OPERATION MANUAL
PROPORTIONAL PRESSURE VALVES FOR EXTERNAL ELECTRONICS

Series RE06, PE06, R4V*P2, R6V*P2, VMY/VBY, R5V*P2

WARNING — USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

1. Introduction

Parker proportional pressure valve valves are available with and without integrated electronics. In the latter case an external electronic is required, which matches the characteristics of the valve. Parker provides an optimal tuned electronic for each valve equipped with different operating and configurating options.

Order code

Each valve carries a name plate with the order code indicating the definite valve type. The meaning of the individual characters can be taken from the corresponding catalog sheet of the valve.

Related catalogues

- Catalogues RE06
- Catalogues PE06
- Catalogues R4V/R6V Prop
- Catalogues R4R Prop
- Catalogues R5V P2
- Catalogues VMY/VBY
- Catalogues RE*E*W

Characteristics of valves

Parker proportional pressure valves show all attributes which are essential for optimal and trouble-free operation under industrial conditions:

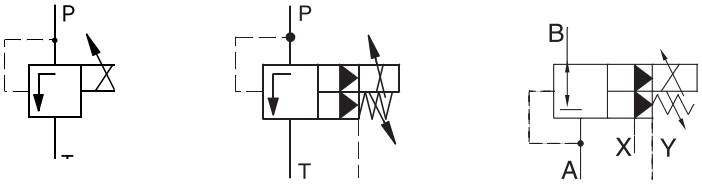
- Excellent valve characteristics
- Driven by modern DC-proportional solenoids
- Hydraulic connection via standard mounting interface
- Electrical connection via standard connectors

RE06M

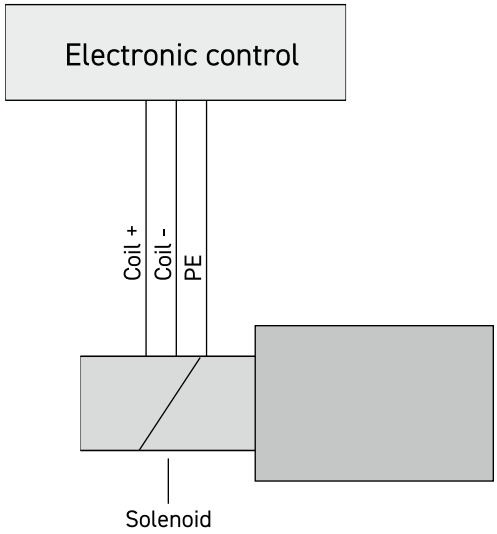
R6V06

R5V*P2 mit 3 Anschlüssen

Symbols



Electronic connection



Technical data

General		
Model	[bar]	See catalog
Drive		Proportional solenoid
Installation position		Unrestricted
Ambient temperature range	[°C]	-20...+60
Hydraulic		
Fluid rate		Hydraulic oil acc. DIN 51524...535, other on request
Viscosity	[mm^2/s]	30...80 (max. 20...400)
Fluid temperature	[°C]	-20...+60 (NBR: -25...+60)
Cleanliness class		18/16/13 acc. to ISO 4406
Operating pressure max.	[bar]	See catalog
Electrical		
Duty ratio	[%]	100
Protection class		Standard (as per EN175301-803) IP65 in acc. with EN 60529 DT04-2P "Deutsch" IP69K (with correctly mounted plug-in connector)
Solenoid		
Supply voltage	[VDC]	See catalog
Current consumption	[A]	See catalog
Connection		2 + PE acc. EN 175301-803
Connection cable	[mm^2/s]	3 x 1.5 (AWG 16) overall braid shield
Insulation class		F (155°C)
EMC		EN 61000-6-2, EN 61000-6-4
Cable length max.	[m]	50

2. Safety Instructions

Please read the operation manual before installation, startup, service, repair or stocking! Paying no attention may result in damaging the valve or incorporated system parts.

Symbols

This manual uses symbols which have to be followed accordingly:

Instructions with regard to the warranty

Instructions with regard to possible damaging of the valve or linked system components

Helpful additional instructions

Marking, Name Plates

Instructions applied on the valve, i.e. wiring diagrams and name plates, must be observed and maintained legibly.

Work at the Valve

Workings in the area of installation, commissioning, maintenance and repair of the valve may only be allowed by qualified personnel. This means persons which have, because of education, experience and instruction, sufficient knowledge on relevant directives and approved technical rules.

3. Important Details

Intended Usage

This operation manual is valid for proportional pressure valves RE06M / PE06 / RE*M*W / RE*R*W / RE*E*W / R4V / R5V / R6V series. Any different or beyond it usage is deemed to be as not intended. The manufacturer is not liable for warranty claims resulting from this.

Common Instructions

We reserve the right for technical modifications of the described product. Illustrations and drawings within this manual are simplified representations. Due to further development, improvement and modification of the product the illustrations might not match precisely with the described valve. The technical specifications and dimensions are not binding. No claim may resulting out of it. Copyrights are reserved.

Liability

The manufacturer does not assume liability for damage due to the following failures:

incorrect mounting / installation
improper handling
lack of maintenance
operation outside the specifications

Do not disassemble the valve! In case of suspicion for a defect please return the valve to the factory.

Storage

In case of temporary storage the valve must be protected against contamination, atmospheric exposure and mechanical damages. Each valve has been factory tested with hydraulic oil, resulting in protection of the core parts against corrosion. Yet this protection is only ensured under the following conditions:

Outdoor storage or within sea and tropical climate will lead to corrosion and might disable the valve!

Storage period	Storage requirements
12 months	constant humidity < 60 % as well as constant temperature < 25 °C
6 months	varying humidity as well as varying temperature < 35 °C

4. Mounting / Installation

Scope of Supply

Please check immediately after receiving the valve, if the content is matching with the specified scope of supply. The delivery includes:

- valve
- operation manual

The central connector assembly as well as the parametrizing cable has to be ordered separately and are not included in the delivery.

☞ Please check the delivery immediately after receiving the shipment for apparent damages due to shipping. Report shipment losses at once to the carrier, the insurance company and the supplier!

Mounting

- Compare valve type (located on the name plate) with part list resp. circuit diagram.
- The valve may be mounted fix or movable in any direction.
- Verify the mounting surface for the valve. Uneveness of 0.01 mm/100 mm, surface finish of 6.3 µm are tolerable values.

☞ Keep clean valve mounting surface and work environment!

- Remove protection plate from the valve mounting surface
- Check the proper position of the valve ports and the O-rings.
- Mounting bolts:
  use property class ISO 4762-12.9
- Tighten the bolts crisscross with the following torque values acc. to table below

Available bolt kits

Valve type	Bolt dimensions	Torque	Ordering number
RE06M	4 St. M5x30mm	7,6 Nm	BK375
PE06M	4 St. M5x30mm	7,6 Nm	BK375
R4V03/R4R03	4 St. M10x35 mm	63 Nm	BK505
R4V06/R4R06	4 St. M10x45 mm	63 Nm	BK485
R4V10/R4R10	4 St. M10x45 mm	63 Nm	BK506
R6V03	4 St. M12x45 mm	108 Nm	BK494
R6V06	4 St. M16x70 mm	264 Nm	BK366
R6V10	4 St. M18x75 mm	398 Nm	BK507
RE16E*W	4 St. M8x40 mm	32 Nm	BK414
RE25E*W	4 St. M12x50 mm	108 Nm	BK391
RE32E*W	4 St. M16x55 mm	264 Nm	BK415
RE40E*W	4 St. M20x70 mm	517 Nm	BK416
RE50E*W	4 St. M20x75 mm	517 Nm	BK417
RE63E*W	4 St. M30x100 mm	1775 Nm	BK418
R5V	*	*	*

* The dimension of the screws resp. tie rods depends on the used SAE flanges and on the number of SAE valves.

⚠ Insufficient condition of the valve mounting surface migth create malfunction!
Incorrect mounting resp. bolt torque may result in abrupt leakage of hydraulic fluid on the valve ports.

Operation Limits

The valve may be operated within the determined limits only. Please refer to the "technical data" section as well as to the "characteristic curves" in the catalog.

⚠ Follow the environmental conditions! Unallowable temperatures, shock load, aggresive chemicals exposure, radiation exposure, illegal electromagnetic emissions may result in operating trouble and may lead to failure! Follow the operating limits listed in the "specifications" table!

Pressure Fluids

The following rules applies for the operation with various pressure fluids:

⚠ This information serves for orientation and does not substitute user tests among the particular operating conditions. Particularly no liabiliy for media compatibility may be derived out of it.

Mineral oil: usable without restriction.

For operation with the following pressure fluids please consult Parker:

HFA	oil-in-water emulsion
HFB	water-in-oil emulsion
HFC	aqueous solution (glycols)
HFD	unhydrous fluids (Phosphor-Ester)

☞ For detailed information concerning pressure fluids note VDMA-document 24317 as well as DIN 51524 & 51502.

Special gaskets may be available depending on the utilized fluid.
In case of insecurity please consult Parker.

Air Bleeding of Hydraulic System

During initial startup, after an oil change as well as after the opening of lines or valves the hydraulic system must be air bleeded.

Filter

The function and lifetime of the valve are strongly affected by the cleanliness of the fluid. Purity level class of 18/16/13 acc. ISO4406 is required.

Flushing

It is recommended to flush the pipelines by short circuiting the pressure and return lines. This prevents the installation dirt from entering the valve.

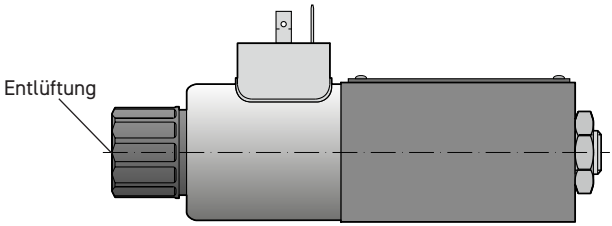
Temperature

⚠ The service temperaturesmay exceed the temperature threshold for burn injury 70 °C. Above this threshold even brief contact with the surface may result a burn. The only way to consistently prevent burn injuries is to use personal protective equipment and to remain safety-concious at all times.

Power failure

In a power failure, the pressure valve opens completely and relieves pressure on the hydraulic system. You must check whether this creates potential hazards.

Example RE06M

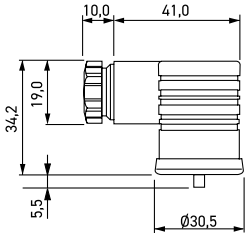


Electrical connection

Solenoid connection

Each solenoid requires one connector assembly 2 + PE acc. to EN 175301-803.

The connector assemblies have to be ordered separately.



The applied connector assemblies may not contain adaptive circuits, as signal lamps or recovery diodes, otherwise malfunctions and irreparable damages may occur on the electronic control unit!

The connection cable has to comply to the following specification:

Cable type:	control cable, flexible, 3 conductors, overall braid shield
Cross section:	min. 1.5 mm² (AWG 16)
Outer dimension:	PG9: 4,5...7 mm / PG11: 6...9 mm
Cable length:	max. 50 m

For cable lengths > 50 m consult factory.

The mounting surface of the valve has to be carefully tied to the earth grounded machine frame. The earth ground wires as well as the cable shields have to be tied to the protective earth terminal within the control unit.

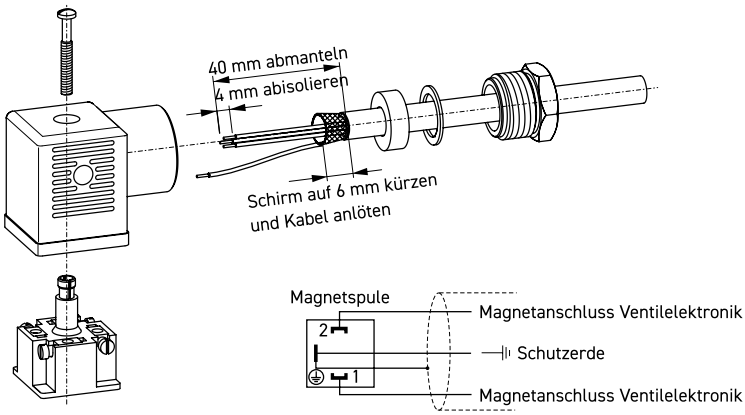
The connection cable will be coupled to the connector assembly via terminal screws.

The backshell nut of the cable gland has to be tighten with a suitable tool.

Incomplete tightening of the screw threads may result in automatic release of the connection as well as degradation of the water tightness. Follow the “instructions for use“ for installation of female connectors made by other manufacturers!

The cable connection to the female connector has to take place by qualified personnel! A short between individual conductors resp. to the connector housing, bad workmanship as well as improper shield connection may result in malfunction and breakdown of the valve.

Connection of the female connector assembly



5. Operating Instructions

Electronic control unit

The valve has to be driven by a suitable electronic control unit.

☞ The compatible electronic may be selected from the catalog (chapter "Electronics"). When insecure, please consult Parker.

⚠ Connection to an unsuitable electronic may cause irreparable damages to valve resp. electronic control!

Solenoid selection

The selection of the suitable solenoid actuator is most important for the reliability of the valve. Miscellaneous valve series are available with multiple options concerning the nominal solenoid voltage. If the electronic provides a selection of solenoid parameters, the matching solenoid option has to be chosen.

⚠ Instruction for using of valves with 24 V-solenoids:
Because of the increasing coil resistance up to 40% at heating, the electronic increases the solenoid voltage to keep the adjusted current constant. On solenoids with nominal voltages of 24 V this may result in an electronic supply voltage requirement of more than 24 V, to keep the nominal solenoid current constant. This denotes for example, that the supply voltage of the electronic unit for driving a solenoid with nominal data of 24 V / 0.8 A respectively 24 V / 1.1 A has to be increased up to 30 V to ensure the proper energizing of the solenoid. Therefore use preferably solenoids with lower voltage option!

⚠ Do not exceed the nominal max. supply voltage value of the electronic unit! Non-observance of this rule may result in permanent damaging the electronic!

Operation

⚠ If any of the safety features of the product are not operational, the system/machine must be shut down immediately.

☞ Do not carry out any activities that might jeopardize safety.

Note also the information in sections "Warranty and liability", "Use of operating instructions)", "Compliance with other rules and instructions", "Personnel requirements", "Remaining risks".

Modification

We define modification as the replacement of a defective valve with a new valve of the same series. In particular, it is not permitted to open the valve.

⚠ Make sure that the hydraulic system/machine is unpressurised before the product is installed/removed.

Disposal

☞ At the end of the service life of this product

- all escaping pressure fluids must be removed and disposed of properly.
- any significant fluids remaining in the product must be removed and disposed of properly.
- all materials must be segregated for recycling when they are removed and taken to a suitable recycling center.

Please segregate the packaging material properly (e.g. paper, plastic). None of the components of the product contain hazardous materials.

☞ The normal local environmental protection laws must always be met when disposing the product.

Note also the information in sections "Safety instructions" and "Important details".

6. Trouble Shooting

Basis of troubleshooting is always a systematic approach.

For suspect of a sluggish spool the valve may be flushed with clean pressure fluid.

Troubleshooting in a hydraulic system requires detailed knowledge about function and construction of the system. Therefore the work may exclusively be performed by qualified personnel.

malfunction at hydraulic load runtime							
- generally no function							
	- high frequent oscillation						
		- low frequent oscillation					
			- pressure at unchanging command				
				- pressure too low			
					- drifting without command		
						possible reasons for malfunction	**corrective actions**
x						hydraulic pump resp. motor defective	replace hydraulic pump resp. motor
x		x	x	x		drive overloaded	reduce pressure resp. speed, increase valve size
x		x	x	x	x	valve contaminated	clean pressure fluid, filter / flush valve
			x	x		hydraulic fluid too viscous / too cold	change fluid grade, provide operational temperature
x		x				too low oil level within tank	refill pressure fluid
			x	x		filter contaminated	replace filter
x		x		x	x	supply voltage too low	keep supply voltage range
	x					supply voltage carries too much ripple	reduce ripple
x				x		command signal too low	increase command signal
	x					command signal carries too much ripple	reduce ripple
	x					dither signal amplitude too high	reduce parameter P5
		x				dither signal amplitude too low	increase parameter P5
x	x		x	x	x	central connector contact failure	clean contacts resp. replace connector
x						feed cable interrupted	fix feed cable
x	x	x	x	x	x	wiring sequence incorrect	correct wiring sequence
	x				x	feed cable without shielding	change cable grade

7. Accessories / Spare parts

Accessories

The following accessories are available for the valves series: female connector 6+PE: ordering code 5004072
Bolt kits: see table on page 7.

Spare parts / seal kits

Valve type	NBR	FPM
RE06M	SK-RE06MTN	SK-RE06MTV
PE06M	SK-PE06MTV	SK-PE06MTV
R4V03/R4R03	S26-58507-0 [1)]	S26-58507-5 [1)]
R4V06/R4R06	S26-58475-0 [1)]	S26-58475-5 [1)]
R4V10/R4R10	S26-58508-0 [1)]	S26-58508-5 [1)]
R6V03	S26-98589-0	S26-98589-5
R6V06	S26-96396-0	S26-96396-5
R6V10	S26-96392-0	S26-96392-5
RE16E*W	SK-RE16EN	SK-RE16EV

Valve type	NBR	FPM
RE25E*W	SK-RE25EN	SK-RE25EV
RE32E*W	SK-RE32EN	SK-RE32EV
RE40E*W	SK-RE40EN	SK-RE40EV
RE50E*W	SK-RE50EN	SK-RE50EV
RE63E*W	SK-RE63EN	SK-RE63EV
R5V06	S16-91850-0	S16-91850-5
R5V08	S16-91851-0	S16-91851-5
R5V10	S16-91852-0	S16-91852-5
R5V12	S26-27421-0	S26-27421-5

1) Please combine seal kit of one size with seal kit of proportional section P2 for complete seal kit.
NBR: S26-58473-0, FPM: S26-58473-5.

Parker Hannifin
Manufacturing Germany GmbH & Co. KG
Hydraulic Valve Systems Europe
Gutenbergstr. 38
41564 Kaarst, Germany
E-mail: isde.kaarst.support@support.parker.com

Hotline in Europa: Tel.: 00800-2727-5374

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