8	41.9

Reducers



Size in mm

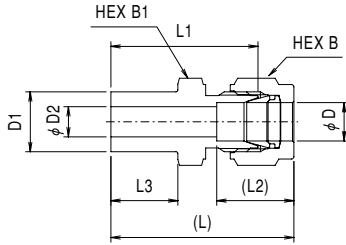
Part number	Nominal diameter D	D1	D2	B	B1	L	L1	L2
PUWR-3×6	3	6	2.3	10	10	36.1	29.5	12.9
PUWR-4×6	4	6	2.4	12	12	37.1	30.5	13.7
PUWR-4×8	4	8	2.4	12	12	38.1	31.5	13.7
PUWR-6×3	6	3	4.8	14	14	36.9	29.5	15.2
PUWR-6×8	6	8	4.8	14	14	39.9	32.5	15.2
PUWR-6×10	6	10	4.8	14	14	40.7	33.3	15.2
PUWR-6×12	6	12	4.8	14	14	46.3	38.9	15.2
PUWR-8×6	8	6	4	16	16	40.3	32.8	16.2
PUWR-8×10	8	10	6.4	16	16	42	34.5	16.2
PUWR-8×12	8	12	6.4	16	16	47.6	40.1	16.2
PUWR-10×6	10	6	4	19	19	42.4	34.8	17.2
PUWR-10×8	10	8	6	19	19	43.4	35.8	17.2
PUWR-10×12	10	12	7.9	19	19	49.8	42.2	17.2
PUWR-12×6	12	6	4	22	22	44.9	34.8	22.8
PUWR-12×8	12	8	6	22	22	45.9	35.8	22.8
PUWR-12×10	12	10	7.9	22	22	46.7	36.6	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	B	B1	L	L1	L2
PUWR-1.6×6.35	1.6	6.35	1.3	8	8	31.5	27.7	8.6
PUWR-3.2×1.6	3.2	1.6	0.8	10	10	29	22.4	12.7
PUWR-3.2×6.35	3.2	6.35	2.3	10	10	36.1	29.5	12.7
PUWR-3.2×9.52	3.2	9.52	2.3	10	12	38.1	31.5	12.7
PUWR-6.35×3.2	6.35	3.2	2	14	14	36.9	29.5	15.2
PUWR-6.35×6.35	6.35	6.35	4.3	14	14	39.2	31.8	15.2
PUWR-6.35×9.52	6.35	9.52	4.8	14	14	41.2	33.8	15.2
PUWR-6.35×12.7	6.35	12.7	4.8	14	14	47.3	39.9	15.2
PUWR-9.52×6.35	9.52	6.35	4.3	17	17	41.4	34	16.8
PUWR-9.52×9.52	9.52	9.52	7.1	17	17	43.7	36.3	16.8
PUWR-9.52×12.7	9.52	12.7	7.1	17	17	49.5	42.1	16.8
PUWR-12.7×6.35	12.7	6.35	4.3	22	22	44.9	34.8	22.8
PUWR-12.7×9.52	12.7	9.52	7.1	22	22	47.2	37.1	22.8
PUWR-12.7×19.05	12.7	19.05	10.4	22	22	54.8	44.7	22.8
PUWR-19.05×12.7	19.05	12.7	9.5	29	29	54.6	44.5	24.4

POWERFULL Series

Welding Reducers



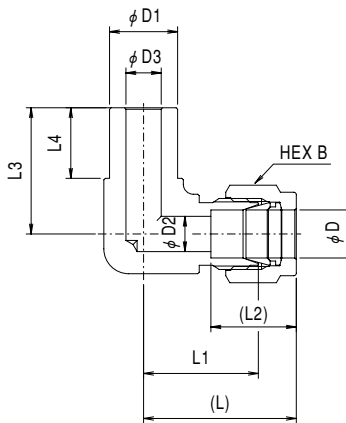
Size in mm

Part number	Nominal diameter D	D1	D2	B	B1	L	L1	L2	L3
PUWR-6×10.5	6	10.5	4.8	14	14	32.8	25.4	15.2	9.7
PUWR-6×13.8	6	13.8	4.8	14	16	37.9	30.5	15.2	14.2
PUWR-8×13.8	8	13.8	6.4	16	16	38.7	31.2	16.2	14.2
PUWR-8×17.3	8	17.3	6.4	16	19	38.7	31.2	16.2	14.2
PUWR-8×21.7	8	21.7	6.4	16	23	45.6	38.1	16.2	19.1
PUWR-10×13.8	10	13.8	7.1	19	19	40.9	33.3	17.2	14.2
PUWR-10×17.3	10	17.3	7.9	19	19	40.9	33.3	17.2	14.2
PUWR-10×21.7	10	21.7	7.9	19	23	46.5	38.9	17.2	19.1
PUWR-12×13.8	12	13.8	7.1	22	22	43.4	33.3	22.8	14.2
PUWR-12×17.3	12	17.3	9.5	22	22	43.4	33.3	22.8	14.2
PUWR-12×21.7	12	21.7	9.5	22	23	49	38.9	22.8	19.1

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	B	B1	L	L1	L2	L3
PUWR-6.35×10.5	6.35	10.5	4.8	14	14	32.8	25.4	15.2	9.7
PUWR-6.35×13.8	6.35	13.8	4.8	14	16	37.9	30.5	15.2	14.2
PUWR-6.35×17.3	6.35	17.3	4.8	14	19	37.9	30.5	15.2	14.2
PUWR-6.35×21.7	6.35	21.7	4.8	14	23	44.7	37.3	15.2	19.1
PUWR-9.52×13.8	9.52	13.8	7.1	17	17	39.9	32.5	16.8	14.2
PUWR-9.52×17.3	9.52	17.3	7.1	17	19	39.9	32.5	16.8	14.2
PUWR-9.52×21.7	9.52	21.7	7.1	17	23	46.3	38.9	16.8	19.1
PUWR-12.7×17.3	12.7	17.3	10.4	22	22	43.4	33.3	22.8	14.2
PUWR-12.7×21.7	12.7	21.7	10.4	22	23	49	38.9	22.8	19.1

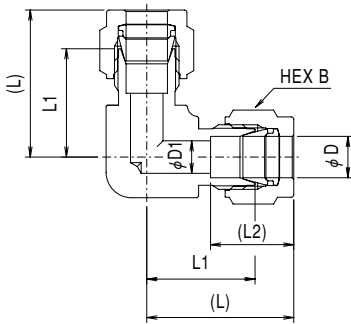
Welding Elbow Reducers



Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	D3	B	L	L1	L2	L3	L4
PUWLR-6.35×10.5	6.35	10.5	4.8	4.8	14	27	19.6	15.2	18.8	9.7
PUWLR-9.52×13.8	9.52	13.8	7.1	7.1	17	30.5	23.1	16.8	25.4	14.2
PUWLR-12.7×21.7	12.7	21.7	10.4	10.4	22	36	25.9	22.8	32	17

Elbow Unions



Size in mm

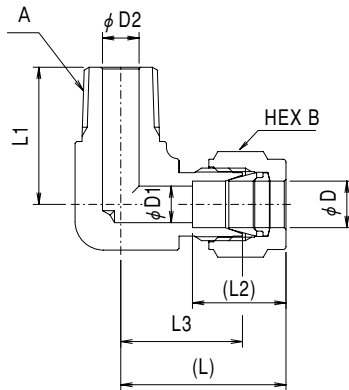
Part number	Nominal diameter D	D1	B	L	L1	L2
PUWL-3	3	2.3	10	22.3	15.7	12.9
PUWL-4	4	2.4	12	25.4	18.8	13.7
PUWL-6	6	4.8	14	27	19.6	15.2
PUWL-8	8	6.4	16	28.8	21.3	16.2
PUWL-10	10	7.9	19	31.5	23.9	17.2
PUWL-12	12	9.5	22	36	25.9	22.8
PUWL-14	14	11.1	26	38	27.9	24.4
PUWL-16	16	12.7	26	38	27.9	24.4
PUWL-18	18	15.1	30	39.8	29.7	24.4
PUWL-20	20	15.9	32	44.6	34.5	26
PUWL-25	25	21.8	38	49	36.8	31.2

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	B	L	L1	L2
PUWL-3.2	3.2	2.3	10	22.3	15.7	12.7
PUWL-6.35	6.35	4.8	14	27	19.6	15.2
PUWL-9.52	9.52	7.1	17	30.5	23.1	16.8
PUWL-12.7	12.7	10.4	22	36	25.9	22.8
PUWL-15.88	15.88	12.7	26	38.1	27.9	24.4
PUWL-19.05	19.05	15.7	29	39.9	29.7	24.4
PUWL-25.4	25.4	22.4	38	49	36.8	31.2

POWERFULL Series

Male Elbows (R thread)



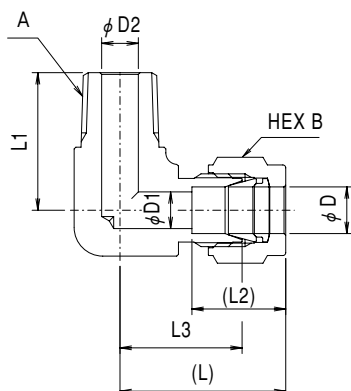
Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWL-3A	3	R1/8	2.3	4	10	23.6	20	12.9	17
PUWL-3B	3	R1/4	2.3	4	10	24.6	23.4	12.9	18
PUWL-4A	4	R1/8	2.4	4	12	25.4	18.8	13.7	18.8
PUWL-4B	4	R1/4	2.4	4	12	25.4	23.4	13.7	18.8
PUWL-6A	6	R1/8	4.8	4.8	14	27	18.8	15.2	19.6
PUWL-6B	6	R1/4	4.8	4.8	14	27	23.4	15.2	19.6
PUWL-6C	6	R3/8	4.8	4.8	14	29.8	25	15.2	22.4
PUWL-6D	6	R1/2	4.8	4.8	14	31.8	32	15.2	24.4
PUWL-8A	8	R1/8	6.4	4.8	16	28.8	24	16.2	21.3
PUWL-8B	8	R1/4	6.4	6.4	16	28.8	24	16.2	21.3
PUWL-8C	8	R3/8	6.4	6.4	16	30.6	25	16.2	23.1
PUWL-8D	8	R1/2	6.4	6.4	16	32.6	32	16.2	25.1
PUWL-10A	10	R1/8	7.9	4.8	19	31.5	21.6	17.2	23.9
PUWL-10B	10	R1/4	7.9	7.1	19	31.5	26.2	17.2	23.9
PUWL-10C	10	R3/8	7.9	7.9	19	31.5	26.2	17.2	23.9
PUWL-10D	10	R1/2	7.9	7.9	19	33.5	32	17.2	25.9
PUWL-12A	12	R1/8	9.5	4.8	22	36	29	22.8	25.9
PUWL-12B	12	R1/4	9.5	7.1	22	36	29	22.8	25.9
PUWL-12C	12	R3/8	9.5	9.5	22	36	29	22.8	25.9
PUWL-12D	12	R1/2	9.5	9.5	22	36	32	22.8	25.9
PUWL-14D	14	R1/2	11.1	11.1	26	38	35.1	24.4	27.9
PUWL-16D	16	R1/2	12.7	11.9	26	38	35.1	24.4	27.9
PUWL-18D	18	R1/2	15.1	11.9	30	39.8	36.8	24.4	29.7
PUWL-20D	20	R1/2	15.9	11.9	32	44.6	41.7	26	34.5
PUWL-20E	20	R3/4	15.9	15.9	32	44.6	41.7	26	34.5
PUWL-25E	25	R3/4	21.8	15.9	38	53.9	41.7	31.2	36.8
PUWL-25F	25	R1	21.8	21.8	38	58.7	46.5	31.2	36.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWL-1.6A	1.6	R1/8	1.3	4	8	19	17.6	8.6	15.2
PUWL-3.2A	3.2	R1/8	2.3	4	10	23.6	20	12.7	17
PUWL-3.2B	3.2	R1/4	2.3	4	10	24.6	23.4	12.7	18
PUWL-6.35A	6.35	R1/8	4.8	4.8	14	27	18.8	15.2	19.6
PUWL-6.35B	6.35	R1/4	4.8	4.8	14	27	23.4	15.2	19.6
PUWL-6.35C	6.35	R3/8	4.8	4.8	14	29.8	25	15.2	22.4
PUWL-6.35D	6.35	R1/2	4.8	4.8	14	31.8	32	15.2	24.4
PUWL-9.52A	9.52	R1/8	7.1	4.8	17	30.5	24	16.8	23.1
PUWL-9.52B	9.52	R1/4	7.1	7.1	17	30.5	24	16.8	23.1
PUWL-9.52C	9.52	R3/8	7.1	7.1	17	31.3	25	16.8	23.9
PUWL-9.52D	9.52	R1/2	7.1	7.1	17	33.3	32	16.8	25.9
PUWL-12.7A	12.7	R1/8	10.4	4.8	22	36	29	22.8	25.9
PUWL-12.7B	12.7	R1/4	10.4	7.1	22	36	29	22.8	25.9
PUWL-12.7C	12.7	R3/8	10.4	9.7	22	36	29	22.8	25.9
PUWL-12.7D	12.7	R1/2	10.4	10.4	22	36	32	22.8	25.9
PUWL-15.88D	15.88	R1/2	12.7	11.9	26	38	35.1	24.4	27.9
PUWL-19.05D	19.05	R1/2	15.7	11.9	29	39.8	36.8	24.4	29.7
PUWL-19.05E	19.05	R3/4	15.7	15.7	29	39.8	36.8	24.4	29.7
PUWL-25.4E	25.4	R3/4	22.4	15.7	38	49	41.7	31.2	36.8
PUWL-25.4F	25.4	R1	22.4	22.4	38	49	46.5	31.2	36.8

Male Elbows (NPT thread)



Size in mm

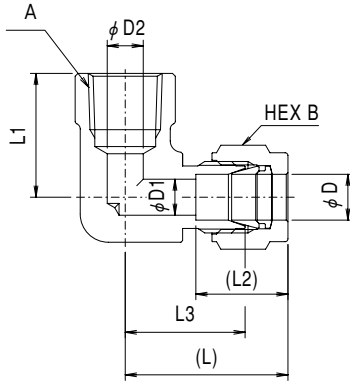
Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWL-3AN	3	1/8NPT	2.3	4	10	23.6	20	12.9	17
PUWL-3BN	3	1/4NPT	2.3	4	10	24.6	23.4	12.9	18
PUWL-4AN	4	1/8NPT	2.4	4	12	25.4	18.8	13.7	18.8
PUWL-4BN	4	1/4NPT	2.4	4	12	25.4	23.4	13.7	18.8
PUWL-6AN	6	1/8NPT	4.8	4.8	14	27	18.8	15.2	19.6
PUWL-6BN	6	1/4NPT	4.8	4.8	14	27	23.4	15.2	19.6
PUWL-6CN	6	3/8NPT	4.8	4.8	14	29.8	25	15.2	22.4
PUWL-6DN	6	1/2NPT	4.8	4.8	14	31.8	32	15.2	24.4
PUWL-8AN	8	1/8NPT	6.4	4.8	16	28.8	24	16.2	21.3
PUWL-8BN	8	1/4NPT	6.4	6.4	16	28.8	24	16.2	21.3
PUWL-8CN	8	3/8NPT	6.4	6.4	16	30.6	25	16.2	23.1
PUWL-8DN	8	1/2NPT	6.4	6.4	16	32.6	32	16.2	25.1
PUWL-10AN	10	1/8NPT	7.9	4.8	19	31.5	21.6	17.2	23.9
PUWL-10BN	10	1/4NPT	7.9	7.1	19	31.5	26.2	17.2	23.9
PUWL-10CN	10	3/8NPT	7.9	7.9	19	31.5	26.2	17.2	23.9
PUWL-10DN	10	1/2NPT	7.9	7.9	19	33.5	32	17.2	25.9
PUWL-12AN	12	1/8NPT	9.5	4.8	22	36	29	22.8	25.9
PUWL-12BN	12	1/4NPT	9.5	7.1	22	36	29	22.8	25.9
PUWL-12CN	12	3/8NPT	9.5	9.5	22	36	29	22.8	25.9
PUWL-12DN	12	1/2NPT	9.5	9.5	22	36	32	22.8	25.9
PUWL-14DN	14	1/2NPT	11.1	11.1	26	38	35.1	24.4	27.9
PUWL-16DN	16	1/2NPT	12.7	11.9	26	38	35.1	24.4	27.9
PUWL-18DN	18	1/2NPT	15.1	11.9	30	39.8	36.8	24.4	29.7
PUWL-20DN	20	1/2NPT	15.9	11.9	32	44.6	41.7	26	34.5
PUWL-20EN	20	3/4NPT	15.9	15.9	32	44.6	41.7	26	34.5
PUWL-25EN	25	3/4NPT	21.8	15.9	38	53.9	41.7	31.2	36.8
PUWL-25FN	25	1NPT	21.8	21.8	38	58.7	46.5	31.2	36.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWL-3.2AN	3.2	1/8NPT	2.3	4	10	23.6	20	12.7	17
PUWL-3.2BN	3.2	1/4NPT	2.3	4	10	24.6	23.4	12.7	18
PUWL-6.35AN	6.35	1/8NPT	4.8	4.8	14	27	18.8	15.2	19.6
PUWL-6.35BN	6.35	1/4NPT	4.8	4.8	14	27	23.4	15.2	19.6
PUWL-6.35CN	6.35	3/8NPT	4.8	4.8	14	29.8	25	15.2	22.4
PUWL-6.35DN	6.35	1/2NPT	4.8	4.8	14	31.8	32	15.2	24.4
PUWL-9.52AN	9.52	1/8NPT	7.1	4.8	17	30.5	24	16.8	23.1
PUWL-9.52BN	9.52	1/4NPT	7.1	7.1	17	30.5	24	16.8	23.1
PUWL-9.52CN	9.52	3/8NPT	7.1	7.1	17	31.3	25	16.8	23.9
PUWL-9.52DN	9.52	1/2NPT	7.1	7.1	17	33.3	32	16.8	25.9
PUWL-12.7AN	12.7	1/8NPT	10.4	4.8	22	36	29	22.8	25.9
PUWL-12.7BN	12.7	1/4NPT	10.4	7.1	22	36	29	22.8	25.9
PUWL-12.7CN	12.7	3/8NPT	10.4	9.7	22	36	29	22.8	25.9
PUWL-12.7DN	12.7	1/2NPT	10.4	10.4	22	36	32	22.8	25.9
PUWL-15.88DN	15.88	1/2NPT	12.7	11.9	26	38	35.1	24.4	27.9
PUWL-19.05DN	19.05	1/2NPT	15.7	11.9	29	39.8	36.8	24.4	29.7
PUWL-19.05EN	19.05	3/4NPT	15.7	15.7	29	39.8	36.8	24.4	29.7
PUWL-25.4EN	25.4	3/4NPT	22.4	15.7	38	49	41.7	31.2	36.8
PUWL-25.4FN	25.4	1NPT	22.4	22.4	38	49	46.5	31.2	36.8

POWERFULL Series

Female Elbows (Rc thread)



Size in mm

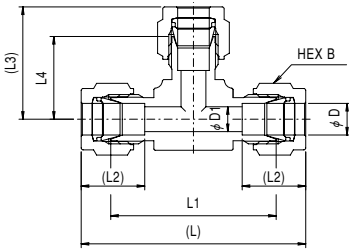
Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWLG-3A	3	Rc1/8	2.3	7	10	24.6	19.1	12.9	18
PUWLG-3B	3	Rc1/4	2.3	7	10	27.4	22	12.9	20.8
PUWLG-4B	4	Rc1/4	2.4	7	12	28.2	22	13.7	21.6
PUWLG-6A	6	Rc1/8	4.8	7	14	27	19.1	15.2	19.6
PUWLG-6B	6	Rc1/4	4.8	7	14	29.8	22	15.2	22.4
PUWLG-6C	6	Rc3/8	4.8	7	14	31.8	26	15.2	24.4
PUWLG-8A	8	Rc1/8	6.4	7	16	29.9	22	16.2	22.4
PUWLG-8B	8	Rc1/4	6.4	7	16	30.6	22	16.2	23.1
PUWLG-8C	8	Rc3/8	6.4	7	16	32.6	26	16.2	25.1
PUWLG-8D	8	Rc1/2	6.4	7	16	36.5	36	16.2	29
PUWLG-10A	10	Rc1/8	7.9	7	19	31.5	19	17.2	23.9
PUWLG-10B	10	Rc1/4	7.9	7.9	19	31.5	22.4	17.2	23.9
PUWLG-10C	10	Rc3/8	7.9	7.9	19	33.5	26	17.2	25.9
PUWLG-10D	10	Rc1/2	7.9	7.9	19	37.3	36	17.2	29.7
PUWLG-12A	12	Rc1/8	9.5	7	22	36	26	22.8	25.9
PUWLG-12B	12	Rc1/4	9.5	9.5	22	36	26	22.8	25.9
PUWLG-12C	12	Rc3/8	9.5	9.5	22	36	26	22.8	25.9
PUWLG-12D	12	Rc1/2	9.5	9.5	22	39.8	36	22.8	29.7

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWLG-3.2A	3.2	Rc1/8	2.3	7	10	24.6	19.1	12.7	18
PUWLG-3.2B	3.2	Rc1/4	2.3	7	10	27.4	22	12.7	20.8
PUWLG-6.35A	6.35	Rc1/8	4.8	7	14	27	19.1	15.2	19.6
PUWLG-6.35B	6.35	Rc1/4	4.8	7	14	29.8	22	15.2	22.4
PUWLG-6.35C	6.35	Rc3/8	4.8	7	14	31.8	26	15.2	24.4
PUWLG-9.52A	9.52	Rc1/8	7.1	7.1	17	30.5	22	16.8	23.1
PUWLG-9.52B	9.52	Rc1/4	7.1	7.1	17	30.5	22	16.8	23.1
PUWLG-9.52C	9.52	Rc3/8	7.1	7.1	17	33.3	26	16.8	25.9
PUWLG-12.7A	12.7	Rc1/8	10.4	7.1	22	36	26	22.8	25.9
PUWLG-12.7B	12.7	Rc1/4	10.4	10.4	22	36	26	22.8	25.9
PUWLG-12.7C	12.7	Rc3/8	10.4	10.4	22	36	26	22.8	25.9
PUWLG-12.7D	12.7	Rc1/2	10.4	10.4	22	39.8	36	22.8	29.7

Also available with NPT (ANSI) threads.

Tee Unions



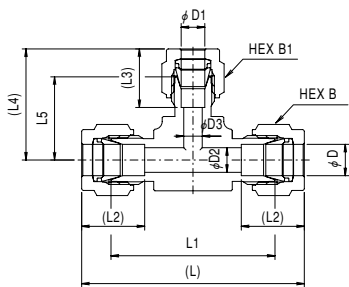
Size in mm

Part number	Nominal diameter D	D1	B	L	L1	L2	L3	L4
PUWT-3	3	2.3	10	44.6	31.4	12.9	22.3	15.7
PUWT-4	4	2.4	12	50.8	37.6	13.7	25.4	18.8
PUWT-6	6	4.8	14	54	39.2	15.2	27	19.6
PUWT-8	8	6.4	16	59.8	44.8	16.2	29.9	22.4
PUWT-10	10	7.9	19	63	47.8	17.2	31.5	23.9
PUWT-12	12	9.5	22	72	51.8	22.8	36	25.9
PUWT-14	14	11.1	26	76	55.8	24.4	38	27.9
PUWT-16	16	12.7	26	76	55.8	24.4	38	27.9
PUWT-18	18	15.1	30	79.6	59.4	24.4	39.8	29.7
PUWT-20	20	15.9	32	89.2	69	26	44.6	34.5
PUWT-25	25	21.8	38	98	73.6	31.2	49	36.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	B	L	L1	L2	L3	L4
PUWT-1.6	1.6	1.3	8	35.6	28	8.6	17.8	14
PUWT-3.2	3.2	2.3	10	44.6	31.4	12.7	22.3	15.7
PUWT-6.35	6.35	4.8	14	54	39.2	15.2	27	19.6
PUWT-9.52	9.52	7.1	17	61	46.2	16.8	30.5	23.1
PUWT-12.7	12.7	10.4	22	72	51.8	22.8	36	25.9
PUWT-15.88	15.88	12.7	26	77.6	57.4	24.4	38.8	28.7
PUWT-19.05	19.05	15.7	29	79.6	59.4	24.4	39.8	29.7
PUWT-25.4	25.4	22.4	38	98	73.6	31.2	49	36.8

Reducing Tee Unions



Size in mm

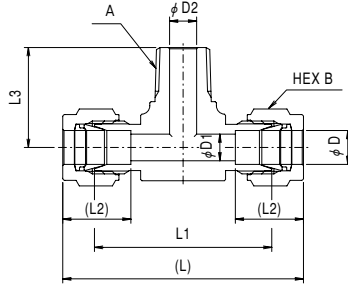
Part number	Nominal diameter D	Nominal diameter D1	D2	D3	B	B1	L	L1	L2	L3	L4	L5
PUWT-8X8X6	8	6	6.4	4.8	16	14	59.8	44.8	16.2	15.2	29	21.6
PUWT-10X10X6	10	6	7.9	4.8	19	14	63	47.8	17.2	15.2	31.3	23.9
PUWT-10X10X8	10	8	7.9	6.4	19	16	63	47.8	17.2	16.2	30.6	23.1
PUWT-12X12X6	12	6	9.5	4.8	22	14	72	51.8	22.8	15.2	31.8	24.4
PUWT-12X12X8	12	8	9.5	6.4	22	16	72	51.8	22.8	16.2	32.6	25.1
PUWT-12X12X10	12	10	9.5	7.9	22	19	72	51.8	22.8	17.2	33.5	25.9

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	Nominal diameter D1	D2	D3	B	B1	L	L1	L2	L3	L4	L5
PUWT-6.35X6.35X3.2	6.35	3.2	4.8	2.3	14	10	54	39.2	15.2	12.7	24.6	18
PUWT-9.52X9.52X6.35	9.52	6.35	7.1	4.8	17	14	61	46.2	16.8	15.2	29	21.6
PUWT-12.7X12.7X6.35	12.7	6.35	10.4	4.8	22	14	72	51.8	22.8	15.2	31.8	24.4
PUWT-12.7X12.7X9.52	12.7	9.52	10.4	7.1	22	17	72	51.8	22.8	16.8	33.3	25.9
PUWT-19.05X19.05X9.52	19.05	9.52	15.7	7.1	29	17	79.8	59.4	24.4	16.8	37.1	29.7
PUWT-19.05X19.05X12.7	19.05	12.7	15.7	10.4	29	22	79.8	59.4	24.4	22.8	39.8	29.7
PUWT-25.4X25.4X12.7	25.4	12.7	22.4	10.4	38	22	98	73.6	31.2	22.8	44.6	34.5
PUWT-25.4X25.4X19.05	25.4	19.05	22.4	15.7	38	29	98	73.6	31.2	24.4	44.6	34.5

POWERFULL Series

Male Branch Tees (R thread)



Size in mm

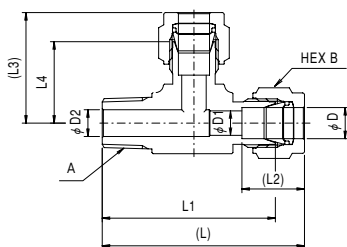
Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTS-3A	3	R1/8	2.3	4	10	47.2	34	12.9	20
PUWTS-3B	3	R1/4	2.3	4	10	49.2	36	12.9	23.4
PUWTS-4A	4	R1/8	2.4	4	12	50.8	37.6	13.7	18.8
PUWTS-4B	4	R1/4	2.4	4	12	50.8	37.6	13.7	23.4
PUWTS-6A	6	R1/8	4.8	4.8	14	54	39.2	15.2	18.8
PUWTS-6B	6	R1/4	4.8	4.8	14	54	39.2	15.2	23.4
PUWTS-6C	6	R3/8	4.8	4.8	14	59.6	44.8	15.2	25
PUWTS-6D	6	R1/2	4.8	4.8	14	63.6	48.8	15.2	32
PUWTS-8A	8	R1/8	6.4	4.8	16	57.6	42.6	16.2	24
PUWTS-8B	8	R1/4	6.4	6.4	16	59.8	44.8	16.2	24
PUWTS-8C	8	R3/8	6.4	6.4	16	61.2	46.2	16.2	25
PUWTS-8D	8	R1/2	6.4	6.4	16	65.2	50.2	16.2	32
PUWTS-10A	10	R1/8	7.9	4.8	19	63	47.8	17.2	21.6
PUWTS-10B	10	R1/4	7.9	7.1	19	63	47.8	17.2	26.2
PUWTS-10C	10	R3/8	7.9	7.9	19	63	47.8	17.2	26.2
PUWTS-10D	10	R1/2	7.9	7.9	19	67	51.8	17.2	32
PUWTS-12A	12	R1/8	9.5	4.8	22	72	51.8	22.8	29
PUWTS-12B	12	R1/4	9.5	7.1	22	72	51.8	22.8	29
PUWTS-12C	12	R3/8	9.5	9.5	22	72	51.8	22.8	29
PUWTS-12D	12	R1/2	9.5	9.5	22	72	51.8	22.8	32

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTS-3.2A	3.2	R1/8	2.3	4	10	47.2	34	12.7	20
PUWTS-3.2B	3.2	R1/4	2.3	4	10	49.2	36	12.7	23.4
PUWTS-6.35A	6.35	R1/8	4.8	4.8	14	54	39.2	15.2	18.8
PUWTS-6.35B	6.35	R1/4	4.8	4.8	14	54	39.2	15.2	23.4
PUWTS-6.35C	6.35	R3/8	4.8	4.8	14	59.6	44.8	15.2	25
PUWTS-6.35D	6.35	R1/2	4.8	4.8	14	63.6	48.8	15.2	32
PUWTS-9.52A	9.52	R1/8	7.1	4.8	17	61	46.2	16.8	24
PUWTS-9.52B	9.52	R1/4	7.1	7.1	17	61	46.2	16.8	24
PUWTS-9.52C	9.52	R3/8	7.1	7.1	17	62.6	47.8	16.8	25
PUWTS-9.52D	9.52	R1/2	7.1	7.1	17	66.6	51.8	16.8	32
PUWTS-12.7A	12.7	R1/8	10.4	4.8	22	72	51.8	22.8	29
PUWTS-12.7B	12.7	R1/4	10.4	7.1	22	72	51.8	22.8	29
PUWTS-12.7C	12.7	R3/8	10.4	9.7	22	72	51.8	22.8	29
PUWTS-12.7D	12.7	R1/2	10.4	10.4	22	72	51.8	22.8	32

Also available with NPT (ANSI) threads.

Male Run Tees (R thread)



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3	L4
PUWTL-3A	3	R1/8	2.3	4	10	43.6	37	12.9	23.6	17
PUWTL-3B	3	R1/4	2.3	4	10	48	41.4	12.9	24.6	18
PUWTL-4A	4	R1/8	2.4	4	12	44.2	37.6	13.7	25.4	18.8
PUWTL-4B	4	R1/4	2.4	4	12	48.8	42.2	13.7	25.4	18.8
PUWTL-6A	6	R1/8	4.8	4.8	14	45.8	38.4	15.2	27	19.6
PUWTL-6B	6	R1/4	4.8	4.8	14	50.4	43	15.2	27	19.6
PUWTL-6C	6	R3/8	4.8	4.8	14	54.8	47.4	15.2	29.8	22.4
PUWTL-6D	6	R1/2	4.8	4.8	14	63.8	56.4	15.2	31.8	24.4
PUWTL-8A	8	R1/8	6.4	4.8	16	52.8	45.3	16.2	28.8	21.3
PUWTL-8B	8	R1/4	6.4	6.4	16	53.9	46.4	16.2	29.9	22.4
PUWTL-8C	8	R3/8	6.4	6.4	16	55.6	48.1	16.2	30.6	23.1
PUWTL-8D	8	R1/2	6.4	6.4	16	64.6	57.1	16.2	32.6	25.1
PUWTL-10A	10	R1/8	7.9	4.8	19	53.1	45.5	17.2	31.5	23.9
PUWTL-10B	10	R1/4	7.9	7.1	19	57.7	50.1	17.2	31.5	23.9
PUWTL-10C	10	R3/8	7.9	7.9	19	57.7	50.1	17.2	31.5	23.9
PUWTL-10D	10	R1/2	7.9	7.9	19	65.5	57.9	17.2	33.5	25.9
PUWTL-12A	12	R1/8	9.5	4.8	22	65	54.9	22.8	36	25.9
PUWTL-12B	12	R1/4	9.5	7.1	22	65	54.9	22.8	36	25.9
PUWTL-12C	12	R3/8	9.5	9.5	22	65	54.9	22.8	36	25.9
PUWTL-12D	12	R1/2	9.5	9.5	22	68	57.9	22.8	36	25.9

Size in metric equivalents (mm) of fractional inches

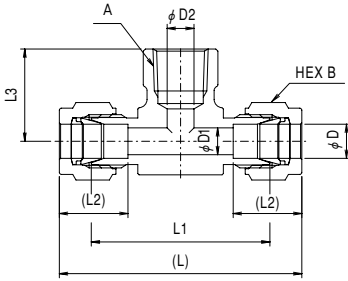
Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3	L4
PUWTL-3.2A	3.2	R1/8	2.3	4	10	43.6	37	12.7	23.6	17
PUWTL-3.2B	3.2	R1/4	2.3	4	10	48	41.4	12.7	24.6	18
PUWTL-6.35A	6.35	R1/8	4.8	4.8	14	45.8	38.4	15.2	27	19.6
PUWTL-6.35B	6.35	R1/4	4.8	4.8	14	50.4	43	15.2	27	19.6
PUWTL-6.35C	6.35	R3/8	4.8	4.8	14	54.8	47.4	15.2	29.8	22.4
PUWTL-6.35D	6.35	R1/2	4.8	4.8	14	63.8	56.4	15.2	31.8	24.4
PUWTL-9.52A	9.52	R1/8	7.1	4.8	17	54.5	47.1	16.8	30.5	23.1
PUWTL-9.52B	9.52	R1/4	7.1	7.1	17	54.5	47.1	16.8	30.5	23.1
PUWTL-9.52C	9.52	R3/8	7.1	7.1	17	56.3	48.9	16.8	31.3	23.9
PUWTL-9.52D	9.52	R1/2	7.1	7.1	17	65.3	57.9	16.8	33.3	25.9
PUWTL-12.7A	12.7	R1/8	10.4	4.8	22	65	54.9	22.8	36	25.9
PUWTL-12.7B	12.7	R1/4	10.4	7.1	22	65	54.9	22.8	36	25.9
PUWTL-12.7C	12.7	R3/8	10.4	9.7	22	65	54.9	22.8	36	25.9
PUWTL-12.7D	12.7	R1/2	10.4	10.4	22	68	57.9	22.8	36	25.9

Also available with NPT (ANSI) threads.

POWERFULL Series

Female Branch Tees

(Rc thread)



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTG-3A	3	Rc1/8	2.3	7	10	49.2	36	12.9	19.1
PUWTG-3B	3	Rc1/4	2.3	7	10	54.8	41.6	12.9	22
PUWTG-4A	4	Rc1/8	2.4	7	12	50.8	37.6	13.7	19.1
PUWTG-4B	4	Rc1/4	2.4	7	12	56.4	43.2	13.7	22
PUWTG-6A	6	Rc1/8	4.8	7	14	54	39.2	15.2	19.1
PUWTG-6B	6	Rc1/4	4.8	7	14	59.6	44.8	15.2	22
PUWTG-6C	6	Rc3/8	4.8	7	14	63.6	48.8	15.2	26
PUWTG-8A	8	Rc1/8	6.4	7	16	59.8	44.8	16.2	22
PUWTG-8B	8	Rc1/4	6.4	7	16	61.2	46.2	16.2	22
PUWTG-8C	8	Rc3/8	6.4	7	16	65.2	50.2	16.2	26
PUWTG-10A	10	Rc1/8	7.9	7	19	63	47.8	17.2	19
PUWTG-10B	10	Rc1/4	7.9	7.9	19	63	47.8	17.2	22.4
PUWTG-10C	10	Rc3/8	7.9	7.9	19	67	51.8	17.2	26
PUWTG-12A	12	Rc1/8	9.5	7	22	72	51.8	22.8	26
PUWTG-12B	12	Rc1/4	9.5	9.5	22	72	51.8	22.8	26
PUWTG-12C	12	Rc3/8	9.5	9.5	22	72	51.8	22.8	26
PUWTG-12D	12	Rc1/2	9.5	9.5	22	79.6	59.4	22.8	36

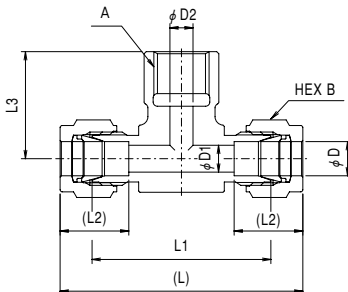
Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTG-3.2A	3.2	Rc1/8	2.3	7	10	49.2	36	12.7	19.1
PUWTG-3.2B	3.2	Rc1/4	2.3	7	10	54.8	41.6	12.7	22
PUWTG-6.35A	6.35	Rc1/8	4.8	7	14	54	39.2	15.2	19.1
PUWTG-6.35B	6.35	Rc1/4	4.8	7	14	59.6	44.8	15.2	22
PUWTG-6.35C	6.35	Rc3/8	4.8	7	14	63.6	48.8	15.2	26
PUWTG-9.52A	9.52	Rc1/8	7.1	7.1	17	61	46.2	16.8	22
PUWTG-9.52B	9.52	Rc1/4	7.1	7.1	17	61	46.2	16.8	22
PUWTG-9.52C	9.52	Rc3/8	7.1	7.1	17	66.6	51.8	16.8	26
PUWTG-9.52D	9.52	Rc1/2	7.1	7.1	17	74.2	59.4	16.8	36
PUWTG-12.7A	12.7	Rc1/8	10.4	7.1	22	72	51.8	22.8	26
PUWTG-12.7B	12.7	Rc1/4	10.4	10.4	22	72	51.8	22.8	26
PUWTG-12.7C	12.7	Rc3/8	10.4	10.4	22	72	51.8	22.8	26
PUWTG-12.7D	12.7	Rc1/2	10.4	10.4	22	79.6	59.4	22.8	36

Also available with NPT (ANSI) threads.

Female Branch Tees

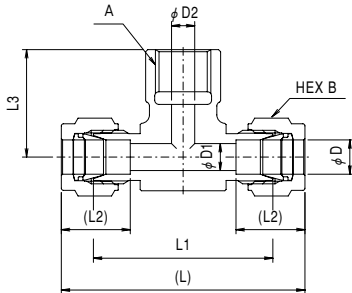
(G thread)



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTG-3AF	3	G1/8	2.3	5.5	10	49.2	36	12.9	22
PUWTG-3BF	3	G1/4	2.3	5.5	10	54.8	41.6	12.9	25.5
PUWTG-4AF	4	G1/8	2.4	5.5	12	50.8	37.6	13.7	22
PUWTG-4BF	4	G1/4	2.4	5.5	12	56.4	43.2	13.7	25.5
PUWTG-6AF	6	G1/8	4.8	5.5	14	54	39.2	15.2	22
PUWTG-6BF	6	G1/4	4.8	5.5	14	59.6	44.8	15.2	25.5
PUWTG-6CF	6	G3/8	4.8	5.5	14	63.6	48.8	15.2	32
PUWTG-8AF	8	G1/8	6.4	5.5	16	59.8	44.8	16.2	22
PUWTG-8BF	8	G1/4	6.4	5.5	16	61.2	46.2	16.2	25.5
PUWTG-8CF	8	G3/8	6.4	5.5	16	65.2	50.2	16.2	32
PUWTG-10AF	10	G1/8	7.9	5.5	19	63	47.8	17.2	22
PUWTG-10BF	10	G1/4	7.9	5.5	19	63	47.8	17.2	22
PUWTG-10CF	10	G3/8	7.9	5.5	19	67	51.8	17.2	32
PUWTG-12AF	12	G1/8	9.5	5.5	22	72	51.8	22.8	26
PUWTG-12BF	12	G1/4	9.5	5.5	22	72	51.8	22.8	26
PUWTG-12CF	12	G3/8	9.5	5.5	22	72	51.8	22.8	32
PUWTG-12DF	12	G1/2	9.5	5.5	22	79.6	59.4	22.8	36

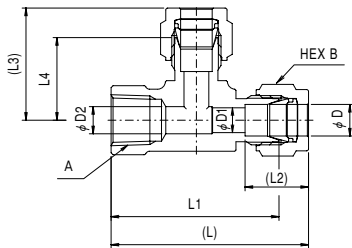
Female Branch Tees (G thread)



Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3
PUWTG-3.2AF	3.2	G1/8	2.3	5.5	10	49.2	36	12.7	22
PUWTG-3.2BF	3.2	G1/4	2.3	5.5	10	54.8	41.6	12.7	25.5
PUWTG-6.35AF	6.35	G1/8	4.8	5.5	14	54	39.2	15.2	22
PUWTG-6.35BF	6.35	G1/4	4.8	5.5	14	59.6	44.8	15.2	25.5
PUWTG-6.35CF	6.35	G3/8	4.8	5.5	14	63.6	48.8	15.2	32
PUWTG-9.52AF	9.52	G1/8	7.1	5.5	17	61	46.2	16.8	22
PUWTG-9.52BF	9.52	G1/4	7.1	5.5	17	61	46.2	16.8	25.5
PUWTG-9.52CF	9.52	G3/8	7.1	5.5	17	66.6	51.8	16.8	32
PUWTG-12.7AF	12.7	G1/8	10.4	5.5	22	72	51.8	22.8	26
PUWTG-12.7BF	12.7	G1/4	10.4	5.5	22	72	51.8	22.8	26
PUWTG-12.7CF	12.7	G3/8	10.4	5.5	22	72	51.8	22.8	32
PUWTG-12.7DF	12.7	G1/2	10.4	5.5	22	79.6	59.4	22.8	36

Female Run Tees (Rc thread)



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3	L4
PUWTLG-3A	3	Rc1/8	2.3	7	10	43.7	37.1	12.9	24.6	18
PUWTLG-3B	3	Rc1/4	2.3	7	10	49.4	42.8	12.9	27.4	20.8
PUWTLG-4A	4	Rc1/8	2.4	7	12	44.5	37.9	13.7	25.4	18.8
PUWTLG-4B	4	Rc1/4	2.4	7	12	50.2	43.6	13.7	28.2	21.6
PUWTLG-6A	6	Rc1/8	4.8	7	14	46.1	38.7	15.2	27	19.6
PUWTLG-6B	6	Rc1/4	4.8	7	14	51.8	44.4	15.2	29.8	22.4
PUWTLG-6C	6	Rc3/8	4.8	7	14	57.8	50.4	15.2	31.8	24.4
PUWTLG-8A	8	Rc1/8	6.4	7	16	51.9	44.4	16.2	29.9	22.4
PUWTLG-8B	8	Rc1/4	6.4	7	16	52.6	45.1	16.2	30.6	23.1
PUWTLG-8C	8	Rc3/8	6.4	7	16	58.6	51.1	16.2	32.6	25.1
PUWTLG-10A	10	Rc1/8	7.9	7	19	50.5	42.9	17.2	31.5	23.9
PUWTLG-10B	10	Rc1/4	7.9	7.9	19	53.9	46.3	17.2	31.5	23.9
PUWTLG-10C	10	Rc3/8	7.9	7.9	19	59.5	51.9	17.2	33.5	25.9
PUWTLG-12A	12	Rc1/8	9.5	7	22	62	51.9	22.8	36	25.9
PUWTLG-12B	12	Rc1/4	9.5	9.5	22	62	51.9	22.8	36	25.9
PUWTLG-12C	12	Rc3/8	9.5	9.5	22	62	51.9	22.8	36	25.9
PUWTLG-12D	12	Rc1/2	9.5	9.5	22	75.8	65.7	22.8	39.8	29.7

Size in metric equivalents (mm) of fractional inches

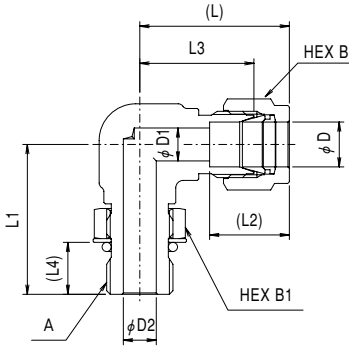
Part number	Nominal diameter D	A	D1	D2	B	L	L1	L2	L3	L4
PUWTLG-3.2A	3.2	Rc1/8	2.3	7	10	43.7	37.1	12.7	24.6	18
PUWTLG-3.2B	3.2	Rc1/4	2.3	7	10	49.4	42.8	12.7	27.4	20.8
PUWTLG-6.35A	6.35	Rc1/8	4.8	7	14	46	38.6	15.2	26	19.6
PUWTLG-6.35B	6.35	Rc1/4	4.8	7	14	51.8	44.4	15.2	29.8	22.4
PUWTLG-6.35C	6.35	Rc3/8	4.8	7	14	57.8	50.4	15.2	31.8	24.4
PUWTLG-9.52A	9.52	Rc1/8	7.1	7.1	17	52.5	45.1	16.8	30.5	23.1
PUWTLG-9.52B	9.52	Rc1/4	7.1	7.1	17	52.5	45.1	16.8	30.5	23.1
PUWTLG-9.52C	9.52	Rc3/8	7.1	7.1	17	59.3	51.9	16.8	33.3	25.9
PUWTLG-12.7A	12.7	Rc1/8	10.4	7	22	62	51.9	22.8	26	25.9
PUWTLG-12.7B	12.7	Rc1/4	10.4	10.4	22	62	51.9	22.8	26	25.9
PUWTLG-12.7C	12.7	Rc3/8	10.4	10.4	22	62	51.9	22.8	26	25.9
PUWTLG-19.05D	19.05	Rc1/2	15.7	15.7	29	75.8	65.7	24.4	39.8	29.7

Also available with NPT (ANSI) threads.

You can download the latest catalogue from <http://www.fujikin.co.jp/go/c72100e>

POWERFULL Series

Positionable Elbow Unions (UNF)

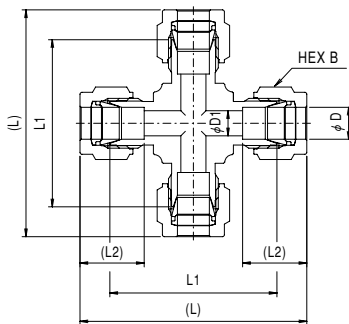


Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	B1	L	L1	L2	L3	L4	O-ring Size AS568
PUWPL-6.35X7/16	6.35	7/16-20UNF	4.8	4.8	14	14	28.4	28.4	15.2	21.1	9.9	904
PUWPL-6.35X9/16	6.35	9/16-18UNF	4.8	4.8	14	17	30.5	32.3	15.2	23.1	11.2	906
PUWPL-9.52X9/16	9.52	9/16-18UNF	7.1	7.1	17	17	32	32.3	16.8	24.6	11.2	906

For interfacing with SAE J1926 ports, O-rings are made of fluororubber with a Shore A hardness of 90. The maximum operating temperature is 200°C.

Cross Unions



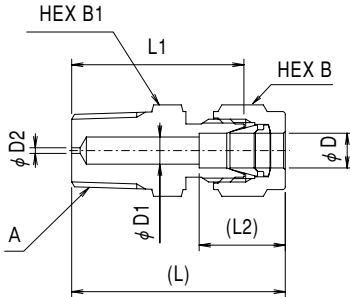
Size in mm

Part number	Nominal diameter D	D1	B	L	L1	L2
PUWX-3	3	2.3	10	44.6	31.4	12.9
PUWX-4	4	2.4	12	50.8	37.6	13.7
PUWX-6	6	4.8	14	54	39.2	15.2
PUWX-8	8	6.4	16	59.8	44.8	16.2
PUWX-10	10	7.9	19	63	47.8	17.2
PUWX-12	12	10.4	22	72	51.8	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	B	L	L1	L2
PUWX-3.2	3.2	2.3	10	44.6	31.4	12.7
PUWX-6.35	6.35	4.8	14	54	39.2	15.2
PUWX-9.52	9.52	7.1	17	61	46.2	16.8
PUWX-12.7	12.7	10.4	22	72	51.8	22.8

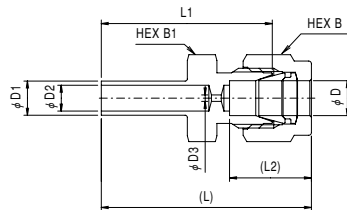
Orifice Male Connectors



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	B1	L	L1	L2
PUWH-6B-H0.3	6	R1/4	4.8	0.3	14	14	37.9	30.5	15.2
PUWH-6B-H0.5	6	R1/4	4.8	0.5	14	14	37.9	30.5	15.2
PUWH-6B-H0.7	6	R1/4	4.8	0.7	14	14	37.9	30.5	15.2
PUWH-6B-H1	6	R1/4	4.8	1	14	14	37.9	30.5	15.2
PUWH-6BN-H0.3	6	1/4NPT	4.8	0.3	14	14	37.9	30.5	15.2
PUWH-6BN-H0.5	6	1/4NPT	4.8	0.5	14	14	37.9	30.5	15.2
PUWH-6BN-H0.7	6	1/4NPT	4.8	0.7	14	14	37.9	30.5	15.2
PUWH-6BN-H1	6	1/4NPT	4.8	1	14	14	37.9	30.5	15.2

Orifice Reducers

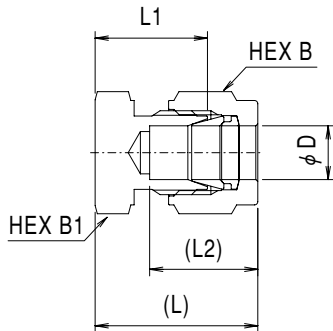


Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	D3	B	B1	L	L1	L2
PUWR-6.35X6.35-H0.5	6.35	6.35	4.8	0.5	14	14	39.2	31.8	15.2
PUWR-6.35X6.35-H0.7	6.35	6.35	4.8	0.7	14	14	39.2	31.8	15.2
PUWR-6.35X6.35-H1	6.35	6.35	4.8	1	14	14	39.2	31.8	15.2

POWERFULL Series

Cap Unions



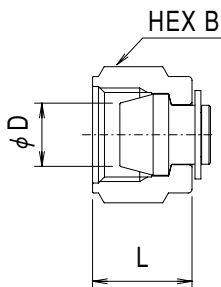
Size in mm

Part number	Nominal diameter D	B	B1	L	L1	L2
PUWJC-3	3	10	10	20.1	13.5	12.9
PUWJC-4	4	12	12	21.3	14.7	13.7
PUWJC-6	6	14	14	23.1	15.7	15.2
PUWJC-8	8	16	16	24.5	17	16.2
PUWJC-10	10	19	19	26.6	19	17.2
PUWJC-12	12	22	22	29.1	19	22.8
PUWJC-14	14	26	24	29.9	19.8	24.4
PUWJC-16	16	26	24	29.9	19.8	24.4
PUWJC-18	18	30	27	31.4	21.3	24.4
PUWJC-20	20	32	30	34	23.9	26
PUWJC-25	25	38	35	38.4	26.2	31.2

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	B	B1	L	L1	L2
PUWJC-1.6	1.6	8	8	15	11.2	8.6
PUWJC-3.2	3.2	10	10	20.1	13.5	12.7
PUWJC-6.35	6.35	14	14	23.4	16	15.2
PUWJC-9.52	9.52	17	17	25.7	18.3	16.8
PUWJC-12.7	12.7	22	22	29.2	19.1	22.8
PUWJC-15.88	15.88	26	24	29.9	19.8	24.4
PUWJC-19.05	19.05	29	27	31.4	21.3	24.4
PUWJC-25.4	25.4	38	35	38.4	26.2	31.2

Plug Unions



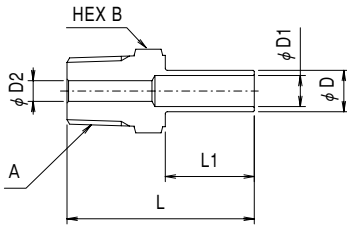
Size in mm

Part number	Nominal diameter D	B	L
PUWJP-3	3	10	11.8
PUWJP-4	4	12	11.8
PUWJP-6	6	14	12.7
PUWJP-8	8	16	13.5
PUWJP-10	10	19	15.1
PUWJP-12	12	22	17.5
PUWJP-14	14	26	17.5
PUWJP-16	16	26	17.5
PUWJP-18	18	30	17.5
PUWJP-20	20	32	17.5
PUWJP-25	25	38	20.7

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	B	L
PUWJP-1.6	1.6	8	7.9
PUWJP-3.2	3.2	10	11.8
PUWJP-6.35	6.35	14	12.7
PUWJP-9.52	9.52	17	14.2
PUWJP-12.7	12.7	22	17.5
PUWJP-15.88	15.88	26	17.5
PUWJP-19.05	19.05	29	17.5
PUWJP-25.4	25.4	38	20.7

Tube Adapters



Size in mm

Part number	Nominal diameter D	A	D1	D2	B	L	L1
PUW-A-3A	3	R1/8	1.8	4.5	12	29.1	14.1
PUW-A-3B	3	R1/4	1.8	4.5	14	32.1	14.1
PUW-A-4A	4	R1/8	2.4	4.5	12	29.6	14.6
PUW-A-4B	4	R1/4	2.4	4.5	14	33.6	14.6
PUW-A-6A	6	R1/8	4	4	12	31.5	16.5
PUW-A-6B	6	R1/4	4	4	14	35.5	16.5
PUW-A-6C	6	R3/8	4	4	17	36.5	16.5
PUW-A-6D	6	R1/2	4	4	22	41.5	16.5
PUW-A-8A	8	R1/8	6	4	12	32.2	17.2
PUW-A-8B	8	R1/4	6	6	14	36.2	17.2
PUW-A-8C	8	R3/8	6	6	17	37.2	17.2
PUW-A-8D	8	R1/2	6	6	22	42.2	17.2
PUW-A-10A	10	R1/8	7.8	5	12	33.5	18.5
PUW-A-10B	10	R1/4	7.8	6.5	14	37.5	18.5
PUW-A-10C	10	R3/8	7.8	7.8	17	38.5	18.5
PUW-A-10D	10	R1/2	7.8	7.8	22	43.5	18.5
PUW-A-12A	12	R1/8	9.5	5	14	40	24
PUW-A-12B	12	R1/4	9.5	7.5	14	43	24
PUW-A-12C	12	R3/8	9.5	9.5	17	44	24
PUW-A-12D	12	R1/2	9.5	9.5	22	49	24

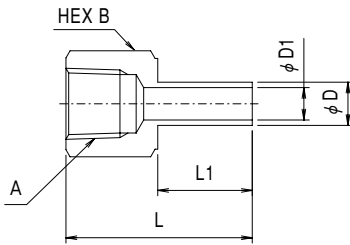
Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	D2	B	L	L1
PUW-A-3.2A	3.2	R1/8	1.8	4.5	12	28.5	13.5
PUW-A-3.2B	3.2	R1/4	1.8	4.5	14	31.5	13.5
PUW-A-6.35A	6.35	R1/8	4.5	4.5	12	31	16
PUW-A-6.35B	6.35	R1/4	4.5	4.5	14	35	16
PUW-A-6.35C	6.35	R3/8	4.5	4.5	17	36	16
PUW-A-6.35D	6.35	R1/2	4.5	4.5	22	41	16
PUW-A-9.52A	9.52	R1/8	7	5	12	33	18
PUW-A-9.52B	9.52	R1/4	7	7	14	37	18
PUW-A-9.52C	9.52	R3/8	7	7	17	38	18
PUW-A-9.52D	9.52	R1/2	7	7	22	43	18
PUW-A-12.7A	12.7	R1/8	10	5	14	40.5	24.5
PUW-A-12.7B	12.7	R1/4	10	7.5	14	43.5	24.5
PUW-A-12.7C	12.7	R3/8	10	10	17	44.5	24.5
PUW-A-12.7D	12.7	R1/2	10	10	22	49.5	24.5

Also available with NPT (ANSI) threads.

POWERFULL Series

Tube Gauge Adapters



Size in mm

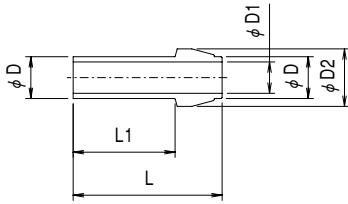
Part number	Nominal diameter D	A	D1	B	L	L1
PUW-GA-3A	3	Rc1/8	1.8	14	28.1	14.1
PUW-GA-3B	3	Rc1/4	1.8	17	31.1	14.1
PUW-GA-4A	4	Rc1/8	2.4	14	28.6	14.6
PUW-GA-4B	4	Rc1/4	2.4	17	31.6	14.6
PUW-GA-6A	6	Rc1/8	4	14	30.5	16.5
PUW-GA-6B	6	Rc1/4	4	17	33.5	16.5
PUW-GA-6C	6	Rc3/8	4	21	35.5	16.5
PUW-GA-6D	6	Rc1/2	4	26	39.5	16.5
PUW-GA-8A	8	Rc1/8	6	14	31.5	17.5
PUW-GA-8B	8	Rc1/4	6	17	34.5	17.5
PUW-GA-8C	8	Rc3/8	6	21	36.5	17.5
PUW-GA-8D	8	Rc1/2	6	26	40.5	17.5
PUW-GA-10A	10	Rc1/8	7.8	14	32.5	18.5
PUW-GA-10B	10	Rc1/4	7.8	17	35.5	18.5
PUW-GA-10C	10	Rc3/8	7.8	21	37.5	18.5
PUW-GA-10D	10	Rc1/2	7.8	26	41.5	18.5
PUW-GA-12A	12	Rc1/8	9.5	14	38	24
PUW-GA-12B	12	Rc1/4	9.5	17	41	24
PUW-GA-12C	12	Rc3/8	9.5	21	43	24
PUW-GA-12D	12	Rc1/2	9.5	26	47	24

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	D1	B	L	L1
PUW-GA-3.2A	3.2	Rc1/8	1.8	14	27.5	13.5
PUW-GA-3.2B	3.2	Rc1/4	1.8	17	30.5	13.5
PUW-GA-6.35A	6.35	Rc1/8	4.5	14	30	16
PUW-GA-6.35B	6.35	Rc1/4	4.5	17	33	16
PUW-GA-6.35C	6.35	Rc3/8	4.5	21	35	16
PUW-GA-6.35D	6.35	Rc1/2	4.5	26	39	16
PUW-GA-9.52A	9.52	Rc1/8	7	14	32	18
PUW-GA-9.52B	9.52	Rc1/4	7	17	35	18
PUW-GA-9.52C	9.52	Rc3/8	7	21	37	18
PUW-GA-9.52D	9.52	Rc1/2	7	26	41	18
PUW-GA-12.7A	12.7	Rc1/8	7.5	14	38.5	24.5
PUW-GA-12.7B	12.7	Rc1/4	10	17	41.5	24.5
PUW-GA-12.7C	12.7	Rc3/8	10	21	43.5	24.5
PUW-GA-12.7D	12.7	Rc1/2	10	26	47.5	24.5

Also available with NPT (ANSI) threads.

Port Connectors



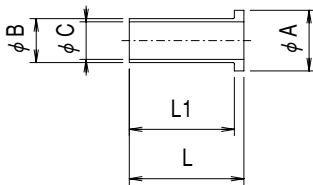
Size in mm

Part number	Nominal diameter D	D1	D2	L	L1
PUW-PC-6	6	4	9.1	28	19
PUW-PC-8	8	6	11	28.5	19.5
PUW-PC-10	10	7.5	13.1	32	23
PUW-PC-12	12	9.5	16.6	41.5	28

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	L	L1
PUW-PC-3.2	3.2	1.8	6.2	25	16
PUW-PC-6.35	6.35	4.5	9.4	28	19
PUW-PC-9.52	9.52	7	12.6	30.5	21.5
PUW-PC-12.7	12.7	10	17.4	42	28.5
PUW-PC-15.88	15.88	12	20.5	44	30.5
PUW-PC-19.05	19.05	15	23.7	44	30.5
PUW-PC-25.4	25.4	21	30	51	35.7

Insert Bushes



Size in mm

Part number	Nominal diameter	L	L1	A	B	C
PUW-IN-6	6	16	14.5	6	4	3
PUW-IN-8	8	17	15.5	8	6	5
PUW-IN-10	10	18	16.5	10	8	7
PUW-IN-12	12	18	16.5	12	10	9

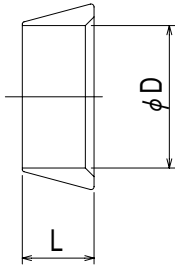
Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter	L	L1	A	B	C
PUW-IN-6.35	6.35	16	14.5	6.35	4.5	3.5
PUW-IN-9.52	9.52	18	16.5	9.52	6.9	5.9
PUW-IN-12.7	12.7	18	16.5	12.7	9.5	8.5
PUW-IN-19.05	19.05	25	23.5	19.05	15.88	13.6
PUW-IN-25.4	25.4	32	30	25.4	22.2	19.5
PUW-IN-6.35-CKH	6.35	16	14.5	6.35	3.9	2.9
PUW-IN-9.52-CKH	9.52	18	16.5	9.52	6.3	5.3

When using POWERFULLOK fittings with resin tubes, be sure to connect insert bushes to the ends of the tubes. Note that different types of PFA tubes have different inner diameters. Use only tubes with part numbers that end in -CKH.

POWERFULL Series

Front Ferrules



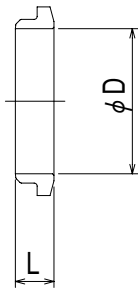
Size in mm

Part number	Nominal diameter D	L
PUW-3S	3	4.9
PUW-4S	4	4.9
PUW-6S	6	4.9
PUW-8S	8	4.9
PUW-10S	10	4.9
PUW-12S	12	7.3
PUW-14S	14	7.3
PUW-16S	16	7.3
PUW-18S	18	7.3
PUW-20S	20	7.3
PUW-25S	25	9.7

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	L
PUW-1.6S	1.6	2.5
PUW-3.2S	3.2	4.9
PUW-6.35S	6.35	4.9
PUW-9.52S	9.52	4.9
PUW-12.7S	12.7	7.3
PUW-15.88S	15.88	7.3
PUW-19.05S	19.05	7.3
PUW-25.4S	25.4	9.7

Back Ferrules



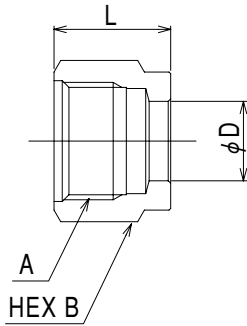
Size in mm

Part number	Nominal diameter D	L
PUW-3R	3	2.6
PUW-4R	4	2.6
PUW-6R	6	2.6
PUW-8R	8	2.6
PUW-10R	10	2.6
PUW-12R	12	3.8
PUW-14R	14	3.8
PUW-16R	16	3.8
PUW-18R	18	3.8
PUW-20R	20	3.8
PUW-25R	25	5

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	L
PUW-1.6R	1.6	1.6
PUW-3.2R	3.2	2.5
PUW-6.35R	6.35	2.6
PUW-9.52R	9.52	2.6
PUW-12.7R	12.7	3.8
PUW-15.88R	15.88	3.8
PUW-19.05R	19.05	3.8
PUW-25.4R	25.4	5

Nuts



Size in mm

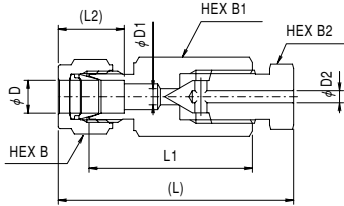
Part number	Nominal diameter D	A	B	L
PUW-3N	3	5/16-20UN	10	11.8
PUW-4N	4	3/8-20UN	12	11.8
PUW-6N	6	7/16-20UNF	14	12.7
PUW-8N	8	1/2-20UNF	16	13.5
PUW-10N	10	5/8-20UN	19	15.1
PUW-12N	12	3/4-20UNEF	22	17.5
PUW-14N	14	7/8-20UNEF	26	17.5
PUW-16N	16	7/8-20UNEF	26	17.5
PUW-18N	18	1-20UNEF	30	17.5
PUW-20N	20	1 1/16-20UN	32	17.5
PUW-25N	25	1 5/16-20UN	38	20.7

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	A	B	L
PUW-1.6N	1.6	No. 10-32UNF	8	7.9
PUW-3.2N	3.2	5/16-20UN	10	12
PUW-6.35N	6.35	7/16-20UNF	14	12.7
PUW-9.52N	9.52	9/16-20UN	17	14.2
PUW-12.7N	12.7	3/4-20UNEF	22	17.5
PUW-15.88N	15.88	7/8-20VNEF	26	17.5
PUW-19.05N	19.05	1-20UNEF	29	17.5
PUW-25.4N	25.4	1 5/16-20UN	38	20.7

POWERFULL Series

Vent Plugs with POWERFULOK Connectors



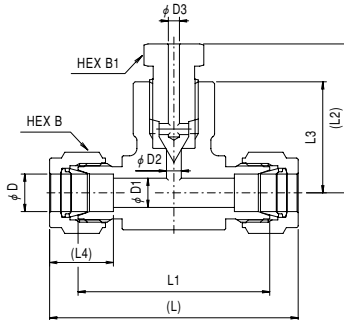
Size in mm

Part number	Nominal diameter D	D1	D2	B	B1	B2	L	L1	L2
UV-6PUW	6	4	3	14	17	14	57.4	40	15.2
UV-8PUW	8	4	3	16	17	14	58	40.5	16.2
UV-10PUW	10	4	3	19	19	14	69.4	51.8	17.2
UV-12PUW	12	4	3	22	22	14	72.1	52	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	B	B1	B2	L	L1	L2
UV-6.35PUW	6.35	4	3	14	17	14	57.4	40	15.2
UV-9.52PUW	9.52	4	3	17	17	14	68.4	51	16.8
UV-12.7PUW	12.7	4	3	22	22	14	72.1	52	22.8

Branch Tee Vent Plugs



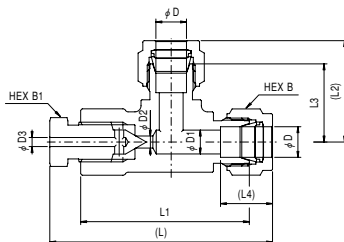
Size in mm

Part number	Nominal diameter D	D1	D2	D3	B	B1	L	L1	L2	L3	L4
UVTS-10PUW	10	7.9	4	3	19	14	67	51.8	40	30	17.2
UVTS-12PUW	12	9.5	4	3	22	14	72	51.8	40	30	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	D3	B	B1	L	L1	L2	L3	L4
UVTS-6.35PUW	6.35	4.8	4	3	14	14	63.4	48.6	40	30	15.2
UVTS-9.52PUW	9.52	7.1	4	3	17	14	66.6	51.8	40	30	16.8
UVTS-12.7PUW	12.7	10.4	4	3	22	14	72	51.8	40	30	22.8

Run Tee Vent Plugs



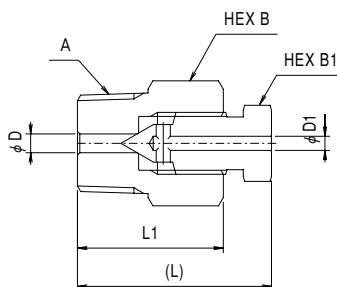
Size in mm

Part number	Nominal diameter D	D1	D2	D3	B	B1	L	L1	L2	L3	L4
UVTL-10PUW	10	7.9	4	3	19	14	73.5	55.9	33.5	25.9	17.2
UVTL-12PUW	12	9.5	4	3	22	14	76	55.9	36	25.9	22.8

Size in metric equivalents (mm) of fractional inches

Part number	Nominal diameter D	D1	D2	D3	B	B1	L	L1	L2	L3	L4
UVTL-9.52PUW	9.52	7.1	4	3	19	14	73.3	55.9	33.3	25.9	16.8
UVTL-12.7PUW	12.7	10.4	4	3	22	14	76	55.9	36	25.9	22.8

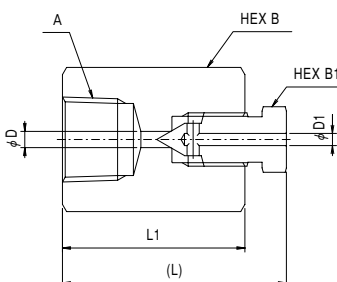
Vent Plugs (R thread, NPT thread)



Part number	A	D	D1	B	B1	L	L1
UV-A	R1/8	4	3	19	14	42.5	32.5
UV-B	R1/4	4	3	19	14	42.5	32.5
UV-C	R3/8	4	3	19	14	43.5	33.5
UV-D	R1/2	4	3	23	14	41	31
UV-AN	1/8NPT	4	3	19	14	42.5	32.5
UV-BN	1/4NPT	4	3	19	14	42.5	32.5
UV-CN	3/8NPT	4	3	19	14	43.5	33.5
UV-DN	1/2NPT	4	3	23	14	41	31

The maximum operating pressure for vent plugs is 25.4 MPa.

Vent Plugs (Rc thread, NPT thread)

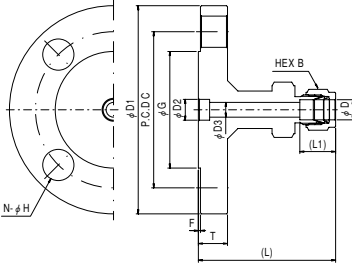


Part number	A	D	D1	B	B1	L	L1	Max. operating pressure (MPa)
UVF-A	Rc1/8	4	3	19	14	44.5	34.5	25.4
UVF-B	Rc1/4	4	3	19	14	44.5	34.5	25.4
UVF-C	Rc3/8	4	3	21	14	47	37	25.4
UVF-D	Rc1/2	4	3	26	14	49	39	23.5
UVF-AN	1/8NPT	4	3	19	14	44.5	34.5	25.4
UVF-BN	1/4NPT	4	3	19	14	44.5	34.5	25.4
UVF-CN	3/8NPT	4	3	21	14	47	37	18.6
UVF-DN	1/2NPT	4	3	26	14	49	39	18.6

The maximum operating pressure for vent plugs is 25.4 MPa.

POWERFULL Series

Flange Unions (JIS 10k)



Size in mm

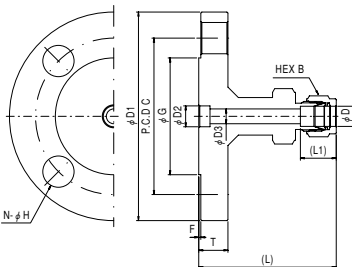
Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6D-J10R	6	15A	63.1	15.2	95	12	1	51	70	4	15	10	4.8	14
PUWRF-8D-J10R	8	15A	64	16.2	95	12	1	51	70	4	15	10	6.4	16
PUWRF-10D-J10R	10	15A	64.9	17.2	95	12	1	51	70	4	15	10	7.9	19
PUWRF-12D-J10R	12	15A	67.4	22.8	95	12	1	51	70	4	15	10	9.5	22
PUWRF-6E-J10R	6	20A	64.1	15.2	100	14	1	56	75	4	15	10	4.8	14
PUWRF-8E-J10R	8	20A	65	16.2	100	14	1	56	75	4	15	10	6.4	16
PUWRF-10E-J10R	10	20A	65.9	17.2	100	14	1	56	75	4	15	10	7.9	19
PUWRF-12E-J10R	12	20A	68.4	22.8	100	14	1	56	75	4	15	10	9.5	22
PUWRF-6F-J10R	6	25A	64.1	15.2	125	14	1	67	90	4	19	10	4.8	14
PUWRF-8F-J10R	8	25A	65	16.2	125	14	1	67	90	4	19	10	6.4	16
PUWRF-10F-J10R	10	25A	65.9	17.2	125	14	1	67	90	4	19	10	7.9	19
PUWRF-12F-J10R	12	25A	68.4	22.8	125	14	1	67	90	4	19	10	9.5	22

Size in metric equivalents (mm) of fractional inches

Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6.35D-J10R	6.35	15A	63.1	15.2	95	12	1	51	70	4	15	10	4.8	14
PUWRF-9.52D-J10R	9.52	15A	64.7	16.8	95	12	1	51	70	4	15	10	7.1	17
PUWRF-12.7D-J10R	12.7	15A	67.4	22.8	95	12	1	51	70	4	15	10	10.4	22
PUWRF-6.35E-J10R	6.35	20A	64.1	15.2	100	14	1	56	75	4	15	10	4.8	14
PUWRF-9.52E-J10R	9.52	20A	65.7	16.8	100	14	1	56	75	4	15	10	7.1	17
PUWRF-12.7E-J10R	12.7	20A	68.4	22.8	100	14	1	56	75	4	15	10	10.4	22
PUWRF-6.35F-J10R	6.35	25A	64.1	15.2	125	14	1	67	90	4	19	10	4.8	14
PUWRF-9.52F-J10R	9.52	25A	65.7	16.8	125	14	1	67	90	4	19	10	7.1	17
PUWRF-12.7F-J10R	12.7	25A	68.4	22.8	125	14	1	67	90	4	19	10	10.4	22

Flanges with pressure ratings other than JIS 10k are also available.

Flange Unions (JPI class 150)



Size in mm

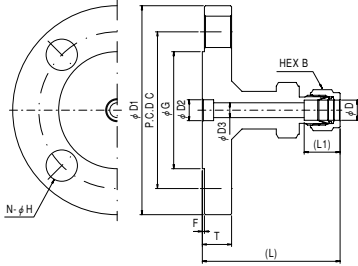
Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6D-JP2R	6	15A	62.8	15.2	89	11.2	1.6	35.1	60.5	4	16	10	4.8	14
PUWRF-8D-JP2R	8	15A	63.7	16.2	89	11.2	1.6	35.1	60.5	4	16	10	6.4	16
PUWRF-10D-JP2R	10	15A	64.6	17.2	89	11.2	1.6	35.1	60.5	4	16	10	7.9	19
PUWRF-12D-JP2R	12	15A	67.1	22.8	89	11.2	1.6	35.1	60.5	4	16	10	9.5	22
PUWRF-6E-JP2R	6	20A	63.3	15.2	99	12.7	1.6	42.9	69.8	4	16	10	4.8	14
PUWRF-8E-JP2R	8	20A	64.2	16.2	99	12.7	1.6	42.9	69.8	4	16	10	6.4	16
PUWRF-10E-JP2R	10	20A	65.1	17.2	99	12.7	1.6	42.9	69.8	4	16	10	7.9	19
PUWRF-12E-JP2R	12	20A	67.6	22.8	99	12.7	1.6	42.9	69.8	4	16	10	9.5	22
PUWRF-6F-JP2R	6	25A	63.3	15.2	108	14.3	1.6	50.8	79.2	4	16	10	4.8	14
PUWRF-8F-JP2R	8	25A	64.2	16.2	108	14.3	1.6	50.8	79.2	4	16	10	6.4	16
PUWRF-10F-JP2R	10	25A	65.1	17.2	108	14.3	1.6	50.8	79.2	4	16	10	7.9	19
PUWRF-12F-JP2R	12	25A	67.6	22.8	108	14.3	1.6	50.8	79.2	4	16	10	9.5	22

Size in metric equivalents (mm) of fractional inches

Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6.35D-JP2R	6.35	15A	62.8	15.2	89	11.2	1.6	35.1	60.5	4	16	10	4.8	14
PUWRF-9.52D-JP2R	9.52	15A	64.4	16.8	89	11.2	1.6	35.1	60.5	4	16	10	7.1	17
PUWRF-12.7D-JP2R	12.7	15A	67	22.8	89	11.2	1.6	35.1	60.5	4	16	10	10.4	22
PUWRF-6.35E-JP2R	6.35	20A	63.3	15.2	99	12.7	1.6	42.9	69.8	4	16	10	4.8	14
PUWRF-9.52E-JP2R	9.52	20A	64.9	16.8	99	12.7	1.6	42.9	69.8	4	16	10	7.1	17
PUWRF-12.7E-JP2R	12.7	20A	67.6	22.8	99	12.7	1.6	42.9	69.8	4	16	10	10.4	22
PUWRF-6.35F-JP2R	6.35	25A	63.3	15.2	108	14.3	1.6	50.8	79.2	4	16	10	4.8	14
PUWRF-9.52F-JP2R	9.52	25A	64.9	16.8	108	14.3	1.6	50.8	79.2	4	16	10	7.1	17
PUWRF-12.7F-JP2R	12.7	25A	67.6	22.8	108	14.3	1.6	50.8	79.2	4	16	10	10.4	22

Flanges with pressure ratings that conform to JPI 150 are also available.

Flange Unions (ASME class 150)



Size in mm

Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6D-A2R	6	15A	62.8	15.2	88.9	11.2	1.6	35.1	60.5	4	16	15	4.8	14
PUWRF-8D-A2R	8	15A	63.7	16.2	88.9	11.2	1.6	35.1	60.5	4	16	15	6.4	16
PUWRF-10D-A2R	10	15A	64.6	17.2	88.9	11.2	1.6	35.1	60.5	4	16	15	7.9	19
PUWRF-12D-A2R	12	15A	67.1	22.8	88.9	11.2	1.6	35.1	60.5	4	16	15	9.5	22
PUWRF-6E-A2R	6	20A	63.3	15.2	98.6	12.7	1.6	43	69.9	4	16	15	4.8	14
PUWRF-8E-A2R	8	20A	64.2	16.2	98.6	12.7	1.6	43	69.9	4	16	15	6.4	16
PUWRF-10E-A2R	10	20A	65.1	17.2	98.6	12.7	1.6	43	69.9	4	16	15	7.9	19
PUWRF-12E-A2R	12	20A	67.6	22.8	98.6	12.7	1.6	43	69.9	4	16	15	9.5	22
PUWRF-6F-A2R	6	25A	64.9	15.2	108	14.3	1.6	50.8	79.3	4	16	15	4.8	14
PUWRF-8F-A2R	8	25A	65.8	16.2	108	14.3	1.6	50.8	79.3	4	16	15	6.4	16
PUWRF-10F-A2R	10	25A	66.7	17.2	108	14.3	1.6	50.8	79.3	4	16	15	7.9	19
PUWRF-12F-A2R	12	25A	69.2	22.8	108	14.3	1.6	50.8	79.3	4	16	15	9.5	22

Size in metric equivalents (mm) of fractional inches

Part number	Fitting Nominal dia D	Flange Nominal dia D	L	L1	Flange								D3	B
					D1	T	F	G	Bolt hole			D2		
									C	N	H			
PUWRF-6.35D-A2R	6.35	15A	62.8	15.2	88.9	11.2	1.6	35.1	60.5	4	16	15	4.8	14
PUWRF-9.52D-A2R	9.52	15A	64.4	16.8	88.9	11.2	1.6	35.1	60.5	4	16	15	7.1	17
PUWRF-12.7D-A2R	12.7	15A	67.1	22.8	88.9	11.2	1.6	35.1	60.5	4	16	15	10.4	22
PUWRF-6.35E-A2R	6.35	20A	63.3	15.2	98.6	12.7	1.6	43	69.9	4	16	15	4.8	14
PUWRF-9.52E-A2R	9.52	20A	64.9	16.8	98.6	12.7	1.6	43	69.9	4	16	15	7.1	17
PUWRF-12.7E-A2R	12.7	20A	67.6	22.8	98.6	12.7	1.6	43	69.9	4	16	15	10.4	22
PUWRF-6.35F-A2R	6.35	25A	64.9	15.2	108	14.3	1.6	50.8	79.3	4	16	15	4.8	14
PUWRF-9.52F-A2R	9.52	25A	66.5	16.8	108	14.3	1.6	50.8	79.3	4	16	15	7.1	17
PUWRF-12.7F-A2R	12.7	25A	69.2	22.8	108	14.3	1.6	50.8	79.3	4	16	15	10.4	22

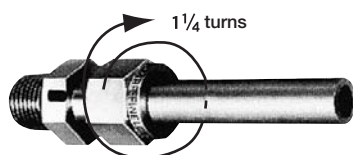
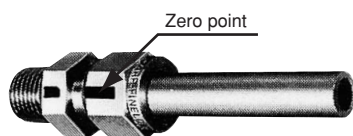
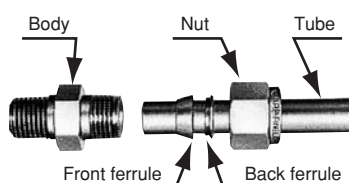
Flanges with pressure ratings that conform to ANSI 150 are also available.

Installation Guide

1-1 Before Installation

1. Use an austenitic stainless steel tube with a seamless bright anneal finish, a hardness of Hv200 or less, and a tolerance within ± 0.1 mm of the tube OD.
2. Please refer to the "Appendix 2: Tube Selection Guide" on page 41 for recommended tube thicknesses.
3. There should be no visible scratches 30mm from either end of the tube. Remove any foreign matter.
4. Avoid abrading the tube.
5. Before assembling the fittings, cut the tubes to the required length.
6. Use a tube cutter to cut the tube. If it is necessary to use a different method, be sure to cut the tube at a right angle, and then remove burrs carefully from the outer circumference by filing at a 45° angle to the centerline.
7. Tube cutter blades should be replaced regularly to maintain sharpness.

1-2 Assembly: Fittings



1. Ensure that the parts are installed in the order shown in the picture (left).

2. Insert the tube completely until it makes contact with the body. Hand-tighten the nut until it cannot be tightened further. After manually tightening the nut, mark both the body and the nut. This point is the zero point.

3. With a wrench, tighten the nut 1 1/4 turns from the zero point. Assembly is then complete.
4. Ensure that the fittings are securely tightened. Check the zero point marking, or use a gap inspection gauge (only if you are assembling new fittings).

Assembly: Smaller Fittings, Plugs, and Port Connectors

1. Fittings with nominal diameters of 4mm, 3.2mm (1/8" OD) or smaller: First tighten the nuts manually, and then use a wrench to tighten them a further 3/4 turn only. Assembly is then complete.
2. Plug unions (product number: PUWJP) and port connectors (product number: PUW-PC): First tighten the nuts manually, and then use a wrench to tighten them a further 1/4 turn only, regardless of size. Assembly is then complete.

1-3 Preparations: Before Operation

1. For tightening, use the appropriate wrench.
2. Before tightening the fitting, ensure that its body has been secured using a wrench. Never hold the nut in place while attempting to tighten the body.
3. Before adjusting the orientation (installation angle) of a fitting that has already been tightened into place, be sure to loosen the nut sufficiently.
4. Before tightening the fitting, ensure that the tube and the fitting are properly aligned.
5. If the fitting (or any of its components) are dropped accidentally, ensure that the parts have no scratches or foreign matter on them before use.
6. For tightening tee or elbow fittings, use a tee wrench whenever possible.
7. If tightening the fitting is difficult, first attach the front and back ferrules to the tube. Then, insert the front ferrule into the body until it reaches the body threads, and manually tighten the nut.
8. Front and back ferrules are available in a wide variety of sizes, in both metric and fractional inch measurements. Using ferrules of the incorrect size can cause leakage. Ensure that the ferrule type and size are correct before installation.

●1-4 Post-assembly: Inspection with a Gap Inspection Gauge (New Fittings Only)



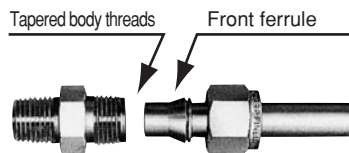
1. Position the gap inspection gauge next to the gap between the nut and body.
2. If the gauge cannot fit into the gap, the fitting is sufficiently tightened.



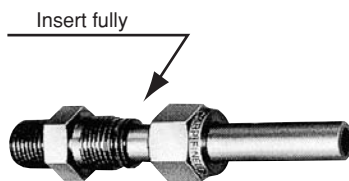
3. If the gauge can enter the gap, additional tightening is required.

Note: Do not use the gap gauge on retightened or pre-tightened fittings and brass POWERFULL Locks (PDW type).

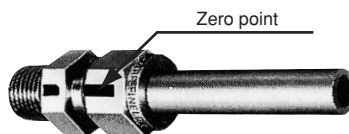
●1-5 Reassembly



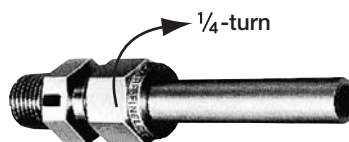
1. Before reassembling the parts, ensure that there is no foreign matter on the body threads or the front ferrules.



2. Insert the front ferrule until it reaches the body threads, and then manually tighten the nut.



3. This is the zero point.



4. With a wrench, tighten the nut approximately 1/4 turn. Assembly is then complete.

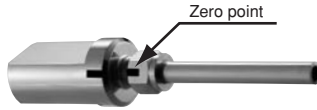
Note: After reassembly, the body and the nut should return to their original position, or be tightened slightly further.

For fittings with nominal diameters between 1.6mm (1/16" OD) and 4mm, tighten the nut 1/6 turn.

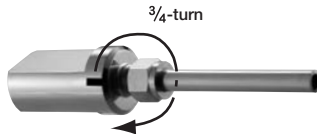
For fittings with nominal diameters of 15.88 (5/8" OD) or larger, it may occasionally be necessary to tighten the nut 1/4 turn or more.

1-6 Preswaging

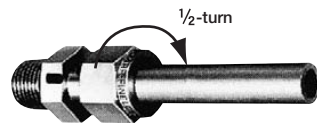
In situations where it may be difficult to tighten the ferrules (e.g., in installation locations where a wrench cannot be used), the fittings may not be assembled correctly. In such situations, use the Fujikin-designed preswaging tool to attach the front ferrule, back ferrule, and nut to the tube beforehand.



Insert the tube into the preswaging tool until it reaches the shoulder of the tool's body. Then, hand-tighten the nut until it cannot be tightened further. After manually tightening the nut, mark both the body and the nut. This point is the zero point.



With a wrench, tighten the nut 3/4 turns from the zero point. Next, loosen the nut and remove the tube from the preswaging tool. Preswaging is then complete.



At the fitting's actual installation location, connect the tube with the preassembled front ferrule, back ferrule, and nut to the fitting's body. Hand-tighten the nut until it cannot be tightened further. With a wrench, tighten the nut another 1/2 turn. Assembly is then complete.

Note: If the overall length of the connected tubes is shorter than expected after preswaging and assembly, the fitting's sealing performance will be compromised.
Do not use the gap gauge on preswaged fittings.

1-7 Specialized Tools

1. Gap Inspection Gauge



The gap inspection gauge confirms that a fitting is sufficiently tightened after initial assembly.

Product code: G-GAUGE-PUW-12.7-10
G-GAUGE-PUW-9.52-6.35

5. Tube Cutter (pat. pending)



This tube cutter assures a clean cut, and the special rollers leave virtually no marks on the tube. Fujikin recommends this tool for flareless fittings.

2. Tee Wrench (pat. pending)



This tool is used to adjust tees and elbows when a conventional wrench would not provide adequate support. This tool can also be used to hold the fitting securely, making installation easier.

Product code: T-WRENCH-PUW-*

6. Adjustable Wrench



Fujikin recommends this wrench from Lobtex Co. Ltd., which has a slim head and a comfortable grip for easier installation.

3. Special Wrench



This special fitting wrench has a slimmer head, is easier to apply force with, and reduces user fatigue.

Product code: S-SPANNER-PUW-*

7. Tool Kit



Fujikin offers a tool kit, which includes the gap gauge, tee wrench, tube cutter, and adjustable wrench.

4. Preswaging Tool



The Fujikin-designed preswaging tool allows ferrules to be tightened properly in situations in which tightening is difficult, such as the installation of piping in ceilings, under floors, or in complicated assemblies.

Product code: PRE-TIGHTEN-PUW-*

The asterisk (*) represents the nominal diameter.

Product code: PUW-TOOLSET

1-8 Oil-free Ultra-pure Compression Fittings

POWERFULLOK fittings used for oxygen service are degreased. Lubricants not designed for use with oxygen will cause an explosion if they come into contact with this fluid.

If you require oil-free ultra-pure compression fittings, use Fujikin's FINELOK fittings. For more information on these fittings, please refer to the FINELOK brochure.

Tube Selection Guide

●2-1 Introduction

Since the POWERFULLOK is designed to ensure airtight tube connections, the selection of appropriate tubes is important for reliability and safety.

●2-2 Minimum Tube Wall Thickness

Nominal Diameter Metric (mm)	Metric Equivalents (mm) of Fractional Inches	Minimum Wall Thickness (mm)
—	1.6	0.25
3, 4	3.2	0.8
6	6.35	0.88
8, 10	9.52	1
12	—	1.2
—	12.7	1.24
14	—	1.5
—	15.88, 19.05	1.65
16, 18, 20	—	1.8
—	25.4	2.11
25	—	2.2

To achieve optimal POWERFULLOK performance, select a tube with a wall thickness greater than the minimum wall thickness listed in the table to the left.

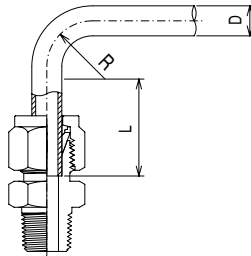
Note: Please contact Fujikin if you need to use tubes with thinner walls than those listed.

●2-3 Tube Hardness

While tests have shown that tubes with a hardness of Hv250 may be used, we recommend using tubes with a hardness of Hv200 or below with the POWERFULLOK for ease of tube bending and for the prevention of stress corrosion cracking during work hardening. For tubes with a bright anneal finish, the hardness should be approximately Hv160.

●2-4 Installing Fittings Near Tube Bends

Nominal Diameter (mm) D	Minimum Length (mm)		Min. Radius (mm) R
	L1	L2	
1.6	15	11	—
3, 3.2	19	15	9.5
4	20	16	11.1
6, 6.35	21	17	14.3
8	22	18	17.5
10, 9.52	24	19.5	23.8
12, 12.7	31	26	38.1
14, 16, 15.88	32	27	57.1
18, 19.05, 20	33	27	76.2
25, 25.4	38	33	88.9



Before tightening POWERFULLOK fittings, the end of the tube must be flush against the shoulder of the body hex. Therefore, when installing fittings near tube bends, there must be a sufficient straight length of tubing to allow for proper installation (see the table to the left).

L1: Recommended straight tube length.
L2: Minimum straight tube length.

●2-5 Maximum Allowable Working Pressure and Operating Temperature Range

Tables 1 and 2 indicate the maximum allowable working pressure based on tube nominal diameter and wall thickness at room temperature.

To calculate the maximum allowable working pressures for a given operating temperature, multiply the values in these tables by the pressure drop factors listed in Table 3.

Maximum Allowable Working Pressure

Table 1: Tube Size in Metric Equivalents of Fractional Inches (mm)

Tube Nominal Diameter	SUS316 Tube Wall Thickness (mm)						
	0.25	0.8	0.88	1	1.24	1.65	2.11
Maximum Allowable Working Pressure (MPa)							
1.6	34						
3.2		69	→				
6.35			35	40	42	→	
9.52				26	30	→	→
12.7					25.4	35	→
15.88						27.5	→
19.05						22	→
25.4							21

Table 2: Tube Size in Millimeters

Tube Nominal Diameter	SUS316 Tube Wall Thickness (mm)						
	0.8	1	1.2	1.5	1.8	2.0	2.2
Maximum Allowable Working Pressure (MPa)							
3	67						
4	55						
6		42	48	→			
8		31	35	→			
10		25.4	30	38	→	→	
12			25.4	33	41	→	
14				25.4	→	→	
16					25.4	→	→
18					25.4	→	→
20					23	→	→
25							23

Table 3: Operating Temperature and Pressure Drop Factor

Temperature (°C)	-196~40	75	100	150	200	250	300	350	400	450	500	550	600
Pressure Drop Factor	1	0.96	0.93	0.82	0.76	0.72	0.68	0.65	0.63	0.62	0.61	0.6	0.57

Note 1: The maximum allowable working pressure of a fitting at a given operating temperature is calculated by multiplying the value from either Table 1 or Table 2 by the pressure drop factor in Table 3.

Note 2: The listed pressure drop factors are based on allowable tensile stresses of SUS316 listed in Table 1 of the Interpretation of Technical Standards of Specific Equipment (Appendix) of Exemplified Standards Related to Specific Equipment Inspection Rules from Japan's High Pressure Gas Safety Law

Note 3: Consult with Fujikin if you plan to use the fittings at temperatures exceeding 400°C for an extended period of time. The fittings' sealing performance may degrade significantly under such conditions.

SI Unit Conversion Charts

4-1 Converting Non-SI Units to SI Units

Category	Measurement	Non-SI Unit	SI Unit (or Other Commonly Used Units)	Conversion Factor
Length and Acceleration	Length	μ (micron)	μm (micrometer)	$1\mu = 1\mu\text{m}$
	Acceleration	gal (galileo)	m/s^2	$1\text{Gal} = 10^{-4}\text{m/s}^2$
g (gravitational acceleration)		m/s^2	$1\text{G} = 9.80665\text{m/s}^2$	
Periodic Phenomena	Frequency	c/s, C, ~	Hz (hertz)	$1\text{c/s} = 1\text{Hz}$
	Rotation speed	rpm	min^{-1} , r/min or rpm (°)	$1\text{rpm} = 1\text{min}^{-1}$
Dynamics	Weight/load (°) (in standard earth gravity) (°)	kgf (°)	—	No change
		(kilogram weight)	—	
	Mass	(°)	kg	No change
	Flow rate (°)	kgf/s (°)	—	
	Flow rate	—	kg/s	No change
	Specific weight (°)	kgf/m ³ (°)	—	
	Density	—	kg/m ³	No change
	Specific volume	m ³ /kgf (°)	m ³ /kg	
	Weight/load (unit of force)	kgf (°)	N (newton)	$1\text{kgf} = 9.80665\text{N}$
	Force	kgf (°)	N	$1\text{kgf} = 9.80665\text{N}$
dyn (dyne)		N	$1\text{dyn} = 10^{-5}\text{N}$	
Moment	kgf·m (°)	N·m	$1\text{kgf}·\text{m} = 9.80665\text{N}·\text{m}$	
Pressure	kgf/cm ² (°)	Pa (pascal) or bar (°) or kgf/cm ² (°)	$1\text{kgf/cm}^2 = 9.80665 \times 10^4\text{Pa}$ $1\text{kgf/cm}^2 = 0.980665\text{bar}$	
		at (barometric pressure, engineering)	$1\text{at} = 9.80665 \times 10^4\text{Pa}$	
	atm (atmospheric pressure)	Pa	$1\text{atm} = 101,325\text{Pa}$	
	mH ₂ O, mH ₂ O	Pa	$1\text{mH}_2\text{O} = 9.80665 \times 10^4\text{Pa}$	
	mmHg	Pa	$1\text{mmHg} = 133,322\text{Pa}$	
	or mmHg	Pa	$1\text{Torr} = 133,322\text{Pa}$	
Stress	kgf/mm ² (°)	Pa	$1\text{kgf/mm}^2 = 9.80665 \times 10^6\text{Pa}$	
Elastic modulus	kgf/cm ² (°)	or N/m ²	$1\text{kgf/cm}^2 = 9.80665 \times 10^4\text{N/m}^2$	
	kgf/m ² (°)	Pa	$1\text{kgf/cm}^2 = 9.80665 \times 10^4\text{Pa}$	
	—	or N/m ²	$1\text{kgf/cm}^2 = 9.80665 \times 10^4\text{N/m}^2$	
	—	Pa	$1\text{kgf/m}^2 = 9.80665\text{Pa}$	
—	—	or N/m ²	$1\text{kgf/m}^2 = 9.80665\text{N/m}^2$	
Energy, work	kgf·m (°)	J (joule)	$1\text{kgf}·\text{m} = 9.80665\text{J}$	
	erg	J	$1\text{erg} = 10^{-7}\text{J}$	
Power	kgf·m/s (°)	W (watt)	$1\text{kgf}·\text{m/s} = 9.80665\text{W}$	
	PS	W	$1\text{PS} = 0.735\text{kW}$	
Thermodynamics	Thermodynamic temperature or temperature interval	°K (degrees kelvin)	K (kelvin)	$1^\circ\text{K} = 1\text{K}$
Energy	cal (calorie)	J	$1\text{cal} = 4.18605\text{J}$	
Heat capacity	cal/°C	J/K (°)	$1\text{cal}/^\circ\text{C} = 4.18605\text{J/K}$	
Specific heat / Specific heat capacity	cal/(kgf·°C) (°)	J/(kg·K) (°)	$1\text{cal}/(\text{kgf}·^\circ\text{C}) = 4.18605\text{J}/(\text{kg}·\text{K})$	
Entropy	cal/°K	J/K	$1\text{cal}/^\circ\text{K} = 4.18605\text{J/K}$	
Specific entropy	cal/(kgf·°K) (°)	J/(kg·K)	$1\text{cal}/(\text{kgf}·^\circ\text{K}) = 4.18605\text{J}/(\text{kg}·\text{K})$	
Internal energy (Enthalpy)	cal	J	$1\text{cal} = 4.18605\text{J}$	
Specific internal energy (Specific enthalpy)	cal/kgf (°)	J/kg	$1\text{cal}/\text{kgf} = 4.18605\text{J}/\text{kg}$	

Category	Measurement	Non-SI Unit	SI Unit (or Other Commonly Used Units)	Conversion Factor
Heat	Heat flow	cal/h	W	$1\text{kcal/h} = 1,162,79\text{W}$
	Heat flux density	cal/(h·m ²)	W/m ²	$1\text{kcal}/(\text{h}·\text{m}^2) = 1,162,79\text{W}/\text{m}^2$
	Thermal conductivity	cal/(h·m·°C)	W/(m·K) (°)	$1\text{kcal}/(\text{h}·\text{m}·^\circ\text{C}) = 1,162,79\text{W}/(\text{m}·\text{K})$
	Coefficient of heat transfer	cal/(h·m ² ·°C)	W/(m ² ·K) (°)	$1\text{kcal}/(\text{h}·\text{m}^2·^\circ\text{C}) = 1,162,79\text{W}/(\text{m}^2·\text{K})$
Magnetic Properties	Magnetic force	Oe (oersted)	A/m	$1\text{Oe} = 10^3/(4\pi)\text{A/m}$
	Magnetic flux	Mx (maxwell)	Wb (weber)	$1\text{Mx} = 10^{-8}\text{Wb}$
	Magnetic flux density	Gs, C (gauss)	T (tesla)	$1\text{Gs} = 10^{-4}\text{T}$

- Notes
- (1) Not mentioned in ISO 31/2-1978 or ISO 1000/1981.
 - (2) In the past, *kgf* was expressed in terms of *kg* and *kgw*.
 - (3) Weight is a function of both gravitational force (relative measurement) and mass (absolute measurement). In the gravitational system of measurement, weight is different from mass. However, in the absolute system, weight is equivalent to mass.
 - (4) The units *kgf·s²/m* (kilogram-force second squared per meter) are used to describe mass *W/g* (weight divided by gravitational acceleration) in the equation for calculating centripetal force, $F_c = (W/g)r\omega^2$.
 - (5) The unit of pressure *bar* is still commonly used in chemistry to describe vapor pressure, and in meteorology to describe atmospheric pressure.
 - (6) When switching to SI units poses a safety concern, scales and pressure gauges may display values in terms of *kgf/cm²*.
 - (7) Temperature may be expressed in *degrees Celsius* (°C) instead of *kelvins* (K).

4-2 Converting SI Units to Non-SI Units

Category	Pa	bar	kgf/cm ²	atm	mmH ₂ O	mmHg or Torr
Pressure	1	1×10^{-5}	1.01972×10^{-5}	9.86923×10^{-6}	1.01972×10^1	7.50062×10^{-3}
	1×10^1	1	1.01972	9.86923×10^{-1}	1.01972×10^1	7.50062×10^1
	9.80665×10^4	9.80665×10^{-1}	1	9.67841×10^{-1}	1×10^1	7.35559×10^1
	1.01325×10^5	1.01325	1.03323	1	1.03323×10^1	7.60000×10^1
	9.80665	9.80665×10^{-1}	1×10^{-1}	9.67841×10^{-1}	1	7.35559×10^{-1}
	1.33322×10^5	1.33322×10^{-1}	1.35951×10^{-1}	1.31579×10^{-1}	1.35951×10	1

Note $1\text{Pa} = 1\text{N/m}^2$

Category	Pa	MPa or N/mm ²	kgf/mm ²	kgf/cm ²
Pressure	1	1×10^{-6}	1.01972×10^{-1}	1.01972×10^{-5}
	1×10^6	1	1.01972×10^{-1}	1.01972×10
	9.80665×10^5	9.80665	1	1×10^2
9.80665×10^4	9.80665×10^{-2}	1×10^{-2}	1	

Category	J	kw·h	kgf·m	kcal
Work/energy/heat	1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
	3.600×10^6	1	3.67098×10^6	8.6000×10^3
	9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
	4.18605×10^3	1.16279×10^{-3}	4.26858×10^1	1

Note $1\text{J} = 1\text{w}·\text{s}$, $1\text{w}·\text{h} = 3600\text{w}·\text{s}$ $1\text{kcal} = 4.18605\text{J}$ (according to Japan's Measurement Law)

Category	kw	kgf·m/s	PS	kcal/h
Power, heat flow	1	1.01972×10^2	1.35962	8.6000×10^2
	9.80665×10^{-3}	1	1.33333×10^{-2}	8.43371
	7.355×10^{-1}	7.5 × 10	1	6.32529×10^2
	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-1}	1

Note $1\text{w} = 1\text{J/s}$ $1\text{PS} = 0.735\text{kW}$ (according to Japan's Enforcement Act for the Law of Weights and Measures) $1\text{kcal} = 4.18605\text{J}$ (according to Japan's Measurement Law)

Note: SI stands for *Le Système international d'unités* (International System of Units).

You can download the latest catalogue from <http://www.fujikin.co.jp/go/c72100e>

Fine Bubble Leak Detection Fluid

Concentration of Impurities (Units: ppm)

Impurities	Na	K	Ca	Cl	F
Concentration	<1	<1	<1	<1	<1

Ordering Number	Container Size	Quantity per Pack	Container
LL-S-1	60cc	6 bottles/pack	Squeeze bottle
LL-M-1	300cc	1 bottle/pack	Squeeze bottle with nozzle cap
LL-L-1	4 l	1 container/pack	Refill container



- With its viscosity and rapid foaming action, Fine Bubble detects the smallest leaks even when it is applied in small amounts.
- Noncorrosive; does not react with metal, coatings, rubber, or plastic surfaces.
- Dries clean and without staining.
- Minimal impurities such as sodium, potassium, calcium, chlorine, fluorine, bromine, and sulfur compounds.
- Nonflammable; does not react with oxygen.
- Available in three convenient sizes: 60cc (squeeze bottle), 300cc (squeeze bottle with nozzle cap), and 4L (refill container).
- Read the instructions carefully before use.

Fine Bubble Test Data

Corrosion Test Results

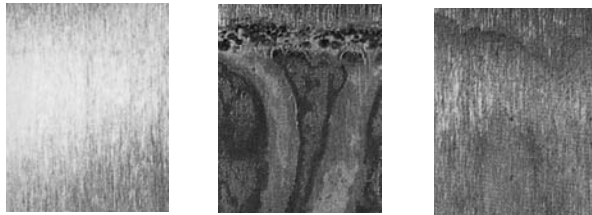
Tube Material (25 x 50 x 15t #400 finish)	Leak Detection Fluid			Duration
	Fine Bubble®	Brand B	Brand C	
S55C	○	× ₃	× ₃	After 24 hours
A1050P	○	○	△ ₁₂₀	After 120 hours
C2801P	△ ₃	△ ₃	△ ₃	After 120 hours
SUS304	○	○	○	After 120 hours

Key: ○: Almost no changes until the end of test
 △: Discolored or slightly corroded
 ×: Corroded

Numbers next to the symbol indicate the when (in terms of hours) changes to the metal were visually observed.

Immersion Corrosion Test

The metal samples were immersed in the leak detection fluids at 30°C and inspected for changes.



Fine Bubble® Brand B Brand C

S55C samples after 24 hours of immersion in the leak detection fluids

Fujikin®



Fujikin® Carp® Group

URL <http://www.fujikin.co.jp/> E-mail info@fujikin.co.jp



The Year 2005
The 1st Monozukuri (manufacturing)
Nippon Grand Awards
: Excellence Prize