The promise of precision, every time.

MACWELD machining

www.mac-weld.com

NEEDLE VALVES

MACWELD machining

At Mac-Weld we promise precision, every time. We're proud of our work, and we work closely with our customers. We design and develop products that perform best under the most challenging conditions. We don't crack under pressure. We don't melt under heat. We measure the flow, and we're measured in our response. We stand by our quality, our time, and our price. We're Mac-Weld, and our promise is, to be the best.

The promise of precision, every time.

Table of Contents

Mac-Weld reserves the right to update and/or change our product line at anytime without written notice. Drawings may differ slightly from final product. For the most up to date and accurate drawing, please contact your Mac-Weld Sales representative today at 1-877-622-9353. Revised June 2023.

Instrument Needle Valve
Female Inlet x Female Outlet

Instrument Needle Valve
Male Inlet x Female Outlet

Instrument Needle Valve
Female Inlet x Male Outlet

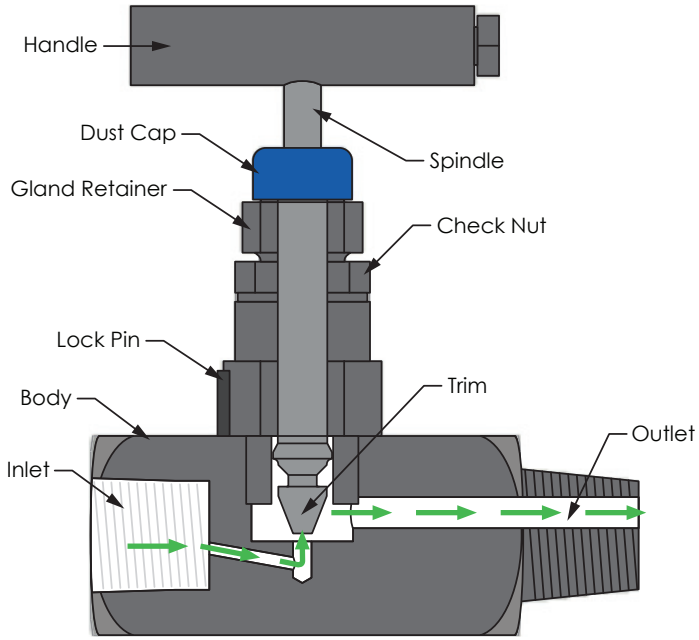
Instrument Needle Valves
with Drain Plugs

Gauge Root Valve
Male Inlet x 3 Female Outlet

Instrument Valves

Our valves are designed and tested to industry quality standards.

Widely used in many industries, Mac-Weld high pressure instrument needle valves provide quality and reliable function to isolate gaseous and aggressive non-viscous liquid services. Drain or vent impulse lines allow for repair or replacement of pressure gauges, level switches or other static instruments. The isolation valves allow for calibration of transmitters, their replacement and repair. Gauge root valves allow for installation of multiple instruments at the same location.



Specifications and Features

Mac-Weld instrument Needle and Gauge Valves incorporate high quality needle valves designed to operate at pressures up to 6000 psig with standard PTFE gland packing. The packing is positioned below the stem threads to ensure no contact between system process and the stem threads. The upper gland body is tightened and secured into position by a lock nut. The lower gland body is directly screwed into the component body and secured into place to prevent accidental loosening of the gland body during operation.

Additionally features include:

- Standard seat diameter – 5mm CV: 0.4
- Maximum standard pressure up to 6000 psig @ 100˚F (414 bar @ 38˚C)
- Stainless steel pin prevents loosening of the gland body during operation.
- Gland is externally adjustable
- Backseat stop spindle prevents blowout
- Non-rotating trim enables the spindle to self center with the orifice for bubble tight shut-off.
- Dust cap prevents ingress of contaminants

CRN Registered Valves

A majority of our needle valves have a CRN number, see page 7 for the complete list.

Please refer to the following pages to reference Instrument Needle & Gauge Valve specifications.

Part Number Reference Chart

PART NUMBER	NV-L-XXF-XXF-P		
Component	NV	Needle Valve	
	GV	Gauge Valve	
Body Material	SS	316 Stainless Steel	
	L	316L Stainless Steel	
End Connection Inlet	02F	1/8" Female NPT	Threads to ASME BI .20.1
	04F	1/4" Female NPT	
	06F	3/8" Female NPT	
	08F	1/2" Female NPT	
	12F	3/4" Female NPT	
	16F	1" Female NPT	
	02M	1/8" Male NPT	
	04M	1/4" Male NPT	
	06M	3/8" Male NPT	
	08M	1/2" Male NPT	
	12M	3/4" Male NPT	
	16M	1" Male NPT	
End Connection Outlet	02F	1/8" Female NPT	Threads to ASME BI .20.1
	04F	1/4" Female NPT	
	06F	3/8" Female NPT	
	08F	1/2" Female NPT	
	12F	3/4" Female NPT	
	16F	1" Female NPT	
	02M	1/8" Male NPT	
	04M	1/4" Male NPT	
	06M	3/8" Male NPT	
	08M	1/2" Male NPT	
	12M	3/4" Male NPT	
	16M	1" Male NPT	
Drain c/s Plug	P	1/4" Female NPT	Threads to ASME BI .20.1

Part Number Reference Chart is provided for informational purposes only. Mac-Weld provides standard stock items with predetermined part numbers for your convenience.

Mac-Weld CRN Valve List

PART NUMBER	DESCRIPTION	NPT CONNECTIONS (M & F)	Design Temp (°F)	Design Pressure (PSIG)
NV-X-XXF-XXM	NEEDLE VALVE - NPT (F) x NPT (M)	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-XXF-XXM-P	NEEDLE VALVE - NPT (F) x NPT (M) WITH 1/4" NPT DRAIN	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-XXM-XXF	NEEDLE VALVE - NPT (M) x NPT (F)	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-XXM-XXF-P	NEEDLE VALVE - NPT (M) x NPT (F) WITH 1/4" NPT DRAIN	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-XXF-XXF	NEEDLE VALVE - NPT (F) X NPT (F)	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-XXF-XXF-P	NEEDLE VALVE - NPT(F) X NPT(F) WITH 1/4" NPT DRAIN	1/4", 3/8", 1/2", 3/4"	100	6000
NV-X-08F-08F-10	NEEDLE VALVE - NPT (F) X NPT (F)	1/2"	100	10000
NV-X-08M-08F-10	NEEDLE VALVE - NPT (M) x NPT (F) WITH 1/4" NPT DRAIN	1/2"	100	10000
GV-X-XXM-XXF	MULTIPORT GAUGE VALVE - NPT(M) X NPT(F)	1/2", 3/4"	100	6000

CRN applies to the following materials: 316/316L, C-276, Carbon Steel and F51.
Material availability and lead times will vary, see factory for details.

FEMALE INLET X FEMALE OUTLET

CRN Registered

PART DESCRIPTION

FNPT x FNPT			DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)				
PART NUMBER	INLET	OUTLET	"A"	"L"	"H" MAX
NV-L-04F-04F ●	1/4" (F)	1/4" (F)	1.10 (28.00)	2.20 (56.00)	3.43 (87.00)
NV-L-06F-06F ●	3/8" (F)	3/8" (F)			
NV-L-08F-08F ●	1/2" (F)	1/2" (F)	1.26 (32.00)	2.68 (68.00)	3.50 (89.00)
NV-L-12F-12F ●	3/4" (F)	3/4" (F)	1.50 (38.00)		3.66 (93.00)

(●=CRN product, M=Male, F=Female)

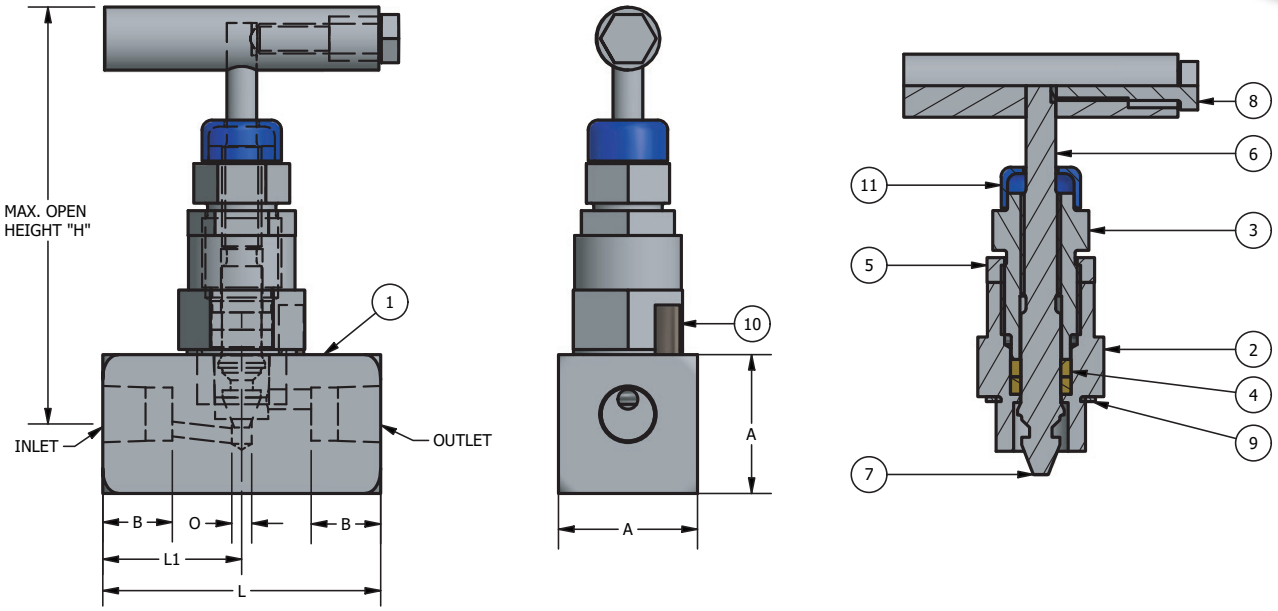
Female Inlet x Female Outlet

Instrument Needle Valve

Mac-Weld Instrument Needle Valves provide realiable isolation capability for high pressure applications.

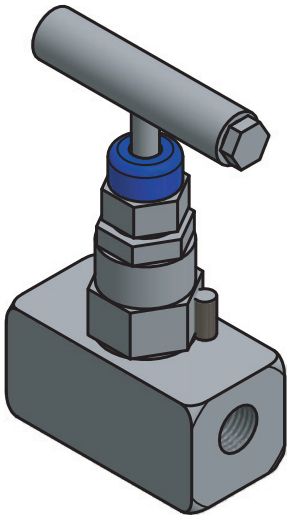
- 316/316L Stainless Steel Body, stem and trim
- 6000 psig @ 100˚F (414 bar @ 38˚C)
- PTFE Packing, with optional graphoil packing available
- Non-rotating trim provides bubble tight shut-off
- NACE certified

10,000 psig valve rating available



NV-X-XXF-XXF shown, for a complete list of CRN valves see page 7.

PART NO.	PART DESCRIPTION	MATERIAL	QTY.
1	BODY	316/316L SS NACE	1
2	GLAND BODY	316/316L SS NACE	1
3	GLAND RETAINER	304/304L SS	1
4	GLAND SEAL	P.T.F.E.	2
5	CHECK NUT	304/304L SS	1
6	SPINDLE	316/316L SS NACE	1
7	TRIM	316/316L SS NACE	1
8	HANDLE	304/304L SS	1
9	WASHER	316/316L SS NACE	1
10	LOCK PIN	316/316L SS	1
11	DUST CAP	PVC	1



MALE INLET X FEMALE OUTLET

CRN Registered

PART DESCRIPTION

MNPT x FNPT			DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)				
PART NUMBER	INLET	OUTLET	"A"	"L"	"H" MAX
NV-L-04M-04F ●	1/4" (M)	1/4" (F)	1.10 (28.00)	3.07 (78.00)	1.10 (28.00)
NV-L-06M-06F ●	3/8" (M)	3/8" (F)			
NV-L-08M-08F ●	1/2" (M)	1/2" (F)	1.26 (32.00)	3.46 (88.00)	3.50 (89.00)
NV-L-12M-12F ●	3/4" (M)	3/4" (F)	1.50 (38.00)		3.66 (93.00)

(●=CRN product, M=Male, F=Female)

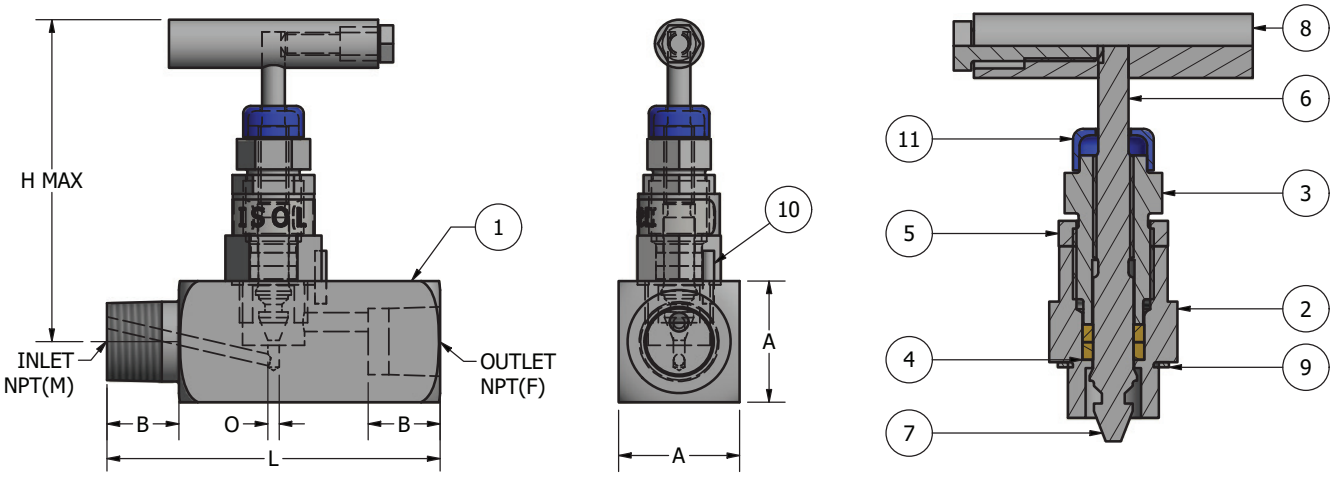
Male Inlet x Female Outlet

Instrument Needle Valve

Mac-Weld Instrument Needle Valves provide realiable isolation capability for high pressure applications.

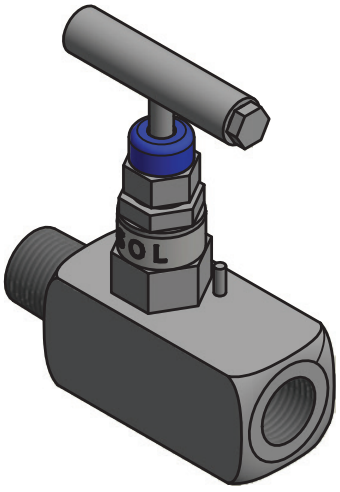
- 316/316L Stainless Steel Body, stem and trim
- Valve available with 1/4" NPT Drain
- 6000 psig @ 100˚F (414 bar @ 38˚C)
- PTFE Packing, with optional graphoil packing available
- Non-rotating trim provides bubble tight shut-off
- NACE certified

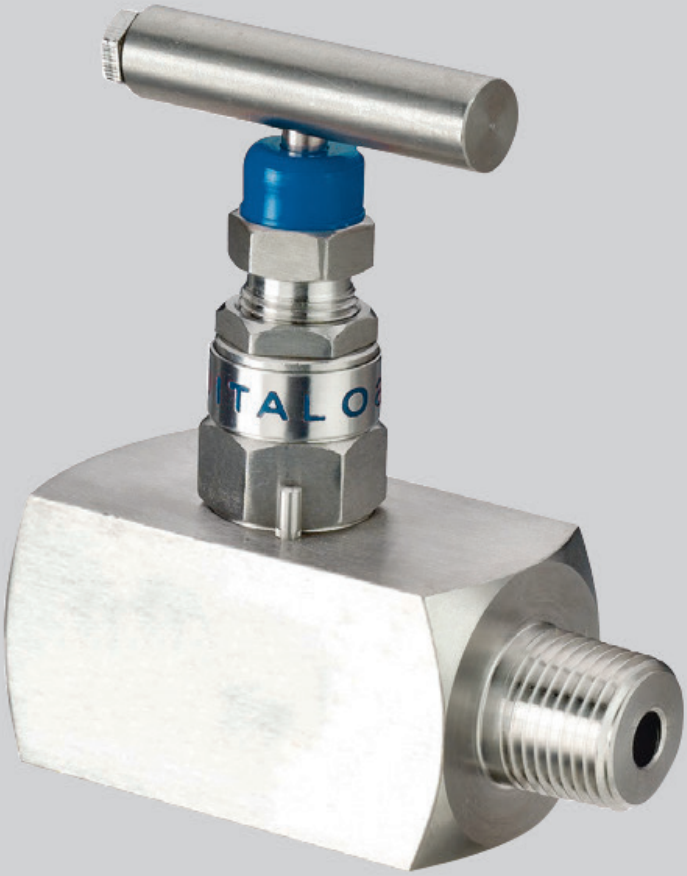
10,000 psig valve rating available



NV-L-XXM-XXF shown, for a complete list of CRN valves see page 7.

PART NO.	PART DESCRIPTION	MATERIAL	QTY.
1	BODY	316/316L SS NACE	1
2	GLAND BODY	316/316L SS NACE	1
3	GLAND RETAINER	304/304L SS	1
4	GLAND SEAL	P.T.F.E.	2
5	CHECK NUT	304/304L SS	1
6	SPINDLE	316/316L SS NACE	1
7	TRIM	316/316L SS NACE	1
8	HANDLE	304/304L SS	1
9	WASHER	316/316L SS NACE	1
10	LOCK PIN	316/316L SS	1
11	DUST CAP	PVC	1





FEMALE INLET X MALE OUTLET

CRN Registered

PART DESCRIPTION

FNPT x MNPT			DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)				
PART NUMBER	INLET	OUTLET	"A"	"L"	"H" MAX
NV-L-04F-04M ●	1/4" (F)	1/4" (M)	1.10 (28.00)	3.07 (78.00)	3.43 (87.00)
NV-L-06F-06M ●	3/8" (F)	3/8" (M)			
NV-L-08F-08M ●	1/2" (F)	1/2" (M)	1.26 (32.00)	3.46 (88.00)	3.50 (89.00)
NV-L-12F-12M ●	3/4" (F)	3/4" (F)	1.77 (45.00)		3.66 (93.00)

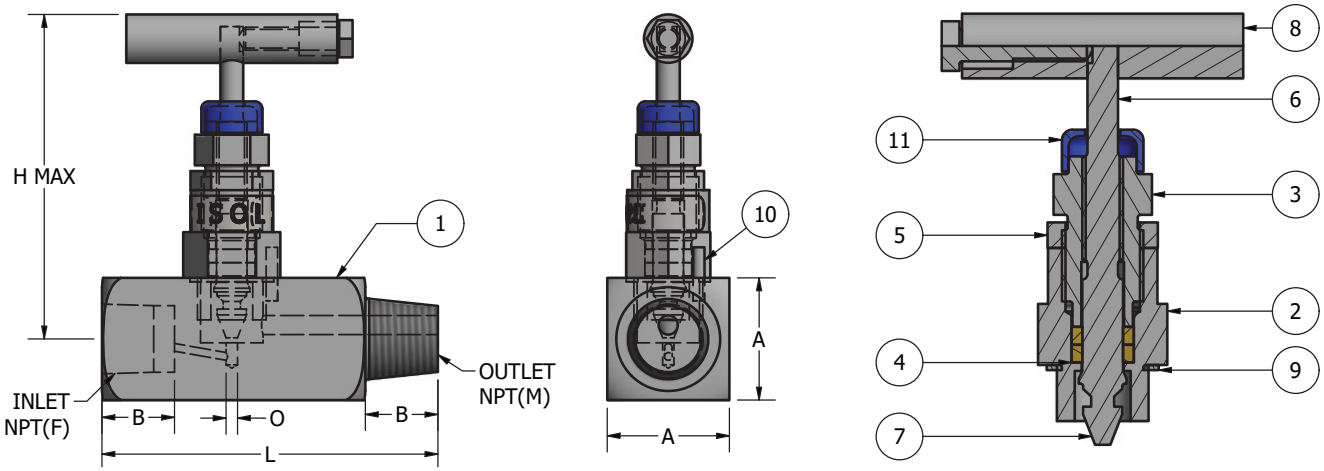
(●=CRN product, M=Male, F=Female)

Female Inlet x Male Outlet

Instrument Needle Valve

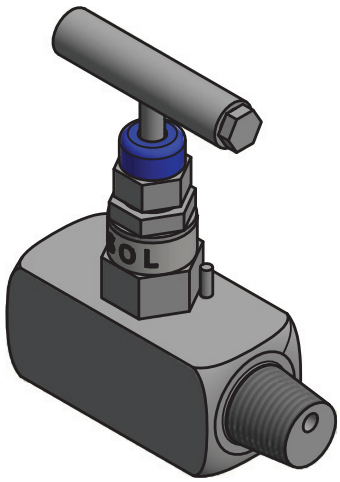
Mac-Weld Instrument Needle Valves provide reliable block capability for high pressure gas or liquid service.

- 316/316L Stainless Steel Body, stem and trim
- Valve available with 1/4" NPT Drain
- 6000 psig @ 100°F (414 bar @ 38°C)
- PTFE Packing, with optional graphoil packing available
- Non-rotating trim provides bubble tight shut-off
- NACE certified



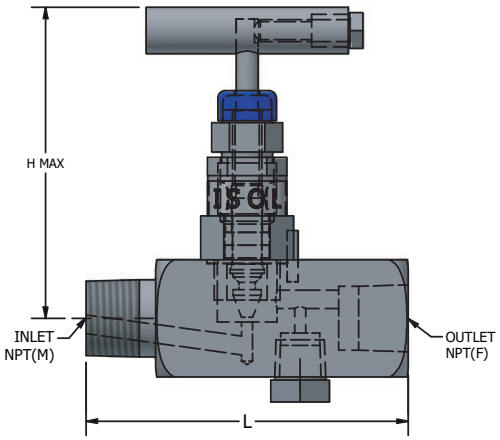
NV-X-XXF-XXM shown, for a complete list of CRN valves see page 7.

PART NO.	PART DESCRIPTION	MATERIAL	QTY.
1	BODY	316/316L SS NACE	1
2	GLAND BODY	316/316L SS NACE	1
3	GLAND RETAINER	304/304L SS	1
4	GLAND SEAL	P.T.F.E.	2
5	CHECK NUT	304/304L SS	1
6	SPINDLE	316/316L SS NACE	1
7	TRIM	316/316L SS NACE	1
8	HANDLE	304/304L SS	1
9	WASHER	316/316L SS NACE	1
10	LOCK PIN	316/316L SS	1
11	BLUE DUST CAP	PVC	1
12	1/4" NPT DRAIN PLUG	316/316L SS NACE	1

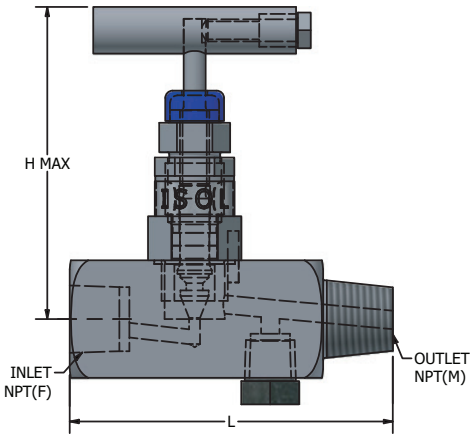


NEEDLE VALVES WITH DRAIN PLUGS

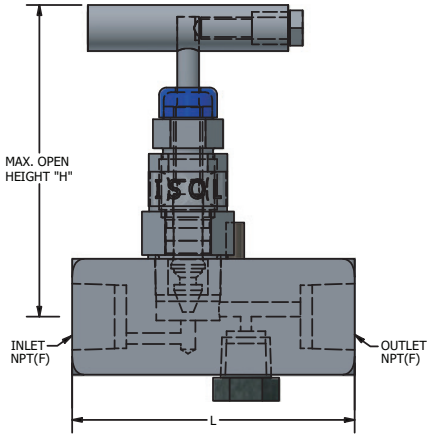
CRN Registered



NV-X-XXM-XXF-P



NV-X-XXF-XXM-P



NV-X-XXF-XXF-P

Needle Valves with Drain Plugs

Instrument Valves

Our line of needle valves are available with 1/4" drain plugs. CRN registration is available for needle valves manufactured from the following materials; 316/316L, C-276, Carbon Steel and F51.

- 316/316L Stainless Steel Body, stem and trim (also available in C-276, CS, F51)
- 6000 psig - 10,000 psig
- 1/4" NPT Drain
- PTFE Packing, with optional graphoil packing available
- Non-rotating trim provides bubble tight shut-off
- NACE certified

FEMALE INLET X FEMALE OUTLET PART DESCRIPTION

FNPT x FNPT x FNPT				DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)		DRAIN/VENT c/w PLUG (NPT)			
PART NUMBER	INLET	OUTLET		"A"	"L"	"H" MAX
NV-L-04F-04F-P ●	1/4" (F)	1/4" (F)	1/4"	1.10 (28.00)	2.76 (70.00)	3.50 (89.00)
NV-L-06F-06F-P ●	3/8" (F)	3/8" (F)	1/4"			
NV-L-08F-08F-P ●	1/2" (F)	1/2" (F)	1/4"	1.26 (32.00)	3.07 (78.00)	3.58 (91.00)
NV-L-12F-12F-P ●	3/4" (F)	3/4" (F)	1/4"	1.50 (38.00)	3.15 (80.00)	3.70 (94.00)

FEMALE INLET X MALE OUTLET - PART DESCRIPTION

FNPT x MNPT x FNPT			DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)				
PART NUMBER	INLET	OUTLET	"A"	"L"	"H" MAX
NV-L-04F-04M-P ●	1/4" (F)	1/4" (M)	1.10 (28.00)	3.07 (78.00)	3.43 (87.00)
NV-L-06F-06M-P ●	3/8" (F)	3/8" (M)			
NV-L-08F-08M-P ●	1/2" (F)	1/2" (M)	1.26 (32.00)	3.46 (88.00)	3.50 (89.00)
NV-L-12F-12M-P ●	3/4" (F)	3/4" (F)	1.77 (45.00)		3.66 (93.00)

MALE INLET X FEMALE OUTLET - PART DESCRIPTION

MNPT x FNPT x FNPT			DIMENSIONS: INCHES (MILLIMETERS)		
	END CONNECTION (NPT)				
PART NUMBER	INLET	OUTLET	"A"	"L"	"H" MAX
NV-L-04M-04F-P ●	1/4" (M)	1/4" (F)	1.10 (28.00)	3.07 (78.00)	1.10 (28.00)
NV-L-06M-06F-P ●	3/8" (M)	3/8" (F)			
NV-L-08M-08F-P ●	1/2" (M)	1/2" (F)	1.26 (32.00)	3.46 (88.00)	3.50 (89.00)
NV-L-12M-12F-P ●	3/4" (M)	3/4" (F)	1.50 (38.00)		3.66 (93.00)

(●=CRN product, M=Male, F=Female)

MALE INLET X 3 FEMALE OUTLET

CRN Registered

PART DESCRIPTION					
MNPT x FNPT x 2 FNPT			DIMENSIONS: INCHES (MILLIMETERS)		
PART NUMBER	END CONNECTION (NPT)		"A"	"L"	"d" ORIFICE
	INLET	OUTLET			
GV-L-08M-08F ●	1/2" (M)	1/2" (F)	1.26 (32.00)	4.33 (110.00)	0.20 (5.00)
GV-L-12M-08F ●	3/4" (M)	1/2" (F)			

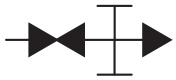
(●=CRN product, M=Male, F=Female)

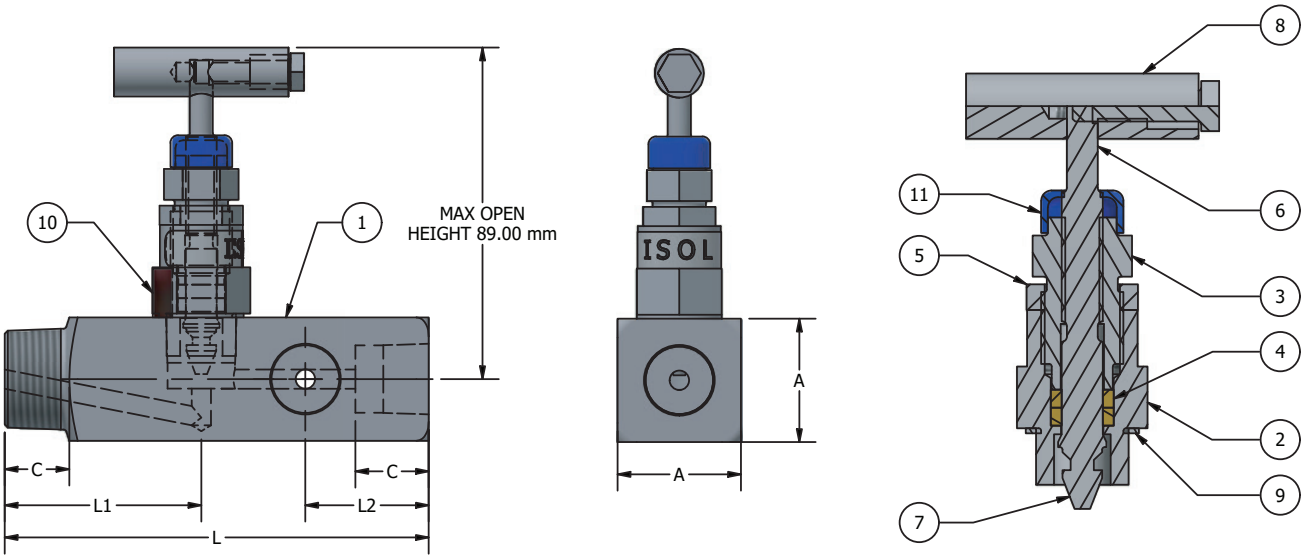
Male Inlet x 3 Female Outlet

Gauge Root Valve

Mac-Weld's Gauge Root Valve provides an efficient means of mounting gauges and any other static instrumentation.

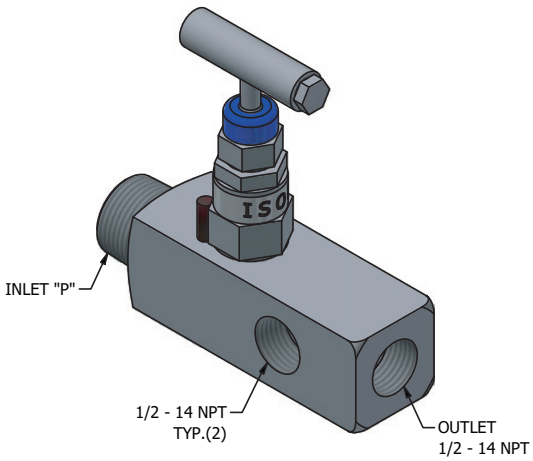
- 316/316L Stainless Steel Body, stem and trim
- 6000 psig @ 100°F (414 bar @ 38°C)
- PTFE Packing, with optional graphoil packing available
- Non-rotating trim provides bubble tight shut-off
- NACE certified





GV-L-XXM-XXF shown, for a complete list of CRN valves see page 7.

PART NO.	PART DESCRIPTION	MATERIAL	QTY.
1	BODY	316/316L SS NACE	1
2	GLAND BODY	316/316L SS NACE	1
3	GLAND RETAINER	304/304L SS	1
4	GLAND SEAL	P.T.F.E.	2
5	CHECK NUT	304/304L SS	1
6	SPINDLE	316/316L SS NACE	1
7	TRIM	316/316L SS NACE	1
8	HANDLE	304/304L SS	1
9	WASHER	316/316L SS NACE	1
10	LOCK PIN	316/316L SS	1
11	DUST CAP	PVC	1



Materials & Testing

Materials

Operating Pressure

The recommended operating pressure for our 316/316L, Hastelloy, Carbon Steel and Duples Stainless Steel valves is 6,000 psig (414 barg).

Select valves are also available with a 10,000 psig (689 barg) pressure rating.

Gland Packing Materials

The standard packing and flange o-ring material for all Mac-Weld valves is polytetrafluoroethylene (PTFE). The maximum operating temperature is 464°F (240°C). Graphoil packing is available for temperatures above 464° F (240°C).

Cleaning

Mac-Weld instrument valve and manifold components are cleaned during the manufacturing process. Upon final assembly and testing each valve manifold undergoes a final cleaning and drying.

Testing

Mac-Weld valve manifolds are factory tested in accordance to the following:

ASME B31.3 and ASME B31.1

Hydrostatic (Body)

Tested at room temperature
(Not exceeding 38°C/100°F)

9000 psig | 6000# rated valves
15000 psig | 10000# rated valves

Hydrostatic (Seat)

Tested at room temperature
(Not exceeding 38°C/100°F)

6600 psig | 6000# rated valves
11000 psig | 10000# rated valves

Pneumatic seat testing is done at 7kg/cm² for all valves, unless specified

MANIFOLD BODY

MATERIAL	BAR STOCK	FORGING	UNS
316/316L SS	A479 316	A182 F316	S31600
Carbon Steel	A105	A105	K03504
Duples Stainless Steel	A479 S31803/S32205	A182 F51	S31803/S32205
Hastelloy	B574 Gr.N10276	B462 Gr.N10276	N10276

FLANGE MOUNTING COMPONENTS

FLANGE O-RINGS	BOLTS
Polytetrafluoroethylene (PTFE)	304/304L SS
Graphoil	304/304L SS

Other O-ring & bolt materials available, see factory for details.

A Note on Safe Product Selection:

Customer to select suitable product type and size based on the application considering the overall system design.

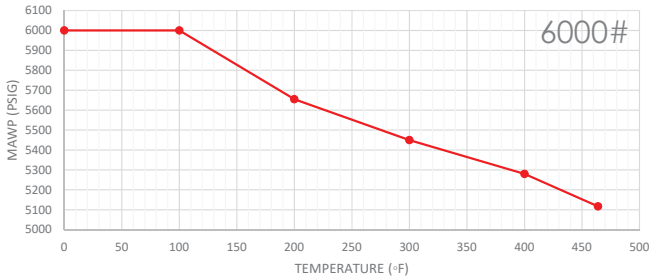
For safe, easy and trouble-free operation the customer must consider material compatibility, temperature and pressure ratings when selecting a product.

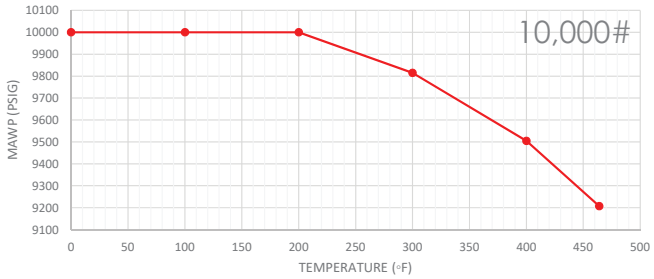
MAWP vs Temperature Charts

Comparing PTFE/Graphoil gasket ratings for A105 and 316SS

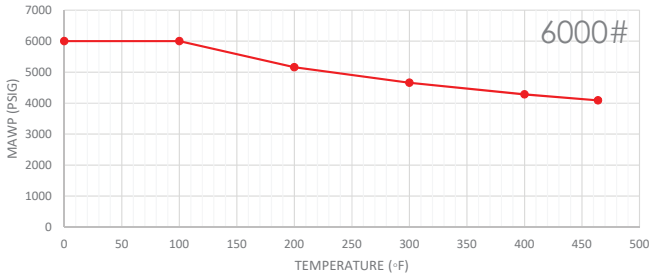
PTFE Gaskets

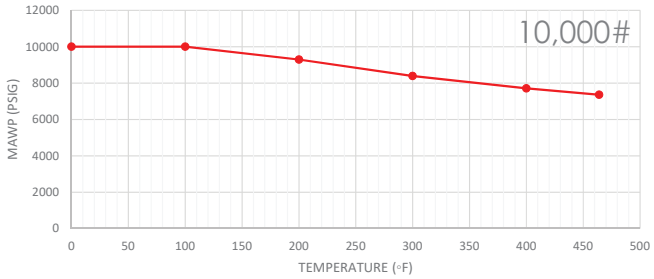
A105 with PTFE Gaskets





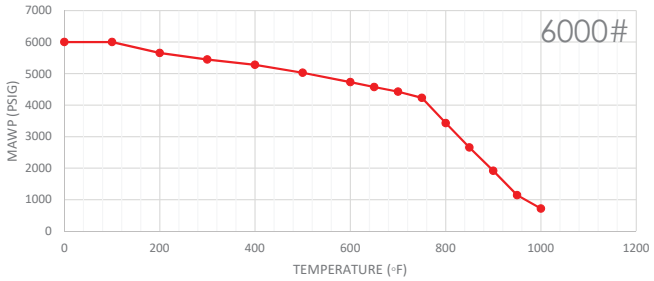
316SS with PTFE Gaskets

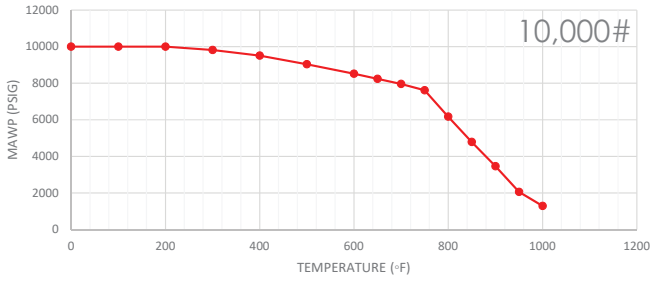




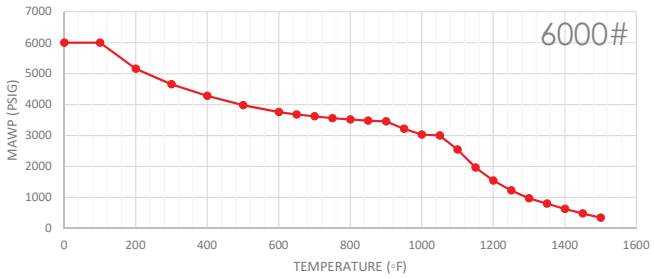
Graphoil Gaskets

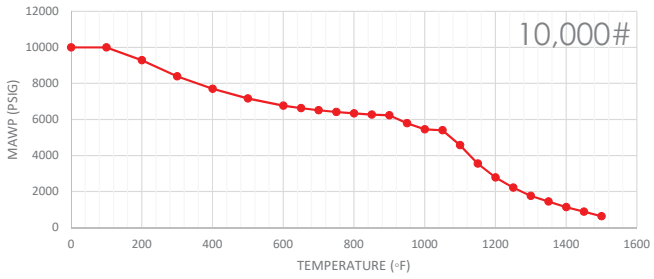
A105 with Graphoil Gaskets





316SS with Graphoil Gaskets





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