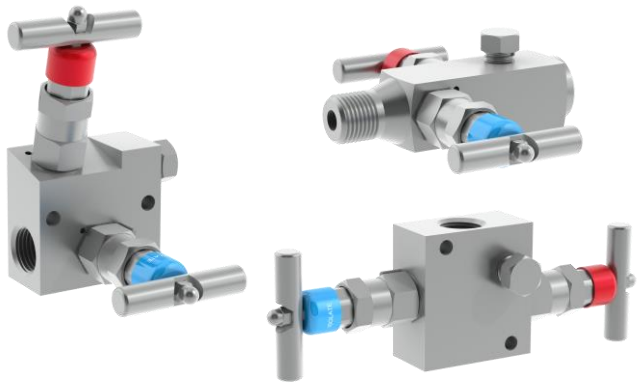
Block and bleed and double block and bleed manifolds

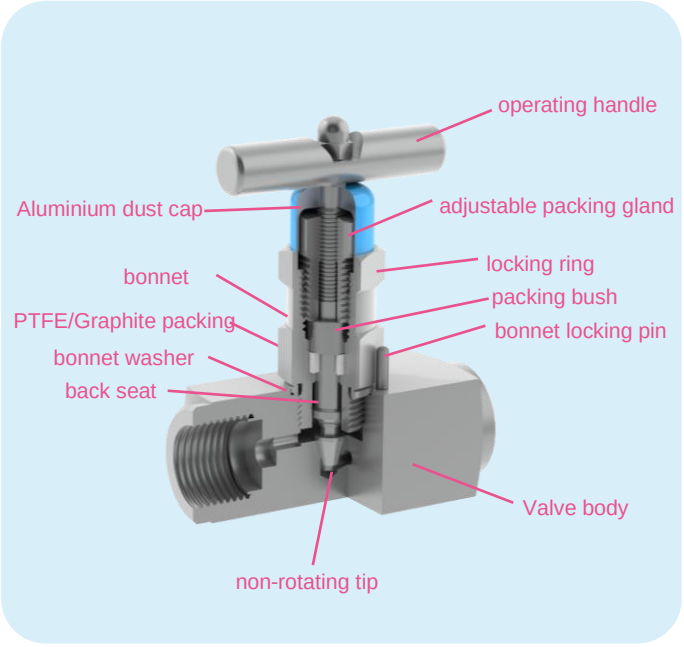


Design description

Badotherm two valve block and bleed manifolds can be used for isolation, bleeding, calibration and testing of pressure instruments. All different configurations are possible to have the best access to the operating valves. All Badotherm manifolds are standard stainless steel and optional available in exotic materials, such as Alloy C276 and Alloy 400. This manifold has a non-rotatable conical tip to ensure perfect alignment. Badotherm manifolds 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 accidently.



Operating handle bar

The operating handle is big enough to operate the manifold 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◄	
Manifold body◄	
Main gasket◄	
Spindle◄	
Spindle tip◄	

◄ are wetted parts

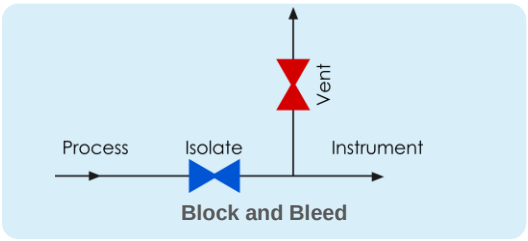
Other materials then mentioned in the selection table are possible. Contact Badotherm for more information and possibilities

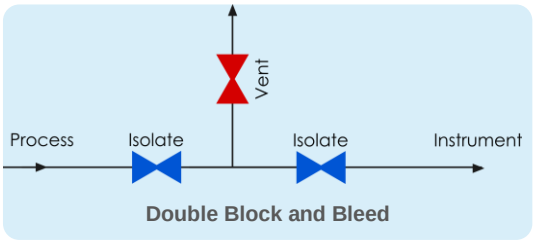
Bonnet packing

The valve bonnet contains the main packing set. This packing set is PFTE or Graphite material. PTFE Packing set can be used from -40 °Cup 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 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". The vent valve is colored with a red anodized aluminum dust cap marked "VENT".

Venting

All block and bleed valves are equipped with a ¼" NPT vent port. The vent port is standard blocked with a vent plug in same material as the wetted parts. The vent ports can be used for external draining or the connection of an external pressure source for testing and calibration of the pressure instrument.

Cleaning

The manifolds are all dried and cleaned after testing. For special service such as oxygen service the manifolds are assembled, tested and packed in a special area. The packing of the manifold 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 manifolds 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 the EN12266-1 (P10, P11, P12) and MSS SP-61. This means that the manifolds have undergone a shell test at ≥1.5x the MWP and a seat test at ≥1.1x the MWP, both at +/- 20°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 the EN 10204 is available on the body material.

A 2.1 conformity certificate according EN 10204 can be supplied a 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
IEC 61518	Mating dimensions between differential pressure (type) measuring instruments
ISO 228	pipe threads, general purpose

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 H_2S-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
Graphite	420 bar at 38 °C	6000 psi at 100 °F
	209 bar at 538 °C	3000 psi at 1000 °F

ASME B31.1 execution

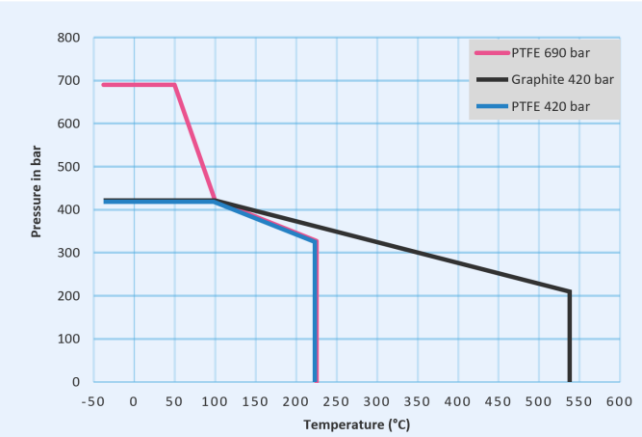
Body material	Pressure vs temperature	
AISI 316/316L	420 bar at 38 °C	6100 psi at 100 °F
	209 bar at 538 °C	3000 psi at 1000 °F
Alloy 400	345 bar at 38 °C	5000 psi at 100 °F
	173 bar at 475 °C	2500 psi at 885 °F
Alloy 276	430 bar at 38 °C	6100 psi at 100 °F
	237 bar at 425 °C	3500 psi at 800 °F

Note: Pressure rating based on cl 2500 ASME B16.34

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

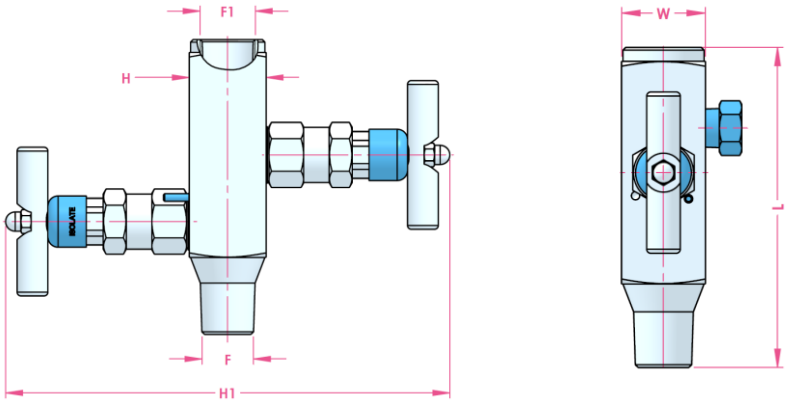
Low temperature limits are -40 °C for both PTFE as graphite gasket



Block & bleed valves

Threaded valve with isolate and vent valve

Direct mount to pressure instrument.
Can be mounted with distance bracket
Model Type 924

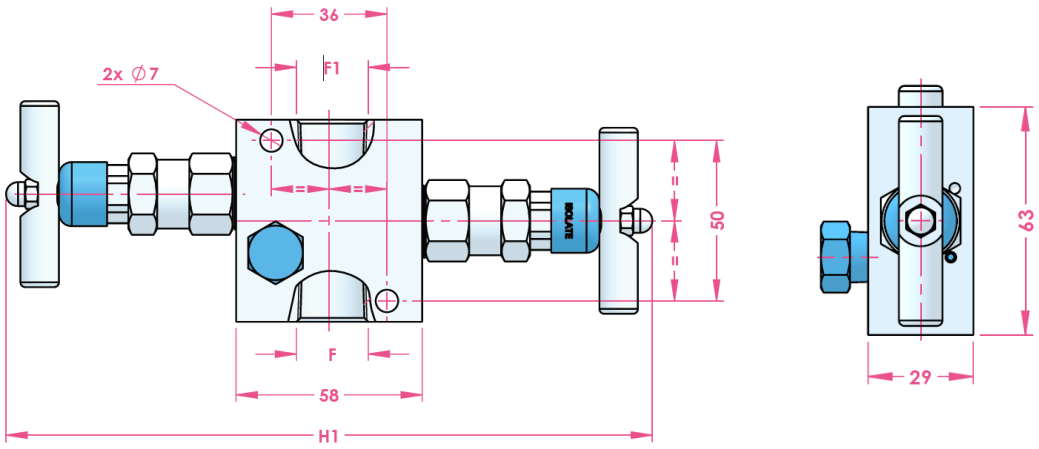


F & F1	W	H	L	H1 min	H1 max
< 3/4" thread	30.0	30.0	165.0	98.0	172.0
≥ 3/4" thread	40.0	40.0		108.0	182.0

All sizes are in mm
F and F1 thread sizes are possible all sizes from ¼" to ¾".
L sizes based on Male x Female configuration.

Threaded valve with isolate and vent valve

Instrument connection and the process connection is ½" NPT female thread
Valves are mounted in line
Model Type 923

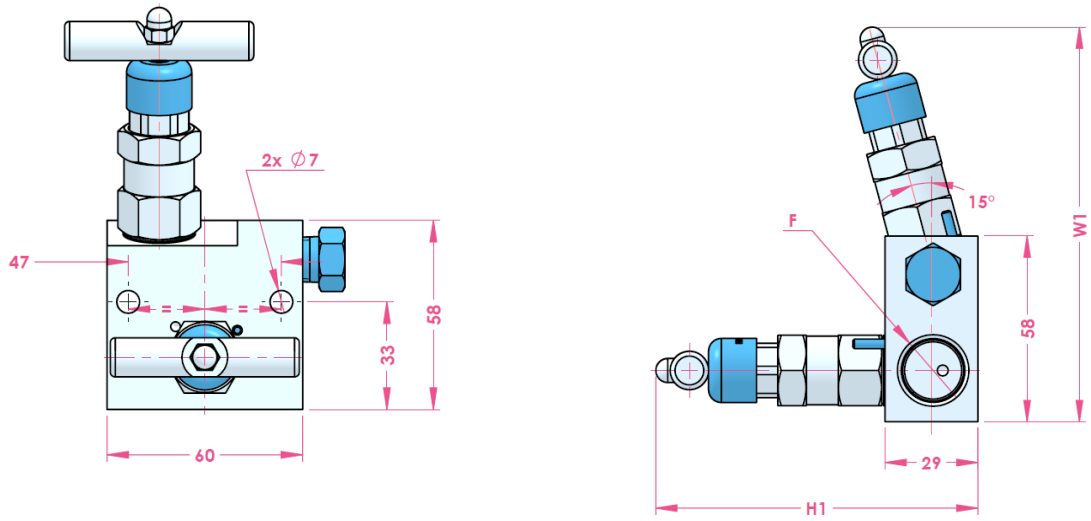


F (process)	F1 (Instrument)	H1 (open)
½" NPT female		203.0

All dimensions in mm

Threaded valve with isolate and vent valve

Both process as instrument connection are ½" NPT female thread
Valve position is angled where the vent valve is 15° angle positioned for better access (e.g. wall mounting)
Model Type 921

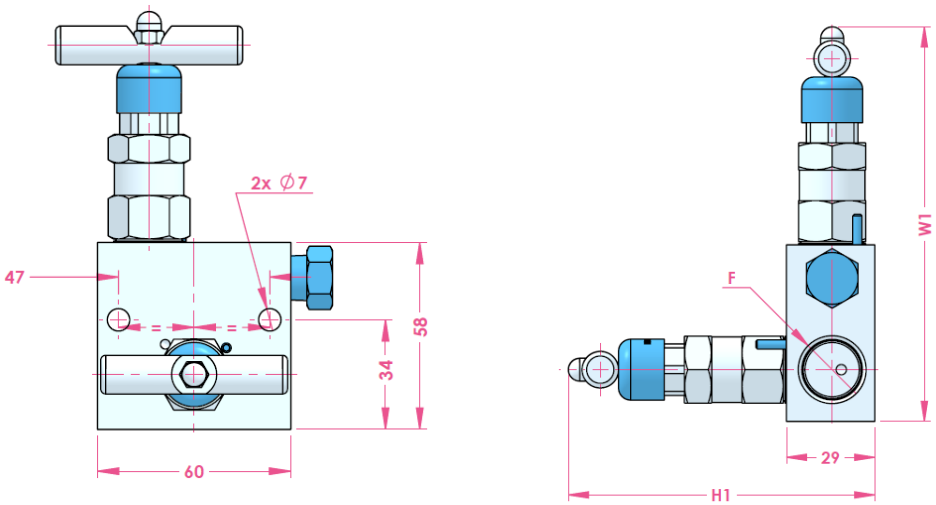


F	H1 (open)	W1 (open)
½" NPT female	101.0	125.0

All dimensions in mm

Threaded valve with isolate and vent valve

Both process as instrument connection are ½" NPT female thread
90° valve position
Model Type 922

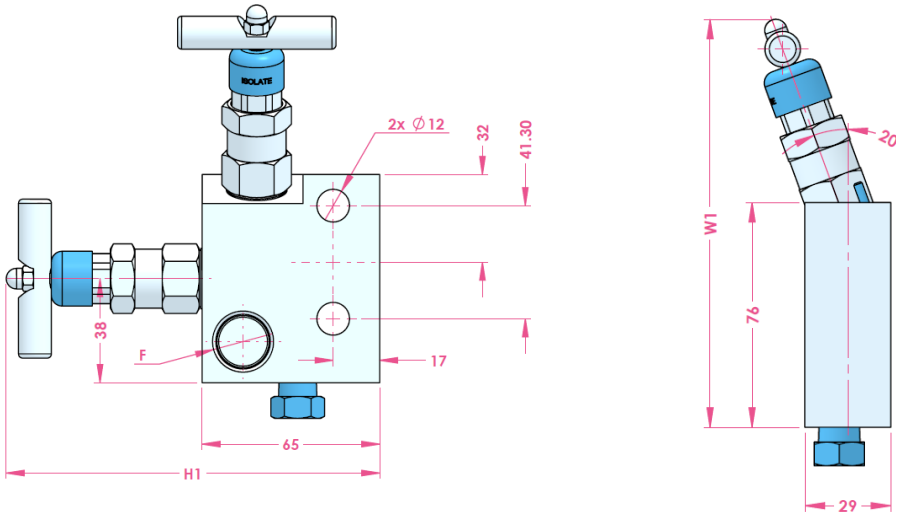


F (process)	F1 (Instrument)	H1 (open)	W1 (open)
½" NPT female		101.0	129.0

All dimensions in mm

Threaded valve with isolate and vent valve

Instrument connection is IEC 61518-B and the process connection is ½" NPT female thread
Model Type 925
*Suitable mounting kits with code _M**15**



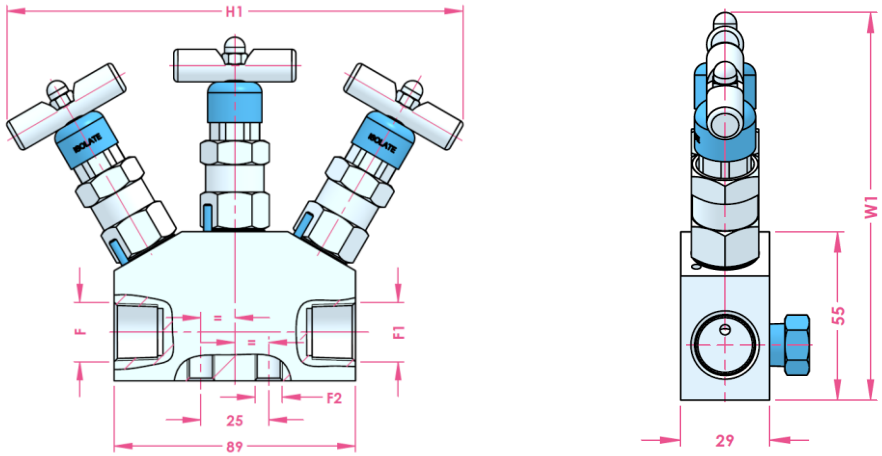
F (process)	H1 (open)	W1 (open)
½" NPT female	138.0	144.0

All dimensions in mm

Double block & bleed valve

Threaded valve with double isolate and one vent valve

Model Type 937

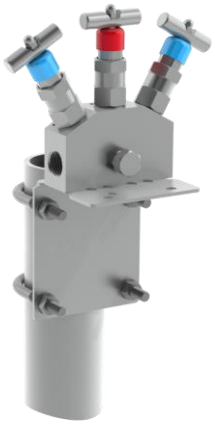


F (process)	F1 (Instrument)	H1 (open)	W1 (open)
½" NPT female		167.0	124.0

All dimensions in mm

Mounting options

The block and bleed options are common used on pressure instruments. They can be either direct or remote mount.

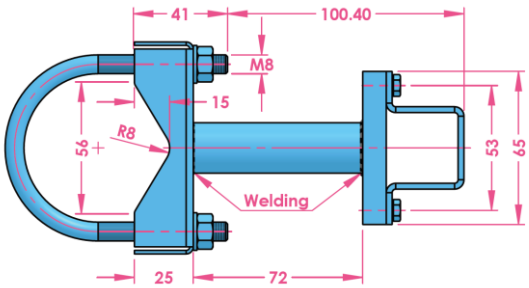


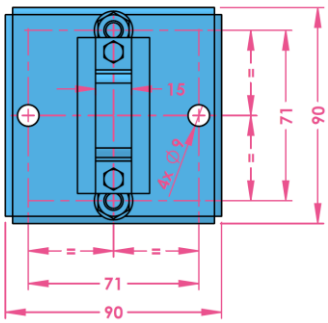
Bracket sets

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.

Distance bracket

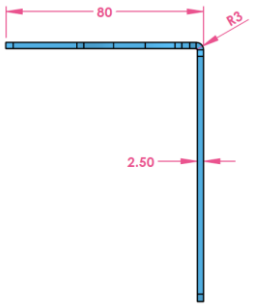
For model Type 924 only

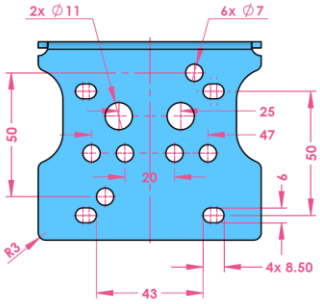




90° bracket

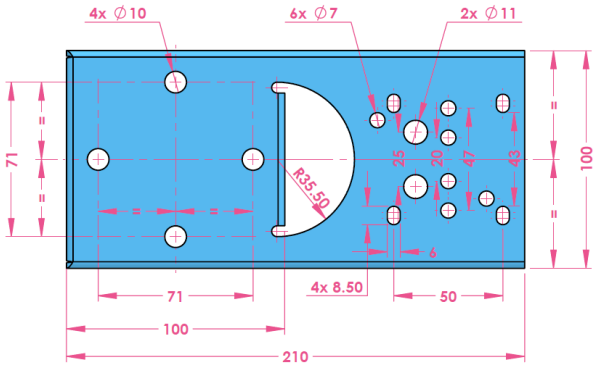
For all models except Type 924

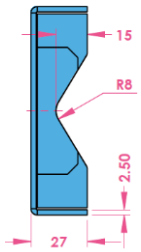




Straight bracket

For all models except Type 924





Product code Block and Bleed model BDTM924

Code						
Example code:	**BDTM924**	N12M	N12F	C	S316	P
Type						
Block and Bleed square model	M924					
Inlet (process connection)						
G 1/4 A (male) EN837-1	G14M					
G 1/2 A (male) EN837-1	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					
1/2" Socket Weld male	S12M					
3/4" Socket Weld male	S34M					
Outlet (Instrument connection)						
G 1/4 A (female) EN 837-1	G14F					
G 1/2 A (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					
Purge/Test port						
With ¼" NPT plugged connection ◄	P					
Material						
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					
Bonnet packing set						
PTFE ◄	P					
Grafoil	G					

Product code Block and Bleed & Double Block and Bleed

Code							
Example code:		**BDTM921**	N12F	N12F	P	S316	P
Type							
Block and Bleed flat model	BDTM923						
Block and Bleed L-shaped with 15° vent valve	BDTM921						
Block and Bleed L-shaped	BDTM922						
Block and Bleed direct mount IEC 61518-B	BDTM925						
Double Block and Bleed	BDTM937						
Inlet							
1/2" NPT (female) ◄	N12F						
Outlet							
1/2" NPT (female) ◄	N12F						
IEC 61518-B*1	I61B						
Vent port							
With ¼" NPT plugged connection ◄	P						
Material							
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						
Packing set							
PTFE ◄	P						
Grafoil	G						

*1: Only for the BDTM925

Table 1: Options

Option (start options with X_)	code
Bracket set distance mount	_BSD
Bracket set 90° mount	_BSA
Bracket set straight mount	_BSS
ASME B31.1 for power piping (Grafoil gasket only)	_AB31
Cleaned for Oxygen use *1	_CFO
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
Bracket set 90°	_BR9
Bracket set straight	_BRS
Bracket set distance	_BRD

*1: Only in combination with PTFE gasket (Code P)
*2: Not possible for all materials (see NACE explanation)

Table 2: Mounting options

Option (start options with X_)	Manifold type	code
Hex cap screw set 7/16-20 UNF, bolt length 1.5" Carbon Steel, Graphite seal ring	925	_MCS15G
Hex cap screw set 7/16-20 UNF, bolt length 1.5" Carbon Steel, PTFE seal ring		_MCS15P
Hex cap screw set 7/16-20 UNF, bolt length 1.5" 316 ASTM A193 B8M cl 2, Graphite seal ring		_MSS15G
Hex cap screw set 7/16-20 UNF, bolt length 1.5" 316 ASTM A193 B8M cl 2, PTFE seal ring		_MSS15P

Note: A set contains 2 screws, 2 gaskets, and a bag of anti-seizure paste .

Change log

Date	Change
6-11-2020	Additional information on standards and regulations.
15-2-2021	Table text 2” changed to 1.5”.