

VALVES & FITTINGS

for Hydrogen Refueling Station



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

Initiatives to use hydrogen as a power source and to generate electricity are gaining momentum around the world as society strives to realize carbon neutrality.

Against this backdrop, promoting global adoption of fuel cell vehicles (FCVs) and fuel cell-powered heavy-duty vehicles (HDVs) and building hydrogen refueling stations are urgent priorities, and valve devices that can withstand demanding environmental conditions such as super-low temperature and super-high pressure will play an essential role in realizing those goals.

Fujikin is developing products like the "Global Series, High-Flow Type" and "Global Series, Low-Temperature Valves for Use with Super-High-Pressure Liquid Hydrogen" for use as valves in hydrogen refueling stations, and we continue to strengthen a line of products that meet demanding requirements.

Going forward, we will continue to make improvements so that we can help realize the hydrogen-fueled society of the future.

H₂

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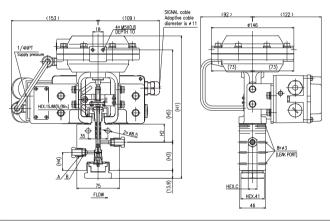
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Flow Control Valves / Shut-off Valves

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

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	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	H1	H2	НЗ	H4	H5	Cv value MAX.	Ordering No	
D	Α	В							IVIAA.		
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	252	32	50	32	163	0.15	E34GM3R4-7100-4M-*-WN	
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	252	32	50	32	163	0.25	E34GM3R4-7100-6M-*-WN	
14.2	13/16-16UN	(Left)9/16-18UNF	19	252	32	50	32	163	0.25	E34GM3R4-7100-9M-*-WN	
14.2	13/16-16UN	(Left)9/16-18UNF	19	254	33	51	33	164	0.5 [Middle flow type]	E34GM3R4-7100-9M-*-MF	

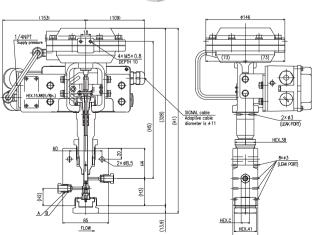
Coned &Threaded Connection MP type

Global Series

Globa Series

100 MPa Flow Control Valves (For Precool Low Temperature)





Features

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

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.)

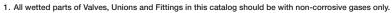
■ Dimensions, Ordering No.

—											
Nominal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	H1	H2	НЗ	H4	H4 H5 Cv value MAX. Ordering No	Ordering No		
D	Α	В							IVIAA.		
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	342	32	50	56	254	0.15	E34GM3R4-7100M-4M-*-WN	
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	342	32	50	56	254	0.25	E34GM3R4-7100M-6M-*-WN	
14.2	13/16-16UN	(Left)9/16-18UNF	19	342	32	50	56	254	0.25	E34GM3R4-7100M-9M-*-WN	
14.2	13/16-16UN	(Left)9/16-18UNF	19	344	33	51	57	255	0.5 [Middle flow type]	E34GM3R4-7100M-9M-*-MF	

Coned &Threaded Connection MP type

★:indicates the Cv value number (Refer to "Combination of Cv Value and Rangeability" on page 30.)





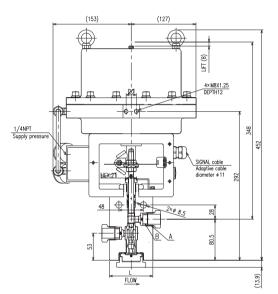
2. Please use each valve after confirming the instruction manual and daily inspection manual.

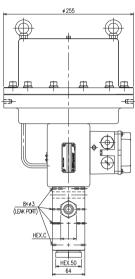
^{*:}indicates the Cv value number (Refer to "Combination of Cv Value and Rangeability" on page 30.)

100 MPa Flow Control Valves (High-Flow Type)









Features

- 1. Flow coefficient (Cv value) can be selected by replaced stem and seat.
- 2.High Flow series with Cv value of 2
- 3. Smart positioner with communications function can be available
- 4.CE ⟨ II 2G Exc IIC T6

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.)

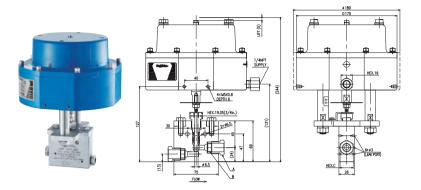
■ Dimensions, Ordering No.

Nominal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	Cv value MAX.	Ordering No		
D	Α	В			IVIAA.			
19.05	3/4-14NPSM	(Left)3/4-16UNF	30.2	85	2	E34GM4R6-7100-12M-*		
25.4	1•3/8-12UNF	(Left)3/4-16UNF	34.9	105	2	E34GM4R6-7100-16M-*		

Coned &Threaded Connection MP type

*:indicates the Cv value number (Refer to "Combination of Cv Value and Rangeability" on page 30.)

100 MPa Shut-off Valves



Features

1. CE 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.)

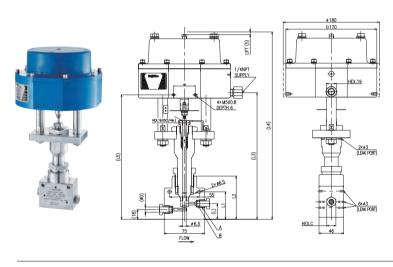
Note: When using in a pre-cool line, please contact Fujikin when ordering.

■ Dimensions, Ordering No.

Nominal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	Cv value MAX.	Ordering No
D	Α	В			
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 II 2G Exc IIC T6

■ 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.)

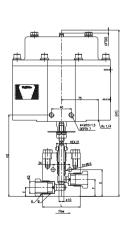
■ Dimensions, Ordering No.

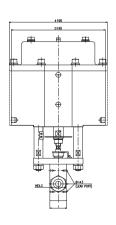
Nominal size	Gland Thread (Valves body side)	Collar Thread (tube side)	L	L1	L2	L3	L4	L5	HEX.C	Cv value MAX.	Ordering No
D	Α	В								IVI/-UX.	
6.35	7/16-20UNF	(Left)1/4-28UNF	29	51	80	235	347	231	12.7	0.25	APR-GUH-7100M-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	29	51	80	235	347	231	15.8	0.7	APR-GUH-7100M-6M
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 WII 2G Exc IIC T6

■ 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.)



Global Series

■ Dimensions, Ordering No.

Normal size D	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	H1	H2	Е	F	G	1	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

- 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



Features

Regulating required air supply pressure for Flow Control Valves.

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

Solenoid Valves





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	
	WBLPG551A005MS	Direct Mount Type 3-Way		Safety & Resin Filling Explosion Proof Type	
Ex e mb IIC	WBLPG551A017MS	Direct Mount Type 4-Way	ASCO JAPAN Co., Ltd	Hydrogen Explosion Proof Type Ex e mb IIC, Outdoor Prevention	
	WBLPG551A001MS	NAMUR Type 3,4-Way	OO., Ltd	Drop IP67 •Applicable to Manifold Type	
	CFSCISG551C505MO	Direct Mount Type 3-Way		Instrinsically Safe Explosion Proof Type	
Ex ia IIC T4	CFSCISG551C517MO	Direct Mount Type 4-Way	ASCO JAPAN Co., Ltd	Hydrogen Explosion Proof Type Ex ia IIC T4, Outdoor Prevention Drop IP67	
	CFSCISG551C501MO	NAMUR Type 3,4-Way	OO., LIU	Certain operation by spring return Type	

^{*:} When ordering, please specify explosion-proof construction and power supply specification.

Proximity Switch, Controller



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



★: Please request necessary.

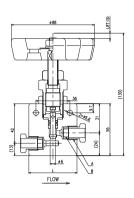
Intrinsically Safe Explosion proof Barrier for E32M3 Series

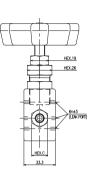
Makers		Model No.	Explosion-proof Construction
P&F	KFD	2-SCD-Ex1. LK	Exia IIC

Manual Valves / Check Valves / Filters

100 MPa Manual Valves







Features

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

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	Gland Thread (Valves body side)	Collar Thread (tube side)	HEX.C	L	Cv value	Ordering No.
D	Α	В				
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

Globa

Series

Global Series

Coned &Threaded Connection MP type

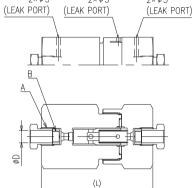
100 MPa Check Valves



 \oplus

HEX.C

HEX.44.5 (1-3/4 in.)



FLOW

Features

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

■ Specifications

Des	ign Pressure	100 MPa		
Fluid ter	mperature range	−40 to +85 °C		
Ambient t	emperature range	−40 to +85 °C		
Boo	dy materials	ASTM A479 316/316L		
Doc	dy materials	(Dual spec.)		
Crack	king pressure	Under 0.0069 MPa		
Operating	Flow rate	Over 40 m ³ /h normal		
conditions	Differential pressure (Reverse Pressure)			

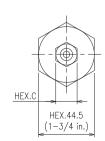
■ Dimensions, Ordering No.

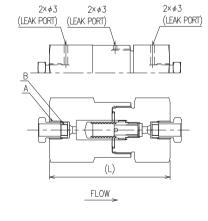
Nominal size	Gland Thread (Valves body side)	Collar Thread (tube side)	HEX.C	L	Cv value	Ordering No.
D	Α	В				
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	89	0.21	GUCL-7100-4M
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	89	0.66	GUCL-7100-6M
14.2	13/16-16UN	(Left)9/16-18UNF	22.2	100	1	GUCL-7100L-9M-S

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

Specifications

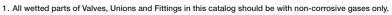
Design Pressure	100 MPa
Fluid temperature range	−40 to +85 °C
Ambient temperature range	−40 to +85 °C
Body materials	ASTM A479 316/316L(Dual spec.)

■ Dimensions, Ordering No.

	Nominal size	Gland Thread (Valves body side)	Collar Thread (tube side)	HEX.C	L	Ordering No.
	D	Α	В			
ı	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

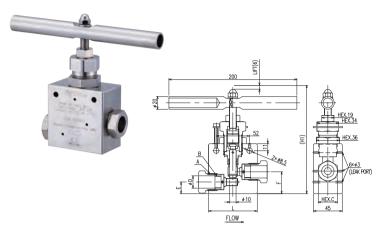
Coned &Threaded Connection MP type *1: Element size number is added. (Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page





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



Specifications

Des	ign Pressure	100 MPa
Fluid ter	mperature range	−40 to +85 °C
Ambient t	emperature range	−40 to +60 °C
Boo	dy materials	ASTM A479 316/316L(Dual spec.)

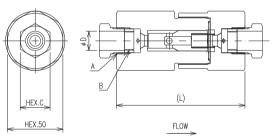
■ Dimensions, Ordering No.

Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	H1	Е	F	Cv Value	Ordering No.
D	Α	В							
19.05	3/4-14NPS	(Left)3/4-16UNF	30.2	76	169	18	34	2.5	GUH-7100 L-12M
25.4	1.3/8-12UNF	(Left)1-14UNS	34.9	100	177	24	42.5	2.5	GUH-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

■ Specifications

D€	esign pressure	100 MPa
Fluid te	emperature range	−40 to +85 °C
Ambient	temperature range	−40 to +85 °C
Во	ody materials	ASTM A479 316/316L(Dual spec.)
Cra	cking pressure	Under 0.0069 MPa
Operating	Flow rate	Over 40 m ³ /h normal
conditions Different pressure (Reverse Pressure)		Over 10 MPa

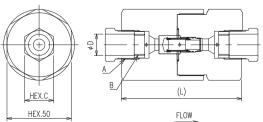
■ Dimensions, Ordering No.

Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	L	Cv value	Ordering No.
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

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.
ט	Α	В			
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 31.)



- 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)

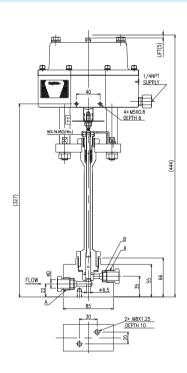


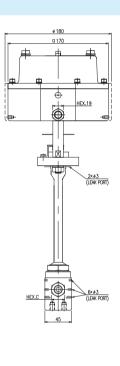
Monodzukuri, Nippon Conference/Nikkan Kogyo Shimbun, LTD.



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

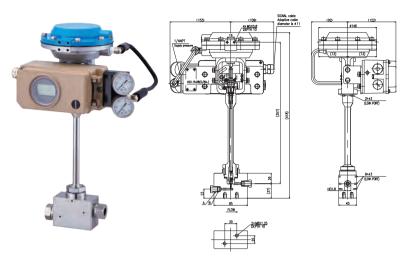
- opcomoditorio	
Design Pressure	100 MPa
Fluid temperature range	−253 to +50 °C
Ambient temperature range	−40 to +50 °C
Body materials	SUH660

■ Dimensions, Ordering No.

Normal size D	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	Cv Value MAX.	Ordering No.
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

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



Check Valves for low temperature are also available.

Features



Global

- 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
- 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.

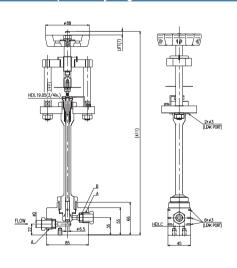
Nominal size	Gland Thread (valve body side)	Collar Thread (tube side)	HEX.C	Cv Value	Ordering No.
D	Α	В		MAX.	
6.35	7/16-20UNF	(Left)1/4-28UNF	12.7	0.15	E34GM3R4-7100C-4M-*
9.52	9/16-18UNF	(Left)3/8-24UNF	15.8	0.25	E34GM3R4-7100C-6M-*
14.2	13/16-16UN	(Left)9/16-18UNF	19	0.25	E34GM3R4-7100C-9M-*

Coned &Threaded Connection MP type

★:indicates the Cv value number (Refer to "Combination of Cv Value and Rangeability" on page 30.)

Ultra Low Temperature Valves For Liquefied Hydrogen (Manual Valves)





Features



- 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

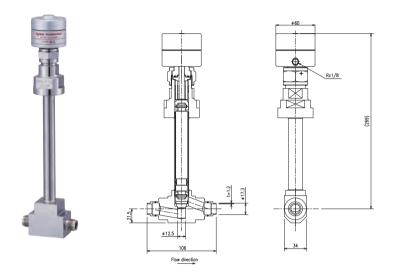
Design Pressure	100 MPa
Fluid temperature range	−253 to +50 °C
Ambient temperature range	−40 to +50 °C
Body materials	SUH660

■ Dimensions, Ordering No.

	=					
Normal size	Gland Thread (valves body side)	Collar Thread (tube side)	HEX.C	Cv Value	Ordering No.	
D	Α	В		MAX.		
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

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



Features

- 1. Compact actuator
- 2. High sealing performance by bellows
- 3. High-Flowrate (Cv value of 2.4)

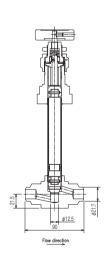
■ Specifications(example)

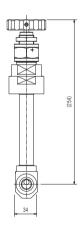
	. ,
Design Pressure	1 MPa
Design Temperature	− 253 to +85°C
Body Materials	SUS316L

■ Ordering No. APR-UBF-51JCC-*** (example)

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







Features

- 1. Compact
- 2. High sealing performance by bellows
- 3. High-Flowrate (Cv value of 2.4)

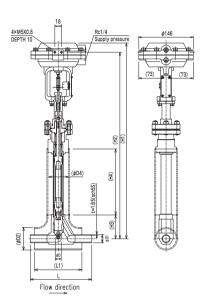
■ Specifications(example)

	- X - X - X - X - X - X - X - X - X - X
Design Pressure	1 MPa
Design Temperature	– 253 to +85°C
Rody Materials	SUS316I

■ Ordering No. UBF-51JCC-*** (example)

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





Features

- 1. High sealing performance by bellows
- 2. High-Flowrate (Cv value of 7.5)

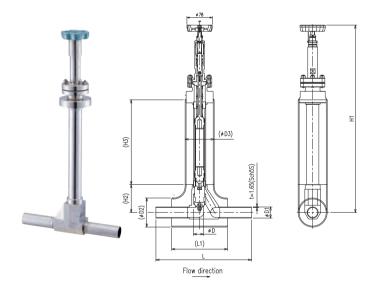
■ Specifications(example)

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

■ Dimensions, Ordering No.

	Non		D	D1	L	H1	H2			ACKET Reference			Cv value MAX.	Ordering No
	Α	В						D2	L1	D3	НЗ	H4	MAA.	
Г	15	1/2	16	21.7	165	524	500	60.5	127	60.5	63.5	177	3.9	APR-ULD-52BCD
1	25	1	25	34	293	634	610	89.1	171.4	89.1	85.7	260	7.5	APR-ULD-52BCF

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



Features

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

■ Specifications(example)

	zaumpic)
Design Pressure	2 MPa
Design Temperature	−253 to +75°C
Body Materials	SUS316L

■ Dimensions, Ordering No.

	Non siz		D	D1	L	H1			ACKET Reference			Cv value MAX.	Ordering No	
	Α	В					D2	L1	D3	H2	НЗ	MAX.		
1	15	1/2	16	21.7	165	478	60.5	127	60.5	63.5	177	3.9	ULD-52BCGLD	
2	25	1	25	34	293	588	89.1	171.4	89.1	85.7	260	9	ULD-52BCGLF	

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.

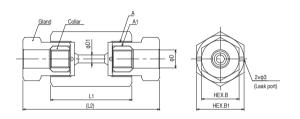


GUJU-H Type

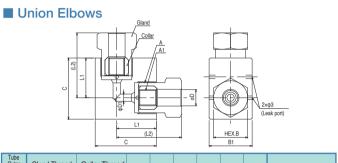
Coned-and-Threaded Connection High-Pressure (HP) Type Body

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.

■ Straight Union

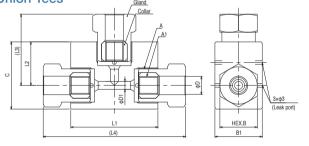


Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2 D1	D1	В	B1	Ordering No.	
D	Α	A1							
6.35	9/16-18UNF	(Left)1/4-28UNF	40	64	2.4	15.9	24	GUJU-F-4H-N	
9.52	3/4-16UNF	(Left)3/8-24UNF	55	87	3.2	20.6	27	GUJU-F-6H-N	
14.2	1·1/8-12UNF	(Left)9/16-18UNF	65	111	6.4	30.2	38	GUJU-F-9H-N	



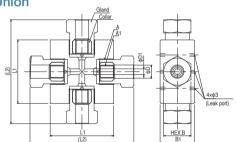
Outer Diameter	Gland Thread	Collar Thread	С	L1	L2	D1	В	B1	Ordering No.
D	Α	A1							
6.35	9/16-18UNF	(Left)1/4-28UNF	34.5	22.5	34.5	2.4	15.9	24	GUJU-L-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	41	27.5	43.5	3.2	20.6	27	GUJU-L-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	54	35	58	6.4	30.2	38	GUJU-L-9H-N

Union Tees



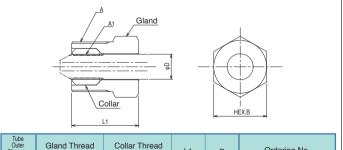
Tube Outer Diameter	Gland Thread	Collar Thread	С	L1	L2	L3	L4	D1	В	B1	Ordering No.
D	Α	A1									
6.35	9/16-18UNF	(Left)1/4-28UNF	34.5	45	22.5	34.5	69	2.4	15.9	24	GUJU-T-4H-N
9.52	3/4-16UNF	(Left)3/8-24UNF	41	55	27.5	43.5	87	3.2	20.6	27	GUJU-T-6H-N
14.2	1·1/8-12UNF	(Left)9/16-18UNF	54	70	35	58	116	6.4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

■ Cross Union



Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	В	B1	Ordering No.
D	Α	A1						
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	Gland Thread	Collar Thread	L1	В	Ordering No.
D	Α	A1			
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

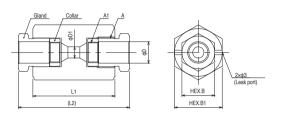
_	
Parts	Materials
Body	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)
Gland	ASTM A479 316
Collar	ASTM A479 316

GUJU-M Type

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

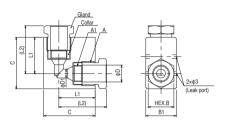
Body

■ Straight Union



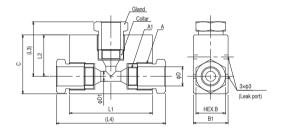
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	В	B1	Ordering No.
D	Α	A1						
6.35	7/16-20UNF	(Left)1/4-28UNF	35	53	2.8	12.7	19	GUJU-F-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	45	63	5.2	15.8	26	GUJU-F-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	55	75	7.9	22.2	32	GUJU-F-9M-N
19.05	3/4-14NPS	(Left)3/4-16UNF	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



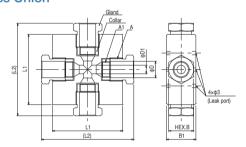
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	D1	С	В	B1	Ordering No.	
D	Α	A1								
6.35	7/16-20UNF	(Left)1/4-28UNF	20	29	2.8	29	12.7	18	GUJU-L-4M-N	
9.52	9/16-18UNF	(Left)3/8-24UNF	25.5	34.5	5.2	36	15.8	20	GUJU-L-6M-N	
14.2	13/16-16UN	(Left)9/16-18UNF	31	41	7.9	44	22.2	26	GUJU-L-9M-N	
19.05	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



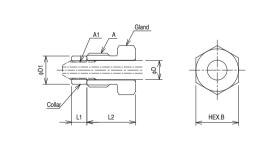
Tube Outer Diameter	Gland Thread	Collar Thread	L1	L2	L3	L4	D1	С	В	B1	Ordering No.
D	Α	A1									
6.35	7/16-20UNF	(Left)1/4-28UNF	40	20	29	58	2.8	29	12.7	18	GUJU-T-4M-N
9.52	9/16-18UNF	(Left)3/8-24UNF	51	25.5	34.5	69	5.2	36	15.8	20	GUJU-T-6M-N
14.2	13/16-16UN	(Left)9/16-18UNF	62	31	41	82	7.9	44	22.2	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	В	B1	Ordering No.
D	Α	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	В	Ordering No.
D	А	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 hig							
Gland ASTM A479 316							
Collar	ASTM A479 316						

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.

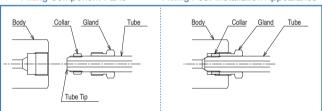
2. Basic Structural Overview

- 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.

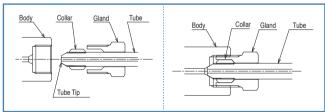
■ Fitting Structural Drawing

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



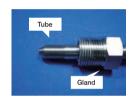
4. Important Considerations for Selections

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)

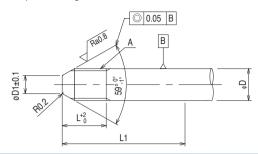


5-5. Using a wrench, tighten the gland by a 1/8 - 1/6 turn from the zero point. (When tightening the gland, always make sure to hold the body in place.) No further tightening is needed.



	Tightenir	ng Torque (N•m)
Nominal Diameter	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

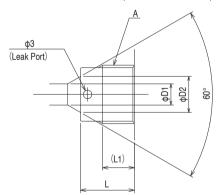
5-6. Tube Tip Processing Dimensions



Nominal Diameter	Fitting Types	Tube Tip Pr Dimens		ing	Required Min. Straight Tube Length *3			
D	71	A *2	D1	L	L1	Collar	gland	
6.35		(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	MP	(Left)9/16-18UNF	10.3	12.7	50	GUJU-9MC	GUJU-9MN	
19.05	Type	(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		(Left)1/4-28UNF	3.2	14.3	40	GUJU-4HC	GUJU-4HN	
9.52	HP Type	(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	А	L	L1	D1	D2
6.35		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	MP Type	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		9/16-18UNF	11.2	9.7	2.4	4.3
9.52	HP Type	3/4-16UNF	15.8	13.5	3.2	6.6
14.2	71.	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.

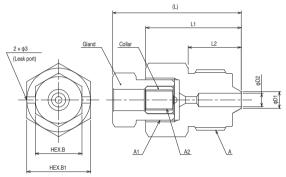
Specifications

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

Materials

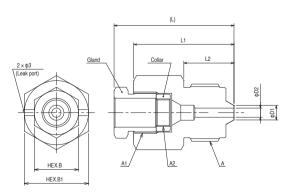
Part	Materials							
Body	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)							
Gland	ASTM A479 316							
Collar	ASTM A479 316							

Male (HP) × Female (HP)



Nomin	al size	Thread	Nominal size	Gland Thread	Collar Thread			L2	D1	Do	В	B1	Ordering No
1	1	Α	2	A1	A2					D2	В		
14	1.2	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	1.2	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)

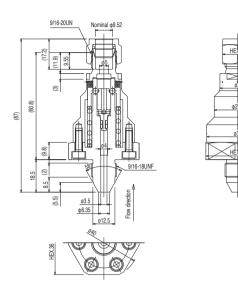


Nominal size	Thread	Nominal size	Gland Thread	Collar Thread	,	11	L2	D1	D2	В	B1	Ordering No
1	Α	2	A1	A2	L	LI	L2	LZ DI		В	ы	Ordering No
6.35	9/16-18UNF	6.35	7/16-20UNF	(Left)1/4-28UNF	45	36	16	3.2	2.1	12.7	21	GUJB-4HX4M-N
9.52	3/4-16UNF	9.52	9/16-18UNF	(Left)3/8-24UNF	49	40	20	5.6	3.2	15.8	24	GUJB-6HX6M-N
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.

Fusible-plug Type Pressure Relief Devices / Container Main Valves

Fusible-plug Type Pressure Relief Devices (PRD)

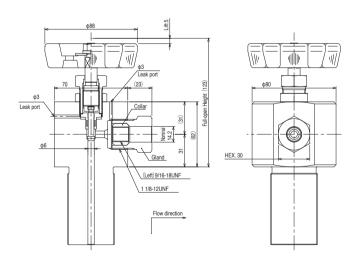


■ Specifications (example)

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)

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



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.

material standard

• Compared to coned-and-threaded joint, construction with low torque can be done.

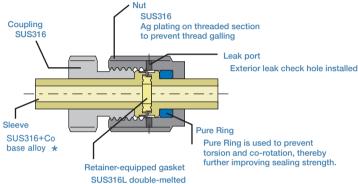
3. Excellent Scalability

- 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.





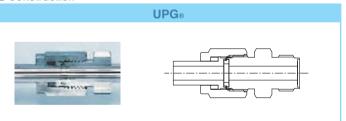
Construction

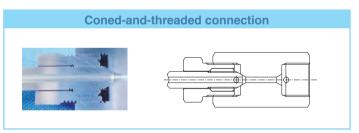


*: HRX19® sleeve can be also manufactured.

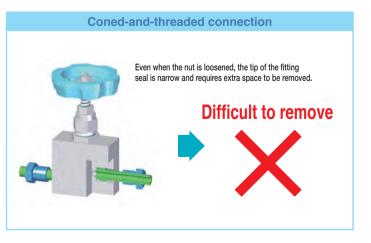
Comparison with Coned-and-threaded connection

■ Construction





■ Removability **UPG**® When nut is loosened... Easy to remove



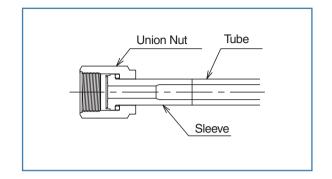
HRX 19® is a registered trademark of NIPPON STEEL CORPORATION.

Piping Installation Guidelines

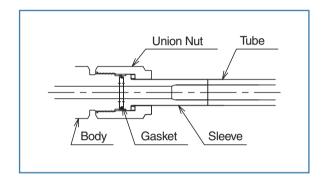
(50 MPa UPGo fitting, 95 MPa UPGo fitting)

 With the union nut already installed, weld the tube onto the sleeve. (When welding, please flow inert gas to prevent oxidation. When removing the protective cap from the seal, be careful not to damage it.)

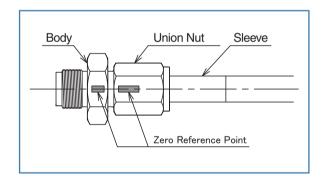
If there is some time between welding and tightening, reattach the protective cap after cooling down sufficiently.



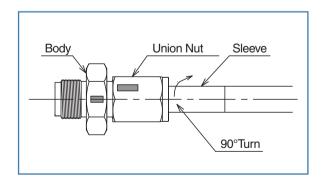
Attach the gasket with retainer to either the body or the sleeve end. Hand-tighten the nut until the body, gasket, and sleeve are in tight contact.



3. Scribe a line with a felt-tip maker on the body and union nut. This will be your zero reference point.



4. With the body held stationary and nothing the reference point, tighten the union nut with a wrench 90°. Complete!



↑ Important Note: If it is over-tightened, the UPG® seal will deform and seize, making it impossible to reuse it.

95 MPa UPG_® Fittings

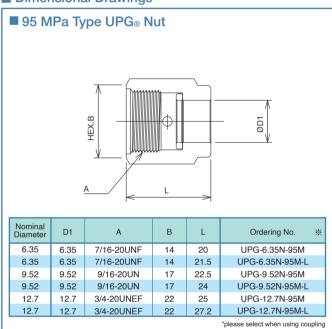
Features

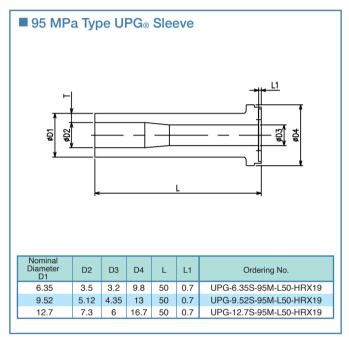
Design Pressure	95 MPa
Temperature Range	−40 ~ +50 °C
Nominal Diameter	6.35、9.52、12.7
Main Materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)(Sleeve: HRX 19®)

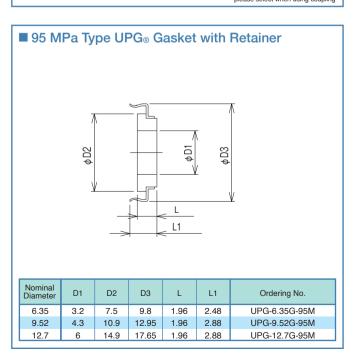


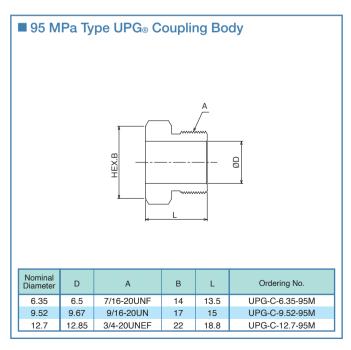


■ Dimensional Drawings









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



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

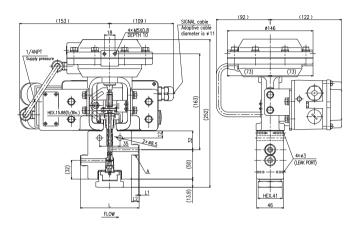
Valves with 95 MPa UPG® Fittings

Features

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

Flow Control Valves with 95 MPa UPG® Fittings





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)

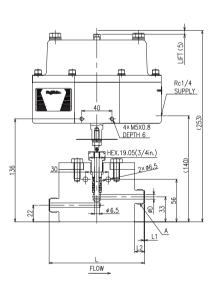
Specifications

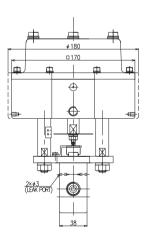
Nominal Diameter	C	onnectio	on	THREAD	L	L	Cv value MAX.	Ordering No
Diameter	D	L1	L2	Α		IVIMA.		
9.52	4.35	0.7	11	9/16-20UN	97	0.15	E34GM3R4-795-6G-*-WN-N	
12.7	6	0.7	12.8	3/4-20UNEF	100	0.25	E34GM3R4-795-8G-*-WN-N	

★:indicates the Cv value number (Refer to "Combination of Cv Value and Rangeability" on page 30.)

Shut-off Valves with 95 MPa UPG® Fittings







Features

- 1. Full-bore type [accommodates port diameter equal to or greater than the inner diameter of 12.7 size (ø6)]
- 2. No usage restrictions on flow direction and differential pressure.

Specifications

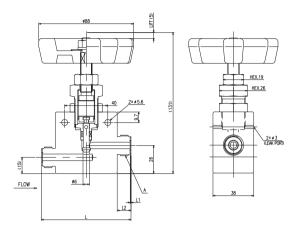
Design Pressure	95 MPa				
Fluid temperature range -40 to +50 °C					
Note:When using in a pre-cool line, please select the valve for precool low temperature type					
Ambient temperature range -40 to +50 °C					
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)				

■ Dimensions, Ordering No.

Nominal Diameter	C	onnectio	on	THREAD	L	L	Cv value	Ordering No
Diamotoi	D	L1	L2	Α		MAX.		
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	

- 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

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	Ambient temperature range -40 to +50 °C				
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)				

Global

Series

Globa Series

Global

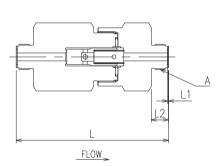
Series

Dimensions, Ordering No.

Nominal Diameter	Co	onnectio	on	THREAD	L	Cv VALUE	Ordering No
Diameter	D	L1	L2	Α			
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

Specifications

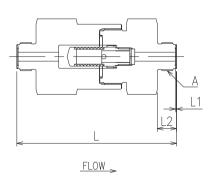
Des	ign Pressure	95 MPa				
Fluid te	mperature range	-40 to +50 °C				
Ambient	temperature range	-40 to +50 °C				
Boo	dy materials	SUH 660				
Cracl	king pressure	Under 0.0069 MPa				
Operating Flow rate		Over 40 m ³ /h normal				
conditions	Differential pressure (Reverse Pressure)					

■ Dimensions, Ordering No.

Nominal Diameter	Co	onnectio	on	THREAD	L	Cv	Ordering No
Diameter	D	L1	L2	Α		VALUE	
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

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	Co	onnectio	on	THREAD	L	Ordering No
Diameter	D	L1	L2	Α		
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 31.)



- 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.

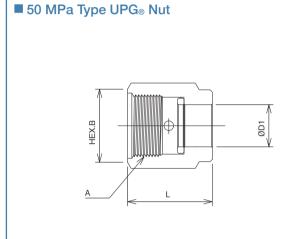
50 MPa UPG_® Fittings

Specifications and Materials

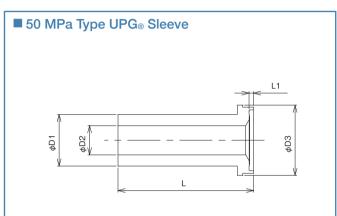
Pressure Range	50 MPa
Temperature Range	-45 to +85 °C
Nominal Diameter	6.35, 9.52, 12.7
Main Materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)



■ Dimensional Drawings

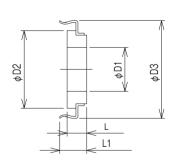


Nominal Diameter	D1	А	В	L	Ordering No.
6.35	6.5	7/16-20UNF	14	17.5	UPG-6.35N-50M
9.52	9.7	9/16-20UNF	17	19.5	UPG-9.52N-50M
12.7	12.9	3/4-20UNEF	22	23	UPG-12.7N-50M



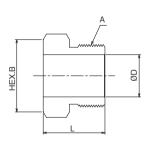
Nominal Diameter D1	D2	D3	L	L1	Ordering No.
6.35	3.9	9.8	23	0.7	UPG-6.35S-L23-50M-N28.5
9.52	5.4	13	31	0.7	UPG-9.52S-L31-50M-N28.5
9.52	5.4	13	38	0.7	UPG-9.52S-L38-50M-N28.5 *
12.7	8	17.7	33	0.7	UPG-12.7S-L33-50M-N28.5
12.7	8	17.7	44	0.7	UPG-12.7S-L44-50M-N28.5 *
					★1: Please select when using Counling

■ 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



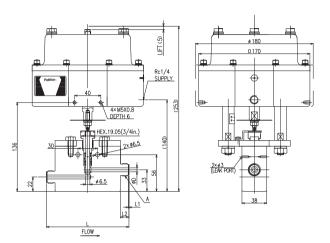
Nominal Diameter	D	А	В	L	Ordering No.
6.35	6.5	7/16-20UNF	14	13.5	UPG-C-6.35
9.52	9.67	9/16-20UNF	17	15	UPG-C-9.52
12.7	12.85	3/4-20UNEF	22	18.8	UPG-C-12.7

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	−40 to +60 °C
Body materials	SUS316(Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

■ Dimensions, Ordering No.

Nominal	Co	onnecti	on	Thread	Interfacial Distance	Cv Value	Ordering No.
Diameter	D	L1	L2	Α	L	MAX.	
6.35	3.9	0.7	10	7/16-20UNF	120	0.4	APR-GUH-750-4G-N
9.52	5.4	0.7	11	9/16-20UN	122	0.7	APR-GUH-750-6G-N
12.7	8	0.7	12.8	3/4-20UNEF	126	1	APR-GUH-750-8G-N

Shut-off Valves with 45 MPa UPG® Fittings

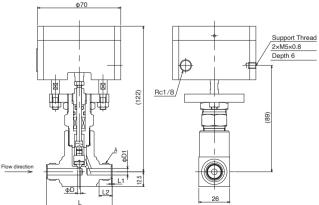


■ Specifications

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

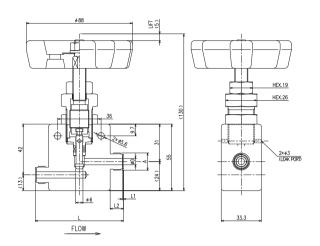
■ Dimensions, Ordering No.

Nominal	Orifice Diameter		Conn	ection	า	Thread	Interfacial Distance	Cv Value	Mass (approx.)	Ordering No.
Diameter	D	D1	D2	L1	L2	Α	L	MAX.	(kg)	
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



Manual Valves with 50 MPa UPG® Fittings





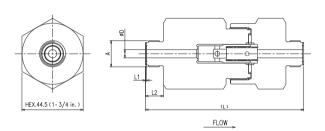
■ Specifications

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	Nu	t connect	ion	Thread	Interfacial Distance	Cv Value	Ordering No.
	Biamotor	D	L1	L2	Α	L	MAX.	
ſ	6.35	3.9	0.7	10	7/16-20UNF	71	0.37	GUH-750L-4G-N
ı	9.52	5.4	0.7	11	9/16-20UN	73	0.55	GUH-750L-6G-N
	12.7	8	0.7	12.8	3/4-20UNEF	78	1	GUH-750L-8G-N

Check Valves with 50 MPa UPG® Fittings



Features

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



Globa

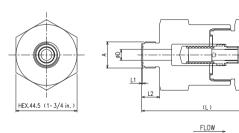
Specifications

Des	ign Pressure	50 MPa			
	Ů.	40.405.00			
Fluid ter	mperature range	−40 to +85 °C			
Anbier	nt Temperature	−40 to +85 °C			
Boo	dy materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)			
Crack	king pressure	Under 0.0069 MPa			
Operating	Flow rate	Over 40 m³/h normal			
conditions	Differential pressure (Reverse Pressure)				

■ Dimensions, Ordering No.

Nominal Diameter	Nut connection Thread			Thread		Cv Value	Ordering No.
Diamotor	D	L1	L2	Α	L	MAX.	
6.35	3.9	0.7	10	7/16-20UNF	87	0.35	GUCL-750-4G-N
9.52	5.4	0.7	11	9/16-20UN	89	0.66	GUCL-750-6G-N
12.7	8	0.7	12.8	3/4-20UNEF	92.6	0.8	GUCL-750-8G-N

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

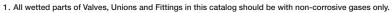
Design Pressure	50 MPa
Fluid Temperature Range	−40 ~ +85 °C
Anbient Temperature	−40 ~ +85 °C
Body materials	SUS316 (Ni equivalent of 28.5 or higher, area reduction of 75% or higher)

■ Dimensions, Ordering No.

	ninal neter	Nut connection		Thread	Interfacial Distance	Ordering No.	
Dian	110101	D	L1	L2	А	L	
6.3	35	3.9	0.7	10	7/16-20UNF	92	GUFL-750-4G-*1-N
9.	52	5.4	0.7	11	9/16-20UN	94	GUFL-750-6G-+1-N
12	2.7	8	0.7	12.8	3/4-20UNEF	97	GUFL-750-8G-+1-N

*1: Element size number is added. (Refer to ⑥ in "Manual Valve/Check Valve/Filter Part Number" on page 31.)





2. Please use each valve after confirming the instruction manual and daily inspection manual.

Various Change Couplers for UPG®

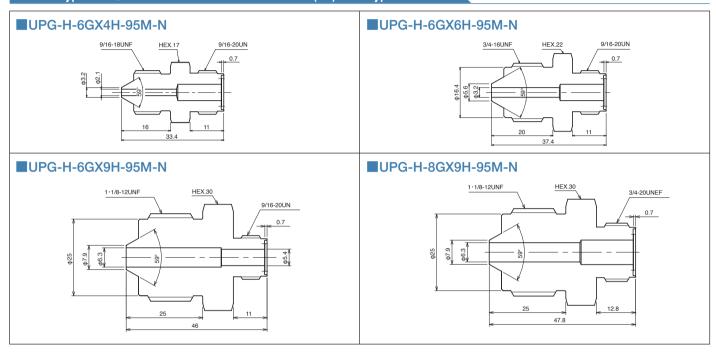
Specifications

Materials

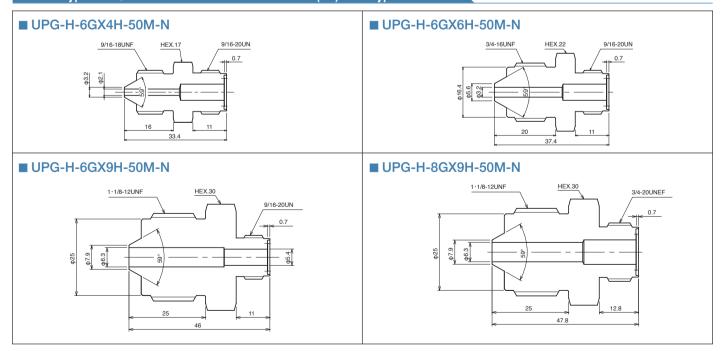
Maximum operating pressure and temperature are changeable according to the materials and thickness of the tubes. Please contact Fujikin before ordering.

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

95 MPa Type UPG₈ × Coned-and-Threaded Connection (HP) Male Type



50 MPa Type UPG₈ × Coned-and-Threaded Connection (HP) Male Type



Note: Please consult Fujikin about different connections.

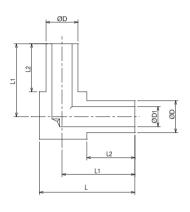
Weld Fittings

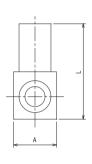
95 MPa Weld Fittings

Specifications and Materials

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

■Weld Fittings-Elbows

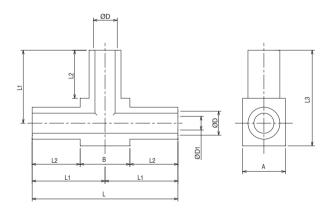




■ Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	Α	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.

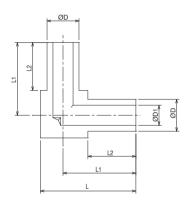
Nominal Diameter (D)	D1	L	L1	L2	L3	Α	В	Ordering No.
6.35	3.5	60	30	25	35	11	10	UJT-6.35-95M-HRX19-S
9.52	5.12	70	35	25	45	17	20	UJT-9.52-95M-HRX19-S
12.7	7.3	70	35	25	45	17	20	UJT-12.7-95M-HRX19-S

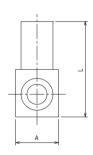
50 MPa Weld Fittings

Specifications and Materials

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

■Weld Fittings-Elbows

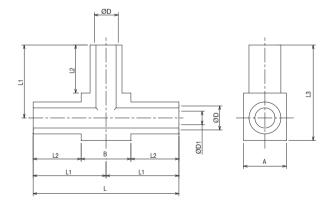




■ Dimensions, Ordering No.

Nominal Diameter (D)	D1	L	L1	L2	А	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	В	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.

Model Number System

Flow Control Valve Model Number

1 Positioner specification

E34	Intrinsically safety explosion-proof construction (Exia II CT6)
E53	Pressure-resistant explosion-proof construction

2 Type

GM3	Flow control valve
GM4	Flow control valve (High Flow Type)

3Operating type

D4	Normally open
R4	Normally closed

4 Design pressure

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

5Hood

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

6 Nominal diameter

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

7Connection specification

М	Coned-and-Threaded MP type
Н	Coned-and-Threaded HP type
G	UPG® Fitting type

8 Valve characteristic

L	Linear
Е	EQ%

10 Rangeability

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.			

12 Accessories

AS	Regulator
٧	Solenoid valve
KC	Proximity sensor

13 Actuator 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	R2	R3	R4	R5	R6	R7	R8	R9	R10
	ability	20:1	30:1	40:1	50:1	60:1	70:1	80:1	90:1	100:1
Cv value no.	Cv value									
03	2									
04	1.5									
07	0.5									
80	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

1Operating type

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

2Type

GUH	Shut-off Valve (Global Series)
-----	--------------------------------

3 Design pressure

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

4Hood

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

5 Nominal diameter

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

6 Connection specification

М	Coned-and-Threaded MP type
Н	Coned-and-Threaded HP type
G	UPG _® Fitting type

7Accessories

AS	Regulator
٧	Solenoid valve
KC	Proximity sensor

8 Actuator 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

$\frac{\text{GUH} - 7100}{1} = \frac{L}{3} = \frac{9}{4} = \frac{M}{5} = \frac{2}{6}$

1 Type

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

2 Design pressure

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

3 Accessories (manual valve only)

L Lock nut provided

4 Nominal diameter

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

5 Connection specification

М	Coned-and-Threaded MP type
Н	Coned-and-Threaded HP type
G	UPG _® Fitting Type

6 Element size (filter only)

2	2μm
5	5μm
10	10μm

Coned-and-Threaded Connection Model Number





1Type

GUJU Coned-and-Threaded

2 Fitting shape

	F	Straight union
	L	Elbow union
	Т	T union
	Х	Cross union

4 Connection specification

М	MP: Middle pressure
Н	HP: High pressure

5Unit body material

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

М	MP: Middle pressure
Н	HP: High pressure

16 25.4mm

М	MP: Middle pressure
Н	HP: High pressure

3Connection specification

Coned-and-Threaded

2 Nominal diameter

6.35mm

9.52mm

14.2mm

19.05mm

(4)Collar-and-Gland

Collar-and-Gland Model Number

1Type

GUJU

6

12

Collar-and-Gland

3 Nominal diameter

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

UPG® Fitting Part Number

1Type

UPG UPG® Fitting

2 Nominal diameter

6.35	6.35mm
9.52	9.52mm
12.7	12.7mm

3Part types

N	Nut
S	Sleeve
G	Gasket
С	Coupling

4 Design 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
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6 Material (sleeve only)

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

7Other

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

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(°C)
500 (Liquid)	
150 (N2 Gas)	5 - 40
Please contact us if you need other type of gases.	

^{*:} 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, automatically max. pressure is

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.

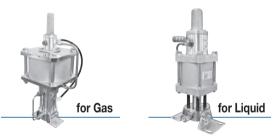


Please use in the room of temperature 5 - 40°C.

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.





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



MG Series for GAS



ML Series for Liquid/ Double action type

Fluid

Gases:

Liquids:Water, Oil, Organic Solvent,

(MNP, Methanol), etc.

APPLICATION

Typical Use Example

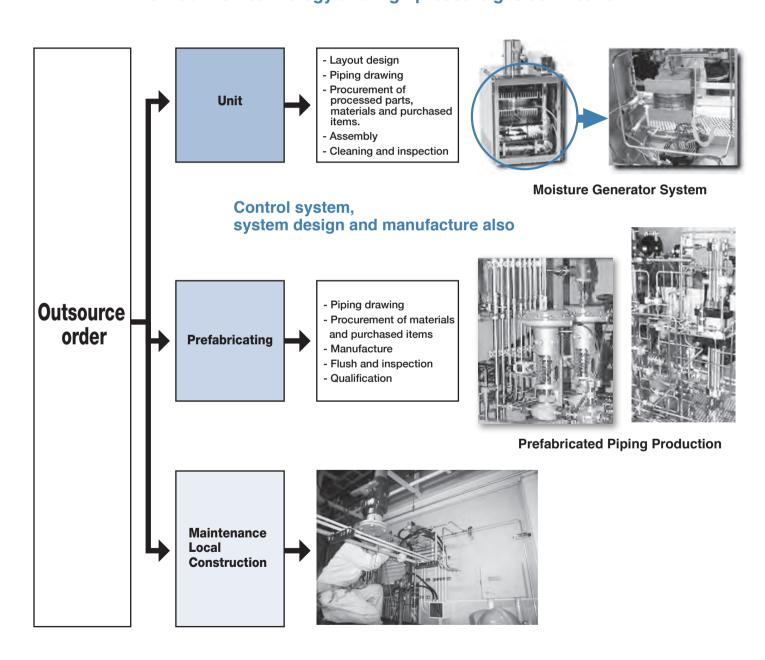
PROVIDER is using widely by the high performance beyond the expectation.

- 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.

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.

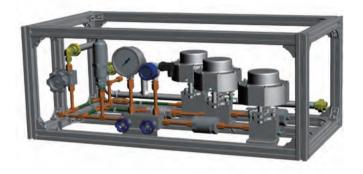
Engineering services, equipment / piping design and production

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.



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.

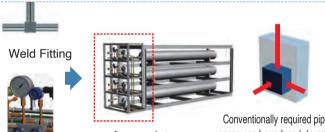
- 1. Excellent airtightness
- ◆Original seal structure realizes excellent airtightness.
- Metal gaskets minimize loads on pressure-resistant parts even if attached and detached repeatedly.
- 2. Easy installation and operation

and the overall unit size.

- ◆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.

Use of welded joints and manifold valves

has reduced the number of connections



Manifold valve

Accumulator unit (example)

Conventionally required piping space can be reduced. (example) (70% reduction or more in volume)

Feature 3

Feature 2



Accumulator unit (example)

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

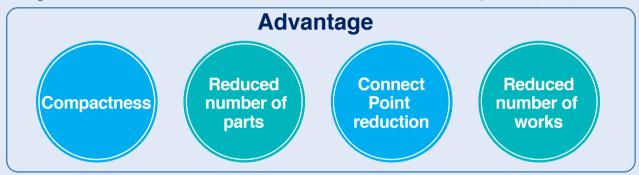
Fujikin can respond to customers' request in various system including Integrated Gas System, Moisture Generator System, static mixer-dispending unit, prefabricated piping and etc., utilizing our extensive manufacturing experiences and flow control technology in each industry that we've cultivated so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

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

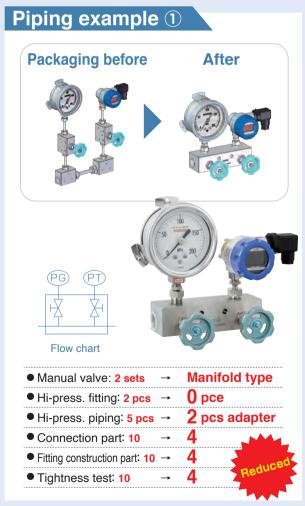
Integrated Solutions

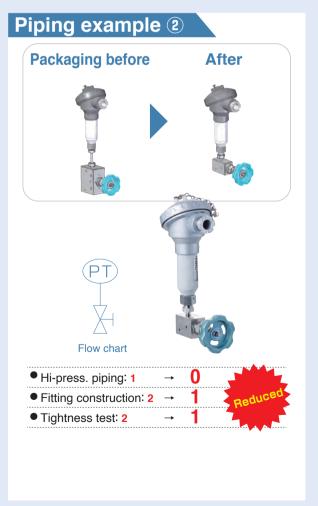
We can propose packaged products of instrumentation piping for Hydrogen station and etc..

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



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





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

Dif	ferential Pressure Conditions	$P_2 > \frac{P_1}{2}$	$P_2 \leq \frac{P_1}{2}$	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	
Liquid	High Viscosity *1	$Cv = 0.366Q_L K_V \sqrt{\frac{G_L}{P_1 - P_2}}$	Same as left	normal state (15°C, 0.1013 MPa abs) Qs [kg/h]: Steam flow volume P1 [MPa abs]: Primary side absolute pressure *2	
Gas		$Cv = \frac{Q_G}{4140} \sqrt{\frac{G_G(273+t)}{(P_1 - P_2) P_2}}$	$Cv = \frac{Q_G}{2070P_1} \sqrt{G_G(273+t)}$	P ₂ [MPa abs]: Secondary side absolute pressure : K _V : Viscosity correction factor * 1 t [°C]: Fluid temperature	
	Saturated Water Vapor	$Cv = \frac{Q_s}{197.8\sqrt{(P_1 - P_2) P_2}}$	$Cv = \frac{Q_s}{98.91P_1}$	G _L : Fluid specific gravity (water = 1) G _G : Gas specific gravity (air = 1)	
Steam	Heated Water Vapor	$Cv = \frac{Q_s}{197.8\sqrt{(P_1 - P_2)P_2}} (1 + 0.0013S)$	$Cv = \frac{Q_s}{98.91P_1}(1 + 0.0013S)$	S [°C]: Steam superheated temp. X: Dry steam temp. (dry saturated vapor X = 1)	
	Wet Steam	$Cv = \frac{Q_s X}{197.8 \sqrt{(P_1 - P_2) P_2}}$	$Cv = \frac{Q_s X}{98.91 P_1}$		

- ★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.



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)

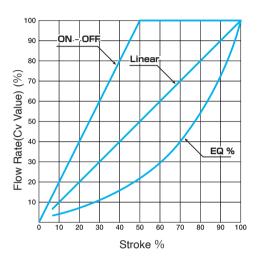
The characteristic that a flow rate (Cv Value) is proportional to a valve lift. A linear flow characteristic is known even if it sees the graph, but if the valve stroke increases 10%, Cv Value will also increase 10%. It is suitable for temperature control, open loop control, etc.

♦ 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

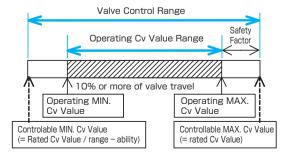
The Rated Cv Value in consideration of a safety factor is selected from calculated maximum Cv Value. The maximum calculated Cv Value is multiplied by the safety ratio according to a valve characteristic.

- 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)





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.

Certifications



CRN

The Canadian Registration Number (CRN) is a number issued by a provincial safety authority that legally allows the installation and use of boilers, pressure vessels or fitting.



It signify that products sold in the EU area have been assessed to meet high safety, health, and environmental protection requirements.



98QR-132

ISO9001

It is quality management systems standards to aim quality improvement of products and services.

Scope: Osaka Plant - Kashiwara

ISO9001 Scope

Products/Service: Design, Manufacture, and Related Services of Valves,

Strainers, Fittings, Seal Pots, Boosters, Piping and Complex Equipments which are combination of them.



02ER · 262

ISO14001

It is an environmental management system standard that is established to minimize the environmental impact of a company's activities, such as manufacturing products and providing services.

Scope: Tsukuba Advanced Research Center

Scope

Products/Service: 1.Design, Development and Manufacturing of Valves and Fittings, and Gas Systems

2.Incubation and Cultivation of Sturgeon 3.Design, Development and Manufacturing of

Medical Equipment



20HR · 018

ISO45001

It is an occupational health and safety management system, which is intended to improve the safety and health of all employees and other personnel related to the organization's business activities.

Scope: Tsukuba Advanced Research Center

Scope

Products/Service: 1.Design, Development and Manufacturing of Valves and Fittings, and Gas Systems

2.Incubation and Cultivation of Sturgeon Design, Development and Manufacturing of Medical Equipment



MEMO			

MEMO	

MEMO			

