DUPLOMATIC
HYDRAULICS

RPCE07

PILOT OPERATED FLOW AND PRESSURE CONTROL VALVE WITH ELECTRIC PROPORTIONAL CONTROL

SERIES 13

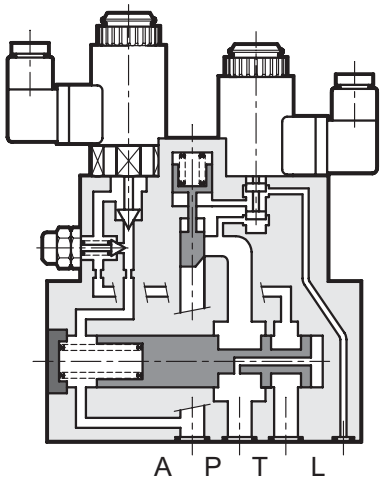
SUBPLATE MOUNTING

ISO 6263-07 (CETOP 07)

p max **250** bar

Q max **150** l/min

OPERATING PRINCIPLE



— The RPCE07 valve is a pilot operated three-way directional control valve with pressure and thermal compensation, proportional pressure control and mounting surfaces in compliance with ISO 6263 (CETOP RP121H) standards.

— The valves allow the control of flow to the circuit by dumping excess oil flow to tank. Energy consumption is thereby reduced and optimised for each phase of the machine cycle.

— Flow rate and pressure levels are controlled independently and can be modulated continuously in proportion to the current supplied to the solenoids.

— To ensure correct valve operation, maintain a minimum control pressure of 20 bar.

Piloting is inside the valve and obtained by intake of oil from line P.

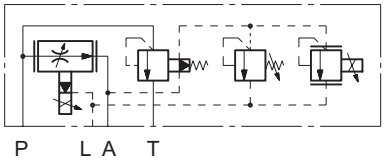
Drain line L is external and must be connected directly to the tank without backpressure.

— The valve features a built-in manual pressure relief valve which is factory set to a pressure value of ³15% of the maximum operating pressure to protect the circuit against excess pressure or faults.

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

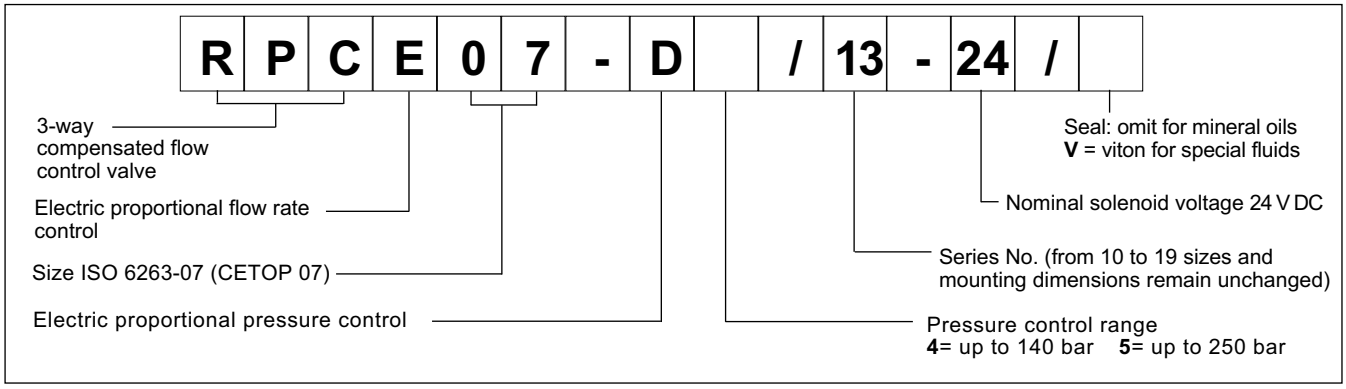
Maximum operating pressure Minimum pilot pressure Minimum Δp across P and A ports	bar bar bar	250 20 12
Maximum controlled flow	l/min.	150
Minimum controlled flow	l/min.	1,5
Step response	see par. 7	
Hysteresis	% of Q max	< 8%
Repeatability	% of Q max	< ±3%
Electrical characteristics	see par. 6	
Ambient temperature range	°C	–10 / +50
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	11,5

HYDRAULIC SYMBOL



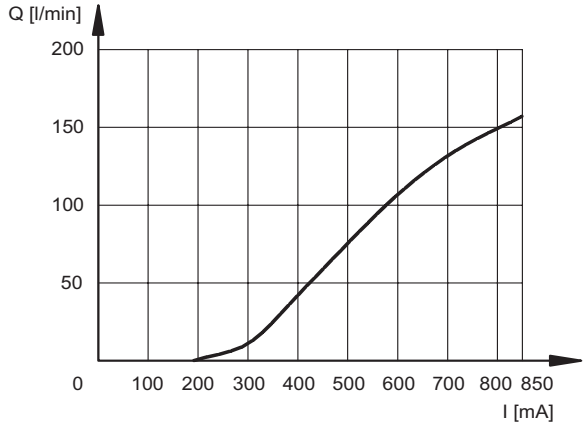
RPCE07
SERIES 13

1 - IDENTIFICATION CODE



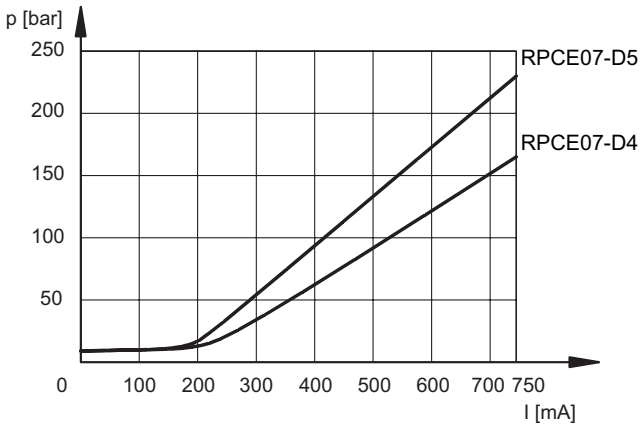
2 - CHARACTERISTIC CURVES (measured with viscosity of 36 cSt at 50°C and UEIK-11 electronic control unit)

FLOW CONTROL Q=f (I)



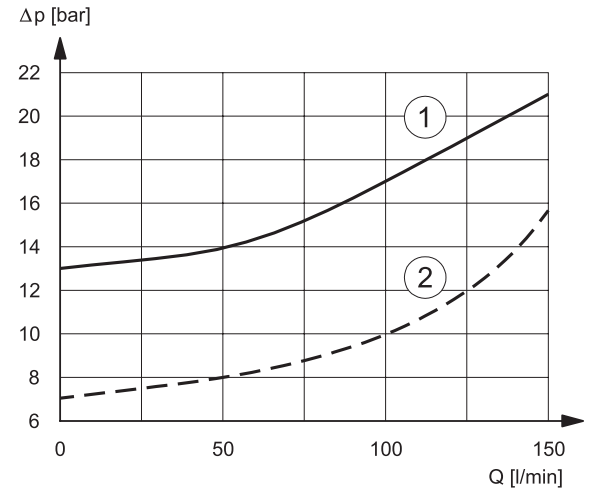
Typical curve of flow control P → A according to current supplied to the solenoid.

PRESSURE CONTROL p=f (I)



NOTE: The valve is preset at factory with a maximum current to the proportional solenoid of 750mA, to control the pressure. This setting must not exceeds the 750ma value.

PRESSURE DROP Δp=f(Q); FLOW P → T



① Curve obtained with port A closed, zero current to the pressure control proportional solenoid and maximum current to the flow control proportional solenoid.

② Curve obtained with zero current to both the proportional solenoids.

3 - PRESSURE COMPENSATION

The valves are equipped with two restrictors in series. The first is an opening which can be adjusted by the proportional solenoid; the second, controlled by the pressure upstream and downstream of the first restrictor ensures constant pressure drop across the adjustable restrictor.

In these conditions, the set flow rate value is maintained constant within a tolerance limit of ± 3% of the full scale flow rate for maximum pressure variation between the valve inlet and outlet chambers.

4 - THERMAL COMPENSATION

A temperature-sensitive device installed on the flow control element of the valve corrects the position to maintain the set flow rate virtually unchanged, also in the case of fluid viscosity variation.

Flow rate variation is therefore maintained within ± 2,5% of the set flow rate.

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

NOMINAL VOLTAGE	V DC	**24**
COIL RESISTANCE (at 20°C)	Ω	16,6
MAXIMUM CURRENT	A	0,85
DUTY CYCLE	100%	
ELECTROMAGNETIC COMPATIBILITY (EMC) **- EMISSIONS** EN 50081-1 **- IMMUNITY** EN 50082-2	in compliance with 89/336 EEC	
PROTECTION TO ATMOSPHERIC AGENTS (according to IEC 144 standards)	IP 65	

7 - STEP RESPONSE (with mineral oil with viscosity of 36 cSt at 50°C in conjunction with the relative electronic control unit)

7.1 - Flow step response

Step response is the time taken for the valve to reach 90% of the set pressure value following a step change of reference signal.
The table shows typical response times with an inlet flow of 100 l/min and a backpressure of 50 bar on the A port.

REFERENCE SIGNAL STEP	0→100%	100%→0
Flow step response [ms]	250	120
Pressure step response [ms]	130	100

7.2 - Pressure step response

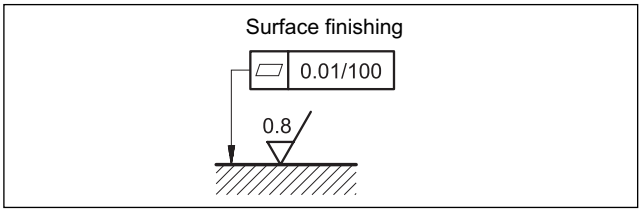
Step response is the time taken for the valve to reach 90% of the set pressure value following a step change of reference signal.
The table shows typical response times with a flow of 50 l/min and the A port closed.

8 - INSTALLATION

The RPCE07 valve can be installed in any position without impairing correct operation.

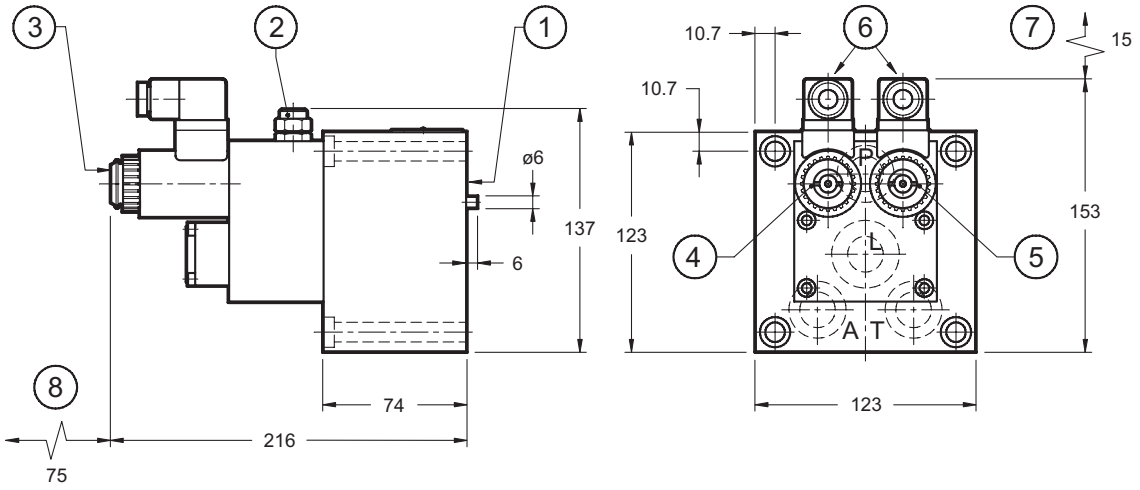
Ensure that there is no air in the hydraulic circuit. In particular applications, it can be necessary to vent the air entrapped in the solenoid tube, by using the apposite drain screw in the solenoid tube. Ensure that the solenoid tube is always filled with oil (see par. 9). At the end of the operation, make sure of having screwed correctly the drain screw.

Connect the L port on the valve directly to the tank without backpressure.



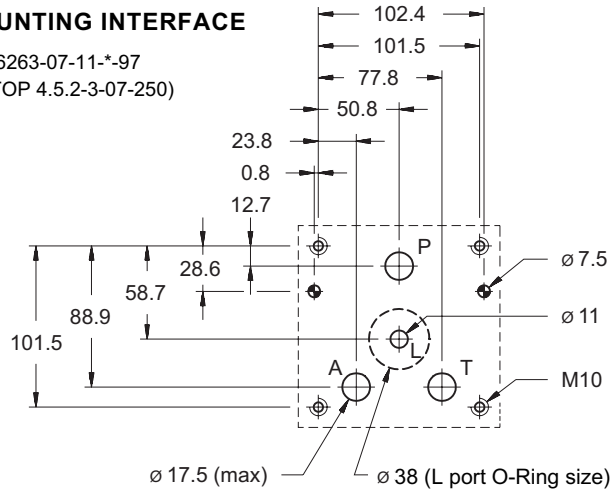
Valves are fixed by means of screws or tie rods on a flat surface with planarity and/or roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed fluid can easily leak between the valve and support surface.

9 - OVERALL AND MOUNTING DIMENSIONS



MOUNTING INTERFACE

ISO 6263-07-11-*-97
(CETOP 4.5.2-3-07-250)



Fastening bolts: 4 bolts M10x90
Torque: 40 Nm

NOTE:
at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (3) placed at the end of the solenoid tube.

dimensions in mm

1	Mounting surface with sealing rings: 3 OR type 3106 (26.65x2.62) - 90 Shore 1 OR type 2137 (34.65x1.78) - 90 Shore
2	Pre-calibrated pressure relief valve
3	Breather (male hexagonal spanner 4)
4	Proportional solenoid for pressure adjustment
5	Porportional solenoid for flow rate control
6	DIN 43650 electric connectors
7	Connector removal space
8	Coil removal space

10 - ELECTRONIC CONTROL UNITS

(valid for both flow rate and pressure controls)

EDC-112	for solenoid 24V DC	plug version	see cat.89 120
EDM-M3112	for solenoid 24V DC	DIN EN 50022 rail mounting	see cat. 89 250
UEIK-11	for solenoid 24V DC	Eurocard type	see cat. 89 300

DUPLOMATIC HYDRAULICS

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