



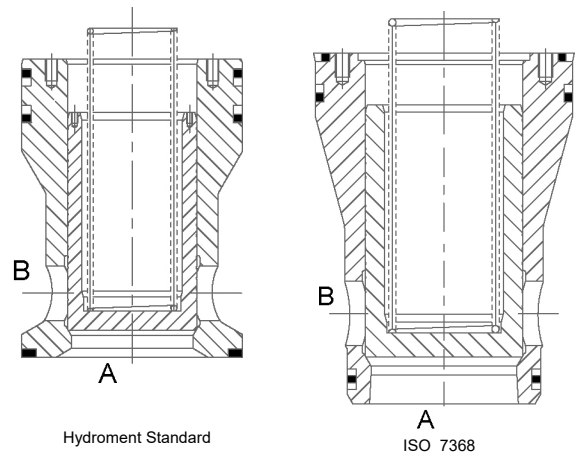
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1 General Description

2/2 way cartridge valves are logic valves for the use in hydraulic control blocks, which allow a very compact design and provide a high power density. They have two operational ports (A and B) and a pilot port X. Depending on the valve function the flow is running from A to B or from B to A. Due to the conical seat design the valves are leakage free at port A. As an option port B can also be leakage free by the use of an additional seal. For a complete valve function, a control cover and in most cases a pilot control valve is needed. Depending on the cover design the cartridge valves are operating as check valves, directional valves or pressure relief valves.

WESSEL-HYDRAULIK provides the cartridge valve program for mounting cavities according to DIN 24342 respectively ISO 7368 as well as an in-house standard (Hydromont standard). Due to the optimized mounting cavity geometry Hydromont standard allows a more compact design with the same performance.

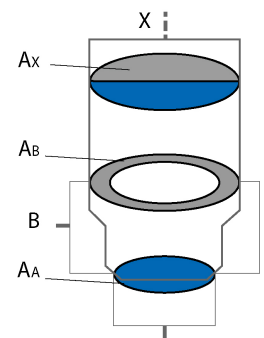


1.1 Applications

2/2 way cartridge valves could be used in multiple application. They can be used as directional valves, check valves or pressure relief valves up to complex control functionalities.

1.2 Function

2/2 way cartridge valves consists of a sleeve, a poppet and a spring which results in a normally closed position when the valve is unloaded. The cartridge is closed by a cover on the top. The cover connects the pilot port X with the control port of the valve. When used with a cartridge cover and corresponding pilot valve, the sum of the pressures applied to each of these control surfaces either opens or closes the cartridge valve. The surfaces A_A and A_B work to open the valve, while surface A_X together with the spring force work to close the valve. B, C and R poppets with a stepped shape have these three different surfaces while poppet A and D have only two control surfaces ($A_B = 0$). An overview of the surfaces can be seen on the graph on the right. When in the open position, the poppet enables fluid flow in both directions, from A to B or B to A depending on the needs of the application. When the poppet is in the closed position, the valve seat design ensures a leak free separation of ports A and B:



1.3 Characteristics

- Very high power density
- compact design
- High flexibility in the control block design
- high reliability
- Increased pollution tolerance
- Short response times
- Leak-free check valve function
- Easy replacement of elements for Maintenance

2 Technical Data

Criteria	Unit	Value
Design		piloted throttle-seat valve
Direction of flow		A ↔ B (A → B)
Installation position		any
Porting pattern		DIN ISO 7368 / Hydroment Standard
Maximum inlet pressure port A, B, X	bar	420
Hydraulic fluid		Mineral oil (HL, HLP) conforming with DIN 51524, other fluids upon request
NBR		<ul style="list-style-type: none"> ▪ hydraulic fluids based on mineral oils ▪ HFD- hydraulic fluids
FKM		<ul style="list-style-type: none"> ▪ hydraulic fluids based on mineral oils ▪ HFB-, HFC- hydraulic fluids
Hydraulic fluid temperature range		
NBR	°C	temperature range -25 bis +80
FKM	°C	temperature range -20 bis +120
Ambient temperature:		
NBR	°C	temperature range -25 bis +80
FKM	°C	temperature range -20 bis +120
Viscosity range	mm ² /s	2,8 – 500
Contamination grade		Filtering conforming with NAS 1638, class 9, with minimum retention rate $\beta_{10} \geq 75$

3 Ordering Information

3.1 Type Code

CEE						
00	01	02	03	04	05	06
00	Product group	2/2 way cartridge valve				CEE
01	Design	DIN ISO 7368	16, 25, 32, 40, 50, 63			
		Hydroment-standard	10, 15, 30, 40, 50, 63			
02	DIN ISO 7368				B6	
	Hydroment-standard	Hydroment standard allows a more compact design with the same performance.			C1	
03	Cone design	A-cone (always with sleeve A)	1:1		A	
		D- cone (always with sleeve A)	1:1, same as A but with damping nose		D	
		B- cone (always with sleeve B)	1:1,6 a reduced seat		B	
		C- cone (always with sleeve B)	1:1,6 a reduced seat and with damping nose		C	
		R- cone (always with sleeve B)	1:1,6 a reduced seat		R	
04	Spring		Cone A, D	Cone B, C, R		
			0,6 bar	1,0 bar	S	
			1,2 bar	2,0 bar	T	
			2,4 bar	4,0 bar	U	
			3,7 bar	6,0 bar	V	
05	Seal	NBR	temperature range -25°C bis +80°C		N	
		FKM / Viton	temperature range -20°C bis +120°C		V	
06	nozzle in cone	Cone without diaphragm Cone with nozzle	Cone with plug		K00	
			Cone with thread, without nozzle		K99	
			Cone without hole		K0B	
			Nozzle size 0.6		K06	
			Nozzle size 0.8		K08	
			Nozzle size 1.0		K10	
			Nozzle size 1.2		K12	
			Nozzle size 1.5		K15	
			Nozzle size 2.0		K20	
			Nozzle size 2.2		K22	
Nozzle size 2.5		K25				

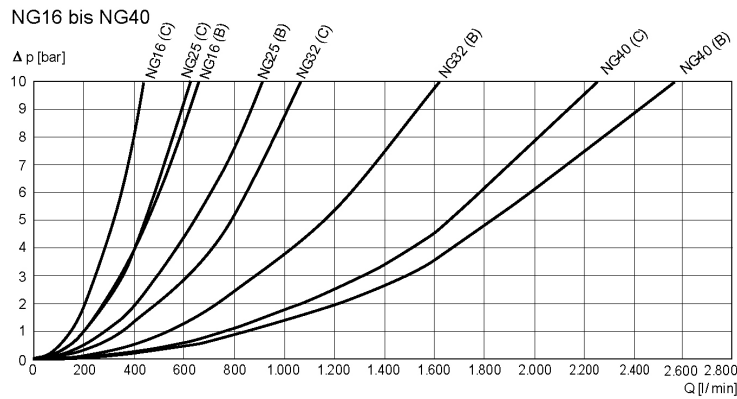
XXX – fixed features XXX – customer selectable features ■ available ○ not available

Some theoretical configurations might be not feasible for technical reasons. For relating questions please ask for our advice.

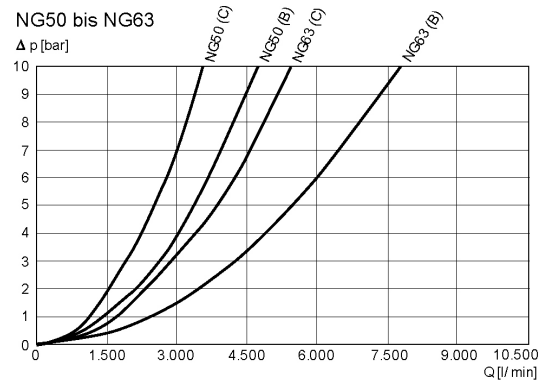
4 Description of Features according to Type Code

4.1 Feature 1: Cone design

4.1.1 Characteristic



(B) Kegel B, (C) Kegel C

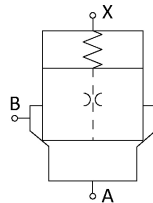
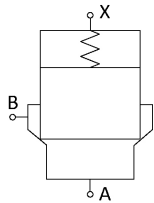


4.1.2 Cone

Pressure valve function

cone A:

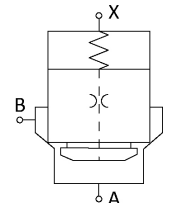
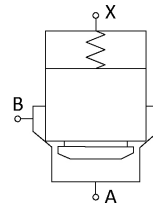
control area ratio 1:1



Nozzle for internal control oil supply
between A and X

cone D with additional damping nose:

control area ratio 1:1

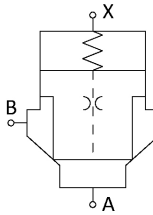
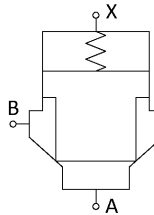


Nozzle for internal control oil supply
between A and X

Directional valve function

conel B:

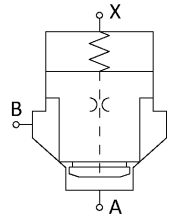
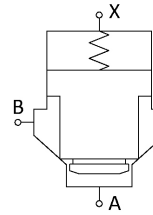
control area ratio 1:1,6



Nozzle for internal control oil supply
between A and X

cone C with additional damping nose:

control area ratio 1:1,6

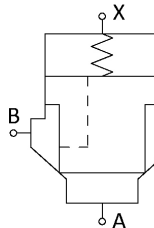


Nozzle for internal control oil supply
between A and X

Check valve function

cone R:

control area ratio 1:1,6



5 Installation

5.1 General Instructions

Observe all installation and safety information of the machine manufacturer.

Only technically permitted changes may be made on the machine.

The user has to ensure that the device is suitable for the respective application.

Use exclusively for the range of application specified by the manufacturer.

Depressurize the hydraulic system prior to installation or dismantling.

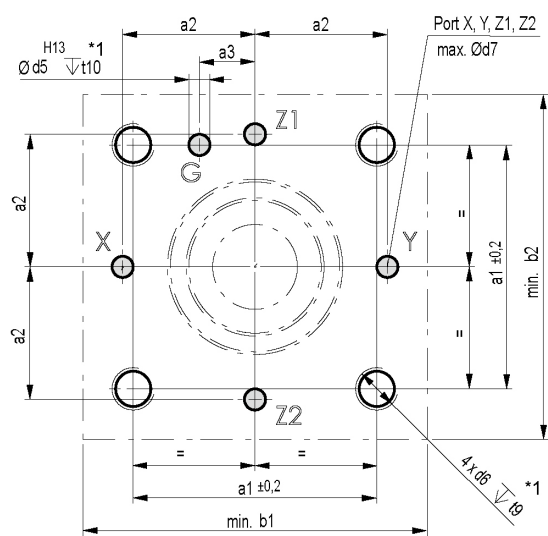
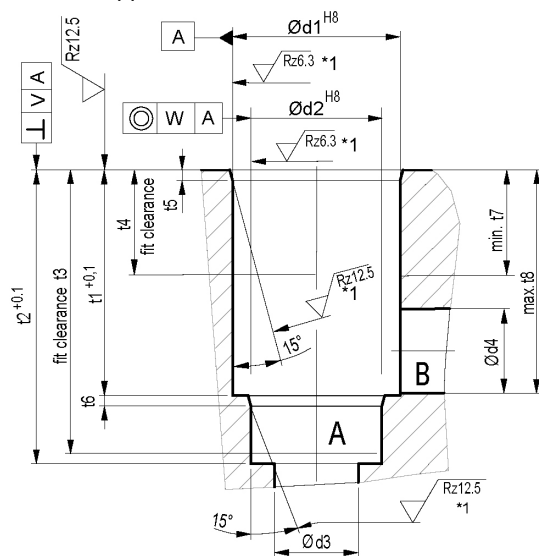
May only be adjusted by technical staff.

May only be opened with the approval of the manufacturer, otherwise the warranty is invalidated.

The enclosed connection recommendation is without guarantee. The functionality and the technical specifications of the machine require checking.

5.2 Stepped bore

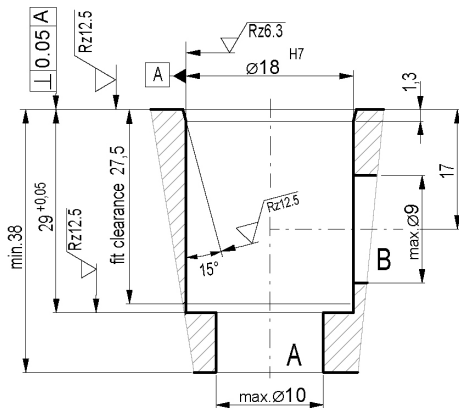
5.2.1 stepped bore DIN ISO 7368



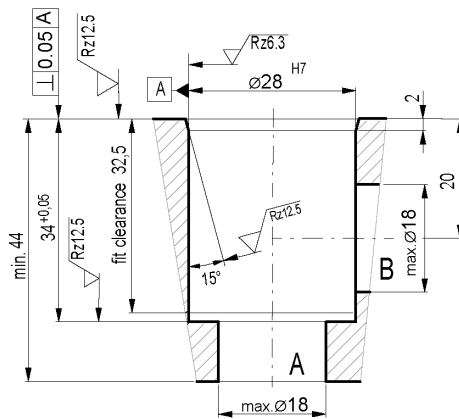
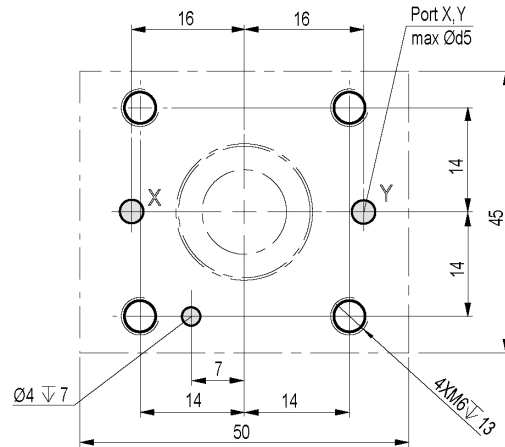
*1 Recommendation deviating from the norm

	NG16	NG25	NG32	NG40	NG50	NG63
d1	32	45	60	75	90	120
d2	25	34	45	55	68	90
d3	16	25	32	40	50	63
d4	16	25	31,5	40	50	63
d5	4	6	6	6	8	8
d6	M8	M12	M16	M20	M20	M30
d7	4	6	8	10	10	12
t1	43 ±0,2	58	70	87	100	130
t2	56	72	85	105	122	155
t3	54	70	83	102	117	150
t4	20	30	30	30	35	40
t5	2	2,5	2,5	3	4	4
t6	2	2,5	2,5	3	3	4
t7	20	30	30	30	35	40
t8	42,5	57	68,5	84,5	97,5	127
t9 *	14	20	26	32	32	50
t10*	10	10	10	10	10	10
a1	46	58	70	85	100	125
a2	25	33	41	50	58	75
a3	10,5	16	17	23	30	38
b1	65	85	102	125	140	180
b2	65	85	102	125	140	180
V	0,05	0,05	0,1	0,1	0,1	0,2
W	0,03	0,03	0,03	0,05	0,05	0,05

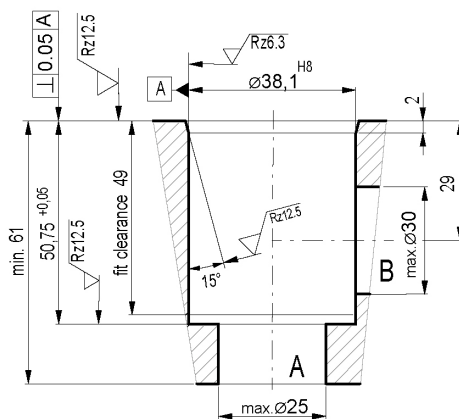
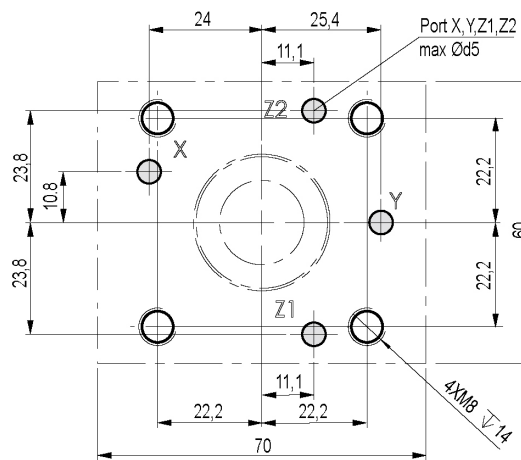
5.2.2 stepped bore Hydroment-standard



NG10

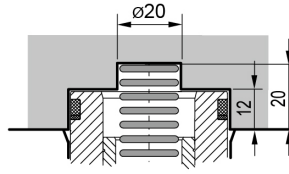
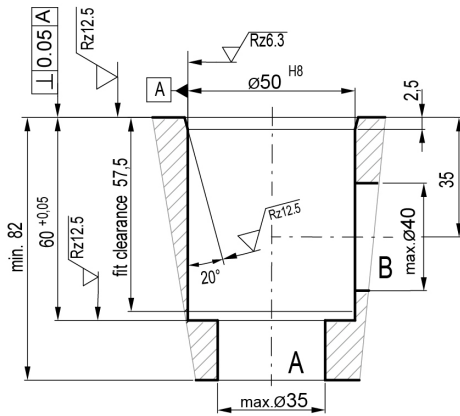


NG15

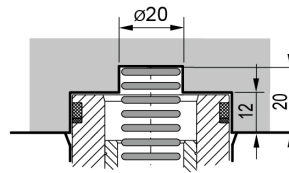
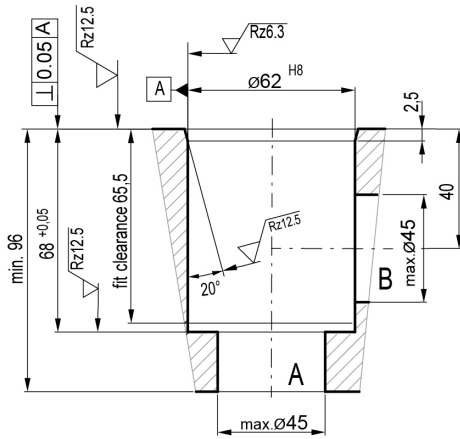
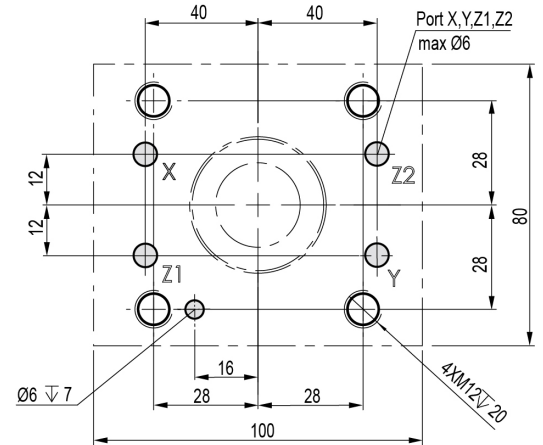


NG30

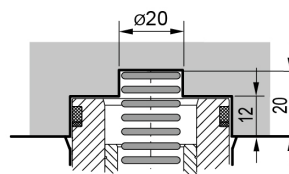
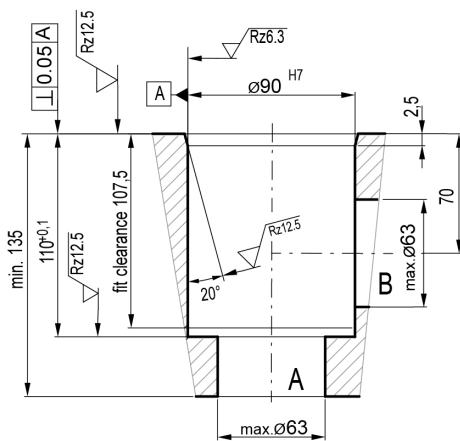
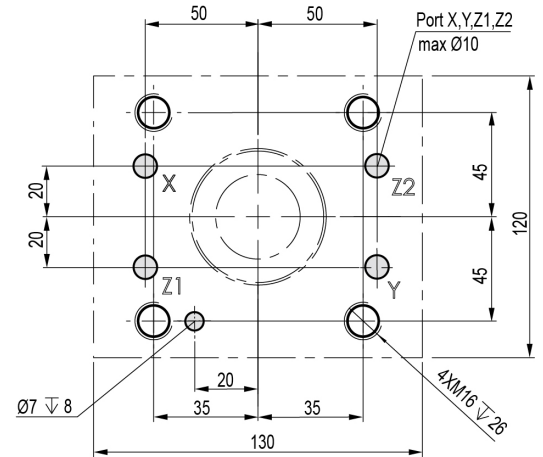
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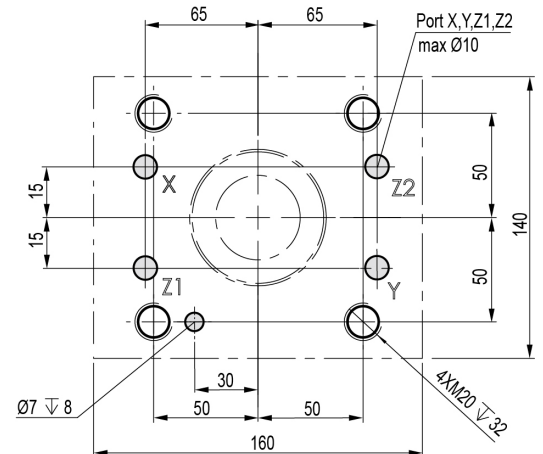
NG40



NG50



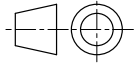
NG63



6 Notes, Standards and Safety Instructions

6.1 General Instructions

The views in drawings are shown in accordance with the European normal projection variant



A comma (,) is used as a decimal point in drawings
All dimensions are given in mm

6.2 Standards

The following standards must be observed when installing and operating the valve:

DIN EN ISO 13732-1:2008-12, Temperatures on accessible surfaces

7 Accessories