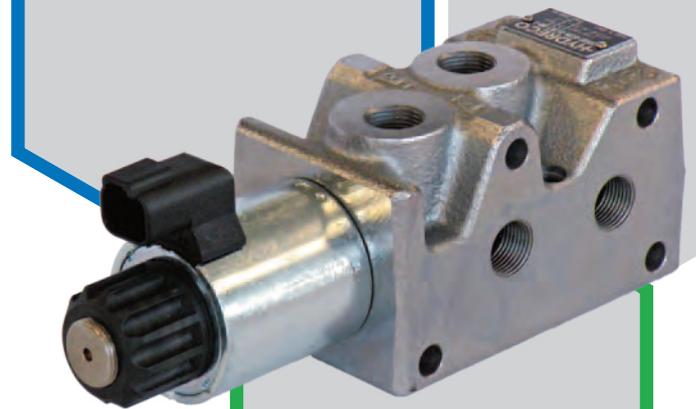


## DD\*

### 6-PORTS FLOW DIVERTER

DDL	max 320 bar	60 l/min
DDM	max 320 bar	90 l/min



### INTRODUCTION

DDL and DDM are flow diverters with 6 ports, 2 positions.

They allow the connection of the pressure lines with two working lines. The solenoid switches the flow alternatively through the flow paths.

Version with drain port allows higher pressures.

Up to 5 modules can be bundled up in series operation.

These valves are supplied with a zinc-nickel plating making them the perfect choice for mobile and environmental applications that require better protection.

### FLUIDS

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

Using fluids at temperatures higher than 80 °C (180 °F) causes the accelerated degradation of seals as well as the fluid physical and chemical properties.

From a safety standpoint, temperatures above 55 °C (130 °F) are not recommended.

### OPERATING PARAMETERS

<b>MAXIMUM OPERATING PRESSURE</b>		250 bar	3600 psi
	with drain Y	320 bar	4600 psi
<b>FLOW RATE</b>	DDL	60 l/min	16 gpm
	DDM	90 l/min	24 gpm

<b>STEP RESPONSE</b>	DDL	0 → 100%	25 ÷ 75
		100 → 0%	20 ÷ 50
	DDM	0 → 100%	50 ÷ 100
		100 → 0%	20 ÷ 40

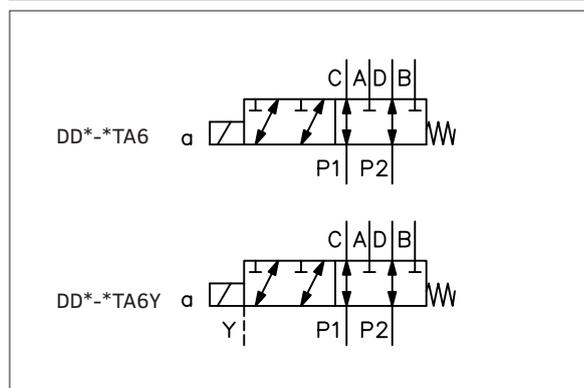
<b>WEIGHT</b>	DDL	3 kg	6.6 lbs
	DDM	4.2 kg	9.3 lbs

<b>RANGE TEMPERATURES</b>	ambient	-20 to +54 °C	-4 to +130 °F
	fluid	-20 to +82 °C	-4 to +180 °F

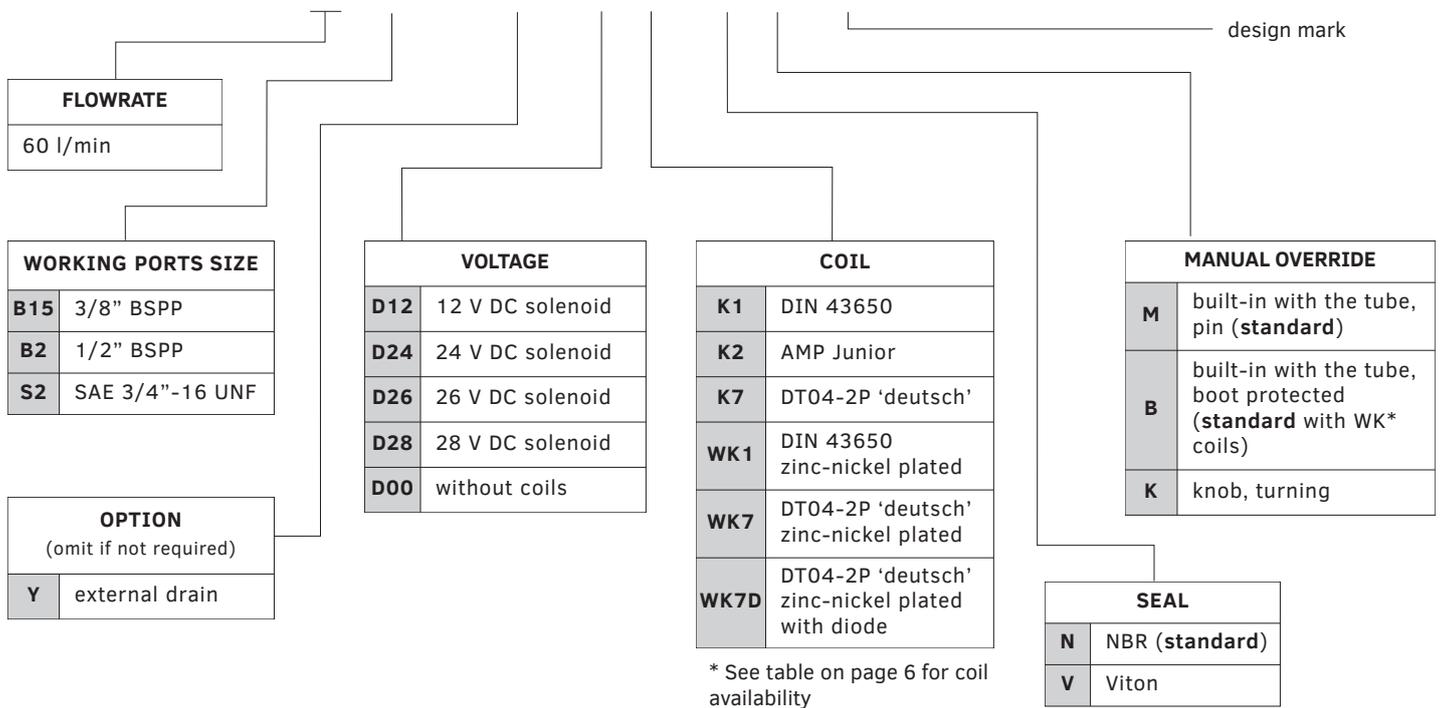
<b>FLUID VISCOSITY</b>	range	10 - 400 cSt	60 - 1900 SUS
	recommended	25 cSt	120 SUS

<b>FLUID CONTAMINATION</b>	ISO 4406:1999 class 20/18/15
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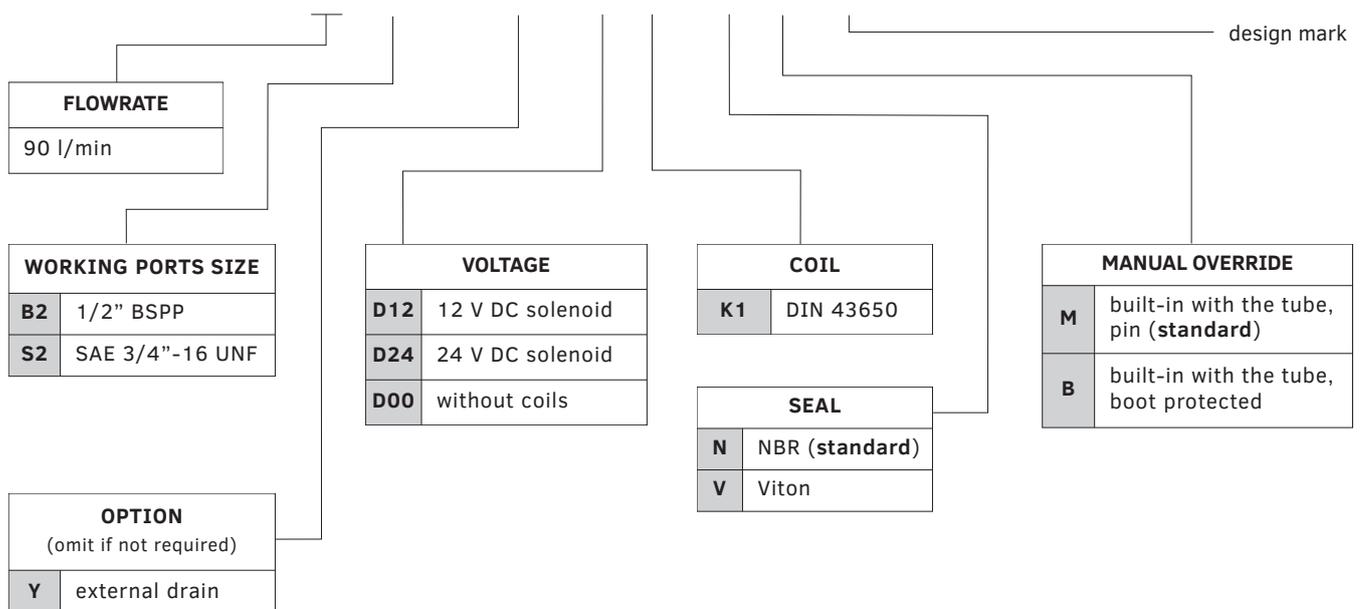
### HYDRAULIC SYMBOLS (TYPICAL)



## DDL - TA6 - - - 1



## DDM - TA6 - K1 - - 1



### CODE EXAMPLES:

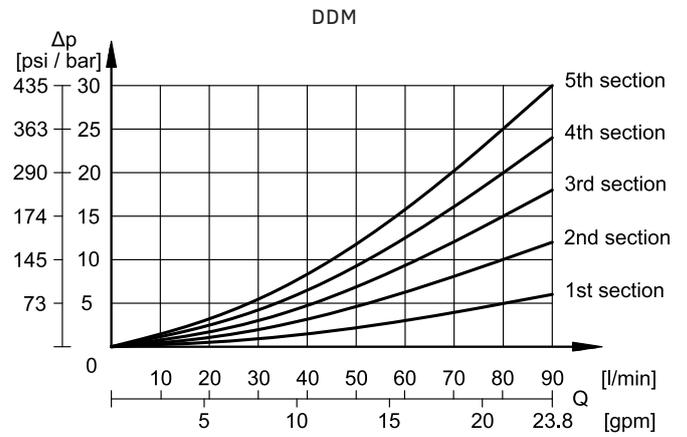
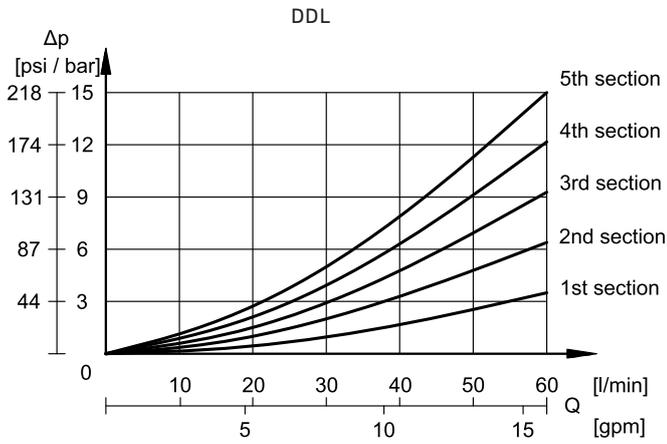
DDL - B2TA6Y - D12K7 - NM - 1

DDM - S2TA6 - D12K1 - NM - 1

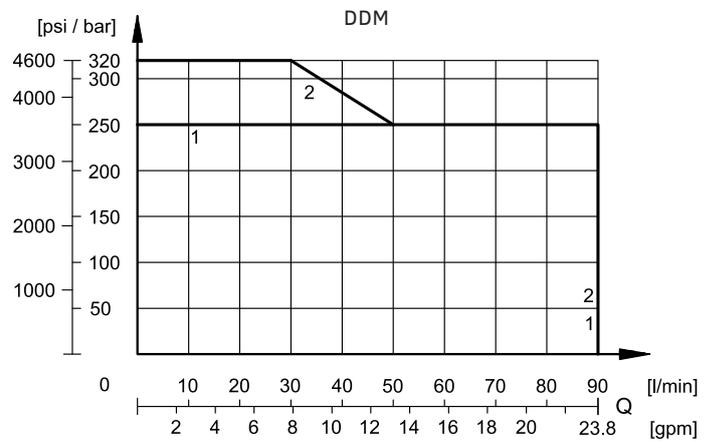
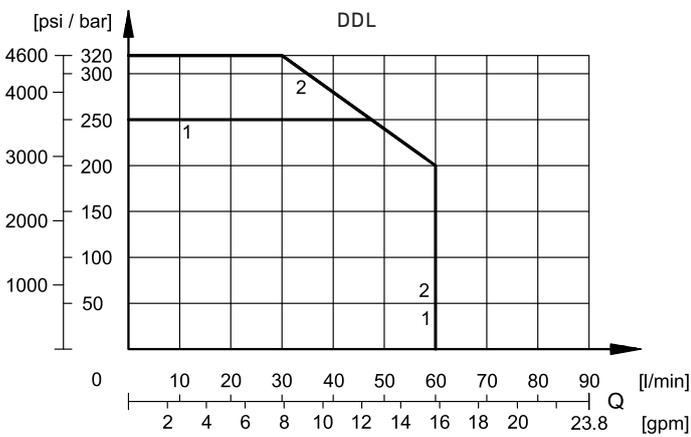
DD\* - Characteristic Curves

Flow characteristic curves obtained with mineral oil with viscosity of 36 cSt (170 sus) at 50 °C (122 °F) and 24V DC valve.

PRESSURE DROPS  $\Delta p$ -Q



PERFORMANCE CURVES



TYPE	CURVE
DD*-*	1
DD*-*Y	2

## ELECTRICAL DATA

Solenoids are 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 retainer, and can be indexed 360°, to suit the clearance space.

The WK7D coil includes a suppressor diode of pulses for protection from voltage peaks. During the switching the diode significantly reduces the energy released by the winding, by limiting the voltage to 31.4V in the D12 coil and to 58.9 V in the D24 coil.

Use coil codes in the table below to order spare parts.

<b>DUTY CYCLE</b>	100%	
<b>MAXIMUM SWITCH ON FREQUENCY</b>	10,000 cycles/hr	
<b>SUPPLY VOLTAGE FLUCTUATION</b>	± 10% Vnom	
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	2014/30/EU	
<b>LOW VOLTAGE</b>	2014/35/EU	
<b>PROTECTION CLASS FOR INSULATION</b>	coil	class H (180 °C)
	DDL copper wire	class H (180 °C)
	DDM copper wire	class F (155 °C)

(values ± 10%)

Valve	Coil	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]	Coil code				
						K1	K7	WK1	WK7	WK7D
DDL	D12	12	4.4	2.72	32.7	1903080	1902940	1903590	1903580	1903600
	D24	24	18.6	1.29	31	1903081	1902941	1903591	1903581	1903601
	D26	26.4	21.8	1.21	32			1903599	1903589	
	D28	28	26	1.11	31	1903082				
DDM	D12	12	2.9	4.14	50	1903150				
	D24	24	12.3	1.95	47	1903151				

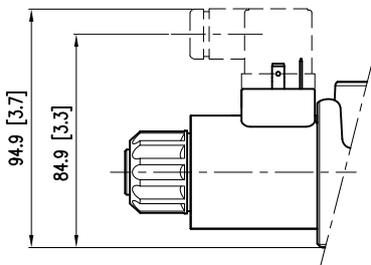
DD\* - Coil Connections and IP Degree

Declared IP degrees are intended according to EMC 2014/30/EU, only for both valve and connectors of an equivalent IP degree, installed properly.

WK1, WK7 and WK7D coils reach a better IP degree than standard coils thanks to the zinc-nickel plating and to some constructive measures. The valves with these coils have a salt spray resistance up to 600 hours (test performed according to UNI EN ISO 9227 and assessment test performed according to UNI EN ISO 10289).

Mating connectors are not included in solenoid valves delivery. Connectors for K1 and WK1 coils can be ordered separately.

**K1 (DDL)**



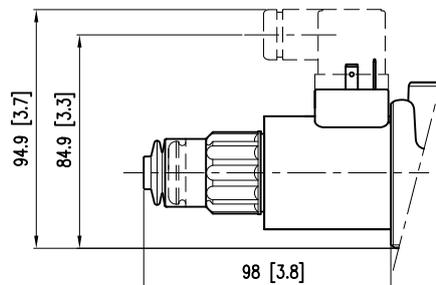
**DIN 43650 (EN 175301-803)**

Mating connectors type ISO 4400 / DIN 43650 (EN 175301-803).

IP degree of electrical connection: IP65

IP degree of whole valve: IP 65

**WK1 (DDL)**



**DIN 43650 (EN 175301-803)**

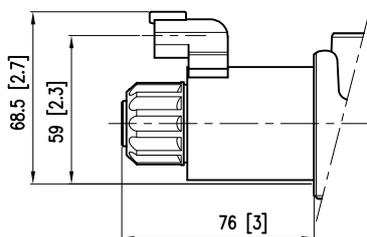
Zinc-nickel plated coil.

IP degree of electrical connection: IP66

IP degree of whole valve: IP66

The pin for manual override is boot-protected (code B).

**K7 (DDL)**

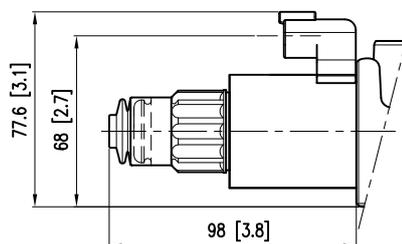


**DEUTSCH DT04 MALE**

IP degree of electrical connection: IP65/IP67

IP degree of whole valve: IP65

**WK7 / WK7D (DDL)**



**DEUTSCH DT04 MALE**

Zinc-nickel plated coil.

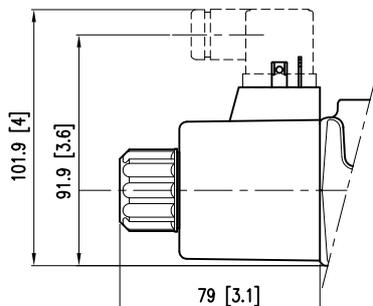
IP degree of electrical connection: IP66/IP68/IP69 -

IP degree of whole valve: IP66/IP68/IP69

IP degree according to ISO 20653: IP69K

The pin for manual override is boot-protected (code B).

**K1 (DDM)**



**DIN 43650 (EN 175301-803)**

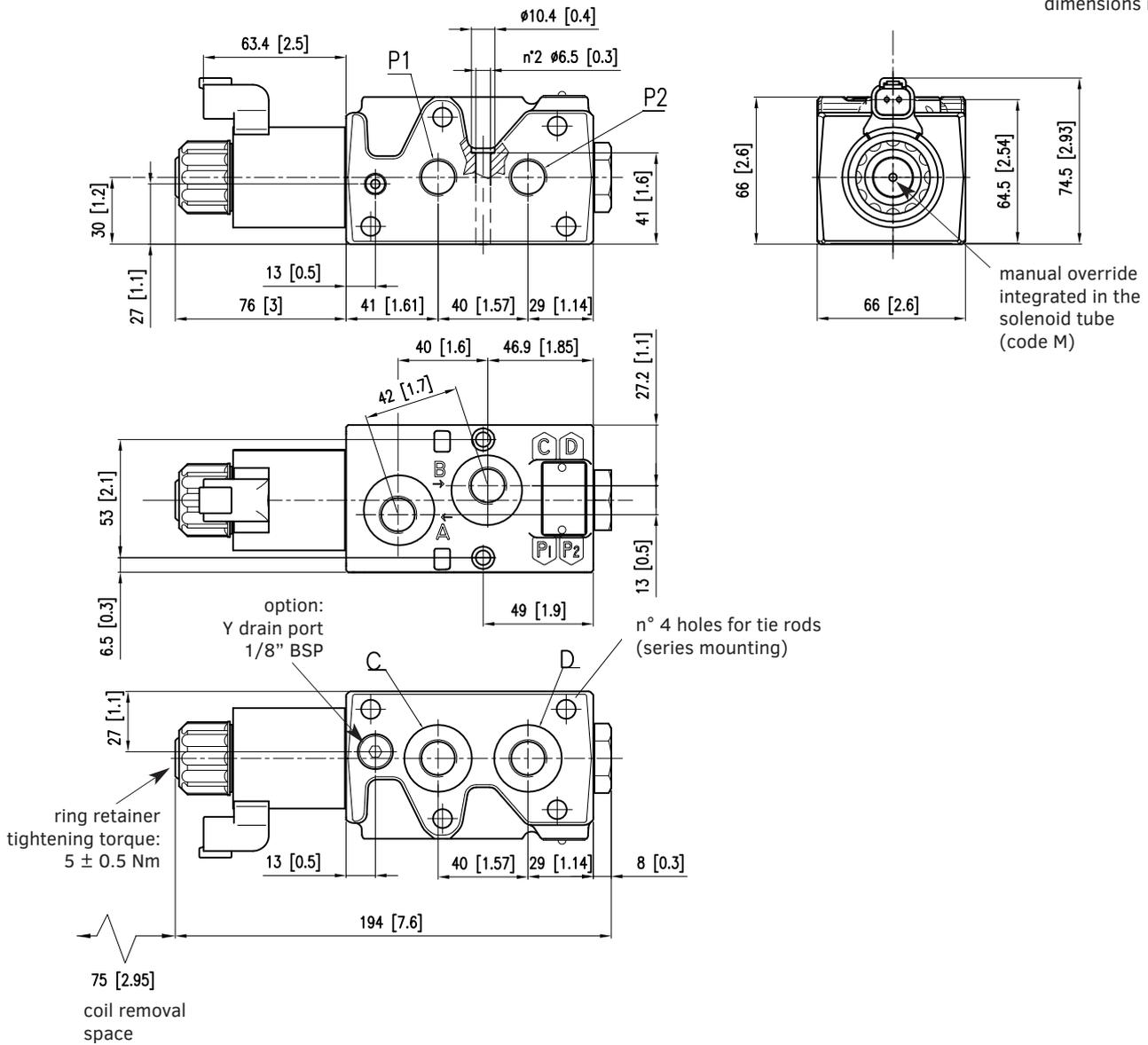
Mating connectors type ISO 4400 / DIN 43650 (EN 175301-803). Plastic coil.

IP degree of electrical connection: IP65

IP degree of whole valve: IP65

DDL-B15 (K7 COIL)

dimensions in mm [in]



**Ports:**

DDL-B15 = 3/8" BSPP

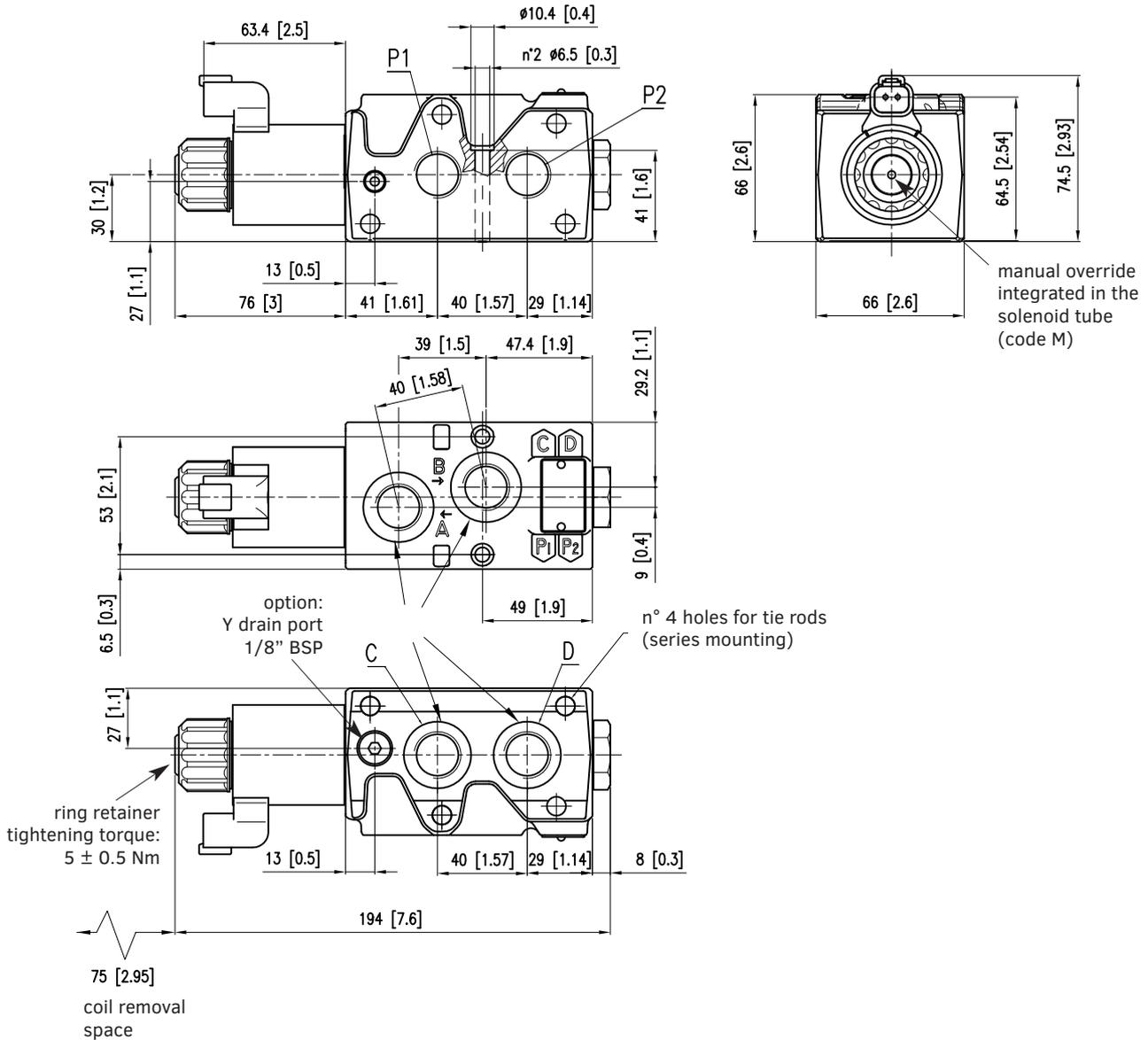
**Fastening bolts:**

4 SHCS M6x50 - ISO 4762 - torque 8 Nm (A 8.8)

**Threads of mounting holes:** M6x12

DDL-\*2 (K7 COIL)

dimensions in mm [in]



**Ports:**

DDL-B2 = 1/2" BSPP

DDL-S2 = 3/4" 16-UNF

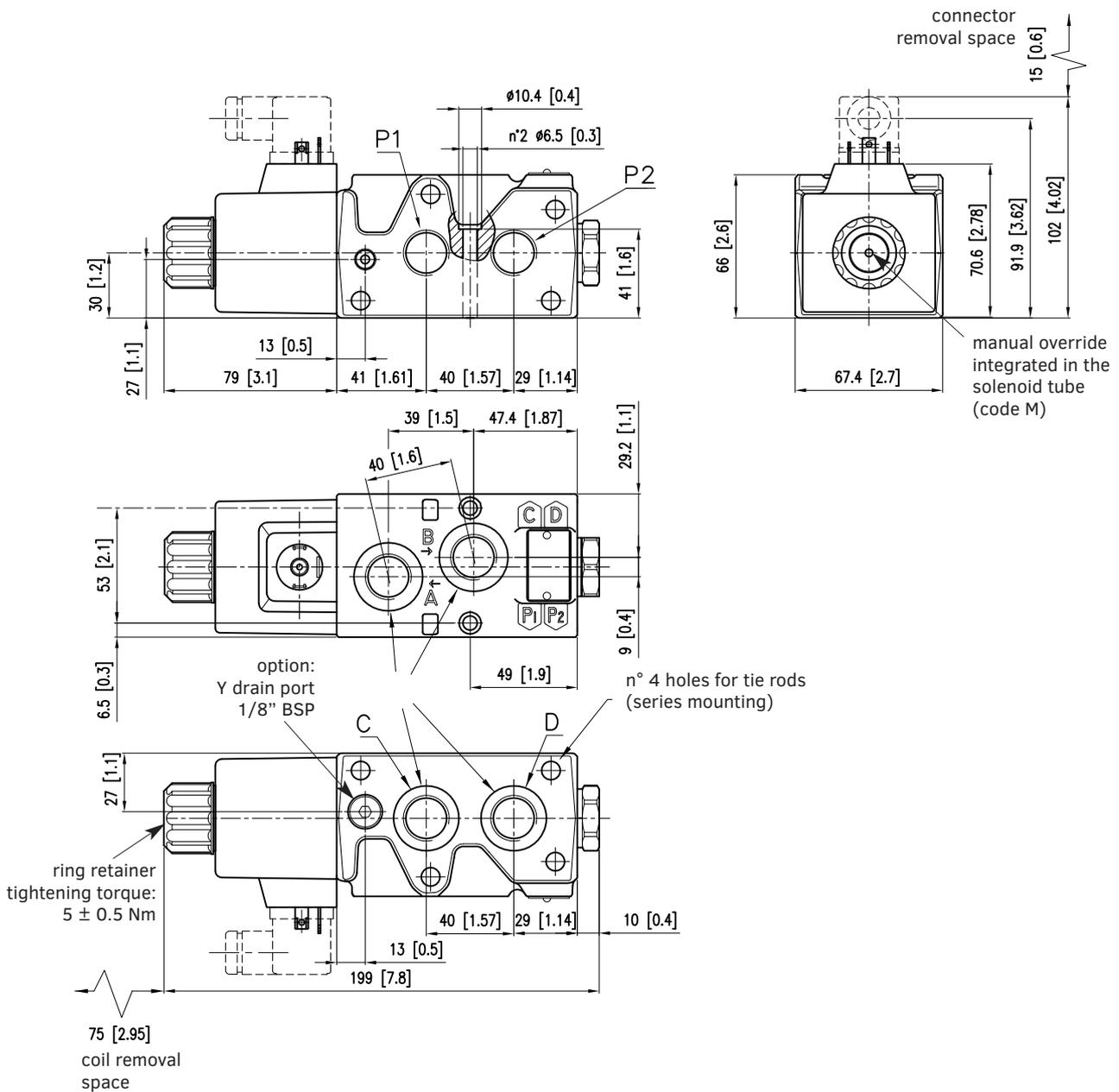
**Fastening bolts:**

4 SHCS M6x50 - ISO 4762 - torque 8 Nm (A 8.8)

**Threads of mounting holes:** M6x12

**DDM-\*2**

dimensions in mm [in]



**Ports:**

DDM-B2 = 1/2" BSPP  
DDM-S2 = 3/4" 16-UNF

**Fastening bolts:**

4 SHCS M6x50 - ISO 4762 - torque 8 Nm (A 8.8)

**Threads of mounting holes:** M6x12

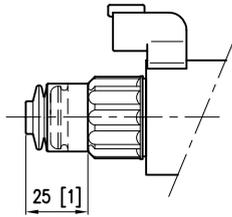
## DD\* - Manual Overrides

The standard valve has override pins integrated in the tube.  
The operation of this control must be executed with a suitable tool, carefully not to damage the sliding surface.

Further manual overrides are available, entering the proper code in the model number.

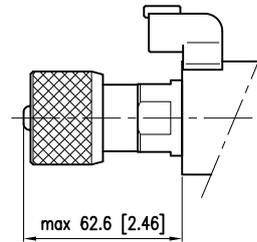
## OVERRIDE PINS INTEGRATED THE TUBE, BOOT PROTECTED

Code B



## KNOB, TURNING (DDL ONLY)

Code K



## IP DEGREE TIPS

The technical reference standard for IP degree is IEC 60529, which classifies and rates the degree of protection provided by equipments and electrical enclosures against intrusions.

The first digit (6) concerns the protection from solid particles (body parts to dust).

The second digit of the IP rating concerns the liquid ingress protection. It indicates three different types of atmospheric agents from which protection is provided:

Values from 1 to 6 → water jets.

Values 7 and 8 → immersion.

Value 9 → high pressure and high temperature water jets.

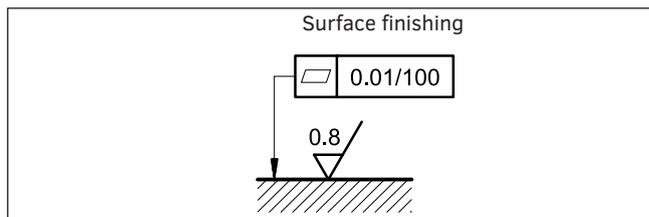
This means that IP66 covers all the lower steps, rating IP68 covers IP67 but not IP66 and lower. Instead, IP69 does not cover any of them. Whether a device meets two types of protection requirements it must be indicated by listing both separated by a slash. (E.g. a marking of an equipment covered both by temporary immersion and water jets is IP66/IP68).

### INSTALLATION

These valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.

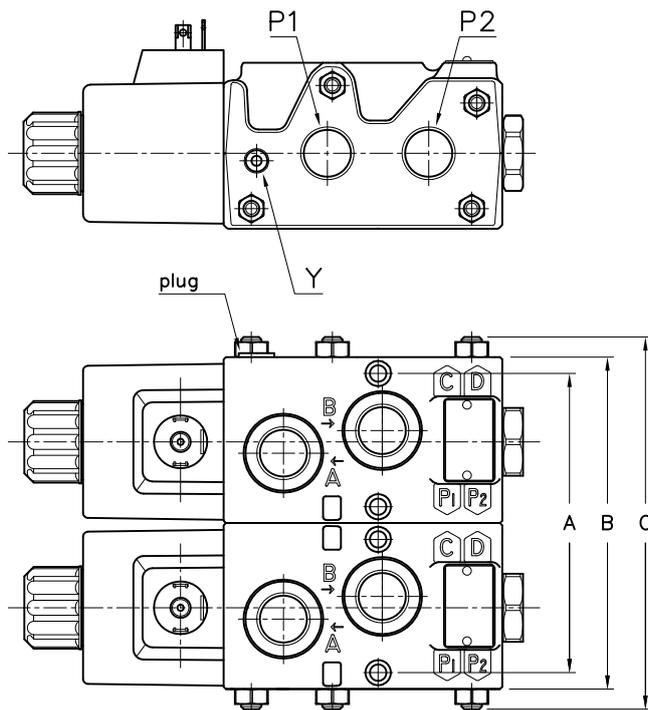
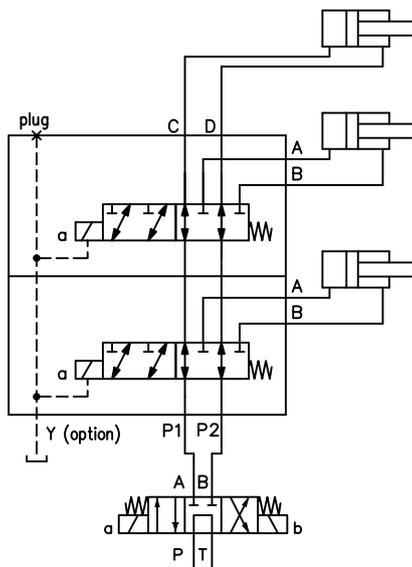


### SERIES INSTALLATION

Both DDL and DDM valves can be assembled in series, bundled up to 5 pieces.

The fixing kit must be ordered separately.

It includes: rods and screws, nuts, security washers and O-Rings, as indicated in the table below.



#### Sealing rings for interface mounting:

OR 2106 (26.7x1.78) 90 shore  
additional just for Y version: OR 2050 (12,42x1,78) 90 shore

**Tightening torque:** 17 Nm

Qty pieces	Qty ports	A	B	C	bolts or tie-rods	nuts & washers	Qty. OR 2106	Qty. OR 2050	NBR kit	Viton kit
2	8	119	132	156	4 bolts M8x145	4+4	2	1	H3404200002	H3404200012
3	10	185	198	220	4 tie-rods M8x200	8+8	4	2	H3404200003	H3404200013
4	12	251	264	285	4 tie-rods M8x265	8+8	6	3	H3404200004	H3404200014
5	14	317	330	350	4 tie-rods M8x330	8+8	8	4	H3404200005	H3404200015

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