Fujikin

VALVES & FITTINGS

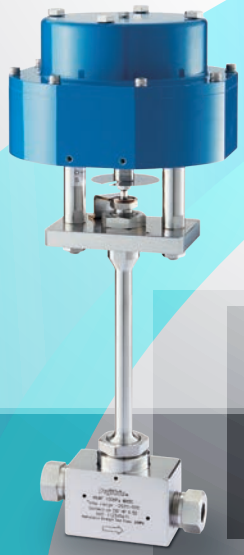
for Hydrogen Refueling Station

Manual Valves
(High-Flow Type)

Flow Control Valves

Filters

Check Valves



Shut-off Valves
(High-Flow Type)

Coned-and-Threaded
Connection

UPG Fittings

Ultra Low Temperature Valves
For Liquefied Hydrogen (Shut-off Valves)

JAB CM007

ISO9001
98QR·132

Fujikin creates a new “flow of things” in the hydrogen era with ultra-precision flow control.

Countries around the world are striving to utilize hydrogen as a source of motive power and electric power generation.

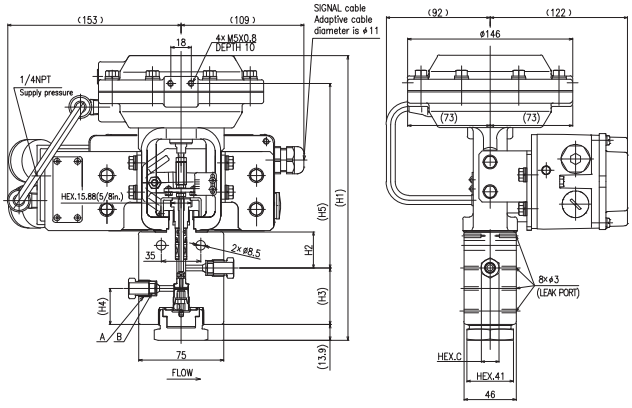
Fujikin has added to its product lineup new Global Series, High-Flow Type in response to the increasing use of FCV (fuel cell vehicles) and establishment of hydrogen stations around the globe in anticipation of the realization of hydrogen-based society.

Table of contents

Click here for catalog (PDF).

Flow Control Valves / Shut-off Valves

100 MPa Flow Control Valves (Compact Type)



Features

1. Flow coefficient (Cv value) can be selected by replaced stem and seat.
2. Smart positioner with communications function can be available.
3. CE Ⓔx II 2G Exc IIC T6

Global Series

Specifications

Design Pressure	100 MPa
Fluid temperature range	−40 to +85 °C
Note:When using in a pre-cool line, please select the valve for precool low temperature type	
Ambient temperature range	−40 to +60 °C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

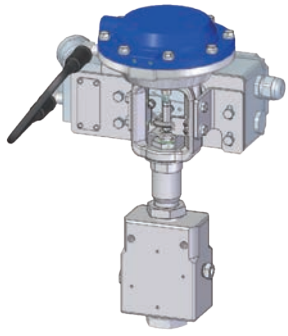
Nominal size D	Gland Thread (valves body side) A	Collar Thread (tube side) B	HEX.C	H1	H2	H3	H4	H5	Cv value MAX.	Ordering No
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	252	32	50	32	163	0.15	E32GM3R4-7100-4M-★-WN
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	252	32	50	32	163	0.25	E32GM3R4-7100-6M-★-WN
14.2	13/16-16UN	(Left)9/16-18UNF	19	252	32	50	32	163	0.25	E32GM3R4-7100-9M-★-WN
14.2	13/16-16UN	(Left)9/16-18UNF	19	254	33	51	33	164	0.5 【Middle flow type】	E32GM3R4-7100-9M-★-MF

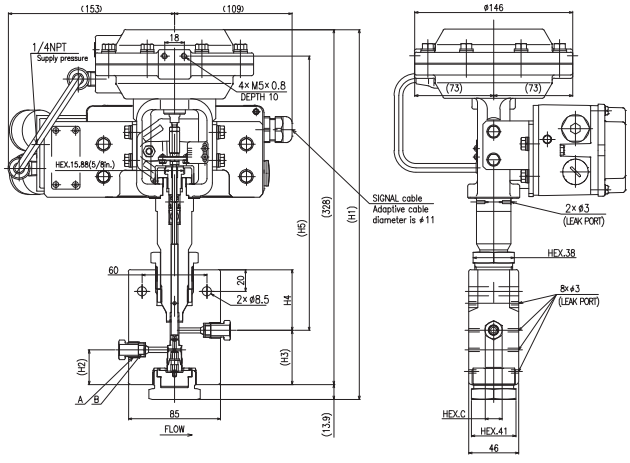
Coned &Threaded Connection MP type

★:indicates the Cv value number

(Refer to "Combination of Cv Value and Rangeability" on page 29.)

100 MPa Flow Control Valves (For Precool Low Temperature)





Features

1. Flow coefficient (Cv value) can be selected by replaced stem and seat.
2. Smart positioner with communications function can be available.
3. CE Ⓔx II 2G Exc IIC T6
4. Improved durability against heat cycles on the pre-cool line.

Global Series

Specifications

Design Pressure	100 MPa
Fluid temperature range	−40 to +85 °C
Ambient temperature range	−40 to +60 °C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

Nominal size D	Gland Thread (valves body side) A	Collar Thread (tube side) B	HEX.C	H1	H2	H3	H4	H5	Cv value MAX.	Ordering No
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	342	32	50	56	254	0.15	E32GM3R4-7100M-4M-★-WN
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	342	32	50	56	254	0.25	E32GM3R4-7100M-6M-★-WN
14.2	13/16-16UN	(Left)9/16-18UNF	19	342	32	50	56	254	0.25	E32GM3R4-7100M-9M-★-WN
14.2	13/16-16UN	(Left)9/16-18UNF	19	344	33	51	57	255	0.5 【Middle flow type】	E32GM3R4-7100M-9M-★-MF

Coned &Threaded Connection MP type

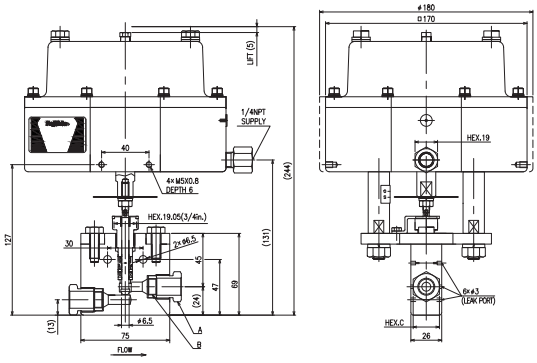
★:indicates the Cv value number

(Refer to "Combination of Cv Value and Rangeability" on page 29.)

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

100 MPa Shut-off Valves



Features

1. CE Ⓔx II 2G Exc IIC T6

Global Series

Specifications

Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60 °C
Body materials	ASTM A479 316/316L(Dual spec.)

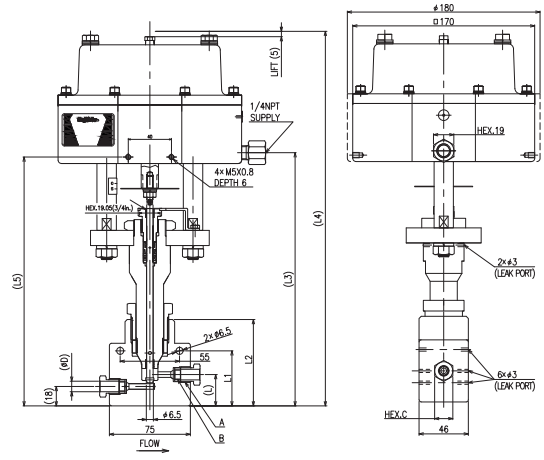
Note: When using in a pre-cool line, please contact Fujikin when ordering.

Dimensions, Ordering No.

Nominal size D	Gland Thread (valves body side) A	Collar Thread (tube side) B	HEX.C	Cv value MAX.	Ordering No
6.35	7/16–20UNF	(Left)1/4–28UNF	12.7	0.25	APR-GUH-7100-4M
9.52	9/16–18UNF	(Left)3/8–24UNF	15.8	0.7	APR-GUH-7100-6M
14.2	13/16–16UN	(Left)9/16–18UNF	22.2	1	APR-GUH-7100-9M-S

Coned &Threaded Connection MP type

100 MPa Shut-off Valves (For Precool Low Temperature)



Features

1. Improved durability against heat cycles on the pre-cool line.
2. CE Ⓔx II 2G Exc IIC T6

Global Series

Specifications

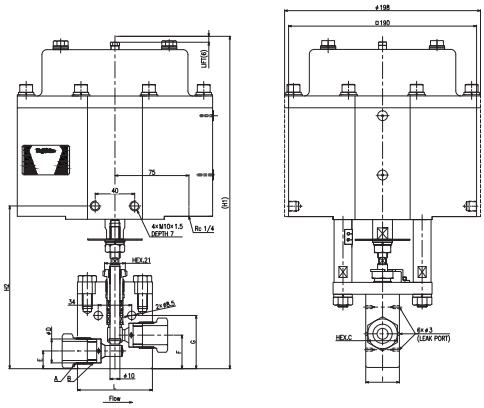
Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60°C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

Nominal size D	Gland Thread (Valves body side) A	Collar Thread (tube side) B	L	L1	L2	L3	L4	L5	HEX.C	Cv value MAX.	Ordering No
6.35	7/16-20UNF	(Left)1/4-28UNF	29	51	80	235	347	231	12.7	0.25	APR-GUH-7100M-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	29	51	80	235	347	231	15.8	0.7	APR-GUH-7100M-6M
14.2	13/16-16UN	(Left)9/16-18UNF	31	53	82	237	349	233	22.2	1	APR-GUH-7100M-9M-S

Coned &Threaded Connection MP type

100 MPa Shut-off Valves (High-Flow Type)



Features

1. High flow series with Cv value of 2 or higher
2. No differential pressure restriction conditions for use
3. CE Ⓔx II 2G Exc IIC T6

Global Series

Specifications

Design pressure	100 MPa
Fluid temperature range	–40 to +85°C
Ambient temperature range	–40 to +60°C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

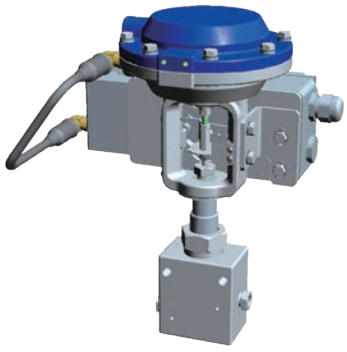
Normal size D	Gland Thread (valves body side) A	Collar Thread (tube side) B	HEX.C	L	H1	H2	E	F	G	I	Cv Value MAX.	Ordering No
19.05	3/4-14NPS	(Left)3/4-16UNF	30.2	76	339	167	18	34	54	35	2.5	APR-GUH-7100-12M
25.4	1·3/8-12UNF	(Left)1-14UNS	34.9	100	347	175	24	42.5	74	45	2.5	APR-GUH-7100-16M

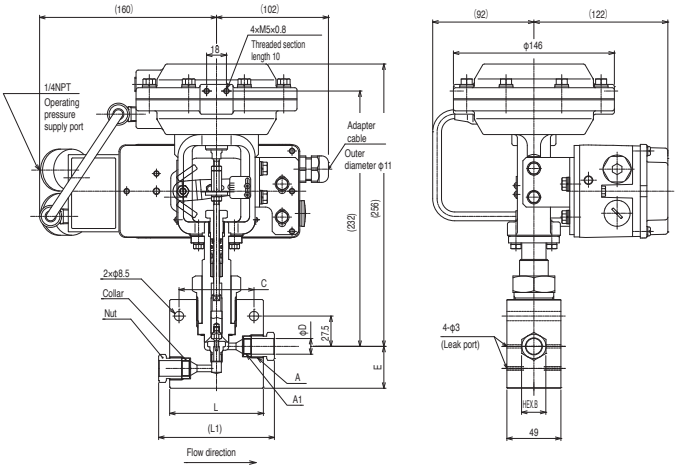
Coned &Threaded Connection MP type

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

50 MPa Flow Control Valves





Features

1. Precise flow control for ultra high-pressure hydrogen gas.
2. Flow coefficient (Cv Value) can be selected and replaced from a large variety of disc sheets.
3. Smart positioner with communications functioncan be available.

Specifications

Design Pressure	50 MPa
Fluid Temperature Range	–40 to +85 °C
Ambient temperature range	–10 to +60 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

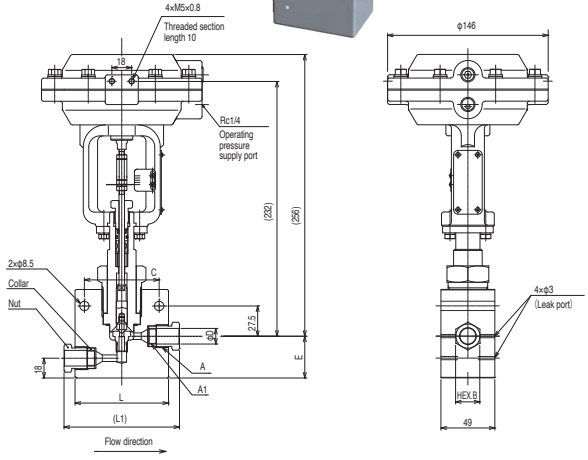
Dimensions, Ordering No.

Nominal Diameter	Gland Thread (valve body side)	Collar Thread (tube side)	L	L1 Collar and nut insertion reference dimensions	C	E	HEX.B	Cv Value MAX.	Ordering No.
D	A	A1							
6.35	7/16-20UNF	(Left)1/4-28UNF	70	88	26.5	36	14	0.15	E32M3R4-750-6.35-★-N28.5-CN
9.52	9/16-18UNF	(Left)3/8-24UNF	70	88	26.5	36	17	0.35	E32M3R4-750-9.52-★-N28.5-CN
14.2	13/16-16UNF	(Left)9/16-18UNF	85	105	34	38	22	0.5	E32M3R4-750-14.2-★-N28.5-CN

Coned &Threaded Connection MP type

★:indicates the Cv value number
(Refer to "Combination of Cv Value and Rangeability" on page 29.)

50 MPa Shut-off Valves



Features

1. Easy maintenance doe to disk and sheet replacement.

Specifications

Design Pressure	50 MPa
Fluid Temperature Range	–40 to +85 °C
Ambient temperature range	–10 to +60 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter	Gland Thread (valve body side)	Collar Thread (tube side)	L	L1 Collar and nut insertion reference dimensions	C	E	HEX.B	Cv Value MAX.	Ordering No.
D	A	A1							
6.35	7/16-20UNF	(Left)1/4-28UNF	70	88	26.5	36	14	0.15	M3R4-750-6.35-N28.5-CN
9.52	9/16-18UNF	(Left)3/8-24UNF	70	88	26.5	36	17	0.5	M3R4-750-9.52-N28.5-CN
14.2	13/16-16UNF	(Left)9/16-18UNF	85	105	34	38	22	0.5	M3R4-750-14.2-N28.5-CN

Coned &Threaded Connection MP type

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Accessories for Automatic Valves

Regulators with Filter

SSS Co., Ltd.

Features

Regulating required air supply pressure for Flow Control Valves.

Makers		SSS Co., Ltd.
Model No.		XR-108
Specifications	Air Connecting Port	Rc1/4 (Pressure gauge: Rc1/8)
	Filter Element	Polyprene bonded material Element: 5 μm
	Max Supply Pressure	0.9 MPa
	Weight	0.26 Kg

Solenoid Valves

KANEKO SANGYO CO., LTD

ASCO JAPAN Co., Ltd

Explosion Proof Construction	Item Numbers	Types	Makers	Features
ExdIICT6	MOOU-8-E22POA-SA	——	KANEKO SANGYO CO., LTD	·Pressure-resistant & Explosion Proof Type ·Outdoor Prevention Drop IP67 ·Changerble by manual operation ·Various Explosion Proof Standard
Ex e mb IIC	WBLPG551A005MS	Direct Mount Type 3-Way	ASCO JAPAN Co., Ltd	·Safety & Resin Filling Explosion Proof Type ·Hydrogen Explosion Proof Type Ex e mb IIC、 ·Outdoor Prevention Drop IP67 ·Applicable to Manifold Type
	WBLPG551A017MS	Direct Mount Type 4-Way		
	WBLPG551A001MS	NAMUR Type 3,4-Way		
Ex ia IIC T4	CFSCISG551C505MO	Direct Mount Type 3-Way	ASCO JAPAN Co., Ltd	·Instrinsically Safe Explosion Proof Type ·Hydrogen Explosion Proof Type Ex ia IIC T4、 ·Outdoor Prevention Drop IP67 ·Certain operation by spring return Type
	CFSCISG551C517MO	Direct Mount Type 4-Way		
	CFSCISG551C501MO	NAMUR Type 3,4-Way		

★: When ordering, please specify explosion-proof construction and power supply specification.

Proximity Switch, Controller

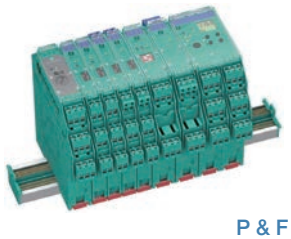
IDEC Corporation

Features

1. Output electrical signals indicating open or close status of valves.
2. Uses a two-wire DC system to allow for long-distance wiring highly resistant to noise.

Item	Model No. IDEC Corporation	Explosion-proof Construction
Proximity switch	Bi2-G12-Y1	ExiaIICT6
Controller	IM1-12EX-R	[Exia]IIC

Explosion-Proof accessories For Positioners



P & F

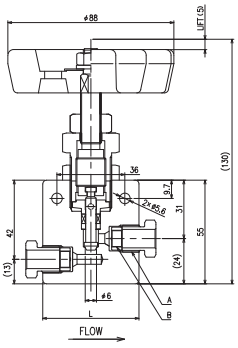
★: Please request necessary.

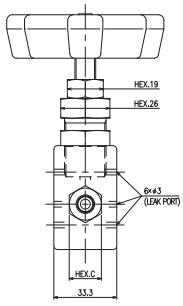
Intrinsially Safe Explosion proof Barrer for E32M3 Series

Makers	Model No.	Explosion-proof Construction
P & F	KFD2-SCD-Ex1. LK	Exia IIC

Manual Valves / Check Valves / Filters

100 MPa Manual Valves





Features

1. Compact and with Durable Manual Valves
2. With Lock Nut

Global Series

Specifications

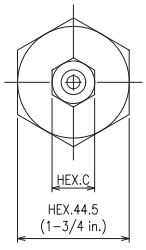
Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60 °C
Body materials	ASTM A479 316/316L(Dual spec.)

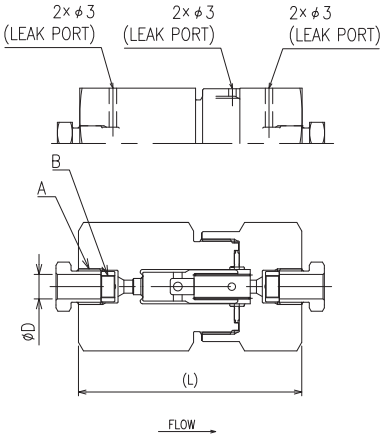
Dimensions, Ordering No.

Nominal size D	Gland Thread (Valves body side) A	Collar Thread (tube side) B	HEX.C	L	Cv value	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	51	0.18	GUH-7100L-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	51	0.55	GUH-7100L-6M
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	63.5	1	GUH-7100L-9M-S

Coned &Threaded Connection MP type

100 MPa Check Valves





Features

1. Compact, in-line type
2. Little pressure drop due to optimal flow pass

Global Series

Specifications

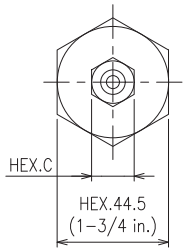
Design Pressure		100 MPa
Fluid temperature range		–40 to +85 °C
Ambient temperature range		–40 to +85 °C
Body materials		ASTM A479 316/316L (Dual spec.)
Cracking pressure		Under 0.0069 MPa
Operating conditions	Flow rate	Over 40 m³/h normal
	Differential pressure (Reverse Pressure)	Over 10 MPa

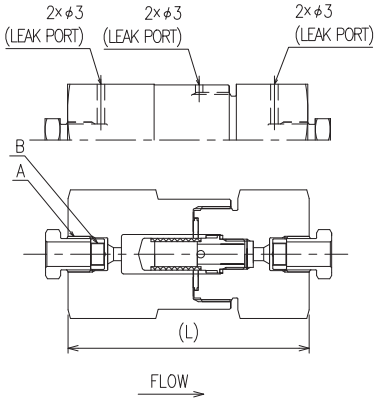
Dimensions, Ordering No.

Nominal size D	Gland Thread (Valves body side) A	Collar Thread (tube side) B	HEX.C	L	Cv value	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	89	0.21	GUCL-7100-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	89	0.66	GUCL-7100-6M
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	100	1	GUCL-7100L-9M-S

Coned &Threaded Connection MP type

100 MPa Filters





Features

1. Compact, in-line type
2. Little pressure drop due to optimal flow pass
3. Element size from 2, 5, and 10μm

Global Series

Specifications

Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +85 °C
Body materials	ASTM A479 316/316L(Dual spec.)

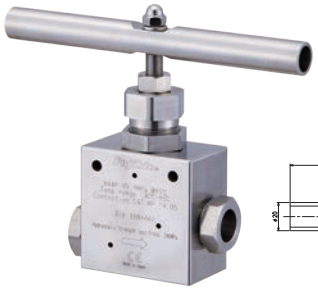
Dimensions, Ordering No.

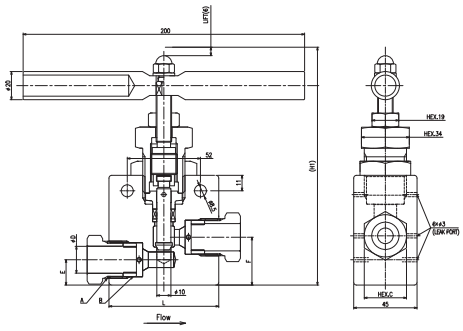
Nominal size D	Gland Thread (Valves body side) A	Collar Thread (tube side) B	HEX.C	L	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	96	GUFL-7100-4M-*1
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	96	GUFL-7100-6M-*1
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	107	GUFL-7100-9M-*1

Coned &Threaded Connection MP type *1: Element size number is added.
(Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 30.)

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

100 MPa Manual Valves (High-Flow Type)





Features

1. High flow series with Cv value of 2 or higher
2. Equipped with a lock nut to fix the open/closed position of the valve

Global Series

Specifications

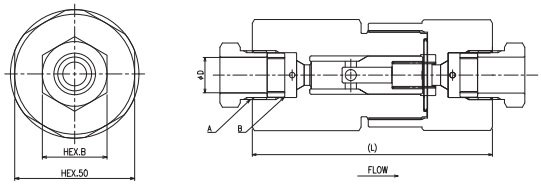
Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60 °C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	H1	E	F	Cv Value	Ordering No.
D	A	B							
19.05	3/4-14NPS	(Left)3/4-16UNF	30.2	76	169	18	34	2.5	GHU-7100L-12M
25.4	1-3/8-12UNF	(Left)1-14UNS	34.9	100	177	24	42.5	2.5	GHU-7100L-16M

Coned &Threaded Connection MP type

100 MPa Check Valves (High-Flow Type)



Features

1. High flow series with Cv value of 2 or higher
2. In-line shape, compact
3. Simple flow path shape and low pressure loss

Global Series

Specifications

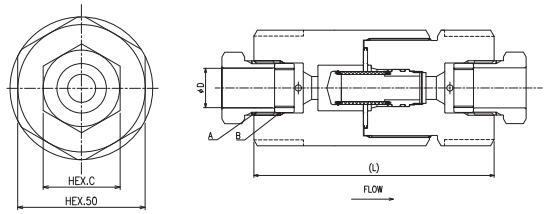
Design pressure		100 MPa
Fluid temperature range		–40 to +85 °C
Ambient temperature range		–40 to +85 °C
Body materials		ASTM A479 316/316L(Dual spec.)
Cracking pressure		Under 0.0069 MPa
Operating conditions	Flow rate	Over 40 m^3/h normal
	Different pressure (Reverse Pressure)	Over 10 MPa

Dimensions, Ordering No.

Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	Cv value	Ordering No.
D	A	B				
19.05	3/4-14NPS	(Left)3/4-16UNF	30.2	130	2	GUCL-7100-12M
25.4	1-3/8-12UNF	(Left)1-14UNS	34.9	163	2	GUCL-7100-16M

Coned &Threaded Connection MP type

100 MPa Filters (High-Flow Type)



Features

1. In-line shape, compact
2. Simple flow path shape and low pressure loss
3. Elemnt size from 2,5, and 10 µm

Global Series

Specifications

Design Pressure	100 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +85 °C
Body materials	ASTM A479 316/316L(Dual spec.)

Dimensions, Ordering No.

Nominal size	Gland Thread (Valves body side)	Collar Thread (tube side)	HEX.C	L	Ordering No.
D	A	B			
19.05	3/4-14NPS	(Left)3/4-16UNF	30.2	116	GUFL-7100-12M-★1
25.4	1-3/8-12UNF	(Left)1-14UNS	34.9	145	GUFL-7100-16M-★1

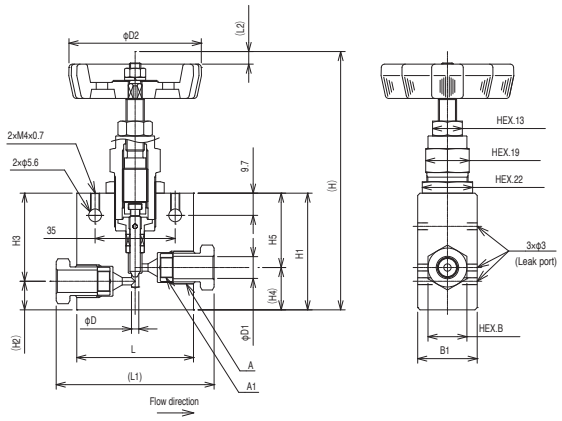
Coned &Threaded Connection MP type

★1: Element size number is added.
(Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 30.)

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

50 MPa Manual Valves



Features

1. Compact and with Durable Manual Valves
2. Provided with a lock nut for retaining valve open/close position.

Specifications

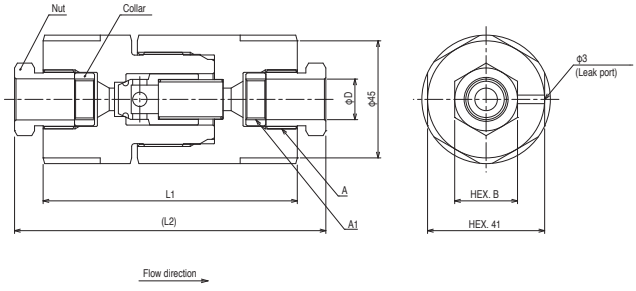
Design Pressure	50 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal size D1	Orifice Diameter D	Gland Thread (valves body side) A	Collar Thread (tube side) B	L	L1	H	L2	D2	HEX.B	B1	H1	H2	H3	H4	H5	Cv value MAX.	Ordering No
6.35	3.2	7/16-20UNF	(左)1/4-28UNF	51	69	113	5	58	14	26	51	12.5	38.5	18.5	32.5	0.18	UH-750L-6.35-N28.5-CN
9.52	3.2	9/16-18UNF	(左)3/8-24UNF	51	69	113	5	58	17	26	51	12.5	38.5	18.5	32.5	0.23	UH-750L-9.52-N28.5-CN
14.2	6	13/16-16UN	(左)9/16-18UNF	62	82	121	5	68	22	26	57	15	42	26	31	1	UH-750L-14.2-N28.5-CN

Coned &Threaded Connection MP type

50 MPa Check Valves



Features

1. Compact, in-line type
2. Little pressure drop due to optimal flow pass

Specifications

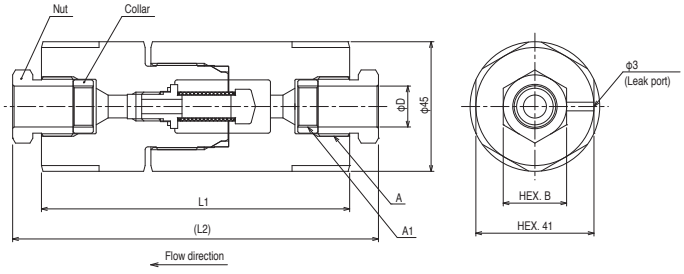
Design pressure		50 MPa
Fluid temperature range		–40 ~ +85 °C
Ambient temperature range		–40 ~ +85 °C
Body materials		SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Cracking pressure		Under 0.0069 MPa
Operating conditions	Differential pressure (Reverce Pressure)	Over 10 MPa

Dimensions, Ordering No.

Nominal Diameter D	Gland Thread (filter body side) A	Collar Thread (tube side) A1	HEX.B	Interfacial Distance L1	Interfacial Distance L2	Cv Value MAX.	Mass (approx.) (kg)	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	14	89	107	0.18	0.9	UCL-750-6.35-N28.5-CN
9.52	9/16-18UNF	(Left)3/8-24UNF	17	89	107	0.55	1.1	UCL-750-9.52-N28.5-CN
14.2	13/16-16UN	(Left)9/16-18UNF	22	89	109	1.0	1.0	UCL-750-14.2-N28.5-CN

Coned &Threaded Connection MP type

50 MPa Filters



Features

1. Compact, in-line type
2. Little pressure drop due to optimal flow pass
3. Element size from 2, 5 and 10 μm

Specifications

Design pressure	50 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +85 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter D	Gland Thread (valve body side) A	Collar Thread (tube side) A1	HEX.B	Interfacial Distance L1	Interfacial Distance L2	Mass (approx.) (kg)	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	14	107	125	1.1	UFL-750-6.35-✶1-N28.5-CN
9.52	9/16-18UNF	(Left)3/8-24UNF	17	107	125	1.3	UFL-750-9.52-✶1-N28.5-CN
14.2	13/16-16UN	(Left)9/16-18UN	22	107	127	1.2	UFL-750-14.2-✶1-N28.5-CN

Coned &Threaded Connection MP type

✶1: Element size number is added.
(Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 30.)

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Ultra Low Temperature Valves For Liquefied Hydrogen

Ultra Low Temperature Valves For Liquefied Hydrogen (Shut-off Valves)

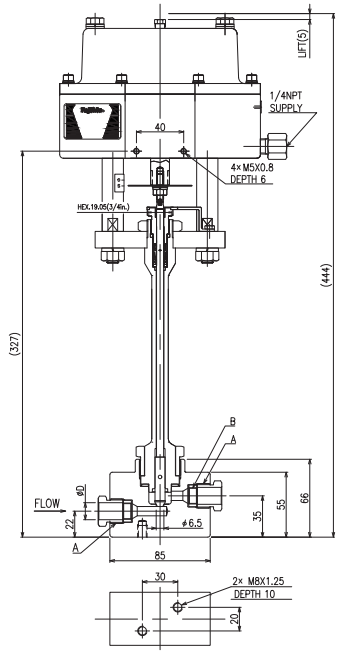
Global Series

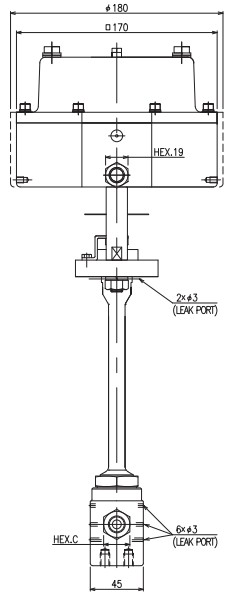
Thank you, we appreciate your support

Monodzukuri, Nippon Conference/Nikkan Kogyo Shimbun, LTD.

2019 16th

Cho Monodzukuri Grand Award for Parts Grand Award





Features

1. Capable of controlling ultra high-pressure liquefied hydrogen
   (Control range: ultra high-pressure of up to 100 MPa, ultra low temperature of down to -253°C)
2. High-Flowrate (Cv value of 1.0)

Specifications

Design Pressure	100 MPa
Fluid temperature range	–253 to +50 °C
Ambient temperature range	–40 to +50 °C
Body materials	SUH660

Dimensions, Ordering No.

Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	Cv Value MAX.	Ordering No.
D	A	B			
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	0.25	APR-GKLH-7100C-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	0.7	APR-GKLH-7100C-6M
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	1	APR-GKLH-7100C-9M-S

Coned &Threaded Connection MP type

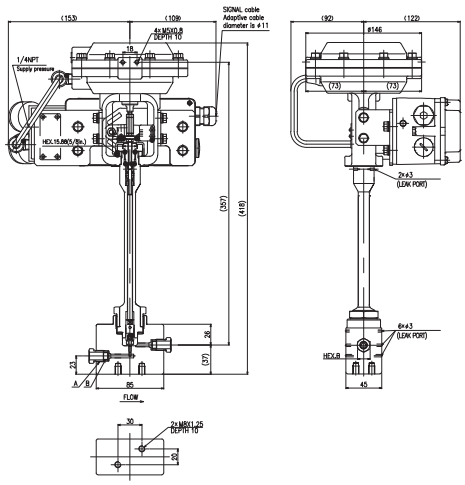
Ordering No. APR-GKLH-7100C-4H~9H (Ultra Low Temperature Valves For Liquefied Hydrogen (Shut-off Valves))

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Ultra Low Temperature Valves for Liquefied Hydrogen

Ultra Low Temperature Valves For Liquefied Hydrogen (Flow Control Valves)



Check Valves for low temperature are also available.

Features

1. Capable of controlling ultra high-pressure liquefied hydrogen (Control range: ultra high-pressure of up to 100 MPa, ultra low temperature of down to -253°C)
2. Flow coefficient(Cv value) selectable from the wide range of options
3. Smart positioner with communications functioncan be available.

Specifications

Design Pressure	100 MPa
Fluid temperature range	–253 to +50 °C
Ambient temperature range	–40 to +50 °C
Body materials	SUH660

Dimensions, Ordering No.

Nominal size D	Gland Thread (valve body side) A	Collar Thread (tube side) B	HEX.C	Cv Value MAX.	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	0.15	E32GM3R4-7100C-4M-*
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	0.25	E32GM3R4-7100C-6M-*
14.2	13/16-16UN	(Left)9/16-18UNF	19	0.25	E32GM3R4-7100C-9M-*

Coned &Threaded Connection MP type

*:indicates the Cv value number

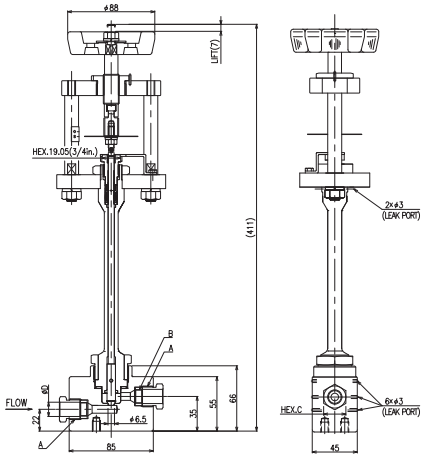
(Refer to "Combination of Cv Value and Rangeability" on page 29.)

Ordering No.

E32GM3R4-7100C-4M~9M-*

(Ultra Low Temperature Valves For Liquefied Hydrogen (Flow Control Valves))

Ultra Low Temperature Valves For Liquefied Hydrogen (Manual Valves)



Features

1. Capable of controlling ultra high-pressure liquefied hydrogen (Control range: ultra high-pressure of up to 100 MPa, ultra low temperature of down to -253°C)
2. High-Flowrate (Cv value of 1.0)

Specifications

Design Pressure	100 MPa
Fluid temperature range	–253 to +50 °C
Ambient temperature range	–40 to +50 °C
Body materials	SUH660

Dimensions, Ordering No.

Normal size D	Gland Thread (valves body side) A	Collar Thread (tube side) B	HEX.C	Cv Value MAX.	Ordering No.
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	0.25	GKLH-7100C-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	0.7	GKLH-7100C-6M
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	1	GKLH-7100C-9M-S

Coned &Threaded Connection MP type

Ordering No.

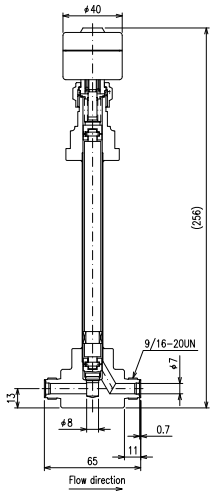
GKLH-7100C-4H9H

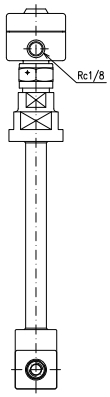
(Ultra Low Temperature Valves For Liquefied Hydrogen (Manual Valves))

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Ultra Low Temperature Valves For Liquefied Hydrogen(Shut-off Valves),Low pressure type





Features

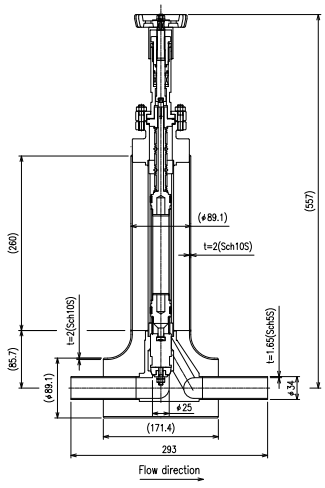
1. Compact actuator
2. High sealing performance by bellows

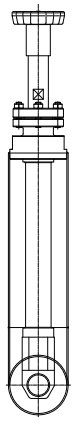
Specifications(example)

Design Pressure	1 MPa
Design Temperature	– 253 to +85°C
Body Materials	SUS316L

Ordering No. APR-UBF-71JC-9.52UPG-∗∗∗ (example)

Ultra Low Temperature Valves For Liquefied Hydrogen(Manual Valves),Low pressure type





Features

1. High-Flowrate (Cv value of 9)
2. High sealing performance by bellows

Specifications(example)

Design Pressure	2 MPa
Design Temperature	–253 to +75°C
Body Materials	SUS316L

Ordering No. ULD-52BCF-∗∗∗ (example)

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Coned-and-Threaded Connection

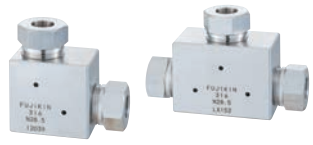
Features

1. Metal seal construction, extremely airtight.
2. No need to weld due to screwed to tube end.

Note: Please refer to No.5 on page 15-No.6 on page 16 for dimensions and precision of tube threading and cone machining.

Specifications

Maximum operating pressure and temperature are changeable according to the materials and thickness of the tubes.
Please contact Fujikin before ordering.



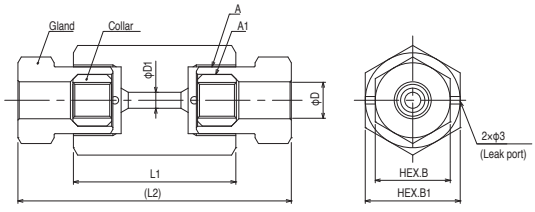
GUJU-H Type

Coned-and-Threaded Connection High-Pressure (HP) Type

Note 1: Nominal diameter 6.35 and 9.52 are for the 60,000 psi type, and nominal diameter 14.2 is for the 40,000 psi type.

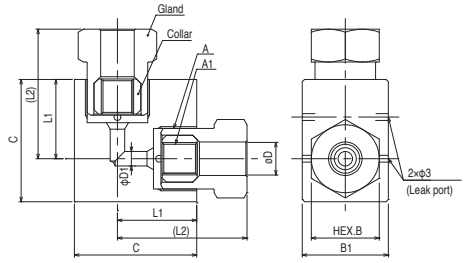
Body

■ Straight Union



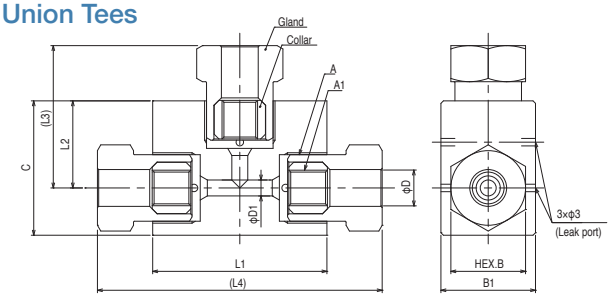
Tube Outer Diameter D	Gland Thread A	Collar Thread A1	L1	L2	D1	B	B1	Ordering No.
6.35	9/16-18UNF	(Left)1/4-28UNF	40	64	2.4	15.9	24	GUJU-F-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	55	87	3.2	20.6	27	GUJU-F-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	65	111	6.4	30.2	38	GUJU-F-9H-N

■ Union Elbows



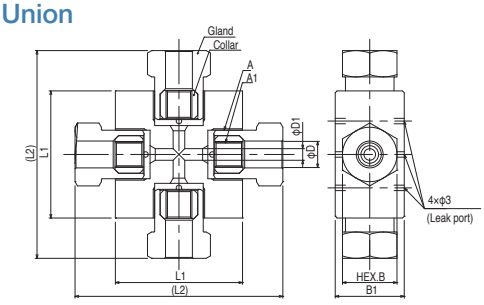
Tube Outer Diameter D	Gland Thread A	Collar Thread A1	C	L1	L2	D1	B	B1	Ordering No.
6.35	9/16-18UNF	(Left)1/4-28UNF	34.5	22.5	34.5	2.4	15.9	24	GUJU-L-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	41	27.5	43.5	3.2	20.6	27	GUJU-L-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	54	35	58	6.4	30.2	38	GUJU-L-9H-N

■ Union Tees



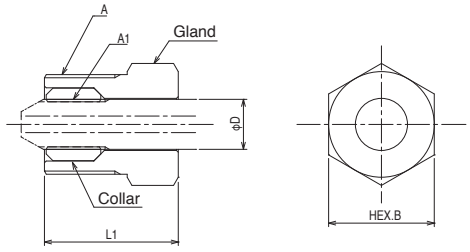
Tube Outer Diameter D	Gland Thread A	Collar Thread A1	C	L1	L2	L3	L4	D1	B	B1	Ordering No.
6.35	9/16-18UNF	(Left)1/4-28UNF	34.5	45	22.5	34.5	69	2.4	15.9	24	GUJU-T-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	41	55	27.5	43.5	87	3.2	20.6	27	GUJU-T-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	54	70	35	58	116	6.4	30.2	38	GUJU-T-9H-N

■ Cross Union



Tube Outer Diameter D	Gland Thread A	Collar Thread A1	L1	L2	D1	B	B1	Ordering No.
6.35	9/16-18UNF	(Left)1/4-28UNF	45	69	2.4	15.9	24	GUJU-X-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	55	87	3.2	20.6	27	GUJU-X-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	70	116	6.4	30.2	38	GUJU-X-9H-N

Collar & Gland



Tube Outer Diameter D	Gland Thread A	Collar Thread A1	L1	B	Ordering No.
6.35	9/16-18UNF	(Left)1/4-28UNF	21	15.9	GUJU-4HCN
9.52	3/4-16UNF	(Left)3/8-24UNF	29	20.6	GUJU-6HCN
14.2	1·1/8-12UNF	(Left)9/16-18UNF	38	30.2	GUJU-9HCN

Materials

Parts	Materials
Body	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Gland	ASTM A479 316
Collar	ASTM A479 316

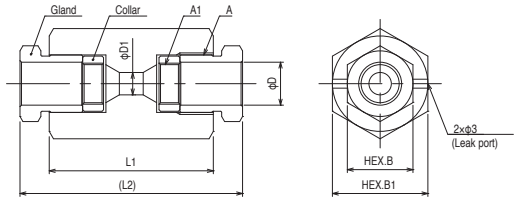
Caution | All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

GUJU-M Type

Coned-and-Threaded Connection Medium Pressure (MP) Type

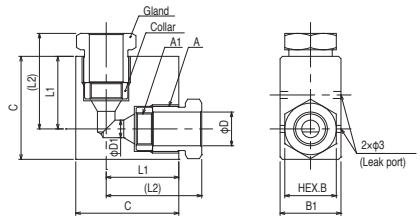
Body

■ Straight Union



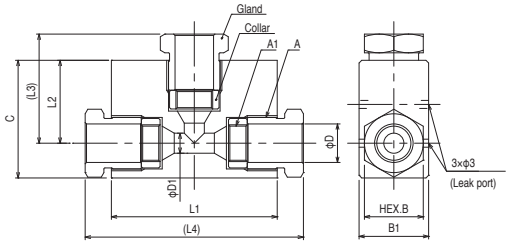
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	B	B1	Ordering No.
D	A	A1						
6.35	7/16-20UNF	(Left)1/4-28UNF	35	53	2.8	12.7	19	GUJU-F-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	45	63	5.2	15.8	26	GUJU-F-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	55	75	7.9	22.2	32	GUJU-F-9M-N
19.05	3/4-14NPS	(Left)3/4-16UNF	65	94	11.1	30.2	40	GUJU-F-12M-N
25.4	1·3/8-12UNF	(Left)1-14UNS	100	131	14.3	34.9	50	GUJU-F-16M-N

■ Union Elbows



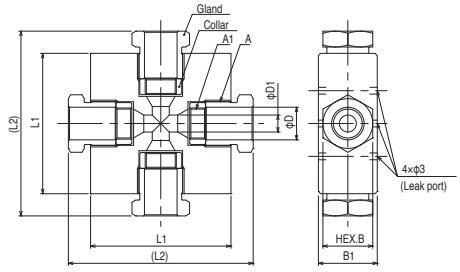
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	C	B	B1	Ordering No.
D	A	A1							
6.35	7/16-20UNF	(Left)1/4-28UNF	20	29	2.8	29	12.7	18	GUJU-L-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	25.5	34.5	5.2	36	15.8	20	GUJU-L-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	31	41	7.9	44	22.2	26	GUJU-L-9M-N
19.05	3/4-14NPS	(Left)3/4-16UNF	40	54.5	11.1	60	30.2	40	GUJU-L-12M-N
25.4	1·3/8-12UNF	(Left)1-14UNS	55	70.5	14.3	80	34.9	50	GUJU-L-16M-N

■ Union Tees



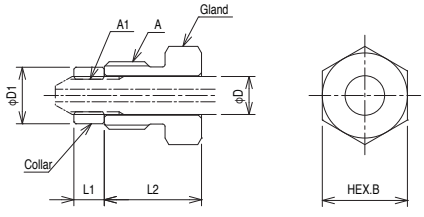
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	L3	L4	D1	C	B	B1	Ordering No.
D	A	A1									
6.35	7/16-20UNF	(Left)1/4-28UNF	40	20	29	58	2.8	29	12.7	18	GUJU-T-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	51	25.5	34.5	69	5.2	36	15.8	20	GUJU-T-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	62	31	41	82	7.9	44	22.2	26	GUJU-T-9M-N
19.05	3/4-14NPS	(Left)3/4-16UNF	80	40	54.5	109	11.1	60	30.2	40	GUJU-T-12M-N
25.4	1·3/8-12UNF	(Left)1-14UNS	110	55	70.5	141	14.3	80	34.9	50	GUJU-T-16M-N

■ Cross Union



Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	B	B1	Ordering No.
D	A	A1						
6.35	7/16-20UNF	(Left)1/4-28UNF	40	58	2.8	12.7	18	GUJU-X-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	51	69	5.2	15.8	20	GUJU-X-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	62	82	7.9	22.2	26	GUJU-X-9M-N
19.05	3/4-14NPS	(Left)3/4-16UNF	80	109	11.1	30.2	40	GUJU-X-12M-N
25.4	1·3/8-12UNF	(Left)1-14UNS	110	141	14.3	34.9	50	GUJU-X-16M-N

Collar & Gland



Tube Outer Diameter	Gland Thread	Collar Thread	D1	L1	L2	B	Ordering No.
D	A	A1					
6.35	7/16-20UNF	(Left)1/4-28UNF	9.2	5	16	12.7	GUJU-4MCN
9.52	9/16-18UNF	(Left)3/8-24UNF	12.2	5.5	18	15.8	GUJU-6MCN
14.2	13/16-16UN	(Left)9/16-18UNF	18.5	7	21	22.2	GUJU-9MCN
19.05	3/4-14NPS	(Left)3/4-16UNF	11.1	9.5	25.5	30.2	GUJU-12MCN
25.4	1·3/8-12UNF	(Left)1-14UNS	14.3	12.7	35	34.9	GUJU-16MCN

Materials

Parts	Materials
Body	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Gland	ASTM A479 316
Collar	ASTM A479 316

Caution All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

Piping Installation Guidelines

1. Introduction

1-1. Our stainless steel high pressure and medium pressure fittings are carefully designed and manufactured, and subjected to strict quality control, down to the smallest detail utilizing the technical expertise we have built up over many years as precision fittings manufacturers, and we therefore ask that care be taken when installing and utilizing those products.

1-2. Any installation of piping utilizing stainless steel high pressure and medium pressure fittings should be carried out by a person or persons thoroughly familiar and experienced with those fittings.

1-3. Stainless steel high pressure and medium pressure fittings should not be used in locations subject to excessively repetitive conditions, vibrations, impacts, pulsations, etc.

1-4. Customers who will be repeatedly using the same product should inform Fujikin when there is a change in usage condition or method in order to avoid any problems before they arise.

2. Basic Structural Overview

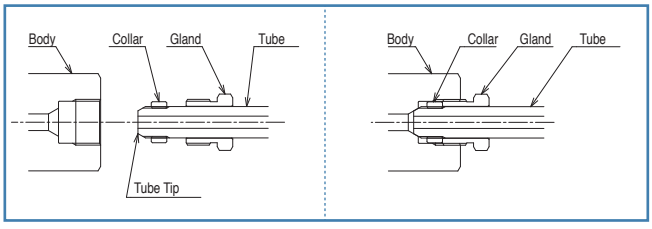
2-1. The fittings have concentrically conical-shaped body and tube seal sections as well as a preciously finished surface, making them highly airtight coned-and-threaded-type fittings which also utilize a metallic seal method.

2-2. The basic structural components are comprised of a stainless steel body, collars, glands and connecting tubes.

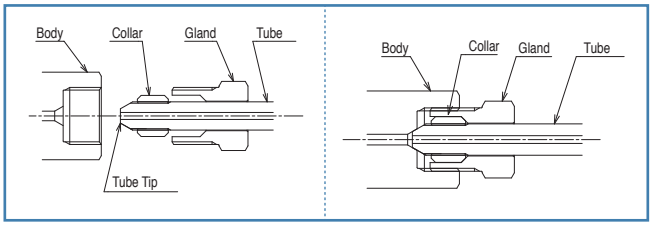
2-3. The sealing principle of the fittings involves tightening the glands using a wrench, etc., to tightly affix the cone tip-processed tube to the body.

■ Fitting Structural Drawing

Fitting Component Parts　　Fitting Post-Installation Appearance



GUJU-M Type



GUJU-H Type

3. Design Specifications

3-1. Maximum Operating Pressure, Temperature Range

100MPa, –40 ~ +85 °C ★

★: Varies according to the materials and thickness of the tubes used. Please contact Fujikin before ordering.

3-2. Body Material

SUS316
(Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

3-3. Nominal Diameter 6.35, 9.52, 14.2, 19.05, 25.4

3-4. Hydrogen gas and other gases and liquids which are non-corrosive to stainless steel, and which are the primary constituent material, may be used.

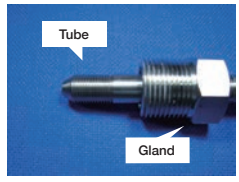
4. Important Considerations for Selections

Incorrect device selection and handling can lead to system problems and accidents. It is therefore important to fully consider the compatibility of devices with the systems in which they are used, as well as the conditions under which they are used, as the authority and responsibility for device selection left up to the customer. Also, it is important to have a full understanding of the specification range of a given device before utilizing it.

5. Fitting Installation Guidelines

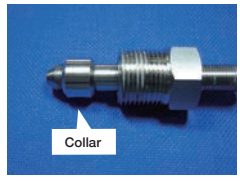
(Installation guidelines are the same for GUJU-M Type and GUJU-H Type)

5-1. Assemble the parts of the fitting according to each step as below. Perform cone processing of the tube tip according to the figure on the next page.

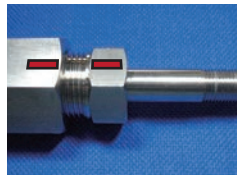


5-2. Put the gland onto the tube and then affix the threaded section of the tube tip to the collar. (The tube threading is left-handed. Please remember this when affixing.)
Apply a small amount of fluorinated grease to the tube tip.

5-3. Screw the collar with your fingers until it cannot turn any further and one or two thread ridges are visible on the tube tip side.

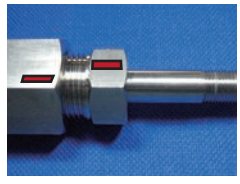


5-4. Screw the tube and gland together into the fitting (valve) body.
Then, put a match marking ★ on the body and the gland. This represents the zero point for tightening.
(★: The red lines in the photograph)



5-5. Using a wrench, tighten the gland by a 1/8 - 1/6 turn from the zero point.
(When tightening the gland, always make sure to hold the body in place.)

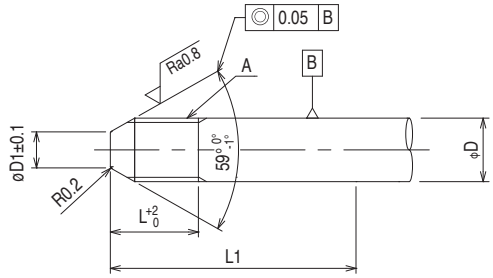
No further tightening is needed.



Nominal Diameter	Tightening Torque (N•m)	
	GUJU-H Type High Pressure (HP) Type	GUJU-M Type Medium Pressure (MP) Type
6.35	21	14
9.52	43	25
14.2	90	40
19.05	—	120
25.4	—	200

Caution　All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

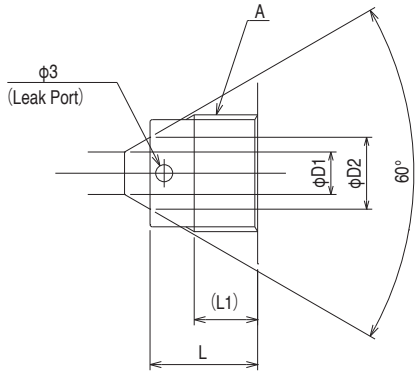
5-6. Tube Tip Processing Dimensions



Nominal Diameter	Fitting Types	Tube Tip Processing Dimensions			Required Min. Straight Tube Length ★3	Accessory Part No. ★4	
D		A ※2	D1	L	L1	Collar	gland
6.35	MP Type	(Left)1/4-28UNF	3.6	8.8	35	GUJU-4MC	GUJU-4MN
9.52		(Left)3/8-24UNF	6.4	11.2	40	GUJU-6MC	GUJU-6MN
14.2		(Left)9/16-18UNF	10.3	12.7	50	GUJU-9MC	GUJU-9MN
19.05		(Left)3/4-16UNF	14.3	15.9	65	GUJU-12MC	GUJU-12MN
25.4		(Left)1-14UNS	18.3	19.9	85	GUJU-16MC	GUJU-16MN
6.35	HP Type	(Left)1/4-28UNF	3.2	14.3	40	GUJU-4HC	GUJU-4HN
9.52		(Left)3/8-24UNF	5.6	19.1	50	GUJU-6HC	GUJU-6HN
14.2		(Left)9/16-18UNF	7.9	24	70	GUJU-9HC	GUJU-9HN

★1: After cutting the tube with an appropriate tool, please perform tube tip as above to the above length.
★2: Regarding thread grade, processing should be performed at 2A or higher.
★3: When bending tube, please keep straight tube above length as L1 or more.
★4: If you use other parts, please consult with Fujikin in advance.
★: Please consult with Fujikin about coned-and-threaded machining also.

5-7. Mechanical Finished Dimensions (Female Thread Side)



Nominal Dia.	Fitting Types	A	L	L1	D1	D2
6.35	MP Type	7/16-20UNF	12.7	7.1	2.8	4.8
9.52		9/16-18UNF	15.8	9.7	5.2	7.9
14.2		13/16-16UN	19	11.2	7.9	12.7
19.05		3/4-14NPS	23.9	12.7	11.1	15.8
25.4		1･3/8-12UNF	33.3	20.6	14.3	22.4
6.35	HP Type	9/16-18UNF	11.2	9.7	2.4	4.3
9.52		3/4-16UNF	15.8	13.5	3.2	6.6
14.2		1･1/8-12UNF	19.1	15.8	6.4	9.7

6. Caution Regarding Installation

6-1. Please use tubes and fittings without scratches in the tube end and sealing area of fittings.

6-2. After cutting the tube, please remove burr of the cut cross-section; also, make sure the cross-section is at a right angle to the long axis of the tube.

7. Removal and Re-tightening Procedure

7-1. To remove, use a wrench or other appropriate tool to turn the gland half-rotations in a anti-clockwise direction.

7-2. When re-tightening, the guidelines are exactly the same as those given in Item 5.

Note 1: If you accidentally drop the fitting part, please check the body and tube seal section for scratches or any adhering material before using.
If a scratch is discovered, please replace the part, because it will cause leakage.
If adhering material is discovered, lightly wipe the part with a clean cloth until the material is completely removed.
Do not use an organic solvent when cleaning, as this will also remove the lubricant from the seal section.

Note 2: Please make sure to use a suitable wrench to a hexagonal gland.

Note 3: When disassembling, please protect the sealing part of fittings to avoid scratch.

8. Caution After Piping

8-1. After piping, check all sections again to ensure that joined sections are not loose and that fittings are mounted in the prescribed manner.

8-2. After the stainless steel high-pressure/medium-pressure fittings and tube are joined, the person performing installation should conduct a final check of overall air-tightness.

8-3. If you change tube orientation after all joining has been completed, only do so after first loosening the gland.
Adjusting the tube's orientation without first loosening the gland can scratch the fitting seal's surface.

8-4. When purging gas, ensure beforehand that the gland is not loose.
Loosening the gland when the system is under high pressure can result in a sudden and dangerous venting of the liquid inside the system from the spaces between the body leak port and the gland and sleeve.

9. Troubleshooting Here

Proper installation of this fitting will ensure no leakage occurs; however, performing installation in locations where it is difficult to assemble and joins parts or which are at an extreme angle can, on rare occasions, result in leakage.
In such cases, first release the pressure and then perform a 1/16th turn tightening. If this does not resolve the problem, release the pressure again, disassemble the fitting, check the body and tube tip seal surfaces for scratches or adhering material, and then re-tightening the fitting according to the guidelines.
If a scratch is discovered, please replace the part, as not doing so could result in leakage.
If adhering foreign matter is discovered, lightly wipe the part with a clean cloth until it is completely removed. Do not use an organic solvent or other agent when cleaning, as this will also remove the lubricant from the seal section.

Adapters

Features

1. Metal seal construction makes it extremely airtight
2. No need to weld due to screwed to tube end.

Note: Please refer to No.5 on page 15-No.6 on page 16 for dimensions and precision of tube threading and cone machining.

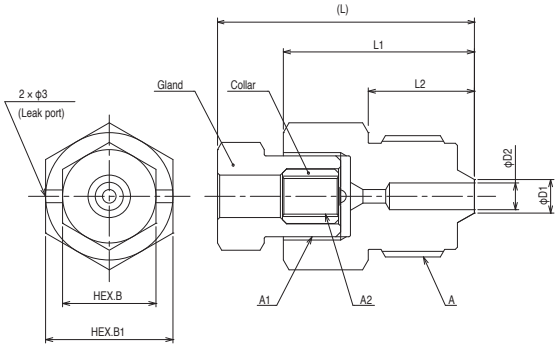
Specifications

Maximum operating pressure and temperature are changeable according to the materials and thickness of the tubes.
Please contact Fujikin before ordering.

Materials

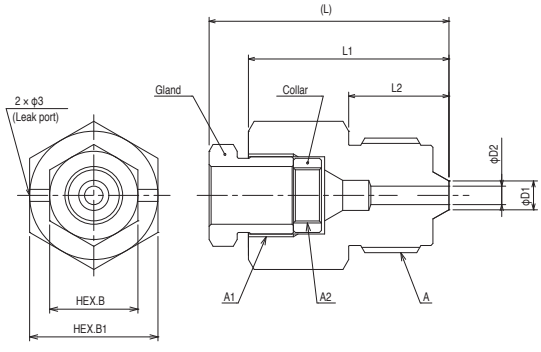
Part	Materials
Body	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Gland	ASTM A479 316
Collar	ASTM A479 316

Male (HP) × Female (HP)



Nominal size 1	Thread A	Nominal size 2	Gland Thread A1	Collar Thread A2	L	L1	L2	D1	D2	B	B1	Ordering No
14.2	1-1/8-12UNF	6.35	9/16-18UNF	(Left)1/4-28UNF	52	40	25	7.9	6.3	15.9	30	GUJB-9HX4H-N
14.2	1-1/8-12UNF	9.52	3/4-16UNF	(Left)3/8-24UNF	61	45	25	7.9	6.3	20.6	30	GUJB-9HX6H-N

Male (HP) × Female (MP)



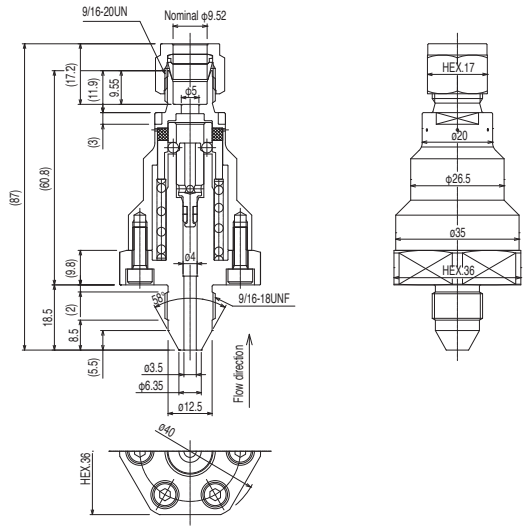
Nominal size 1	Thread A	Nominal size 2	Gland Thread A1	Collar Thread A2	L	L1	L2	D1	D2	B	B1	Ordering No
6.35	9/16-18UNF	6.35	7/16-20UNF	(Left)1/4-28UNF	45	36	16	3.2	2.1	12.7	21	GUJB-4HX4M-N
9.52	3/4-16UNF	9.52	9/16-18UNF	(Left)3/8-24UNF	49	40	20	5.6	3.2	15.8	24	GUJB-6HX6M-N
14.2	1-1/8-12UNF	14.2	13/16-16UN	(Left)9/16-18UNF	55	45	25	7.9	6.4	22.2	30	GUJB-9HX9M-N

Note: Please consult Fujikin about different connections.

Caution	All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

Fusible-plug Type Pressure Relief Devices / Container Main Valves

Fusible-plug Type Pressure Relief Devices (PRD)

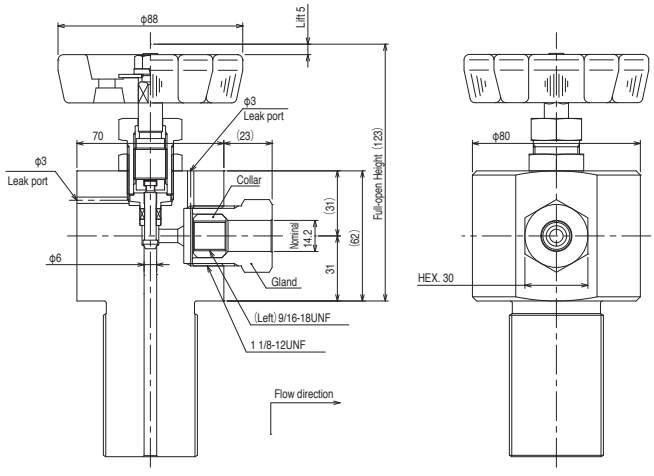


Specifications (example)

Design Pressure	95 MPa
Design Temperature	85 °C
Body materials	SUS316L

Ordering No. URF-795-6.35-DSH (example)

Container Main Valves



Features

1. Compact and with Durable Manual Valves
2. We will produce an interface with a container in the specified shape.

Specifications

Design Pressure	99.9 MPa
Fluid temperature range	–40 to +85 °C
Ambient temperature range	–40 to +60 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Ordering No. GUH-8100-9H-N-＊＊＊ (example)

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

UPG® High Performance Metal Gasket Fittings for Ultra High-Pressure Hydrogen Gas

Thank you ! 2017
The 14th Monozukuri Parts Grand Award
Machine Parts Award

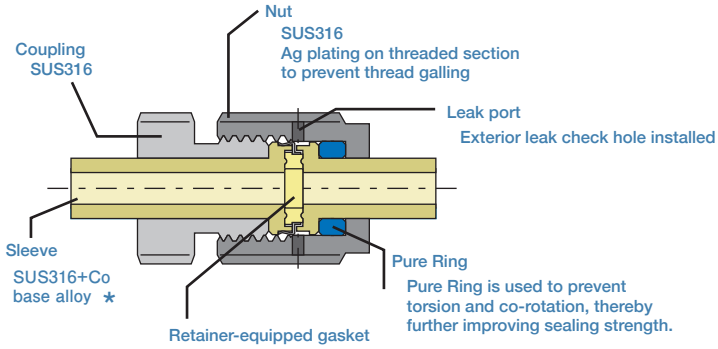
Features

1. Excellent Air Tightness
- The unique seal structure realizes excellent airtightness.
- Metal gasket type with small load on pressure-resistant parts even when detaching is repeated.

2. Excellent Installation and Operability
- No need for an axial space for detaching the device when detaching / removing.
- Construction instructions include rotation control and overtightening prevention mechanism.
- Compared to coned-and-threaded joint, construction with low torque can be done.

3. Excellent Scalability
- Excellent vibration proof is achieved by separating the part to be sealed and the part receiving the external force.
- Lineup includes two pressure series: 95 MPa and 50 MPa.

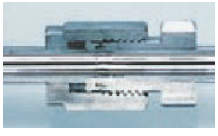
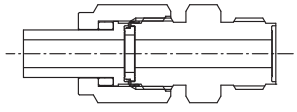
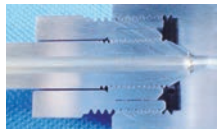
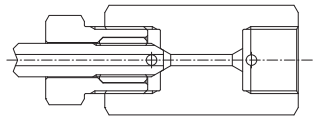
Construction



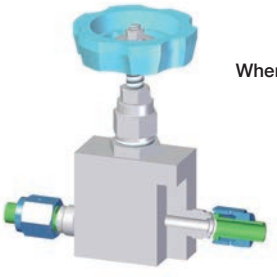
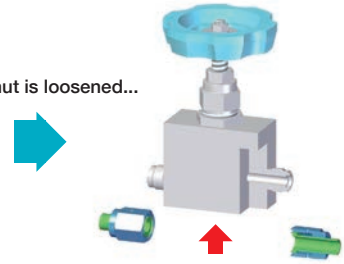
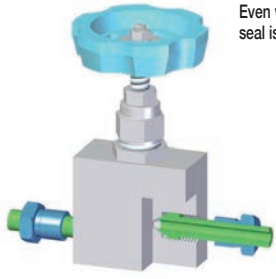
★: HRX19® sleeve can be also manufactured.

Comparison with Coned-and-threaded connection

■ Construction

UPG®	Coned-and-threaded connection
 	 

■ Removability

UPG®	Coned-and-threaded connection
 When nut is loosened...  Easy to remove	 Even when the nut is loosened, the tip of the fitting seal is narrow and requires extra space to be removed. Difficult to remove 

⚠ Caution	All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

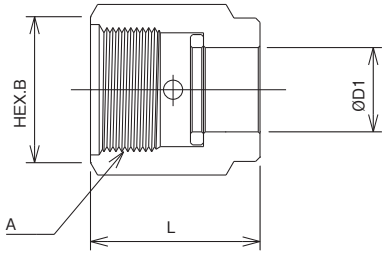
95 MPa UPG® Fittings

Features

Design Pressure	95 MPa
Temperature Range	–40 ～ +50 °C
Nominal Diameter	6.35、9.52、12.7
Main Materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)(Sleeve: HRX 19®)

■ Dimensional Drawings

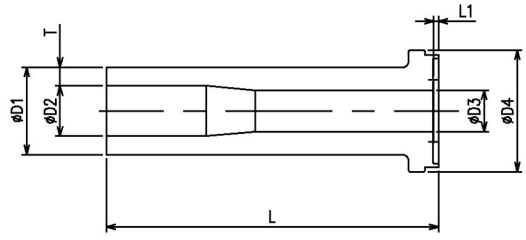
■ 95 MPa Type UPG® Nut



Nominal Diameter	D1	A	B	L	Ordering No. ※
6.35	6.35	7/16-20UNF	14	20	UPG-6.35N-95M
6.35	6.35	7/16-20UNF	14	21.5	UPG-6.35N-95M-L
9.52	9.52	9/16-20UN	17	22.5	UPG-9.52N-95M
9.52	9.52	9/16-20UN	17	24	UPG-9.52N-95M-L
12.7	12.7	3/4-20UNEF	22	25	UPG-12.7N-95M
12.7	12.7	3/4-20UNEF	22	27.2	UPG-12.7N-95M-L

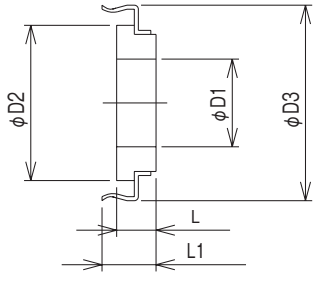
*please select when using coupling

■ 95 MPa Type UPG® Sleeve



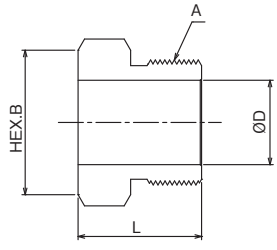
Nominal Diameter D1	D2	D3	D4	L	L1	Ordering No.
6.35	3.5	3.2	9.8	50	0.7	UPG-6.35S-95M-L50-HRX19
9.52	5.12	4.35	13	50	0.7	UPG-9.52S-95M-L50-HRX19
12.7	7.3	6	16.7	50	0.7	UPG-12.7S-95M-L50-HRX19

■ 95 MPa Type UPG® Gasket with Retainer



Nominal Diameter	D1	D2	D3	L	L1	Ordering No.
6.35	3.2	7.5	9.8	1.96	2.48	UPG-6.35G-95M
9.52	4.3	10.9	12.95	1.96	2.88	UPG-9.52G-95M
12.7	6	14.9	17.65	1.96	2.88	UPG-12.7G-95M

■ 95 MPa Type UPG® Coupling Body



Nominal Diameter	D	A	B	L	Ordering No.
6.35	6.5	7/16-20UNF	14	13.5	UPG-C-6.35-95M
9.52	9.67	9/16-20UN	17	15	UPG-C-9.52-95M
12.7	12.85	3/4-20UNEF	22	18.8	UPG-C-12.7-95M

HRX 19® is a registered trademark of NIPPON STEEL CORPORATION.

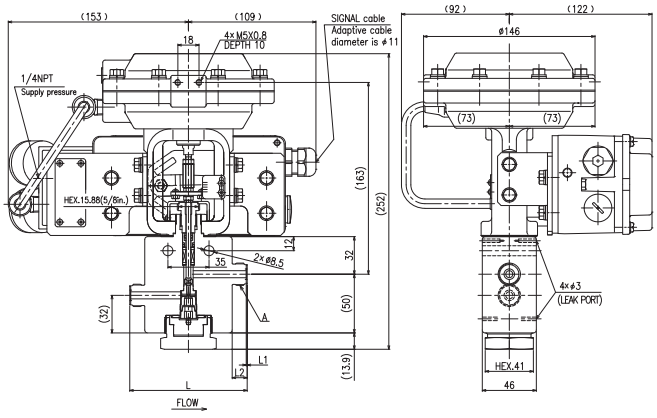
Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Valves with 95 MPa UPG® Fittings

Features

1. Fittings are installed without load for surrounding piping by adopting unique metal gasket-type.

Flow Control Valves with 95 MPa UPG® Fittings



Global Series

Features

1. Precise flow control for ultra high-pressure hydrogen gas.
2. Flow coefficient (Cv Value) can be selected and replaced from a large variety of disc & sheats.

Specifications

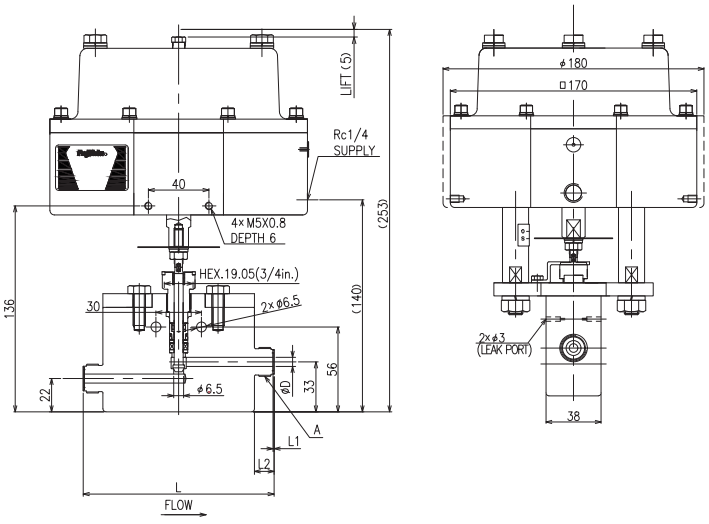
Design Pressure	95 MPa
Fluid temperature range	–40 to +50 °C
Ambient temperature range	–40 to +50 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Specifications

Nominal Diameter	Connection			THREAD	L	Cv value MAX.	Ordering No
	D	L1	L2	A			
9.52	4.35	0.7	11	9/16-20UN	97	0.15	E32GM3R4-795-6G-★-WN-N
12.7	6	0.7	12.8	3/4-20UNEF	100	0.25	E32GM3R4-795-8G-★-WN-N

★:indicates the Cv value number
(Refer to "Combination of Cv Value and Rangeability" on page 29.)

Shut-off Valves with 95 MPa UPG® Fittings



Global Series

Features

1. Full-bore type [accommodates port diameter equal to or greater than the inner diameter of 14.2 (40,000psi) size (ø6.35)]
2. No usage restrictions on flow direction and differential pressure.

Specifications

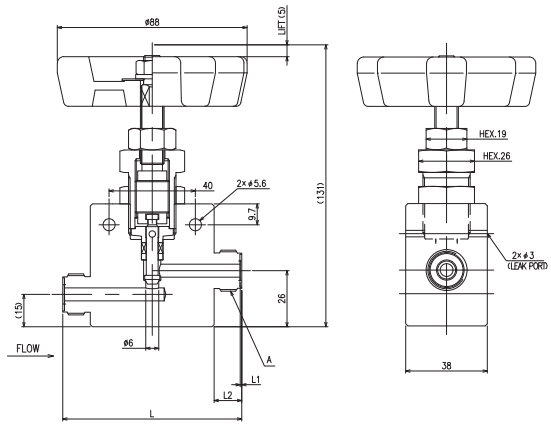
Design Pressure	95 MPa
Fluid temperature range	–40 to +50 °C
Note:When using in a pre-cool line, please select the valve for precool low temperature type	
Ambient temperature range	–40 to +50 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter	Connection			THREAD	L	Cv value MAX.	Ordering No
	D	L1	L2	A			
9.52	4.35	0.7	11	9/16-20UN	122	0.45	APR-GUH-795-6G-N
12.7	6	0.7	12.8	3/4-20UNEF	126	0.81	APR-GUH-795-8G-N

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Manual Valves with 95 MPa UPG® Fittings



Features

1. Compact and with Durable Manual Valves
2. With Lock Nut

Global Series

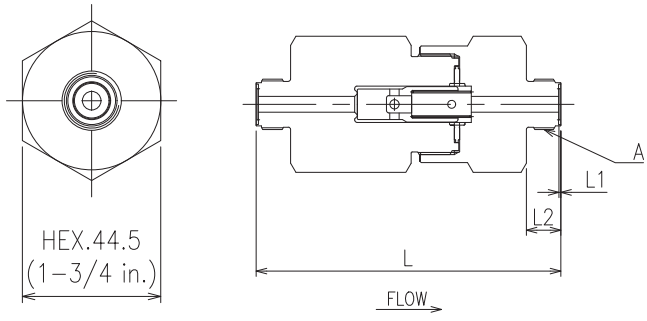
Specifications

Design Pressure	95 MPa
Fluid temperature range	–40 to +50 °C
Note:When using in a pre-cool line, please select the valve for precool low temperature type	
Ambient temperature range	–40 to +50 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter	Connection			THREAD	L	Cv VALUE	Ordering No
	D	L1	L2	A			
9.52	4.35	0.7	11	9/16-20UN	79.4	0.47	GUH-795L-6G-N
12.7	6	0.7	12.8	3/4-20UNEF	83	0.75	GUH-795L-8G-N

Check Valves with 95 MPa UPG® Fittings



Features

1. Compact, in-line type
2. Little pressure drop to optimal flow pass

Global Series

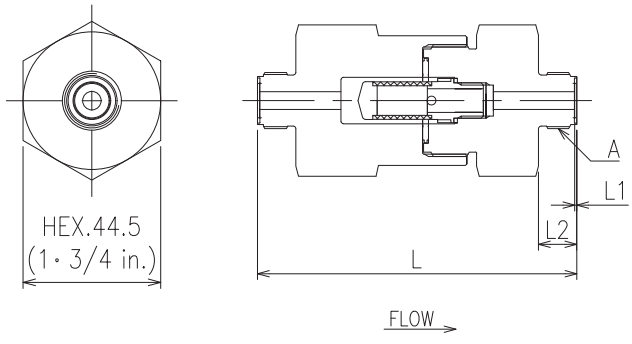
Specifications

Design Pressure		95 MPa
Fluid temperature range		–40 to +50 °C
Ambient temperature range		–40 to +50 °C
Body materials		SUH 660
Cracking pressure		Under 0.0069 MPa
Operating conditions	Flow rate	Over 40 m^3/h normal
	Differential pressure (Reverse Pressure)	Over 10 MPa

Dimensions, Ordering No.

Nominal Diameter	Connection			THREAD	L	Cv VALUE	Ordering No
	D	L1	L2	A			
9.52	4.35	0.7	11	9/16-20UN	111.4	0.25	GUCL-795-6G-N
12.7	6	0.7	12.8	3/4-20UNEF	115	0.83	GUCL-795-8G-N

Filters with 95 MPa UPG® Fittings



Features

1. Compact, in-line type
2. Little pressure drop to optimal flow pass

Global Series

Specifications

Design Pressure	95 MPa
Fluid temperature range	–40 to +50 °C
Ambient temperature range	–40 to +50 °C
Body materials	SUH660

Dimensions, Ordering No.

Nominal Diameter	Connection			THREAD	L	Ordering No
	D	L1	L2	A		
9.52	4.35	0.7	11	9/16-20UN	104.4	GUFL-795-6G-★1-N
12.7	6	0.7	12.8	3/4-20UNEF	108	GUFL-795-8G-★1-N

★1: Element size number is added.
(Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 30.)

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

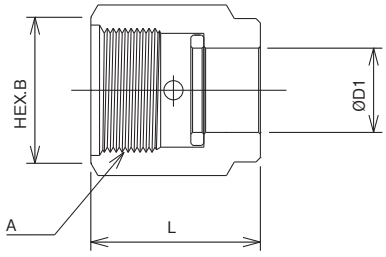
50 MPa UPG® Fittings

Specifications and Materials

Pressure Range	50 MPa
Temperature Range	-45 to +85 ˚C
Nominal Diameter	6.35, 9.52, 12.7
Main Materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

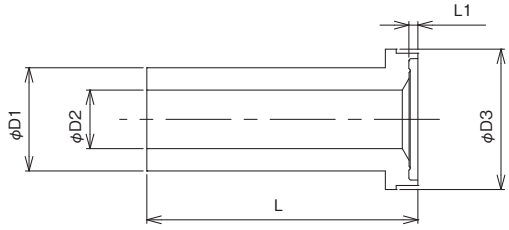
■ Dimensional Drawings

■ 50 MPa Type UPG® Nut



Nominal Diameter	D1	A	B	L	Ordering No.
6.35	6.5	7/16-20UNF	14	17.5	UPG-6.35N-50M
9.52	9.7	9/16-20UNF	17	19.5	UPG-9.52N-50M
12.7	12.9	3/4-20UNEF	22	23	UPG-12.7N-50M

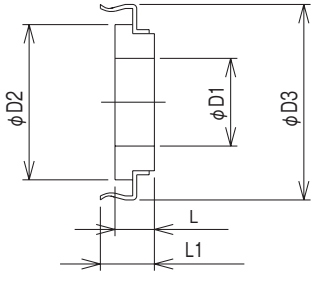
■ 50 MPa Type UPG® Sleeve



Nominal Diameter D1	D2	D3	L	L1	Ordering No.	
6.35	3.9	9.8	23	0.7	UPG-6.35S-L23-50M-N28.5	
9.52	5.4	13	31	0.7	UPG-9.52S-L31-50M-N28.5	
9.52	5.4	13	38	0.7	UPG-9.52S-L38-50M-N28.5	*
12.7	8	17.7	33	0.7	UPG-12.7S-L33-50M-N28.5	
12.7	8	17.7	44	0.7	UPG-12.7S-L44-50M-N28.5	*

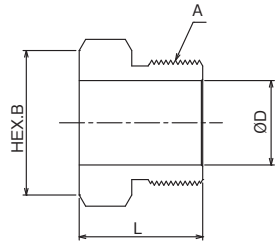
★1：Please select when using Coupling.

■ 50 MPa Type UPG® Gasket with Retainer



Nominal Diameter	D1	D2	D3	L	L1	Ordering No.
6.35	4.4	7.5	9.8	1.96	2.48	UPG-6.35G
9.52	7.5	10.9	12.95	1.96	2.88	UPG-9.52G
12.7	10.2	14.9	17.65	1.96	2.88	UPG-12.7G

■ 50 MPa Type UPG® Coupling Body



Nominal Diameter	D	A	B	L	Ordering No.
6.35	6.5	7/16-20UNF	14	13.5	UPG-C-6.35
9.52	9.67	9/16-20UNF	17	15	UPG-C-9.52
12.7	12.85	3/4-20UNEF	22	18.8	UPG-C-12.7

Caution

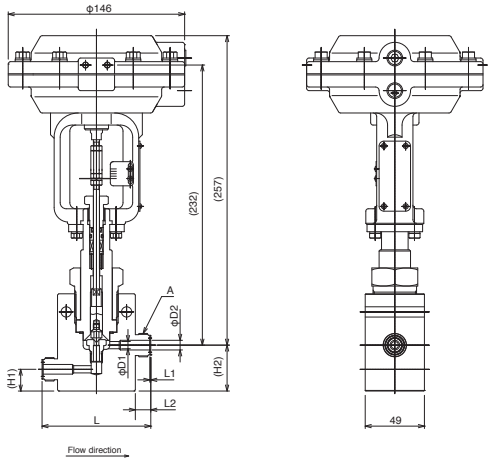
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Shut-off Valves with UPG® Fittings

Features

1. Fittings are installed without load for surrounding piping by adopting unique metal gasket-type.

Shut-off Valves with 50 MPa UPG® Fittings



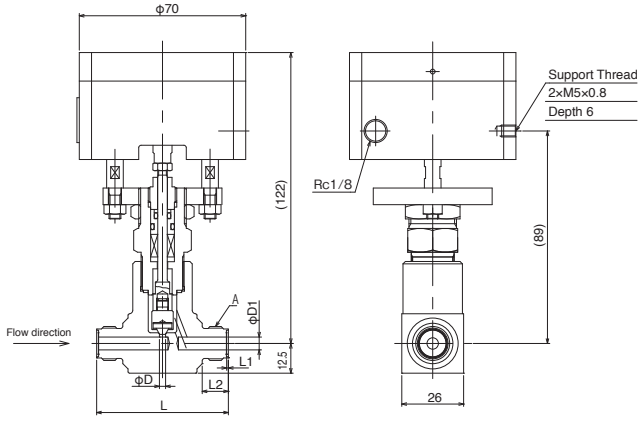
Specifications

Design Pressure	50 MPa
Fluid Temperature Range	–40 to +85 °C
Anbient Temperature	–10 to +60 °C
Body materials	SUS316+Co base alloy

Dimensions, Ordering No.

Nominal Diameter	Connection				Thread	Interfacial Distance	H1	H2	Cv Value MAX.	Mass (approx.) (kg)	Ordering No.
	D1	D2	L1	L2	A	L					
6.35	2.8	3.9	0.83	10	7/16-20UNF	85	18	38	0.15	4	M3R4-750-6.35UPG-N28.5
9.52	3.2	5.4	0.83	11	9/16-20UN	87	18	38	0.15	4	M3R4-750-9.52UPG-N28.5
12.7	6	8	0.83	12.8	3/4-20UNEF	90	18	38	0.5	4	M3R4-750-12.7UPG-N28.5

Shut-off Valves with 45 MPa UPG® Fittings



Specifications

Design Pressure	45 MPa
Fluid Temperature Range	–10 ~ +80 °C
Anbient Temperature	–10 ~ +60 °C
Body materials	SUS316+Co base alloy

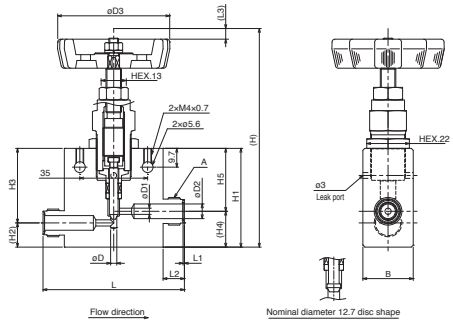
Dimensions, Ordering No.

Nominal Diameter	Orifice Diameter	Connection				Thread	Interfacial Distance	Cv Value MAX.	Mass (approx.) (kg)	Ordering No.
	D	D1	D2	L1	L2	A	L			
6.35	2.6	4	3.9	0.7	10	7/16-20UNF	53.4	0.2	0.9	APR-UM-745-6.35UPG-N28.5
9.52	2.6	4	5.4	0.7	11	9/16-20UN	55.4	0.2	0.9	APR-UM-745-9.52UPG-N28.5
12.7	2.6	4	8	0.7	12.8	3/4-20UNEF	59	0.2	0.9	APR-UM-745-12.7UPG-N28.5

Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Manual Valves with 50 MPa UPG® Fittings



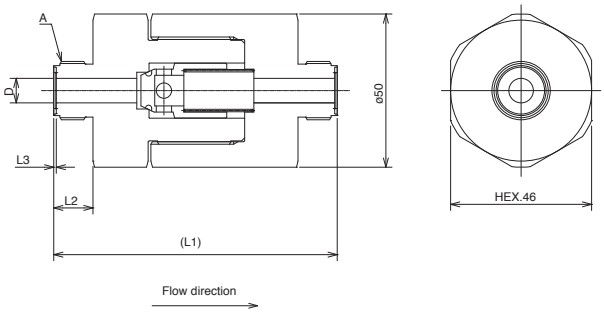
Specifications

Design Pressure	50 MPa
Fluid Temperature Range	–40 ~ +85 °C
Anbient Temperature	–40 ~ +60 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter	Orifice Diameter	Nut connection				Thread	Interfacial Distance	Full-open Height	Lift	Handle Diameter	B	H1	H2	H3	H4	H5	Cv Value MAX.	Mass (approx.) (kg)	Ordering No.
	D	D1	D2	L1	L2	A	L	H	L3	D3									
6.35	3.2	2.8	3.9	0.7	10	7/16-20UNF	71	113	5	58	26	51	12.5	38.5	18.5	32.5	0.18	0.7	UH-750L-6.35UPG-N28.5
9.52	3.2	3.2	5.4	0.7	11	9/16-20UN	73	113	5	58	26	51	12.5	38.5	18.5	32.5	0.23	0.7	UH-750L-9.52UPG-N28.5
12.7	6	6	8	0.7	12.8	3/4-20UNEF	78	121	5	68	26	57	15	42	26	31	0.85	0.85	UH-750L-12.7UPG-N28.5

Check Valves with 50 MPa UPG® Fittings



Features

1. Compact, in-line type
2. Little pressure drop to optimal flow pass

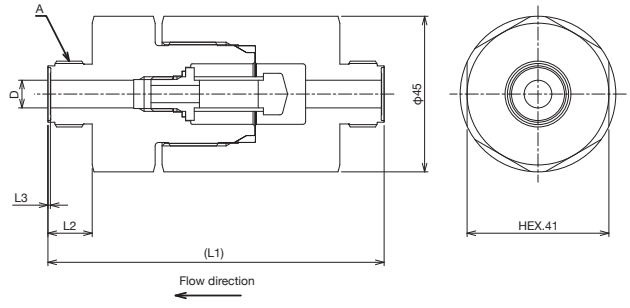
Specifications

Design Pressure		50 MPa
Fluid temperature range		–40 to +85 °C
Anbient Temperature		–40 to +85 °C
Body materials		SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Cracking pressure		Under 0.0069 MPa
Operating conditions	Flow rate	Over 40 m³/h normal
	Differential pressure (Reverse Pressure)	Over 10 MPa

Dimensions, Ordering No.

Nominal Diameter	Nut connection			Thread	Interfacial Distance	Mass (approx.) (kg)	Ordering No.
	D	L2	L3	A	L1		
6.35	3.9	10	0.7	7/16-20UNF	87	1	UCL-750-6.35UPG-N28.5
9.52	5.4	11	0.7	9/16-20UN	89	1.1	UCL-750-9.52UPG-N28.5
12.7	8	12.8	0.7	3/4-20UNEF	93	1.1	UCL-750-12.7UPG-N28.5

Filters with 50 MPa UPG® Fittings



Features

1. Compact, in-line type
2. Little pressure drop to optimal flow pass
3. Element size from 2, 5 and 10 µm

Specifications

Design Pressure	50 MPa
Fluid Temperature Range	–40 ~ +85 °C
Anbient Temperature	–40 ~ +85 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Dimensions, Ordering No.

Nominal Diameter	Nut connection			Thread	Interfacial Distance	Mass (approx.) (kg)	Ordering No.
	D	L2	L3	A	L1		
6.35	3.9	10	0.7	7/16-20UNF	92	1.1	UFL-750-6.35UPG-★1-N28.5
9.52	5.4	11	0.7	9/16-20UN	94	1.2	UFL-750-9.52UPG-★1-N28.5
12.7	8	12.8	0.7	3/4-20UNEF	97	1.2	UFL-750-12.7UPG-★1-N28.5

★1: Element size number is added.
(Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 30.)

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Various Change Couplers for UPG®

Specifications

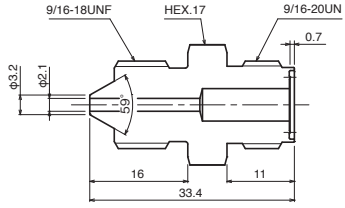
Maximum operating pressure and temperature are changeable according to the materials and thickness of the tubes.
Please contact Fujikin before ordering.

Materials

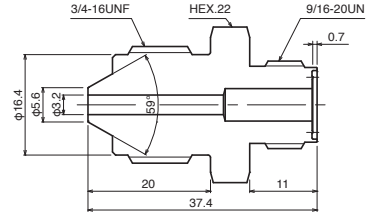
SUS316
(Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

95 MPa Type UPG® × Coned-and-Threaded Connection (HP) Male Type

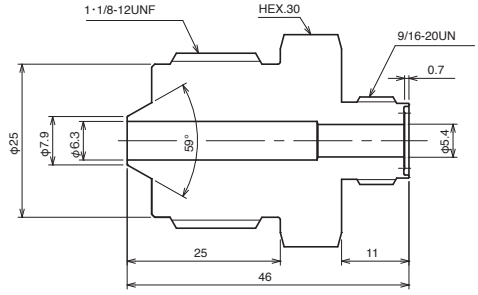
■UPG-H-6GX4H-95M-N



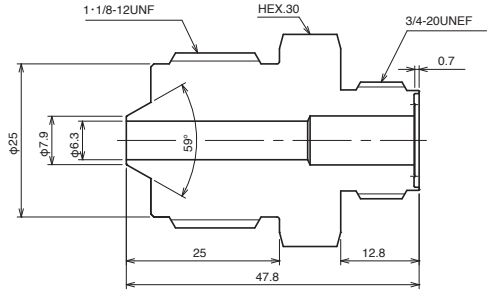
■UPG-H-6GX6H-95M-N



■UPG-H-6GX9H-95M-N

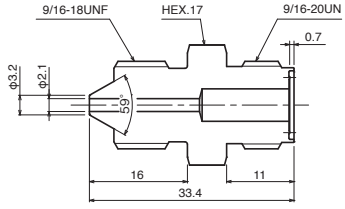


■UPG-H-8GX9H-95M-N

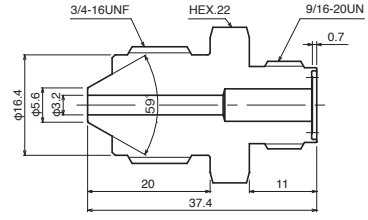


50 MPa Type UPG® × Coned-and-Threaded Connection (HP) Male Type

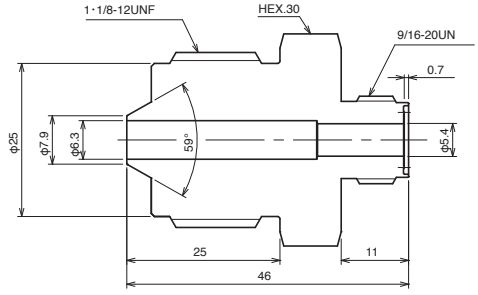
■ UPG-H-6GX4H-50M-N



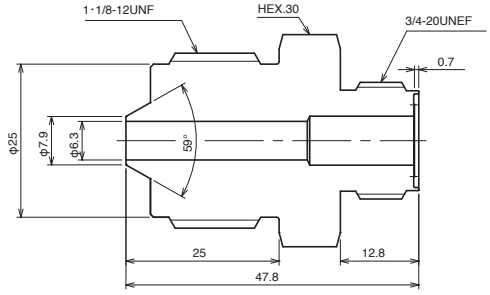
■ UPG-H-6GX6H-50M-N



■ UPG-H-6GX9H-50M-N



■ UPG-H-8GX9H-50M-N



Note: Please consult Fujikin about different connections.

Caution	All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.

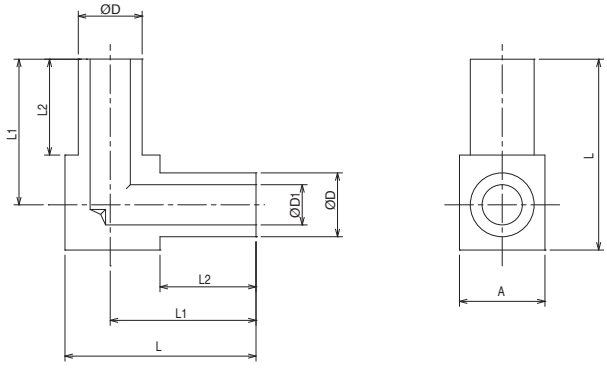
Weld Fittings

95 MPa Weld Fittings

Specifications and Materials

Design Pressure	95 MPa
Fluid Temperature Range	−40 ~ +50°C
Body materials	HRX19®

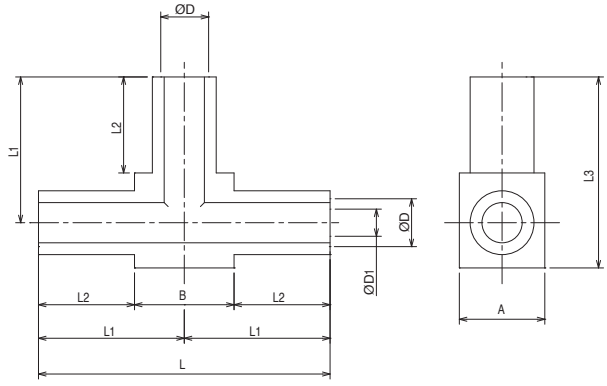
■Weld Fittings-Elbows



■ Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	A	Ordering No.
6.35	3.5	35	30	25	11	UJL-6.35-95M-HRX19-S
9.52	5.12	45	35	25	17	UJL-9.52-95M-HRX19-S
12.7	7.3	45	35	25	17	UJL-12.7-95M-HRX19-S

■Weld Fittings-Tees



■ Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	L3	A	B	Ordering No.
6.35	3.5	60	30	25	35	11	10	UJT-6.35-95M-HRX19-S
9.52	5.12	70	35	25	45	17	20	UJT-9.52-95M-HRX19-S
12.7	7.3	70	35	25	45	17	20	UJT-12.7-95M-HRX19-S

Note: Please consult Fujikin about different connections.

HRX 19® is a registered trademark of NIPPON STEEL CORPORATION.

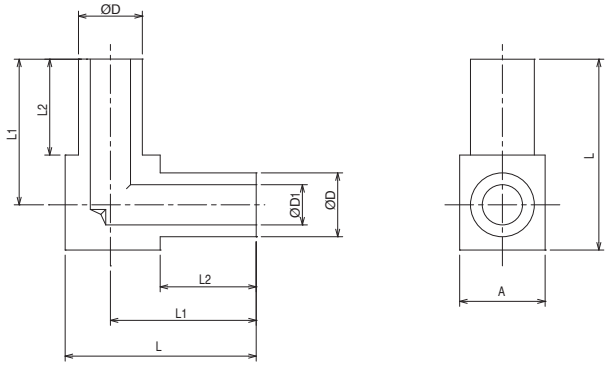
Caution

1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Specifications and Materials

Design Pressure	50 MPa
Fluid Temperature Range	−40 ~ +85℃
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

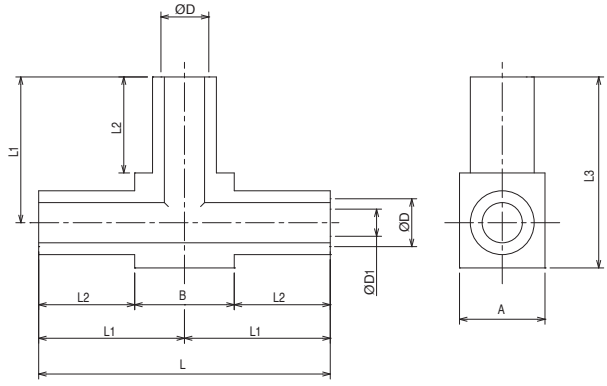
Weld Fittings-Elbows



Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	A	Ordering No.
6.35	3.9	31	25	19.1	11	UJL-6.35-50M-N28.5
9.52	5.4	38	29	19.1	17	UJL-9.52-50M-N28.5
9.52	5.4	45	35	25	17	UJL-9.52-L25-50M-N28.5
12.7	8	38	29	19.1	17	UJL-12.7-50M-N28.5
12.7	8	45	35	25	17	UJL-12.7-L25-50M-N28.5

Weld Fittings-Tees



Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	L3	A	B	Ordering No.
6.35	3.9	50	25	19.1	31	11	11.8	UJT-6.35-50M-N28.5
9.52	5.4	58	29	19.1	38	17	19.8	UJT-9.52-50M-N28.5
9.52	5.4	70	35	25	45	17	20	UJT-9.52-L25-50M-N28.5
12.7	8	58	29	19.1	38	17	19.8	UJT-12.7-50M-N28.5
12.7	8	70	35	25	45	17	20	UJT-12.7-L25-50M-N28.5

Note: Please consult Fujikin about different connections.

Caution
1. All wetted parts of Valves, Unions and Fittings in this catalog should be with non-corrosive gases only.
2. Please use each valve after confirming the instruction manual and daily inspection manual.

Model Number System

Flow Control Valve Model Number

E32 GM3 R4 – 7100 __ – 9 M – E 09 R10 – WN – AS – 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

①Positioner specification

E32	Intrinsically safety explosion-proof construction (Exia II CT6)
E53	Pressure-resistant explosion-proof construction

②Type

GM3	Flow control valve (Global Series)

③Operating type

D4	Normally open
R4	Normally closed

④Design pressure

7100	100 MPa
795	95 MPa (95 MPa UPG® connection only)

⑤Hood

None	Standard
M	For precool low temperature only (7100 only)

⑥Nominal diameter

4	6.35mm
6	9.52mm
8	12.7mm
9	14.2mm

⑦Connection specification

M	Coned-and-Threaded MP type
H	Coned-and-Threaded HP type
G	UPG® Fitting type

⑧Valve characteristic

L	Linear
E	EQ%

⑨Rated Cv value

⑩Rangeability

Select the numbers corresponding to the suitable Cv value and rangeability by referring to the table, “Combination of Cv Value and Rangeability”, below.

⑪WN

WN	Gen.2 type seat: Fujikin Standard * Durability has been improved.
MF	Middle flow type (Cv value of 0.5 supported) Indicated in the model number when Cv value number 07 or 08 is selected.

⑫Accessories

AS	Regulator
V	Solenoid valve
KC	Proximity sensor

⑬Actuator installation posture

1	Installation posture no. 1
2	Installation posture no. 2
3	Installation posture no. 3
4	Installation posture no. 4

* Regarding the installation posture number, refer to the product drawing.

Combination of Cv Value and Rangeability

Valve characteristic	EQ%, linear								
Range ability	R2	R3	R4	R5	R6	R7	R8	R9	R10
	20:1	30:1	40:1	50:1	60:1	70:1	80:1	90:1	100:1
Cv value no. / Cv value									
07 / 0.5									
08 / 0.35									
09 / 0.25									
10 / 0.15									
11 / 0.1									
12 / 0.07									
13 / 0.05									
14 / 0.035									
15 / 0.025									
16 / 0.015									
17 / 0.01									

We can manufacture inner valves for the combinations indicated in [BLUE].

Shut-off Valve Model Number

APR – GUH – 7100 __ – 9 M – KC – 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①Operating type

AP	Pneumatically operated, normally open
APR	Pneumatically operated, normally closed

②Type

GUH	Shut-off Valve (Global Series)

③Design pressure

7100	100 MPa
795	95 MPa (95 MPa UPG® connection only)

④Hood

None	Standard
M	For precool low temperature only (7100 only)

⑤Nominal diameter

4	6.35mm
6	9.52mm
8	12.7mm
9	14.2mm
12	19.05mm
16	25.4mm

⑥Connection specification

M	Coned-and-Threaded MP type
H	Coned-and-Threaded HP type
G	UPG® Fitting type

⑦Accessories

AS	Regulator
V	Solenoid valve
KC	Proximity sensor

⑧Actuator installation posture

1	Installation posture no. 1
2	Installation posture no. 2
3	Installation posture no. 3
4	Installation posture no. 4

* Regarding the installation posture number, refer to the product drawing.

Manual Valve / Check Valve / Filter Model Number

GUH – 7100 L – 9 M – 2

① ② ③ ④ ⑤ ⑥

①Type

GUH	Manual Valve (Global Series)
GUCL	Check Valve (Global Series)
GUFL	Filter (Global Series)

②Design pressure

750	50 MPa
7100	100 MPa
795	95 MPa (95 MPa UPG® connection only)

③Accessories (manual valve only)

L	Lock nut provided

④Nominal diameter

4	6.35mm
6	9.52mm
8	12.7mm
9	14.2mm
12	19.05mm
16	25.4mm

⑤Connection specification

M	Coned-and-Threaded MP type
H	Coned-and-Threaded HP type
G	UPG® Fitting Type

⑥Element size (filter only)

2	2μm
5	5μm
10	10μm

Coned-and-Threaded Connection Model Number

GUJU – L – 9 M – N
① ② ③ ④ ⑤

①Type

GUJU	Coned-and-Threaded

②Fitting shape

F	Straight union
L	Elbow union
T	T union
X	Cross union

③Nominal diameter

4	6.35mm
6	9.52mm
9	14.2mm
12	19.05mm
16	25.4mm

④Connection specification

M	MP: Middle pressure
H	HP: High pressure

⑤Unit body material

N	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

Collar-and-Gland Model Number

GUJU – 9 M CN
① ② ③ ④

①Type

GUJU	Coned-and-Threaded

②Nominal diameter

4	6.35mm
6	9.52mm
9	14.2mm
12	19.05mm
16	25.4mm

③Connection specification

M	MP: Middle pressure
H	HP: High pressure

④Collar-and-Gland

CN	Collar-and-Gland

UPG® Fitting Part Number

UPG – 9.52 S – 95M – L23 – N28.5 – __
① ② ③ ④ ⑤ ⑥ ⑦

①Type

UPG	UPG® Fitting

②Nominal diameter

6.35	6.35mm
9.52	9.52mm
12.7	12.7mm

③Part types

N	Nut
S	Sleeve
G	Gasket
C	Coupling

④Design pressure

None or 50M	50 MPa
95M	95 MPa

⑤ Length (sleeve only)

◆For 50 MPa type

L23	23mm
L31	31mm
L33	33mm
L38	38mm *1
L44	44mm *1

◆For 95 MPa type

L50	50mm

⑥Material (sleeve only)

N28.5	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
HRX19	HRX19® *2

⑦Other

L	long nut (95 MPa type nut only) *1

*1. Select when using a coupling
*2. Material of sleeve is HRX19® in the case of 95 MPa

PROVIDER POWER UNIT

WHAT is PROVIDER?

0.7MPa Operating Air pressure whichi is available in any plant move the PISTON.

Discharge high pressure continuously
150MPa (N2 GAS)
500MPa (Liquid)
3 series(Model:JHP, MG, ML)

JHP series: Small body, companct (for Intermittent drive)

MG, ML series: for continuous drive

Specifications

Max. Discharge Pressure(MPa)	Operating Temperature(℃)
500 (Liquid) 150 (N2 Gas) Please contact us if you need other type of gases.	5 – 40

*: Even more hotness is sometimes practicable by the gas kind, so please consult Fujikin

Features

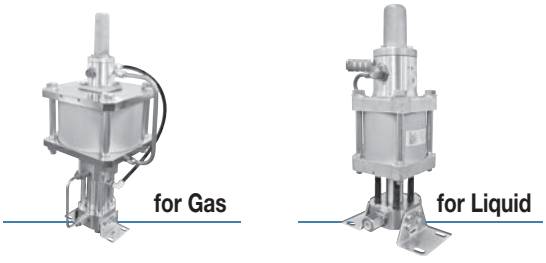
- **Pressure Set:**
  Once you set operation pressure between 0.1 – 0.7 MPa, automaticaly max. pressure is availavle.
- **Explosion Proof:**
  as only air is use.
- **Wetted parts:**
  Suitable material & oil free type is available.
- **Double action cylinder: discharge big volume outlet.**
- **Stable Action:**
  Balancing of Inlet & outlet pressure keeps set pressure. No trouble against over load
- **Low Noise Drive:**
  This system uses only air and use no motor. Silencer reduce the air vent noise.
- **Low Price:**
  because of no motor like compressor type.

Caution	Please use in the room of temperature 5 - 40℃.

Products Line Up

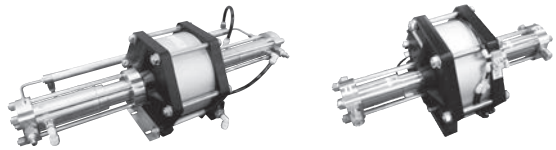
PROVIDER series kept responding to the customer's needs, and the rich product line-up is made even.

JHP Series: Small, Compact, for intermittent drive.



for Gas　　for Liquid

MG, ML Series: For continuous drive, (Oil free, for liquid, etc.)

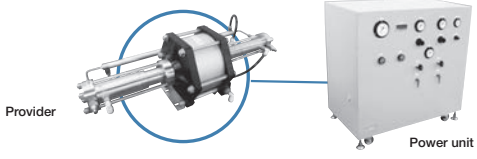


MG Series for GAS

ML Series
for Liquid/ Double action type

POWER UNIT

Equipped with all functions necessary to operating PROVIDER.



Power unit includes all necessary equipments to produce high pressure like:
Provider, Air-regurator, Air-filter, Pressure gauge, Exaust & Inlet pressure control valves, strainer.

Compact ! Light Weight! Transportable !

APPLICATION

Typical Use Exanple

PROVIDER is using widely by the high performance beyond the expectation.

- **Test under high pressure safety regulation for tank, pressure registant, air tightness, destructive test.**
- **For test of plant piping, instrumentation line pressure registant, air tightness.**
- **As test equipment for plant pressure gauge, bourdon gauge.**
- **For molding bellows, valve.**
- **For oil pressure equipment.**
- **For high pressure boost.**

Fluid

Gases :
Air, N2, He, H2, O2, others

Liquids :
Water, Oil, Organic Solvent, (MNP, Methanol), etc.

When it's for gases besides Air and N_2, it'll be the different specification, so please consult Fujikin

**To contribute to preservation of law and order,
safety and stable driving of hydrogen related equipment,
Fujikin also works on substantiality of customer service aggressively.**

Flow Control Problem Solutions

ESUSOC

(abbreviations: Engineering Services Unit Solutions Company)

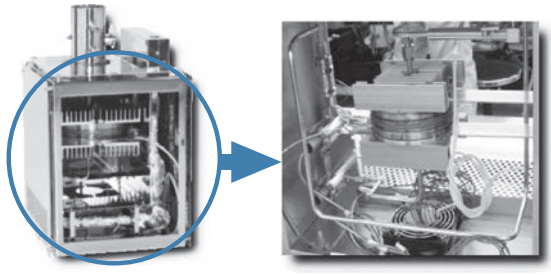
Fujikin can provide customer support in all aspects from design to production, launching, modification and maintenance, utilizing No.1 capability and experience of flow control technology and high pressure gas certification.

Engineering services, equipment/ piping design and production

Outsource order

Unit

- Layout design
- Piping drawing
- Procurement of processed parts, materials and purchased items.
- Assembly
- Cleaning and inspection

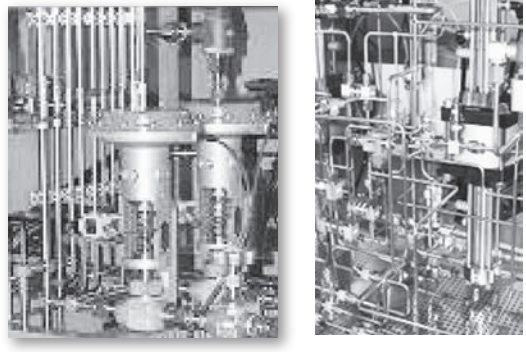


Moisture Generator System

Control system, system design and manufacture also

Prefabricating

- Piping drawing
- Procurement of materials and purchased items
- Manufacture
- Flush and inspection
- Qualification

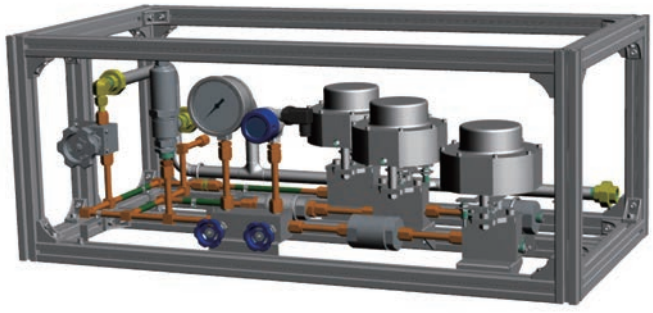


Prefabricated Piping Production

Maintenance Local Construction

If you have trouble with unit or piping, please contact Fujikin local office by all means !

Valve Unit Featuring UPG® Fittings for Hydrogen Station's Accumulator



Feature 1 Use of UPG® joints provides the following benefits.

1. Excellent airtightness

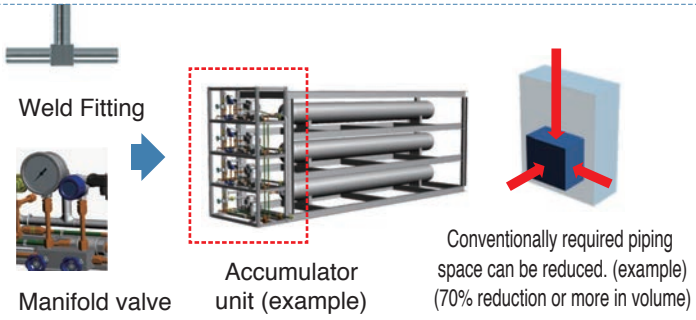
◆Original seal structure realizes excellent airtightness.
◆Metal gaskets minimize loads on pressure-resistant parts even if attached and detached repeatedly.

2. Easy installation and operation

◆Space for the removal of equipment in axial direction is not necessary for assembly or disassembly.
◆Installation is as easy as managing rotation. Overtightening prevention mechanism is built in.
◆Installation requires less tightening torque than when coned-and-threaded connection is used.

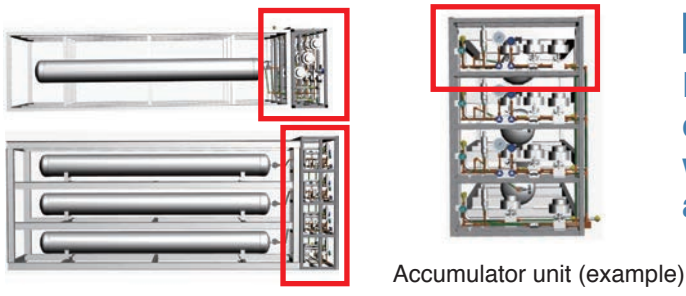
3. Excellent extendibility

◆Seal sections are separated from sections subject to external force to realize superb vibration resistance.



Feature 2

Use of welded joints and manifold valves has reduced the number of connections and the overall unit size.



Feature 3

Prefabricated structures enable the construction of the unit in a factory without considering the number of accumulators (number of banks).

Rich manufacturing experience and cutting edge technology

Fujikin can respond to customers' request in various system including Integrated Gas System, Moisture Generator System, static mixer-dispending unit, prefabricated piping and etc., utilizing our extensive manufacturing experiences and flow control technology in each industry that we've cultivated so far.

Please be free to contact Fujikin for production or sales of systems utilizing some elements based on customer's technology.

Flow Control Problem Solutions Company
ESUSOC
(abbreviations: Engineering Services Unit Solutions Company)

Integrated Solutions

We can propose packaged products of instrumentation piping for Hydrogen station and etc..

Fujikin and NAGANO KEIKI co.,LTD. joint proposal.

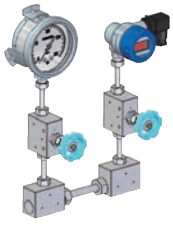
Advantage

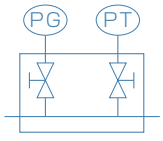
- Compactness
- Reduced number of parts
- Connect Point reduction
- Reduced number of works

Fujikin contributes to security and safety and security of the instruments.

Piping example ①

Packaging before → After





Flow chart

- Manual valve: 2 sets → Manifold type
- Hi-press. fitting: 2 pcs → 0 pce
- Hi-press. piping: 5 pcs → 2 pcs adapter
- Connection part: 10 → 4
- Fitting construction part: 10 → 4
- Tightness test: 10 → 4

Reduced

Piping example ②

Packaging before → After

Flow chart

- Hi-press. piping: 1 → 0
- Fitting construction: 2 → 1
- Tightness test: 2 → 1

Reduced

Cv Value Calculation

Please confirm the necessary Cv Value suited to the intended use (process valves, meter master valves, etc.) before selecting an appropriate valves. Also, if there is a large difference between the flow channel diameter and piping diameter, please multiply the Cv value for the valve unit by revising coefficient Fp to determine the revised Cv Value (CvR).

What is Cv Value?

Cv Value is a capacity coefficient for valves and other devices. It is defined in the Japanese Industrial Standards (JIS) as **"the flow volume expressed in US gal/min of clear water at 60°F (15°C) through a valve within a particular operating range with a pressure differential of 1 lb/inch² (= 1 psi)."**

■ Cv Value Calculation

Fluid \ Differential Pressure Conditions		$P_2 > \frac{P_1}{2}$	$P_2 \leqq \frac{P_1}{2}$	Explanation of Symbols
Liquid	General	$Cv=0.366Q_L\sqrt{\frac{G_L}{P_1-P_2}}$	Same as left	Q_L [m³/h]: Liquid flow volume Q_G [m³/h(normal)]: Gas flow volume in normal state (15°C, 0.1013 MPa abs) Q_S [kg/h]: Steam flow volume P_1 [MPa abs]: Primary side absolute pressure ✶2 P_2 [MPa abs]: Secondary side absolute pressure ✶2 K_V: Viscosity correction factor ✶1 t [°C]: Fluid temperature G_L: Fluid specific gravity (water = 1) G_G: Gas specific gravity (air = 1) S [°C]: Steam superheated temp. X: Dry steam temp. (dry saturated vapor X = 1)
	High Viscosity ✶1	$Cv=0.366Q_LK_V\sqrt{\frac{G_L}{P_1-P_2}}$	Same as left	
Gas		$Cv=\frac{Q_G}{4140}\sqrt{\frac{G_G(273+t)}{(P_1-P_2)P_2}}$	$Cv=\frac{Q_G}{2070P_1}\sqrt{G_G(273+t)}$	
Steam	Saturated Water Vapor	$Cv=\frac{Q_S}{197.8\sqrt{(P_1-P_2)P_2}}$	$Cv=\frac{Q_S}{98.91P_1}$	
	Heated Water Vapor	$Cv=\frac{Q_S}{197.8\sqrt{(P_1-P_2)P_2}}(1+0.0013S)$	$Cv=\frac{Q_S}{98.91P_1}(1+0.0013S)$	
	Wet Steam	$Cv=\frac{Q_SX}{197.8\sqrt{(P_1-P_2)P_2}}$	$Cv=\frac{Q_SX}{98.91P_1}$	

✶1: For liquids, if kinematic viscosity is 20 mPa·s or more and calculated Cv value is 0.01 or less, viscosity correction calculation is required. Please contact Fujikin if fluid specifications are needed for viscosity correction.

✶2: Please use pressure in the immediate proximity of the valve. Calculations using pressure from a point distant from the valve can produce significant errors due to the effects of piping pressure loss, etc.

Important Note

Cv Value calculation provides the standard used in valve selection; so, please use as a reference value. It is possible that fixed piping conditions, usage conditions or other factors can cause actual values to differ from calculated values.

About Selection of Cv Value for Flow Control Valves

1 Selection of Characteristics

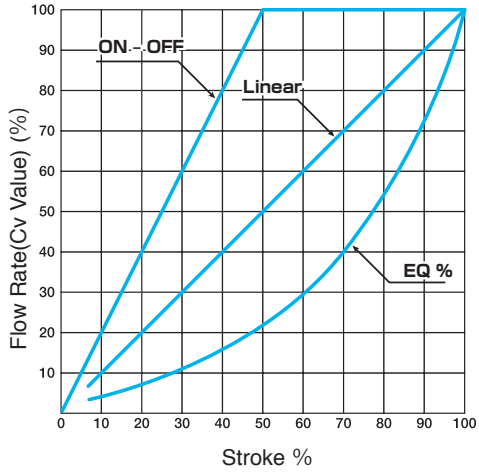
Select please Linear or EQ% or ON=OFF

◆ Linear (Straight line form flow characteristic)

The characteristic that a flow rate (Cv Value) is proportional to a valve lift. A linear flow characteristic is known even if it sees the graph, but if the valve stroke increases 10%, Cv Value will also increase 10%. It is suitable for temperature control, open loop control, etc.

◆ EQ% (Equal ratio form flow characteristic)

The rate of change of the flow to change of a unit stroke leads all the strokes, and it is the fixed characteristic. For example, if range ability is 20:1, whenever the stroke of a valve increases 10%, a Cv Value will increase about 48% respectively, when every about 35% Range - ability is 50:1. It is suitable for pressure control, closed loop control, etc.



◆ ON – OFF

It is also called the quick open characteristic. Valve is the characteristic that it is begun from the start of a difference to pass a large flow, and the rating Cv Value can be secured by about 50 % of valve travel.

2 Determination of Rated Cv Value

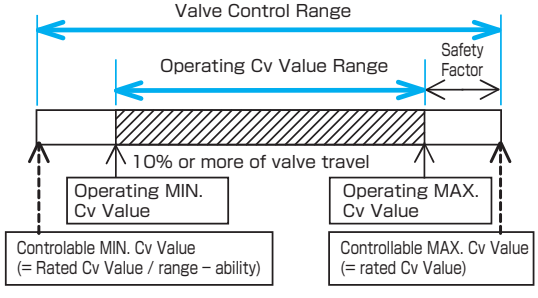
The Rated Cv Value in consideration of a safety factor is selected from calculated maximum Cv Value. The maximum calculated Cv Value is multiplied by the safety ratio according to a valve characteristic.

① ON = OFF ···· 2
② EQ % ····· 1.5
③ Linear ····· 1.2

(The maximum calculation Cv Value) x (safety factor) < (Rated Cv Value) – becoming Cv Value is selected. (Please refer to the right table for the Cv Value currently manufactured)

3 Selection of Range – ability

(Rated Cv Value)/ (minimum calculated Cv Value) becomes necessary Range – ability in control. In the domain of not less than 10% of valve travel, it selects so that the minimum calculation Cv Value can be controlled. (Refer to the right table for the value of the Range – ability currently manufactured)



WARNING	Flow control valves has the tolerance according to the plan Cv Value in each valve travel. When you determine Rated Cv Value, please select suitable margin.

MEMO

CAT: No.100-03E-G