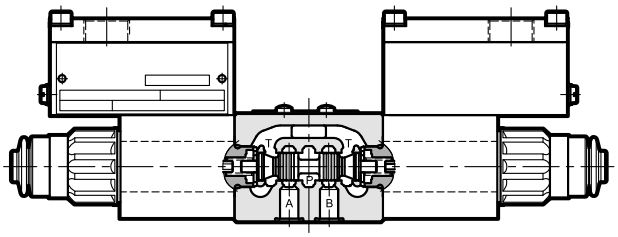
D*K*
EXPLOSION-PROOF DIRECTIONAL SOLENOID VALVES ATEX, IECEx, PESO

DS3K*	**ISO 4401-03**
DL5BK*	**ISO 4401-05**
DSP5K*	**CETOP P05**
DSP5RK*	**ISO 4401-05**
DSP7K*	**ISO 4401-07**
DSP8K*	**ISO 4401-08**
DSP10K*	**ISO 4401-10**

OPERATING PRINCIPLE



— The direct operated valves are available in ISO 4401-03 and ISO 4401-05 size. The pilot operated valves are available in CETOP P05, ISO 4401-05, ISO 4401-07, ISO 4401-08 and ISO 4401-10 size.

— The valves are compliant with ATEX, IECEx or PESO requirements. They are suitable for use in potentially explosive atmospheres, for surface plants or mines.

— A low temperature version (up to -40 °C) is also available.

— DS3K* and DL5BK* valves are supplied with a zinc-nickel finishing surface treatment that ensures a salt spray resistance up to 600h. This treatment is available upon request for DSP*K* valves.

— Details for classification, operating temperatures and electrical characteristics are in the technical data sheet 02 500 'Explosion proof classification'.

PERFORMANCES
(obtained with mineral oil with viscosity of 36 cSt at 50°C)

		DS3K*	DL5BK*	DSP5K* DSP5RK*	DSP7K*	DSP8K*	DSP10K*
Maximum operating pressure P - A - B ports T port	bar	350 210	320 210	350	350 see operating limits at point 7	350	350
Maximum flow from P port to A - B - T	l/min	80	125	150	300	600	1100
Operating temperatures (ambient and fluid)	°C	see data sheet 02 500					
Fluid viscosity range	cSt	10 ÷ 400					
Fluid contamination degree		according to ISO 4406:1999 class 20/18/15					
Recommended viscosity	cSt	25					
Mass single solenoid valve double solenoid valve	kg	1.8 3	2.7 3.8	6.2 7.2	8.6 9.8	14.4 15.4	41.9 43.1

1 - IDENTIFICATION OF DIRECT OPERATED SOLENOID VALVES

Direct operated solenoid valve

Size:
S3 = ISO 4401-03
L5B = ISO 4401-05

Explosion-proof certification:
See table 1.1

Spool type (see p. 1.2)

S*	**TA**	**TB**	**RK**
SA*	**TA02**	**TB02**	
SB*	**TA23**	**TB23**	

Series No.:
(the overall and mounting dimensions do not change from 10 to 19)

Seals:
For temperature range -20 / +80 °C
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

For temperature range -40 / +80 °C
NL = seal for low temperatures (for mineral oil)

Power supply:
Direct current (DC)
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
Alternate current with built-in rectifier bridge (RAC)
R120 = 120 V
R240 = 240 V

Coil electrical connection: junction box

Connection type for cable gland
upper connection:
T01 = M20x1.5 - ISO 261
T02 = Gk 1/2 - UNI EN 10226-2
T03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
side connection:
S01 = M20x1.5 - ISO 261
S02 = Gk 1/2 - UNI EN 10226-2
S03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
S04 = M16x1.5 - ISO 261

Manual override:
CM = boot protected
standard for both N and V seals
not available for NL seals
CB = blind ring nut
standard for NL seals
available upon request for both N and V seals
CK1 = knob manual override
(DC version only)
CH = lever manual override.
not available for DL5BK*
Dimensions for CB and CH at p. 18

Option: **/T5**
version in T5 temperature class.
Omit if not required.

NOTE: Valves are supplied with zinc-nickel surface treatment, that is suitable to ensure a salt spray resistance up to 600 h (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

Version with monobloc steel coil

Standard coils are made of zinc-nickel steel, with anodized aluminium junction box on it.

Monobloc coils **MD24K9S01** completely made of steel are available upon request. They have zinc-nickel treatment, power supply voltage D24 and cable gland connection type S01. Other variants for voltage and cable gland connection are available, always on request.

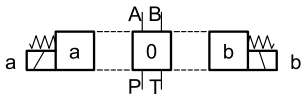
1.1 - Names of valves per certification

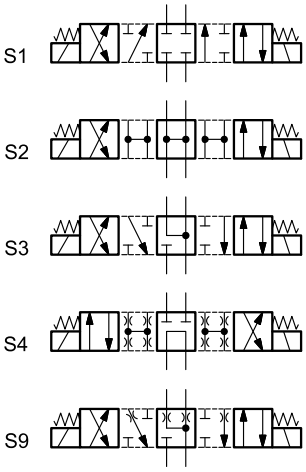
	ATEX		IECEx		PESO	
for gases for dusts	**KD2**	II 2GD	**KXD2**	IECEx Gb IECEx Db	**KPD2**	PESO Gb not applicable for dust
for mines	**KDM2**	I M2	**KXDM2**	IECEx Mb	not applicable for mines	

NOTE: Refer to the technical data sheet 02 500 for marking, operating temperatures and available versions.

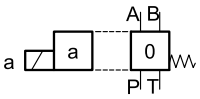
1.2 - Available spools

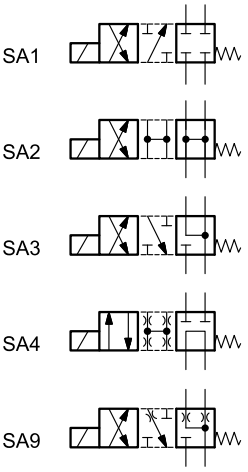
Version **S***:
2 solenoids - 3 positions
with spring centering



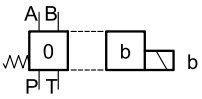


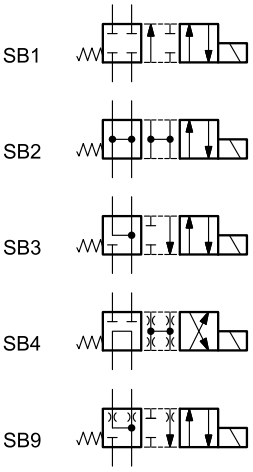
Version **SA***:
1 solenoid side A
2 positions (central + external)
with spring centering





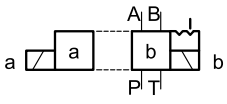
Version **SB***:
1 solenoid side B
2 positions (central + external)
with spring centering

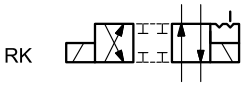




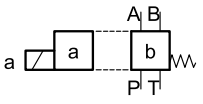
NOTE: S9, SA9 and SB9 spools are available for DS3K only.

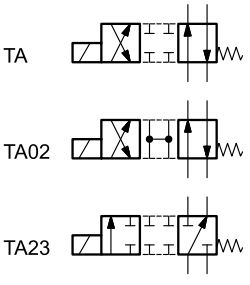
Version **RK**:
2 solenoids - 2 positions
with mechanical detent



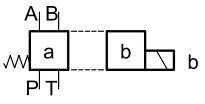


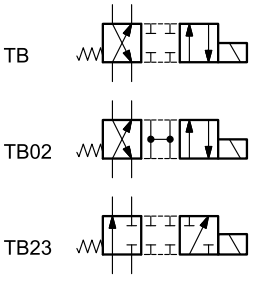
Version **TA**:
1 solenoid side A
2 external positions
with return spring





Version **TB**:
1 solenoid side B
2 external positions
with return spring





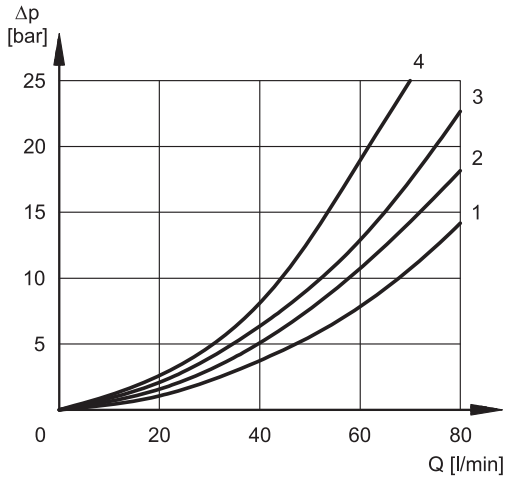
NOTE: TA02/TB02
spools are not available
for RAC solenoid valves.

2 - CHARACTERISTIC CURVES AND PERFORMANCES OF DIRECT OPERATED SOLENOID VALVES

2.1 - Pressure drops Δp-Q

(values obtained with viscosity 36 cSt at 50 °C)

DS3K*



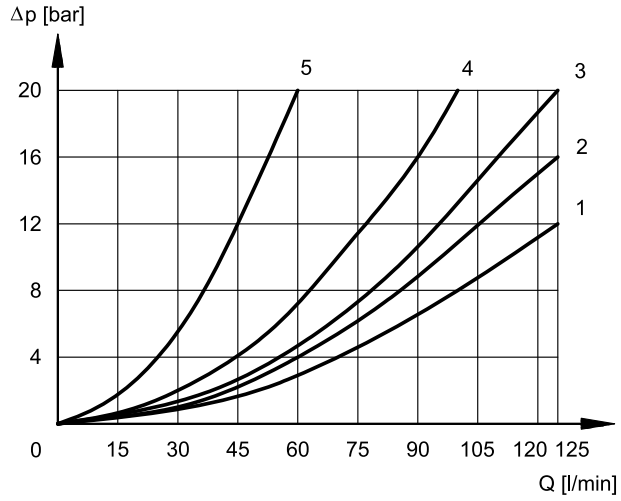
ENERGIZED VALVE

SPOOL	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SB2	2	2	3	3
S2, SA2, SB2	1	1	3	3
S3, SA3, SB3	3	3	1	1
S4, SA4, SB4	4	4	4	4
S9, SA9, SB9	2	2	3	3
TA, TB	3	3	3	3
TA02, TB02	2	2	2	2
TA23, TB23	3	3	-	-
RK	2	2	2	2

DE-ENERGIZED VALVE

SPOOL	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SB2	-	-	-	-	2
S3, SA3, SB3	-	-	3	3	-
S4, SA4, SB4	-	-	-	-	3

DL5BK*



ENERGIZED VALVE

SPOOL	FLOW DIRECTIONS			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPHS			
S1	1	1	2	2
S2	1	1	1	1
S3	1	1	1	1
S4	4	4	4	4
RK	2	2	2	2
TA	2	2	3	3
TA02	2	2	1	1
TA23	3	3	-	-

DE-ENERGIZED VALVE

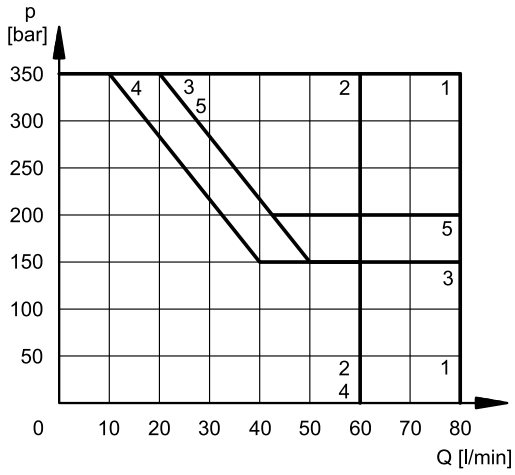
SPOOL	FLOW DIRECTIONS		
	A→T	B→T	P→T
	CURVES ON GRAPHS		
S2	-	-	1
S3	5	5	-
S4	-	-	1

2.2 - Performance limits

The curves define the flow rate operating fields according to the valve pressure of the different versions. The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage, with mineral oil with viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.

The operating limits can be considerably reduced if a 4-port valve operates as 3-port valve with port A or B plugged or without flow.

DS3K*



DC SOLENOID VALVE

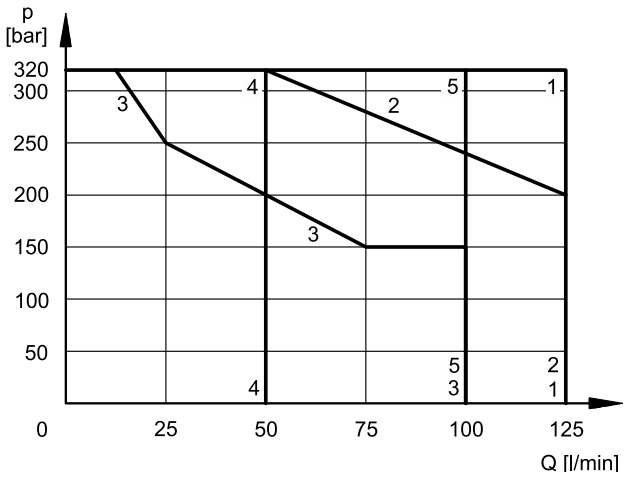
SPOOL	CURVE	
	P→A	P→B
S1,SA1,SB1	1	1
S2, SA2, SB2	2	2
S3, SA3, SB3	3	3
S4, SA4, SB4	2	2
S9, SA9, SB9	1	1
TA, TB	5	5
TA02, TB02	4	4
TA23, TB23	4	4
RK	1	1

RAC SOLENOID VALVE

SPOOL	CURVE	
	P→A	P→B
S1,SA1,SB1	1	1
S2, SA2, SB2	2	2
S3, SA3, SB3	3	3
S4, SA4, SB4	4	4
S9, SA9, SB9	1	1
TA, TB	4	4
TA02 *, TB02 *		
TA23, TB23	4	4
RK	1	1

* not available

DL5BK*



SPOOL	CURVE
S1, S2, RK	1
TA02	2
S3	3
S4	4
TA, TA23	5

2.3 - Switching times

The indicated values are obtained according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50°C.

	DS3K*		DL5BK*	
TIMES [ms]	ENERGIZING	DE-ENERGIZING	ENERGIZING	DE-ENERGIZING
DC	60	40	70 ÷ 100	15 ÷ 20
RAC	60	140	70 ÷ 100	140

3 - ELECTRICAL CHARACTERISTICS

(values ± 5%)

Coil type	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [W]
D12	12	7,2	1,7	20
D24	24	28,7	0,83	20
D48	48	115	0,42	20
D110	110	549	0,2	22

Coil type (**NOTE**)	Nominal voltage [V]	Freq. [Hz]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [VA]
R120	110V-50Hz 120V-60Hz	50/60	489,6	0,19	21
				0,21	25
R240	230V-50Hz 240V-60Hz		2067,7	0,098	22,5
				0,1	24

VOLTAGE SUPPLY FLUCTUATION (ripple included)	± 10% Vnom
MAX SWITCH ON FREQUENCY DS3K*, DL5BK* DSP5K*, DSP5RK* DSP7K* DSP8K* DSP10K*	 8.000 ins/hr 6.000 ins/hr 6.000 ins/hr 4.000 ins/hr 3.000 ins/hr
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC)	According to 2014/30/EU
CLASS OF PROTECTION: Atmospheric agents Coil insulation (VDE 0580)	 IP66/IP68 class H

NOTE: type R* coils are for alternating current supply for both 50 or 60 Hz. For R* coils the resistance can not be measured in the usual way because of the presence of diodes bridge inside the coil.

3.1 - Wiring

In order to realise the electrical connection of the coil, it is necessary to access the terminal block (1) unscrewing the 4 screws (2) that fasten the cover (3) with the box (4) that contains the terminal block.

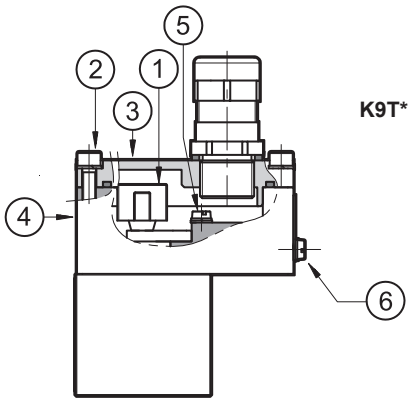
The electrical connection is polarity-independent.

By doing electrical connection it is important to connect also the grounding point (5) in the terminal block box (M4 screws), through suitable conductors with the general grounding line of the system.

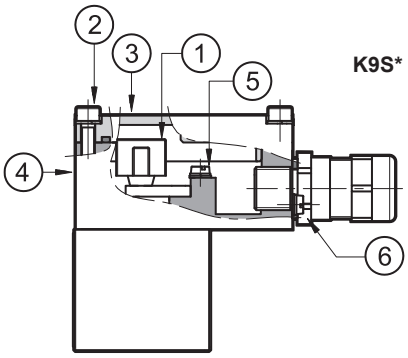
On the external body of the coil there is a grounding point (6) (M4 screw) that allow to ensure equipotentiality between the valve and the general grounding line of the system; connecting this point the regulation of the EN 13463-1 standard, that impose to verify the equipotentiality of the elements included in a potentially explosive environment (the maximum resistance between the elements must be 100 Ω), is guaranteed.

At the end of the electrical wiring, it is necessary to reassemble the cover (3) on the box (4), checking the correct positioning of the seal located in the cover seat and fastening the 4 M5 screws with a torque of 4.9÷6 Nm.

Electrical wiring must be done following in compliance with standards about protection against explosion hazards.



K9T*



K9S*

Characteristics of the cables connectable for wiring are indicated in the table below:

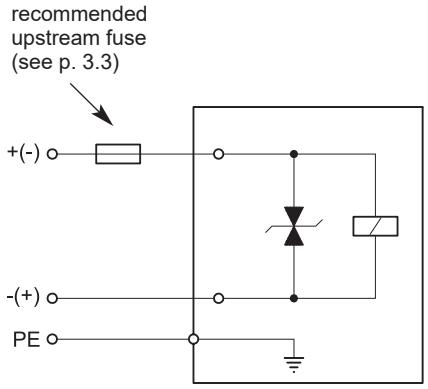
Function	Cable section
Operating voltage cables connection	max 2.5 mm²
Connection for internal grounding point	max 2.5 mm²
Connection for external equipotential grounding point	max 6 mm²

Cables for wiring must be non-armoured cables, with external covering sheath and must be suitable for use in environments with temperatures from - 20 °C to +110 °C (for valves either with N or V seals) or from - 40 °C to +110 °C (for valves with NL seals).

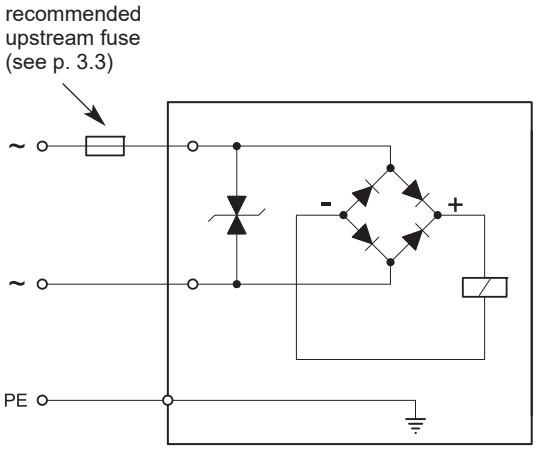
Cable glands (which must be ordered separately, see point 19) allow to use cables with external diameter between 8 and 10 mm.

3.2 - Electrical diagrams

DC coil



RAC coil



3.3 - Overcurrent fuse and switch-off voltage peak

Upstream of each valve, an appropriate fuse (max 3 x In according to IEC 60127) or a protective motor switch with short-circuit and thermal instantaneous tripping, as short-circuit protection, must be connected. The cut-off power of the fuse must correspond or exceed the short circuit current of the supply source. The breaking capacity of the fuse link shall be the same as or higher than the maximum short-circuit current expected to occur at the place of installation (normally 1500 A).

The fuse or the protective motor must be placed outside the dangerous area or they must be protected with an explosion-proof covering.

In order to safeguard the electronic device to which the valve is connected, there is a protection circuit in the coil, that reduces voltage peaks, which can occur when inductances are switched off.

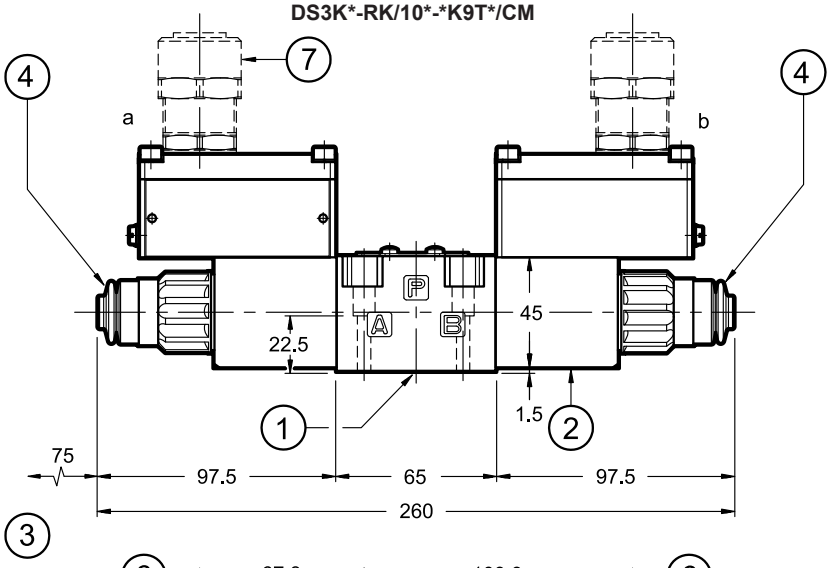
The table shows the type of fuse recommended according to the nominal voltage of the valve and to the value of the voltage peaks reduction.

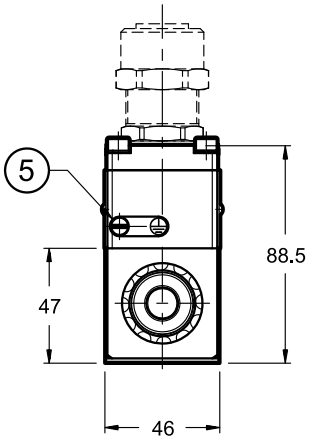
Coil type	Nominal voltage [V]	Rated current [A]	**Recommended pre-fuse characteristics medium time-lag according to DIN 41571 [A]**	Maximum voltage value upon switch off [V]	Suppressor circuit
D12	12	1,7	2,5	- 49	Transient voltage suppressor bidirectional
D24	24	0,83	1,25	- 49	
D48	48	0,42	0,6	- 81	
D110	110	0,2	0,3	- 309	
R120	120	0,21	0,3	- 3	
R240	240	0,1	0,15	- 3	

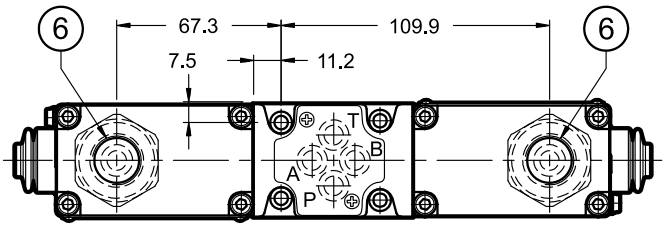
4 - OVERALL AND MOUNTING DIMENSIONS OF DIRECT OPERATED VALVES

dimensions in mm

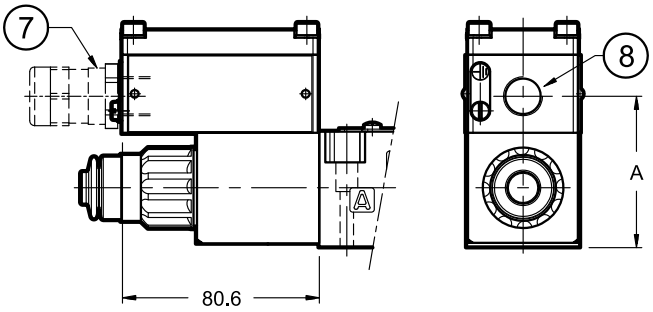
DS3K*-S*/10*-*K9T*/CM
DS3K*-RK/10*-*K9T*/CM





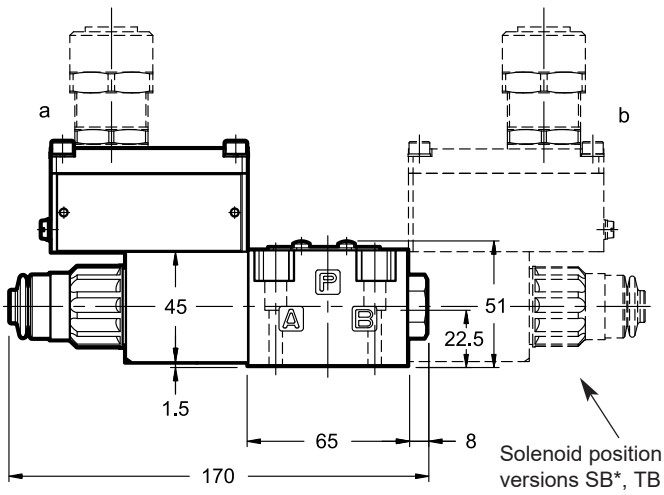


DS3K*-*/10*-*K9S*/CM



Side port type	A
S01, S04	60.5
S02, S03	60

DS3K*-SA*/10*-*K9T*/CM
DS3K*-TA/10*-*K9T*/CM
DS3K*-TA*/10*-*K9T*/CM

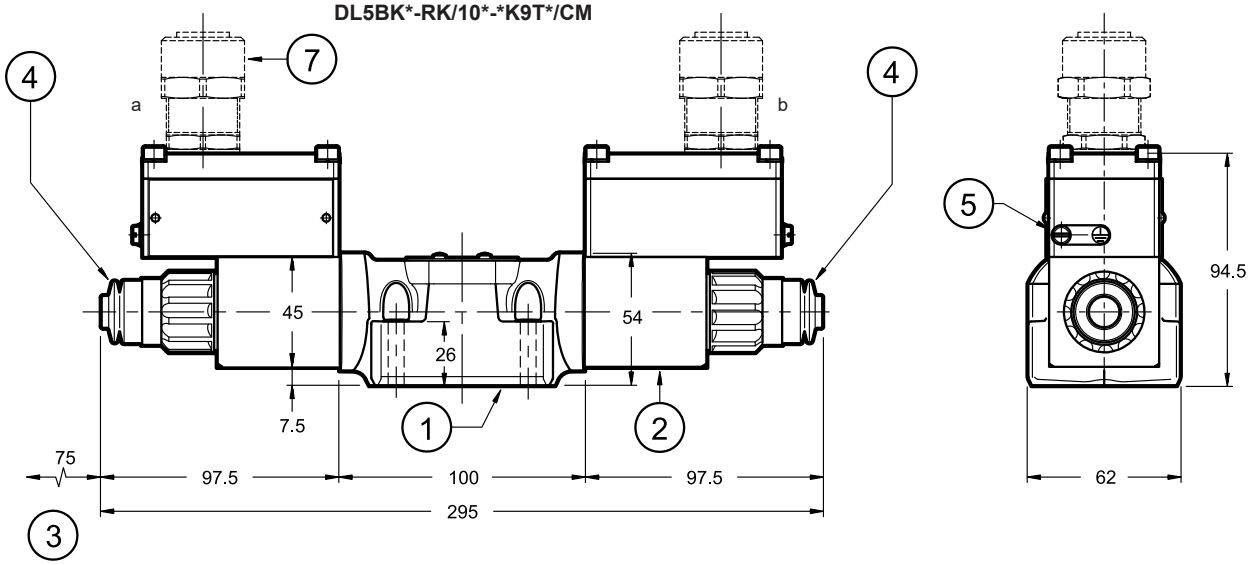


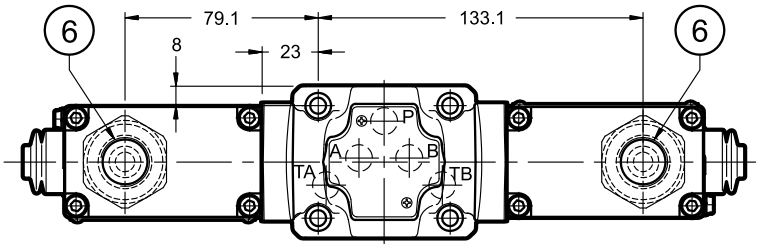
1	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19
8	Side port for cable gland

Valve fastening: 4 SHC screws ISO 4762 M5x30
Tightening torque: 5 Nm (A8.8 screws)
Threads of mounting holes: M5x10

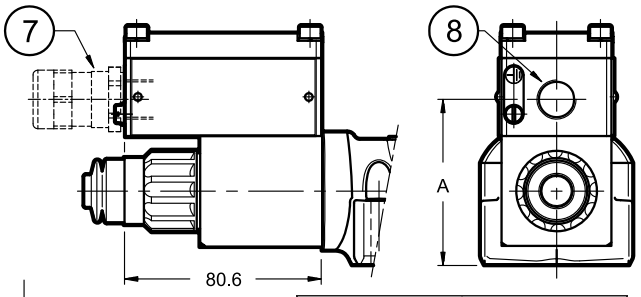
DL5BK*-S*/10*-*K9T*/CM
DL5BK*-RK/10*-*K9T*/CM

dimensions in mm



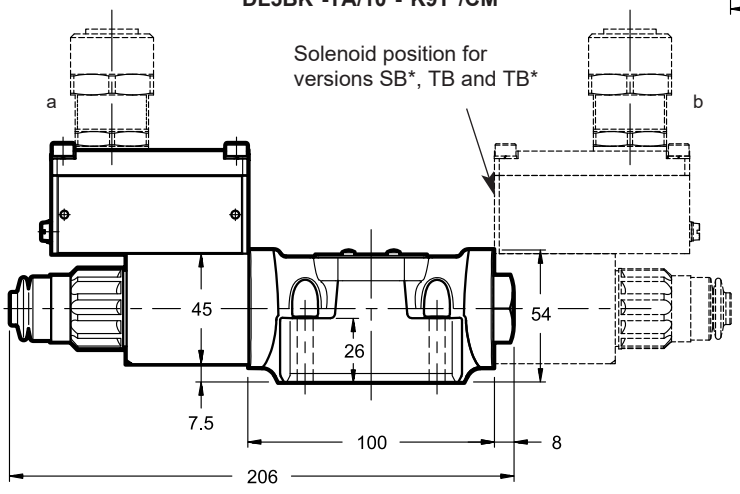


DL5BK*-*/10*-*K9S*/CM



Side port type	Dimension A
S01, S04	66.5
S02, S03	66

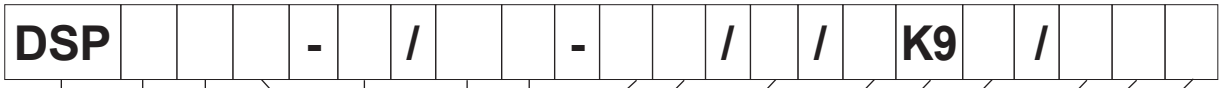
DL5BK*-SA*/10*-*K9T*/CM
DL5BK*-TA/10*-*K9T*/CM



1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19
8	Side port for cable gland

Valve fastening: 4 SHC screws ISO 4762 M6x35
Tightening torque: 8 Nm (A8.8 screws)
Threads of mounting holes: M6x10

5 - IDENTIFICATION OF PILOT OPERATED SOLENOID VALVES



Pilot operated directional valve

Size:
5 = CETOP P05
5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08
10 = ISO 4401-10

Option:
(omit for standard version)
H = high pressure p_{max} 420 bar

Explosion-proof certification:
See table 1.1

Spool type (see p. 5.1)
S* **TA** **TB** **RK**
SA* **TA02** **TB02**
SB*

Series No.
20 = DSP5K*, DSP5RK* and DSP8K*
10 = DSP7K*
11 = DSP10K*

Seals:
For temperature range -20 / +80 °C
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

For temperature range -40 / +80 °C
NL = seal for low temperatures (for mineral oil)

Pilot supply:
E = external
I = internal (not available for S2, S4, TA02, TB02, S*2 and S*4 spools)
Z = internal pilot supply with 30 bar pressure reducing valve fixed adjustment (not available for S2, S4, TA02, TB02, S*2 and S*4 spools)

Alternative options for valves size 7 or 8 only, S2, S4, TA02, TB02, S*2 and S*4 spools :
C = internal pilot supply with backpressure valve in P port
CZ = internal pilot supply with 30 bar pressure reducing valve fixed adjustment, and with backpressure valve in P port.

Drain:
E = external
I = internal

Options:
C = main spool stroke control
D = main spool switching speed control
for DSP5 - DSP5R - DSP7 - DSP8 valves :
P08 = subplate with restrictor Ø0,8 on port P placed under the pilot stage
Only for DSP10 valves:
P15 = subplate with restrictor Ø1,5 on port P placed under the pilot stage

Power supply:
Direct current (DC)
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
Alternate current with built-in rectifier bridge (RAC)
R120 = 120 V
R240 = 240 V

Coil electrical connection: junction box

Connection type for cable gland
upper connection:
T01 = M20x1.5 - ISO 261
T02 = Gk 1/2 - UNI EN 10226-2
T03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
side connection:
S01 = M20x1.5 - ISO 261
S02 = Gk 1/2 - UNI EN 10226-2
S03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
S04 = M16x1.5 - ISO 261

Manual override:
CM = boot protected
standard for both N and V seals
not available for NL seals
CB = blind ring nut
standard for NL seals
available upon request for both N and V seals
see dimensions at point 16

Option: **/T5**
version in T5 temperature class.
Omit if not required.

Option:
surface treatment not standard.
Omit if not required
(see **NOTE**)

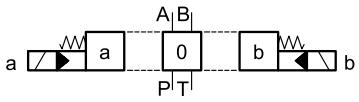
NOTE: Valves are supplied with standard surface treatment of black phosphating on the main body and zinc-nickel on the pilot body. The full zinc-nickel surface treatment is available upon request. This treatment ensures a salt spray resistance of up to 600 h(test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

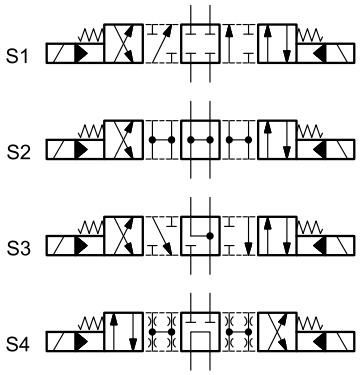
For full zinc-nickel surface treatment, add suffix **/W7** to the end of the identification code.

A version with monobloc coils made of steel is available. Please refer to details in page 2.

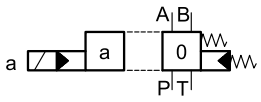
5.1 - Spool types

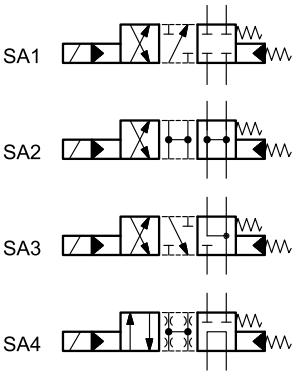
Version **S***:
2 solenoids - 3 positions
with spring centering



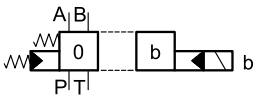


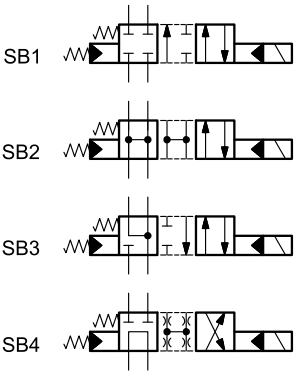
Version **SA***:
1 solenoid side A
2 positions (central + external)
with spring centering



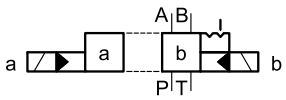


Version **SB***:
1 solenoid side B
2 positions (central + external)
with spring centering

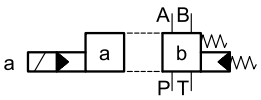


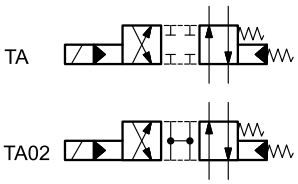


Version **RK**:
2 solenoids - 2 positions
with mechanical detent

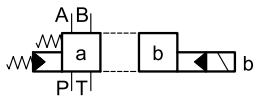


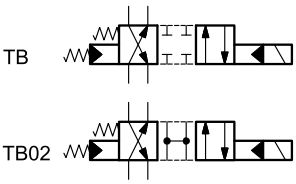
Version **TA**:
1 solenoid side A
2 external positions
with return spring





Version **TB**:
1 solenoid side B
2 external positions
with return spring



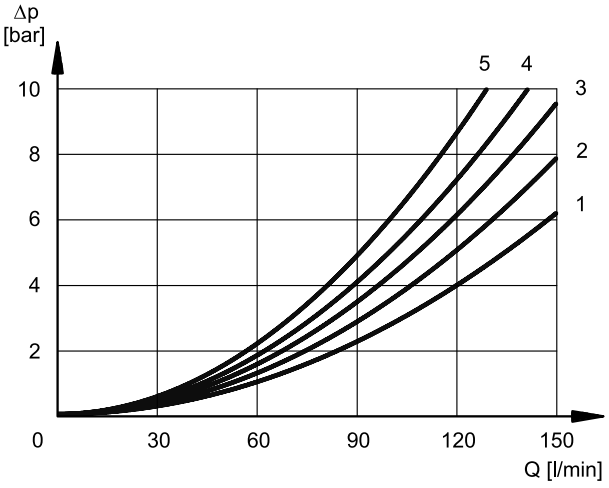


6 - CHARACTERISTIC CURVES AND PERFORMANCES OF PILOT OPERATED SOLENOID VALVES

6.1 - Pressure drops Δp-Q

(values obtained with viscosity 36 cSt at 50 °C)

DSP5K* - DSP5RK*



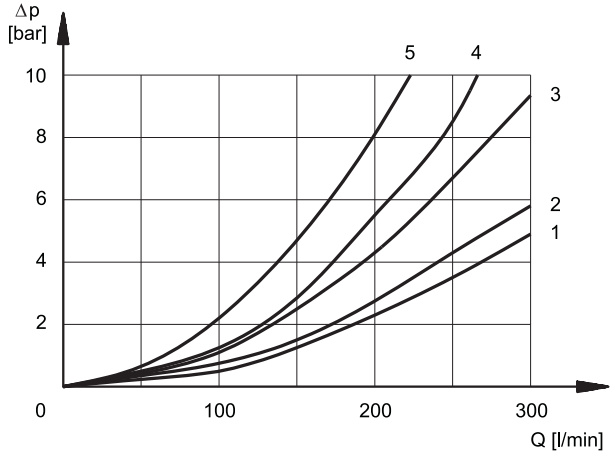
ENERGIZED POSITION

SPOOL	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SB1	2	2	2	3
S2, SA2, SB2	3	3	1	2
S3, SA3, SB3	2	2	1	2
S4, SA4, SB4	2	2	2	4
TA, TB	3	3	3	4
TA02, TB02	-	-	-	-
RK	-	-	-	-

DE-ENERGIZED POSITION

SPOOL	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SB2	-	-	2	2	3
S3, SA3, SB3	-	-	5	5	-
S4, SA4, SB4	-	-	-	-	5

DSP7K*



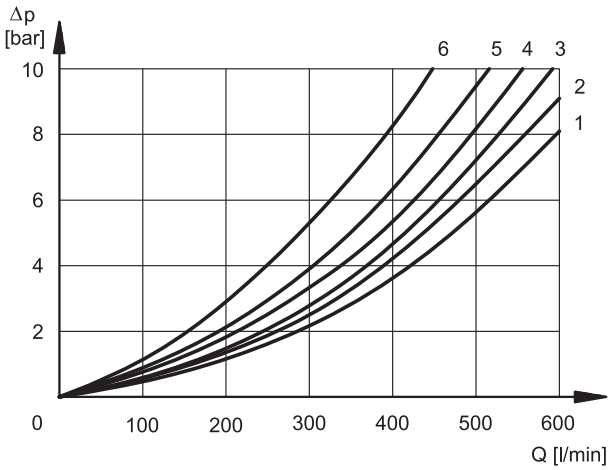
ENERGIZED POSITION

SPOOL	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SB1	1	1	3	4
S2, SA2, SB2	1	1	4	4
S3, SA3, SB3	1	1	4	4
S4, SA4, SB4	2	2	4	5
TA, TB	1	1	3	4
TA02, TB02	1	1	4	4
RK	1	1	3	4

DE-ENERGIZED POSITION

SPOOL	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SB2	-	-	-	-	2
S3, SA3, SB3	-	-	4	4	-
S4, SA4, SB4	-	-	-	-	4

DSP8K*



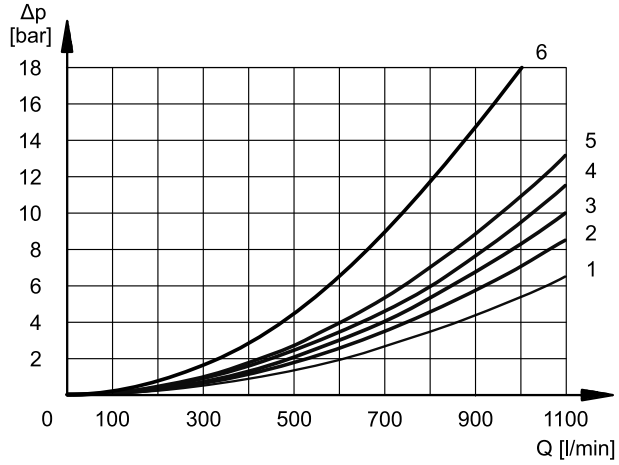
ENERGIZED POSITION

SPOOL	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SB1	2	2	3	3
S2, SA2, SB2	1	1	2	1
S3, SA3, SB3	2	2	2	1
S4, SA4, SB4	4	4	3	5
TA, TB	2	2	3	3
TA02, TB02	2	2	3	3
RK	2	2	3	3

DE-ENERGIZED POSITION

SPOOL	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SB2	-	-	-	-	4
S3, SA3, SB3	-	-	4	4	-
S4, SA4, SB4	-	-	-	-	6

DSP10K*



ENERGIZED POSITION

SPOOL	FLOW DIRECTIONS				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1, SB1	3	3	1	2	-
S2, SA2, SB2	4	4	2	4	-
S3, SA3, SB3	3	3	2	4	-
S4, SA4, SB4	3	3	2	4	-
TA, TB	3	3	1	2	-
TA02, TB02	4	4	2	4	-
RK	3	3	1	2	-

DE-ENERGIZED POSITION

SPOOL	FLOW DIRECTIONS				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2	-	-	3	4	5
S3	-	-	5	5	-
S4, TA02	-	-	-	-	6

6.2 - Switching times

The values indicated refer to a solenoid valve working with pilot supply pressure of 100 bar, with mineral oil at a temperature of 50°C, at viscosity of 36 cSt and with PA and BT connections.

The energizing and de-energizing times are obtained at the pressure variation which occurs on the lines.

TIMES (± 10%) [ms]	ENERGIZING	DE- ENERGIZING	
	DC - RAC	DC	RAC
DSP5K* - DSP5RK*	70	60	160
DSP7K*	80	70	170
DSP8K*	90	70	170
DSP10K*	120	90	190

7 - HYDRAULIC CHARACTERISTICS

PRESSURES (bar)	DSP5K* DSP5RK*	DSP5HK* DSP5RHK*	DSP7K*	DSP7HK*	DSP8K*	DSP8HK*	DSP10K*	DSP10HK*
Max pressure in P, A, B ports	350	420	350	420	350	420	350	420
Max pressure in T line with external drain	250	350	250	350	250	350	300	350
Max pressure in T line with internal drain	210		210		210		210	
Max pressure in Y line with external drain	210		210		210		210	
Min pilot supply pressure **NOTE 1**	5 ÷ 12						10	
Max pilot supply pressure **NOTE 2**	210	350	210	350	210	350	280	350

NOTE 1: The valve needs a difference between the pilot pressure value and the discharge/drain pressure value in order to work correctly.

NOTE 2: If the working pressure is higher than these rated limits, then provide an external pilot line with p_{max} within the rated limits and order the valve with E type pilot supply.

If the external pilot line is not possible, you must opt for the version with Z type pilot supply (see point 8.2), providing max 350 bar at inlet pressure P.

MAXIMUM FLOW RATES		DSP5K* DSP5RK*		DSP7K*		DSP8K*		DSP10K*	
Spool type		PRESSURES							
		at 210 bar	at 350 bar	at 210 bar	at 350 bar	at 210 bar	at 350 bar	at 210 bar	at 350 bar
S4 - SA4 - SB4	[l/min]	120	100	200	150	500	450	800 (**NOTE**)	600 (**NOTE**)
Other spools		150	120	300	300	600	500	900	700

NOTE: for the DSP10K* valve these values are the same even for S2 - SA2 - SB2 spools.

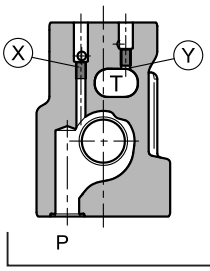
8 - PILOT AND DRAIN

DSP*K* valves are available with both pilot supply and drain internal or external type. The version with external drain allows a higher back pressure on the return line.

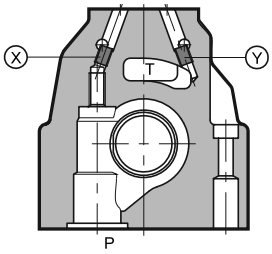
NOTE: The pilot supply and drain configuration must be chosen when ordering. Subsequent modification is only permitted by authorized experienced operators or at the factory.

TYPE OF VALVE		Plug assembly	
		X	Y
IE	internal pilot and external drain	NO	YES
II	internal pilot and internal drain	NO	NO
EE	external pilot and external drain	YES	YES
EI	external pilot and internal drain	YES	NO

DSP5K* / DSP5RK*

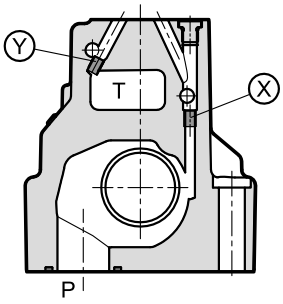


DSP7K*

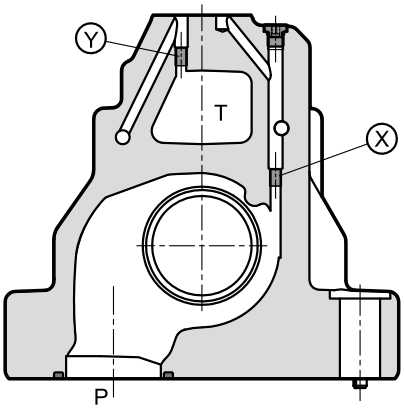


X: plug M5x6 for external pilot
Y: plug M5x6 for external drain

DSP8K*



DSP10K*



X: plug M6x8 for external pilot
Y: plug M6x8 for external drain

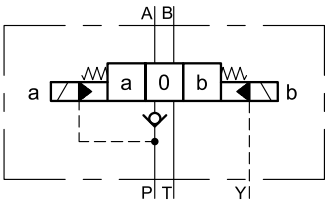
8.1 - C type pilot supply: internal pilot supply with backpressure valve in P port

DSP7K* and DSP8K* valves are available with incorporated backpressure valve in the P port. This is in order to reach the minimum pilot supply pressure at normal position in valves in which the inlet port (P) and the return port (T) are connected (spools S2, S4, S7, S8, S*2, S*4, T*02).

The pressure differential of the backpressure valve must be added to that of the main valve shown at point 6.

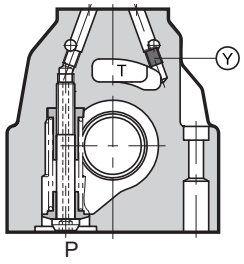
The cracking pressure is 5 bar (DSP7K*) and 6 bar (DSP8K*) with a minimum flow rate of 15 l/min.

NOTE: The backpressure valve doesn't assure the seal so it has not be intended as a check valve. Add **C** to the identification code for this request (see point 5).



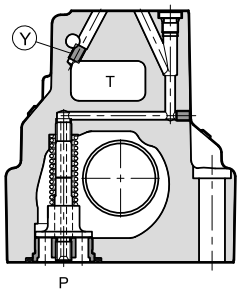
DSP7K* only: the backpressure valve can also be delivered separately. It can be easily mounted on the P port of the main control valve. Order code for the backpressure valve: **0266577**.

DSP7K*

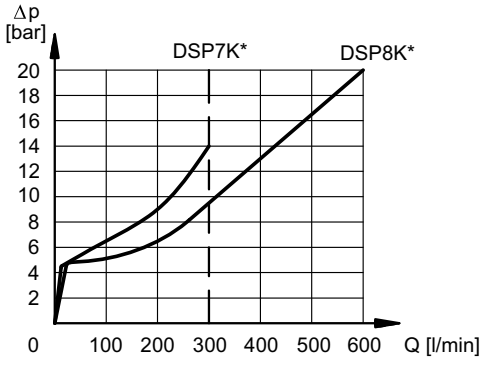


pilot supply always internal
Y: plug M5x6 for external drain

DSP8K*



pilot supply always internal
Y: plug M6x8 for external drain



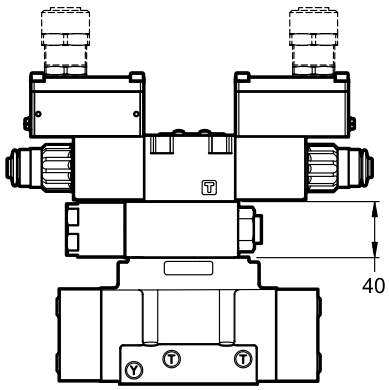
Pressure drops of the backpressure valve.

8.2 - Z type pilot supply: internal pilot supply with pressure reducing valve

The Z type pilot supply consists of an arrangement with internal pilot and 30 bar supply pressure to the pilot stage, by means of a fixed adjustment pressure reducing valve placed between the main stage and the pilot valve.

Consider an increase of 40 mm in height for valves ordered with Z option .

DSP*K*-*/Z*



9 - OPTIONS

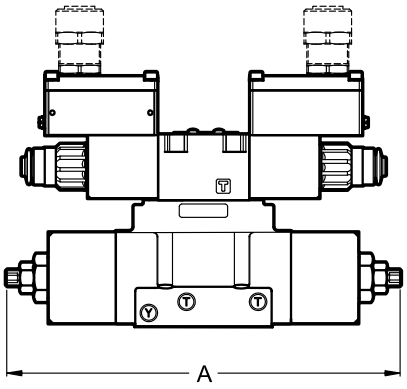
9.1 - Control of the main spool stroke: C

With the help of special side plugs, it is possible to introduce stroke controls in the heads of the piloted valve so as to vary the maximum spool clearance opening.

This solution allows control of the flow rate from the pump to the actuator and from the actuator to the outlet, obtaining a double adjustable control on the actuator.

Add the letter C in the identification code to order this version (see point 5).

DSP*K*-*/C



dimensions in mm

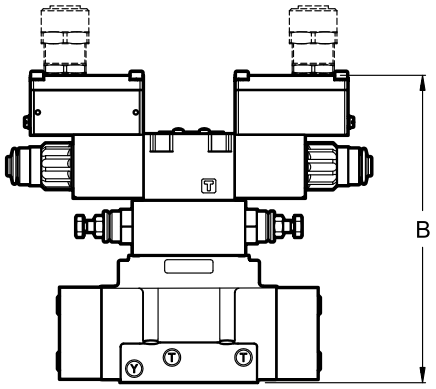
	DSP5K* DSP5RK*	DSP7K*	DSP8K*	DSP10K*
A	284	319	401.5	520

9.2 - Control of the main spool shifting speed: D

By placing a double flow control valve (QTM3 type) between the pilot solenoid valve and the main stage, the pilot supply flow can be adjusted and therefore the changeover smoothness can be varied..

Add the letter **D** in the identification code to order this version (see point 5).

DSP*K*-*/D



dimensions in mm

	DSP5K* DSP5RK*	DSP7K*	DSP8K*	DSP10K*
B	218.5	225.5	254.5	310.5

9.3 - Subplate with throttle on line P

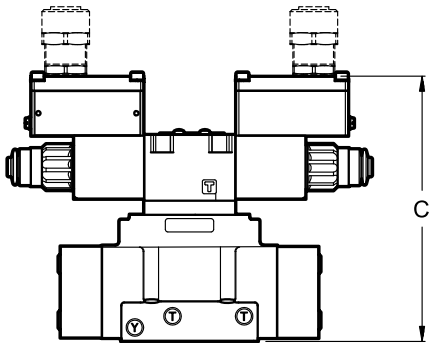
It is possible to introduce a subplate with a restrictor in line P between the pilot valve and the main stage. Subplate width 10 mm.

restrictor Ø0.8 for DSP5K*, DSP5RK*, DSP7K* and DSP8K*
restrictor Ø1.5 for DSP10K*:

To order include in the code (p. 5):

P08 for DSP5K*, DSP5RK*, DSP7K* and DSP8K*
P15 for DSP10K*

DSP*K*-*/P*



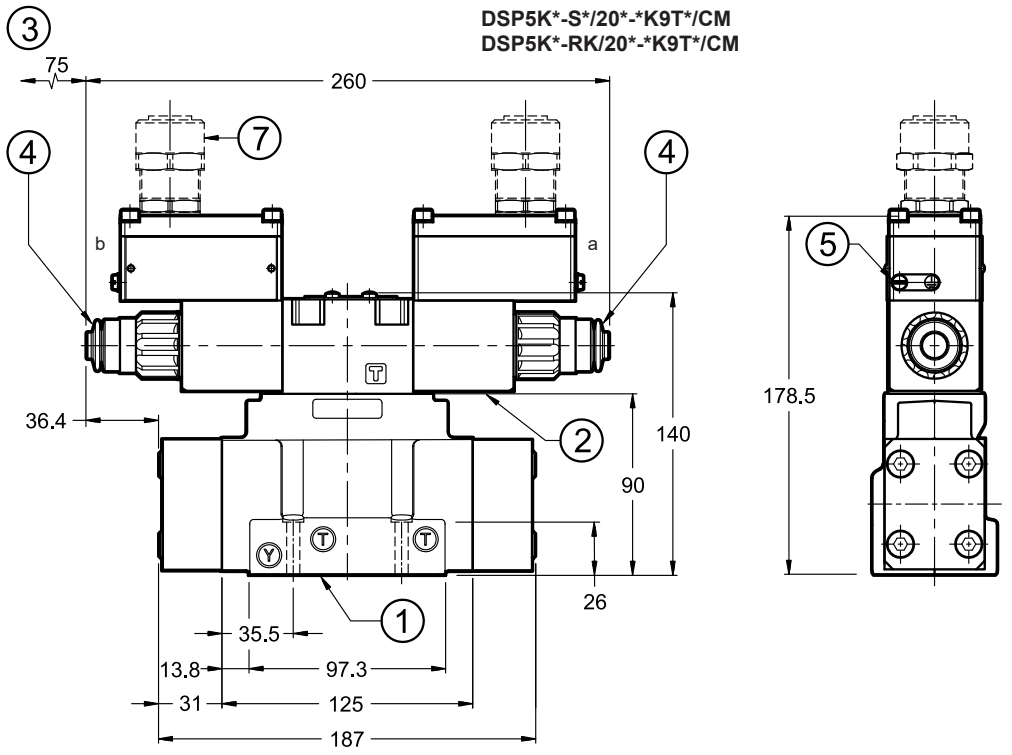
dimensions in mm

	DSP5K* DSP5RK*	DSP7K*	DSP8K*	DSP10K*
C	188.5	195.5	224.5	280.5

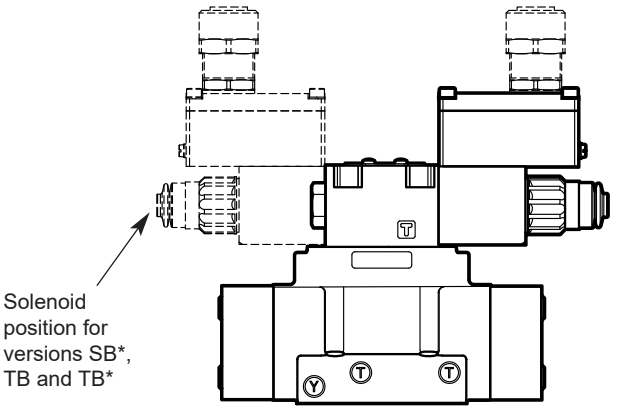
10 - DSP5K* AND DSP5RK* WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

DSP5K*-S*/20*-*K9T*/CM
DSP5K*-RK/20*-*K9T*/CM



DSP5K*-SA*/20*-*K9T*/CM
DSP5K*-TA/20*-*K9T*/CM
DSP5K*-TA*/20*-*K9T*/CM



1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore 2 OR type 2037 (9.25x1.78) - 90 Shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19

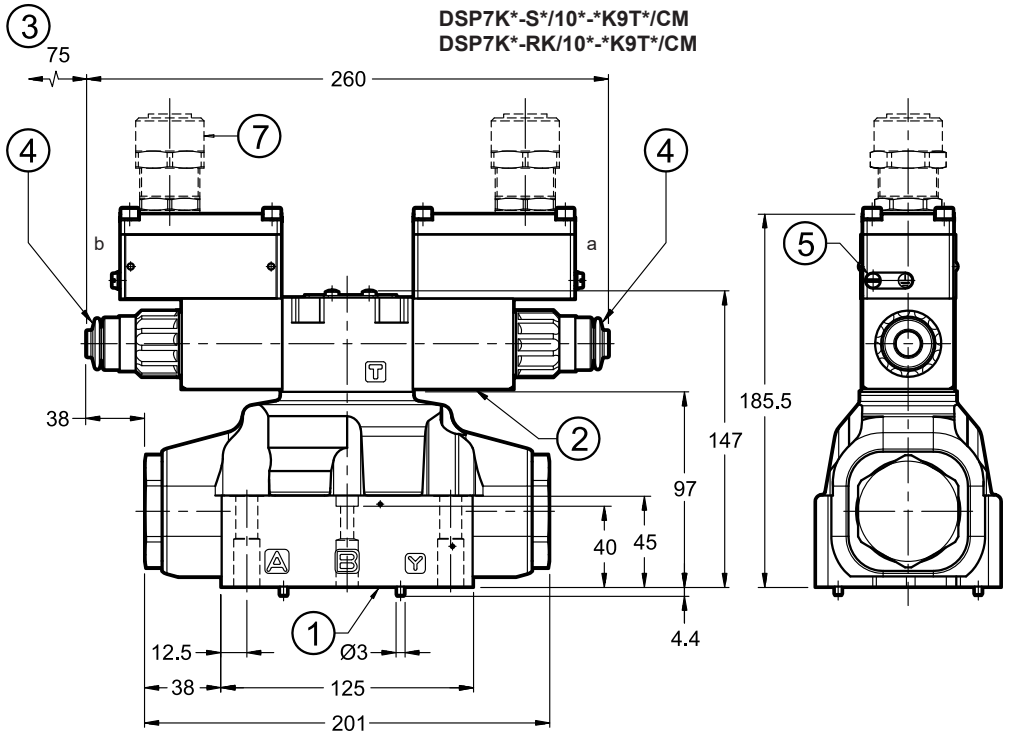
NOTE 1: See point 8.2. for overall dimensions with Z option (fixed adjustment pressure reducing valve)
NOTE 2: for side port cable gland see point 14.

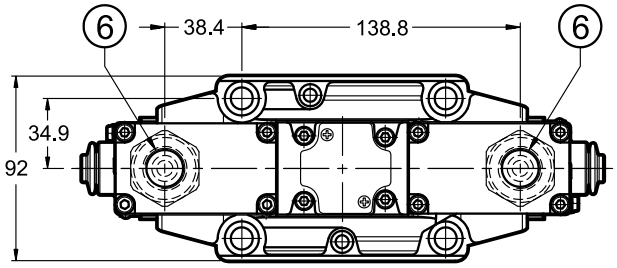
Valve fastening: 4 SHC screws ISO 4762 M6x35
Tightening torque: 8 Nm (A8.8 screws)
Threads of mounting holes: M6x10

11 - DSP7K* WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

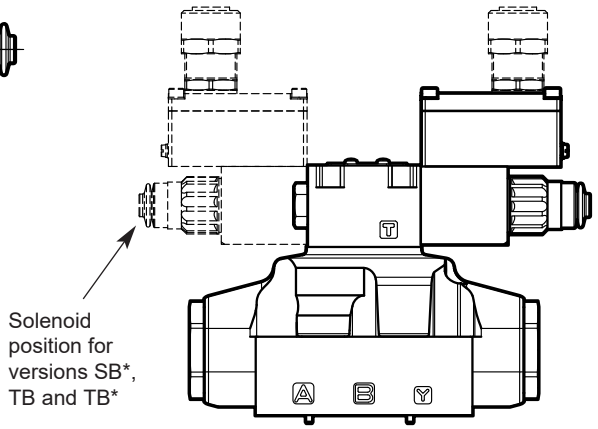
dimensions in mm

DSP7K*-S*/10*-*K9T*/CM
DSP7K*-RK/10*-*K9T*/CM





DSP7K*-SA*/10*-*K9T*/CM
DSP7K*-TA/10*-*K9T*/CM
DSP7K*-TA*/10*-*K9T*/CM



Solenoid position for versions SB*, TB and TB*

1	Mounting surface with sealing rings: 4 OR type 130 (22.22x2.62) - 90 Shore 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (standard for both N and V seals) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19

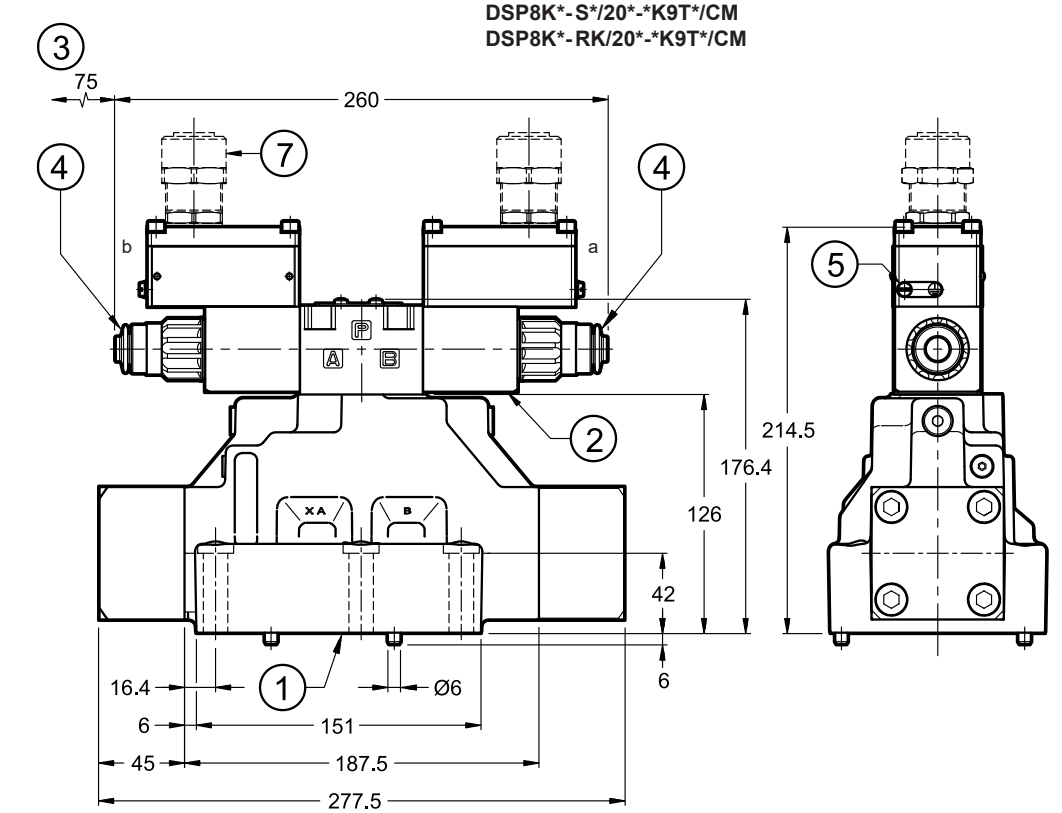
NOTE 1: for overall dimensions with Z option (fixed adjustment pressure reducing valve) see point 8.2.
NOTE 2: for side port cable gland see point 14.
NOTE 3: A10.9 fastening screws are recommended for high pressure valves (H versions).

Valve fastening: 4 SHC screws ISO 4762 M10x60 2 SHC screws ISO 4762 M6x50
Tightening torque: M10x60: 40 Nm (A8.8 screws) - 57 Nm (A10.9 screws) M6x50: 8 Nm (A8.8 screws) - 12 Nm (A10.9 screws)
Threads of mounting holes: M6x12; M10x18

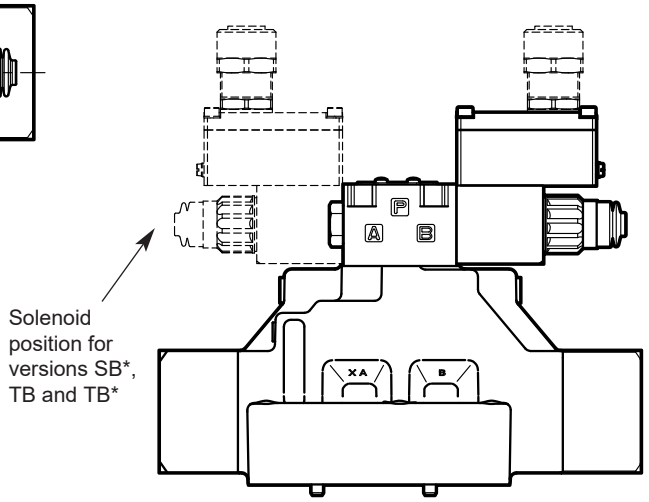
12 - DSP8K* WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

DSP8K*-S*/20*-*K9T*/CM
DSP8K*-RK/20*-*K9T*/CM



DSP8K*-SA*/20*-*K9T*/CM
DSP8K*-TA/20*-*K9T*/CM
DSP8K*-TA*/20*-*K9T*/CM



Solenoid position for versions SB*, TB and TB*

1	Mounting surface with sealing rings: 4 OR type 3131 (32.99x2.62) - 90 Shore 2 OR type 3087 (21.89x2.62) - 90 Shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19

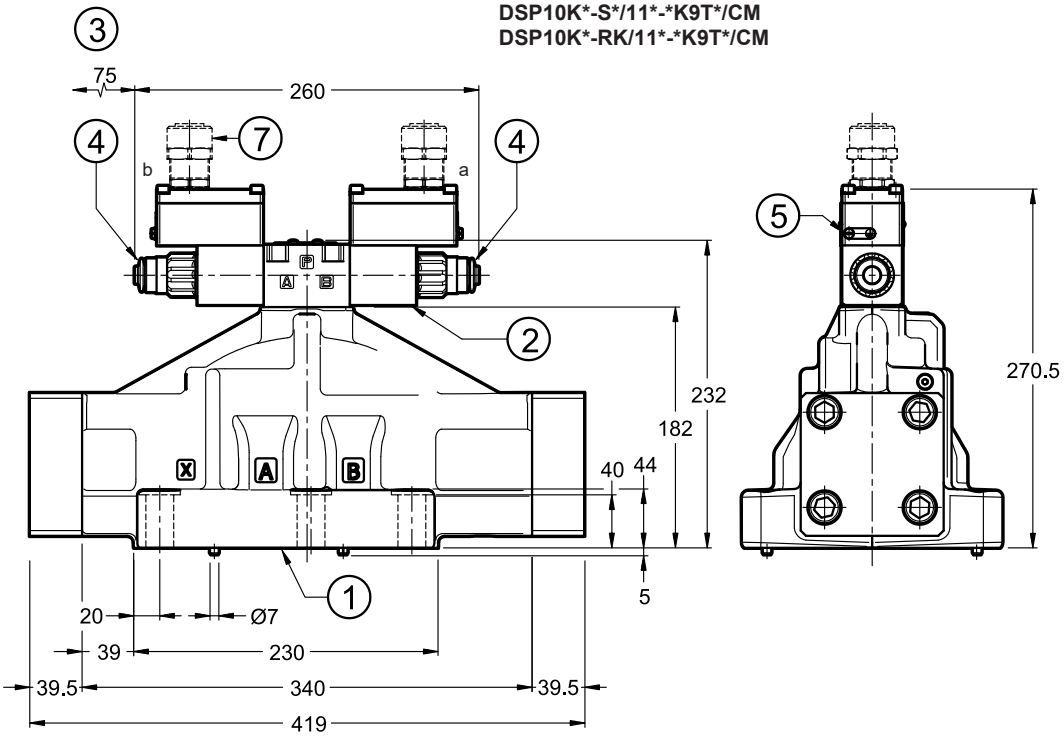
NOTE 1: for overall dimensions with Z option (fixed adjustment pressure reducing valve) see point 8.2.
NOTE 2: for side port cable gland see point 14.
NOTE 3: A10.9 fastening screws are recommended for high pressure valves (H versions).

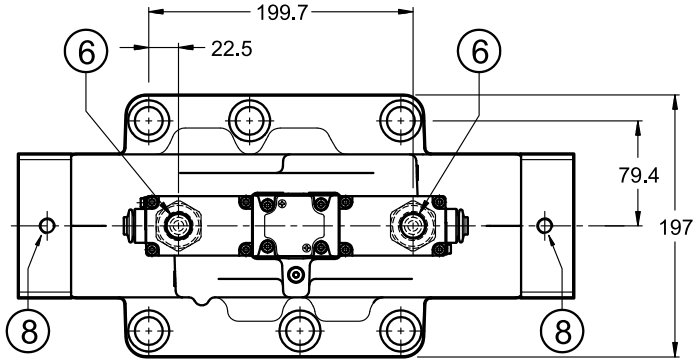
Valve fastening: 6 SHC screws ISO 4762 M12x60
Tightening torque: 69 Nm (A8.8 screws) - 96 Nm (A10.9 screws)
Threads of mounting holes: M12x20

13 - DSP10K* WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

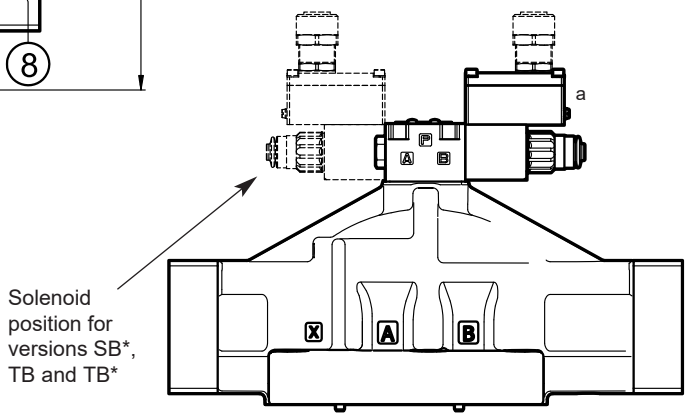
dimensions in mm

DSP10K*-S*/11*-*K9T*/CM
DSP10K*-RK/11*-*K9T*/CM





DSP10K*-SA*/11*-*K9T*/CM
DSP10K*-TA/11*-*K9T*/CM
DSP10K*-TA*/11*-*K9T*/CM



Solenoid position for versions SB*, TB and TB*

1	Mounting surface with sealing rings: 4 OR type 4162 (40.86x3.53) - 90 shore 2 OR type 3081 (20.24x2.62) - 90 shore
2	Explosion-proof coil
3	Minimum clear space required
4	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see p. 18
5	Terminal for supplementary GND connection
6	Upper port for cable gland
7	Cable gland. To be ordered separately, see point 19
8	M12 eyebolt seat for safe lift

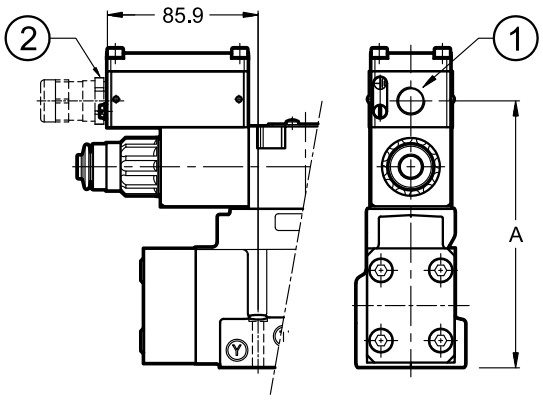
NOTE 1: for overall dimensions with Z option (fixed adjustment pressure reducing valve) see point 8.2.
NOTE 2: for side port cable gland see point 14.

Valve fastening: 6 SHC screws ISO 4762 M20x70 (supplied)
Tightening torque: 470 Nm (A10.9 screws)
Threads of mounting holes: M20x40

14 - DSP*K* WITH SIDE CONNECTIONS - OVERALL AND MOUNTING DIMENSIONS

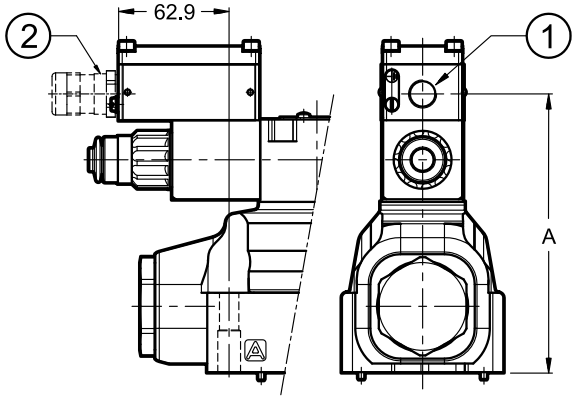
dimensions in mm

DSP5K*-*/20*-*K9S*/*
DSP5RK*-*/20*-*K9S*/*



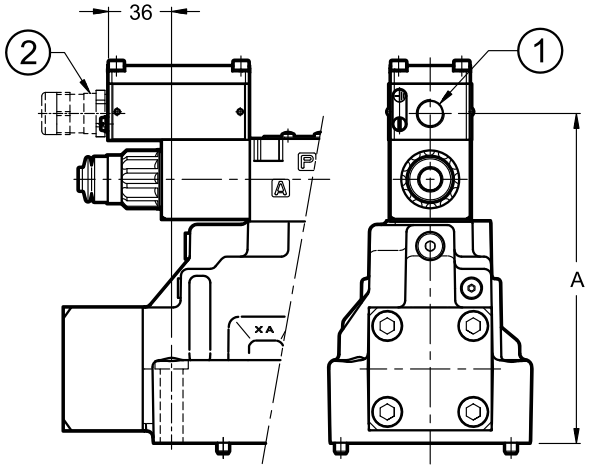
Side port type	A
S01, S04	150.5
S02, S03	150

DSP7K*-*/10*-*K9S*/*



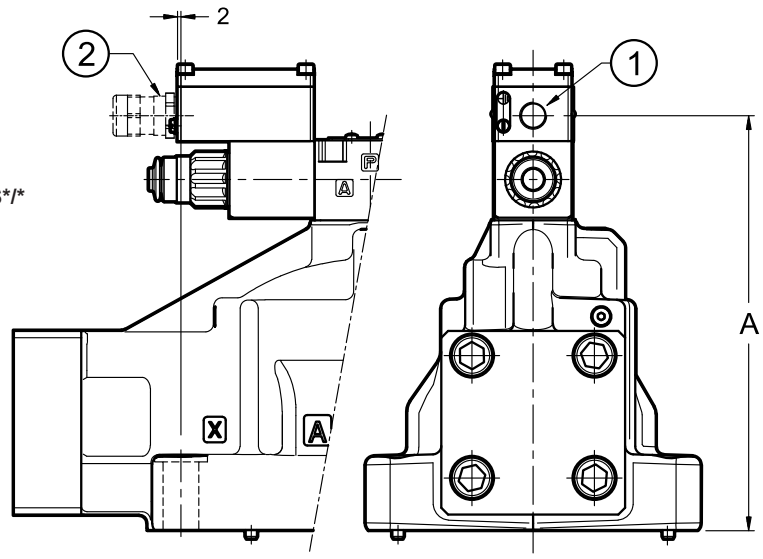
Side port type	A
S01, S04	157.5
S02, S03	157

DSP8K*-*/20*-*K9S*/*



Side port type	A
S01, S04	186.5
S02, S03	186

DSP10K*-*/11*-*K9S*/*

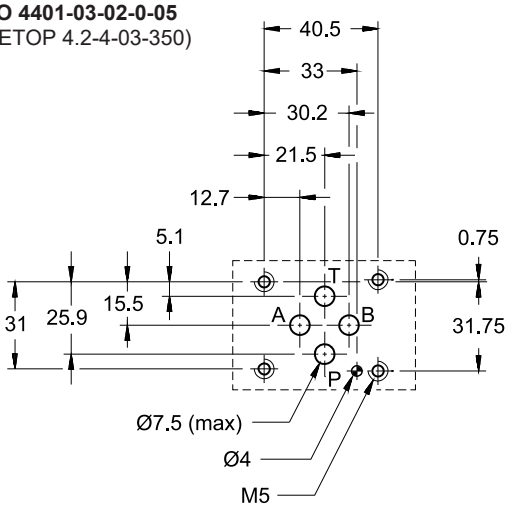


Side port type	A
S01, S04	242.5
S02, S03	242

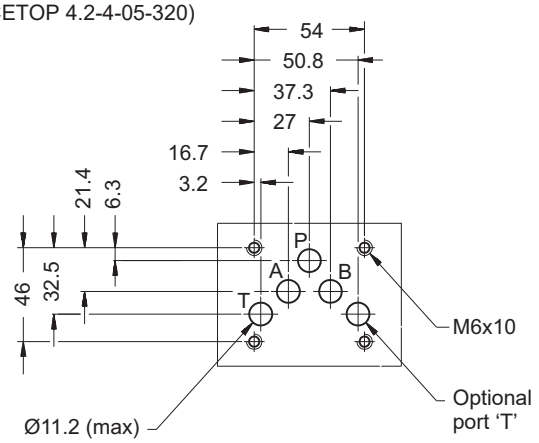
1	Side port
2	Cable gland. To be ordered separately, see p. 19

15 - MOUNTING SURFACES

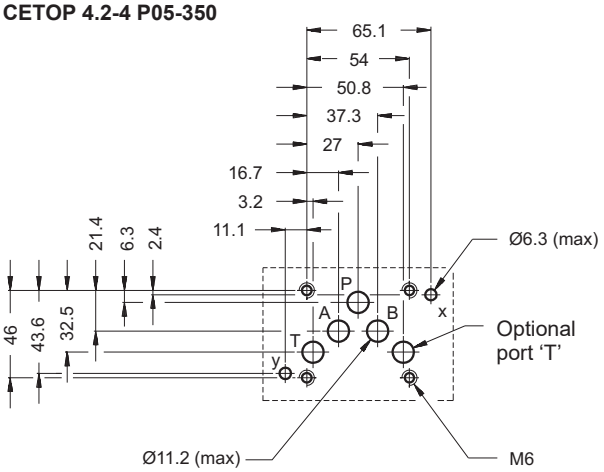
DS3K*
ISO 4401-03-02-0-05
(CETOP 4.2-4-03-350)



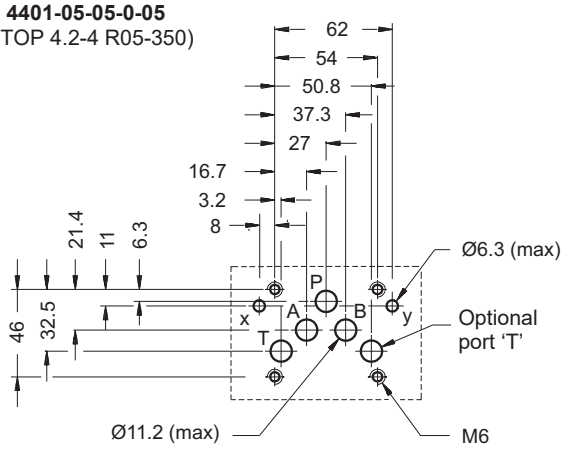
DL5BK*
ISO 4401-05-04-0-05
(CETOP 4.2-4-05-320)



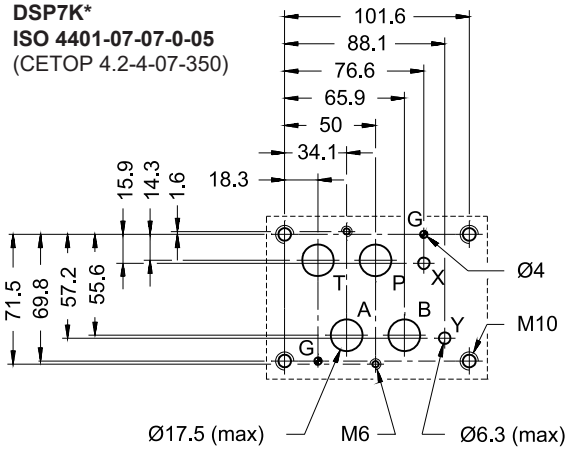
DSP5K*
CETOP 4.2-4 P05-350



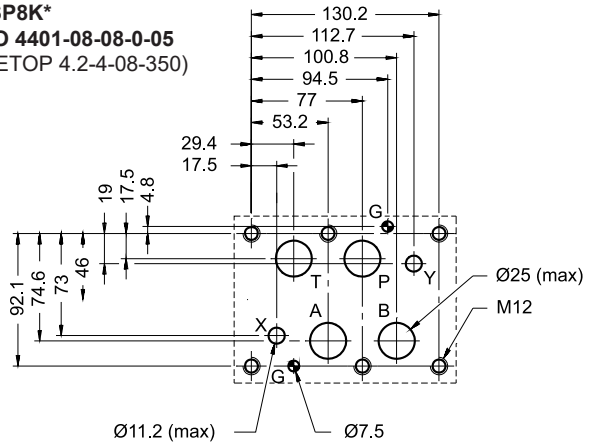
DSP5RK*
ISO 4401-05-05-0-05
(CETOP 4.2-4 R05-350)



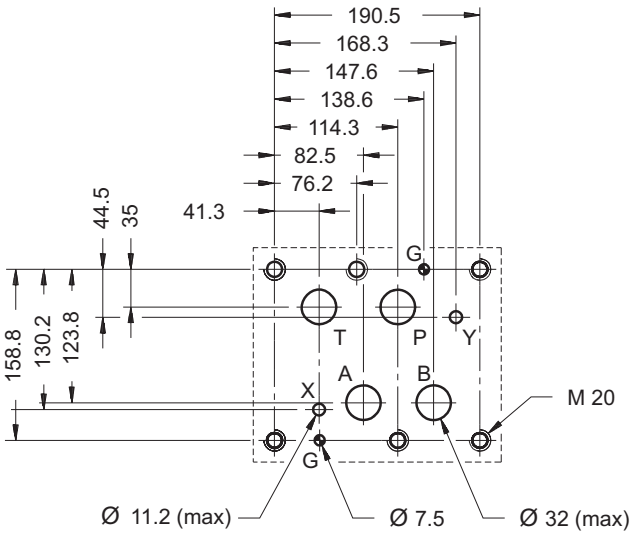
DSP7K*
ISO 4401-07-07-0-05
(CETOP 4.2-4-07-350)



DSP8K*
ISO 4401-08-08-0-05
(CETOP 4.2-4-08-350)



DSP10K*
ISO 4401-10-09-0-05
(CETOP 4.2-4-10-350)



16 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

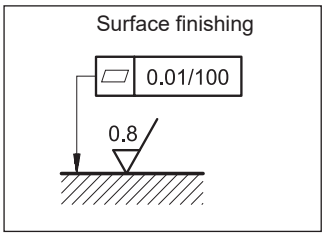
17 - INSTALLATION

Installation must adheres to instructions reported in the *Use and Maintenance manual*, always attached to the valve. Unauthorized interventions can be harmful to people and goods because of the explosion hazards present in potentially explosive atmospheres.

Configurations with centering and recall springs can be mounted in any position; The RK versions, without springs and with mechanical detent, must be mounted with the longitudinal axis horizontal.

Valve fastening takes place by means of screws or tie rods, laying the valve on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing.

If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.



18 - MANUAL OVERRIDES

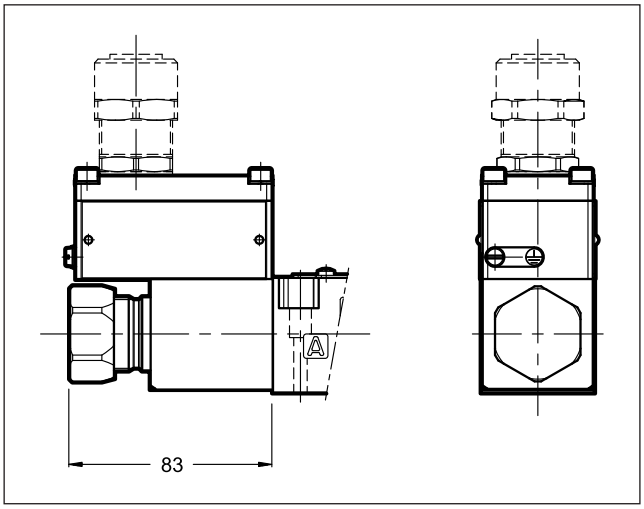
18.1 - CB - Blind ring nut

The metal ring nut protects the solenoid tube from atmospheric agents and isolates the manual override from accidental operations. The ring nut is tightened on a threaded fastener that keeps the coil in its position even without the ring nut.

To access the manual override loosen the ring nut and remove it; then reassemble hand tightening, until it stops.

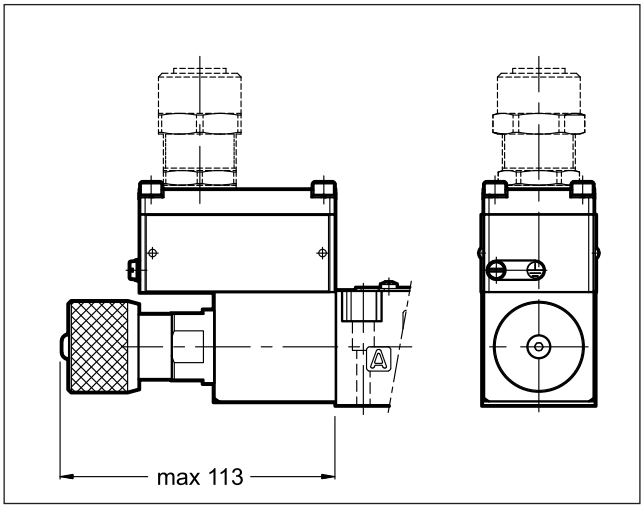
Activate the manual override always and only with non-sparking tools suitable for use in potentially explosive atmospheres.

More information on safe use of explosion-proof components are provided in the instruction manual, always supplied with the valve.



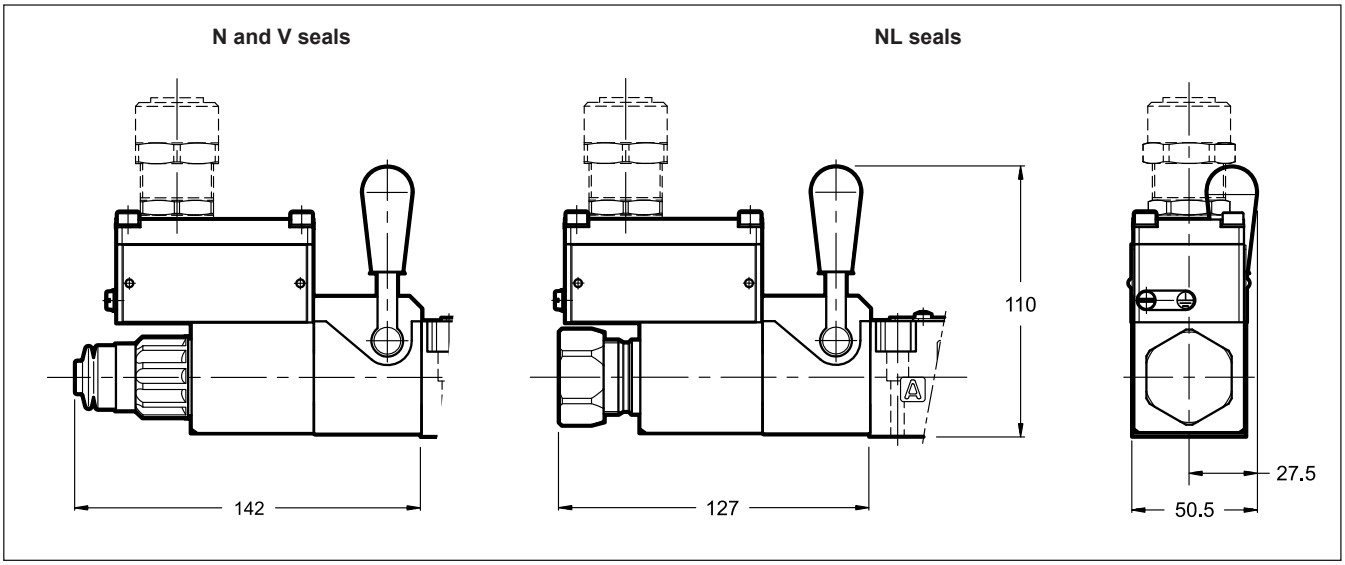
18.2 - CK1 - Knob manual override

This turning knob is available for DC valves only.



18.3 - CH - Lever manual override

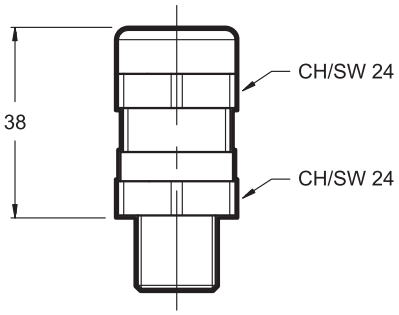
The lever manual override is available for DS3K only. The seals choice leads the type of the standard ring nut to be mounted. The boot isn't a redundant manual override, instead acts as protection for the tube. The lever device is always placed at side A, except for valves with TB spools.



19 - CABLE GLANDS

Cable glands must be ordered separately; Duplomatic offers some types of cable glands with the following features:

- version for non-armoured cable, external seal on the cable (suitable for Ø 8÷10 mm cables);
- ATEX II 2GD, I M2; IECEx Gb, Db, Mb certified
- cable gland material: nickel brass
- inner rubber tip material: silicone
- ambient temperature range: -65 ºC ÷ +220 ºC
- protection degree: IP66/IP68



To order the desired cable glands, specify description, code and quantity.

Description: CGK2/NB-01/10

Code: 3908108001

M20x1.5 - ISO 261 male thread, suitable for coils with T01 and S01 connections. It is supplied equipped with copper washer, that must be assembled between the cable gland and the coil, so as to ensure IP66/IP68 protection degree.

Tightening torque: 45 ÷ 50 Nm

Description: CGK2/NB-02/10

Code: 3908108002

Gk 1/2 - UNI EN 10226-2 male thread, suitable for coils with T02 and S02 connections. The customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil in order to ensure IP66/IP68 protection degree.

Tightening torque: 20 ÷ 25 Nm

Description: CGK2/NB-03/10

Code: 3908108003

1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1), suitable for coils with T03 and S03 connections. The customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil in order to ensure IP66/IP68 protection degree.

Tightening torque: 20 ÷ 25 Nm

Description: CGK2/NB-04/10

Code: 3908108004

M16x1.5 - ISO 261 male thread, suitable for coils with S04 connection. It is supplied equipped with copper washer, that must be assembled between the cable gland and the coil, so as to ensure IP66/IP68 protection degree.

Tightening torque: 45 ÷ 50 Nm

20 - SUBPLATES

(see catalogue 51 000)

	DS3K*	DL5BK*		DSP5K*	DSP7K*	DSP8K*
Type with rear ports	PMMD-AI3G	PMD4-AI4G	-	PME4-AI5G	PME07-AI6G	-
Type with side ports	PMMD-AL3G	-	PMD4-AL4G	PME4-AL5G	PME07-AL6G	PME5-AL8G
P, T, A, B ports dimensions X, Y ports dimensions	3/8" BSP -	3/4" BSP -	1/2" BSP -	3/4" BSP 1/4" BSP	1" BSP 1/4" BSP	1 ½" BSP 1/4" BSP

NOTE: Subplates (to be ordered separately) contain neither aluminium nor magnesium at a rate higher than the value allowed by norms according to ATEX directive for category II 2GD and I M2.

The user will bear to do the complete assessment of the ignition risk that can occur from the relative use in potentially explosive environments.

DUPLOMATIC MOTION SOLUTIONS
a member of DAIKIN group

DUPLOMATIC MS Spa
via Mario Re Depaolini, 24 | 20015 Parabiago (MI) | Italy
T +39 0331 895111 | E vendite.ita@duplomatic.com | sales.exp@duplomatic.com
duplomaticmotionsolutions.com

EXPLOSION-PROOF CLASSIFICATION for

SOLENOID AND PROPORTIONAL VALVES

ref. catalogues:

pressure control valves	
RQM*K*-P	**21 515**
P*E*K*	**81 316**
ZDE3K*	**81 515**
DZCE*K*	**81 606**
flow control valves	
QDE3K*	**82 225**
directional valves	
D*K*	**41 515**
DT3K*	**42 215**
DS(P)E*K*	**83 510**

GENERAL INFO

This informative technical datasheet displays information about **classification and marking** of Duplomatic explosion-proof valves range.

Duplomatic MS offers valves with the following certifications:

ATEX	**II 2G**	**II 2D**	**I M2**
IECEx	**Gb**	**Db**	**Mb**
PESO	**Gb**		

Instructions for use and maintenance can be found in the related manuals, always supplied toghether with valves.

1 - ATEX CLASSIFICATION AND TEMPERATURES

Duplomatic valves are suitable for application and installation in potentially explosive atmospheres, according to ATEX directive; the supply always includes the declaration of conformity to the directive and the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environments.

Coils assembled on these valves have been separately certified according to ATEX directive and so they are suitable for use in potentially explosive atmospheres.

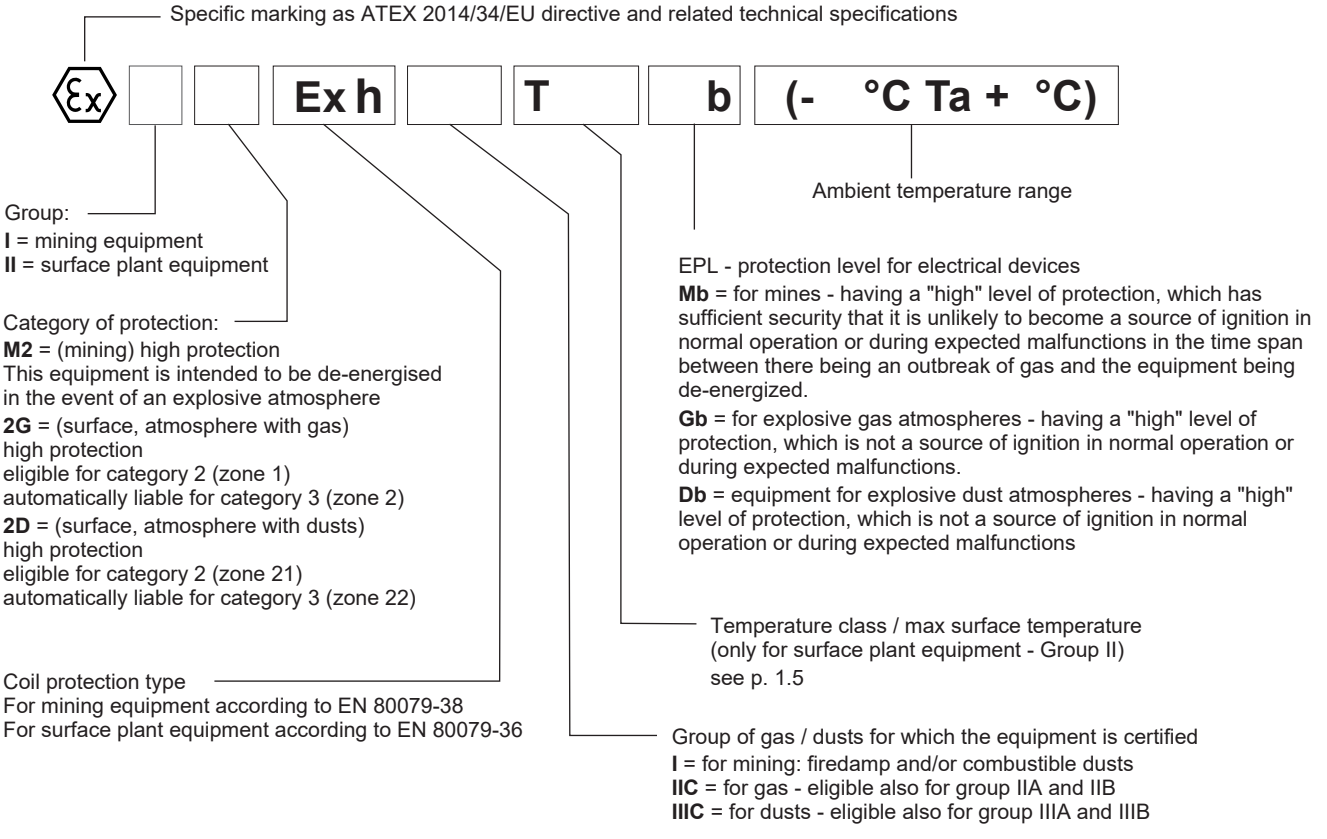
1.1 - ATEX classification for valves

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

ATEX II 2G ATEX II 2D	***KD2**	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally.The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
ATEX I M2	***KDM2**	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

1.2 - ATEX marking for valves

valve code		N and V seals	NL seals
***KD2**	for gas	Ⓔx II 2G Ex h IIC T4 Gb (-20°C Ta +80°C)	Ⓔx II 2G Ex h IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ⓔx II 2D Ex h IIIC T135°C Db (-20°C Ta +80°C)	Ⓔx II 2D Ex h IIIC T135°C Db (-40°C Ta +80°C)
***KD2 /T5**	for gas	Ⓔx II 2G Ex h IIC T5 Gb (-20°C Ta +55°C)	Ⓔx II 2G Ex h IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ⓔx II 2D Ex h IIIC T100°C Db (-20°C Ta +55°C)	Ⓔx II 2D Ex h IIIC T100°C Db (-40°C Ta +55°C)
***KDM2**	mining	Ⓔx I M2 Ex h I Mb (-20°C Ta +80°C)	Ⓔx I M2 Ex h I Mb (-40°C Ta +80°C)



1.3 - ATEX classification of the coils

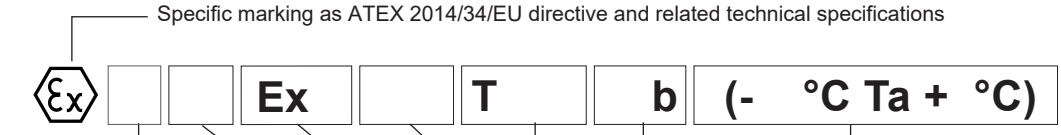
The coil of the explosion-proof valves is ATEX certified and, as such, is identified with its own tag, carries the relative ATEX marking. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an “Ex db” type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

1.4 - ATEX marking on coils

EU-type examination certificate: TÜV 25 ATEX 410149 X

for valve type ***KD2**	for gas	Ex II 2G Ex db IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ex II 2D Ex tb IIIC T135°C Db (-40°C Ta +80°C)
for valve type ***KD2 /T5**	for gas	Ex II 2G Ex db IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ex II 2D Ex tb IIIC T100°C Db (-40°C Ta +55°C)
for valve type ***KDM2**	mining	Ex I M2 Ex db I Mb (-40°C Ta +80°C)



Group:
I = mining equipment
II = surface plant equipment

Category of protection:
M2 = (mining) high protection
This equipment is intended to be de-energised in the event of an explosive atmosphere
2G = (surface, atmosphere with gas)
high protection
eligible for category 2 (zone 1)
automatically liable for category 3 (zone 2)
2D = (surface, atmosphere with dusts)
high protection
eligible for category 2 (zone 21)
automatically liable for category 3 (zone 22)

Coil protection type:
db = flameproof enclosure
tb = protection from dust by enclosure

EPL - protection level for electrical devices
Mb = for mines - having a "high" level of protection, which has sufficient security that it is unlikely to become a source of ignition in normal operation or during expected malfunctions in the time span between there being an outbreak of gas and the equipment being de-energized.
Gb = for explosive gas atmospheres - having a "high" level of protection, which is not a source of ignition in normal operation or during expected malfunctions.
Db = equipment for explosive dust atmospheres - having a "high" level of protection, which is not a source of ignition in normal operation or during expected malfunctions

Temperature class / max surface temperature
(only for surface plant equipment - Group II)
see p. 1.5

Group of gas / dusts for which the equipment is certified
I = for mining: firedamp and/or combustible dusts
IIC = for gas - eligible also for group IIA and IIB
IIIC = for dusts - eligible also for group IIIA and IIIB

1.5 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

The valves in group II can also be used for less limiting temperature classes (surface temperature allowed higher).

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
ATEX II 2G ATEX II 2D	***KD2**	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T135°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
	***KD2 /T5**	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas) T100°C (dusts)	T4, T3, T2, T1 T135°C and higher
		of fluid	-20 / +60 °C	-40 / +60 °C		
ATEX I M2	***KDM2**	of ambient	-20 / +80 °C	-40 / +80 °C	-	-
		of fluid				

1.6 - Protection degree from atmospheric agents (EN 60529)

Protection degree from atmospheric agents according to EN 60529 is IP66/IP68.

2 - IECEX CLASSIFICATION AND TEMPERATURES

The IECEx certification requires the classification of the electrical equipment only.

Duplomatic supplies valves with IECEx certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an “Ex db” type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

2.1 - IECEx classification

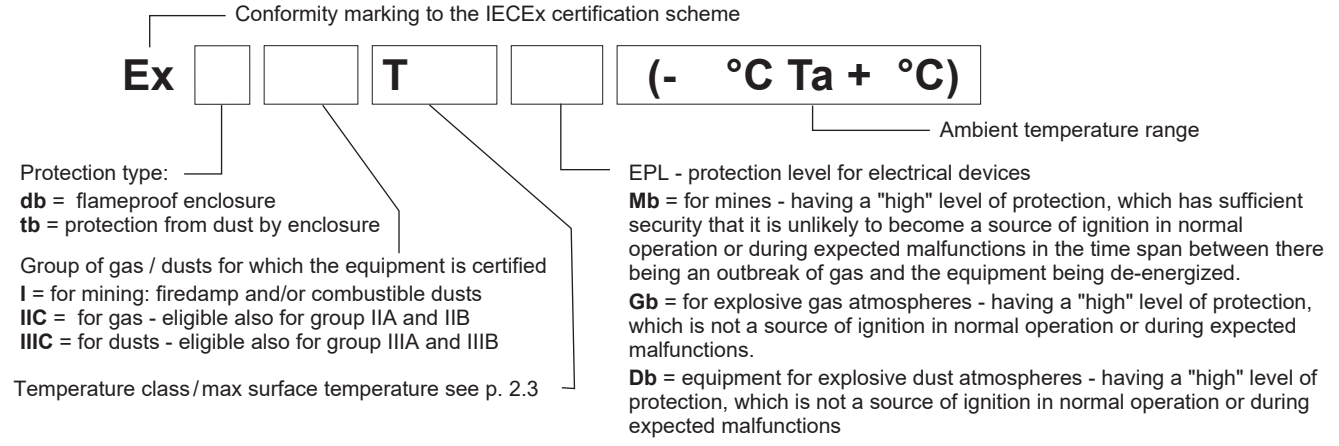
Certificate of conformity (CoC): IECEx TUN 15.0028X
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

IECEx Gb IECEx Db	***KXD2**	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally.The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
IECEx Mb	***KXDM2**	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

2.2 - IECEx marking

There is a plate with the IECEx mark on each coil.

***KXD2** valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ex tb IIIC T135°C Db (-40°C Ta +80°C)
***KXD2 /T5** valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ex tb IIIC T100°C Db (-40°C Ta +55°C)
***KDM2** valves	mining	Ex db I Mb (-40°C Ta +80°C)



2.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

		temperature range	**N and V seals**	**NL seals**	Temperature class	eligible also for
IECEx Gb IECEx Db	***KXD2**	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T135°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
	***KXD2 /T5**	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas) T100°C (dusts)	T4, T3, T2, T1 T135°C and higher
		of fluid	-20 / +60 °C	-40 / +60 °C		
IECEx Mb	***KXDM2**	of ambient	-20 / +80 °C	-40 / +80 °C	-	-
		of fluid				

2.4 - Protection degree from atmospheric agents (IEC EN 60529)

Protection degree from atmospheric agents according to IEC EN 60529 is IP66/IP68.

3 - PESO CLASSIFICATION AND TEMPERATURES

The PESO certification requires the classification of the electrical equipment only.

Duplomatic supplies valves with PESO certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an “Ex db” type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

3.1 - PESO classification

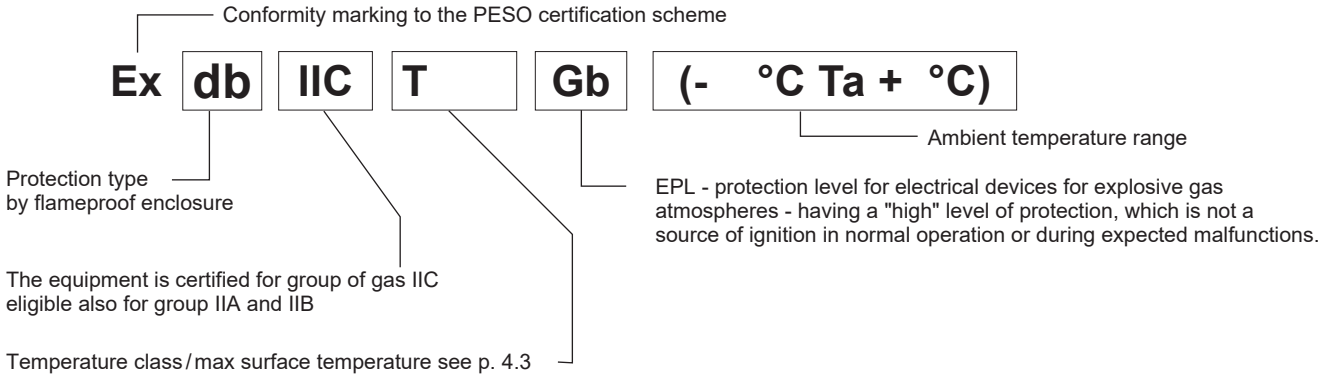
Certificate of conformity: P636522
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

PESO Gb	***KPD2**	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists are likely to occur occasionally.The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.

3.2 - PESO marking

There is a plate with the PESO mark on each coil.

***KPD2** valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
***KPD2 /T5** valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)



3.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

		temperature range	**N and V seals**	**NL seals**	Temperature class	eligible also for
PESO Gb	***KPD2**	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas)	T3, T2, T1
		of fluid				
	***KPD2 /T5**	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas)	T4, T3, T2, T1
		of fluid	-20 / +60 °C	-40 / +60 °C		

3.4 - Protection degree from atmospheric agents (IEC EN 60529)

Protection degree from atmospheric agents according to IEC EN 60529 is IP66/IP68.

DUPLOMATIC
MOTION SOLUTIONS
a member of DAIKIN group

DUPLOMATIC MS Spa
via Mario Re Depaolini, 24 | 20015 Parabiago (MI) | Italy
T +39 0331 895111 | E vendite.ita@duplomatic.com | sales.exp@duplomatic.com
duplomaticmotionsolutions.com