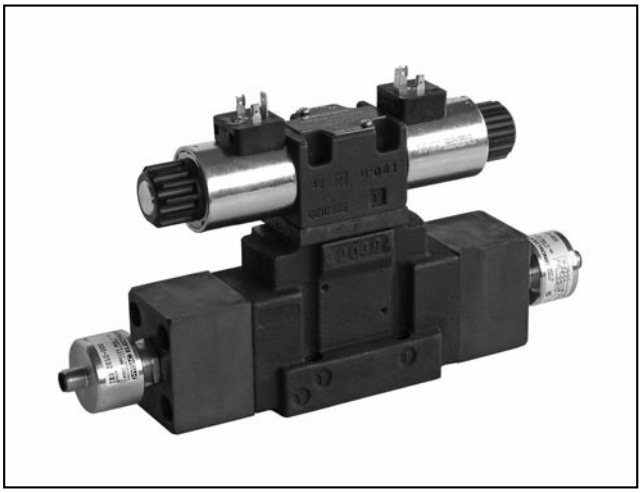
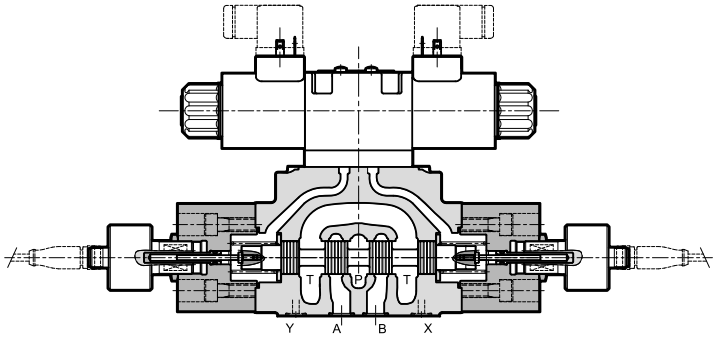


DS(P)*M

DIRECTIONAL VALVES WITH SPOOL POSITION MONITORING

DS3M	**ISO 4401-03**
DS5M	**ISO 4401-05**
DSP5RM	**ISO 4401-05**
DSP5M	**CETOP P05**
DSP7M	**ISO 4401-07**
DSP8M	**ISO 4401-08**
DSP10M	**ISO 4401-10**

OPERATING PRINCIPLE



— These solenoid operated directional valves are equipped with position sensors that monitor the main spool position. The switching position is indicated by a binary signal.

— TÜV certification body certifies the compliance of DS(P)*M valves with safety standards (see point 1).

— The valves are available in direct current versions only (see point 9).

— These valves do not have a manual override and can not be disassembled, because of their characteristics and their possible use on machinery subject to safety requirements. Moreover, their components are not interchangeable.

Read the *Use and Maintenance Manual* for instructions on operation, safe use, and repair of the product.

PERFORMANCES

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

		DS3M	DS5M	DSP5M DSP5RM	DSP7M	DSP8M	DSP10M
Maximum operating pressure: P - A - B ports T port (external drain)	bar	350 210	320	350 250	350	350	350 300
Maximum flow rate from P to A - B - T	l/min	80	120	150	300	600	1100
Ambient temperature range	°C	-20 / +50					
Fluid temperature range	°C	-20 / +80					
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 2,2	5 -	6,3 7,5	8,7 9,6	15,0 15,9	40,1 41,0

1 - TÜV CERTIFICATION

The product conformity of the solenoid actuated directional hydraulic valves (direct-acting or pilot-operated) of the DS(P)*M family has been verified by TÜV Italia S.r.l. - TÜV SÜD Group:

These components bear the CE marking as they comply with the essential requirements of the Machinery Directive 2006/42/EC.

More specifically, they comply with the following EU Directives and harmonised standards:

- Machinery Directive 2006/42/EC: EN ISO 12100:2010 (Risk assessment and risk reduction); EN ISO 13849-2:2012 (Validation, Tables C.1 and C.2); EN ISO 4413:2010 (Requirements for hydraulic fluid power systems).
- Electromagnetic Compatibility Directive 2014/30/EU.

NOTE: Components may be considered 'well-tried' if they comply with the basic safety principles and the 'well-tried' safety principles specified in Tables C.1 and C.2 of EN ISO 13849-2:2012, depending on the specific application.

Products in the DS(P)*M family may be used in safety-related parts of control systems in Category 1 (or higher), as specified in standard EN ISO 13849-1:2023.

Certificate: **TÜV IT 26 MAC 540**

2 - IDENTIFICATION OF SOLENOID VALVES, DIRECT OPERATED

2.1 - Identification code

D	S		M	-		/	21		-		K1	/		

Directional control valve solenoid operated

3 = ISO 4401-03 size
5 = ISO 4401-05 size

Monitoring of the spool position

Spool type (see p. 2.2)

S1	**SA1**	**SB1**	**TA**	**TB**
S3			**TA02**	**TB02**
S4	**SA4**	**SB4**	**TA100**	**TB100**

Series No.
(the overall and mounting dimensions remain unchanged from 20 to 29)

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

DC power supply
D12 = 12 V
D24 = 24 V
D110 = 110 V
D220 = 220 V

Coil electrical connection:
plug for connector type
EN 175301-803 (ex DIN 43650)

Monitored position:
(see p. 17 for switching logic)
R0 = monitored rest position
MA = monitored position 'a'
MB = monitored position 'b'

Position sensor supply voltage:
Omit for 24V
12 = 12 V
(only available for monitored position type M *)

NOTE: To comply with EN 693:2011, the valves are not equipped with manual override.

NOTE: Verify spool and sensor type availability in the tables below

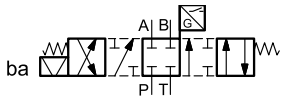
DS3		SPOOLS				
		S*	**SA***	**SB***	**TA TA100**	**TB TB100**
SENSOR TYPE	**R0**	x				
	MA		x	x	x	x
	MB		x	x	x	x

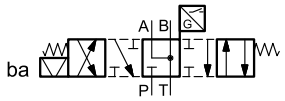
DS5		SPOOLS					
		S*	**SA***	**SB***	**TA TA100**	**TA02 TB02**	**TB TB100**
SENSOR TYPE	**R0**	x					
	MA		x	x	x	x	x
	MB		x	x	x	x	x

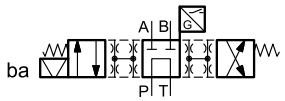
2.2 - Spool types for DS3M and DS5M

Type **DS3M-S***:
2 solenoids - 3 positions
with spring centring

Sensor **R0**

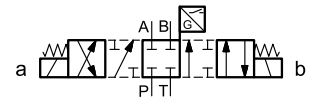
S1 

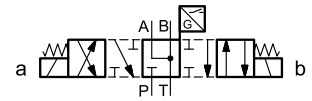
S3 

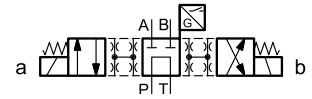
S4 

Type **DS5M-S***:
2 solenoids - 3 positions
with spring centring

Sensor **R0**

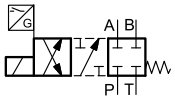
S1 

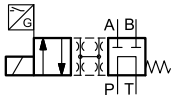
S3 

S4 

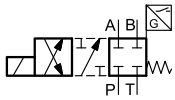
Type **SA***:
1 solenoid side A
2 positions (central + external) with return spring

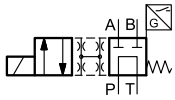
Sensor **MA**

SA1 

SA4 

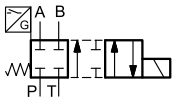
Sensor **MB**

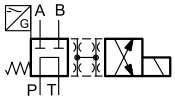
SA1 

SA4 

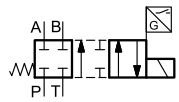
Type **SB***:
1 solenoid side B
2 positions (central + external) with return spring

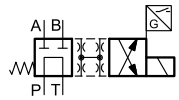
Sensor **MA**

SB1 

SB4 

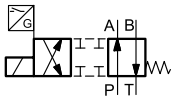
Sensor **MB**

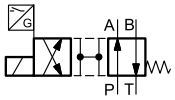
SB1 

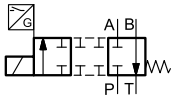
SB4 

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

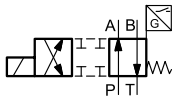
Sensor **MA**

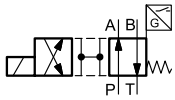
TA 

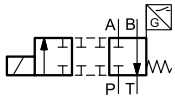
TA02 

TA100 

Sensor **MB**

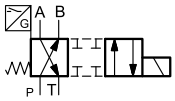
TA 

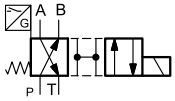
TA02 

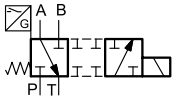
TA100 

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

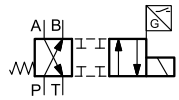
Sensor **MA**

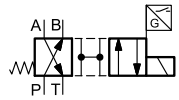
TB 

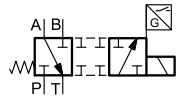
TB02 

TB100 

Sensor **MB**

TB 

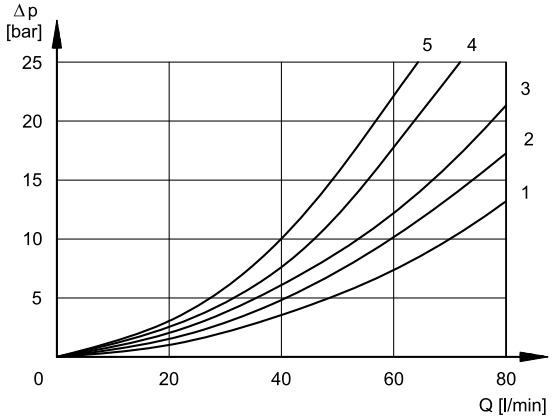
TB02 

TB100 

3 - CHARACTERISTIC CURVES OF DIRECT OPERATED SOLENOID VALVES

(obtained with viscosity 36 cSt at 50 °C)

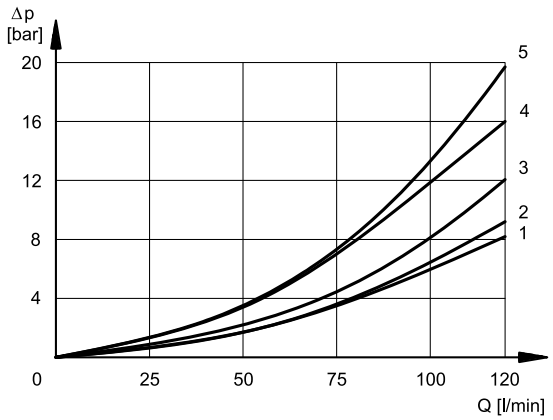
3.1 - DS3M - Pressure drops ∆p-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1; SB1	2	2	3	3	-
S3	3	3	1	1	-
S4, SA4	5	5	5	5	3
TA, TB	2	2	2	2	-
TA100, TB100	4	4	4	4	-

For S3 in central position B→T refer to curve 3.

3.2 - DS5M - Pressure drops ∆p-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1, SB1	2	2	1	1	
S3	2	1	2	3	
S4, SA4, SB4	1	1	2	2	4
TA, TB, TA02, TB02	3	3	2	2	-
TA100, TB100	2	2	2	2	-

For S3 in central position B→T refer to curve 5.

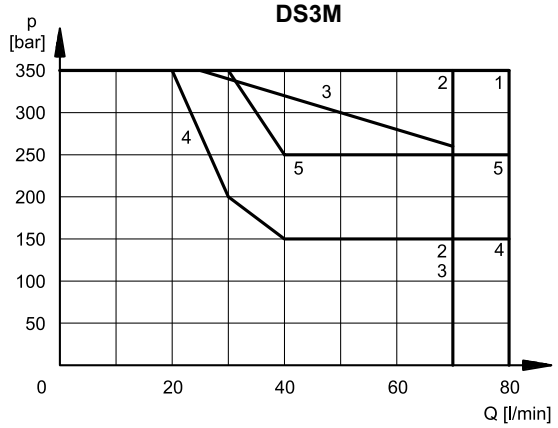
3.3 - Performance limits for DS3M and DS5M solenoid valves

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. The values have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.

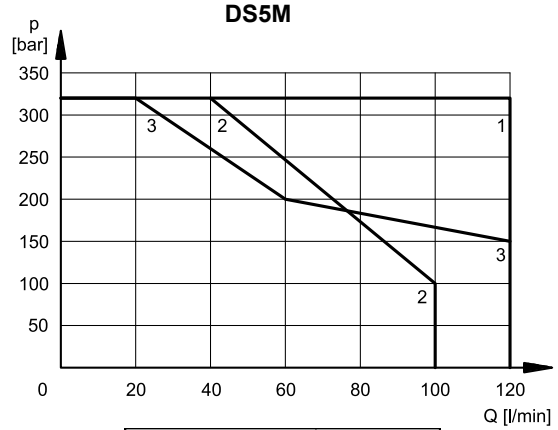
The operating limits can be considerably reduced if a 4-way valve is used as 3-way valve with port A or B plugged or without flow.

DS3M



SPOOL	CURVE	
	P→A	P→B
S1,SA1	1	1
S3,	4	4
S4, SA4	2	2
TA, TB	5	5
TA100, TB100	3	3

DS5M



SPOOL	CURVE	
	P→A	P→B
S1	1	1
S3	3	3
S4	2	2
TA02	1	1
TA, TA100	1	1

3.4 - Switching times

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

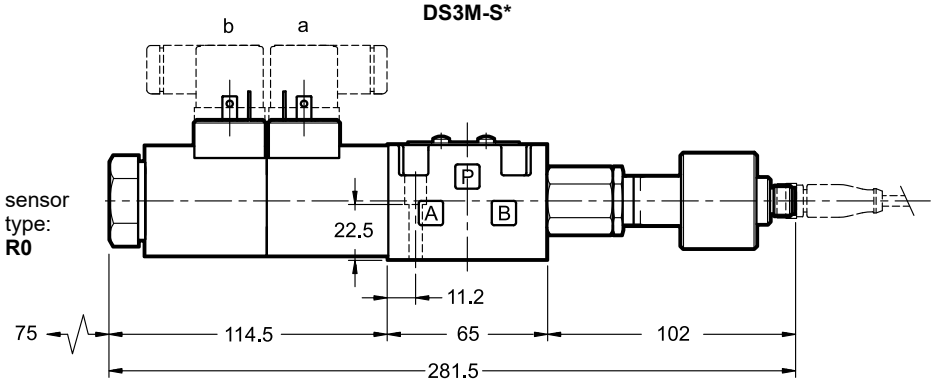
TIMES [ms]	ENERGIZING	DE-ENERGIZING
DS3M	25 ÷ 75	15 ÷ 25

TIMES [ms]	ENERGIZING	DE-ENERGIZING
DS5M	100 ÷ 150	20 ÷ 50

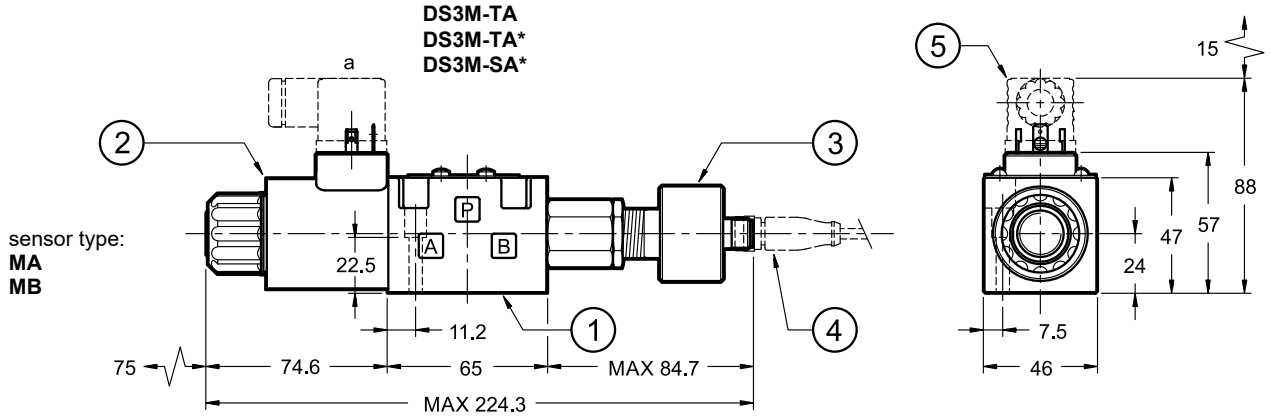
4 - OVERALL AND MOUNTING DIMENSIONS FOR DIRECT OPERATED VALVES

dimensions in mm

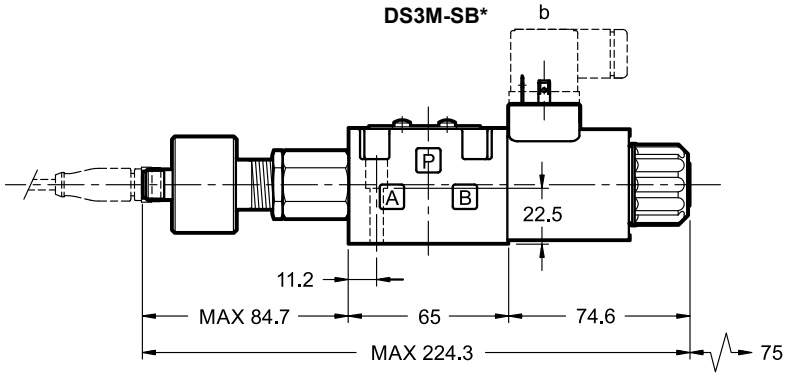
DS3M-S*



DS3M-TA
DS3M-TA*
DS3M-SA*



DS3M-TB
DS3M-TB*
DS3M-SB*

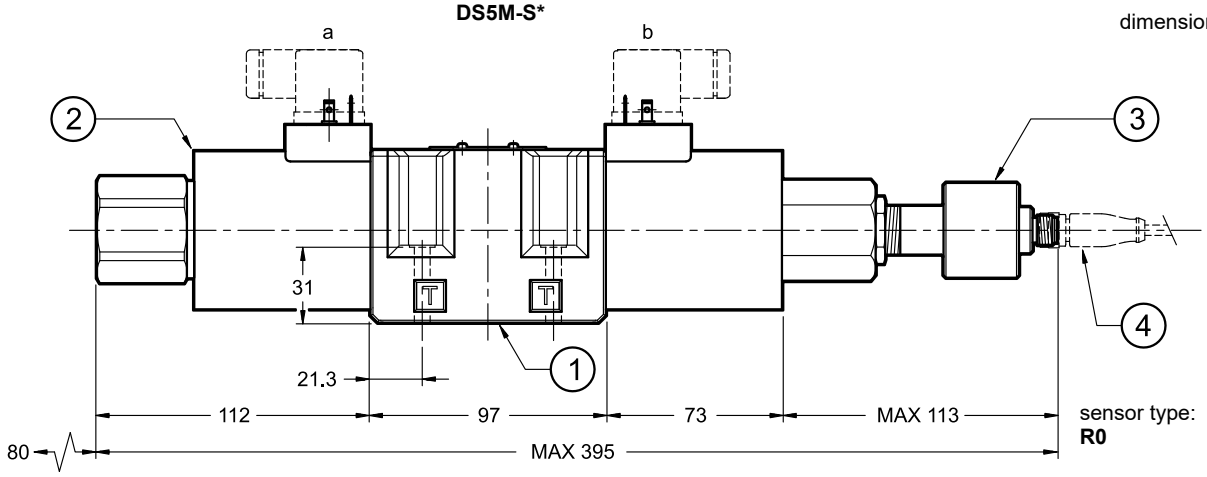


Valve fastening: 4 SHC screws ISO 4762 M5x30
Tightening torque: 5 Nm (A8.8)
Threads of mounting holes: M5x10

1	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) 90 Shore
2	Coil rotating 360°
3	Position sensor: setting sealed at factory, do not tamper.
4	Connector for Position sensor type straight, moulded. To be ordered separately, see p.20
5	Coil electric connector EN 175301-803 (ex DIN 43650) to be ordered separately cat. 49 000

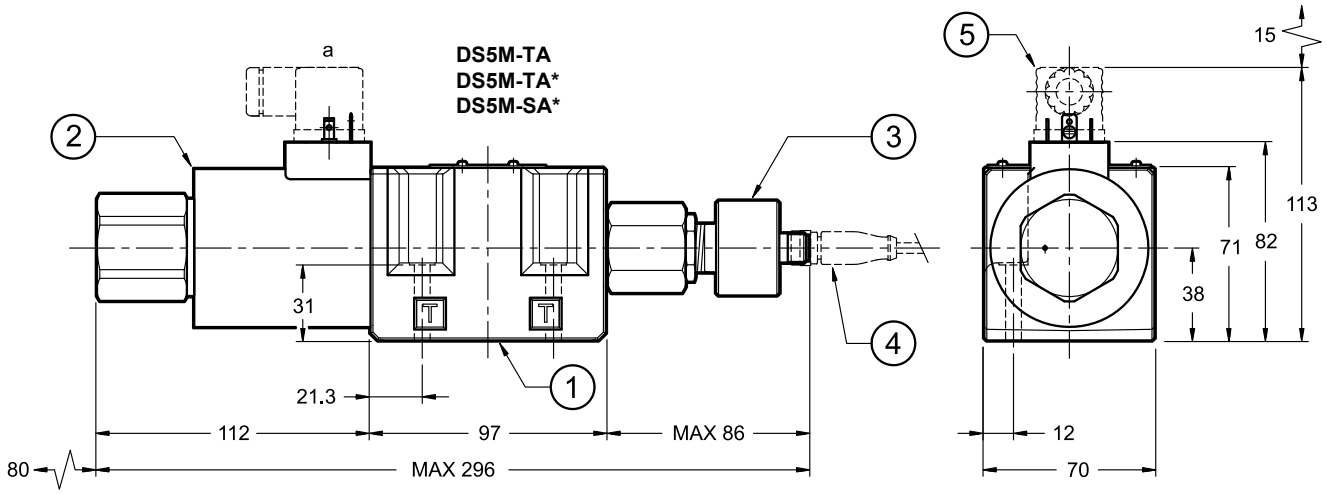
DS5M-S*

dimensions in mm

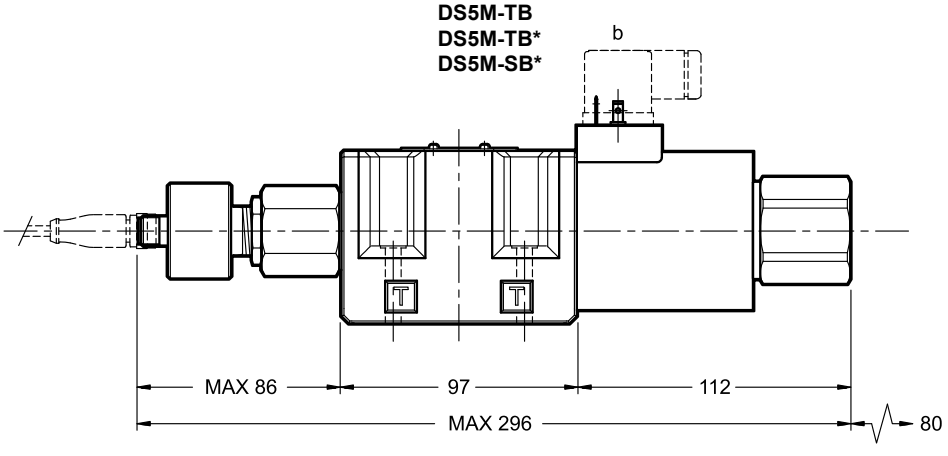


sensor type:
R0

DS5M-TA
DS5M-TA*
DS5M-SA*



DS5M-TB
DS5M-TB*
DS5M-SB*



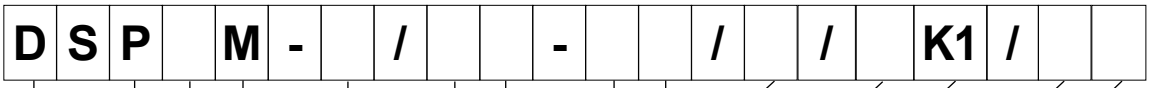
sensor type:
MA
MB

1	Mounting surface with sealing rings. 5 OR type 2050 (12.42x1.78) - 90 Shore
2	Coil rotating 360°
3	Position sensor: setting sealed at factory, do not tamper.
4	Connector for position sensor type straight, moulded. To be ordered separately, see p. 20
5	Coil electric connector EN 175301-803 (ex DIN 43650) to be ordered separately cat. 49 000

Valve fastening: 4 SHC screws ISO 4762 M6x40
Tightening torque: 8 Nm
Threads of mounting holes: M6x10

5 - IDENTIFICATION OF PILOT OPERATED SOLENOID VALVES

5.1 - Identification code



Directional valve, pilot operated by solenoid actuation

Size:
5R = ISO 4401-05
5 = CETOP P05
7 = ISO 4401-07
8 = ISO 4401-08
10 = ISO 4401-10 (**NOTE 2**)

Monitoring of the spool position

Spool type (see point 5.2)
S1 **SA1** **SB1** **TA** **TB**
S3 **TA100** **TB100**
S4
RK

Series:
20 = for DSP5M, DSP5RM, DSP7M and DSP8M
32 = for DSP10M
(the overall and mounting dimensions within the same ten remain unchanged)

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

Pilot supply (see point 7):
E = external
I = internal (not available for S4 spool)
Z = internal pilot supply with 30 bar pressure reducing valve, fixed adjustment (see p. 6.5) (not available for S4 spool)
Alternative options for valve sizes 7 and 8 only, spool type S4:
C = internal pilot supply and 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 (see point 6):
I = Internal
E = External

P = Orifice plate on P port (mandatory), mounted under the pilot valve.
Omit for valves with pilot supply type Z and for valves with option D - Main spool switching speed control
D = Main spool switching speed control (see p. 8)

DC power supply
D12 = 12 V **D110** = 110 V
D24 = 24 V **D220** = 220 V

Coil electrical connection:
plug for connector type DIN 43650

Monitored position:
(see p. 17 for switching logic)
1 position sensor
R0 = rest position monitored
MA = position 'a' monitored
MB = position 'b' monitored
2 position sensors
M0 = rest position monitored
MAB = 'a' and 'b' positions monitored

Position sensor supply voltage:
Omit for 24V
12 = 12 V
(only available for monitored position type M*)

NOTE 1: Check availability of the spool / sensor type.

		SPOOLS				
		S*	**SA* SB***	**TA TB**	**TA100 TB100**	**RK**
SENSOR TYPE	**R0**	x				
	MA		x	x	x	x
	MB		x	x	x	x
	M0	x				
	MAB	x	x	x	x	x

NOTE 2: DSP10M valves are available only with S1 or S3 spool, with monitored position type MAB or M0.

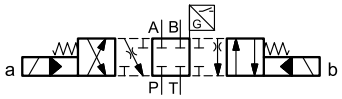
NOTE: To comply with EN 693:2011, the valves are not equipped with manual override.

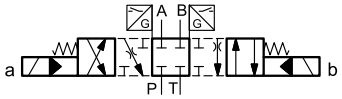
5.2 - Spool types for DSP5M, DSP5RM, DSP7M and DSP8M

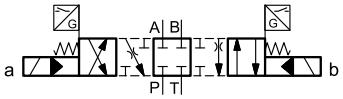
Type **S***:
2 solenoids - 3 positions with spring centring

R0 sensor | **M0** sensor | **MAB** sensor

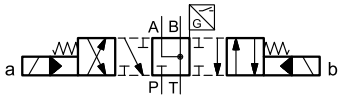
S1

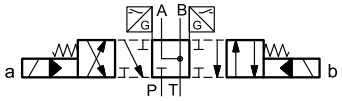


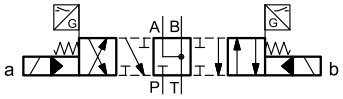




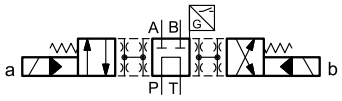
S3

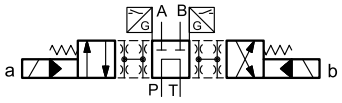


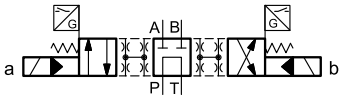




S4







MA sensor | **MB** sensor | **MAB** sensor

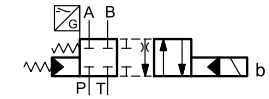
Type **SA***:
1 solenoid side A

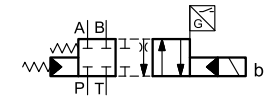
Type **SB***:
1 solenoid side B

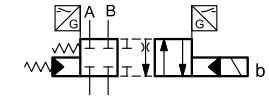
2 positions
(central + external)
with spring centring

SA1

SB1





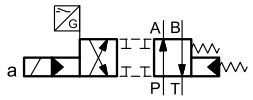


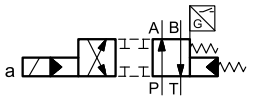
MA sensor | **MB** sensor | **MAB** sensor

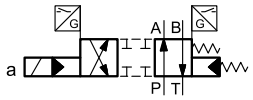
Type **TA**:
1 solenoid side A

2 external positions
with return spring

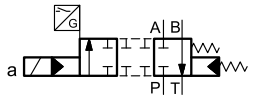
TA

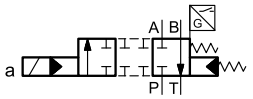


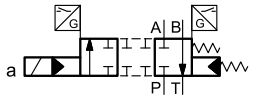




TA100



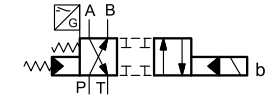


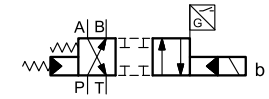


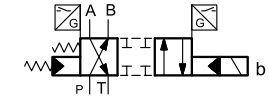
Type **TB**:
1 solenoid side B

2 external positions
with return spring

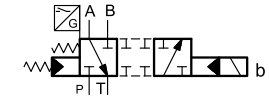
TB

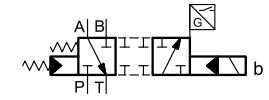


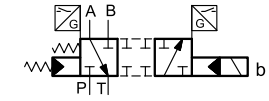




TB100



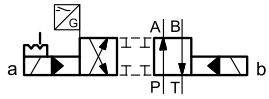


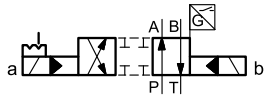


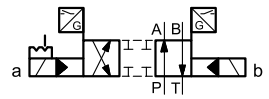
MA sensor | **MB** sensor | **MAB** sensor

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

RK





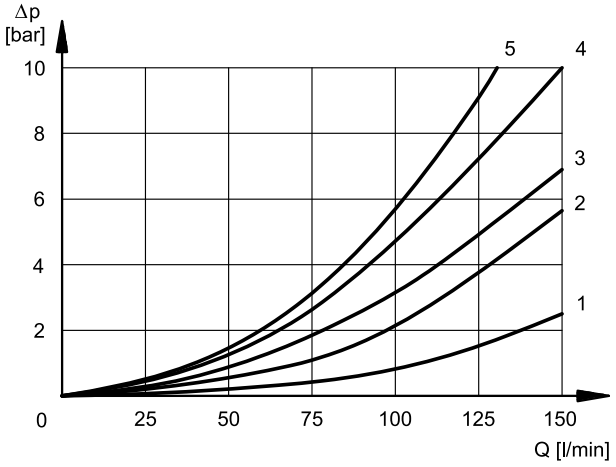


NOTE: DSP10M valves are available only with S1 or S3 spool, with monitored position type MAB or M0.

6 - CHARACTERISTIC CURVES AND PERFORMANCES

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

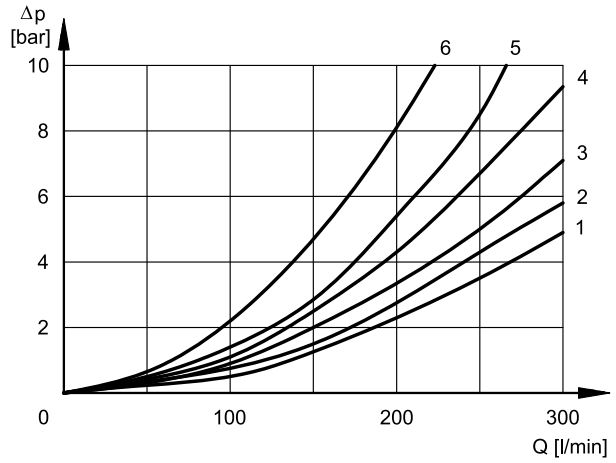
6.1 - DSP5M and DSP5RM - Pressure drops Δp-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1	4	4	1	1	-
S3	4	4	1	1	-
S4	5	5	2	3	5
TA, TB	4	4	1	1	-
TA100, TB100	3	3	1	1	-
RK	4	4	1	1	-

For pressure drops of the S3 spool in central position refer to the curve 4.

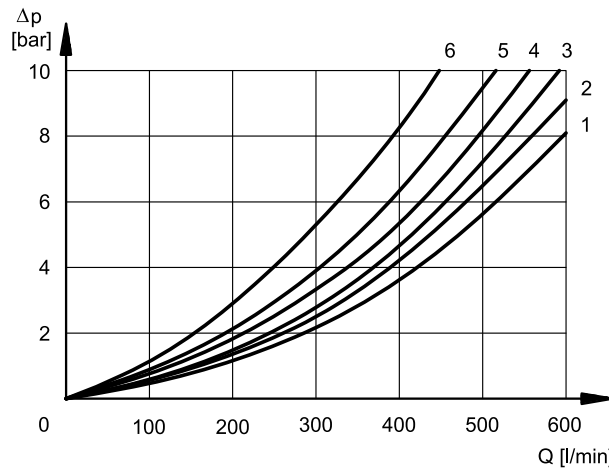
6.2 - DSP7M - Pressure drops Δp-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1	1	1	4	5	-
S3	1	1	5	5	-
S4	2	2	5	6	5
TA, TB	1	1	4	5	-
TA100, TB100	3	3	3	5	-
RK	1	1	4	5	-

For pressure drops of the S3 spool in central position refer to the curve 5.

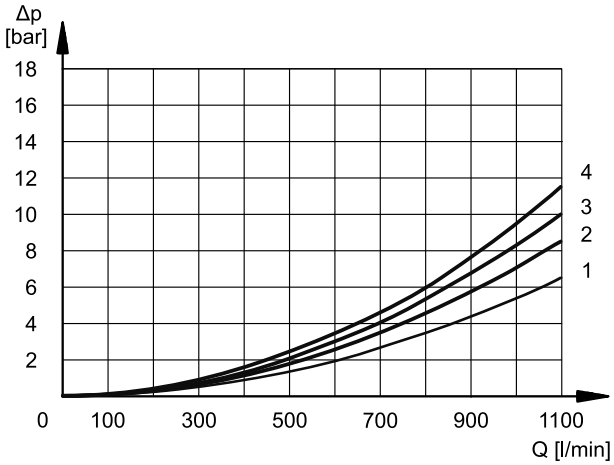
6.3 - DSP8M - Pressure drops Δp-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1	2	2	3	3	-
S3	2	2	2	1	-
S4	4	4	3	5	6
TA, TB	2	2	3	3	-
TA100, TB100	5	5	5	5	-
RK	2	2	3	3	-

For pressure drops of the S3 spool in central position refer to the curve 4.

6.4 - DSP10M - Pressure drops ∆p-Q



SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1	3	3	1	2	-
S3	3	3	2	4	-

6.5 - Performance limits for pilot operated valves

PRESSURES	**DSP5M DSP5RM**	**DSP7M**	**DSP8M**	**DSP10M**
Max pressure in P, A, B ports	350	350	350	350
Max pressure in T line with internal drain	250	250	250	300
Max pressure in Y line	210	210	210	210
Min pilot supply pressure **NOTE 1**	5 ÷ 12	5 ÷ 12	5 ÷ 12	6 ÷ 12
Max pilot supply pressure **NOTE 2**	210	210	210	280

NOTE 1: The minimum pilot pressure can be the lower value of the range at low flow rates, but at higher flow rates the higher value is required.

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 purchase the valve with E type pilot supply. .

For DSP7M and DSP8M valves, if the external pilot line is not possible, you must opt for the version with Z type pilot supply (see point 7.2), providing max 350 bar at inlet pressure P.

MAXIMUM FLOW RATES		**DSP5M DSP5RM**		**DSP7M**		**DSP8M**		**DSP10M**	
Spool type		PRESSURES 210 bar	350 bar	210 bar	350 bar	210 bar	350 bar	210 bar	350 bar
S4 - TA100	[l/min]	120	100	200	150	500	450	-	-
S1 - S3 - TA - RK		150	120	300	300	600	500	900	700

6.6 - Switching times

The values indicated refer to a solenoid valve working with a pilot pressure of 100 bar, with mineral oil at a temperature of 50 °C, a viscosity of 36 cSt, and P>A and B>T connections.

The energizing and de-energizing times are measured based on the pressure variation occurring in the lines.

TIMES (± 10%) [ms]	ENERGIZING		DE-ENERGIZING	
	2 Pos.	3 Pos.	2 Pos.	3 Pos.
DSP5M - DSP5RM	60	50	50	40
DSP7M	75	60	60	45
DSP8M	100	70	80	50
DSP10M	-	100	-	140

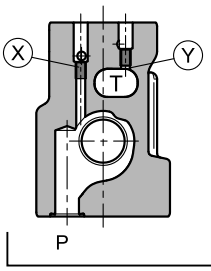
7 - PILOT AND DRAIN

These 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.

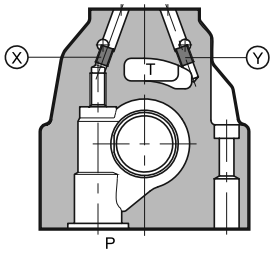
NOTE: The pilot supply and drain configuration must be chosen when ordering. Subsequent modification is only permitted by authorized experienced operators or at the factory.

TYPE OF VALVE		Plug assembly X	Plug assembly 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

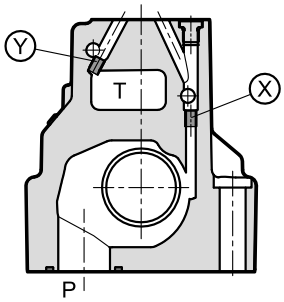
DSP5M
DSP5RM



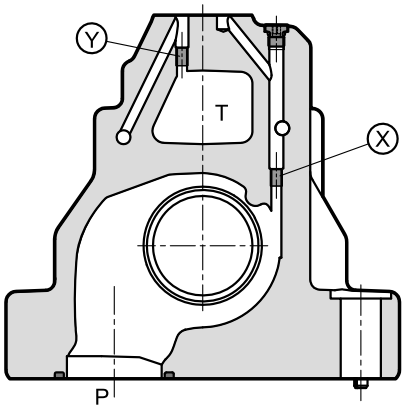
DSP7M



DSP8M



DSP10M



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

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

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

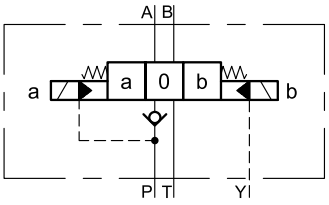
DSP7M and DSP8M valves are available with an incorporated backpressure valve in the P port.

This ensures the minimum pilot supply pressure in the normal position of valves where the inlet port (P) and the return port (T) are connected (spool S4).

The pressure differential of the backpressure valve must be added to that of the main valve, shown on page 9.

The cracking pressure is approx. 5 bar for DSP7M and 6 bar for DSP8M at 15 l/min.

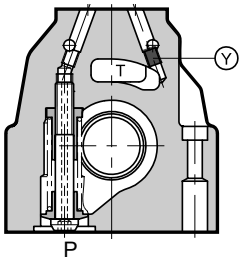
NOTE: The backpressure valve does not ensure sealing, and therefore, should not be considered a check valve.



Add the letter 'C' to the identification code for this request (see point 5.1).

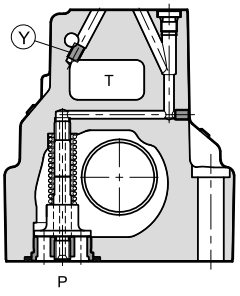
For DSP7M only, the backpressure valve can also be supplied separately and can be easily mounted in the P line of the main control valve. To order the backpressure valve, request code **0266577.**

DSP7M

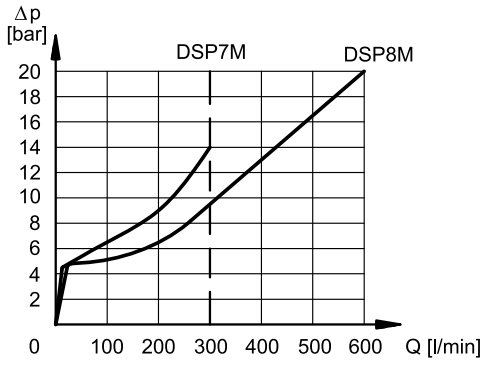


pilot supply always internal
Y: plug M5x6 for external drain

DSP8M



pilot supply always internal
Y: plug M6x8 for external drain

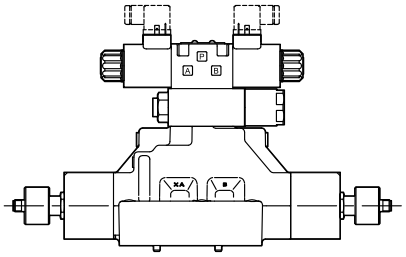


The curve relates to the pressure drop of the body only, with the backpressure valve installed, to which the pressure drop of the reference spool must be added (see p. 6)

7.2 - 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 30 mm in height for valves ordered with Z option.

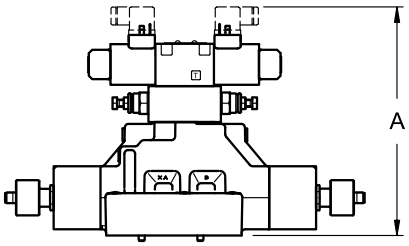


8 - OPTIONS

8.1 - Option D: control of the main spool shifting speed

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 5.1).



dimensions in mm

	DSP5M DSP5RM	DSP7M	DSP8M	DSP10M
A	218	225	254	307

9 - ELECTRICAL FEATURES

9.1 - Solenoids

These are essentially made up of two parts: the tube and the coil. The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation.

The coil is fastened to the tube by a threaded ring, and can be rotated and locked to suit the available space.

NOTE 1 : In order to further reduce the emissions, use of type H connectors is recommended. These prevent voltage peaks on opening of the coil supply electrical circuit (see catalogue 49 000).

NOTE 2: The IP65 protection degree is intended for the whole valve. It is guaranteed only with valve and connectors correctly connected and installed.

VOLTAGE SUPPLY FLUCTUATION	± 10% Vnom
MAX SWITCH ON FREQUENCY DS3M DS5M DSP5M - DSP5RM DSP7M DSP8M DSP10M	 15.000 ops/h 13.000 ops/h 5.000 ops/h 5.000 ops/h 4.000 ops/h 3.000 ops/h
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE 1)	in compliance with 2014/30/EU
LOW VOLTAGE	in compliance with 2014/35/EU
CLASS OF PROTECTION Atmospheric agents (IEC 60529) Coil insulation (VDE 0580) Impregnation	 IP65 (**NOTE 2**) class H class F

9.2 - Current and absorbed power

The tables shows current and power consumption values relevant to the different coil types for DC.

DS3M, DSP5M, DSP5RM, DSP7M, DSP8M and DSP10M
(values ± 10%)

Suffix	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]
D12	12	4,4	2,72	32,7
D24	24	18,6	1,29	31
D110	110	436	0,26	28,2
D220	220	1758	0,13	28,2

DS5M (values ± 5%)

Suffix	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]
D12	12	3	4	48
D24	24	12	2	48
D110	110	252	0,44	48
D220	220	1010	0,22	48

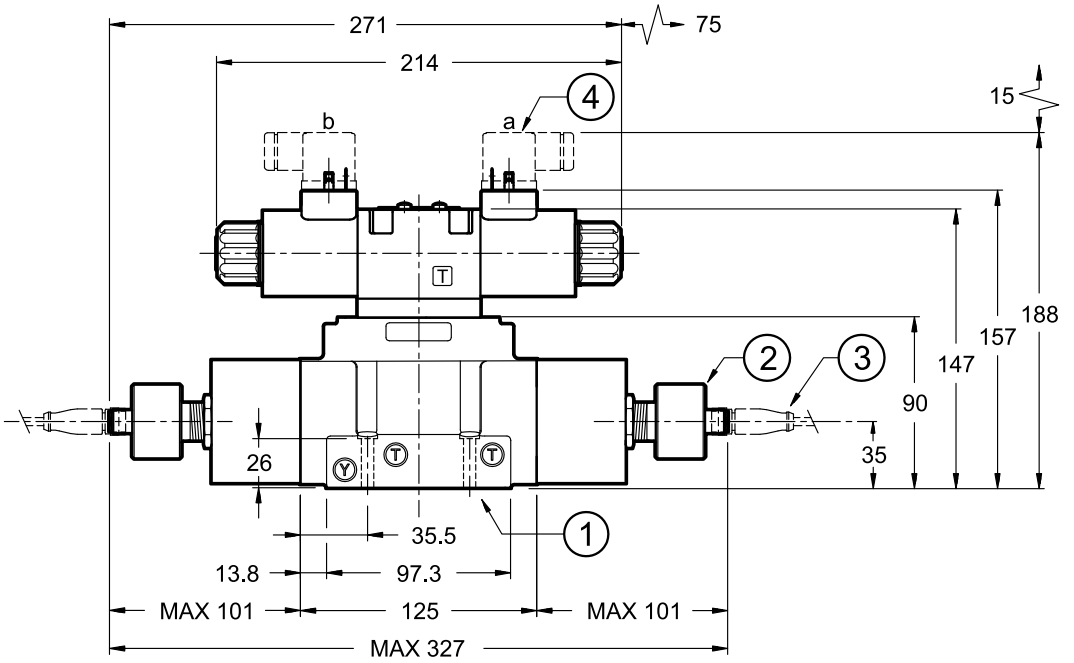
10 - COIL CONNECTORS

The solenoid valves are supplied without connectors. EN 175301-803 (formerly DIN 43650) connectors for K1 electrical connection can be ordered separately; see catalogue 49 000.

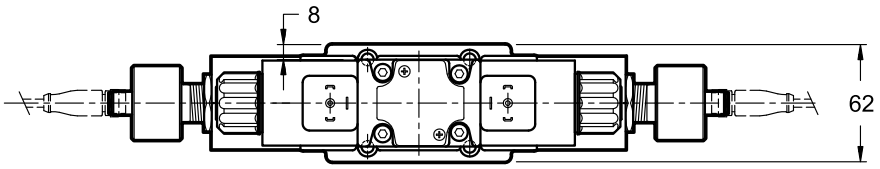
11 - DSP5M AND DSP5RM OVERALL AND MOUNTING DIMENSIONS

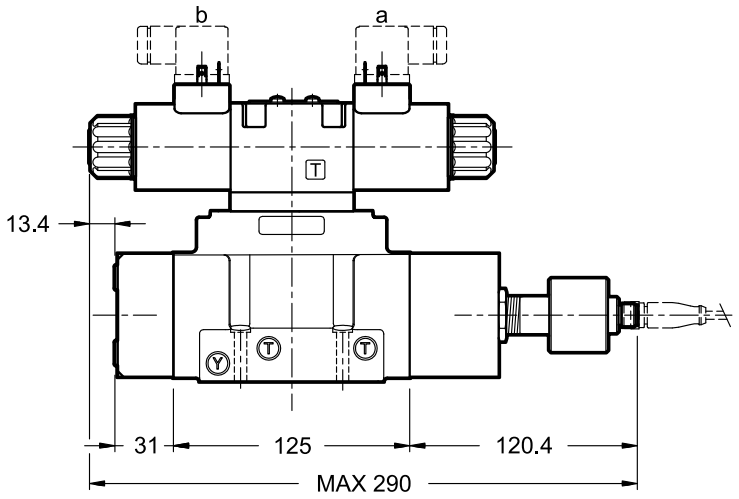
dimensions in mm

DSP5M-S*
DSP5RM-S*



sensor type:
M0
MAB





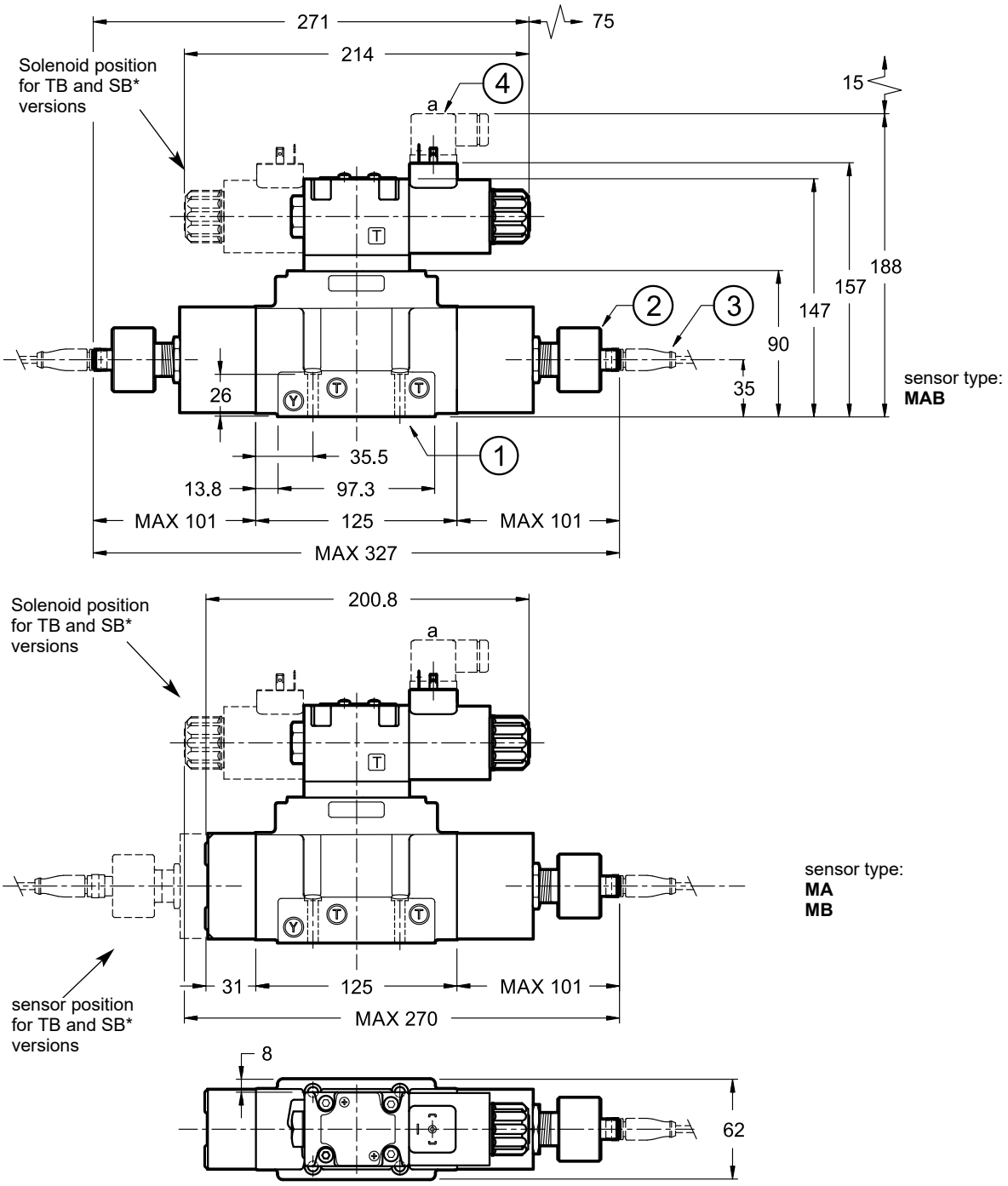
sensor type:
R0

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	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

Valve fastening: 4 SHC screws ISO 4762 M6x35
Tightening torque: 8 Nm (screws A 8.8)
Threads of mounting holes: M6x10

DSP5M-TA, TA100, SA1
DSP5RM-TA, TA100, SA1

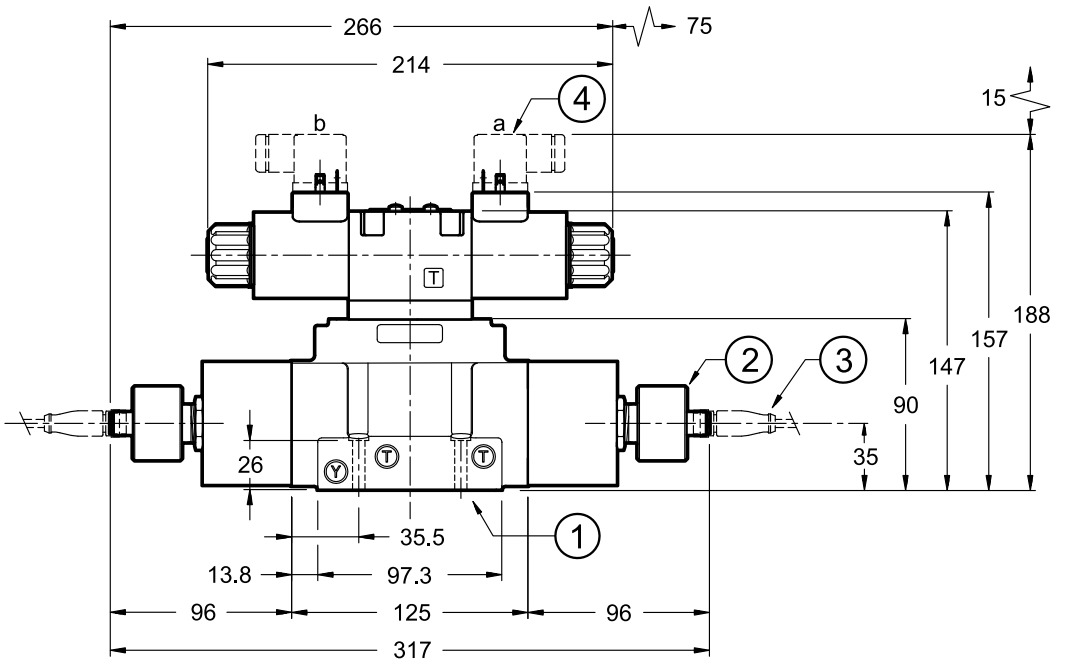
dimensions in mm



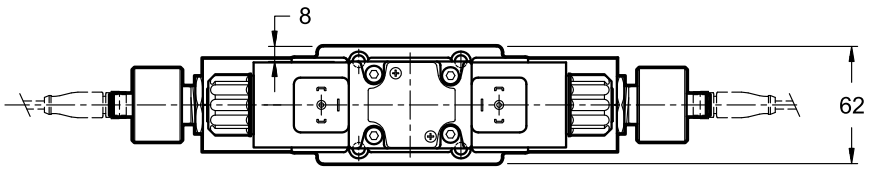
1	Mounting surface with sealing rings 5 OR type 2050 (12.42x1.78) - 90 Shore 2 OR type 2037 (9.25x1.78) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

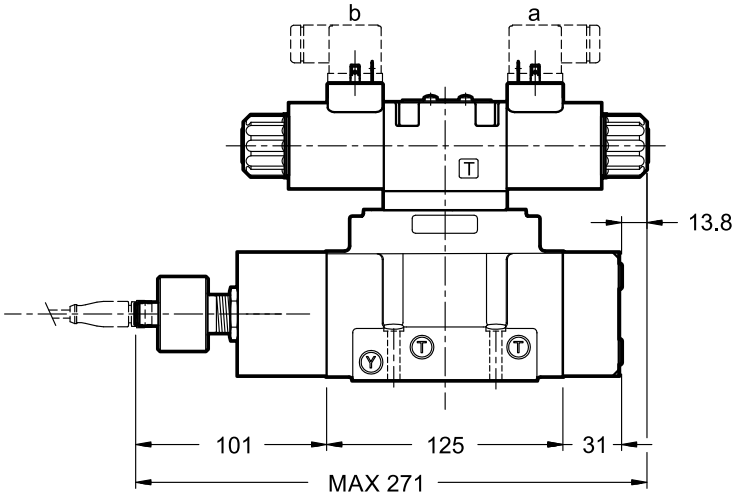
dimensions in mm

DSP5M-RK
DSP5RM-RK



sensor type:
MAB





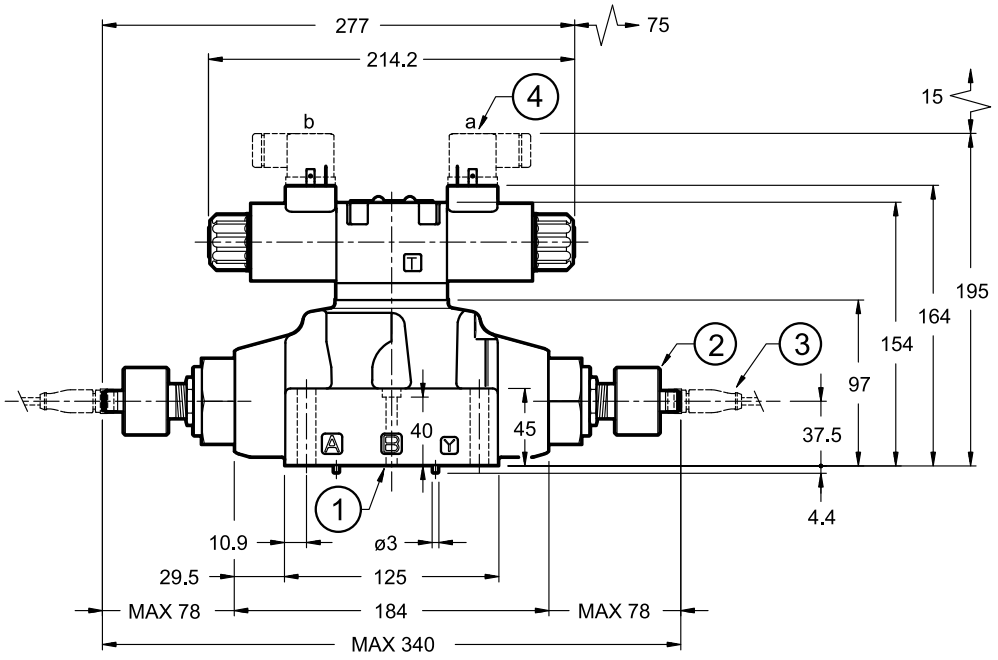
sensor type:
MA
MB

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	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

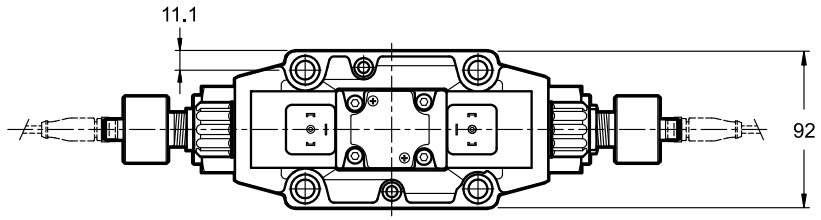
12 - DSP7M OVERALL AND MOUNTING DIMENSIONS

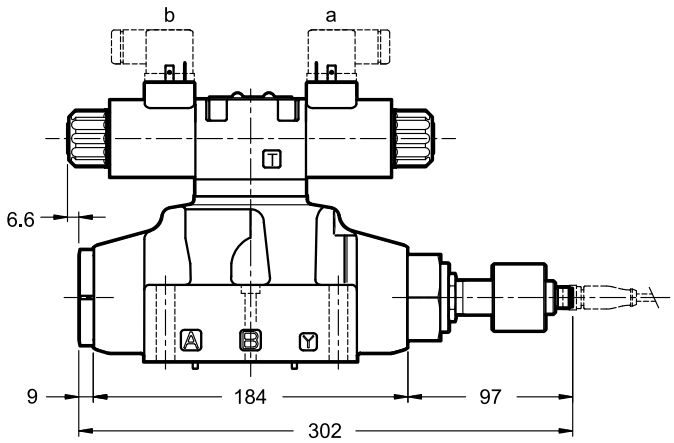
DSP7M-S*

dimensions in mm



sensor type:
M0
MAB





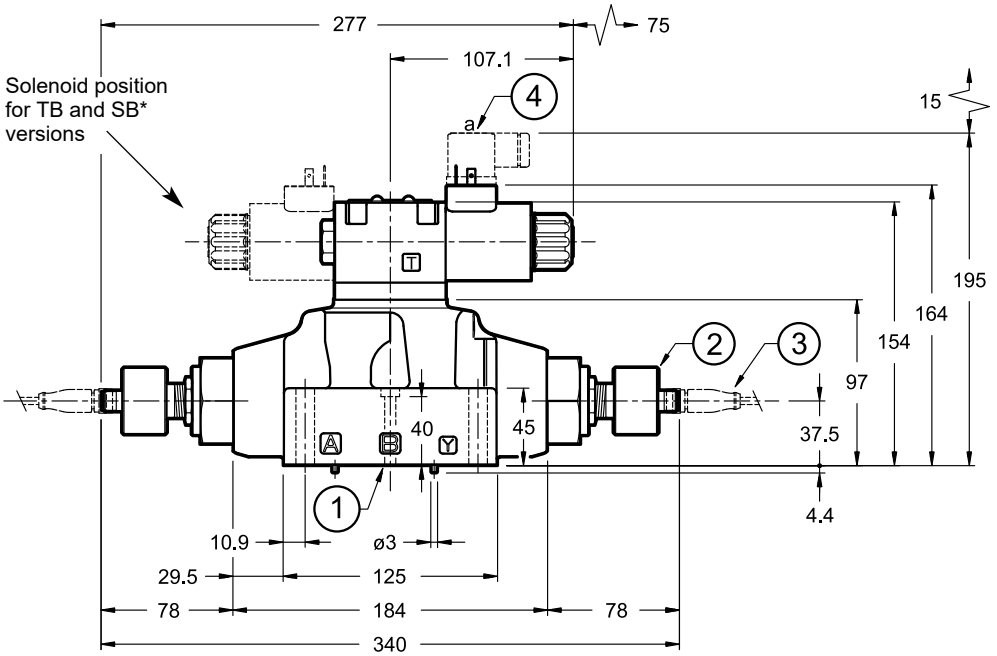
sensor type:
R0

Valve fastening:	4 SHC screws ISO 4762 M10x60 2 SHC screws ISO 4762 M6x50
Tightening torque:	M10x60: 40 Nm M6x50: 8 Nm
Threads of mounting holes: M6x18; M10x18	

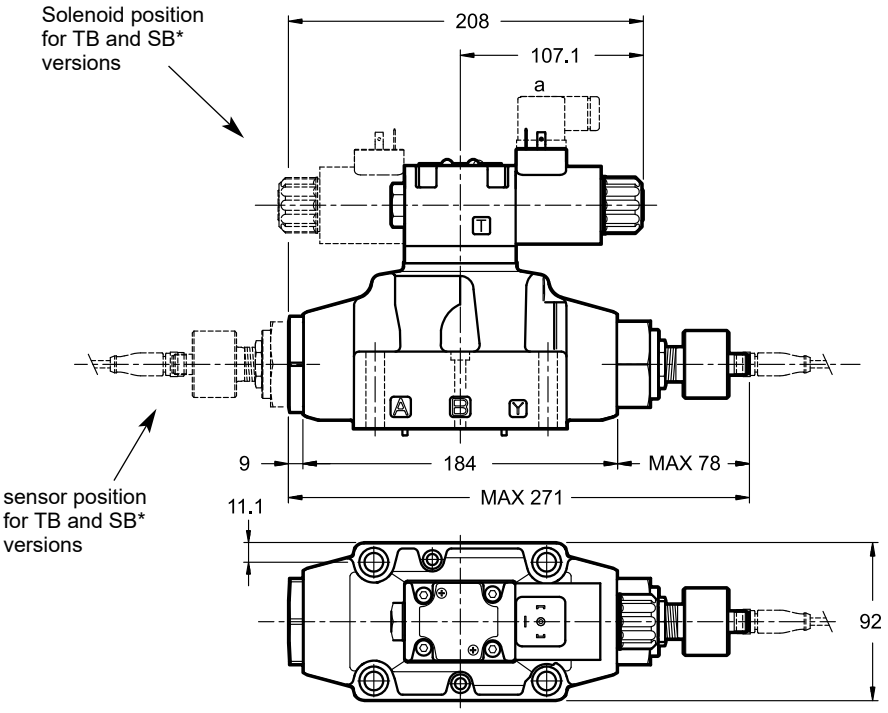
1	Mounting surface with sealing rings. 4 OR type 130 (22.22x2.62) - 90 Shore 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

DSP7M-TA, TA100, SA1

dimensions in mm



sensor type:
MAB

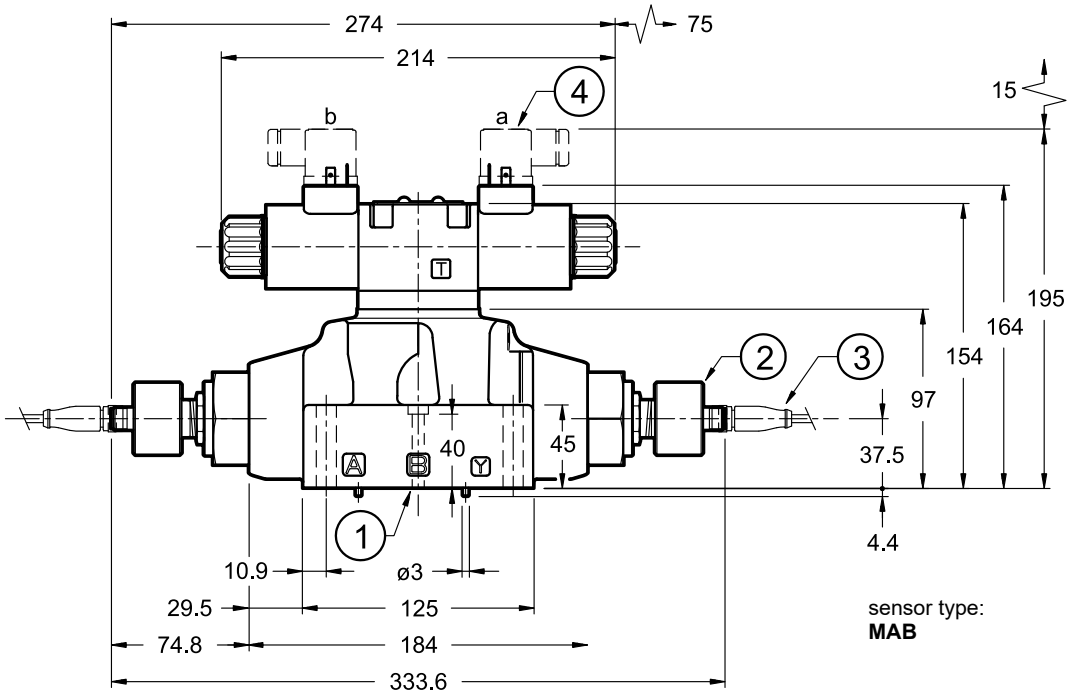


sensor type:
MA
MB

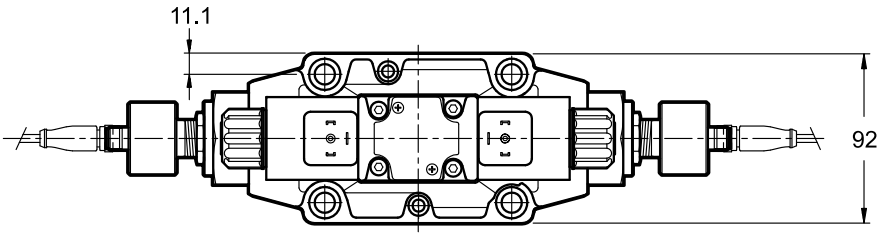
1	Mounting surface with sealing rings. 4 OR type 130 (22.22x2.62) - 90 Shore 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

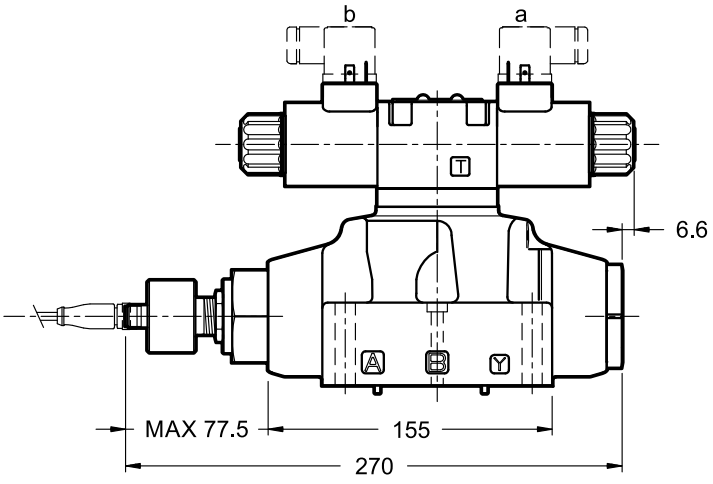
dimensions in mm

DSP7M-RK



sensor type:
MAB





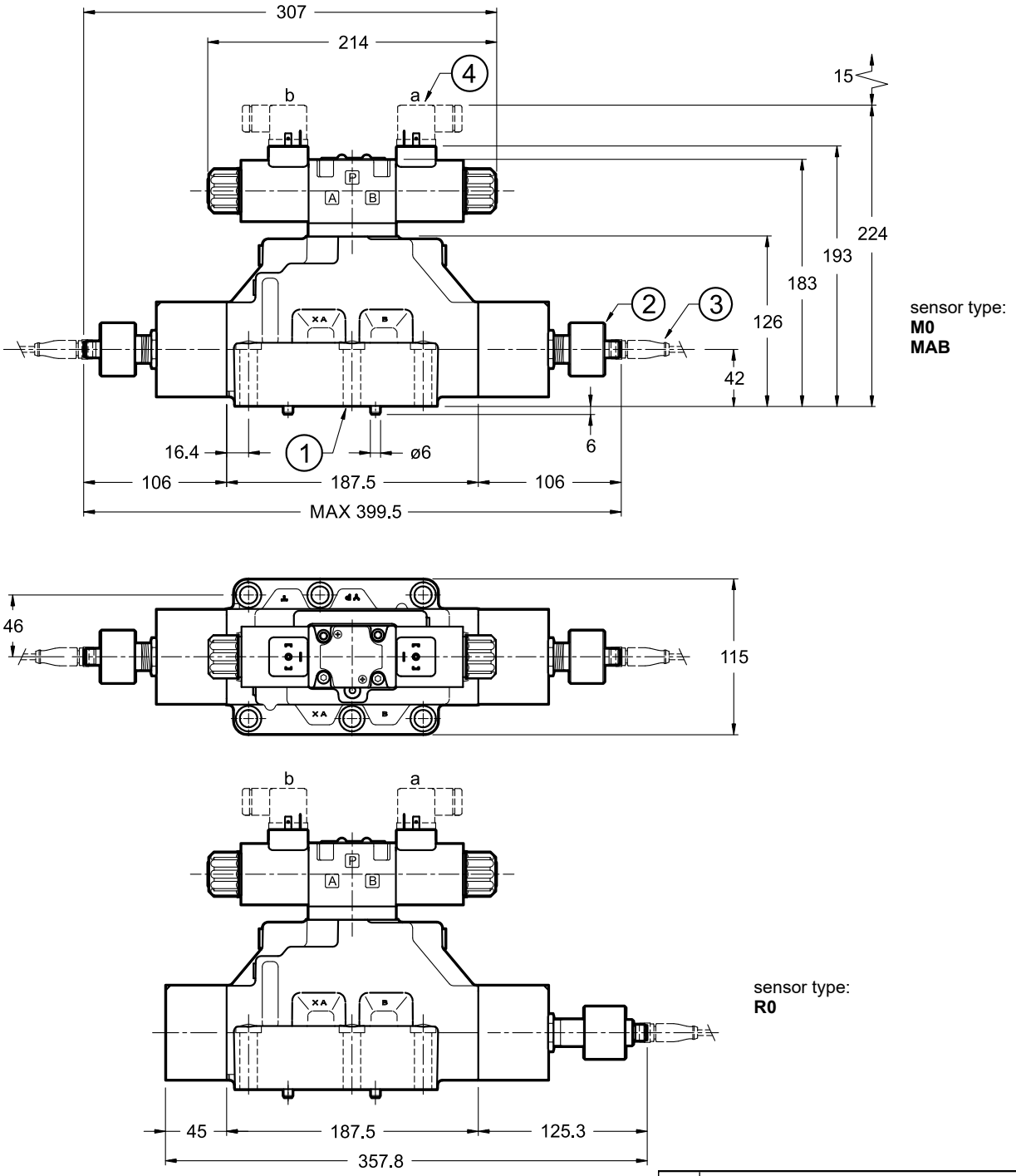
sensor type:
MA
MB

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	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

13 - DSP8M OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

DSP8M-S*

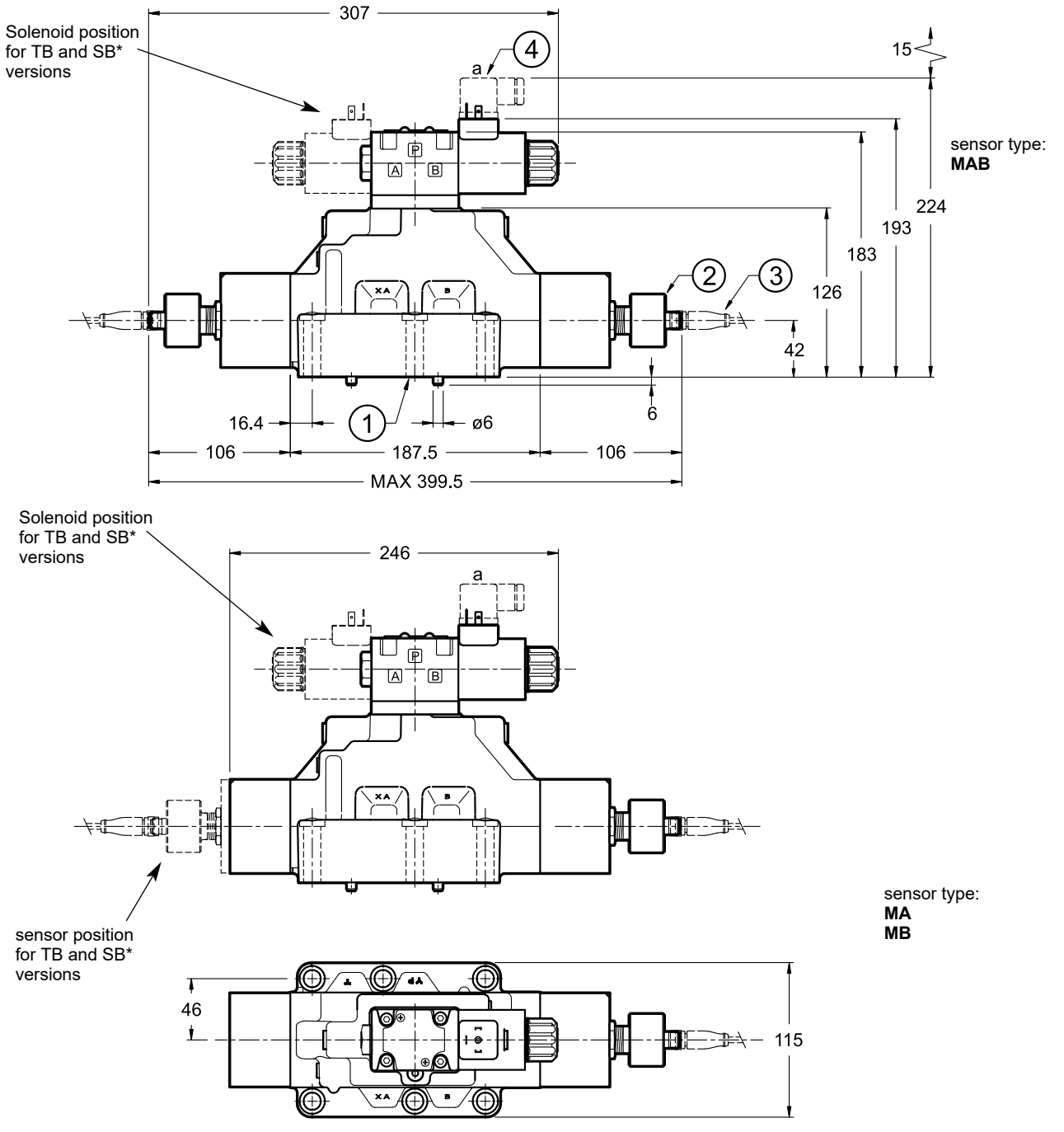


1	Mounting surface with sealing rings. 4 OR type 3131 (32.99x2.62) - 90 Shore 2 OR type 3087 (21.89x2.62) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

Valve fastening: 6 SHC screws ISO 4762 M12x60
Tightening torque: 69 Nm (A 8.8 bolts)
Threads of mounting holes: M12x20

DSP8M-TA, TA100, SA1

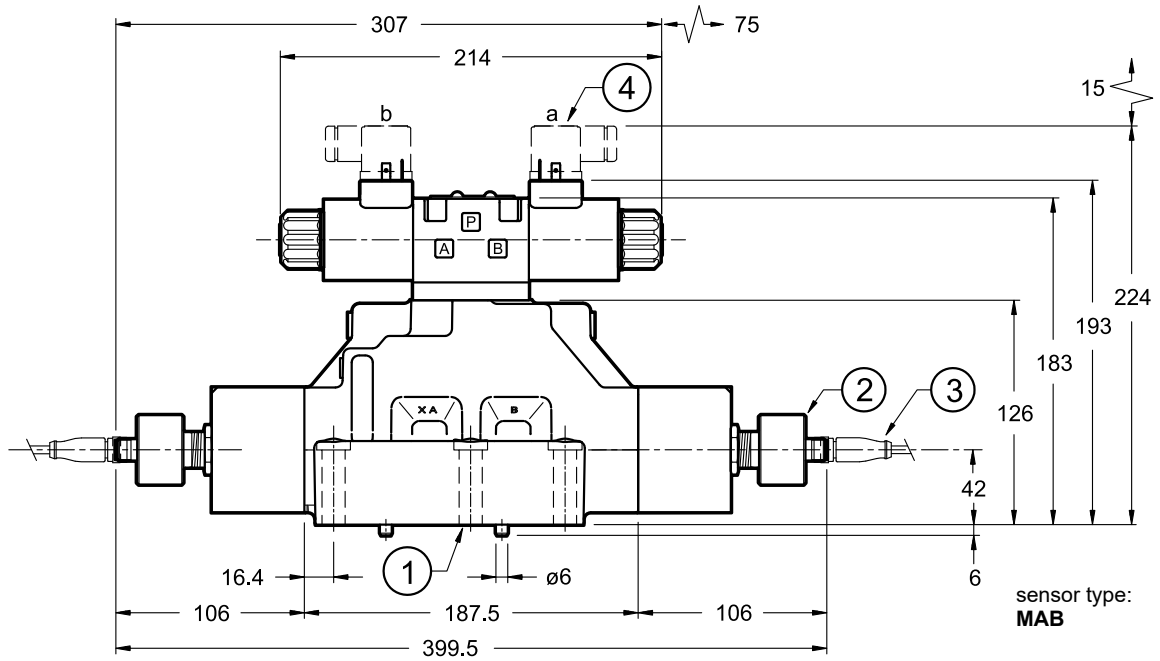
dimensions in mm

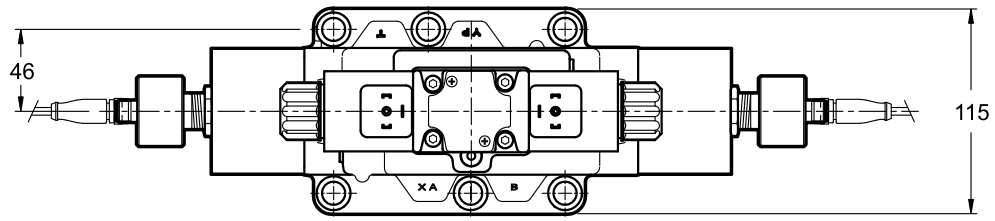


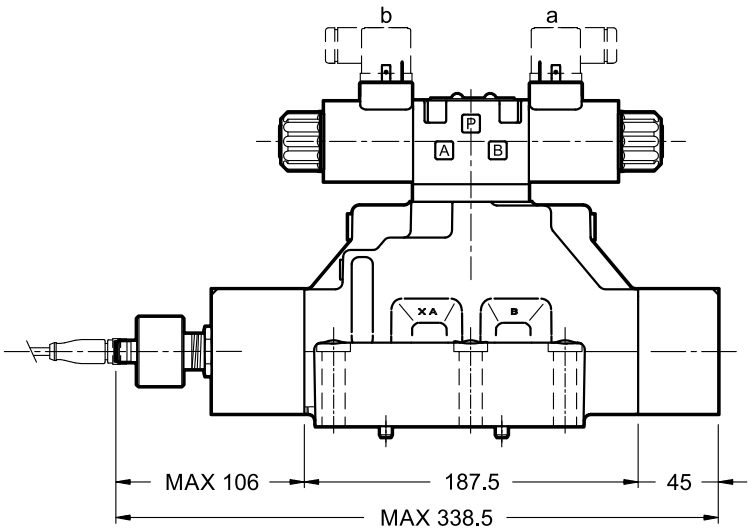
1	Mounting surface with sealing rings. 4 OR type 3131 (32.99x2.62) - 90 Shore 2 OR type 3087 (21.89x2.62) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type. To be ordered separately see cat. 49 000

DSP8M-RK

dimensions in mm







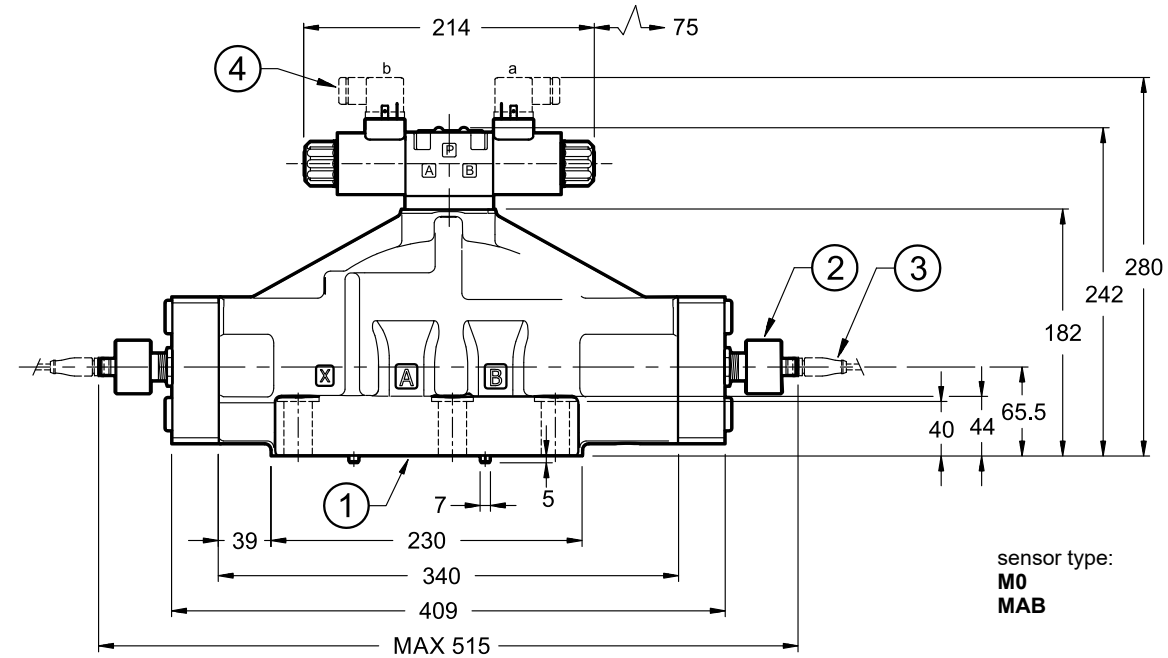
sensor type:
MA
MB

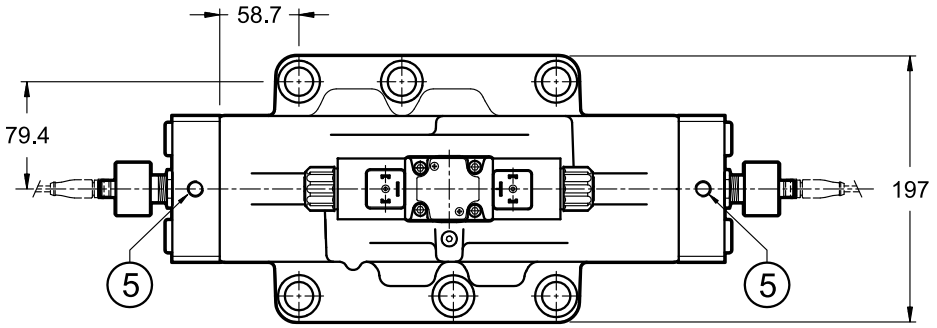
1	Mounting surface with sealing rings. 4 OR type 3131 (32.99x2.62) - 90 Shore 2 OR type 3087 (21.89x2.62) - 90 Shore
2	Position sensor: set and sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil electric connector EN 175301-803 (ex DIN 43650) type To be ordered separately see cat. 49 000

14 - DSP10M OVERALL AND MOUNTING DIMENSIONS

DSP10M-S*

dimensions in mm



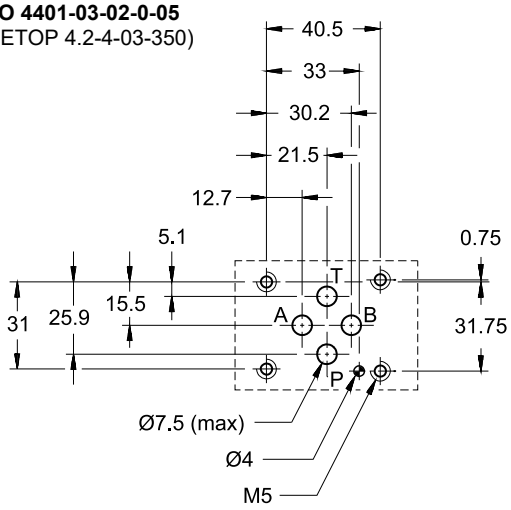


1	Mounting surface with sealing rings. 4 OR type 4162 (40.86x3.53) - 90 shore 2 OR type 3081 (20.24x2.62) - 90 shore
2	Position sensor: setting sealed at factory. Do not tamper.
3	Connector for position sensor, type straight, moulded. To be ordered separately, see p. 20
4	Coil connector EN 175301-803 (ex DIN 43650) type. - To be ordered separately - see cat. 49 000
5	M12 eyebolt seat for safe lift

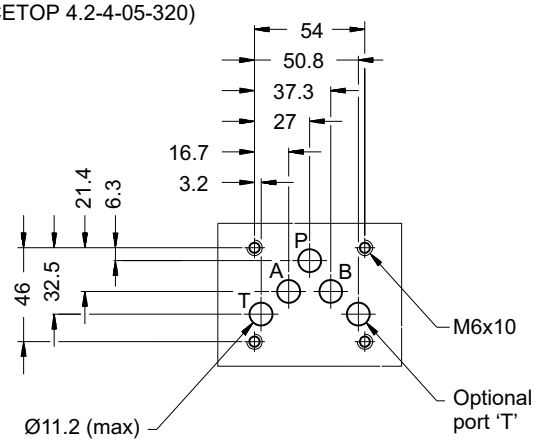
Valve fastening: 6 SHC screws ISO 4762 M20x70 (supplied)
Tightening torque: 470 Nm (A10.9 screws)
Threads of mounting holes: M20x40

15 - MOUNTING SURFACES

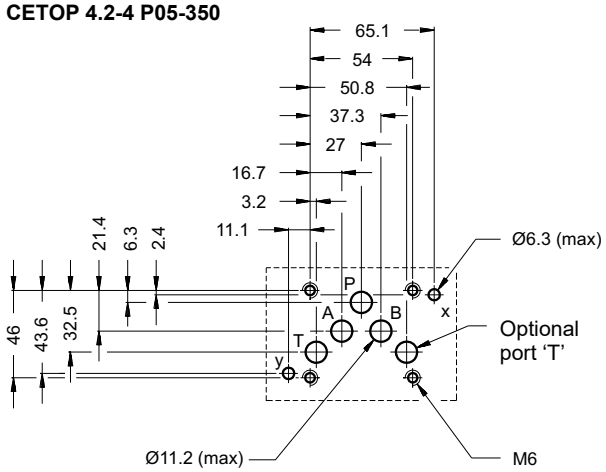
DS3M
ISO 4401-03-02-0-05
(CETOP 4.2-4-03-350)



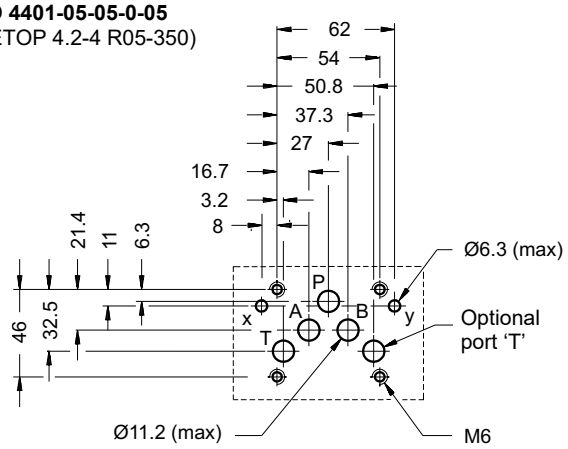
DS5M
ISO 4401-05-04-0-05
(CETOP 4.2-4-05-320)



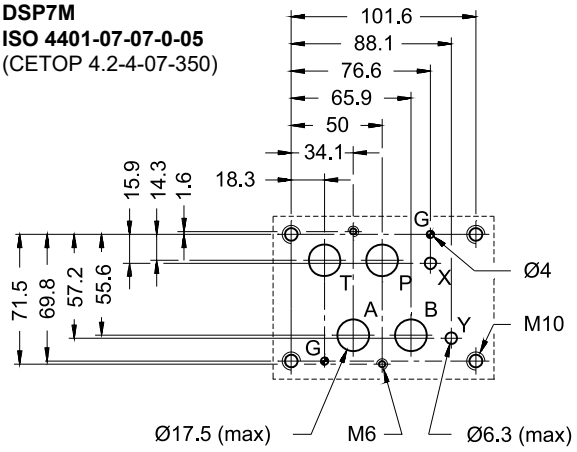
DSP5M
CETOP 4.2-4 P05-350



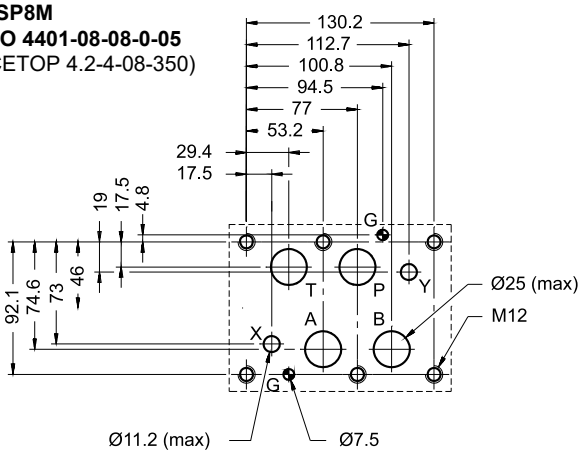
DSP5RM
ISO 4401-05-05-0-05
(CETOP 4.2-4 R05-350)



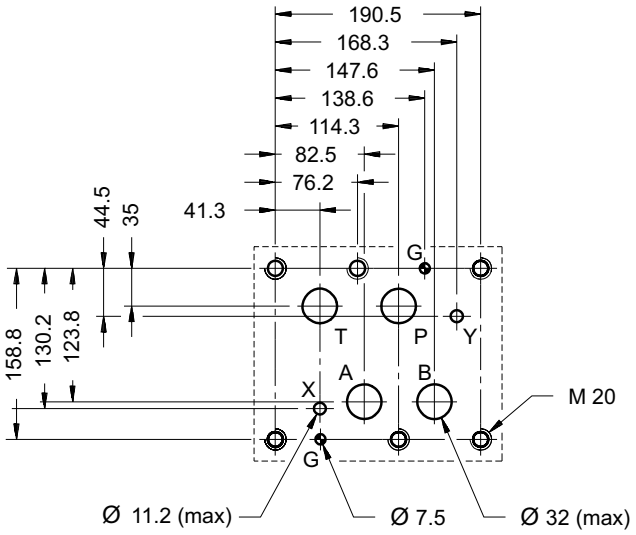
DSP7M
ISO 4401-07-07-0-05
(CETOP 4.2-4-07-350)



DSP8M
ISO 4401-08-08-0-05
(CETOP 4.2-4-08-350)



DSP10M
ISO 4401-10-09-0-05
(CETOP 4.2-4-10-350)

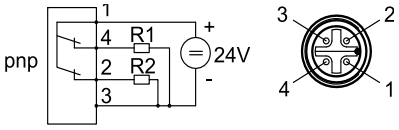


16 - POSITION SENSORS

WARNING! Disassembly of the valve is not permitted. The sensors must not be unscrewed or otherwise tampered with in any way.

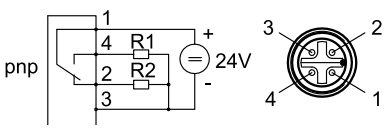
The M0 and MAB versions are equipped with two position sensors; the wiring diagram shown must be applied to each sensor.

R0 CONNECTION SCHEME



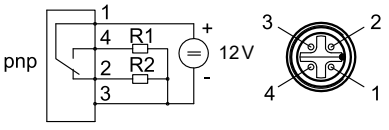
Pin	Values	Function
1	+24 V	Supply
2	NC	Normal Closed -
3	0 V	-
4	NC	Normal Closed +

M* CONNECTION SCHEME



Pin	Values	Function
1	+24 V	Supply
2	NC	Normal Closed
3	0 V	-
4	NO	Normal Open

M*12 CONNECTION SCHEME



Pin	Values	Function
1	+12 V	Supply
2	NC	Normal Closed
3	0 V	-
4	NO	Normal Open

ELECTRICAL CHARACTERISTICS		
Operating voltage range 24 V DC 12 V DC	V DC	 20 ÷ 32 10.5 ÷ 16
Absorbed current	A	0.4
Max output load	mA	400
Output		2 PNP
Electric protections		polarity inversion short circuit
Hysteresis	mm	≤ 0.1
Operating temperature range	°C	-25 / +80
Class of protection from atmospheric agents (IEC 60529)		IP65
EMC Electromagnetic compatibility		In compliance with 2014/30/EU

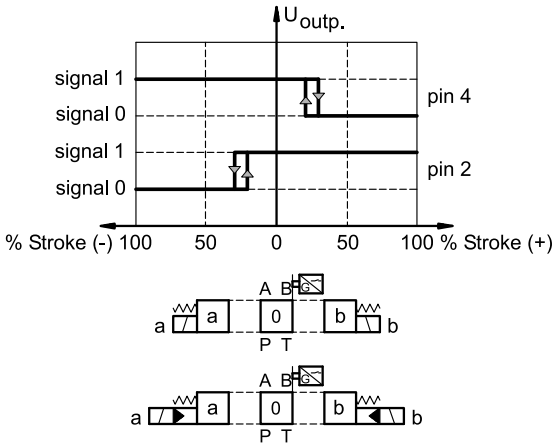
17 - SWITCHING LOGICS

Duplomatic offers a wide range of position monitoring options. For pilot-operated valves, monitoring with a redundant signal is also available.

17.1 - R0 monitoring

Central position monitored by one position sensor.

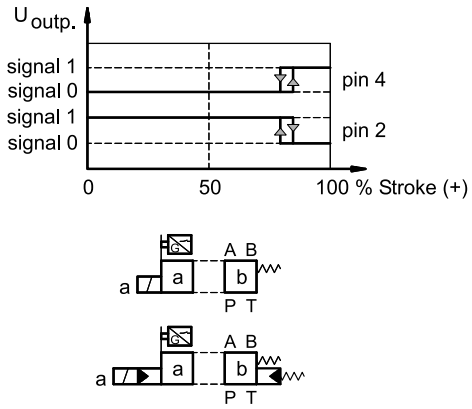
Available on both direct and pilot operated valves;
spool type S*



17.2 - MA monitoring

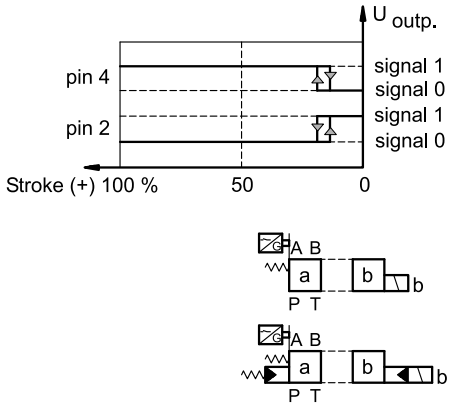
Energized position monitored by one position sensor.

Available on both direct and pilot operated valves;
spool type SA*, TA, TA02, TA100



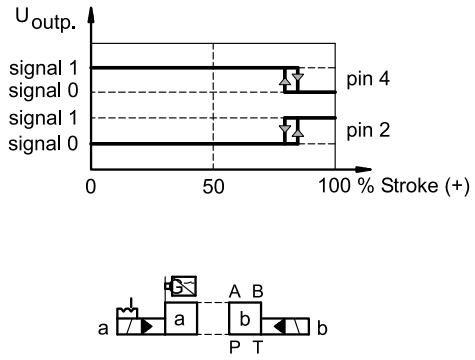
De-energized position monitored by one position sensor.

Available on both direct and pilot operated valves;
spool type SB*, TB, TB02, TB100



Position ‘a’ monitored by one position sensor.

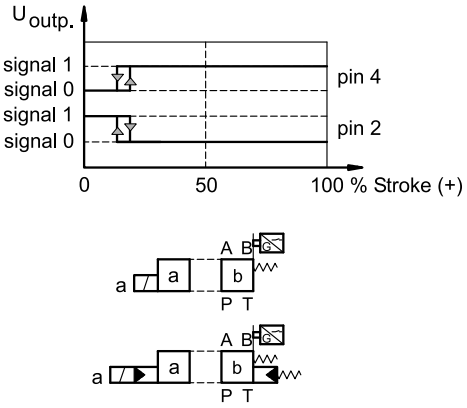
Available on pilot operated valves only;
spool type RK



17.3 - MB monitoring

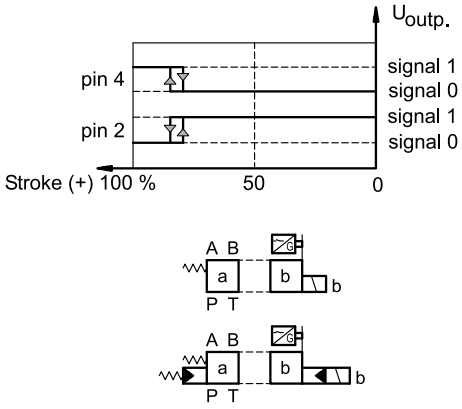
De-energized position monitored by one position sensor.

Available on both direct and pilot operated valves;
spool type SA*, TA, TA02, TA100



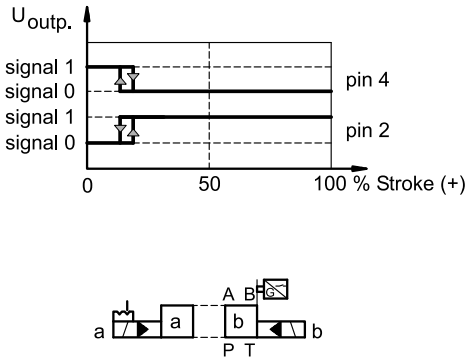
Energized position monitored by one position sensor.

Available on both direct and pilot operated valves;
spool type SB*, TB, TB02, TB100



Position ‘b’ monitored with one position sensor.

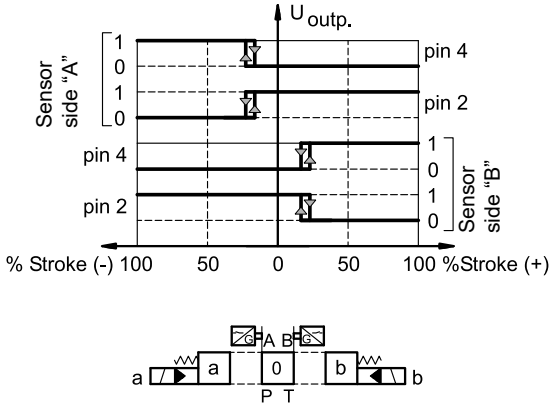
Available on pilot operated valves only;
spool type RK



17.4 - M0 monitoring

Central position monitored by two separate position sensors.

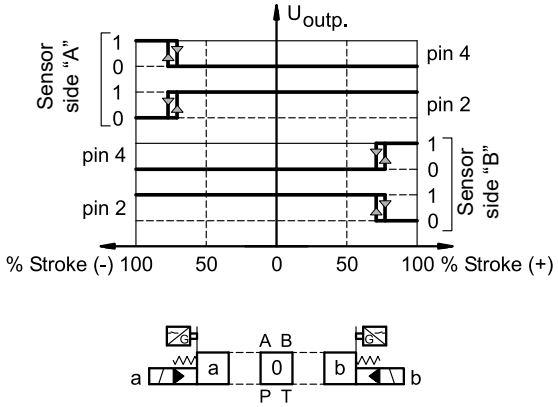
Available on pilot operated valves only;
spool type S*



17.5 - MAB monitoring

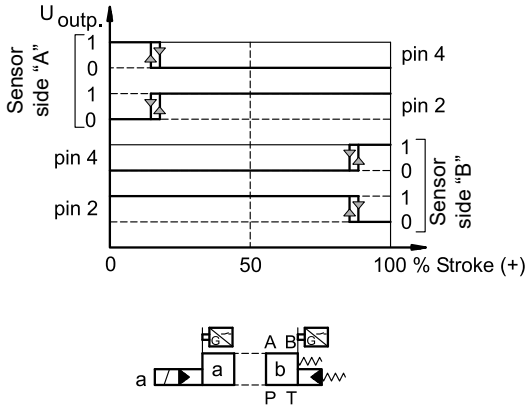
Both external positions monitored by two separate position sensors.

Available on pilot operated valves only;
spool type S*



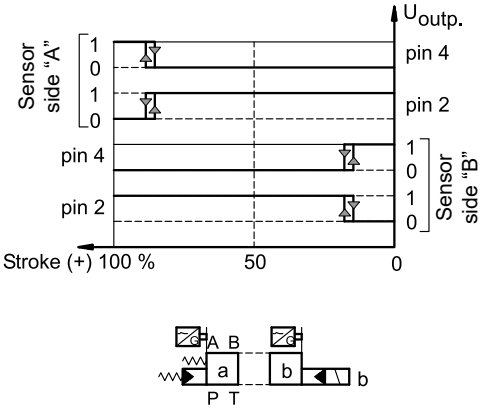
De-energized position monitored on side A.
Energized position monitored on side B.

Available on pilot operated valves only;
spool type SA1, TA, TA100



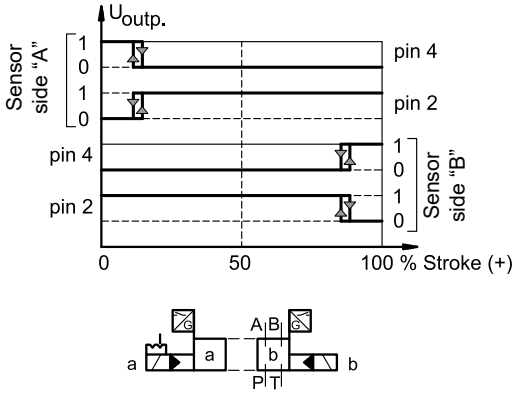
Energized position monitored on side A.
De-energized position monitored on side B.

Available on pilot operated valves only;
spool type SB1, TB, TB100



Energized position monitored.

Available on pilot operated valves only;
spool type RK



18 - 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.

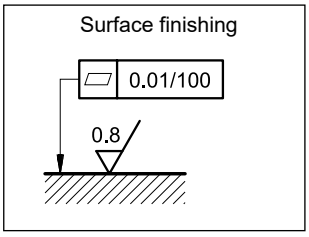
19 - INSTALLATION

WARNING! These valves must be installed and commissioned by qualified personnel only. Before starting any installation, commissioning or maintenance is mandatory read the *manual of use and maintenance*, delivered together with the valve.

Configurations with centring and return 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.



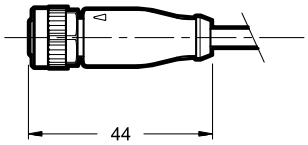
20 - SENSOR CONNECTORS

The female connectors for the position sensors can be ordered separately, according to the descriptions given below.The IP degree of protection indicated is valid only when the connector is correctly tightened onto the corresponding counterpart.

description: ECM4S/M12L/10/L5 code: 3491000008

right connector moulded cable pre-wired M12x1
4 poles, female, IP67, IP68, IP69K

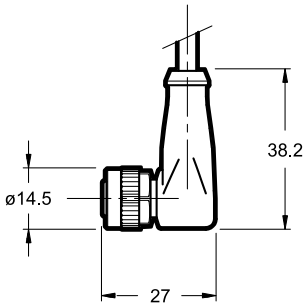
cable:	Ø 4.7 mm; lenght 5 mt;
conductor:	section 0.34 mm²
cable material	polyurethane resin (oil resistant)
LED	no



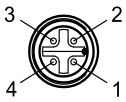
description : ECM4S/M12S/10/L5 code: 3491000009

angle connector pre-wired M12x1 with moulded cable
4 poles, female, IP67, IP68, IP69K

cable:	Ø 4.7 mm; lenght 5 mt;
conductor:	section 0.34 mm²
cable material	polyurethane resin (oil resistant)
LED	no



Wire colours for connectors ECM4*

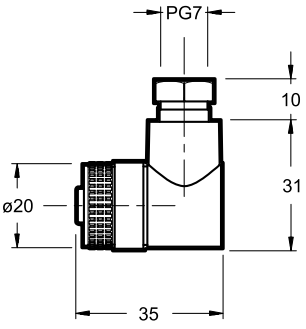


1	BN	brown
2	WH	white
3	BU	blue
4	Bk	black

description : EC4S/M12S/10 code: 3491001002

circular connector M12 with screw locking, angular, to wire.
4 poles, female, IP67

ref. norm:	IEC 61076-2-101 (Ed. 1) / IEC 60947-5-2
cable gland:	PG7
cable:	Ø 4 ÷ 6 mm
conductors:	max 0.75 mm²
contacts:	screw
Case material	polyamide (nylon)
LED	no



21 - SUBPLATES

(see catalogue 51 000)

	DS3M	DS5M	DSP5M	DSP7M	DSP8M
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	3/8” BSP	3/4” BSP (PMD4-AI4G) 1/2” BSP (PMD4-AL4G)	3/4” BSP	1” BSP	1 ½” BSP
X, Y ports dimensions	-	-	1/4” BSP	1/4” BSP	1/4” BSP

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