



DIVERTER VALVES

DF

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DPE

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DH

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 **walvoil**  
HYDRAULIC CONTROL SYSTEMS

valvoilgroup

### **Additional information**

This catalog shows the product in the most usual configurations.  
Please contact Sales Dpt. for more detailed information or special request.

### **WARNING!**

All specifications of this catalog refers to the standard product at this date.  
Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

**WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN  
INCORRECT USE OF THE PRODUCT.**

9<sup>th</sup> edition April 2006:

**This edition supercedes all prior documents.**

They're simple, compact and heavy duty designed, with cast iron body and steel spool.

Available from 2-way to 10-way, diverter valves are suitable to intercept and divert the flow on hydraulic systems, wherever movement sequence or control selection of different actuators is needed.

### With mechanical control



#### **DF series** ..... page 5

- 2-3-6-way with alternating spool.
- It's available in several sizes for flow up to 220 l/min.
- Lever, pneumatic, hydraulic, cam and ON/OFF electro-hydraulic controls

### With ON/OFF solenoid control



#### **Monoblock DFE series** ..... page 53

- 2-3-6-8-way with alternating spool.
- It's available in several sizes for flow up to 120 l/min.
- Coils with several feeding voltage are available.



#### **Sectional DFE series** ..... page 85

- 6-way with alternating spool; it's sectional type to obtain 8-way or 10-way circuit.
- It's possible to flange mounting a block with cross return anti-shock valves.
- Coils with several feeding voltage are available.

### With rotary control



#### **DH series** ..... page 103

- 3-4-way with rotary spool, that can be coupled to obtain 6-way or 8-way circuit.
- It's available in several sizes for flow up to 280 l/min - 74 US gpm.

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## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature.

|  |   | DF5  | DF10  | DF20  | DF25  |
|--|---|--|---|---|---|
| N. of available ways                       |   | 2-3-6  | 2-3-6   | 2-3-6   | 3   |
| Nominal flow rating                        |   | 60 l/min<br>16 US gpm                                | 90 l/min<br>24 US gpm                               | 140 l/min<br>37 US gpm                              | 280 l/min<br>74 US gpm                              |
| Operating pressure (maximum)               |   | 315 bar<br>4600 psi                                  | 315 bar<br>4600 psi                                 | 315 bar<br>4600 psi                                 | 315 bar<br>4600 psi                                 |
| Internal leakage A(B)→T                    | $\Delta p = 100 \text{ bar } 1450 \text{ psi}$ with fluid and valve at 40°C - 104°F | 5 cm <sup>3</sup> /min<br>0.31 in <sup>3</sup> /min  | 5 cm <sup>3</sup> /min<br>0.31 in <sup>3</sup> /min | 8 cm <sup>3</sup> /min<br>0.49 in <sup>3</sup> /min | 8 cm <sup>3</sup> /min<br>0.49 in <sup>3</sup> /min |
| Hydraulic fluid                            |   | Mineral base oil                                     |   |   |   |
| Fluid temperature                          | with NBR seals  | from -20°C to 80°C / from -4°F to 176°F              |   |   |   |
|  | with FPM seals  | from -20°C to 100°C / from -4°F to 212°F             |   |   |   |
| Viscosity                                  | operating range   | from 15 to 75 mm <sup>2</sup> /s - from 15 to 75 cSt |   |   |   |
|  | minimum   | 12 mm <sup>2</sup> /s - 12 cSt                       |   |   |   |
|  | maximum   | 400 mm <sup>2</sup> /s - 400 cSt                     |   |   |   |
| Max. level of contamination                |   | -/19/16 - ISO 4406 / NAS 1638 - class10              |   |   |   |
|  | with mechanical control   | from -40°C to 60°C / from -40°F to 140°F             |   |   |   |
| Ambient temperature for working conditions | with hydraulic and pneumatic controls   | from -30°C to 60°C / from -22°F to 140°F             |   |   |   |
|  | with electric controls  | from -20°C to 50°C / from -4°F to 122°F              |   |   |   |

NOTE - For different working conditions please contact Sales Dept.

## Standard threads

### REFERENCE STANDARDS

|                     |     | BSP                    | UN-UNF            | NPTF         | METRIC                 |         |
|---------------------|-----|------------------------|-------------------|--------------|------------------------|---------|
| THREAD ACCORDING TO |     | ISO 228/1              | ISO 263           | ANSI B1.20.3 | ISO 262                | ISO 262 |
|                     |     | BS 2779                | ANSI B1.1 unified |              |                        |         |
| CAVITY ACCORDING TO | ISO | 1179                   | 11926             |              | 9974-1                 | 6149    |
|                     | SAE |                        | J1926             | J476a        |                        | J2244   |
|                     | DIN | 3852-2<br>shape X or Y |                   |              | 3852-1<br>shape X or Y |         |

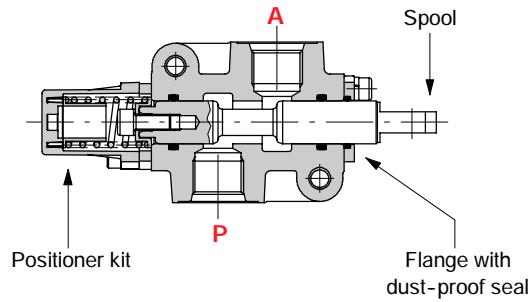
### PORTS THREAD

| ALL PORTS   | BSP        | UN-UNF             | METRIC<br>(ISO 9974-1) | METRIC<br>(ISO 6149) |
|-------------|------------|--------------------|------------------------|----------------------|
| DF5         | G 3/8      | 3/4-16 (SAE 8)     | M18x1.5                | M18x1.5              |
| DF10        | G 1/2      | 7/8-14 (SAE 10)    | M22x1.5                |                      |
| DF20        | G 3/4      | 1 1/16-12 (SAE 12) |                        |                      |
| DF25        | G 1        | 1 5/16-12 (SAE 16) |                        |                      |
| PILOT PORTS |            |                    |                        |                      |
| Pneumatic   | NPT 1/8-27 | NPT 1/8-27         | NPT 1/8-27             | NPT 1/8-27           |
| Hydraulic   | G 1/4      | 9/16-18 (SAE 6)    |                        |                      |

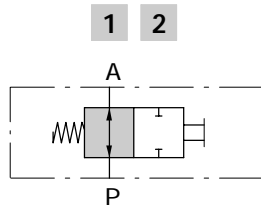
Optional threads: for availability contact Sales Department

2-way

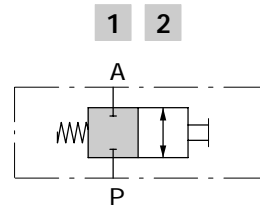
Available as body only in DF5/2 execution; for other executions 3-way body is used.



Spool type A

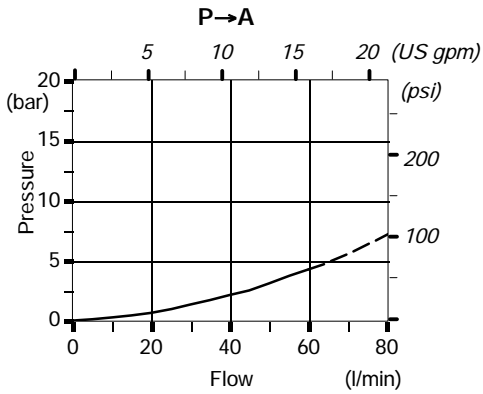


Spool type B



Performance data

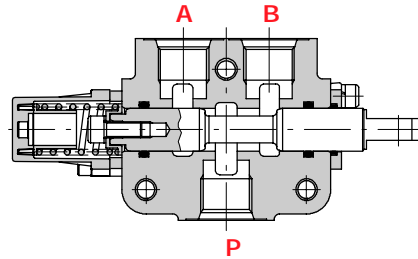
Pressure drop versus flow



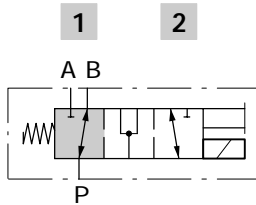
Hydraulic circuit

3-way

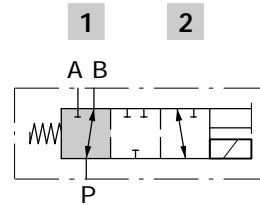
It's possible to obtain 2-way diverter valve plugging port A or B.



Spool type A

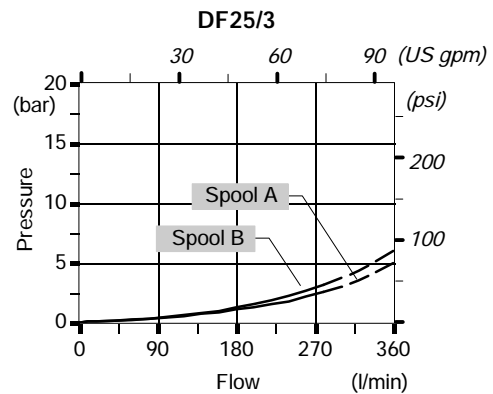
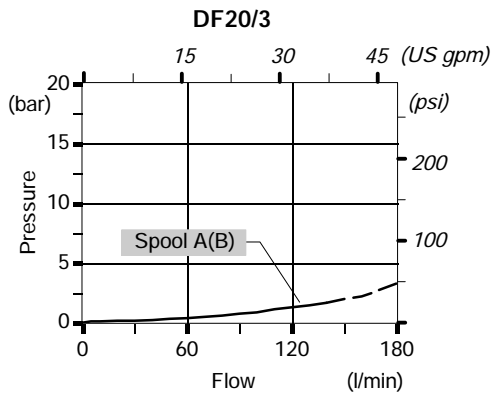
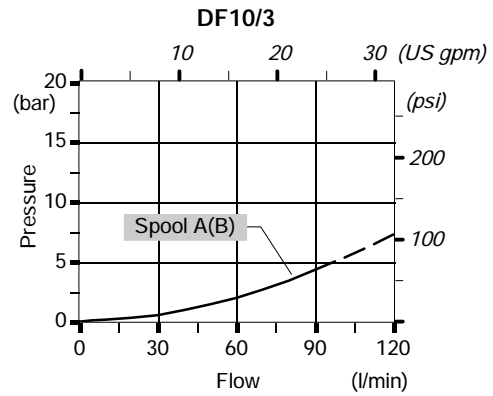
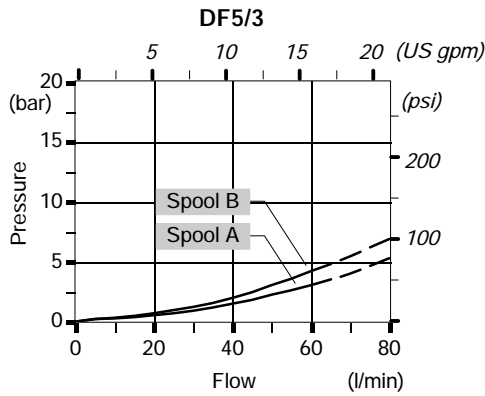


Spool type B B



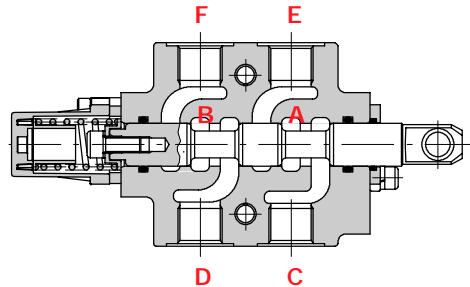
Performance data

Pressure drop versus flow: P→A(B)

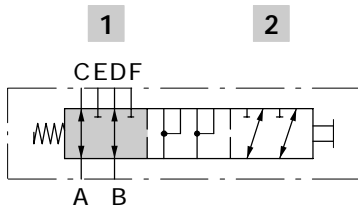




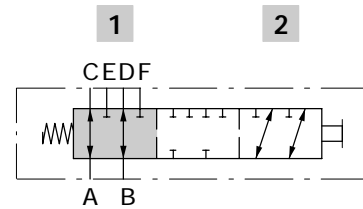
6-way



Spool type A

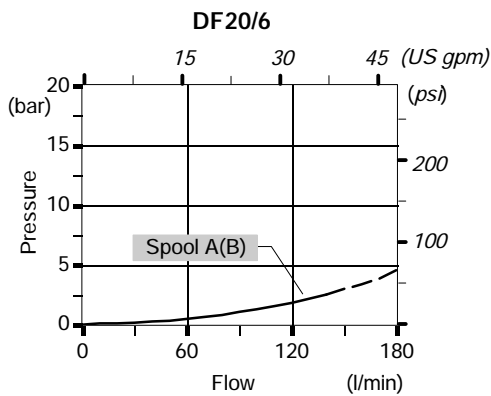
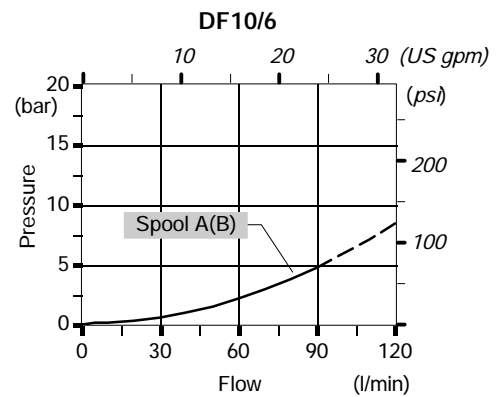
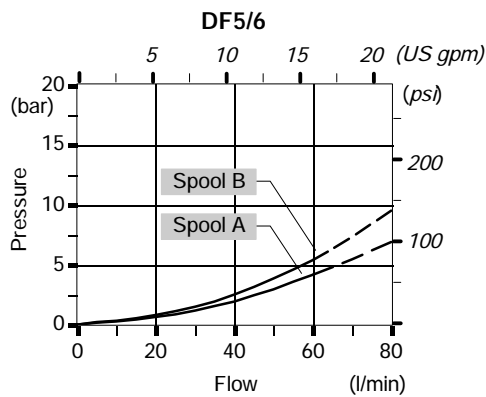


Spool type B



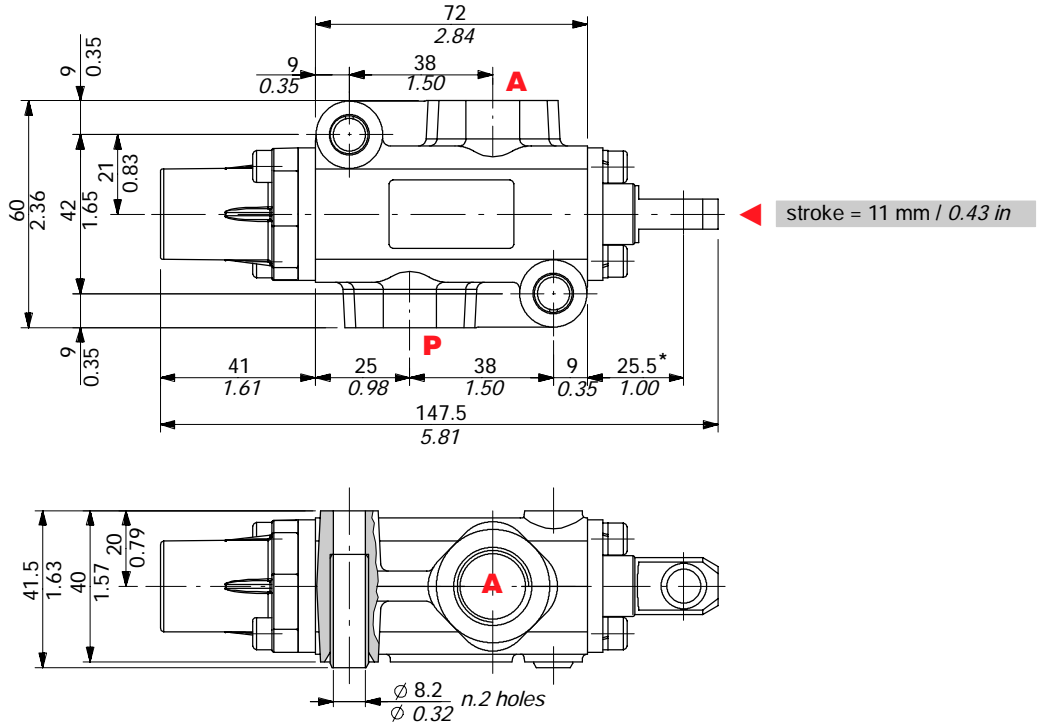
Performance data

Pressure drop versus flow: A→C(E).

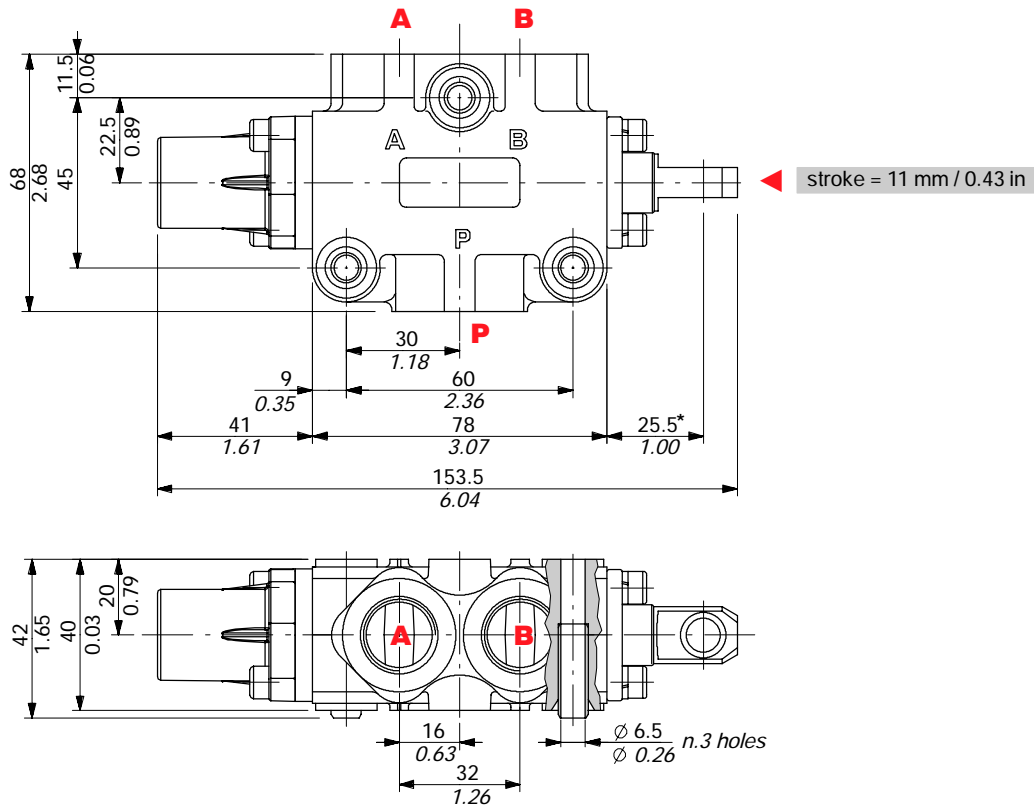


Dimensional data

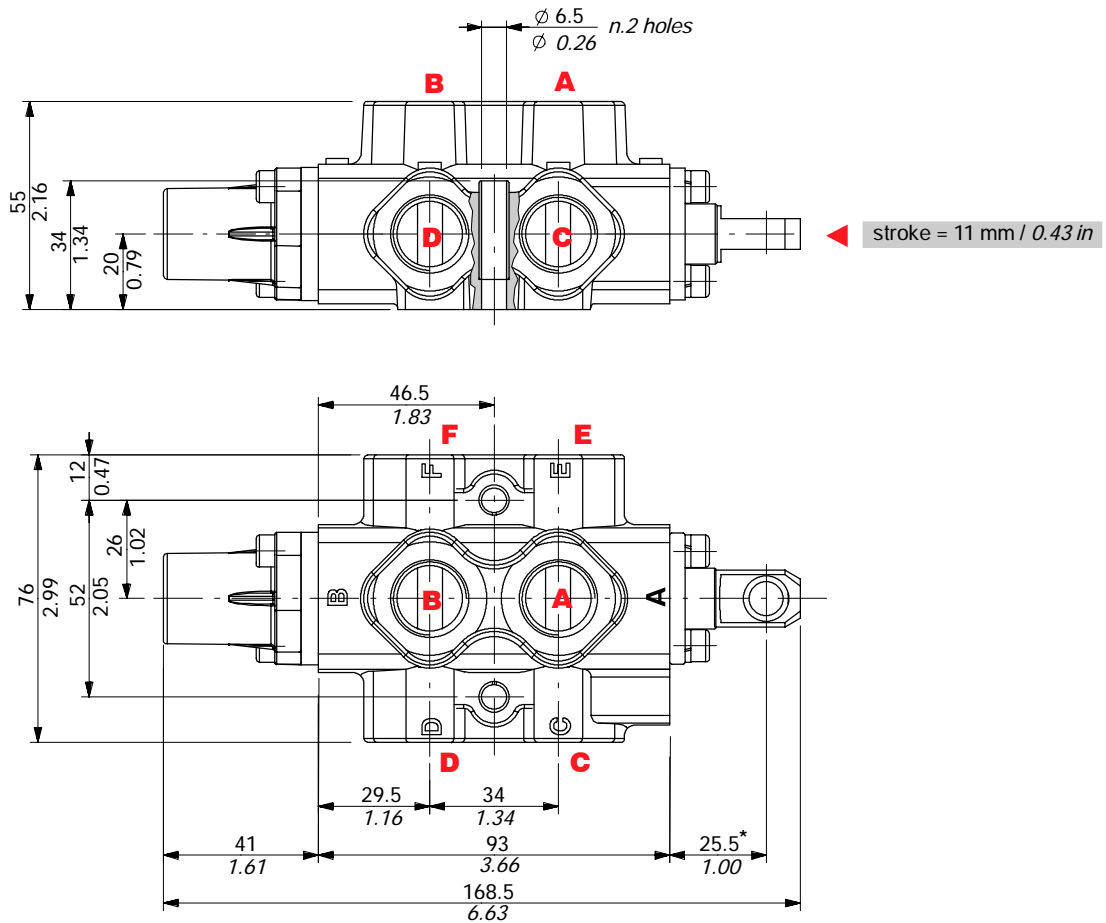
2-way DF5/2 valve



3-way DF5/3 valve

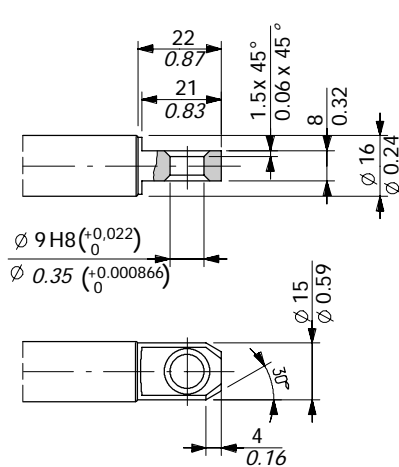


6-way DF5/6 valve



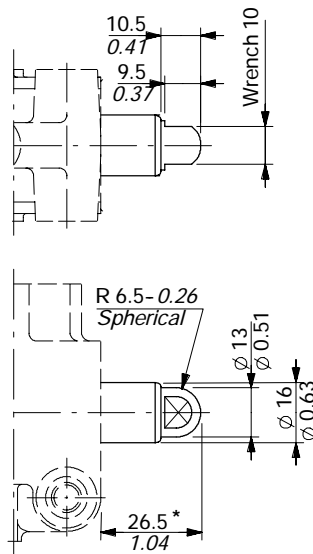
Spool end

Standard end

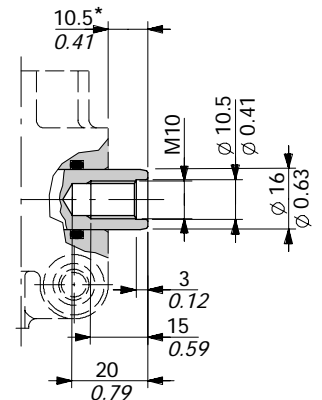


NOTE (\*) - With spool out  
(positioner kit type 17)

Spherical end type T



Rotary cam prearrangement

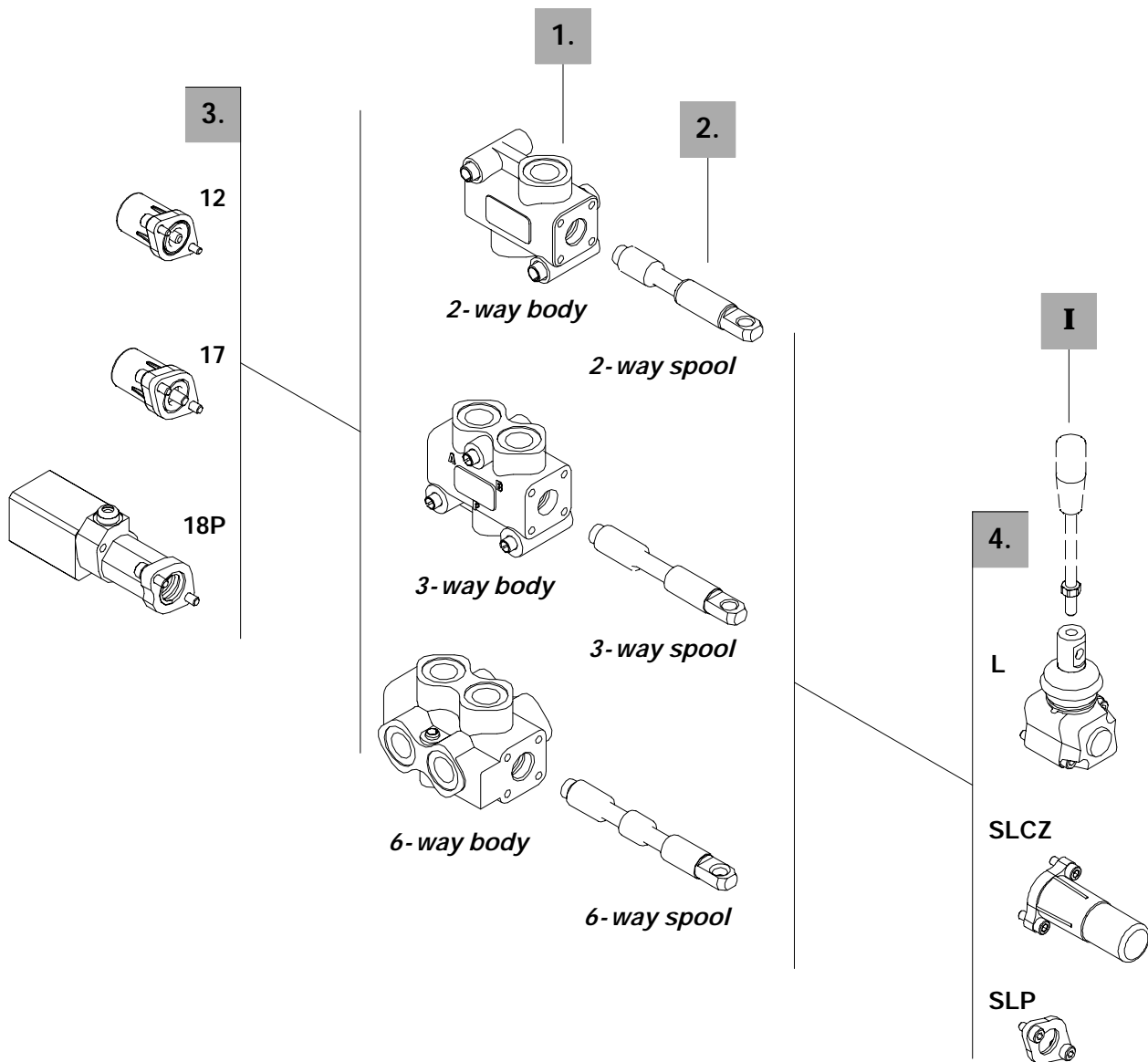


Ordering codes

Description example:

Diverter valve **DF5/3** **A** **17** **SLP** - SAE

- 1.
- 2.
- 3.
- 4.



**2-way**
**1. Kit corpo \***

| TYPE  | BODY       | DESCRIPTION       |
|-------|------------|-------------------|
| DF5/2 | 5CO2220700 | Standard body kit |

*Include body and seals*

**2. Spool options**

| TYPE | CODE       | DESCRIPTION                               |
|------|------------|---|
| A    | 3CAS105210 | 2 positions with open centre in neutral   |
| B    | 3CAS105110 | 2 positions with closed centre in neutral |
| AT   | 3CAS105230 | As type A with spherical end              |
| BT   | 3CAS105130 | As type B with spherical end              |
| AC   | 3CAS105220 | As type A prearranged for cam control     |
| BC   | 3CAS105120 | As type B prearranged for cam control     |

**3-way**
**1. Body kit \***

| TYPE  | CODE       | DESCRIPTION       |
|-------|------------|-------------------|
| DF5/3 | 5CO2221700 | Standard body kit |

*Include body and seal*

**2. Spool options**

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS105310 | 3-way, 2 positions with ports connected in transit position |
| B    | 3CAS105410 | 3-way, 2 positions with ports closed in transit position    |
| AT   | 3CAS105330 | As type A with spherical end                                |
| AC   | 3CAS105320 | As type A prearranged for cam control                       |
| BC   | 3CAS105420 | As type B prearranged for cam control                       |

**6-way**
**1. Body kit \***

| TYPE  | CODE       | DESCRIPTION       |
|-------|------------|-------------------|
| DF5/6 | 5CO2222700 | Standard body kit |

*Include body and seals*

**2. Spool options**

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS105610 | 6-way, 2 positions with ports connected in transit position |
| B    | 3CAS105710 | 6-way, 2 positions with ports closed in transit position    |
| AC   | 3CAS105620 | As type A prearranged for cam control                       |
| BC   | 3CAS105720 | As type B prearranged for cam control                       |

**3. Positioner kits**

page 14

| TYPE   | CODE        | DESCRIPTION  |
|--------|-------------|--|
| 12     | 5V12105000  | Detent in positions 1 and 2  |
| 17     | 5V17105000  | Spring return in position 1  |
| 17Y    | 5V17105010  | As type 17, it must be coupled to IA2 control                          |
| 18ME   | 5V18405110  | Spring return in position 2  |
| 18P    | 5V18105700  | ON/OFF pneumatic kit with spring return in position 2                  |
| 18IA1  | 5V18105850* | ON/OFF high pressure hydraulic kit with spring return in position 2    |
| 18IB1N | 5V18105870* | Comando idraulico a bassa pressione con ritorno a molla in posizione 2 |

**4. Control kits**

page 17

| TYPE | CODE        | DESCRIPTION                                 |
|------|-------------|---|
| SLP  | 5COP105000  | Without lever box with dust-proof plate kit |
| SLCZ | 5COP205030  | Without lever box with endcap               |
| TQ   | 5TEL105110  | Flexible cable connection                   |
| L    | 5LEV105000  | Standard kever box                          |
| CB   | 5CAM105020  | Cam control                                 |
| IA2  | 5IDR505700* | ON/OFF high pressure hydraulic control      |
| IB2  | 5IDR705700* | ON/OFF low pressure hydraulic control       |

**I Optional handlever**

| TYPE        | CODE      | DESCRIPTION                          |
|-------------|-----------|--------------------------------------|
| AL01/M8x120 | 170011012 | For lever L: height 120 mm / 4.72 in |

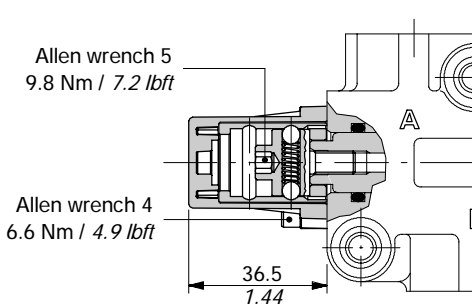
NOTE (\*) - Codes are referred to **UN-UNF** thread.

Positioners kits

With detent

Kit 12

Detent in positions 1 and 2.



Operating features

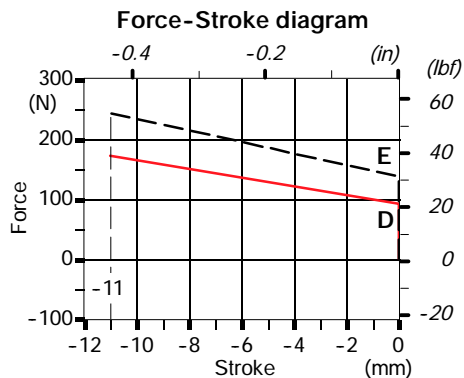
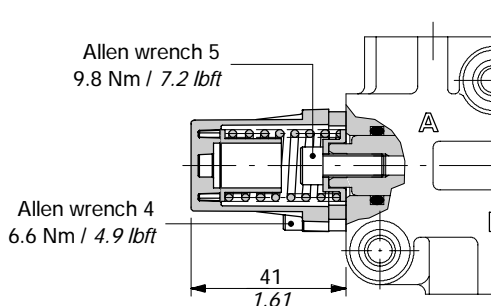
Locking and unlocking force . . . . . : 100 N / 22.5 lbf ±10%

With spring return

17 kit

Spring return in position 1; it's supplied with standard spring type D (see force-stroke diagram).

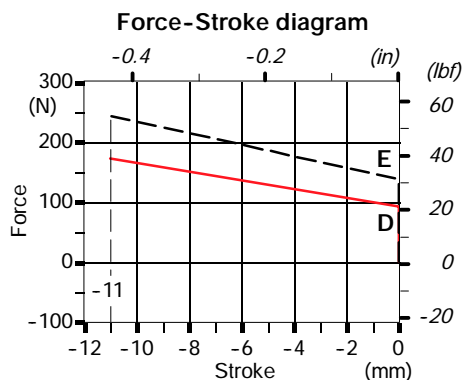
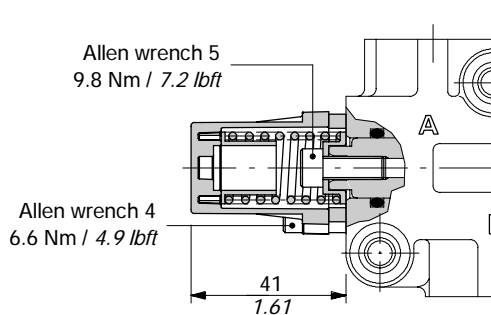
Available also with heavier spring type E (17ME code 5V17305000).



17Y kit

As kit 17, it must be only coupled to IA2 control on page 18.

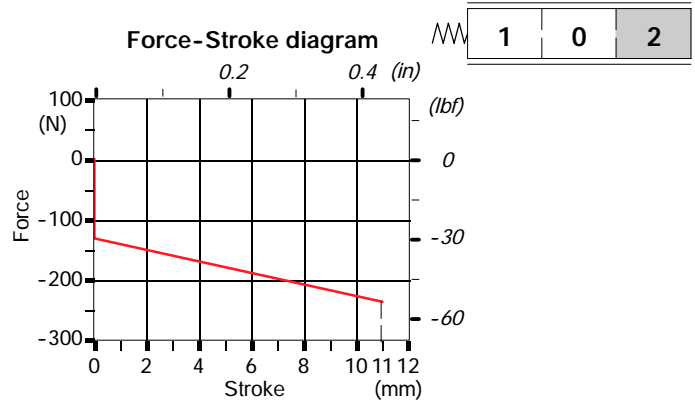
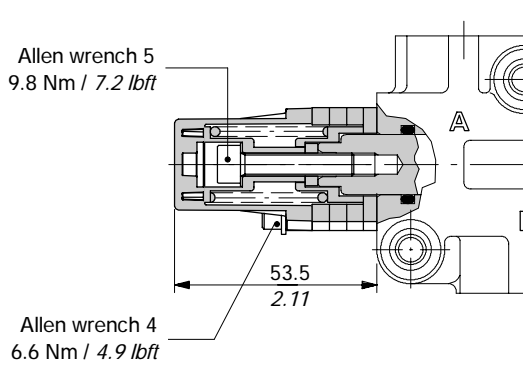
It's available also with heavier spring type E (17YME code: 5V17305003).



With spring return

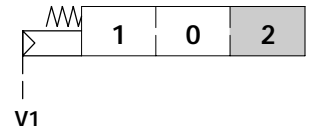
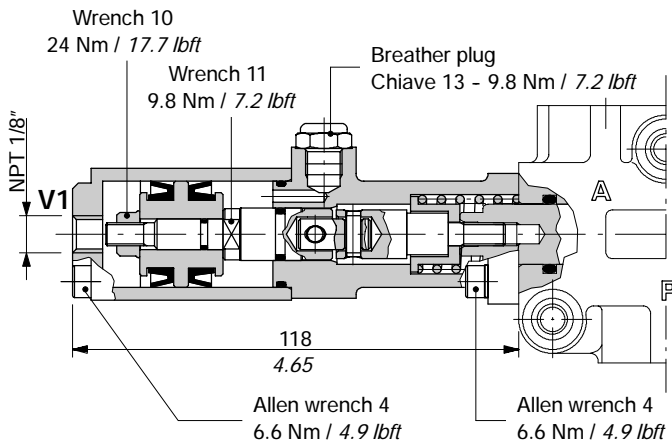
18ME kit

Spring return in position 2.



ON/OFF pneumatic kit type 18P

With spring return in position 2.



Operating features

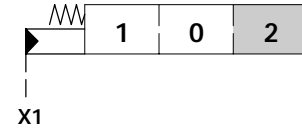
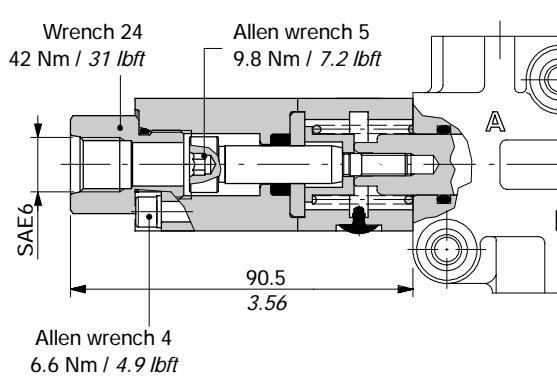
Pilot pressure ..... : min 6 bar / 87 psi  
max. 10 bar / 145 psi

Positioner kits

With ON/OFF hydraulic control

18IA1 kit

With high pressure pilot and spring return to position 2.

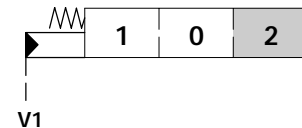
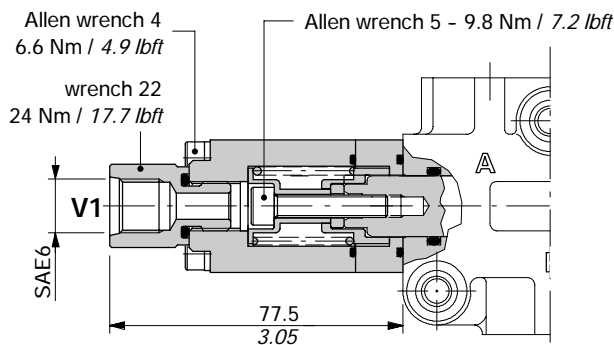


Operating features

Pilot pressure ..... : min. 30 bar / 435 psi  
 max. 250 bar / 3600 psi

18IB1N kit

With low pressure pilot and spring return to position 2.



Operating features

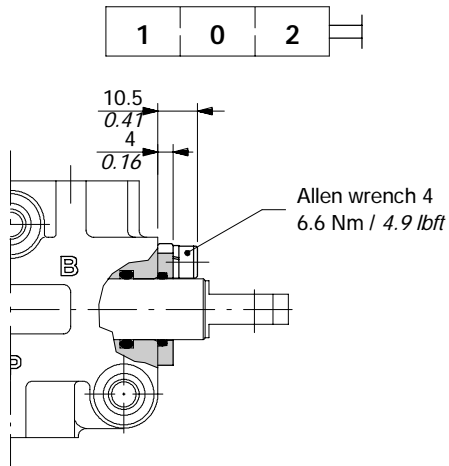
Pilot pressure ..... : min. 15 bar / 220 psi  
 max. 50 bar / 725 psi



Controls prearrangement

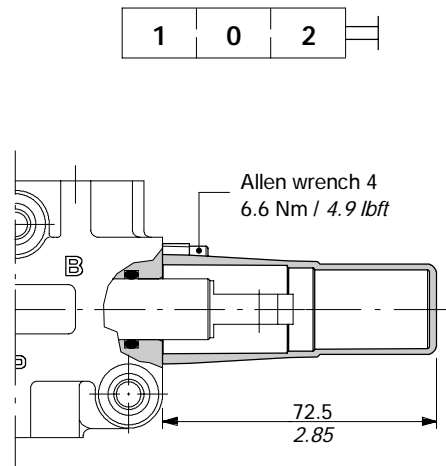
SLP kit

Mechanical control with dust-proof plate.



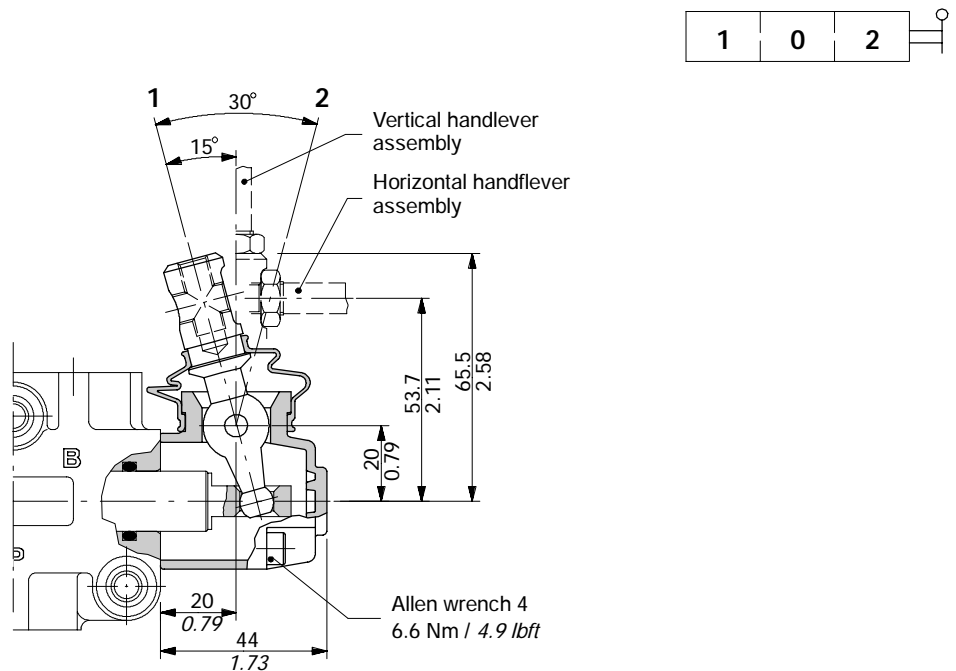
SLCZ kit

Protection cap usable with pneumatic and hydraulic spool positioner kits.



L lever control

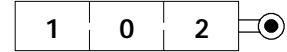
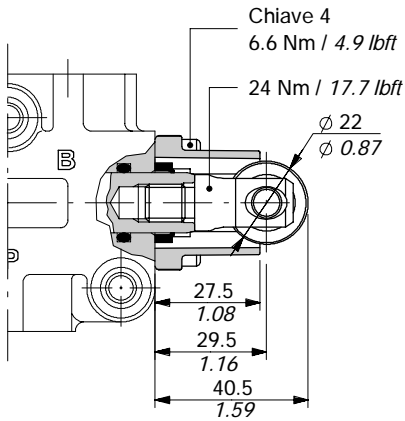
Aluminum with protection boot lever pivot box; it can be rotated 180° (execution L180).



Control kits

CB cam control

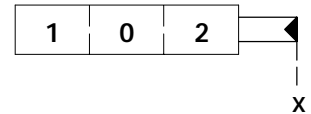
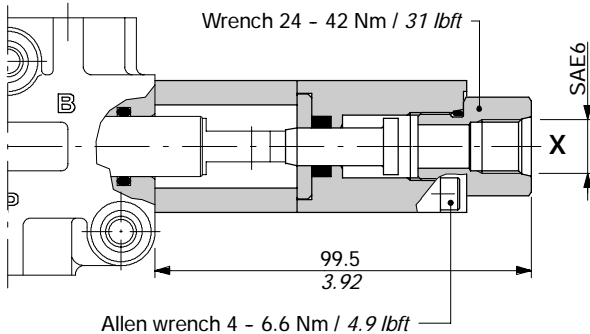
With bronze bearing; it must be coupled to 17 kit (see page 14).



ON/OFF hydraulic controls

IA2 kit

With high pressure pilot; it must be coupled to 17Y kit (see page 14).

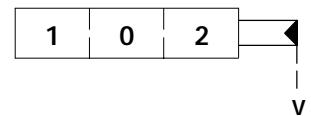
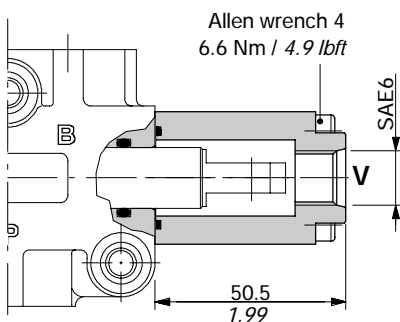


Operating features

Pilot pressure ..... : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

IB2 kit

With low pressure pilot; it must be coupled to 17 kit (see page 14).



Operating features

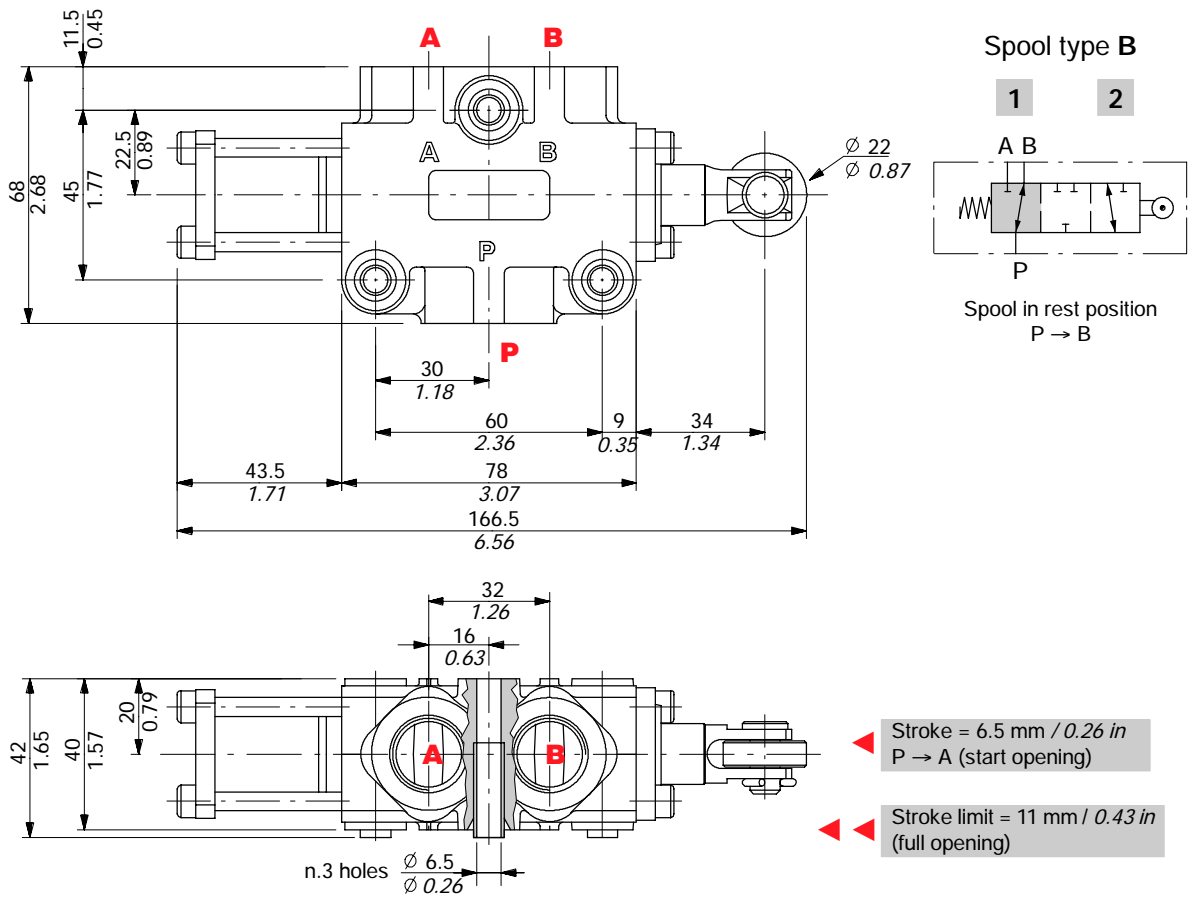
Pilot pressure ..... : min. 15 bar / 220 psi  
max. 50 bar / 725 psi

Cam spool control suggested for severe applications; it requires a special body, spool and control kit.

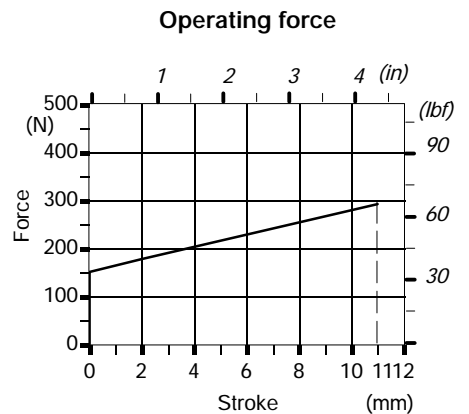
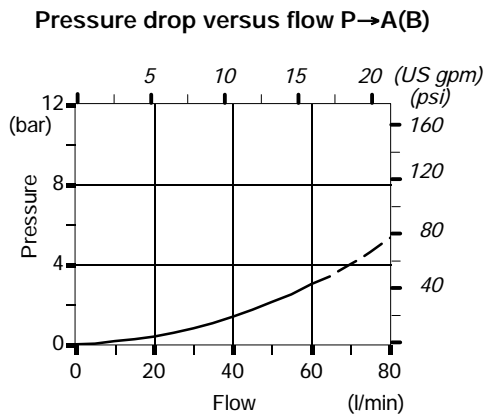
**3-way DFC050/3 valve**

Complete description: DFC050/3B17GSLP-SAE-<CVN> code: 122050028

Valve is supplied painted as standard, with one coat of Primer black antirust paint



**Performance data**

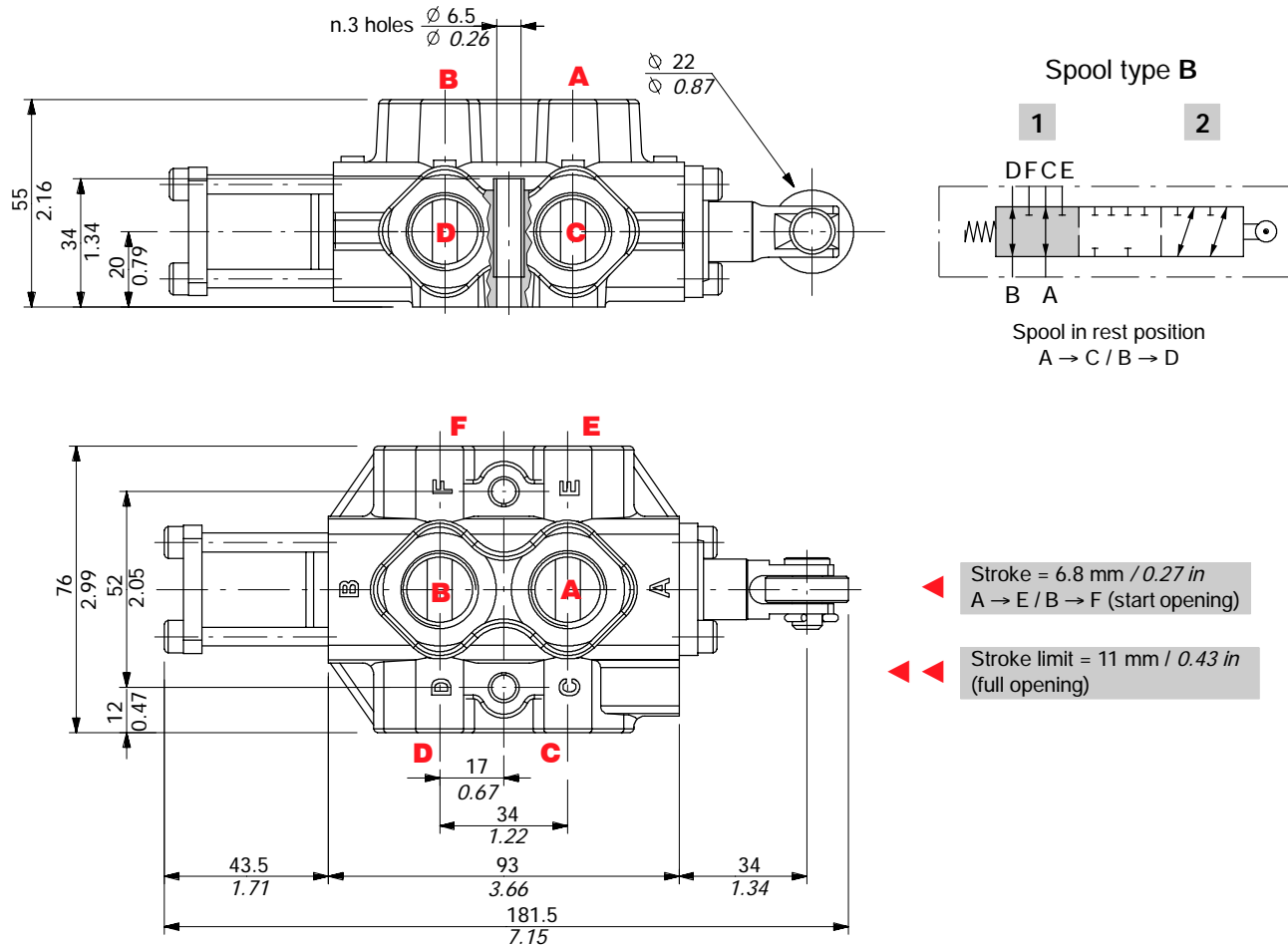


Other executions

6-way DFC050/6 valve

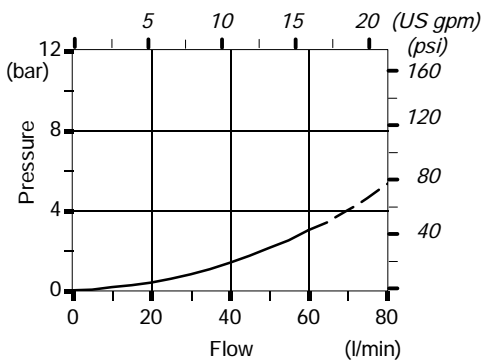
Complete description: DFC050/6B17GSLP-SAE-<CVN> code: 122080019

Valve is supplied painted as standard, with one coat of Primer black antirust paint

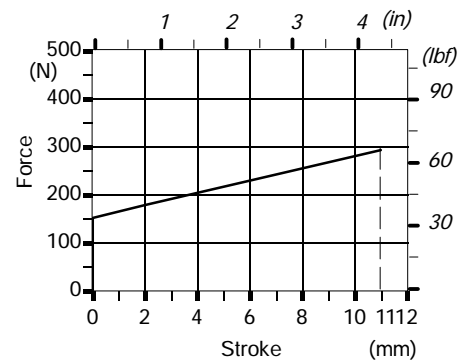


Performance data

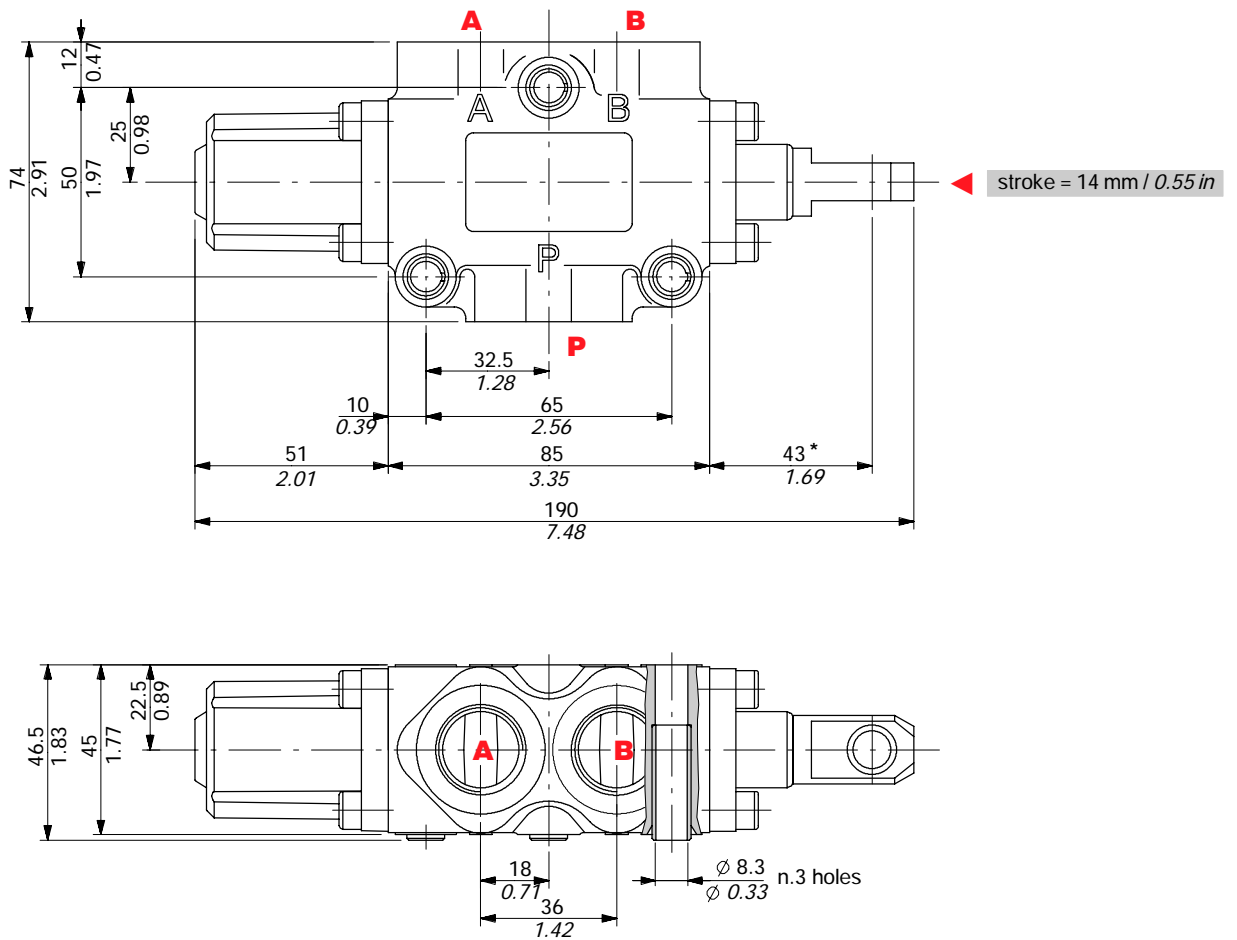
Pressure drop versus flow P→A(B)



Operating force

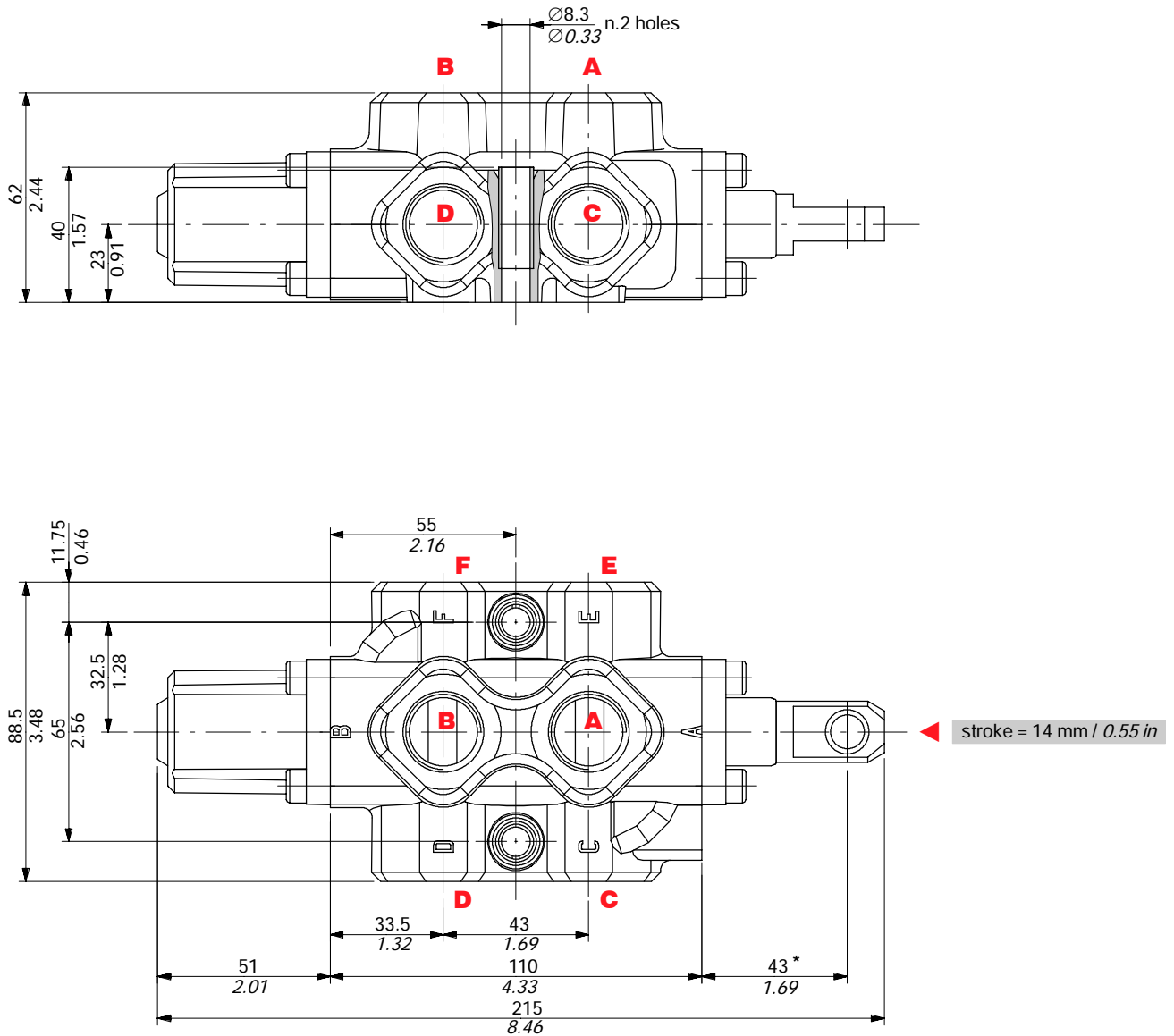


3-way DF10/3 valve



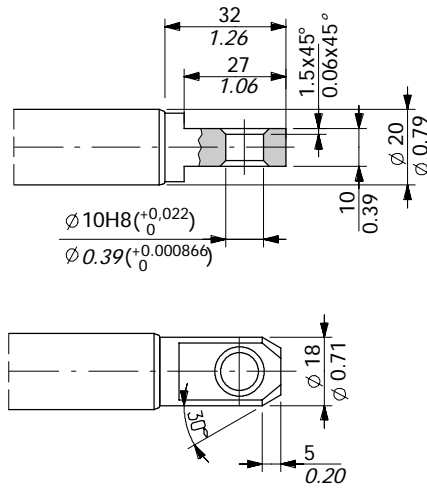
Dimensional data

6-way DF10/6 valve

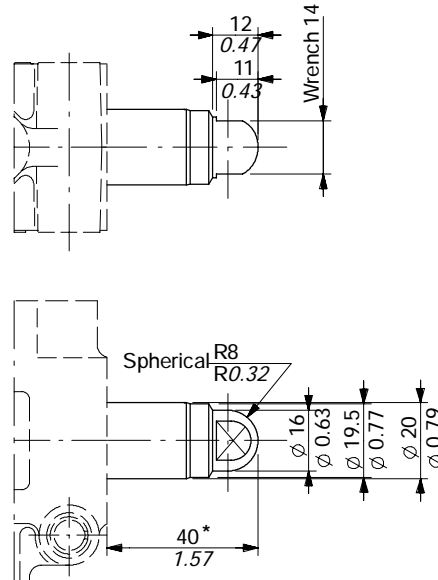


Spool end

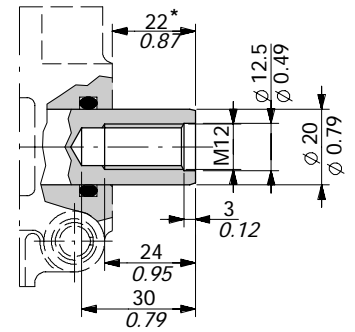
Standard end



Spherical end type T



Rotary cam prearrangement



NOTE (\*) - With spool out (positioner kit type 17)

Ordering codes

DEscription example

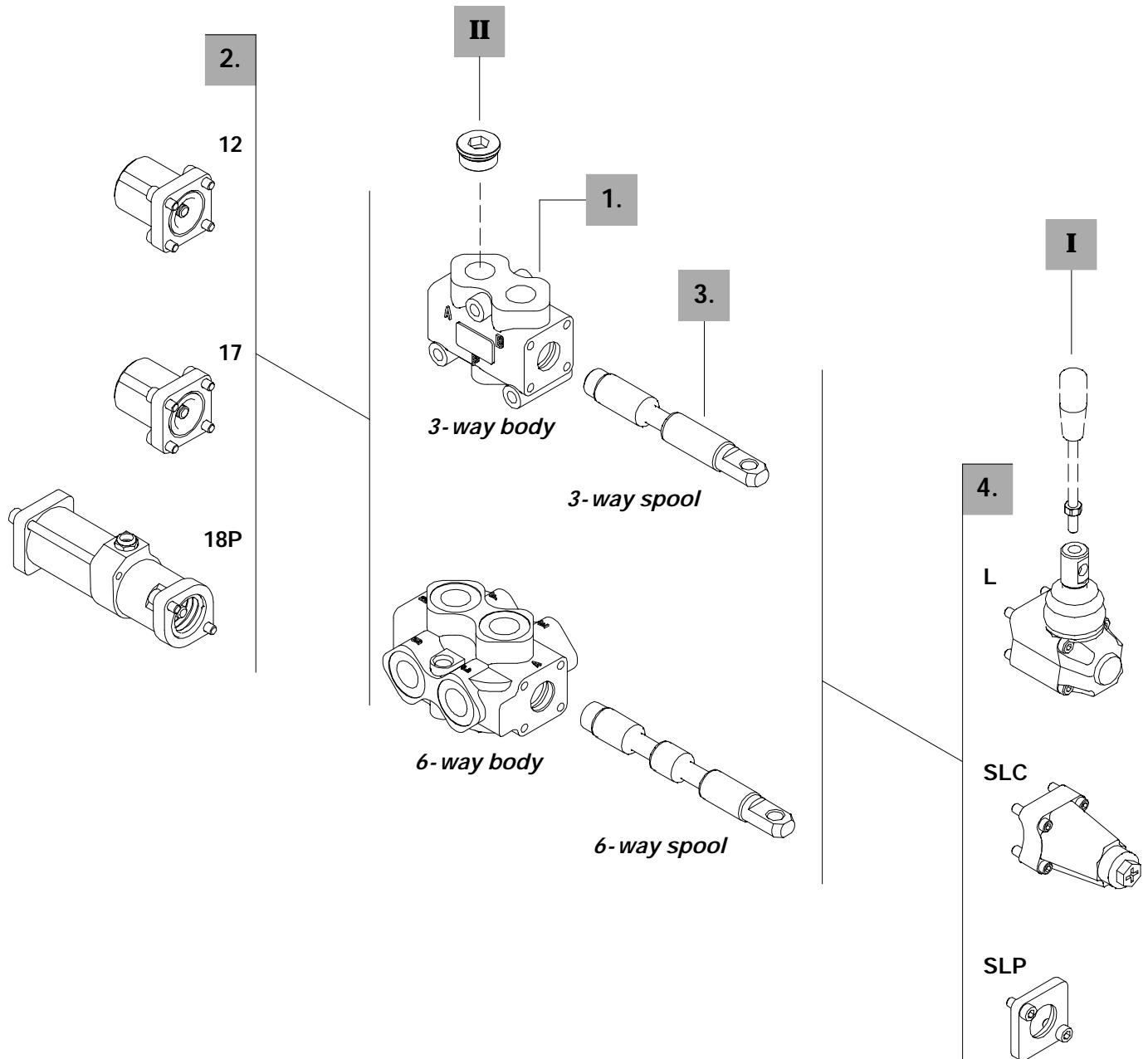
Diverter valve DF10/3 A 17 SLP - SAE

1.

3.

2.

4.





**3-way**
**1. Body kit \***

| TYPE   | CODE       | DESCRIPTION       |
|--------|------------|-------------------|
| DF10/3 | 5CO2241700 | Standard body kit |

*Include body and seals*

**3. Spool options**

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS110310 | 3-way, 2 positions with ports connected in transit position |
| B    | 3CAS110410 | 3-way, 2 positions with ports closed in transit position    |
| AT   | 3CAS110330 | As type A with spherical end                                |
| AC   | 3CAS110320 | As type A prearranged for cam control                       |
| BC   | 3CAS110420 | As type B prearranged for cam control                       |

**6-way**
**1. Body kit \***

| TYPE   | CODE       | DESCRIPTION       |
|--------|------------|-------------------|
| DF10/6 | 5CO2242700 | Standard body kit |

*Include body and seals*

**3. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS110610 | 6-way, 2 positions with ports connected in transit positions |
| B    | 3CAS110710 | 6-way, 2 positions with ports closed in transit positions    |
| AC   | 3CAS110620 | As type A prearranged for cam control                        |
| BC   | 3CAS110720 | As type B prearranged for cam control                        |

**2. Positioner kits**
*page 26*

| TYPE  | CODE        | DESCRIPTION   |
|-------|-------------|---|
| 12    | 5V12110000  | Detent in positions 1 and 2   |
| 17    | 5V17110000  | Spring return in position 1   |
| 18    | 5V18110000  | Spring return in position 2   |
| 18P   | 5V18110710  | ON/OFF pneumatic kit with spring return in position 2               |
| 18IA1 | 5V18110850* | ON/OFF high pressure hydraulic kit with spring return in position 2 |
| 18IB1 | 5V18110870* | ON/OFF low pressure hydraulic kit with spring return in position 2  |

**4. Control kits**
*page 28*

| TYPE | CODE        | DESCRIPTION                                 |
|------|-------------|---|
| SLP  | 5COP110000  | Without lever box with dust-proof plate kit |
| SLC  | 5COP210000  | Without lever box with endcap               |
| L    | 5LEV110000  | Standard lever box                          |
| CB   | 5CAM110020  | Cam control                                 |
| IA2  | 5IDR510701* | ON/OFF high pressure hydraulic control      |
| IB2  | 5IDR710700* | ON/OFF low pressure hydraulic control       |

**I Optional handlever**

| TYPE         | CODE      | DESCRIPTION                          |
|--------------|-----------|--------------------------------------|
| AL01/M10x200 | 170012020 | For lever L, height 200 mm / 7.87 in |

**II Ports plug**

| TYPE  | CODE         | DESCRIPTION                                 |
|-------|--------------|---|
| SAE10 | 3XTAP826160* | Body conversion from 3-way to 2-way circuit |

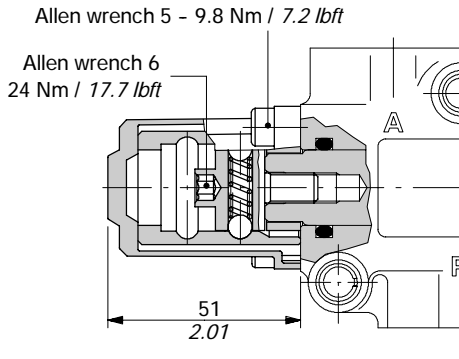
NOTE (\*) - Codes are referred to **UN-UNF** thread.

Positioner kits

With detent

12 kit

Detent in positions 1 and 2.



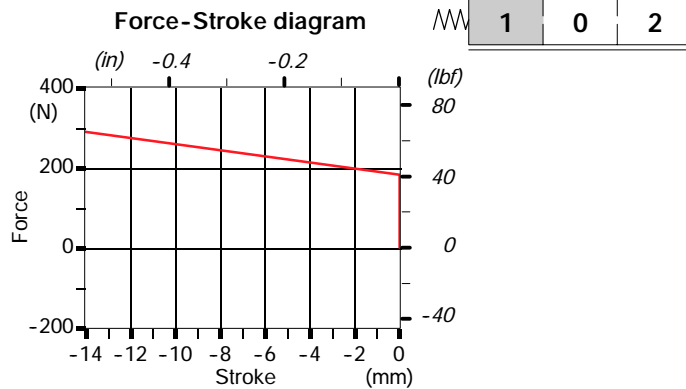
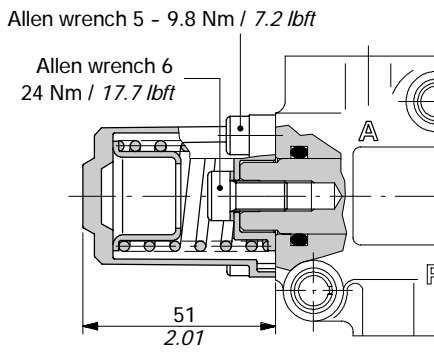
Operating features

Locking and unlocking force . . . . . : 280 N / 63 lbf ±10%

With spring return

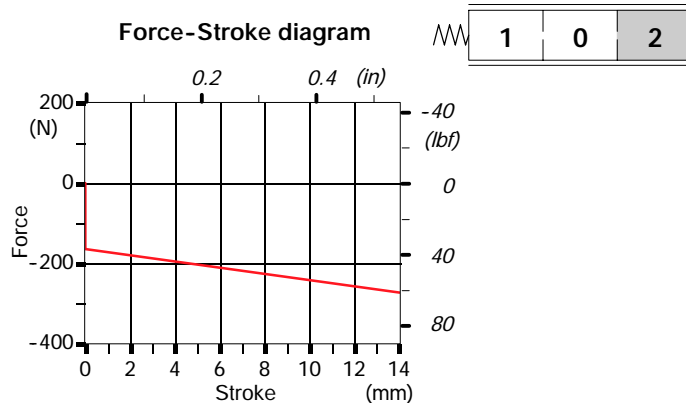
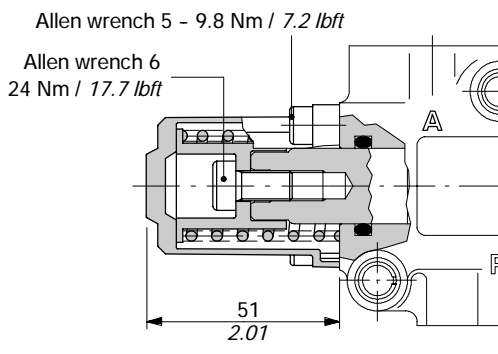
17 kit

Spring return in position 1.



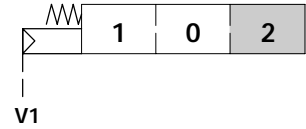
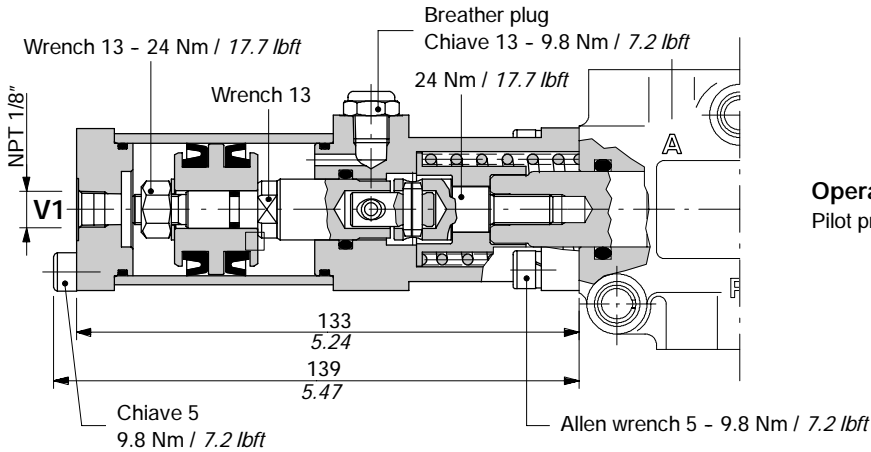
18 kit

Spring return in position 2.



**ON/OFF pneumatic kit type 18P**

With spring return in position 2.



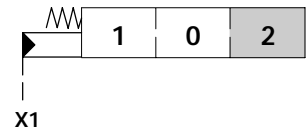
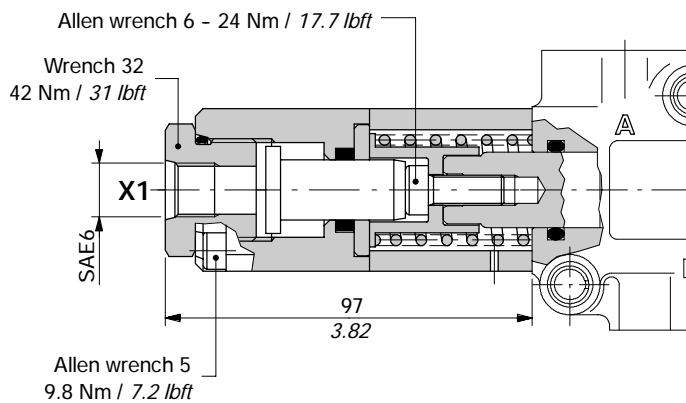
**Operating features**

Pilot pressure ..... : min. 6 bar / 87 psi  
max. 10 bar / 145 psi

**With ON/OFF hydraulic control**

**18IA1 kit**

With high pressure pilot and spring return to position 2.

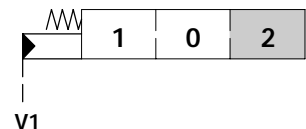
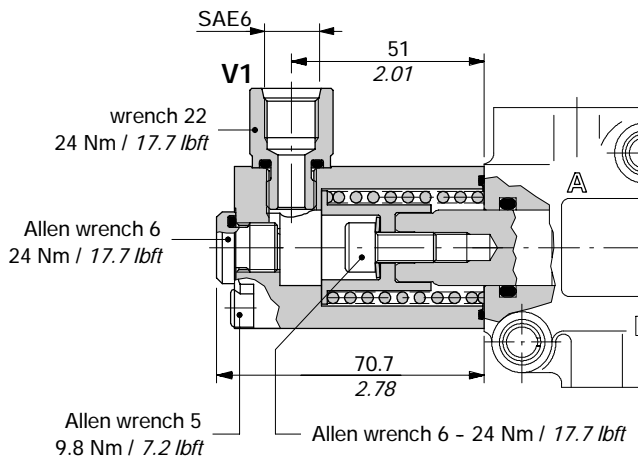


**Operating features**

Pilot pressure ..... : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

**18IB1 kit**

With low pressure pilot and spring return to position 2.



**Operating features**

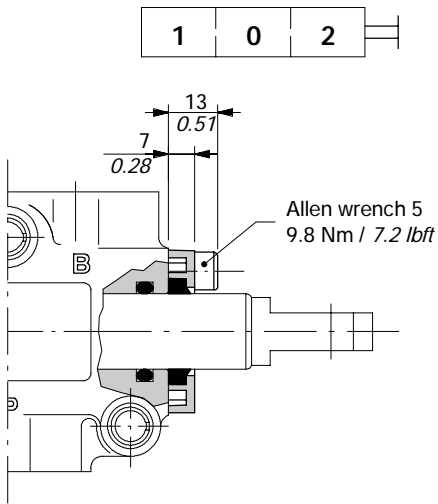
Pilot pressure ..... : min. 15 bar / 220 psi  
max. 50 bar / 725 psi

Control kits

Controls prearrangement

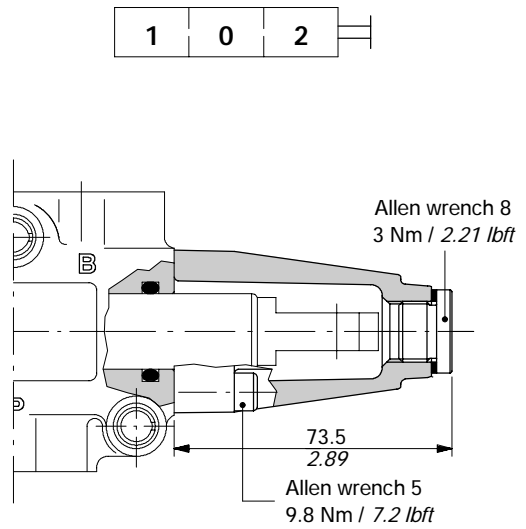
SLP kit

Mechanical control with dust-proof plate.



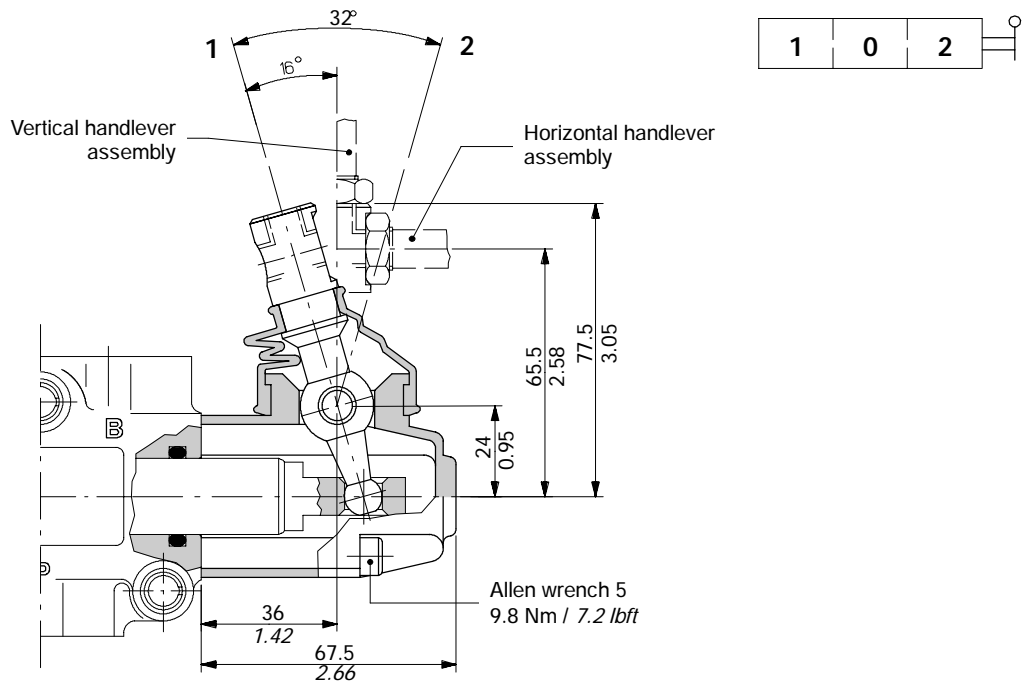
SLC kit

Protection cap usable with pneumatic and hydraulic spool positioner kits.



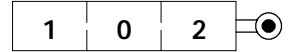
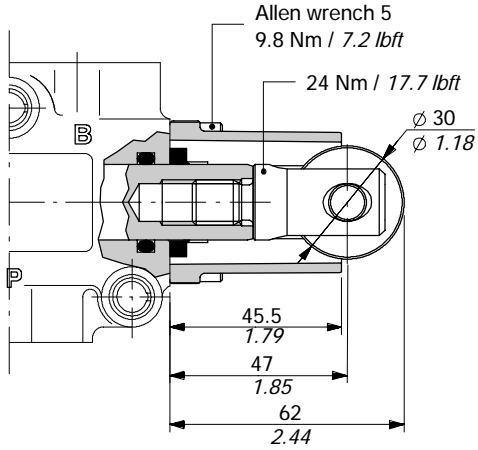
L lever control

Alumium with protection boot lever pivot box; it can be rotated 180° (execution L180).



**CB cam control**

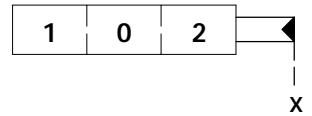
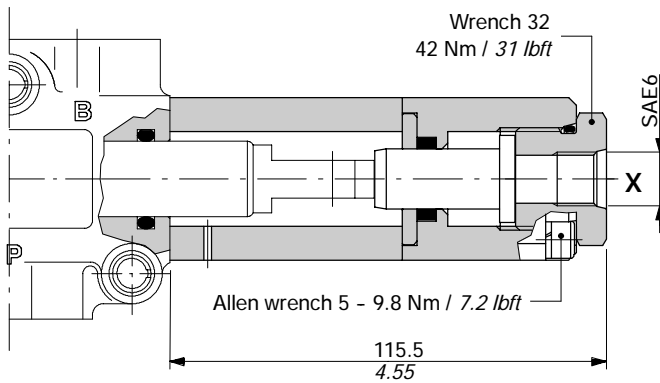
With bronze bearing; it must be coupled to 17 kit (see page 26).



**ON/OFF hydraulic controls**

**IA2 kit**

With high pressure pilot; it must be coupled to 17 kit (see page 26).

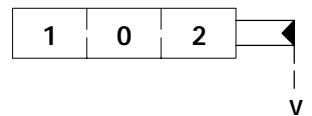
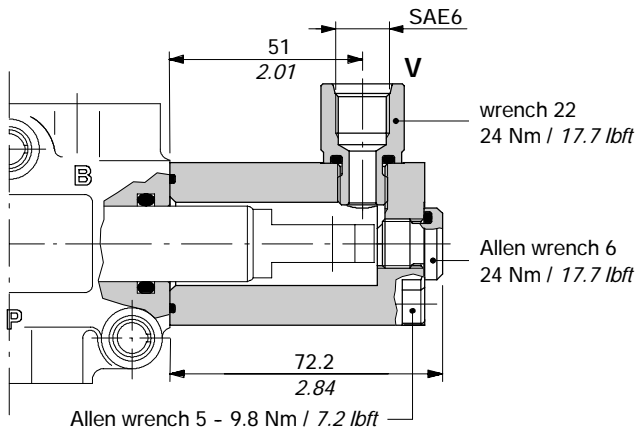


**Operating features**

Pilot pressure ..... : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

**IB2 kit**

With low pressure pilot; it must be coupled to 17 kit (see page 26).



**Operating features**

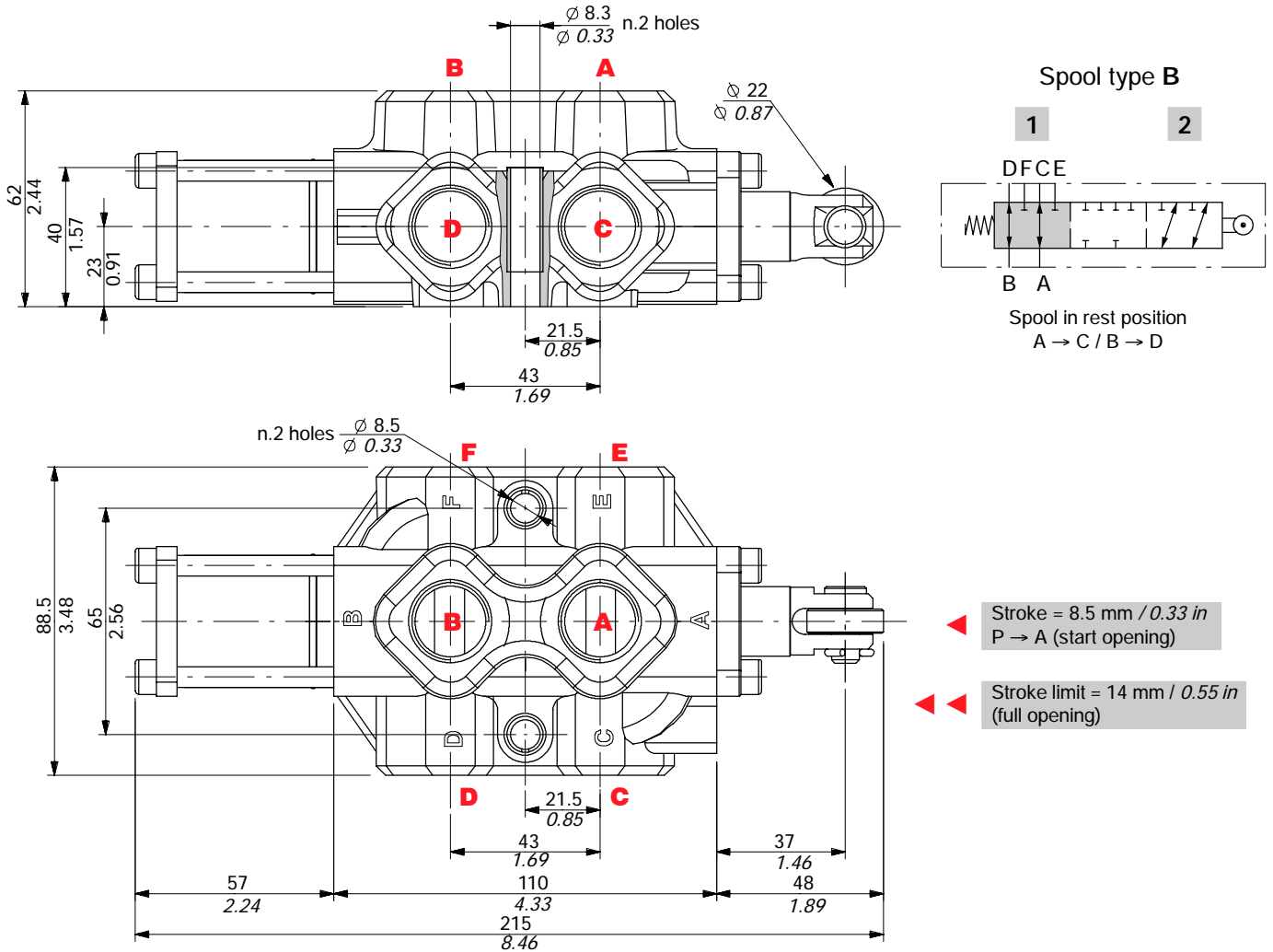
Pilot pressure ..... : min. 15 bar / 220 psi  
max. 50 bar / 725 psi



6-way DFC100/6 valve

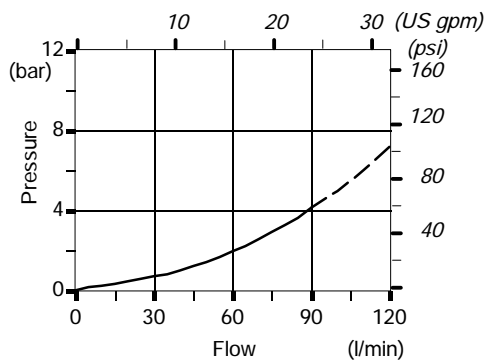
Complete description: DFC100/6B17GSLP-SAE-<CVN> code: 124080016

Valve is supplied painted as standard, with one coat of Primer black antirust paint

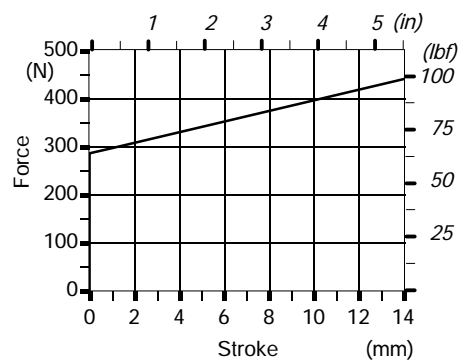


Performance data

Pressure drop versus flow P → A(B)

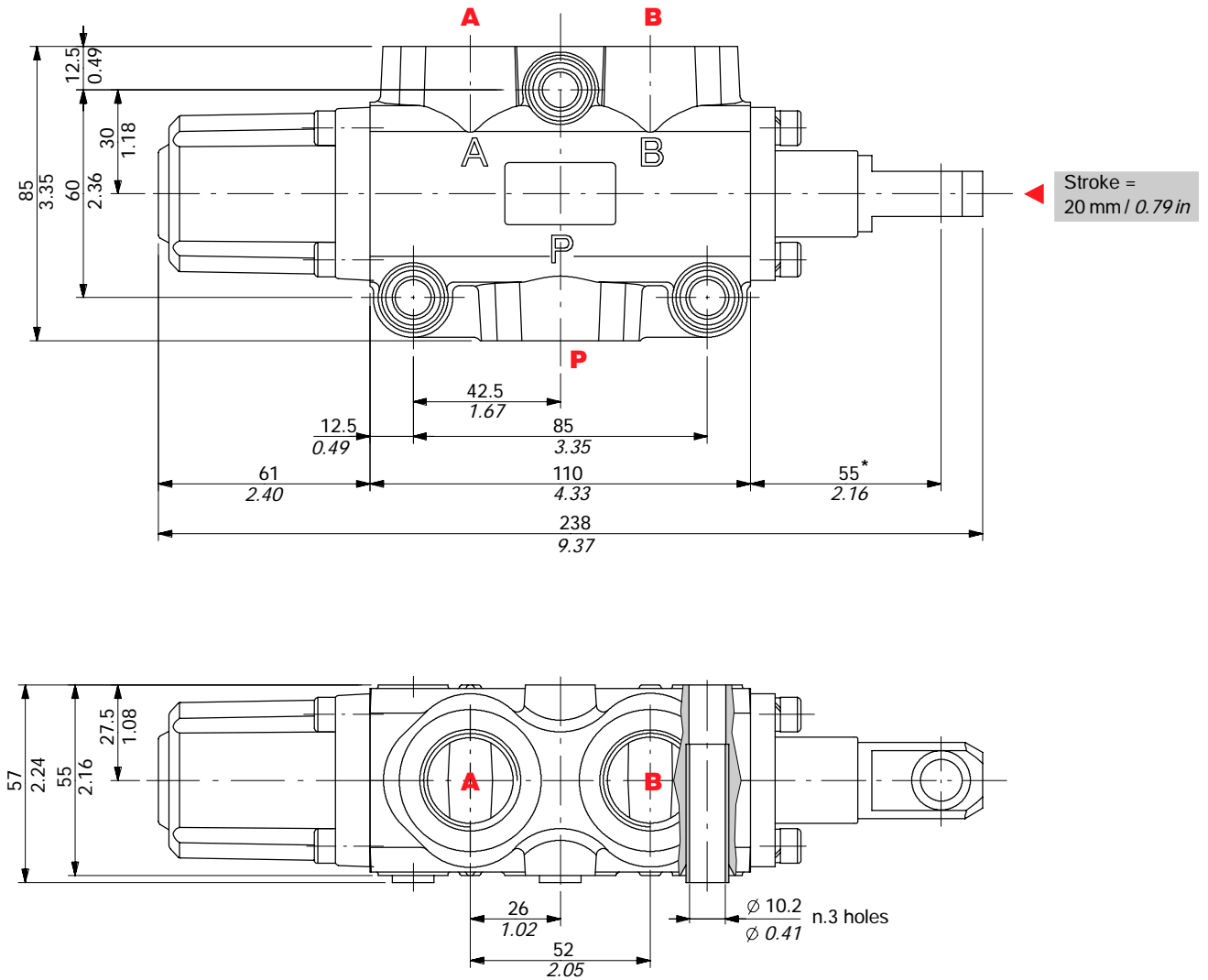


Operating force



Dimensional data

3-way DF20/3 valve







Ordering codes

Description example

Diverter valve DF20/3 A 17 SLP - SAE

1.

3.

2.

4.

2.

12

17

18P

II

1.

3.

3-way body

3-way spool

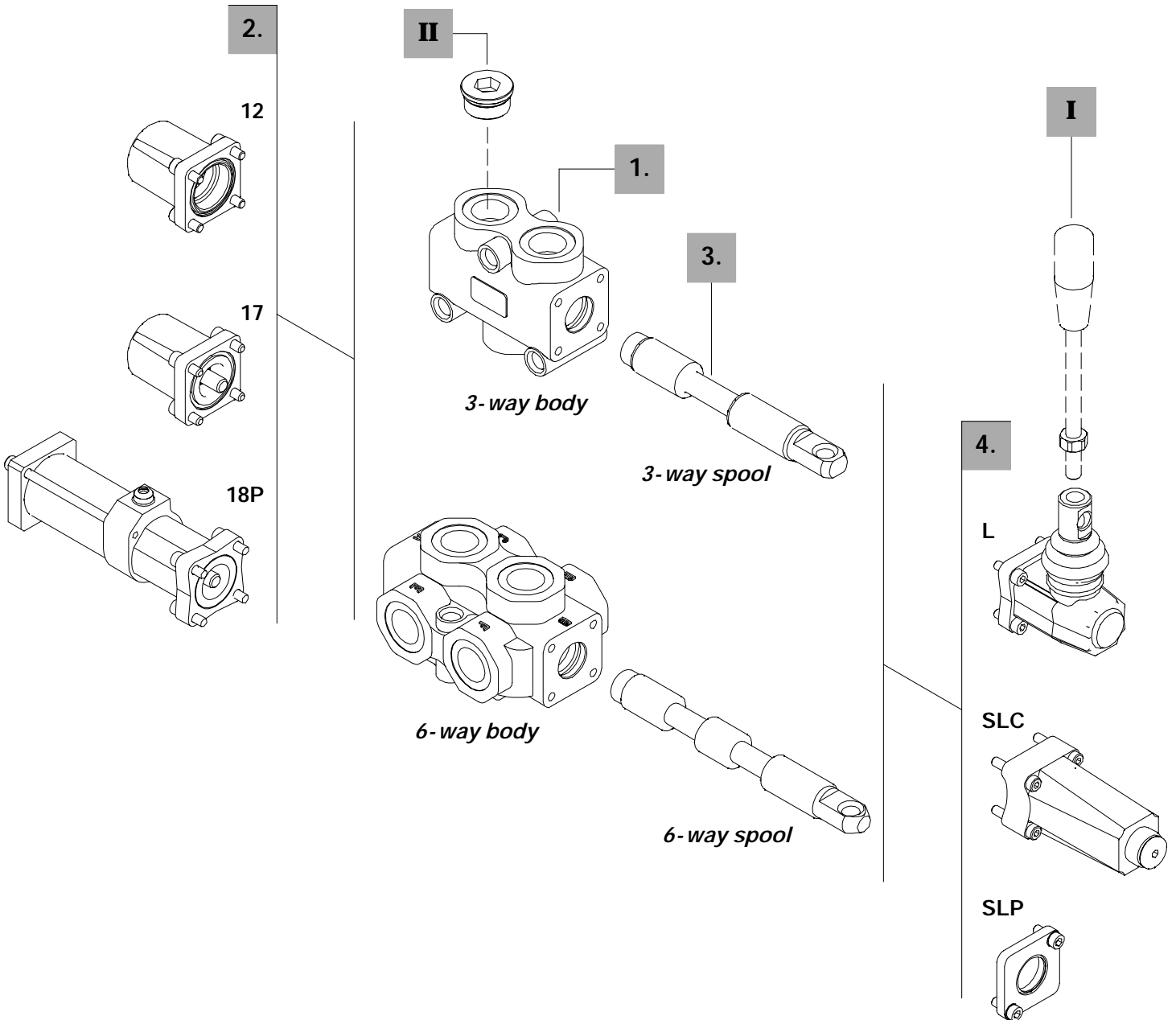
I

4.

L

SLC

SLP



### 3-way

#### 1. Body kit \*

| TYPE   | CODE       | DESCRIPTION       |
|--------|------------|-------------------|
| DF20/3 | 5CO2261700 | Standard body kit |

Include body and seals

#### 3. Spool options

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS120310 | 3-way, 2 positions with ports connected in transit position |
| B    | 3CAS120410 | 3-way, 2 positions with ports closed in transit position    |
| AC   | 3CAS120320 | As type A prearranged for cam control                       |
| BC   | 3CAS120420 | As type B prearranged for cam control                       |

### 6-way

#### 1. Body kit \*

| TYPE   | CODE       | DESCRIPTION       |
|--------|------------|-------------------|
| DF20/6 | 5CO2263700 | Standard body kit |

Include body and seals

#### 3. Spool options

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS120610 | 6-way, 2 positions with ports connected in transit position |
| B    | 3CAS120710 | 6-way, 2 positions with ports closed in transit position    |
| AC   | 3CAS120620 | As type A prearranged for cam control                       |
| BC   | 3CAS120720 | As type B prearranged for cam control                       |

#### 2. Positioner kits

page 36

| TYPE  | CODE        | DESCRIPTION   |
|-------|-------------|---|
| 12    | 5V12120000  | Detent in positions 1 and 2   |
| 17    | 5V17120000  | Spring return in position 1   |
| 18MB  | 5V18120000  | Spring return in position 2   |
| 18P   | 5V18120700  | ON/OFF pneumatic kit with spring return in position 2               |
| 18IA1 | 5V18120825* | ON/OFF high pressure hydraulic kit with spring return in position 2 |
| 18IB1 | 5V18120815* | ON/OFF low pressure hydraulic kit with spring return in position 2  |
| 18E11 | 5V18120350  | 12VDC ON/OFF electro-hydraulic kit with spring return in position 2 |
|       | 5V18120351  | 24VDC ON/OFF electro-hydraulic kit with spring return in position 2 |

#### 4. Comandi di azionamento

page 40

| TYPE | CODE        | DESCRIPTION                                 |
|------|-------------|---|
| SLP  | 5COP120000  | Without lever box with dust-proof plate kit |
| SLC  | 5COP220000  | Without lever box with endcap               |
| L    | 5LEV120000  | Standard lever box                          |
| CB   | 5CAM120020  | Cam control                                 |
| IA2  | 5IDR520700* | ON/OFF high pressure hydraulic control      |
| IB2  | 5IDR720700* | ON/OFF low pressure hydraulic control       |

#### I Optional handlever

| TYPE         | CODE      | DESCRIPTION                          |
|--------------|-----------|--------------------------------------|
| AL01/M12x200 | 170013020 | For lever L, height 200 mm / 7.87 in |

#### II Ports plug

| TYPE  | CODE         | DESCRIPTION                                 |
|-------|--------------|---|
| SAE12 | 3XTAP832200* | Body conversion from 3-way to 2-way circuit |

NOTE (\*) - Codes are referred to UN-UNF thread.

**Positioner kit**

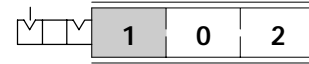
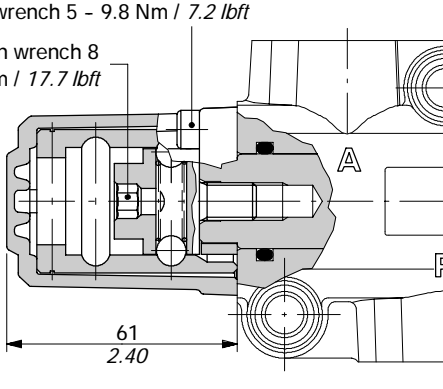
**With detent**

**12 kit**

Detent in positions 1 and 2.

Allen wrench 5 - 9.8 Nm / 7.2 lbf

Allen wrench 8  
24 Nm / 17.7 lbf



**Operating features**

Locking and unlocking force . . . . . : 420 N / 94.4 lbf ±10%

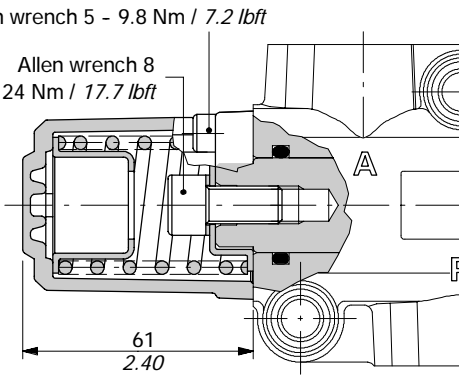
**With spring return**

**17 kit**

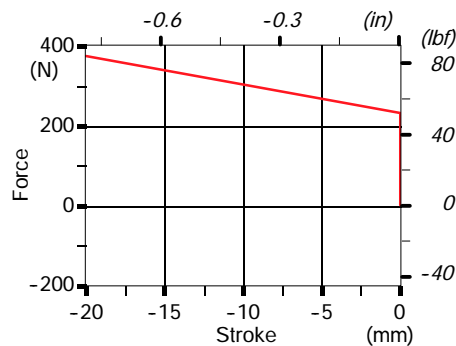
Spring return in position 1.

Allen wrench 5 - 9.8 Nm / 7.2 lbf

Allen wrench 8  
24 Nm / 17.7 lbf



**Force-Stroke diagram**

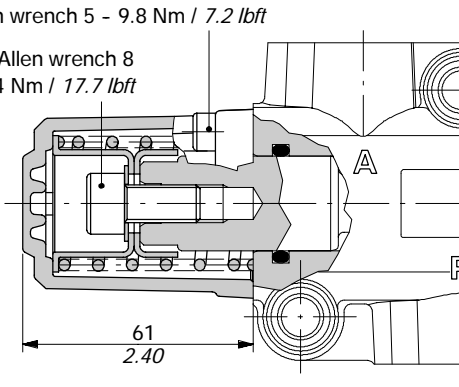


**18MB kit**

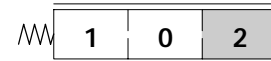
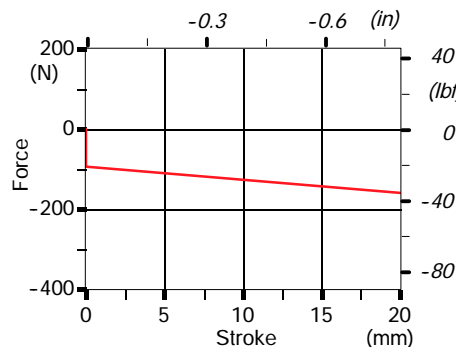
Spring return in position 2.

Allen wrench 5 - 9.8 Nm / 7.2 lbf

Allen wrench 8  
24 Nm / 17.7 lbf

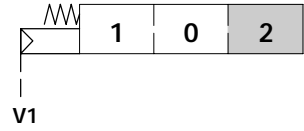
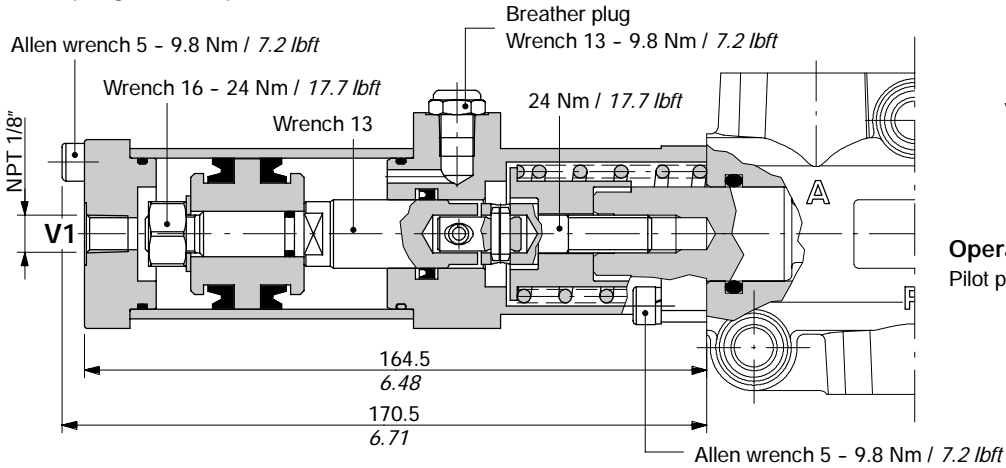


**Force-stroke diagram**



**ON/OFF pneumatic kit type 18P**

With spring return in position 2.



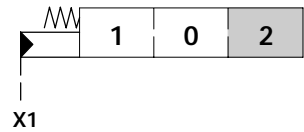
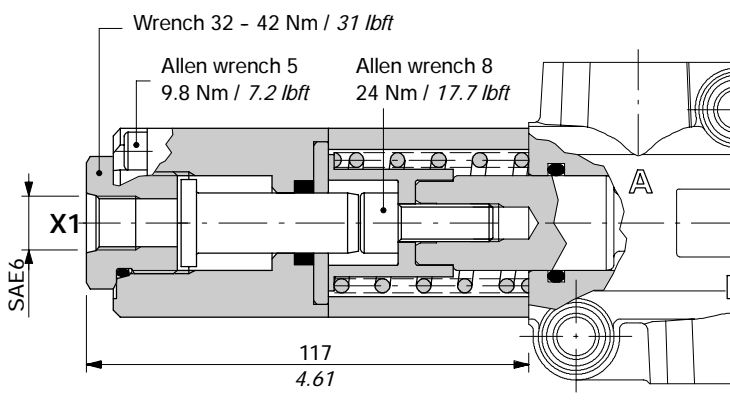
**Operating features**

Pilot pressure . . . . . : min. 6 bar / 87 psi  
max. 10 bar / 145 psi

**With ON/OFF hydraulic control**

**18IA1 kit**

With high pressure pilot and spring return to position 2.

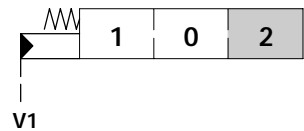
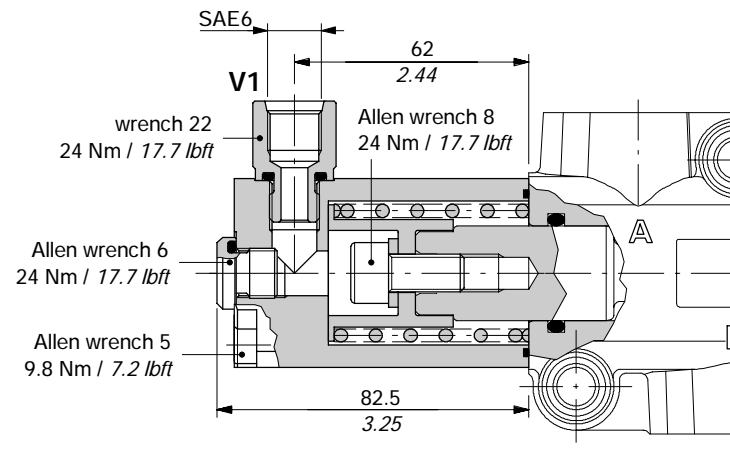


**Operating features**

Pilot pressure . . . . . : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

**18IB1 kit**

With low pressure pilot and spring return to position 2.



**Operating features**

Pilot pressure . . . . . : min. 15 bar / 220 psi  
max. 50 bar / 725 psi

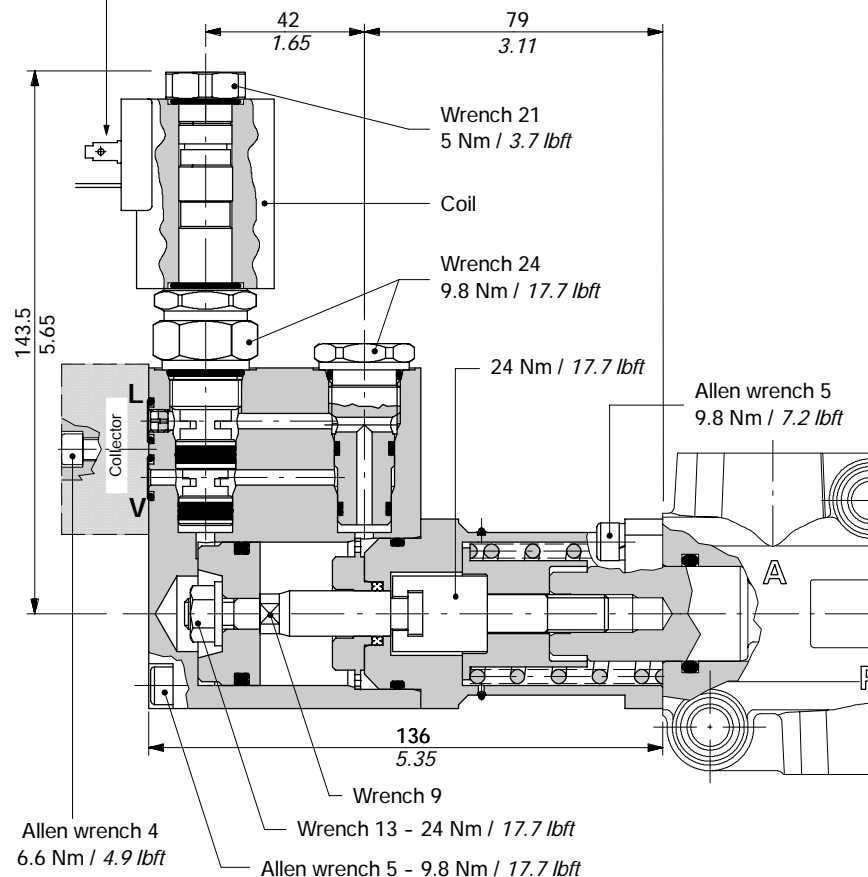
Positioner kits

ON/OFF hydraulic kit type 18E11

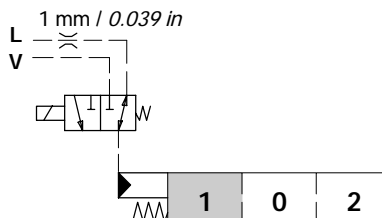
External pilot and drain, with spring return in position 2.

Connection ISO4400

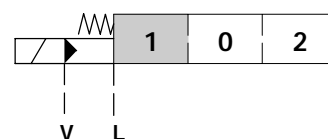
(needs C02 connector, see page 119)



Scheme



Scheme ISO 1219



Operating features

CONTROL

Pilot pressure : min. 10 bar / 145 psi

: max. 50 bar / 725 psi

Max backpressure on drain L : 4 bar / 58 psi

COIL

Nominal voltage tolerance : ±10%

Power rating : 21 W

Nominal current : 1.75 A - 12 VDC / 0.87 A - 24VDC

Coil insulation : Class F

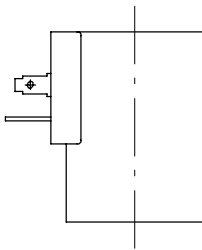
Weather protection : depending on coil model: see next page

Duty cycle : 100%

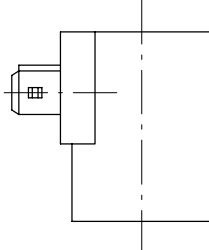
ON/OFF hydraulic kit type 18E11

| COIL CODES                     |                 |               |               |               |
|--------------------------------|-----------------|---------------|---------------|---------------|
| Voltage                        | CONNECTION TYPE |               |               |               |
|                                | ISO4400         | AMP JPT       |               | Deutsch DT    |
|                                |                 | without diode | with diode    |               |
| 12 VDC                         | 2XB1400121100   | 2XB1400121200 | 2XB1400121210 | 2XB1400120400 |
| 24 VDC                         | 2XB1400241100   | 2XB1400241200 | 2XB1400241210 | 2XB1400240400 |
| Need connector type (page 119) | C02             | C08           | C08           | C19           |

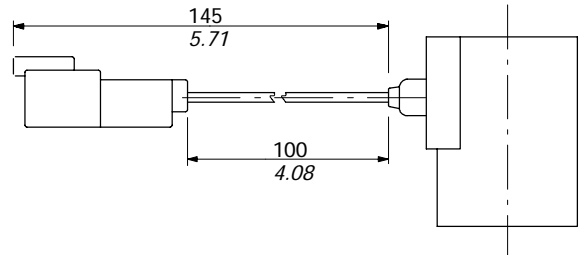
Coil with ISO4400 connection (weather protection IP65)



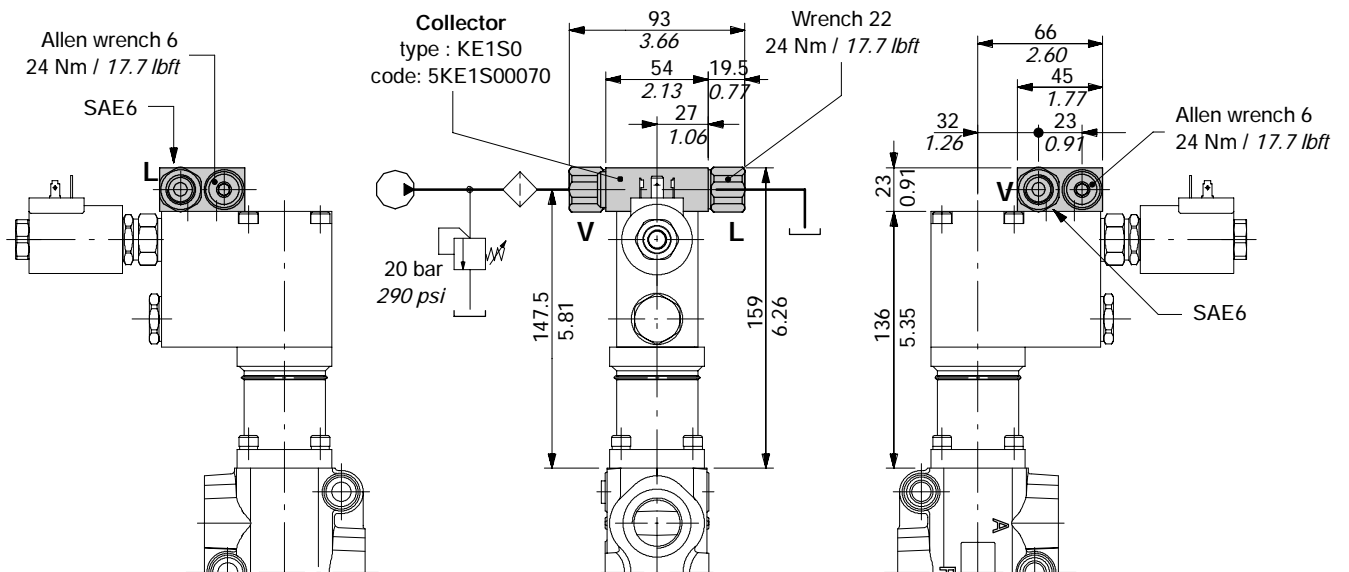
Coil with AMP JPT connection (weather protection IP65)



Coil with Deutsch DT connection (weather protection IP67)



Collector kit for external pilot and drain



Description example:  
DF20/3A18E11SLC/SAE-KE1S0-12VDC

Control kits

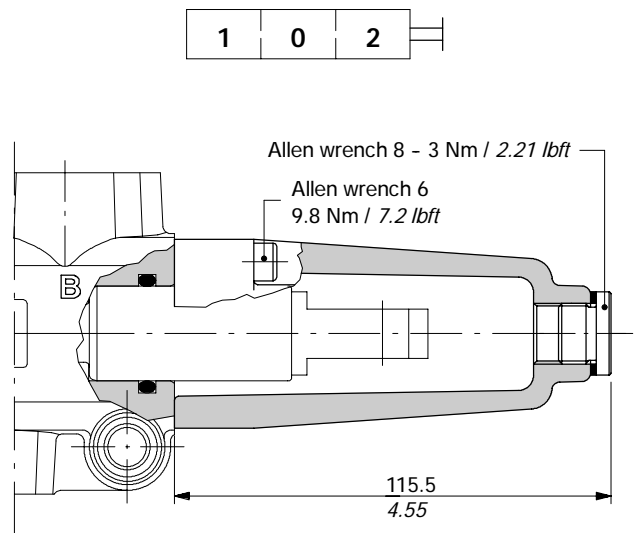
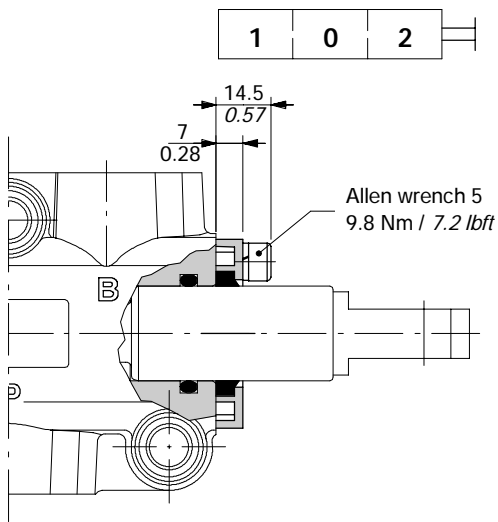
Controls prearrangement

SLP kit

Mechanical control with dust-proof plate.

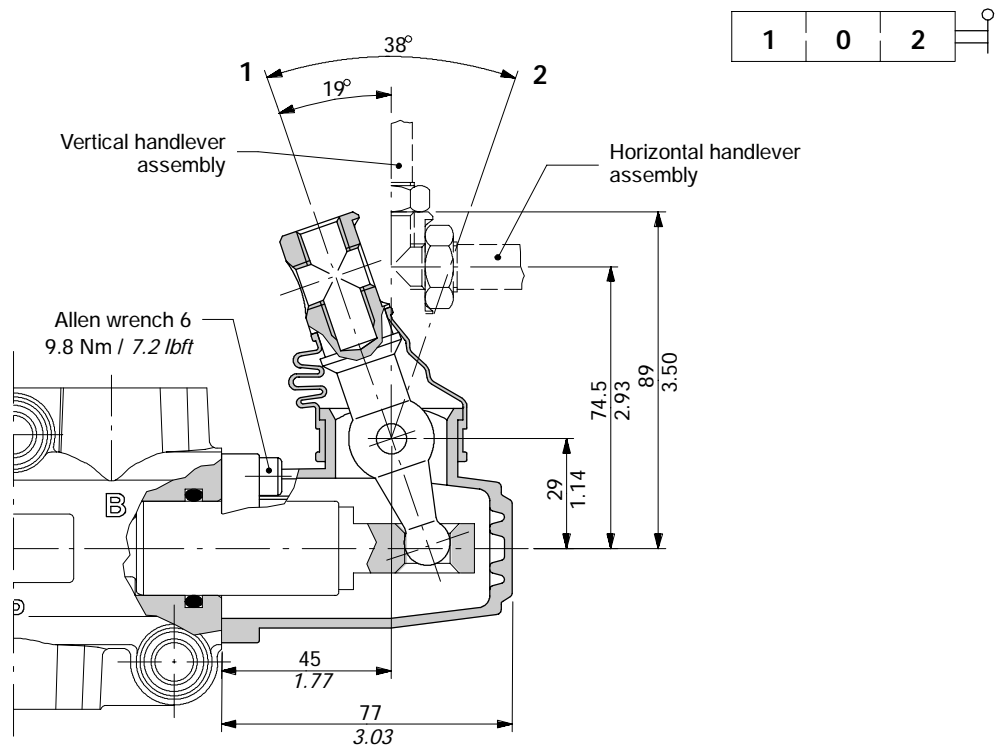
SLC kit

Protection cap usable with pneumatic and hydraulic spool positioner kits.



L lever control

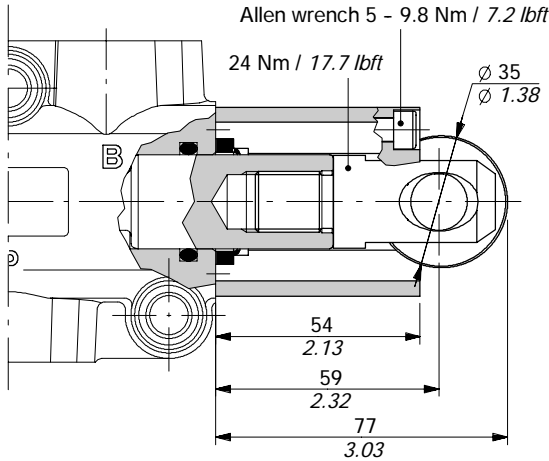
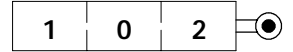
Alumium with protection boot lever pivot box; it can be rotated 180° (execution L180).





**CB cam control**

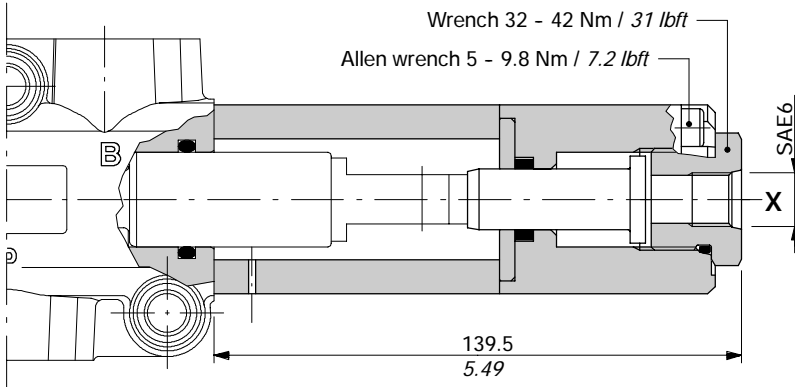
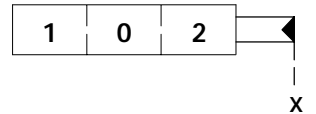
With bronze bearing; it must be coupled to 17 kit (see page 36).



**ON/OFF hydraulic controls**

**IA2 kit**

With high pressure pilot; it must be coupled to 17 kit (see page 36).

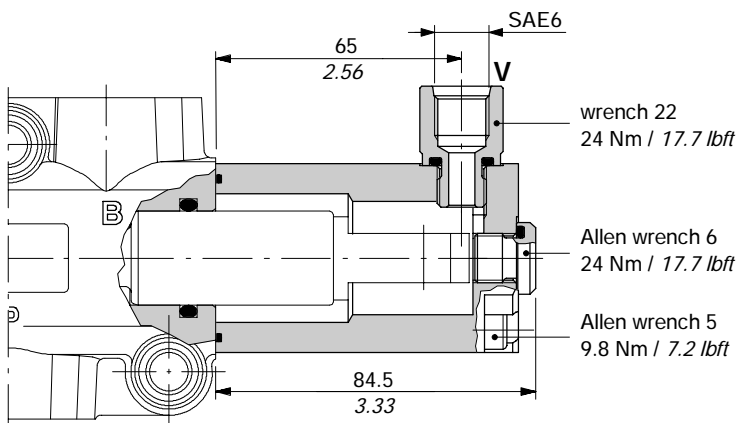
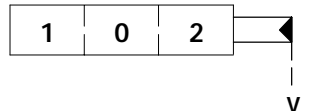


**Operating features**

Pilot pressure . . . . . : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

**IB2 kit**

With low pressure pilot; it must be coupled to 17 kit (see page 36).

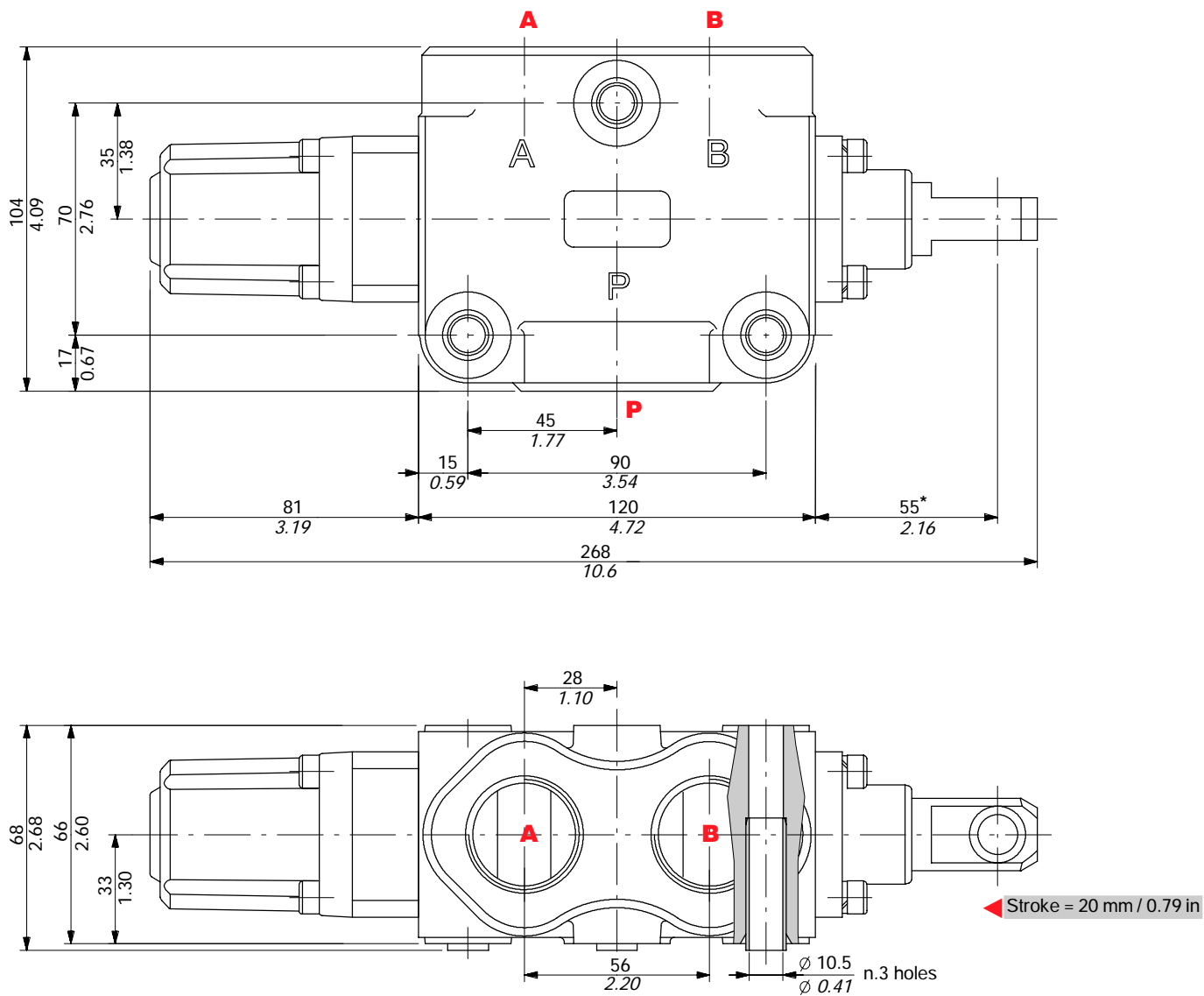


**Operating features**

Pilot pressure . . . . . : min. 15 bar / 220 psi  
max. 50 bar / 725 psi

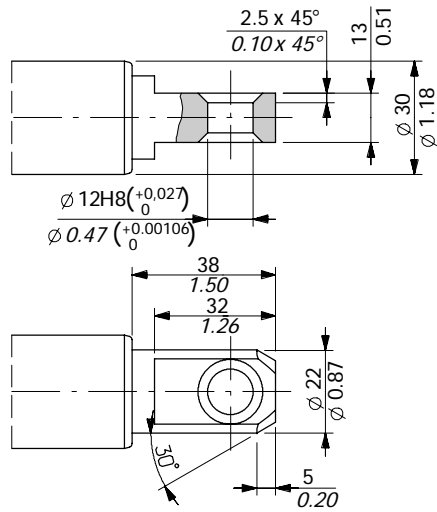
Dimensional data

3-way DF25/3 valve

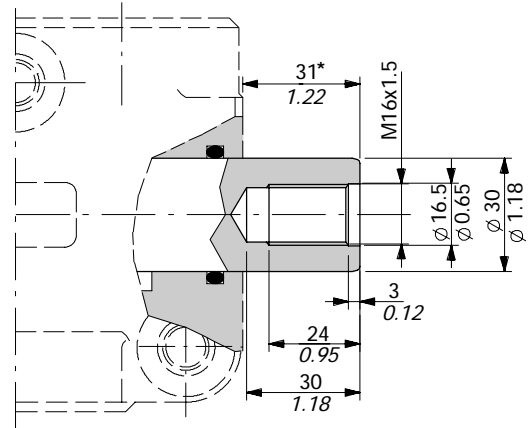


Spool end

Standard end



Rotary cam prearrangement

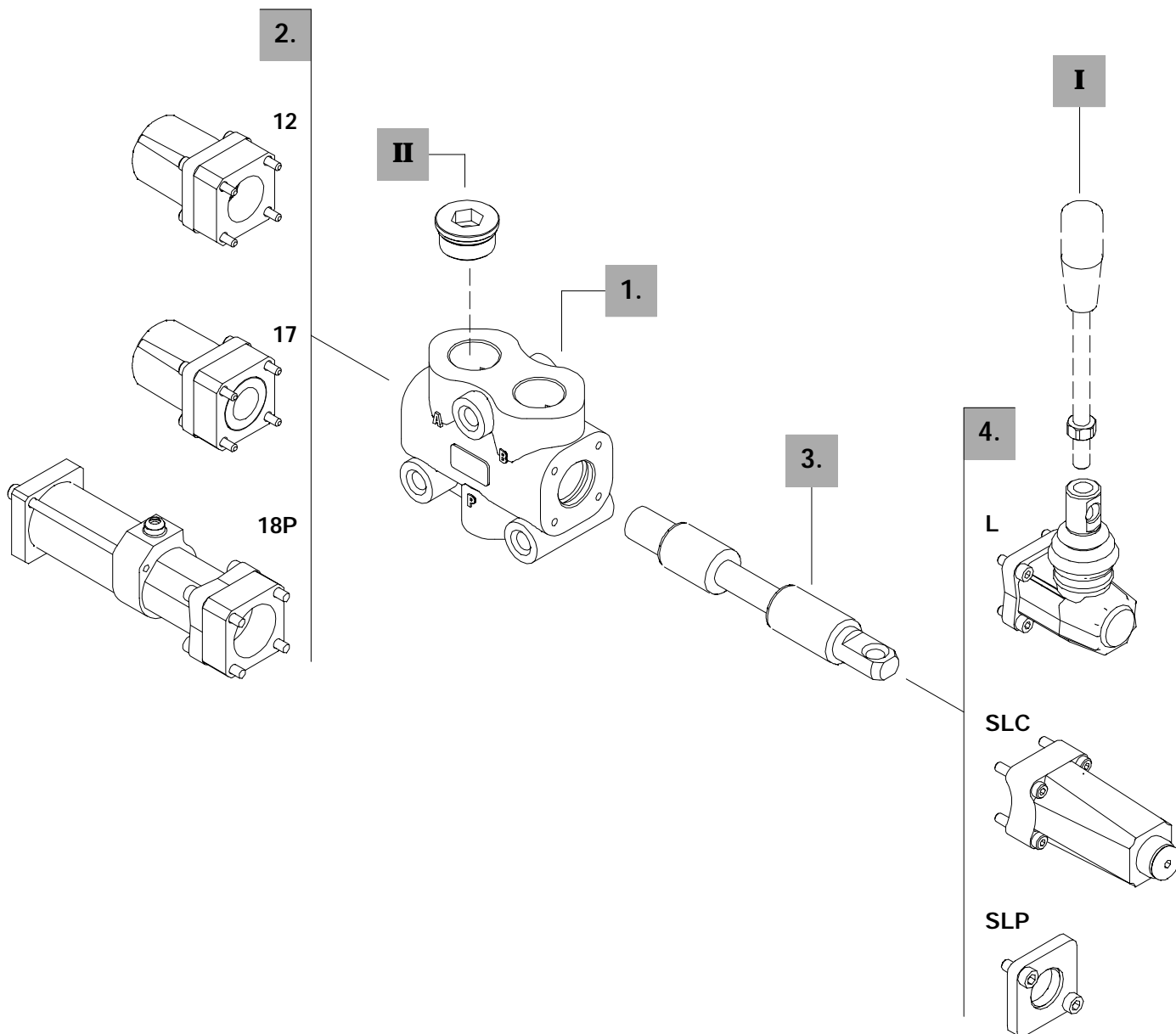
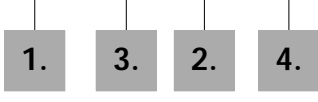


NOTA (\*) - With spool out (positioner kit type 17)

Ordering codes

Description example :

Diverter valve DF25/3 A 17 SLP - SAE



**3-way**
**1. Body kit \***

| TYPE   | CODE       | DESCRIPTION       |
|--------|------------|-------------------|
| DF25/3 | 5CO2271700 | Standard body kit |

*Include body and seals*

**3. Spool options**

| TIPO | CODICE     | DESCRIZIONE   |
|------|------------|---|
| A    | 3CAS125310 | 3-way, 2 positions with ports connected in transit position |
| B    | 3CAS125410 | 3-way, 2 positions with ports closed in transit position    |
| AC   | 3CAS125320 | As type A prearranged for cam control                       |
| BC   | 3CAS125420 | As type B prearranged for cam control                       |

**2. Positioner kits** *page 46*

| TYPE  | CODE       | DESCRIPTION   |
|-------|------------|---|
| 12    | 5V12125000 | Detent in positions 1 and 2   |
| 17    | 5V17125000 | Spring return in position 1   |
| 18P   | 5V18125700 | ON/OFF pneumatic kit with spring return in position 2               |
| 18E11 | 5V18125350 | 12VDC ON/OFF electro-hydraulic kit with spring return in position 2 |
|       | 5V18125351 | 24VDC ON/OFF electro-hydraulic kit with spring return in position 2 |

**4. Control kits** *page 50*

| TYPE | CODE        | DESCRIPTION                                 |
|------|-------------|---|
| SLP  | 5COP125000  | Without lever box with dust-proof plate kit |
| SLC  | 5COP220000  | Without lever box with endcap               |
| L    | 5LEV120000  | Standard lever box                          |
| CB   | 5CAM125020  | Cam control                                 |
| IA2  | 5IDR520700* | ON/OFF high pressure hydraulic control      |
| IB2  | 5IDR720700* | ON/OFF low pressure hydraulic control       |

**I Optional handlever**

| TYPE         | CODE      | DESCRIPTION                          |
|--------------|-----------|--------------------------------------|
| AL01/M12x200 | 170013020 | For lever L, height 200 mm / 7.87 in |

**II Ports plug**

| TYPE  | CODE         | DESCRIPTION                                 |
|-------|--------------|---|
| SAE16 | 3XTAP838200* | Body conversion from 3-way to 2-way circuit |

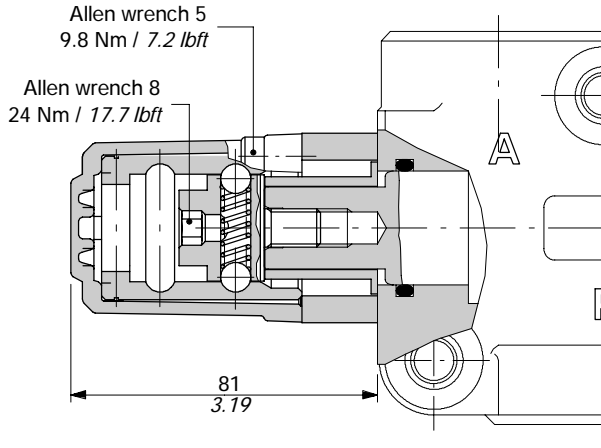
NOTE (\*) - Codes are referred to **UN-UNF** thread.

Positioner kits

With detent

12 kit

Detent in positions 1 and 2.



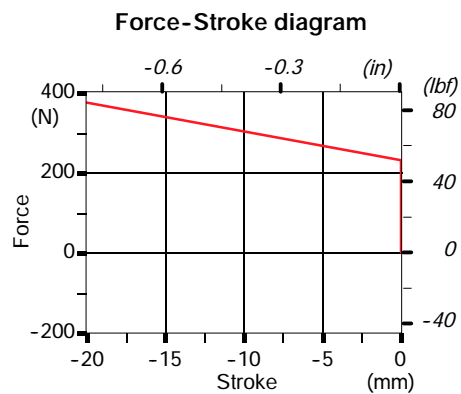
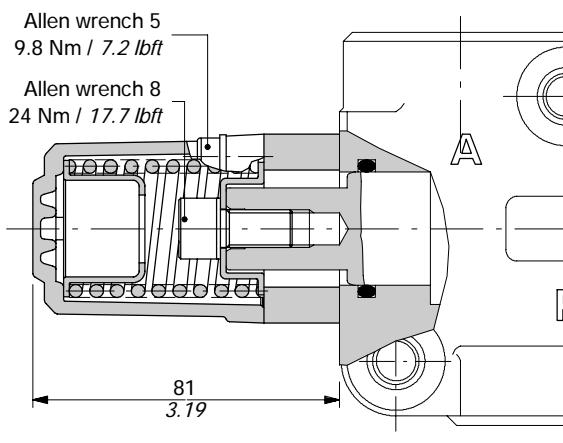
Operating features

Locking and unlocking force ..... : 420 N / 94.4 lbf ±10%

With spring return

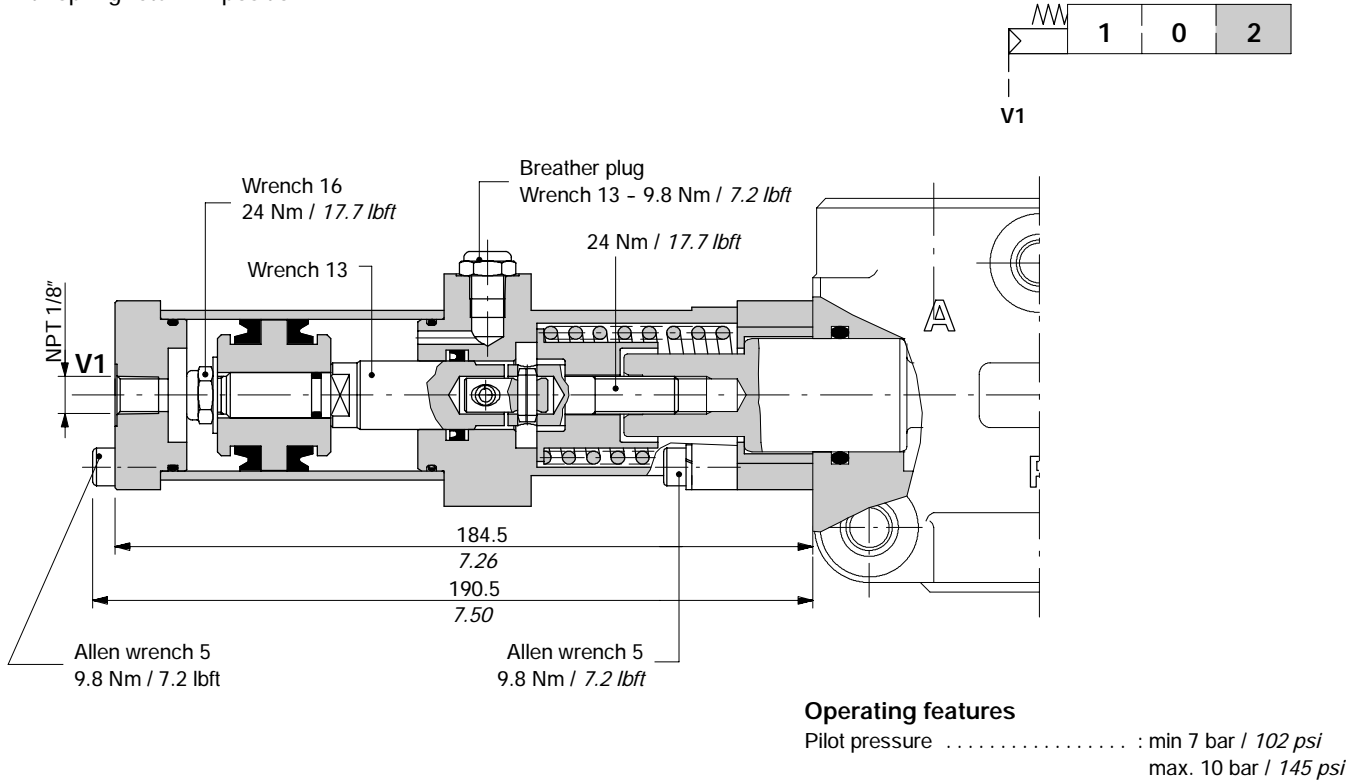
17 kit

Spring return in position 1.



**ON/OFF pneumatic kit type 18P**

With spring return in position 2.



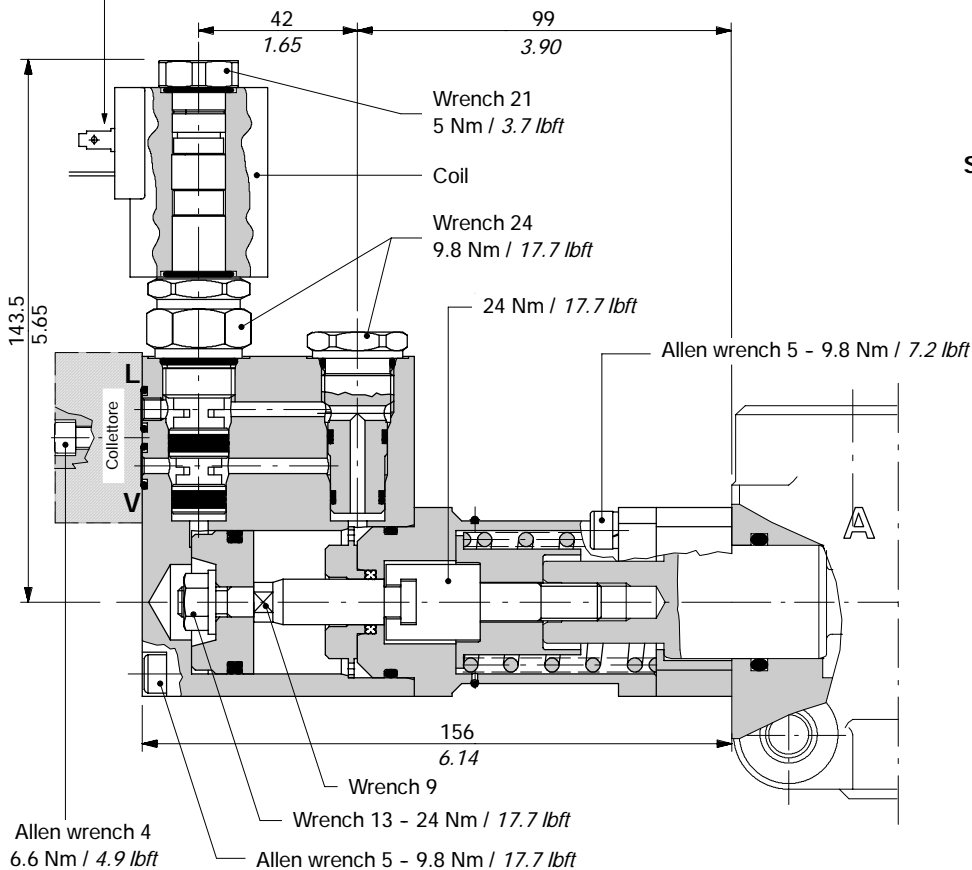
Positioner kits

ON/OFF hydraulic kit type 18E11

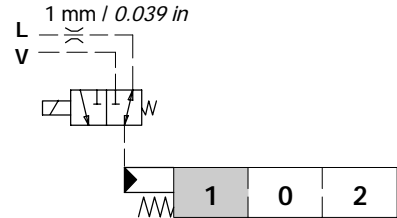
External pilot and drain, with spring return in position 2.

Connection ISO4400

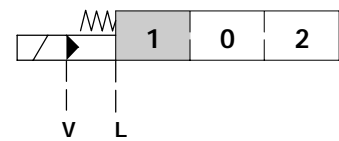
(needs C02 connector, see page 119)



Scheme



Scheme ISO 1219



Operating features

CONTROL

- Pilot pressure : min. 10 bar / 145 psi
- : max. 50 bar / 725 psi
- Max backpressure on drain L : 4 bar / 58 psi

COIL

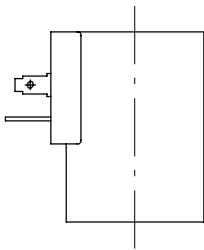
- Nominal voltage tolerance : ±10%
- Power rating : 21 W
- Nominal current : 1.75 A - 12 VDC / 0.87 A - 24VDC
- Coil insulation : Class F
- Weather protection : depending on coil model: see next page
- Duty cycle : 100%



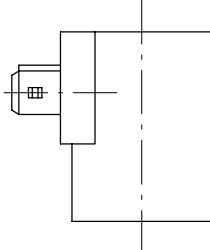
ON/OFF hydraulic kit type 18E11

| COIL CODES                     |                 |               |               |               |
|--------------------------------|-----------------|---------------|---------------|---------------|
| Voltage                        | CONNECTION TYPE |               |               |               |
|                                | ISO4400         | AMP JPT       |               | Deutsch DT    |
|                                |                 | without diode | with diode    |               |
| 12 VDC                         | 2XB1400121100   | 2XB1400121200 | 2XB1400121210 | 2XB1400120400 |
| 24 VDC                         | 2XB1400241100   | 2XB1400241200 | 2XB1400241210 | 2XB1400240400 |
| Need connector type (page 119) | C02             | C08           | C08           | C19           |

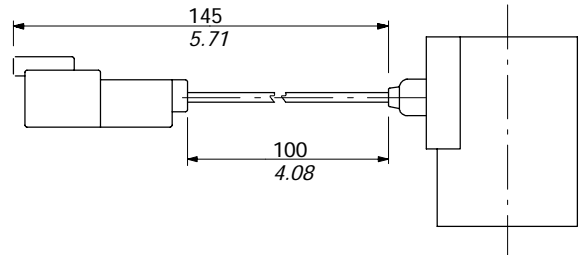
Coil with ISO4400 connection (weather protection IP65)



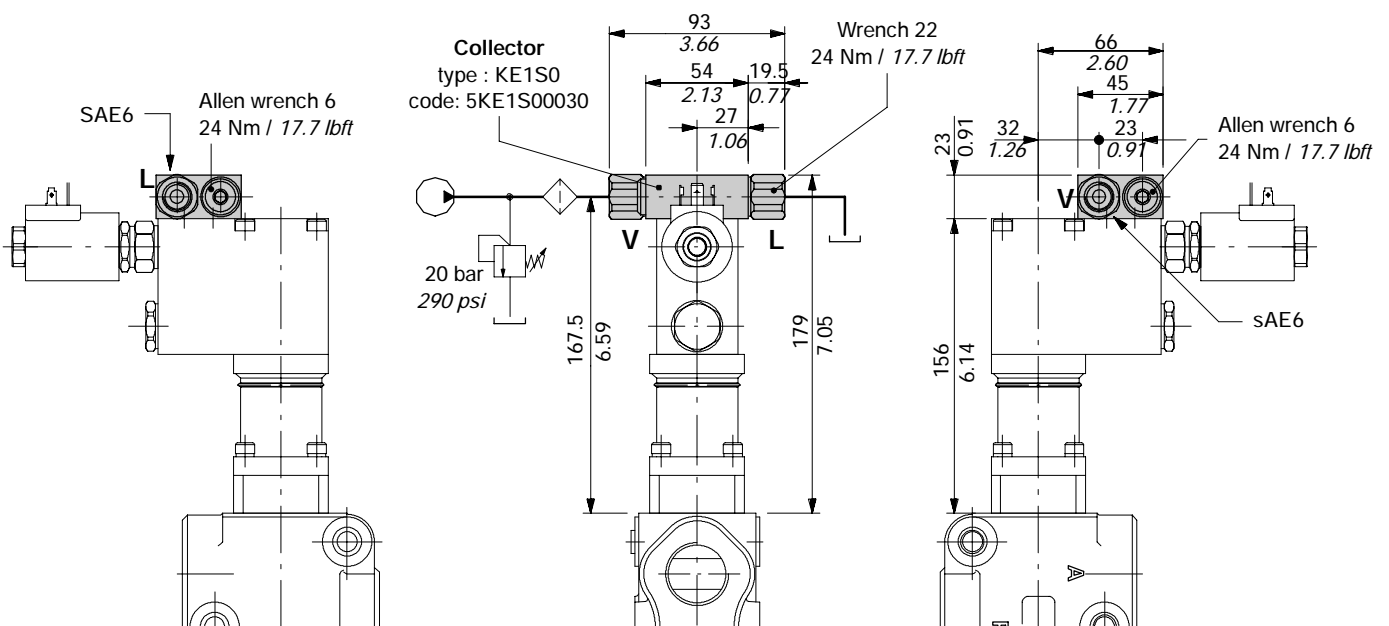
Coil with AMP JPT connection (weather protection IP65)



Coil with Deutsch DT connection (weather protection IP67)



Collector kit for external pilot and drain



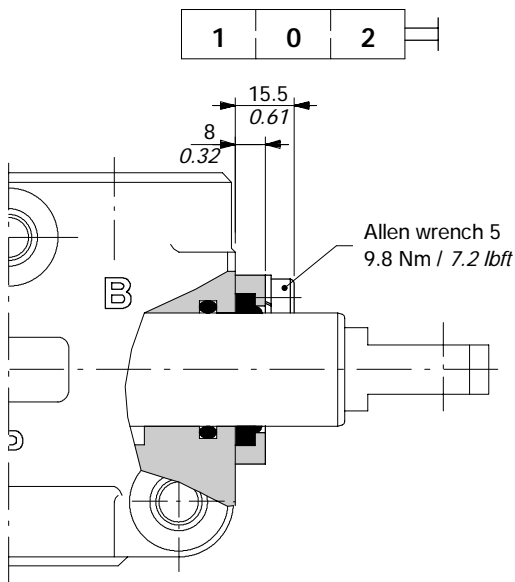
Description example:  
DF25/3A18E11SLC/SAE-KE1S0-12VDC

Control kits

Controls prearrangement

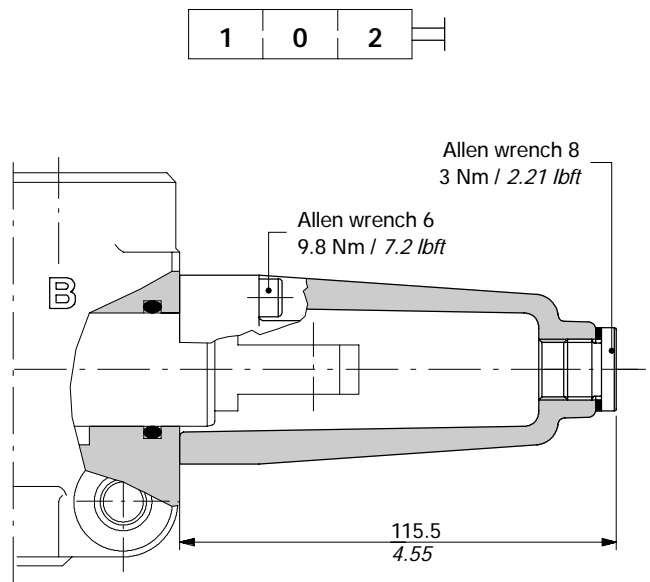
SLP kit

Mechanical control with dust-proof plate.



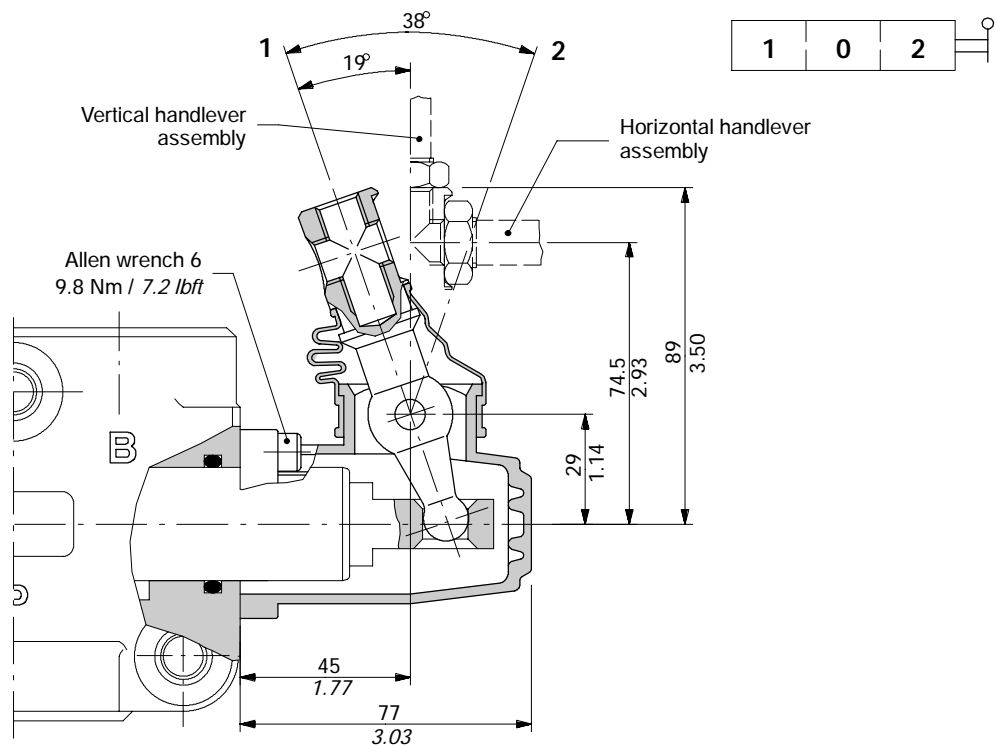
SLC kit

Protection cap usable with pneumatic and hydraulic spool positioner kits.



L lever control

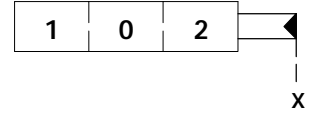
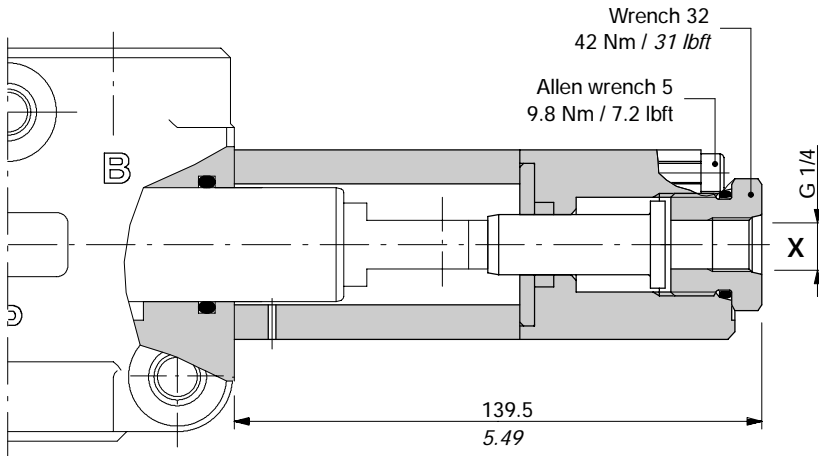
Alumium with protection boot lever pivot box; it can be rotated 180° (execution L180).



ON/OFF hydraulic controls

IA2 kit

With high pressure pilot; it must be coupled to 17 kit (see page 46).

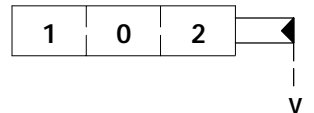
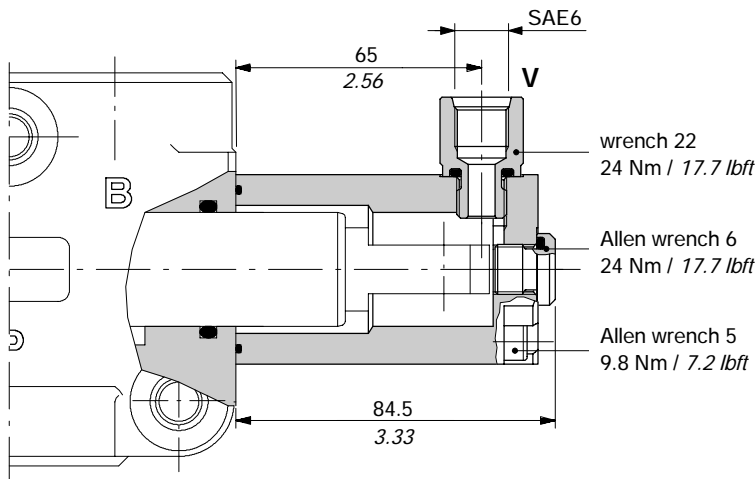


**Operating features**

Pilot pressure . . . . . : min. 30 bar / 435 psi  
max. 250 bar / 3600 psi

IB2 kit

With low pressure pilot; it must be coupled to 17 kit (see page 46).



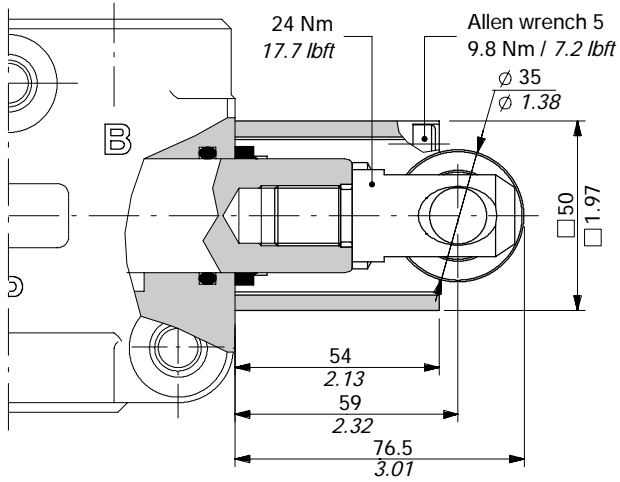
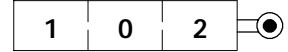
**Operating features**

Pilot pressure . . . . . : min. 15 bar / 220 psi  
max. 50 bar / 725 psi

Positioner kits

CB cam control

With bronze bearing; it must be coupled to 17 kit (see page 46).



**Content**

Working conditions ..... 54

Hydraulic circuit ..... 55

**DFE052**

    Dimensional data ..... 60

    Ordering codes ..... 64

    Positioner kits ..... 67

    Solenoid parts ..... 68

**DFE10**

    Dimensional data ..... 69

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**DFE110**

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    Solenoid parts ..... 83

## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature.

|  |  | DFE052   | DFE10  | DFE20  | DFE110   |
|--|--|--|--|--|--|
| N. of available ways                       |  | 2-3-6-8  | 3-6  | 3-6  | 12   |
| Nominal flow rating                        | <i>in steady conditions</i>                                      | 60 l/min<br>16 US gpm                                | 90 l/min<br>24 US gpm                                | 140 l/min<br>37 US gpm                               | 90 l/min<br>24 US gpm                                |
| Operating pressure (maximum) *             | <i>without drain</i>   | 200 bar - 2900 psi                                   |  |  |  |
|  | <i>with drain</i>  | 315 bar - 4600 psi                                   |  |  |  |
| Available nominal voltage                  | VDC  | 12-24<br>48-110                                      | 12-24-48   | 12-24  | 12-24  |
|  | VAC 50Hz<br>(with C04 connector)                                 | 24-110-220   | 110-220  | 24-110-220   | 24-110-220   |
| Nominal power                              | W  | 38   | 60   | 60   | 60   |
| Internal leakage A(B)→T                    | $\Delta p=100$ bar 1450 psi with fluid and valve at 40°C - 104°F | 7 cm <sup>3</sup> /min<br>0.43 in <sup>3</sup> /min  | 10 cm <sup>3</sup> /min<br>0.61 in <sup>3</sup> /min | 15 cm <sup>3</sup> /min<br>0.92 in <sup>3</sup> /min | 10 cm <sup>3</sup> /min<br>0.61 in <sup>3</sup> /min |
| Hydraulic fluid                            |  | Mineral base oil                                     |  |  |  |
| Fluid temperature                          | <i>with NBR seals</i>  | from -20°C to 80°C / from -4°F to 176°F              |  |  |  |
|  | <i>with FPM seals</i>  | from -20°C to 100°C / from -4°F to 212°F             |  |  |  |
| Viscosity                                  | <i>operating range</i>   | from 15 to 75 mm <sup>2</sup> /s / from 15 to 75 cSt |  |  |  |
|  | <i>minimum</i>   | 12 mm <sup>2</sup> /s / 12 cSt                       |  |  |  |
|  | <i>maximum</i>   | 400 mm <sup>2</sup> /s / 400 cSt                     |  |  |  |
| Max. level of contamination                |  | -/19/16 - ISO 4406 / NAS 1638 - class10              |  |  |  |
| Ambient temperature for working conditions |  | from -20°C to 50°C / from -4°F to 122°F              |  |  |  |

NOTE - For different working conditions please contact Sales Dept.

(\*) - This value is reachable only in steady conditions; for dynamic working conditions see the related pages.

## Standard threads

### REFERENCE STANDARDS

|                     |     | BSP                    | UN-UNF            | METRIC                 |         |
|---------------------|-----|------------------------|-------------------|------------------------|---------|
| THREAD ACCORDING TO |     | ISO 228/1              | ISO 263           | ISO 262                | ISO 262 |
|                     |     | BS 2779                | ANSI B1.1 unified |                        |         |
| CAVITY ACCORDING TO | ISO | 1179                   | 11926             | 9974-1                 | 6149    |
|                     | SAE |                        | J1926             |                        | J2244   |
|                     | DIN | 3852-2<br>shape X or Y |                   | 3852-1<br>shape X or Y |         |

### PORTS THREAD

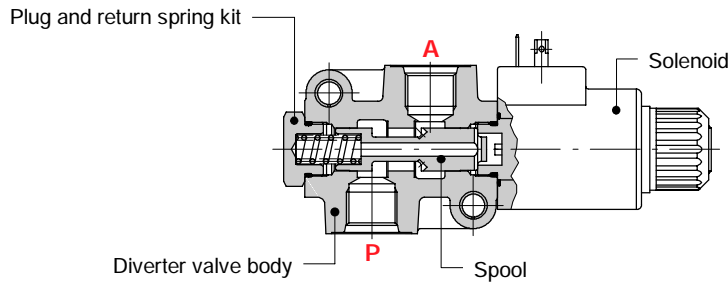
| ALL PORTS         | BSP   | UN-UNF                             | METRIC<br>(ISO 9974-1) | METRIC<br>(ISO 6149) |
|-------------------|-------|------------------------------------|------------------------|----------------------|
| DFE052            | G 3/8 | 3/4-16 (SAE 8)                     | M18x1,5                |                      |
| DFE10             | G 1/2 | 7/8-14 (SAE 10)                    |                        |                      |
| DFE20             | G 3/4 | 1 1/16-12 (SAE 12)                 |                        |                      |
| DF110             | G 1/2 | 7/8-14 (SAE 10)                    | M22x1.5                | M22x1.5              |
| <b>DRAIN PORT</b> |       |                                    |                        |                      |
| L                 | G 1/4 | 9/16-18 (SAE 6)<br>7/16-20 (SAE4)* | M12x1.5                | M12x1.5              |

(\*) For DFE052/8 and series DFE20 diverter valves

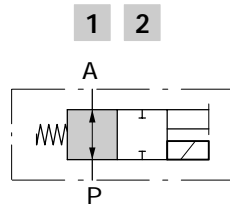
Optional threads: for availability contact Sales Department

**2-way**

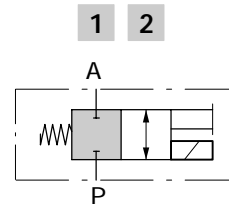
Available as body only in DFE052/2 execution; for other executions 3-way body is used.



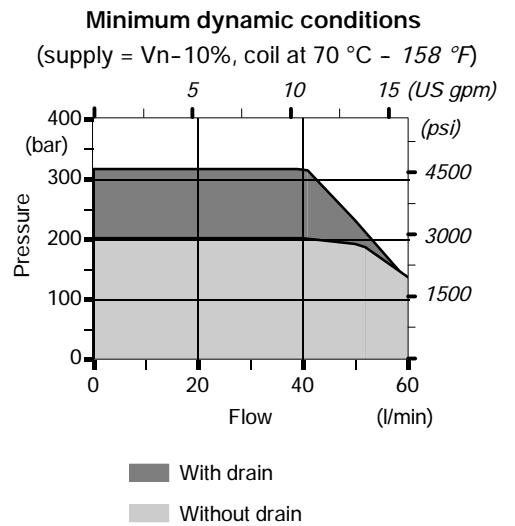
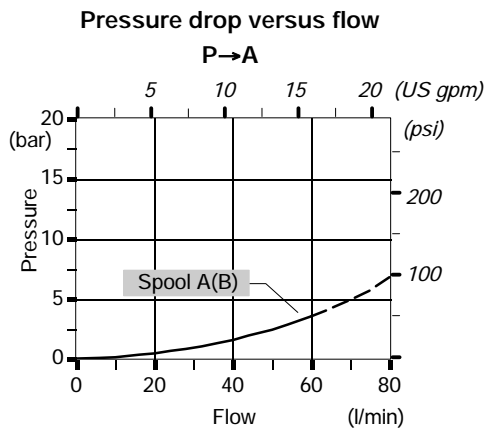
**Spool type A**



**Spool type B**



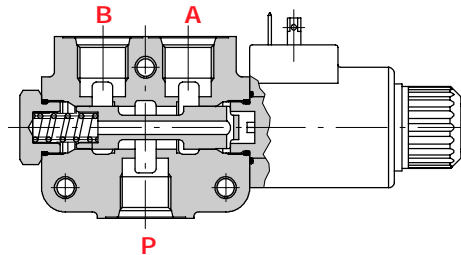
**Performance data**



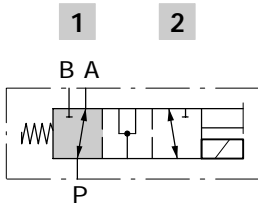
Hydraulic circuit

3-way

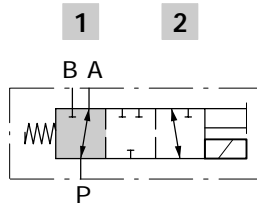
It's possible to obtain 2-way diverter valve plugging port A or B.



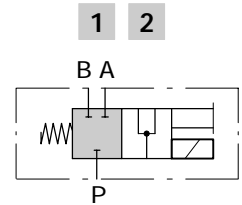
Spool type A



Spool type B

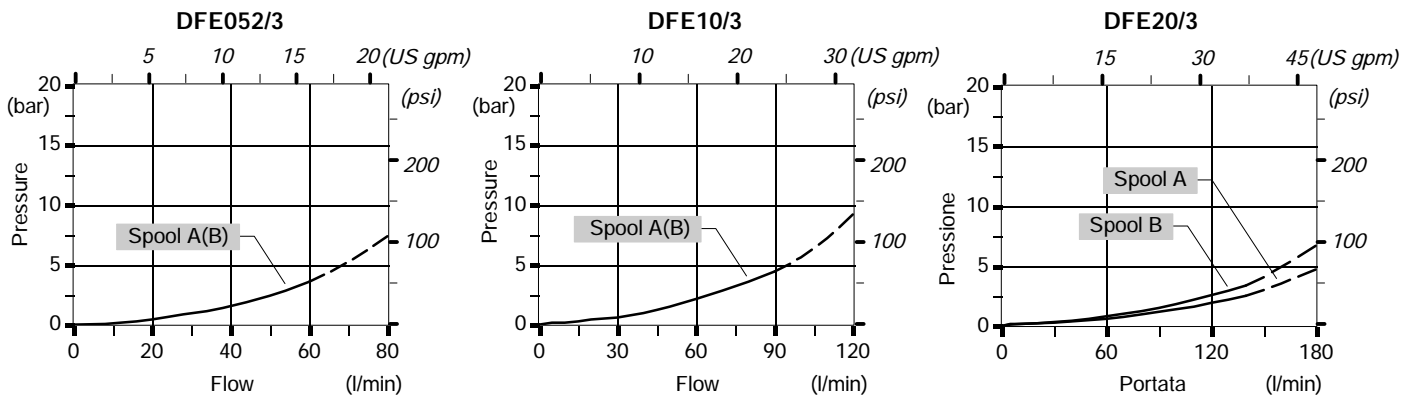


Spool type D

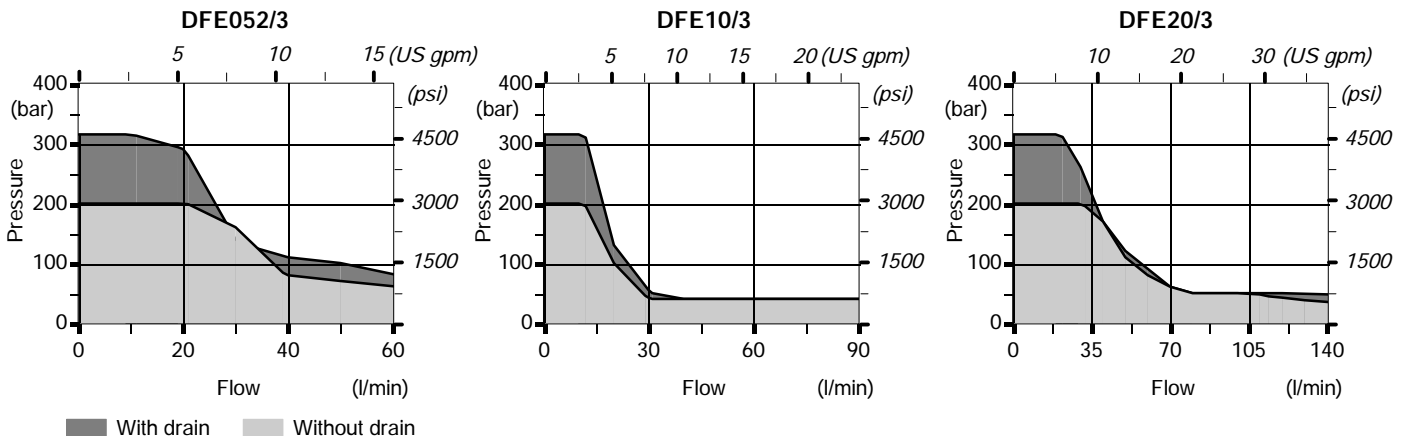


Performance data

Pressure drop versus flow: P→A(B)

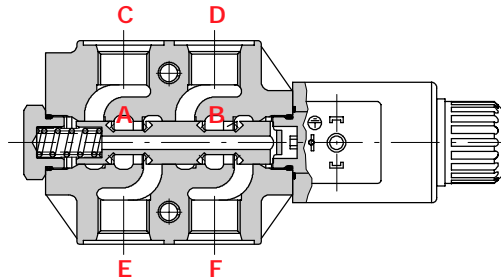


Minimum dynamic conditions: (supply = Vn-10%, coil at 70 °C - 158 °F)

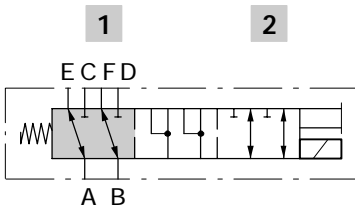




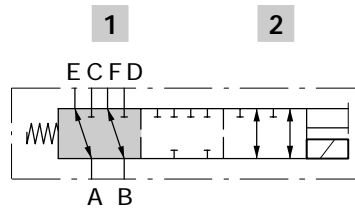
6-way



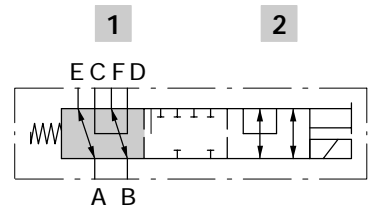
Spool type A



Spool type B

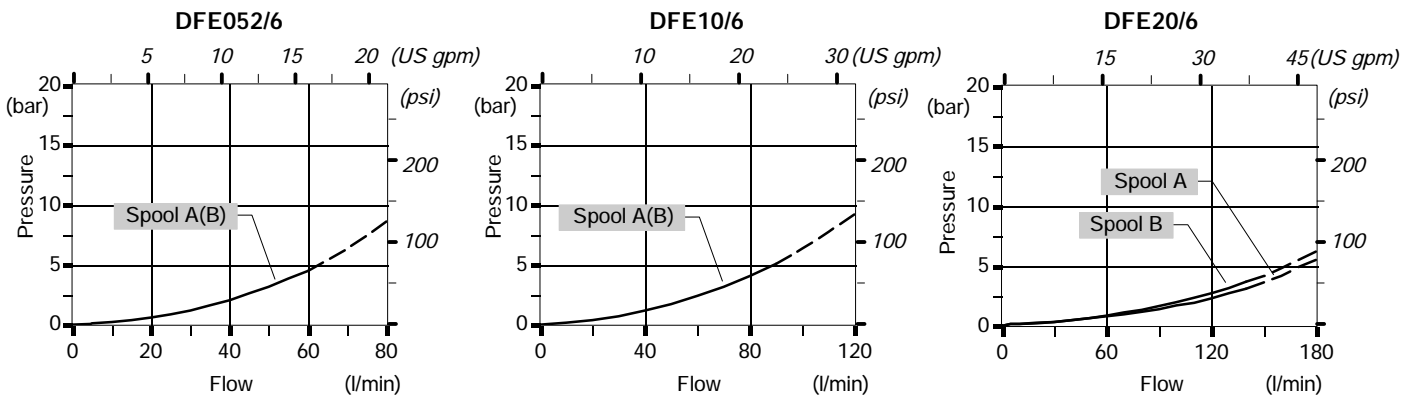


Spool type H

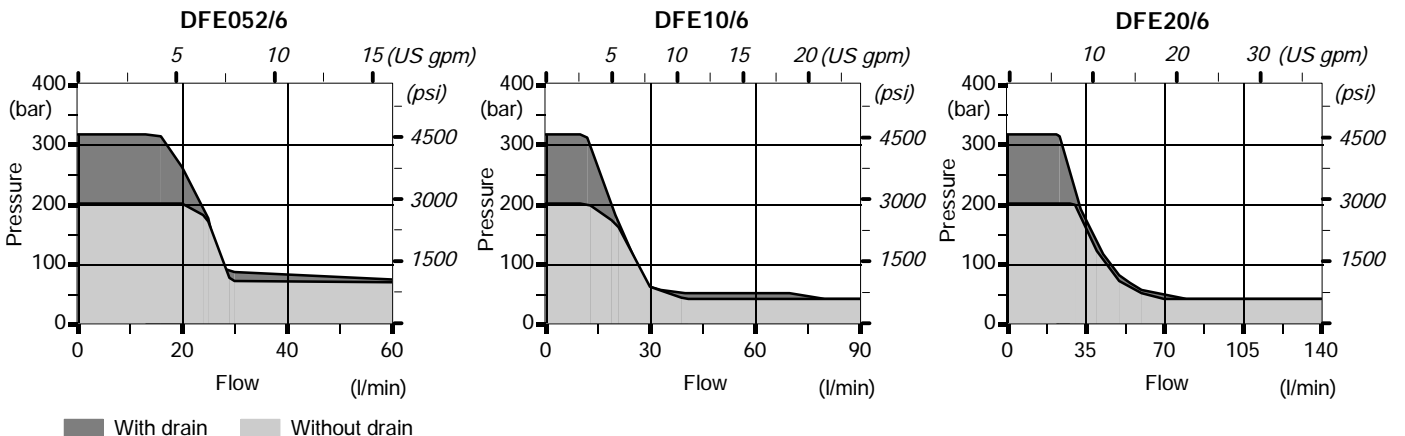


Performance data

Pressure drop versus flow: A→E(C).

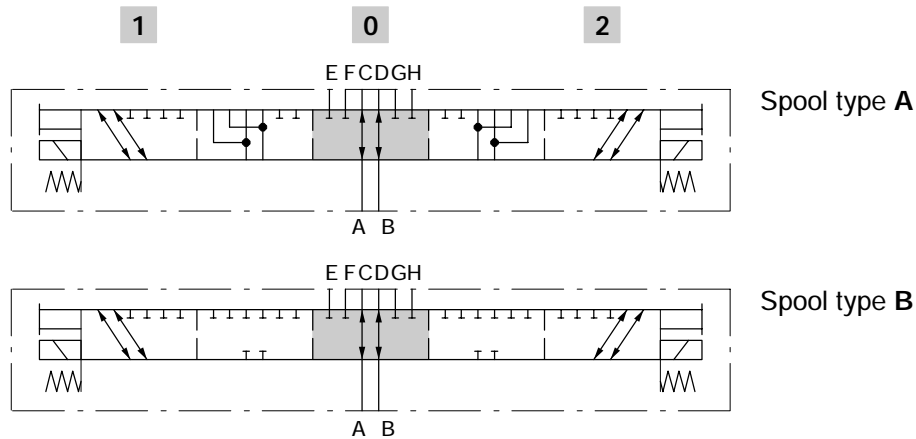
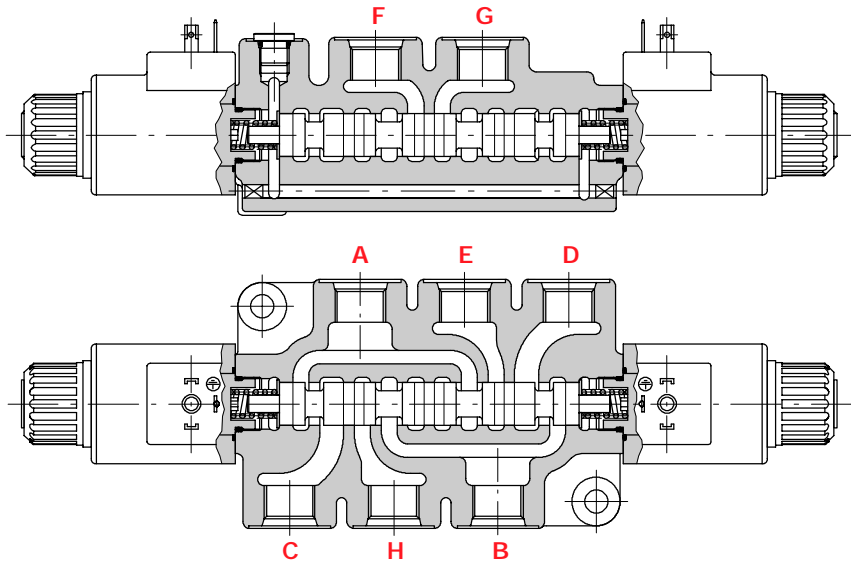


Minimum dynamic conditions: (supply =  $V_n - 10\%$ , coil at 70 °C - 158 °F)

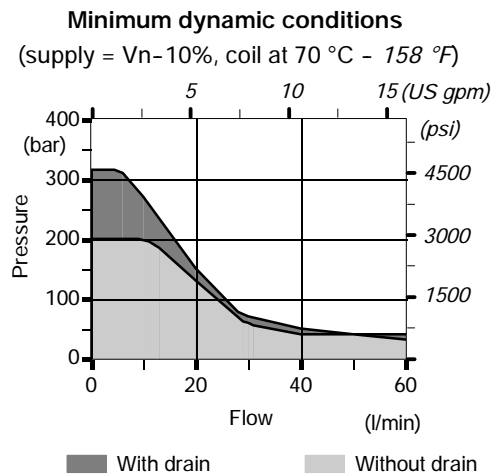
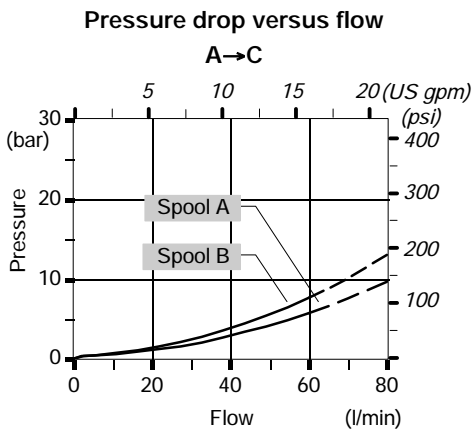


HYdraulic circuit

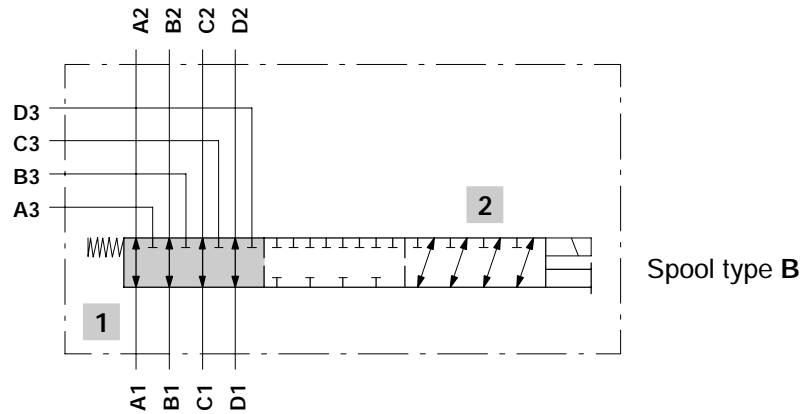
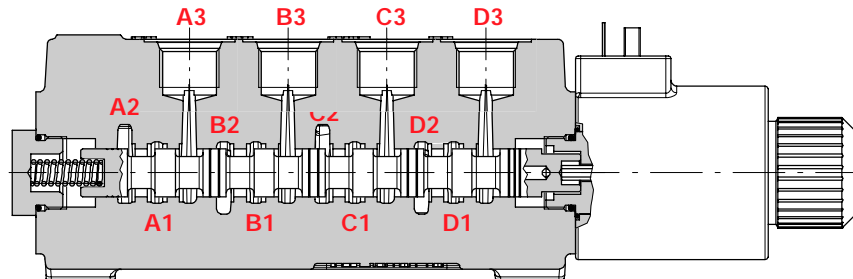
8-way



Performance data

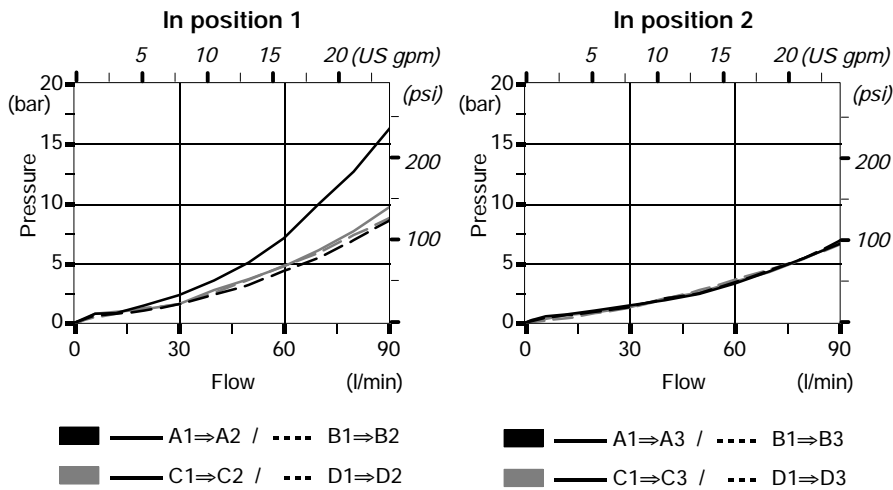


12-way

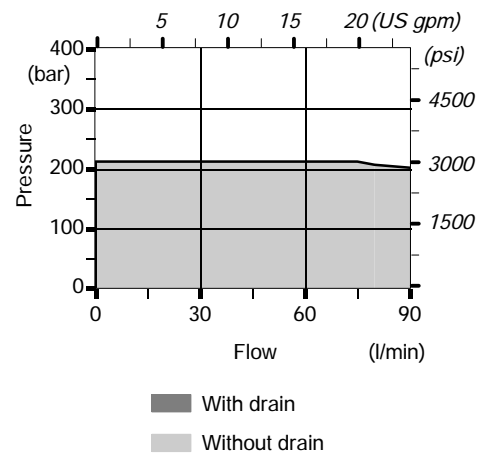


Performance data

Pressure drop versus flow

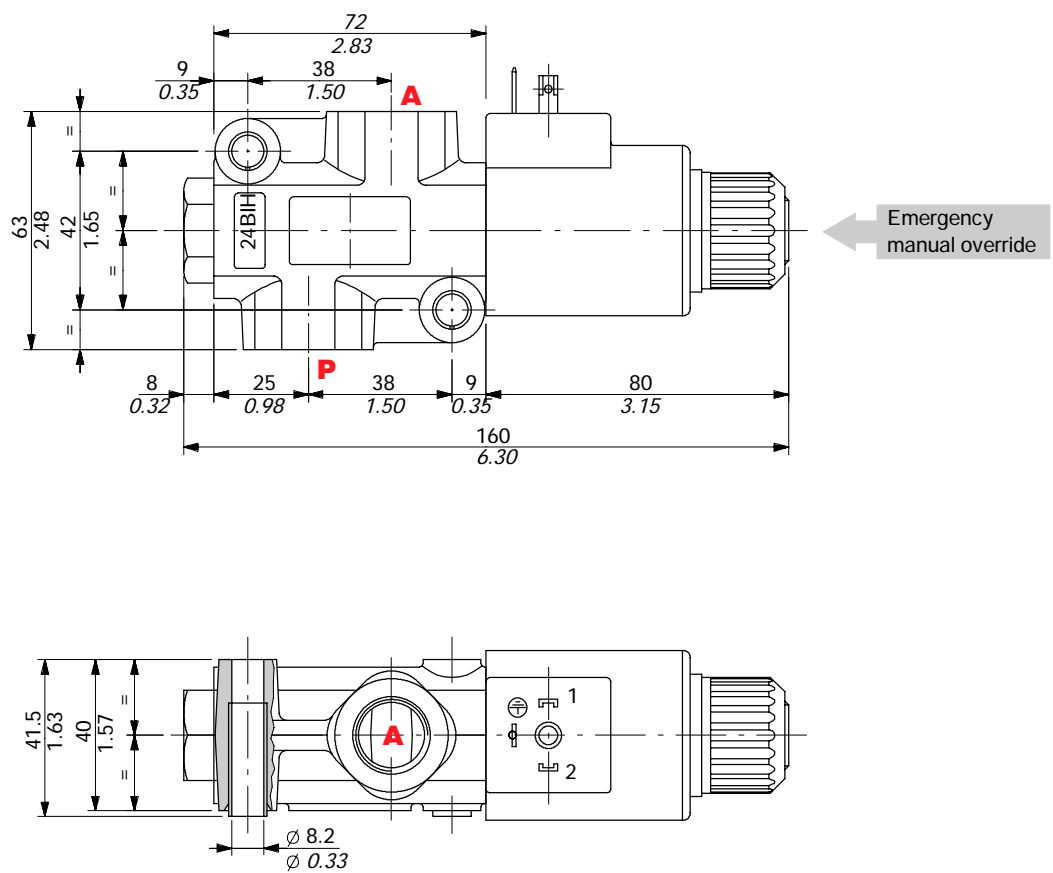


Minimum dynamic conditions  
(supply =  $V_n - 10\%$ , coil at  $70\text{ }^\circ\text{C} - 158\text{ }^\circ\text{F}$ )

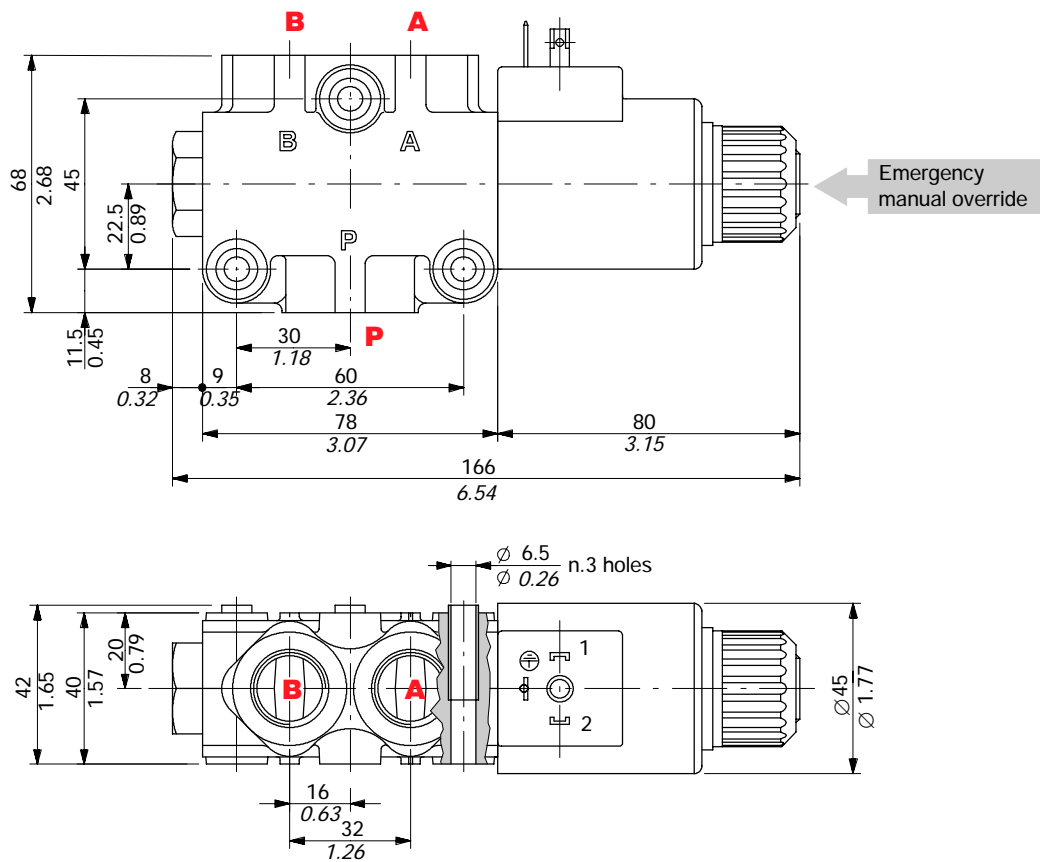


Dimensional data

2-way DFE052/2 valve

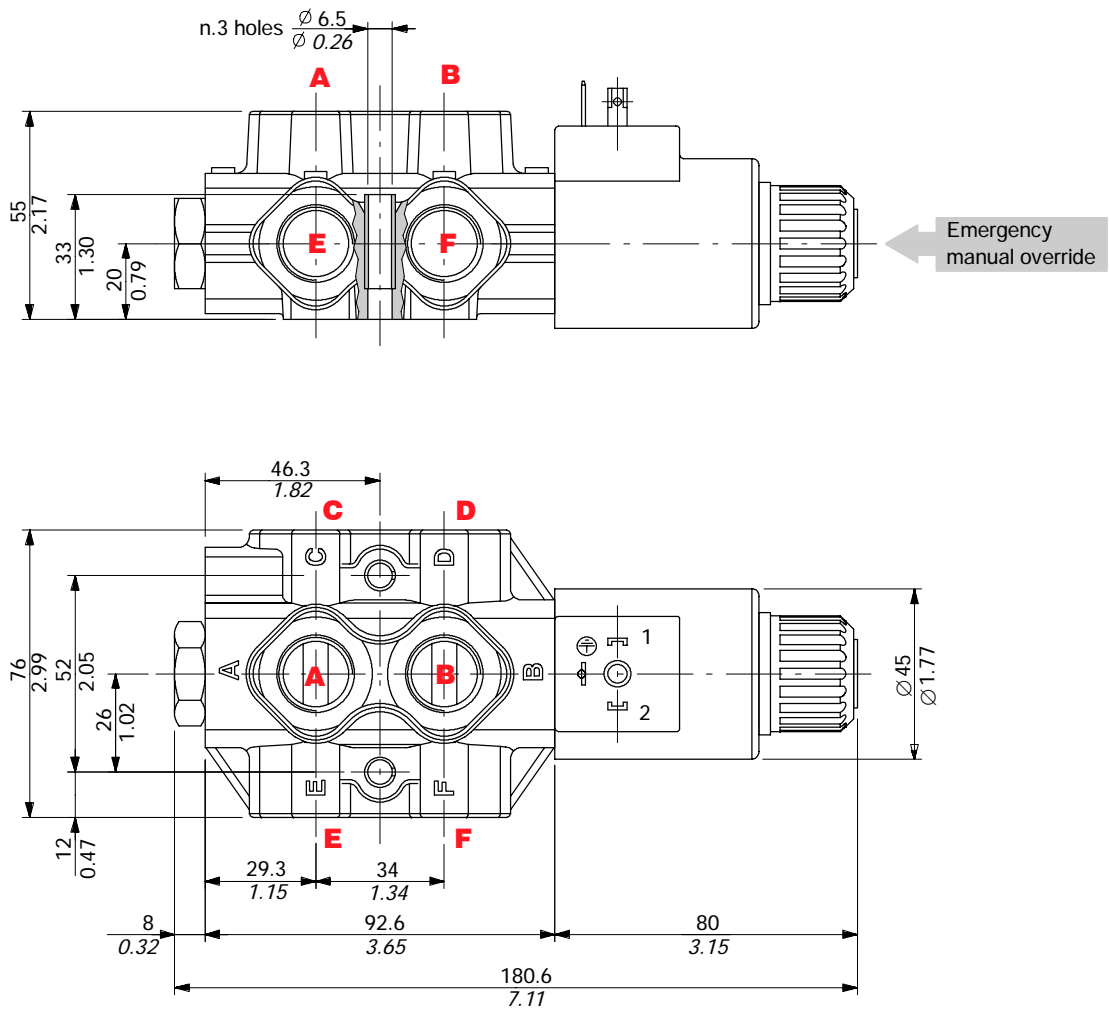


**3-way DFE052/3 valve**



Dimensional data

6-way DFE052/6 valve

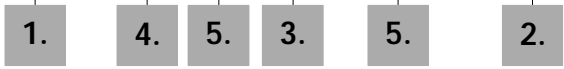




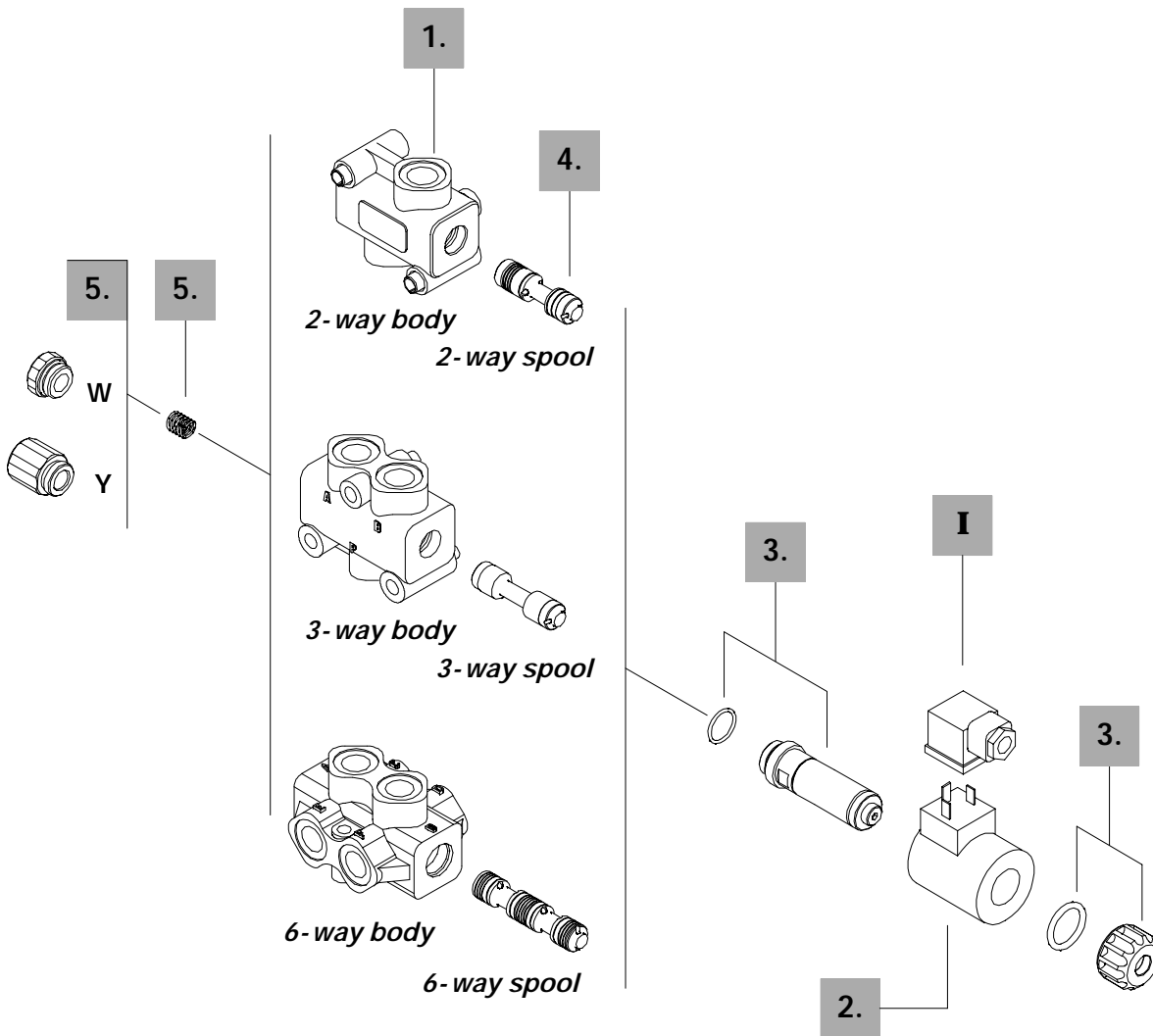
Ordering codes

DEscription example :

Diverter valve DFE052/2 A 18 ES - W 201-12VDC - SAE - <CVN>



Valve is supplied painted as standard, with one coat of Primer black antirust paint





**2-way**
**1. Body \***

| TYPE     | CODE       | DESCRIPTION   |
|----------|------------|---------------|
| DFE052/2 | 3CO2220721 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION                               |
|------|------------|---|
| A    | 3CAS105245 | 2 positions with open centre in neutral   |
| B    | 3CAS105145 | 2 positions with closed centre in neutral |

**3-way**
**1. Body \***

| TYPE     | CODE       | DESCRIPTION   |
|----------|------------|---------------|
| DFE052/3 | 3CO2221725 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS105345 | 3-way, 2 positions with ports connected in transit position                      |
| B    | 3CAS105445 | 3-way, 2 positions with ports closed in transit position                         |
| D    | 3CAS105546 | 3-way, 2 positions, without transit position, with ports closed in rest position |

**6-way**
**1. Body \***

| TYPE     | CODE       | DESCRIPTION   |
|----------|------------|---------------|
| DFE052/6 | 3CO2222725 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS105645 | 6-way, 2 positions with ports connected in transit position                                |
| B    | 3CAS105746 | 6-way, 2 positions with ports closed in transit position                                   |
| H    | 3CAS105845 | 6-way, 2 positions, D↔C in position 1, F↔E in position 2, ports closed in transit position |

**5. Positioner kits**
*page 67*

| TYPE   | CODE      | DESCRIPTION                                       |
|--------|-----------|---|
| 18...W | 5TAP001   | Spring return in position 1                       |
| 18...Y | 5GIU003 * | Spring return in position 1, with SAE6 drain port |

**3. Tube assembly**
*page 68*

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL515000 | Spring return in position 1 (without coil) |

**2. Coil options**
*page 68*

| TYPE  | CODE       | DESCRIPTION                       |
|---|------------|-----------------------------------|
| 101   | -          | Without coil (only with tube kit) |
| <u>With ISO4400 connector</u>                 |            |                                   |
| 201-12VDC                                     | 4SOL515012 | Coil with 12VDC nominal voltage   |
| 201-24VDC                                     | 4SOL515024 | Coil with 24VDC nominal voltage   |
| <u>With integrated DEUTSCH DT04 connector</u> |            |                                   |
| 241-12VDC                                     | 4SOL515014 | Coil with 12VDC nominal voltage   |
| 241-24VDC                                     | 4SOL515025 | Coil with 24VDC nominal voltage   |

**I Optional connectors**
*page 119*

| TYPE | CODE      | DESCRIPTION          |
|------|-----------|----------------------|
| C02  | 2X1001010 | According to ISO4400 |
| C19  | 5CON007   | Type DEUTSCH DT06    |

 NOTE (\*) - Codes are referred to **UN-UNF** thread.

## Ordering codes

DEscription example :

Diverter valve **DFE052/8 B 8 ES3 - W 201-12VDC - SAE - <CVN>**

2.

5.

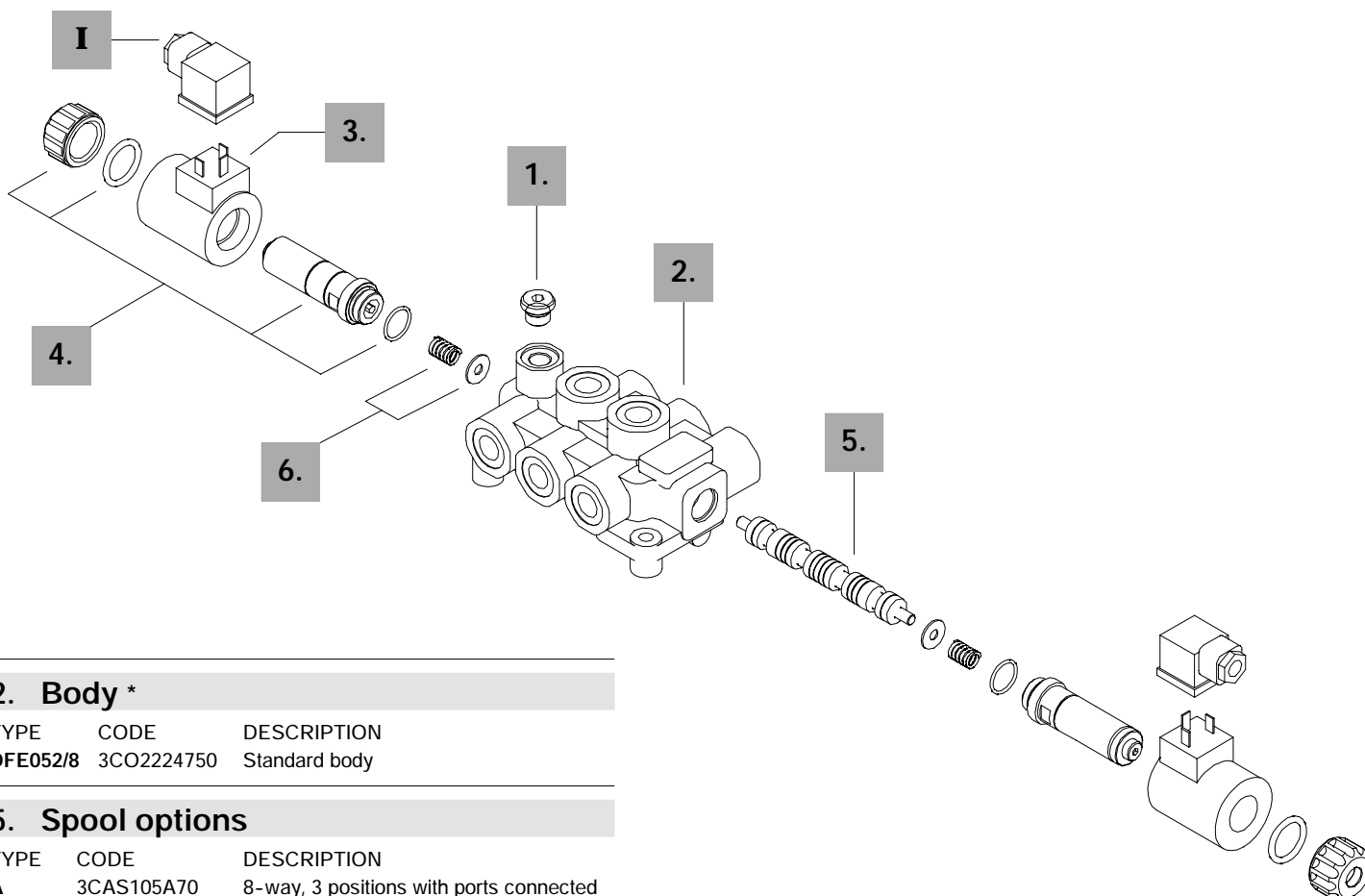
6.

4.

1.

3.

Valve is supplied painted as standard, with one coat of Primer black antirust paint



### 2. Body \*

| TYPE     | CODE       | DESCRIPTION   |
|----------|------------|---------------|
| DFE052/8 | 3CO2224750 | Standard body |

### 5. Spool options

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS105A70 | 8-way, 3 positions with ports connected in transit position |
| B    | 3CAS105B70 | 8-way, 3 positions with ports closed in transit position    |

### 6. Positioner kit

*page 67*

| TYPE | CODE    | DESCRIPTION                       |
|------|---------|-----------------------------------|
| 8    | 5V08001 | Spring return in neutral position |

### 4. Tube assembly

*page 68*

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| ES3  | 5SOL515000 | With spring return in neutral position (without coil) |

### 1. Drain options \*

*page 67*

| TYPE | CODE       | DESCRIPTION          |
|------|------------|----------------------|
| W    | 3XTA814120 | With drain plugged   |
| Y    | -          | With SAE4 drain port |

NOTE (\*) - Code are referred to **UN-UNF** thread.

### 3. Coil options

*page 68*

| TYPE  | CODE       | DESCRIPTION                       |
|---|------------|-----------------------------------|
| 101   | -          | Without coil (only with tube kit) |
| <u>With ISO4400 connector</u>                 |            |                                   |
| 201-12VDC                                     | 4SOL515012 | Coil with 12VDC nominal voltage   |
| 201-24VDC                                     | 4SOL515024 | Coil with 24VDC nominal voltage   |
| <u>With integrated DEUTSCH DT04 connector</u> |            |                                   |
| 241-12VDC                                     | 4SOL515014 | Coil with 12VDC nominal voltage   |
| 241-24VDC                                     | 4SOL515025 | Coil with 24VDC nominal voltage   |

### I Optional connectors

*page 119*

| TYPE | CODE      | DESCRIPTION          |
|------|-----------|----------------------|
| C02  | 2X1001010 | According to ISO4400 |
| C19  | 5CON007   | Type DEUTSCH DT06    |

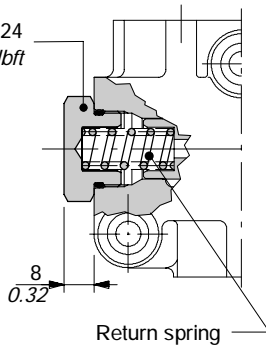
**DFE052/2 - /3 - /6**

**18W kit**

Spring return in position 1 with plug.



Plug - wrench 24  
24 Nm / 17.7 lbft

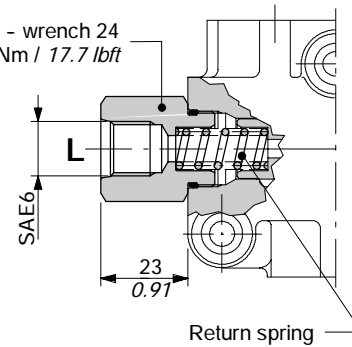


**18Y kit**

Spring return in position 1, with SAE6 joint for drain.



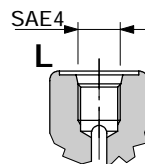
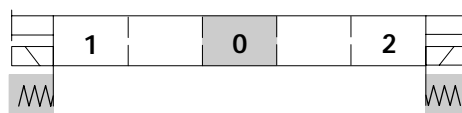
Joint - wrench 24  
24 Nm / 17.7 lbft



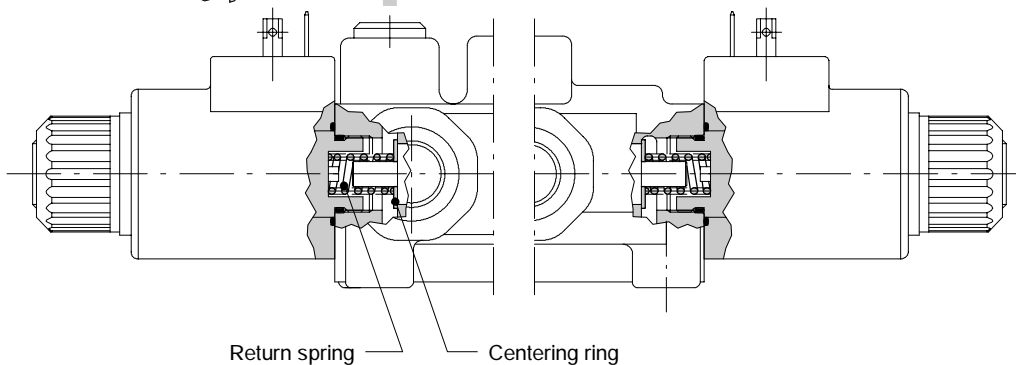
**DFE052/8**

**8 kit**

Spring return in position 0.

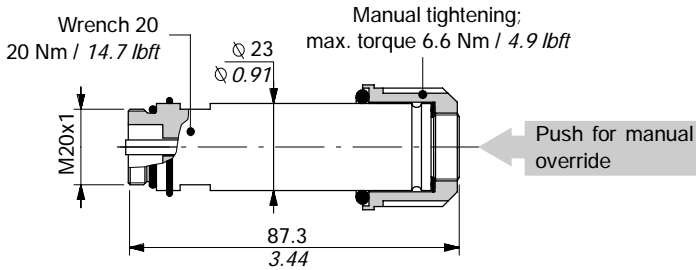


For drain, unscrew the plug  
Allen wrench 6 - 24 Nm / 17.7 lbft



Solenoid parts

ES tube assembly

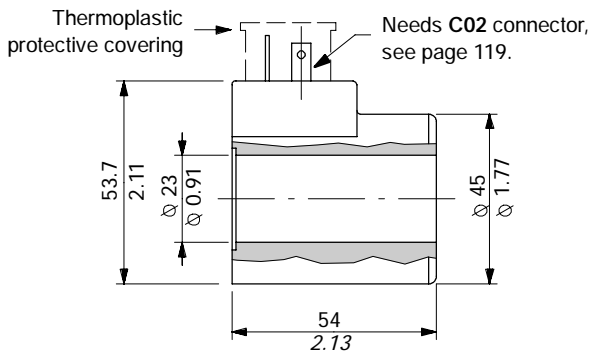


Operating features

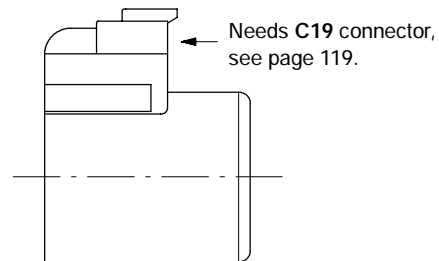
Plunger stroke . . . . . : 7.1 mm / 0.28 in

Coil options

With ISO4400 connector  
(weather protection IP65)



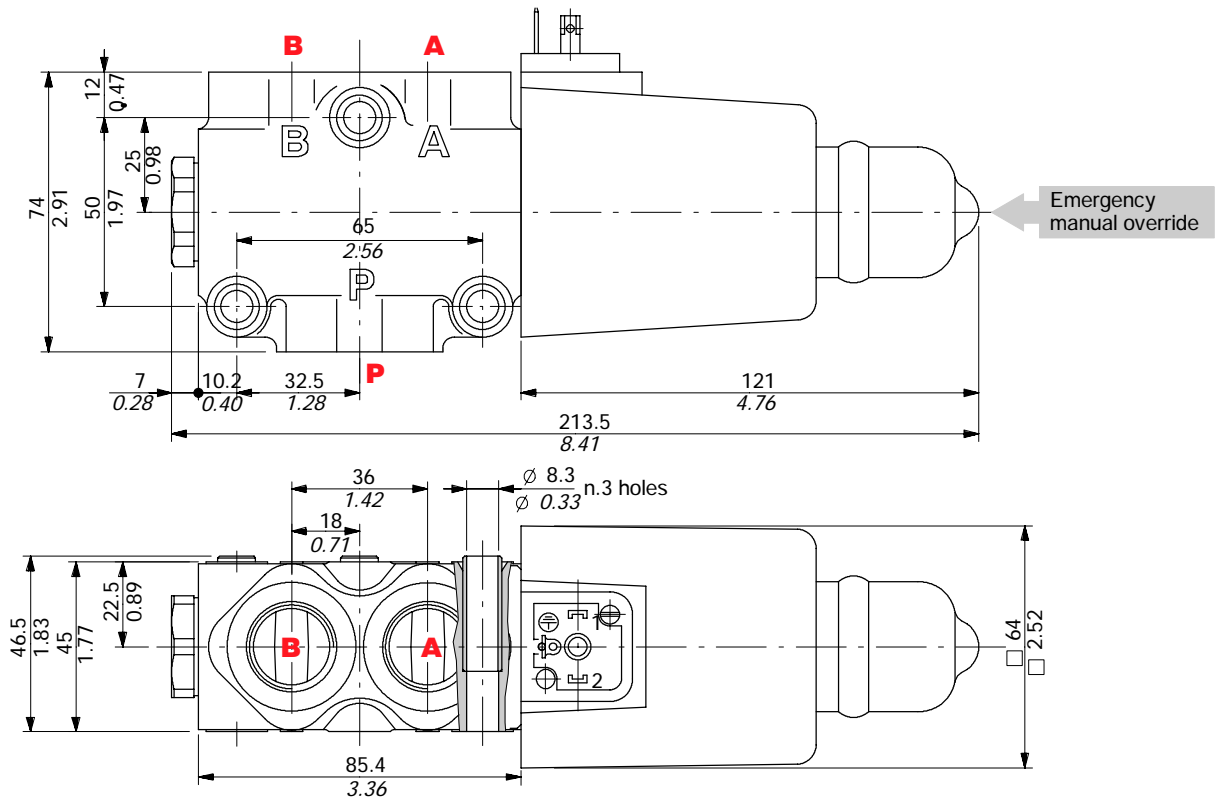
With integrated DEUTSCH 04 connector  
(weather protection IP67)



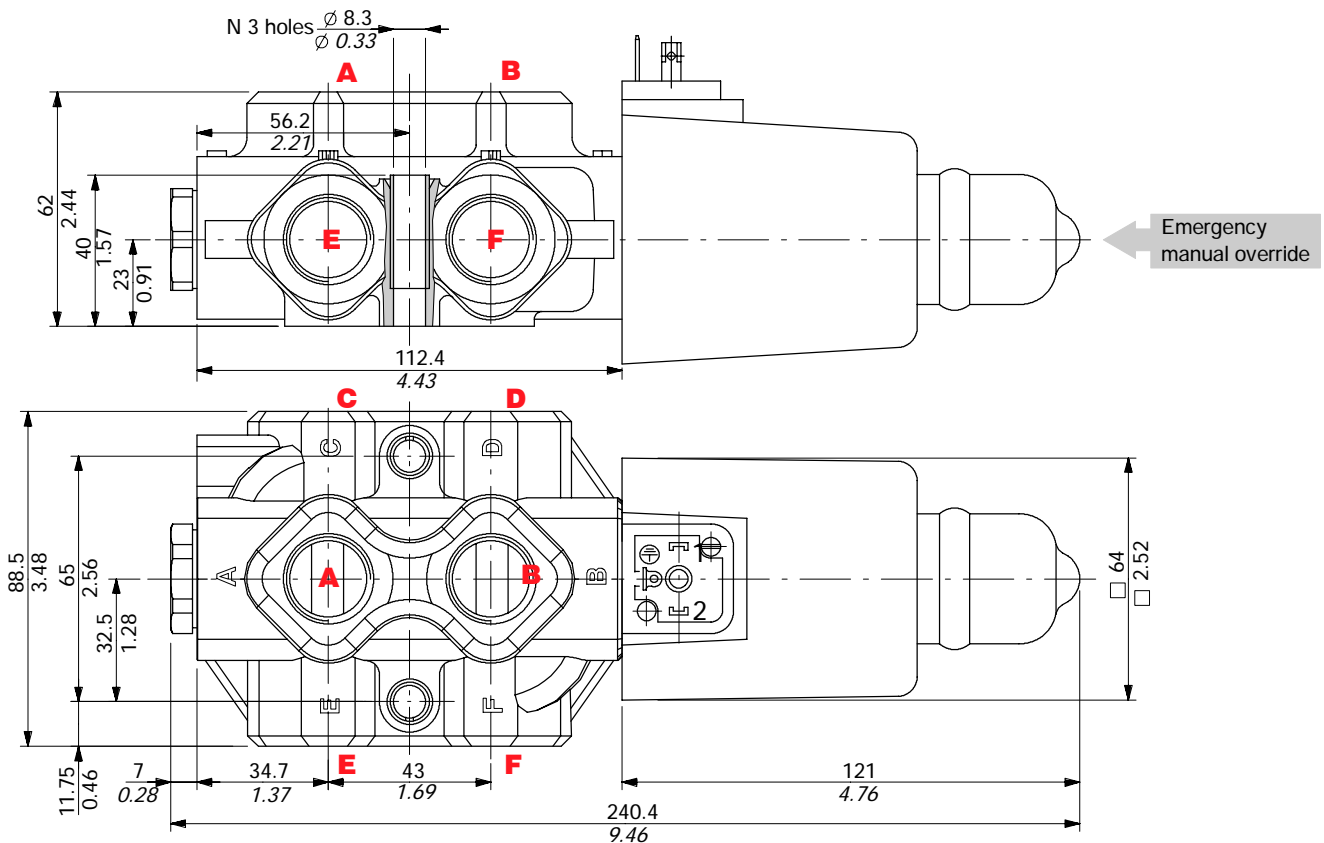
Operating features

- Nominal voltage . . . . . : 12VDC / 24VDC
- Nominal voltage tolerance . . . : ±10%
- Power rating . . . . . : 38 W
- Duty cycle . . . . . : 100%
- Weather protection . . . . . : Depending on connector type
- Coil insulation . . . . . : Class H

**3-way DFE10/3 valve**



**6-way DFE10/6 valve**



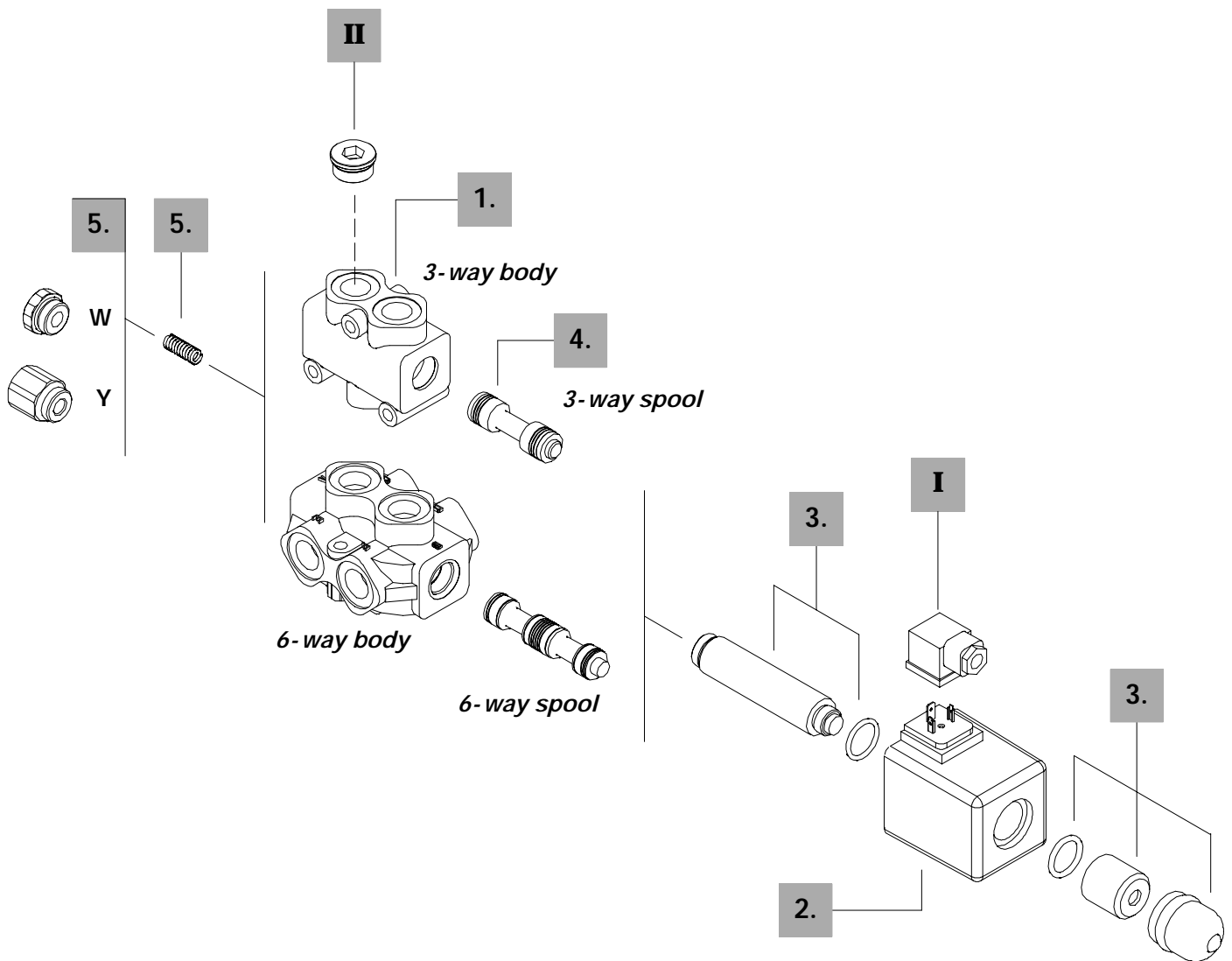
Ordering codes

Description example :

Diverter valve DFE10/3 A 18 ES - W 202-12VDC - SAE - <CVN>

1.
4.
5.
3.
5.
2.

Valve is supplied painted as standard, with one coat of Primer black antirust paint



**3-way**
**1. Body \***

| TYPE    | CODE       | DESCRIPTION   |
|---------|------------|---------------|
| DFE10/3 | 3CO2241720 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS110341 | 3-way, 2 positions with ports connected in transit position                      |
| B    | 3CAS110441 | 3-way, 2 positions with ports closed in transit position                         |
| D    | 3CAS110540 | 3-way, 2 positions, without transit position, with ports closed in rest position |

**6-way**
**1. Body \***

| TYPE    | CODE       | DESCRIPTION   |
|---------|------------|---------------|
| DFE10/6 | 3CO2242721 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS110641 | 6-way, 2 positions with ports connected in transit position                                |
| B    | 3CAS110741 | 6-way, 2 positions with ports closed in transit position                                   |
| H    | 3CAS110840 | 6-way, 2 positions, D↔C in position 1, F↔E in position 2, ports closed in transit position |
| N    | 3CAS110952 | 6-way, 2 positions with ports closed in transit position, with check valve                 |

**5. Positioner kits** *page 72*

| TYPE   | CODE      | DESCRIPTION                                       |
|--------|-----------|---|
| 18...W | 5TAP002   | Spring return in position 1                       |
| 18...Y | 5GIU005 * | Spring return in position 1, with SAE6 drain port |

**3. Tube assembly** *page 73*

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL516000 | Spring return in position 1 (without coil) |

**2. Coil options** *page 73*

| TYPE  | CODE       | DESCRIPTION   |
|---|------------|---|
| 102   | -          | Without coil (only with tube kit)                                 |
| <u>With ISO4400 connector</u>                       |            |   |
| 202-12VDC   | 4SOL516012 | Coil with 12VDC nominal voltage                                   |
| 202-24VDC   | 4SOL516024 | Coil with 24VDC nominal voltage                                   |
| 202-48VDC   | 4SOL516048 | Coil with 48VDC nominal voltage                                   |
| 202-92VDC   | 4SOL516094 | Coil with 92VDC nominal voltage (for 110VAC): need C04 connector  |
| 202-192VDC  | 4SOL516192 | Coil with 192VDC nominal voltage (for 220VAC): need C04 connector |
| <u>With flying leads and DEUTSCH DT04 connector</u> |            |   |
| 241-12VDC   | 4SOL516412 | Coil with 12VDC nominal voltage                                   |
| 241-24VDC   | 4SOL516424 | Coil with 24VDC nominal voltage                                   |

**I Optional connectors** *page 119*

| TYPE | CODE      | DESCRIPTION                         |
|------|-----------|-------------------------------------|
| C02  | 2X1001010 | According ISO4400                   |
| C04  | 2X1001040 | According to ISO4400 with rectifier |
| C19  | 5CON007   | Type DEUTSCH DT06                   |

**II Ports plug**

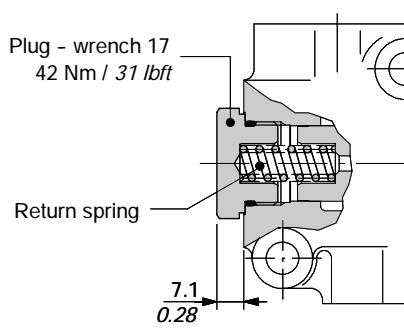
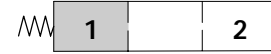
| TYPE  | CODE         | DESCRIPTION                                 |
|-------|--------------|---|
| SAE10 | 3XTAP826160* | Body conversion from 3-way to 2-way circuit |

 NOTE (\*) - Codes are referred to **UN-UNF** thread.

Positioner kits

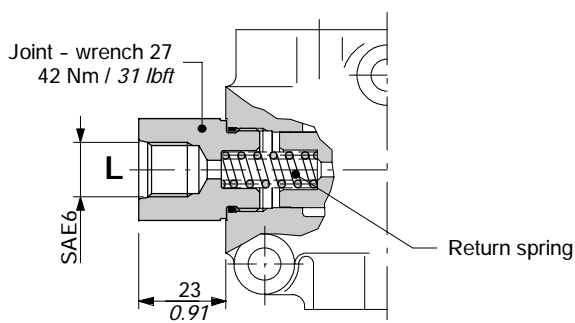
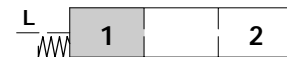
18W kit

Spring return in position 1 with plug.



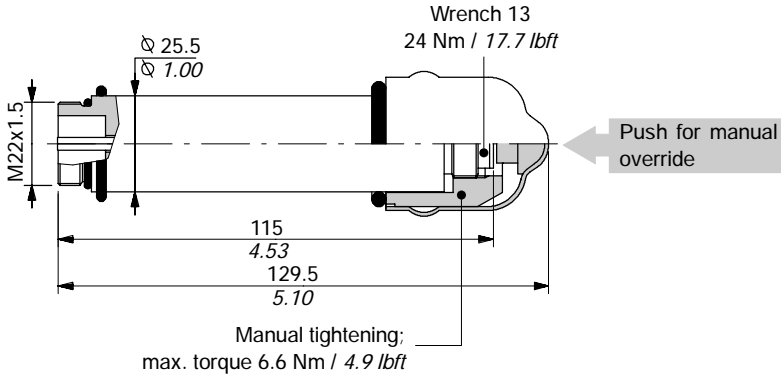
18Y kit

Spring return in position 1, with SAE6 joint for drain.





**ES tube assembly**

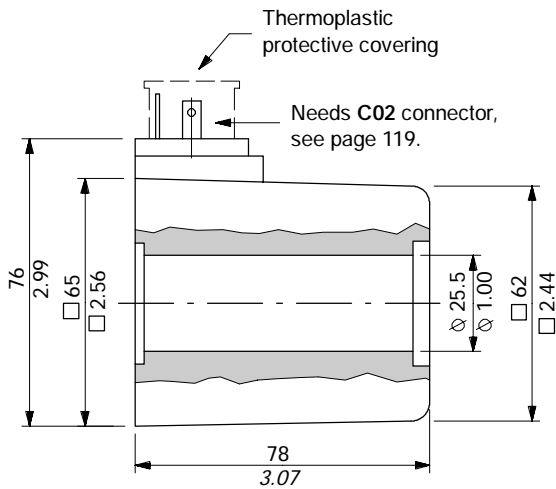


**Operating features**

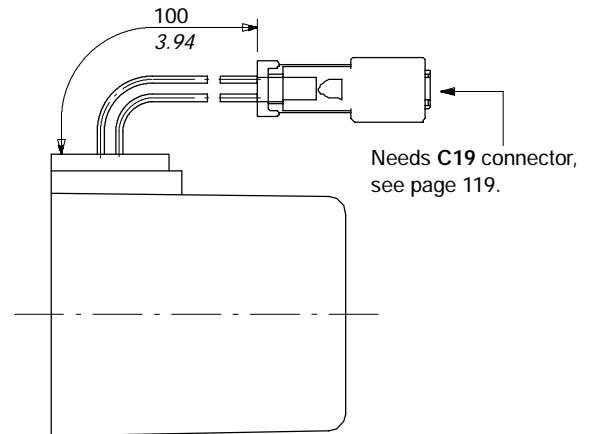
Plunger stroke . . . . . : 10.2 mm / 0.40 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



**With flying leads and DEUTSCH DT04 connector**  
(weather protection IP67)

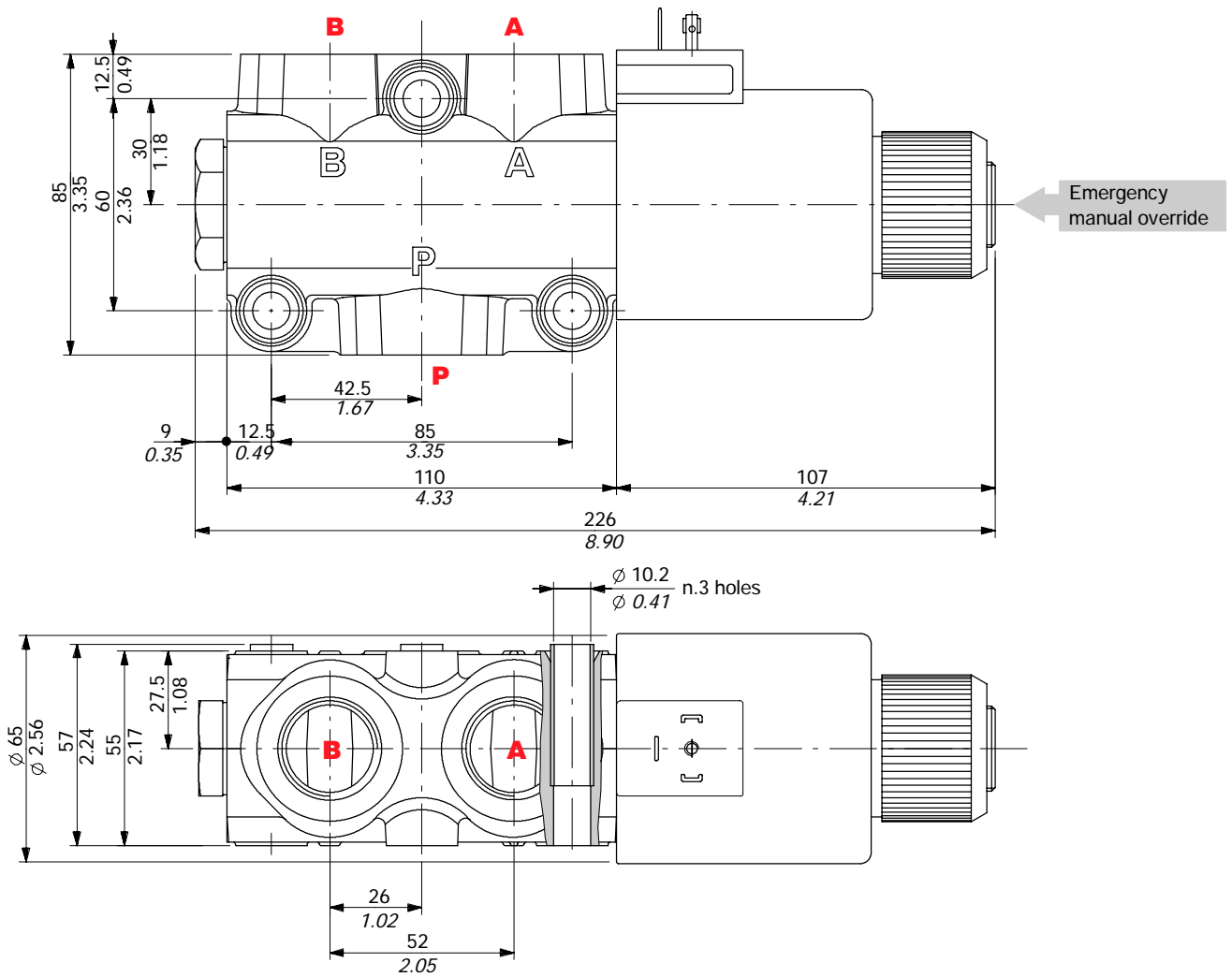


**Operating features**

- Nominal voltage . . . . . : 12-24-48-92-192VDC
- Nominal voltage tolerance . . . :  $\pm 10\%$
- Power rating . . . . . : 60 W
- Duty cycle . . . . . : 100%
- Weather protection . . . . . : depending on connector type
- Coil insulation . . . . . : Class H

Dimensional data

3-way DFE20/3 valve

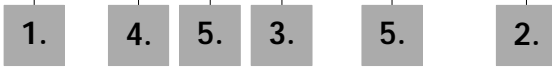




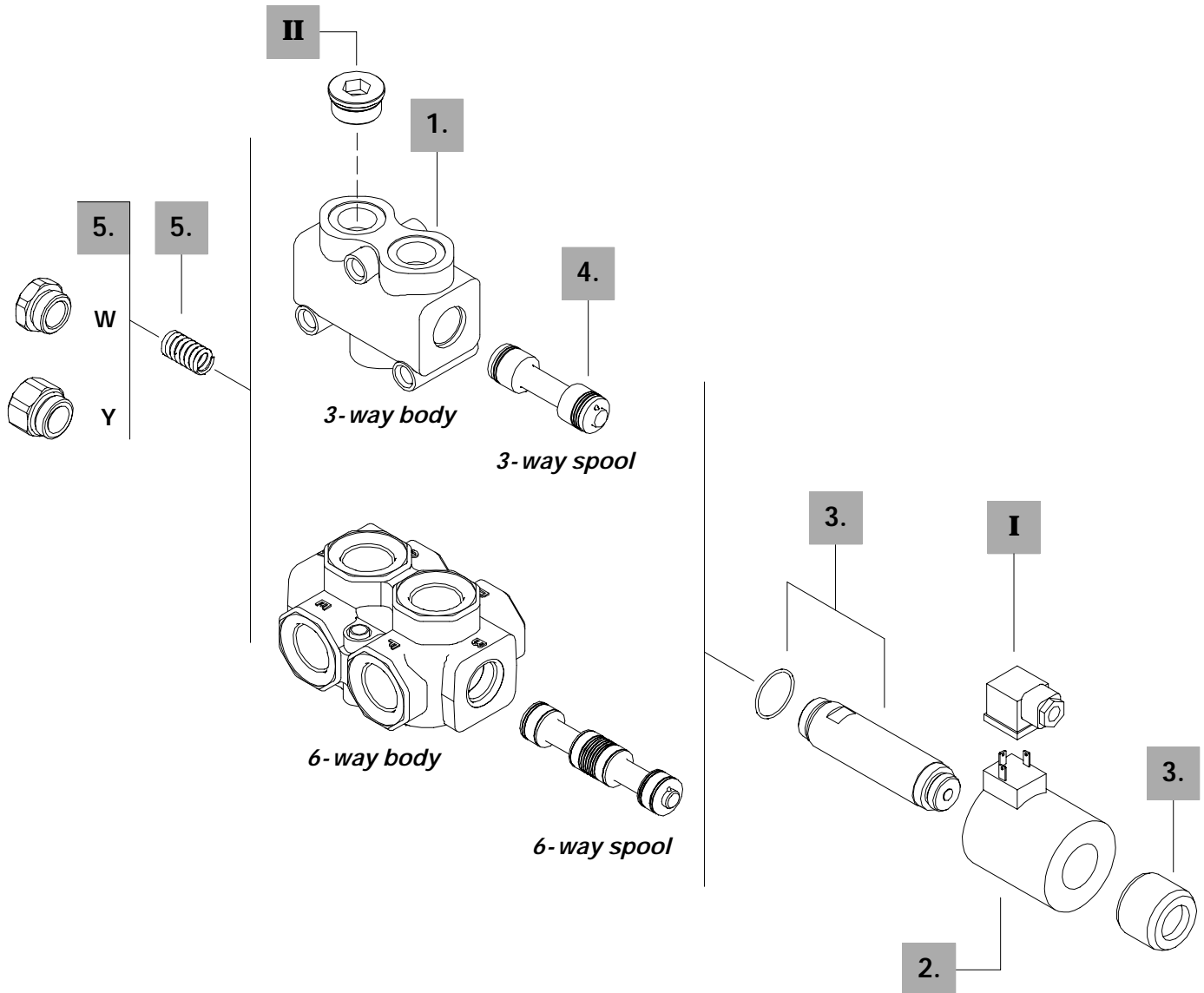
Ordering codes

Description example :

Diverter valve DFE20/3 A 18 ES - W 201-12VDC - SAE - <CVN>



Valve is supplied painted as standard, with one coat of Primer black antirust paint



**3-way**
**1. Body \***

| TYPE    | CODE       | DESCRIPTION   |
|---------|------------|---------------|
| DFE20/3 | 3CO2261720 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS120341 | 3-way, 2 positions with ports connected in transit position |
| B    | 3CAS120441 | 3-way, 2 positions with ports closed in transit position    |

**6-way**
**1. Body \***

| TYPE    | CODE       | DESCRIPTION   |
|---------|------------|---------------|
| DFE20/6 | 3CO2263720 | Standard body |

**4. Spool options**

| TYPE | CODE       | DESCRIPTION  |
|------|------------|--|
| A    | 3CAS120641 | 6-way, 2 positions with ports connected in transit position                                |
| B    | 3CAS120741 | 6-way, 2 positions with ports closed in transit position                                   |
| H    | 3CAS120841 | 6-way, 2 positions, D↔C in position 1, F↔E in position 2, ports closed in transit position |

**5. Positioner kits page 78**

| TYPE   | CODE      | DESCRIPTION                                       |
|--------|-----------|---|
| 18...W | 5TAP003   | Spring return in position 1                       |
| 18...Y | 5GIU008 * | Spring return in position 1, with SAE4 drain port |

**3. Tube assembly page 78**

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL519001 | Spring return in position 1 (without coil) |

**2. Coil options page 79**

| TYPE  | CODE       | DESCRIPTION   |
|---|------------|---|
| 101   |            | Without coil (only with tube kit)                                 |
| <u>With ISO4400 connector</u>                       |            |   |
| 201-12VDC   | 4SOL519112 | Coil with 12VDC nominal voltage                                   |
| 201-24VDC   | 4SOL519124 | Coil with 24VDC nominal voltage                                   |
| 201-20VDC   | 4SOL519120 | Coil with 20VDC nominal voltage (for 24VAC): need C04 connector   |
| 201-94VDC   | 4SOL519094 | Coil with 94VDC nominal voltage (for 110VAC): need C04 connector  |
| 201-192VDC  | 4SOL519192 | Coil with 192VDC nominal voltage (for 220VAC): need C04 connector |
| <u>With flying leads and DEUTSCH DT04 connector</u> |            |   |
| 241-12VDC   | 4SOL519412 | Coil with 12VDC nominal voltage                                   |
| 241-24VDC   | 4SOL519424 | Coil with 24VDC nominal voltage                                   |

**I Optional connectors page 119**

| TYPE | CODE      | DESCRIPTION                         |
|------|-----------|-------------------------------------|
| C02  | 2X1001010 | According ISO4400                   |
| C04  | 2X1001040 | According to ISO4400 with rectifier |
| C19  | 5CON007   | Type DEUTSCH DT06                   |

**II Ports plug**

| TYPE  | CODE         | DESCRIPTION                                 |
|-------|--------------|---|
| SAE12 | 3XTAP832200* | Body conversion from 3-way to 2-way circuit |

 NOTE (\*) - Codes are referred to **UN-UNF** thread.

**Positioner kits**

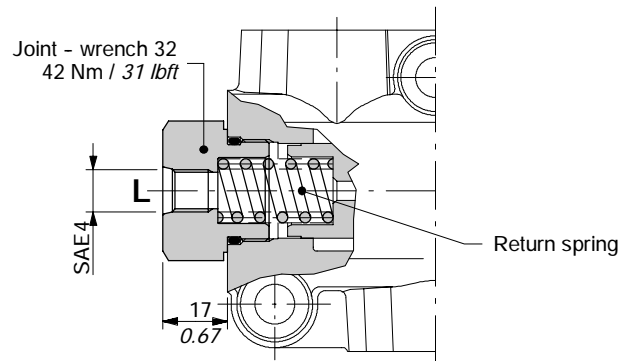
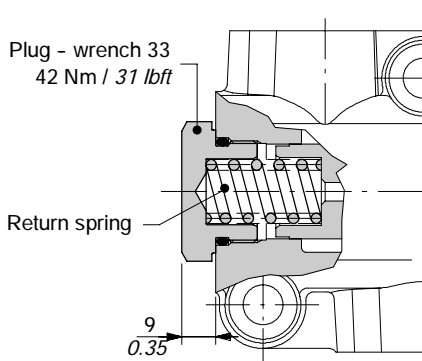
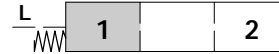
**18W kit**

Spring return in position 1 with plug.



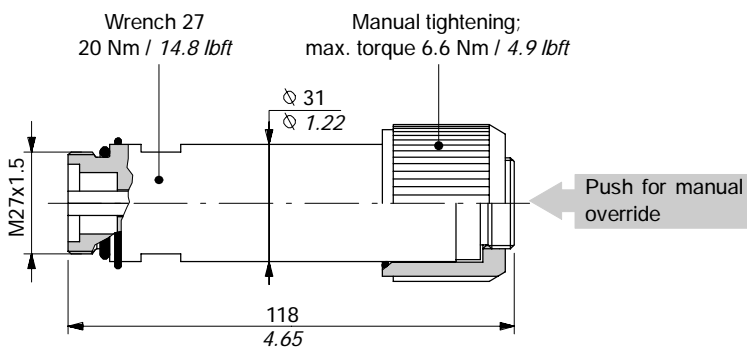
**18Y kit**

Spring return in position 1, with SAE4 joint for drain.



**Solenoid parts**

**ES tube assembly**

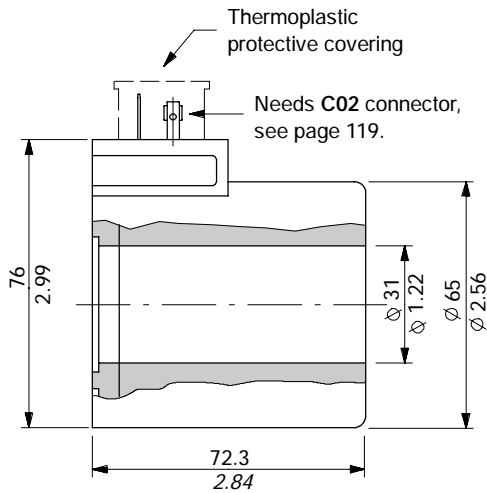


**Operating features**

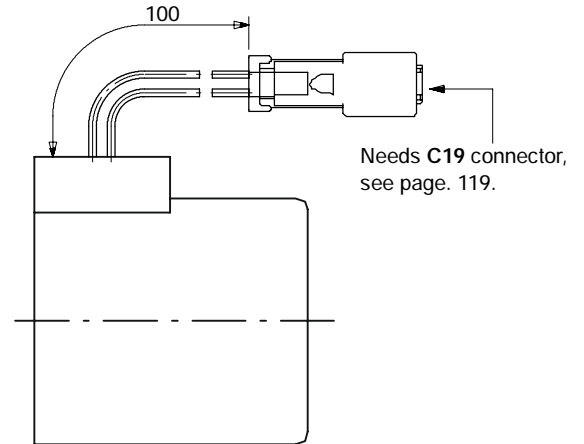
Plunger stroke . . . . . : 10.2 mm / 0.40 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



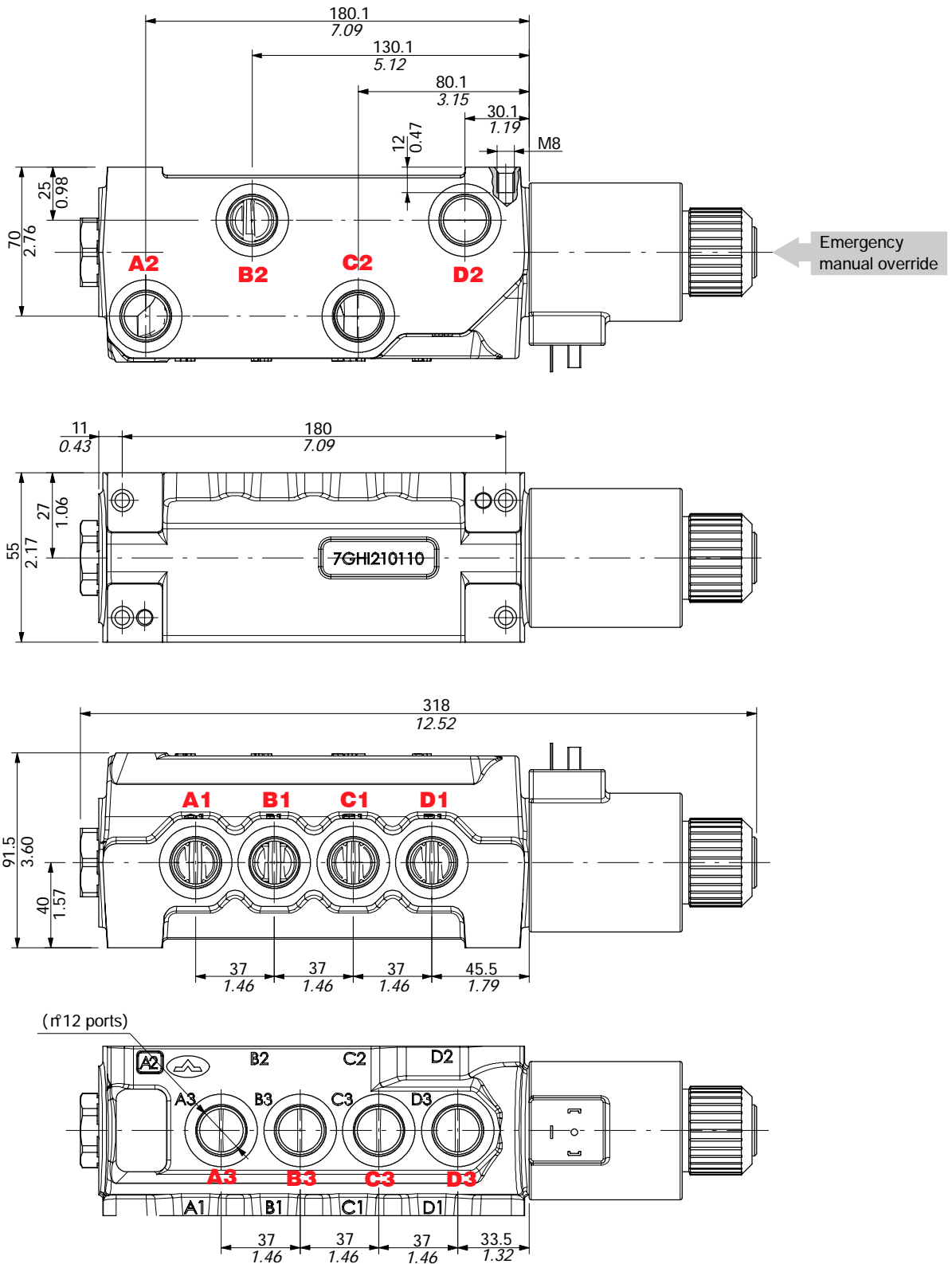
**With flying leads and DEUTSCH DT04 connector**  
(weather protection IP67)



**Operating features**

- Nominal voltage . . . . . : 12-20-24-94-192VDC
- Nominal voltage tolerance . . . : ±10%
- Power rating . . . . . : 60 W
- Duty cycle . . . . . : 100%
- Weather protection . . . . . : depending on connector type
- Coil insulation . . . . . : Class H

Dimensional data



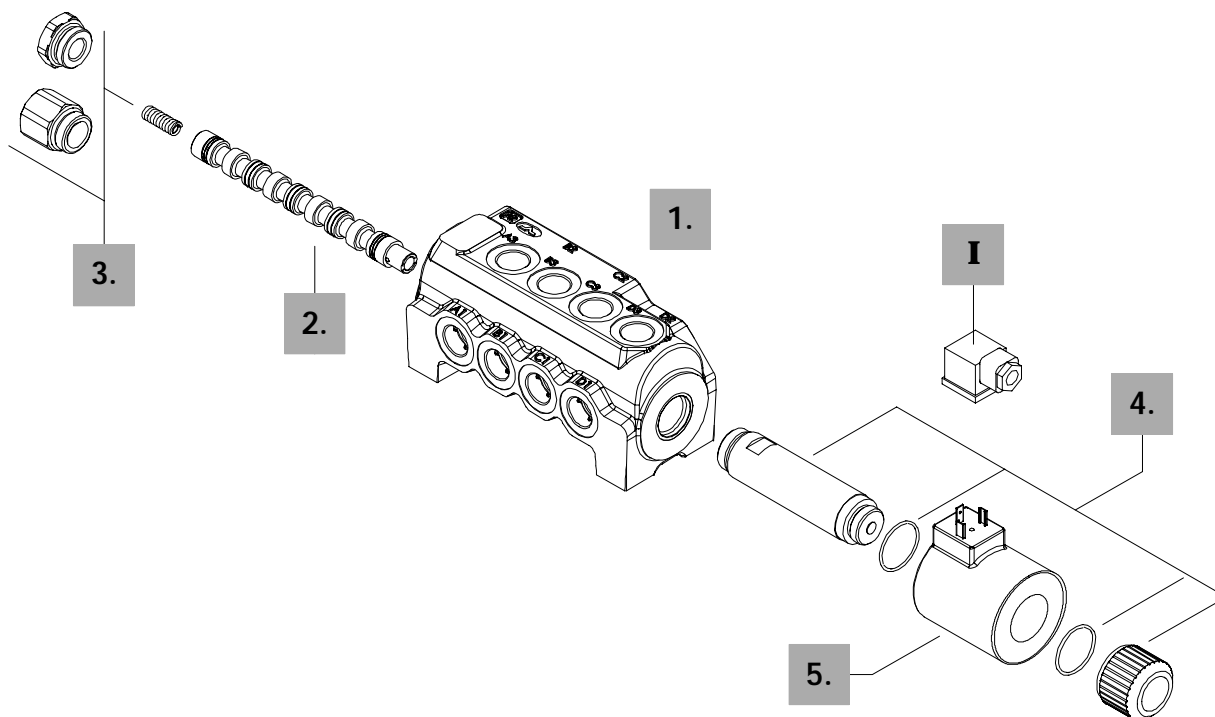


Description example :

Diverter valve **DFE110/12** **B** **18** **ES** - **W** **201-12VDC** - **SAE** - **<CVN>**

1.   
 2.   
 3.   
 4.   
 3.   
 5.

Valve is supplied painted as standard, with one coat of Primer black antirust paint



**1. Body \***

| TYPE   | CODE       | DESCRIPTION          |
|--------|------------|----------------------|
| 110/12 | 3CO2243720 | 12-way standard body |

**2. Spool options**

| TYPE | CODE       | DESCRIPTION                                       |
|------|------------|---|
| B    | 3CAS108H40 | 2 positions with ports closed in transit position |

**3. Positioner kits** *page 82*

| TYPE   | CODE     | DESCRIPTION                                       |
|--------|----------|---|
| 18...W | 5TAP005  | Spring return in position 1                       |
| 18...Y | 5GIU011* | Spring return in position 1, with SAE6 drain port |

**4. Tube assembly** *page 82*

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL519001 | Spring return in position 1 (without coil) |

**5. Coil options** *page 83*

| TYPE  | CODE       | DESCRIPTION   |
|---|------------|---|
| 101   |            | Without coil (only with tube kit)                                 |
| <u>With ISO4400 connector</u>                       |            |   |
| 201-12VDC   | 4SOL519112 | Coil with 12VDC nominal voltage                                   |
| 201-24VDC   | 4SOL519124 | Coil with 24VDC nominal voltage                                   |
| 201-20VDC   | 4SOL519120 | Coil with 20VDC nominal voltage (for 24VAC): need C04 connector   |
| 201-94VDC   | 4SOL519094 | Coil with 94VDC nominal voltage (for 110VAC): need C04 connector  |
| 201-192VDC  | 4SOL519192 | Coil with 192VDC nominal voltage (for 220VAC): need C04 connector |
| <u>With flying leads and DEUTSCH DT04 connector</u> |            |   |
| 241-12VDC   | 4SOL519412 | Coil with 12VDC nominal voltage                                   |
| 241-24VDC   | 4SOL519424 | Coil with 24VDC nominal voltage                                   |

**I Optional connectors** *page 119*

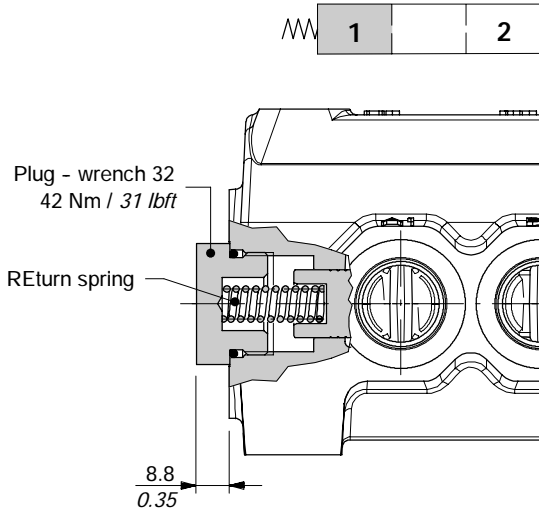
| TYPE | CODE      | DESCRIPTION                         |
|------|-----------|-------------------------------------|
| C02  | 2X1001010 | According ISO4400                   |
| C04  | 2X1001040 | According to ISO4400 with rectifier |
| C19  | 5CON007   | Type DEUTSCH DT06                   |

NOTE (\*) - Codes are referred to **UN-UNF** thread.

**Positioner kits**

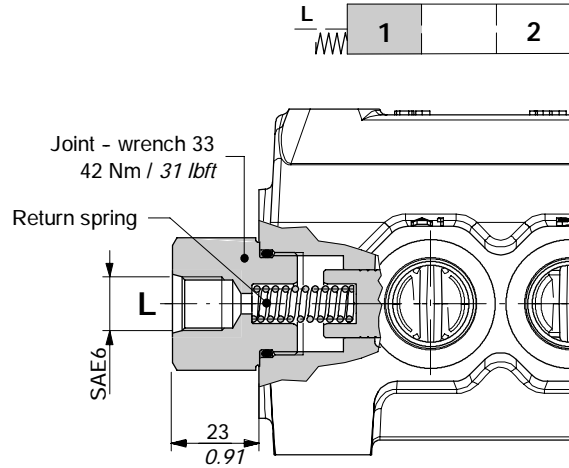
**18W kit**

Spring return in position 1 with plug.



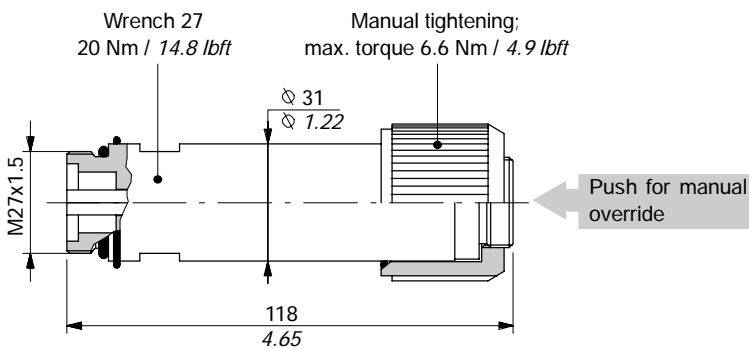
**18Y kit**

Spring return in position 1, with SAE6 joint for drain.



**Solenoid parts**

**ES tube assembly**

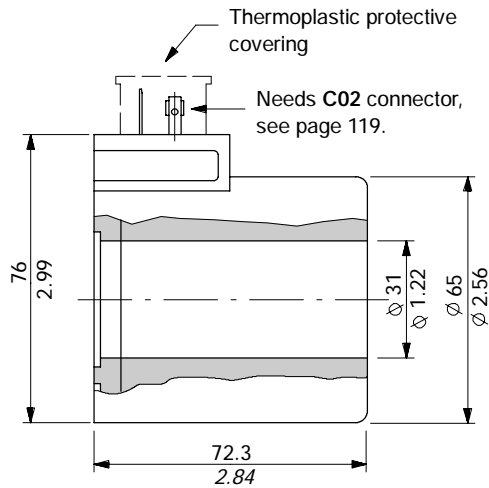


**Operating features**

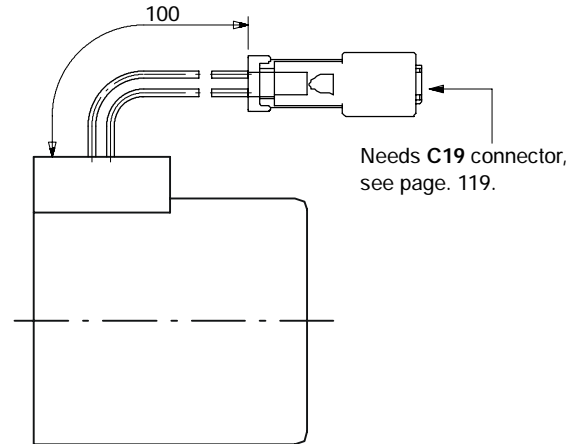
Plunger stroke ..... : 10.2 mm / 0.40 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



**With flying leads and DEUTSCH DT04 connector**  
(weather protection IP67)



**Operating features**

- Nominal voltage . . . . . : 12-20-24-94-192VDC
- Nominal voltage tolerance . . . : ±10%
- Power rating . . . . . : 60 W
- Duty cycle . . . . . : 100%
- Weather protection . . . . . : depending on connector type
- Coil insulation . . . . . : Class H



## **Content**

|                         |     |
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## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature.

|  |  | DFE080   | DFE100   | DFE140   |
|--|--|--|--|--|
| N. of available ways                       |  | 6-8-10   | 6-8-10   | 6-8-10   |
| Nominal flow rating                        | <i>in steady conditions</i>                                      | 25 l/min<br>6.6 US gpm                               | 50 l/min<br>13 US gpm                                | 80 l/min<br>21 US gpm                                |
| Operating pressure (maximum) *             | <i>without drain</i>   | 200 bar - 2900 psi                                   |  |  |
|  | <i>with drain</i>  | 315 bar - 4600 psi                                   |  |  |
| Available nominal voltage                  | VDC  | 12-24  | 12-24  | 12-24  |
|  | VAC 50Hz<br>(with C04 connector)                                 | 24-110-220   | 24-110-220   | 24-110-220   |
| Nominal power                              | W  | 38   | 60   | 60   |
| Internal leakage A(B)→T                    | $\Delta p=100$ bar 1450 psi with fluid and valve at 40°C - 104°F | 7 cm <sup>3</sup> /min<br>0.43 in <sup>3</sup> /min  | 10 cm <sup>3</sup> /min<br>0.61 in <sup>3</sup> /min | 10 cm <sup>3</sup> /min<br>0.61 in <sup>3</sup> /min |
| Tie rods tightening torque                 |  | 9.8 Nm<br>7.2 lbft                                   | 18 Nm<br>13.3 lbft                                   | 25 Nm<br>18.4 lbft                                   |
| Hydraulic fluid                            |  | Mineral base oil                                     |  |  |
| Fluid temperature                          | <i>with NBR seals</i>  | from -20°C to 80°C / from -4°F to 176°F              |  |  |
|  | <i>with FPM seals</i>  | from -20°C to 100°C / from -4°F to 212°F             |  |  |
| Viscosity                                  | <i>operating range</i>   | from 15 to 75 mm <sup>2</sup> /s / from 15 to 75 cSt |  |  |
|  | <i>minimum</i>   | 12 mm <sup>2</sup> /s / 12 cSt                       |  |  |
|  | <i>maximum</i>   | 400 mm <sup>2</sup> /s / 400 cSt                     |  |  |
| Max. level of contamination                |  | -/19/16 - ISO 4406 / NAS 1638 - class10              |  |  |
| Ambient temperature for working conditions |  | from -20°C to 50°C / from -4°F to 122°F              |  |  |

NOTE - For different working conditions please contact Sales Dept.

(\*) - This value is reachable only in steady conditions; for dynamic working conditions see the related pages.

## Standard threads

### REFERENCE STANDARDS

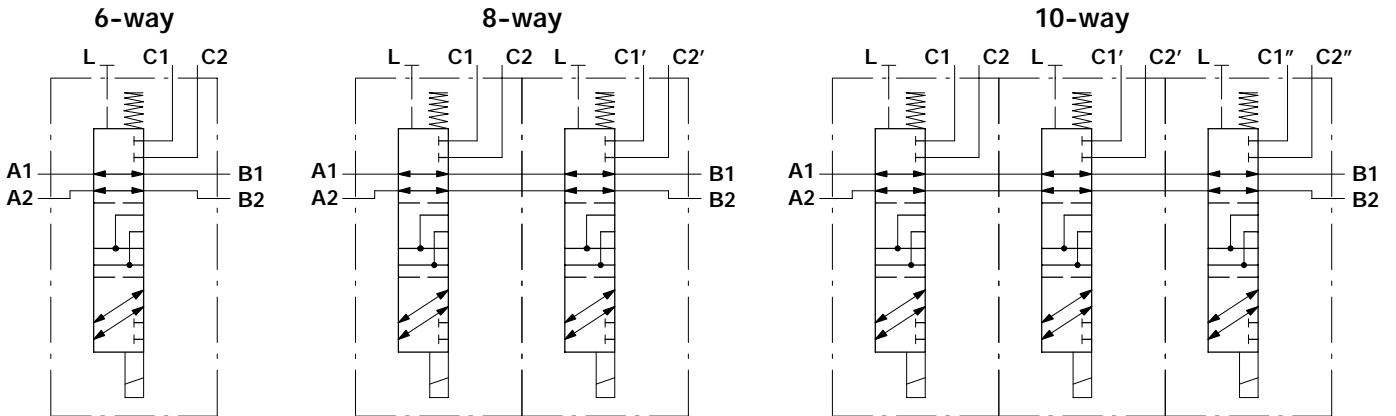
|                     |     | BSP                    | UN-UNF            | METRIC                 |         |
|---------------------|-----|------------------------|-------------------|------------------------|---------|
| THREAD ACCORDING TO |     | ISO 228/1              | ISO 263           | ISO 262                | ISO 262 |
|                     |     | BS 2779                | ANSI B1.1 unified |                        |         |
| CAVITY ACCORDING TO | ISO | 1179                   | 11926             | 9974-1                 | 6149    |
|                     | SAE |                        | J1926             |                        | J2244   |
|                     | DIN | 3852-2<br>shape X or Y |                   | 3852-1<br>shape X or Y |         |

### PORTS THREAD

| ALL PORTS         | BSP   | UN-UNF                              | METRIC<br>(ISO 9974-1) | METRIC<br>(ISO 6149) |
|-------------------|-------|-------------------------------------|------------------------|----------------------|
| DFE080            | G 1/4 | 7/16-20 (SAE 4)                     |                        |                      |
| DFE100            | G 3/8 | 3/4-16 (SAE 8)                      | M18x1.5                | M18x1.5              |
| DFE140            | G 1/2 | 7/8-14 (SAE 10)                     |                        |                      |
| <b>DRAIN PORT</b> |       |                                     |                        |                      |
| L                 | G 1/4 | 7/16-20 (SAE 4)*<br>9/16-18 (SAE 6) | M12x1.5                | M12x1.5              |

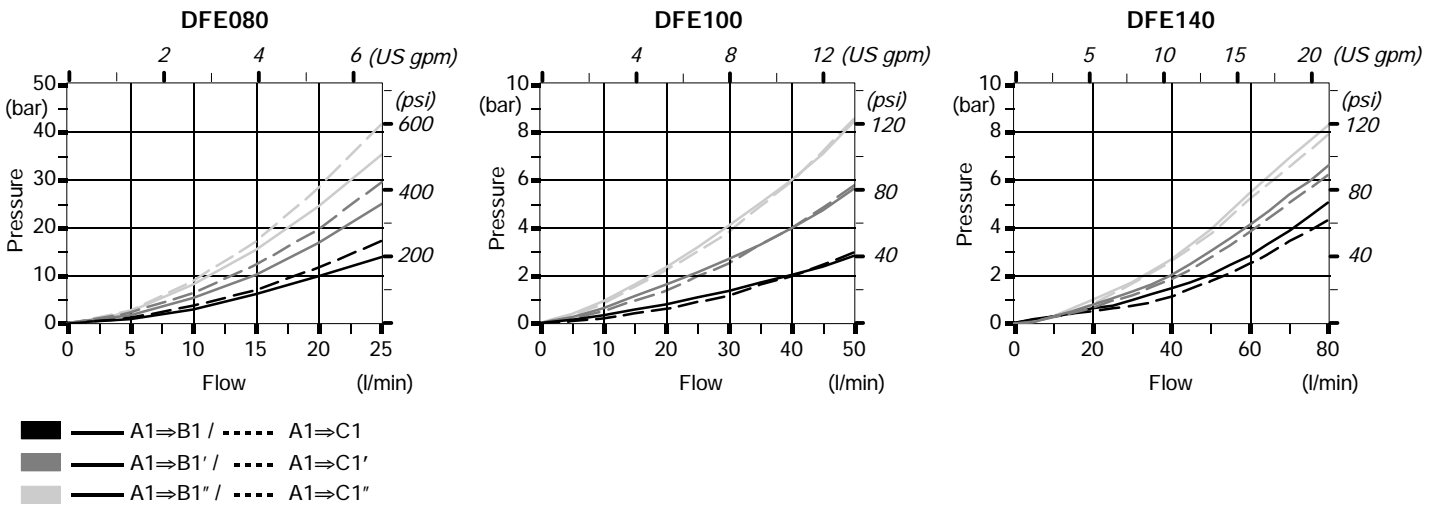
(\*) For DFE080 diverter valve

Optional threads: for availability contact Sales Department

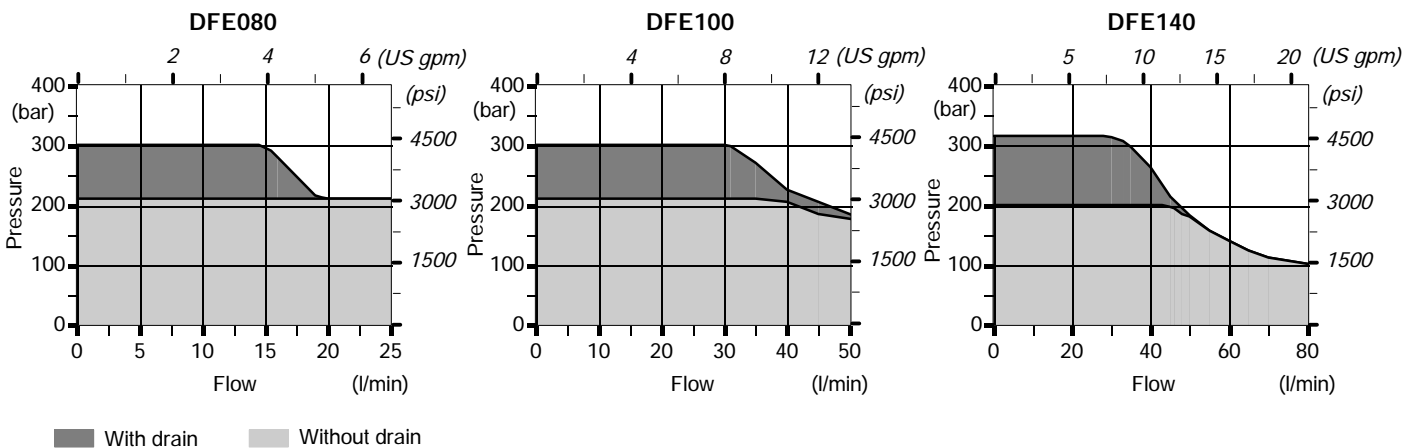


**Performance data**

**Pressure drop versus flow**

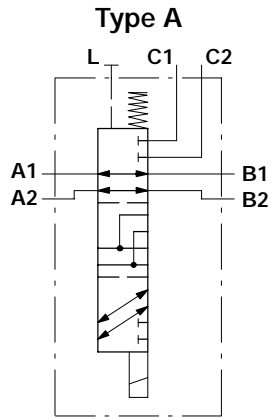


Minimum dynamic conditions: (supply =  $V_n - 10\%$ , coil at 70 °C - 158 °F)

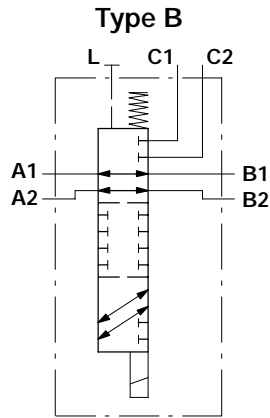


Hydraulic circuit

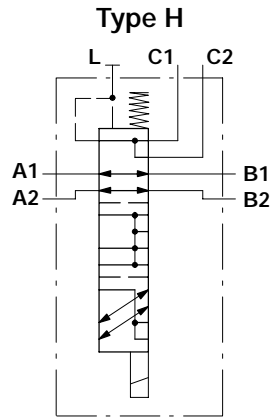
Spool circuits



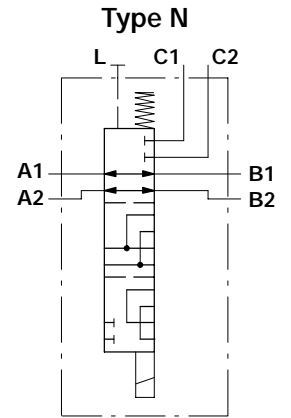
2 positions with ports connected in transit position



2 positions with ports closed in transit position



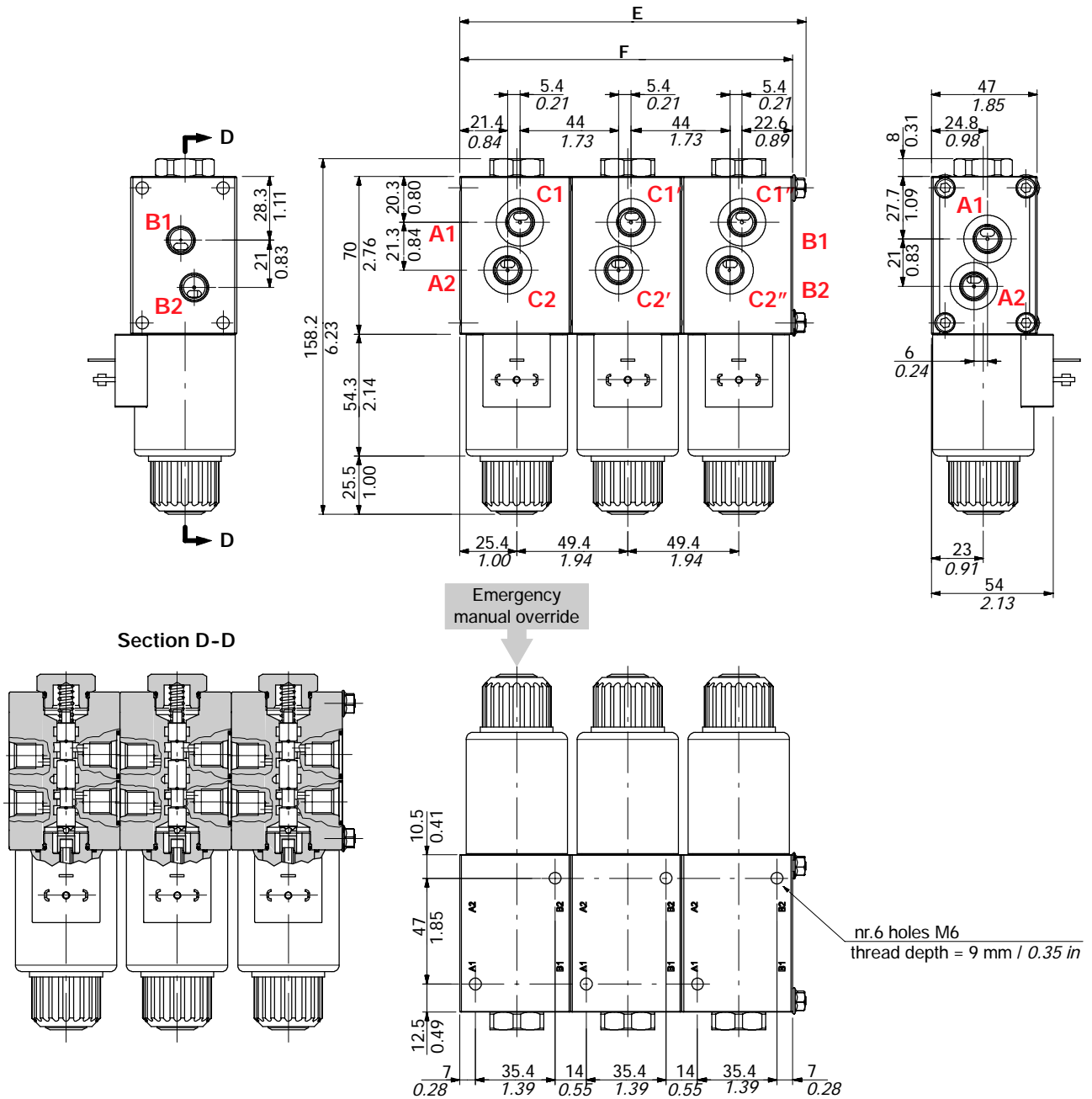
2 positions with ports connected to drain in transit position



As type A, for right inlet



The drawing below show diverter valve in 10-way configuration.



| TYPE      | E    |      | F     |      | Weight |     |
|-----------|------|------|-------|------|--------|-----|
|           | mm   | in   | mm    | in   | kg     | lb  |
| DFE080/6  | 49.4 | 1.94 | 49.4  | 1.94 | 1.4    | 3.1 |
| DFE080/8  | 105  | 4.13 | 98.8  | 3.86 | 2.8    | 6.2 |
| DFE080/10 | 155  | 6.10 | 148.2 | 5.84 | 4.3    | 9.5 |

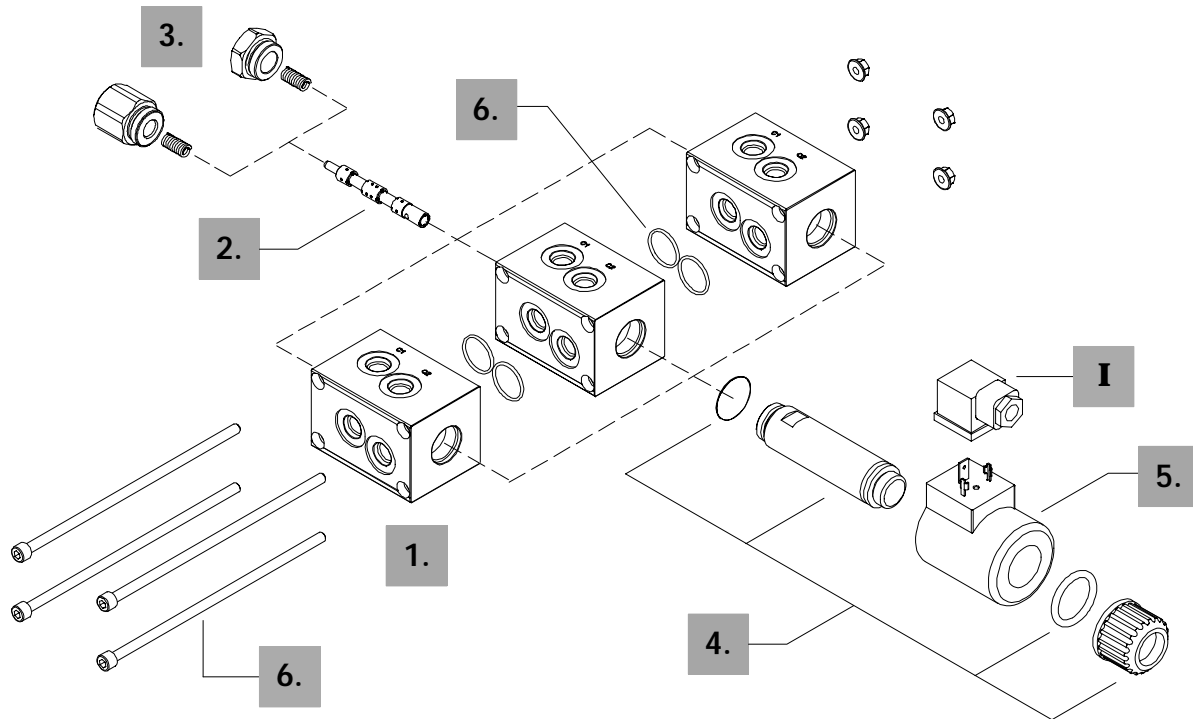
Ordering codes

Description example :

Diverter valve DFE080/10 A 18 ES - W 201-12VDC - SAE - CRZ

1.   
 2.   
 3.   
 4.   
 3.   
 5.

Valve body is supplied galvanized



I

**1. Body \***

| TYPE   | CODE       | DESCRIPTION                           |
|--------|------------|---------------------------------------|
| 080/6  | 3CO2208720 | 6-way body                            |
| 080/8  | "          | Nr 2 of 6-way body for 8-way circuit  |
| 080/10 | "          | Nr 3 of 6-way body for 10-way circuit |

**2. Spool options**

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS108640 | 2 positions with ports connected in transit position          |
| B    | 3CAS108740 | 2 positions with ports closed in transit position             |
| H    | 3CAS108840 | 2 positions with ports connected to drain in transit position |
| N    | 3CAS108940 | As type A, for right inlet                                    |

**3. Positioner kits *page 92***

| TYPE   | CODE      | DESCRIPTION                                       |
|--------|-----------|---|
| 18...W | 5TAP007   | Spring return in position 1                       |
| 18...Y | 5GIU015 * | Spring return in position 1, with SAE4 drain port |

**4. Tube assembly *page 92***

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL515000 | Spring return in position 1 (without coil) |

**5. Coil options *page 92***

| TYPE  | CODE       | DESCRIPTION                       |
|---|------------|-----------------------------------|
| 101   | -          | Without coil (only with tube kit) |
| <u>With ISO4400 connector</u>                 |            |                                   |
| 201-12VDC                                     | 4SOL515012 | Coil with 12VDC nominal voltage   |
| 201-24VDC                                     | 4SOL515024 | Coil with 24VDC nominal voltage   |
| <u>With integrated DEUTSCH DT04 connector</u> |            |                                   |
| 241-12VDC                                     | 4SOL515014 | Coil with 12VDC nominal voltage   |
| 241-24VDC                                     | 4SOL515025 | Coil with 24VDC nominal voltage   |

**6. Tie rods kit and O-ring seals**

| CODE       | MOUNTED ON               |
|------------|--------------------------|
| 5TIR080008 | DFE080/8 diverter valve  |
| 5TIR080010 | DFE080/10 diverter valve |

**I Optional connectors *page 119***

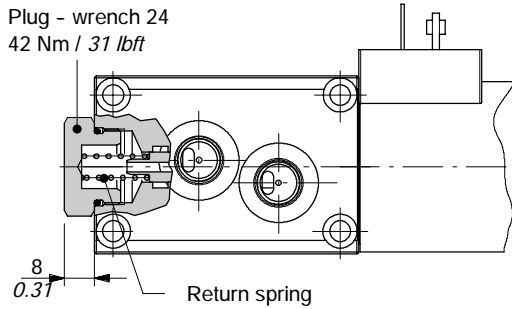
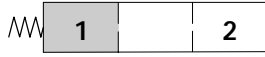
| TYPE | CODE      | DESCRIPTION          |
|------|-----------|----------------------|
| C02  | 2X1001010 | According to ISO4400 |
| C19  | 5CON007   | Type DEUTSCH DT06    |

 NOTE (\*) - Codes are referred to **UN-UNF** thread.

**Positioner kits**

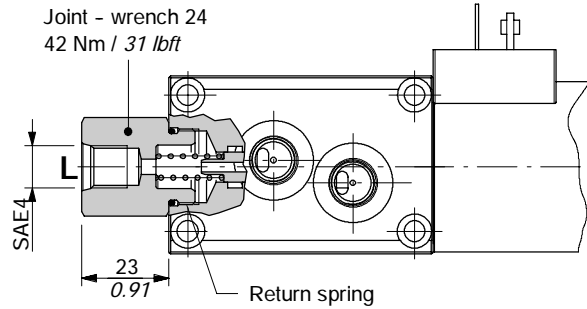
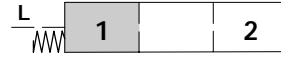
**18W kit**

Spring return in position 1 with plug.



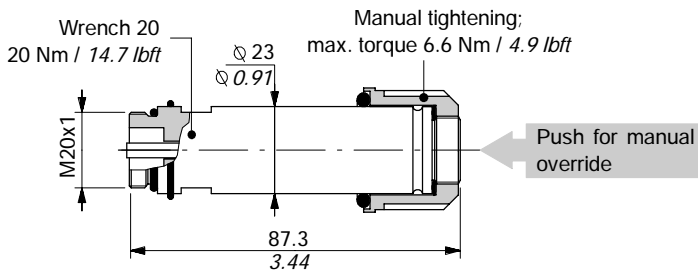
**18Y kit**

Spring return in position 1, with SAE4 joint for drain.



**Solenoid parts**

**ES tube assembly**

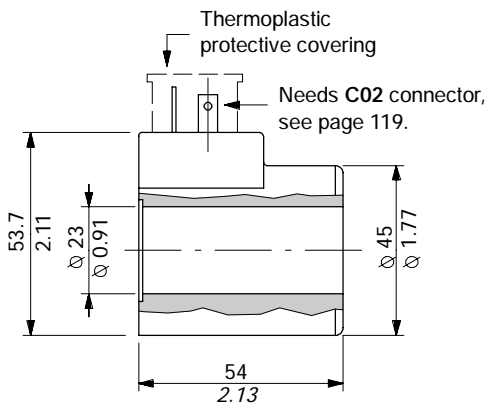


**Operating features**

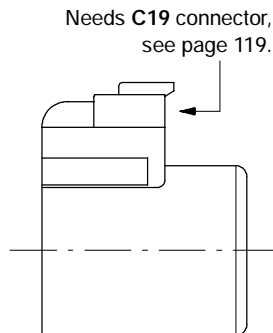
Plunger stroke ..... : 7.1 mm / 0.28 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



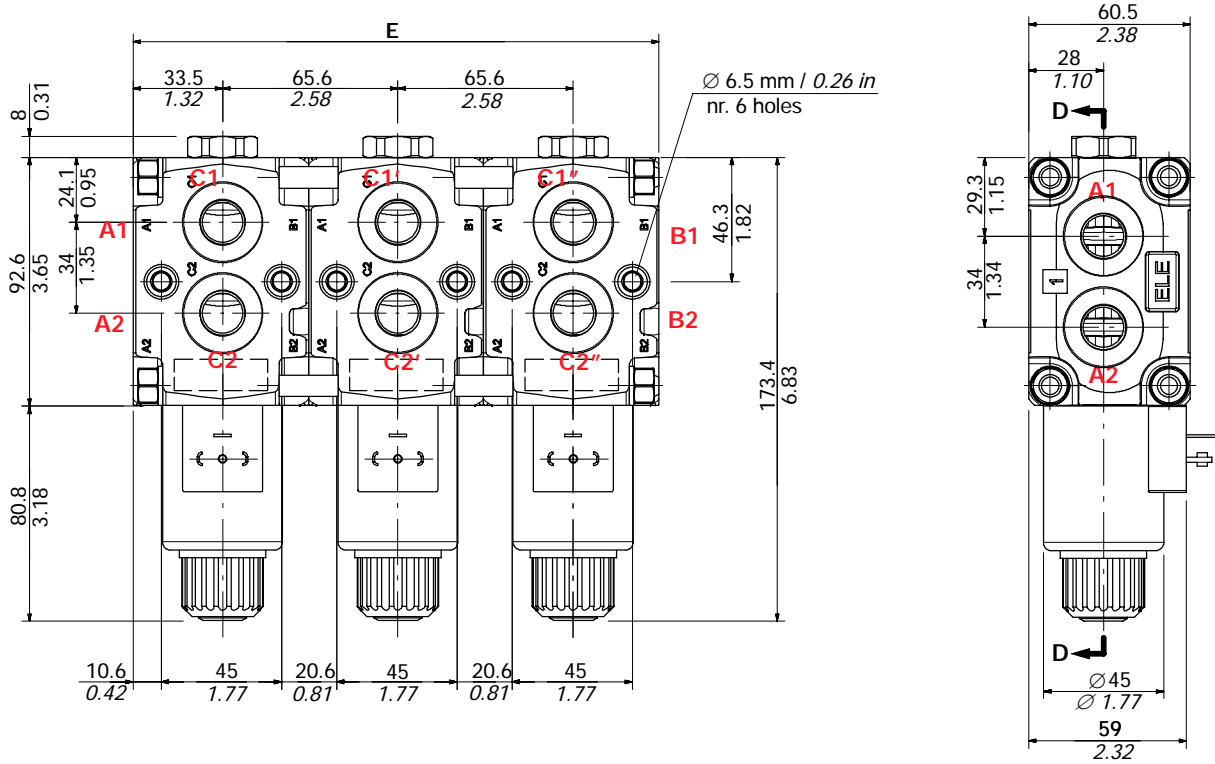
**With integrated DEUTSCH 04 connector**  
(weather protection IP67)



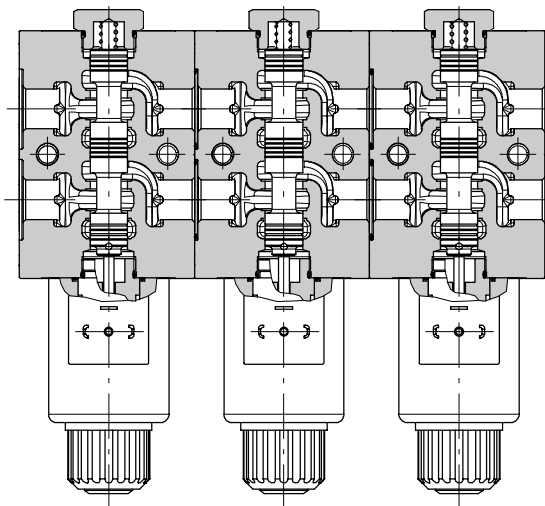
**Operating features**

Nominal voltage ..... : 12VDC / 24VDC  
 Nominal voltage tolerance ... : ±10%  
 Power rating ..... : 38 W  
 Duty cycle ..... : 100%  
 Weather protection ..... : Depending on connector type  
 Coil insulation ..... : Class H

The drawing below show diverter valve in 10-way configuration.



Section D-D



Emergency manual override

| TYPE      | E     |      | Weight |      |
|-----------|-------|------|--------|------|
|           | mm    | in   | kg     | lb   |
| DFE100/6  | 65.6  | 2.58 | 2.4    | 5.3  |
| DFE100/8  | 105   | 4.13 | 5.1    | 11.2 |
| DFE100/10 | 196.8 | 7.75 | 8.4    | 18.5 |

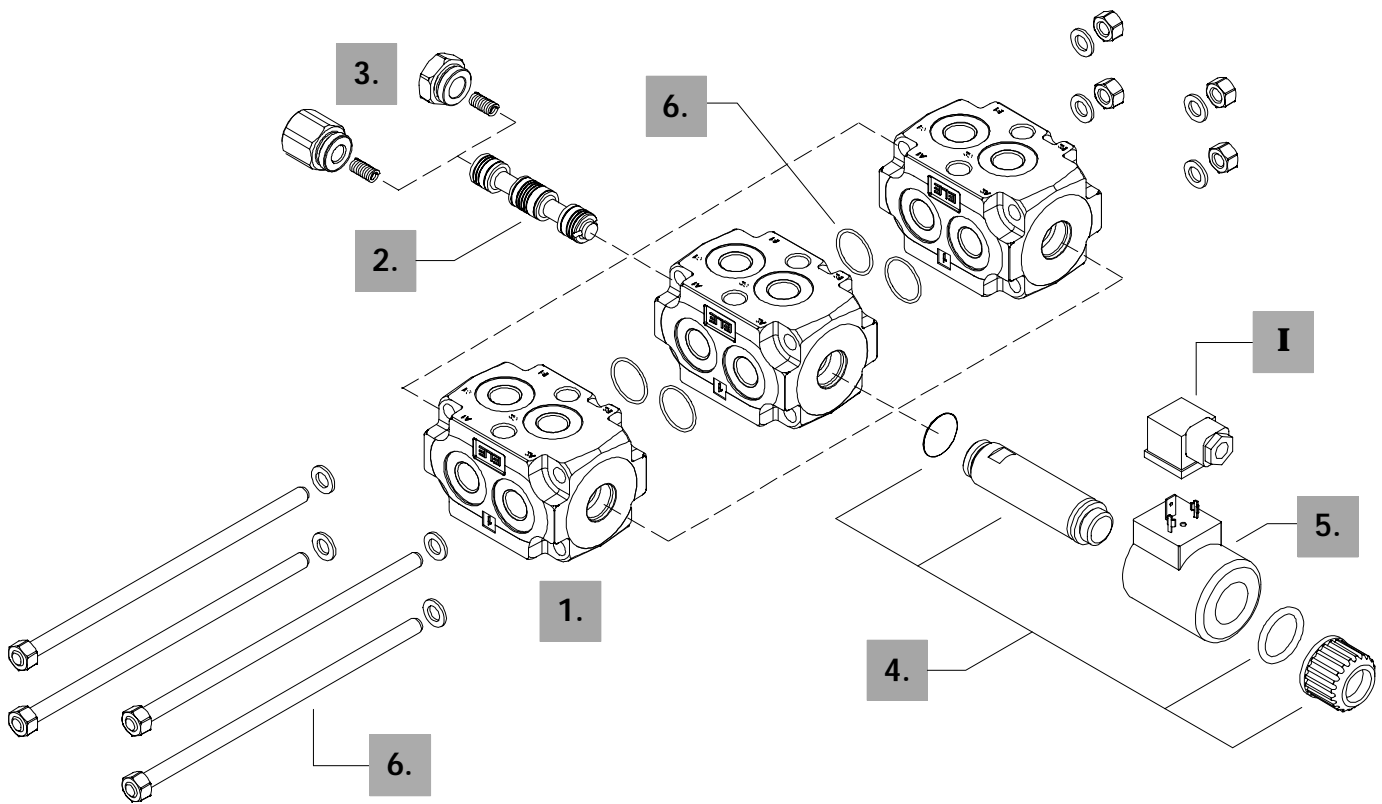
Ordering codes

Description example :

Diverter valve DFE100/10 A 18 ES - W 201-12VDC - SAE - CRZ

1.  
 2.  
 3.  
 4.  
 3.  
 5.

Valve body is supplied galvanized



### 1. Body \*

| TYPE   | CODE       | DESCRIPTION                           |
|--------|------------|---------------------------------------|
| 100/6  | 3CO2244721 | 6-way body,                           |
| 100/8  | "          | Nr 2 of 6-way body for 8-way circuit  |
| 100/10 | "          | Nr 3 of 6-way body for 10-way circuit |

### 2. Spool options

| TYPE | CODE       | DESCRIPTION   |
|------|------------|---|
| A    | 3CAS110647 | 2 positions with ports connected in transit position          |
| B    | 3CAS110747 | 2 positions with ports closed in transit position             |
| H    | 3CAS110847 | 2 positions with ports connected to drain in transit position |
| N    | 3CAS110947 | As type A, for right inlet                                    |

### 3. Positioner kits *page 96*

| TYPE   | CODE      | DESCRIPTION                                       |
|--------|-----------|---|
| 18...W | 5TAP006   | Spring return in position 1                       |
| 18...Y | 5GIU014 * | Spring return in position 1, with SAE6 drain port |

### 4. Tube assembly *page 96*

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL515000 | Spring return in position 1 (without coil) |

### 5. Coil options *page 96*

| TYPE  | CODE       | DESCRIPTION                       |
|---|------------|-----------------------------------|
| 101   | -          | Without coil (only with tube kit) |
| <u>With ISO4400 connector</u>                 |            |                                   |
| 201-12VDC                                     | 4SOL515012 | Coil with 12VDC nominal voltage   |
| 201-24VDC                                     | 4SOL515024 | Coil with 24VDC nominal voltage   |
| <u>With integrated DEUTSCH DT04 connector</u> |            |                                   |
| 241-12VDC                                     | 4SOL515014 | Coil with 12VDC nominal voltage   |
| 241-24VDC                                     | 4SOL515025 | Coil with 24VDC nominal voltage   |

### 6. Tie rods kit and O-ring seals

| CODE       | MOUNTED ON               |
|------------|--------------------------|
| 5TIR108132 | DFE100/8 diverter valve  |
| 5TIR108205 | DFE100/10 diverter valve |

### I Optional connectors *page 119*

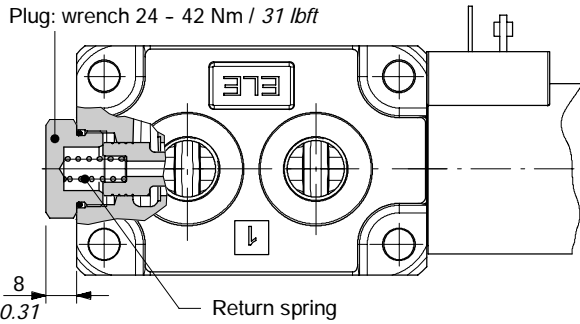
| TYPE | CODE      | DESCRIPTION          |
|------|-----------|----------------------|
| C02  | 2X1001010 | According to ISO4400 |
| C19  | 5CON007   | Type DEUTSCH DT06    |

NOTE (\*) - Codes are referred to **UN-UNF** thread.

**Positioner kits**

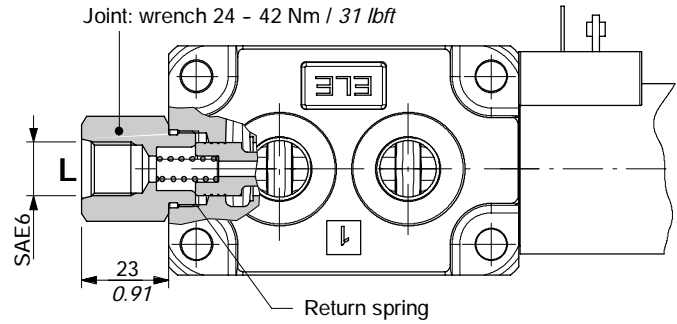
**18W kit**

Spring return in position 1 with plug.



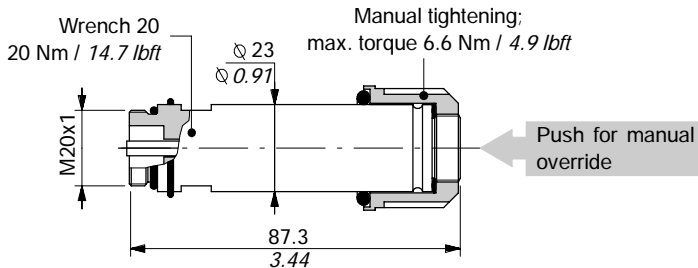
**18Y kit**

Spring return in position 1, with SAE6 joint for drain.



**Solenoid parts**

**ES tube assembly**

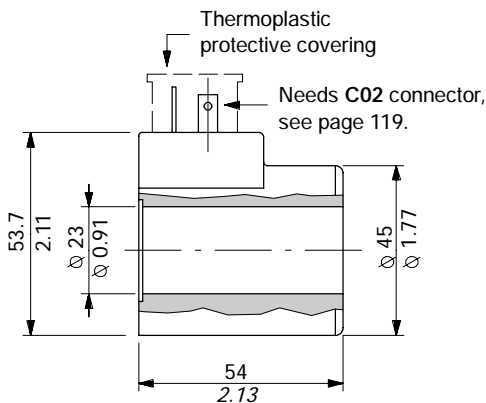


**Operating features**

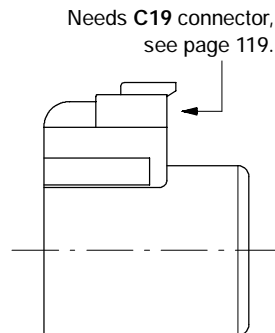
Plunger stroke ..... : 7.1 mm / 0.28 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



**With integrated DEUTSCH 04 connector**  
(weather protection IP67)

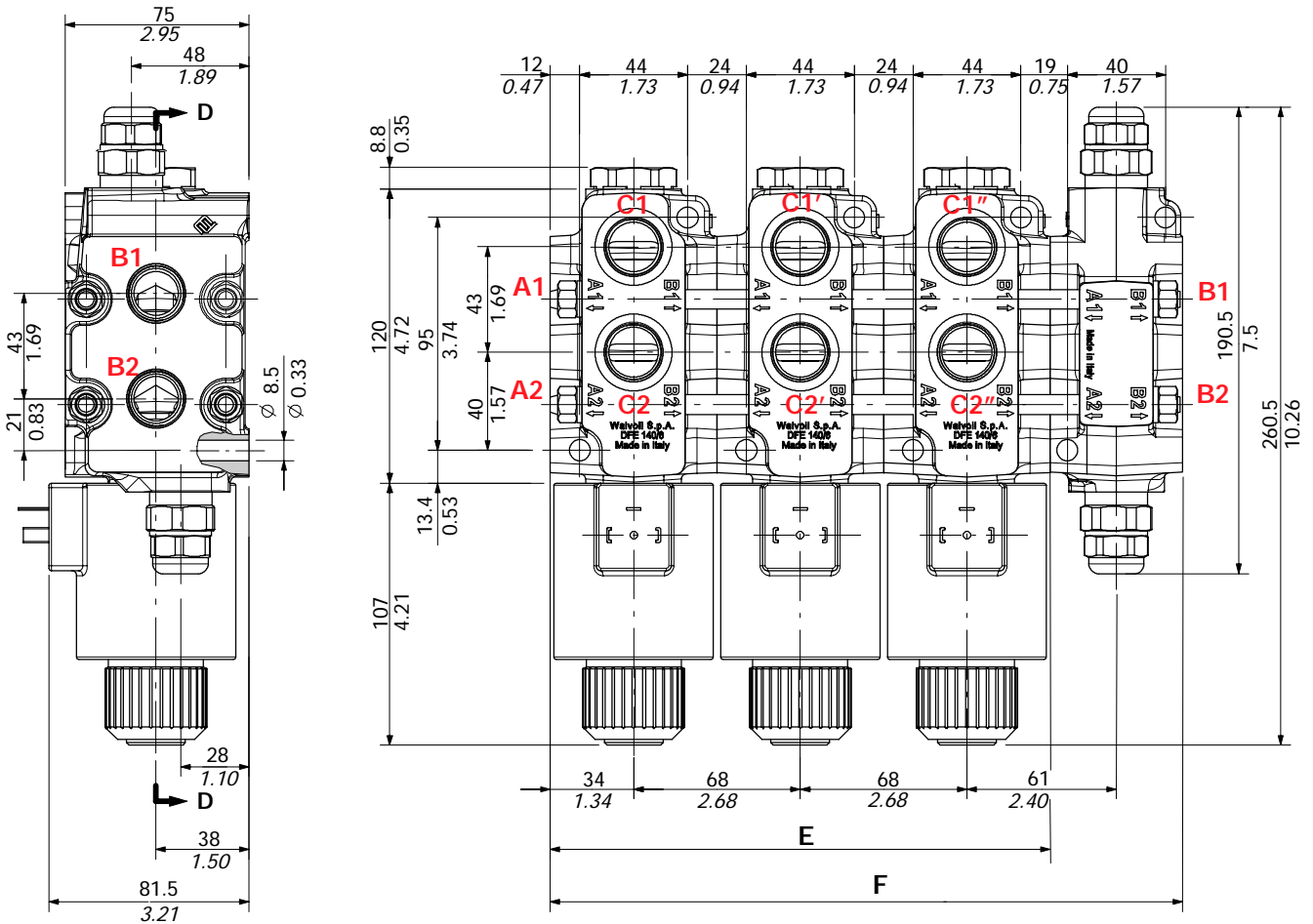


**Operating features**

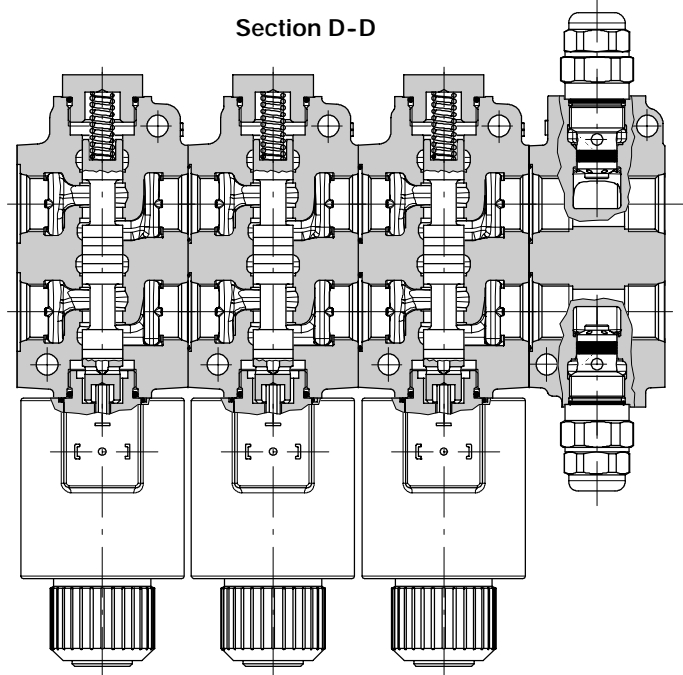
Nominal voltage ..... : 12VDC / 24VDC  
 Nominal voltage tolerance ... : ±10%  
 Power rating ..... : 38 W  
 Duty cycle ..... : 100%  
 Weather protection ..... : Depending on connector type  
 Coil insulation ..... : Class H



The drawing below show diverter valve in 10-way configuration with anti-shock valves block.



Section D-D



Emergency manual override

| TYPE              | E   |       | Weight |      |
|-------------------|-----|-------|--------|------|
|                   | mm  | in    | Kg     | lb   |
| DFE140/6          | 68  | 2.68  | 4.6    | 10.1 |
| DFE140/8          | 136 | 5.35  | 9.5    | 20.9 |
| DFE140/10         | 204 | 8.03  | 14.4   | 31.7 |
| With valves block | E   |       | Weight |      |
|                   | mm  | in    | Kg     | lb   |
| DFE140/6          | 122 | 4.80  | 7.8    | 17.2 |
| DFE140/8          | 190 | 7.48  | 12.5   | 27.6 |
| DFE140/10         | 258 | 10.16 | 17.6   | 38.8 |

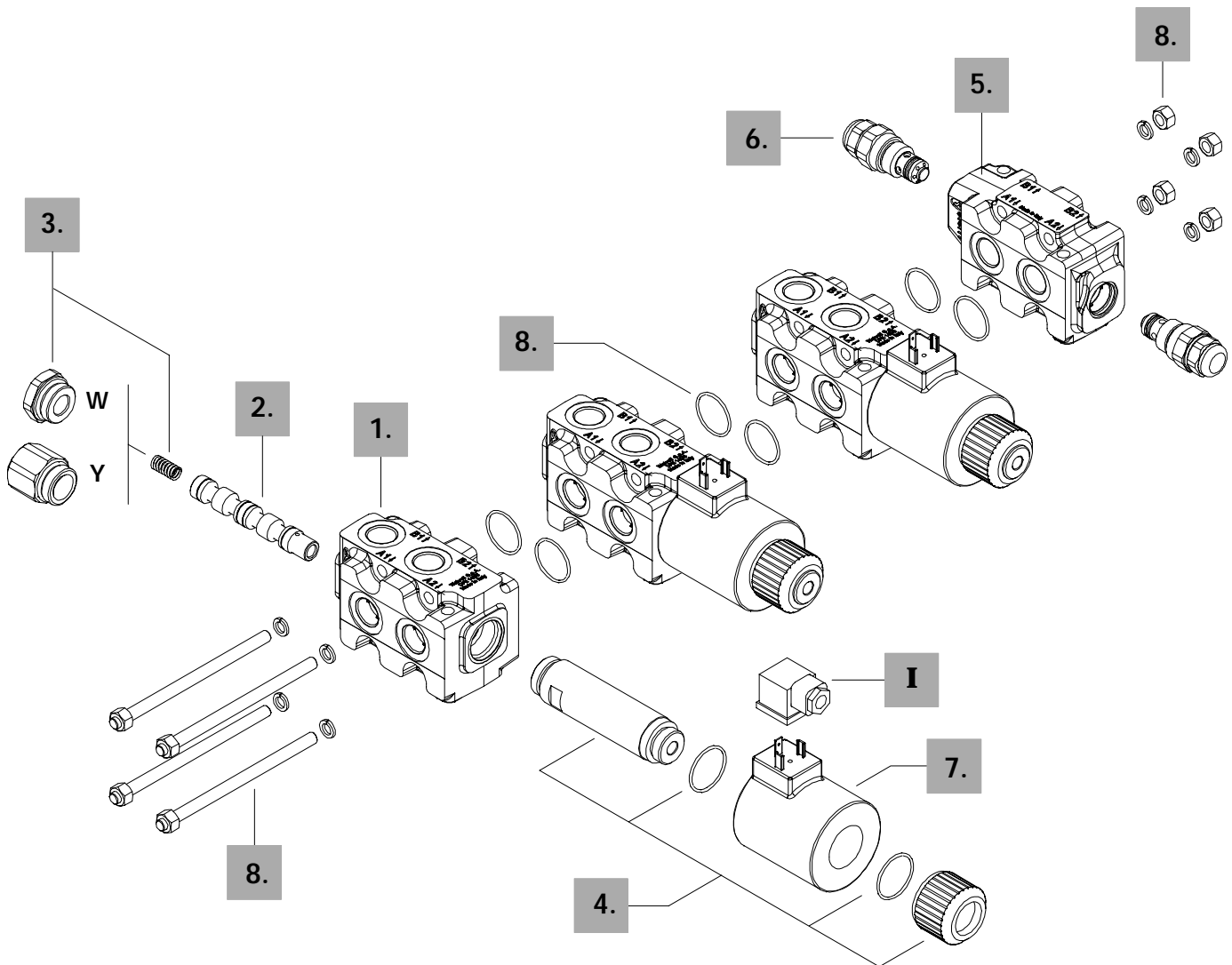
Ordering codes

Description example :

Diverter valve DFE 140 / 10 B 18 ES . P3 (D4-185) - W 201-12VDC - SAE - CRZ \*

Valve setting in bar

Valve body is supplied galvanized



### 1. Body \*

| TYPE   | CODE       | DESCRIPTION                           |
|--------|------------|---------------------------------------|
| 140/6  | 3CO2280302 | 6-way body                            |
| 140/8  | "          | Nr 2 of 6-way body for 8-way circuit  |
| 140/10 | "          | Nr 3 of 6-way body for 10-way circuit |

### 2. Spool option

| TYPE | CODE       | DESCRIPTION                                       |
|------|------------|---|
| B    | 3CAS110740 | 2 positions with ports closed in transit position |

### 3. Positioner kits page 100

| TYPE   | CODE     | DESCRIPTION                                       |
|--------|----------|---|
| 18...W | 5TAP005  | Spring return in position 1                       |
| 18...Y | 5GIU011* | Spring return in position 1, with SAE6 drain port |

### 4. Tube assembly page 100

| TYPE | CODE       | DESCRIPTION                                |
|------|------------|--|
| ES   | 5SOL519001 | Spring return in position 1 (without coil) |

### 5. Valves block \* page 102

| TYPE | CODE       | DESCRIPTION                      |
|------|------------|----------------------------------|
| P3   | 3CO2780301 | Cross-over anti-shock valve body |

### 6. Anti-shock valve page 102

With fixed setting: setting is referred to valve opening

| TYPE     | CODE       | DESCRIPTION                |
|----------|------------|----------------------------|
| (D2-80)  | X005125095 | Setting 80 bar / 1150 psi  |
| (D3-125) | X005125145 | Setting 125 bar / 1800 psi |
| (D3-140) | X005125155 | Setting 140 bar / 2050 psi |
| (D3-170) | X005125190 | Setting 170 bar / 2450 psi |
| (D4-185) | X005125216 | Setting 185 bar / 2700 psi |
| (D4-210) | X005125245 | Setting 210 bar / 3050 psi |
| (D4-240) | X005125270 | Setting 240 bar / 3500 psi |

### 7. Coil options page 101

| TYPE  | CODE       | DESCRIPTION   |
|---|------------|---|
| 101   |            | Without coil (only with tube kit)                                 |
| <u>With ISO4400 connector</u>                       |            |   |
| 201-12VDC   | 4SOL519112 | Coil with 12VDC nominal voltage                                   |
| 201-24VDC   | 4SOL519124 | Coil with 24VDC nominal voltage                                   |
| 201-20VDC   | 4SOL519120 | Coil with 20VDC nominal voltage (for 24VAC): need C04 connector   |
| 201-94VDC   | 4SOL519094 | Coil with 94VDC nominal voltage (for 110VAC): need C04 connector  |
| 201-192VDC  | 4SOL519192 | Coil with 192VDC nominal voltage (for 220VAC): need C04 connector |
| <u>With flying leads and DEUTSCH DT04 connector</u> |            |   |
| 241-12VDC   | 4SOL519412 | Coil with 12VDC nominal voltage                                   |
| 241-24VDC   | 4SOL519424 | Coil with 24VDC nominal voltage                                   |

### 8. Tie rods kit and O-ring seals

| CODE       | MOUNTED ON                    |
|------------|-------------------------------|
| 5TIR108121 | DFE140/6 with P3 valves block |
| 5TIR108134 | DFE140/8                      |
| 5TIR108189 | DFE140/8 with P3 valves block |
| 5TIR108202 | DFE140/10                     |

### I Optional connectors page 119

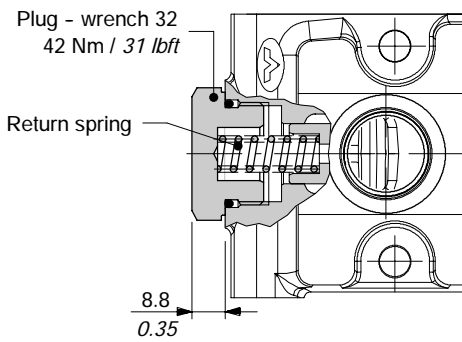
| TYPE | CODE      | DESCRIPTION                         |
|------|-----------|-------------------------------------|
| C02  | 2X1001010 | According ISO4400                   |
| C04  | 2X1001040 | According to ISO4400 with rectifier |
| C19  | 5CON007   | Type DEUTSCH DT06                   |

NOTE (\*) - Codes are referred to **UN-UNF** thread.

**Positioner kits**

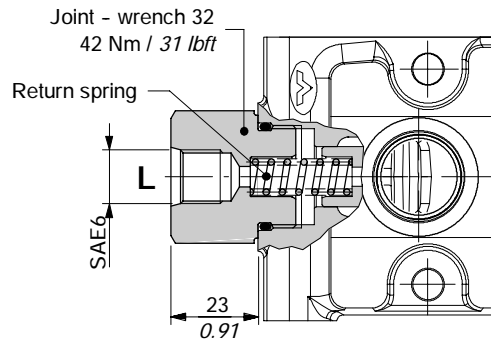
**18W kit**

Spring return in position 1 with plug.



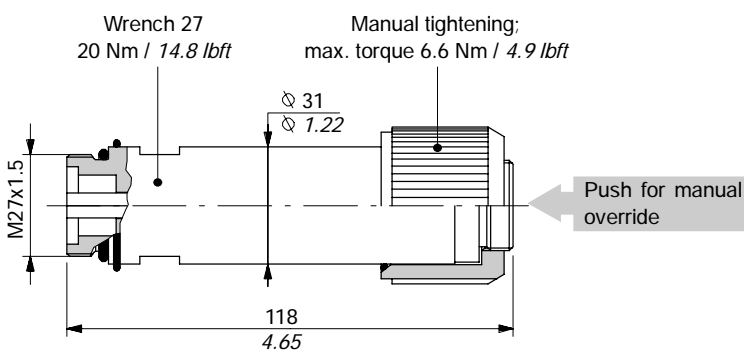
**18Y kit**

Spring return in position 1, with SAE6 joint for drain.



**Solenoid parts**

**ES tube assembly**

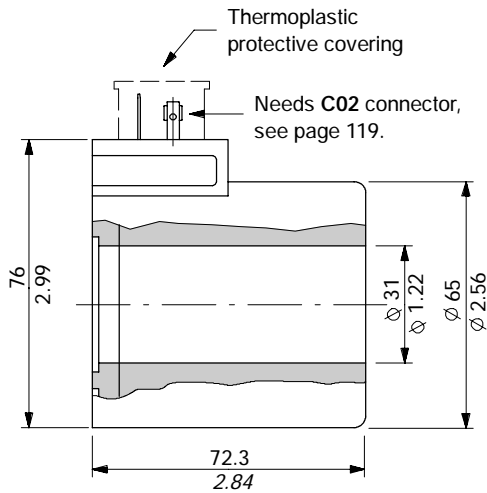


**Operating features**

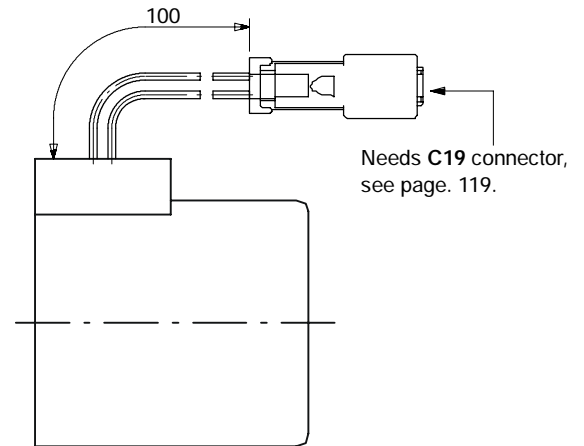
Plunger stroke ..... : 10.2 mm / 0.40 in

**Coil options**

**With ISO4400 connector**  
(weather protection IP65)



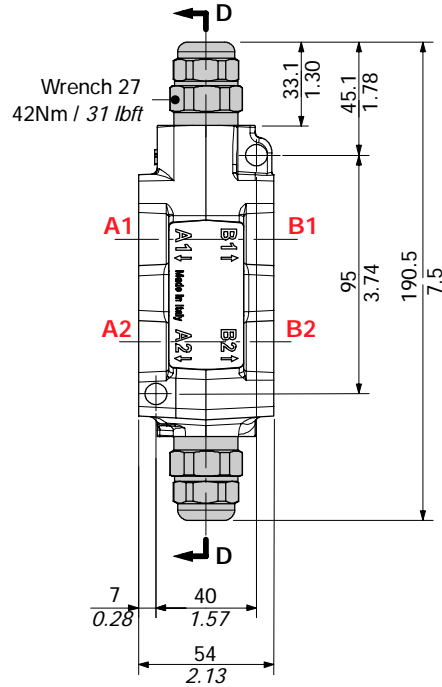
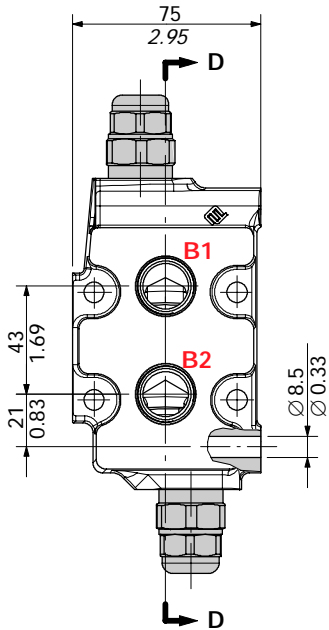
**With flying leads and DEUTSCH DT04 connector**  
(weather protection IP67)



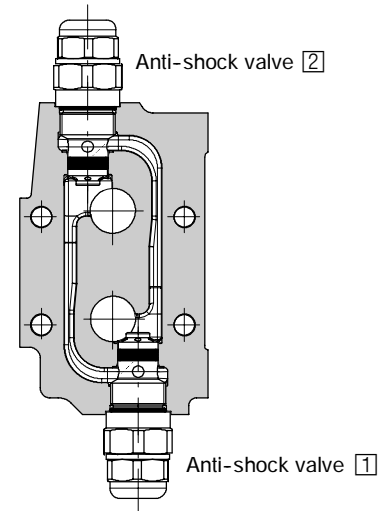
**Operating features**

- Nominal voltage . . . . . : 12-20-24-94-192VDC
- Nominal voltage tolerance . . . : ±10%
- Power rating . . . . . : 60 W
- Duty cycle . . . . . : 100%
- Weather protection . . . . . : depending on connector type
- Coil insulation . . . . . : Class H

P3 block complete with anti-shock valves

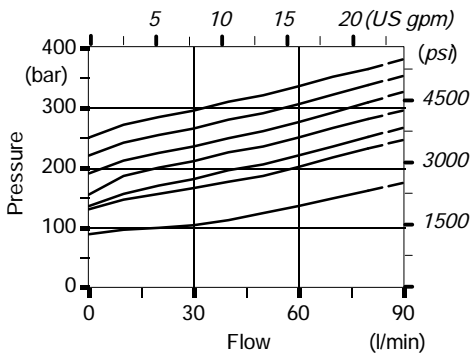


Section D-D

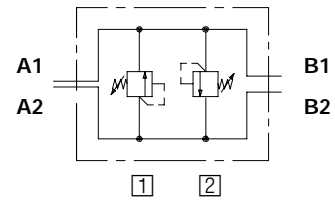


Anti-shock valves performance data

(setting: 80-125-140-170-185-210-240 bar / 1150-1800-2050-2450-2700-3050-3500 psi)



Hydraulic circuit



## Contents

|                          |     |
|--------------------------|-----|
| Working conditions ..... | 104 |
| Hydraulic circuit .....  | 105 |
| DH5 .....                | 106 |
| DH10 .....               | 107 |
| DH20 .....               | 108 |
| DH25 .....               | 109 |
| DH30 .....               | 111 |

## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature. DH rotary spool diverter valve position cannot be changed when valve is pressurized.

|  | DH5   | DH10  | DH20  | DH25  | DH30  |
|--|---|---|---|---|---|
| N. of available ways                       | 3-4-6-8   | 3-4-6-8   | 3-4-6-8   | 3-4-6-8   | 3-6   |
| Nominal flow rating                        | 60 l/min<br>16 US gpm   | 90 l/min<br>24 US gpm                               | 140 l/min<br>37 US gpm                              | 200 l/min<br>53 US gpm                              | 280 l/min<br>74 US gpm                              |
| Operating pressure (maximum)               | 315 bar<br>4600 psi   | 315 bar<br>4600 psi                                 | 315 bar<br>4600 psi                                 | 250 bar<br>3600 psi                                 | 210 bar<br>3050 psi                                 |
| Internal leakage A(B)→T                    | $\Delta p = 100 \text{ bar } 1450 \text{ psi}$ with fluid and valve at 40°C - 104°F |   |   |   |   |
|  | 3 cm <sup>3</sup> /min<br>0.18 in <sup>3</sup> /min                                 | 3 cm <sup>3</sup> /min<br>0.18 in <sup>3</sup> /min | 3 cm <sup>3</sup> /min<br>0.18 in <sup>3</sup> /min | 3 cm <sup>3</sup> /min<br>0.18 in <sup>3</sup> /min | 3 cm <sup>3</sup> /min<br>0.18 in <sup>3</sup> /min |
| Hydraulic fluid                            | Mineral base oil  |   |   |   |   |
| Fluid temperature                          | with NBR seals<br>from -20°C to 80°C / from -4°F to 176°F                           |   |   |   |   |
|  | with FPM seals<br>from -20°C to 100°C / from -4°F to 212°F                          |   |   |   |   |
| Viscosity                                  | operating range<br>from 15 to 75 mm <sup>2</sup> /s - from 15 to 75 cSt             |   |   |   |   |
|  | minima<br>12 mm <sup>2</sup> /s - 12 cSt  |   |   |   |   |
|  | massima<br>400 mm <sup>2</sup> /s - 400 cSt   |   |   |   |   |
| Max. level of contamination                | -/19/16 - ISO 4406 / NAS 1638 - class 10  |   |   |   |   |
| Ambient temperature for working conditions | from -40°C to 60°C / from -40°F to 140°F  |   |   |   |   |

NOTE - For different working conditions please contact Sales Dept

## Standard threads

### REFERENCE STANDARDS

|                     |     | BSP                    | UN-UNF            | METRIC                 |         |
|---------------------|-----|------------------------|-------------------|------------------------|---------|
| THREAD ACCORDING TO |     | ISO 228/1              | ISO 263           | ISO 262                | ISO 262 |
|                     |     | BS 2779                | ANSI B1.1 unified |                        |         |
| CAVITY ACCORDING TO | ISO | 1179                   | 11926             | 9974-1                 | 6149    |
|                     | SAE |                        | J1926             |                        | J2244   |
|                     | DIN | 3852-2<br>shape X or Y |                   | 3852-1<br>shape X or Y |         |

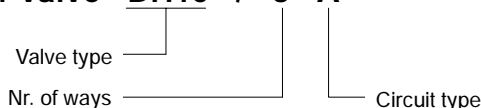
### PORTS THREAD

| ALL PORTS | BSP     | UN-UNF             |
|-----------|---------|--------------------|
| DH5       | G 3/8   | 3/4-16 (SAE 8)     |
| DH10      | G 1/2   | 7/8-14 (SAE 10)    |
| DH20      | G 3/4   | 1 1/16-12 (SAE 12) |
| DH25      | G 1     | 1 5/16-12 (SAE 16) |
| DH30      | G 1 1/2 | 1 7/8-12 (SAE 24)  |

NOTE - For different thread contact Sales Department

## Designation

Diverter valve **DH10 / 3 A**



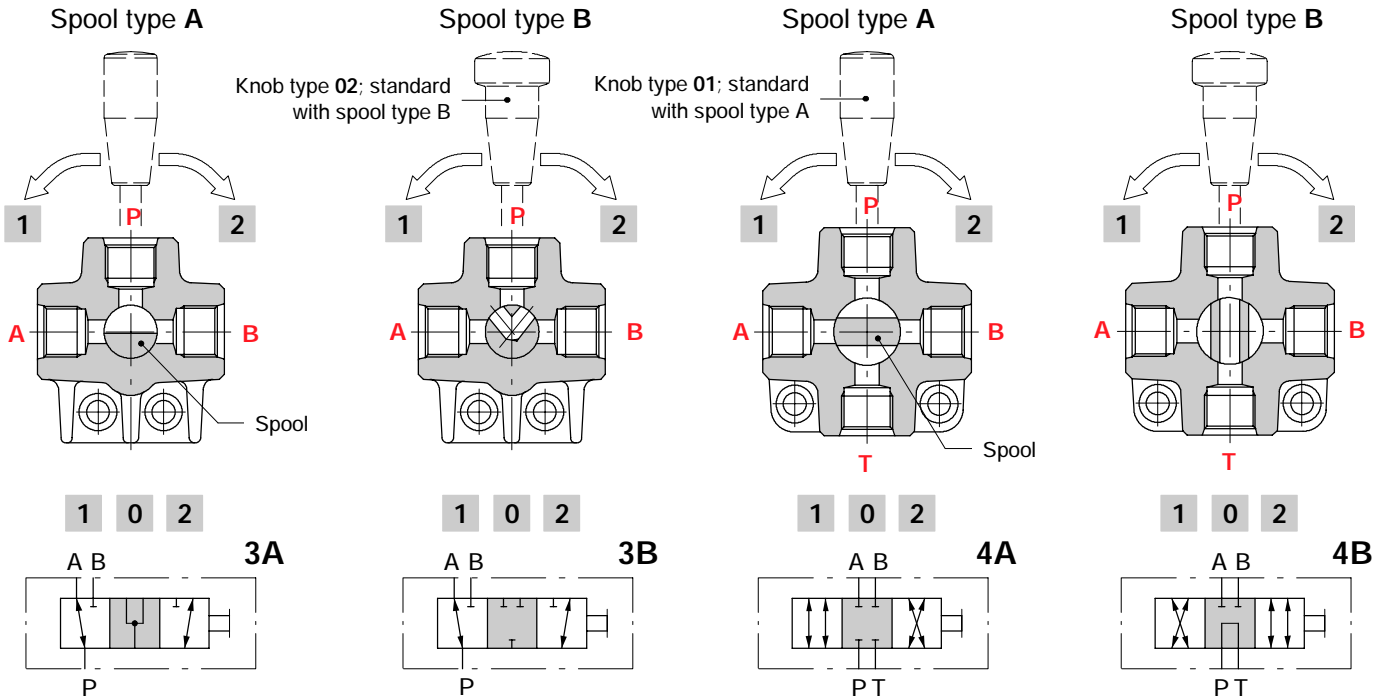


**3-way and 6-way**

6-way diverter valve is obtained by coupling two 3-way bodies using assembling kit.

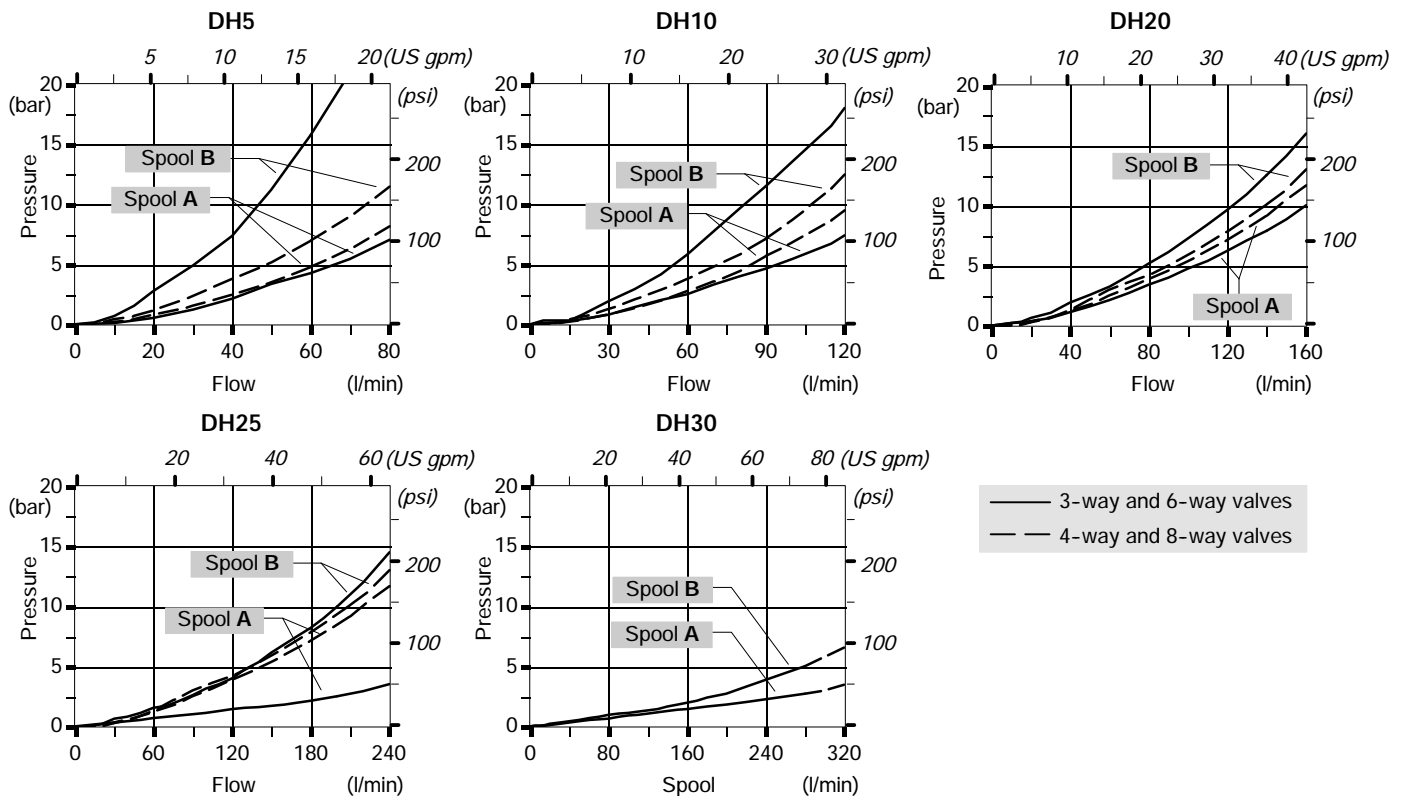
**4-way and 8-way**

8-way diverter valve is obtained by coupling two 4-way bodies using assembling kit.



**Performance data**

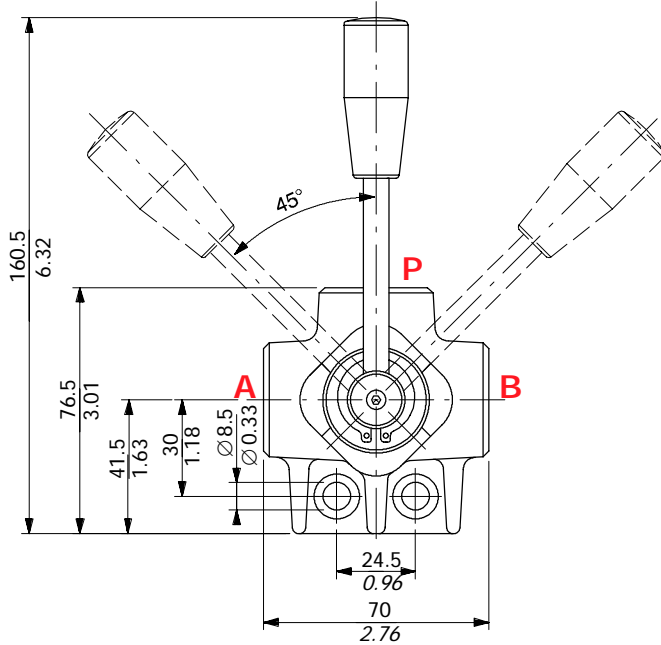
Pressure drop versus flow P→A(B): spool in position 1 (2)



### Dimensional data

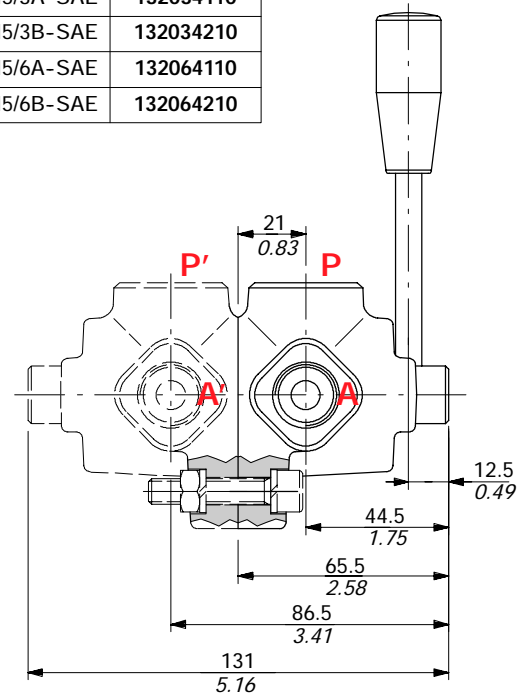
#### 3-way DH5/3 and 6-way DH5/6 valves

Drawing is referred to valve with type A spool.



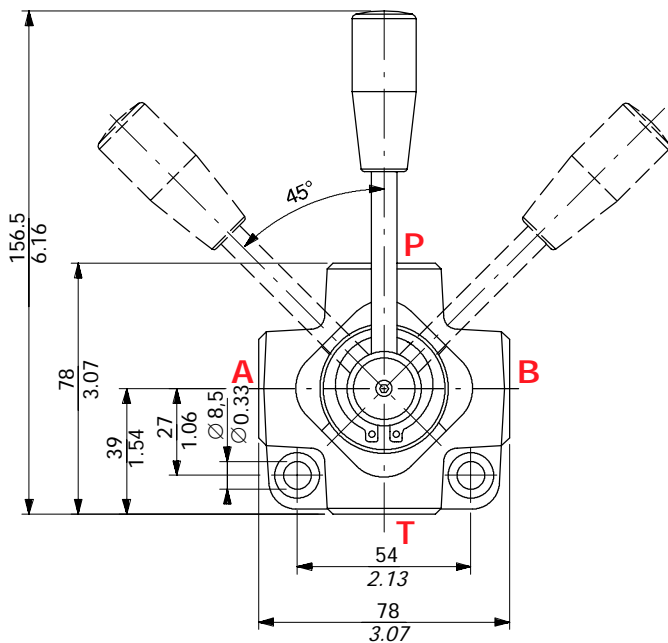
#### Ordering codes

|            |           |
|------------|-----------|
| DH5/3A-SAE | 132034110 |
| DH5/3B-SAE | 132034210 |
| DH5/6A-SAE | 132064110 |
| DH5/6B-SAE | 132064210 |



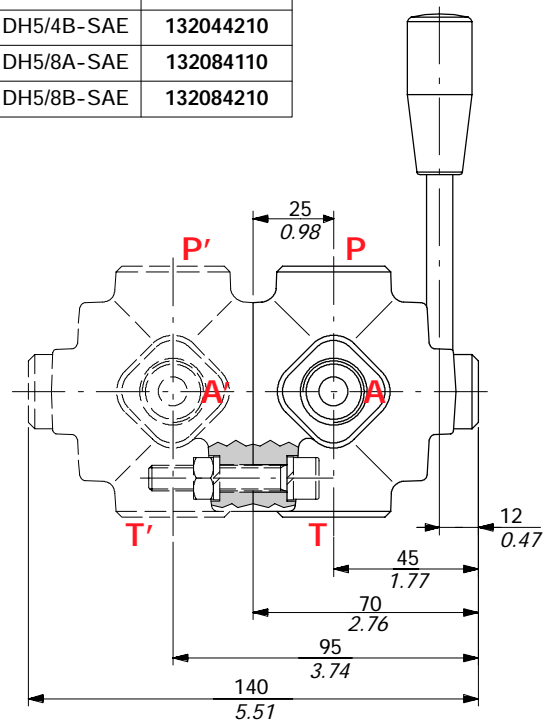
#### 4-way DH5/4 and 8-way DH5/8 valves

Drawing is referred to valve with type A spool.



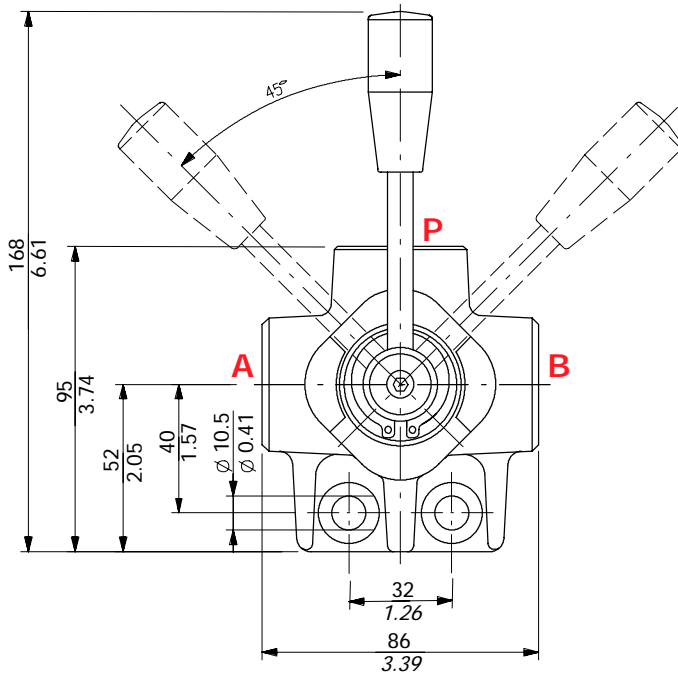
#### Ordering codes

|            |           |
|------------|-----------|
| DH5/4A-SAE | 132044110 |
| DH5/4B-SAE | 132044210 |
| DH5/8A-SAE | 132084110 |
| DH5/8B-SAE | 132084210 |



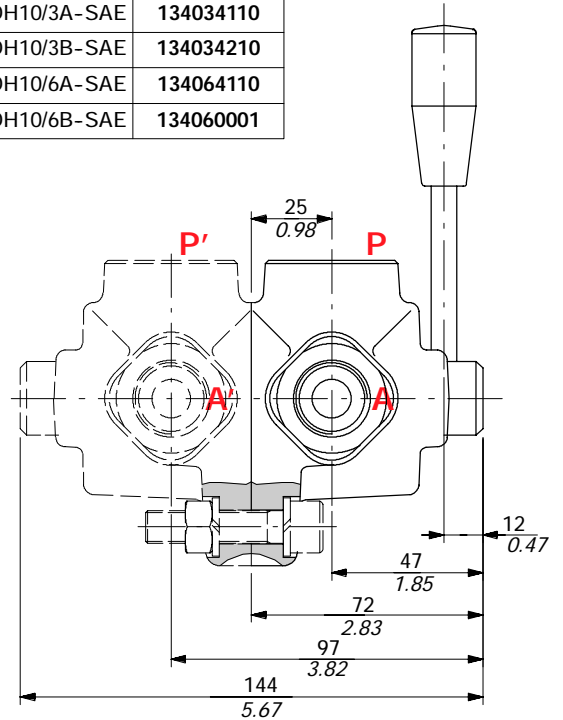
**3-way DH10/3 and 6-way DH10/6 valves**

Drawing is referred to valve with type A spool.



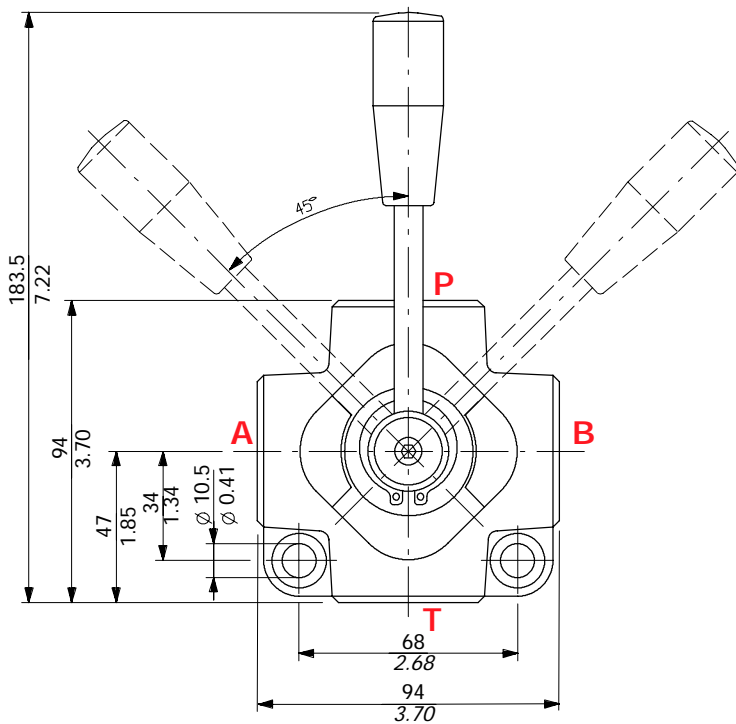
**Ordering codes**

|             |           |
|-------------|-----------|
| DH10/3A-SAE | 134034110 |
| DH10/3B-SAE | 134034210 |
| DH10/6A-SAE | 134064110 |
| DH10/6B-SAE | 134060001 |



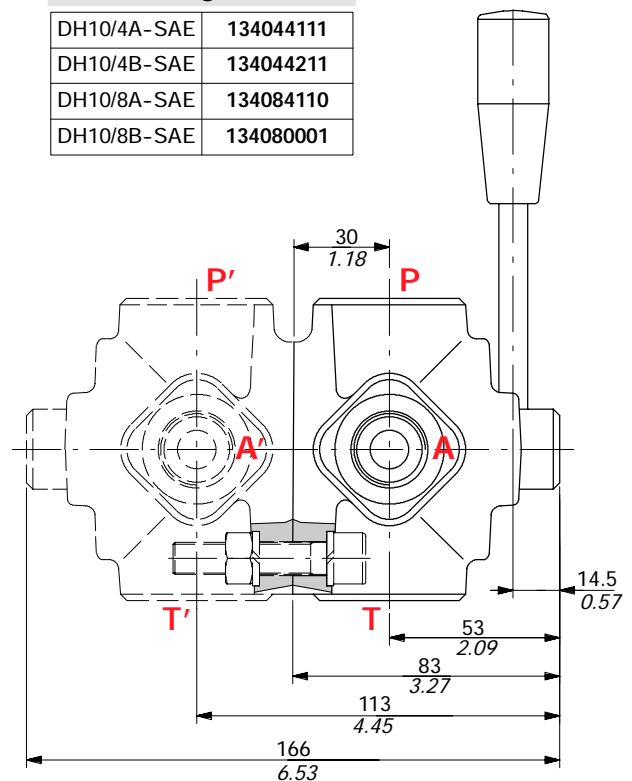
**4-way DH10/4 and 8-way DH10/8 valves**

Drawing is referred to valve with type A spool.



**Ordering codes**

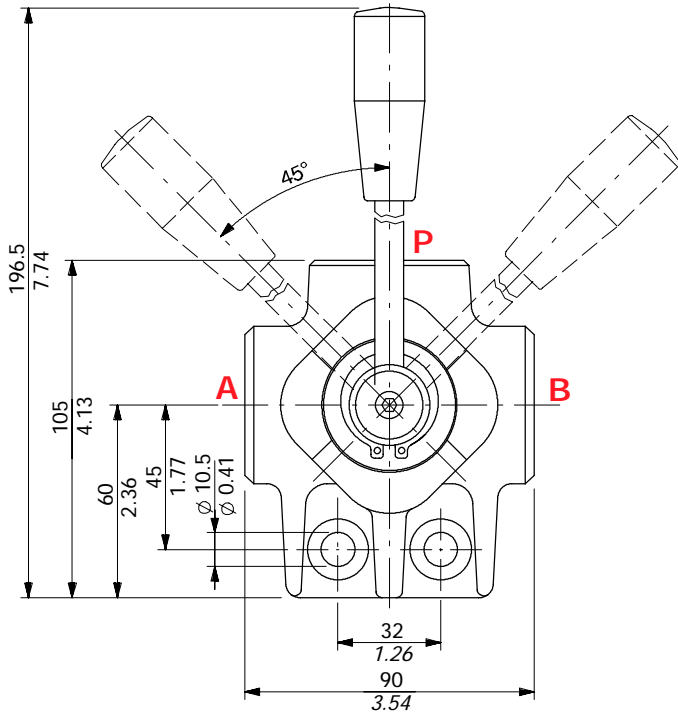
|             |           |
|-------------|-----------|
| DH10/4A-SAE | 134044111 |
| DH10/4B-SAE | 134044211 |
| DH10/8A-SAE | 134084110 |
| DH10/8B-SAE | 134080001 |



### Dimensional data

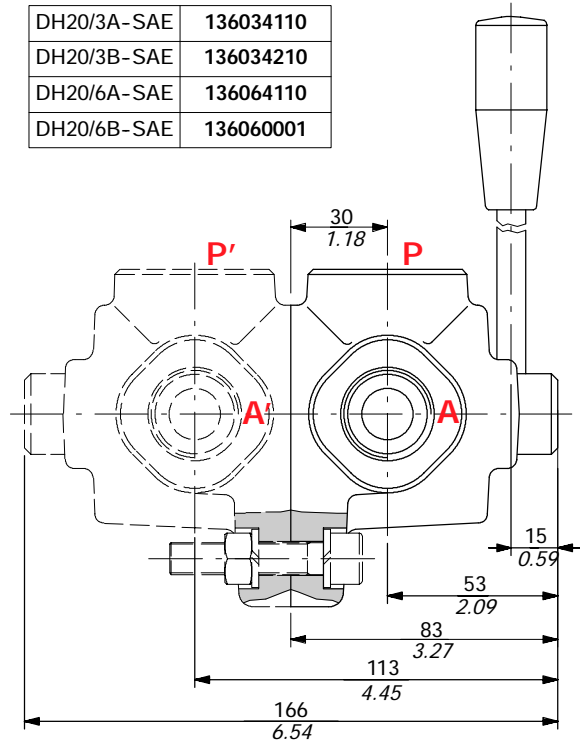
#### 3-way DH20/3 and 6-way DH20/6 valves

Drawing is referred to valve with type A spool.



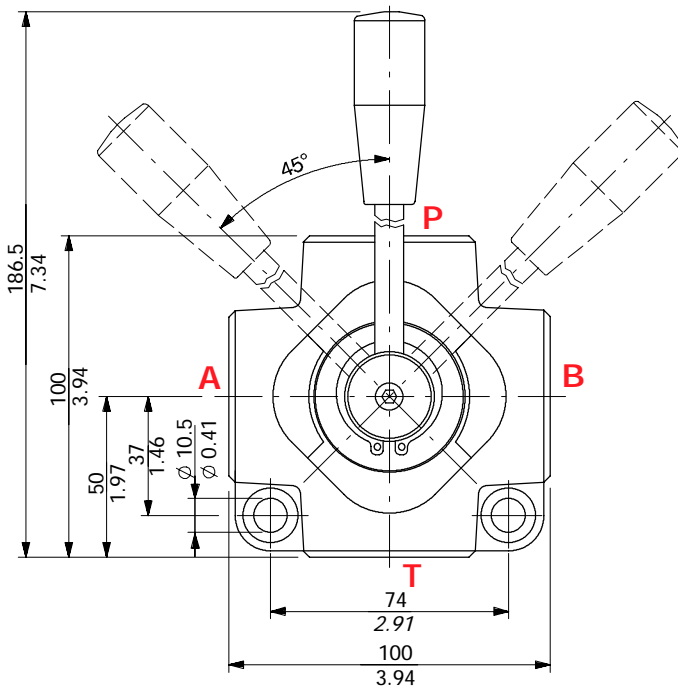
#### Ordering codes

|             |           |
|-------------|-----------|
| DH20/3A-SAE | 136034110 |
| DH20/3B-SAE | 136034210 |
| DH20/6A-SAE | 136064110 |
| DH20/6B-SAE | 136060001 |



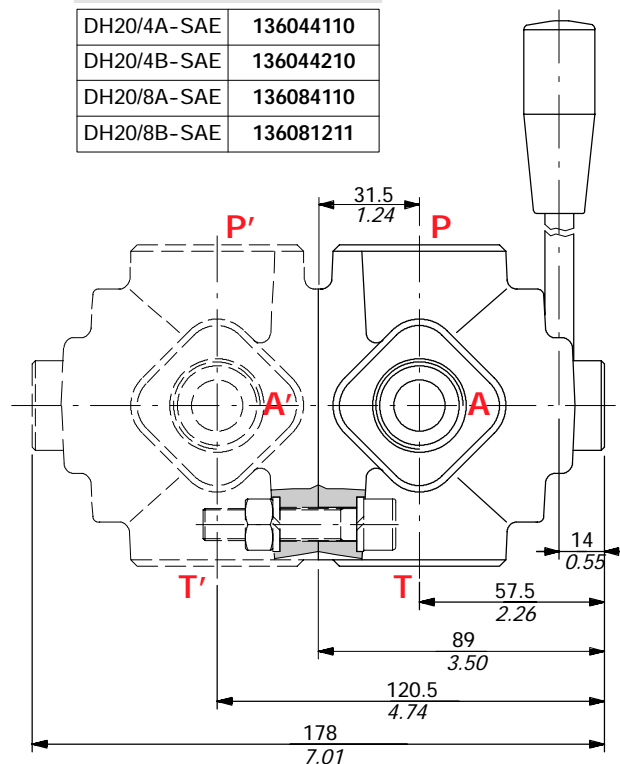
#### 4-way DH20/4 and 8-way DH20/8 valves

Drawing is referred to valve with type A spool.



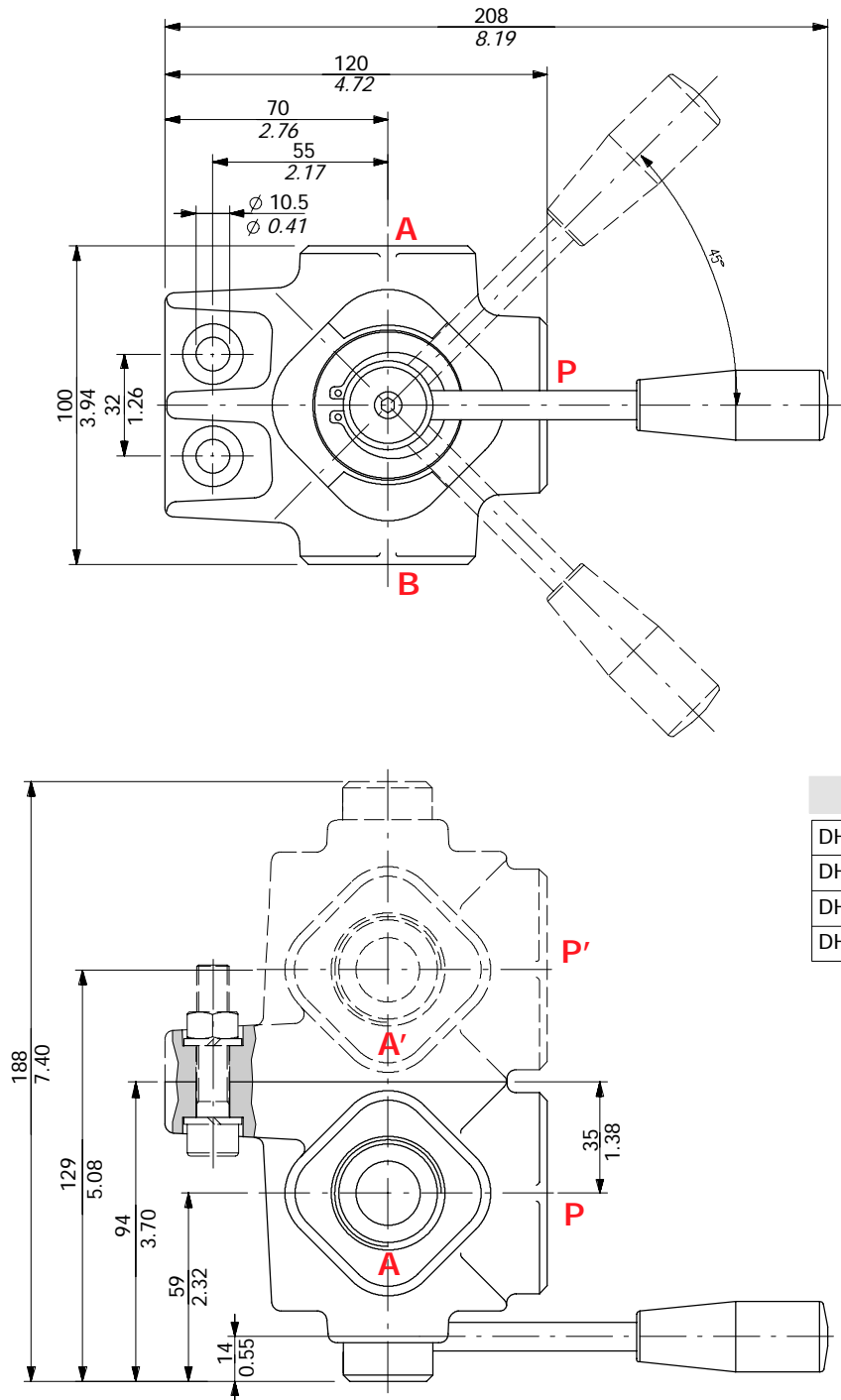
#### Ordering codes

|             |           |
|-------------|-----------|
| DH20/4A-SAE | 136044110 |
| DH20/4B-SAE | 136044210 |
| DH20/8A-SAE | 136084110 |
| DH20/8B-SAE | 136081211 |



3-way DH25/3 and 6-way DH25/6 valves

Drawing is referred to valve with type A spool.



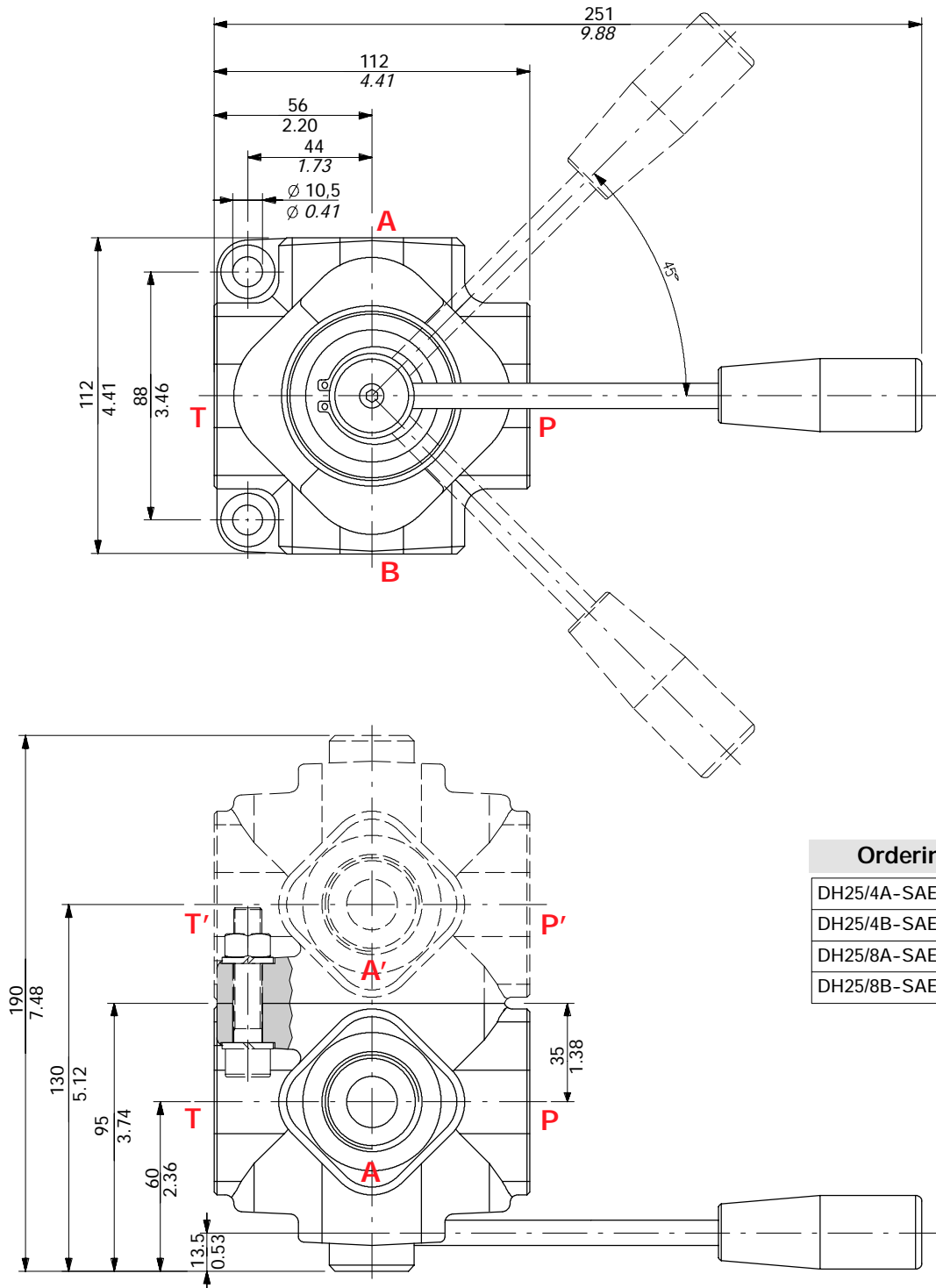
Ordering codes

|             |           |
|-------------|-----------|
| DH25/3A-SAE | 137034110 |
| DH25/3B-SAE | 137034210 |
| DH25/6A-SAE | 137064110 |
| DH25/6B-SAE | 137064210 |

Dimensional data

4-way DH25/4 and 8-way DH25/8 valves

Drawing is referred to valve with type A spool.

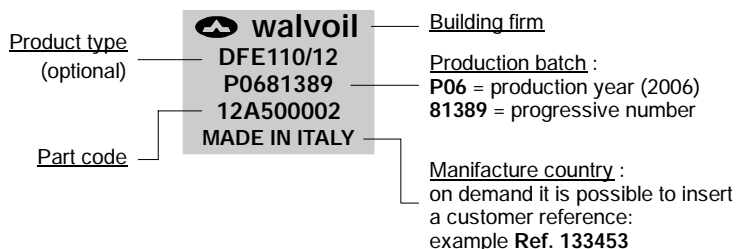




## Product marking

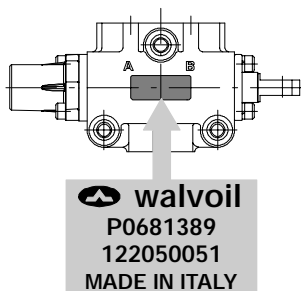
All Walvoil diverter valves are marked according to EN 982 normative.  
 This marking includes: building firm, part code, production batch and manufacture country.

### Marking example

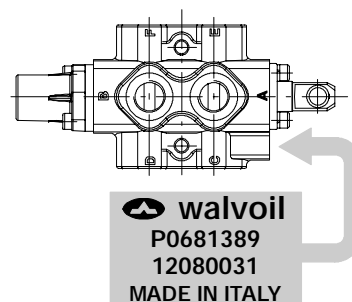


Marking zone depending on valve type, as indicate below.

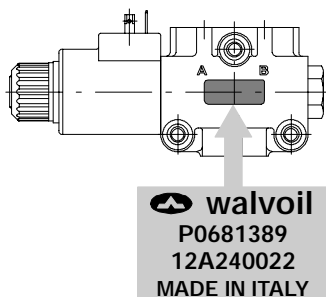
### 2-way and 3-way DF mechanical control type



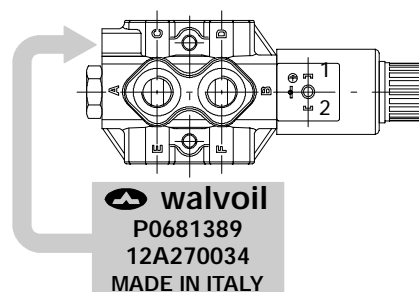
### 6-way DF mechanical control type



### 2-way and 3-way DFE solenoid control monoblock type

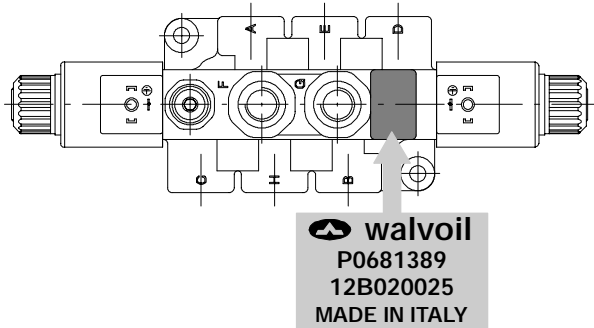


### 6-way DFE solenoid control monoblock type

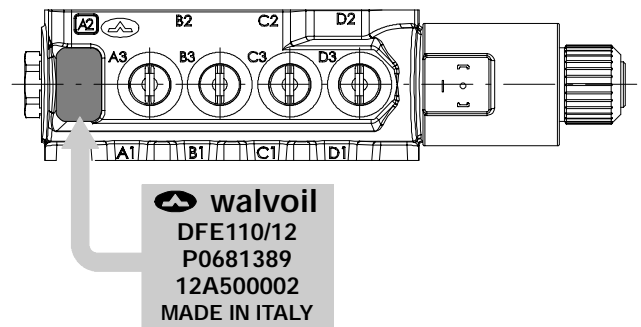




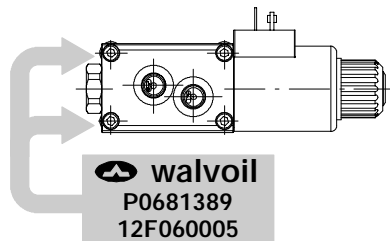
8-way DFE solenoid control monoblock type



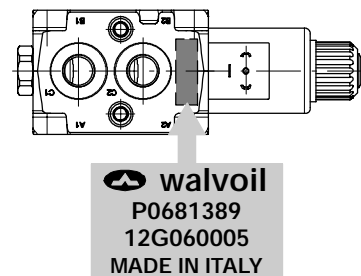
DFE110 solenoid control monoblock type



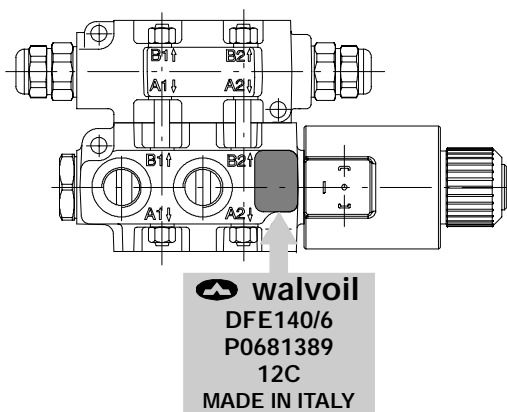
DFE080 solenoid control sectional type



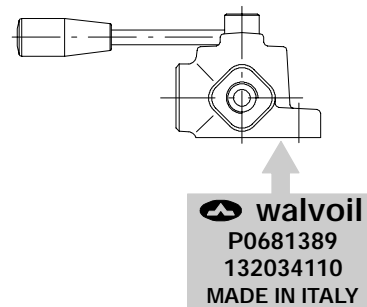
DFE100 solenoid control sectional type



DFE140 solenoid control sectional type



DH rotary control type



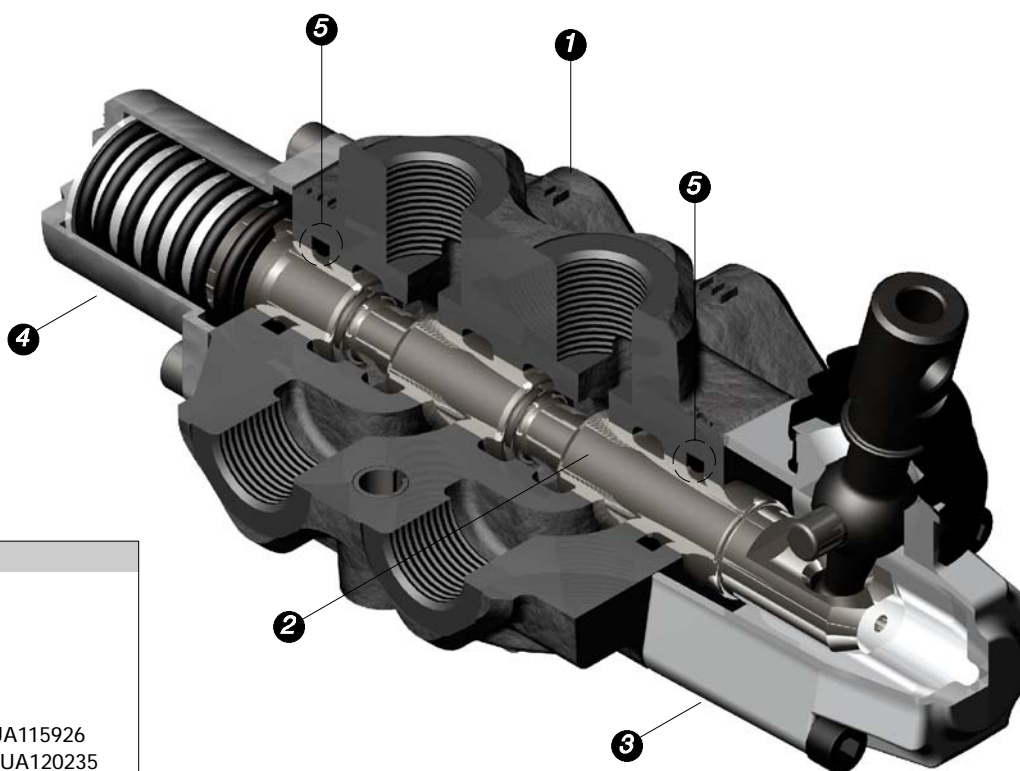
## Installation and maintenance

The DF-DFE-DH diverter valves are assembled and tested as per the technical specification of this catalogue.

Before the final installation on your equipment, follow the below recommendations:

- the diverter valves can be assembled in any position, in order to prevent body deformation and spool sticking mount the product on a flat surface;
- in order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the diverter valves;
- prior to painting, ensure plastic port plugs are tightly in place.

### With mechanical control series DF



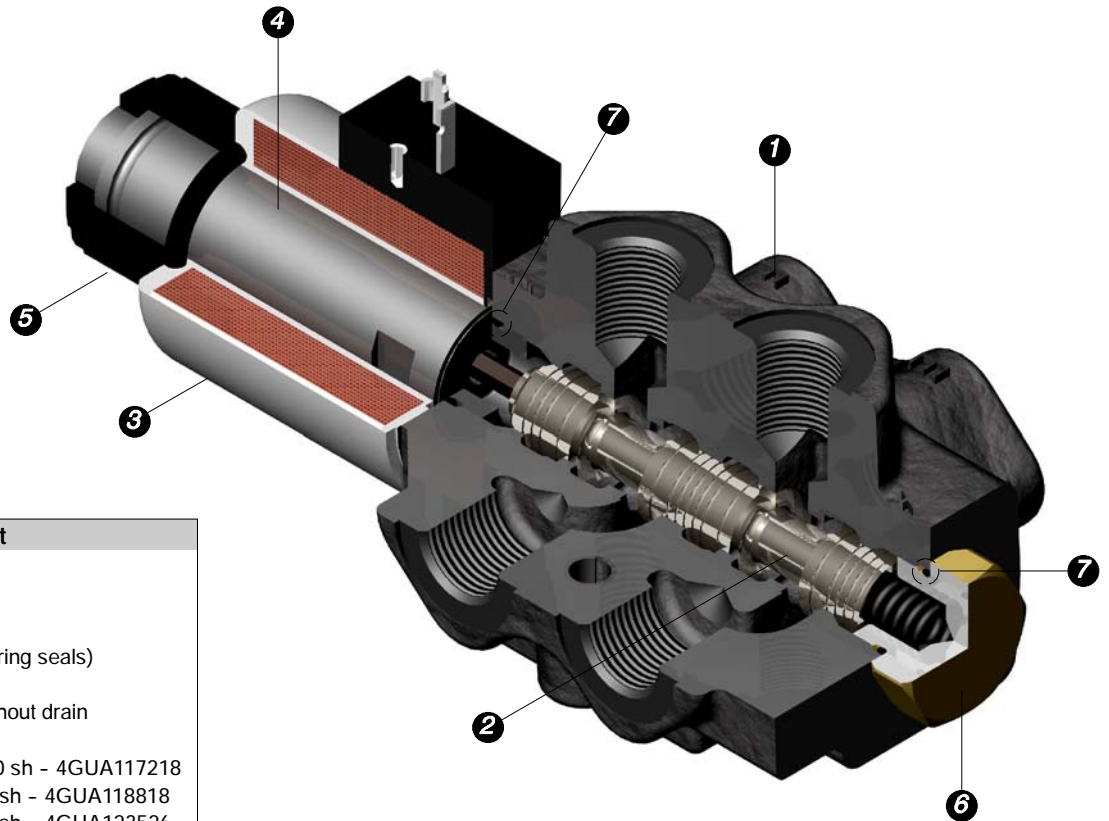
#### Item list

- 1) Diverter valve body
  - 2) Spool
  - 3) Control kit: lever box
  - 4) Positioner kit
  - 5) O-ring seals on spool
- DF5: 15.88x2.62 NBR 70 sh - 4GUA115926  
 DF10: 20.22x3.53 NBR 70 sh - 4GUA120235  
 DF20: 24.99x3.53 NBR 70 sh - 4GUA125035  
 DF25: 29.75x3.53 NBR 70 sh - 4GUA129835

NOTE - All articulated parts inside cap, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2.

| Malfunction                   | Cause  | Remedy   |
|-------------------------------|--|--|
| External leakage.             | Worn spool seal due to mechanical actuation.                 | Locate the leakage and replace the seal.                                   |
| Excessive internal leakage.   | Increase clearance between spools and body due to high wear. | Replace the diverter valve and check the oil contamination level.          |
| Diverter valve don't commute. | Spool blocked.   | Remove the spool, clean it and check the oil contamination level.          |
|                               | High pressure and/or flow.                                   | Verify that pressure and flow values are within working conditions limits. |

With ON/OFF solenoid control series DFE monoblock type

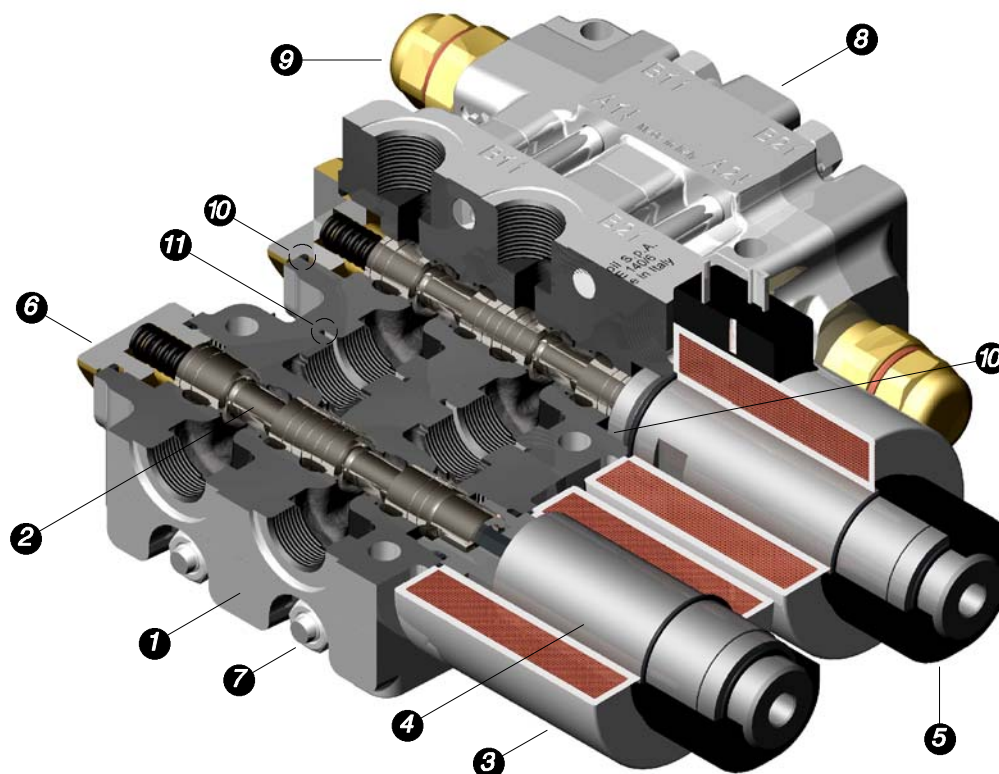


| Item list                                 |
|---|
| 1) Diverter valve body                    |
| 2) Spool                                  |
| 3) Coil                                   |
| 4) Tube assembly (with O-ring seals)      |
| 5) Lock ring                              |
| 6) Positioner kit, with or without drain  |
| 7) O-ring seals on body                   |
| DFE052: 17.17x1.78 NBR 70 sh - 4GUA117218 |
| DFE10: 18.77x1.78 NBR 70 sh - 4GUA118818  |
| DFE20: 23.47x2.62 NBR 70 sh - 4GUA123526  |
| DFE110: 23.47x2.62 NBR 70 sh - 4GUA123526 |

| Malfunction                   | Cause  | Remedy   |
|-------------------------------|--|--|
| External leakage.             | Worn body seal due to mechanical actuation                   | Locate the leakage and replace the seal.                                   |
| Excessive internal leakage.   | Increase clearance between spools and body due to high wear. | Replace the diverter valve and check the oil contamination level.          |
|                               | Spool blocked.   | Remove the spool, clean it and check the oil contamination level.          |
| Diverter valve don't commute. | Coil winding burnt.  | Replace the coil and check the supply voltage value.                       |
|                               | Uncorrected supply voltage.                                  | Test the electric circuit and check the supply voltage value.              |
|                               | High pressure and/or flow.                                   | Verify that pressure and flow values are within working conditions limits. |

Installation and maintenance

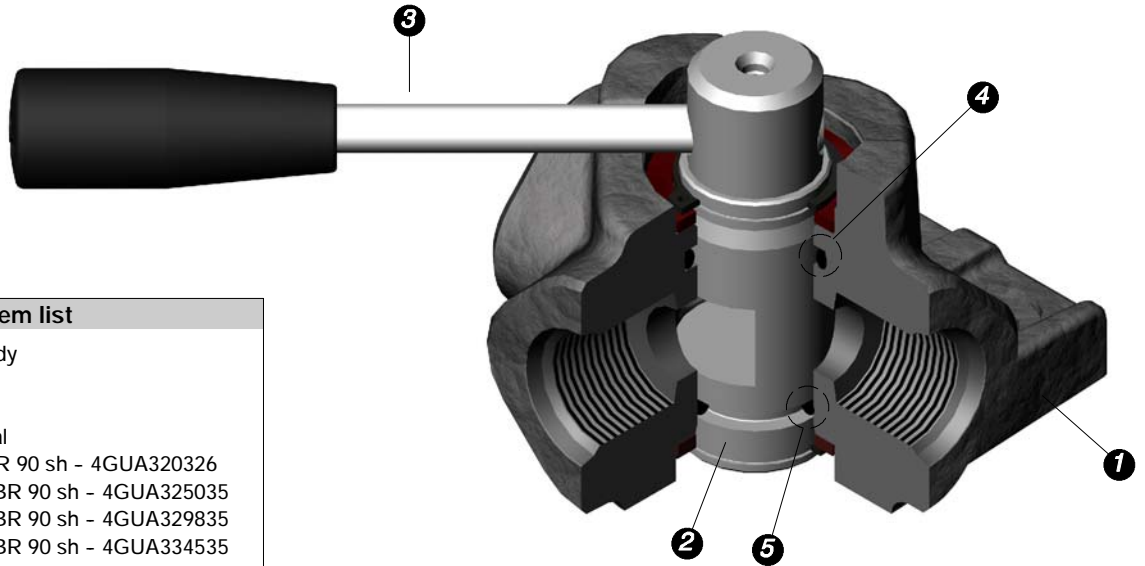
With ON/OFF solenoid control series DFE sectional type



| Item list                                |   |
|--|---|
| 1) Diverter valve body                   | 10) O-ring seals on body                  |
| 2) Spool                                 | DFE080: 17.17x1.78 NBR 70 sh - 4GUA117218 |
| 3) Coil                                  | DFE100: 17.17x1.78 NBR 70 sh - 4GUA117218 |
| 4) Tube assembly (with O-ring seals)     | DFE140: 23.47x2.62 NBR 70 sh - 4GUA123526 |
| 5) Lock ring                             | 11) O-ring seals between sections         |
| 6) Positioner kit, with or without drain | DFE080: 18.77x1.78 NBR 90 sh - 4GUA318818 |
| 7) Tie rods kit                          | DFE100: 26.70x1.78 NBR 90 sh - 4GUA326718 |
| 8) Valves block (only for DFE140)        | DFE140: 28.30x1.78 NBR 90 sh - 4GUA328318 |
| 9) Anti-shock valves (only for DFE140)   |   |

| Malfunction                   | Cause  | Remedy   |
|-------------------------------|--|--|
| External leakage.             | Worn body seal.  | Locate the leakage and replace the seal.   |
|                               | Worn section seal.   | Locate the leakage and replace the seal. Be sure to tighten the tie rods to correct value. |
| Excessive internal leakage.   | Increase clearance between spools and body due to high wear. | Replace the diverter valve and check the oil contamination level.                          |
|                               | Spool blocked.   | Remove the spool, clean it and check the oil contamination level.                          |
| Diverter valve don't commute. | Coil winding burnt.  | Replace the coil and check the supply voltage value.                                       |
|                               | Uncorrected supply voltage.                                  | Test the electric circuit and check the supply voltage value.                              |
|                               | High pressure and/or flow.                                   | Verify that pressure and flow values are within working conditions limits.                 |

With rotary control series DH



**Item list**

- 1) Diverter valve body
- 2) Rotative spool
- 3) Handlever
- 4) Upper O-ring seal  
DH5: 20.29X2.62 NBR 90 sh - 4GUA320326  
DH10: 24.99X3.53 NBR 90 sh - 4GUA325035  
DH20: 29.75X3.53 NBR 90 sh - 4GUA329835  
DH25: 34.52X3.53 NBR 90 sh - 4GUA334535  
DH30: 49.21X3.53 NBR 90 sh - 4GUA349235
- 5) Bottom O-ring seal  
DH5: 15.08X2.62 NBR 90 sh - 4GUA315126  
DH10: 18.64X3.53 NBR 90 sh - 4GUA318635  
DH20: 23.39X3.53 NBR 90 sh - 4GUA323435  
DH25: 28.17X3.53 NBR 90 sh - 4GUA328235  
DH30: 42.86X3.53 NBR 90 sh - 4GUA342935

| Malfunction                   | Cause  | Remedy   |
|-------------------------------|--|--|
| External leakage.             | Worn spool seal due to mechanical actuation.                 | Locate the leakage and replace the seal.                                   |
| Excessive internal leakage.   | Increase clearance between spools and body due to high wear. | Replace the diverter valve and check the oil contamination level.          |
| Diverter valve don't commute. | Spool blocked.   | Remove the spool, clean it and check the oil contamination level.          |
|                               | High pressure and/or flow.                                   | Verify that pressure and flow values are within working conditions limits. |

## Installation and maintenance

### Fittings tightening torque - Nm / lbft

These torque are recommended.

Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.

#### MECHANICAL CONTROL DIVERTER VALVE VALVES

| THREADS TYPE                 | DF5            | DF10            | DF20               | DF25               |
|------------------------------|----------------|-----------------|--------------------|--------------------|
| BSP                          | G 3/8          | G 1/2           | G 3/4              | G 1                |
| With O-Ring seal             | 35 / 25.8      | 50 / 37         | 90 / 66.4          | 100 / 73.8         |
| With copper washer           | 40 / 29.5      | 60 / 44.3       | 60 / 44.3          | 90 / 66.4          |
| With steel and rubber washer | 30 / 22        | 60 / 44.3       | 70 / 51.6          | 100 / 73.8         |
| UN-UNF                       | 3/4-16 (SAE 8) | 7/8-14 (SAE 10) | 1 1/16-12 (SAE 12) | 1 5/16-12 (SAE 16) |
| With O-Ring seal             | 50 / 37        | 60 / 44.3       | 95 / 70            | 150 / 111          |

#### SOLENOID CONTROL MONOBLOCK DIVERTER VALVES

| THREADS TYPE                 | DFE052         |                 |                | DFE10           |                 | DFE110          |                 | DFE20              |                |
|------------------------------|----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|--------------------|----------------|
|                              | Ports          | Drain           | Drain *        | Ports           | Drain           | Ports           | Drain           | Ports              | Drain          |
| BSP                          | G 3/8          | G 1/4           | G 1/4          | G 1/2           | G 1/4           | G 1/2           | G 1/4           | G 3/4              | G 1/4          |
| With O-Ring seal             | 35 / 25.8      | 20 / 14.8       | 20 / 14.8      | 50 / 37         | 20 / 14.8       | 50 / 37         | 20 / 14.8       | 90 / 66.4          | 20 / 14.8      |
| With copper washer           | 40 / 29.5      | 25 / 18.4       | 25 / 18.4      | 60 / 44.3       | 25 / 18.4       | 60 / 44.3       | 25 / 18.4       | 60 / 44.3          | 25 / 18.4      |
| With steel and rubber washer | 30 / 22        | 16 / 11.8       | 16 / 11.8      | 60 / 44.3       | 16 / 11.8       | 60 / 44.3       | 16 / 11.8       | 70 / 51.6          | 16 / 11.8      |
| UN-UNF                       | 3/4-16 (SAE 8) | 9/16-18 (SAE 6) | 7/16-20 (SAE4) | 7/8-14 (SAE 10) | 9/16-18 (SAE 6) | 7/8-14 (SAE 10) | 9/16-18 (SAE 6) | 1 1/16-12 (SAE 12) | 7/16-20 (SAE4) |
| With O-Ring seal             | 50 / 37        | 30 / 22.1       | 15 / 11        | 60 / 44.3       | 30 / 22.1       | 60 / 44.3       | 30 / 22.1       | 95 / 70            | 15 / 11        |

(\*) drain only for DFE052/8

#### SOLENOID CONTROL SECTIONAL DIVERTER VALVES

| THREADS TYPE                 | DFE080          |                 | DFE100          |                 | DFE140          |                 |
|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                              | Bocche          | Drenaggio       | Bocche          | Drenaggio       | Bocche          | Drenaggio       |
| BSP                          | G 1/4           | G 1/4           | G 3/8           | G 1/4           | G 1/2           | G 1/4           |
| With O-Ring seal             | 20 / 14.8       | 20 / 14.8       | 35 / 25.8       | 20 / 14.8       | 50 / 37         | 20 / 14.8       |
| With copper washer           | 25 / 18.4       | 25 / 18.4       | 40 / 29.5       | 25 / 18.4       | 60 / 44.3       | 25 / 18.4       |
| With steel and rubber washer | 16 / 11.8       | 16 / 11.8       | 30 / 22         | 16 / 11.8       | 60 / 44.3       | 16 / 11.8       |
| UN-UNF                       | 7/16-20 (SAE 4) | 7/16-20 (SAE 4) | 7/8-14 (SAE 10) | 9/16-18 (SAE 6) | 7/8-14 (SAE 10) | 9/16-18 (SAE 6) |
| With O-Ring seal             | 15 / 11         | 15 / 11         | 50 / 37         | 30 / 22.1       | 60 / 44.3       | 30 / 22.1       |

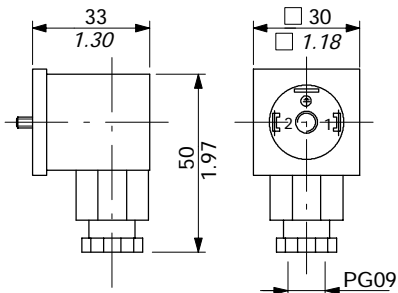
#### ROTARY CONTROL DIVERTER VALVES

| THREADS TYPE                 | DH5            | DH10            | DH20               | DH25               | DH30              |
|------------------------------|----------------|-----------------|--------------------|--------------------|-------------------|
| BSP                          | G 3/8          | G 1/2           | G 3/4              | G 1                | G 1 1/2           |
| With O-Ring seal             | 35 / 25.8      | 50 / 37         | 90 / 66.4          | 100 / 73.8         | 120 / 44.3        |
| With copper washer           | 40 / 29.5      | 60 / 44.3       | 60 / 44.3          | 90 / 66.4          | 100 / 73.8        |
| With steel and rubber washer | 30 / 22        | 60 / 44.3       | 70 / 51.6          | 100 / 73.8         | 120 / 44.3        |
| UN-UNF                       | 3/4-16 (SAE 8) | 7/8-14 (SAE 10) | 1 1/16-12 (SAE 12) | 1 5/16-12 (SAE 16) | 1 7/8-12 (SAE 24) |
| With O-Ring seal             | 50 / 37        | 60 / 44.3       | 95 / 70            | 150 / 111          | 210 / 155         |

Optional connectors

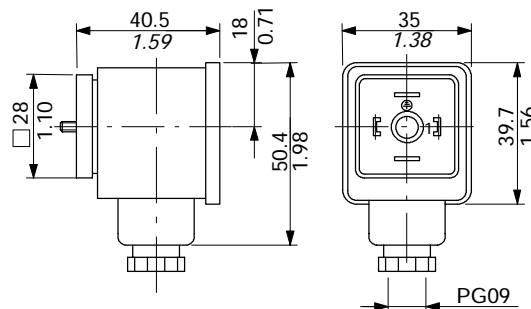
**Type C02 code: 2X1001010**

2P+T according to  
ISO4400 / EN175301-803



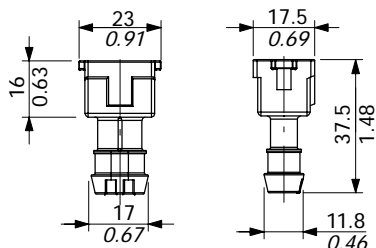
**Type C04 code: 2X1001040**

2P+T according to ISO4400 / EN175301-803  
With bridge rectifier, to use with VAC supply.



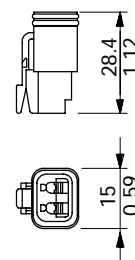
**Type C08 code: 5CON003**

2P female case with female end  
type AMP "Junior-Power-Timer"



**Type C19 code: 5CON007**

2P male case with female end  
type Deutsch DT06-2S



| Type | Poles  | Nominal voltage   | Nominal current | Permitted conductor section range                       | Permitted cable diameter range | Weather protection |
|------|--------|-------------------|-----------------|---|--------------------------------|--------------------|
| C02  | 2P + T | 250 VAC / 300 VDC | 10 A            | max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>    | 6-8 mm / 0.24-0.31 in          | IP65               |
| C04  | 2P + T | /                 | 10 A            | max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>    | 6-8 mm / 0.24-0.31 in          | IP65               |
| C08  | 2P     | 250 VAC           | 12 A            | 0.5-1 mm <sup>2</sup> / 0.00077-0.00155 in <sup>2</sup> | 1.4-1.6 mm / 0.055-0.063 in    | IP65               |
| C19  | 2P     | /                 | 13 A            | 1-1.2 mm <sup>2</sup> / 0.00155-0.00186 in <sup>2</sup> | 2.2-3.5 mm / 0.088-0.14 in     | IP67               |



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