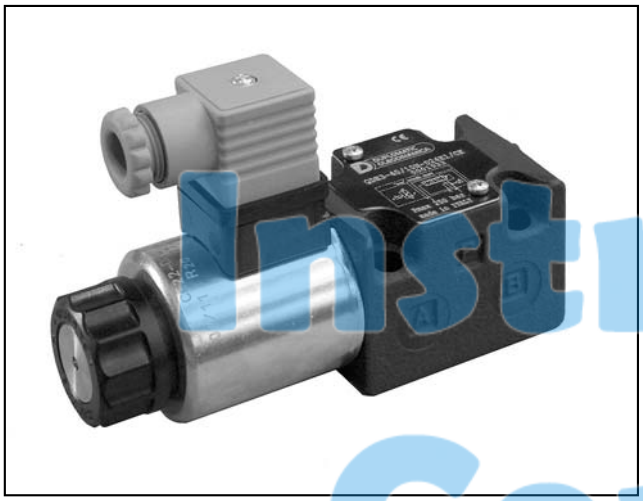
DUPLOMATIC OLEODINAMICA



QDE*

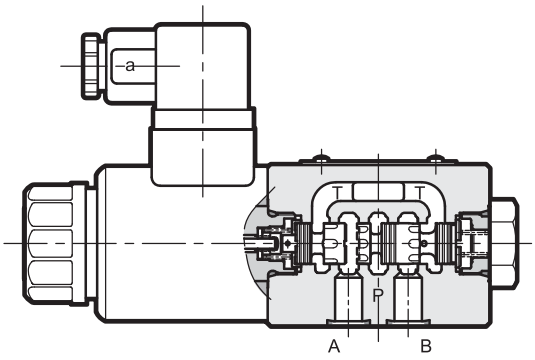
DIRECT OPERATED FLOW CONTROL VALVE WITH PROPORTIONAL CONTROL AND COMPENSATION

SERIES 10

SUBPLATE MOUNTING
ISO 6263-03 (CETOP 03)
ISO 4401-05 (CETOP 05)

p max **250** bar
Q max **80** l/min

OPERATING PRINCIPLE



— The QDE* are a compensated flow control valves with pressure compensation and proportional electric control, with mounting surface according to ISO 6263-03 and ISO 4401-05 (CETOP RP121H), supplied with 2 or 3 way design, depending on the use of port P.

— This valve is used for the regulation of the flow in branches of a hydraulic circuit or for the speed control of hydraulic cylinders.

— The flow can modulated continuously in proportion to the current supplied by the solenoid

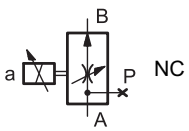
— The valve can be controlled directly from a current controlled power supply or with an integrated electronic, which allow to fully exploit the performance of the valve.

— QDE* valves are available in two sizes, for 5 flow adjustment ranges of up to 80 l/min.

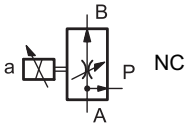
PERFORMANCES (Obtained with mineral oil of viscosity 36 cSt at 50°C and electronic control card)		QDE3				QDE5
Maximum operating pressure	bar	250				250
Controlled flow (Q_B)	l/min	14	20	30	40	80
Minimum suggested input flow (Q_A)	l/min	40	50	40	50	90
Spring setting in pressure compensator	bar	4	8	4	8	8
Minimum pressure drop A > B	bar	10	22	10	22	22
Hysteresis	% of Q_{max}	< 6 %				< ±2 %
Repeatability	% of Q_{max}	< ± 1,5 %				
Electrical characteristics	see paragraph 6					
Fluid 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	kg	1,6				4,6

HYDRAULIC SYMBOLS

TWO WAYS



THREE WAYS



1 - IDENTIFICATION CODE

Q	D	E	3	-		/	10		-		K1	

Direct flow control valve pressure compensated

Electric proportional control

3 = Size NG06 - ISO 6263-03 (CETOP 03)
5 = Size NG10 - ISO 4401-05 (CETOP 05)

Controlled flow:
QDE3
14 = 14 l/min
20 = 20 l/min
30 = 30 l/min
40 = 40 l/min

QDE5
80 = 80 l/min

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

Series no. (from 10 to 19 sizes and mounting dimensions remains unchanged)

D12 = Nominal solenoid voltage 12V DC
D24 = Nominal solenoid voltage 24V DC

Coil electrical connection:
plug for connector type
DIN 43650 (**standard**)

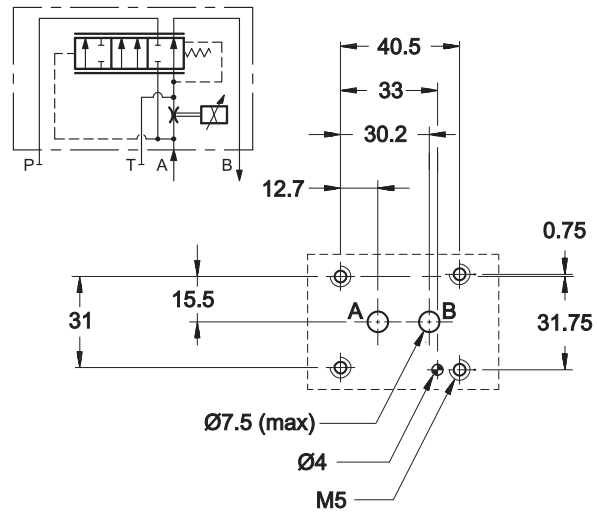
Manual override
(see par. 12)

2 - CONFIGURATIONS AND MOUNTING INTERFACE

The function of two or three ways is obtained realizing the mounting interface according to ISO 6263-03 (CETOP 03) for QDE3 and ISO 4401-05 (CETOP 05) for QDE5, using the port P for three way configuration only. The port T will never be used.

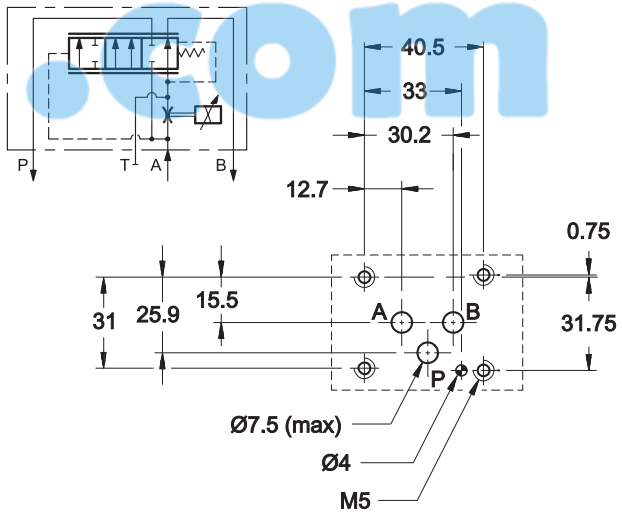
To use the valve in two ways for QDE3 is also possible to interpose a subplate with plug (code 0113388 and 0530384) be ordered separately.

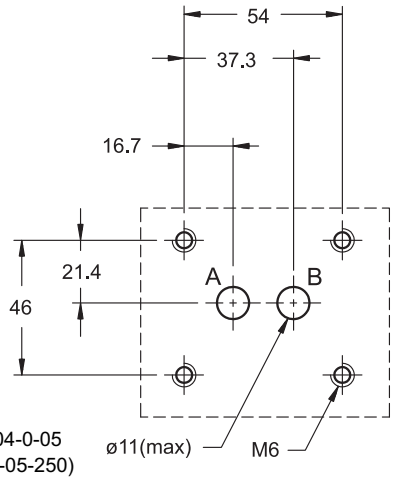
2-WAYS



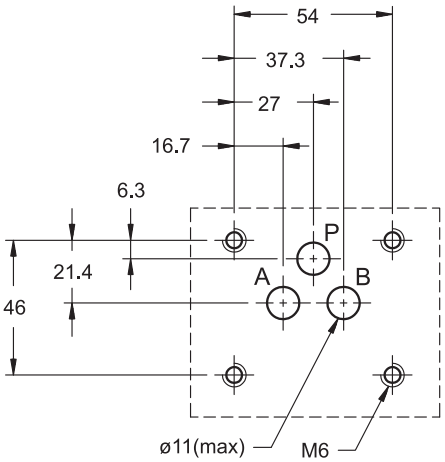
ISO 6263-03-03-*-97
(CETOP 4.5.2-2-03-250)

3-WAYS



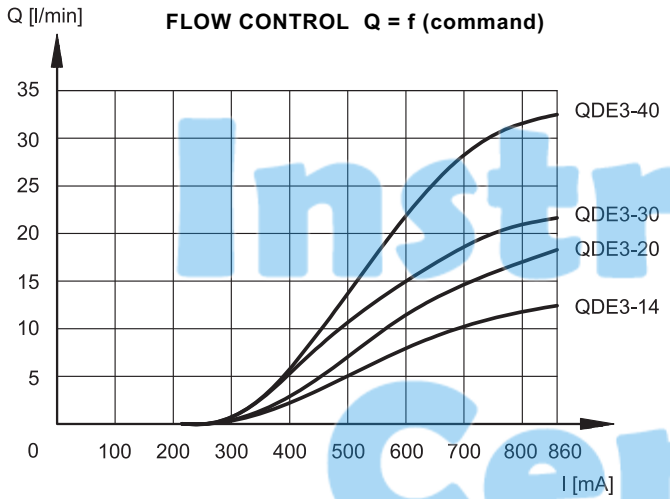


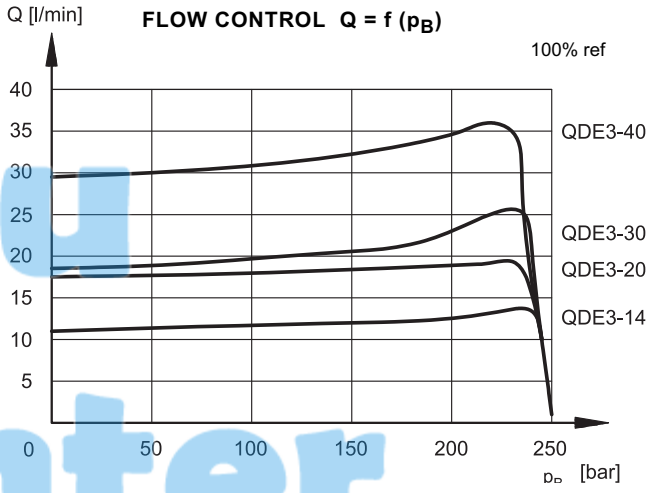
ISO 4401-05-04-0-05
(CETOP 4.5.4-05-250)



4 - CHARACTERISTIC CURVES QDE3 (obtained with viscosity of 36 cSt a 50°C)

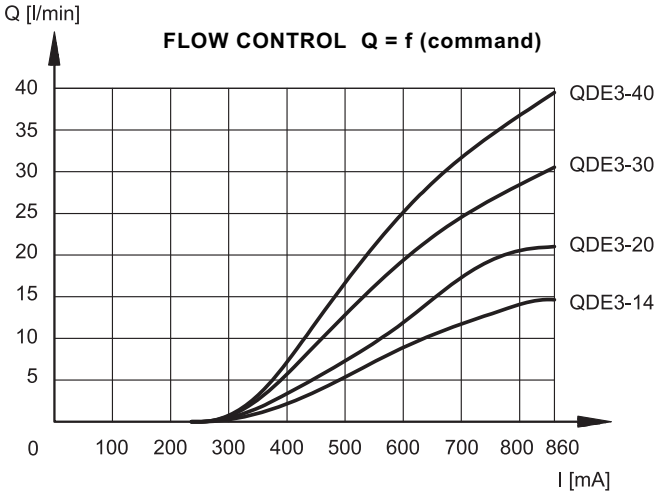
4.1 - Two ways

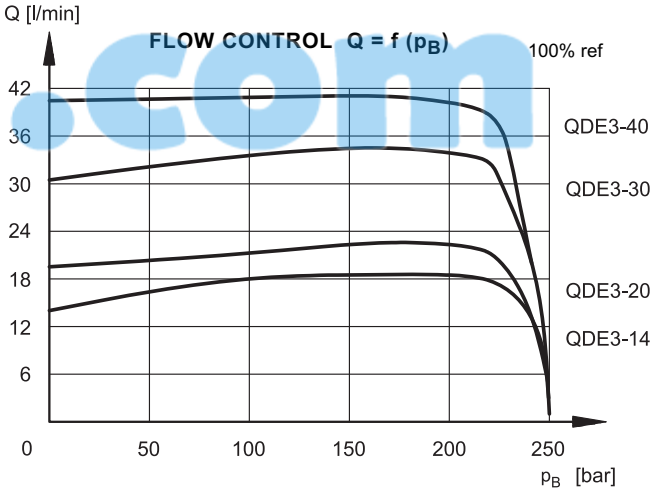




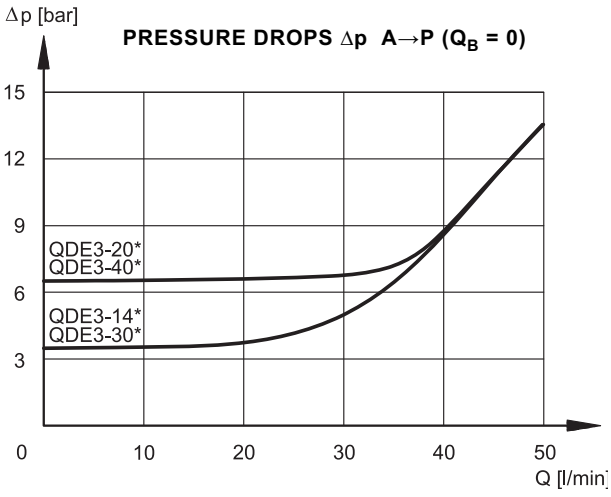
Typical flow rate characteristics A → B for controlled flow rate: 14 - 20 - 30 - 40 l/min in function of the current supplied to the solenoid (D24 version, maximum current 860 mA, PWM 100 Hz)

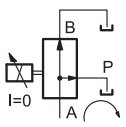
4.2 - Three ways





Typical flow rate characteristics A → B for controlled flow rate: 14 - 20 - 30 - 40 l/min in function of the current supplied to the solenoid (D24 version, maximum current 860 mA, PWM 100 Hz)

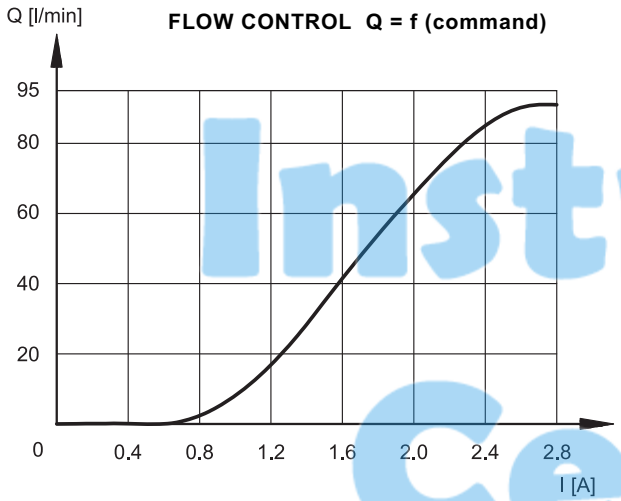


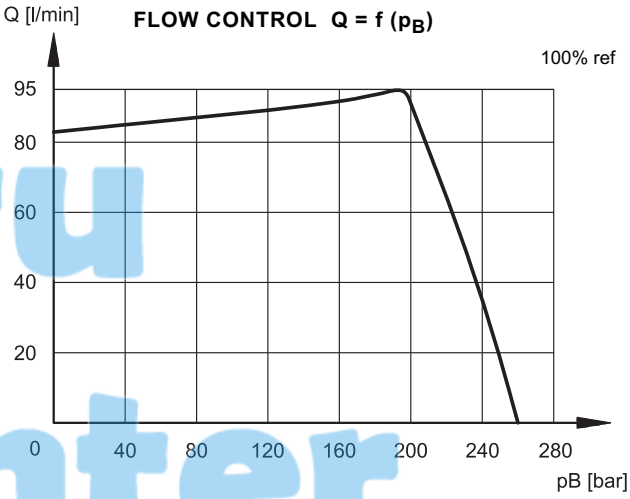


Pressure drops with flow A→P.
Obtained with Q_B = 0 (no current)

4 - CHARACTERISTIC CURVES QDE5 (obtained with viscosity of 36 cSt a 50°C)

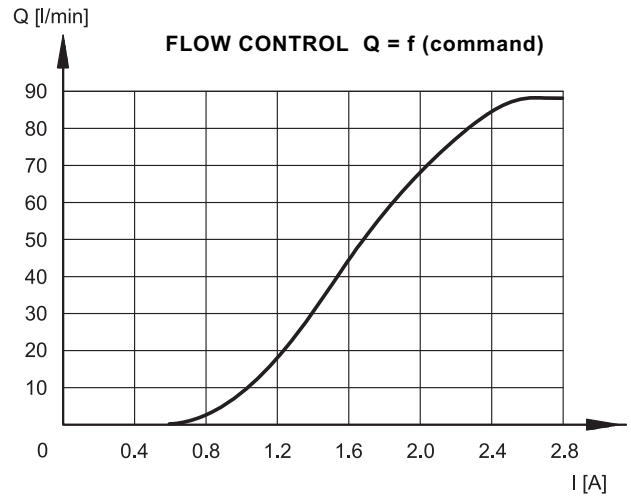
4.1 - Two ways

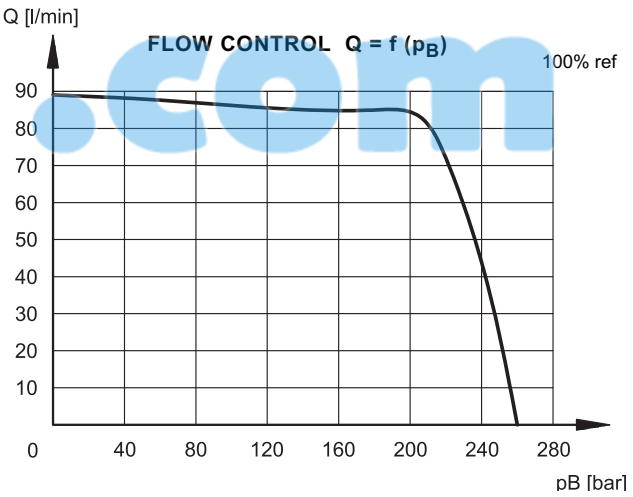




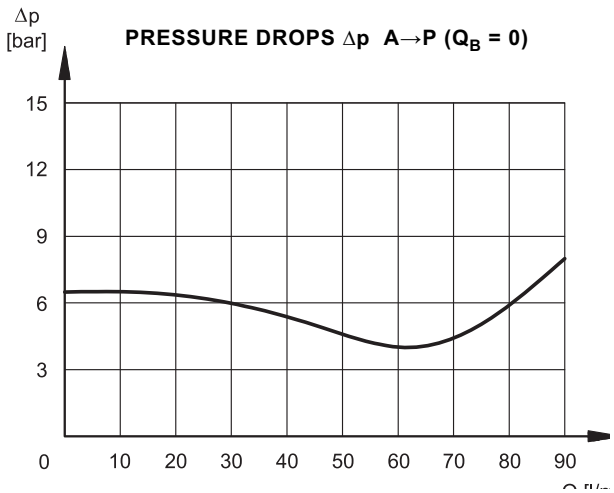
Typical flow rate characteristics A→B in function of the current supplied to the solenoid (D12 version, max current 2.8 A, PWM 100 Hz).

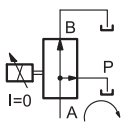
4.2 - Three ways





Typical flow rate characteristics A→B in function of the current supplied to the solenoid (D12 version, max current 2.8 A, PWM 100 Hz).





Pressure drops with flow A→P.
Obtained with Q_B = 0 (no current)

5 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

6 - ELECTRICAL CHARACTERISTIC

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

NOMINAL VOLTAGE	V DC	**12**	**24**
RESISTANCE (at 20°C) QDE3 QDE5	Ω	 3,66 3,2	 17,6 8,65
NOMINAL CURRENT QDE3 QDE5	A	 1,88 2,8	 0,86 1,6
PWM FREQUENCY QDE3 QDE5	Hz	 200 100	 100 100
DUTY CYCLE	100%		
ELECTROMAGNETIC COMPATIBILITY (EMC)	According to 2004/108/CE		
CLASS OF PROTECTION: atmospheric agents (CEI EN 60529) coil insulation (VDE 0580) Impregnation	 IP 65 class H class F		

7 - STEP RESPONSE

(obtained with mineral oil with viscosity of 36 cSt at 50°C and electronic control cards)

Step response is the time taken for the valve to reach 90% of the set flow value following a step change of reference signal.

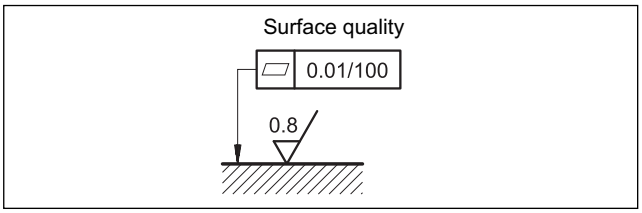
The table illustrates typical response times with Δp = 8 bar.

REFERENCE SIGNAL STEP	0 →100%
Step response [ms]	< 70

8 - INSTALLATION

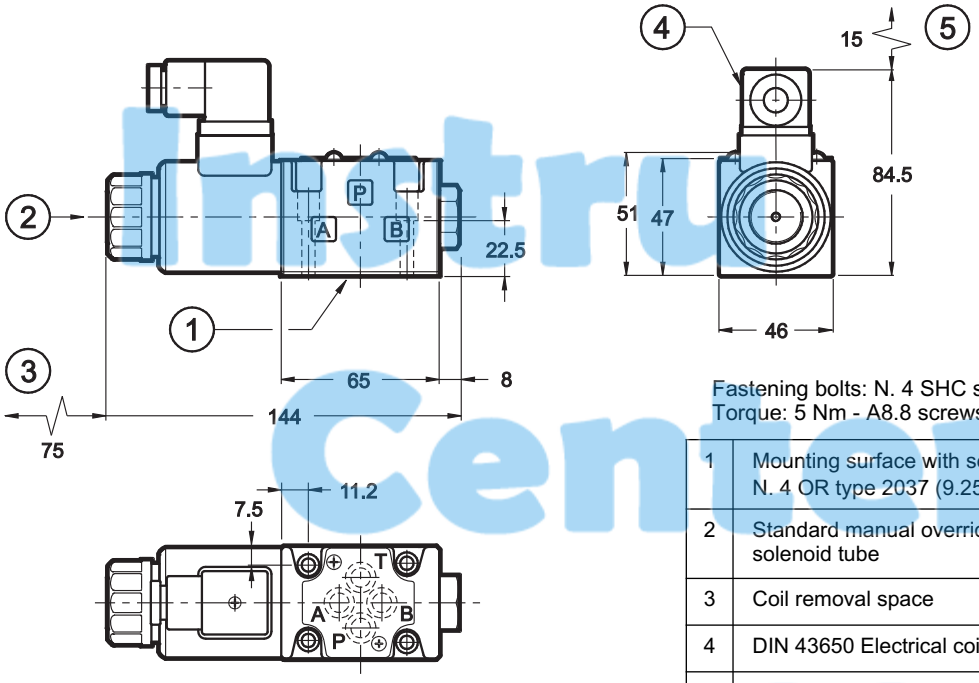
QDE* valves can be installed in any position without impairing correct operation.

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.



9 - QDE3 OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

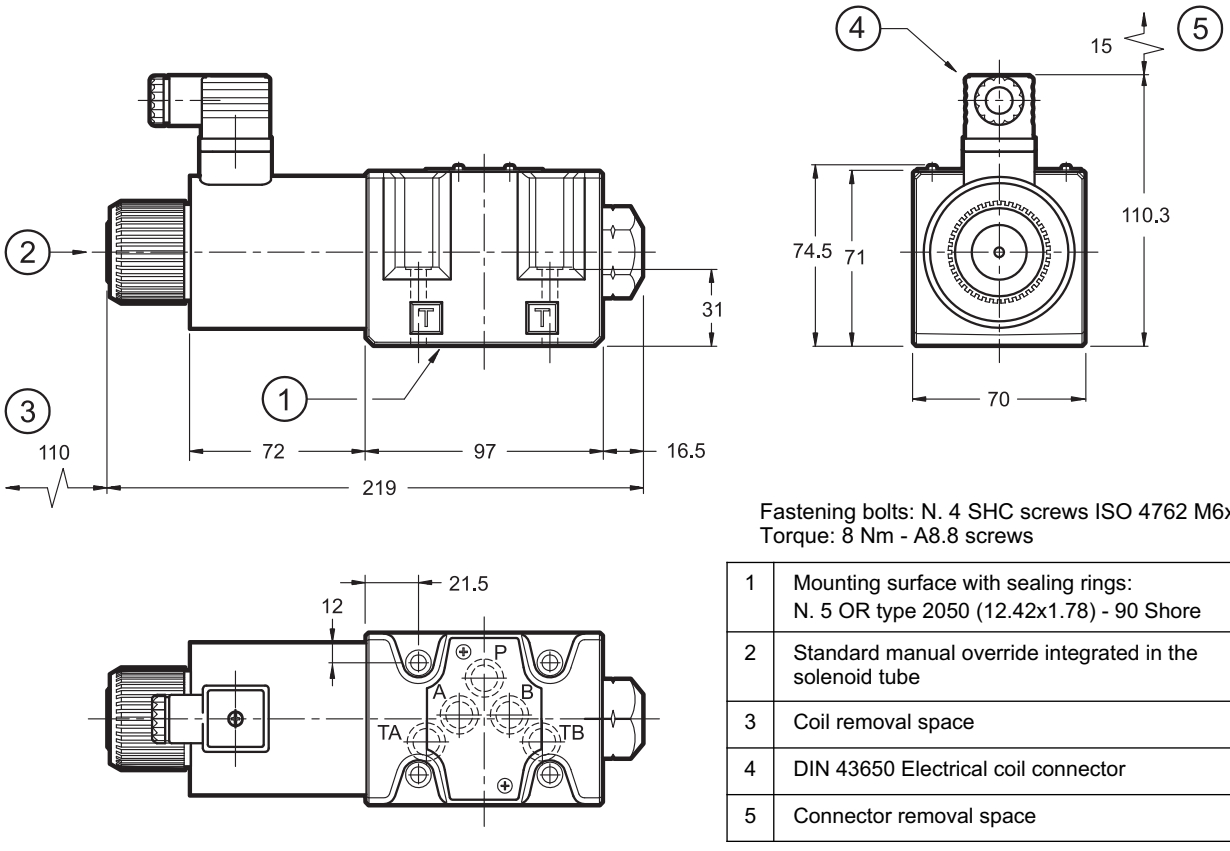


Fastening bolts: N. 4 SHC screws ISO 4762 M5x30
Torque: 5 Nm - A8.8 screws

1	Mounting surface with sealing rings: N. 4 OR type 2037 (9.25x1.78) - 90 Shore
2	Standard manual override integrated in the solenoid tube
3	Coil removal space
4	DIN 43650 Electrical coil connector
5	Connector removal space

10 - QDE5 OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



Fastening bolts: N. 4 SHC screws ISO 4762 M6x40
Torque: 8 Nm - A8.8 screws

1	Mounting surface with sealing rings: N. 5 OR type 2050 (12.42x1.78) - 90 Shore
2	Standard manual override integrated in the solenoid tube
3	Coil removal space
4	DIN 43650 Electrical coil connector
5	Connector removal space

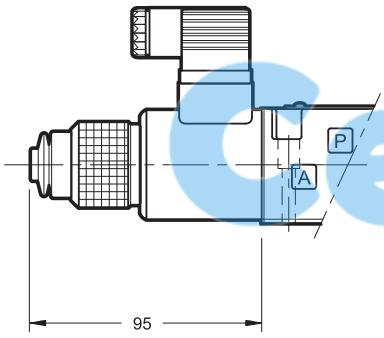
11 - MANUAL OVERRIDE

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.

On demand, there are three types of manual override:

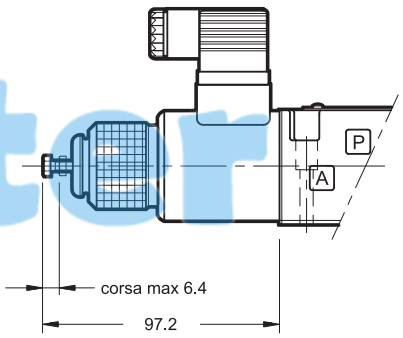
- **CM** version, manual override belt protected (available only for QDE3).
- **CS** version, with metal ring nut provided with a M4 screw and a blocking locknut to allow the continuous mechanical operations (available only for QDE3).
- **CK** version, knob. When the set screw is screwed and its point 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 loosing.

CM Version



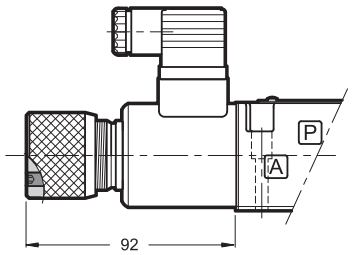
Code: 3803210003

CS Version



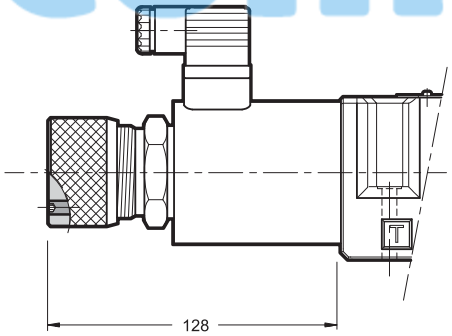
Code: 3803210004

CK Version for QDE3



Spanner for set screw: 3 mm.
Code: 3803210005

CK Version for QDE5



Spanner for set screw : 3 mm.
Code: 3803260003

12 - ELECTRONIC CONTROL UNITS

QDE3

EDC-111	24V DC solenoids	plug version	see cat. 89 120
EDC-142	12V DC solenoids		
EDM-M111	24V DC solenoids	rail mounting DIN EN 50022	see cat. 89 250
EDM-M142	12V DC solenoids		

QDE5

EDC-131	24V DC solenoids	plug version	see cat. 89 120
EDC-151	12V DC solenoids		
EDM-M131	24V DC solenoids	rail mounting DIN EN 50022	see cat. 89 250
EDM-M151	12V DC solenoids		

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