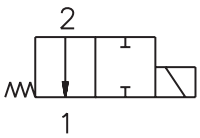
2/2 Way Solenoid Operated Directional Control Valves Spool Type SD2E-A2

3/4-16 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 30 L/min (7.9 GPM)

HA 4040
1/2005



- ❑ **2/2 Way cartridge valves solenoid operated with spool direction**
- ❑ **Manual override**
- ❑ **No spool sticking by too a high tightening torque**
- ❑ **High transmitted power**

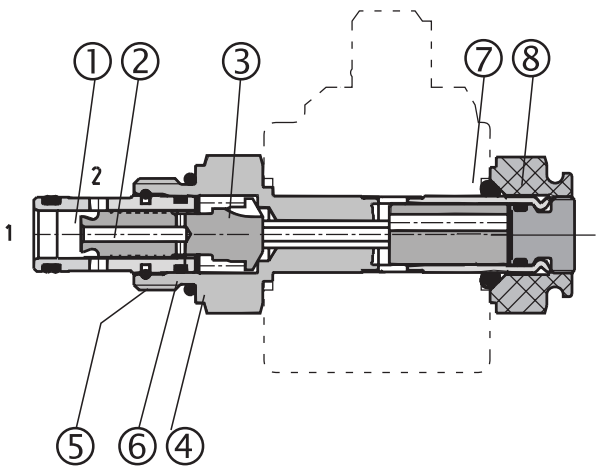
Functional Description

The directly operated 2/2-Way solenoid actuated spool valve controls in the first line the start and stop function of the oil flow. The valve consists of the valve body (1), control spool (2), return spring (3), cartridge with actuating system (4) and of the solenoid coil (7) that is mounted on the actuating system. The valve bushing is screwed into the cartridge part (4).
The valve bushing is fixed in the cartridge by a wire ring (5) and sealed with the seal ring (6). Separation of the valve bushing and the cartridge prevent transmitting the stresses, which could be caused by too high tightening torques. The DC solenoid coils can be delivered for 12 V and 24 V supply voltages. For AC applications 120 V/ 60 Hz or 230 V/ 50 Hz, the suitable rectifiers for the standard solenoid coils are available, with them being mounted in an additional terminal box. With the high power solenoid coils in AC variants, the rectifiers are integrated directly in the connector. By loosening the fixing nut (8), the solenoid coil can be replaced or turned in the range of 360°. The valve body is zinc coated.

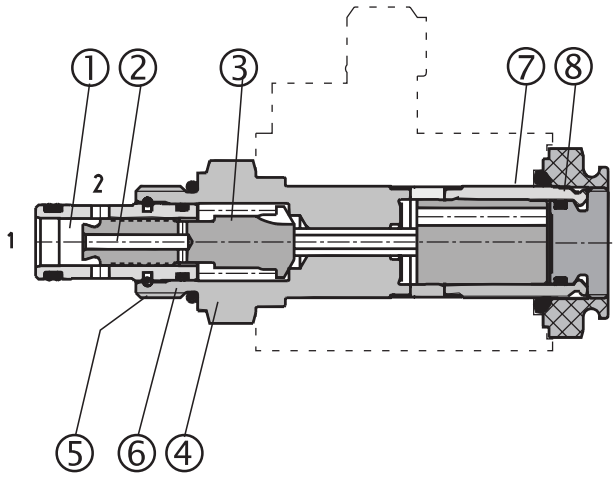
Note:
The valves are supplied without solenoids coils. The solenoid coil, the terminal box and the housing body for line mounting have to be ordered separately.

Cartridge Valve

Standard performance



High performance



Ordering Code

SD2E-A2 / □ □ □ □

2/2 Way Solenoid Operated Directional Control Valves

Standard **S**
High performance **H**

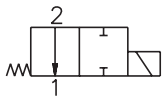
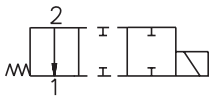
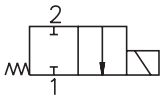
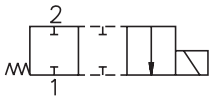
Description
Refer to the table with functional symbols

Manual override
Push button **N1**
Socket head screw **N2**
Without manual override **No designation**

Polyurethan, Viton **V**
Polyurethan, NBR **No designation**

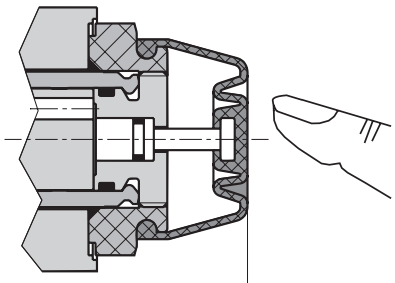
Solenoid coil, terminal box and body for line mounting have to be ordered separately.

Functional Symbols

Designation	Symbol	Interposition	Designation	Symbol	Interposition
2111			2112		

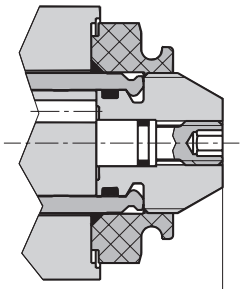
Manual Override

Dimensions in millimeters (inches)



Standard valve ~75.5(2.972)
High performance valve ~81.5(3.209)

N1- manual override by pushing



Standard valve ~71.5(2.815)
High performance valve ~77.5(3.051)

N2- manual override with socket head screw 2.5 (0.098)

Technical Data

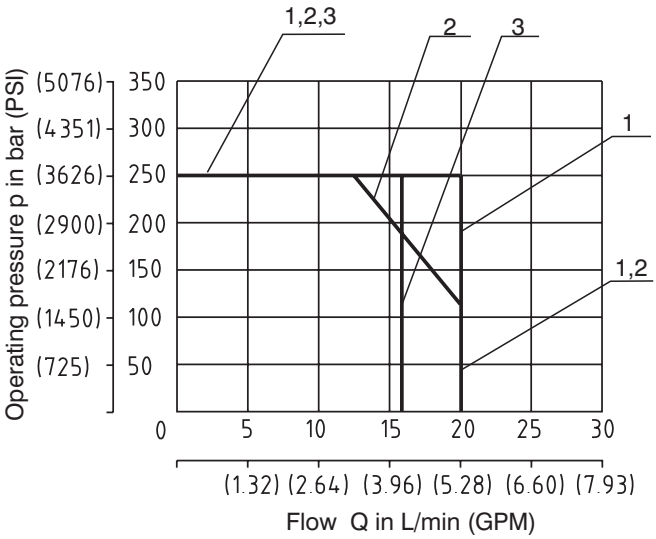
		Standard	High performance
Cartridge thread		3/4-16 UNF-2B	
Maximum flow	L/min (GPM)	20 (5.3)	30 (7.9)
Max. operating pressure	bar (PSI)	250 (3626)	350 (5076)
Pressure drop	bar (PSI)	see Δp-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP - RP 91H in viscosity classes ISO VG 32, 46 and 68	
Coil gronps (see the datasheet of coils)		C 51-26	C 04-20
Fluid temperature range	°C (°F)	-20 ... 60 (-4 ... 140)	-20 ... 80 (-4 ...176)
Ambient temperature, max.	°C (°F)	-20 ... 50 (-4 ...122)	-20 ... 80 (-4 ... 176)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)	
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999).	
Permissible rated voltage variation	%	AC,DC ±10	AC,DC ±15
Max. switching frequency	1/h	15 000	
Duty cycle	%	100	
Service life	cycles	10^7	
Weight	kg(lbs)	0.10 (0.22)	0.20 (0.44)
Maximum valve tightening torque	Nm (lbf.ft)	30+2 (22.127+1.475)	
Maximum plastic nut tightening torque	Nm (lbf.ft)	3+1 (2.213+0.738)	5+1 (3.688+0.738)
Mounting position		optional	

p-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

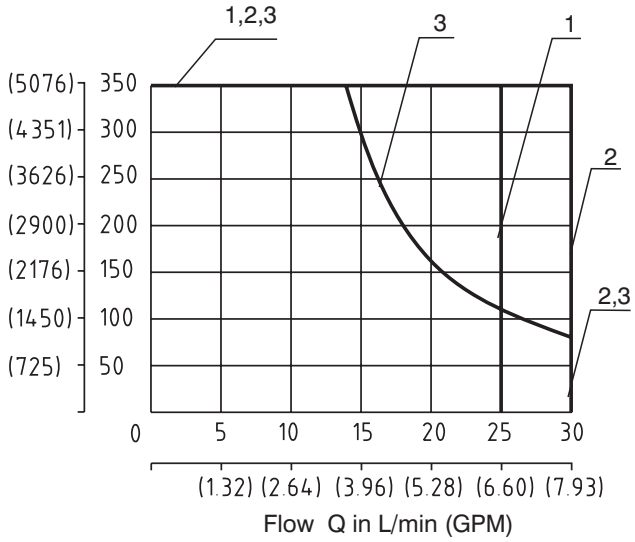
Operating limits for hydraulic power transferred by the directional valve. For respective spool type - see functional symbols.

Standard valve
Oil 60 °C(140 °F) / Ambient temperature 40 °C (104 °F)
Voltage Un [V]



	Connection	Direction
1	2I11	2→1
1	2I12	1→2
2	2I11	1→2
3	2I12	2→1

High performance valve
Oil 80 °C (176 °F) / Ambient temperature 50 °C (122 °F)
Voltage Un -10% [V]



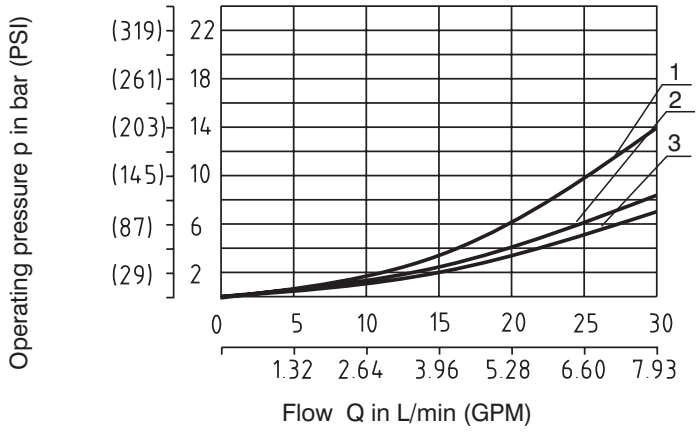
	Connection	Direction
1	2I12	2→1
2	2I12	1→2
2	2I11	2→1
3	2I11	1→2

Δp-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

Pressure drops related to flow rate.

Standard valve + High performance valve

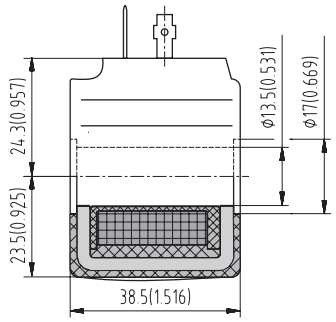


	Connection	Direction
1	2I12	1→2
1	2I12	2→1
2	2I11	1→2
3	2I11	2→1

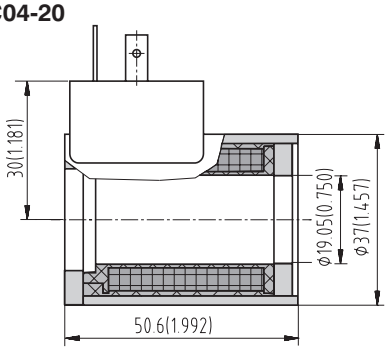
Type of the Solenoid Coils

Dimensions in millimeters (inches)

Coil for Standard valve
C51-26



Coil for High performance valve
C04-20



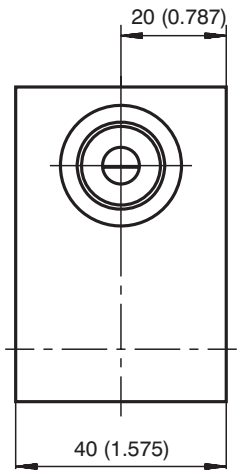
Solenoid	Connector	Standard valve SD2E-A2 / **S...** Type code	High performance valve SD2E-A2 / **H...** Type code
12 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-012DC-E2	C04-20-012DC-E2
24 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-024DC-E2	C04-20-024DC-E2
12 VDC	AMP (with quenching diode)	C51-26-012DC-E4	C04-20-012DC-E4
24 VDC	AMP (with quenching diode)	C51-26-024DC-E4	C04-20-024DC-E4
120 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-120AC-E5
230 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-230AC-E5
120 VAC	EN 175301-803-A (DIN 43 650)	C51-26-105DC-E1*	C04-20-105DC-E1*
230 VAC	EN 175301-803-A (DIN 43 650)	C51-26-205DC-E1*	C04-20-205DC-E1*

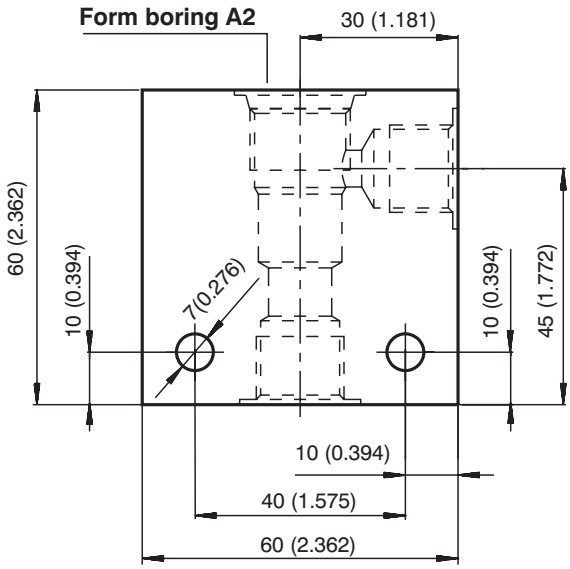
Note: *Use the terminal box with rectifier!

- For other voltages, connector variants, quenching diodes or rectifiers refer to Coil data sheet HA 8007
- Coil size for Standard valve: C51-26
- Coil size for High performance valve: C04-20

Valve Body

Dimensions in millimeters (inches)





Body material	Connecting size	Type code	Operating pressures
Steel	G3/8	SB-A2-0103ST	420 bar (6091 PSI)
Steel	SAE 6	SB-A2-0102ST	420 bar (6091 PSI)
Aluminium	G3/8	SB-A2-0103AL	250 bar (3626 PSI)
Aluminium	SAE 6	SB-A2-0102AL	250 bar (3626 PSI)

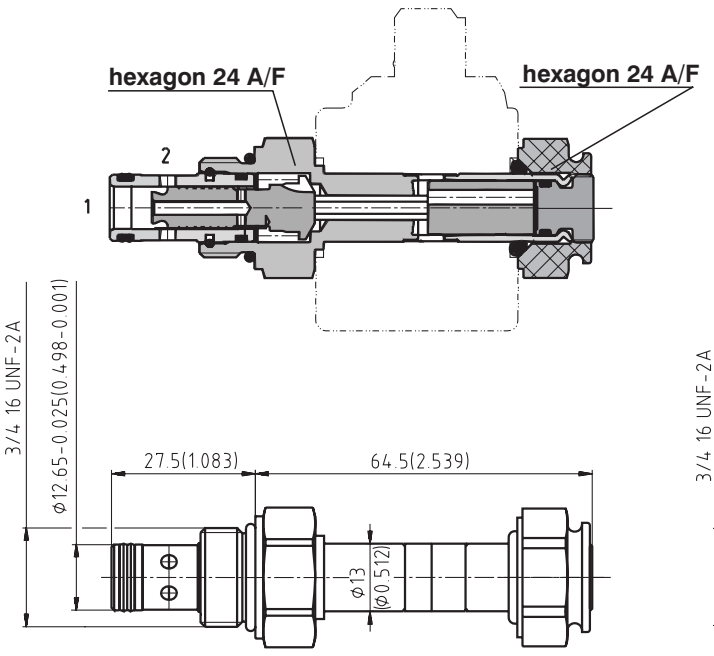
Note:

- For detailed valve body ordering code refer to data sheet HA 0018

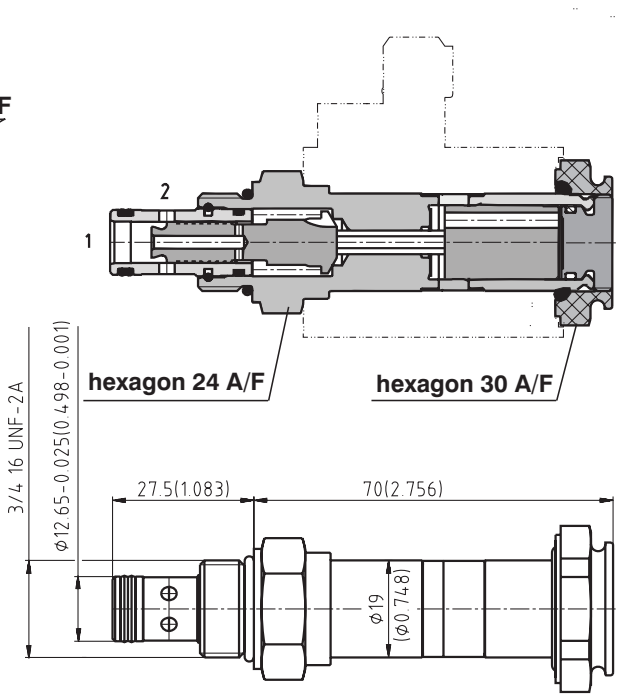
Valve Dimensions

Dimensions in millimeters (inches)

Standard valve

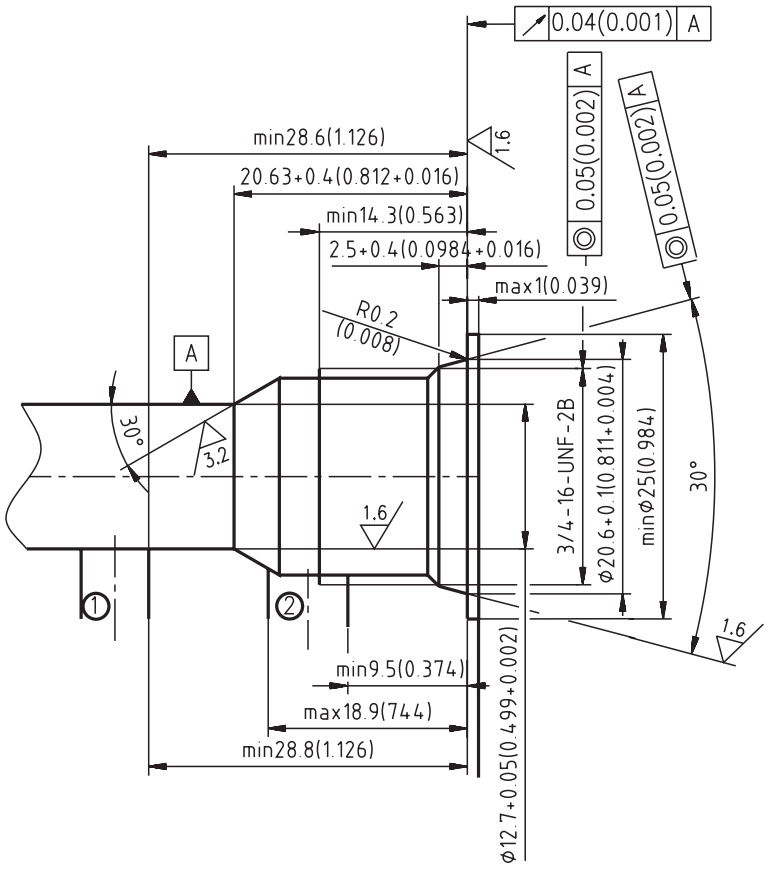


High performance valve



Insatallation Cavity

Dimensions in millimeters (inches)



Spare Parts

Dimensions in millimeters

Standard and high performance valve

Dualseal - PU	O-ring - NBR	O-ring - Viton	Order number
10,3 x 12,7 x 3,1 (1pc.)	17 x 1,8 (1pc.)	-	408-9001
10,3 x 12,7 x 3,1 (1pc.)	-	17,17 x 1,78 (1pc.)	408-9002

Soenoid retaining nut with seal for standard valve

Type of nut	O-ring - Viton	
Standard nut	12,3 x 2,4 (1pc.)	408-9003
Nut N1	12,3 x 2,4 (1pc.)	408-9010

Solenoid retaining nut with seal for high performance valve

Type of nut	O-ring - Viton	
Standard nut	20 x 2,5 (1pc.)	408-9004
Nut N1	20 x 2,5 (1pc.)	408-9011

Caution!

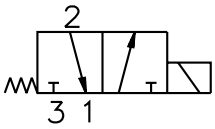
- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

ARGO-HYTOS a. s. CZ - 543 15 Vrchlabí
Tel.: +420-499-403111, Fax: +420-499-403421
E-mail: sales.cz@argo-hytos.com
www.argo-hytos.com

3/2 Way Solenoid Operated Directional Control Valves Spool Type SD2E-A3

3/4-16 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 30 L/min (7.9 GPM)

HA 4041
2/2005



- ❑ **3/2 Way cartridge valves solenoid operated with spool direction**
- ❑ **Manual override**
- ❑ **No spool sticking by too a high tightening torque**
- ❑ **High transmitted power**

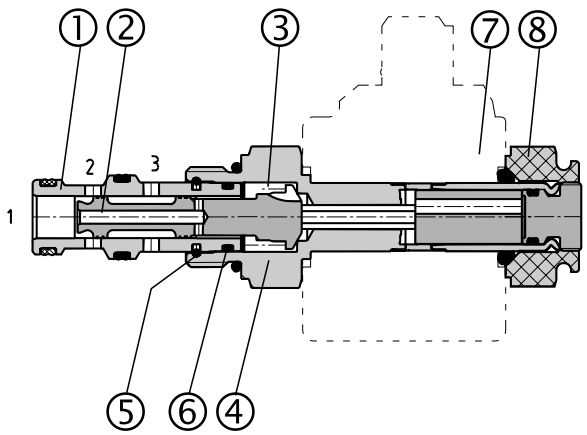
Functional Description

The directly operated 3/2-Way solenoid actuated spool valve controls in the first line the start and stop function of the oil flow. The valve consists of the valve body (1), control spool (2), return spring (3), cartridge with actuating system (4) and of the solenoid coil (7) that is mounted on the actuating system. The valve bushing is screwed into the cartridge part (4).
The valve bushing is fixed in the cartridge by a wire ring (5) and sealed with the seal ring (6). Separation of the valve bushing and the cartridge prevent transmitting the stresses, which could be caused by too high tightening torques. The DC solenoid coils can be delivered for 12 V and 24 V supply voltages. For AC applications 120 V/ 60 Hz or 230 V/ 50 Hz, the suitable rectifiers for the standard solenoid coils are available, with them being mounted in an additional terminal box. With the high power solenoid coils in AC variants, the rectifiers are integrated directly in the connector. By loosening the fixing nut (8), the solenoid coil can be replaced or turned in the range of 360°. The valve body is zinc coated.

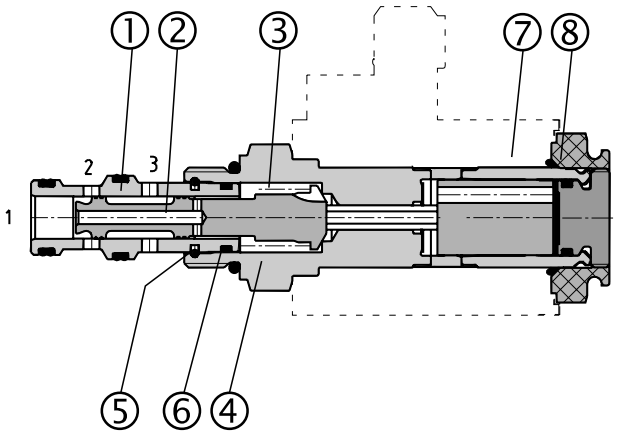
Note:
The valves are supplied without solenoids coils. The solenoid coil, the terminal box and the housing body for line mounting have to be ordered separately.

Cartridge Valve

Standard performance



High performance



Ordering Code

SD2E-A3 / □ □ □ □

3/2 Way Solenoid Operated Directional Control Valve

Standard **S**
High performance **H**

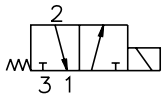
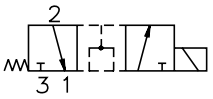
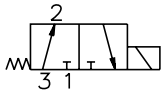
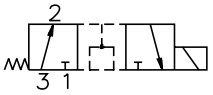
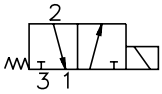
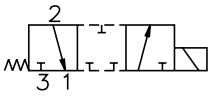
Description
Refer to the table with functional symbols

Polyurethan, Viton **V**
Polyurethan, NBR **No designation**

Manual override
Push button **N1**
Socket head screw **N2**
Without manual override **No designation**

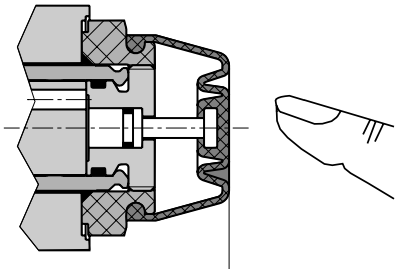
Solenoid coil, terminal box and body for line mounting have to be ordered separately.

Functional Symbols

Designation	Symbol	Interposition	Designation	Symbol	Interposition
2D21			2D26		
2D25					

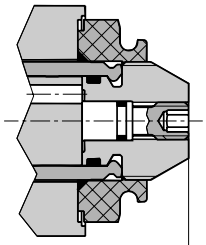
Manual Override

Dimensions in millimeters (inches)



Standard valve ~75.5(2.972)
High performance valve ~81.5(3.209)

N1- manual override by pushing



Standard valve ~71.5(2.815)
High performance valve ~77.5(3.051)

N2- manual override with socket head screw 2.5(0.098)

Technical Data

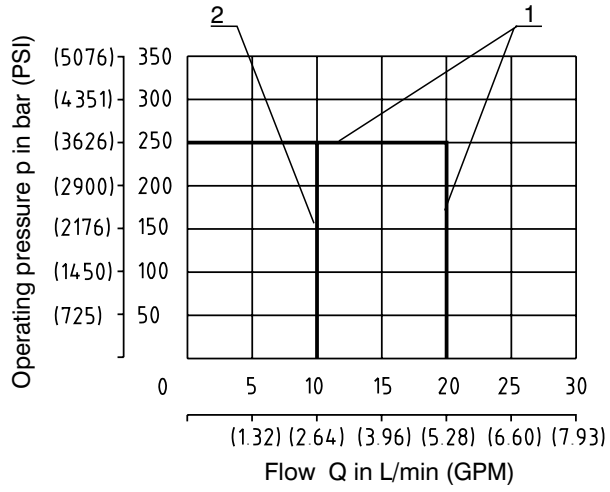
		Standard	High performance
Cartridge thread		3/4-16 UNF- 2B	
Maximum flow	L/min (GPM)	20 (5.3)	30 (7.9)
Max. operating pressure	bar (PSI)	250 (3626)	350 (5076)
Pressure drop	bar (PSI)	see Δp-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP - RP 91H in viscosity classes ISO VG 32, 46 and 68	
Coil groups (see the datasheet of coils)		C 51-26	C 04-20
Fluid temperature range	°C (°F)	-20 ... 60 (-4 ... 140)	-20 ... 80 (-4 ...176)
Ambient temperature, max.	°C (°F)	-20 ... 50 (-4 ... 122)	-20 ... 80 (-4 ...176)
Viscosity range	mm^2/s (SUS)	10 ... 500 (149 ... 2450)	
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999).	
Permissible rated voltage variation	%	AC,DC ±10	AC,DC ±15
Max. switching frequency	1/h	15 000	
Duty cycle	%	100	
Service life	cycles	10^7	
Weight	kg (lbs)	0.15 (0.33)	0.20 (0.44)
Maximum valve tightening torque	Nm (lbf.ft)	30 +2 (22.127+1.475)	
Maximum plastic nut tightening torque	Nm (lbf.ft)	3+1 (2.213+0.738)	5+1 (3.688+0.738)
Mounting position		optional	

p-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

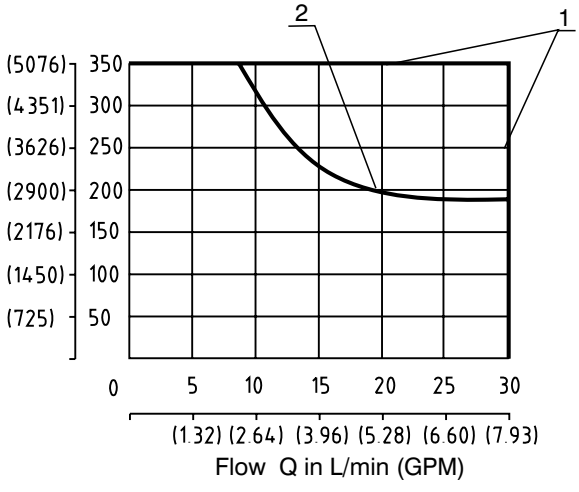
Operating limits for hydraulic power transferred by the directional valve. For respective spool type - see functional symbols.

Standard valve
Oil 60 °C (140 °F) / Ambient temperature 40 °C (104 °F)
Voltage Un [V]



	Connection
1	2D21
1	2D25
2	2D26

High performance valve
Öl 80 °C (176 °F) / Ambient temperature 50 °C (122 °F)
Voltage Un -10% [V]



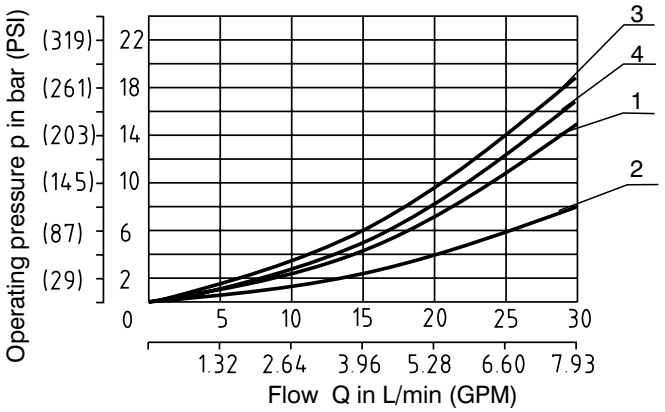
	Connection
1	2D21
1	2D25
2	2D26

Δp-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

Pressure drops related to flow rate.

Standard valve + High performance valve

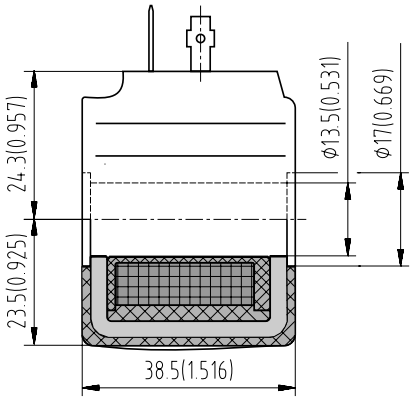


	Connection	Direction
1	2D21	3→2
1	2D25	3→2
2	2D21	2→1
3	2D26	3→2
4	2D25	2→1
4	2D26	2→1

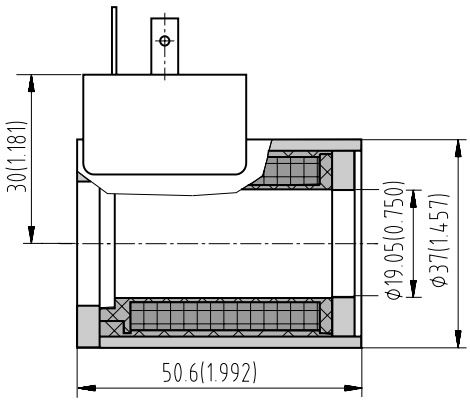
Type of the Solenoid Coils

Dimensions in millimeters (inches)

Coil for Standard valve
C51-26



Coil for High performance valve
C04-20



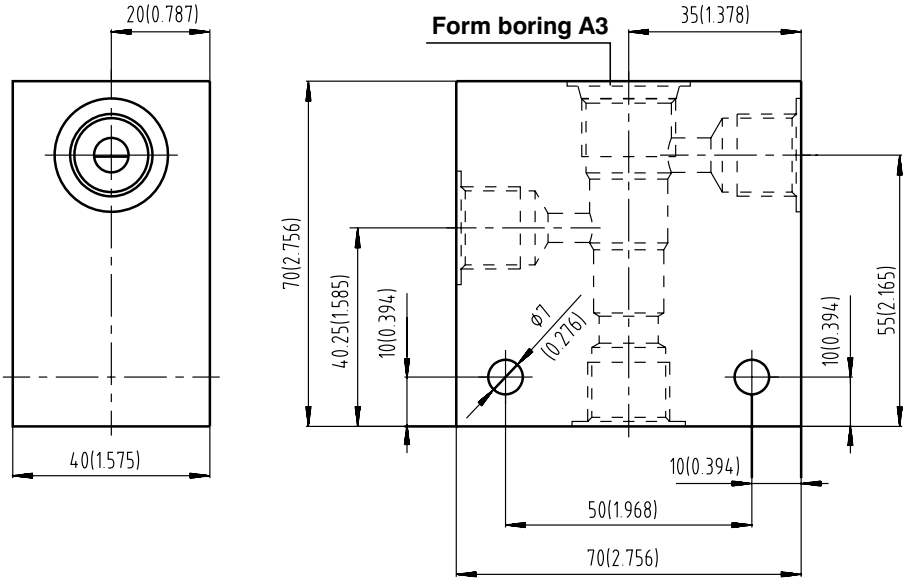
Solenoid	Connector	Standard valve	High performance valve
		SD2E-A3 / **S...**	SD2E-A3 / **H...**
		Type code	**Type code**
12 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-012DC-E2	C04-20-012DC-E2
24 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-024DC-E2	C04-20-024DC-E2
12 VDC	AMP (with quenching diode)	C51-26-012DC-E4	C04-20-012DC-E4
24 VDC	AMP (with quenching diode)	C51-26-024DC-E4	C04-20-024DC-E4
120 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-120AC-E5
230 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-230AC-E5
120 VAC	EN 175301-803-A (DIN 43 650)	C51-26-105DC-E1*	C04-20-105DC-E1*
230 VAC	EN 175301-803-A (DIN 43 650)	C51-26-205DC-E1*	C04-20-205DC-E1*

*Use the terminal box with rectifier!

Note:
- For other voltages, connector variants, quenching diodes or rectifiers refer to Coil data sheet HA 8007
- Coil size for Standard valve: C51-26
- Coil size for High performance valve: C04-20

Valve Body

Dimensions in millimeters (inches)



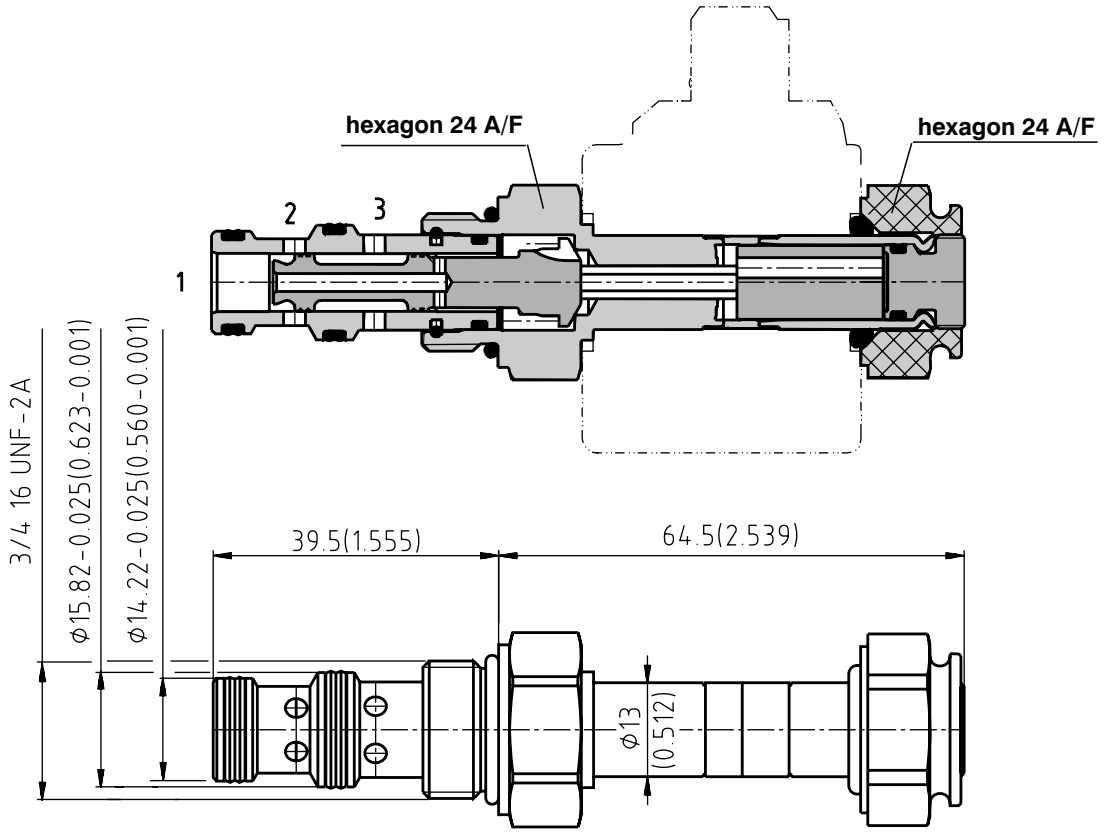
Body material	Connecting size	Type code	Operating pressures
Steel	G3/8	SB-A3-0103ST	420 bar (6091 PSI)
Steel	SAE 6	SB-A3-0102ST	420 bar (6091 PSI)
Aluminium	G3/8	SB-A3-0103AL	250 bar (3626 PSI)
Aluminium	SAE 6	SB-A3-0102AL	250 bar (3626 PSI)

Note:
- For detailed valve body ordering code refer to data sheet HA 0018

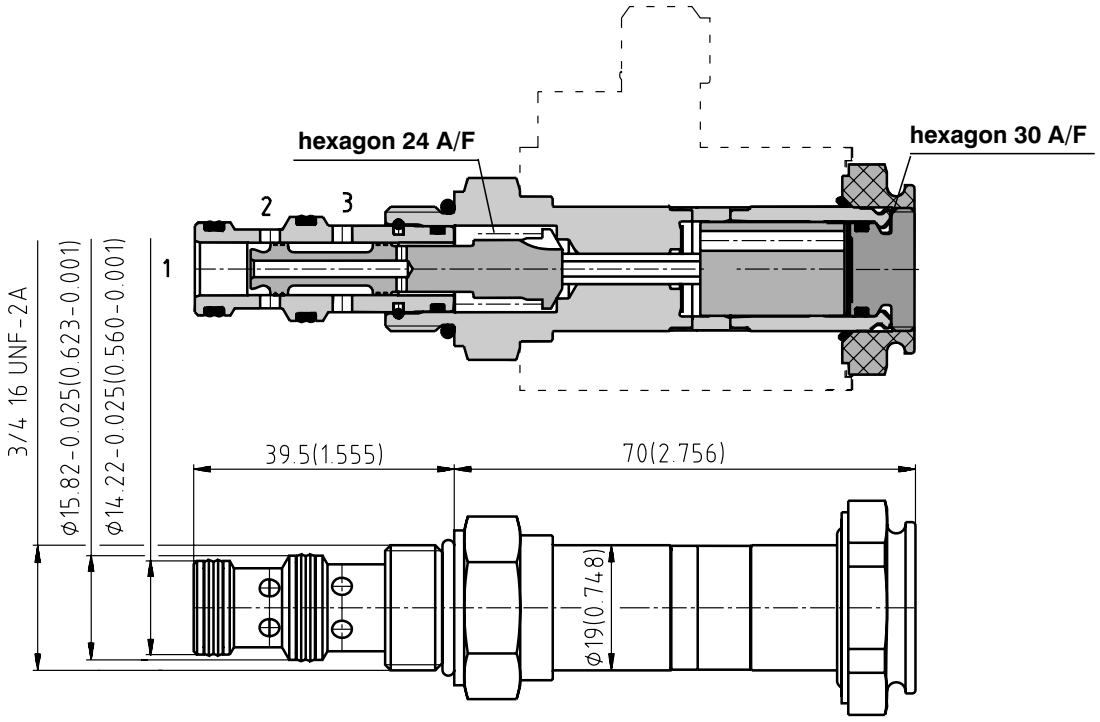
Valve Dimensions

Dimensions in millimeters (inches)

Standard valve

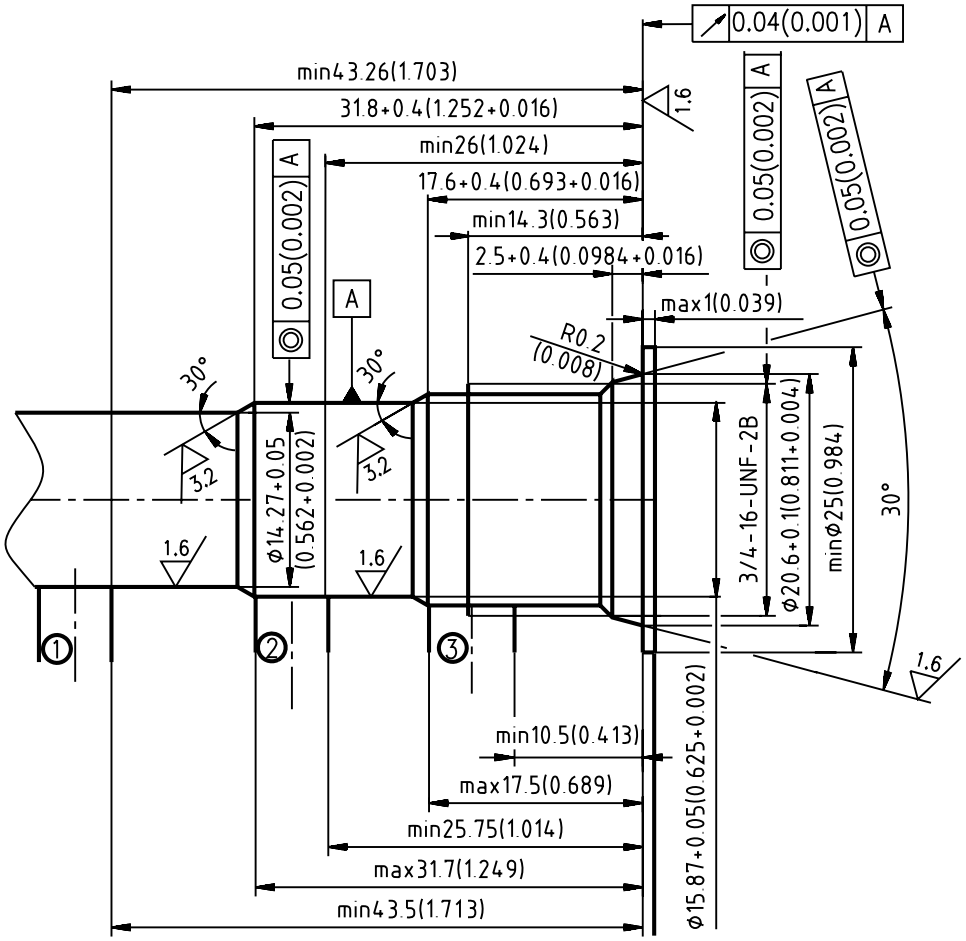


High performance valve



Insatallation Cavity

Dimensions in millimeters (inches)



Spare Parts

Dimensions in millimeters

Standard and high performance valve

Dualseal - PU	O-ring - NBR	O-ring - Viton	Order number
11,87 x 14,27 x 3,1 (1pc.)	17 x 1,8 (1pc.)	-	408-9006
13,4 x 15,87 x 3,1 (1pc.)			
11,87 x14,27 x 3,1 (1pc)	-	17,17 x 1,78 (1pc.)	408-9007
13,4 x 15,87 x 3,1 (1pc.)			

Soenoid retaining nut with seal for standard valve

Type of nut	O-ring - Viton	
Standard nut	12,3 x 2,4 (1pc.)	408-9003
Nut N1	12,3 x 2,4 (1pc.)	408-9010

Soenoid retaining nut with seal for high performance valve

Type of nut	O-ring - Viton	
Standard nut	20 x 2,5 (1pc.)	408-9004
Nut N1	20 x 2,5 (1pc.)	408-9011

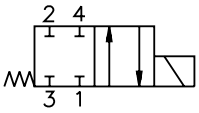
2

Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

ARGO-HYTOS a. s. CZ - 543 15 Vrchlabí
Tel.: +420-499-403111, Fax: +420-499-403421
E-mail: sales.cz@argo-hytos.com
www.argo-hytos.com

- ❑ **4/2 Way cartridge valves solenoid operated spool directed**
- ❑ **Manual override**
- ❑ **No spool sticking by too a high tightening torque**
- ❑ **High transmitted power**



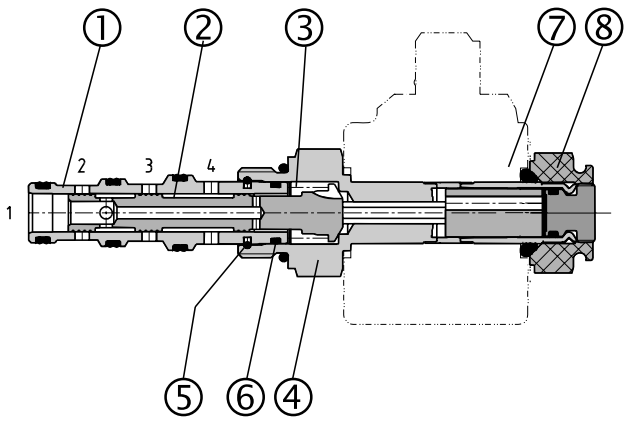
Functional Description

The directly operated 4/2-Way solenoid actuated spool valve controls in the first line the start and stop function of the oil flow. The valve consists of the valve body (1), control spool (2), return spring (3), cartridge with actuating system (4) and of the solenoid coil (7) that is mounted on the actuating system. The valve bushing is screwed into the cartridge part (4).
The valve bushing is fixed in the cartridge by a wire ring (5) and sealed with the seal ring (6). Separation of the valve bushing and the cartridge prevent transmitting the stresses, which could be caused by too high tightening torques. The DC solenoid coils can be delivered for 12 V and 24 V supply voltages. For AC applications 120 V/ 60 Hz or 230 V/ 50 Hz, the suitable rectifiers for the standard solenoid coils are available, with them being mounted in an additional terminal box. With the high power solenoid coils in AC variants, the rectifiers are integrated directly in the connector. By loosening the fixing nut (8), the solenoid coil can be replaced or turned in the range of 360°. The valve body is zinc coated.

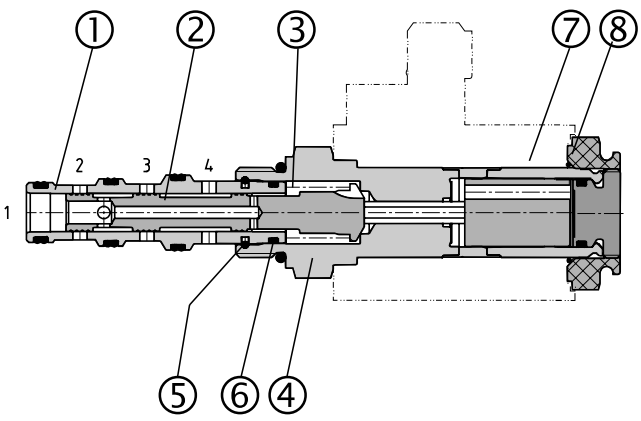
Note:
The valves are supplied without solenoids coils. The solenoid coil, the terminal box and the housing body for line mounting have to be ordered separately.

Cartridge Valve

Standard performance



High performance



Ordering Code

SD2E-A4 / □ □ □ □

4/2 Way Solenoid Operated Directional Control Valve

Standard **S**
High Performance **H**

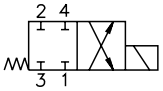
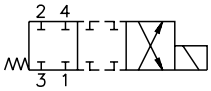
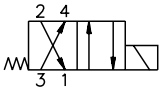
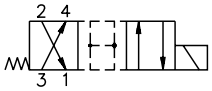
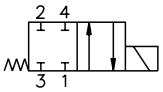
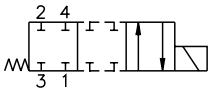
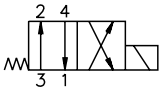
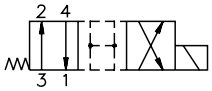
Description
Refer to the table with functional symbols

Polyurethan, Viton **V**
Polyurethan, NBR **No designation**

Manual override
Push button **N1**
Socket head screw **N2**
Without manual override **No designation**

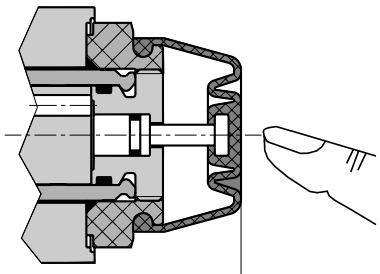
Solenoid coil, terminal box and body for line mounting have to be ordered separately.

Functional Symbols

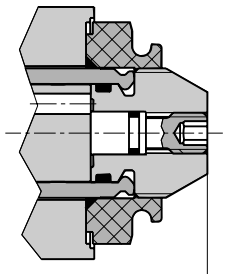
Designation	Symbol	Interposition	Designation	Symbol	Interposition
2Z51			2X21		
2Z11			2R21		

Manual Override

Dimensions in millimeters (inches)



Standard valve ~75.5(2.972)
High performance valve ~81.5(3.209)



Standard valve ~71.5(2.815)
High performance valve ~77.5(3.051)

N1- manual override by pushing

N2- manual override with socket head screw 2.5(0.098)

Technical Data

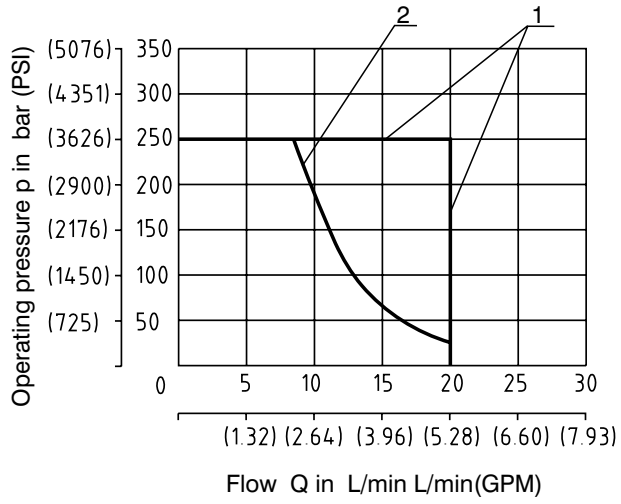
		Standard	High performance
Cartridge thread		3/4-16 UNF- 2B	
Maximum flow	L/min (GPM)	20 (5.3)	30 (7.9)
Max. operating pressure	bar (PSI)	250 (3625)	350 (5076)
Pressure drop	bar (PSI)	see Δp-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP - RP 91H in viscosity classes ISO VG 32, 46 and 68	
Coil groups (see the datasheet of coils)		C 51-26	C 04-20
Fluid temperature range	°C (°F)	-20 ... 60 (-4 ... 140)	-20 ... 80 (-4 ... 176)
Ambient temperature, max.	°C (°F)	-20 ... 50 (-4 ...122)	-20 ... 80 (-4 ... 176)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)	
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999).	
Permissible rated voltage variation	%	AC,DC ±10	AC,DC ±15
Max. switching frequency	1/h	15 000	
Duty cycle	%	100	
Service life	cycles	10^7	
Weight	kg (lbs)	0.18 (0.40)	0.23 (0.51)
Maximum valve tightening torque	Nm (lbf.ft)	30+2 (22.127+1.475)	
Maximum plastic nut tightening torque	Nm (lbf.ft)	3+1 (2.213+0.738)	5+1 (3.688+0.738)
Mounting position		optional	

p-Q Characteristics

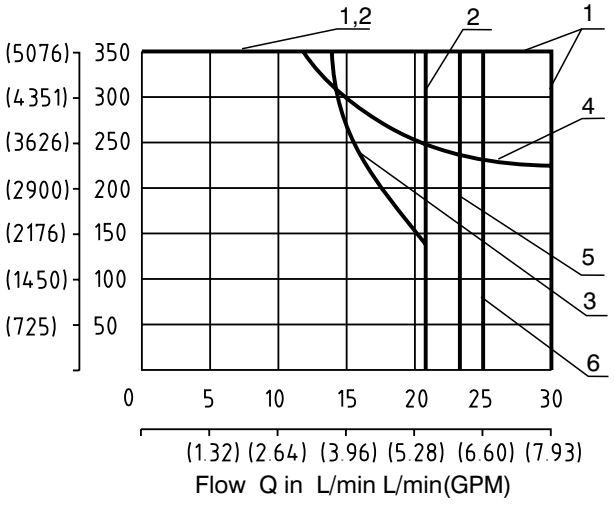
Measured at ν = 32mm^2/s (156 SUS)

Operating limits for maximum hydraulic power transferred by the directional valve. For respective spool type - see functional symbols.

Standard valve
Oil 140 °F (60 °C) / Ambient temperature 104 °F (40 °C)
Voltage Un [V]



High performance valve
Öl 176 °F (80 °C) / Ambient temperature 122 °F (50 °C)
Voltage Un -10% [V]



	Connection	Direction
1	2Z11	3→2
1	2Z11	4→1
1	2Z51	2→1
1	2Z51	3→4
1	2R21	3-4→2-1
1	2X21	3-4→2-1
1	2X21	3-2→4-1
2	2R21	3-2→4-1

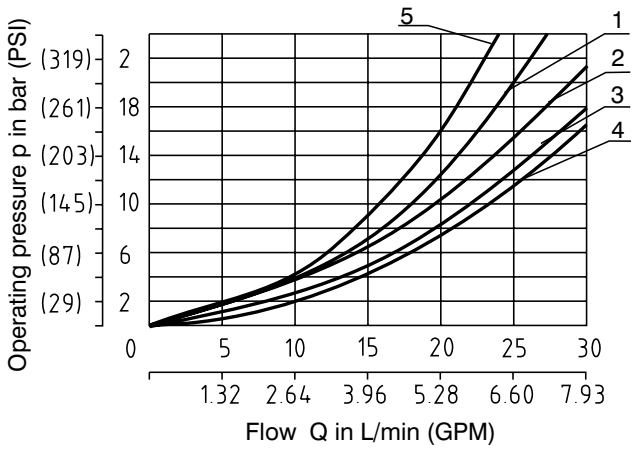
	Connection	Direction
1	2Z51	3→4
1	2Z51	2→1
2	2Z11	3→2
2	2Z11	4→1
3	2R21	3-2→4-1
4	2X21	3-4→2-1
5	2X21	3-2→4-1
6	2R21	3-4→2-1

Δp-Q Characteristics

Measured at ν = 32mm^2/s (156 SUS)

Pressure drops related to flow rate.

Standard valve + High performance valve

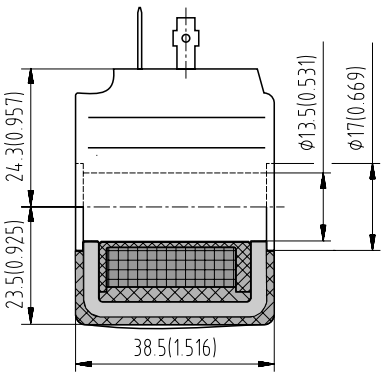


	Connection	Direction
1	2Z11	4→1
1	2R21	2→1
2	2Z11	3→2
2	2Z51	2→1
2	2X21	3→4
2	2X21	4→1
2	2R21	3→2
3	2Z51	3→4
4	2X21	3→2
3	2R21	3→4
4	2X21	2→1
5	2R21	4→1

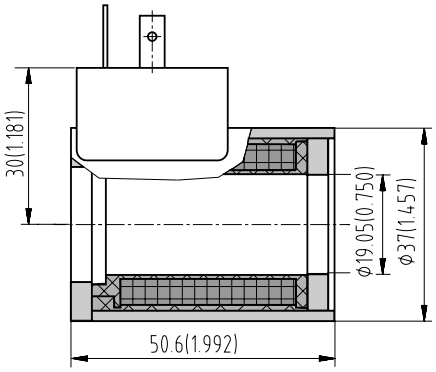
Type of the Solenoid Coils

Dimensions in millimeters (inches)

Coil for Standard valve
C51-26



Coil for High performance valve
C04-20



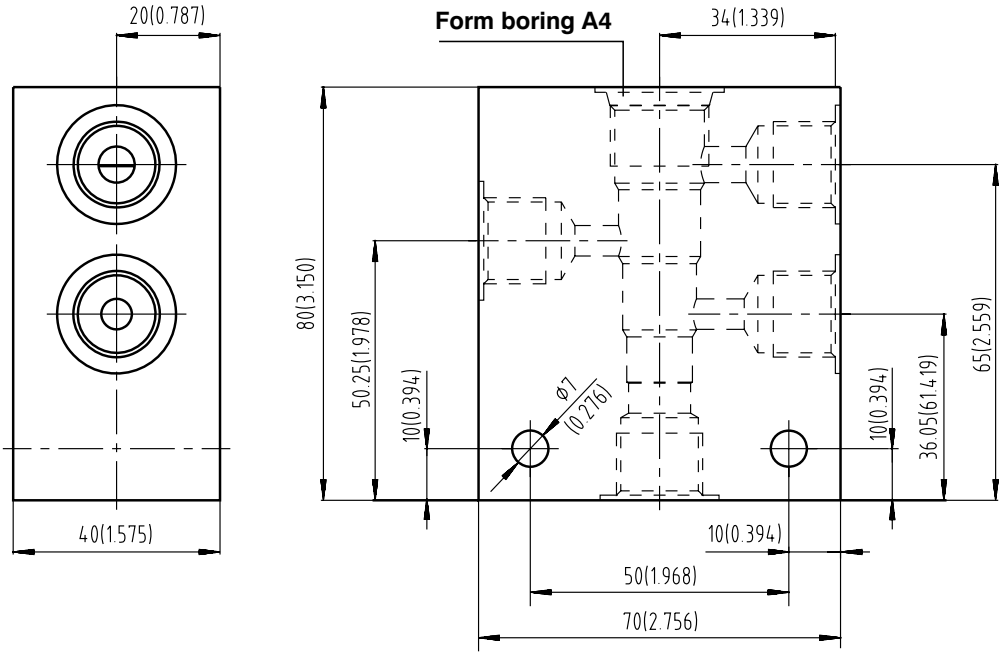
Solenoid	Connector	Standard valve	High performance valve
		SD2E-A4 / **S...**	SD2E-A4 / **H...**
		Type code	**Type code**
12 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-012DC-E2	C04-20-012DC-E2
24 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-024DC-E2	C04-20-024DC-E2
12 VDC	AMP (with quenching diode)	C51-26-012DC-E4	C04-20-012DC-E4
24 VDC	AMP (with quenching diode)	C51-26-024DC-E4	C04-20-024DC-E4
120 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-120AC-E5
230 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-230AC-E5
120 VAC	EN 175301-803-A (DIN 43 650)	C51-26-105DC-E1*	C04-20-105DC-E1*
230 VAC	EN 175301-803-A (DIN 43 650)	C51-26-205DC-E1*	C04-20-205DC-E1*

*Use the terminal box with rectifier!

Note:
- For other voltages, connector variants, quenching diodes or rectifiers refer to Coil data sheet HA 8007
- Coil size for standard valve: C51-26
- Coil size for high performance valve: C04-20

Valve Body

Dimensions in millimeters (inches)



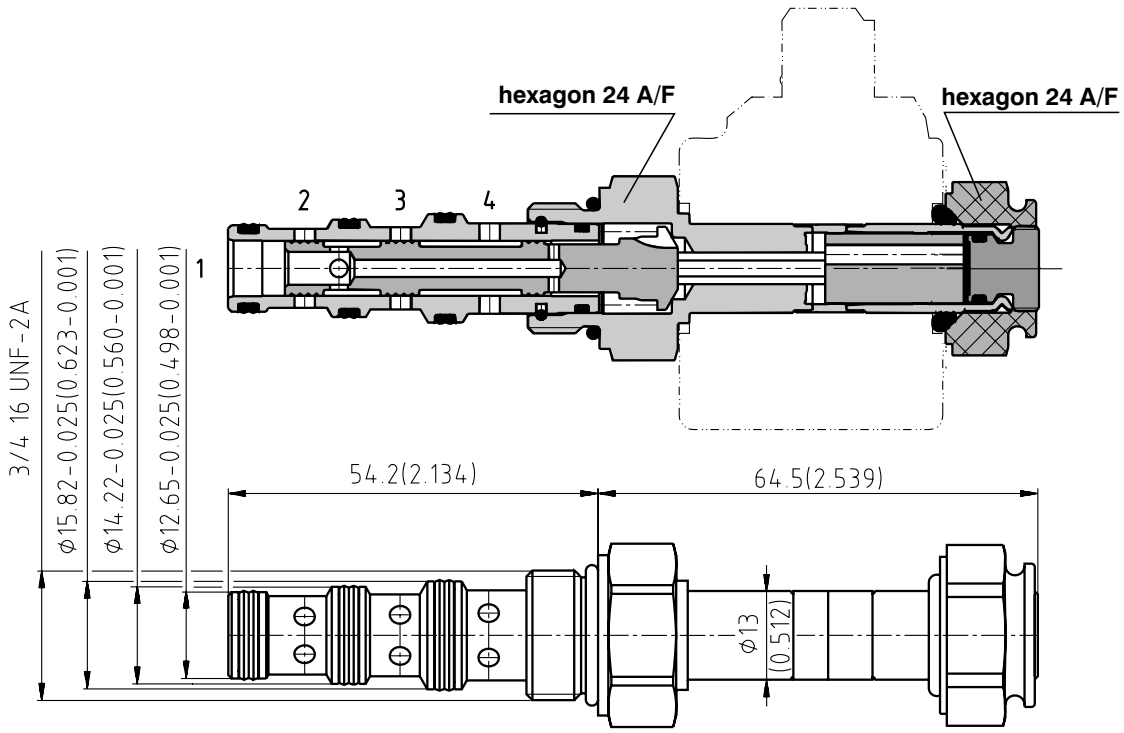
Body material	Connecting size	Type code	Operating pressures
Steel	G3/8	SB-A4-0103ST	420 bar (6091 PSI)
Steel	SAE 6	SB-A4-0102ST	420 bar (6091 PSI)
Aluminium	G3/8	SB-A4-0103AL	250 bar (3626 PSI)
Aluminium	SAE 6	SB-A4-0102AL	250 bar (3626 PSI)

Note:
- For detailed valve body ordering code refer to data sheet HA 0018

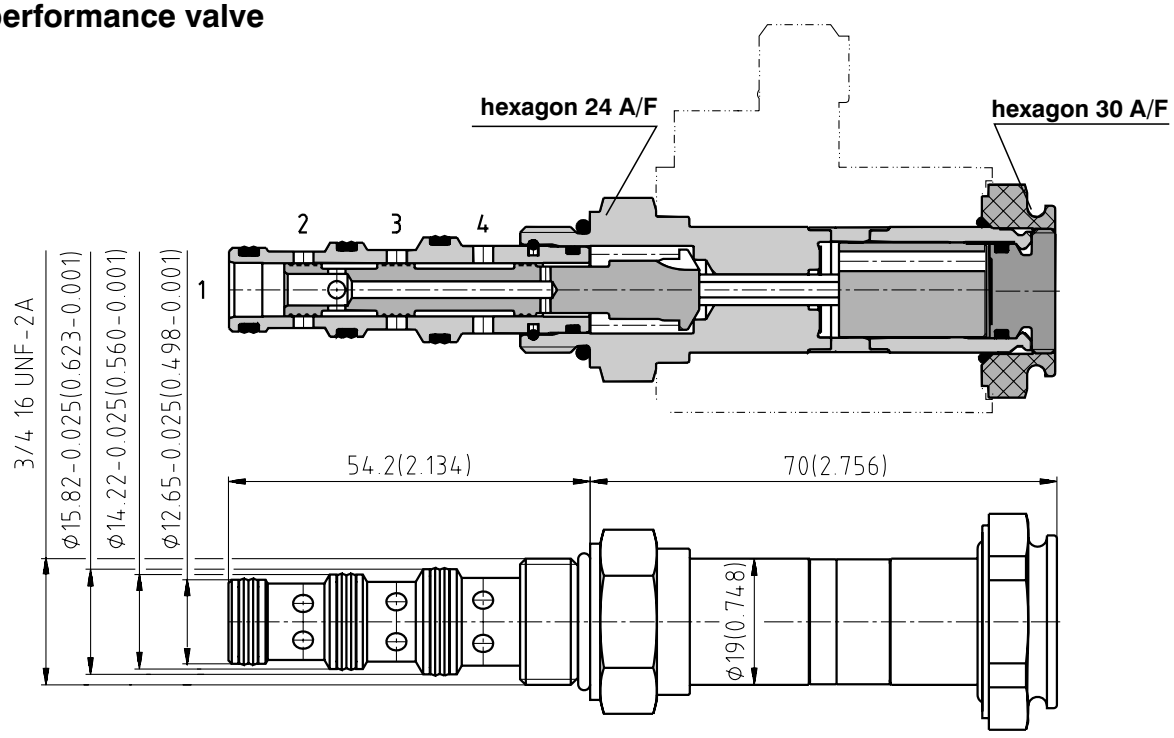
Valve Dimensions

Dimensions in millimeters (inches)

Standard valve

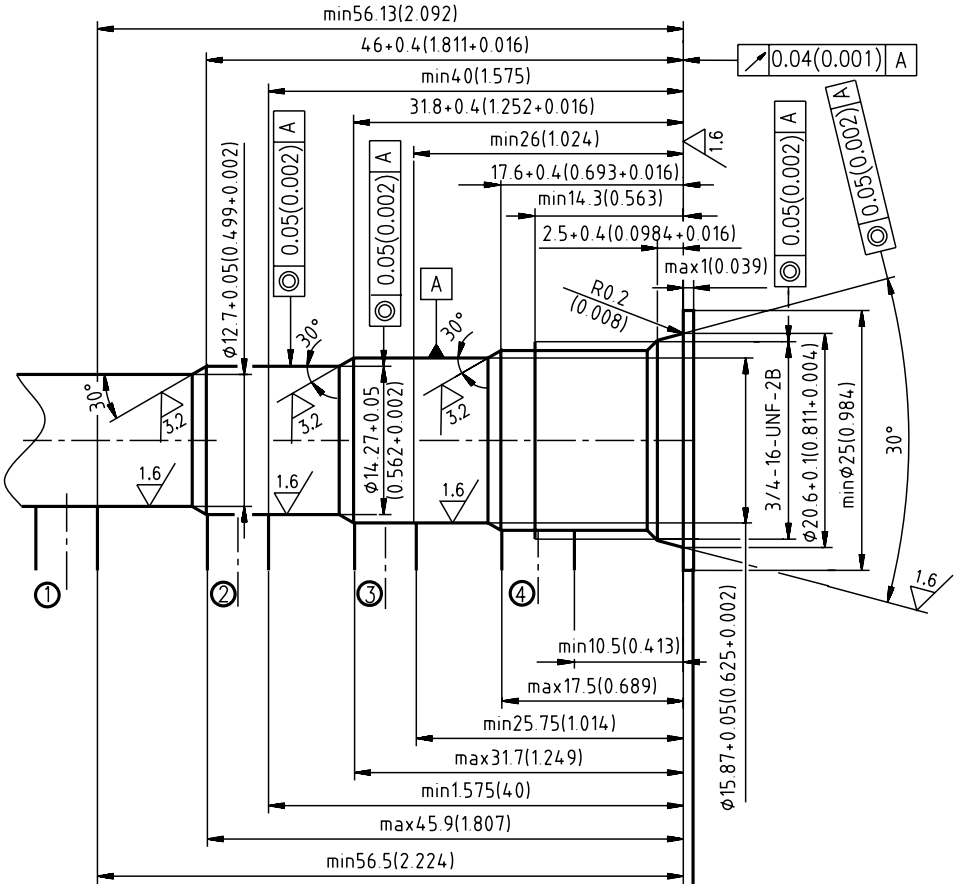


High performance valve



Insatallation Cavity

Dimensions in millimeters (inches)



Spare Parts

Dimensions in millimeters

Standard and high performance valve

Dualseal - PU	O-ring - NBR	O-ring - Viton	Order number
10,3 x 12,7 x 3,1 (1pc.)	17 x 1,8 (1pc.)	-	408-9008
11,87 x 14,27 x 3,1 (1pc.)			
13,4 x 15,87 x 3,1 (1pc.)			
10,3 x 12,7 x 3,1 (1pc.)	-	17,17 x 1,78 (1pc.)	408-9009
11,87 x 14,27 x 3,1 (1pc.)			
13,4 x 15,87 x 3,1 (1pc.)			

Solenoid retaining nut with seal for standard valve

Type of nut	O-ring - Viton	
Standard nut	12,3 x 2,4 (1pc.)	408-9003
Nut N1	12,3 x 2,4 (1pc.)	408-9010

Solenoid retaining nut with seal for high performance valve

Mutterausführung	O-ring - Viton	
Standard nut	20 x 2,5 (1pc.)	408-9004
Nut N1	20 x 2,5 (1pc.)	408-9011

Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

ARGO-HYTOS a. s. CZ - 543 15 Vrchlabí
Tel.: +420-499-403111, Fax: +420-499-403421
E-mail: sales.cz@argo-hytos.com
www.argo-hytos.com

2/2 Way Solenoid Operated Directional Control Valves Poppet Type SD3E-A2

3/4-16 UNF • p_{max} 420 bar (6091 PSI) • Q_{max} 30 L/min (7.9 GPM)

HA 4043
01/2005

- **Cartridge and module design as well as housing for pipeline mounting**
- **Poppet design – no internal oil leakage**
- **High switching reliability also after long stand times**
- **High transmitted power**

Functional Description

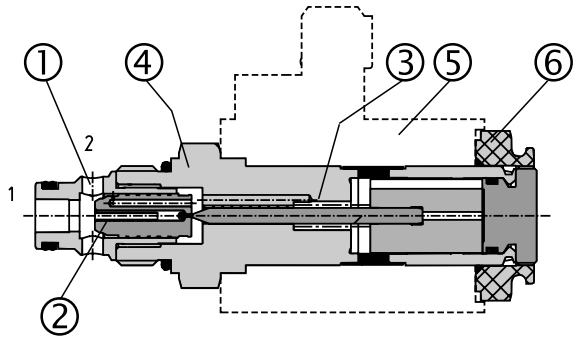
The pilot operated 2/2-Way solenoid actuated poppet valves control in the first line the start and stop function of the oil flow. The valve consists of the valve bushing (1), main control spool (2), return spring (3), cartridge with actuating system (4) and of the solenoid coil (5) that is mounted on the actuating system. The valve bushing is screwed into the cartridge part (4).
In the variant normally closed and normally opened, the valve is securely held in the respective basic position by a spring. By energizing the solenoid coil the spring force is overcome and the pilot valve is pressed onto the seat or lifted. Opening and closing of the main control spool is hydraulically supported through the orifice boring created in the main control spool.

The DC solenoid coils can be delivered for 12 V and 24 V supply voltages. For AC applications 120 V/ 60 Hz or 230 V/ 50 Hz, the suitable rectifiers for the standard solenoid coils are available, with them being mounted in an additional terminal box. With the AC high power solenoid coils, the rectifiers are integrated directly in the connector. By loosening the fixing nut (6), the solenoid coil can be replaced or turned in the range of 360°.

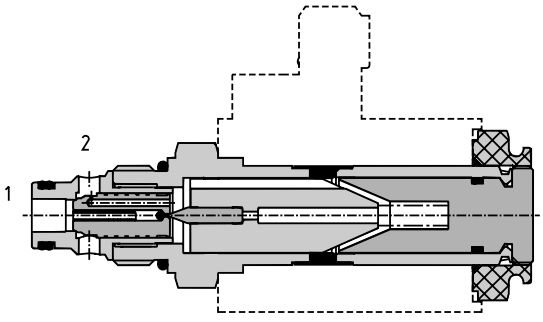
Notice.
The valves are supplied without solenoids coils. The solenoid coil, the terminal box and the body for line mounting have to be ordered separately.

Cartridge Valve

Absence of current opened 2O2



Absence of current closed 2L2



Ordering Code

SD3E-A2 / □ □ □ □

2/2 Way Solenoid Operated Directional Control Valves

Standard	**S**
High Performance	**H**

Description
Refer to the table with functional symbols

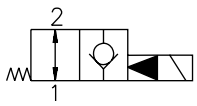
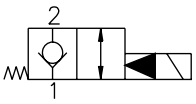
Polyurethan, Viton	**V**
Polyurethan, NBR	**No designation**

Manual override

Push button	**N1**
Socket head screw	**N2**
Without manual override	**No designation**

Solenoid coil, terminal box and body for line mounting have to be ordered separately.

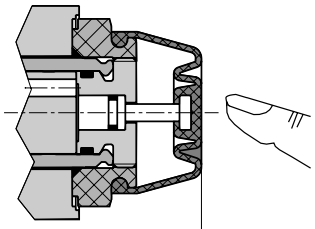
Functional Symbols

Designation	Symbol	Designation	Symbol
2O2		2L2	

Manual Override

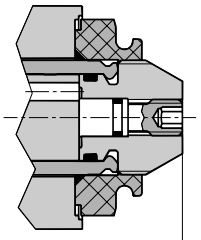
Dimensions in millimeters (inches)

N1- manual override by pushing only for symbols **2O2**



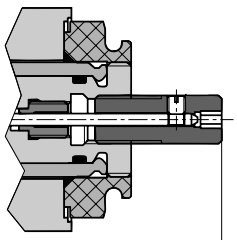
Standard valve ~71(2.759)
High performance valve ~81.5(3.209)

N2- manual override by screwing in of the socket head screw 2,5(0,098) for symbols **2O2**



Standard valve ~67(2.638)
High performance valve ~77.5(3.051)

N2- manual override by screwing in of the socket head screw 2,5(0,098) for symbols **2L2**



Standard valve ~71.5(2.815)
High performance valve ~89(3.504)

Technical Data

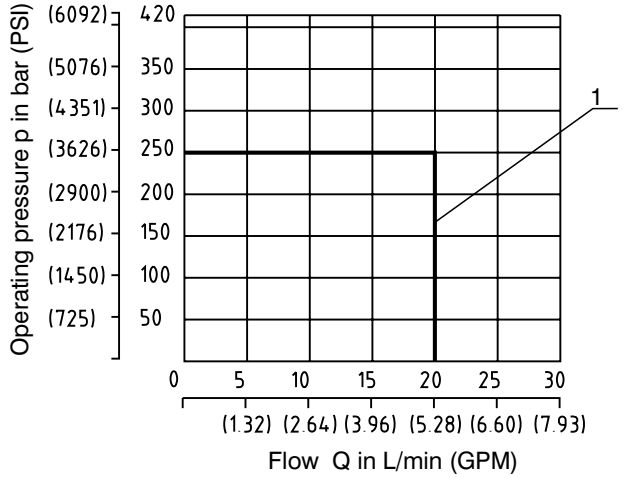
		Standard	High performance
Cartridge thread		3/4-16 UNF -2B	
Maximum flow	L/min (GPM)	20 (5.3)	30 (7.9)
Max. operating pressure	bar (PSI)	250 (3626)	420 (6091)
Pressure drop	bar (PSI)	see Δp-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP - RP 91H in viscosity classes ISO VG 32, 46 and 68	
Fluid temperature range	°C (°F)	-20 ... 60 (-4 ... 140)	-20 ... 80 (-4 ...176)
Ambient temperature, max.	°C (°F)	-20 ... 50 (-4 ... 122)	-20 ... 80 (-4 ...176)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)	
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999).	
Coil gronps (see the datasheet of coils)		C 51-26	C 04-20
Permissible rated voltage variation	%	AC,DC ±10	AC,DC ±15
Max. switching frequency	1/h	15 000	
Duty cycle	%	100	
Service life	cycles	10^7	
Weight	kg (lbs)	0.10 (0.22)	0.20 (0.44)
Maximum valve tightening torque	Nm (lbf.ft)	30+2 (22.127+1.475)	
Maximum plastic nut tightening torque	Nm (lbf.ft)	3+1 (2.213+0.738)	5+1 (3.688+0.738)
Mounting position		optional	

p-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

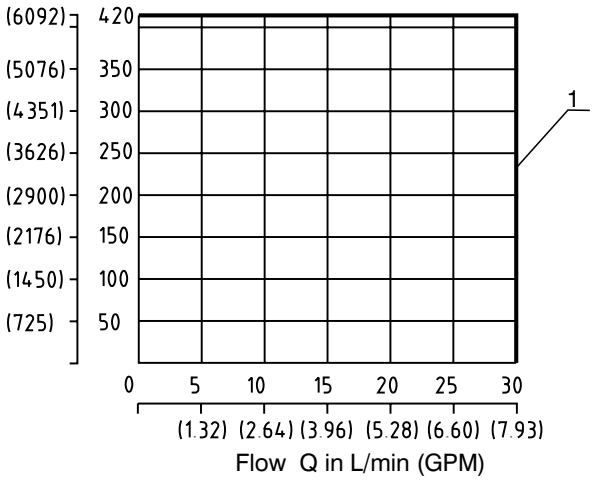
Operating limits for hydraulic power transferred by the directional valve. For respective spool type - see functional symbols.

Standard valve
Oil 60 °C (140 °F) / Ambient temperature 40 °C (104 °F)
Voltage Un [V]



	Connection
1	2L2
1	2O2

High performance valve
Oil 80 °C (176 °F) / Ambient temperature 50 °C (122 °F)
Voltage Un -10% [V]



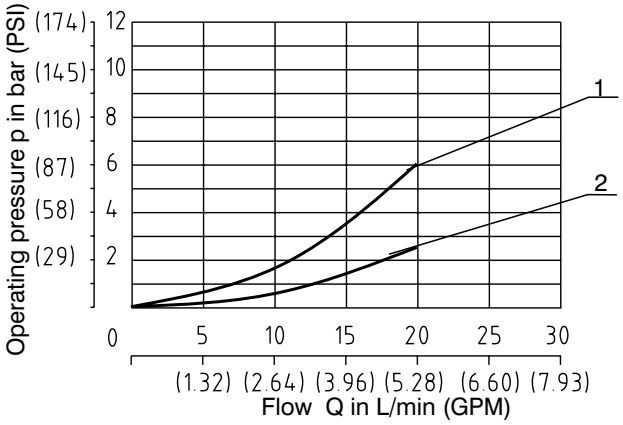
	Connection
1	2L2
1	2O2

Δp-Q Characteristics

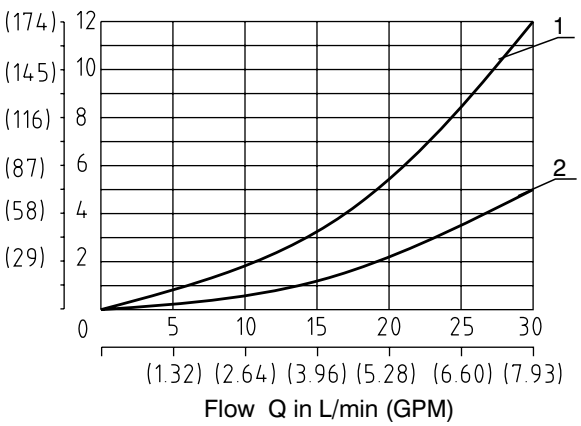
Measured at ν = 32 mm^2/s (156 SUS)

Pressure drops related to flow rate.

Standard valve + High performance valve



	Connection	Dirrection
1	2L2	1→ 2
1	2L2	2→ 1
2	2O2	1→ 2*
2	2O2	2→ 1
		*Solenoid switched off

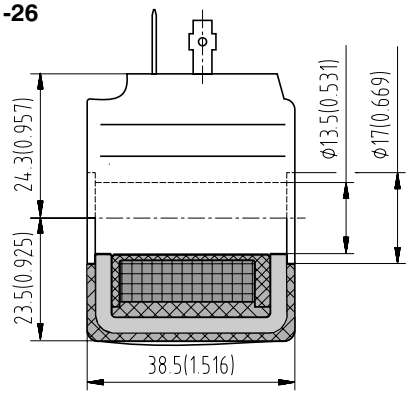


	Connection	Dirrection
1	2L2	1→ 2
1	2L2	2→1
2	2O2	1→ 2*
2	2O2	2→1
		*Solenoid switched off

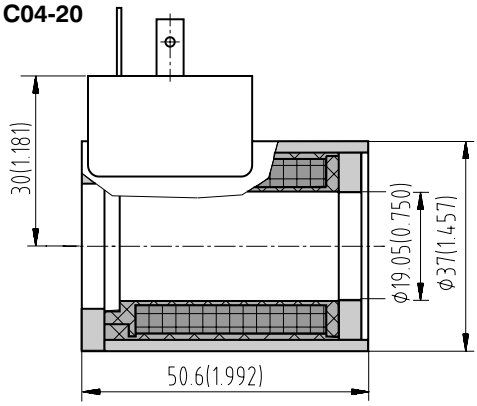
Type of the Solenoid Coils

Dimensions in millimeters (inches)

Coil for Standard valve
C51-26



Coil for High performance valve
C04-20



Solenoid	Connector	Standard SD3E-A2 / **S...** Type code	High performance SD3E-A2 / **H...** Type code
12 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-012DC-E2	C04-20-012DC-E2
24 VDC	EN 175301-803-A (DIN 43 650) with quenching diode	C51-26-024DC-E2	C04-20-024DC-E2
12 VDC	AMP (with quenching diode)	C51-26-012DC-E4	C04-20-012DC-E4
24 VDC	AMP (with quenching diode)	C51-26-024DC-E4	C04-20-024DC-E4
120 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-120AC-E5
230 VAC	EN 175301-803-A (DIN 43 650) with rectifier	-	C04-20-230AC-E5
120 VAC	EN 175301-803-A (DIN 43 650)	C51-26-105DC-E1*	C04-20-105DC-E1*
230 VAC	EN 175301-803-A (DIN 43 650)	C51-26-205DC-E1*	C04-20-205DC-E1*

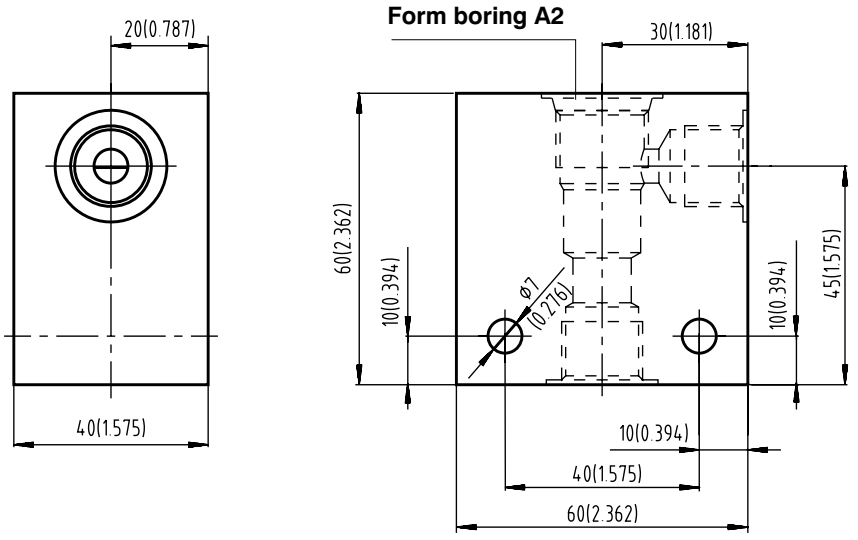
*Use the terminal box with rectifier!

Note:

- For other voltages, connector variants, quenching diodes or rectifiers refer to Coil data sheet HA 8007
- Coil size for standard valve: C51-26
- Coil size for high performance valve: C04-20

Valve Body

Dimensions in millimeters (inches)



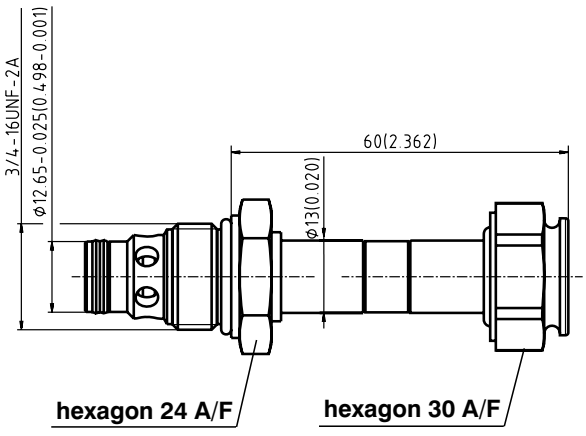
Body material	Connecting size	Type code	Operating pressures
Steel	G3/8	SB-A2-0103ST	420 bar (6091 PSI)
Steel	SAE 6	SB-A2-0102ST	420 bar (6091 PSI)
Aluminium	G3/8	SB-A2-0103AL	250 bar (3626 PSI)
Aluminium	SAE 6	SB-A2-0102AL	250 bar (3626 PSI)

Note:
- For detailed valve body ordering code refer to data sheet HA 0018

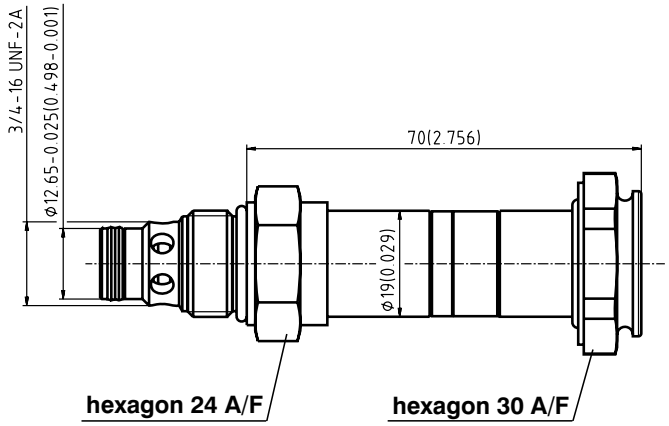
Valve Dimensions

Dimensions in millimeters (inches)

Standard valve



High performance valve



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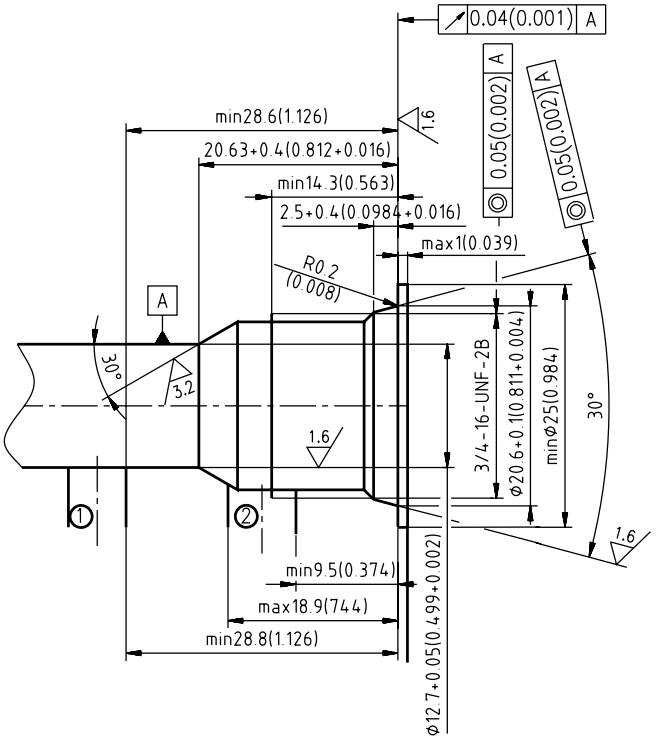
Insatallation Cavity

Dimensions in millimeters (inches)



Spare Parts

Dimensions in millimeters

Standard and high performance valve

Dualseal - PU	O-ring - NBR	O-ring - Viton	Order number
10,3 x 12,7 x 3,1 (1pc.)	17 x 1,8 (1pc.)	-	408-9001
10,3 x 12,7 x 3,1 (1pc.)	-	17,17 x 1,78 (1pc.)	408-9002

Soenoid retaining nut with seal for standard valve

Type of nut	O-ring - Viton	
Standard nut	12,3 x 2,4 (1pc.)	408-9003
Nut N1	12,3 x 2,4 (1pc.)	408-9010

Solenoid retaining nut with seal for high performance valve

Type of nut	O-ring - Viton	
Standard nut	20 x 2,5 (1pc.)	408-9004
Nut N1	20 x 2,5 (1pc.)	408-9011

Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

ARGO-HYTOS a. s. CZ - 543 15 Vrchlabí
Tel.: +420-499-403111, Fax: +420-499-403421
E-mail: sales.cz@argo-hytos.com
www.argo-hytos.com