

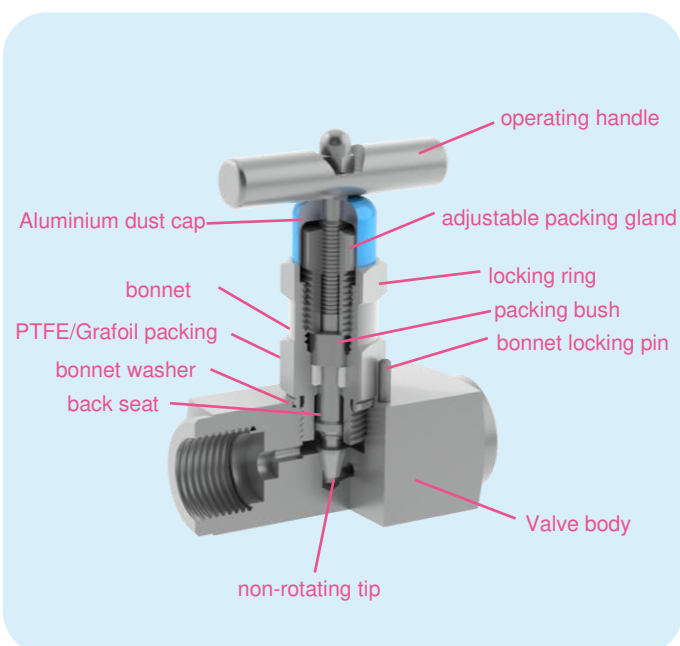
# Instrument needle valve for pressure instruments

## Design description

Badotherm instrument needle valves can be used for shutting off impulse lines, for isolation of pressure instruments or for vent and drain connection of flush flanges. All Badotherm valves are standard stainless steel AISI 316(L) and optional available in exotic materials, such as Alloy C276 and Alloy 400. This valve has a non-rotatable conical tip to ensure perfect alignment. Badotherm valves are manufactured within the European Union.

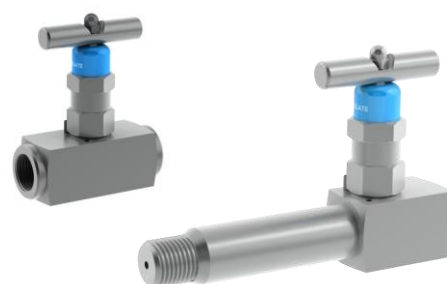
## Valve assembly

The valves spindle assembly is build up from various parts. All non-wetted parts are made from AISI316(L). All wetted parts are matching the body material. The bonnet is locked with a locking pin to the main valve body. The spindle has a safety back seat that prevents that the spindle can be removed accidentally.



## Operating handle bar

The operating handle is big enough to operate the valve under pressure. Optionally the anti-tamper construction is available. Valves that have been cycled for a period of time may have a higher initial actuation torque.



## Materials of Construction

Component	Material
Handle bar	AISI 316(L)
Handle locking nut	A2-70
Dust cap	Aluminium
Gland locking nut	AISI 316(L)
Gland	AISI 316(L)
Compression ring	AISI 316(L)
Packing set	PTFE or Graphite
Locking pin	AISI 316(L)
Lubricant	Silvermark / Krytox 8908 (oxygen service)
Purge plug ◀	Wetted parts (See selection table)
Bonnet body ◀	
Valve body ◀	
Main gasket ◀	
Spindle ◀	
Spindle tip ◀	

◀ are wetted parts

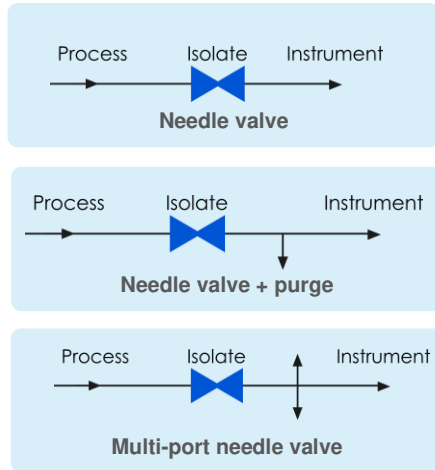
Other materials then mentioned in the selection table are possible. Contact Badotherm for more information and possibilities

## Bonnet packing

The valve bonnet contains the main packing set. This packing set is PTFE or Graphite material. PTFE Packing set can be used from -40 °C up to 260 °C where the Graphite can be used between -40 °C up to 538 °C. Packing adjustment may be required during the service life of valves.

## Flow

The valve has a flow coefficient  $C_v$  or 0.23. The flow direction is marked on the body. The flow symbol on the product is:



## Color coding

The spindle of the valve is color coded. The isolation valve is colored with a blue anodized aluminum dust cap marked "ISOLATION".

## Purging

The BDTV910 and BDTV911 can be equipped with a 1/4" NPT purge port. This is a separate selection at time of order. The purge port is standard blocked with a blind plug in same material as the wetted parts. Type 912 is having multi-ports that can be blocked with vent or plug

## Cleaning

The valves are all dried and cleaned after testing. For special service such as oxygen service the valves are assembled, tested and packed in a special area. The packing of the valve is in a double plastic sealed bag with a clear label and individual box. This option is only possible in combination with a PTFE packing in the bonnet.

## Marking

The marking on the valves is containing all relevant information needed for determining the function and material as mentioned in the MSS SP-25. The marking on the body contains the manufacturer, model, threads, traceability information, material designation, operating pressure, functional diagram and flow direction.

## Pressure test

All manifolds are tested in the factory according to the EN12266-1 (P10, P11, P12) and MSS SP-61. This means that the manifolds have undergone a shell test at  $\geq 1.5x$  the MWP and a seat test at  $\geq 1.1x$  the MWP, both at  $\pm 20^\circ\text{C}$ . More information on test media and process can be found in the general datasheet "pressure testing"

## Certification & Declaration of Conformity

A 3.1 Inspection certificate according to the EN 10204 is available on the body material.

A 2.1 conformity certificate according to EN 10204 can be supplied as a conformation for the pressure test.

Additional certification and testing can be provided on request, such as Positive Material Identification (PMI), NACE compliance certificate and many more.

## Standards used

### Design Standards

Standard	Description
ASME B16.34	valves - flanged, threaded and welding end
ASME B31.1	power piping
ASME B31.3	process piping
ASME B1.20.1	pipe threads, general purpose
MSS SP-99	valves for measuring instruments

### Test Standards

Standard	Description
EN12266-1	pressure tests, test procedures and acceptance criteria for industrial valves
MSS SP-61	pressure testing of valves
ISO 5208	pressure testing of metallic valves with leakage rate A

### Marking Standards

Standard	Description
MSS SP-25	Marking on valves

### Material Standards

Standard	Description
NACE MR0175/MR0103 ISO 15156	use in $\text{H}_2\text{S}$ -containing environments in oil and gas production
NORSOK M-630	specification for use in pipelines
ASTM standards	Material specific standards

### Certification Standards

Standard	Description
EN 10204	Inspection documents

## Pressure – Temperature limits

The manifolds are limited by pressure and temperature based on the materials used and the packing set materials.

### Standard execution

Packing material	Pressure vs temperature	
PTFE (High Pressure)	690 bar at 38 °C	10.000 psi at 100 °F
PTFE	420 bar at 38 °C	3000 psi at 100 °F
	276 bar at 204 °C	4000 psi at 400 °F
Grafoil	420 bar at 38 °C	6000 psi at 100 °F
	209 bar at 538 °C	3000 psi at 1000 °F

### ASME B31.1 execution

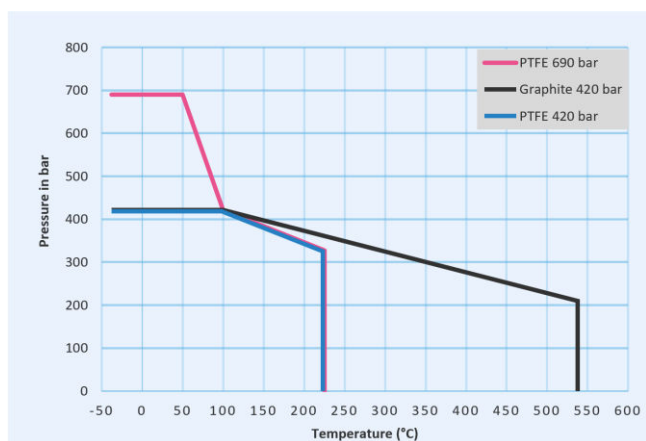
Body material	Pressure vs temperature	
AISI 316/316L	413 bar at 38 °C	6000 psi at 100 °F
	209 bar at 538 °C	3000 psi at 1000 °F
Alloy 400	345 bar at 38 °C	5000 psi at 100 °F
	173 bar at 475 °C	2500 psi at 885 °F
Alloy 276	430 bar at 38 °C	6200 psi at 100 °F
	237 bar at 425 °C	3500 psi at 800 °F

Note: Pressure rating based on cl 2500 ASME B16.34 and with grafoil packing

### Cleaned for oxygen purpose execution

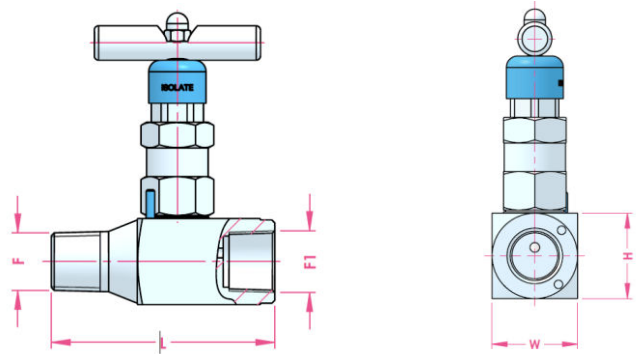
Packing material	Pressure vs temperature	
PTFE	420 at 60 °C	6000 psi at 140 °F
	90 bar at 200 °C	1305 psi at 392 °F

Low temperature limits are -40 °C for both PTFE as graphite gasket



## Threaded instrument needle valve

Specially designed for mounting to pressure instruments and flush flanges  
Model Type 910

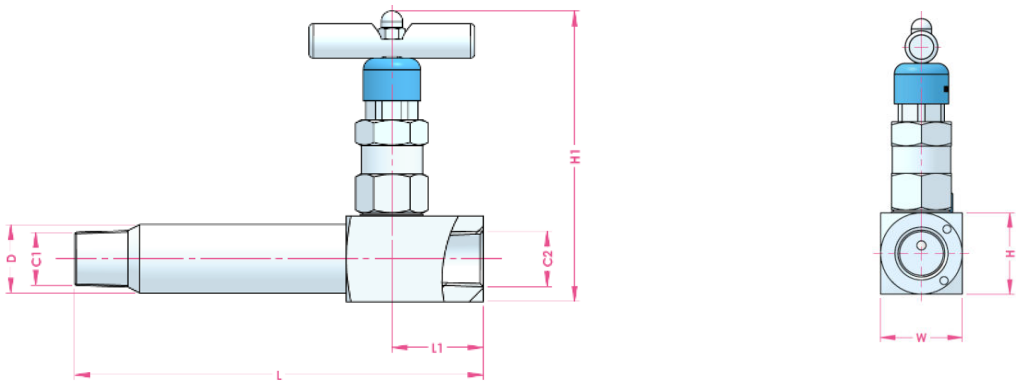


F (process)	F1 (outlet)	L	H	W	H1 min	H1 max
1/4" male threads	1/2" female threads	78.0	30.0	30.0	98.0	102.0
1/2" male threads						
1/2" butt weld end						
3/4" butt weld end						
1/4" socket weld end						
1/2" socket weld end						
3/4" socket weld end						

All dimensions in mm.  
L dimensions can vary based on the thread sizes.

## Threaded valve with extended process connection

Specially designed for mounting to flush rings  
Model Type 911



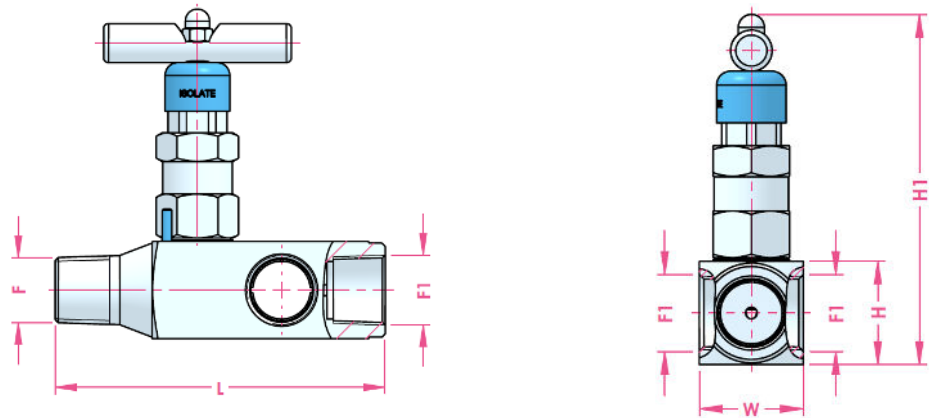
C1	C2	D	L	H	H1 max	W
1/4" male threads	1/2" female threads	Ø18.0	143.0	30.0	102.0	30.0
1/2" male threads		Ø24.0				
1/2" butt weld end		Ø22.0				
3/4" butt weld end		Ø28.0				
1/4" socket weld end		Ø22.0				
1/2" socket weld end		Ø21.3				
3/4" socket weld end		Ø26.7				

All dimensions in mm.  
L dimensions can vary based on the thread sizes.

## Threaded valve with multi-port outlet

Model Type 912

Multi-port can be supplied with 1x vent and 1x blind plug (not fitted)

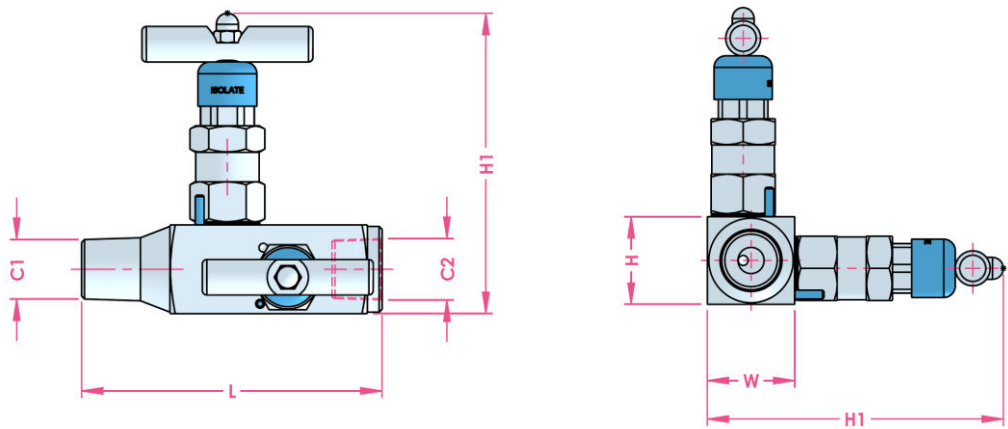


F	F1	L	H	H1 max	W
1/4" male threads	1/2" female threads	72.0	30.0	102.0	30.0
1/2" male threads					
1/2" butt weld end					
3/4" butt weld end					
1/4" socket weld end					
1/2" socket weld end					
3/4" socket weld end					

All dimensions in mm.  
L dimensions can vary based on the thread sizes.

## Threaded valve with double isolate valve

Model Type 927



C1 & C2	W	H	L	H1 max
< 3/4" thread	30.0	30.0	165	102
≥ 3/4" thread	40.0	40.0	165	112

All dimensions in mm.  
L dimensions can vary based on the thread sizes.

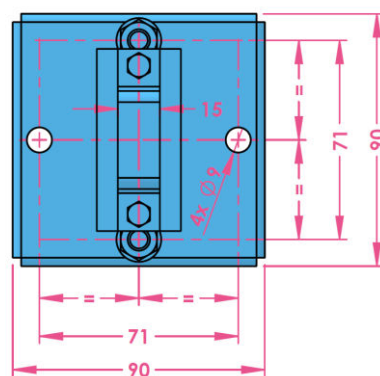
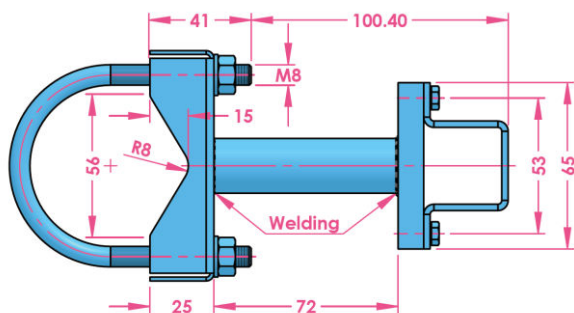
## Mounting options

Typical assembly of the type 910 and type 911 is welded or fitted to a flush ring or flange or to block a pressure instrument from the main process.



## Bracket sets

Most manifold and valves have the possibility to be mounted to a bracket in order to fix it to a 2" pipe when required. The brackets are supplied with U-bolts, washers, hexagon nuts, and screws and washers to mount the valve to the bracket. The size and quantity are depending on the type of bracket.



## Product code instrument needle valve

Code						
Example code:	<b>BDT</b>	N12M	N12F	C	S316	P
<b>Type</b>						
Instrument needle valve	V910					
Extended instrument needle valve	V911					
Multiport needle valve	V912					
Double block needle valve	M927					
<b>Inlet (process connection)</b>						
G 1/4 A (male) EN 837-1	G14M					
G 1/2 A (male) EN 837-1	G12M					
G 1/4 A (male) ISO 1179-1	G49M					
G 1/2 A (male) ISO 1179-1	G29M					
1/4" NPT (male)	N14M					
1/2" NPT (male) ◀	N12M					
1/4" NPT (female)	N14F					
1/2" NPT (female)	N12F					
1/2" Butt Weld	B12M					
3/4" Butt Weld	B34M					
1/4" Socket Weld male	S14M					
1/2" Socket Weld male	S12M					
3/4" Socket Weld male	S34M					
<b>Outlet (instrument connection)</b>						
G 1/4 (female) EN 837-1	G14F					
G 1/2 (female) EN 837-1	G12F					
1/4" NPT (female)	N14F					
1/2" NPT (female) ◀	N12F					
3/8" tube Compression fitting	CI38					
1/2" tube Compression fitting	CI12					
<b>Purge/Test port</b>						
Without ◀	C					
With NPT plugged connection*1	P					
<b>Material</b>						
AISI 316(L) ◀	S316					
Alloy C276	A276					
AISI 321	S321					
Alloy 400	A400					
Alloy 625	A625					
Alloy 825	A825					
254 SMO	S254					
Duplex 2205	2205					
Super Duplex 2507	2507					
Titanium Grade 2	TI02					
<b>Bonnet packing set</b>						
PTFE ◀	P					
Grafoil	G					

\*1) BDTV912 is supplied with 1x 1/2" blind plug and 1x 1/2 vent plug not fitted.

### Table 2: Options

Option (start options with X_)	code
Bracket set distance mount	_BSD
Valve high pressure 689 bar (10,000 psi)	_HPV
Cleaned for Oxygen use *1	_CFO
ASME B31.1 for power piping (Grafoil gasket only)	_AB31
NACE ISO 15156 (MR 01 75)	_N75
3.1 material certificate	_IC31
2.1 Pressure leak test certificate standard pressure	_LTPS
2.2 Positive Material Identification	_PMI

\*1: Only in combination with PTFE gasket (Code P)

\*2: Not possible for all materials (see NACE explanation)

## Change log

Date	Change
6-11-2020	Additional information on standards and regulations.
	BDTV912 options added vent and blind plug.
5-7-2021	Added bracket to the option table
30-6-2022	Minor textual changes in sizing tables.
16-3-2023	Added ¼" SW connection to dimension table

Holland – Romania – India – Thailand – Dubai – USA

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