



# RPCER1

## DIRECT OPERATED FLOW CONTROL VALVE WITH ELECTRIC PROPORTIONAL CONTROL AND POSITION FEEDBACK

SERIES 54

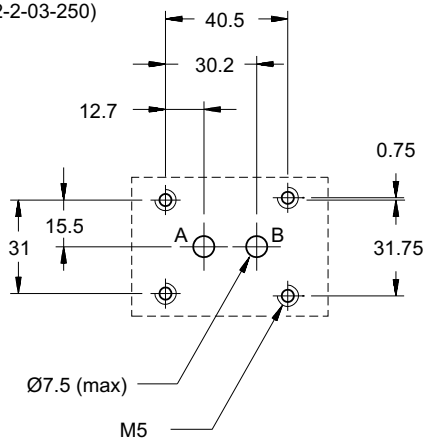
**SUBPLATE MOUNTING  
ISO 6263-03**

**p max 250 bar**

**Q max (see performances table)**

### MOUNTING INTERFACE

ISO 6263-03-03-0-97  
(CETOP 4.5.2-2-03-250)



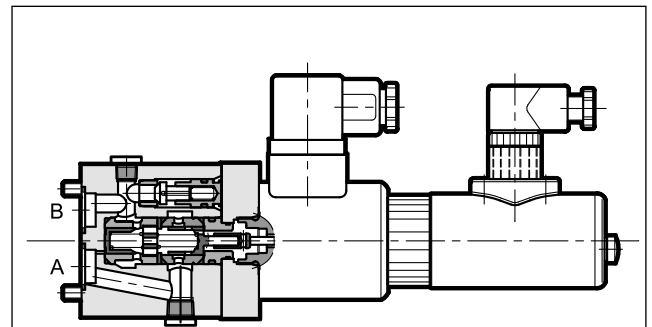
**NOTE:** the RPCER1 mounting interface, with holes according to ISO 6263-03, must not have P and T ports

### PERFORMANCES

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

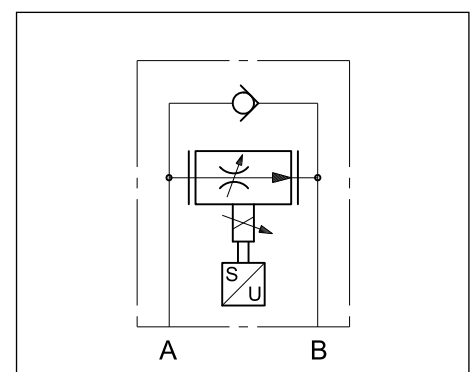
Maximum operating pressure Minimum $\Delta p$ between A and B port	bar	250 10
Maximum controlled flow Min. controlled flow (for 1 and 4 l/min. reg.) Maximum free-reverse flow	l/min	1,5 - 4 - 8 - 16 - 25 0,025 40
Step response	see point 7	
Hysteresis	% of Q max	< 2,5%
Repeatability	% of Q max	< $\pm 1\%$
Electrical characteristic	see point 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 (class 17/15/12 for flows < 0,5 l/min)	
Recommended viscosity	cSt	25
Mass	kg	2,2

### OPERATING PRINCIPLE

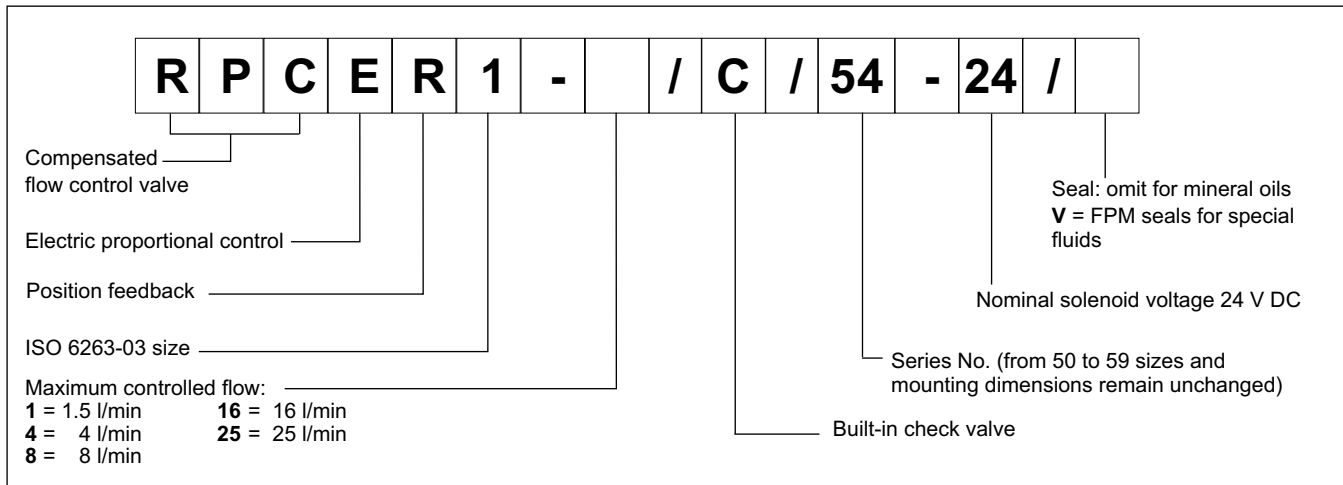


- RPCER1 is a pressure and temperature compensated two-way flow control valve, with electric proportional control and mounting interface according to ISO 6263 standards.
- The position feedback of the flow rate controlling throttle gives regulation conditions featuring highly reduced hysteresis and high repeatability.
- This valve controls the flow rate in a branch of the hydraulic circuit or the speed of hydraulic actuators.
- The flow rate can be modulated continuously in proportion to the reference signal coming from the electronic control unit.
- It is available in five flow rate control ranges up to 25 l/min.

### HYDRAULIC SYMBOLS

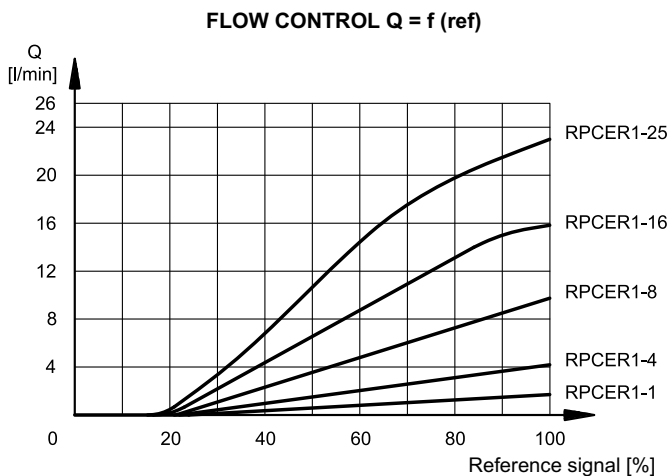


## 1 - IDENTIFICATION CODE

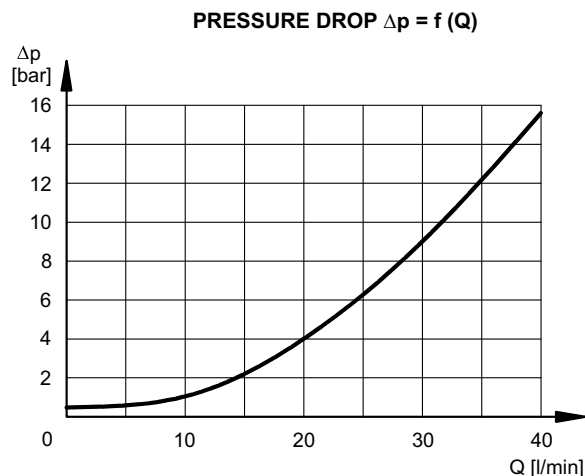


## 2 - CHARACTERISTIC CURVES

(measured with viscosity of 36 cSt at 50°C and UEIK-11RSQ/52-24 card)



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



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

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 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 card.

### 6.2 - Position transducer

The RPCER1 valve has an LVDT type position transducer with amplified signal. This type of transducer allows a precise control of the restrictor and of the set flow rate, thus improving repeatability and hysteresis characteristics.

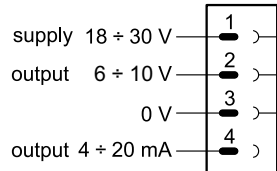
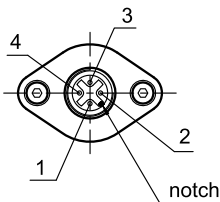
The transducer is fitted coaxially on the proportional solenoid and the connector features 360° positioning. The field-wireable mating connector is always included.

Use a screened cable to avoid interferences.

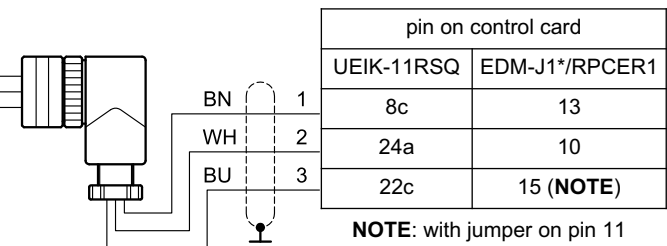
Technical specifications and connections are indicated here below.

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

transducer output at closed valve 6 V, at open valve 10 V



<b>NOMINAL VOLTAGE</b>	V DC	<b>24</b>
<b>RESISTANCE (at 20°C)</b>	Ω	17.6
<b>MAXIMUM CURRENT</b>	A	0.86
<b>DUTY CYCLE</b>	100%	
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	According to 2014/30/EU	
<b>CLASS OF PROTECTION</b> Atmospheric agents (IEC EN 60529)	IP65	



## 7 - STEP RESPONSE

(measured with mineral oil with viscosity of 36 cSt at 50°C with UEIK-11RSQ/52-24 card)

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.

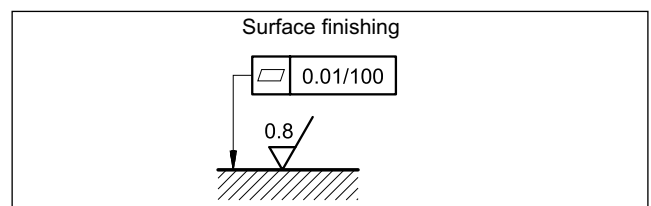
REFERENCE SIGNAL	0 → 100%	100 → 0%	25→100%	100→25%
Step response [ms]	180	150	150	120

## 8 - INSTALLATION

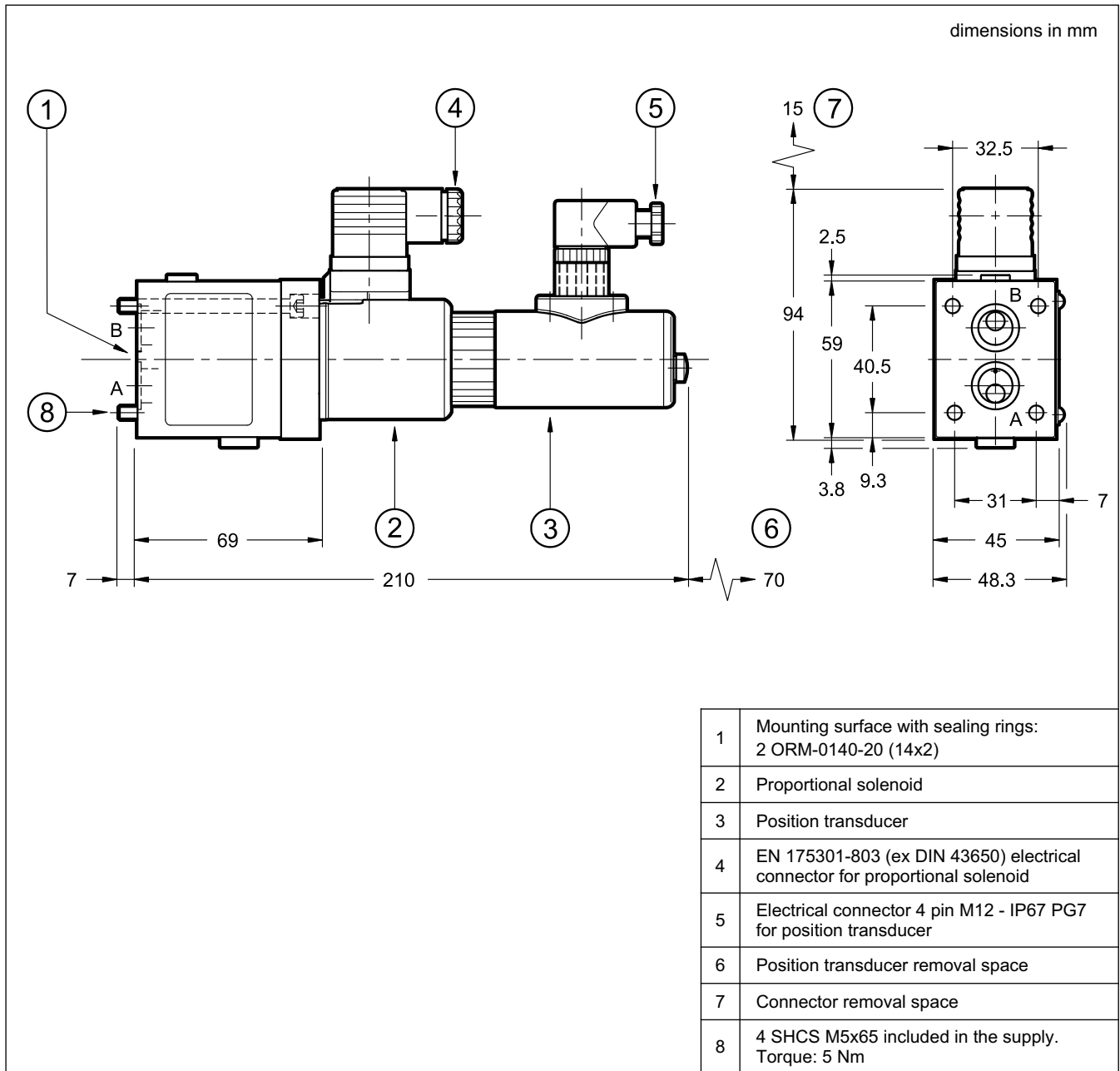
RPCER1 valves can be installed in any position without impairing correct operation.

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.



## 9 - OVERALL AND MOUNTING DIMENSIONS



## 10 - ELECTRONIC CONTROL UNIT

EDM-J1*RPCER1	DIN EN 50022 rail mounting	see cat. 89 255
UEIK-11RSQ	Eurocard	see cat. 89 315

The card holder for Eurocard electronics is available.  
See catalogue 89 900

## 11 - SUBPLATES (see cat. 51 000)

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