

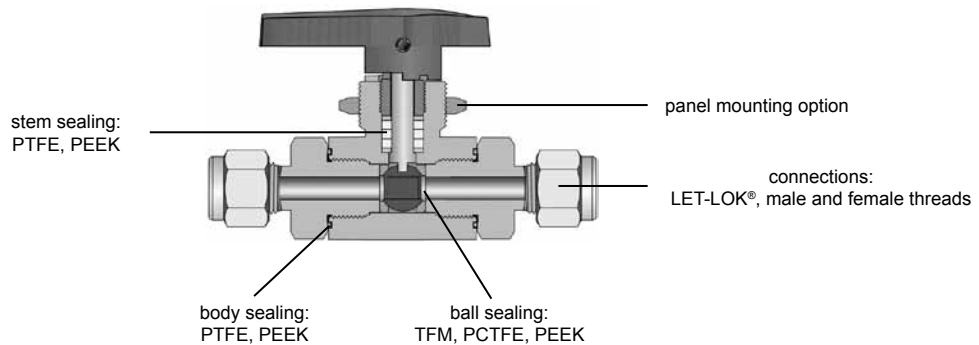
# INSTRUMENTATION - valves

Top grade, precision valves of different types (ball, needle, check valves and many other) used in control and measuring equipment for chemical, petrochemical, pharmaceutical and power industry, nuclear power plants and process engineering. Available in many different versions depending on working temperature, pressure and connection size. Made of AISI 316 stainless steel as a standard.

## Ball valves

Ball valves are used to fully open or close the flow path. Should not be used in the intermediate position.

**The construction of ball valve (on the example of H-6800 series valve):**



**Types of main seals (ball) used in ball valves:**

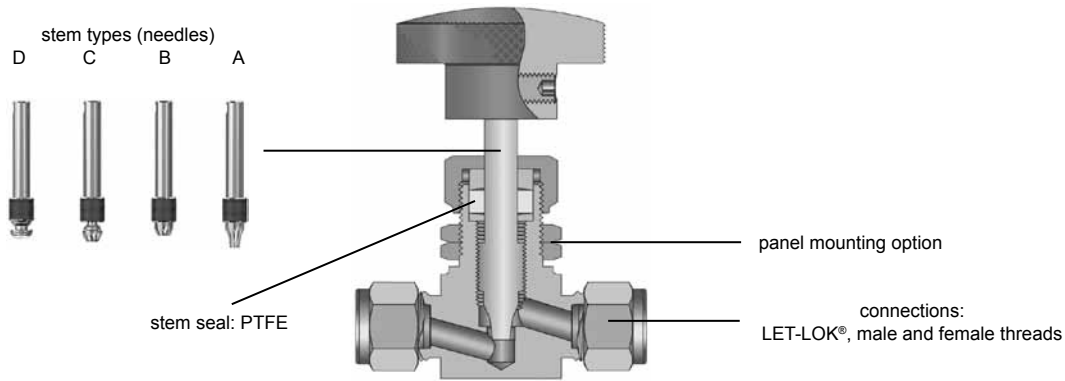
material	valve type	working temperature range	characteristics and seals applications
TFM®1600	H-6800	from -34°C up to +210°C	Modified PTFE with the same chemical resistance, but with better pressure characteristics. Compared to standard PTFE, it undergoes less deformation under pressure load and has greater ability to regain its original shape once the pressure load is removed.
	H-500	from -28°C up to +204°C	
	H-700	from -34°C up to +204°C	
PCTFE	H-6800	from -40°C up to +140°C	Modified PTFE with the same chemical resistance. Recommended for low temperature applications e.g. nitrogen or oxygen.
PEEK	H-6800	from -34°C up to +260°C	Very good resistance to chemicals and hydrolysis, very high mechanical strength and dimensional stability. Retains rigidity and shape in its working temperature range.
	H-500	from -28°C up to +232°C	
PFA	H-800	from -54°C up to -149°C	Modified PTFE with the same chemical and temperature resistance, but with better mechanical properties.
PTFE	H-500	from -28°C up to +186°C	Very good resistance to chemicals, aging, hydrolysis and weather conditions. Low coefficient of friction. Perfect sealing material for general purpose application.
SS PTFE	H-500	from -28°C up to +232°C	PTFE filled with stainless steel powder. It has better temperature and pressures properties, lower deformation factor with the same chemical resistance as standard PTFE.
UPE	H-500	from -28°C up to +122°C	Very good chemical resistance, low coefficient of friction. It is used mainly in the tobacco industry.

# INSTRUMENTATION - valves

## Needle valves

Needle valves (depending on the type of a valve and stem) may be used to fully open and close the flow path, to regulate the flow rate or to dose the media.

The construction of needle valve (on the example of H-300 series valve):



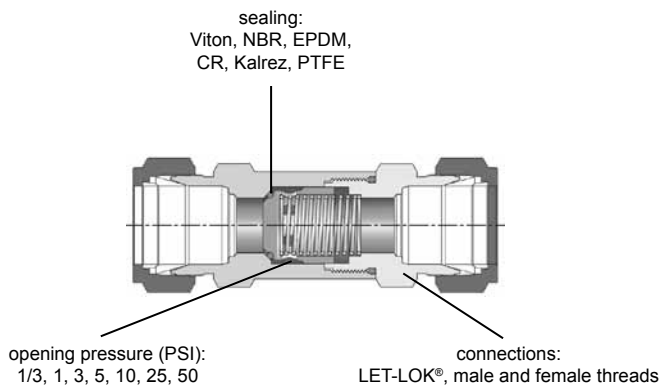
Four types of stems used in H-300 series needle valves:

- A - regulating stem,
- B - standard V-stem type, close-open valve position,
- C - with non-rotating stem, reduces friction, recommended for high pressure gases and large number of cycles,
- D - with non-rotating stem with soft removable seal, assures lower torque when tightening, recommended for high pressure gases of high purity.

## Check, release and excess flow valves

Check valves open flow in one direction at the set difference between pressure values. Release valves (overflow) open the flow when pressure in the system rises above the set value. Excess flow valves close the flow if pressure drops behind the valve, when e.g. installation bursts. All these valves are equipped with springs calibrated for a defined pressure value.

The construction of check valve (on the example of H-400 series valve):



## INSTRUMENTATION - valves



### Ball valve H-6800 type

**Body material:** AISI 316  
**Ball material:** AISI 316  
**Ball seal:** TFM®1600 (PTFE, PEEK - option)  
**Working temp.:** TFM®1600 - up to +210°C  
                           PTFE - up to +140°C  
                           PEEK - up to +260°C  
**Working press.:** TFM®1600 - up to 206 bar  
                           PTFE, PEEK - up to 410 bar  
**Connection:** LET-LOK® type connectors,  
                           NPT, BSPT, BSP threads

High pressure two-way ball valve designed to be assembled in an installation or for panel mounting. Lever made of Nylon (black as standard, blue, red, green and yellow and metal lever available on request). ISLT version equipped with a padlock used to lock the position of the lever. Available also as a two-way 90 version or three-way version (bottom inlet). Pneumatic control available on request. All valves are pressure tested before shipment.

code	connection size	flow diameter [mm]	seal	length [mm]	body material
LET-LOK® metric connectors					
HM-H6800-SS-LM-03-PSS	3 mm	2.4	TFM®1600	78.6	AISI 316
HM-H6800-SS-LM-06-PSS	6 mm	4.8		83.6	
HM-H6800-SS-LM-08-PSS	8 mm	4.8		84.8	
HM-H6800-SS-LM-10-PSS	10 mm	4.8		86.4	
HM-H6800-SS-LM-12-PSS	12 mm	10.3		102.5	
HM-H6800-SS-LM-18-PSS	18 mm	10.3		102.5	
LET-LOK® imperial connectors					
HM-H6800-SS-LC-01-PSS	1/16"	1.3	TFM®1600	70.2	AISI 316
HM-H6800-SS-LC-02-PSS	1/8"	2.4		78.6	
HM-H6800-SS-LC-04-PSS	1/4"	4.8		83.6	
HM-H6800-SS-LC-06-PSS	3/8"	4.8		86.3	
HM-H6800-SS-LC-08-PSS	1/2"	10.3		102.5	
HM-H6800-SS-LC-12-PSS	3/4"	10.3		102.5	
NPT female thread					
HM-H6810-SS-N-02-PSS	1/8"	4.8	TFM®1600	63.6	AISI 316
HM-H6810-SS-N-04-PSS	1/4"	4.8		63.6	
HM-H6810-SS-N-06-PSS	3/8"	4.8		69.6	
HM-H6810-SS-N-08-PSS	1/2"	10.3		87.4	
HM-H6810-SS-N-12-PSS	3/4"	10.3		91	
BSPT female thread					
HM-H6810-SS-R-02-PSS	1/8"	4.8	TFM®1600	63.6	AISI 316
HM-H6810-SS-R-04-PSS	1/4"	4.8		63.6	
HM-H6810-SS-R-06-PSS	3/8"	4.8		69.6	
HM-H6810-SS-R-08-PSS	1/2"	10.3		87.4	
HM-H6810-SS-R-12-PSS	3/4"	10.3		91	
NPT male thread					
HM-H6880-SS-N-02-PSS	1/8"	4.8	TFM®1600	67.6	AISI 316
HM-H6880-SS-N-04-PSS	1/4"	4.8		76.6	
HM-H6880-SS-N-06-PSS	3/8"	4.8		76.6	
HM-H6880-SS-N-08-PSS	1/2"	10.3		92.4	
HM-H6880-SS-N-12-PSS	3/4"	10.3		94.4	

# INSTRUMENTATION - valves



## Ball valve H-800 type

**Body material:** AISI 316  
**Ball material:** AISI 316  
**Ball seal:** PTFE  
**Working temp.:** From -54°C up to +150°C  
**Working press.:** Up to 206 bar  
**Connection:** LET-LOK® type connectors, NPT, BSPT, BSP threads

Highest quality, middle pressure, one piece, two-way ball valve designed to be mounted in an installation or for panel mounting. It has virtually no dead space which is one distinctive but not the only advantage. The valve is very compact, available in three body size versions: „S”, „M” and „L”. A lever made of Nylon (black as standard; blue, red, green, yellow and metal lever available on request). ISLT version is equipped with a padlock used to lock the position of the lever. Available also as a two-way angle version or three-way version (bottom inlet) designed for diverting only. Pneumatic control available on request. All valves are pressure tested before shipment.

code	connection size	flow diameter [mm]	seal	length [mm]	body material
LET-LOK® metric connectors					
HM-H800S-SS-LM-03	3 mm	2.4	PTFE	51.1	AISI 316
HM-H800S-SS-LM-06	6 mm	3.2		56.1	
HM-H800M-SS-LM-06	6 mm	4.8		60.7	
HM-H800M-SS-LM-08	8 mm	4.8		62.5	
HM-H800L-SS-LM-10	10 mm	7.1		78.0	
HM-H800L-SS-LM-12	12 mm	7.1		83.1	
LET-LOK® imperial connectors					
HM-H800S-SS-LC-01	1/16"	1.3	PTFE	42.7	AISI 316
HM-H800S-SS-LC-02	1/8"	2.4		51.1	
HM-H800S-SS-LC-04	1/4"	3.2		56.1	
HM-H800M-SS-LC-04	1/4"	4.8		60.7	
HM-H800M-SS-LC-06	3/8"	4.8		65.5	
HM-H800L-SS-LC-06	3/8"	7.1		77.5	
HM-H800L-SS-LC-08	1/2"	7.1		83.1	
NPT female thread					
HM-H810S-SS-N-02	1/8"	3.2	PTFE	41.4	AISI 316
HM-H810M-SS-N-02	1/8"	4.8		50.8	
HM-H810M-SS-N-04	1/4"	4.8		52.3	
HM-H810L-SS-N-04	1/4"	7.1		63.5	
HM-H810L-SS-N-06	3/8"	7.1		63.5	
BSP female thread					
HM-H810S-SS-G-02	1/8"	3.2	PTFE	41.4	AISI 316
HM-H810M-SS-G-02	1/8"	4.8		50.8	
HM-H810M-SS-G-04	1/4"	4.8		52.3	
HM-H810L-SS-G-04	1/4"	7.1		63.5	
HM-H810L-SS-G-06	3/8"	7.1		63.5	

## INSTRUMENTATION - valves



### Ball valve H-700 type

**Body material:** AISI 316  
**Ball material:** AISI 316  
**Ball seal:** TFM®1600  
**Working temp.:** Up to +204°C  
**Working press.:** Up to 135 bar  
**Connection:** LET-LOK® type connectors, NPT, BSPT, BSP thread

Middle pressure two-way ball valve for general purpose application. Features compact construction, relatively high flow rate, low torque and long service life. Standard lever with position blocking system. Available with butterfly lever as well. All valves are pressure tested before shipment.

code	connection size	flow diameter [mm]	seal	length [mm]	body material
LET-LOK® metric connectors					
HM-H700-SS-LM-06-TLD	6 mm	5	TFM®1600	90	AISI 316
HM-H700-SS-LM-08-TLD	8 mm	7		90	
HM-H700-SS-LM-10-TLD	10 mm	9.2		95.3	
HM-H700-SS-LM-12-TLD	12 mm	12.5		113.4	
HM-H700-SS-LM-25-TLD	25 mm	15		129.6	
LET-LOK® imperial connectors					
HM-H700-SS-LC-04-TLD	1/4"	5	TFM®1600	90	AISI 316
HM-H700-SS-LC-06-TLD	3/8"	7		90	
HM-H700-SS-LC-08-TLD	1/2"	9.2		95.3	
HM-H700-SS-LC-12-TLD	3/4"	12.5		113.4	
HM-H700-SS-LC-16-TLD	1"	15		129.6	
NPT female thread					
HM-H710-SS-N-04-TLD	1/4"	5	TFM®1600	50	AISI 316
HM-H710-SS-N-06-TLD	3/8"	7		60	
HM-H710-SS-N-08-TLD	1/2"	9		75	
NPT male thread					
HM-H780-SS-N-04-TLD	1/4"	5	TFM®1600	50.3	AISI 316
HM-H780-SS-N-06-TLD	3/8"	7		62.2	
HM-H780-SS-N-08-TLD	1/2"	9.2		74.9	
NPT male thread / LET-LOK® imperial connectors					
HM-H795-SS-LCN-04-04-TLD	1/4"	5	TFM®1600	70.15	AISI 316
HM-H795-SS-LCN-06-06-TLD	3/8"	7		82.3	
HM-H795-SS-LCN-08-08-TLD	1/2"	9.2		85.1	

#### Other ball valves

<p><b>H-500</b></p>	<p>Middle pressure 2-way 3-piece ball valve for general purpose application, made of AISI 316 steel. Sizes from 1/4" up to 1" with LET-LOK®, threaded connectors and welding ends. Working pressure up to 204 bar. Working temperature up to +232°C.</p>
---------------------	--

## INSTRUMENTATION - valves



### Check valve H-400 type

**Body material:** AISI 316 (brass - option)  
**Seal:** O-ring Viton (NBR, EPDM, CR, Kalrez, PTFE - option)  
**Working temp.:** From -23°C up to +190°C (Viton)  
**Working press.:** Up to 206 bar  
**Connection:** LET-LOK® connectors, NPT, BSPT, BSP thread

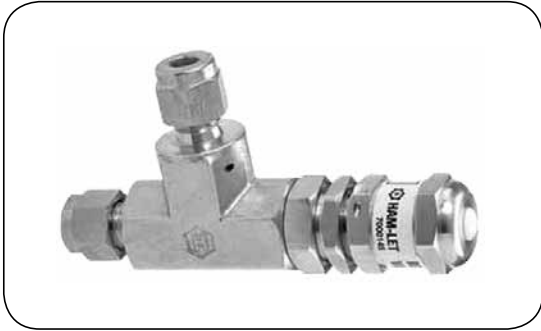
Check valve designed for instrumentation applications. Closed as a rule, the valve opens when the pressure difference between inlet and outlet is higher than the valve opening pressure (depending on a spring applied). The valves are set with one of the opening pressure values: 1/3 PSI (0.02 bar), 1 PSI (0.06 bar), 10 PSI (0.68 bar), 25 PSI (1.7 bar) or 50 PSI (3.4 bar). H-400 series comprises 5 groups of valves: basic H-400, high pressure H-400HP (up to 410 bar), one-piece H-400OP, H-400OPA and H-400A with adjustable opening pressure. All valves are pressure tested before shipment.

code	connection size	nominal opening pressure	seal	length [mm]	body material
LET-LOK® metric connections					
HM-H400-SS-LM-06-0.33	6 mm	1/3 PSI (0.02 bar)	Viton	60.5	AISI 316
HM-H400-SS-LM-10-0.33	10 mm			64	
HM-H400-SS-LM-12-0.33	12 mm			77	
LET-LOK® imperial connections					
HM-H400-SS-LC-02-0.33	1/8"	1/3 PSI (0.02 bar)	Viton	56	AISI 316
HM-H400-SS-LC-04-0.33	1/4"			60.5	
HM-H400-SS-LC-06-0.33	3/8"			63.5	
HM-H400-SS-LC-08-0.33	1/2"			77	
HM-H400-SS-LC-12-0.33	3/4"			88.5	
HM-H400-SS-LC-16-0.33	1"			120	
NPT female thread					
HM-H410-SS-N-02-0.33	1/8"	1/3 PSI (0.02 bar)	Viton	44	AISI 316
HM-H410-SS-N-04-0.33	1/4"			52.5	
HM-H410-SS-N-06-0.33	3/8"			51.5	
HM-H410-SS-N-08-0.33	1/2"			76.5	
HM-H410-SS-N-12-0.33	3/4"			86	
HM-H410-SS-N-16-0.33	1"			107	

#### Other check valves

<b>H-911</b> 	High pressure emergency excess flow valve. Sizes from 1/8" to 1/2". With LET-LOK® connectors and threaded connections. Working pressure up to 410 bar. Working temperature up to +204°C.
------------------	--

## INSTRUMENTATION - valves



### Relief valve H-900, H-900HP type

**Body material:** AISI 316 steel  
**Seal:** O-ring (Viton, NBR, EPDM, CR)  
**Working temp.:** From -40°C up to +148°C (Viton)  
**Working press.:** Up to 414 bar  
**Connection:** LET-LOK® connectors, NPT, BSPT, BSP thread

Top quality, high pressure relief valve for general purpose application, available in one size, 1/4. There are two version of the valve, one is for low pressure (working pressure: 15.5 bar) and the other for high pressure HP (working pressure 414 bar) in 8 pressure range options for fully open mode. The valve is marked with the colour of a spring and label on the valve in different way for each pressure range option (from A to H). The colour-coding helps to identify the valve's opening pressure range.

code	connection size	max. working pressure [bar]	opening pressure range [bar]	seal	body material
LET-LOK® metric connections					
HM-900-SS-LM-06-V	6 mm	15.5	0.7 ÷ 15.5	Viton	AISI 316
HM-900HP-SS-LM-06-AV*	6 mm	414	3.4 ÷ 24		
LET-LOK® imperial connections					
HM-900-SS-LC-04-V	1/4"	15.5	0.7 ÷ 15.5	Viton	AISI 316
HM-900HP-SS-LC-06-AV*	1/4"	414	3.4 ÷ 24		
male / female NPT thread					
HM-985-SS-N-04-V	1/4"	15.5	0.7 ÷ 15.5	Viton	AISI 316
HM-985HP-SS-N-06-AV*	1/4"	414	3.4 ÷ 24		

\* - for different opening pressure, change A for one of the letters from B to H, according to the table below:

pressure [bar]	spring marking	spring colour
3.4 ÷ 24	A	white
24 ÷ 51.5	B	blue
51.5 ÷ 103	C	gold
103 ÷ 155	D	turquoise
155 ÷ 206	E	green
206 ÷ 275	F	red
275 ÷ 344	G	silver
344 ÷ 413	H	black

# INSTRUMENTATION - valves



## Needle valve H-99 type

**Body material:** AISI 316  
**Stem material:** AISI 316  
**Valve seal:** Metal / metal (AISI 316)  
**Throttle seal:** PTFE, PEEK, GRAFOIL  
**Working temp.:** Up to +204°C (PTFE)  
                           Up to +260°C (PEEK)  
                           Up to +648°C (GRAFOIL)  
**Working press.:** Up to 690 bar  
**Connection:** LET-LOK® connectors, NPT, BSPT,  
                           BSP threads, welding ends

High pressure needle valve designed to be assembled in an installation or for panel mounting. Used mainly in heavy duty conditions, for taking samples, shutting off the flow and testing equipment. As a standard equipped with V-type stem (close-open valve position). Versions with a regulating or non-rotating stem are also available. All valves are pressure tested before shipment.

code	connection size	flow diameter [mm]	throttle seal	length [mm]
NPT female thread				
HM-H99-SS-FNV-02	1/8"	5	PTFE	58
HM-H99-SS-FNV-04	1/4"	5		58
HM-H99-SS-FNV-06	3/8"	5		58
HM-H99-SS-FNV-08	1/2"	5		65
HM-H99-SS-FNV-12	3/4"	6		70
HM-H99-SS-FNV-16	1"	8		80

code	connection size	flow diameter [mm]	throttle seal	length [mm]
LET-LOK® metric connections				
HM-H99HP-SS-LMV-06	6 mm	5	PTFE	72.8
HM-H99HP-SS-LMV-08	8 mm	5		73
HM-H99HP-SS-LMV-10	10 mm	5		73.2
HM-H99HP-SS-LMV-12	12 mm	5		78.2
LET-LOK® imperial connections				
HM-H99HP-SS-LCV-04	1/4"	5	PTFE	72.7
HM-H99HP-SS-LCV-06	3/8"	5		72.7
HM-H99HP-SS-LCV-08	1/2"	5		78.3
HM-H99HP-SS-LCV-12	3/4"	6		85.3

Relation between valve working pressure and connection:

connection	pressure [bar]
threaded	690
LET-LOK® 6 mm and 1/4"	690
LET-LOK® 8 mm and 10 mm	517
LET-LOK® 12 mm, 3/8" and 1/2"	448
LET-LOK® 3/4"	390
LET-LOK® 25 mm	324
LET-LOK® 1"	276

The lower pressure rate of the valves with LET-LOK® connection is related to the maximum permissible working pressure of the particular connection size.



## INSTRUMENTATION - valves



### Needle valve H-300 type

**Body material:** AISI 316  
**Stem material:** AISI 316  
**Valve seal:** Metal / metal (AISI 316)  
**Throttle seal:** PTFE  
**Working temp.:** Up to +230°C  
**Working press.:** Up to 345 bar  
**Connection:** LET-LOK® connectors, NPT, BSPT, BSP threads

High pressure needle valve designed to be assembled in an installation or for panel mounting. Features compact construction and relatively high flow rate. Two versions: straight and 90 elbow. As a standard equipped with V-type stem (close-open valve position). Versions with a regulating stem or non-rotating stem with soft, non-rotating seal are available on request. All valves are pressure tested before shipment.

code	connection size	flow diameter [mm]	stem	length [mm]
LET-LOK® metric connections				
HM-H300-SS-LM-03-VRS	3 mm	2	V-stem	50.8
HM-H300-SS-LM-06-VRS	6 mm	4.4		58.8
HM-H300-SS-LM-08-VRS	8 mm	4.4		58.8
HM-H300-SS-LM-10-VRS	10 mm	6.4		66.4
HM-H300-SS-LM-12-VRS	12 mm	6.4		76.2
LET-LOK® imperial connections				
HM-H300-SS-LC-02-VRS	1/8"	2	V-stem	50.8
HM-H300-SS-LC-04-VRS	1/4"	4.4		58.8
HM-H300-SS-LC-06-VRS	3/8"	6.4		66
HM-H300-SS-LC-08-VRS	1/2"	6.4		71.6
HM-H300-SS-LC-12-VRS	3/4"	9.5		97
NPT female thread				
HM-H310-SS-N-02-VRS	1/8"	4.4	V-stem	41.2
HM-H310-SS-N-04-VRS	1/4"	6.4		54.0
HM-H310-SS-N-06-VRS	3/8"	9.5		76.2
HM-H310-SS-N-08-VRS	1/2"	9.5		76.2
NPT male thread				
HM-H380-SS-N-02-VRS	1/8"	4.4	V-stem	50.8
HM-H380-SS-N-04-VRS	1/4"	4.4		50.8
HM-H380-SS-N-06-VRS	3/8"	6.4		57
HM-H380-SS-N-08-VRS	1/2"	9.5		76.2

#### Other needle valves

<b>H-1200</b> 	Low pressure toggle valve made of AISI 316 steel or brass. Full flow opens with 90° lift of the lever. When the lever is pushed down, the valve is closed by the spring. 1/8" and 1/4" sizes with LET-LOK® connectors and threaded connections. Working pressure 21 bar. Working temperature up to +93°C.
-------------------	---

## INSTRUMENTATION - valves



### Metering valve H-1300, HF-1300, HXF-1300 type

**Body material:** AISI 316 (brass - option)  
**Seal:** Metal / metal AISI 316 (brass - option)  
**Working temp.:** Up to +204°  
**Working press.:** Up to 68,9 bar (H i HF)  
                           Up to 138 bar (HXF)  
**Connection:** LET-LOK® connectors,  
                           NPT, BSPT, BSP threads

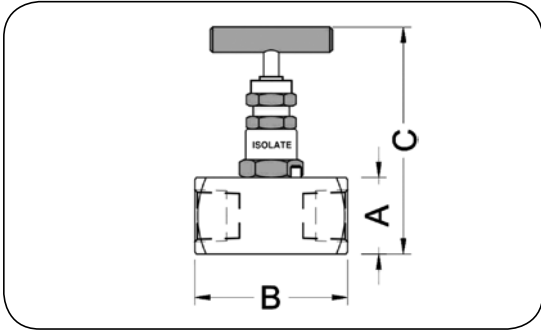
Highest quality, middle pressure metering valve for general purpose application, also for panel mounting. Three valve versions are available depending on required working pressure, flow rate and accuracy. The valve is supplied as straight or angle. Lever made of aluminium is black as standard, whereas blue, red, green and yellow, metal lever or a level with a vernier handle, which facilitates valve opening control are available on request.

code	connection size	flow diameter [mm]	stem angle [°]	length [mm]
LET-LOK® metric connections				
HM-HF1300-SS-LM-03	3 mm	1.4	3	51.3
HM-HXF1300-SS-LM-03	3 mm	0.8	1	48
HM-H1300-SS-LM-06	6 mm	3.3	5	59.5
HM-HF1300-SS-LM-06	6 mm	1.4	3	55.9
HM-HXF1300-SS-LM-06	6 mm	0.8	1	51.9
LET-LOK® imperial connections				
HM-HF1300-SS-LC-02	1/8"	1.4	3	51.3
HM-HXF1300-SS-LC-02	1/8"	0.8	1	48
HM-H1300-SS-LC-04	1/4"	3.3	5	59.5
HM-HF1300-SS-LC-04	1/4"	1.4	3	55.9
HM-HXF1300-SS-LC-04	1/4"	0.8	1	51.9
HM-H1300-SS-LC-06	3/8"	3.3	5	62.4
NPT male thread				
HM-HF1310-SS-N-02	1/8"	1.4	3	38.1
HM-H1310-SS-N-04	1/4"	3.3	5	50.8
HM-HF1310-SS-N-04	1/4"	1.4	3	49.8
HM-HXF1310-SS-N-04	1/4"	0.8	1	48

**NOTE!!!**

A unique, patent version of a metering valve can be also supplied. It is additionally equipped with a ball to allow complete flow shut-off. Contact Sales Department of TUBES INTERNATIONAL®.

## INSTRUMENTATION - valves



### Needle valve SM-1000 type

<b>Body material:</b>	AISI 316L
<b>Stem material:</b>	AISI 316L
<b>Valve seal:</b>	Metal / metal (AISI 316L)
<b>Throttle seal:</b>	PTFE (Graphoil - option)
<b>Working temp.:</b>	PTFE - from -73°C up to +230°C
	Graphoil - from -54°C up to +510°C
<b>Working press.:</b>	Up to 690 bar
<b>Connection:</b>	NPT or BSP thread

High pressure needle valve. As a standard equipped with self-centring, non-rotating stem (needle) extending service life of metal sealing surface and ensuring leak tightness at large number of cycles. In working temperature above +150°C (above +100°C for Graphoil graphite sealing) the maximum working pressure of 690 bar must be reduced in consultation with TUBES INTERNATIONAL® Sales or Technical Department. All valves are pressure tested and marked before shipment.

code	thread size [inch]	DN [mm]	dimensions [mm]			weight [kg]
			A	B	C	
SM-1000A11AA	1/4	4	30	60	89	0.48
SM-1000B11AA	3/8	4	30	60	89	0.48
SM-1000C11AA	1/2	4	30	60	89	0.48
SM-1000D11AA	3/4	4	40	65	99	0.70
SM-1000E11AA	1	6.5	50	75	109	1.10

Also available:

- other types of needle valves of SM-1000 series (valves with drainage, with male thread at the inlet, with three outlets and 90° valves).
- valve blocks (2, 3, 4 and 5 valves), based on the SM-1000 valve series, with female thread, male thread and flanged,
- SM-1000 needle valves and valve blocks made of other materials (Monel, Hastelloy, Inconel, titanium, Duplex steel and many other).

