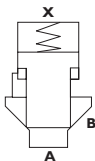
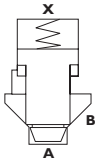


**High Flow Cartridge Valves – 2/2 Way**  
Series NG16 – NG100



# Table of Contents

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This catalogue is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has to check the suitability of the products described herein. In case of doubt please contact Moog Hydrolux.

## General Description

Cartridge valves, also known as 2/2-way valves or logic valves, conform to DIN 24342 and ISO 7368 standards. They have two operational ports A and B. The flow path between these two connections is controlled hydraulically by a pilot pressure applied to X.

Depending on the control input, cartridge valves can be used as:

- Directional Control Valves  
(start, stop, directional control)
- Flow Control Valves

The preferred mode of mounting is the manifold block, which can be equipped with several valves depending on the hydraulic circuit for the specific application. Each valve is connected to each other in the manifold block.

The Moog Hydrolux product line contains valves of nominal bores 16, 25, 32, 40, 50, 63, 80 and 100 as per DIN 24342,

for flows up to 12,000 lpm. Moreover, Moog Hydrolux offers cover plates and pilot valves for a wide variety of functions.

In addition to this, our product offering also contains cartridge housings for a great number of applications for subplate, pipe and flange mounting.

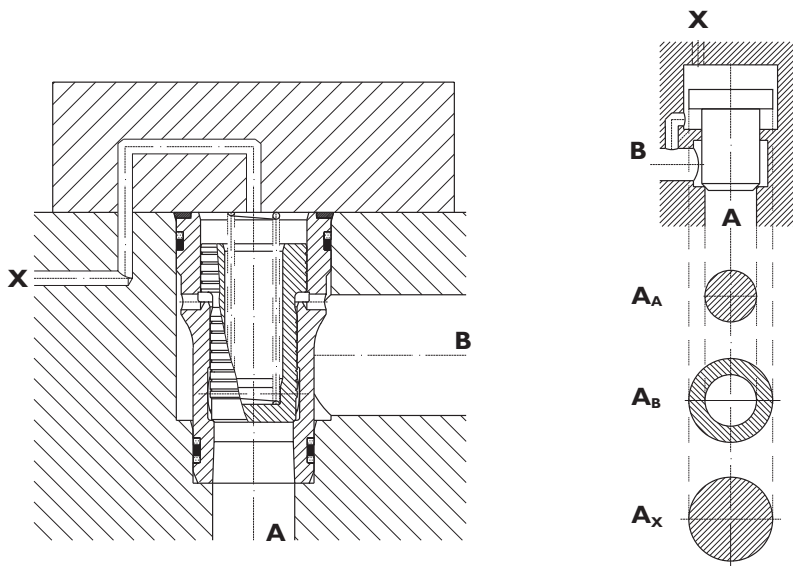
## Operating Principle

Cartridge valves have two working connections A and B, where the main flow is hydraulically operated by a controlling pressure applied to the connection X. The basic cartridge valve includes a valve poppet and sleeve which is normally held in the closed position by a spring. The poppet valve has a seated cone, giving a leakage free (dependent upon pilot control) condition across the two ports. The closing spring is retained by the control cover which encloses the cartridge valve and provides pilot connections from the X port. Various types of pilot control can be mounted either to the control cover or to an adjacent manifold face to provide direct control of the cartridge valve.

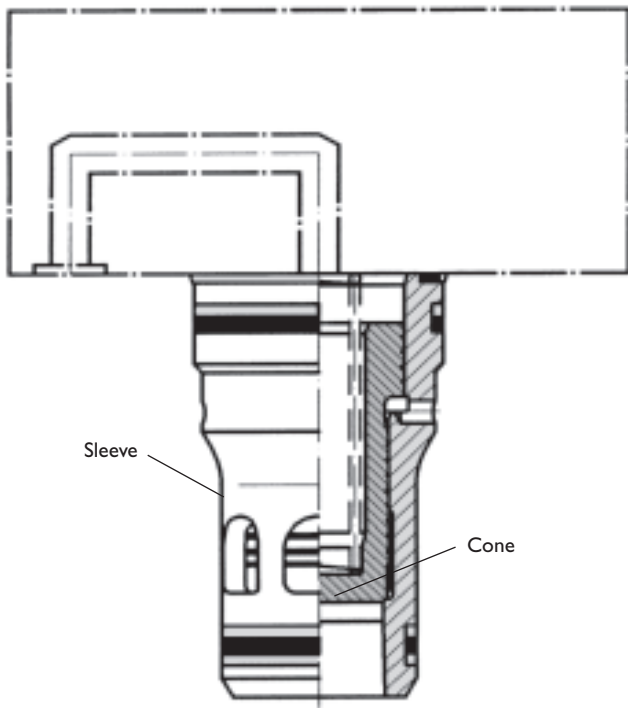
The effective areas of the basic element are  $A_A$ ,  $A_B$  and  $A_X$ . Pilot oil can be taken from port A, B or both A and B (with a shuttle valve) or an external source. Hydraulic fluid can flow through the 2-way cartridge valve from A→B or B→A.

A pilot valve can be used to directly control the switching function of the cartridge valve, either between two extreme positions, open or closed, or in any number of intermediate positions. The exact position of the valve cone depends on the ratio of control surface  $A_X$  to the pressures acting from the working connections A and B on the seating surface of  $A_A$  and the annular area of  $A_B$ .

If the valve cone is open, by reducing the pressure seen at X, then flow can move from A and B or vice-versa. By applying a control pressure at X, the working connections A to B are shut off as the valve cone is closed by the seat mounting. If there is a pressure difference between connection B and pilot connection X, as a result of clearance tolerance between the cone and sleeve, then leakage can be eliminated by using a leakproof seat valve and hooking up the pilot connection X to the working connection B. If the desired function does not permit such a switching operation, a cartridge valve with an additional sealing surface can be used to seal the connections A, B and X from each other.



## Sectional View

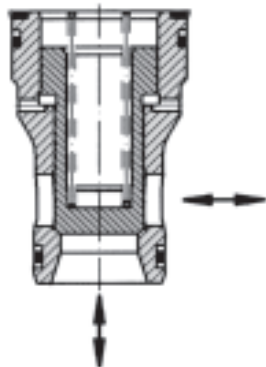


### High Flow Cartridge Valve Advantages

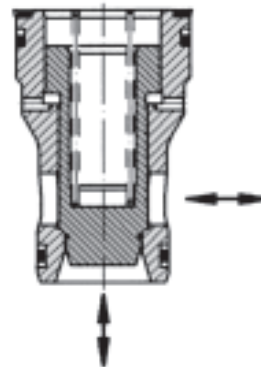
- 40% to 50% more flow with the same size of the DIN 24342 cartridge, relative to standard cartridge valves
- In many applications, the DIN 24342 cartridge can be reduced one size
- Fully interchangeable with DIN 24342 cavity; no manifold redesign required

## Types of Cones and Sleeves

### Directional Control and Flow Control Valves



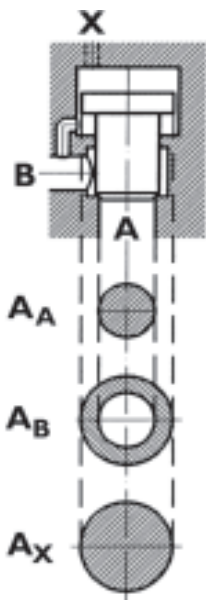
Sleeve-B, Cone-S



Sleeve-B, Cone-T

General Data	Value	Unit	Specifications
Mode of Construction	-	-	2-Way Cartridge seat valve (High Flow Cartridge)
Manner of Mounting	-	-	Manifold Cartridge Mounting
Mounting Dimensions	-	mm	see page 9
Mounting Position	-	-	any
Flow Direction	-	-	A <=> B
Ambient Temperature Range	min.	°C	-25
	max.	°C	+60
<b>Working Pressure</b>			
A-Port	min.	bar	0
	max.	bar	350
B-Port	min.	bar	0
	max.	bar	350
Temperature Range	min.	°C	-25
	max.	°C	+80
Viscosity Range	min.	mm <sup>2</sup> · s <sup>-1</sup>	2,8
	max.	mm <sup>2</sup> · s <sup>-1</sup>	380
Operational Viscosity	v	mm <sup>2</sup> · s <sup>-1</sup>	35
Nominal Size	-	-	NG16 NG25 NG32 NG40 NG50 NG63 NG80 NG100
Weight	m	kg	0,2 0,4 0,9 1,8 3,2 6,9 12 24
Pilot Volume (Area A <sub>X</sub> )			
S-Cone	V <sub>X</sub>	cm <sup>3</sup>	2,5 7,8 18,2 35,5 70,6 151,3 289,9 585
T-Cone			2,85 8,6 19,8 37,8 74 157,6 304,2 585

## Characteristic Parameters

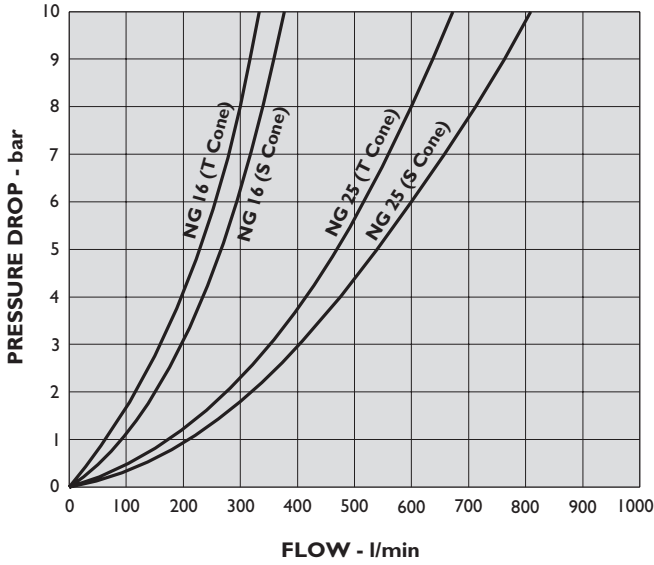


Reference Surface – A <sub>A</sub>								
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
<b>Cone S</b>								
Stroke (mm)	6.5	10	12	15	20	24	30.5	39
A <sub>A</sub> (mm <sup>2</sup> )	211	434	707	1075	2206	3318	5281	8825
A <sub>A</sub>	1	1	1	1	1	1	1	1
A <sub>B</sub>	0.8	0.8	1.15	1.2	0.6	0.9	0.8	0.7
A <sub>X</sub>	1.8	1.8	2.15	2.2	1.6	1.9	1.8	1.7
<b>Cone T</b>								
Stroke (mm)	7.5	11	13	16	21	25	32	39
A <sub>A</sub> (mm <sup>2</sup> )	211	434	707	1075	2206	3318	5281	8825
A <sub>A</sub>	1	1	1	1	1	1	1	1
A <sub>B</sub>	0.8	0.8	1.15	1.2	0.6	0.9	0.8	0.7
A <sub>X</sub>	1.8	1.8	2.15	2.2	1.6	1.9	1.8	1.7

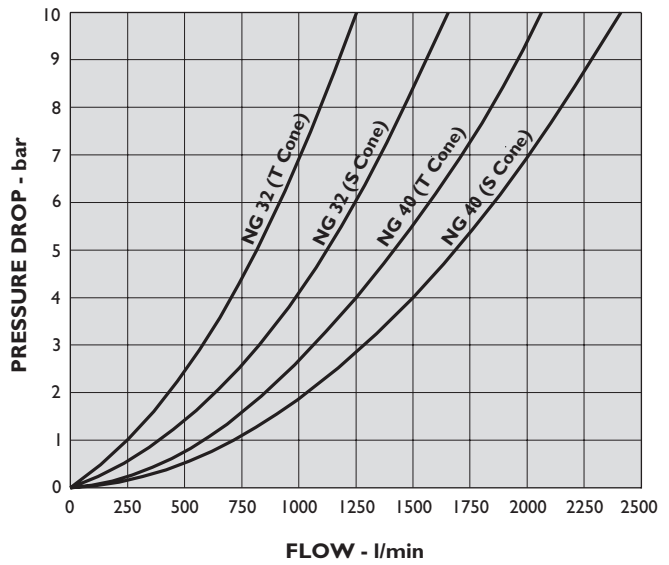
# Typical Characteristic Curves

## Flow and Direction Functions (S & T Cones)

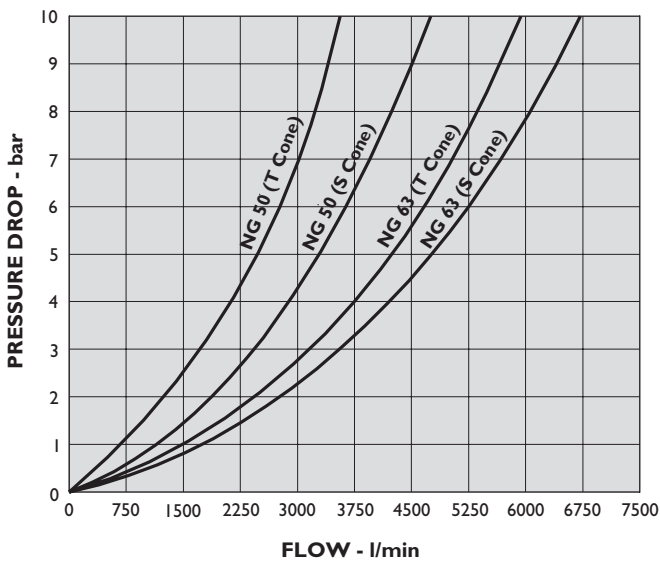
**NG16/NG25**  
 $\Delta p$ -Q-Curves  
 Flow direction: A  $\longleftrightarrow$  B



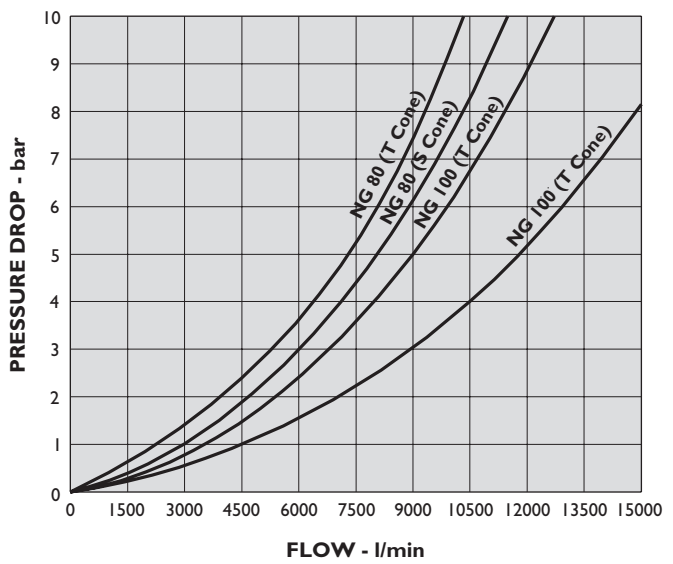
**NG32/NG40**  
 $\Delta p$ -Q-Curves  
 Flow direction: A  $\longleftrightarrow$  B



**NG50/NG63**  
 $\Delta p$ -Q-Curves  
 Flow direction: A  $\longleftrightarrow$  B



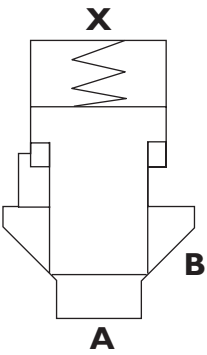
**NG80/NG100**  
 $\Delta p$ -Q-Curves  
 Flow direction: A  $\longleftrightarrow$  B



**Notes:**

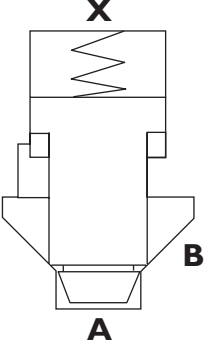
1. Performance characteristics are based on oil viscosity of 32 cSt.
2. Oil temperature – 40°C.
3. Pressure drop vs. flow data measured without spring.

Direction Control (without dampening nose); area ratio = (please refer to page 5 for ratios)

Symbol	Size NG [mm]	Weight kg	Spring Rating bar	Box Car Designation	Part Number
	16	0,2	1,0	M-CEHFE16D6SS	XCB11056-000-00
			2,0	M-CEHFE16D6ST	XCB11057-000-00
			4,0	M-CEHFE16D6SU	XCB11058-000-00
			6,0	M-CEHFE25D6SV	XCB11059-000-00
	25	0,4	1,0	M-CEHFE25D6SS	XCB11066-000-00
			2,0	M-CEHFE25D6ST	XCB11067-000-00
			4,0	M-CEHFE25D6SU	XCB11068-000-00
			6,0	M-CEHFE25D6SV	XCB11069-000-00
	32	0,9	1,0	M-CEHFE32D6SS	XCB11016-000-00
			2,0	M-CEHFE32D6ST	XCB11017-000-00
			4,0	M-CEHFE32D6SU	XCB11019-000-00
	40	1,8	1,0	M-CEHFE40D6SS	XCB11071-000-00
			2,0	M-CEHFE40D6ST	XCB11072-000-00
			4,0	M-CEHFE40D6SU	XCB11108-000-00
	50	3,2	1,0	M-CEHFE50D6SS	XCB11123-000-00
			2,0	M-CEHFE50D6ST	XCB11124-000-00
			4,0	M-CEHFE50D6SU	XCB11125-000-00
	63	6,9	1,0	M-CEHFE63D6SS	XCB11135-000-00
			2,0	M-CEHFE63D6ST	XCB11136-000-00
			4,0	M-CEHFE63D6SU	XCB11138-000-00
	80	12,0	1,0	M-CEHFE80D6SS	XCB11205-000-00
			2,0	M-CEHFE80D6ST	XCB11206-000-00
			4,0	M-CEHFE80D6SU	XCB11208-000-00
	100	24,0	1,0	M-CEHFE100D6SS	XCB11219-000-00
			2,0	M-CEHFE100D6ST	XCB11220-000-00
			3,0	M-CEHFE100D6SL	XCB11221-000-00

# Standard Models

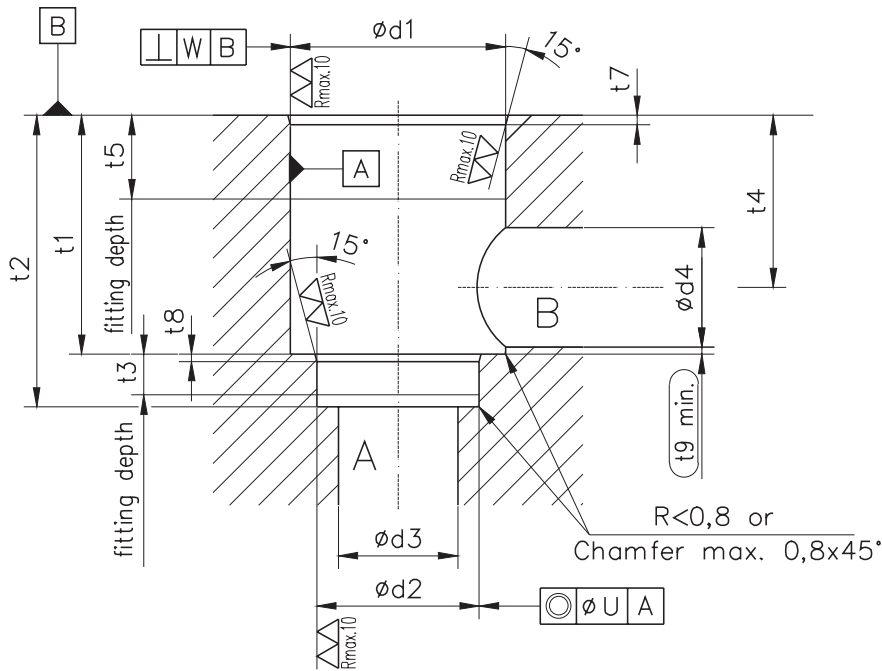
Direction Control (with dampening nose); area ratio = (please refer to page 5 for ratios)

Symbol	Size NG [mm]	Weight kg	Spring Rating bar	Box Car Designation	Part Number
	16	0,2	1,0	M-CEHFE16D6TS	XCB11188-000-00
			2,0	M-CEHFE16D6TT	XCB11189-000-00
			4,0	M-CEHFE16D6TU	XCB11190-000-00
			6,0	M-CEHFE25D6TV	XCB11191-000-00
	25	0,4	1,0	M-CEHFE25D6TS	XCB11183-000-00
			2,0	M-CEHFE25D6TT	XCB11184-000-00
			4,0	M-CEHFE25D6TU	XCB11185-000-00
			6,0	M-CEHFE25D6TV	XCB11186-000-00
	32	0,9	1,0	M-CEHFE32D6TS	XCB11149-000-00
			2,0	M-CEHFE32D6TT	XCB11150-000-00
			4,0	M-CEHFE32D6TU	XCB11151-000-00
	40	1,8	1,0	M-CEHFE40D6TS	XCB11118-000-00
			2,0	M-CEHFE40D6TT	XCB11119-000-00
			4,0	M-CEHFE40D6TU	XCB11217-000-00
	50	3,2	1,0	M-CEHFE50D6TS	XCB11099-000-00
			2,0	M-CEHFE50D6TT	XCB11100-000-00
			4,0	M-CEHFE50D6TU	XCB11101-000-00
	63	6,9	1,0	M-CEHFE63D6TS	XCB11141-000-00
			2,0	M-CEHFE63D6TT	XCB11142-000-00
			4,0	M-CEHFE63D6TU	XCB11144-000-00
	80	12,0	1,0	M-CEHFE80D6TS	XCB11211-000-00
			2,0	M-CEHFE80D6TT	XCB11212-000-00
			4,0	M-CEHFE80D6TU	XCB11214-000-00
	100	24,0	1,0	M-CEHFE100D6TS	XCB11224-000-00
			2,0	M-CEHFE100D6TT	XCB11225-000-00
			3,0	M-CEHFE100D6TL	XCB11226-000-00

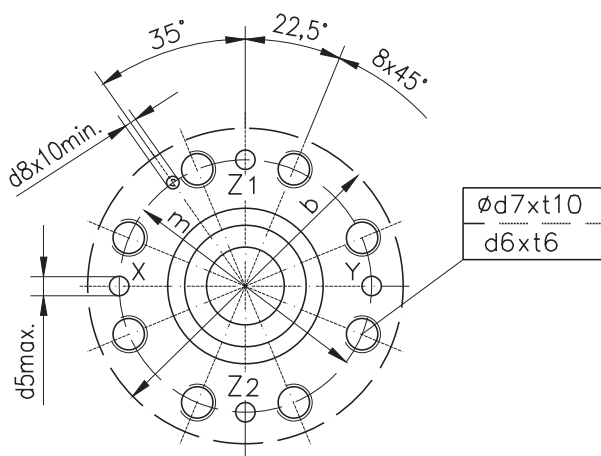
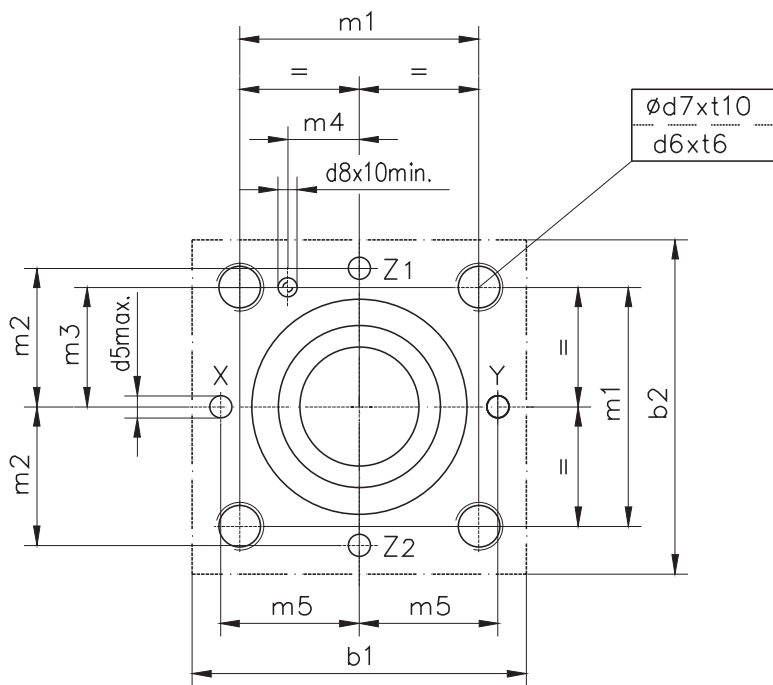
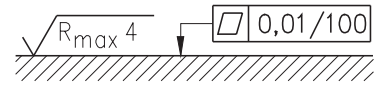


# Mounting Dimensions

CAVITY AS PER ISO 7368



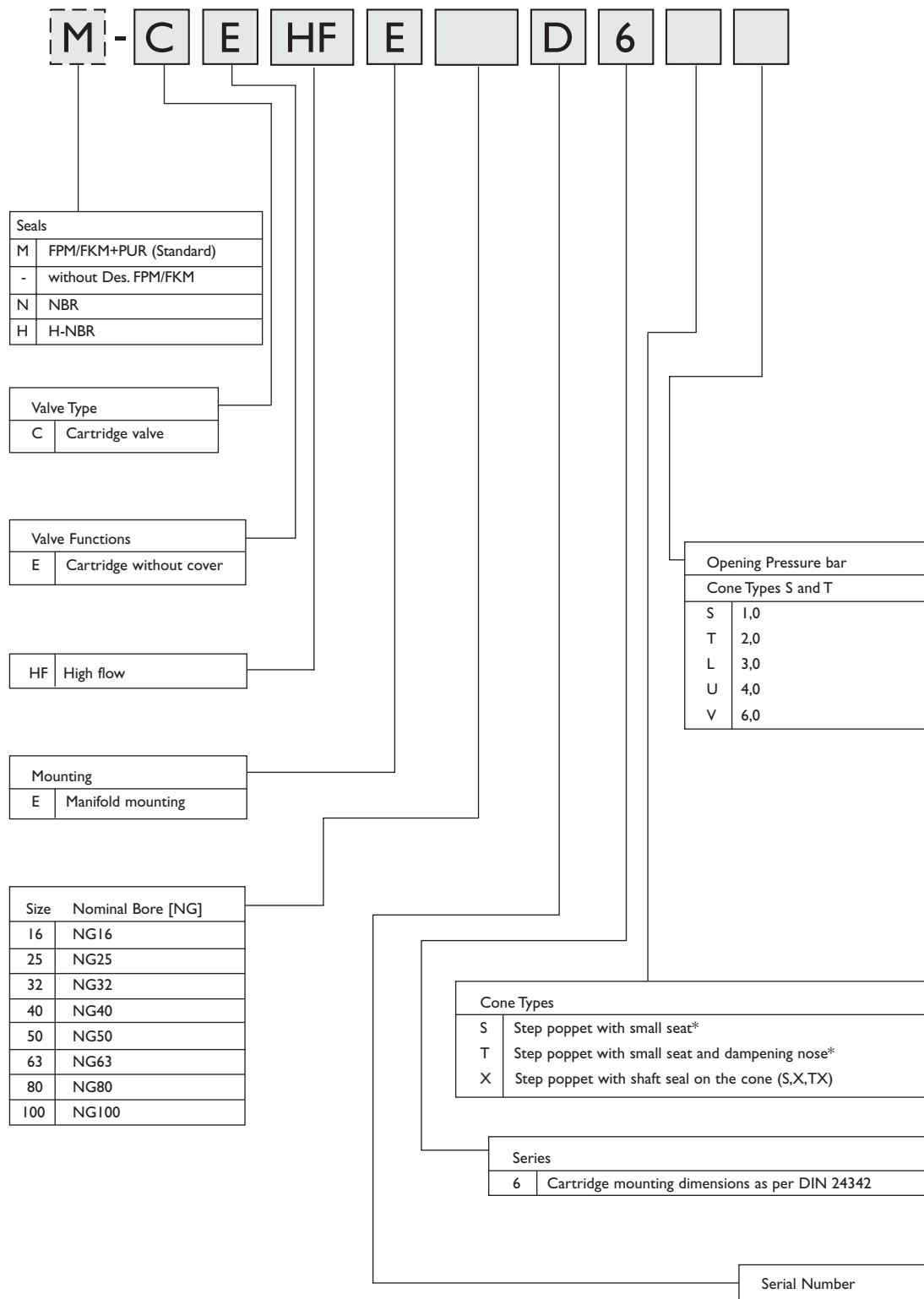
Required surface finish



Dimension	NG16	NG25	NG32	NG40	NG50	NG63
b1	65	85	102	125	140	180
b2	65	85	102	125	140	180
d1 <sup>H7</sup>	32	45	60	75	90	120
d2 <sup>H7</sup>	25	34	45	55	68	90
d3	16	25	32	40	50	63
d3 <sub>max.</sub>	17	25	32	43	54	66
d4	16	25	32	40	50	63
d4 <sub>max.</sub>	25	32	40	50	63	80
d5 <sub>max.</sub>	4	6	8	10	10	12
d6	M8	M12	M16	M20	M20	M30
d7	6,8	10,2	14	17,5	17,5	26,5
d8 <sup>H13</sup>	4	6	6	6	8	8
m1 ±0,2	46	58	70	85	100	125
m2 ±0,2	25	33	41	50	58	75
m3 ±0,2	23	29	35	42,5	50	62,5
m4 ±0,2	10,5	16	17	23	30	38
m5 ±0,2	25	33	41	50	58	75
t1 <sup>+0,1</sup>	43	58	70	87	100	130
t2 <sup>+0,1</sup>	56	72	85	105	122	155
t3	11	12	13	15	17	20
t4	34	44	52	64	72	95
t4 at d4 <sub>max.</sub>	29,5	40,5	48	59	65,5	86,5
t5	20	30	30	30	35	40
t6	14	20	26	33	33	50
t7	2	2,5	2,5	3	4	4
t8	2	2,5	2,5	3	3	4
t9	0,5	1,0	1,5	2,5	2,5	3
t10	17	24	31	38	38	56
U	0,03	0,03	0,03	0,05	0,05	0,05
W	0,05	0,05	0,1	0,1	0,1	0,2

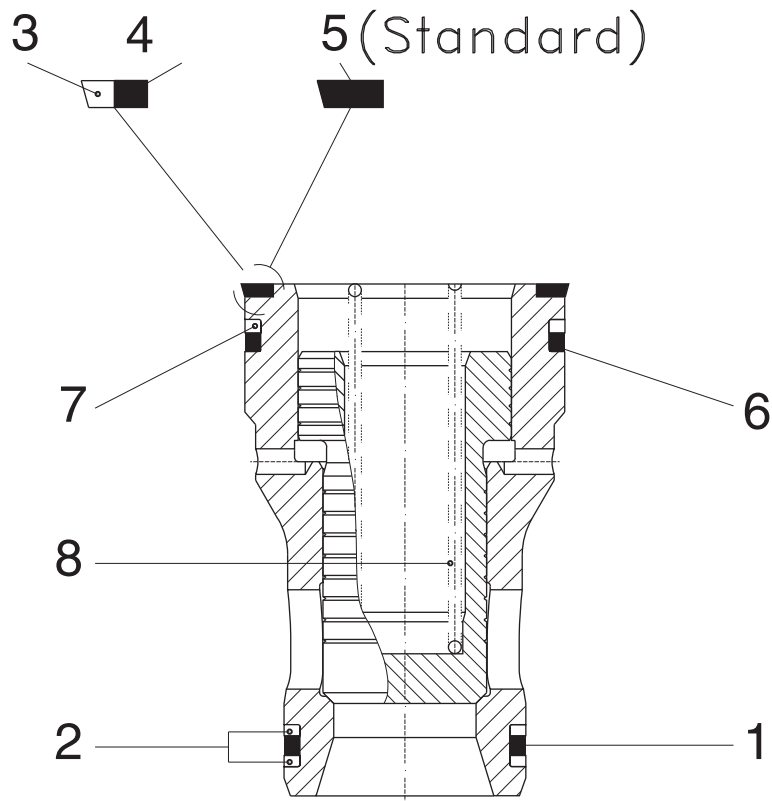
Dimension	NC80	NG100
b <sub>max.</sub>	250	300
d1 <sup>H7</sup>	145	180
d2 <sup>H7</sup>	110	135
d3	80	100
d3 <sub>max.</sub>	82	107
d4	80	100
d4 <sub>max.</sub>	100	125
d5 <sub>max.</sub>	16	20
d6	M24	M30
d7	21	26,5
d8 <sup>H13</sup>	10	10
t1	175	210
t2 <sup>+0,2</sup>	205	245
t3	25	29
t4	130	155
t4 at d4 <sub>max.</sub>	120	142,5
t5	40	50
t6	39	50
t7	5	5
t8	5	5
t9	3	5
t10	45	56
m ±0,3	200	245
U	0,05	0,05
W	0,2	0,2

# Ordering Information



\* Surfaces see Surface Area Ratios page 5.

Subject to technical changes.



Pos.	Designation	Order Number								
			NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
1	O-Ring Viton	X980-	02020	02122	02222	02225	02229	02338	02344	02427
2	Stützring	X780-	08020	18122	18222	18225	18229	18338	18344	18427
3	Axialstützring	X783-	00018	00019	-*	00011	00012	00013	00014	00015
4	O-Ring Viton	X980-	02024	02129	-*	02231	02338	02347	02430	02439
5	Axialdichtring (Standard)(PU)	XE	15402	15422	14345	15224	15200	15161	15202	15223
6	O-Ring Viton	X980-	02024	02129	02227	02231	02338	02347	02430	02439
7	Stützring	X780-	18024	18129	08227	18231	18338	08348	08431	18439
	Dichtungssatz (Pos.1,2,5,6,7)	XEB	14413	14414	14373	14415	14420	14421	14422	14423
	Federn									
8	Feder S - 1,0 bar	XEF	10299	10286	10138	10292	10306	10045	10051	10059
8	Feder T - 2,0 bar	XEF	10300	10287	10140	10293	10307	10310	10323	10326
8	Feder L - 3,0 bar <sup>(1)</sup>	XEF	-	-	10170	10294	10306 10308**	10172	10324	10326 10327**
8	Feder U - 4,0 bar <sup>(2)</sup>	XEF	10301	10288	10171	10293 10295**	10307 10308**	10310 10311**	10323 10325**	-
8	Feder V - 6,0 bar <sup>(2)</sup>	XEF	10302	10289	10171 10322**	-	-	-	-	-
	<sup>(1)</sup> mit Innenfeder - 1,0 bar	XEF	-	-	-	-	-	-	-	10327
	<sup>(2)</sup> mit Innenfeder - 2,0 bar	XEF	-	-	10322	10295	10308	10311	10325	-

\* not yet available

\*\* not possible with stroke limiter IH

Order example: O-Ring Viton Pos. 6 NG 32 => Order Number: X980-02227



Australia  
Brazil  
China

Denmark  
England  
Finland  
France



Germany  
India  
Ireland  
Italy

Japan  
Korea  
Luxembourg  
Philippines  
Singapore  
Spain  
Sweden  
USA

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**HYDROLUX**

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