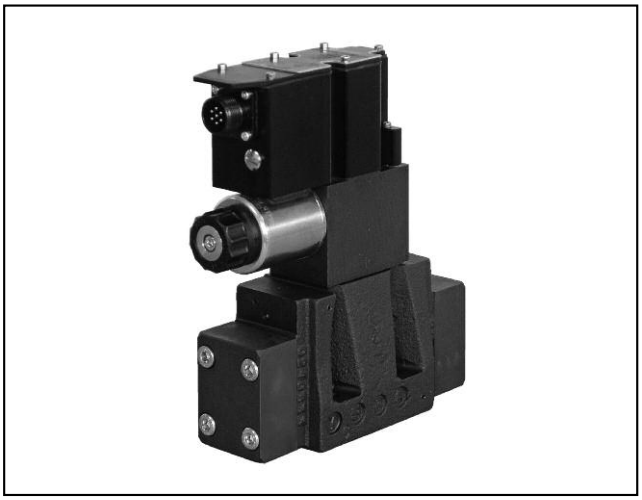


DZCE*G

PRESSURE REDUCING VALVES WITH PROPORTIONAL CONTROL AND INTEGRAL ELECTRONICS

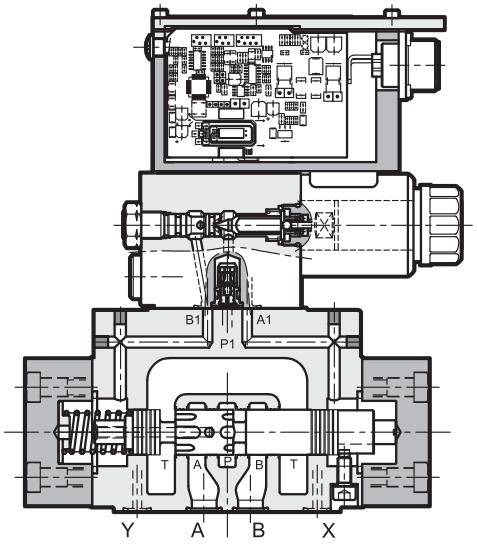
SERIES 31

DZCE5G	**CETOP P05**
DZCE5RG	**ISO 4401-05**
DZCE7G	**ISO 4401-07**
DZCE8G	**ISO 4401-08**

p max **350** bar

Q max (see performance table)

OPERATING PRINCIPLE



— The DZCE*G are pressure reducing valves with electric proportional control with integrated electronics, with mounting interface in compliance with ISO 4401 standards.

— Those valves, besides reducing the pressure from line P to working line A, allow the flow to return from the line A to the return line T when a pressure greater than the set value is generated in the downstream circuit (flow path A): a typical case of hydraulic counterweight or load balancing.

— The valves are available with command signal in voltage or current and on board electronics with internal enable, external enable or 0V monitor on pin C.

— A solenoid current monitoring signal is available.

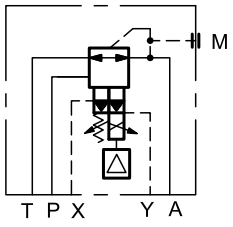
— The valves are easy to install. The driver directly manages digital settings. In the event of special applications, you can customize the settings using the optional kit (see par. 15.3)

PERFORMANCES

(obtained with mineral oil with viscosity of 36 cSt at 50°C p = 140 bar)

		DZCE5G DZCE5RG	DZCE7G	DZCE8G
Max operating pressure	bar	350		
Maximum flow	l/min	150	300	500
Step response		see paragraph 7		
Hysteresis	% of p_{max}	< 2%		
Repeatability	% of p_{max}	< ±2%		
Electrical characteristics		see paragraph 3		
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	kg	7,3	9,5	15,6

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

D	Z	C	E		G	-		/	31		-			/		K11	

Pressure reducing valve

Electric proportional control

Nominal size:
5 = CETOP P05
5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08

Integrated electronics for open loop

Pressure control range:
070 = 1 ÷ 70 bar
140 = 1 ÷ 140 bar
210 = 1 ÷ 210 bar
300 = 1 ÷ 300 bar

Series No.
(the overall and mounting dimensions remain unchanged from 30 to 39)

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

Piloting: **I** = internal
E = external

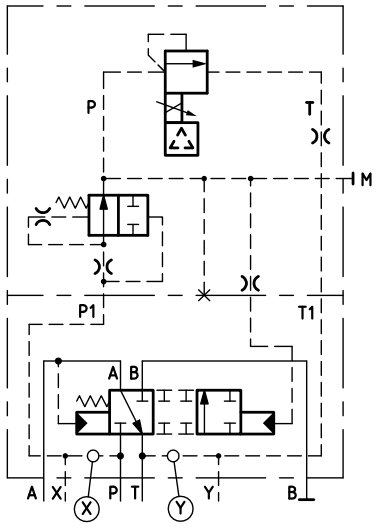
Drainage: **I** = internal
E = external

Reference signal:
E0 = voltage 0÷10 V
E1 = current 4÷20 mA

Main connector 6 pin + PE

Pin C function:
A = external enable
B = internal enable
C = 0V monitor

2 - DETAILED SYMBOL



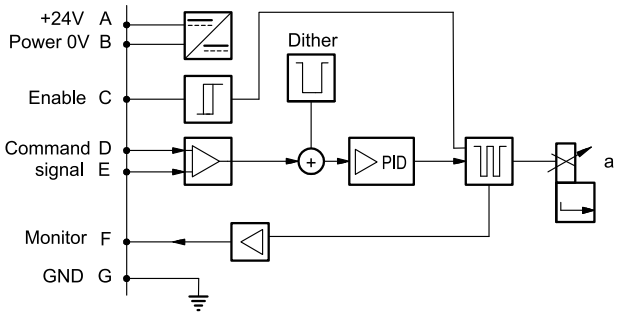
3 - ELECTRICAL CHARACTERISTICS

3.1 - Electrical on board electronics

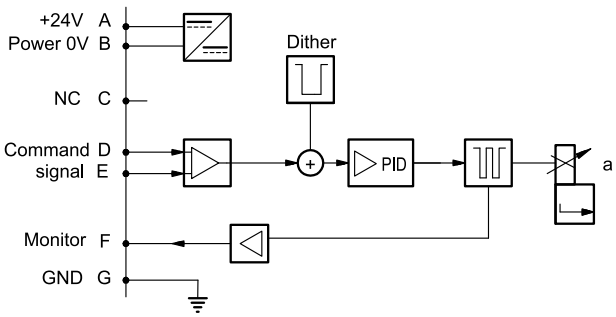
Duty cycle		100% (continuous operation)
Protection class according to IEC 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	25
Maximum solenoid current	A	1.88
Fuse protection, external		2A time lag
Command signals: voltage (E0) current (E1)	V DC mA	0 ÷ 10 (Impedance Ri > 11 kOhm) 4 ÷ 20 (Impedance Ri = 58 Ohm)
Monitor signal (current to solenoid): voltage (E0) current (E1)	V DC mA	0 ÷ 10 (Impedance Ro > 1 kOhm) 4 ÷ 20 (Impedance Ro = 500 Ohm)
Managed breakdowns		Overload and electronics overheating, cable breakdown, supply voltage failures
Communication		LIN-bus Interface (with the optional kit)
Connection		7 - pin MIL-C-5015-G (DIN-EN 175201-804)
Electromagnetic compatibility (EMC) emissions EN 61000-6-4 immunity EN 61000-6-2		According to 2014/30/EU standards

3.2 - On-board electronics diagrams

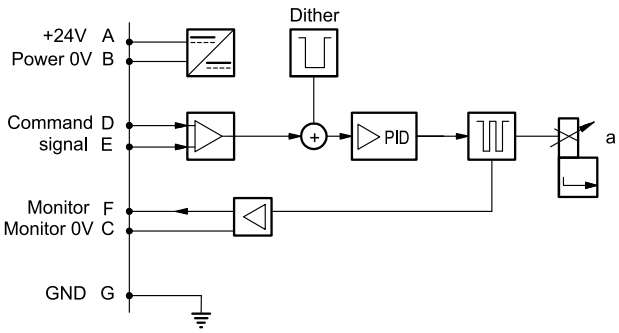
VERSION A - External Enable



VERSION B - Internal Enable

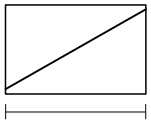


VERSION C - 0V Monitor

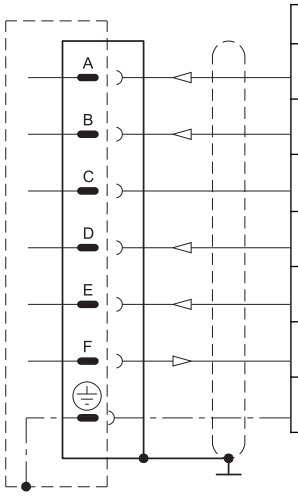


4 - VERSIONS WITH VOLTAGE COMMAND (E0)

The reference signal is between 0 ÷ 10V. The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



COMMAND	**0V**	**+10V**
MONITOR	**0V**	**+10V**

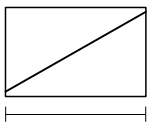


Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0 V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	0 ÷ 10 V	Command (differential input)		
E	0 V	PIN D reference		
F	0 ÷ 10 V	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

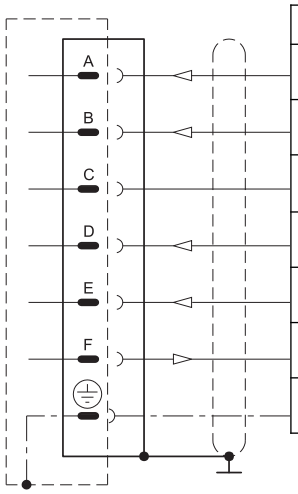
5 - VERSIONS WITH CURRENT COMMAND (E1)

The reference signal is supplied in current 4 ÷ 20 mA. If the current for command is lower, the card shows a breakdown cable error. To reset the error is sufficient to restore the signal.

The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



COMMAND	**4 mA**	**20 mA**
MONITOR	**4 mA**	**20 mA**



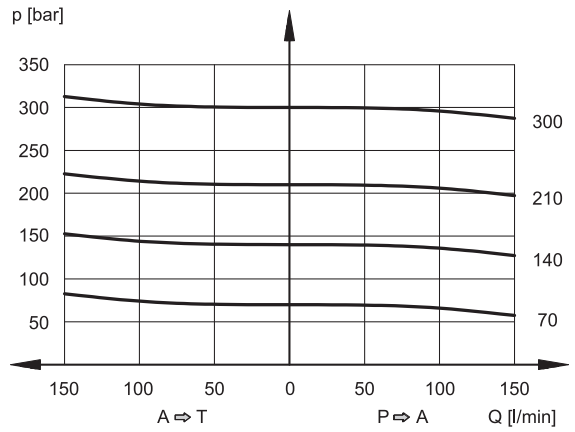
Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0 V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	4 ÷ 20 mA	Command		
E	0 V	PIN D reference		
F	4 ÷ 20 mA	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

6 - CHARACTERISTIC CURVES

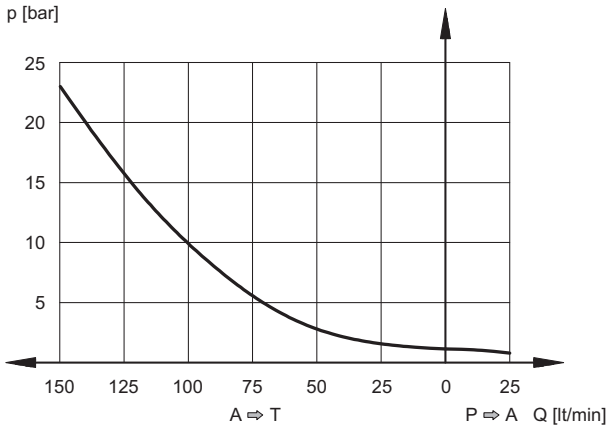
(with mineral oil with viscosity of 36 cSt at 50°C)

6.1 - Characteristic Curves of DZCE5G and DZCE5RG

ADJUSTMENT

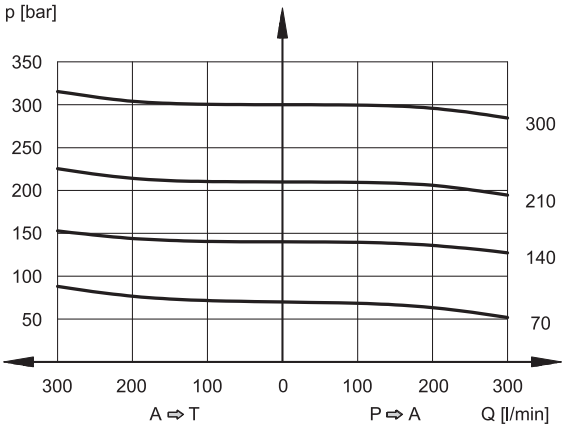


MIN. CONTROLLED PRESSURE p min = f(Q)

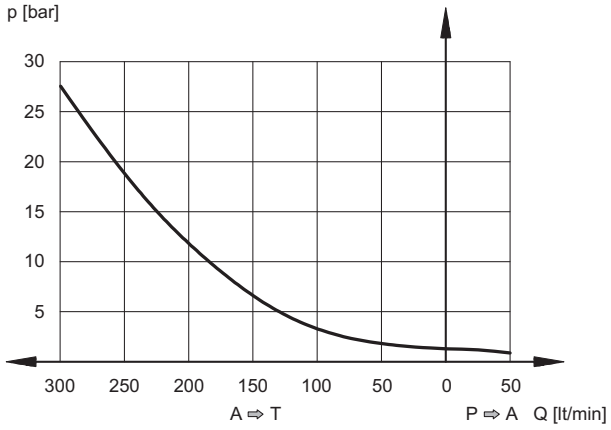


6.2 - Characteristic Curves of DZCE7G

ADJUSTMENT

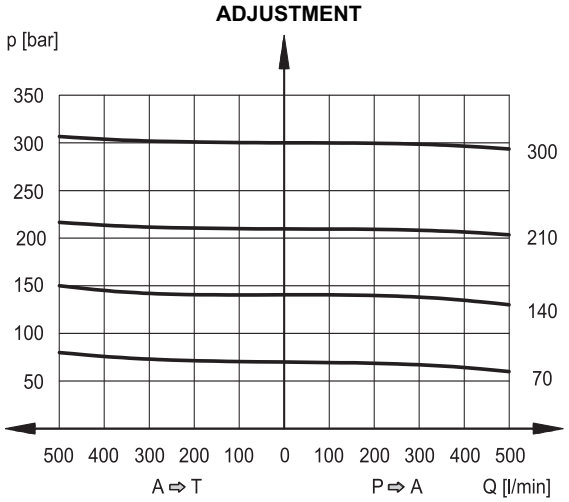


MIN. CONTROLLED PRESSURE p min = f(Q)

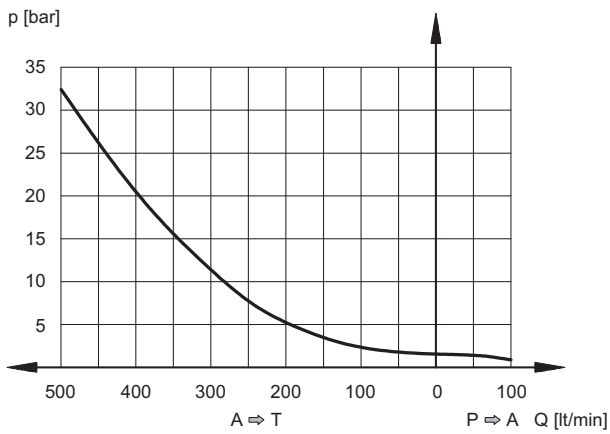


6.3 - Characteristic Curves of DZCE8G

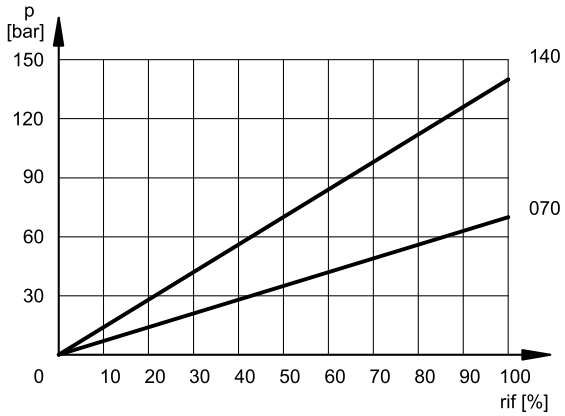
ADJUSTMENT

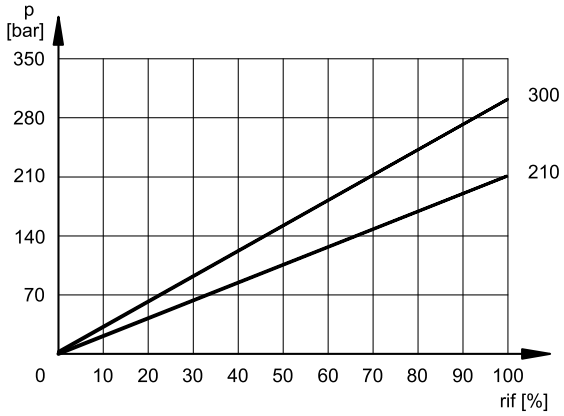


MIN. CONTROLLED PRESSURE p min = f(Q)



6.4 - CONTROLLED PRESSURE p = f(I)



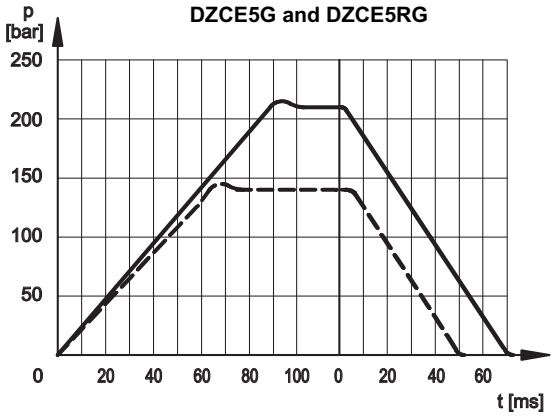


7 - STEP RESPONSE

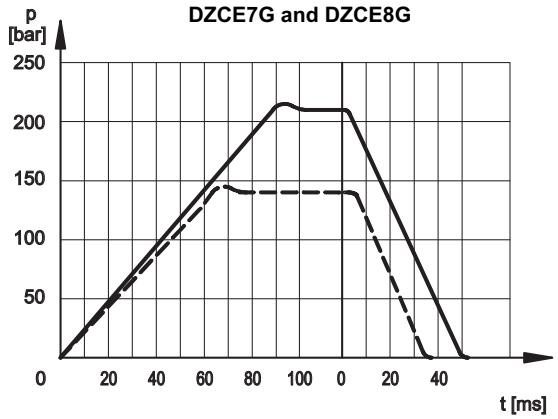
(obtained with mineral oil with viscosity of 36 cSt at 50°C)

The graphs show the typical step response tested with static pressure 100 bar.

DZCE5G and DZCE5RG



DZCE7G and DZCE8G

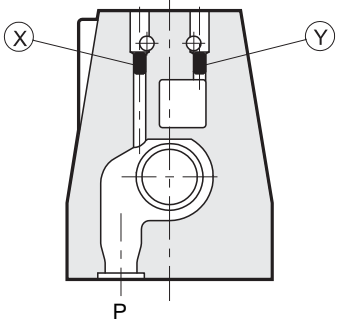


8 - PILOTING AND DRAINAGE

The valves are available with piloting and drainage, both internal and external. The version with external drainage allows a higher backpressure on the unloading.

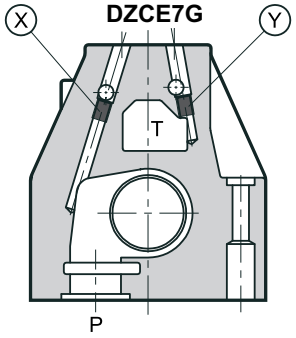
TYPE OF VALVE		Plug assembly	
		X	Y
IE	INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
II	INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
EE	EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
EI	EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO

DZCE5 and DZCE5RG



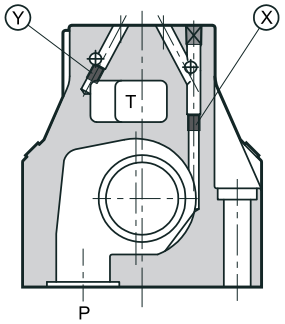
X: M5x6 plug for external pilot
Y: M5x6 plug for external drain

DZCE7G



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

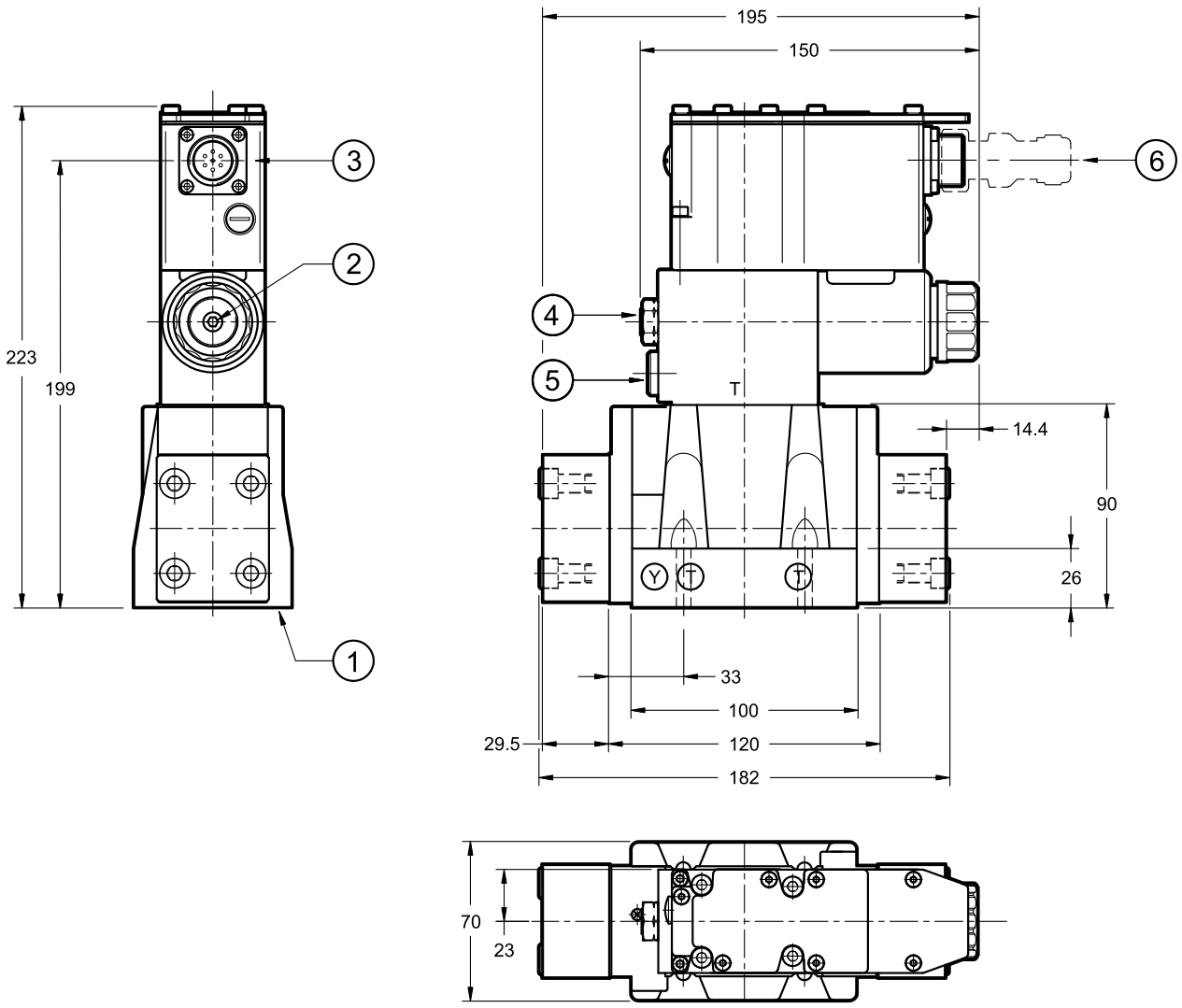
DZCE8G



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

9 - OVERALL AND MOUNTING DIMENSIONS DZCE5G AND DZCE5RG

dimensions in mm



NOTE: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

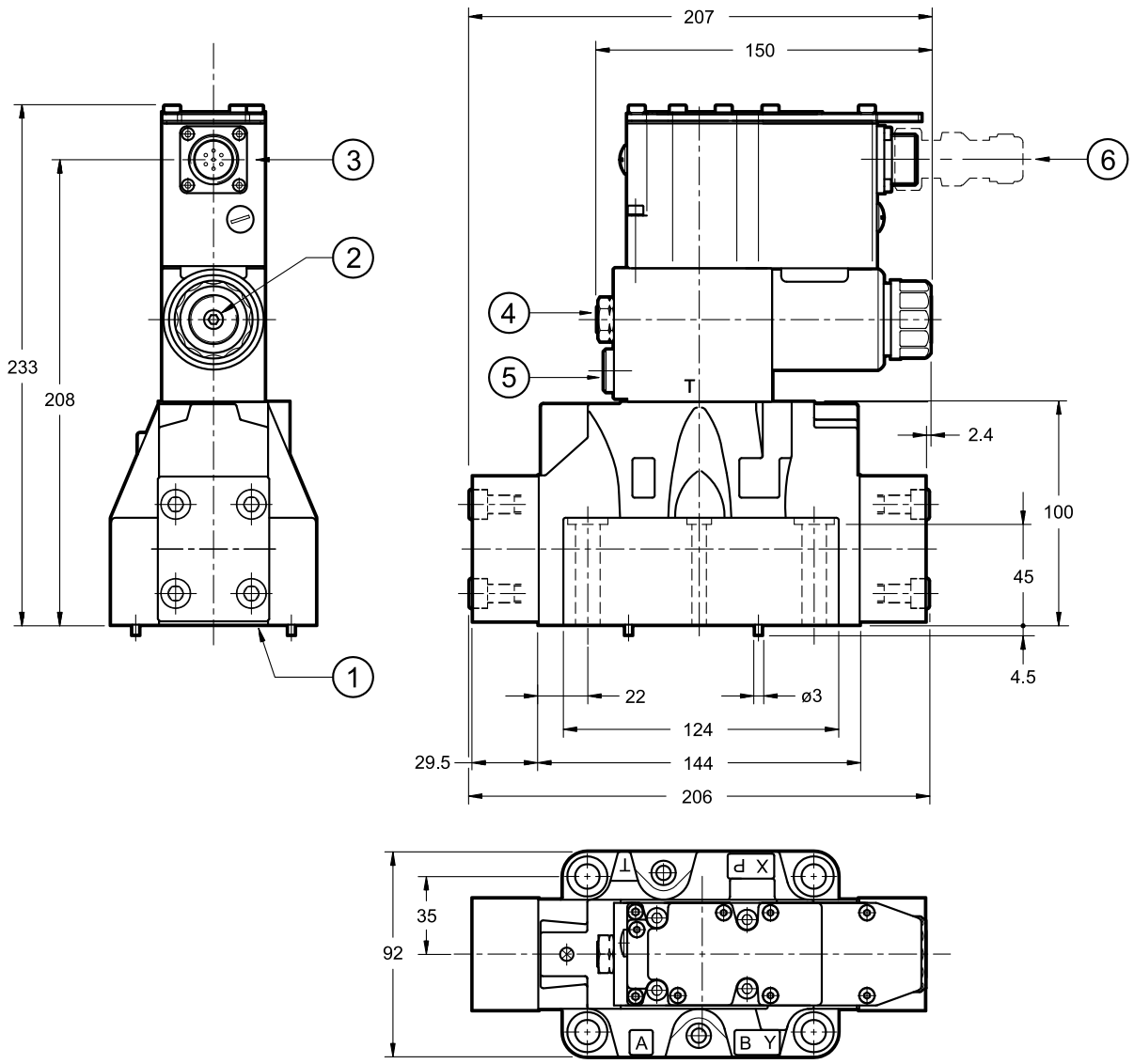
Mounting surface shown at paragraph 12.

Valve fastening: N. 4 bolts SHC M6x35 - ISO 4762	
Tightening torque: 8 Nm (bolts A 8.8)	
Thread of mounting holes: M6x10	

1	Mounting surface with sealing rings: N. 5 OR type 2050 (12.42x1.78) - 90 Shore N. 2 OR type 2037 (9.25x1.78) - 90 Shore
2	Breather (Allen key 4)
3	Main connection
4	Adjustment seal, set in factory. It is recommended not to unscrew the nut.
5	Pressure gauge port 1/4 BSP”
6	Mating electrical connector **to be ordered separately.** See at section 15

10 - OVERALL AND MOUNTING DIMENSIONS DZCE7G

dimensions in mm



NOTE: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

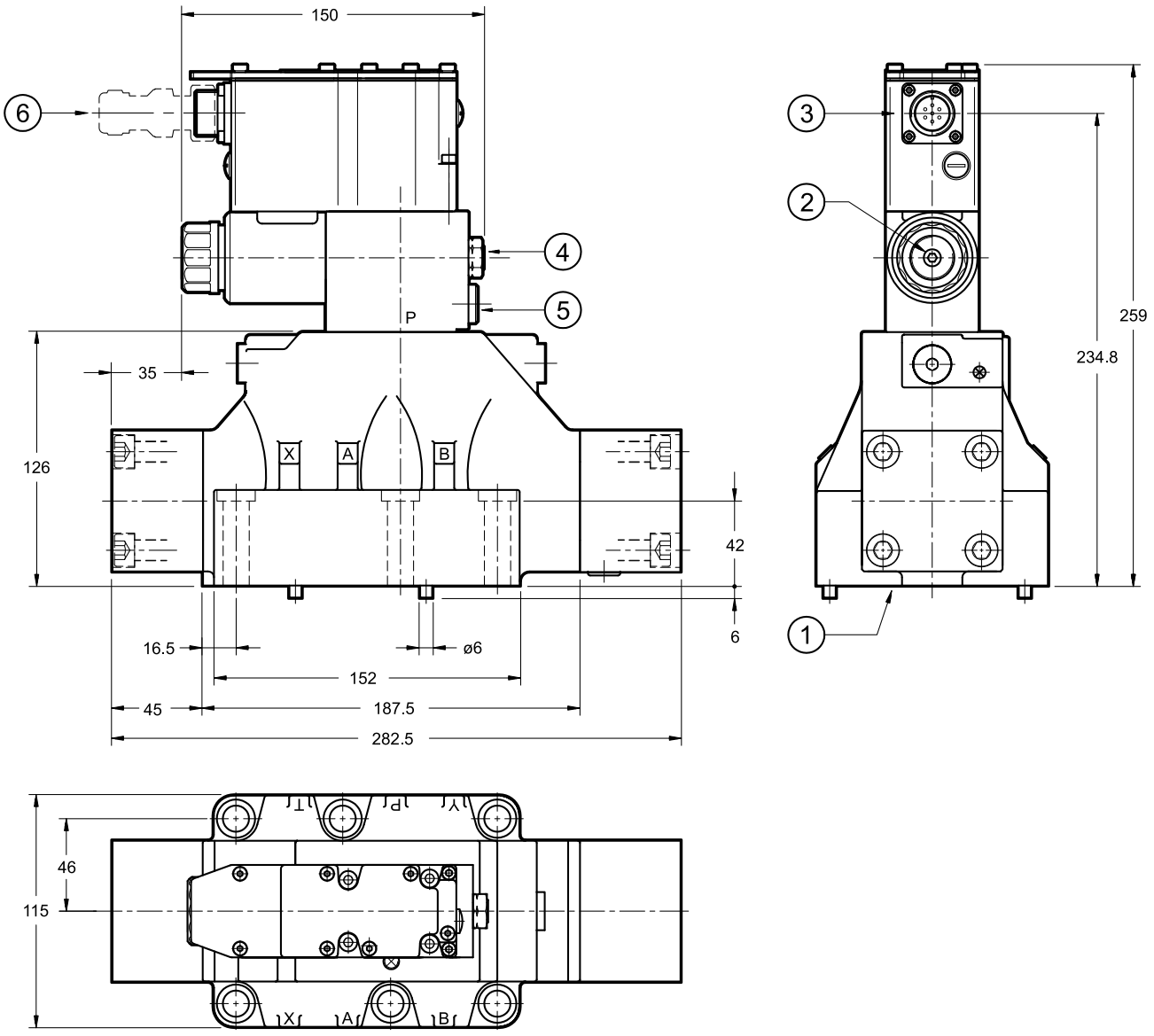
Mounting surface shown at paragraph 12.

Valve fastening:	N. 4 bolts SHC M10x60 - ISO 4762 N. 2 bolts SHC M6x60 - ISO 4762
Tightening torque:	M10x60: 40 Nm (bolts A 8.8) M6x60: 8 Nm (bolts A 8.8)
Thread of mounting holes:	M6x18; M10x18

1	Mounting surface with sealing rings: N. 4 OR type 130 (22.22x2.62) - 90 Shore N. 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Breather (Allen key 4)
3	Main connection
4	Adjustment seal, set in factory. It is recommended not to unscrew the nut.
5	Pressure gauge port 1/4 BSP”
6	Mating electrical connector **to be ordered separately.** See at section 15

11 - OVERALL AND MOUNTING DIMENSIONS DZCE8G

dimensions in mm



NOTE: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

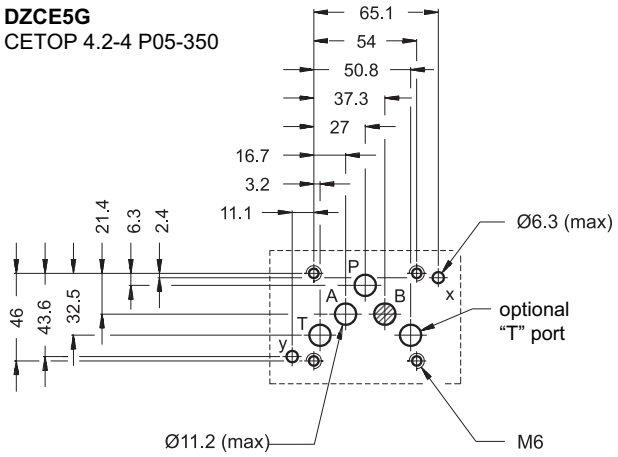
Mounting surface shown at paragraph 12.

1	Mounting surface with sealing rings: N. 4 OR type 3118 (29.82x2.62) - 90 Shore N: 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Breather (Allen key 4)
3	Main connection
4	Adjustment seal, set in factory. It is recommended not to unscrew the nut.
5	Pressure gauge port 1/4 BSP”
6	Mating electrical connector **to be ordered separately.** See at section 15

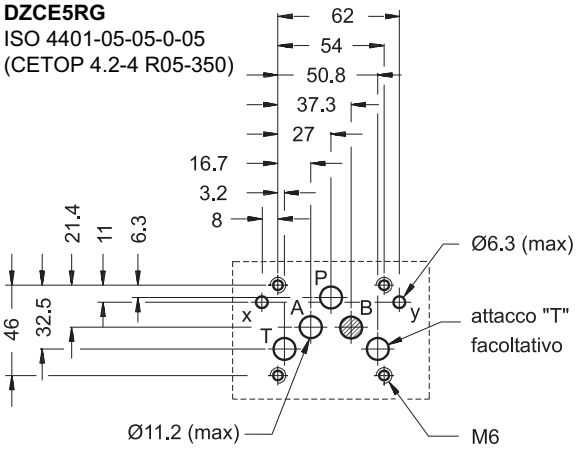
Valve fastening: N. 6 bolts SHC M12x60 - ISO 4762
Tightening torque: 69 Nm (bolts A 8.8)
Thread of mounting holes: M12x20

12 - MOUNTING SURFACES

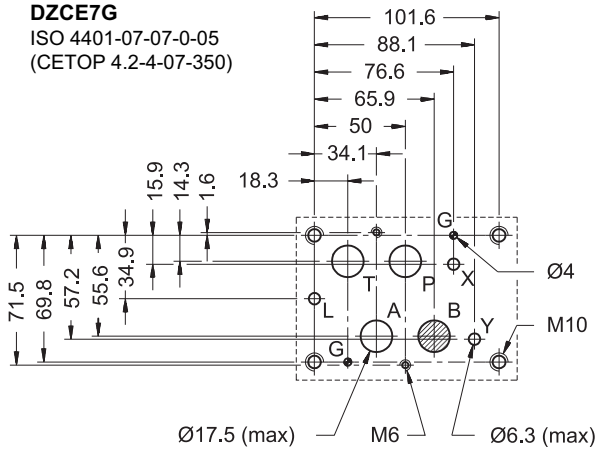
DZCE5G
CETOP 4.2-4 P05-350



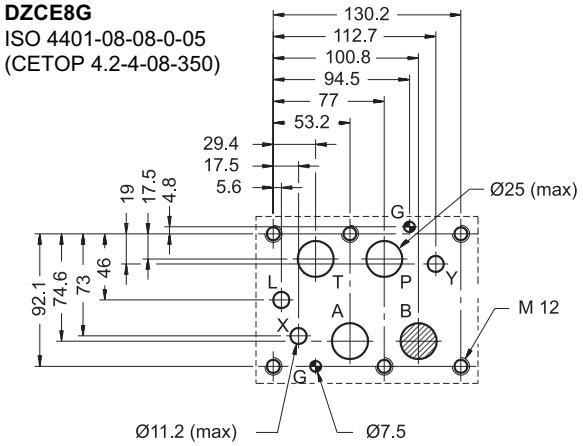
DZCE5RG
ISO 4401-05-05-0-05
(CETOP 4.2-4 R05-350)



DZCE7G
ISO 4401-07-07-0-05
(CETOP 4.2-4-07-350)



DZCE8G
ISO 4401-08-08-0-05
(CETOP 4.2-4-08-350)



13 - 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.

14 - INSTALLATION

We recommend to install the valves either in horizontal position, or vertical position with the solenoid downward. If the valve is installed in vertical position and with the solenoid upward, you must consider possible variations of the minimum controlled pressure, if compared to what is indicated in paragraph 5.

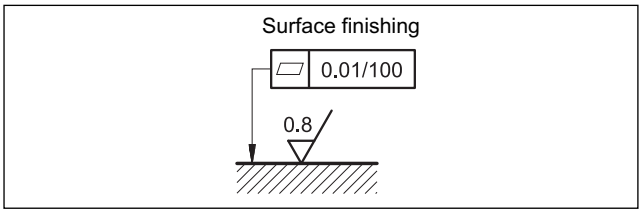
Ensure that there is no air in the hydraulic circuit. In particular applications, can be necessary to vent the air entrapped in the solenoid tube, by using the appropriate drain screw in the solenoid tube.

Ensure the solenoid tube is always filled with oil. At the end of the operation, make sure of having correctly replaced the drain screw.

Connect the valve T port directly to the tank. Add any backpressure value detected in the T line to the controlled pressure value.

Maximum admissible backpressure in the T line, under operational conditions, is 2 bar.

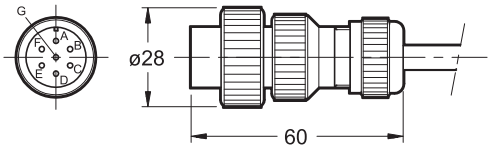
Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



15 - ACCESSORIES
(to be ordered separately)

15.1 Mating connector

These valves have a plug for 7-pin mating connector, that is placed on the box of the integral motion control.



So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

If a plastic connector is used, make sure that the protection characteristics IP and EMC of the valve are guaranteed.

Duplomatic offers a metal cable connector type MIL-C-5015-G (EN 175201-804).

name: **EX7S/L/10** code **3890000003**

15.2 - Connection cables size

Power supply:
- up to 20 m cable length : 1,0 mm^2
- up to 40 m cable length : 1,5 mm^2

Signal: 0,50 mm^2

A suitable cable would have 7 isolated conductors, a separate screen for the signal wires and an overall screen.

15.3 - Kit for start-up LINPC-USB

Device for service start-up and diagnostic, see catalogue 89850.

16 - SUBPLATES
(see catalogue 51 000)

		DZCE5G	DZCE7G	DZCE8G
Type with rear ports		PME4-AI5G	PME07-AI6G	-
Type with side ports		PME4-AL5G	PME07-AL6G	PME5-AL8G
Thread of ports:	P - T - A - B X - Y	3/4” BSP 1/4” BSP	1” BSP 1/4” BSP	1½” BSP 1/4” BSP

DUPLOMATIC MOTION SOLUTIONS

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