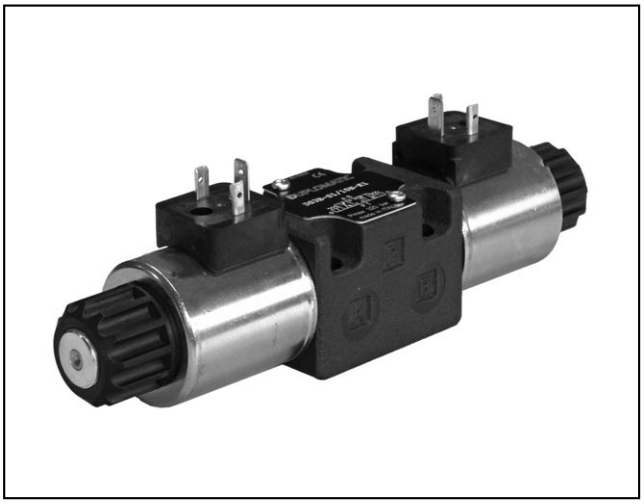


DS3B

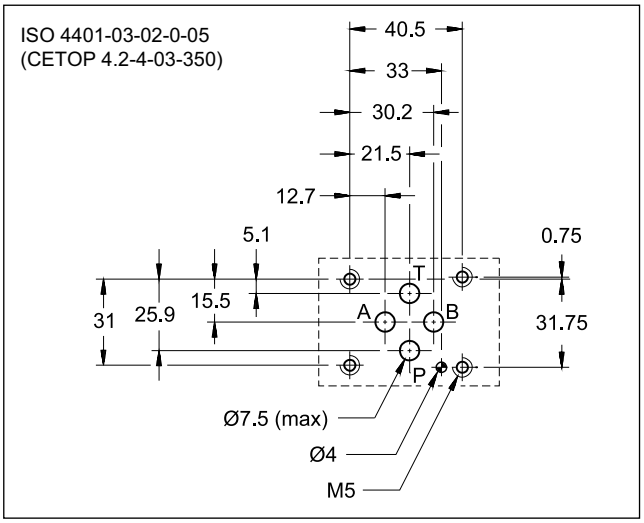
SOLENOID ACTUATED DIRECTIONAL VALVE, DIRECT OPERATED

SERIES 10

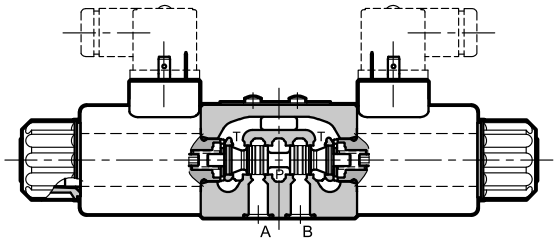
SUBPLATE MOUNTING
ISO 4401-03

p max **320** bar
Q max **60** l/min

MOUNTING INTERFACE



OPERATING PRINCIPLE



— Solenoid actuated directional control valve, direct operated with mounting surface according to ISO 4401-03 standards.

— The valve is supplied with 3 or 4 ways design, 2 or 3 positions, with a wide range of spools.

— The valve body is made with high strength iron castings provided with wide internal paths in order to minimize the flow pressure drop. Wet armature solenoids with interchangeable coils are used (for further information on solenoids see par. 7).

— The valve is available with DC solenoids.

— The valve is also available with zinc-nickel coating that ensures a salt spray resistance up to 120 hours.

PERFORMANCES

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

Maximum operating pressure: - P - A - B ports - T port	bar	 320 250
Maximum flowrate	l/min	60
Pressure drops Δp-Q	see paragraph 4	
Operating limits	see paragraph 5	
Electrical features	see paragraph 7	
Electrical connections	EN 175301-803 (ex DIN 43650)	
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	1,4 2

1 - IDENTIFICATION CODE

Directional valve, solenoid operated

ISO 4401-03 size

Spool type (see paragraph 3)

S*	**TA**	**RK**
SA*	**TB**	
SB*	**TA***	
	TB*	

Series:
(the overall and mounting dimensions remain unchanged from 10 to 19)

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

DC power supply
SD12 = 12 V
SD24 = 24 V
SD00 = valve without coils (see **NOTE 1**)

Coil electrical connection (see par. 10):
K1 = plug for connector type EN 175301-803 (ex DIN 43650) (**standard**)
K7 = plug DEUTSCH DT04-2P for male connector type DEUTSCH DT06-2S

Manual override:
omit for override integrated in the tube (**standard**) (see par. 12)
CM = manual override, boot protected

Option:
/ W7 = Zinc-nickel surface treatment (see **NOTE 2**)
Omit if not required

NOTE 1: Coils locking ring and related OR are supplied together with the valves.

NOTE 2: The standard valve is supplied with surface treatment of phosphating black.

The zinc-nickel finishing on the valve body makes the valve suitable to ensure a salt spray resistance up to **120** hours.
(test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

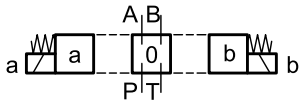
2 - HYDRAULIC FLUIDS

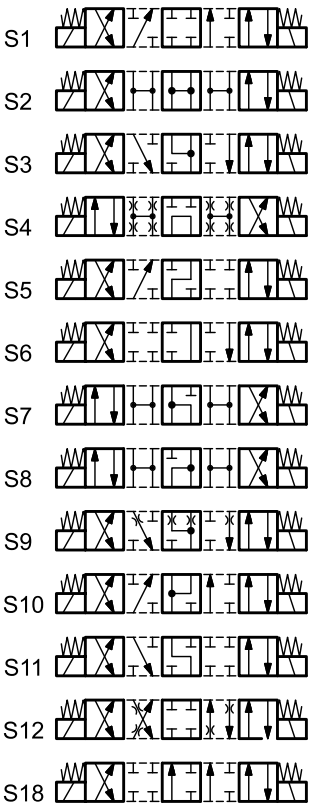
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department.

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.

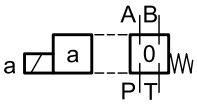
3 - SPOOL TYPE

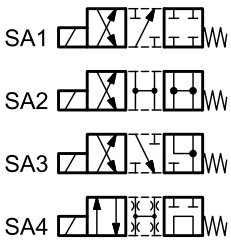
Type **S***:
2 solenoids - 3 positions
with spring centering



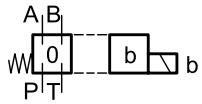


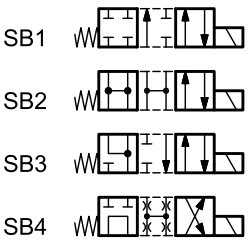
Type **SA***:
1 solenoid side A
2 positions (central + external)
with spring centering



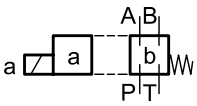


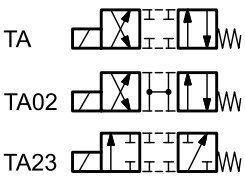
Type **SB***:
1 solenoid side B
2 positions (central + external)
with spring centering



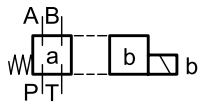


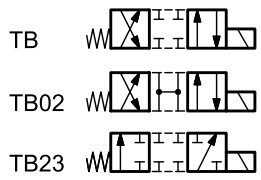
Type **TA**:
1 solenoid side A
2 external positions
with return spring



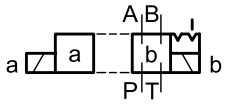


Type **TB**:
1 solenoid side B
2 external positions
with return spring



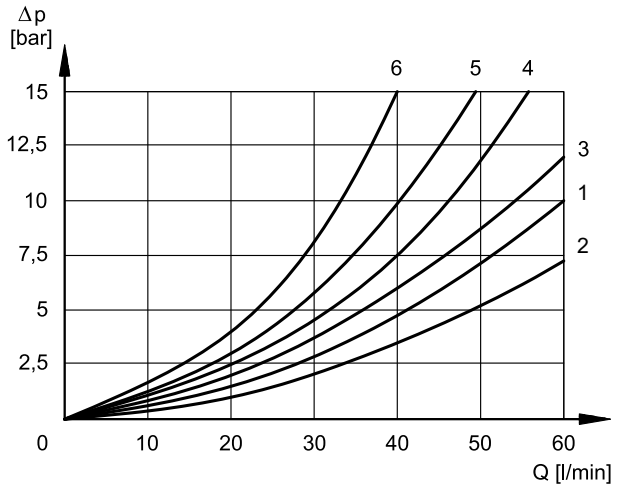


Type **RK**:
2 solenoids - 2 positions
with mechanical retention



4 - PRESSURE DROPS Δp-Q

(obtained with viscosity 36 cSt at 50 °C)



ENERGIZED POSITION

SPOOL TYPE	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SB1	1	1	3	3
S2, SA2, SB2	2	2	3	3
S3, SA3, SB3	3	3	2	2
S4, SA4, SB4	4	4	4	4
S5	1	2	3	3
S6	1	1	3	2
S7, S8	5	4	4	4
S9	1	1	3	3
S10	2	3	2	3
S11	1	1	2	3
S12	1	1	3	3
S18	2	1	3	3
TA, TB	3	3	3	3
TA02, TB02	1	1	1	1
TA23, TB23	3	3		
RK	1	1	1	1

Please refer to curve no. 4 for pressure drops between A and B lines of the S10 spool when used in regenerative circuits.

DE-ENERGIZED POSITION

SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SB2					1
S3, SA3, SB3			3	3	
S4, SA4, SB4					3
S5		5			
S6				3	
S7, S8			6	6	3
S10	3	3			
S11			3		
S18	5				

5 - SWITCHING TIMES

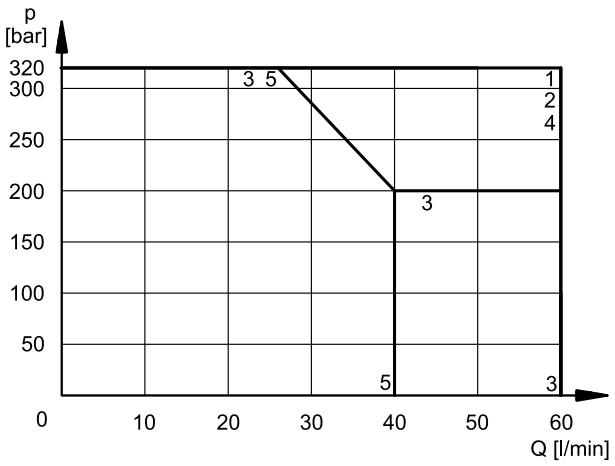
The values indicated are obtained according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50°C.

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

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

The limits have been verified with standard 4-way valve. Performance can be considerably reduced if a 4-way valve is used as 3-way, with port A or B plugged or without flow.



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
S5	1	1
S6	1	5
S7	1	1
S8	1	1
S9	1	1
S10	1	1
S11	1	5
S12	1	1
S18	1	1

SPOOL	CURVE	
	P→A	P→B
TA, TB	1	1
TA02, TB02	1	1
TA23, TB23	1	1
RK	1	1

7 - ELECTRICAL FEATURES

7.1 - Solenoids

These are essentially made up of two parts: tube and 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 360°, to suit the available space.

Protection from atmospheric agents IEC 60529

The IP protection degree is guaranteed only with both valve and connectors of an equivalent IP degree, correctly connected and installed.

electric connection	electric connection protection	whole valve protection
K1 EN 175301-803 (ex DIN 43650)	IP65	IP65
K7 DEUTSCH DT04 male	IP65/67	

SUPPLY VOLTAGE FLUCTUATION	± 10% Vnom
MAX SWITCH ON FREQUENCY	18.000 ins/hr
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE)	In compliance with 2014/30/EU
LOW VOLTAGE	In compliance with 2014/35/EU
CLASS OF PROTECTION Coil insulation (VDE 0580) Impregnation: DC valve	 class H class F

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

7.2 - Current and absorbed power

The table shows current and power consumption values of the DC coils.

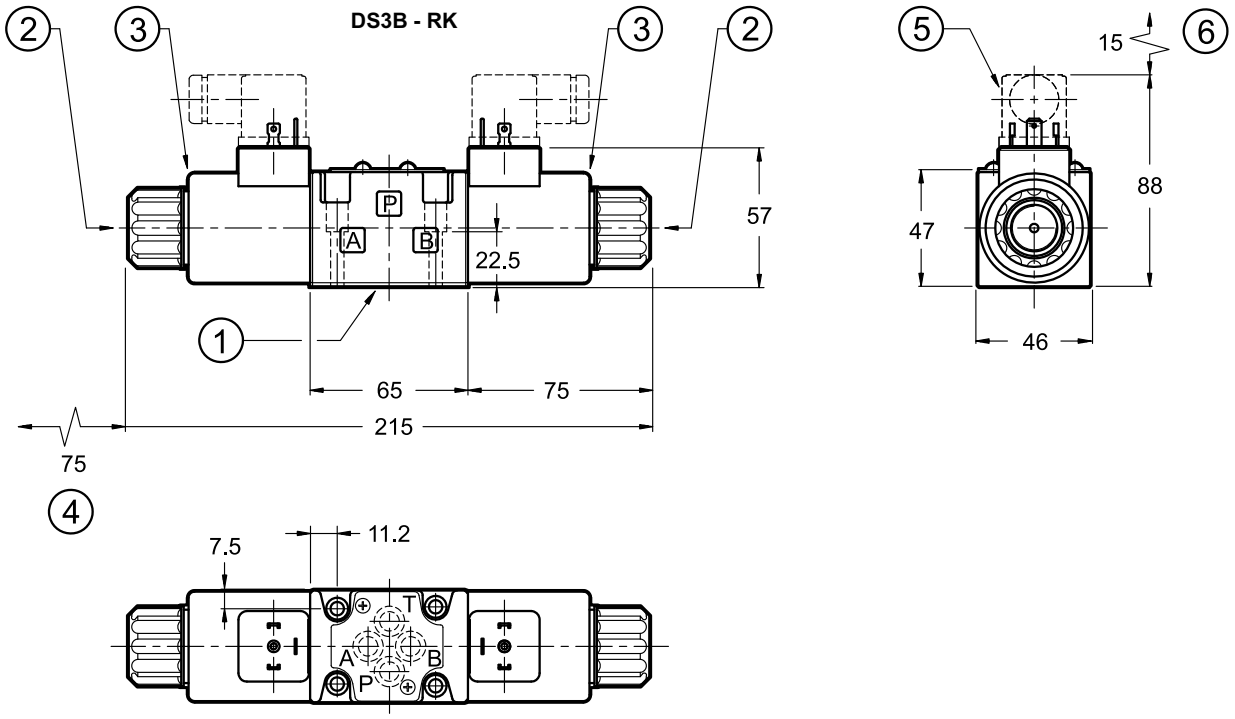
Coils for direct current (values ±10%)

	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]	Coil code K1	Coil code K7
SD12	12	4.5	2.67	32	1903780	1903760
SD24	24	18.6	1.29	31	1903781	1903761

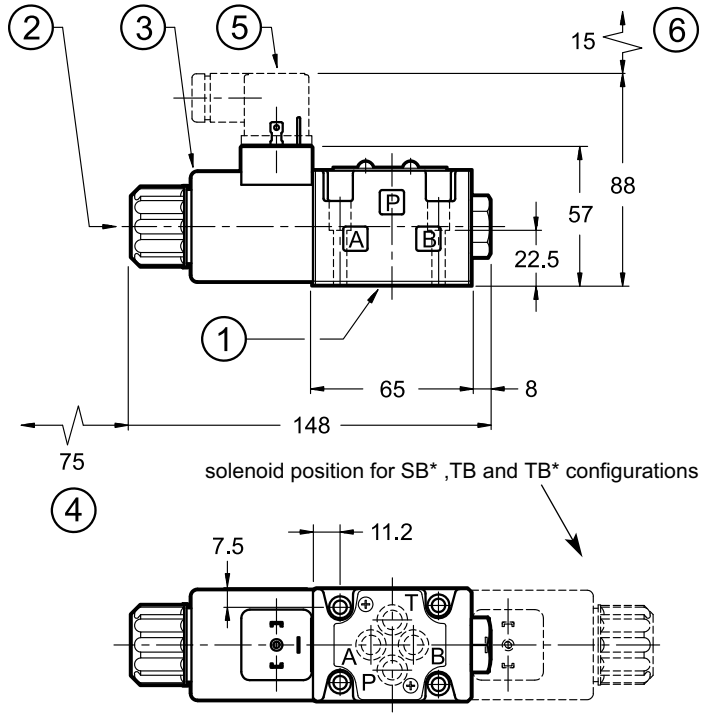
8 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

DS3B - S*
DS3B - RK



DS3B-SA*, DS3B-TA,
DS3B-TA*



solenoid position for SB* ,TB and TB* configurations

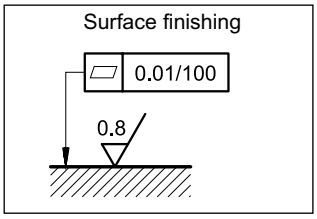
Valve fastening: 4 SHC screws ISO 4762 M5x30	
Tightening torque: 5 Nm (A8.8)	
Threads of mounting holes: M5x10	

1	Mounting surface with sealing rings: 4 OR 2037 (9.25x1.78) - 90 shore
2	Standard manual override included in the solenoid tube
3	Coil (360° revolving)
4	Coil removal space
5	EN 175301-803 (ex DIN 43650) connector To be ordered separately. See cat. 49 000
6	Connector removal space
7	Locking ring: tightening torque 5 ±0.5 Nm

9 - INSTALLATION

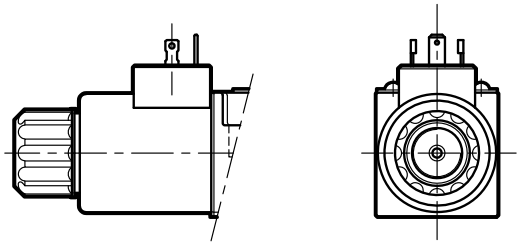
Configurations with centering and return springs can be mounted in any position; type RK valves - without springs and with mechanical detent - must be mounted with the longitudinal axis horizontal.

Valve fixing takes place by means of screws or tie rods, with the valve mounted 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 and/or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.



10 - ELECTRIC CONNECTIONS

connection for EN 175301-803
(ex DIN 43650) connector
code **K1** (**standard**)



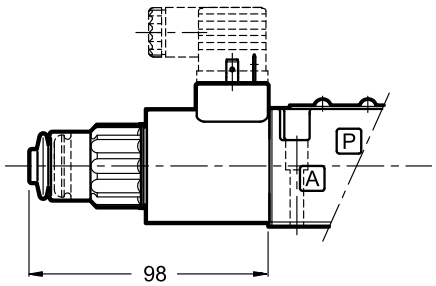
connection for
DEUTSCH DT06-2S male connector
code **K7**

11 - ELECTRIC CONNECTORS

Solenoid operated valves are delivered without connectors. Connectors type EN 175301-803 (ex DIN 43650) for K1 connections can be ordered separately. See catalogue 49 000.

12 - MANUAL OVERRIDES

12.1 - CM-DS3/11 Manual override, boot protected



Code: 3401150006

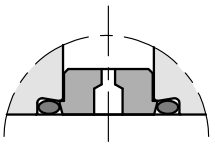
13 - PORT RESTRICTORS

Port restrictors are recommended if flow variations which exceed the valve performance limit during the switching processes occur, or for circuit dampening.

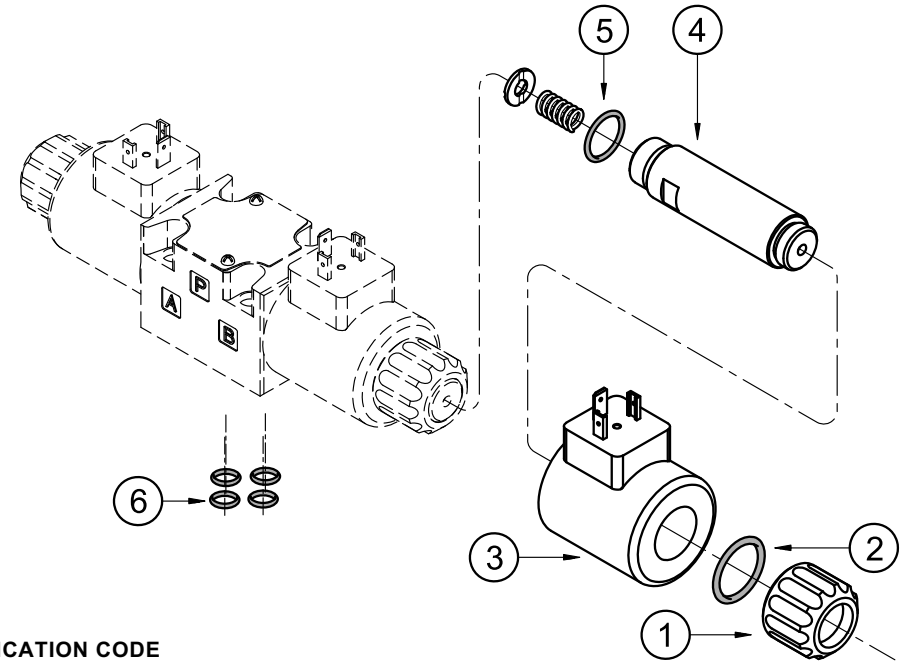
Port restrictor plugs can be ordered separately with the part numbers shown at left.

Ø (mm)	part number
blank	**0144162**
0.6	**0144163**
0.8	**0144033**
1	**0144034**

Ø (mm)	part number
1.2	**0144035**
1.5	**0144036**
1.8	**0144164**
2	**0144165**



14 - SPARE PARTS



COILS IDENTIFICATION CODE

C	22S3	-	S			/	12

Supply voltage
D12 = 12 V
D24 = 24 V

Series no.:

Coil electrical connection
K1 = plug for connector EN 175301-803 (ex DIN 43650)
K7 = plug DEUTSCH DT04-2P, for male connector type DEUTSCH DT06-2S.

NOTE: You can also order coils using the coil codes at section 7.2

1	Coil locking ring with seal included cod. 0119412 Tightening torque 5 ±0.5 Nm
2	ORM type 0220-20 (22x2) - 70 Shore
3	Coil (see identification code)
4	Solenoid tube for standard version: TDS22-DS3/10N (NBR seals) TDS22-DS3/10V (FPM seals) **NOTE:** OR n°5 included
5	OR type 2062 (15.6x1.78) - 70 Shore
6	4 OR type 2037 (9.25x1.78) - 90 Shore

SEALS KIT

The codes include the O-Ring n° 2, 5, and 6

Cod. 1985406 NBR seals
Cod. 1985410 FPM (viton) seals

15 - SUBPLATES

(see catalogue 51 000)

Type PMMD-AI3G with rear ports 3/8” BSP
Type PMMD-AL3G with side ports 3/8” BSP

DUPLOMATIC MOTION SOLUTIONS

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