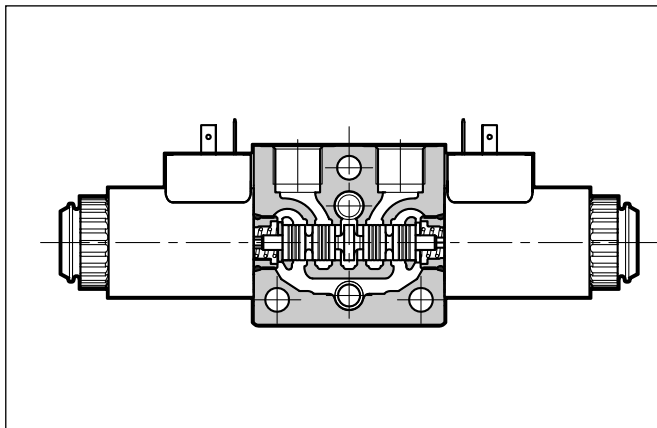


**BD\***  
**STACKABLE**  
**DIRECTIONAL CONTROL VALVE**  
**SERIES 10**

**p** max (see table of performances)  
**Q** max (see table of performances)

**OPERATING PRINCIPLE**



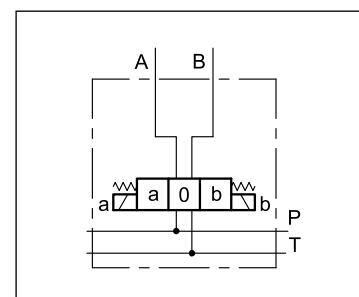
- BDL, BDM and BDS are stacked valve assemblies, very well-rounded thanks to their modular design.
- Elements have been designed to be assembled in parallel connection, mounting up to 10 stackable valves. The same elements allow to create series circuits by inserting plugs in order to divert the oil path.
- Elements specifically designed for BD\*2 series circuits complete the BD\* range.
- BD\* assemblies are suitable for compact applications in the mobile and in mini-power pack industries.
- Directional valve elements are available in two thicknesses, with working ports 3/8" BSP, 1/2" BSP, SAE-06 and SAE-08 threaded.

**PERFORMANCES**

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

		<b>BDL</b>	<b>BDM</b>	<b>BDS</b>
Maximum operating pressure:	- P-A-B ports	280	320	320
	- T / T1 ports	280	250	250
Maximum flowrate:	- parallel	40	50	60
	- series	40	40	50
Pressure drops $\Delta p$ - Q		see paragraph 3		
Electrical characteristics		see paragraph 6		
Operating limits		see paragraph 4		
Electrical connections		see paragraph 7		
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 (BDS3-B38-S)	kg	1,57	1,73	2,1
Surface treatment of inlet and outlet elements and valves bodies		zinc-nickel		

**HYDRAULIC SYMBOL**



### 1 - IDENTIFICATION CODES OF SEPARATE ELEMENTS

Here below are shown the identification codes for the separate elements of the stackable valve. Parallel circuits can be assembled with these elements. The same elements allow to create series circuits by inserting plugs in order to divert the oil path.

#### 1.1 - Directional valve element

<b>BD</b>			-		-		/	<b>10</b>		-		/	
-----------	--	--	---	--	---	--	---	-----------	--	---	--	---	--

Stack directional valve element, on-off

Solenoid tube (mm):  
**L** = 14  
**M** = 19  
**S** = 22 (only size 3)

Size : \_\_\_\_\_  
**2** = thickness 38 mm  
**3** = thickness 46 mm

Ports: \_\_\_\_\_  
**B38** = 3/8" BSP  
**B12** = 1/2" BSP (only for size 3)  
**S06** = 9/16" 18 UNF (SAE 06)  
**S08** = 3/4" 16 UNF (SAE 08) (only for size 3)

Spool type \_\_\_\_\_  
 (see point 1.2)

Series no. \_\_\_\_\_  
 (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

Manual override (see par. 10.6 - 10.8):  
 for **BDL**:  
 omit for manual override boot protected integrated in the coil locking ring (**standard**)  
 for **BDM** and **BDS**:  
 omit for pin manual override integrated in the tube (**standard**).  
**CM** = manual override boot protected  
 for **BDL, BDM** and **BDS**  
**CK1** = turning knob override  
**CHL** = light duty hand lever. p max 50 bar in T line (not available for series circuits)

Coil electrical connection:  
**See below for availability, see par. 6 and 7 for details**  
**K1** = plug for connector type EN 175301-803 (ex DIN 43650) (**standard**)  
**K7, WK7, WK7D** = plug DEUTSCH DT04-2P for male connector type DEUTSCH DT06-2S

The electrical connection **K2** (AMP JUNIOR type) is available upon request

Coil type:  
 DC coils  
**D12** = 12 V  
**D24** = 24 V  
**D28** = 28 V  
**D48** = 48 V  
**D00** = valve without coil supplied with locking ring

**NOTE:** Variants are available. See paragraph 10.1

**Available coils**

	BDL			BDM			BDS					
	K1	K2	WK7	K1	K2	K7	K1	K2	K7	WK1	WK7	WK7D
<b>D12</b>	■	□	■	■	□	■	■	□	■	■	■	■
<b>D24</b>	■	□	■	■	□	■	■	□	■	■	■	■
<b>D28</b>	■	-	-	-	-	-	■	-	-	-	-	-
<b>D48</b>	■	-	-	-	-	-	■	-	-	-	-	-

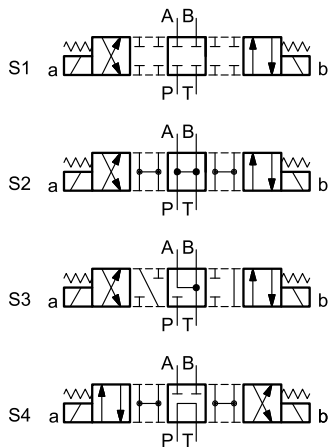
■ available  
 □ upon request

The letter 'W' identifies coils with an high IP degree. This IP degree is reached by specific surface treatments and / or design adaptations.

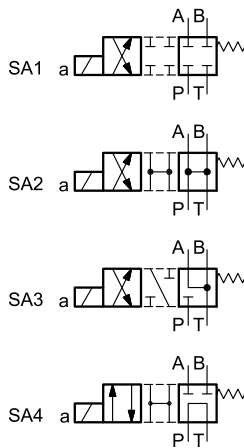
**NOTE:** A galvanic surface treatment zinc-nickel is applied to body elements and plates, so BDS valves with WK\* type coils and the BDL type valves suitable to withstand a salt spray exposure time of 600 hours. BDS valves with K\* type coils and BDM valves are suitable to withstand a salt spray exposure time of 240 hours (test carried out according to the UNI EN ISO 9227 and assessment test carried out according to UNI EN ISO 10289).

**1.2 - Available spools**

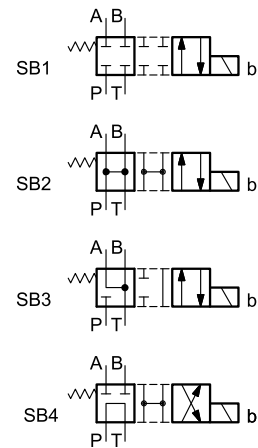
**Type S:**  
 2 solenoids - 3 positions  
 spring centring



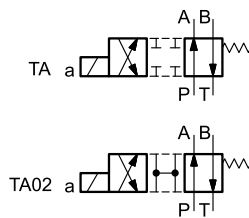
**Type SA\*:** 1 solenoid side A  
 2 positions (central + external)  
 spring centring



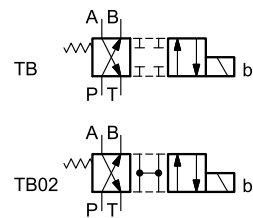
**Type SB\*:** 1 solenoid side B  
 2 positions (central + external)  
 spring centring



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



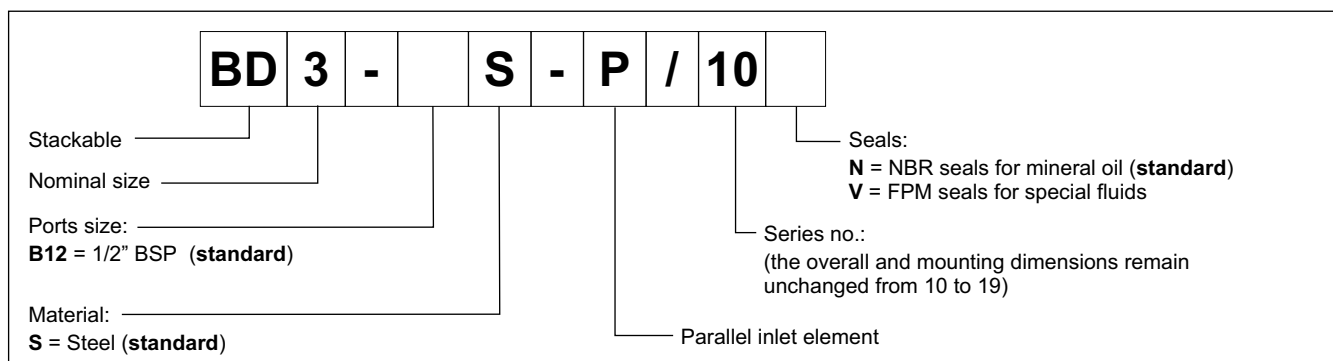
**Type TB\*:**  
 1 solenoid side B  
 2 external positions  
 with return spring



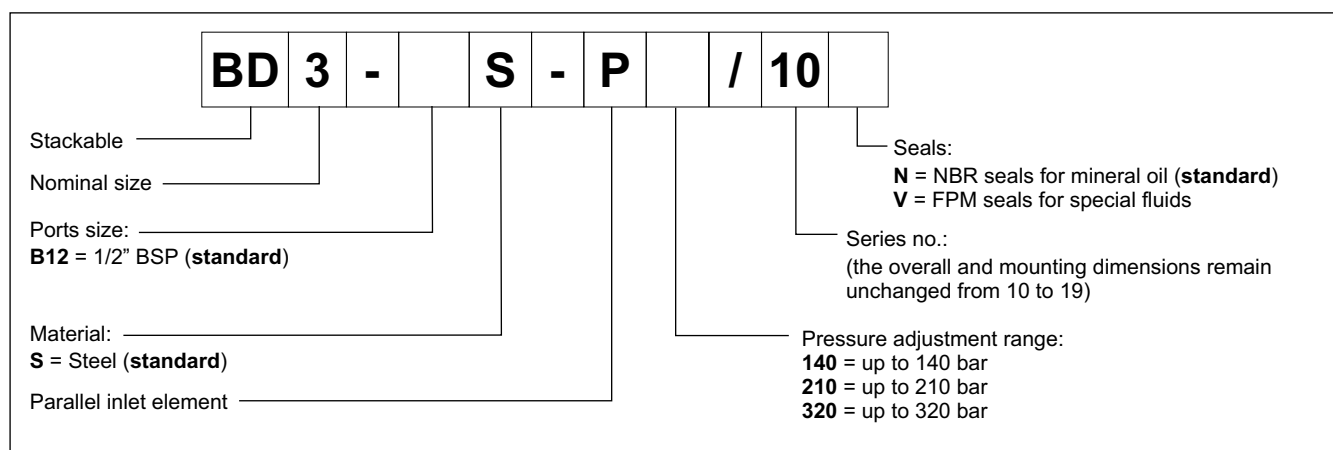
**NOTE 1:** BDS valves use spools of DS3 solenoid valve. Please refer to catalogue 41150 for others spools.

**NOTE 2:** Further spools for BDL and BDM are upon request. Please contact our technical department.

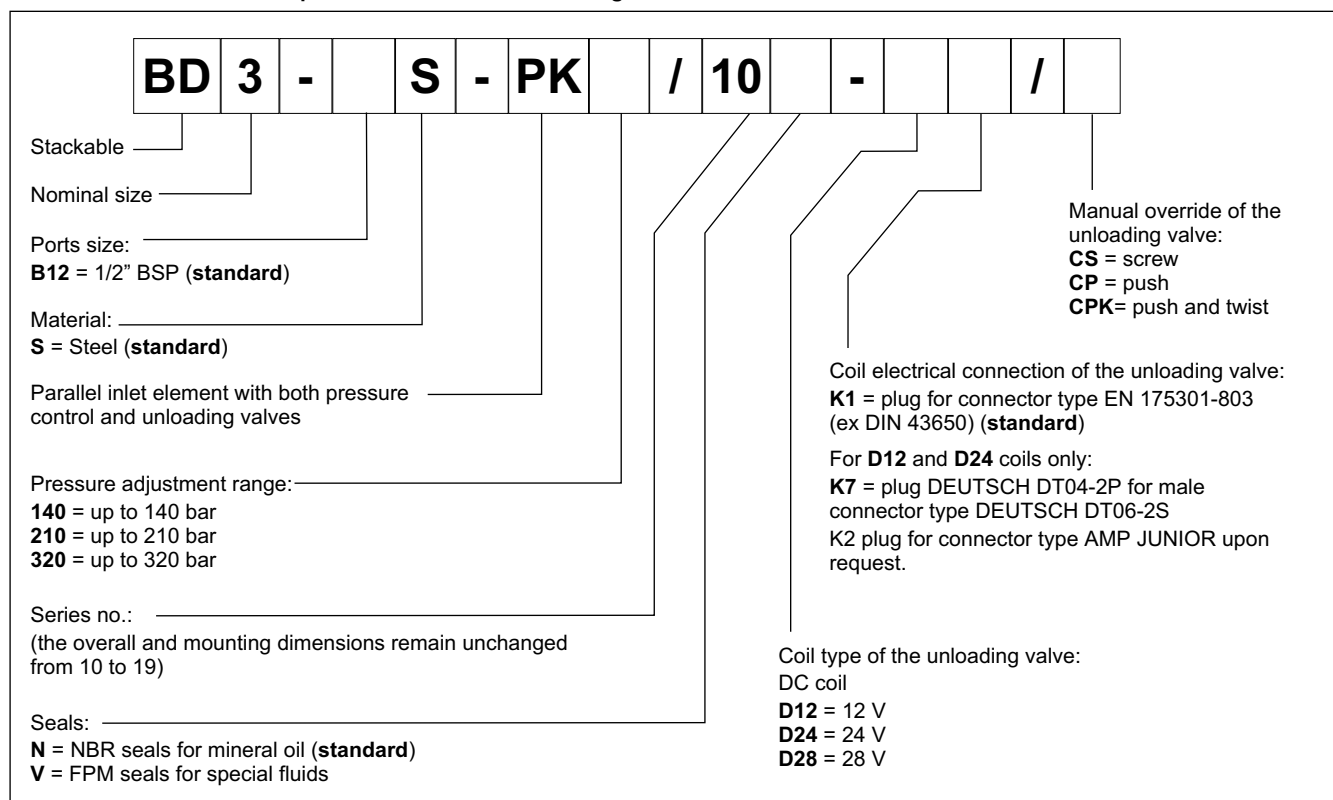
### 1.3 - Inlet element without pressure control valve



### 1.4 - Inlet element with pressure control valve



### 1.5 - Inlet element with both pressure control and unloading valves



**1.6 - Inlet element for flow control valve**

	<b>BD</b>	<b>3</b>	<b>-</b>	<b>B38</b>	<b>S</b>	<b>-</b>	<b>P</b>		<b>-</b>	<b>Q</b>	<b>/</b>	<b>10</b>	<b>-</b>		<b>/</b>	
--	-----------	----------	----------	------------	----------	----------	----------	--	----------	----------	----------	-----------	----------	--	----------	--

Stackable: \_\_\_\_\_

Nominal size: \_\_\_\_\_

Ports size: \_\_\_\_\_  
3/8" BSP (standard)

Material: \_\_\_\_\_  
**S** = Steel (standard)

Parallel inlet element with pressure relief valve: \_\_\_\_\_

**K** = with unloading valve. Omit if not required. \_\_\_\_\_

Pressure relief valve adj. range: \_\_\_\_\_  
**140** = up to 140 bar  
**210** = up to 210 bar  
**320** = up to 320 bar

**Mounting interface ISO 6263-03 style for flow control valve**  
(to be ordered separately, see catalogue 82220).

Series no.: \_\_\_\_\_  
(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

Manual override of the unloading valve:  
**CS** = screw  
**CP** = push  
**CPK** = push and twist

Coil electrical connection of the unloading valve:  
**K1** = plug for connector type EN 175301-803 (ex DIN 43650) (standard)

For **D12** and **D24** coils only:  
**K7** = plug DEUTSCH DT04-2P for male connector type DEUTSCH DT06-2S  
**K2** plug for connector type AMP JUNIOR upon request.

Coil type of the unloading valve:  
DC coil  
**D12** = 12 V  
**D24** = 24 V  
**D28** = 28 V

**NOTE:** if no unloading valve is needed, the identification code ends with seals digit.  
Example: BD3-B38S-P140-Q/10N

**1.7 - Outlet elements**

	<b>BD</b>	<b>3</b>	<b>-</b>		<b>S</b>	<b>-</b>	<b>R</b>		<b>/</b>	<b>10</b>	
--	-----------	----------	----------	--	----------	----------	----------	--	----------	-----------	--

Stackable: \_\_\_\_\_

Nominal size: \_\_\_\_\_

Ports size: \_\_\_\_\_  
Omit for blind plate  
**B38** = 3/8" BSP

Material: \_\_\_\_\_  
**S** = Steel (standard)

Outlet element (rear): \_\_\_\_\_

Series no.: \_\_\_\_\_  
(the overall and mounting dimensions remain unchanged from 10 to 19)

Outlet port:  
**00** = blind plate  
(do not use in stack assemblies for series connection)  
**01** = outlet port P  
**02** = outlet port T  
**03** = outlet port both for P and T

**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 kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

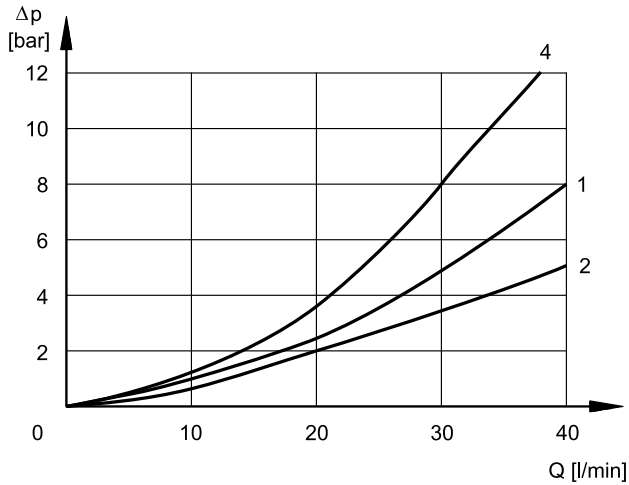
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

### 3 - CHARACTERISTIC CURVES

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

#### 3.1 - BDL

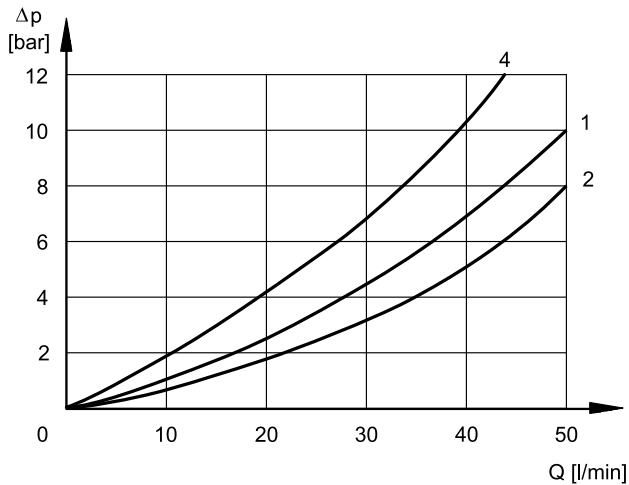
Values obtained with one element BDL2-B38A (thickness 38, ports 3/8" BSP)



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

#### 3.2 - BDM

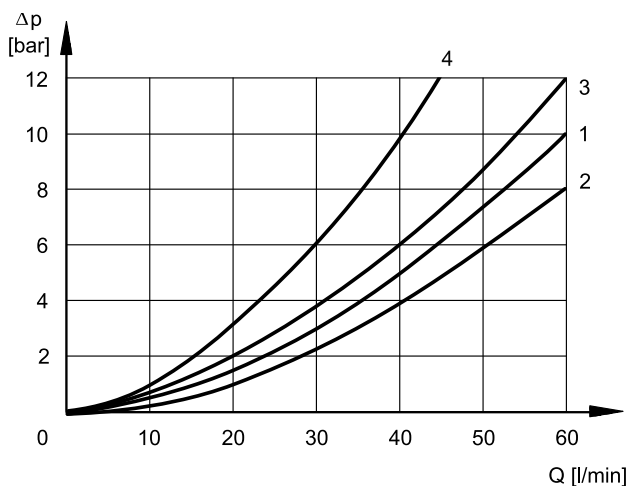
Values obtained with one element BDM3-B38 (thickness 46, ports 3/8" BSP)



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

#### 3.3 - BDS

Values obtained with one element BDS3-B12 (thickness 46, ports 1/2" BSP)



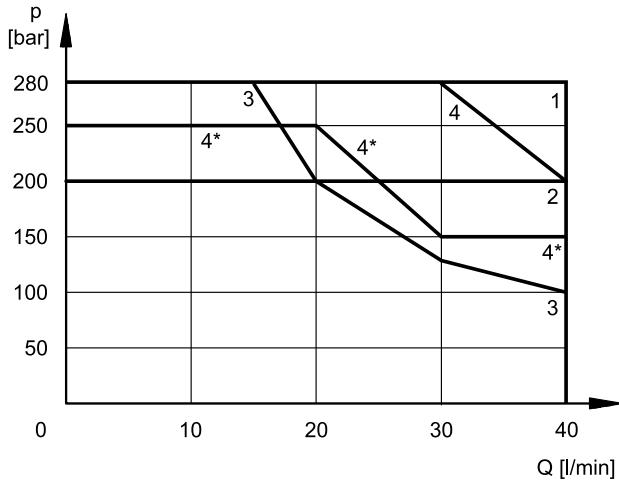
SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPHS				
S1, SA1, SB1	1	1	3	3	-
S2, SA2, SB2	2	2	1	1	2
S3, SA3, SB3	3	3	2	2	-
S4, SA4, SB4	4	4	4	4	1
TA, TB	3	3	3	3	-
TA02, TB02					

#### 4 - 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.

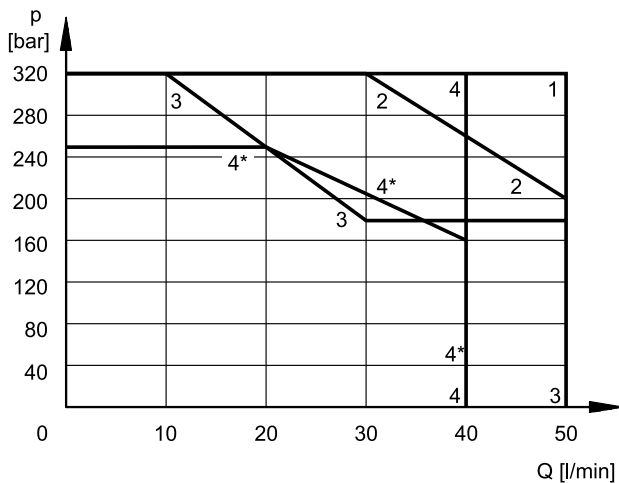
Values obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.

##### 4.1 - BDL



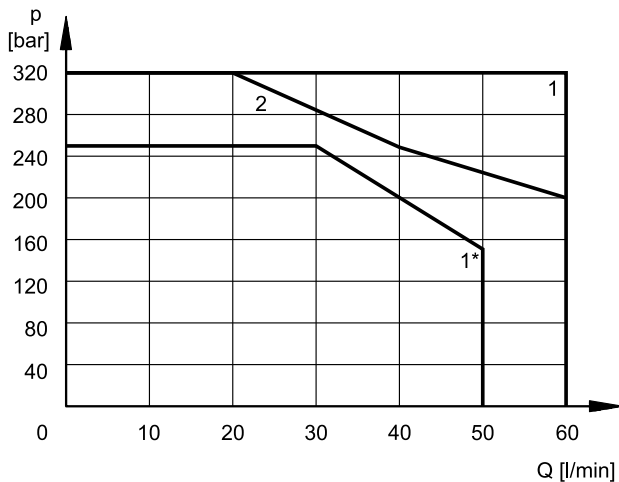
SPOOL TYPE	
S1, SA1, SB1	1
S2, SA2, SB2	2
S3, SA3, SB3	3
S4, SA4, SB4	4
S4, SA4, SB4 reverse flow	4*
TA, TB	4
TA02, TB02	1

##### 4.2 - BDM



SPOOL TYPE	
S1, SA1, SB1	1
S2, SA2, SB2	2
S3, SA3, SB3	3
S4, SA4, SB4	4
S4, SA4, SB4 reverse flow	4*
TA, TB	2
TA02, TB02	1

##### 4.3 - BDS



SPOOL TYPE	
S1, SA1, SB1	1
S2, SA2, SB2	1
S3, SA3, SB3	2
S4, SA4, SB4	1
S4, SA4, SB4 reverse flow	1*
TA, TB	1
TA02, TB02	1

**NOTE:** The reverse flow condition occurs in series circuits made with elements for parallel connection, in even-position elements only.

See scheme at par. 13.2



## 5 - SWITCHING TIMES

Values obtained according to ISO 6403, with mineral oil with viscosity 36 cSt at 50°C.

TIMES [ms] (±10%)	ENERGIZING	DE-ENERGIZING
<b>BDL</b>	25 ÷ 75	15 ÷ 25
<b>BDM</b>	25 ÷ 75	15 ÷ 25
<b>BDS</b>	25 ÷ 75	15 ÷ 25

## 6 - ELECTRICAL FEATURES

### 6.1 - 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 to suit the available space.

### 6.2 - 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.

The protection degree IP69K is not taken into account in IEC 60529 but it is included in ISO 20653.

<b>SUPPLY VOLTAGE FLUCTUATION</b>	± 10% Vnom
<b>MAX SWITCH ON FREQUENCY</b>	10.000 ins/hr
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	In compliance with 2014/30/EU
<b>LOW VOLTAGE</b>	In compliance with 2014/35/EU
<b>CLASS OF PROTECTION</b> Coil insulation (VDE 0580) Impregnation	class H class F

### 6.3 - BDL (solenoid tube Ø14)

#### IP degrees

protection referred to	electrical connection / whole valve				
	IP65	IP66	IP67	IP68	IP69 IP69K
K1 EN 175301-803	x	x			
WK7 DEUTSCH DT04 male	x		x	x	x

#### Current and absorbed power

(values ±5 %)

	Resistance 20°C [Ω]	Absorbed current [A]	Absorbed power [W]	Coil code	
				<b>K1</b>	<b>WK7</b>
<b>D12</b>	5,4	2,2	26,5	1902740	1903510
<b>D24</b>	20,7	1,16	27,8	1902741	1903511
<b>D28</b>	27,5	1,02	28,5	1902744	-
<b>D48</b>	82	0,58	28	1902745	-



**6.4 - BDM (solenoid tube Ø19)**
**IP degrees**

protection referred to	electrical connection whole valve
	IP65
K1 EN 175301-803	x
K7 DEUTSCH DT04 male	x

**Current and absorbed power**

(values ±10 %)

	Resistance 20°C [Ω]	Absorbed current [A]	Absorbed power [W]	Coil code	
				K1	K7
<b>D12</b>	4.98	2.41	28.9	1903560	1903650
<b>D24</b>	21	1.15	28	1903561	1903651

**6.5 - BDS (solenoid tube Ø22)**

Coils with letter 'W' feature a zinc-nickel surface treatment, that makes them resistant to exposure to the salt spray for 600 hours (test performed according to UNI EN ISO 9227 and assessment test performed according to UNI EN ISO 10289).

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

**IP degrees**

protection referred to	electrical connection					whole valve				
	IP65	IP66	IP67	IP68	IP69 IP69K	IP65	IP66	IP67	IP68	IP69 IP69K
K1 EN 175301-803 (ex DIN 43650)	x					x				
WK1 EN 175301-803 (ex DIN 43650)	x	x				x	x			
K7 DEUTSCH DT04 male	x		x			x				
WK7 / WK7D DEUTSCH DT04 male	x	x	x	x	x	x	x	x	x	x

**Current and absorbed power**

(values ±10 %)

	Resistance at 20°C [Ω]	Absorbed current [A]	Absorbed power [W]	Coil code				
				K1	K7	WK1	WK7	WK7D
<b>D12</b>	4,4	2,72	32,7	1903080	1902940	1903050	1903580	1903600
<b>D24</b>	18,6	1,29	31	1903081	1902941	1903051	1903581	1903601
<b>D28</b>	26	1,11	31	1903082	-	-	-	-
<b>D48</b>	78,6	0,61	29,5	1903083	-	-	-	-

**6.6 - Unloading valve, solenoid operated (inlet plates)**
**Current and absorbed power**

(values ±10 %)

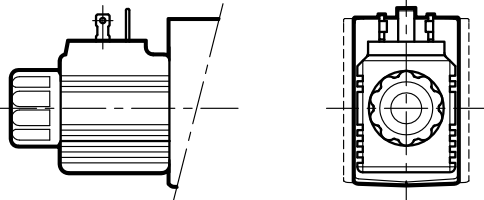
	Resistance 20°C [Ω]	Absorbed current [A]	Absorbed power [W]
<b>D12</b>	7	1.2	20.5
<b>D24</b>	28	0.6	20.5

<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	In compliance with 2014/30/EU
<b>LOW VOLTAGE</b>	In compliance with 2014/35/EU
<b>CLASS OF PROTECTION</b> atmospheric agents (EN 60529) coil insulation (VDE 0580) Impregnation	IP65 class H class H

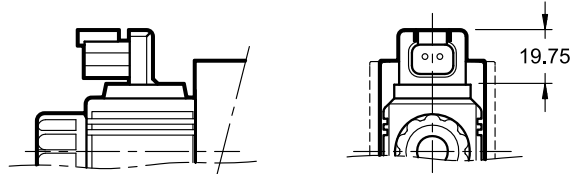
## 7 - ELECTRICAL CONNECTIONS

### 7.1 - BDL

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

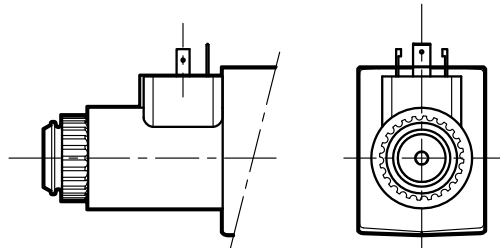


DEUTSCH DT04-2P connection for DEUTSCH  
DT06-2S male connector  
code **WK7**



### 7.2 - BDM

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

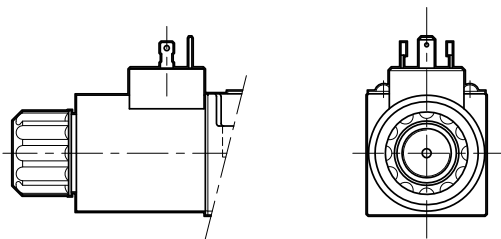


DEUTSCH DT04-2P connection for DEUTSCH  
DT06-2S male connector  
code **K7**

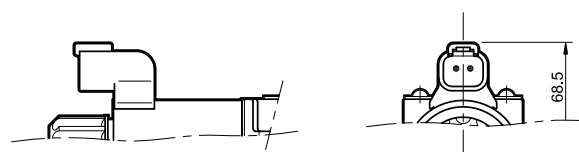


### 7.3 - BDS

connection for EN 175301-803 (ex DIN 43650) connector  
code **K1 (standard)**  
code **WK1** (W7 version only)



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



connection for DEUTSCH DT06-2S male connector  
code **WK7** (W7 version only)  
code **WK7D** (W7 version only - coil with diode)



## 8 - ELECTRICAL CONNECTORS

The solenoid valves are supplied without connectors. Connectors for electrical connections K1 and WK1 (EN 175301-803, ex DIN 43650) can be ordered separately. See catalogue 49 000.

## 9 - INSTALLATION

The stacked valve assembly can be installed in any position without impair the proper functioning.

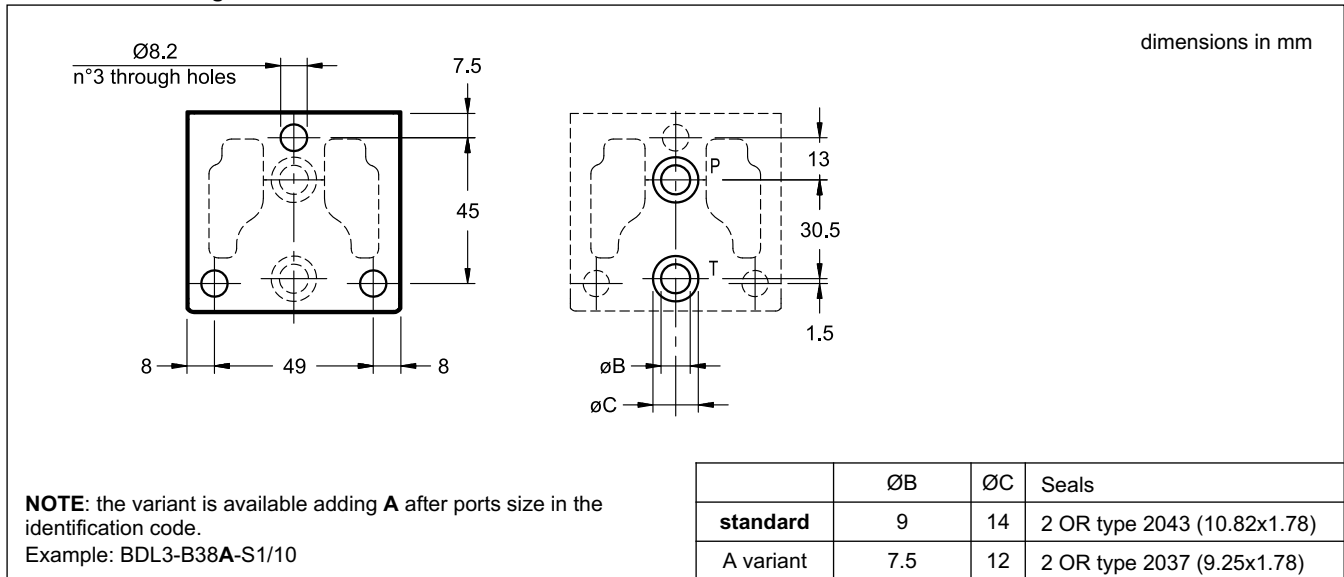
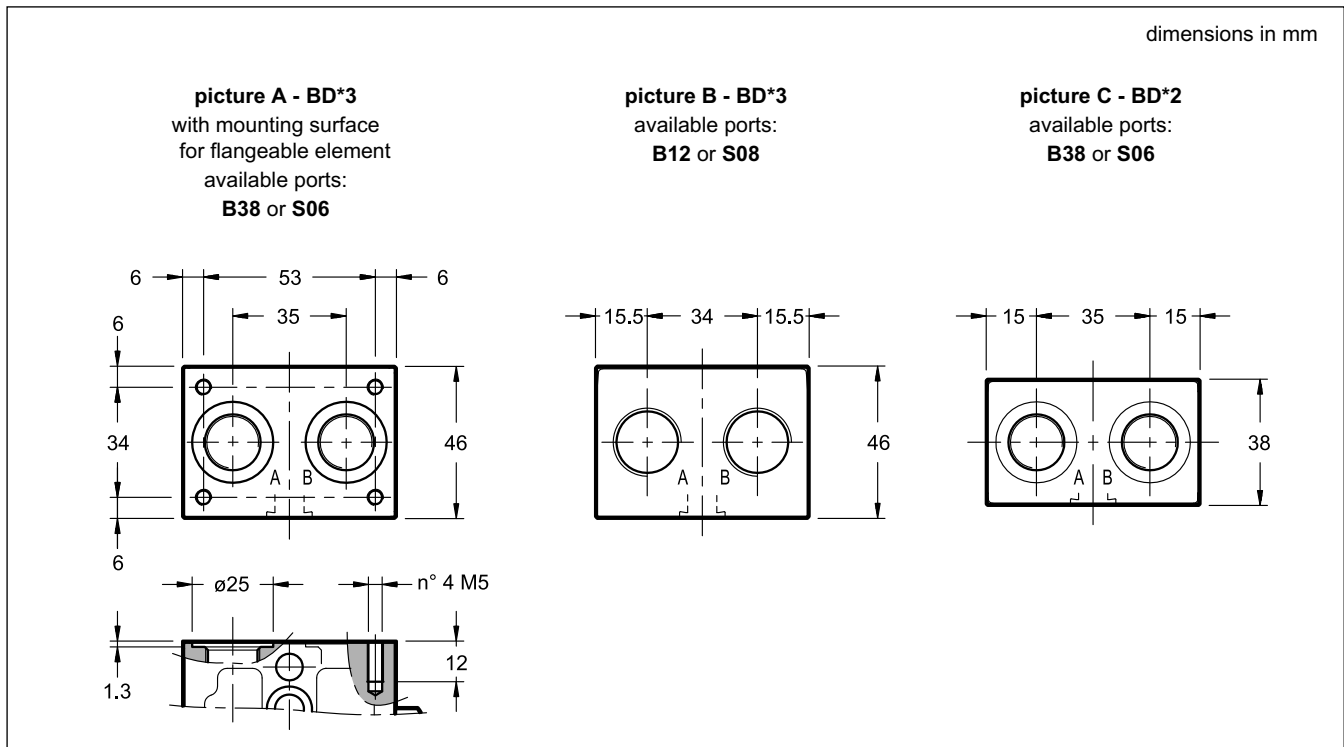
### 9.1 - Fixing and tie-rods

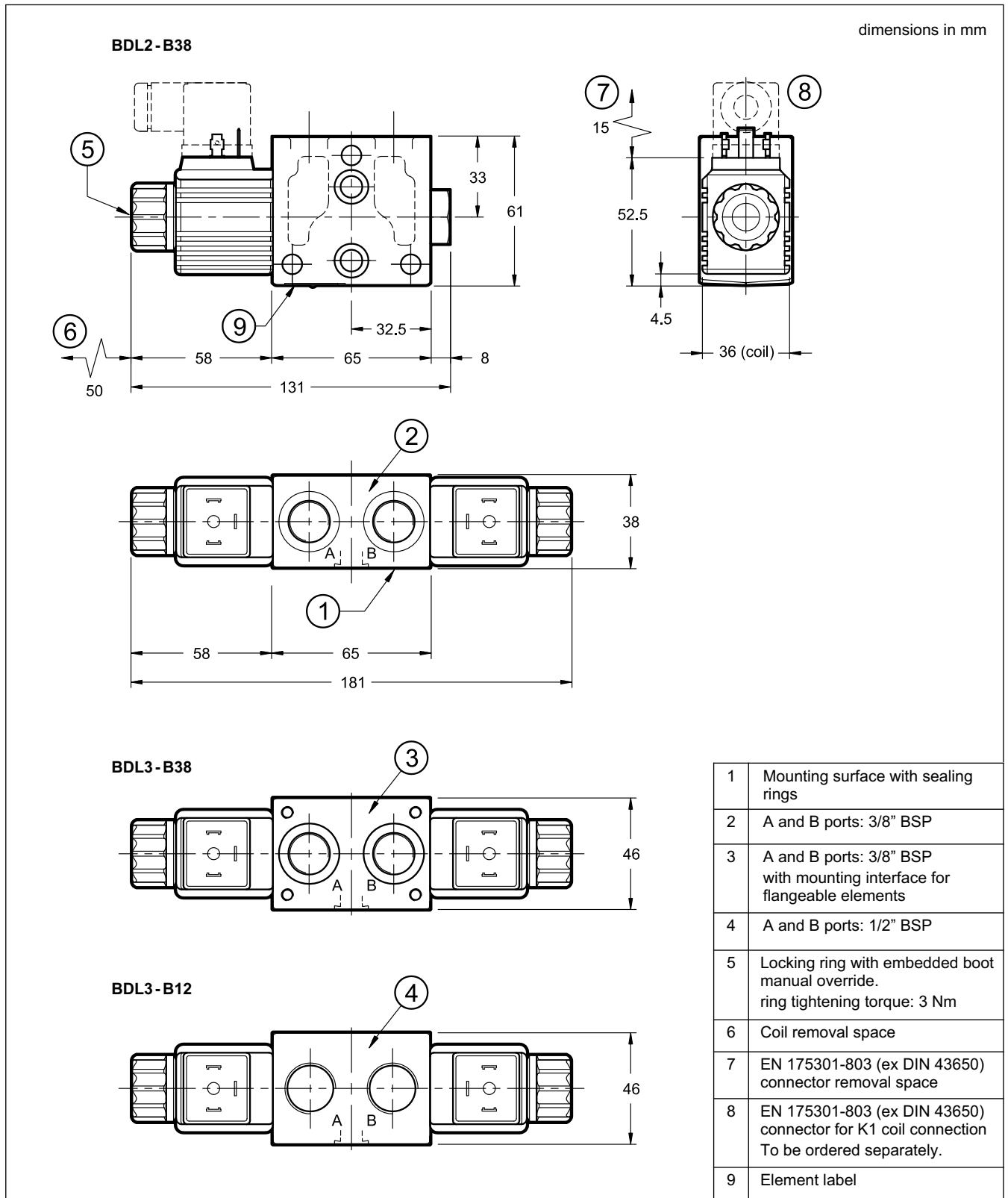
Please contact the technical dept. for dimensional check of special assemblies before order.

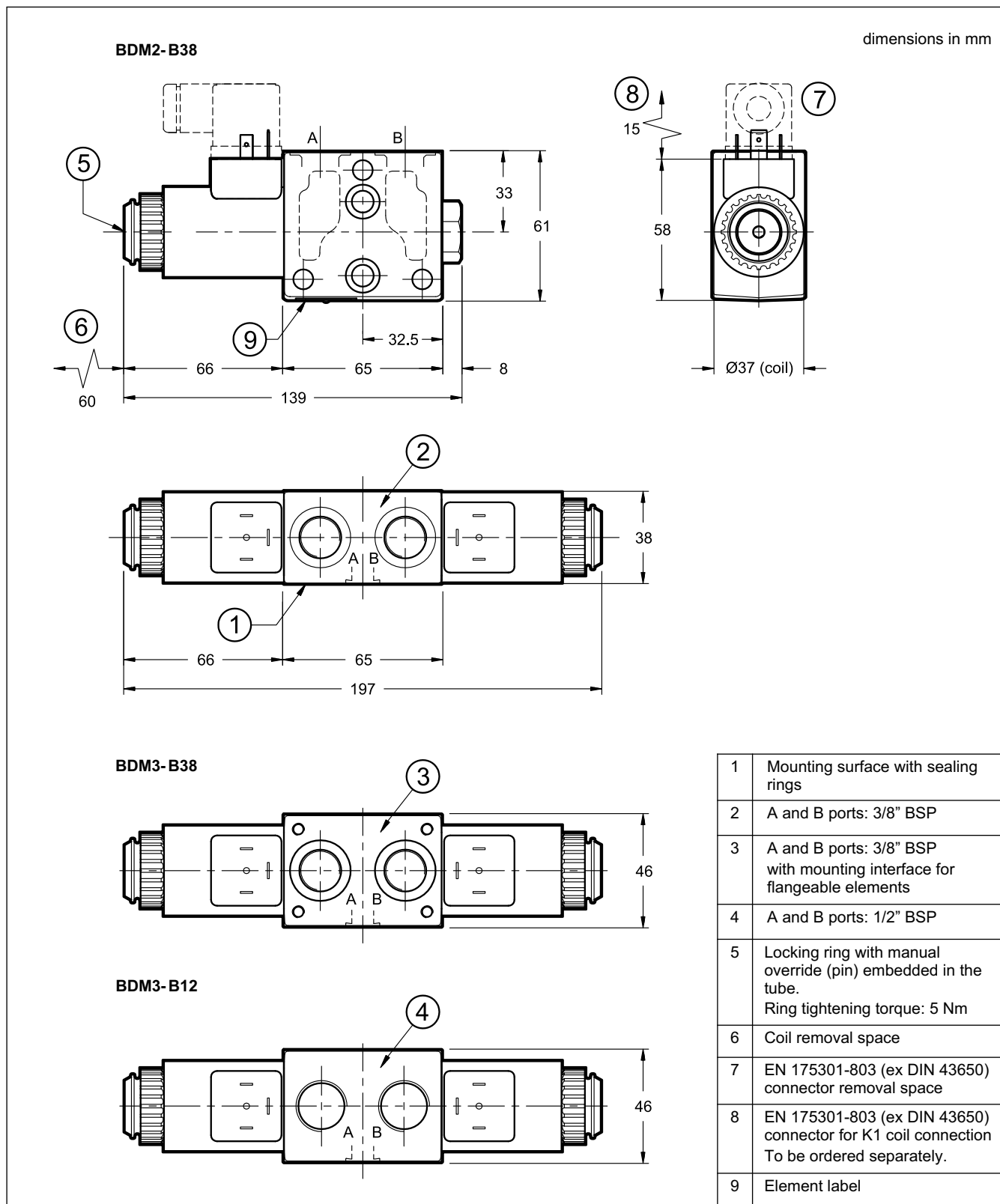
Tightening torque: 20 (0/+3) Nm

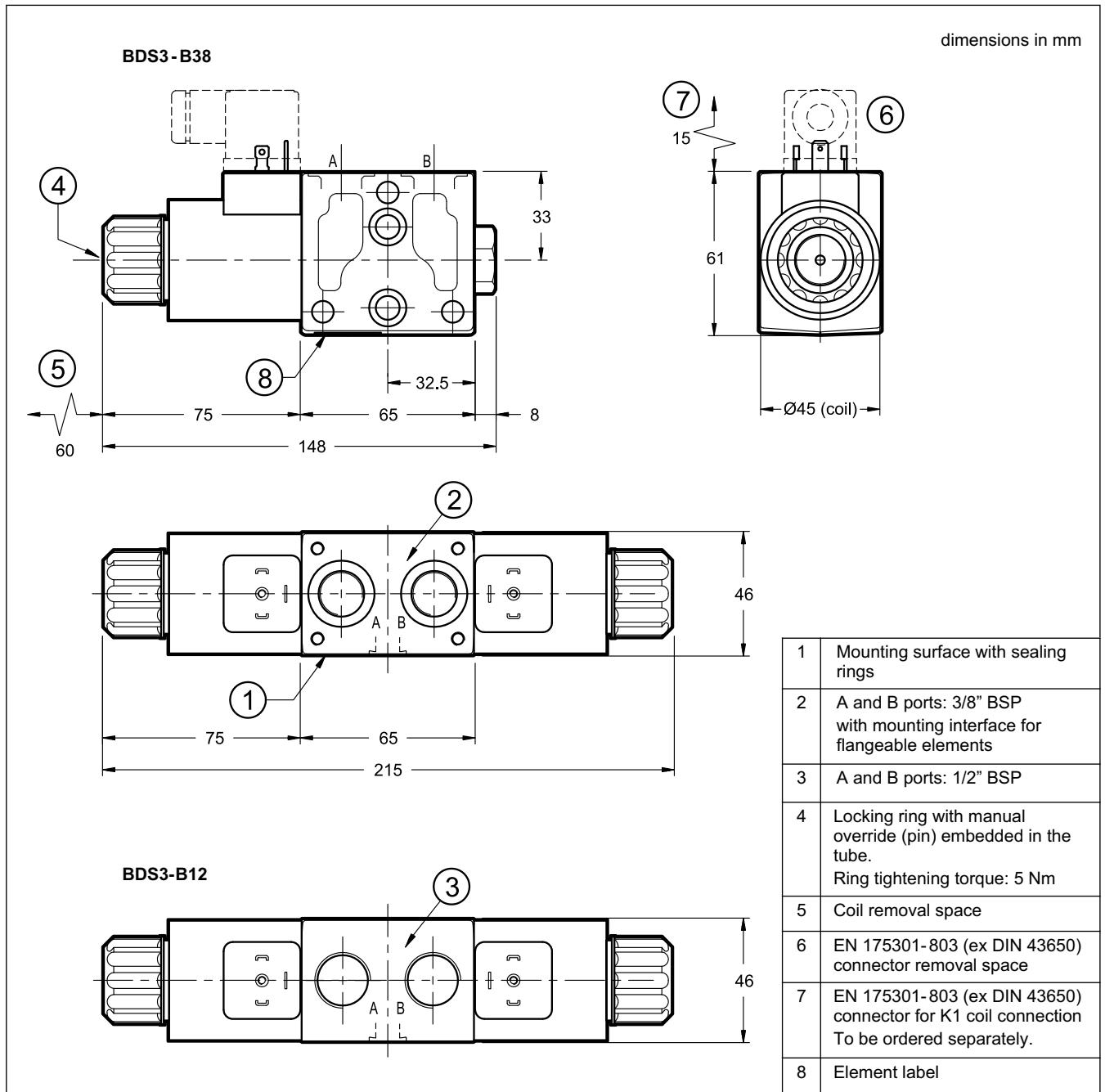
Valve type	Valve qty.	KIT code
BDL2 BDM2	3	3404100100
	4	3404100101
	5	3404100102
	6	3404100103
	7	3404100104
	8	3404100105
	9	3404100106
BDL3 BDM3 BDS3	3	3404100108
	4	3404100109
	5	3404100110
	6	3404100111

1	galvanized trapped screw
2	galvanized nut
3	galvanized safety washer

**10 - OVERALL AND MOUNTING DIMENSIONS OF DIRECTIONAL VALVES**
**10.1 - BD\* - mounting surfaces**

**10.2 - BD\* directional valve element - bodies**


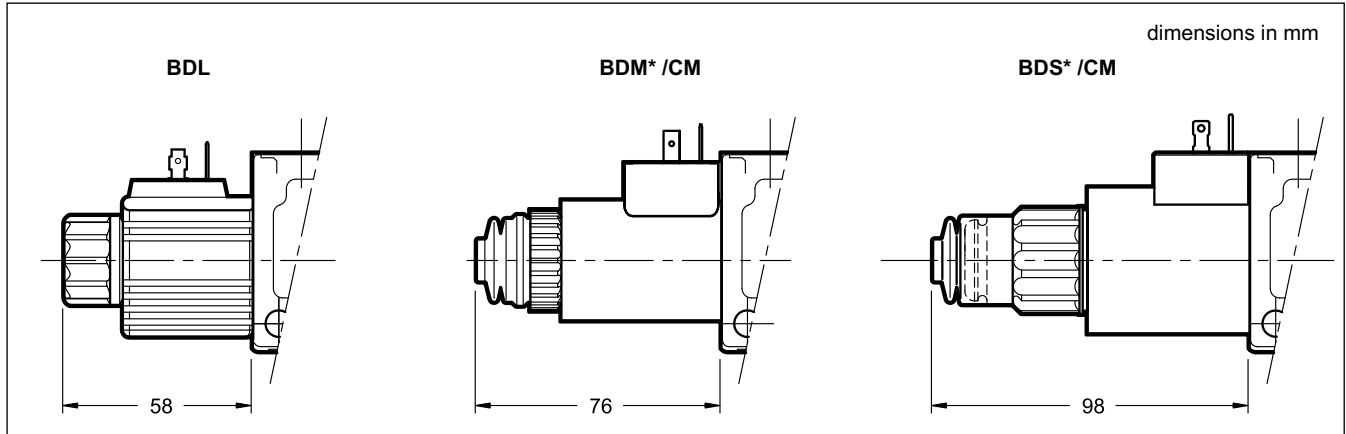
**10.3 - BDL - Directional valve element - solenoid tube  $\varnothing 14$** 


**10.4 - BDM - Directional valve element - solenoid tube  $\phi 19$** 


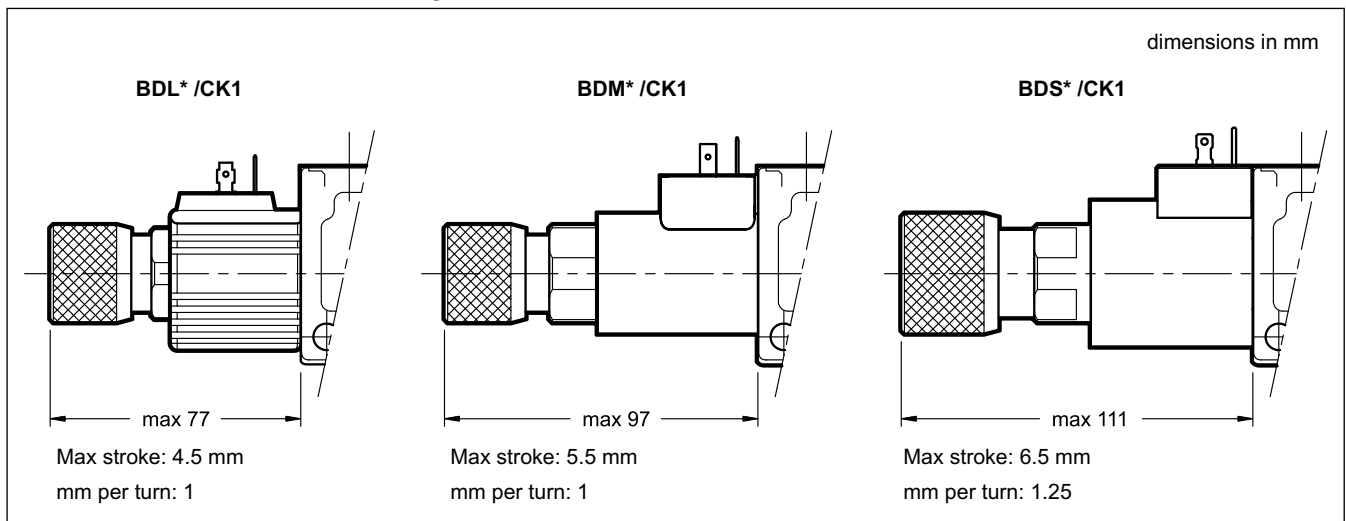
**10.5 - BDS - Directional valve element - solenoid tube  $\varnothing 22$** 


**10.6 - CM - boot protected**

The BDL standard element is already equipped with boot protection of the solenoid tube. For both BDM and BDL elements add /CM at the end of the code.



**10.7 - CK1 - knob manual override, turning**

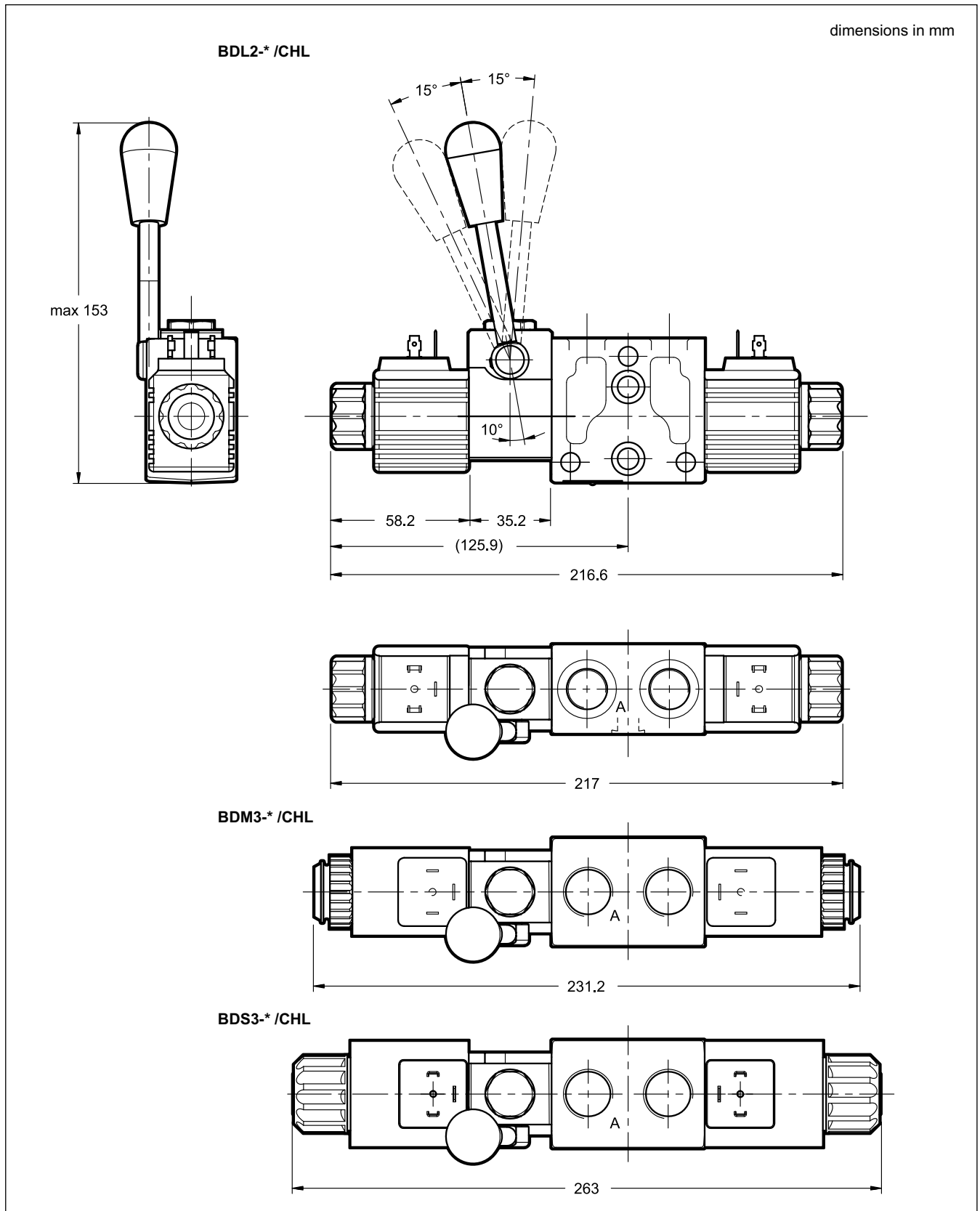




**10.8 - CHL light duty lever manual override**

Devices are placed on side A. Please contact our technical depth for other positions. For non-quoted dimensions, please refer to the overall tables in previous pages.

The CHL lever device can work with a maximum pressure in line T up to 50 bar, therefore it is not suitable for series circuits.



**11 - DIMENSIONS OF INLET AND OUTLET ELEMENTS FOR PARALLEL CIRCUITS**
**11.1 - Inlet elements**

**BD3-B12S-P**  
without pressure control valve

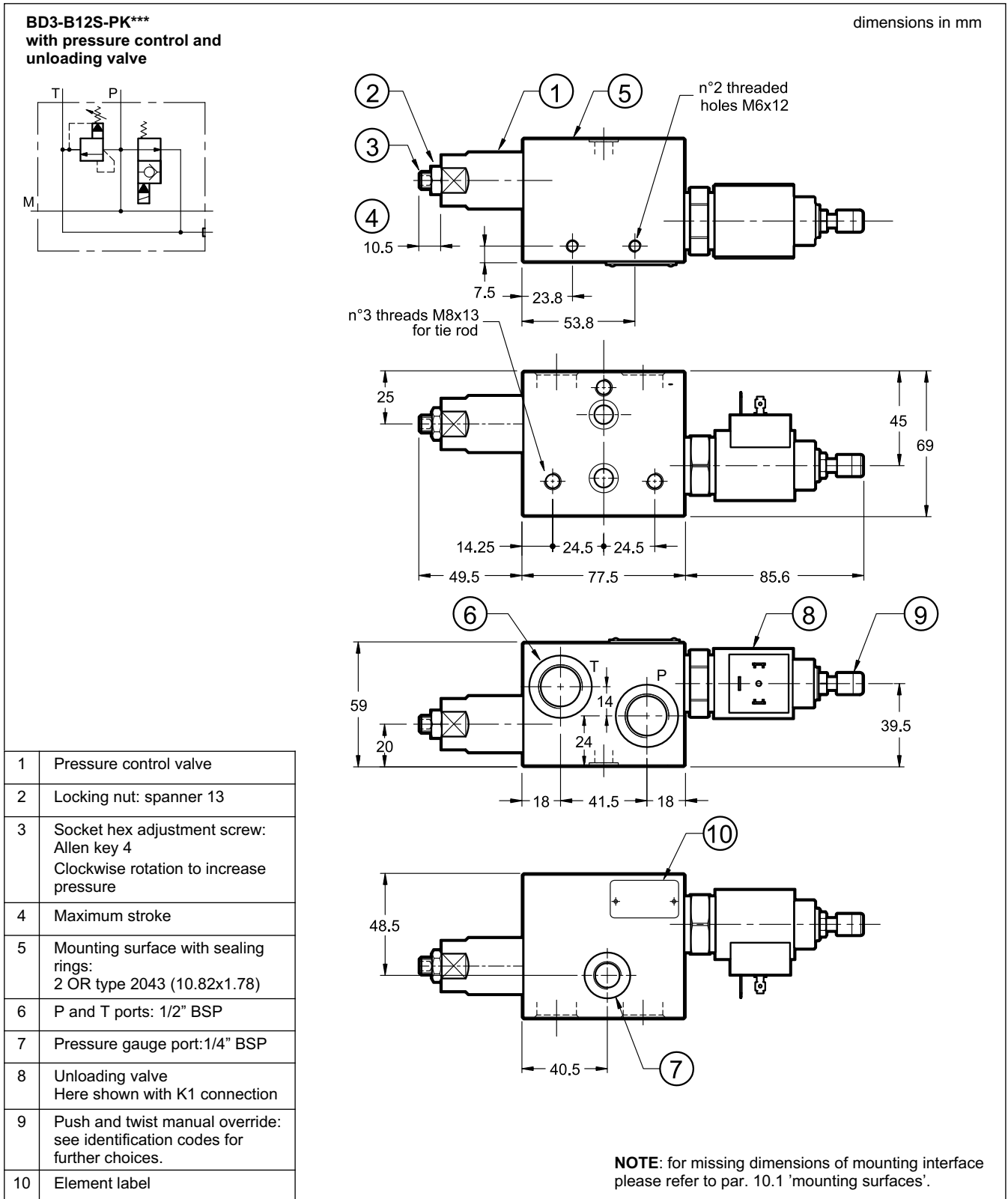
dimensions in mm

1	Mounting surface with sealing rings: 2 OR type 2043 (10.82x1.78)
2	P and T ports: 1/2" BSP
3	Pressure gauge port: 1/4" BSP
4	Element label

**BD3-B12S-P\*\*\***  
with pressure control valve

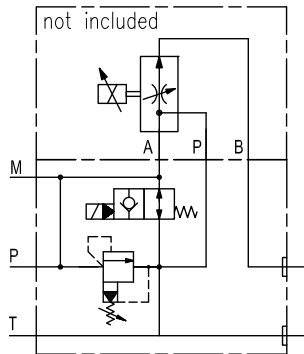
1	Pressure control valve
2	Locking nut: spanner 13
3	Socket hex adjustment screw: Allen key 4 Clockwise rotation to increase pressure
4	Maximum screw stroke
5	Mounting surface with sealing rings: 2 OR type 2043 (10.82x1.78)
6	P and T ports: 1/2" BSP
7	Pressure gauge port: 1/4" BSP
8	Element label



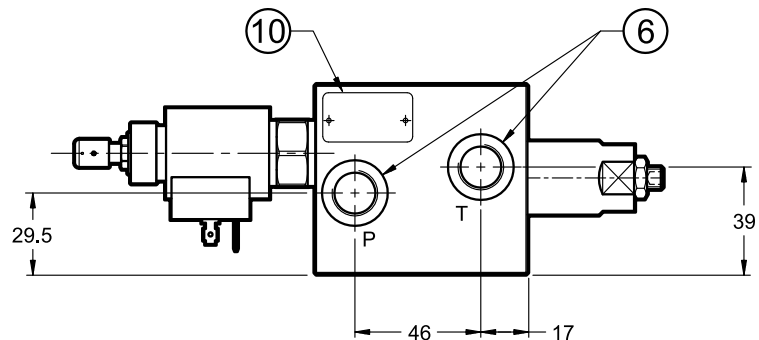
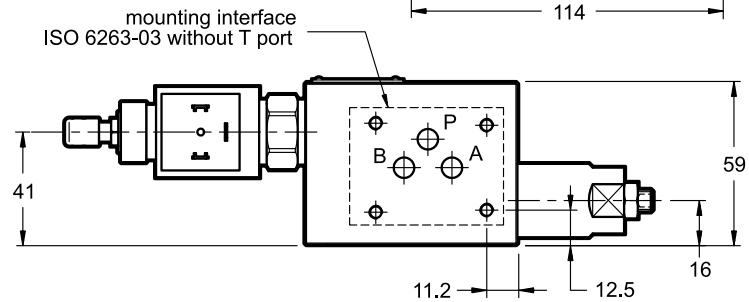
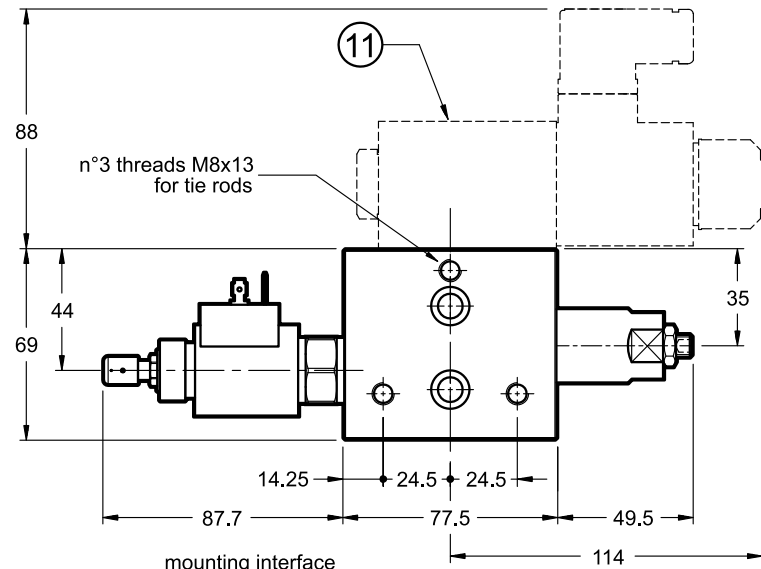
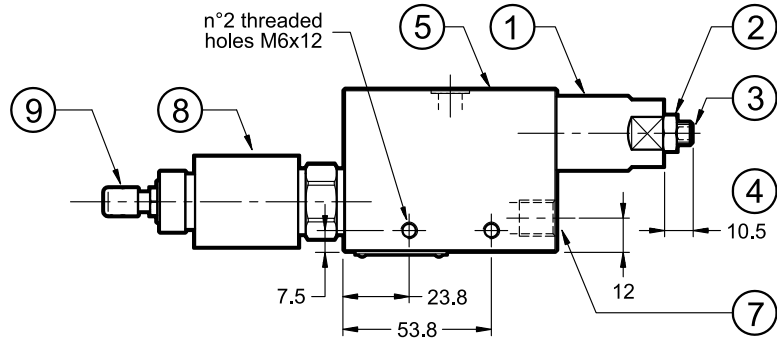
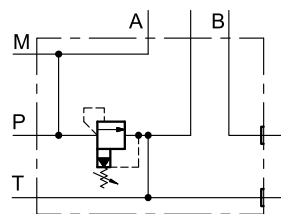
## 11.2 - Inlet elements for flow control valve

**BD3-B38S-PK\*\*\*-Q**  
with pressure control and  
unloading valves

dimensions in mm




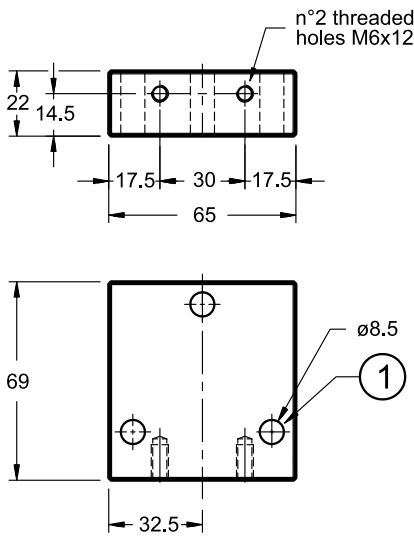

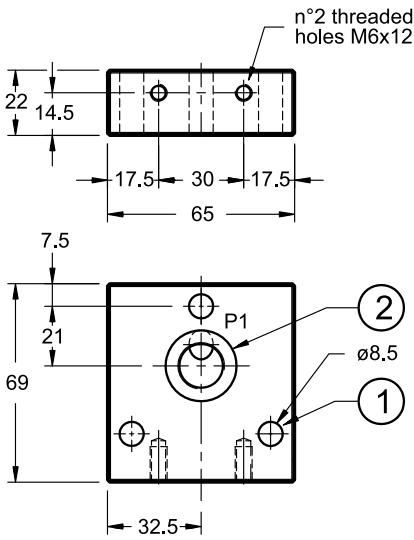
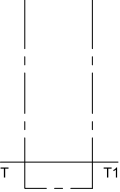
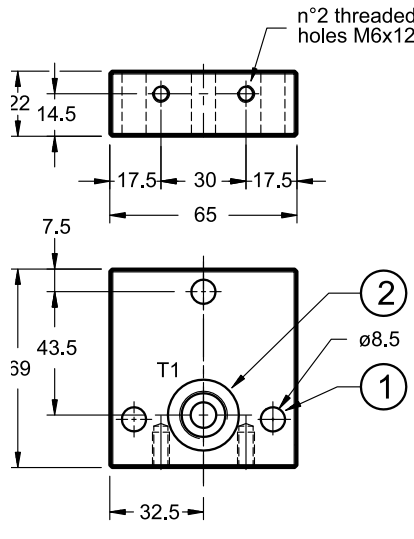
**NOTE** : The same component  
without part no. 8 is:  
**BD3-B38S-P\*\*\*-Q**  
with pressure control  
without unloading valve



1	Pressure control valve
2	Locking nut: spanner 13
3	Socket hex adjustment screw: Allen key 4 Clockwise rotation to increase pressure
4	Maximum stroke
5	Mounting surface with sealing rings: 2 OR type 2043 (10.82x1.78)
6	P and T ports: 3/8" BSP
7	Pressure gauge port: 1/4" BSP
8	Unloading valve Here shown with K1 connection
9	Push and twist manual override: see identification codes for further choices.
10	Element label
11	Encumbrance of flow control valve. To be ordered separately. See catalogue 82 220

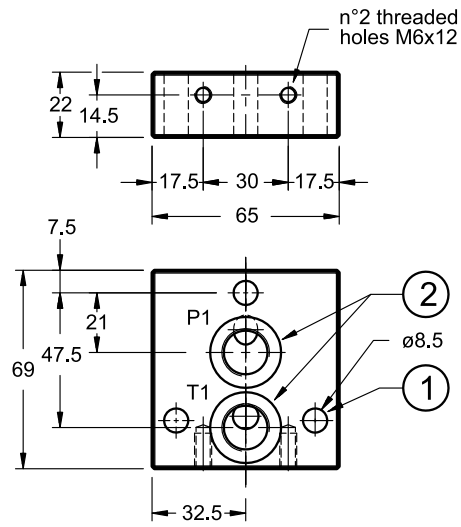
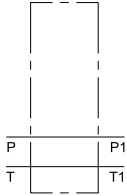
**NOTE**: for missing dimensions of mounting interface  
please refer to par. 10.1 'mounting surfaces'.

**11.3 - Outlet elements**

<p><b>BD3-S-R00</b>  <b>blind plate</b>            Code <b>0194019</b></p> 		<p>dimensions in mm</p> <p><b>NOTE:</b> for missing dimensions of mounting interface please refer to par. 10.1 'mounting surfaces'.</p>				
<table border="1"> <tr> <td>1</td> <td>n° 3 through holes for stack assembly tie-rods</td> </tr> </table>	1	n° 3 through holes for stack assembly tie-rods				
1	n° 3 through holes for stack assembly tie-rods					
<p><b>BD3-B38S-R01</b>  <b>plate with P1 outlet</b>            Code <b>0194062</b></p> 						
<table border="1"> <tr> <td>1</td> <td>n° 3 through holes for stack assembly tie-rods</td> </tr> <tr> <td>2</td> <td>P1 port: 3/8 BSP</td> </tr> </table>	1	n° 3 through holes for stack assembly tie-rods	2	P1 port: 3/8 BSP		
1	n° 3 through holes for stack assembly tie-rods					
2	P1 port: 3/8 BSP					
<p><b>BD3-B38S-R02</b>  <b>plate with T1 outlet</b>            Code <b>0194055</b></p> 						
<table border="1"> <tr> <td>1</td> <td>n° 3 through holes for stack assembly tie-rods</td> </tr> <tr> <td>2</td> <td>T1 port: 3/8 BSP</td> </tr> </table>	1	n° 3 through holes for stack assembly tie-rods	2	T1 port: 3/8 BSP		
1	n° 3 through holes for stack assembly tie-rods					
2	T1 port: 3/8 BSP					

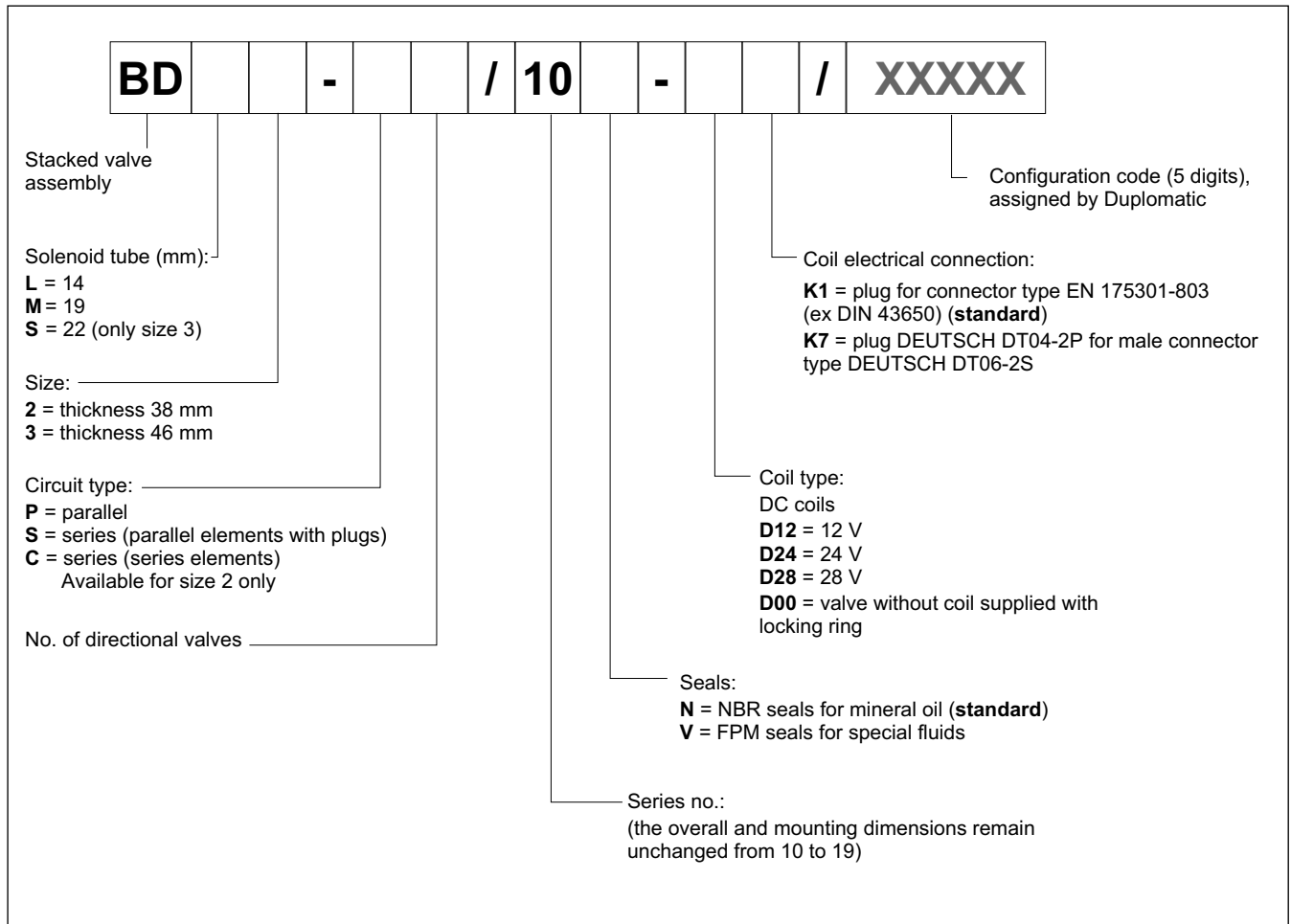
**BD3-B38S-R03**  
plate with P1 and T1 outlet  
Code 0194063

dimensions in mm

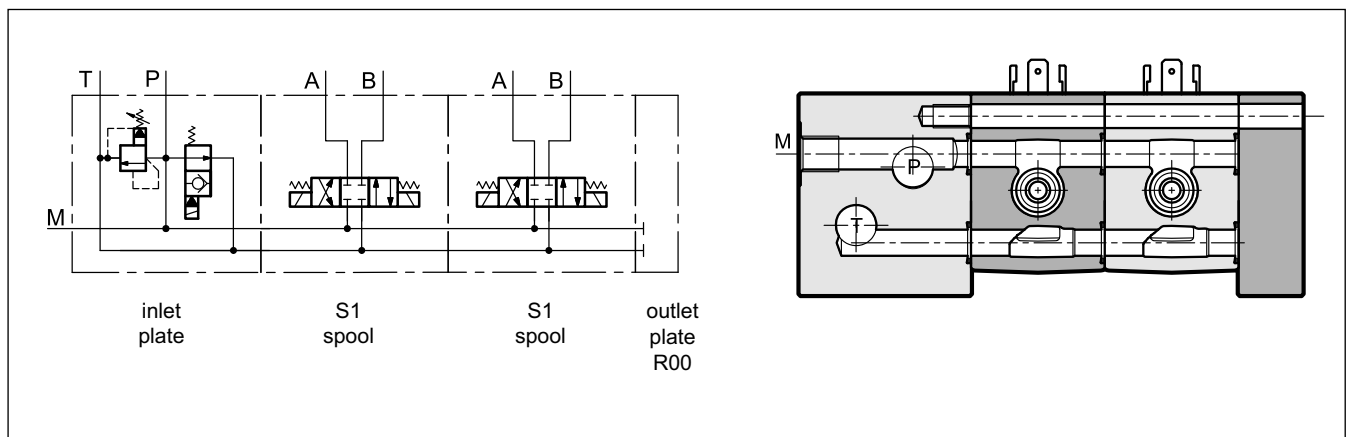


1	n° 3 through holes for stack assembly tie-rods
2	P1 and T1 ports: 3/8" BSP

**NOTE:** for missing dimensions of mounting interface please refer to par. 10.1 'mounting surfaces'.

**12 - IDENTIFICATION CODE FOR STACKED VALVE ASSEMBLY**

**13 - CONNECTION SCHEMES EXAMPLES**
**13.1 - BD\*\*-P parallel connection**

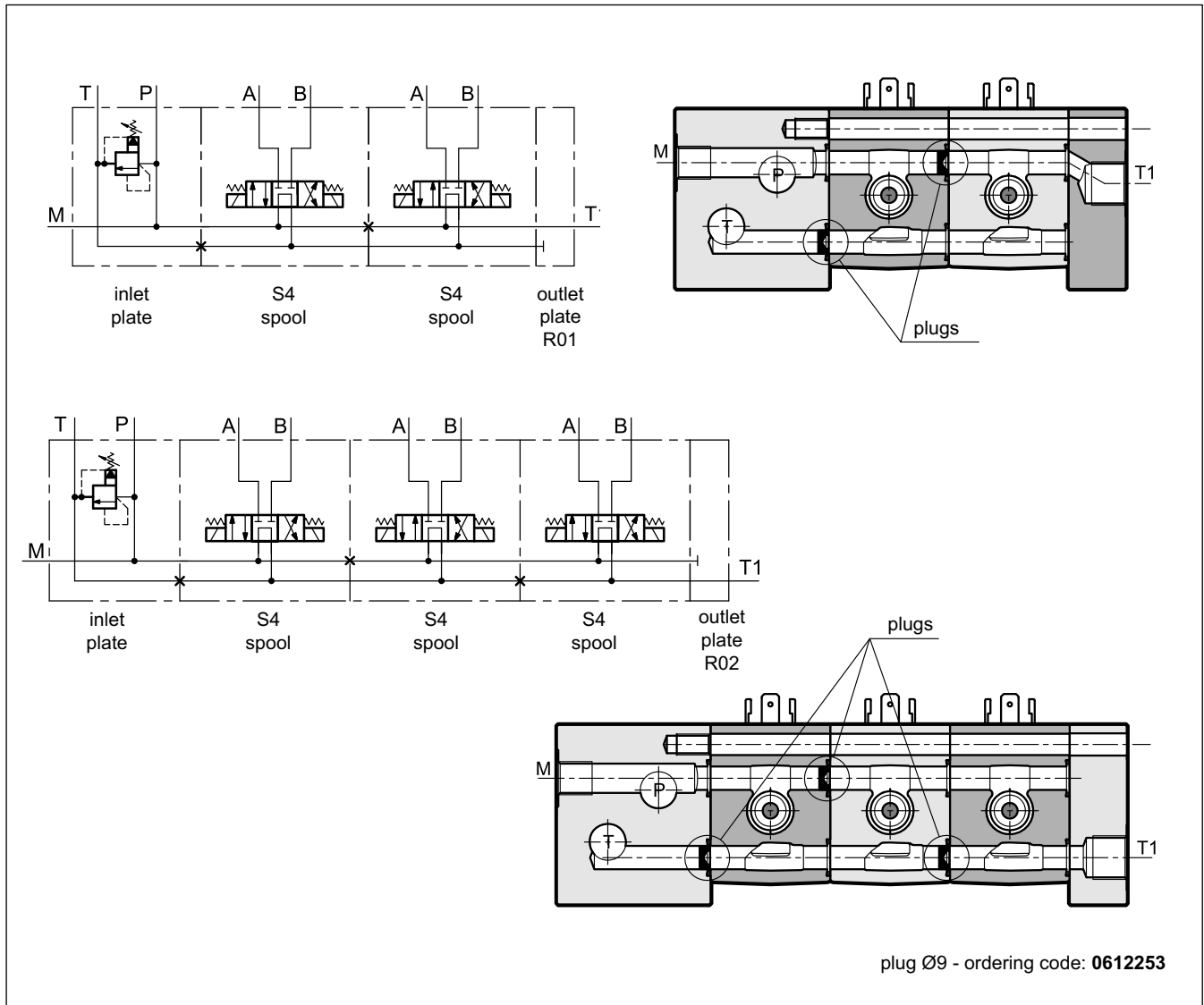
Parallel circuit is obtained with elements for parallel connection (see par. 1).



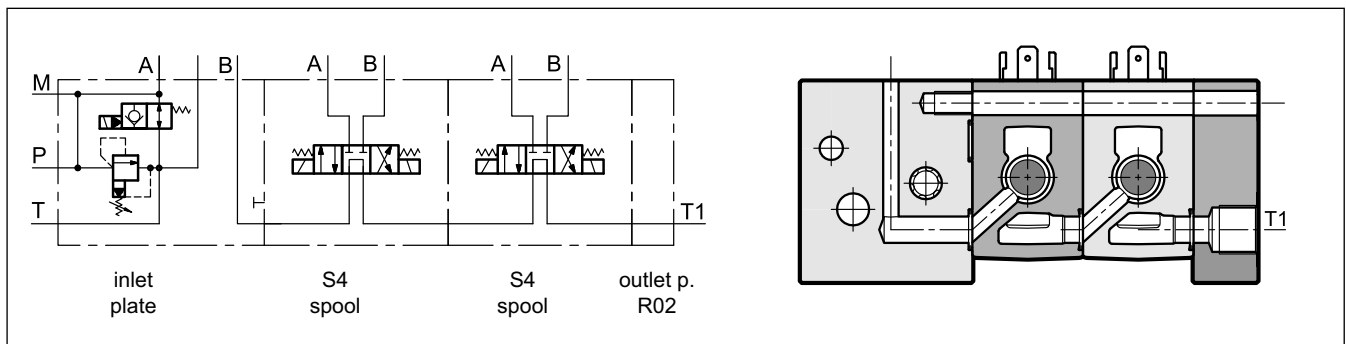
**13.2 - BD\*\*-S series connection**

Series circuit is obtained by inserting plugs in elements for parallel connection (see par. 1).

Please note that this kind of configuration requires a different outlet plate, depending on the number (even or odd) of directional valves in the assembly.


**13.3 - BDL2-C and BDM2-C series connection**

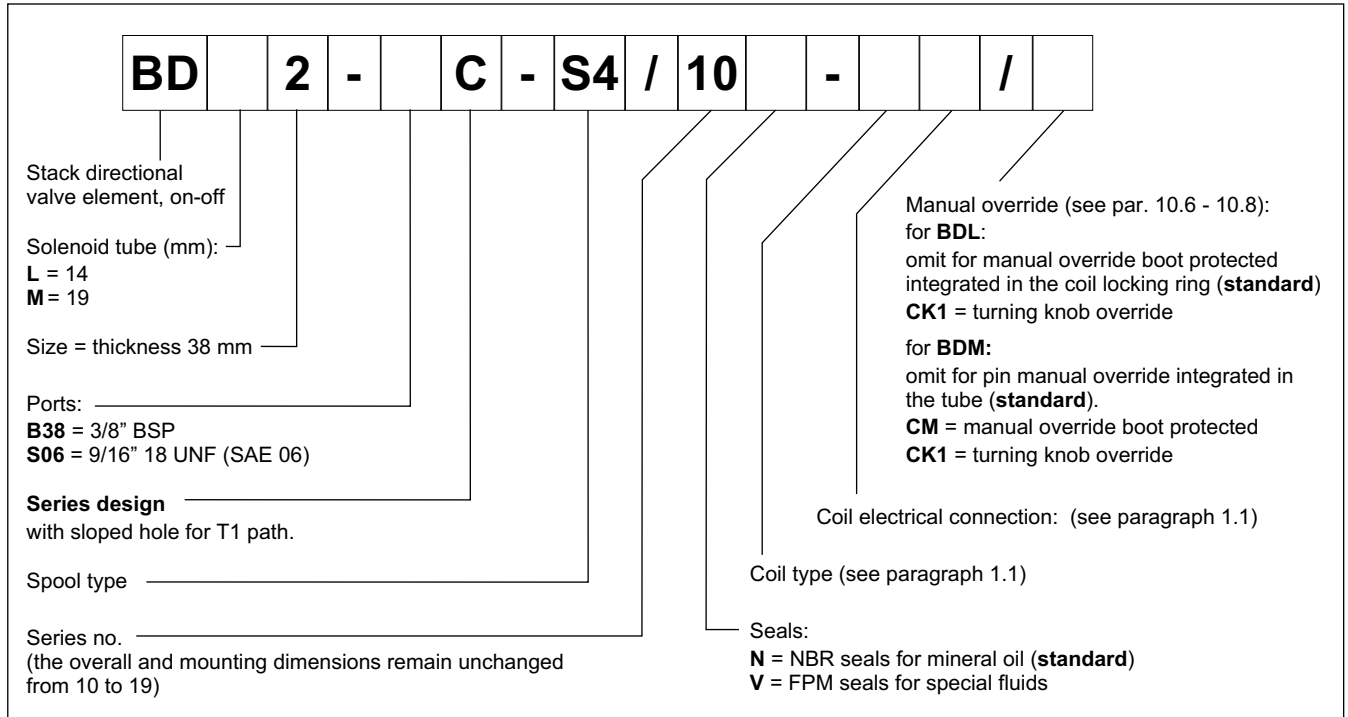
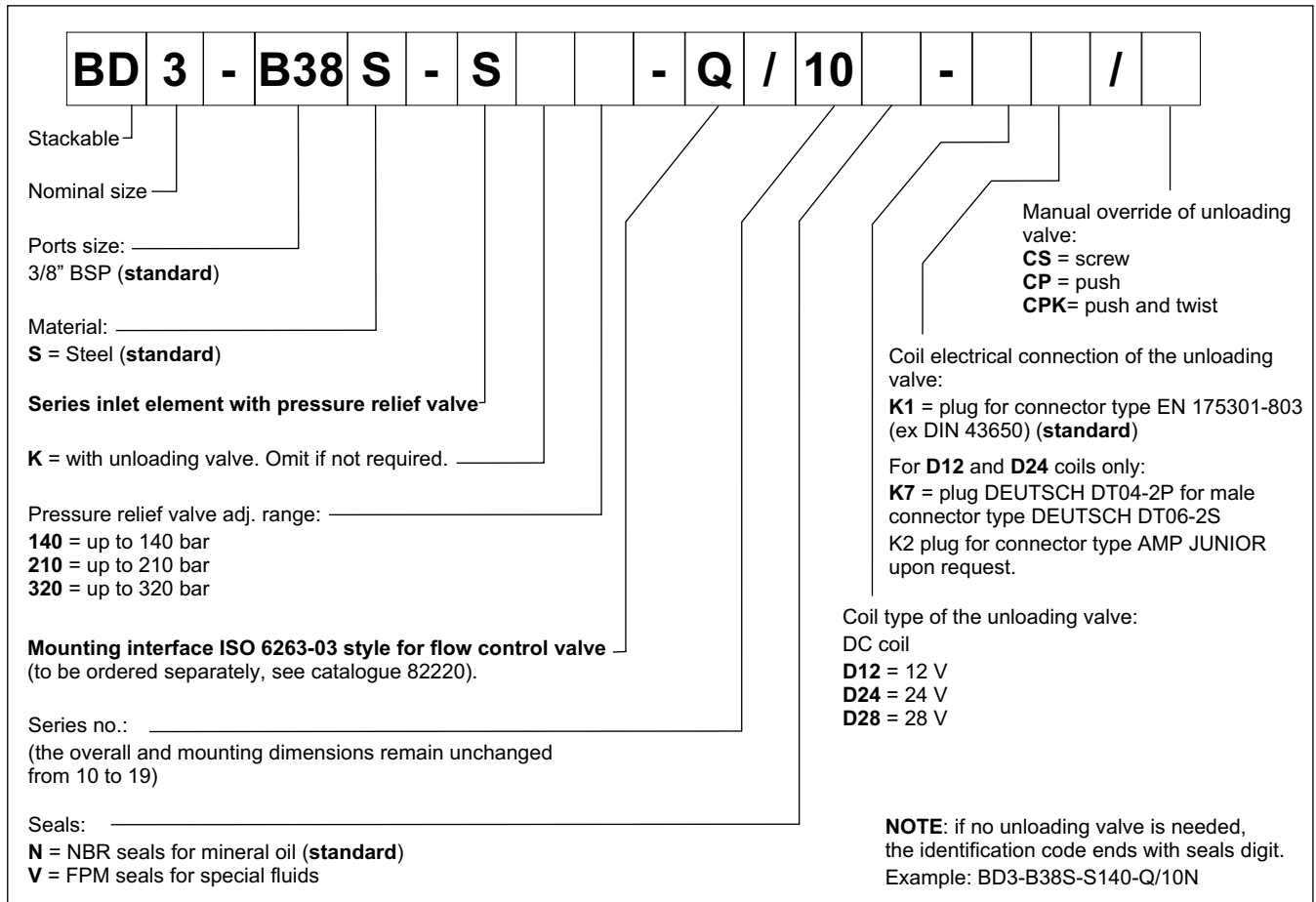
BD\*2-C series connection is obtained with elements designed for series (see par. 14). The series elements are available in size 2 only.





**14 - IDENTIFICATION CODES OF SEPARATE ELEMENTS FOR BDL2 AND BDM2 SERIES CIRCUITS**
**14.1 - Directional valve element**

This code identifies BD\*2 elements, designed for series connection. Series circuits with BD\*3 modules are feasible by inserting plugs to divert the oil path (see paragraph 13.2).

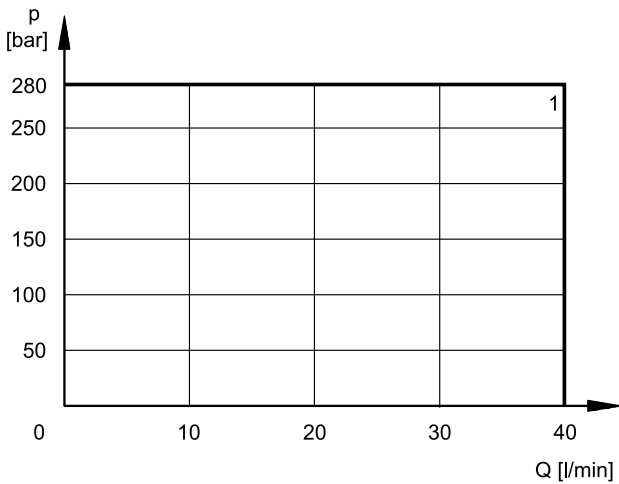
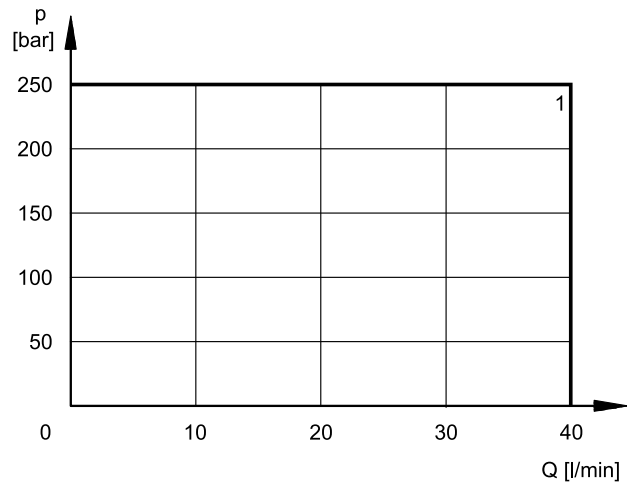

**14.2 - Inlet elements for flow control valve**


**14.3 - Outlet elements**

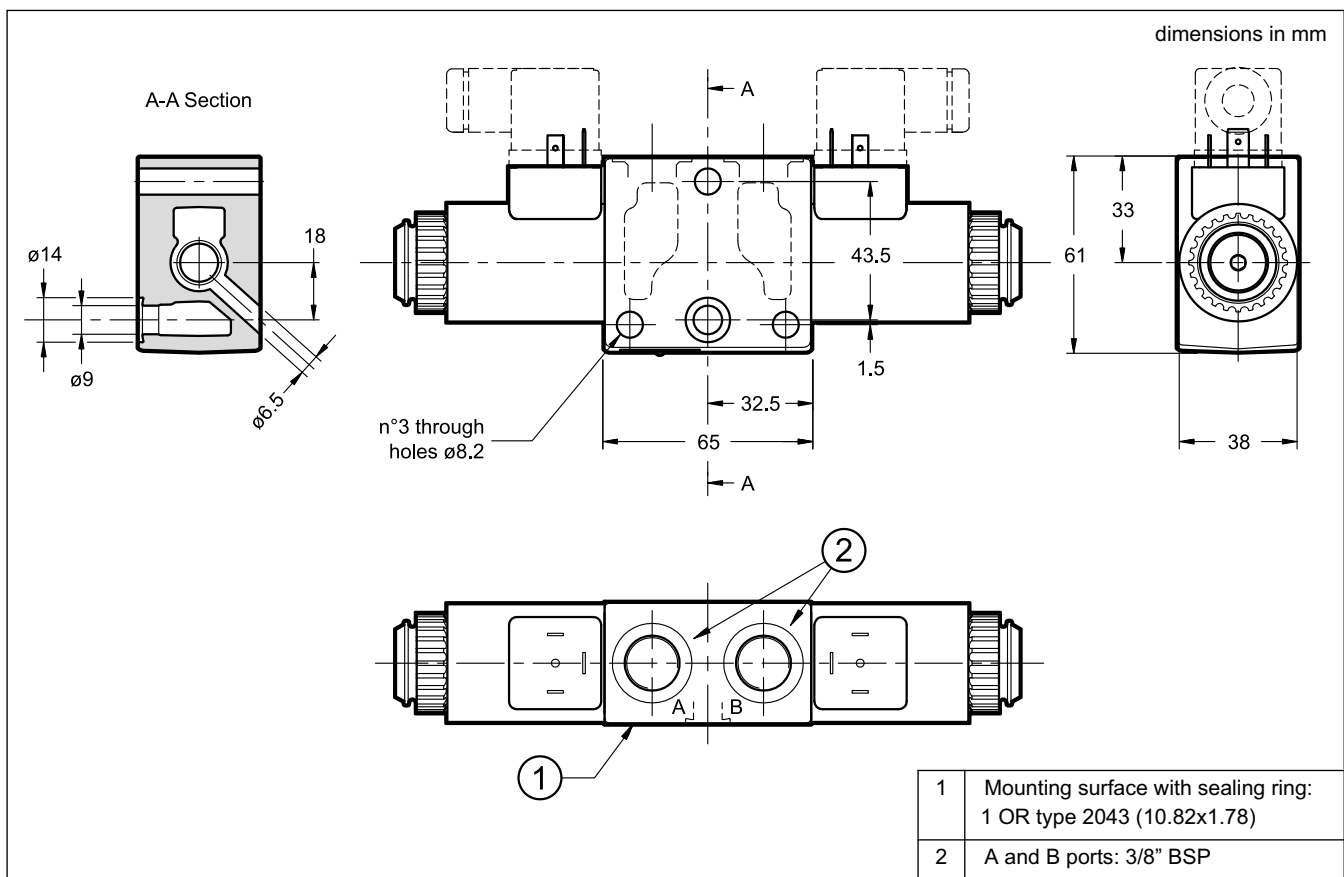
Please choose the proper outlet element amongst those in paragraph 1.7. Overall dimensions are at paragraph 11.3.

**15 - CHARACTERISTIC CURVES AND OPERATING LIMITS FOR SERIES**

Please refer to diagrams at par. 3 for pressure drops, whereas operating limits are here below.

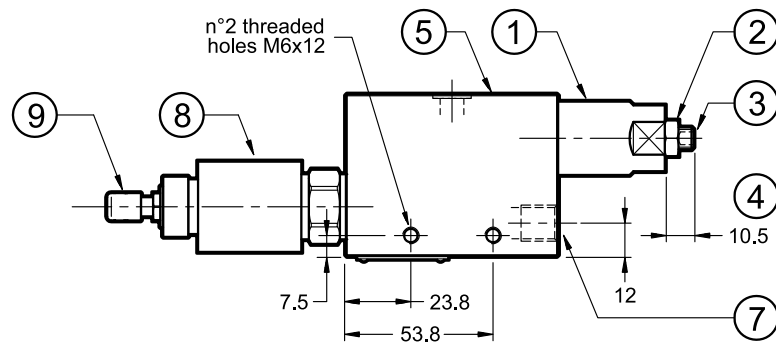
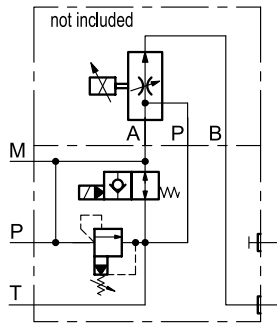
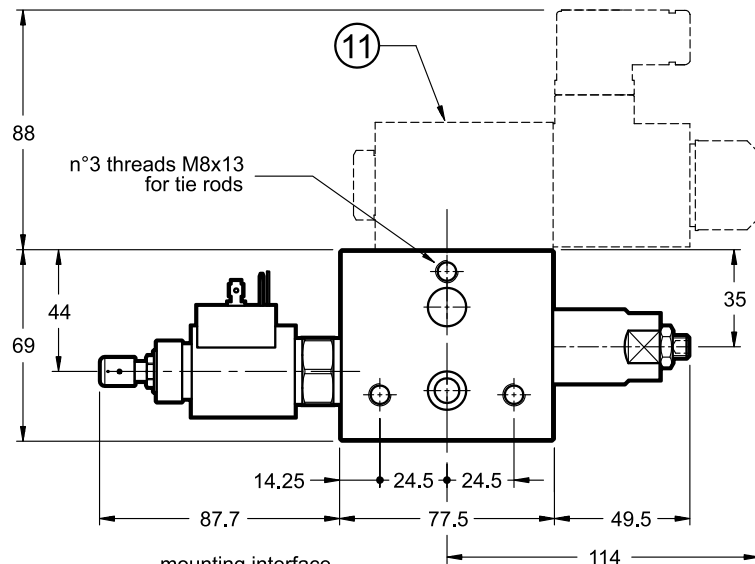
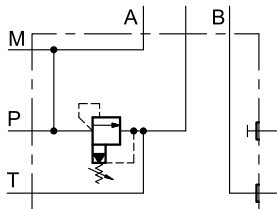
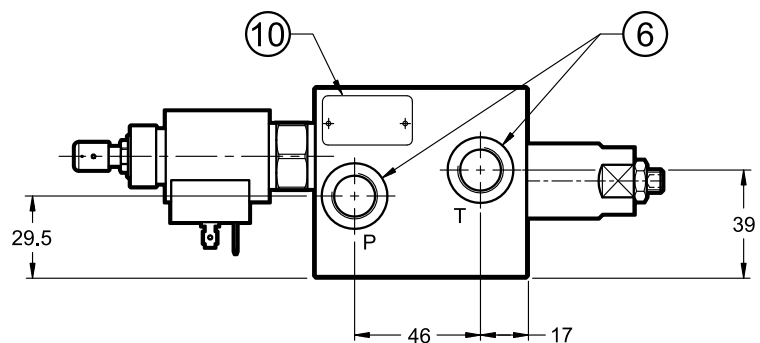
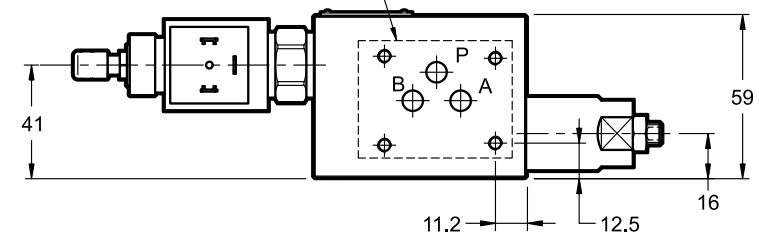
**15.1 - BDL2-B38C-S4**

**15.2 - BDM2-B38C-S4**

**16 - DIMENSIONS OF ELEMENTS FOR SERIES CONNECTION**
**16.1 - BD\*2-B38C-S4/10\* - directional valve element**

The BDM2 configuration is showed here. The same directional valve is available as BDL2. For non-quoted dimensions, please refer to the drawings for parallel circuits. Overall dimensions are the same.



**16.2 - Inlet elements for flow control valve**
**BD3-B38S-SK\*\*\*-Q**  
**with pressure control and**  
**unloading valves**

dimensions in mm


**NOTE :** The same component  
 without part no. 8 is:  
**BD3-B38S-S\*\*\*-Q**  
**with pressure control**  
 without unloading valve

 mounting interface  
 ISO 6263-03 without T port


1	Pressure control valve
2	Locking nut: spanner 13
3	Socket hex adjustment screw: Allen key 4 Clockwise rotation to increase pressure
4	Maximum screw stroke
5	Mounting surface with sealing rings: 2 OR type 2043 (10.82x1.78)
6	P and T ports: 3/8" BSP
7	Pressure gauge port: 1/4" BSP
8	Unloading valve Here shown with K1 connection
9	Push and twist manual override: see identification codes for further choices.
10	Element label
11	Encumbrance of flow control valve. To be ordered separately. See catalog 82220

**NOTE:** for missing dimensions of mounting interface  
 please refer to the par 10.1 'mounting surfaces'.