



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14429**

This is to certify that the
Needle Valves

with type designation(s)
M-series

Manufactured by
Hy-Lok Corporation (Kangseo Factory)
Pusan, Republic of Korea

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application
May be used in the following systems: Air, water based hydraulic fluids

Temperature range:	Material dependent. See certificate
Max. working press.:	Material dependent. See certificate
Sizes:	Orifice: 3.2 to 6.4 mm

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2013-04-12**

DNV local station: **Pusan**

Approval Engineer: **Mohsen Mohebbi**

for **Det Norske Veritas AS**

.....
for **Marianne Spæren Marveng**
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.
If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

Instrument manifold, M-series:

Remote mounting				
Description	Part No.	Orifice	Material	
2-Valves Block	M2V**8N	3.2 mm	SS316/Carbon Steel/Alloy 400	
2-Valves Vertical	M2VV**8N	3.2 mm		
3-Valves Block	M3V**8N	6.4 mm		
5-Valves Block	M5V**8N	6.4 mm		
Direct mounting				
Description	Part No.	Orifice	Material	
2-Valves Single Flange	M2V1F**8N	3.2 mm	SS316/Carbon Steel/Alloy 400	
2-Valves Single Block Flange	M2VDM**8N	6.4 mm		
3-Valves Single Flange	M3V1F**8N	6.4 mm		
3-Valves Dual flange	M3V2F**8N	6.4 mm		
3-Valves Single Block Flange	M3VDM**8N	5 mm		
3-Valves Dual Block Flange	M3V2DM**	5 mm		
5-Valves Single Flange	M5V1F**8N	6.4 mm		
5-Valves Dual Flange	M5V2F**8N	6.4 mm		
5-Valves Single Block Flange	M5VDM**8N	6.4 mm		
5-Valves Single Block Flange "A" style	M5VDMA**8N	5 mm		
Gauge/Root Valve				
Description	Part No.	Orifice	Material	
Gauge Valves	GV**MF8N	6.4 mm	SS316/Carbon Steel/Alloy 400	
	GV**MF12N8N	6.4 mm		
	GV**MF8N12N	6.4 mm		
	GV**F8N	6.4 mm		
Root Valves	GRV**MF8N	6.4 mm		
	GRV**MF12N8N	6.4 mm		
	GRV**MF8N12N	6.4 mm		
	GRV**F8N	6.4 mm		
Gauge 2-Valves	GV2**-MF8N	3.2 mm		

Packing material: PTFE/Grafoil

Application/Limitation

Packing Material	Body Material	Temperature Range	Max working Pressure @ 100°F (37.8°C)
PTFE	Stainless Steel	-65°F~450°F (-54°C~232°C)	6000 psig (41369 KPa)
	Carbon Steel	-20°F~350°F (-29°C~176°C)	6000 psig (41369 KPa)
	Alloy 400	-65°F~450°F (-54°C~232°C)	5000 psig (34474 KPa)
Grafoil	Stainless Steel	-65°F~1200°F (-54°C~648°C)	6000 psig (41369 KPa)
	Carbon Steel	-20°F~350°F (-29°C~176°C)	6000 psig (41369 KPa)
	Alloy 400	-65°F~500°F (-54°C~260°C)	5000 psig (34474 KPa)

Maximum working pressures at elevated temperatures:

Temperature rating	Work pressure by classes, psig			
	Material	Stainless steel 316 ASTM A479 TYPE 316	Carbon Steel ASTM A105 -	Alloy 400 ASTM B164 UNS N04400
	ANSI Group	2.2	1.1	3.4
Min. Temp. to 100°F (37.8°C)		6,000	6,000	5,000
to 200°F (93.3°C)		5,160	5,470	4,400
to 300°F (148.9°C)		4,660	5,319	4,120
to 400°F (204.4°C)		4,280	5,134	3,980
to 500°F (260.0°C)		3,980	4,843	3,960
to 1200°F (648.9°C)		1,175	-	-

The valve housing of each valve shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure.

Holding time: 2 min
Acceptance criteria: No leakage is permitted.

The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least be equal to the design pressure. The test shall be performed with closed valve with the other end open to atmosphere. The pressure shall be applied independently on each side of the closed disc.

Holding time: 5 min
Acceptable leakage range: Drop tight

The material used for valve bodies shall be delivered with test reports according to DNV Rules for Ships Pt. 4 Ch. 6 Sec. 2 Table A2.

Each valve is to be delivered with a manufacturer's product certificate.

Type Approval documentation

Catalogue No. H120MV dated July 2006

Design plan 120MV-DP, Rev. 3 dated 2008-03-14

Design specification data sheet 120MV-DS, Rev. 3 dated 2008-03-14

Design calculation sheet 120MV-DR, Rev. 3 dated 2008-03-14

Calculation verify sheet 120MV-CVS, Rev. 3 dated 2008-03-14

Drawings: 97I12A01, 97I26B01, 94J26B02, 94J26B01, 2000L15E01, 2000L22E01, 2000L15E02, 97H09E04, 97G18E03, 97H09E03, 2000E28B01, 98E12B01, 98E30B20, 97C13B20, 2004A08G15, 2000L22E01, 2002A22E01, 2000L22E01, 2002A22E01, 97H22A04, 2003G21G01, 97H14A01, 97I22B01, 2000K06C05, 97G09A01, 2008F06E01, 2000F14D07, 98K02E01.

Test reports: TR-DNV-HYLOKMOV-081017 and TR-DNV-HYLOKGRV-081017 dated 2008.10.17

Marking of product

For traceability to this type approval, each valve is to be marked with:

- Manufacturer's name or trademark:
- Type designation
- Size
- Max. design pressure(s) or pressure class

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE