



Bulletin MSG11-5715-669/UK

Operation Manual Series D*FB / D*1FB with Integrated Electronics

D*FB Design \geq 12

D*1FB Design \geq 10

Proportional Directional Control Valve



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**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.

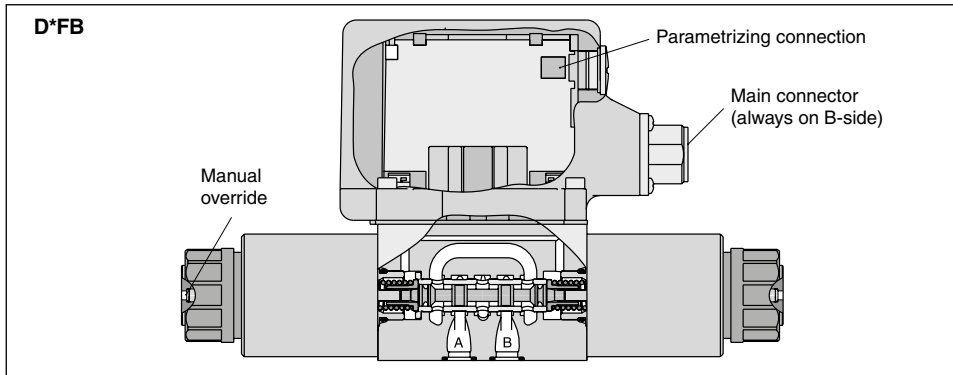
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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. 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.

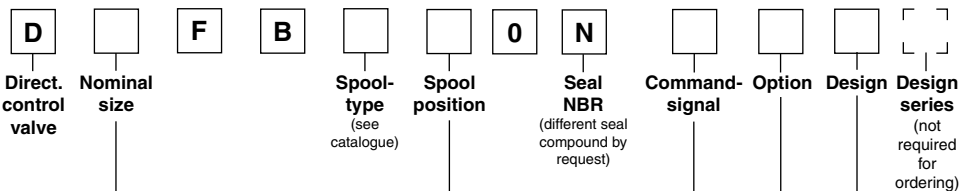
To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably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

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1. Introduction

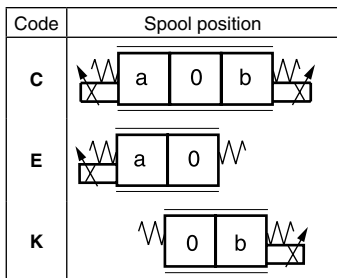


Ordering code D*FB



Code	Nominal size
1	NG06 / CETOP 3
3	NG10 / CETOP 5

Code	Design
0	Spool/sleeve design
3	Spool/body design

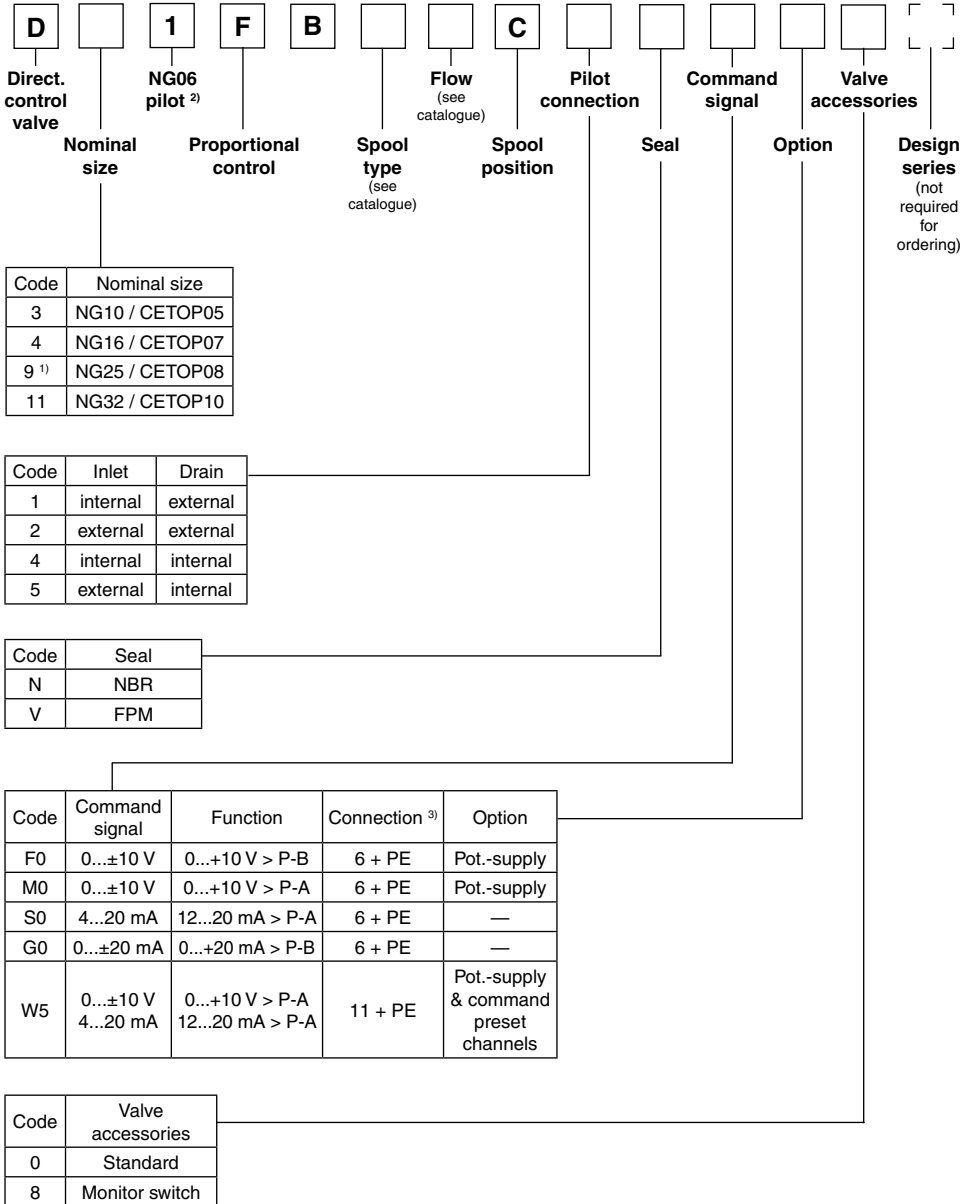


Code	Command signal	Function	Connection ²⁾	Option
F0	0...+/-10 V	0...+10 V > P-A	6 + PE	Pot.-supply
G0	0...+/-20 mA	0...+20 mA > P-A	6 + PE	-
S0	4...20 mA	12...20 mA > P-A	6 + PE	-
W5 ¹⁾	0...+/-10 V 4...20 mA	0...+10 V > P-A 12...20 mA > P-A	11 + PE	Pot.-supply & command preset channel

¹⁾ Factory set +/-10 V

²⁾ Please order female connector separately.

Ordering code D*1FB

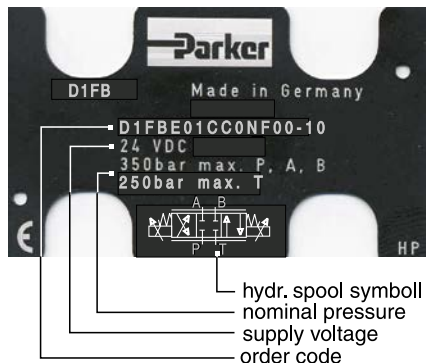


¹⁾ With enlarged connections Ø 32 mm

²⁾ As D1FV* separately available

³⁾ Please order female connector separately.

Name Plate Example



Parker D*FB/D*1FB proportional directional control valves have an integral electronic and requires only one sole electrical common for the control system. Different flow sizes, as well as command signal options are available to achieve an optimal adaption for different applications.

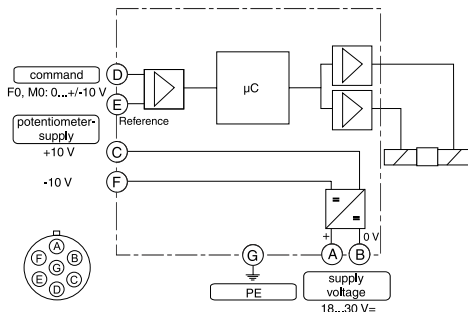
Characteristics of Valve Driver

The described integral electronic driver combines all necessary functions for the optimal operation of the valve. The most important features are:

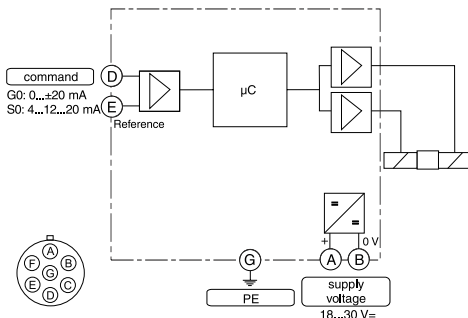
- digital circuit design
- high dynamic constant current solenoid control
- differential input stage with various command signal options
- four quadrant ramp function
- MIN adjustment for deadband compensation
- MAX adjustment to match the command signal span to the valve operating range
- optional reference outputs +/- 10 V for potentiometer supply
- optional four parametrizable preset recall channels
- standard central connection
- compatible to the relevant European EMC-standards
- comfortable interface program



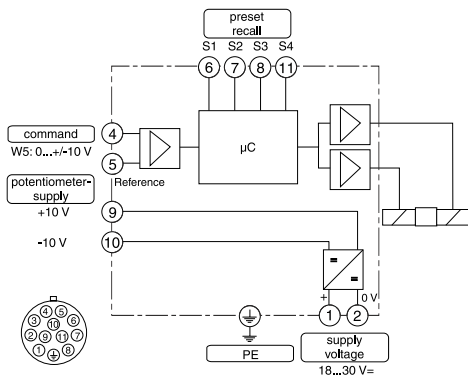
Block Diagram of Integral Electronics Code F0/M0 (6+PE)



Code S0/G0 (6+PE)



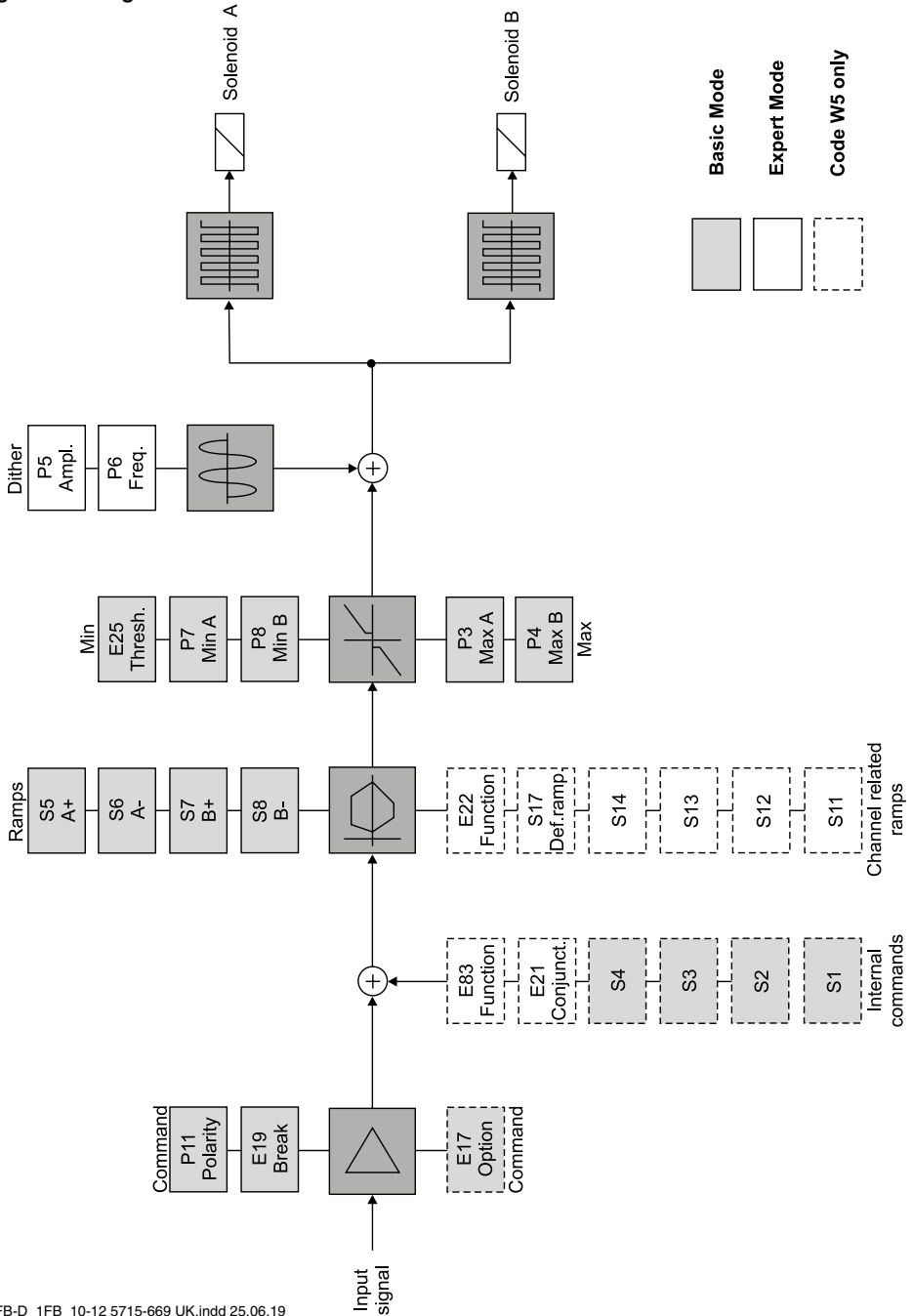
Code W5 (11+PE)



Technical Data

General		
Model		Proportional directional control valve, direct operated (D*FB), pilot operated (D*1FB)
Drive		Proportional solenoid
Mounting Pattern		NG6 (CETOP 3) / NG10 (CETOP 5) NG16 (CETOP 7) / NG25 (CETOP 8) / NG32 (CETOP 11)
Installation Position		Any
Hysteresis	D1FB*0/D3FB*0 [%] D3FB*3/D*1FB [%]	< 4 < 5
Ambient Temperature Range	[°C]	-20...+60
MTTF _D value	[years]	150 (D*FB), 75 (D*1FB)
Protection Class		NEMA 4 (IP 65) acc. EN 60529
Weight	[kg]	NG6: 3 / NG10: 7 / NG16: 11 / NG25: 19.5 / NG32: 61
Vibration Strength	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 10 (RMS) Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic		
Operating Pressure max. (D*FB)	[bar]	350 for ports P, A, B / 210 for port T
Pilot oil intern (D*1FB):	[bar]	350 for ports P, A, B, X / 185 for T, Y
Pilot oil extern (D*1FB):	[bar]	350 for ports P, A, B, T, X / 185 for Y
Fluid		Hydraulic oil according to DIN 51524...535, other on request
Fluid Temperature	[°C]	-20...+60 (NBR: -25...+60)
Viscosity permitted	[cSt]/[mm ² /s]	20...400
Filtration		ISO 4406; 18/16/13
Electrical		
Duty Ratio	[%]	100
Supply Voltage	Us [VDC]	18...30, ripple <5% eff., surge free
Current Consumption max.	[A]	D1FB: 2.0 / D3FB: 3.5 / D*1FB: 2.0
Pre-Fusing	[A]	D1FB: 2.5 / D3FB: 4.0 / D*1FB: 2.5
Potentiometer supply	Up [V]	± 10 / ± 5 % max. 10 mA
Command Signal Options	Uc [V]	Codes F0, M0, W5: +10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm
	lc [mA]	Codes S0 & W5: 4...12...20, ripple <0.01 % eff., surge free, Ri = <250 Ohm
	[mA]	< 3.6 mA = enable off, > 3.8 mA = enable on (acc. NAMUR NE43) Code G0: +20...0...-20, ripple <0.01 % eff., surge free, Ri = <250 Ohm
Differential Input Voltage max.	[V]	Codes F0, M0, S0, G0: 30 for terminal D and E against PE (terminal G)
	[V]	11 for terminal D and E against 0 V (terminal B)
	[V]	Code W5: 30 for terminal 4 and 5 against PE (terminal ↓)
	[V]	11 for terminal 4 and 5 against 0 V (terminal 2)
Channel Recall Signal	Uch [V]	0...2.5: Off / 5...30: On / Ri = 100 kOhm
Adjustment Ranges	Min [%]	0...50
	Max [%]	50...100
	Ramp [s]	0...32.5
Interface		RS 232C, parametrizing connection 5pole
EMC		EN 61000-6-2, EN 61000-6-4
Central Connection		Codes F0, M0, S0, G0: 6 + PE acc. EN 175201-804 Code W5: 11 + PE acc. EN 175201-804
Cable Specification	[mm ²]	Codes F0, M0, S0, G0: 7 x 1.0 (AWG16) overall braid shield
	[mm ²]	Code W5: 11 x 1.0 (AWG16) overall braid shield
Cable Length max.	[m]	50

Signal flow diagram



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 has to be ordered separately and is 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!

Intended usage

This operation manual is valid for proportional directional control valves D*FB/D*1FB 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.


Information on the process of technical changes

We reserve the right to make technical changes as a result of further development of the product described in these operating instructions. Figures and drawings in these instructions are simplified depictions. As a result of developments, improvements and changes to the product, it is possible that the figures are not fully consistent with the valve in operation. The technical details and dimensions are non-binding. They may not form the basis of any claims. Copyright reserved.

Information on warranty and 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 specification

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

CE mark

The CE mark appears on the main nameplate. If the product is installed as part of a larger machine, this larger machine is in turn subject to EU directives and must therefore obtain a general CE mark for the machine as a whole. The machine must not enter circulation in the EU until this is done. The legal requirements corresponding to the CE mark can be found in section "Other applicable standards / rules".

Personnel requirements

The product may only be used, installed, removed, operated and maintained by specialist personnel. For the purposes of these instructions, a specialist is defined as someone who, on the basis of their education, expertise and professional experience, is able to correctly evaluate and carry out the tasks and duties assigned to him/her, and identify and correct potential hazards. Skilled, semi-skilled or trained personnel may not use this product under their own responsibility unless they have the required specialist knowledge. Otherwise, they may only use the product under the constant supervision of a specialist person.

Compliance with other rules and instructions

Carry out transport and installation/repair activities only in accordance with the valid and applicable safety and accident prevention regulations issued by the trade associations.

The valve contains hydraulic oil. The normal local environmental protection requirements must therefore be met when handling the product. The particular circumstances of each place of installation mean that instructions must be followed in order to install and use the product safely.


2. Safety

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.


Use of the product

The product must only be used if it is perfect in working order. Problems that may impair safety must be corrected.

 This product is a safety component that may only be repaired by the manufacturer if it malfunctions. If the safety components are repaired by the user, the manufacturer's warranty is invalidated because the manufacturer is demonstrably unable to ensure that the product is used as specified.


Limits of use

The product may only be operated within the specified limits of use. The relevant details can be found in „Technical data“.

 Ambient conditions must be observed. Unauthorized temperatures, shocks, the effects of aggressive chemicals, radiation, unauthorized electromagnetic emissions may result in disruptions and failures. Observe the limits of operation set out in „Technical data“.

Contaminations

Function and service life of the valve are heavily dependent on the purity and quality of the pressure fluid and depend upon the operating conditions of the hydraulic components. Appropriate filters must be used and regular inspections of the medium must be carried out to prevent contamination of the pressure fluid. Permitted level of contamination is set out in the „Technical data“.

 Be aware of three important sources of contamination:


- Contaminations entering during installation
- Contaminations occurring during operation
- Dirt entering from the surroundings

Remaining risks


Allergic reactions

Hydraulic oil can cause allergic reactions on susceptible skin. This can be prevented by taking the precautions that are usual when handling mineral oil products and by using personal protective equipment.

Leaking plugs


 Leaking plugs can cause a malfunction. That is why the plugs must be checked for leaks at the regular maintenance interval. Leaking plugs may constitute a safety hazard, so the valve must be returned to Parker for repair.


Lightning

 If electronic components are exposed to electromagnetic fields as a result of lightning, they must be checked to ensure they are still working perfectly. If there is a malfunction, the product must be returned to Parker.


Temperature

The surface of our product may heat up in use.

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

 If integrated electronics are exposed to a temperature above 80 °C, they may malfunction.

Power failure

 In a power failure the valve piston returns to the spring centred starting position. You must check whether this creates potential hazards when the system/machine is used.

Hydraulic


D*FB/D*1FB valves are tested and approved with an even flow. If the flow becomes asymmetrical, the safety function of the valve may be compromised. You should therefore carry out tests before commissioning to verify that the valve is in good working order.

If the valve piston has been under pressure and stationary in the end position for an extended period, oil particles may cause the piston to seize. For this reason the valve should be actuated regularly.

3. Use of the product

Transport

Depending on size, lifting equipment or transport aids are needed. Our product leaves the factory in perfect working order, and appropriate packaging is used to protect it from damage.

 The condition of the product on arrival is no longer under our control, so please check for transport damage/defects immediately after arrival. Document the transport damage and immediately notify the carrier, the insurance company and the manufacturer. Do not dispose of the packaging unless there is no transport damage and the entire package contents have been removed from the packaging. If the product has been damaged during transport, it must be exchanged for a new one.

When transporting the product within your premises, make sure it is kept in a safe position and protected in its original packaging until it is ready to use. Note also the information in sections "Warranty and liability", "Basic information on using the manual", "Other applicable standards/rules", "Personnel requirements", "Remaining risks".


Storage


If the product needs to be temporarily stored, it must be protected from dirt, the weather, and damage. Each valve is tested with hydraulic oil in the factory, so that the internal components are protected from corrosion. However, this protection can only be guaranteed under the following conditions:

The product is delivered with adequate corrosion

Storage time	Conditions
12 months	Stable air humidity 60 % and stable temperature < 25 °C
6 months	Fluctuating air humidity and fluctuating temperature < 35 °C


protection, provided our recommendations for the ambient conditions are followed.

 Storage outside or in maritime or tropical climates without appropriate packaging leads to corrosion and may make the product unusable.


 Make sure the product is stored so that no injuries can be caused by tipping or falling. In particular, make sure that the safety rules for high-bay racking are followed.


Commissioning


After installing our product in a system/machine, make sure that the requirements of the Machinery Directive are met if applicable. Access should be provided to the hydraulic diagram, the equipment list and the logic diagram for the system/machine.

 The product must be checked for damage and missing parts (e.g. seals) before installation, especially in the area of the sealing surfaces and the safety devices. If the safety devices or sealing surfaces are damaged or are missing individual parts with relevance to the product's function, the product may not be used.

Remove all transport securing devices, protective covers and packaging.

 Check for foreign objects in the open hydraulic passages. Contaminations may impair operational reliability and shorten the service life.


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

 Before commissioning, the specialist personnel must verify that the entire hydraulic system has been installed correctly. Commissioning must be carried out with care, taking account of all safety regulations.

If necessary, erect warning signs to prevent unintended operation. Note also the information in sections "Warranty and liability", "Basic information on using the manual", "Other applicable standards/rules", "Personnel requirements", "Remaining risks".

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. Unevenness 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:
D1FB: 4 pcs. M5x30
D3FB: 4 pcs. M6x40
D31FB: 4 pcs. M6x40
D41FB: 2 pcs. M6x55 / 4 pcs. M10x60
D91FB: 6 pcs. M12x75
D111FB: 6 pcs. M20x90
Use property class 12.9, ISO 4762

Tighten the bolts crisscross with the following torque values:

D1FB: 7.6 Nm	D31FB: 13.2 Nm
D3FB: 13.2 Nm	D41FB: 13.2/63 Nm
	D91FB: 108 Nm
	D111FB: 517 Nm

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

Pressure fluids

The following rules apply for the operation with various pressure fluids: The above information serves for orientation and does not substitute user tests among the particular operating conditions. Particularly no liability for media compatibility may be derived out of it.

Mineral oil: usable without restrictions

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)

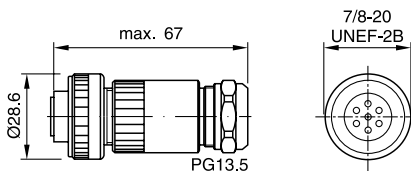
For detailed information concerning pressure fluids note VDMA-document 24317 as well as DIN 51524 & 51502.


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


Electrical connection

The electrical connection of the valve takes place by one common cable, which is coupled to the integrated electronic driver by a central connector assembly.

The connection Codes F0, G0, M0, S0 requires a 6 + PE female connector EN 175201-804.




 The female connector has to be ordered separately under article nr. 5004072.

 A female connector with metal housing is required! Plastic made models may create function problems due to insufficient EMC-characteristics.

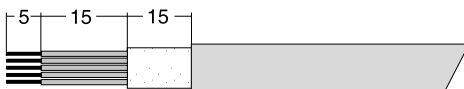
The connecting cable has to comply to the following specification:


Cable type	control cable, flexible, 7 conductors, overall braid shield
Cross section	min. AWG16/1.0 mm ²
Outer dimension	8...12 mm
Cable length	max. 50 m

 For cable lengths > 50 m consult Parker.

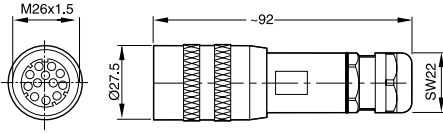
The connection cable is coupled to the female connector by solder joints.

Stripping lengths for the connecting cable:



 Do not disconnect cable socket under tension!

The connection Code W5 requires a 11 + PE female connector EN 175201-804.



➔ The female connector has to be ordered separately under article nr. 5004711.

⚠ A female connector with metal housing is required! Plastic made models may create function problems due to insufficient EMC-characteristics.

The connecting cable has to comply to the following specification:

Cable type	control cable, flexible, 11 conductors, overall braid shield
Cross section	min. AWG16/1.0 mm ²
Outer dimension	12...15 mm
Cable length	max. 50 m

➔ For cable lengths > 50 m consult Parker.

The connection cable is coupled to the female connector by crimp contacts.

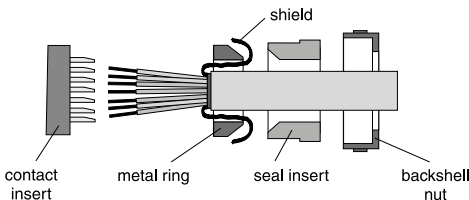
Stripping lengths for the connecting cable:



➔ For the workmanlike termination of the crimp contacts the tool # 932 507-001 – supplier: Hirschmann – is required.

⚠ Do not disconnect cable socket under tension!

The shielding has to be assembled according the outline below:



The backshell nut of the cable gland has to be tightened with a suitable tool. The target value for the tightening torque is 4 Nm. Tighten the cap nut with a torque of approx. 5 Nm after attaching the female connector on the socket outlet.

⚠ Incomplete tightening of backshell nut resp. cap nut 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 kind of brands!

⚠ 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 soldering as well as improper shield connection may result in malfunction and breakdown of the valve.

⚠ The mounting surface of the valve has to be carefully tied to the earth grounded machine frame. The earth ground wire from the valve connecting cable as well as the cable shield have to be tied to the protective earth terminal within the control unit. It is necessary to use a low ohmic potential connection between control unit and machine frame to prevent earth loops (cross section AWG6 > 10 mm²).

Electrical interfacing

Supply voltage:

The supply voltage for the valve has to cover the range of 18...30 V. The residual ripple may not exceed 5 % eff.

! The applied power supply must comply to the relevant regulations (DIN EN 61558) and must carry a CE-mark. The operating voltage for the valve must be free of inductive surges. Do not exceed the max. value of 30 V. Non-observance of this rule may result in permanent damaging of the valve.

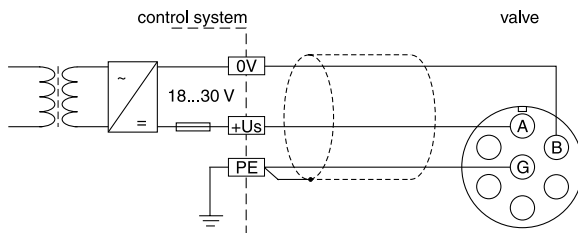
! The increased inrush current of the valve should be considered when selecting the power supply. A stabilized power supply with over-current limiting feature should not be used. Due to the inrush current of the valve the current limit circuit may respond prematurely and create problems during energizing of the supply voltage.

! The operation of the valve is blocked if the supply voltage polarity is interchanged.

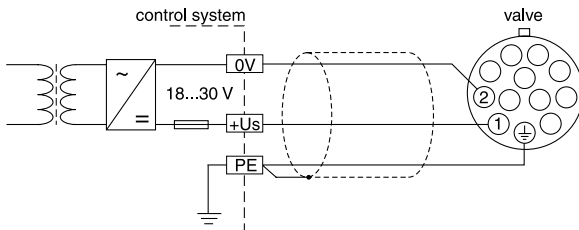
! Each valve requires a separate pre-fuse (rating: s. techn. data). Non-observance of this instruction may create irreparable damage of valve resp. incorporated system parts.

Wiring diagram of supply voltage

Code F0/M0/S0/G0 (6 + PE)



Code W5 (11 + PE)



Command signal input:

The command signal for the valve will be connected to the difference signal input of the electronic driver. The solenoid current behaves proportional to the command signal amplitude. Different versions of command signal processing are available, depending on the valve type. These are described below: For the function description is assumed as signal reference (0V):

Code F0/M0/S0/G0: pin E, Code W5: pin 5

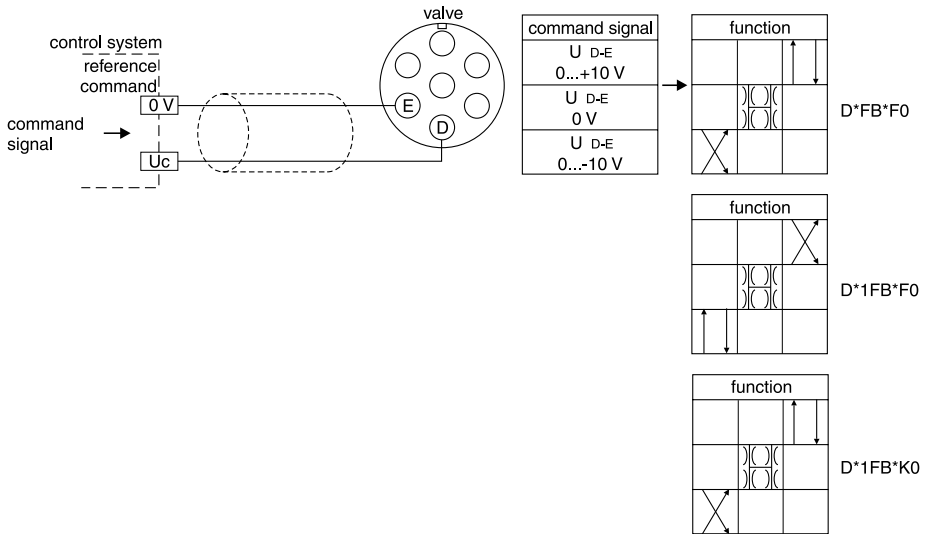
☞ Details are shown from the technical specifications.

⚠ The command input signal needs to be filtered as well as free of inductive surges and modulations. Due to the sensitivity of the valve a high signal quality is recommended, this will prevent malfunction.

⚠ Incorrect signal amplitude levels may disturb the functionality and can damage the valve.

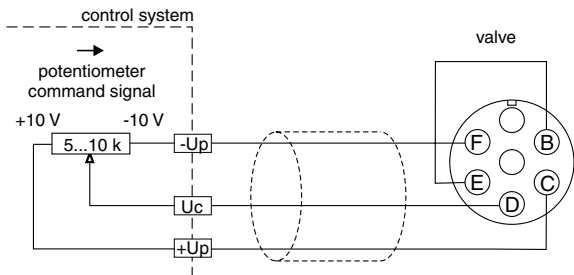
☞ The option 4...20 mA uses the "0 mA" condition as breakdown-information. This means the presence of an evaluable failure information if the input signal line is interrupted. In this case the actuator drive will be switched off. The drive will switch on when the input signal reaches a value of 3.8 mA, it switches off when the command falls below 3.6 mA. This determination follows the NAMUR-specification NE43. NAMUR is an association of users of process control technology.

Wiring diagram of voltage command input +10...0...-10 V Code F0/M0 (6 + PE)



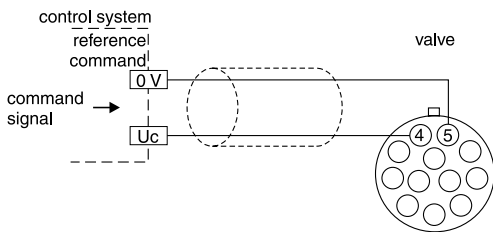
Operation Manual

Wiring diagram of voltage command input +10...0...-10 V via potentiometer Code F0/M0 (6 + PE)



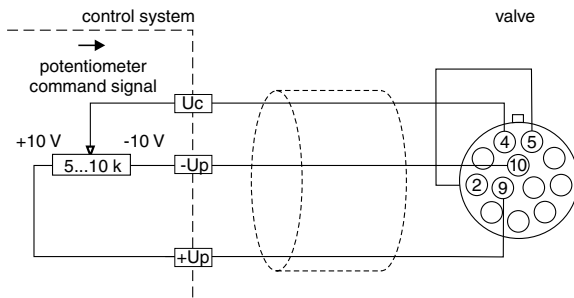
⚠ The external potentiometer is fed via the output "potentiometer supply". To prevent this output from overload, the resistance value of the potentiometer should be within a range of 5...10 kOhm. A nominal power rating of 0.1 W is sufficient.

Wiring diagram of voltage command input +10...0...-10 V Code W5 (11 + PE)



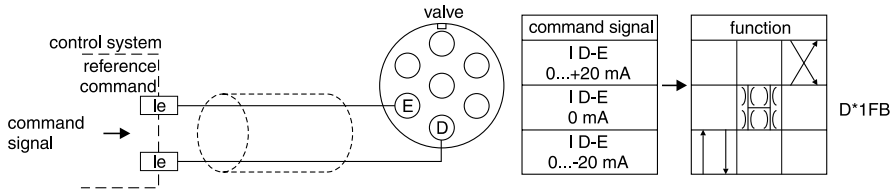
command signal	function	
I 4-5 0...+10 V		D*FB
I 4-5 0 V		
I 4-5 0...-10 V		D*1FB

Wiring diagram of voltage command input +10...0...-10 V via potentiometer Code W5 (11 + PE)

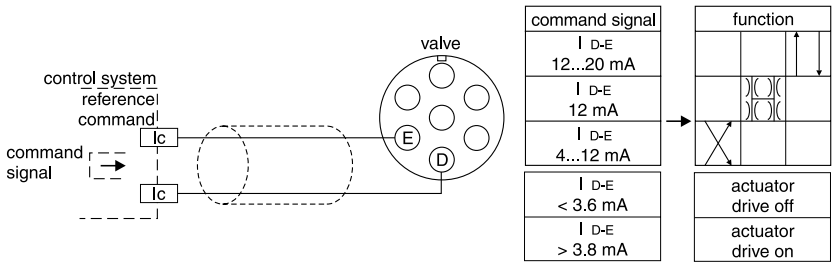


command signal	function	
U 4-5 0...+10 V		D*FB
U 4-5 0 V		
U 4-5 0...-10 V		D*1FB

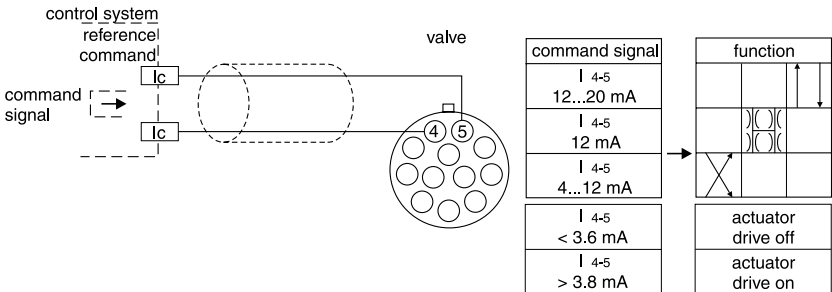
Wiring diagram of current command input +20...0...-20 mA Code G0 (6+PE)



Wiring diagram of current command input 4...12...20 mA Code S0 (6 + PE)



Wiring diagram of current command input 4...12...20 mA Code W5 (11 + PE)



Recall channels for internal command preset

Up to six corresponding inputs are provided for channel recall of internal command presets. The conjunction

options of the internal command channels may be selectable via the parameter E21. The following options are

provided:

- priority dependent
- additive

At priority dependent channel recall the channel with the lowest numerical designation has priority against other simultaneously addressed preset channels.

Example: Channels S1, S2, S3 are addressed. Channel S1 has priority, the corresponding internal command will be assessed as input signal.

The preset channels have priority against the analog signal input for the external command.

At additive channel recall the internal signal presets of the recall channels as well as a possible signal at the external signal input will be added. The sum of the signal values is limited at 100%.

Example 1: Channel S1 = +50%, channel S2 = +20%, external input signal = +5V (= +50%). The sum is +120%, in this case +100% input signal will be assessed.

Example 2: Channel S1 = +50%, channel S2 = +20%, external input signal = -5V (= -50%). The sum is +20%, in this case +20% input signal will be assessed.

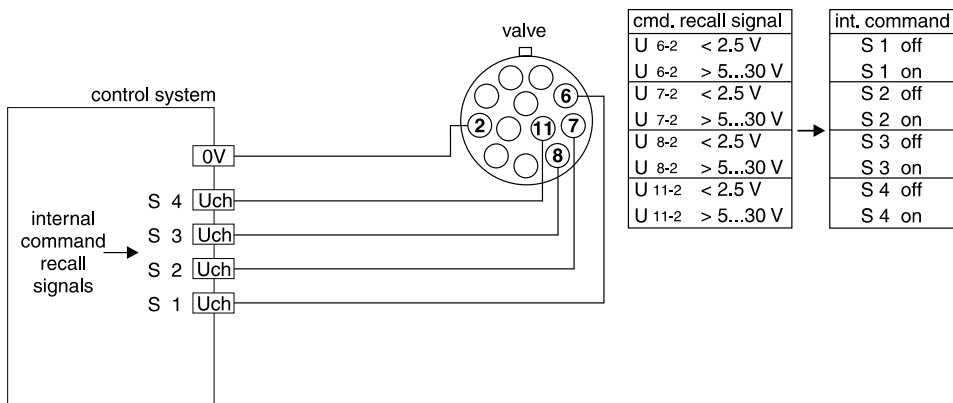
The preset channels are switched through during the signal trigger at the dedicated inputs.

➡ More details are shown from the technical data.

⚠ The channel recall signals needs to be filtered as well as free of inductive surges and modulations. To prevent malfunctions a high signal quality is recommended.

Wiring diagram of recall channels

Code W5 (11 + PE)



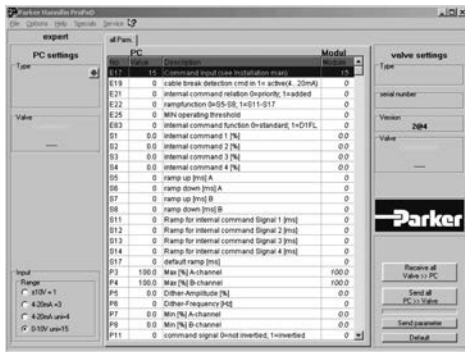
Operation Manual

ProPxD parametrizing software

The ProPxD software allows quick and easy setting of the digital valve electronics. Individual parameters as well as complete settings can be viewed, changed and saved via the comfortable user interface. Parameter sets saved in the non-volatile memory can be loaded to other valves of the same type or printed out for documentation purposes.

See www.parker.com/isde section "Support" or directly at www.parker.com/propxd for free software download.

ProPxD screenshot



Hardware requirements

- PC with operating system from Windows® XP upwards
- Interface RS232C
- display resolution min. 800 x 600
- connection cable between PC and electronic module
- storage requirement approx. 40 MB

☞ If your PC has no serial interface according to RS232 standard, you require in addition an USB-RS232 adapter for connection to the USB interface.

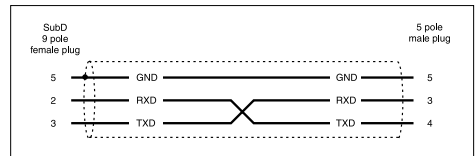
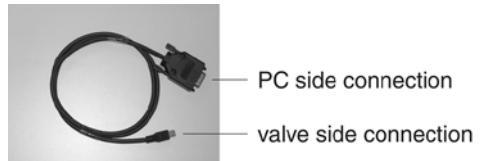
Cable specification

The cable which is required for the connection of the valve electronic to a PC may be ordered under code 40982923. The cable has to be inserted between an unused serial port of the PC and the 5pole socket connector of the valve electronic (parametrizing connector).

⚠ Attention! The valve electronic provides no USB interface, but can only be parametrized via an RS232 - connection. Therefore the usage of USB standard cables is permitted and may result in damaging of valve resp. PC.

Parametrizing cable

Ordering code: 40982923



Parametering interface



cover plug
parametrizing connection

⚠ The cover plug has to be re-installed after completion of the parametrizing work.

Program installation

Please check before installation if the above hardware requirements are met. If your PC has already stored an older version of the "ProPxD" program, it has to be deinstalled by using the Windows® system control feature.

Program installation sequence:

- terminate the execution of other programs
- execute the file "setup.exe"
- follow the instructions on the screen

Answer the question, if an older version should be overwritten, with "ok". During the installation you may change destination drive resp. installation path, if needed. Please answer "ok" if at the end of the installation the program reports any system information. After successful installation the desktop display shows the ProPxD icon for starting the program.

Software operating

Brief instruction for first startup:

- Connect the valve electronic to the supply voltage.
- Connect the valve electronic to a PC via the parametrizing cable.
- Start the operating program.
- After displaying the program resp. data base version a program window opens and the connected valve will be automatically identified (possibly a manual identification via the button "Receive all" is necessary).
- Select the desired version via the menu "Options/Optionen" with the menu item "Language/Sprache".
- The valve specific default parameters are already available within the parameter table.
- Individual parameters may be selected via mouse or the arrow buttons at the center of the program screen.
- Parameter changes are possible via mouse or the arrow buttons on the bottom left within the program screen, also the parameter values may be edited via the keyboard.
- Modified parameters will be stored via the "Enter" key or via the button "Update list".
- Parameters have to be nonvolatile stored on the valve via the button "save parameter".

- The chosen parameters may be optionally stored on the PC via the "File"-menu with the menu item "Save as", data retrieving is always possible via the function "Load file"

Extended functions

The user software is shared into 2 parameter ranges:

- basic mode
- expert mode

For normal startup the basic mode is absolutely sufficient. It permits the setting of all application specific parameters to match the valve function with the task setting. In case of special applications the valve parameters may be adapted via the expert mode. The operating mode may be selected from the "Options"- menu and remains after terminating and re-start of the program.



Changing of expert parameters is only permitted for qualified personnel. Incorrect settings may lead to malfunction! In case of parameter changes shut the drive down!

The expert mode is protected by a pass word request. The name is "parker". The button "Send parameter" appears in the "Expert"-operating mode. This button transmits only the setting of one single parameter to the connected valve. Thus a quick tuning of single parameters is permitted during the setup.



A horizontal bar graph readout between the communication buttons shows the data transfer state.



Because the ProPxD program has also offline (i.e. without connection to the valve) functionality, a manual pre-selection of the parameters is possible. After selection of the valve type via the menu "Options" the parameters may be set and stored for later transmission. Note the design series while selection of the valve!

The "File" menu provides the functions "Printer setup", "Print preview" and "Print". The print preview includes the option for parameter set storage as text file (format.txt) prior to further processing. The "Options" menu provides also the selection of the RS232C interface port via the menu item "Port". Via the menu item "Load file" previously stored parameter sets may be loaded.

Adjustment parameters

The available parameters may be divided into multiple groups and are characterized by different letters:

S-parameters

P-parameters

E-parameters

Parameter overview for basic mode

Parameter	Description	Unit	Parameter Range		Default Setting	Comment
			from	up to		
S1	internal Sollwert S1	%	-100	100	0.0	code W5 only
S2	internal Sollwert S2	%	-100	100	0.0	
S3	internal Sollwert S3	%	-100	100	0.0	
S4	internal Sollwert S4	%	-100	100	0.0	
S5	ramp accel. channel A	ms	0	32500	0	
S6	ramp decel. channel A	ms	0	32500	0	
S7	ramp accel. channel B	ms	0	32500	0	
S8	ramp decel. channel B	ms	0	32500	0	
P3	MAX channel A	%	50.0	100.0	100.0	
P4	MAX channel B	%	50.0	100.0	100.0	
P7	MIN channel A	%	0.0	50.0	0.0	
P8	MIN channel B	%	0.0	50.0	0.0	
P11	polarity command	-	0	1	0	
E17	option command	-	1 = ±10V 3 = 4-20mA		1 = ±10V	code W5 only
E19	cable break detection command	-	0	0 = ±10V 1 = 4-20mA	0 = +/-10V	codes S0 & W5 only
E25	MIN operating threshold	-	0 = 1% 1 = 0.01%		0 = 1%	

Individual Description of Basic Parameters

S1 command signal S1	Adjustment of the internal command signal channel S1. To attenuate of an external accessible command signal.
S2 command signal S2	Adjustment of the internal command signal channel S2. To attenuate of an external accessible command signal.
S3 command signal S3	Adjustment of the internal command signal channel S3. To attenuate of an external accessible command signal.
S4 command signal S4	Adjustment of the internal command signal channel S4. To attenuate of an external accessible command signal.
S5 ramp accel. channel A	Adjustment of ramp rate for increasing of the positive signal polarity. To avoid switching noise.
S6 ramp decel. channel A	Adjustment of ramp rate for decreasing of the positive signal polarity. To avoid switching noise.
S7 ramp accel. channel B	Adjustment of ramp rate for increasing of the negative signal polarity. To avoid switching noise.
S8 ramp decel. channel B	Adjustment of ramp rate for decreasing of the negative signal polarity. To avoid switching noise.
P3 MAX +	Adjustment of maximum signal span for positive output signal. To match the command signal span to the valve operating range.
P4 MAX -	Adjustment of maximum signal span for negative output signal. To match the command signal span to the valve operating range.
P7 MIN +	Adjustment for positive output signal step at 0,1% command signal. To compensate for the overlap of the valve spool.
P8 MIN -	Adjustment for negative output signal step at 0,1% command signal. To compensate for the overlap of the valve spool.
P11 command signal polarity	Adjustment of the command signal polarity. To match the command signal polarity to the valve operating direction.
E17 type of command signal device	Adjustment of the command signal option. To match the command signal input to the input signal mode.
E19 cable break detection command	Adjustment of the operating mode for the command cable break detection. To turn on resp. off of the cable break detection of the command signal at a selected command signal option of 4...20 mA.
E25 MIN operating threshold	Adjustment of the MIN operating threshold. To match the response sensitivity for the MIN-stroke step.

Parameter overview for expert mode

Parameter	Description	Unit	Parameter Range		Default Setting	Comment
			from	up to		
S11	ramp for int. command S1	ms	0	32500	0	code W5 only
S12	ramp for int. command S2	ms	0	32500	0	
S13	ramp for int. command S3	ms	0	32500	0	
S14	ramp for int. command S4	ms	0	32500	0	
S17	default ramp	ms	0	32500	0	
P5	dither amplitude	%	0	10.0	0	
P6	dither frequency	Hz	0	300	0	
E21	option internal command signal conjunction	–	0 = priority dependent 1 = additive		0 = priority dependent	
E22	int. command signal ramp function	–	0 = quadrant dependent (S5...8) 1 = int. command depend. (S11...14)		0 = quadrant dependent	code W5 only
E83	int. command signal functionality	–	0 = standard 1 = special option DFL		0 = standard	

Individual Description of Expert Parameters

S11 ramp for internal command signal 1	Adjustment of the ramp rate for the internal command signal channel S1. To avoid switching noise.
S12 ramp for internal command signal 2	Adjustment of the ramp rate for the internal command signal channel S2. To avoid switching noise.
S13 ramp for internal command signal 3	Adjustment of the ramp rate for the internal command signal channel S3. To avoid switching noise.
S14 ramp for internal command signal 4	Adjustment of the ramp rate for the internal command signal channel S4. To avoid switching noise.
S17 default ramp	Adjustment of the ramp rate for the default ramp. To avoid switching noise.
P5 dither amplitude	Adjustment of dither amplitude. To reduce the influence of solenoid friction.
P6 dither frequency	Adjustment of dither frequency. To match the dither signal to the valve dynamic.
E21 internal command signal conjunction	Adjustment of the conjunction for the internal command signals. To match the command signal logic.
E22 internal command signal ramp function	Adjustment of the ramp function for the internal command signals. To match the ramp functionality.
E83 internal command signal functionality	Adjustment of the functionality for the internal command signals. To match for the special option DFL.

Error messages

Malfunctions when using the ProPxD software program will be indicated via appropriate failure messages.

Failure messages and corrective actions:

Failure message	Description/corrective action
The Com Port is not available!	Terminate the other program, or quit the message and select another RS-232 port via the menu "Options > Port". Afterwards reconnect the parametrizing cable.
Unable to open COM port	Com port is not available. Quit the message and select another RS-232 port via the menu "Options > Port". Afterwards reconnect the parametrizing cable.
There is no module/valve connected or the communication is disturbed! Please check also the interface!	No data exchange possible. Either the electronic has been removed, the port is mismatched, or the connection will be disturbed by strong electrical fields. Check if the Com port is set for "9600, 8, 1. none, none" via the menu "Options > Port".
Wrong password	Retype the password, notice the exact spelling (case sensitivity).
Wrong input	An invalid character or a value outside the permitted range has been used at parameter entry.
Keep the entered parameters?	During parameter loading from the electronics memory the preset parameters from the left hand screen display may be rejected or maintained.
The chosen module/valve isn't the same as the connected hardware. Attention! Unsaved parameters will be lost.	In principle, parameters dedicated to a type which deviates from the connected valve may be edited. However, for data transmitting the correct valve has to be connected. If parameters will be loaded from a valve which deviates from the selected one, the parameters from the left hand side screen display of the program will be overwritten.
The chosen hardware isn't the same as the connected module/valve.	The wrong valve type has been selected from the database, afterwards the function "send all" has been executed.
Attention! Factory settings will be changed! Transmit anyhow?	Default parameters has been read out from the database instead from the valve via the function "receive all".
file name.pxd already exists. Do you want to replace the file?	The file name already exists within the indicated directory. Select another name, another directory or overwrite the existing file with "OK".

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.

Service/maintenance



Service work may only be carried out by qualified personnel. Detailed knowledge of the machine functions concerning switching on and off as well as of the required safety relevant technical tasks is required!

Periodical maintenance is essential for the longevity of the system and guarantees reliability and availability. The following properties of the system has to be checked in continuous short time intervals:

- oil level in the tank
- max. working temperature
- condition of the pressure fluid (visual inspection, color and smell of hydraulic fluid)
- working pressure levels
- gas pre-load pressure on the pressure accumulator
- leakage on all system components
- condition of filter elements
- condition of hose lines
- cleanliness of components

After a certain operating duration a change of the hydraulic fluid is required. The frequency of change depends from the following circumstances:

- kind resp. grade of the pressure fluid
- filtering
- operating temperature and environmental conditions

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 bled.

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. ISO 4406 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.

Decommissioning

Make sure that the hydraulic system/machine is unpressurised before the product is removed. Note also the information in sections "Warranty and liability", "Use of operating instructions", "Compliance with other rules and instructions", "Personnel requirements", "Remaining risks".

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 "Warranty and liability", "Basic information on using the manual", "Other applicable standards/rules", "Personnel requirements", "Remaining risks".


Operation Manual

Trouble shooting

Basis of troubleshooting is always a systematic approach. At first the following questions have to be checked:

- Are there practical experiences with similar failures?
- Have system adjustments been changed?

Afterwards starting of troubleshooting by means of a priority list of the most likely reasons.

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



Troubleshooting in a hydraulic system requires in either case a systematic approach. The work may exclusively be performed by qualified personnel, as it requires detailed knowledge about function and construction of the system. Reversals or disassemblies may not be taken imprudently! Prior to the works it has to be clarified, if the system has been operated properly until the failure occurred.

Troubleshooting table

malfunction at hydraulic load runtime											
										- generally no function	
										- high frequent oscillation	
										- low frequent oscillation	
										- one way operation only	
										- speed variations at unchanging command	
										- different speeds depending on travel direction	
										- speed 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	x	x					drive overloaded	reduce pressure resp. speed, increase valve size
x	x	x	x	x	x	x				valve contaminated	clean pressure fluid, filter / flush valve
										hydraulic fluid too viscous / too cold	change fluid grade, provide operational temperature
x	x	x								too low oil level within tank	refill pressure fluid
										filter contaminated	clean resp. replace filter
x	x									supply voltage too low	keep supply voltage range
										supply voltage carries too much ripple	reduce ripple
x										command signal too low	increase command signal
										command signal carries too much ripple	reduce ripple
										dither signal amplitude too high	reduce parameter P5
										dither signal amplitude too low	increase parameter P5
x	x									central connector contact failure	clean contacts resp. replace connector
x										feed cable interrupted	fix feed cable
x	x	x	x	x						wiring sequence incorrect	correct wiring sequence
										feed cable without shielding	change cable grade
x ¹⁾										pilot flow configuration incorrect	correct pilot flow configuration

¹⁾ only for D*1FB

4. Product information

Other applicable standards / rules

- ISO 4406:1999-12 Hydraulic fluid power - Fluids - Method for coding the level of contamination by solid particles
- ISO 4401:2005-07 Hydraulic valves; mounting surfaces and connecting plates
- DIN EN 60204-1; VDE 0113-1:2007-06 Safety of machinery – Electrical equipment of machines – Part 1: General requirements
- DIN EN 60529; VDE 0470-1:2000-09 Degrees of protection provided by enclosures (IP code)
- DIN EN 61000-4-2/3/4/6/8 Electromagnetic compatibility
- DIN 51524-1:2006-04 Pressure fluids - HLP hydraulic oils - Part 1: Minimum requirements
- DIN 51525-2:2006-04 Pressure fluids - HLP hydraulic oils - Part 2: Minimum requirements
- German Occupation Safety Ordinance (Betriebssicherheitsverordnung)
- German Labour Protection Act (Arbeitsschutzgesetz)

Accessories / Spare Parts

Accessories

The following accessories are available for the valves series D*FB/D*1FB:

D1FB: bolt kit	ordering code BK375
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711
D3FB: bolt kit	ordering code BK385
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711
D31FB: bolt kit	ordering code BK385
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711
D41FB: bolt kit	ordering code BK320
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711
D91FB: bolt kit	ordering code BK360
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711
D111FB: bolt kit	ordering code BK386
Code F0/M0/S0/G0: female connector 6+PE	ordering code 5004072
Code W5: female connector 11+PE	ordering code 5004711

Spare Parts

The following spare parts are available:

D1FB: seal kit NBR	ordering code SK-D1FB
D3FB: seal kit NBR	ordering code SK-D3FB
D31FB: seal kit NBR FPM	ordering code SK-D31FB SK-D31FB-V
D41FB: seal kit NBR FPM	ordering code SK-D41FB SK-D41FB-V
D91FB: seal kit NBR FPM	ordering code SK-D91FB SK-D91FB-V
D111FB: seal kit NBR FPM	ordering code SK-D111FB SK-D111FB-V

Please direct technical product enquiries to:

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