

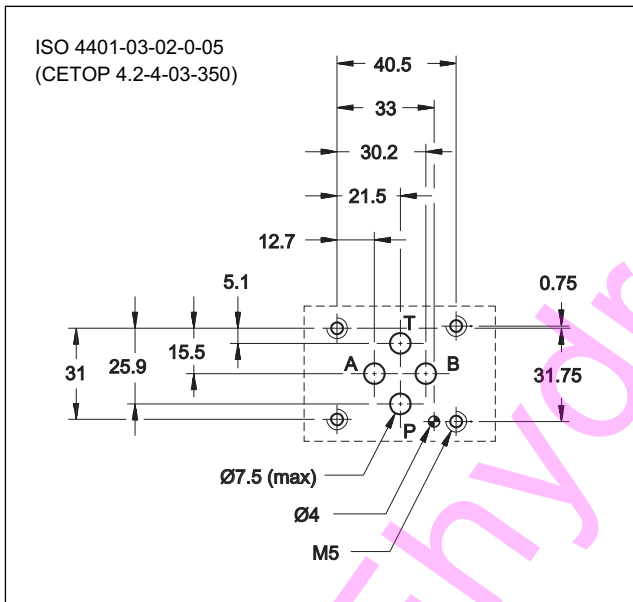
# DSE3

## DIRECTIONAL VALVE WITH PROPORTIONAL CONTROL SERIES 11

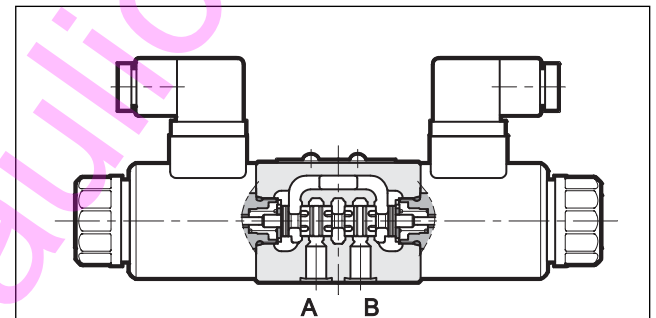
**SUBPLATE MOUNTING  
ISO 4401-03 (CETOP 03)**

**p max 350 bar**  
**Q max 40 l/min**

### MOUNTING INTERFACE



### OPERATING PRINCIPLE

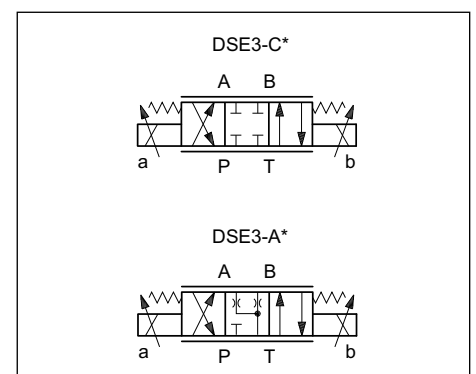


- The DSE3 valve is a directly operated directional control valve with electric proportional control and with ports, in compliance with ISO 4401 standards (CETOP RP 121H).
  - It is used for directional and speed control of hydraulic actuators.
  - Valve opening and hence flow rate can be modulated continuously in proportion to the current supplied to the solenoid.
  - The valve can be controlled directly by a current control supply unit or by means of the relative electronic control units to exploit valve performance to the full (see paragraph 10).
- Also available with manual lever override.

**PERFORMANCES** (obtained with mineral oil with viscosity of 36 cSt at 50°C and with the relative electronic control units)

Max operating pressure: P - A - B ports T port	bar	350 210
Maximum flow with $\Delta p$ 10 bar P-T	l/min	1,3 - 4 - 8 - 16 - 26
Step response		see chapter 6
Hysteresis (with PWM 200 Hz)	% $Q_{max}$	< 6%
Repeatability	% $Q_{max}$	< $\pm 1,5\%$
Electrical characteristics		see chapter 5
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 + 400
Fluid contamination degree	According to ISO 4406:1999 class 18/16/13	
Recommended viscosity	cSt	25
Mass: single solenoid valve double solenoid valve	kg	1,6 2,0

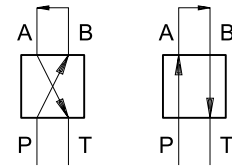
### HYDRAULIC SYMBOLS (typical)



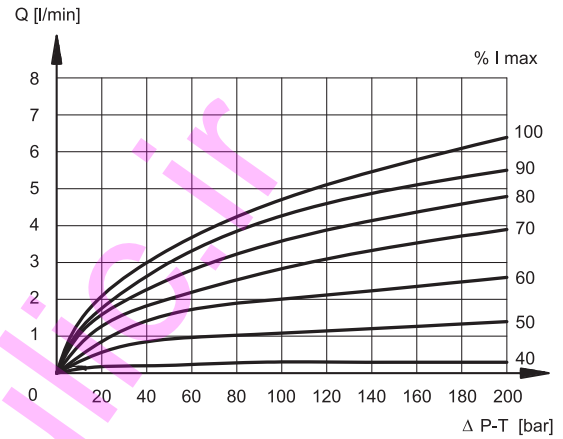
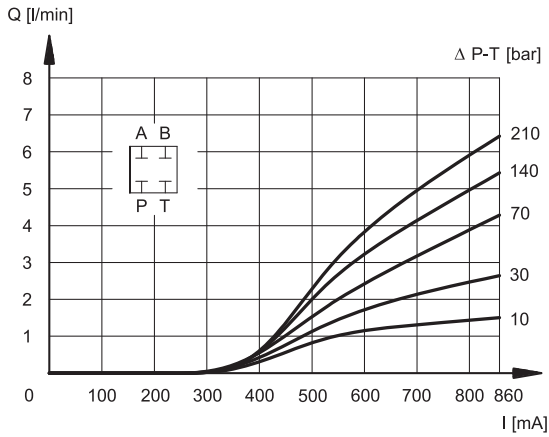


### 3 - CHARACTERISTIC CURVES (values measured with viscosity of 36 cSt at 50°C with valves connected to the relative electronic control units)

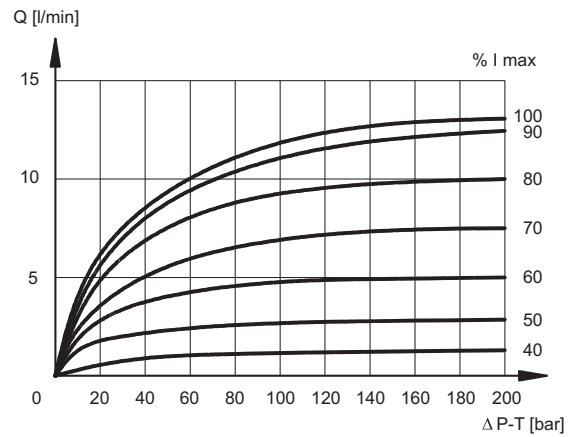
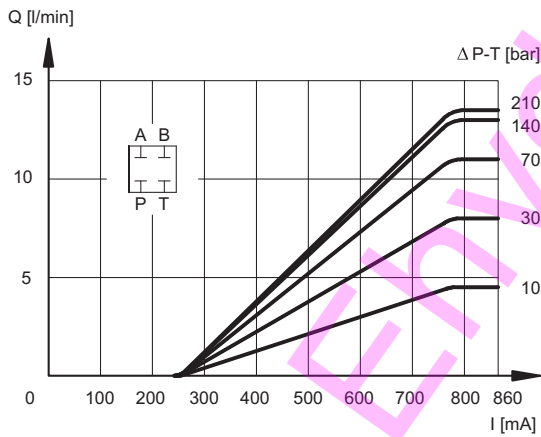
Typical constant flow rate control curves at  $\Delta p$  according to current supply to solenoid (D24 version, maximum current 860 mA), measured for the various spool types available. The reference  $\Delta p$  values are measured between ports P and T on the valve.



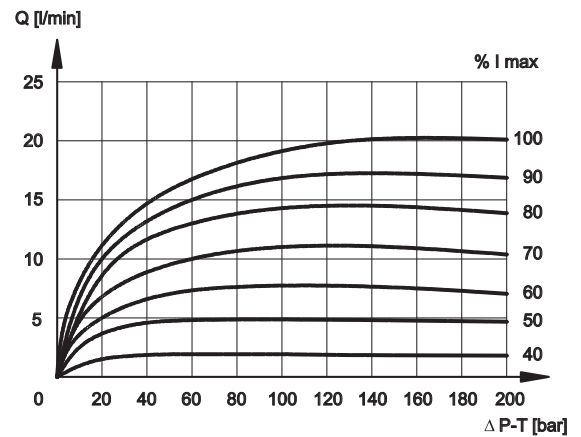
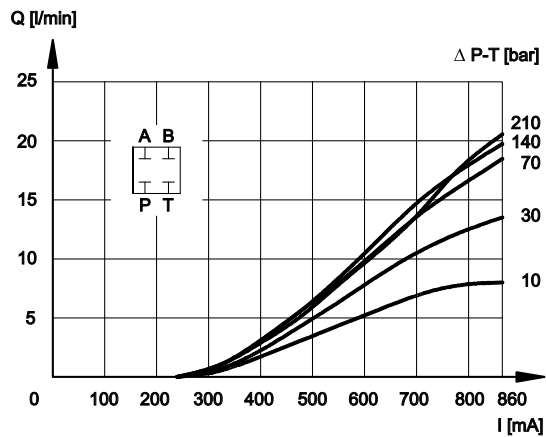
#### SPOOL TYPE C01



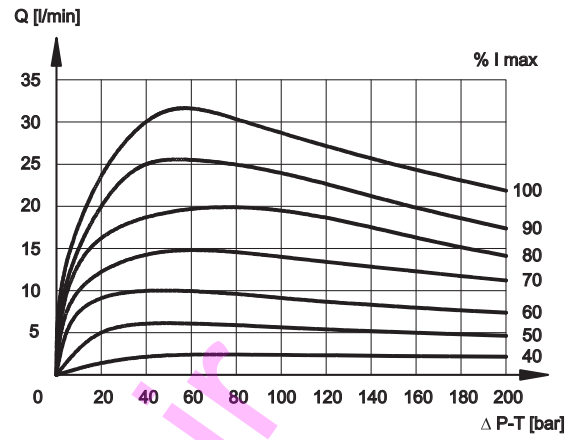
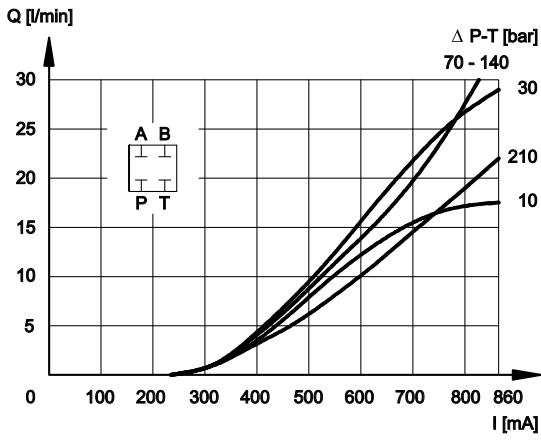
#### SPOOL TYPE C04



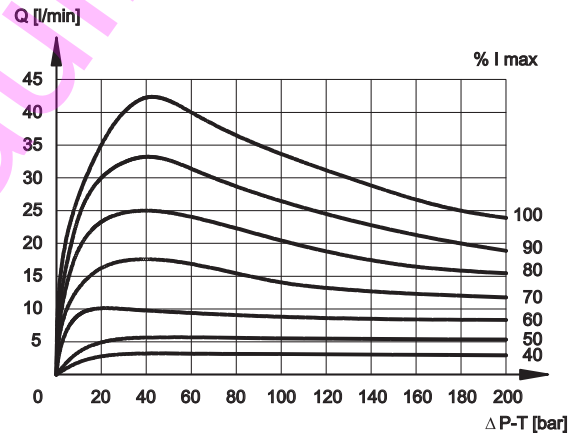
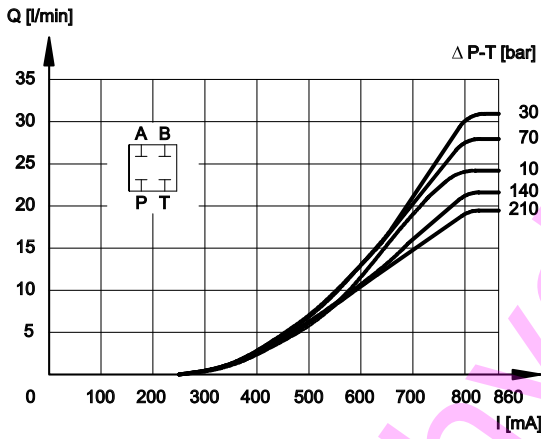
#### SPOOL TYPE C08



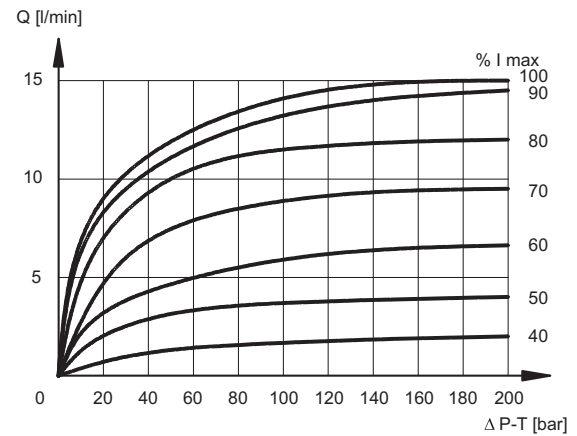
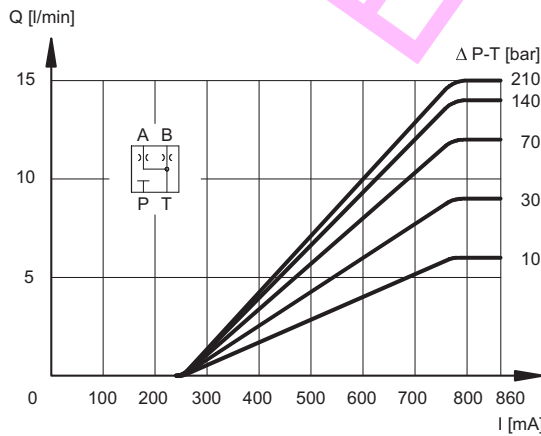
### SPOOL TYPE C16



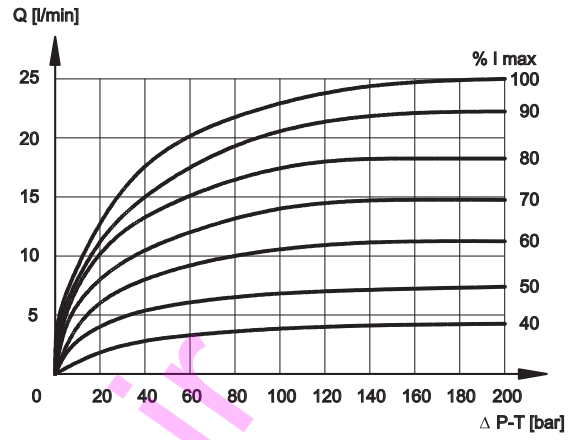
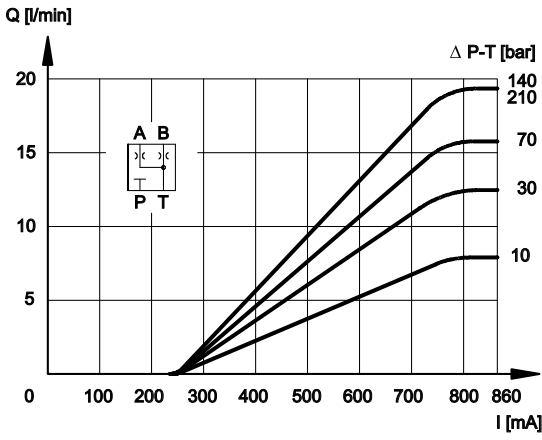
### SPOOL TYPE C26



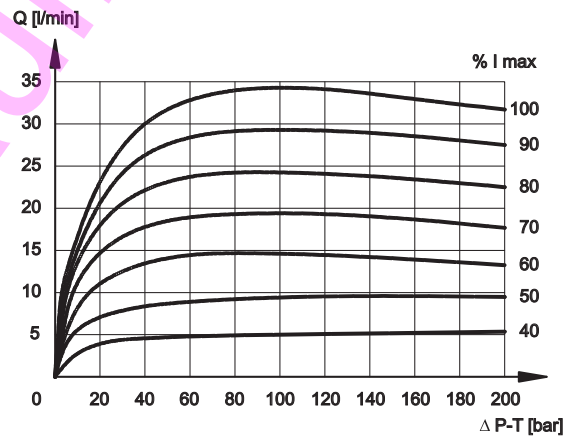
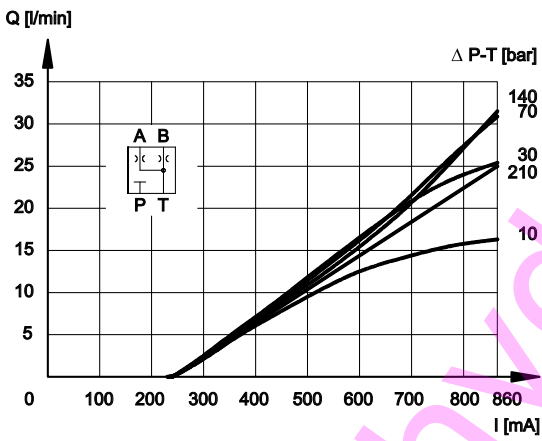
### SPOOL TYPE A04



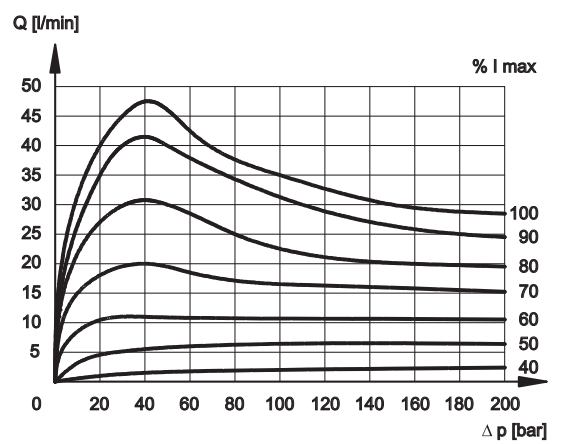
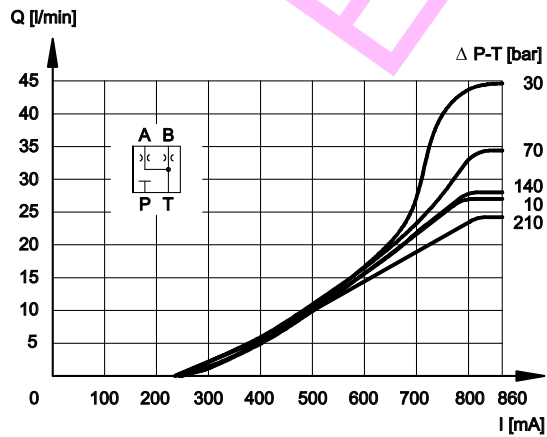
### SPOOL TYPE A08



### SPOOL TYPE A16



### SPOOL TYPE A26



### 4 - HYDRAULIC FLUIDS

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

Operation with fluid temperature exceeding 80°C causes premature deterioration of the quality of the fluid and seals. The physical and chemical properties of the fluid must be maintained.

### 5 - ELECTRICAL CHARACTERISTICS

#### Proportional solenoid

The proportional solenoid comprises two parts: tube and coil.

The tube, screwed to the valve body, contains the armature which is designed to maintain friction to a minimum thereby reducing hysteresis.

The coil is mounted on the tube secured by means of a lock nut.

It can be rotated through 360° depending on installation clearances.

#### Protection from atmospheric agents CEI EN 60529

Plug-in type	IP 65	IP 69 K
K1 DIN 43650	x (*)	
K7 DEUTSCH DT04 male	x	x (*)

(\*) The protection degree is guaranteed only with the connector correctly connected and installed

<b>NOMINAL VOLTAGE</b>	V DC	<b>12</b>	<b>24</b>
<b>RESISTANCE (at 20°C)</b>	<b>K1 COIL</b> <b>K7 COIL</b>	Ω	3.66 4 17.6 19
<b>NOMINAL CURRENT</b>		A	1.88 0.86
<b>DUTY CYCLE</b>			100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>			According to 2004/108/CE
<b>CLASS OF PROTECTION :</b> Coil insulation (VDE 0580) Impregnation:			class H class F

### 6 - STEP RESPONSE

(measured with mineral oil with viscosity of 36 cSt at 50°C with the relative electronic control units)

Step response is the time taken for the valve to reach 90% of the settled positioning value, following a step change of reference signal. The table shows typical response times tested with spool type C16 and  $\Delta p = 30$  bar P-T.

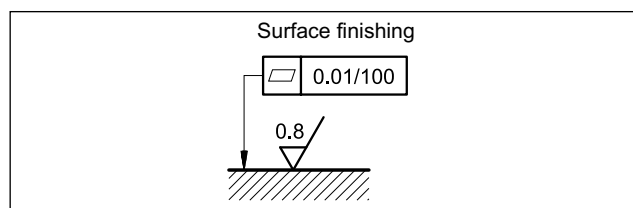
REFERENCE SIGNAL STEP	0→100%	100%→0
Step response [ms]		
<b>DSE3-A*</b> <b>DSE3-C*</b>	50	40

### 7 - INSTALLATION

DSE3 valves can be installed in any position without impairing correct operation.

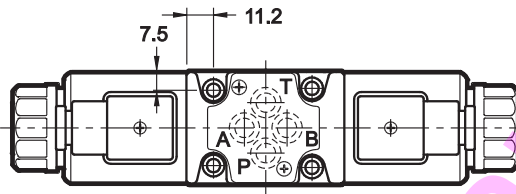
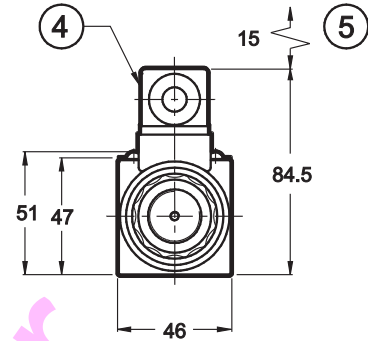
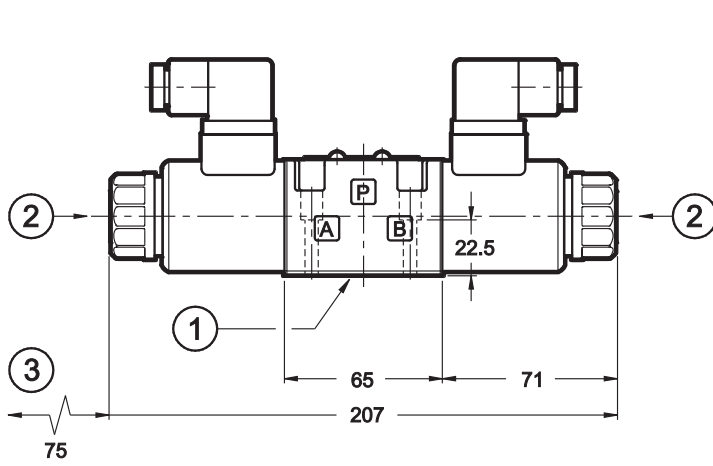
Ensure that there is no air in the hydraulic circuit.

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

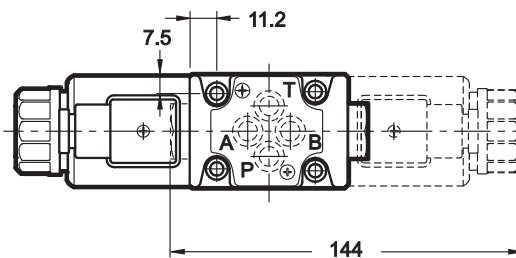
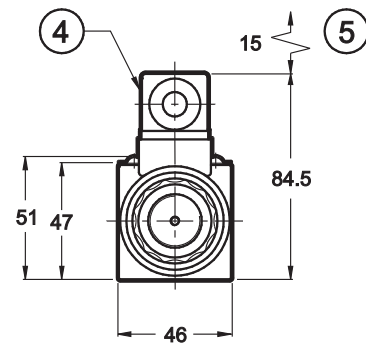
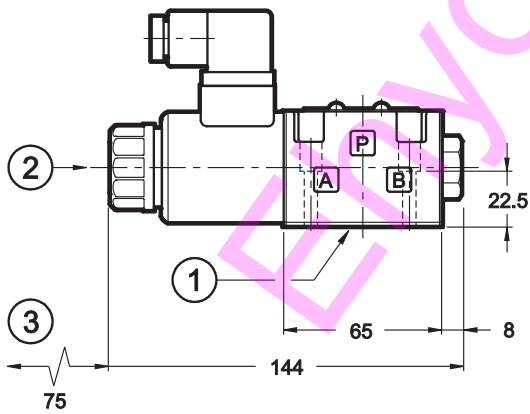


8 - OVERALL AND MOUNTING DIMENSIONS

DSE3-A\*  
DSE3-C\*



DSE3-A\*SA  
DSE3-C\*SA



A\*SB and C\*SB versions solenoid position

dimensions in mm

1	Mounting surface with sealing rings: 4 OR type 2037 - 90 shore (9.25 x 1.78)
2	Standard manual override integrated in the solenoid tube see par. 9
3	Coil removal space
4	DIN 43650 electric coil connector
5	Connector removal space

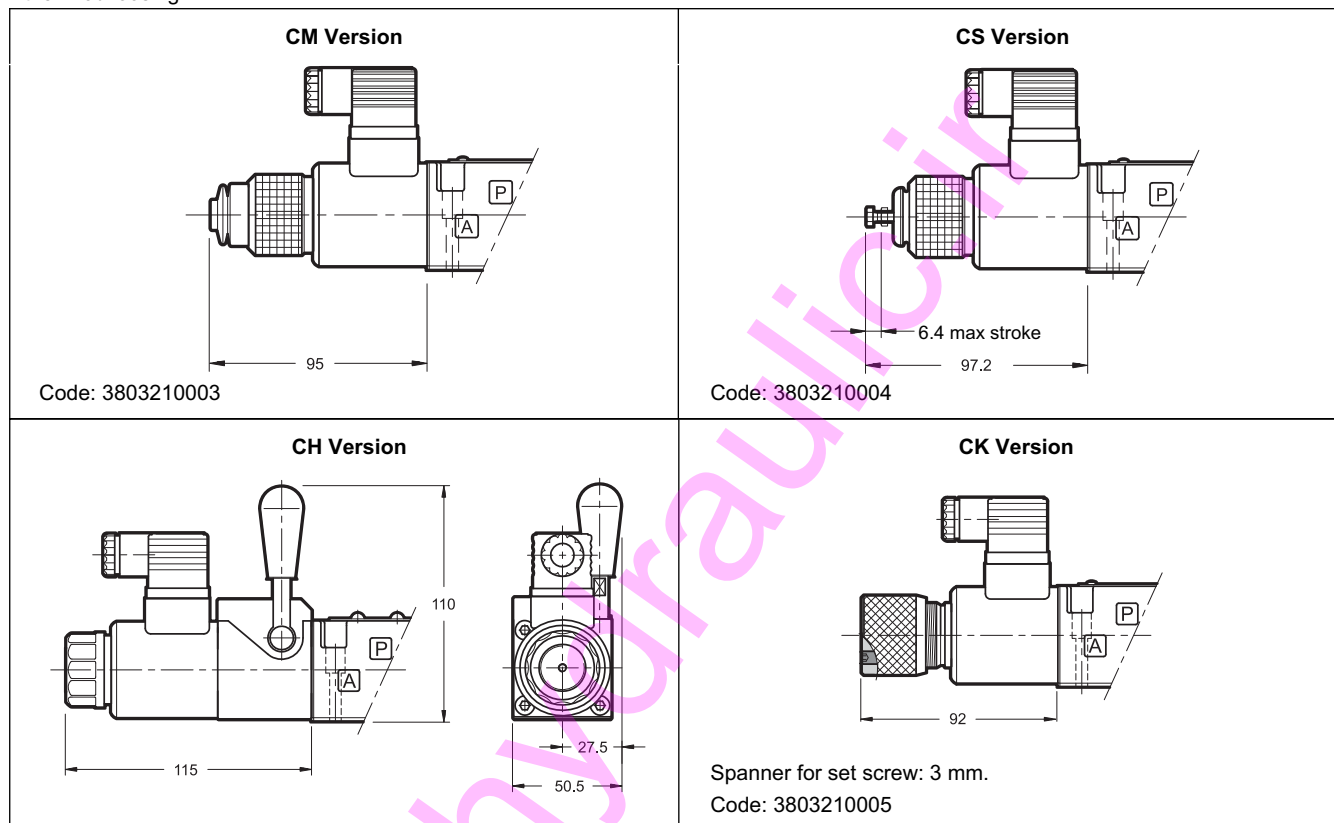
Fastening bolts: 4 bolts M5x30 - ISO 4762  
Torque: 5 Nm

### 9 - MANUAL OVERRIDE

The standard valve has solenoids whose pin for the manual operation is integrated in the tube. The operation of this control must be executed with a suitable tool, minding not to damage the sliding surface.

Four different manual override versions are available upon request:

- **CM** version, manual override belt protected.
- **CS** version, with metal ring nut provided with a M4 screw and a blocking locknut to allow the continuous mechanical operations.
- **CH** version, lever manual override.
- **CK** version, knob. When the set screw is screwed and its point is aligned with the edge of the knob, tighten the knob till it touches the spool: in this position the override is not engaged and the valve is de-energized. After adjusting the override, tighten the set screw in order to avoid the knob loosening.



### 10 - ELECTRONIC CONTROL UNITS DSE3 - \*\* SA (SB)

<b>EDC-112</b>	for solenoid 24V DC	plug version	see cat.89 120
<b>EDC-142</b>	for solenoid 12V DC		
<b>EDM-M112</b>	for solenoid 24V DC	DIN EN 50022 rail mounting	see cat. 89 250
<b>EDM-M142</b>	for solenoid 12V DC		
<b>UEIK-11</b>	for solenoid 24V DC	Eurocard type	see cat. 89 300

### 11 - SUBPLATES (see catalogue 51 000)

Type PMMD-AI3G ports on rear
Type PMMD-AL3G side ports
P, T, A, B port threading: 3/8" BSP

### DSE3 - A\*      DSE3 - C\*

<b>EDM-M212</b>	24V DC solenoids	rail mounting DIN EN 50022	see cat. 89 250
<b>EDM-M242</b>	12V DC solenoids		
<b>UEIK-21</b>	24V DC solenoids	Eurocard format	see cat. 89 320



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