Bulletin HY11-5715-603/UK

Operation Manual
Series PZD00A-40X
Design ≥ 10

Electronic for Command Signal Processing

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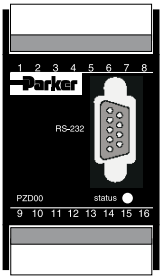
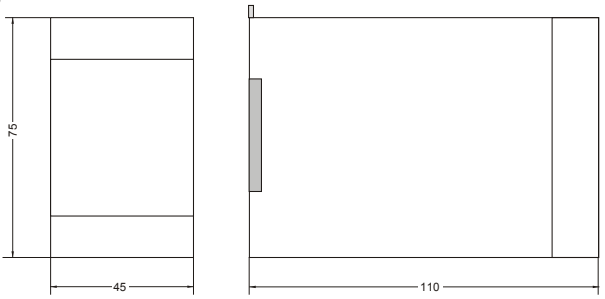
1. Introduction

1.1. Front view / Dimensions



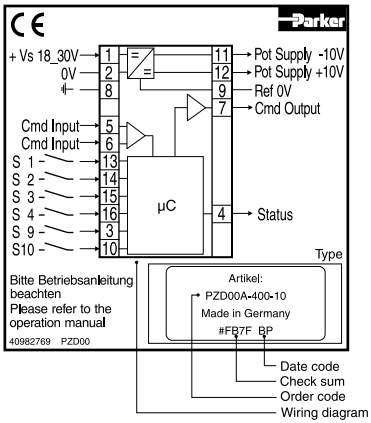


1.2. Ordering Code

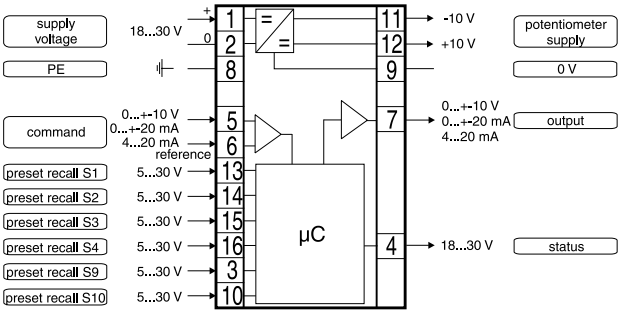
PZD	00	A	—	40	—	□	—	□
Electronic Module Auxiliary Function	Universal			6 Command Signal Presets Command Input Accel/Decel-Ramps		Technology function		Design Series

Code	Function
0	Standard
1	Linearization

1.3. Name Plate



1.4. Block Diagram



Parker electronic modules PZD00A-400 for rail mounting are compact, easy to install and provides time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for command signal processing by a comfortable interface program. The electronic unit may connected in series to proportional valves with onboard electronic as well as to amplifier modules P*D.

1.5. Characteristics of the electronic control module:

- Digital circuit design
- Six parametrizable preset recall channels with optional additive or priority dependent signal processing
- Output stage with different signal options
- Input stage with different signal options
- Status output
- Six parametrizable input command ramps as well as four quadrant ramp function
- Reference output for potentiometer supply
- Status indicator
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC-standards
- Comfortable interface program
- Comfortable PC user software, free of charge: www.parker.com/euro_hcd - see “Support”, or directly at www.parker.com/propxd.
- Optional technology function “linearization”

1.6. Specifications CE

General			
Model			Module package for snap-on mounting on EN 50022 rail
Package material			Polycarbonate
Inflammability class			V0 according to UL 94
Installation position			Any
Amb. temperature range		[°C]	-20...+60
Protection class			IP 20 acc. EN 60529
Weight		[g]	160
Electrical			
Duty ratio		[%]	100
Supply voltage		[VDC]	18...30, ripple < 5% eff., surge free
Current consumption max.		[mA]	100
Pre-fusing		[mA]	500 medium lag
Command signal options		[V]	+10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm
		[mA]	+20...0...-20, ripple <0.01 % eff., surge free, Ri = < 250 Ohm
		[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = < 250 Ohm
			<3.6 mA = output signal 0 V / 0 mA / 12 mA acc. to output option
			>3.8 mA = output signal on (acc. NAMUR NE43)
Input signal resolution		[%]	0.025
Differential input max.		[V]	30 for terminals 5 and 6 against PE (terminal 8)
			11 for terminals 5 and 6 against 0 V /terminal 2)
Channel recall signal		[V]	0...1.0: Off / 5...30: On / Ri = 100 kOhm
Status signal		[V]	0...0.5: Off / Us: On / rated max. 15 mA
Output signal options		[V]	+10...0...-10, rated max. 15 mA
		[mA]	+20...0...-20, Ro < 500 Ohm
		[mA]	4...12...20, Ro < 500 Ohm
Output signal resolution		[%]	0.025
Reference output		[V]	+10 / -10, 2 %, rated max. 15 mA
Adjustment ranges	Min	[%]	0...50
	Max	[%]	50...100
	Cmd channels	[%]	+100...-100
	Ramp	[s]	0...32.5
	Zero offset	[%]	+100...-100
Interface			RS-232C, DSub 9p. male for null modem cable
EMC			EN 50081-2, EN 50082-2
Connection			Screw terminals 0.2...2.5 mm², disconnectable
Cable specification		[AWG]	20 = 0.5mm² overall braid shield
Cable length		[m]	50
Options			
Technology function		Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

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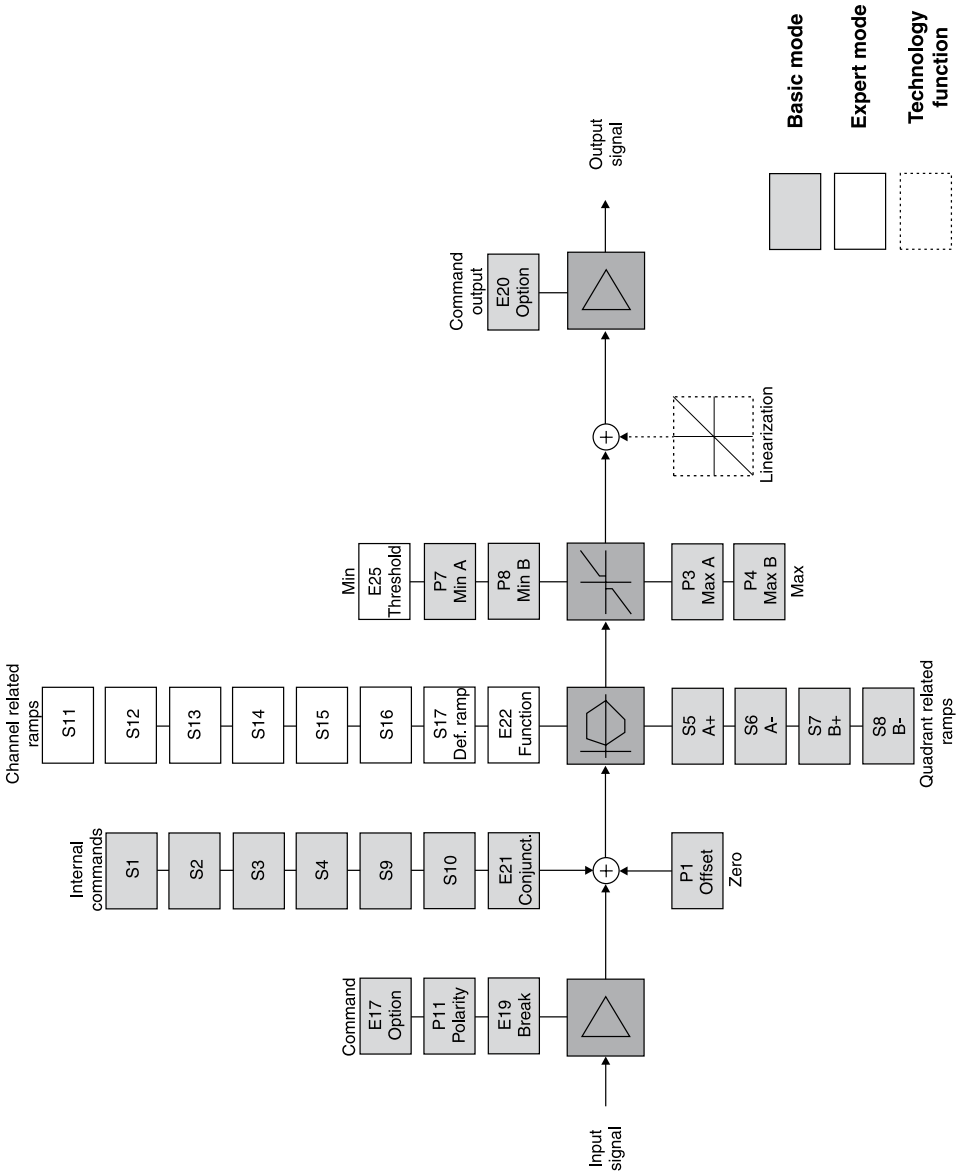
1.7. Signal flow diagram



2. Safety Instructions

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

2.1. 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 electronic or linked system components

Helpful additional instructions

2.2. Marking, Name Plates

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

2.3. Work at the Electronic

Workings in the area of installation and commissioning of the electronic 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

3.1. Intended Usage

This operation manual is valid for module electronics PZD00A-40X 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.

3.2. 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.

3.3. 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 electronic! In case of suspicion for a defect please return the unit to the factory.

3.4. Storage

In case of temporary storage the electronic must be protected against contamination, atmospheric exposure and mechanical damages.

4. Mounting / Installation

4.1. Scope of Supply

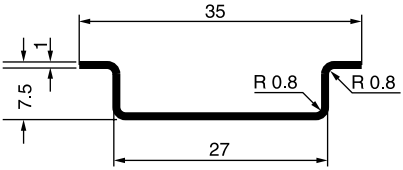
Please check immediately after receiving the electronic, if the content is matching with the specified scope of supply. The delivery includes:

- module electronic
- operation manual

☞ 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!

4.2. Mounting

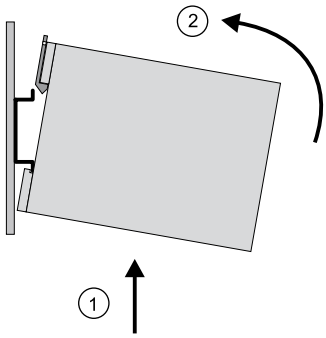
- compare electronic type (located on the name plate) with part list resp. circuit diagram
- the module may be mounted in any direction
- for mounting an assembly rail acc. EN 50022 is required



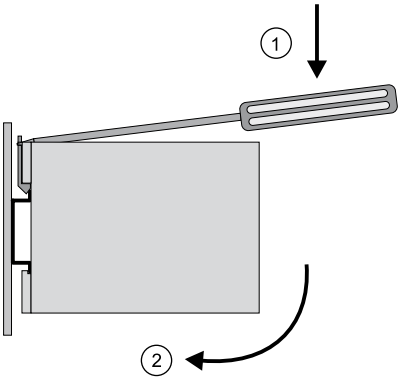
Dimensions

Work flow for module installation

Mounting:
(1) apply the module with the assembly rail guide at the lower edge of the rail
(2) engage the module upward



Removing:
(1) lift the metal socket lock with a suitable screwdriver (approx. 4 x 1 mm blade) against the spring force
(2) unmount the module at the top edge of the assembly rail



4.3. Operation Limits

The electronic may be operated within the determined limits only. Please refer to the “technical data” section.

⚠ Follow the environmental conditions! Unallowable temperatures, shock load, moisture exposure, radiation exposure, illegal electromagnetic emmissions may result in operating trouble and may lead to failure! Follow the operating limits listed in the “specifications” table!

4.4. Electrical Connection

The electrical connection of the module electronic takes place by disconnectable screw terminal blocks.

☞ This easy-to-install connection type allows a fast module replacement and a visible separation of the electrical connection. An additional folding unlocking lever allows simple removing of the terminal blocks and serves at once as shock hazard protection and marking strip.

The connecting wires have to comply to the following specification:

Wire type	hookup cable, stranded
Cross sections	min. AWG 20 / 0.5 mm²
Wire length	max. 50 m

☞ For wire lengths > 50 m consult factory

Skinning lengths for the connecting wires

The screw terminals are designed to allow termination of all kinds of copper wires without the need for preparation. Copper made wire end sleeves may usable as conductor stripping protection for the stranded wires.

△ Soldering of the connection wires is permitted.

To ensure EMC-compatibility the wiring of the module has partly to be undertaken by shielded cables. Detailed information can be read from the chapter “Electrical Interfacing”.

⚠ The installation has to take place by qualified personnel! A short between individual conductors, loose wires as well as improper shield connection may result in malfunction and breakdown of the electronic!

△ The earth ground wire from terminal 8 as well as the cable shields 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 min. AWG 6 / 10 mm²).

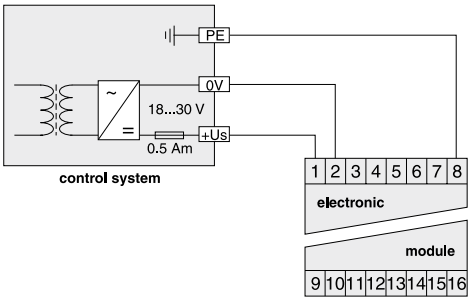
4.5. Electrical Interfacing

Supply Voltage:

The supply voltage for the electronic will be connected to the terminals 1 and 2 of the module electronic and 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 electronic must be free of inductive surges. Do not exceed the maximum value of 30 V! Non-observance of this rule may result in permanent damaging of the electronic!

Wiring diagram of supply voltage



△ The operation of the electronic is blocked if the supply voltage polarity is interchanged.

⚠ Each electronic requires a separate pre-fuse of 0.5 Amp time lag. Non-observance of this instruction may create irreparable damage of electronic resp. incorporated system parts!

Input for external command signal:

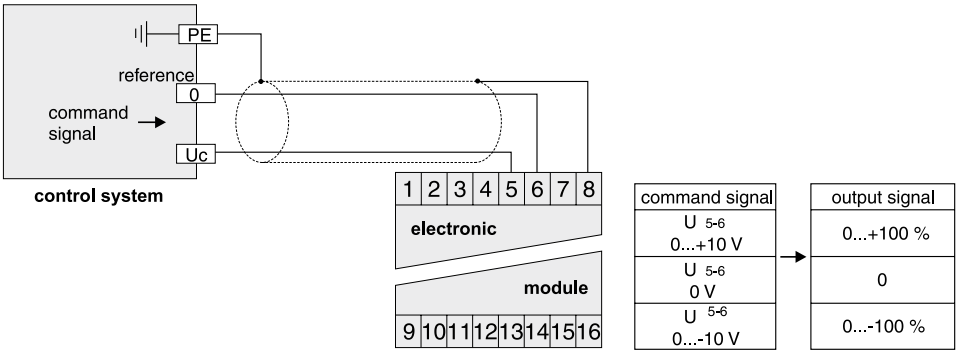
The command signal to the valve will be connected to the terminals 5 and 6 of the difference signal input of the electronic. The connection has to be performed shielded.
The output signal behaves proportional to the command signal amplitude. Depending on the selected electronic parameters different versions of command signal processing are available, which are decribed below. For the function description terminal 6 is assumed as signal reference (0V).

☞ Details are shown from the technical specifications.

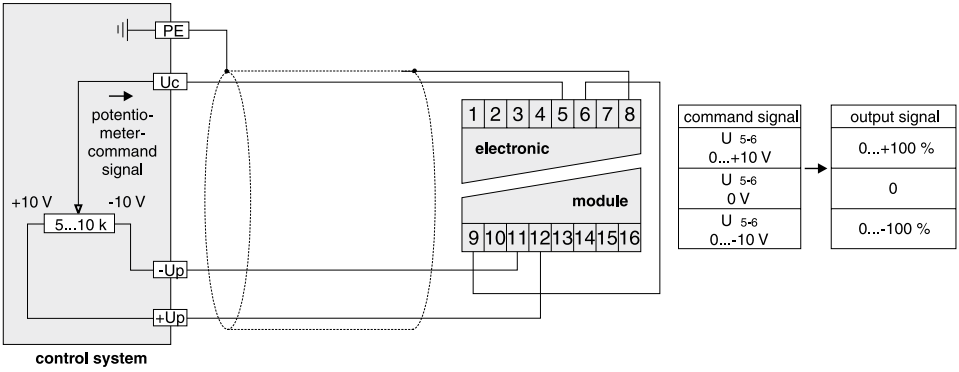
⚠ The parameter options for the command signal input are described in the chapter "Operating Instructions).
The command input signal needs to be filtered as well as free of inductive surges and modulations.
To prevent malfunctions a high signal quality is recommended.

⚠ Incorrect signal amplitude levels may disturb the functionality and can damage the unit!

Wiring diagram of voltage command input +10...0...-10 V

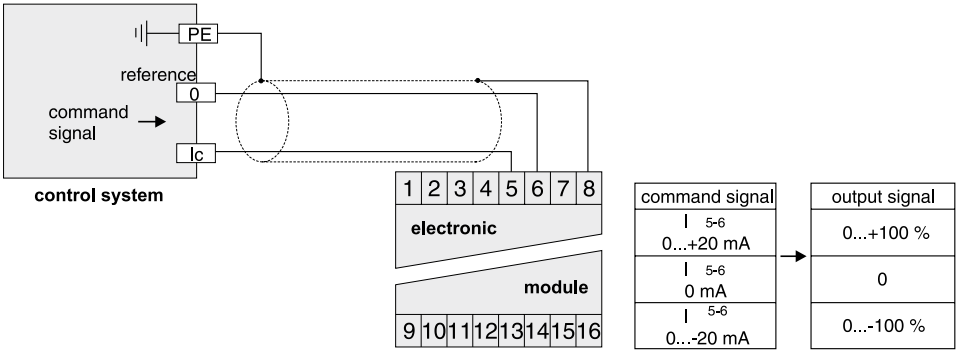


Wiring diagram of voltage command input +10...0...-10 V via potentiometer

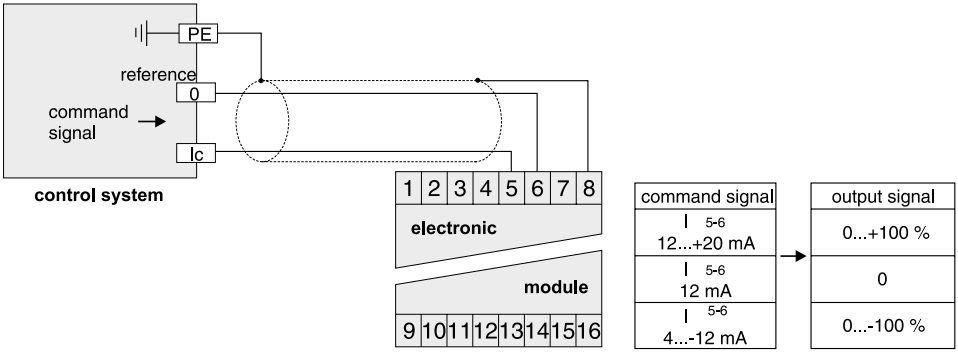


⚠ The external potentiometer is fed via the output "potentiometer supply". To prevent this output from overload, the resistance value of the potentiometer should be within a range of 5...10 kOhm. A nominal power rating of 0.1 W is sufficient.

Wiring diagram of current command input +20...0...-20 mA



Wiring diagram of current command input 4...12...20 mA



☞ 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 solenoid output will be switched off. The output will switched 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. If necessary, the command signal cable break detection can be disabled by selecting the parameter E19.

NAMUR is an association of users of process control technology.

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 adressed preset channels.

Example: Channels S1, S2, S3 are adressed. 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 = +5 V (= +50 %). The sum is +120 %, in this case +100 % input signal will be assessed.

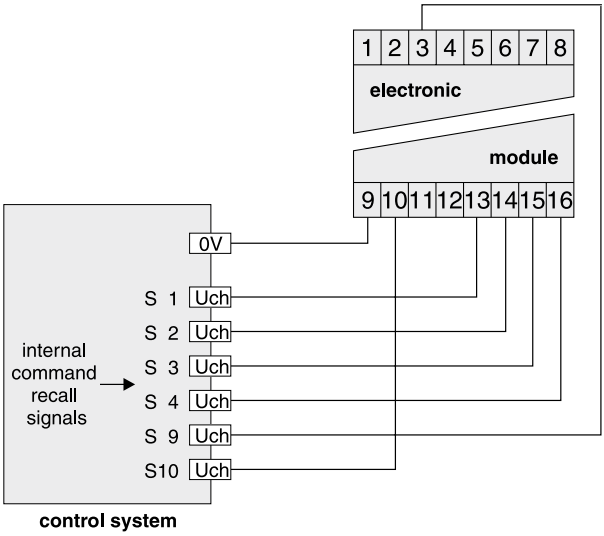
Example 2: Channel S1 = +50 %, channel S2 = +20 %, external input signal = -5 V (= -50 %). The sum is +20 %, in this case +20 % input signal will be assessed.

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. Inputs must be coupled to defined potential, thus open channels has to be connected to 0 V level.

Wiring diagram of channel recall for internal signal presets



cmd. recall signal	int. command
U 13-9 < 1 V	S 1 off
U 13-9 > 5...30 V	S 1 on
U 14-9 < 1 V	S 2 off
U 14-9 > 5...30 V	S 2 on
U 15-9 < 1 V	S 3 off
U 15-9 > 5...30 V	S 3 on
U 16-9 < 1 V	S 4 off
U 16-9 > 5...30 V	S 4 on
U 3-9 < 1V	S 9 off
U 3-9 > 5...30 V	S 9 on
U 10-9 < 1 V	S10 off
U 10-9 > 5...30 V	S10 on

Instruction for ramp function

The function of the integrated ramp generator may be selected via the parameter E22. The following selections are available (valid for priority dependent as well as additive channel recall):

- quadrant dependent (set via the parameters S5...8) = standard operation, in this case the parameter adjustments S11...17 are without function. Any command signal segment consists of a dedicated ramp rate S5...8.

Example:
positive signal rise, positive signal fall, negative signal rise, negative signal fall.

☞ The defined ramp time will be effective between the “Min” an “Max” adjustment.

- internal command channel dependent (preset via the parameters S11...17) = special operation, in this case the parameter adjustments S5...8 are without function. Any internal command channel consists of a dedicated ramp rate S11...16, which affects the signal flow while the channel is switched on.

☞ For the operation mode “internal command channel dependent ramp preset” these rules applies:

- After recall channel switch-off the ramp rate S17 is active.
- At additive channel recall the ramp rate of the channel with the lowest numeric designation is active.

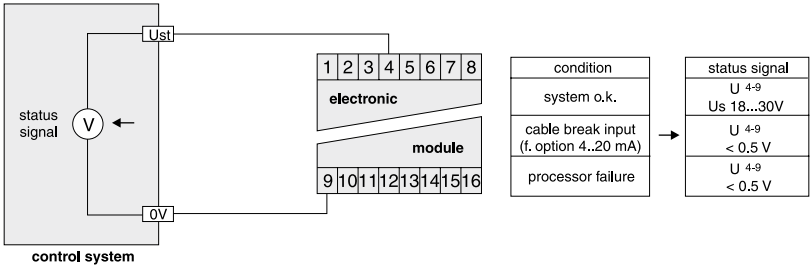
Status output:

The terminals 4 and 9 distributes a signal information about the status of the electronic. The following information is available:

- external command signal cable break (only for option 4...20 mA)
- internal processor fault

☞ The output may drive a load of max. 15 mA. Exceeding of this limit leads to malfunction.

Wiring diagram of status output

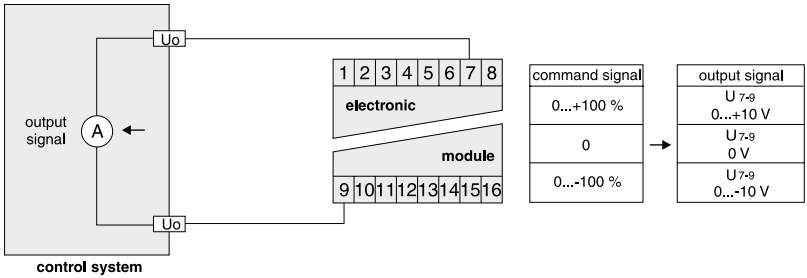


Signal output:

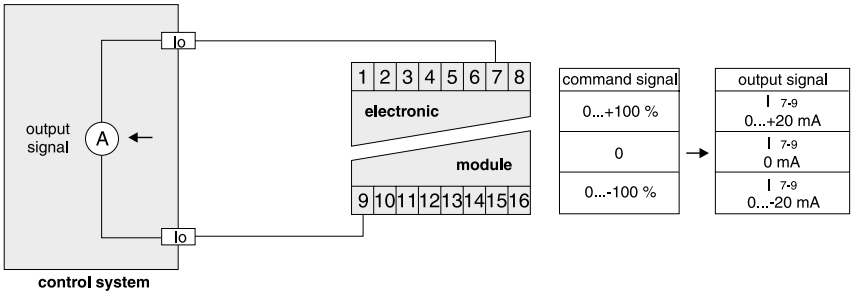
The terminals 7 and 9 provides the output signal, which may be used to control all external amplifier modules as well as integrated valve amplifiers. Different versions of output signal processing are available, which are described below.

△ The output signal option has to be selected according to the requirements of the downstreamed electronic.

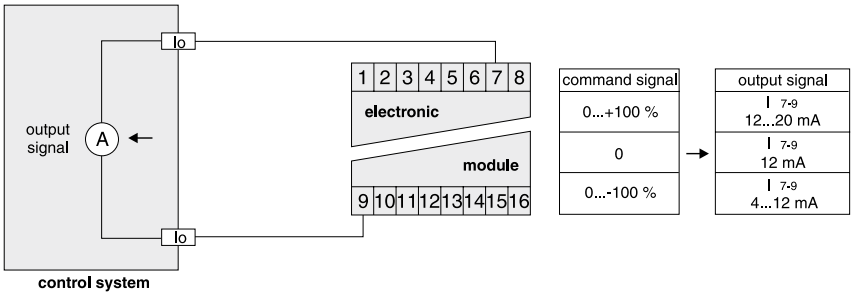
Wiring diagram of voltage output +10...0...-10 V



Wiring Diagram of current output +20...0...-20 mA



Wiring diagram of current output +4...12...20 mA

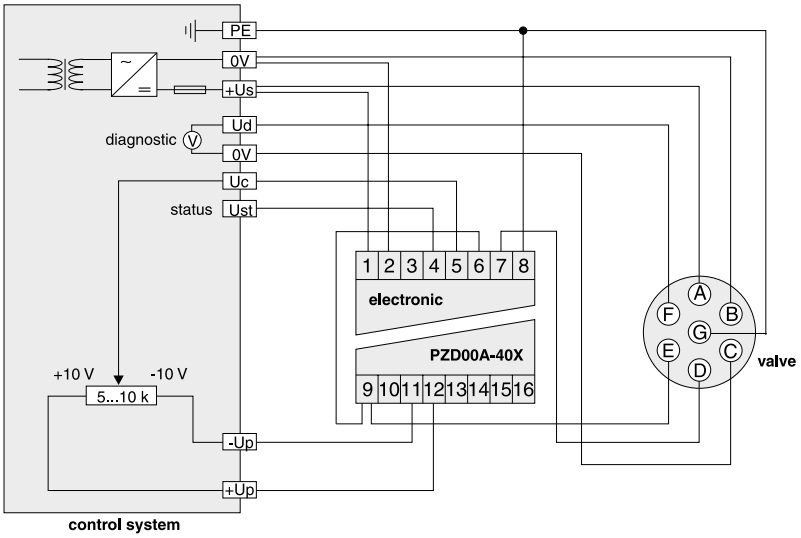


Wiring Examples:

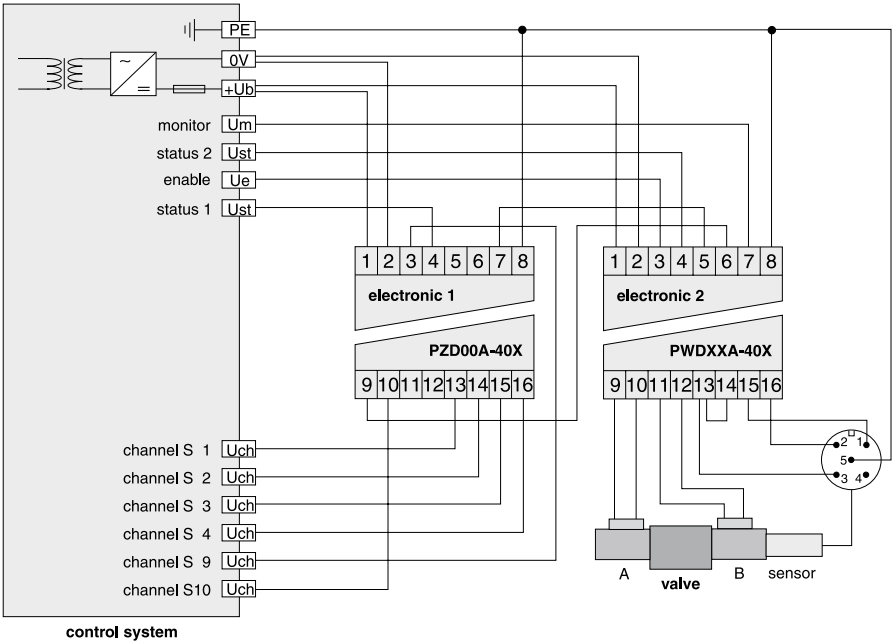
Partially the wiring requires a shielded performance. For the sake of clarity the appropriate illustration is omitted.

Example 1:

Command signal processing via PZD00A-40X to a proportional directional control valve with integrated electronic (D*FP). Voltage command input via potentiometer.



Example 2:
Command signal processing via PZD00A-40X to an amplifier PWDXXA-40X with proportional directional control valve (D*FC, D**FS). Voltage command input via channel recall.



5. Operating Instructions

Basically the electronic performs the task of modulating resp. conditioning a command signal into the required form to be useful as command signal for a downstreamed valve amplifier.

5.1. Operating Software Program

ProPxD parameterizing software:

The ProPxD software permits comfortable parameter setting for the module electronic. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets to floppy or hard disk is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the module electronic in the same manner as the basic parameters which are available for all usable valve series. Inside the electronc a nonvolatile memory stores the data with the option for recalling or modification.

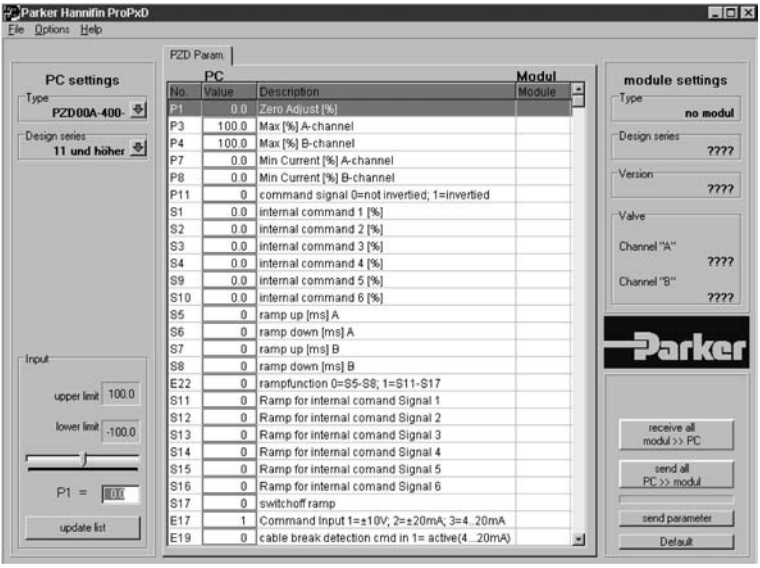
⚠ The connected valve amplifier may not operated before loading an appropriate parameter set from the PC into the module electronic!

Features

- comfortable editing of all parameters
- depiction and documentation of parameter sets
- storage and loading of optimized parameter adjustments
- executable with all actual Windows® operating systems from Windows® XP upwards
- plain communication between PC and electronic via serial interface RS-232C and nullmodem cable

The PC software can be downloaded free of charge at www.parker.com/euro_hcd
see page “Support” or directly at
www.parker.com/propxd.

ProPxD screenshot



Hardware requirements

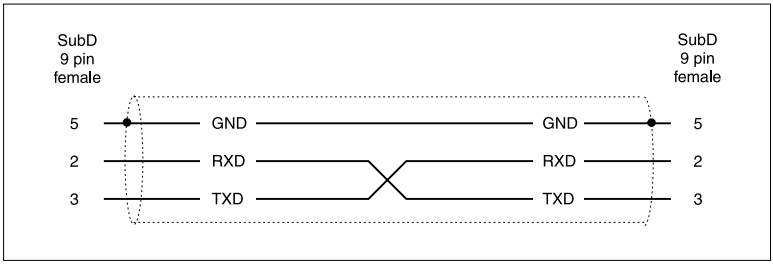
- PC with operating system from Windows® XP upwards
- Interface RS-232C
- display resolution min. 800 x 600
- nullmodem connection cable between PC and electronic module
- storage requirement approx. 4 MB

☞ It is recommended to select “small fonts” at the display setting, otherwise distortion of the display may occur.

Null modem cable

The connection of the module electronic to a PC requires a so-called “null modem cable”. Such a cable can normally be obtained from computer shops as well as from catalog distributors for electronic components. A proper function of the data communication requires in this case at least the following described cable configuration. The cable has to be inserted between an unused serial port COM1 or COM2 of the PC and the 9pole socket connector of the module.

Connection diagram of the null modem cable



Buying sources for the null modem cable

Supplier	Order-nr.
Viking	G2E-71B10
Farnell	976880
DisData	672786
Staples	IM1511680
Newark	83F7101
DigiKey	AE1033-ND

5.2. 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
- insert ProPxD-software CD
- 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 (i.e. if the storage space on drive "c" is not sufficient).
Please answer also "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.

5.3. Software Operating

⚠ Incorrect settings may lead to malfunction!
In case of parameter changes shut the drive down!

Brief instruction for first startup:

- Connect the module electronic to the supply voltage.
- Connect the module to a PC via null modem cable.
- Click on the ProPxD icon to start the operating program.
- After displaying the program resp. data base version a program window opens and the connected electronic 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".
- Select the engaged valve from the provided type table via the menu "Options" and the item "Valve type".
- Subsequently the program inserts the valve specific default parameters into 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".
- After completing of all modifications, the entire parameter set may be transmitted to the electronic via the button "send all", also the parameters will be nonvolatile stored.
- 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 out of database"

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, the valve specific parameters will be selected from the valve library. 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.

To prevent an unauthorized access for the expert mode, a pass word is requested. The name is “parker” and cannot be changed. Thus additionally to the button “Default” for loading of the default parameters, the button “Send parameter” appears in the “Expert”-operating mode. This button transmits only the setting of one single parameter to the connected module electronic. 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.

Additional to the device parameters the electronic stores also the device types, selected from the valve library. Via the button “receive all” the valve parameters will be read out of the electronic and stored including the valve type. If expert parameters will be modified and transfered, the valve information memory inside the electronic will be erased and the word “customized” is shown within the valve display area. Via an arrow button located beside the view boxes of “Type”, “Design series” and “Valve”, the corresponding selection table may be reached directly.

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

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 RS-232C interface port via the menu item “Port”. Via the menu item “Load out of database” previously stored parameter sets may be loaded.

☞ Information on the technology functions is provided within the help function of the operating software.

5.4. Adjustment parameters

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

S-parameters	internal commands and ramps
P-parameters	operating parameters
E-parameters	extended parameters

Parameter overview for basic mode

Parameter	Description	Unit	Parameter range from	Parameter range up to	Default setting
S1	internal command S1	%	-100.0	+100.0	0.0
S2	internal command S2	%	-100.0	+100.0	0.0
S3	internal command S3	%	-100.0	+100.0	0.0
S4	internal command S4	%	-100.0	+100.0	0.0
S5	ramp accel. -	ms	0	32500	0
S6	ramp decel. -	ms	0	32500	0
S7	ramp accel. +	ms	0	32500	0
S8	ramp decel. +	ms	0	32500	0
S9	internal command S9	%	-100.0	+100.0	0.0
S10	internal command S10	%	-100.0	+100.0	0.0
P1	zero	%	-100.0	+100.0	0.0
P3	MAX +	%	50.0	100.0	100.0
P4	MAX -	%	50.0	100.0	100.0
P7	MIN +	%	0.0	50.0	0.0
P8	MIN -	%	0.0	50.0	0.0
P11	polarity command	—	0	1	0
E17	option command	—	1 = ±10 V 2 = ±20 mA 3 = 4-20 mA		1 = ±10 V
E19	cable break detection command	—	0	±10 V: 0 ±20 mA: 0 4-20 mA: 1	0
E20	option command output	—	1 = ±10 V 2 = ±20 mA 3 = 4-20 mA		1 = ±10 V
E21	option internal command signal conjunction	—	0 = priority dependent 1 = additive		0 = priority dependent

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. -	Adjustment of ramp rate for increasing of the negative signal polarity. To avoid switching noise.
S6 ramp decel. -	Adjustment of ramp rate for decreasing of the negative signal polarity. To avoid switching noise.
S7 ramp accel. +	Adjustment of ramp rate for increasing of the positive signal polarity. To avoid switching noise.
S8 ramp decel. +	Adjustment of ramp rate for decreasing of the positive signal polarity. To avoid switching noise.
S9 command signal S9	Adjustment of the internal command signal channel S9. To attenuate of an external accessible command signal.
S10 command signal S10	Adjustment of the internal command signal channel S10. To attenuate of an external accessible command signal.
P1 offset	Adjustment of zero position shifting (offset). To compensate for unbalances within the zero position of the valve.
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.
E20 type of command out signal device	Adjustment of the signal option for the command output. To match the command signal output to the input signal mode of a rear amplifier.
E21 internal command signal conjunction	Adjustment of conjunction for the internal command signals. To match the command signal logic.

Parameter overview for expert mode

Parameter	Description	Unit	Parameter range		Default setting
			from	up to	
S11	ramp for int. command S1	ms	0	32500	0
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
S15	ramp for int. command S9	ms	0	32500	0
S16	ramp for int. command S10	ms	0	32500	0
S17	default ramp	ms	0	32500	0
E22	int. command signal ramp function	–	0 = quadrant depend. (S5...8) 1 = int. command depend. (S11...17)		0 = quadrant depend.
E25	MIN operating threshold	–	0 = 1 % 1 = 0.01 %		0 = 1 %

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.
S15 ramp for internal command signal 9	Adjustment of the ramp rate for the internal command signal channel S9. To avoid switching noise.
S16 ramp for internal command signal 10	Adjustment of the ramp rate for the internal command signal channel S10. To avoid switching noise.
S17 default ramp	Adjustment of the ramp rate for the default ramp. To avoid switching noise.
E22 internal command signal ramp function	Adjustment of the ramp function for the internal command signals. To match the ramp functionality.
E25 MIN operating threshold	Adjustment of the MIN operating threshold. To match the response sensitivity for the MIN-stroke step.

5.5. 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-232C port via the menu “Options > Port”. Afterwards reconnect the null modem cable.
Unable to open COM port	Com port is not available. Quit the message and select another RS-232C port via the menu “Options > Port”. Afterwards reconnect the null modem cable
There is no module connected or the communication is disturbed!	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 unvalid character or a value outside the permitted range has been used at parameter entry.
Keep the entered parameters?	During parameter loading from the electronic module memory the preset parameters from the left hand screen display may be rejected or maintained.
The chosen module isn´t the same as the connected hardware!	In principle, parameters dedicated to a type which deviates from the connected electronic module may be edited. However, for data transmitting the correct module has to be connected. If parameters will be loaded from a module which deviates from the selected one, the parameters from the left hand side screen display of the program will be overwritten.
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”.

6. 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 unit and guarantees reliability and availability. The following properties of the electronic has to be checked in continuous short time intervals:

- tight fit on the mounting rail
- tight fit of the disconnectable terminals
- tight fit of the terminal screws
- environmental temperature level
- supply voltage level
- cleanliness of the ambience

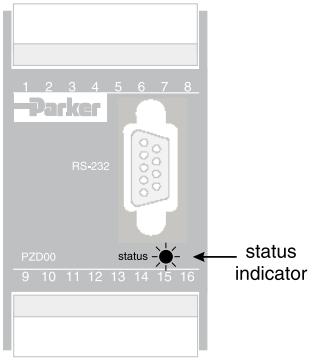
7. Troubleshooting

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?

☞ In either case the available diagnostic options should be used. The electronic permits a diagnostic of the valve function via the monitor output. The status output monitors the working condition of the electronic, an additional visual status results from an LED indicator.

Location of the status indicator



Function assignment

Operating condition	LED-display
no failure	green
no supply voltage	off
cable break command signal (only for option 4...20 mA)	red
internal processor fault	red

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

malfunction at runtime of the connected amplifier									
	- output signal absence								
		- output signal oscillation							
			- wrong output polarity						
				- output signal too low					
					- output signal too high				
						- signal course too abrupt			
							- output signal without input signal presence		
								- no potentiometer supply	
								possible reasons for malfunction	**corrective actions**
X			X				X	supply voltage absent or too low	keep supply voltage range
	X							supply voltage contains too much ripple	reduce ripple
X								missing electronic parameters	provide parameters
X		X	X	X	X			incorrect electronic parameters	check parameters
X	X	X				X	X	wiring sequence incorrect	correct wiring sequence
X							X	wiring interrupted	fix cable
			X				X	potentiometer supply overloaded	increase resistance up to min. 2kOhm
X			X					command input signal too low	increase command input signal
	X							command input signal contains too much ripple	reduce ripple
X							X	electronic terminals contaminated	clean terminals
	X					X		cables partly or totally without shielding	change cable grade
X	X					X	X	electronic defective	keep characteristics, check wiring, replace electronic

⚠ 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 dissassemblings may not be taken imprudently! Prior to the works it has to be clarified, if the system has been operated properly until the failure occured.

8. Repair / Service

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- assistance in the supply of spare parts worldwide
- direct service for mobile applications at our Service Center in Kaarst, Germany
- direct replacement for parts subject to wear at our Service Center in Kaarst, Germany
- technical training in theory and practice

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