



DIPLOMATIC
HYDRAULICS

82 250/103 ED

RPCER1

**DIRECT OPERATED
FLOW CONTROL VALVE
WITH ELECTRIC
PROPORTIONAL CONTROL
AND POSITION FEEDBACK
SERIES 50**

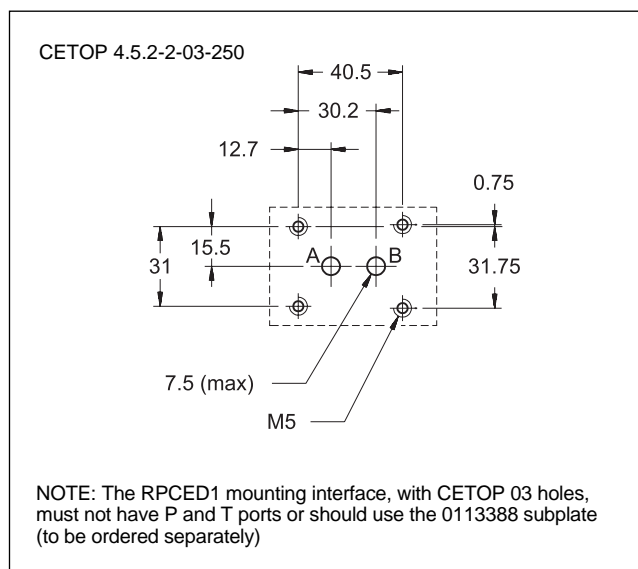


SUBPLATE MOUNTING CETOP 03

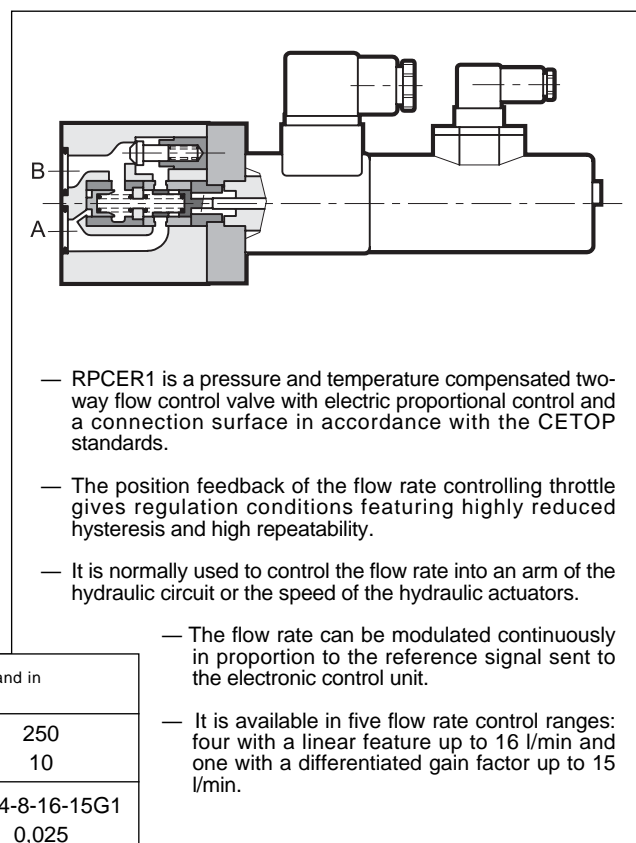
p max 250 bar

Q max (see specification table)

MOUNTING INTERFACE

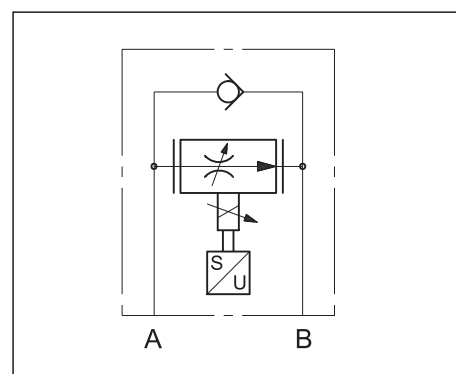


OPERATING PRINCIPLE



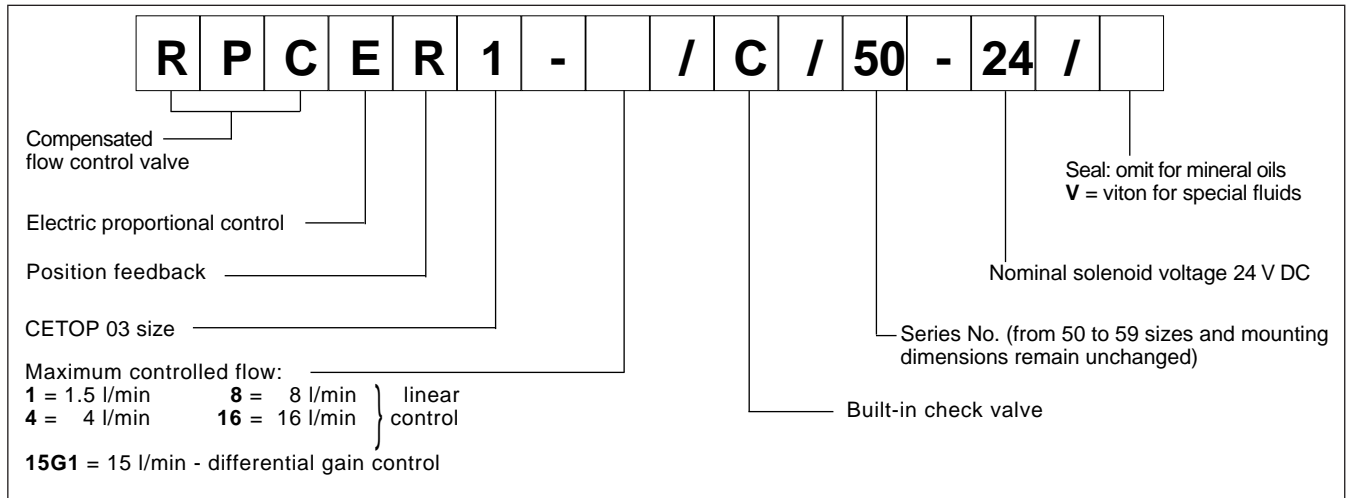
SPECIFICATIONS (obtained with mineral oil with viscosity of 36 cSt at 50°C and in conjunction with the control unit UEIK-11RS)		
Maximum operating pressure	bar	250
Minimum Δp across A and B ports	bar	10
Maximum controlled flow	l/min	1.5-4-8-16-15G1
Min. controlled flow (for 1 and 4 l/min. reg.)	l/min	0,025
Maximum free-reverse flow	l/min	40
Step response	see par. 7	
Hysteresis	% of Q max	< 2,5%
Repeatability	% of Q max	< \pm 1%
Electrical characteristics	see par. 6	
Ambient temperature range	°C	-10 \div +50
Fluid temperature range	°C	-20 \div +80
Fluid viscosity range	cSt	10 \div 400
Recommended viscosity	cSt	25
Degree of fluid contamination	According to NAS 1638 class 7 \div 9	
Degree of fluid contamination for < 0,5 l/min flows	According to NAS 1638 class 6	
Mass	kg	2,9

HYDRAULIC SYMBOLS



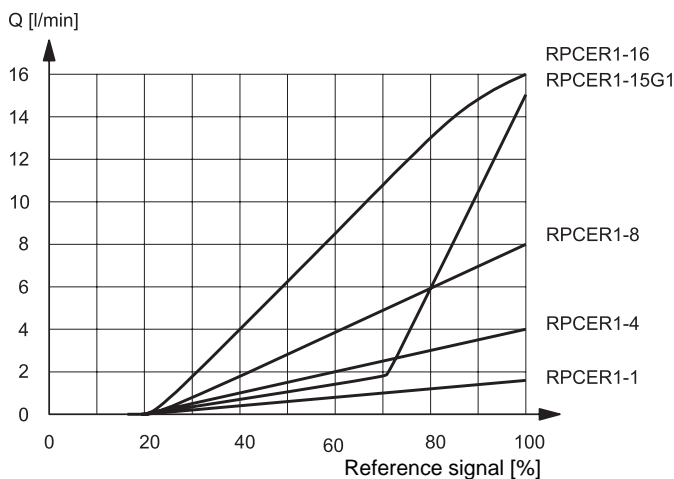


1 - IDENTIFICATION CODE



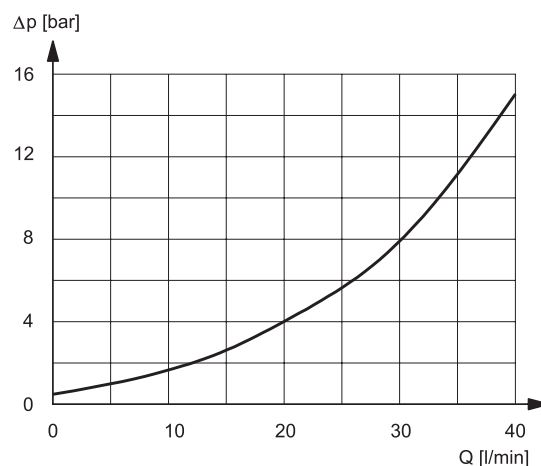
2 - CHARACTERISTIC CURVES (measured with viscosity of 36 cSt at 50°C and UEIK-11RS card)

FLOW CONTROL $Q=f(\text{ref})$



Typical curves for flow rate A → B according to the reference signal sent to the electronic control unit.

PRESSURE DROP $\Delta p=f(Q)$



Pressure drop with free flow B → A through check valve.

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 $\pm 2\%$ of the full scale flow rate for maximum pressure variation between the valve inlet and outlet chambers.

4 - THERMAL COMPENSATION

Thermal compensation of the valve is obtained by adopting the principle of restricted fluid passage, so that the fluid is not influenced significantly by variations in oil viscosity.

For controlled flow rates of lower than 0.5 l/min and with a temperature change of 30°C, flow rate varies by approx. 13% of the set value.

For higher flow rates and with the same temperature change the flow rate variation is <4% of the set flow rate.

5 - HYDRAULIC FLUIDS

5.1 - Use mineral oil-based hydraulic fluids with anti-foam and anti-oxidant additives.

For use with other types of fluids (water glycol, phosphate esters and others) consult our technical department.

5.2 - Operation with fluid temperature exceeding 70°C causes premature deterioration of the quality of the fluid and seals. The physical and chemical properties of the fluid must be maintained.



6 - ELECTRICAL CHARACTERISTICS

6.1 - 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 reduce friction to a minimum thereby reducing hysteresis.

The armature connected to the LVDT transducer core sends the position status to the electronic control unit.

NOMINAL VOLTAGE	VDC	24
COIL RESISTANCE (at 20°C)	Ω	19,4
CURRENT		
nominal	A	0,7
maximum		1,02
DUTY CYCLE	100%	
ELECTROMAGNETIC COMPATIBILITY (EMC)	in compliance with 89/336 EEC	
- EMISSIONS	EN 50081-1	
- IMMUNITY	EN 50082-2	
PROTECTION TO ATMOSPHERIC AGENTS (according to IEC 144 standards)	IP 65	

6.2 - Positional transducer

The feedback control version RPCER1 uses an LVDT type positional transducer with amplified signal to enable precise control of the restrictor and the set flow rate, thus improving repeatability and hysteresis characteristics.

The transducer is fitted coaxially on the proportional solenoid and the connector features 360° positioning.

The table shows technical specifications and connections.

The transducer is protected against polarity inversion on the power line.

Supply voltage	24 V DC ± 20%	
Supply voltage ripple	≤ 5 %	
Power consumption	< 40 mA	
Output voltage (in linear field)	3 ÷ 12 VCC	
Maximum load on output voltage	> 10 KΩ	
Class of protection to atmospheric agents (IEC 144 standards)	IP 65	

7 - STEP RESPONSE (measured with mineral oil with viscosity of 36 cSt at 50°C in conjunction with UEIK-11RS electronic control unit)

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 illustrates typical response times with valve flow rate of 16 l/min and with input pressure of 100 bar.

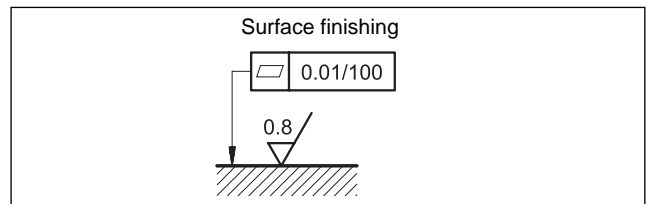
REFERENCE SIGNAL STEP	0→100%	100%→0	25→100%	100→25%
Step response [ms]	180	150	150	120

8 - INSTALLATION

RPCER1 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 mounting surface.

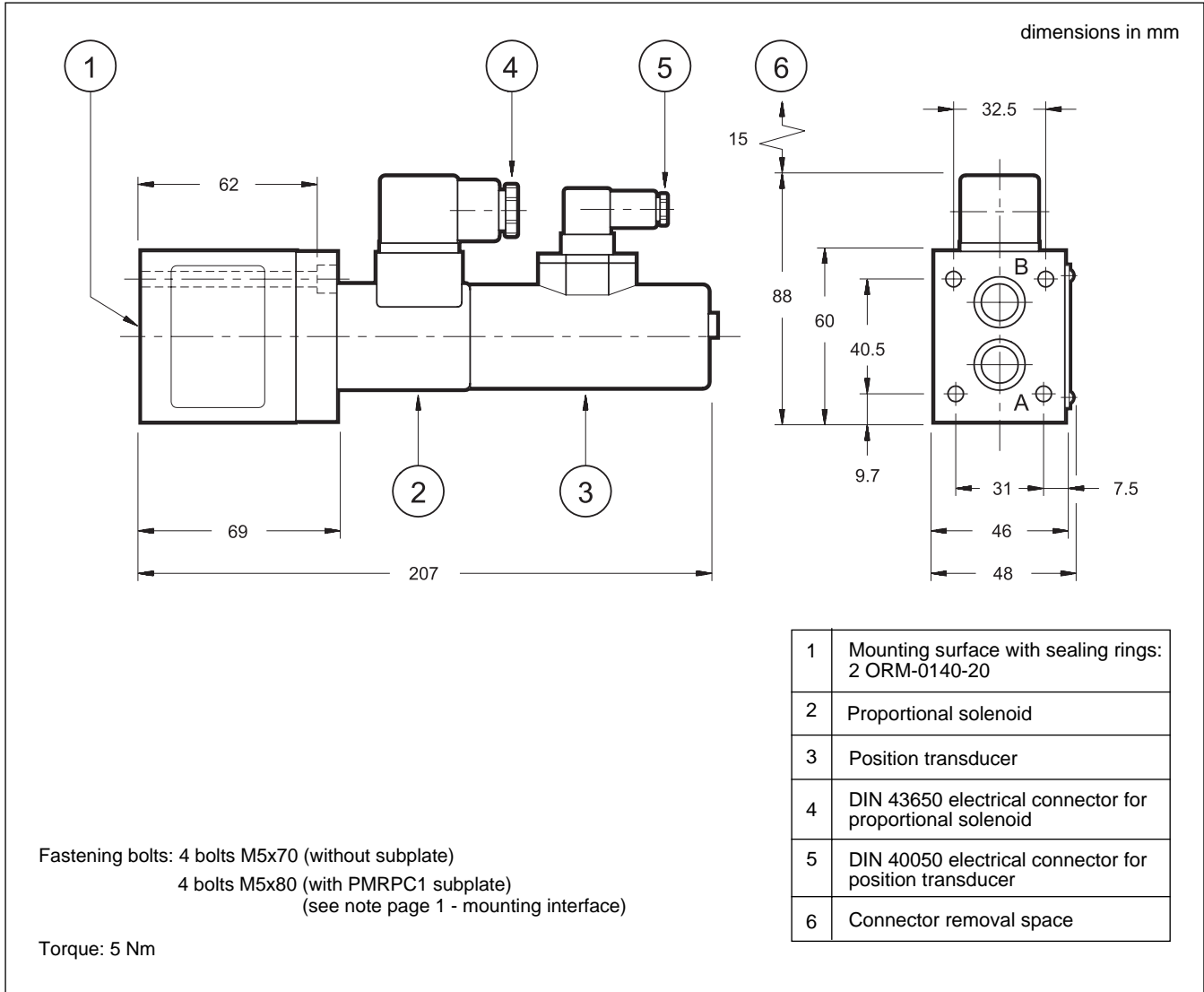




RPCER1

SERIES 50

9 - OVERALL AND MOUNTING DIMENSIONS



10 - ELECTRONIC CONTROL UNITS

UEIK-11RS	Eurocard format	(see cat. 89 310)
EPR-S150	Rail mounting EN 50022	(see cat. 82 300)

11 - SUBPLATES (see catalogue 51 000)

Type	PMRPC1-AI3G rear ports PMRPC1-AL3G side ports
Port dimensions	3/8" BSP

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