

2-WAY SLIP-IN CARTRIDGE VALVES MONITORED

ISO 7368

SIZES 16 TO 63

CSE series



Rev. B, June 2023

FLOW-OPTIMIZED DESIGN FOR UP TO
420 BAR (6,000 PSI) OPERATING PRESSURE
AND MAXIMUM ENERGY EFFICIENCY

Whenever the highest levels of motion control performance and design flexibility are required, you'll find Moog expertise at work. Through collaboration, creativity and world-class technological solutions, we help you overcome your toughest engineering obstacles. Enhance your machine's performance, and help take your thinking further than you ever thought possible.

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This catalog is for users with technical knowledge. To ensure the functionality and safety of the system, the user should check the suitability of the products described herein. The products described herein are subject to change without notice. In case of doubt, please contact Moog.

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All dimensions in mm (in).

PRODUCT OVERVIEW

Mode of Operation/ Scope

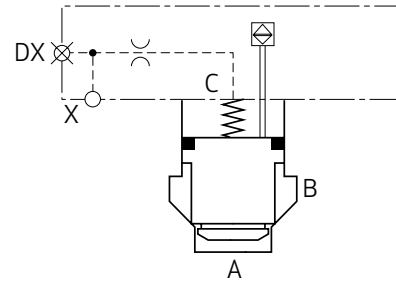
The CSE 2-Way Slip-in Cartridge Valves have two working ports (A and B) and one or more pilot port connections. Flow direction through the valve can be from A to B, or from B to A, depending on the valve function desired. Both check and directional functions are possible. A seated poppet design ensures that the connection between the A and B ports is sealed off leakage free when closed. A poppet shaft seal ensures that the C port is also sealed off leakage free from the B port.

These 2-Way Slip-in Cartridge Valves are preferably used to prevent unintended movements of actuators in hydraulic systems. They are equipped with an electrical position switch to monitor the closed position of the cartridge poppet. Due to the position monitoring, the valves can be used in safety-related parts of control systems (SRP/CS) to increase the safety level of the system and meet the safety standards for the respective application. The valves come with a DGUV Test type examination certificate in order to ease the approval of the SRP/CS.

The valves are adjusted, tested and sealed by Moog. The setting must not be changed, otherwise the defined leakage values in the monitored closed switching position may also change and these are relevant for avoiding undesired movements. In case of manipulations on the valve, the type examination certificate expires.

Features and Benefits

Features	Benefits
Closed valve position monitored with inductive position switch.	Suitable for use in safety-related parts of control systems to increase safety or performance level.
Highly robust and reliable due to a contactless position sensor.	Low maintenance, operation and replacement costs.
Rated pressure up to 420 bar.	Maximum durability, even on demanding applications.
Flow optimized design reduces pressure drops.	High energy efficiency reduces operating costs.
Seated poppet design.	Leakage free design to prevent unintended actuator movements.
Comes with German Accident Prevention and Insurance Association (DGUV) examination certificate.	Supports certification process for the safety-related parts of control systems.



TECHNICAL DATA

Technical Data	Description					
Valve Type	2-Way Slip-in Cartridge Valve with Electrical Position Monitoring					
Valve Model	CSE					
Valve Design	Pilot-operated 2/2 way seat valve					
Mounting Type	Manifold mounting					
Size	16	25	32	40	50	63
ISO 7368 Interface	06-1-1-16	08-3-1-16	09-5-1-16	10-7-1-16	11-09-1-16	12-11-1-16
Valve Stroke [mm (in)]	9 (0.35)	13 (0.51)	15 (0.59)	20 (0.79)	24 (0.94)	28 (1.10)
Control Surface Area [mm ² (in ²)]	See page 5					
Nominal Flow at $\Delta p = 5$ bar (75 psi) Flow Direction from A \rightarrow B [l/min] (gpm)	210 (55)	515 (136)	890 (235)	1800 (475)	2450 (647)	4100 (1,083)
Weight (1D Function) [kg(lb)]	2.0 (4.41)	3.0 (6.61)	5.2 (11.46)	8.9 (19.62)	11.9 (26.24)	24.9 (54.90)
Weight (RM /5W Functions) [kg(lb)]	2.9 (6.39)	3.8 (8.38)	5.1 (11.24)	8.8 (19.40)	11.8 (26.01)	24.4 (53.79)
Dimensions	See pages 10 and 11					
Mounting Orientation	Any					
Flow Direction	A \leftrightarrow B					
Operating Pressure	maximum 420 bar (6,000 psi)					
Ambient Temperature Range	-30 °C to +80 °C (-22 °F to +176 °F)					
Seal Material / Fluid Compatibility	NBR ¹⁾ : Mineral oil-based. HFB, HFC fluids					
	FKM ²⁾ : Mineral oil-based. HFD fluids					
	Other fluids on request					
Fluid Temperature Range	-20 to +80 °C (-4 to +176 °F) for NBR seals					
	-10 to +80 °C (+14 to +176 °F) for FKM seals					
Recommended Viscosity Range	min. 15 mm ² /s to max. 46 mm ² /s (min. 15 cSt to max. 46 cSt)					
Maximum Permissible Viscosity Range	min. 2.8 mm ² /s to max. 380 mm ² /s (min. 2.8 cSt to max. 380 cSt)					
Recommended Cleanliness Class - for Functional Safety	ISO 4406 Class 20/18/15					
Recommended Cleanliness Class - for Longer Service Life	ISO 4406 Class 17/14/11					
MTTF _d Value according to ISO 13849-1	150 Years					

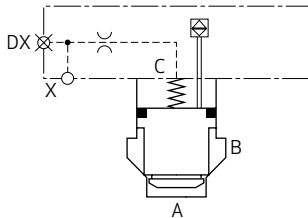
1) NBR: Nitrile Rubber (Buna-N)

2) FKM: Fluorocarbon Rubber

HYDRAULIC SYMBOLS AND CONTROL SURFACES

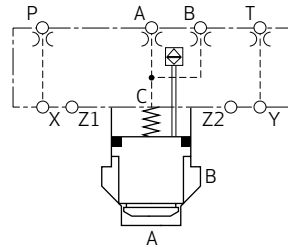
1D - Function

Sizes 16 - 63

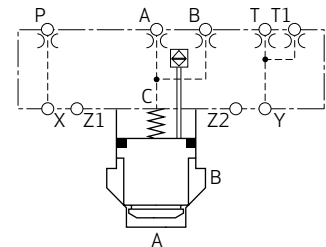


RM - Function

Sizes 16 - 50

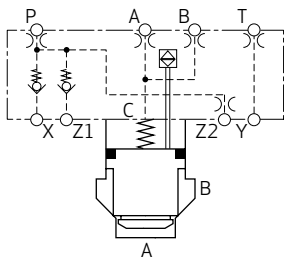


Size 63

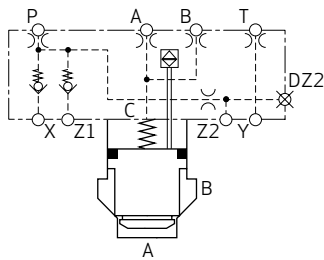


5W - Function

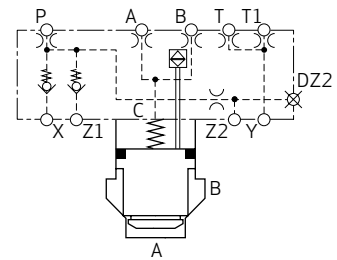
Sizes 16 - 25



Sizes 32 - 50

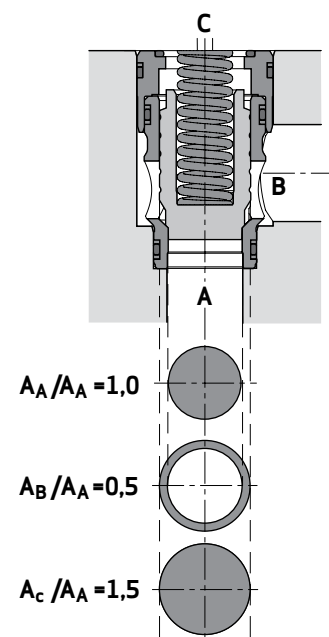


Size 63



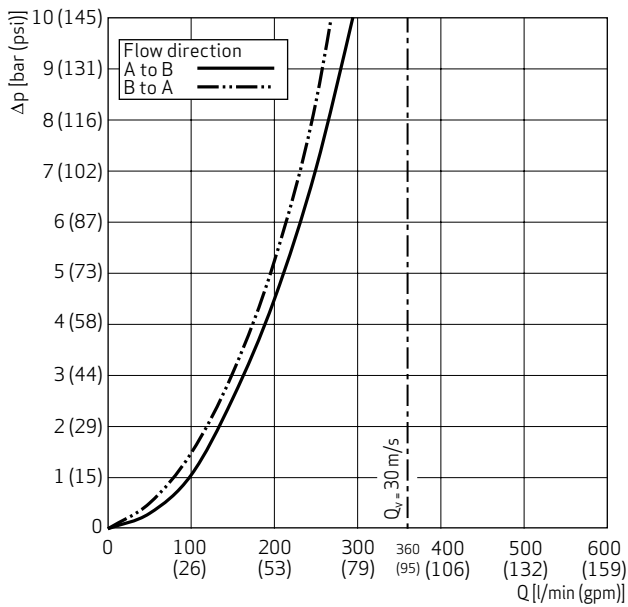
Cartridge Control Surface Areas

SIZE	A _A [mm ² (in ²)]	A _B [mm ² (in ²)]	A _C [mm ² (in ²)]
16	209 (0.32)	104 (0.16)	313 (0.49)
25	471 (0.73)	236 (0.36)	707 (1.10)
32	794 (1.23)	397 (0.61)	1,191 (1.85)
40	1,110 (1.72)	555 (0.86)	1,665 (2.58)
50	1,886 (2.92)	943 (1.5)	2,829 (4.38)
63	3,187 (4.93)	1,593 (2.45)	4,780 (7.41)

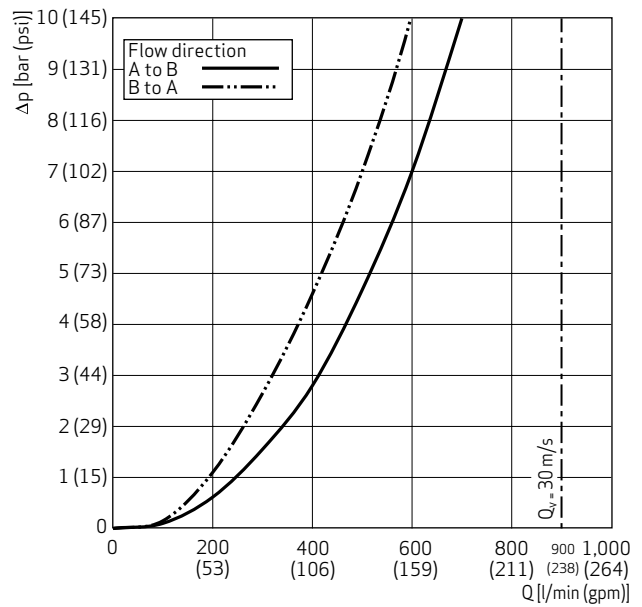


PERFORMANCE CURVES

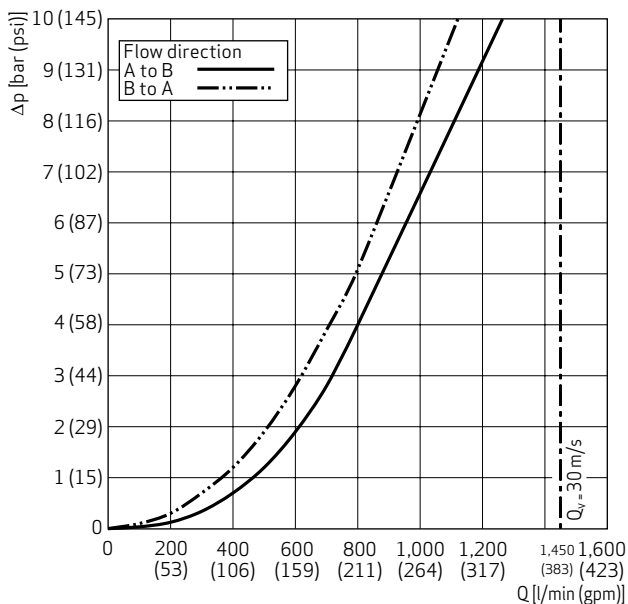
Size 16



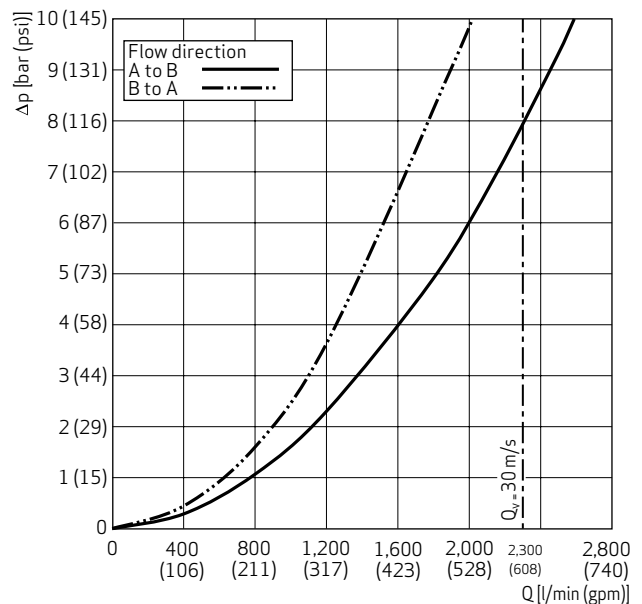
Size 25



Size 32



Size 40

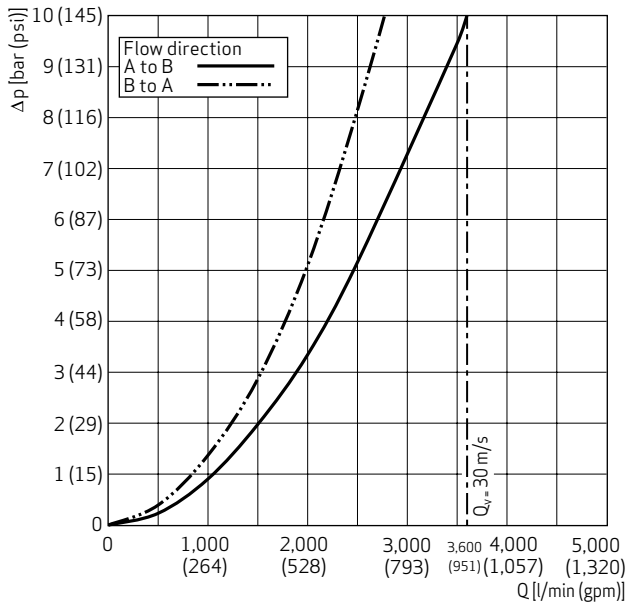


Note:

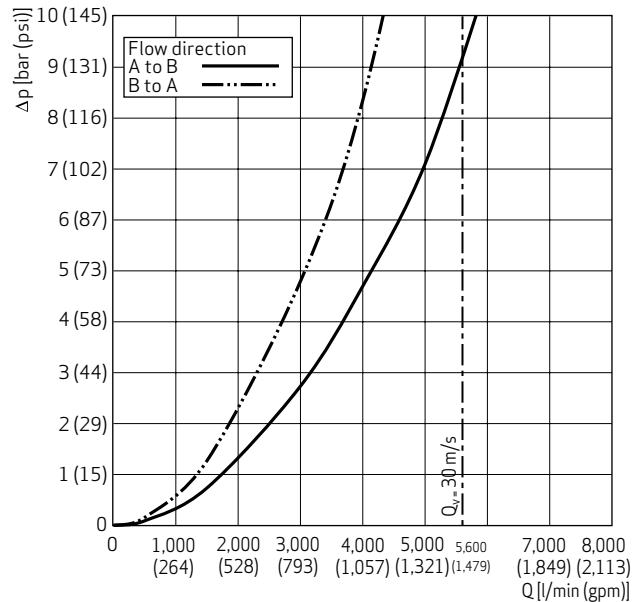
- All performance curves are measured without using a cartridge spring (valve fully open)
- A ⇒ B and B ⇒ A indicate the respective flow direction
- The vertical line labelled $Q_v = 30\text{m/s}$ indicates that a fluid velocity of 30m/s exists in the A-port of the ISO 7368 cavity. This value should not be exceeded in order to avoid cavitation damage to the cartridge and manifold.

PERFORMANCE CURVES AND LEAKAGE RATES

Size 50



Size 63



Note:

- All performance curves are measured without using a cartridge spring (valve fully open)
- A ⇌ B and B ⇌ A indicate the respective flow direction
- The vertical line labelled Q_v = 30m/s indicates that a fluid velocity of 30m/s exists in the A-port of the ISO 7368 cavity. This value should not be exceeded when using these valves.

Valve Leakage at Switching Point

The maximum leakage at the switching point for a fluid with a density of 860 kg/m³, a pressure difference of 100 bar (Δp = |p_A - p_B|) across the valve and a kinematic fluid viscosity of 46 cSt [mm²/s] can be taken from the following table:

SIZE	16	25	32	40	50	63
Q _L [l/min]	0.4	1.4	1.5	2.4	4.3	4.7

Using the above table and the following equation, the valve leakage at the switching point can be calculated for other fluid densities (ρ_{new}), viscosities (ν_{new}) and pressure differences (Δp_{new}):

$$Q_{Lnew} \left[\frac{l}{min} \right] = Q_{L \text{ from Table}} \left[\frac{l}{min} \right] \cdot 395,6 \cdot \frac{\Delta p_{new} [bar]}{\nu_{new} [cSt] \cdot \rho_{new} \left[\frac{kg}{m^3} \right]}$$

Example:

Calculation of the maximum leakage at the switching point of a CSE16 at a fluid density of 860 kg/m³, a pressure difference of 200 bar (Δp = |p_A - p_B|) and a fluid viscosity of 36 cSt [mm²/s].

$$Q_{Lnew} \left[\frac{l}{min} \right] = 0,40 \cdot 395,6 \cdot \frac{200}{36 \cdot 860} = 1,02$$

Note:

Maximum permissible leakage values should be determined through the permissible movements of hydraulically driven components (e.g. cylinders), in accordance with specific machinery operating directives or the relevant regulations.

ORIFICE CONFIGURATIONS

An orifice configuration should be chosen to ensure that, in general terms, a) the poppet velocity does not exceed 0.3 m/s, and b) that the flow capacity of the pilot valve is not exceeded. The following flow assumptions have been made:

Size 6 pilot valve: $Q_{max} = 20 \text{ l/min}$ (CSE Sizes 16-50)

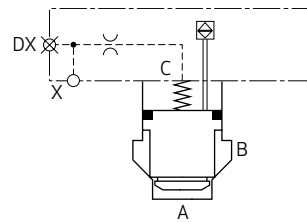
Size 10 pilot valve: $Q_{max} = 70 \text{ l/min}$ (CSE Size 63)

1D Function

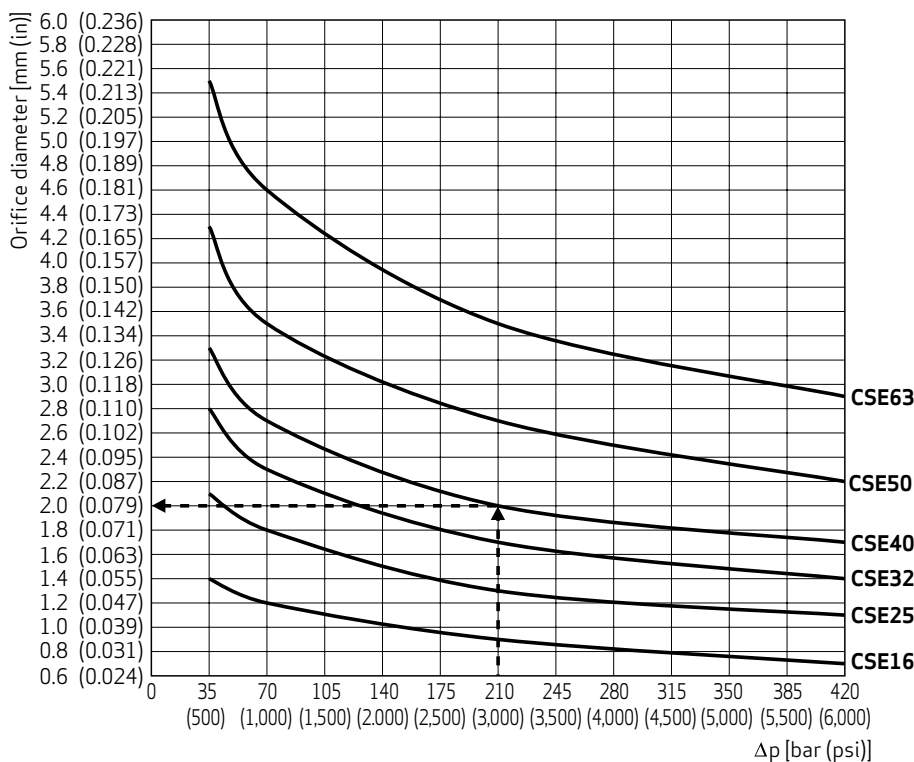
Example:

Both A and B ports have the same pressure, C is vented to tank and the valve opens.

For a size 40 valve and a working pressure of 210 bar this would result in the selection of a **2,0 mm orifice in DX**.



Standard Orifices CSE16-63 - 1D Function



Note: Examples are for reference only. Should the pressures in the working ports A and B and/or the flow capacities of the pilot valves be different from what is described here, then it will be necessary to calculate the orifices sizes separately.

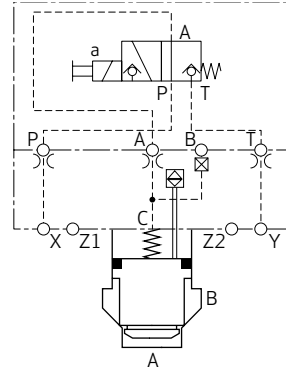
ORIFICE CONFIGURATIONS

RM and 5W Functions

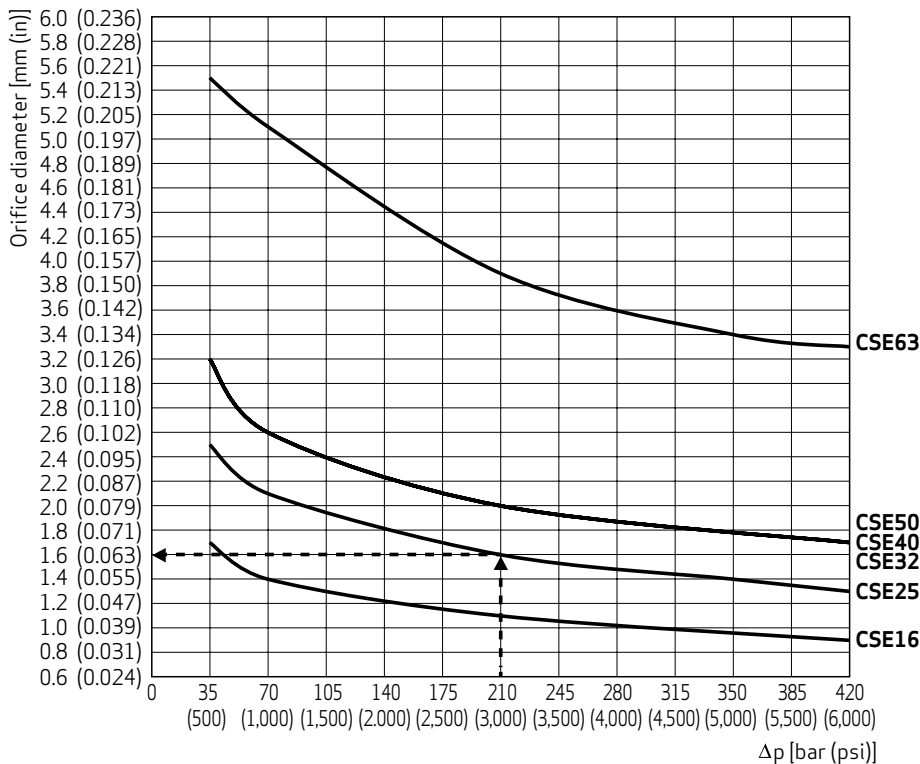
Example:

Both A and B ports have the same pressure, C is vented to tank and the valve opens.

For a size 25 valve and a working pressure of 210 bar this would result in a **1,6 mm orifice each for P, A & T**. In this case, B must be plugged as well.
 Note: plugs are not leakage-free.

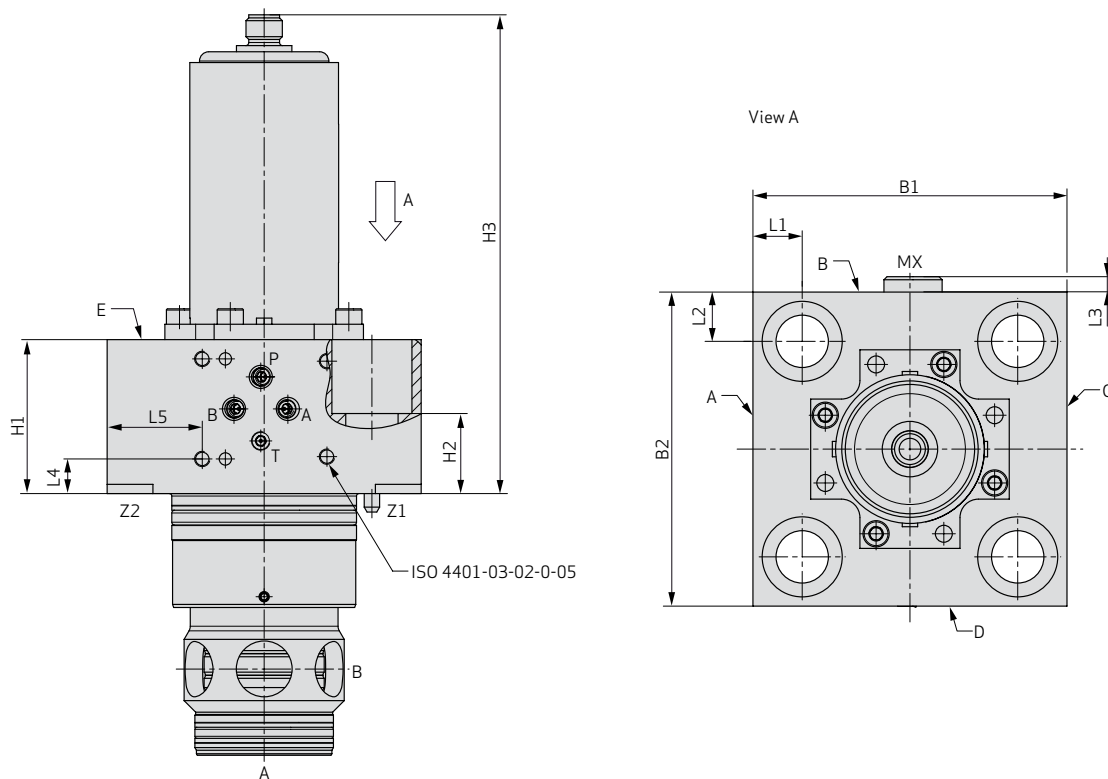


Standard Orifices CSE16-63 - RM/5W Function



Note: Examples are for reference only. Should the pressures in the working ports A and B and/or the flow capacities of the pilot valves be different from what is described here, then it will be necessary to calculate the orifices sizes separately.

VALVE DIMENSIONS - SIZES 16 - 50

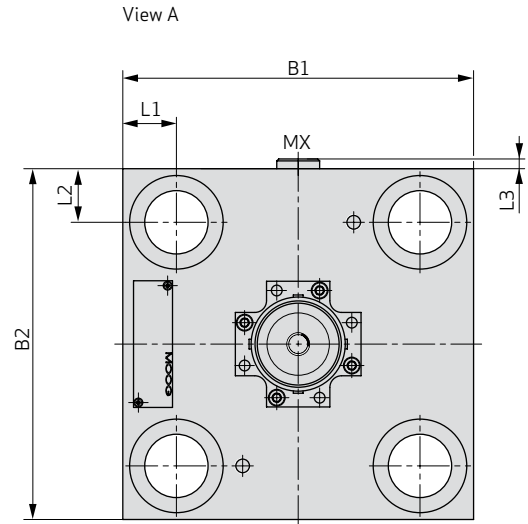
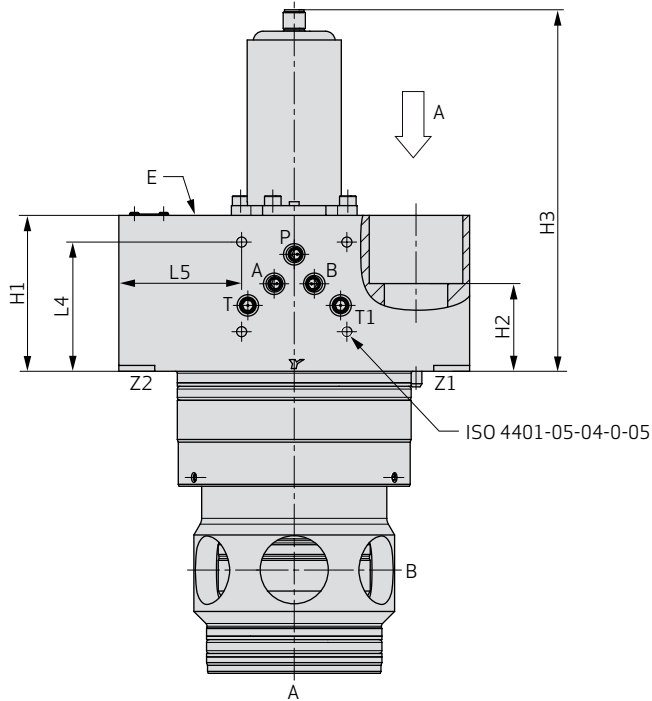


NG (cover type)	16 (1D)	16 (RM and 5W)	25 (1D)	25 (RM and 5W)	32	40	50
B1 [mm (in)]	65 (2.56)	65 (2.56)	85 (3.35)	85 (3.35)	102 (4.06)	125 (4.92)	140 (5.51)
B2 [mm (in)]	65 (2.56)	85 (3.35)	85 (3.35)	85 (3.35)	102 (4.06)	125 (4.92)	140 (5.51)
H1 [mm (in)]	35 (1.38)	50 (1.97)	35 (1.38)	50 (1.97)	50 (1.97)	60 (2.36)	60 (2.36)
H2 [mm (in)]	23 (0.91)	48 (1.89)	22 (0.87)	48 (1.89)	26 (1.02)	39 (1.54)	39 (1.54)
H3 [mm (in)]	140 (5.51)	156 (6.14)	140 (5.51)	156 (6.14)	156 (6.14)	166 (6.54)	166 (6.54)
L1 [mm (in)]	9.5 (0.37)	9.5 (0.37)	13.5 (0.53)	13.5 (0.53)	16 (0.63)	20 (0.79)	20 (0.79)
L2 [mm (in)]	9.5 (0.37)	19.5 (0.77)	13.5 (0.53)	13.5 (0.53)	16 (0.63)	20 (0.79)	20 (0.79)
L3 [mm (in)]	-	-	3.5 (0.14)	-	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)
L4 [mm (in)]	-	12.5 (0.49)	-	11.75 (0.46)	11.25 (0.44)	15.25 (0.60)	14.15 (0.57)
L5 [mm (in)]	-	13.5 (0.53)	-	22 (0.87)	30.9 (1.22)	43.5 (1.71)	53 (2.09)
MX (Access to orifice in X)	G 1/8"	-	G 1/8"	-	G 1/4"	G 1/4"	G 1/4"
Orifice Thread in X	M5	-	M6	-	M6	M8	M8
Orifice Thread in P,A,B,T	-	M6	-	M6	M6	M6	M6
DZ2¹⁾ (Access to orifice in Z)	-	-	-	-	G 1/8"	G 1/8"	G 1/8"
Orifice Thread in Z2)	-	M5	-	M6	M6	M6	M8
Name Plate Position	A	A	A	A	C	D	E
Screws	M8x35	M8x60	M12x40	M12x65	M16x50	M20x70	M20x70

Note: Dimensions in mm (in)

1) Only for 5W cover

VALVE DIMENSIONS - SIZE 63

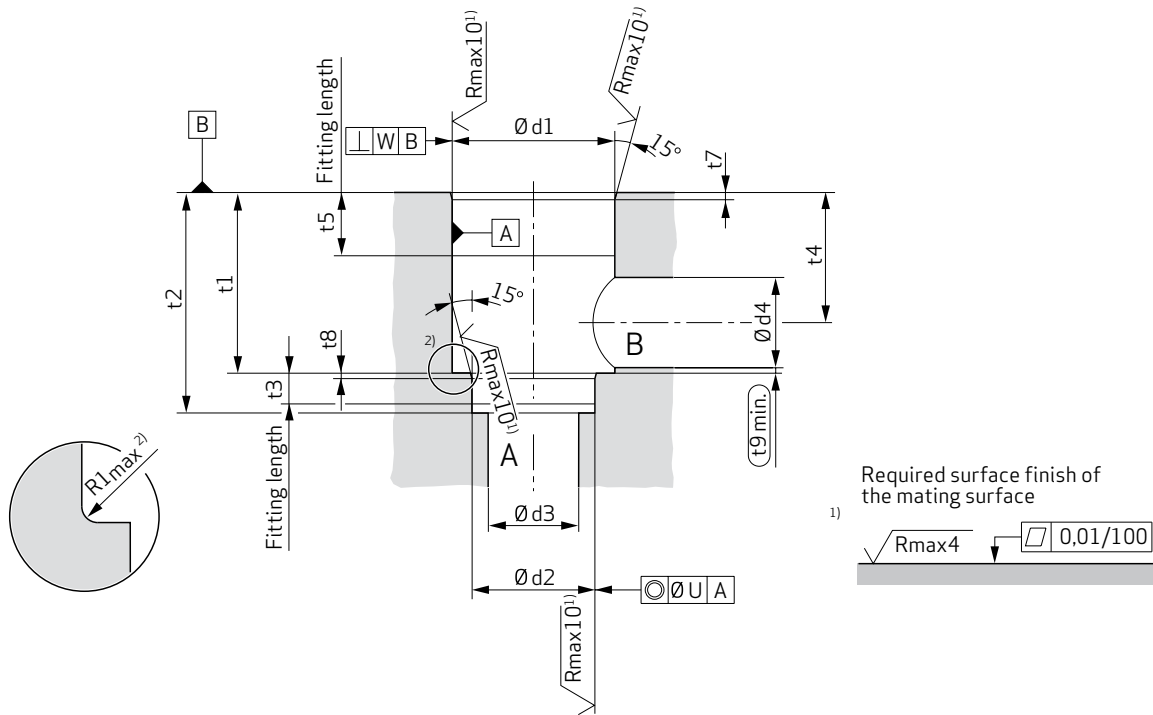


NG (cover type)	63 (1D)	63 (RM and 5W)
B1 [mm (in)]	180 (7.09)	180 (7.09)
B2 [mm (in)]	180 (7.09)	180 (7.09)
H1 [mm (in)]	80 (3.15)	80 (3.15)
H2 [mm (in)]	45 (1.77)	45 (1.77)
H3 [mm (in)]	186 (7.32)	186 (7.32)
L1 [mm (in)]	27.5 (1.08)	27.5 (1.08)
L2 [mm (in)]	27.5 (1.08)	27.5 (1.08)
L3 [mm (in)]	4.5 (0.18)	-
L4 [mm (in)]	-	66.3 (2.61)
L5 [mm (in)]	-	63 (2.48)
MX (Access to orifice in X)	G 3/8"	-
Orifice Thread in X	M10	-
Orifice Thread in P, A, B, T	-	M10
DZ2¹⁾ (Access to orifice in Z2)	-	G 1/4"
Orifice Thread in Z2¹⁾	-	M10
Name Plate Position	E	E
Screws	M30x90	M30x90

Note: Dimensions in mm (in)

1) Only for 5W cover

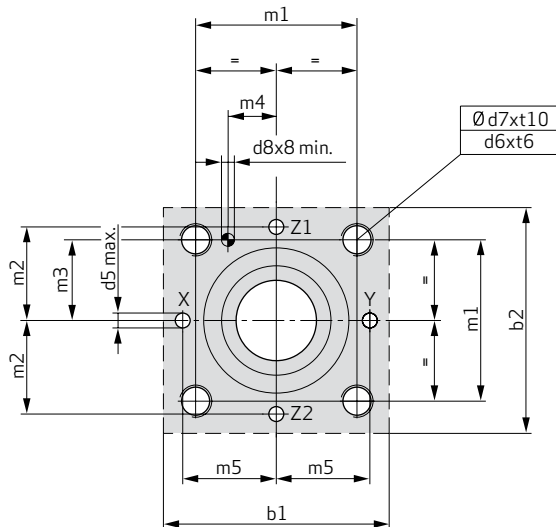
CAVITY DIMENSIONS - ISO 7368



- 1) Recommended value deviates from the ISO standard.
- 2) Moog recommends the following for operating pressures higher than 350 bar:
 - Radius of R2 mm for sizes 16 - 32
 - Radius of R4 mm for sizes 40 - 63.

Bolt and Port Pattern

Sizes 16 - 63



Note: Dimensions in mm

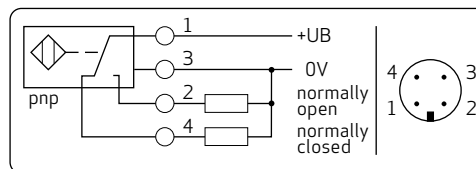
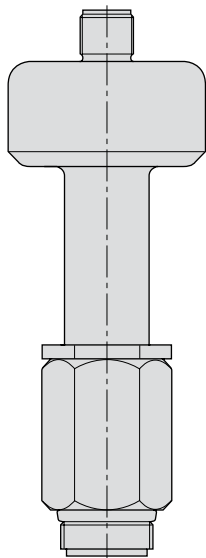
CAVITY DIMENSIONS - ISO 7368

ND	16 mm	25 mm	32 mm	40 mm	50 mm	63 mm
b1	65 (2.56)	85 (3.35)	102 (4.02)	125 (4.92)	140 (5.51)	200 (7.78)
b2	65 (2.56)	85 (3.35)	102 (4.02)	125 (4.92)	140 (5.51)	180 (7.09)
d1 ^{H7 1)}	32 (1.26)	45 (1.77)	60 (2.36)	75 (2.95)	90 (3.54)	120 (4.72)
d2 ^{H7 1)}	25 (0.98)	34 (1.34)	45 (1.77)	55 (2.17)	68 (2.68)	90 (3.54)
d3	16 (0.63)	25 (0.98)	32 (1.26)	40 (1.57)	50 (1.97)	63 (2.48)
d4	16 (0.63)	25 (0.98)	32 (1.26)	40 (1.57)	50 (1.97)	63 (2.48)
d4 _{max.} ¹⁾	25 (0.98)	32 (1.26)	40 (1.57)	50 (1.97)	63 (2.48)	80 (3.15)
d5 _{max.}	4 (0.16)	6 (0.24)	8 (0.31)	10 (0.39)	10 (0.39)	12 (0.47)
d6	M8	M12	M16	M20	M20	M30
d7	6.8 (0.27)	10.2 (0.4)	14 (0.55)	17.5 (0.69)	17.5 (0.69)	26.5 (1.04)
d8 ^{H13}	4 (0.16)	6 (0.24)	6 (0.24)	6 (0.24)	8 (0.31)	8 (0.31)
m1 ^{±0.2 (±0.01)}	46 (1.81)	58 (2.28)	70 (2.76)	85 (3.35)	100 (3.94)	125 (4.92)
m2 ^{±0.2 (±0.01)}	25 (0.98)	33 (1.3)	41 (1.61)	50 (1.97)	58 (2.28)	75 (2.95)
m3 ^{±0.2 (±0.01)}	23 (0.91)	29 (1.14)	35 (1.38)	42.5 (1.67)	50 (1.97)	62.5 (2.46)
m4 ^{±0.2 (±0.01)}	10.5 (0.41)	16 (0.63)	17 (0.67)	23 (0.91)	30 (1.18)	38 (1.5)
m5 ^{±0.2 (±0.01)}	25 (0.98)	33 (1.3)	41 (1.61)	50 (1.97)	58 (2.28)	75 (2.95)
t1 ⁺¹	43 (1.69)	58 (2.28)	70 (2.76)	87 (3.43)	100 (3.94)	130 (5.12)
t2 ⁺¹	56 (2.2)	72 (2.83)	85 (3.35)	105 (4.13)	122 (4.8)	155 (6.1)
t3	11 (0.43)	12 (0.47)	13 (0.51)	15 (0.59)	17 (2.83)	20 (0.79)
t4	34 (1.34)	44 (1.73)	52 (2.05)	64 (2.52)	72 (2.83)	95 (3.74)
t4 at d4 _{max.} ¹⁾	29.5 (1.16)	40.5 (1.59)	48 (1.89)	59 (2.32)	65.5 (2.58)	86.5 (3.41)
t5	20 (0.79)	30 (1.18)	30 (1.18)	30 (1.18)	35 (1.38)	40 (1.57)
t6	14 (0.55)	20 (0.79)	26 (1.02)	33 (1.3)	33 (1.3)	50 (1.97)
t7	2 (0.08)	2.5 (0.1)	2.5 (0.1)	3 (0.12)	4 (0.16)	4 (0.16)
t8	2 (0.08)	2.5 (0.1)	2.5 (0.1)	3 (0.12)	4 (0.16)	4 (0.16)
t9	0.5 (0.02)	1.0 (0.04)	1.5 (0.06)	2.5 (0.1)	2.5 (0.1)	3 (0.12)
t10	17 (0.67)	24 (0.94)	31 (1.22)	38 (1.5)	38 (1.5)	56 (2.2)
U	0.03 (0.001)	0.03 (0.001)	0.03 (0.001)	0.05 (0.002)	0.05 (0.002)	0.05 (0.002)
W	0.05 (0.002)	0.05 (0.002)	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)	0.2 (0.008)

Note: Dimensions in mm (in)

1) Recommendation deviates from Standard

TECHNICAL DATA - INDUCTIVE POSITION SWITCH



1: +24 V

2: Low signal when the valve is in the closed position.

3: 0 V

4: High signal when the valve is in the closed position.

- The limit switch has no PE connection.
- The connecting plug (M12) is not included in delivery (but can be ordered separately – see page 16).

Supply Voltage	$U_B = 24 \text{ VDC} \pm 20 \%$
Residual Ripple	Max. 10 %
Maximum Output Voltage	Min. $U_B - 2,5 \text{ V}$
Reverse Polarity Protection	Max. 300 V (PIN 1-3)
Maximum Consumption (without load current)	Max. 20 mA
Switching Point Hysteresis	Max. 0.06 mm
Repetitive Accuracy (at $T_u = 25 \text{ }^\circ\text{C}$)	$\pm 0.02 \text{ mm}$ (0.0007 in)
Temperature Drift	Typ. 0.002 mm/ $^\circ\text{C}$ (0.000078 in/ $^\circ\text{F}$)
Maximum Output Current	Max. 250 mA (100% duty cycle)
Leak Current at Blocked Output	Max. 0.01 mA
Outputs	High side, overload protected
Operating Temperature	-20 to +85 $^\circ\text{C}$ (-4 F to +185 $^\circ\text{F}$)
Vibration Tolerance	Sine, 20g (5 min), 40 up to 250 Hz (12 h)
Protection According to DIN 40050	IP 65 (with plug attached)
Compressive Strength of Sensor Tube	42 MPa (6,000 psi), dynamic
EMV (Electromagnetic Vulnerability)*	According to 89/336/EWG

*EMV rating is only ensured through the use of insulated cables and plug shielding

BASIC CONFIGURATIONS AND SEAL KITS

Basic Configurations ¹⁾ (NBR Seals)		
Function	Description	Order Number
1D	N-CSE16F6GX1UX3/1D	XSB10400-004N01
	N-CSE25F6GX1UX3/1D	XSB10401-004N01
	N-CSE32F6GX1UX3/1D	XSB10402-004N01
	N-CSE40F6GX1UX3/1D	XSB10403-004N01
	N-CSE50F6GX1UX3/1D	XSB10404-004N01
	N-CSE63F6GX1UX3/1D	XSB10405-004N01
RM	N-CSE16F6GX1UX0/RM	XSB10413-004N01
	N-CSE25F6GX1UX0/RM	XSB10414-004N01
	N-CSE32F6GX1UX0/RM	XSB10415-004N01
	N-CSE40F6GX1UX0/RM	XSB10416-004N01
	N-CSE50F6GX1UX0/RM	XSB10417-004N01
	N-CSE63F6GX1UX0/RM	XSB10418-004N01
5W	N-CSE16F6GX1UX0/5W	XSB10419-004N01
	N-CSE25F6GX1UX0/5W	XSB10420-004N01
	N-CSE32F6GX1UX0/5W	XSB10421-004N01
	N-CSE40F6GX1UX0/5W	XSB10422-004N01
	N-CSE50F6GX1UX0/5W	XSB10423-004N01
	N-CSE63F6GX1UX0/5W	XSB10424-004N01

1) Orifices can be ordered separately (see page 16)

Seal Kits (NBR Seals)		
Note: Seal kits contain only the seals that can be accessed from the exterior of the valves.		
Function	Description	Order Number
1D	Seal Kit N-CSE16F(K)6_/1D	XSB10400D000N00
	Seal Kit N-CSE25F(K)6_/1D	XSB10401D000N00
	Seal Kit N-CSE32F(K)6_/1D	XSB10402D000N00
	Seal Kit N-CSE40F(K)6_/1D	XSB10403D000N00
	Seal Kit N-CSE50F(K)6_/1D	XSB10404D000N00
	Seal Kit N-CSE63F(K)6_/1D	XSB10405D000N00
RM	Seal Kit N-CSE16F(K)6_/RM	XSB10413D000N00
	Seal Kit N-CSE25F(K)6_/RM	XSB10414D000N00
	Seal Kit N-CSE32F(K)6_/RM	XSB10415D000N00
	Seal Kit N-CSE40F(K)6_/RM	XSB10416D000N00
	Seal Kit N-CSE50F(K)6_/RM	XSB10417D000N00
	Seal Kit N-CSE63F(K)6_/RM	XSB10418D000N00
5W	Seal Kit N-CSE16F(K)6_/5W	XSB10419D000N00
	Seal Kit N-CSE25F(K)6_/5W	XSB10420D000N00
	Seal Kit N-CSE32F(K)6_/5W	XSB10421D000N00
	Seal Kit N-CSE40F(K)6_/5W	XSB10422D000N00
	Seal Kit N-CSE50F(K)6_/5W	XSB10423D000N00
	Seal Kit N-CSE63F(K)6_/5W	XSB10424D000N00

ACCESSORIES

Pilot Valves		
Size	Description	Order Number
6	3/2 Way Seat Valve	On Request
	4/2 Way Spool Valve	On Request
10	3/2 Way Seat Valve	On Request
	4/2 Way Spool Valve	On Request

Mounting Screws				
Size (Function)	Description	Hex key [mm]	Torque [Nm (lbf ft)]	Order Number
16 (1D)	ISO 4762-M8x35-12.9	6	30 (22)	X784-10818
16 (RM/5W)	ISO 4762-M8x60-12.9	6	30 (22)	X784-10805
25 (1D)	ISO 4762-M12x40-12.9	10	100 (74)	X784-11202
25 (RM/5W)	ISO 4762-M12x65-12.9	10	100 (74)	X784-11206
32	ISO 4762-M16x50-12.9	14	300 (221)	X784-11601
40	ISO 4762-M20x70-12.9	17	550 (406)	X784-12002
50	ISO 4762-M20x70-12.9	17	550 (406)	X784-12002
63	ISO 4762-M30x90-12.9	22	1,800 (1,328)	X784-13008

Orifices and Plugs			
M6 Orifices and Plugs	Order Number	M10 Orifices and Plugs	Order Number
Plug M6x6	CA37690-000	Plug M10x10	X784-91000
Orifice M6x6x0,7	CA37690-007	Orifice M10x10x2,9	X784-91029
Orifice M6x6x0,8	CA37690-008	Orifice M10x10x3,0	X784-91030
Orifice M6x6x0,9	CA37690-009	Orifice M10x10x3,2	X784-91032
Orifice M6x6x1,0	CA37690-010	Orifice M10x10x3,5	X784-91035
Orifice M6x6x1,2	CA37690-012	Orifice M10x10x4,0	X784-91040
Orifice M6x6x1,4	CA37690-014	Orifice M10x10x4,5	X784-91045
Orifice M6x6x1,5	CA37690-015	Orifice M10x10x5,0	X784-91050
Orifice M6x6x1,8	CA37690-018	Orifice M10x10x5,5	X784-91055
Orifice M6x6x2,0	CA37690-020	-	-
Orifice M6x6x2,4	CA37690-024	-	-
Orifice M6x6x3,0	CA37690-030	-	-

Right Angle Connector - M12 with Cable	
Description	Order Number
M12 Connector with 10 m Cable, 4 wire, unshielded, with function and operating voltage display (LED)	X798-00127

TYPE EXAMINATION CERTIFICATE

certificate
no. **HM 230026**
dated 2023-04-10



Translation In any case, the German original shall prevail.

DGUV Test Certificate

Name and address of the holder of the certificate: (customer) MOOG Luxembourg S.à.r.l.
421, Zone d'activités Economiques Wolser F
3290 BETTEMBOURG
LUXEMBOURG

Product designation: **Cartridge valve in compliance with ISO 7368**

Type: CSE NG K6 GO 1 YX0 mit NG16, 25, 32, 40, 50, 63
CSE NG K6 GX 1 YX0 mit NG16, 25, 32, 40, 50, 63
Y: spring-type, X: control oil ports, O: without pilot valve

Testing based on: GS-HM-23: "Injection moulding machines", 2023-01
DIN EN ISO 20430 "Plastics and rubber machines - Injection moulding machines - Safety requirements"

Test report: No. 2023-0001 of 2023-03-31

Further details: Intended use: To be used for hydraulic locking systems in injection moulding machines in accordance with the manufacturer's installation instructions.
Remarks: The respective valve is to be controlled automatically by the machine control system in accordance with section 4 of EN ISO 20430, so that a new machine cycle cannot be initiated even if the positions switch fails. The valve is set by the manufacturer and may only be replaced completely.
Follow-up certificate of HSM 18004 of 2018-04-10.

The type tested meets the requirements specified in article 3 para. 1 of the German Product Safety Act. Thus, the type tested also complies with the provisions laid down in the directive 2006/42/EC (**Machinery**). The holder of the certificate is entitled to affix the DGUV Test mark shown overleaf to the products complying with the type tested.
The present certificate including the right to affix the DGUV Test mark is valid until: **2028-04-09**

Further provisions concerning the validity, the extension of the validity and other conditions are laid down in the Rules of Procedure for Testing and Certification.



TYPE EXAMINATION CERTIFICATE

Zertifikat
Nr. **HM 230026**
vom 10.04.2023



DGUV Test Zertifikat

Name und Anschrift des Zertifikatsinhabers: (Auftraggeber) MOOG Luxembourg S.à.r.l.
421, Zone d'activités Economiques Wolser F
3290 BETTEMBOURG
LUXEMBURG

Produktbezeichnung: **Cartridgeventil nach ISO 7368**

Typ: CSE NG K6 GO 1 YX0 mit NG16, 25, 32, 40, 50, 63
CSE NG K6 GX 1 YX0 mit NG16, 25, 32, 40, 50, 63
Y: Federtyp, X: Steuerölanschlüsse, O: Ohne Vorsteuerventil

Prüfgrundlage: GS-HM-23: "Spritzgießmaschinen", 2023-01
DIN EN ISO 20430 "Gummi- und Kunststoffmaschinen - Spritzgießmaschinen - Sicherheitsanforderungen"

Zugehöriger Prüfbericht: Nr. 2023-0001 vom 31.03.2023

Weitere Angaben: Bestimmungsgemäße Verwendung: Zur Verwendung für hydraulische Schließicherungen in Spritzgießmaschinen gemäß Herstellereinbauanleitung.
Bemerkungen: Das jeweilige Ventil ist gemäß Kapitel 4 der DIN EN ISO 20430 von der Steuerung der Maschine selbsttätig zu überwachen, so dass auch bei Versagen des Positionsschalters ein erneuter Maschinenzyklus nicht mehr eingeleitet werden kann. Das Ventil ist vom Hersteller eingestellt und darf nur vollständig getauscht werden.
Nachfolgezertifikat zu Nr. HSM 18004 vom 10.04.2018.

Das geprüfte Baumuster stimmt mit den in § 3 Absatz 1 des Produktsicherheitsgesetzes genannten Anforderungen überein. Das Baumuster entspricht somit auch den einschlägigen Bestimmungen der Richtlinie 2006/42/EG (**Maschinen**). Der Zertifikatsinhaber ist berechtigt, das umseitig abgebildete DGUV Test-Zeichen an den mit dem geprüften Baumuster übereinstimmenden Produkten anzubringen.

Dieses Zertifikat einschließlich der Berechtigung zur Anbringung des DGUV Test-Zeichens ist gültig bis: **09.04.2028**

Weiteres über die Gültigkeit, eine Gültigkeitsverlängerung und andere Bedingungen regelt die Prüf- und Zertifizierungsordnung.


Dipl.-Ing. Jan Stegmann
Leiter Zertifizierung



ABOUT MOOG

Moog Inc. is a worldwide designer, manufacturer and integrator of precision control components and systems. Moog's Industrial Group designs and manufactures high performance motion control solutions combining electric, hydraulic, and hybrid technologies with expert consultative support in a range of applications including energy production and generation machinery, industrial production machinery and simulation and test equipment. We help performance-driven companies design and develop their next-generation machines. Moog Industrial Group, with sales of US\$843 million during the 2017 business year and more than 40 locations worldwide, is part of Moog Inc. (NYSE: MOG.A and MOG.B) with sales of US\$2.5 billion.

This vast scope ensures that our engineers remain close to the needs of machine builders, and provide flexible design solutions and technical expertise tailored to our customers' toughest challenges.

Moog experts work in close collaboration with machine builders and application engineers to design motion control systems for greater productivity, higher reliability, superior connectivity, less costly maintenance and more effective operations. Our regional presence, industry knowledge and design flexibility ensures Moog motion control solutions are tailored to their environment — from meeting operating regulations and performance standards, to taking machine performance to a higher level.

Products

At the heart of every Moog solution is an array of products engineered for precision, high performance and reliability. For more than six decades, Moog products have been specified for critical machine applications.

Some are developed specifically for unique operating environments. Others are standard equipment on machines across many industries. All are continuously improved to take advantage of the latest technology breakthroughs and advancements.

Moog products include:

- Servo Valves and Proportional Valves
- Servo Motors and Servo Drives
- Servo Controllers and Software
- Radial Piston Pumps
- Actuators
- Integrated Hydraulic Manifold Systems and Cartridge Valves
- Slip Rings
- Motion Bases



Servo Valves



Servo Cartridge Valves



Radial Piston Pumps



Servo Drives

ABOUT MOOG

Solutions

Hydraulic Solutions

Since Bill Moog invented the first commercially viable servo valve in 1951, Moog has set the standard for world-class hydraulic technology. Today, Moog products are used in a variety of applications - providing high power, enhanced productivity and ever better performance for some of the worlds most demanding applications.

Electric Solutions

Clean operation, low noise generation, less maintenance and reduced power consumption make Moog electric solutions ideal for applications worldwide. Moog is the ideal partner for applications where transitioning technologies requires special expertise.

Hybrid Solutions

By incorporating the advantages of existing hydraulic and electric technologies - including modular flexibility, increased efficiency and cleanliness - into innovative hybrid solutions, Moog offers new performance potential in specialized applications.

Moog Global Support

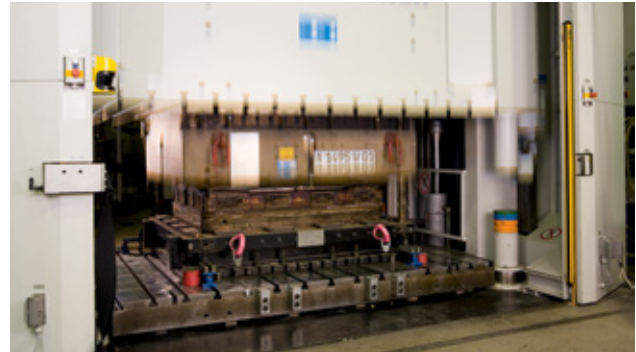
Moog Global Support is our promise to offer world-class Repair and Maintenance Services delivered expertly by our trained technicians. With the reliability only available from a leading manufacturer with facilities around the world, Moog offers you service and expertise you can count on to keep your equipment operating as it should.

This promise offers many benefits to our customers including:

- Reduce your downtime by keeping critical machines running in peak performance
- Protect your investment by ensuring reliability, versatility and long-life of products
- Better plan your maintenance activities and make systematic upgrades
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- Repair services using OEM parts are performed by trained technicians to the latest specifications
- Stock management of spare parts and products to prevent unplanned downtime



Press



Injection Molding Machine

- Flexible programs, tailored to your needs such as upgrades, preventative maintenance and annual/multi-year contracts
- On-site services bring the expertise to you, providing quicker commissioning, set-up and diagnostics
- Access to reliable services that are guaranteed to offer consistent quality anywhere in the world

For more information on Moog Global Support visit www.moog.com/industrial/service.



NOTES

NOTES

ORDERING CODE AND SPRING OPENING PRESSURES

Type designation

1 2 3 4 5 6 7 8 9 10 11
 - CSE K 6 G X 1 U X / ...

1 Seal materials

N	NBR (Standard)
V	FKM

2 Valve type

CSE	2-Way-Cartridge Valve with Electrical Position Monitoring
-----	---

3 Size

16	ISO 7368-06-1-1-16
25	ISO 7368-08-3-1-16
32	ISO 7368-09-5-1-16
40	ISO 7368-10-7-1-16
50	ISO 7368-11-9-1-16
63	ISO 7368-12-11-1-16

4 Series

F*	350 bar (5,000 psi)
K**	420 bar (6,000 psi)

5 Manifold interface

6	ISO 7368
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6 Poppet type

GX	Poppet with shaft seal
----	------------------------

11 Options

1D	Control cover with 1D-Function
RM	Control cover with RM-Function
5W	Control cover with 5W-Function
...	Orifice diameter is given in 1/10 of mm, eg. X12 = 1,2 mm orifice in X

10 Pilot valve

0	Without pilot valve (Pilot valves to order separately)
3	Externally hydraulically operated (only 1D function)

9 Pilot oil supply

X	Through cover interface
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8 Valve spring

U	4 bar
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7 Poppet area ratio

1	Standard 1 : 1,5
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* Series F without approval of the German Accident Prevention and Insurance Association (DGUV)

** Available from Mai 2019

Other configurations on request.

Spring Opening Pressures [bar]

Flow Direction A⇨B						
Spring	Size 16	Size 25	Size 32	Size 40	Size 50	Size 63
U	3.8	4.2	4.0	4.0	4.0	4.0

Flow Direction B⇨A						
Spring	Size 16	Size 25	Size 32	Size 40	Size 50	Size 63
U	7.6	8.3	7.9	8.1	8.0	8.1

MORE PRODUCTS. MORE SUPPORT.

Moog designs a range of motion control products to complement those featured in this document. Moog also provides service and support for all of our products. For more information, contact the Moog facility closest to you.

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CSE_K6-1-EN-2-Way Cartridges monitored - CD55522-001-B-06-2023