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content11.INDD CM_18.01.08.1

Parker electronic modules PWD00A-400 for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional directional control valves by a comfortable interface program.

Features

The described electronic unit combines all necessary functions for the optimal operation of proportional directional control valves without position sensor (series D*FB, D*FW, 4DP*). The most important features are:

- Digital circuit design
- Four parameterizable preset recall channels
- Constant current control
- Differential input stage
- Status output
- Four-quadrant ramp function
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Comfortable interface, see Parker freeware:
  www.parker.com/euro_hcd → **Services** → **Downloads**

Block diagram

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Technical data

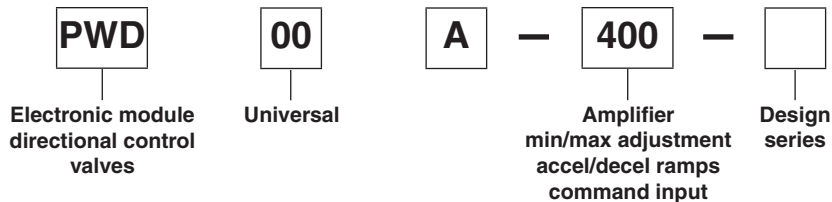| General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V2..V0 acc. UL 94
Installation position		Any
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free *
Switch-on current typ.	[A]	22 for 0.2 ms
Current consumption max.	[A]	2.0
Pre-fusing	[A]	2.5 A medium lag
Command signal	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 150 kOhm
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...5.0: Off / 8,5...30: On / Ri = 30 kOhm
Channel recall signal	[V]	0...5.0: Off / 8,5...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50 preset 0...100
Max	[%]	50...100 preset 0...100
Ramp	[s]	0...32.5 preset 0...32.5
Zero offset	[%]	+75...-75 preset +100...-100
Current	[A]	0.8/1.3/1.8/2.7/3.5 preset 0/4/3/2/1
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]	16 overall braid shield for supply voltage and solenoids
	[AWG]	20 overall braid shield for sensor and signal
Cable length	[m]	50

* If solenoids with a nominal voltage of 24V are connected, the supply voltage has to be raised to 29V.

11

Ordering code

PWD	00	A	—	400	—	
Electronic module directional control valves	Universal			Amplifier min/max adjustment accel/decel ramps command input		Design series

Signal flow diagram

Internal commands
S1
S2
S3
S4

Ramps
S5 A+
S6 A-
S7 B+
S8 B-

Min
P7 Min A
P8 Min B

P3 Max A
P4 Max B
Max

Dither
P5 Ampl.
P6 Freq.

Solenoid current
IA Range

Solenoid A

Command

P1 Offset
Zero

Solenoid B

IB Range
Solenoid current

Dimensions

75

45

110

11

ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for furthe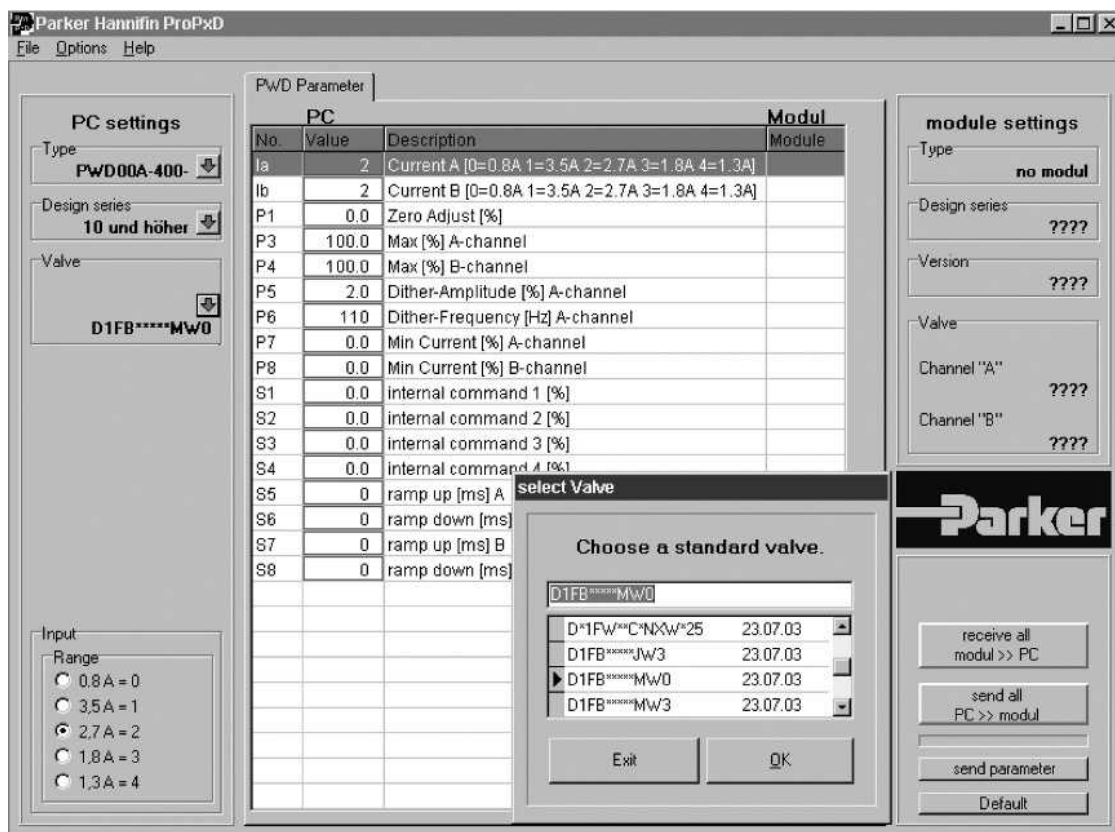r documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

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® 95 upwards

• Plain communication between PC and electronic via serial interface RS-323 and null modem cable

• Comfortable interface, see Parker freeware: **www.parker.com/euro_hcd → Services → Downloads**

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Characteristics
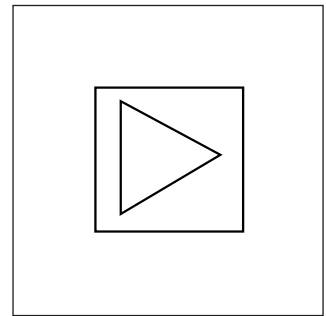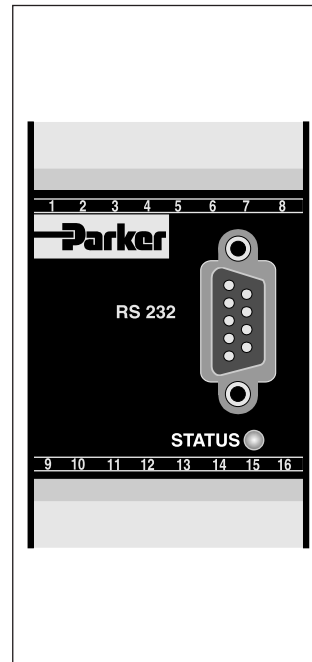
E-Module for Proportional Valves
Series PWDXXA-40*

Parker electronic modules PWDXXA-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional directional control valves with position sensor by a comfortable interface program.
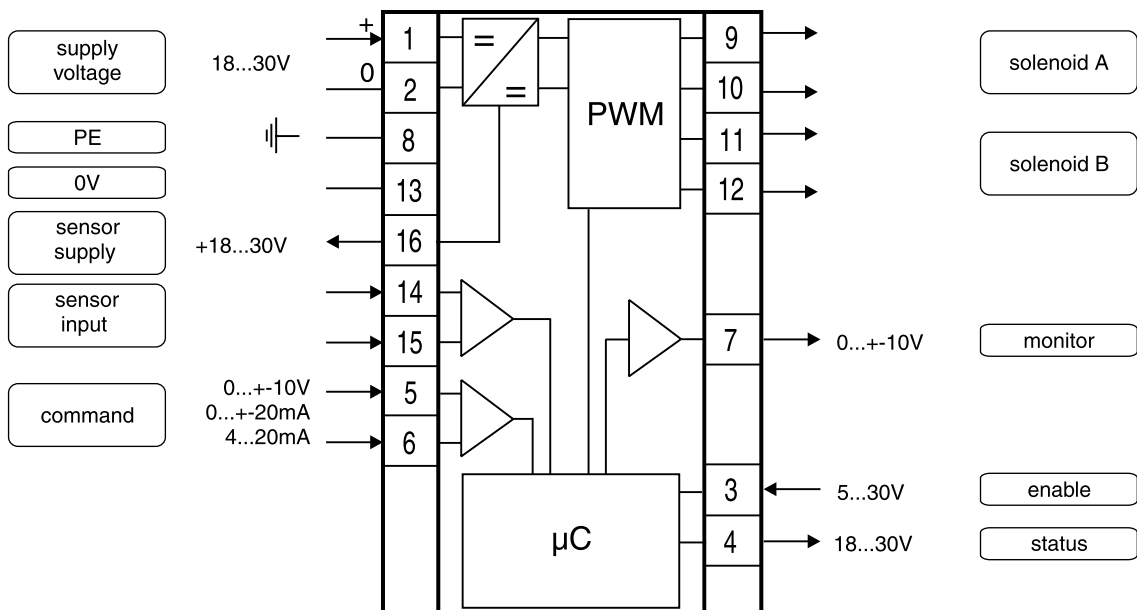
Features

The described electronic unit combines all necessary functions for the optimal operation of proportional directional control valves with position transducer or valves in closed loop systems (series D1FC, D*1FS). The most important features are:

- Digital circuit design
- Parameterizable position control of valve spool
- Constant current control
- Differential input stage with different signal options
- Monitor output for spool stroke
- Four-quadrant ramp function
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- In combination with valves without spool feedback
  - Pressure control with proportional pressure valve and pressure sensor
  - Position control with proportional DC valve and actuator position transducer
- Optional technology function "linearization"
- Comfortable interface, see Parker freeware:
- **www.parker.com/euro_hcd** → **Services** → **Downloads**

Block diagram

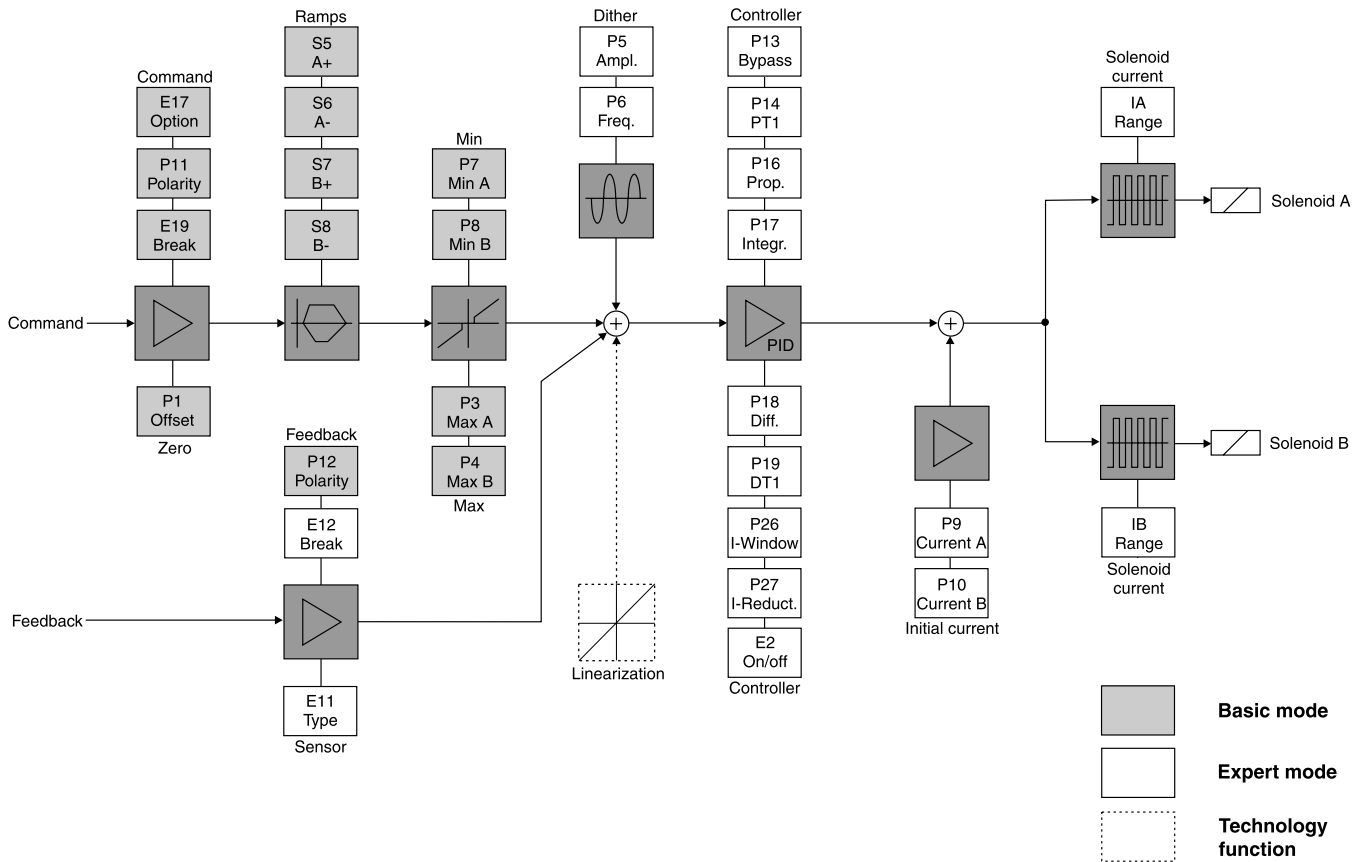| supply voltage | 18...30V | + | 1 | = | | 9 | | solenoid A |
		0	2	=	PWM	10		
PE			8			11		solenoid B
0V			13			12		
sensor supply	+18...30V		16					
sensor input			14					
			15			7	0...+-10V	monitor
command	0...+-10V		5					
	0...+-20mA		6					
	4...20mA							
				μC		3	5...30V	enable
						4	18...30V	status

11

Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V2..V0 acc. UL 94
Installation position		Any
Ambient 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
Switch-on current typ.	[A]	22 for 0.2 ms
Current consumption max.	[A]	2.0
Pre-fusing	[A]	2.5 A 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 = 200 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = 200 Ohm
		<3.6 mA = solenoid output off,
		>3.8 mA = solenoid output on (acc. NAMUR NE43)
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...2.5: Off / 5...30: On / Ri = 100 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Monitor signal	[V]	+10...0...-10, rated max. 5 mA, signal resolution 0.4 %
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Current	[A]	1.3 / 2.7 / 3.5
Initial current	[%]	0...25
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]	16 overall braid shield for supply voltage and solenoids
	[AWG]	20 overall braid shield for sensor and signal
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

11

Ordering code

Code	Function
0	Standard
1	Linearization option

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

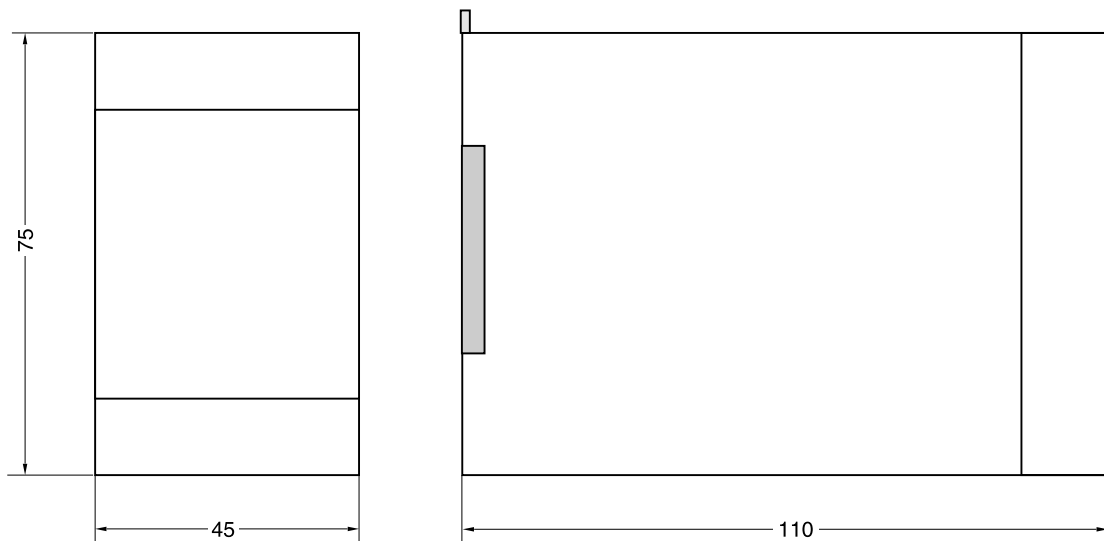## Signal flow diagram

Basic mode

Expert mode

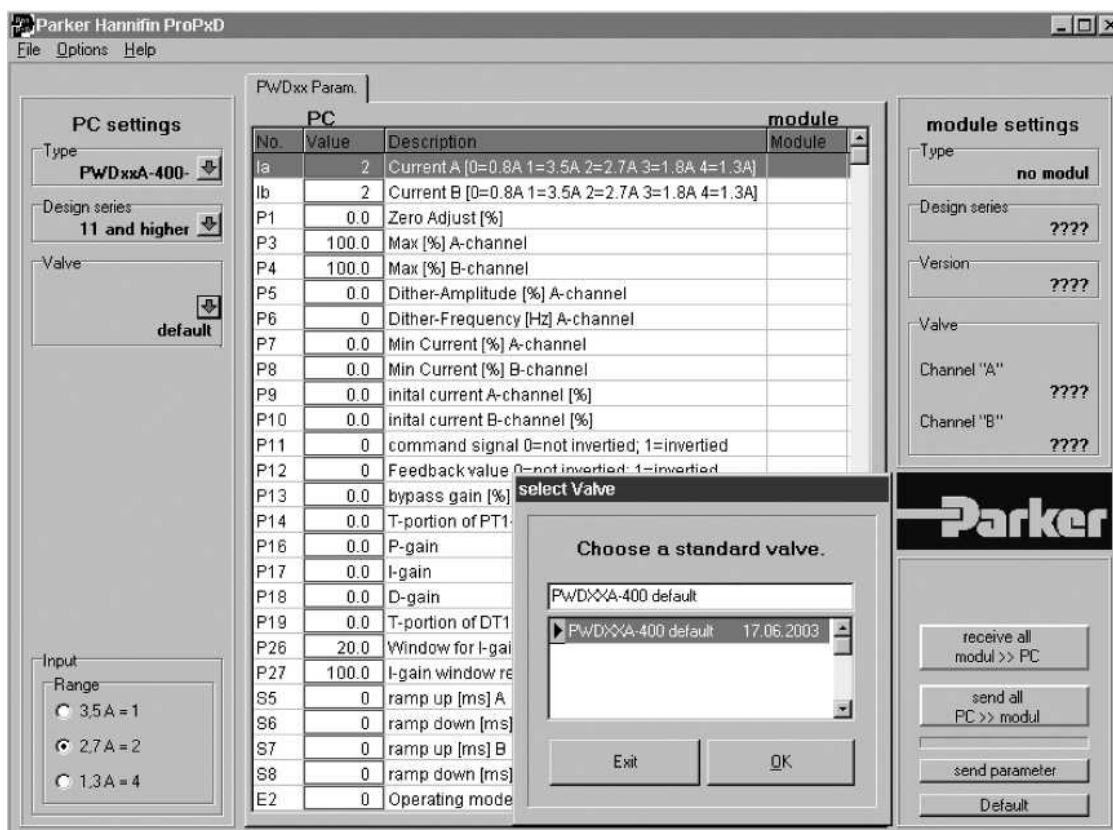**Technology function**

Dimensions

ProPxD interface program

The new ProPxD software permits comfortable param-eter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete param-eter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjust-ments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS-323 and null modem cable
- Comfortable interface, see Parker freeware:
- **www.parker.com/euro_hcd → Services → Downloads**

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Catalogue HY11-3500/UK
Characteristics

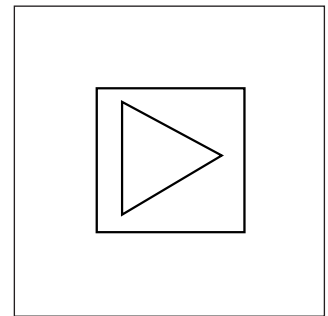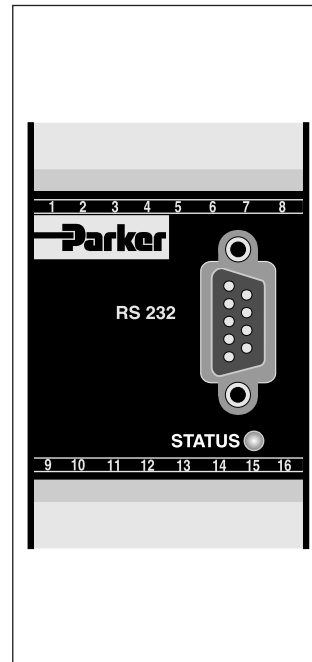E-Module for Prop. Pressure/Flow Control Valves
Series PCD00A-400

Parker electronic modules series PCD00A-400 for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional pressure/flow control valves by a comfortable interface program.

Features

The described electronic unit combines all necessary functions for the optimal operation of two proportional pressure/flow control valves (series RE*W, DSAE, VBY, VMY, TDA, TEA). The most important features are:

- Digital circuit design
- Two independent operable amplifiers
- Four parameterizable preset recall channels
- Constant current control
- Two input stages 0...10V
- Status output
- Two up/down ramp functions
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Comfortable interface, see Parker freeware:
  www.parker.com/euro_hcd → **Services** → **Downloads**

Block diagram

PCD00_UK.INDD CM_18.01.08.1

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany
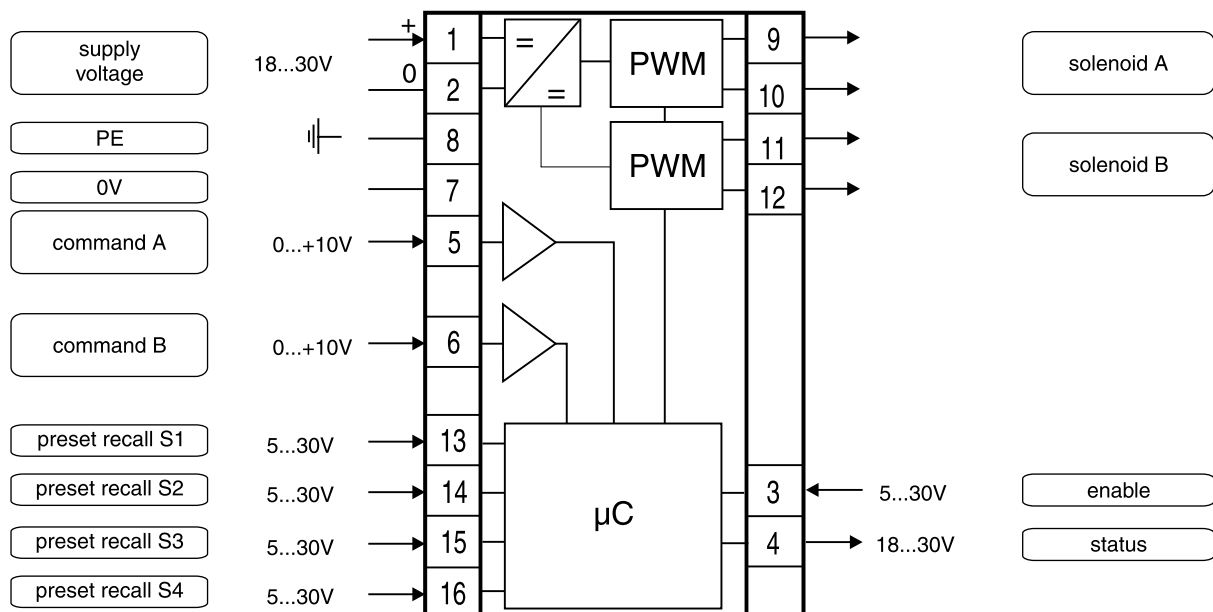
Catalogue HY11-3500/UK
Technical Data / Ordering Code
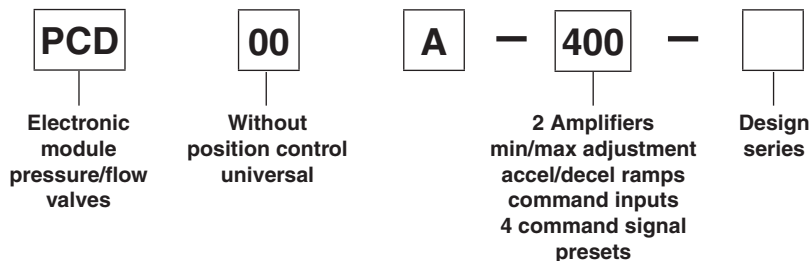
E-Module for Prop. Pressure/Flow Control Valves
Series PCD00A-400

Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V2..V0 acc. UL 94
Installation position		Any
Ambient 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 *
Switch-on current typ.	[A]	22 for 0.2 ms
Current consumption max.	[A]	5.0
Pre-fusing	[A]	6.3 A medium lag
Command signal	[V]	0...+10, ripple < 0.01 % eff., surge free, Ri = 150 kOhm
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...5.0: Off / 8,5...30: On / Ri = 30 kOhm
Channel recall signal	[V]	0...5.0: Off / 8,5...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50 preset 0...100
Max	[%]	50...100 preset 0...100
Ramp	[s]	0...32.5 preset 0...32.5
Current	[A]	0.8/1.3/1.8/2.7/3.5 preset 0/4/3/2/1
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] [AWG]	16 overall braid shield for supply voltage and solenoids 20 overall braid shield for sensor and signal
Cable length	[m]	50

* If solenoids with a nominal voltage of 24V are connected, the supply voltage has to be raised to 29V.

Ordering code

11

PCD	**00**	**A**	—	**400**	—	
Electronic module pressure/flow valves	Without position control universal			2 Amplifiers min/max adjustment accel/decel ramps command inputs 4 command signal presets		Design series

Catalogue HY11-3500/UK
Construction

E-Module for Prop. Pressure/Flow Control Valves
Series PCD00A-400

Signal flow diagram

Dimensions

Catalogue HY11-3500/UK
Interface Program

E-Module for Prop. Pressure/Flow Control Valves
Series PCD00A-400

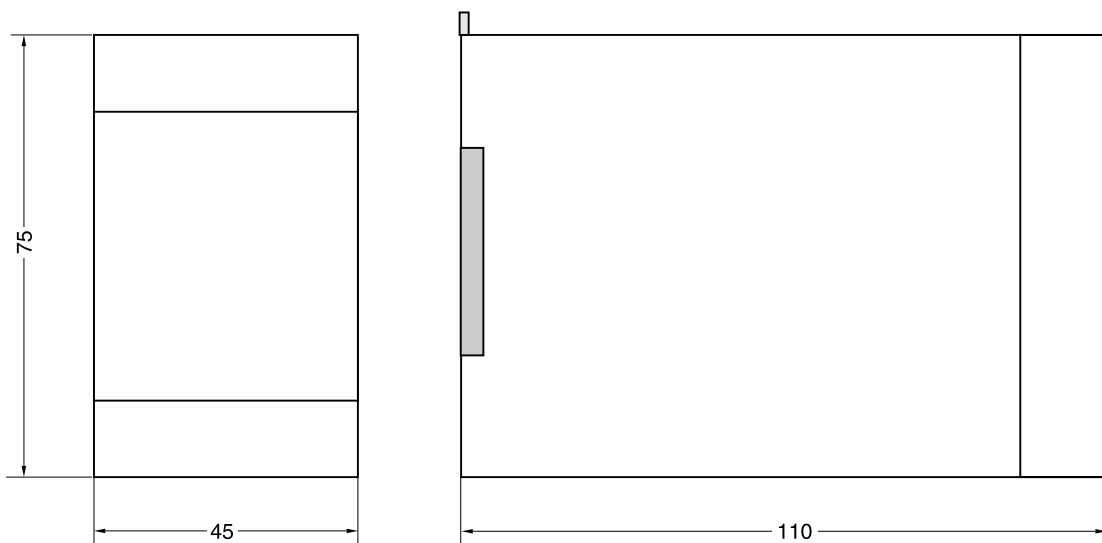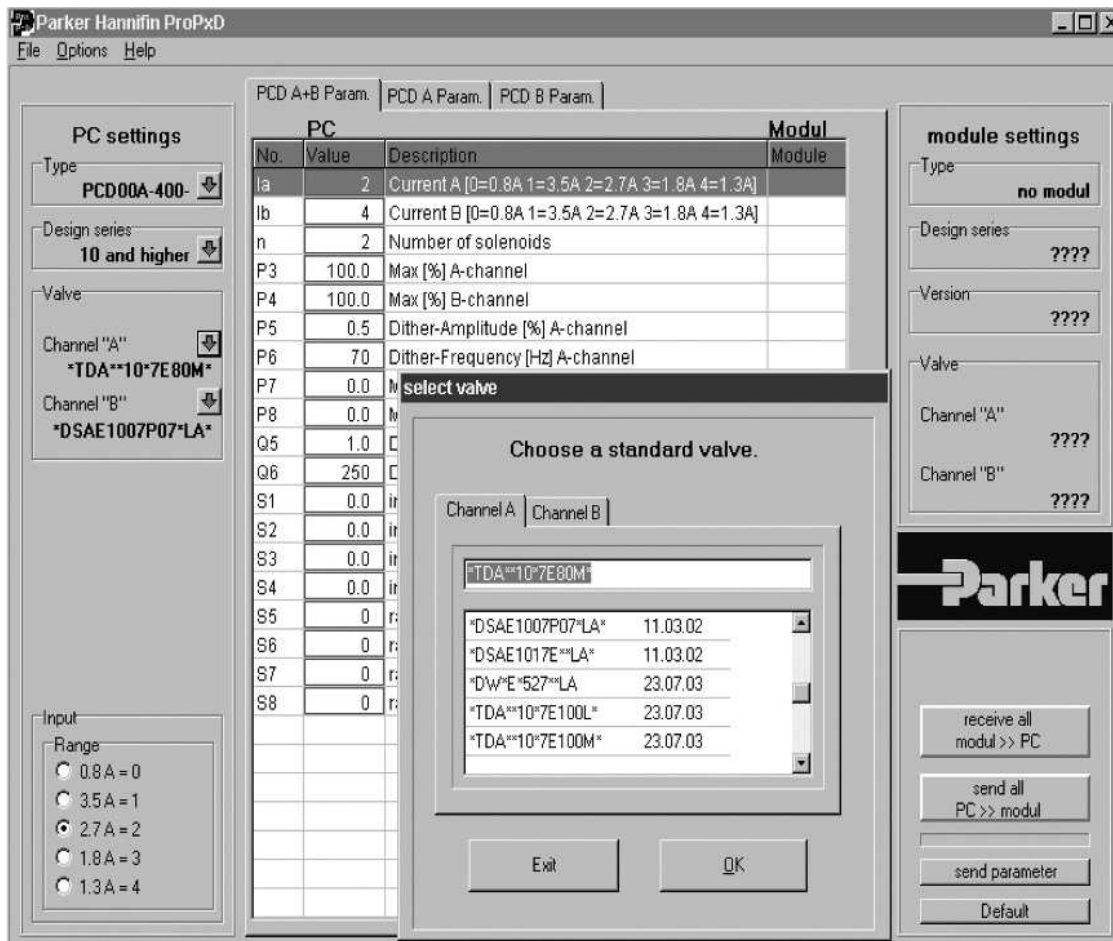## ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

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® 95 upwards
- Plain communication between PC and electronic via serial interface RS-323 and null modem cable
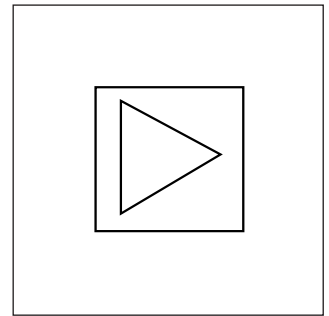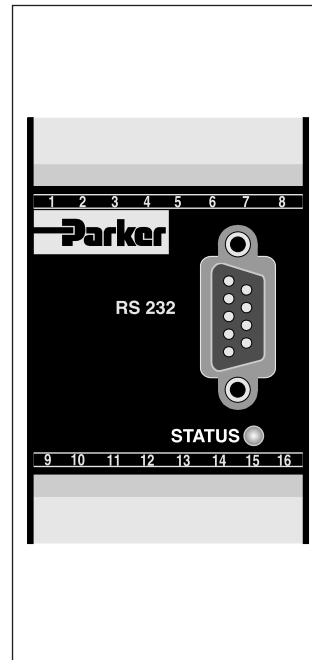- Comfortable interface, see Parker freeware: **www.parker.com/euro_hcd → Services → Downloads**
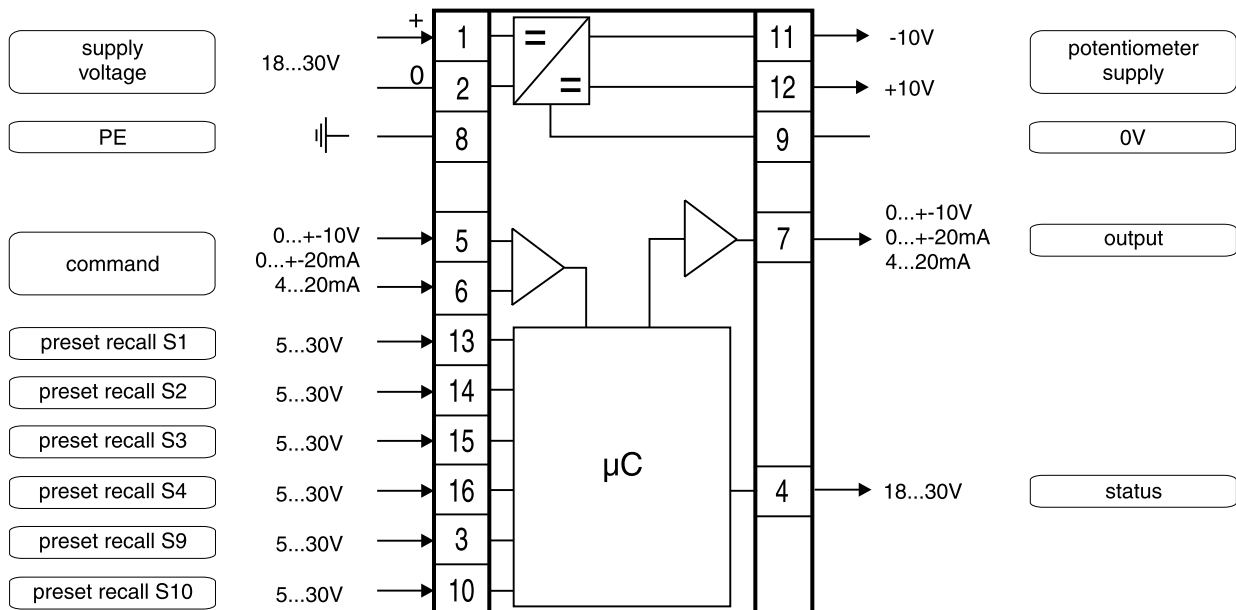
Parker electronic modules PZD00A-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for command signal processing by a comfortable interface program. The electronic unit may be connected in series to proportional valves with onboard electronic as well as to amplifier modules P*D.

Features

- Digital circuit design
- Six parameterizable 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
- 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
- Optional technology function "linearization"
- Comfortable interface, see Parker freeware:
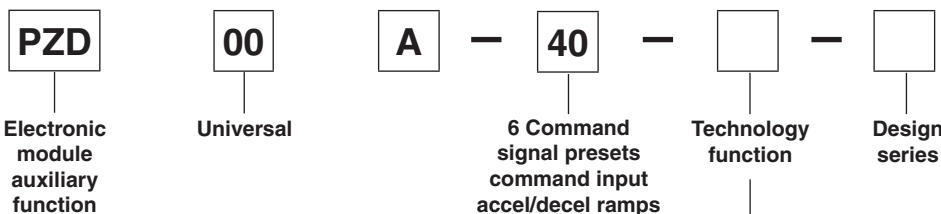 **www.parker.com/euro_hcd → Services → Downloads**

Block diagram

11

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V2..V0 acc. 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 = 200 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = 200 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 und 6 against PE (terminal 8)
Channel recall signal	[V]	0...2.5: 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 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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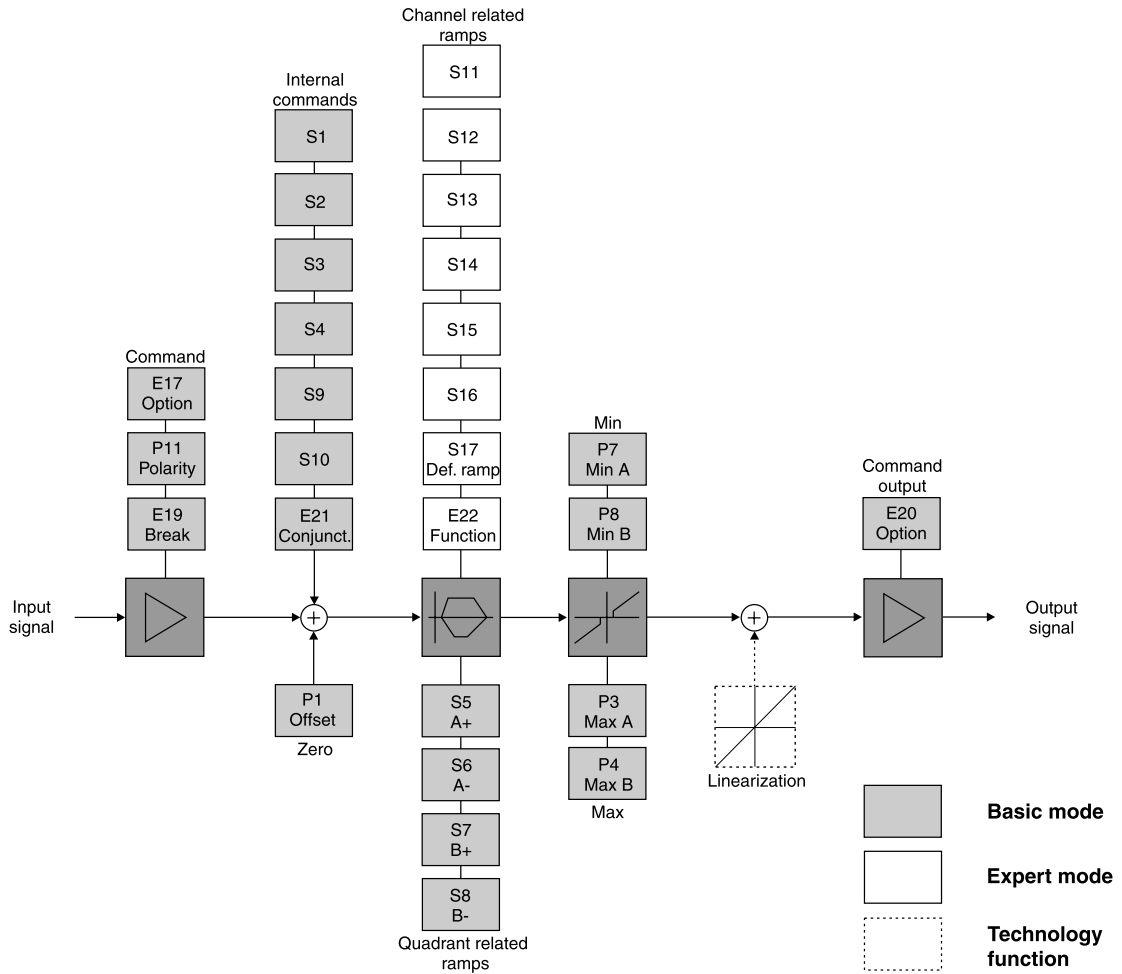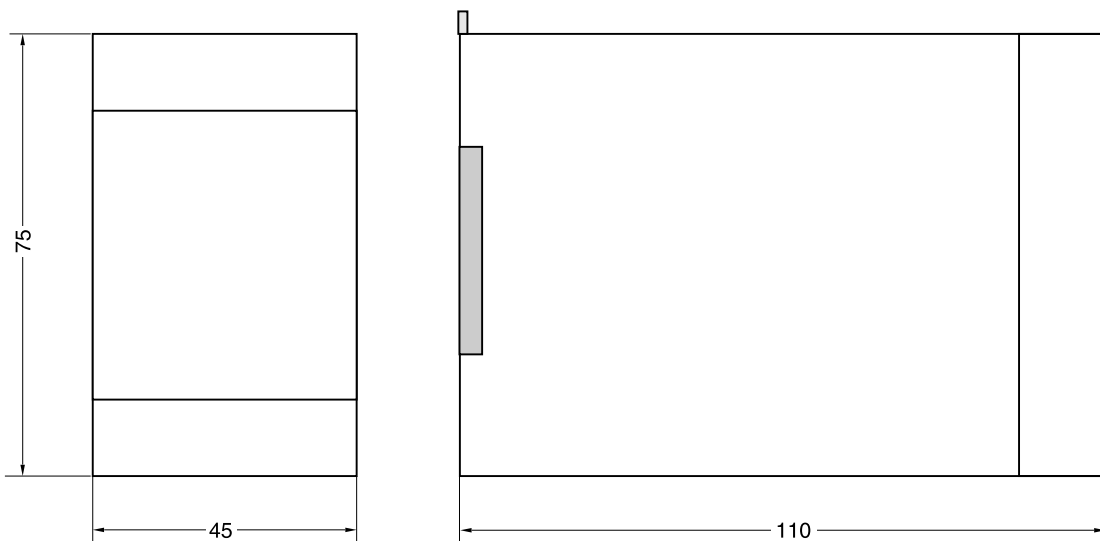
Ordering code

Code	Function
0	Standard
1	Linearization option

Signal flow diagram

Channel related ramps

Internal commands

S1	S11
S2	S12
S3	S13
S4	S14
S9	S15
S10	S16

Command

| E17 Option |
| P11 Polarity |
| E19 Break |

S17 Def. ramp

E21 Conjunct.

E22 Function

Min
P7 Min A
P8 Min B

Command output
E20 Option

Input signal → [▷] → ⊕ → [⬡] → [⊿] → ⊕ → [▷] → Output signal

P1 Offset
Zero

S5 A+
S6 A-
S7 B+
S8 B-

Quadrant related ramps

P3 Max A
P4 Max B
Max

Linearization

Basic mode

Expert mode

Technology function

Dimensions

75

45

110

Parker Hannifin GmbH & Co. KG
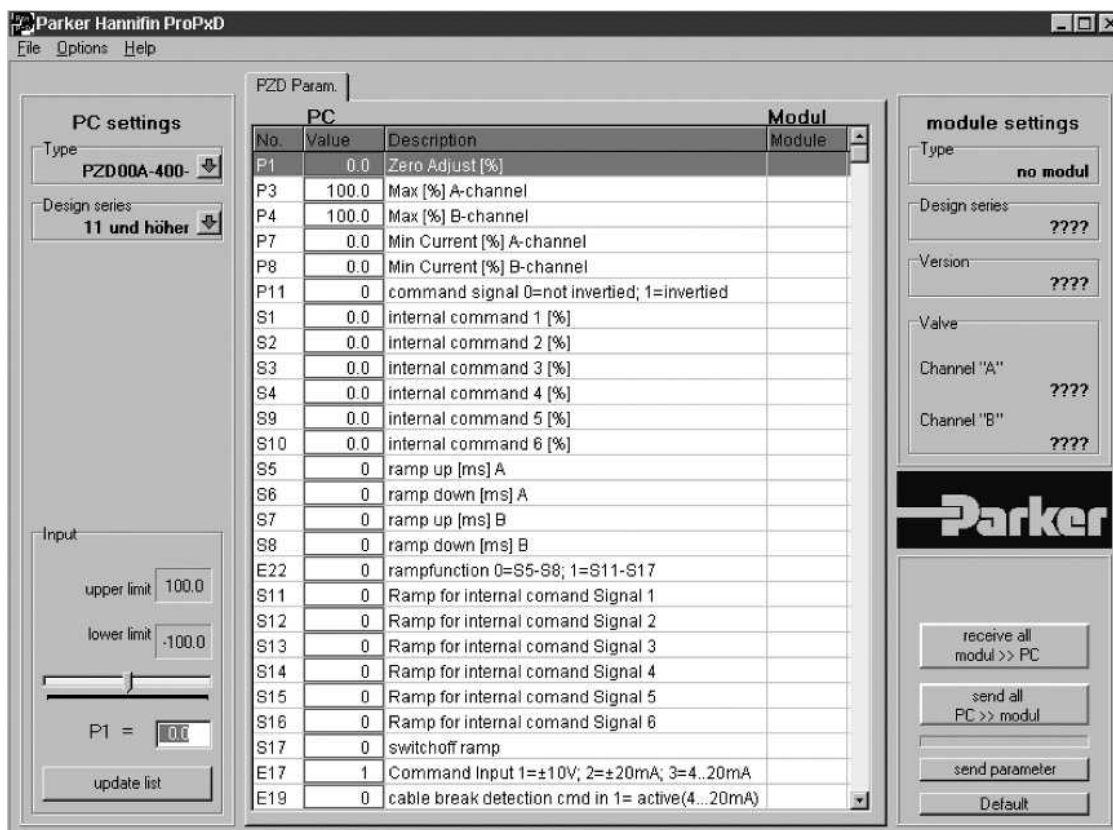Hydraulic Controls Division
Kaarst, Germany

ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

- Comfortable editing of all parameters
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- Plain communication between PC and electronic via serial interface RS-323 and null modem cable
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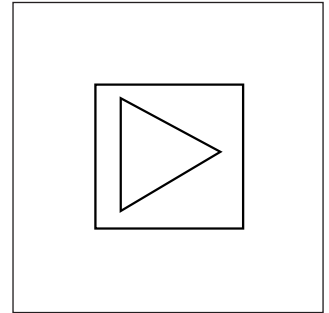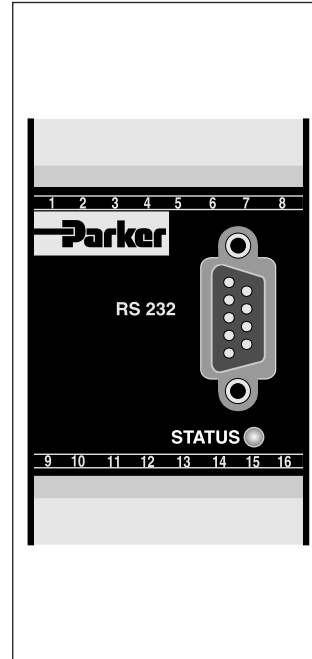

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Parker electronic modules PID00A-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for closed loop controls by a comfortable interface program.
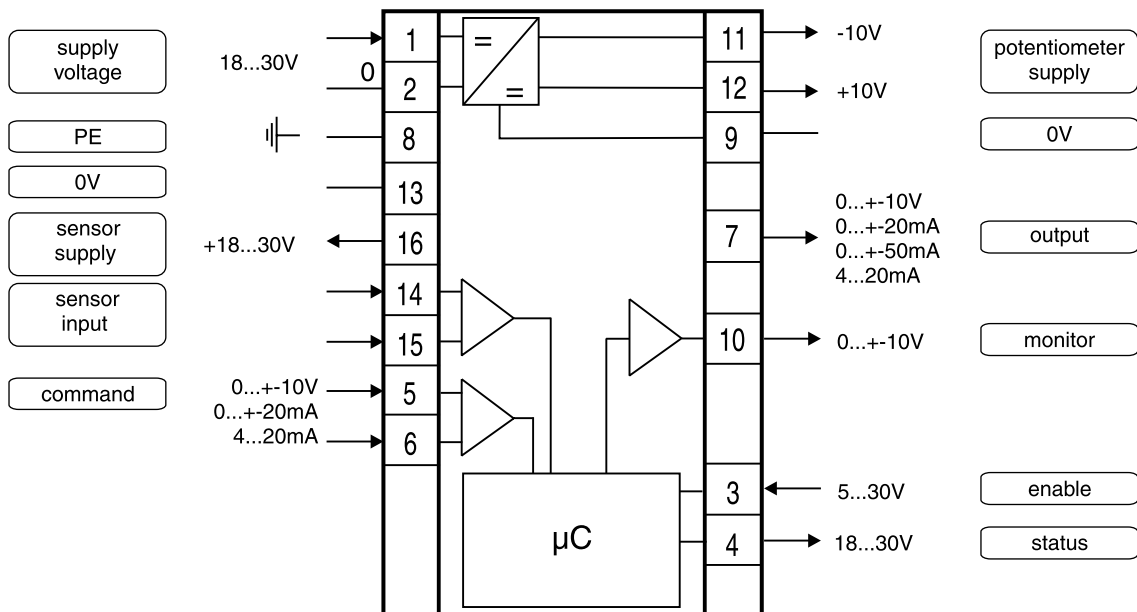
Features

The described electronic unit combines all necessary functions for the optimal operation of closed loop controls. The most important features are:

- Extended PID controls
- Speed control with position feedback
- Differential input stage with different signal options
- Output stage with different output options
- Four-quadrant ramp function
- Status indicator
- Digital circuit design
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Optional technology function "linearization"
- Comfortable interface, see Parker freeware:
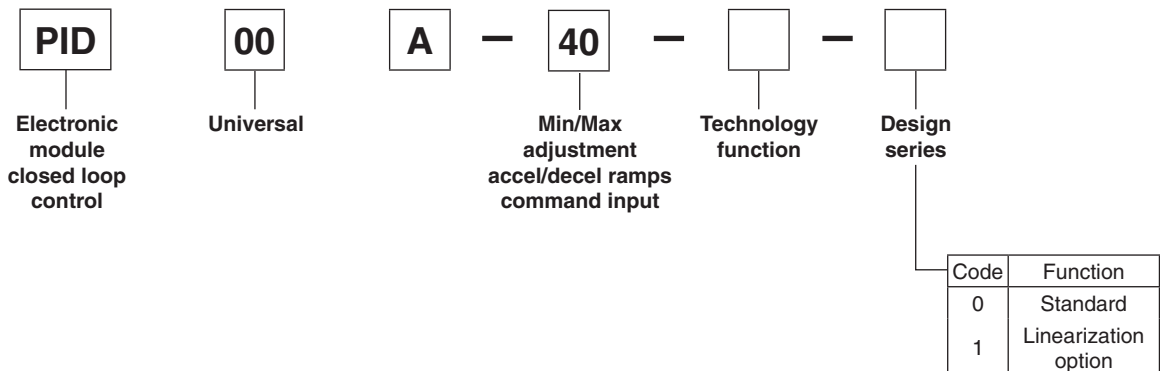 **www.parker.com/euro_hcd** → **Services** → **Downloads**
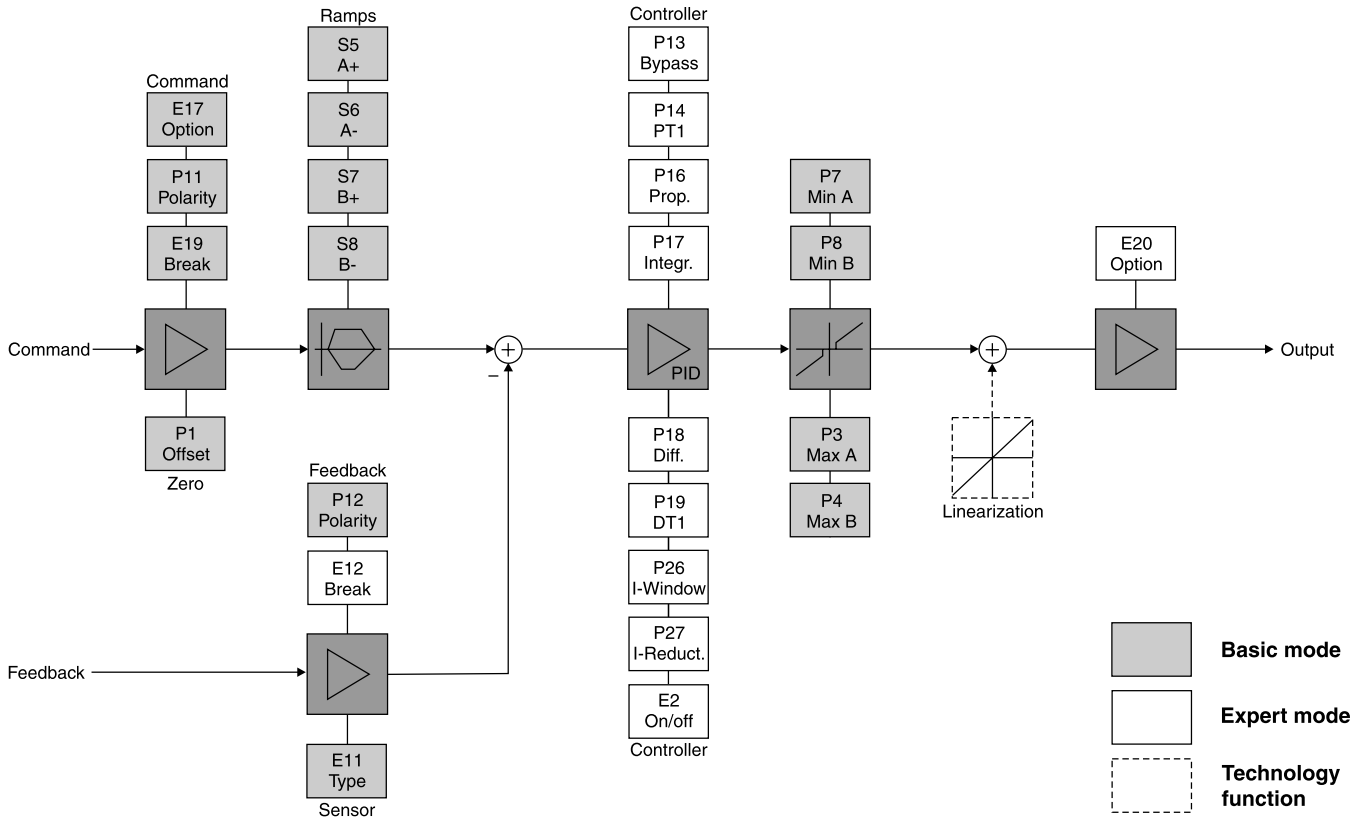

Block diagram

Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V2..V0 acc. UL 94
Installation position		Any
Ambient 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
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 = 200 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = 200 Ohm
		<3.6 mA = solenoid output off,
		>3.8 mA = solenoid output on (acc. NAMUR NE43)
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...2.5: Off / 5...30: On / Ri = 100 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Monitor signal	[V]	+10...0...-10, rated max. 5 mA, signal resolution 0.025 %
Adjustment ranges Min	[%]	0...50
Max	[%]	50...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 overall braid shield
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

Ordering code

11

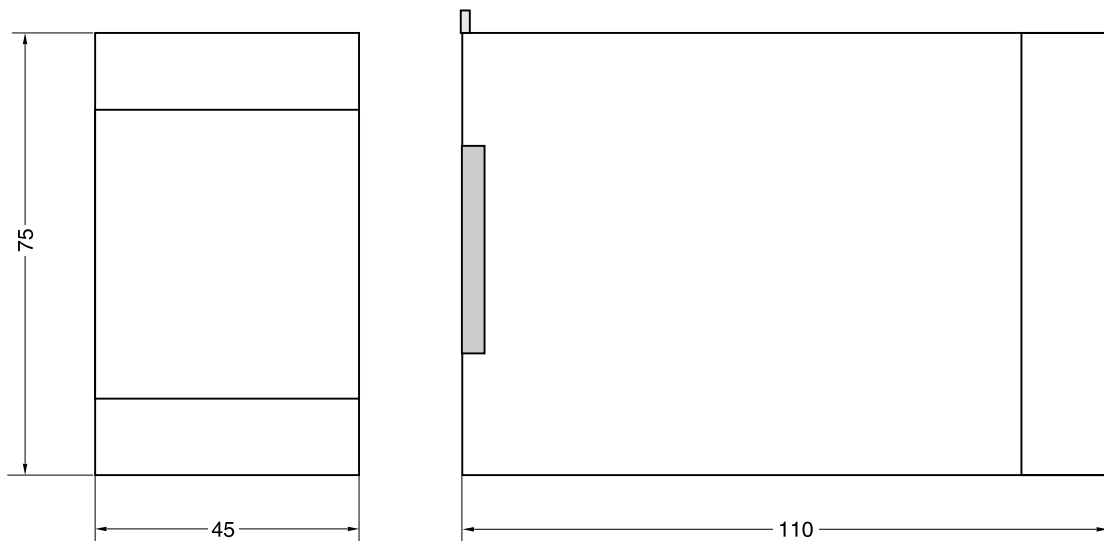| Code	Function
0	Standard
1	Linearization option

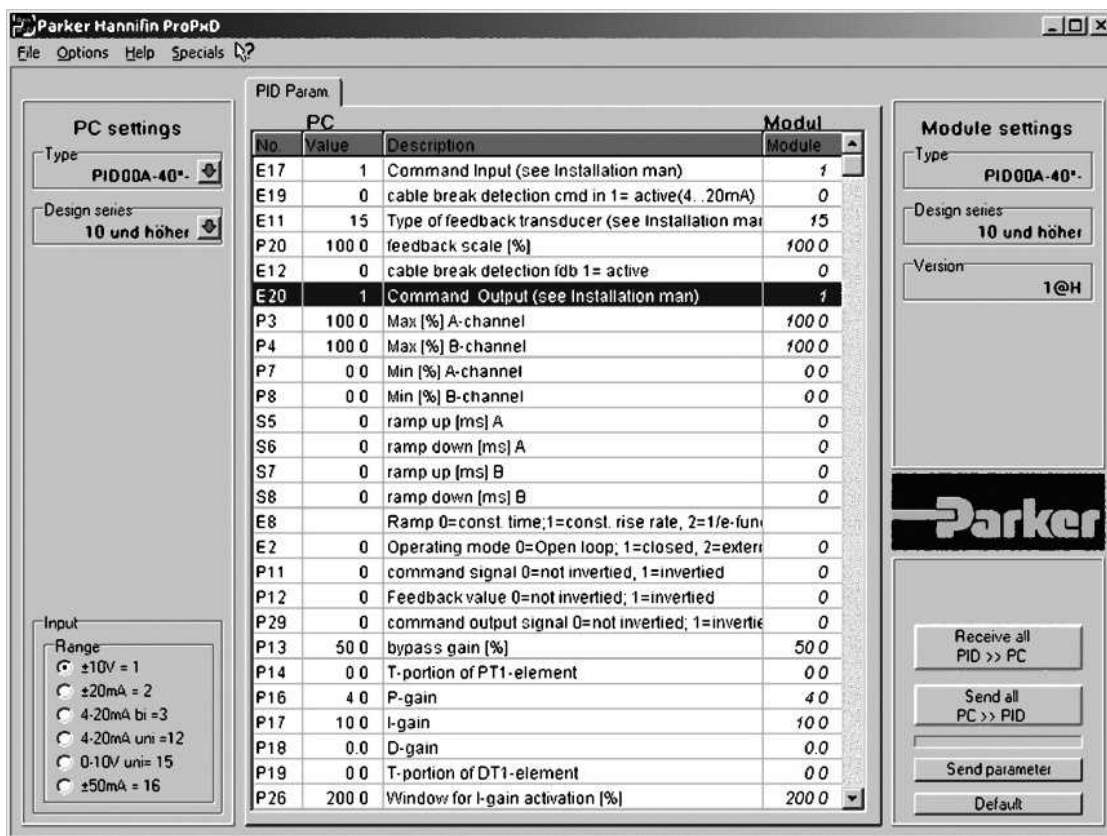## Signal flow diagram

Dimensions

ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD and PID.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

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® 95 upwards
- Plain communication between PC and electronic via serial interface RS-323 and null modem cable
- Comfortable interface, see Parker freeware:
  www.parker.com/euro_hcd → **Services** → **Downloads**

The Compax3F is the new member of the servo drive family of Parker Hannifin. It is especially designed for the requirements of electrohydraulic systems and in particular for position und force control of electrohydraulic axis.

$C\epsilon$ c**RU**us

Attention:
For application support and customized software, please contact your local Parker representative.

Large drive range
- Valves:
    - Proportional direction control valves
    - Proportional pressure relief- and pressure reducing valves
    - Flow valves
- Drives:
    - Cylinders
    - Rotary drives
    - Motors

Range of application
- Closed loop position and force control of linear cylinders and rotary drives
- Switching between position and force control
- Synchronous run with up to 64 axes

Typical applications
- Feeder axis
- Position and force control of press cylinders in material forming machines
- Roller clearance control in roller presses
- Die casting machines

11
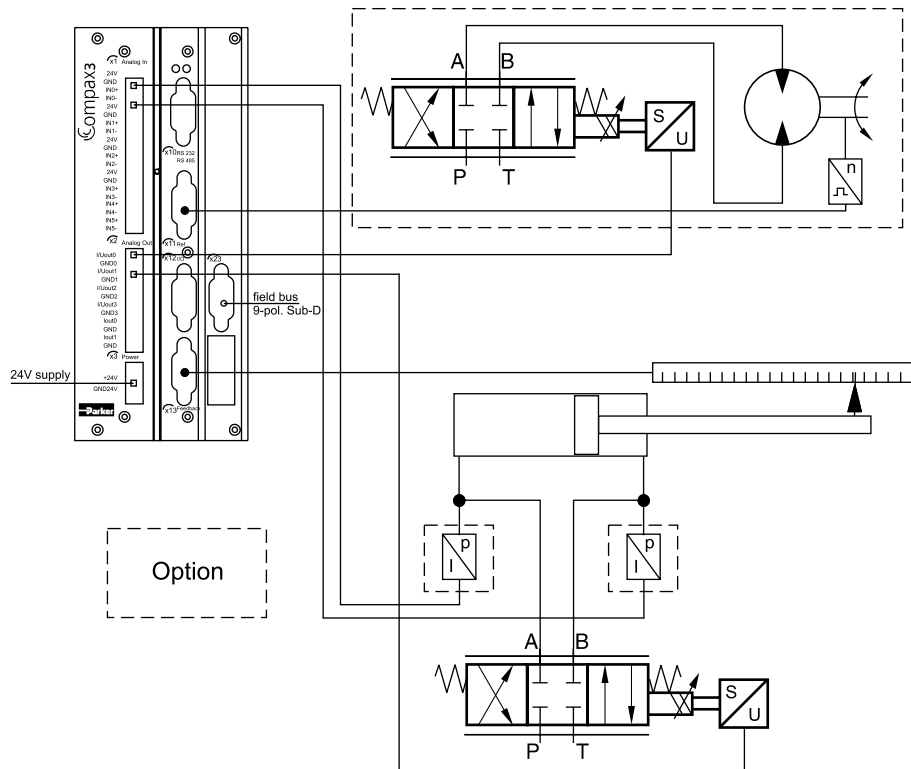
Project development, commissioning and programming

PC Tools - open and transparent

- Compax3 ServoManager
  - Intuitively understandable user interface
  - Wizard technology
  - Online help
  - Oscilloscope function
  - Optimized co-ordination of complete mechatronic systems
- Valve and Drive manager
  - All technical data of Parker valves, cylinders and drives available
- IEC61131-3 debugging facility
- CoDeSys programming system

Additionally support through the Compax3F Hydraulics-Manager by configuration of user defined valves and drives.

Flexible service and maintenance

Operating module

- Backlit plug-in module, text display with two sixteen-character lines
- Simple menu navigation with 4 keys
  - Display of status values and
  - clear text error messages
- Used for changing parameters and manual operation

Jerk-limited set point generation, resulting in

- Gentle handling of the items being moved
- Increased service life of mechanical components
- Overshoot-free positioning
- Reduced excitation of mechanical resonance frequencies
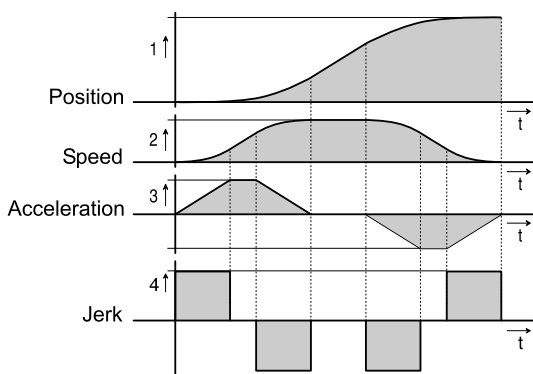
Control

- 2 control loops for each axis for combined position and force/pressure control

Position control

- Automatic controller design
  - User-oriented optimization of parameters
  - Robust controller setting
- Feed forward control of speed and acceleration which results in:
  - Optimization of the response behaviour
  - Minimization of the following error

Force/Pressure controller

- PID controller with feed forward control of speed

2-axis synchronous run

- 2 operation modes:
- Master slave
- Average of actual value

Hydraulic specific functions

- Realization of many different circuit concepts with up to 4 proportional valves possible
- Linearization functions:
  - Consideration of the area of differential cylinders
  - Inverting of the valve set value
  - Compensation of the load pressure (additional pressure sensors necessary)
  - Correction of the nonlinear flow characteristic of the valve
  - Overlap compensation
  - Valve zero point correction
  - Valve set value filters
  - Valve set value limitation
  - For each valve individually available
  - Automatic configuration by component selection in the Compax3 ServoManager
- Hydraulic corner power limitation
  - Limitation of the maximum hydraulic power consumption, intelligent energy management

Set up controller optimization

- Compax3F HydraulicsManager
  - All necessary technical data of Parker valves and drives are available
- Test movement for automatic controller attitude
- Optimization with integrated oscilloscope function

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Real-time signal processing

- Oversampling of the speed and current signals which result in:
    - Reduction of the quantization noise
    - Increase in signal resolution
- Online feedback error compensation corrects for offset and gain errors
- 14 bits increase in resolution
    - By interpolation of sine-cosine feedback signals

Interface
Field bus

- Profibus DP
- CANopen (CiADS402)
- DeviceNet
- PowerLink
- Address configurable via Dip switch

Connection of external inputs/outputs
Parker I/O - System (PIO)

Additional external digital and analog inputs and outputs can be integrated via the CANopen.

Integration with the Office environment
ActiveX plug-in

- Office and industrial environments are constantly growing closer together.
- The use of ActiveX technology allows simple integration into Office application.

Monitoring and control
Operator Panels

Control equipment for all text and graphics applications in industrial environments using Profibus DP, CANopen, DeviceNET and Interbus-S field busses. From two-line displays to touch-panels. For further information please refer to catalogue 192-081011.

In addition to drivers for Compax3/Compax3 powerPLmC, drivers for other PLC products can be integrated on request.

International standards in programming
Advantages offered by integrated standards

- Programming system
    - CoDeSys
- Programming language
    - IEC61131-3
    - Function modules based on PLCopen

Ordering Code

C3   F001   D2   F12   [ ]   [ ]   [ ]

Series   **Interface**   **Technology functions**   **Options**

Code	Interface
I11	Digital inputs/outputs
I20	Profibus DP V0/V1/V2 (12Mbit/s)
I21	CANopen
I22	DeviceNet
I30	PowerLink

Code	Options
M00	Standards
M10	Extension 12 digital I/Os & HEDA (motion bus)
M11	HEDA (motionbus)
M12	Extension 12 digital I/Os

Code	Technology functions
T30	Programmable motion control according to IEC61131
T40	Electronic Cam

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Function	Motion control with motion profils. Suitable for position and force/pressure control
Housing / protection class	closed metal housing, isolation according to VDE 0160 / IP 20
Supply voltage [VDC]	21...27VDC, ripple <1VSS
Current requirements [A]	0,8 for the device, digital outputs 100mA each
Supported feedback-Systems	• Analog 0..20mA, 4..20mA, ±10V • Start-Stop-Interface • SSI-Interface • EnDat2.1-Interface • 1VSS (max. 400kHz) Interface, 13.5Bit / Distance coding • TTL (RS422) (max. 5MHz), internal post-quadrature resolution
Set point generator	• Jerk-limited ramps • Travel data in increments, mm, inches or variable by scale factor • Specification of speed, acceleration, delay and jerk factor • Force/pressure inputs in N, psi, etc. variable by scale factor
Monitoring functions	• Power/auxiliary supply range • Following error monitoring • Hard- and Software switches
Inputs and Outputs	• 8 control inputs: 24V DC / 10kOhm. • 4 control inputs Active HIGH / short-circuit protected / 24V / 100mA. • 4 analog current input (14Bit). • 2 analog voltage input (14Bit). • 4 analog output (16Bit, current or voltage).

RS232 / RS485 (switchable)
    RS232:
 	
    RS485 (2 or 4-wire):
	
	• 115200Baud
	• Word length 8 bits, 1 start bit, 1 stop bit
	• Hardware handshake XON, XOFF
	• 9600, 19200, 38400, 57600 or 115200 Baud
	• Word length 7/8Bit, 1 Start-, 1 Stop bit
	• Parity (switchable) even/odd

Bus systems	• Profibus DP V0-V2 (I20), 12Mbit/s, PROFIdrive-Profil Drive technology • CANopen (CiADS402) (I21) • DeviceNet (I22) • PowerLink (I30)
CE Compliance	• EMC interference emission/limit values for industrial utilization according to EN61 800-3 first environ-ment (commercial and residential area), class A via integrated mains filter for up to 10mCable length, otherwise with external mains filter • EMC immunity/limit values for industrial utilization according to EN61 800-3
Insulation requirements	• Protection class I according to EN 50178 (VDE 0160 part 1) • Contact protection: according to DIN VDE 0106, part 100 • Overvoltage: Voltage class III according to HD 625 (VDE 0110-1) • Degree of contamination 2 according to HD 625 (VDE 0110 part 1) and EN 50178 (VDE 0160 part 1)

Environmental conditions
    General environmental conditions acc. to EN 60 721-3-1 to 3-3
 	
    Permissible ambient tempera-ture
 	
    Tolerated humidity:
    non condensing
 	
    Elevation of operating site: <=1000m above sea level for 100% load ratings
	• Climate (temperature / humidity / barometric pressure)
	• Class 3K3
	• Operation: 0 to +45 °C class 3K3
	• Storage: -25 to +70 °C class 2K3
	• Transport: -25 to +70 °C class 2K3
	• Operation: <= 85% class 2K3
	• Storage: <= 95% class 3K3 (relative humidity)
	• Transport: <= 95% class 2K3
	• Please inquire for greater elevations
	Protection class IP20 according EN 60 529

EMC directives and harmonised EC norms	• EC low voltage directive 73/23/EEC and RL 93/68/EEC: EN 50 178, General industrial safety norm Equipping electric power systems with electronic operating equipment HD 625, general electrical safety. Insulation principles for electrical operating equipment EN 60 204-1, Machinery norm, partly applied • EC-EMC directive 89/336/EEC: EN 61 800-3, EMC norm Product standard for variable speed drives EN 50 081-2 ... 50 082-2, EN 61 000-4-2 ...61 000-4-5
UL-Certification	USL according to UL508 (listed) / CNL according to C22.2 No: 142-M1987 (listed) Certified: E-File-No: E198563
Weight [kg]	2.0

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Compax3 T30 Motion control according to PLCopen

Function range T30

General

Due to its high flexibility and efficiency the Compax3 motion control according to PLCopen is for most applications the optimal basis for decentralized motion control.

Positioning with function modules based on PLCopen

- Programmable based on IEC61131-3
- Programming system: CoDeSys
- Up to 5000 instructions
- 500 16-bit variables / 150 32-bit variables
- Recipe table with 288 variables
- 3 16-bit saved variables (power failure protected) / 3 32-bit saved variables (power failure protected)
- PLCopen-function modules:
  - Positioning: absolute, relative, additive and continuous
  - Machine Zero.
  - Stop, energizing the power stage, quit
  - Position, device status, reading axis error
  - Electronic gearbox (Mc_GearIn)
- IEC61131-3-standard modules:
  - Up to 8 timers (TON, TOF, TP)
  - Trigger (R_TRIG, F_TRIG)
  - Flip-flops (RS, SR)
  - Counters (CTU, CTD, CTUD)
- Device-specific function modules:
  - C3_Input: generates an input process image
  - C3_Output: generates an output process image
  - C3_ReadArray: access to recipe table
- Inputs/outputs:
  - 8 digital inputs (24V level)
  - 4 digital outputs (24V level)
  - 6 analog inputs (14 bits)
  - 4 analog outputs (16 bits)
  - Optional addition of 12 digital inputs/outputs

PLCopen function blocks

- Absolute positioning
- Relative positioning
- Additive positioning
- Continuous positioning
- Stop
- Machine zero
- Energizing the power output stage
- Reading device status
- Reading axis error
- Acknowledging errors
- Reading the current position
- Electronic gearbox (gearing)

Additional function range

- Absolute force control
- Combined position and force control
- Control mode switching between position and force/pressure control
- 2-axis-syncronous-run

Absolute/Relative positioning MoveAbs und MoveRel

One motion set defines a complete motion profile with the parameters:
1: Target position
2: Velocity
3: Maximum acceleration
4: Maximum deceleration
5: Maximum jerk

Stop motion Stop

The Stop set interrupts the current motion set.

Mark-related positioning: RegSearch, RegMove

For mark-related positioning, two operating modes are available:
- RegSearch: Search for an external signal e.g. a registration mark on a product.
- RegMove: The external signal interrupts the search move and the second move follows without interruption
- Precision of the registration mark detection: <1µs

Electronic gearbox Gearing

Motion synchronized to a master axis with any transmission ratio. The position of the master axis can be detected via:
- +/-10V analog input
- Step/direction command input
- The encoder input or HEDA bus, using a Compax3 master.

Dynamic positioning

A new motion profile can be selected during a positioning sequence – a smooth transition takes place.

Example of an field bus interface controlled IEC61131-application

- 2 control words are placed on the cyclic channel of the bus.
- The position data records (position, speed, acceleration etc.) are stored in a table (array).
- The desired position data record is selected with Controlword_2.
- The individual bits of Controlword_1 control positioning.
- A return message is sent via a status word on the cyclic channel of the bus.

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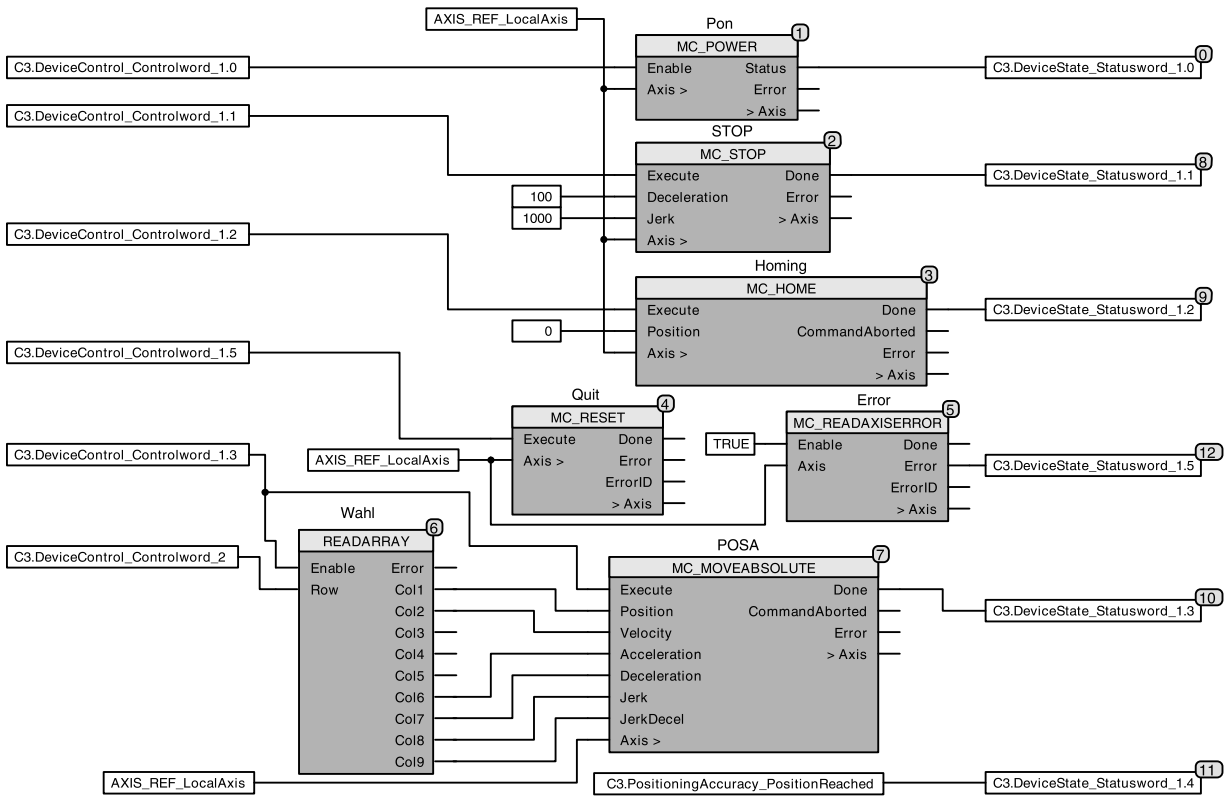
Example of a bus interface controlled IEC61131 application

Compax3 T40 IEC61131-3 positioning with cam function modules

T40 function range

General

Compax3 T40 is able to simulate mechanical cams and cam switching mechanisms electronically. The T40 electronic cam was especially optimized for:

- The packaging machine industry
- For the printing industry
- All applications, where a mechanical cam is to be replaced by a flexible, cyclic electronic solution

This helps to solve discontinuous material supply, flying-knive and similar drive applications using distributed drive technology.

Compax3 T40 supports both real and virtual master movements. In addition, the user can switch to other cam profiles or cam segments ‚on the fly‘.

Programming is carried out in the well-known IEC61131-3 environment.

With the aid of the cam function modules and CamDesigner, cam applications can be implemented very easily.

Function T40

- Technology functions of the T30 version fully integrated and available
- Master position acquisition
- Mark synchronization
- Cam switching mechanism
- Coupling and decoupling function
- Cam profiles
- Cam memory
- Cam creation with CamDesigner

Master position acquisition

- Acquisition by incremental encoder
- Acquisition by the HEDA real-time bus
- Virtual Master:

A second axis in the IEC program can be used to program a motion profile, which serves as a master for one or several axes.
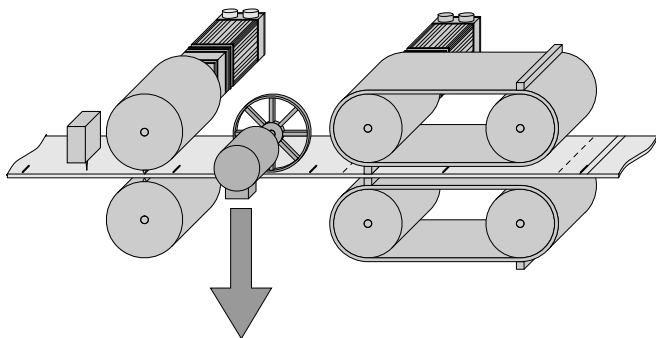

Mark synchronization

- Master or slave oriented (simultaneous, cam-independent)
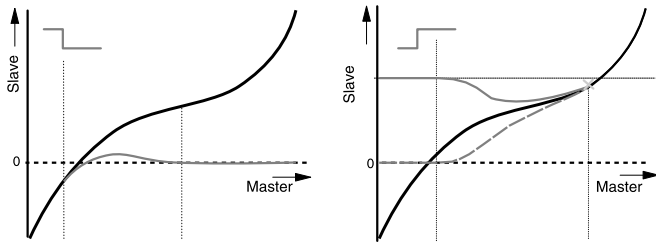- Highly-precise mark recognition (accuracy <1µs; Touchprobe)
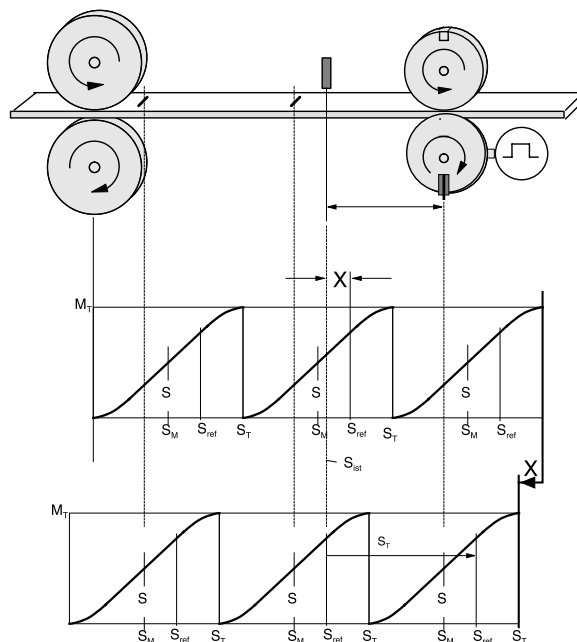
Cam switching mechanism

- 36 cams with individual profiles
- 4 fast cams (125µs per cam) standard: 500µs
- 32 serial cams, 16ms/cam cycle (0.5ms/cam)
- Delay-time compensated cams: Compax3 can advance the cam to compensate for delays in switching elements.
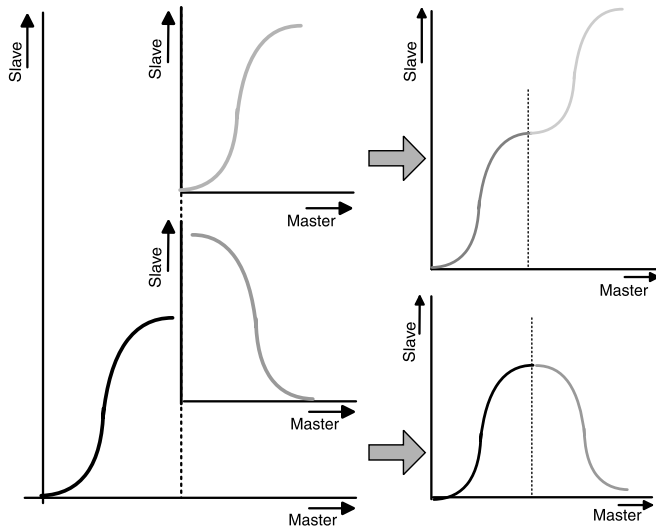
11
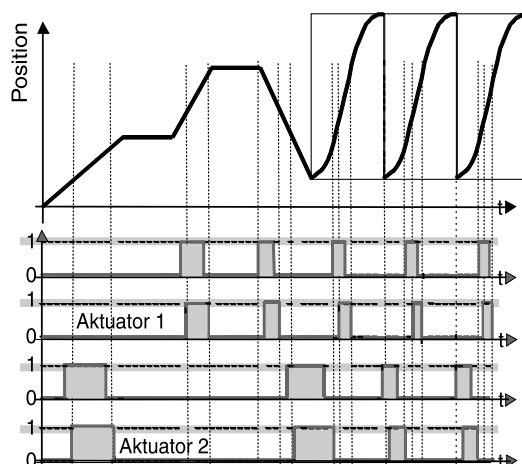
Coupling and decoupling functions

- By means of a set point generator
- By means of a change-over function
- Without overspeeding by coupling over several master cycles
- Virtually free set-up of the coupling and decoupling movement
- Master-guided coupling movement
- Random standstill position

Cam memory

- 10,000 points (Master/Slave) in 24-bit format
- High-precision profile generation:
  - Variable point spacing with full backup of the current master and slave coordinates (even if the power fails)
  - Linear interpolation between points
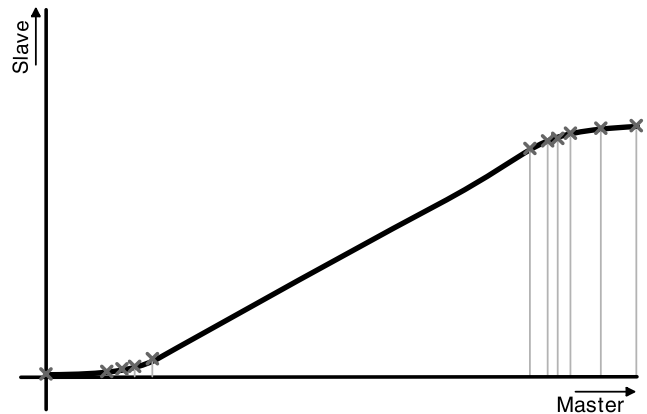- Cam memory for up to 20 curves

- **Cam profiles**
- Up to 20 cam segments can be produced by:
- Virtually random cam links (forwards and backwards)
- Freely programmable event-controlled cam branches
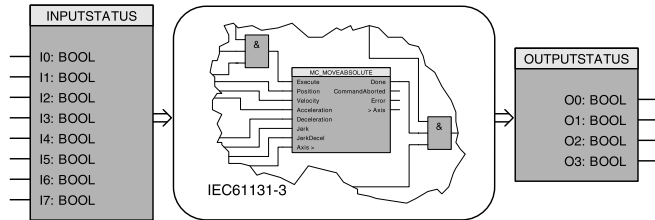- Scalable cam segments and complete cam profiles

Connection of high-level controllers

Control via digital inputs/outputs Compax3 I11T30 / I11T40

The digital I/Os can be optionally extended by 12 I/Os (M10 and M12 option).

Control via Profibus, Compax3 I20T30 / I20T40

Profibus-ratings

DP-Versions	DPV0 / DPV1
Baud rate [MBit/s]	up to 12
Profibus ID	C320

Control via CANopen, Compax3 I21T30 / I21T40

CANopen-ratings

Baud rate [kBit/s]	20, 50, 100, 125, 250, 500, 800, 1000
Service-Data-Object	SDO1
Process-Data-Objects	PDO1, ... PDO4

Control via DeviceNet, Compax3 I22T30 / I22T40

DeviceNet ratings	
I/O - data	up to 32 bytes
Baud rate [kBit/s]	125...500
Nodes	up to 63 Slaves

Control via Ethernet Powerlink, Compax3 I30T30 / I30T40

Ethernet Powerlink ratings	
Baud rate	100Mbits (FastEthernet)
Cycle time	<200µs; to 240 nodes

Decentralized control via CANopen, I21T30 / I21T40

With external inputs/outputs (PIO)

Additional external digital and analog inputs and outputs can be integrated via the CANopen master function. For this purpose we offer the Parker I/O system (PIO):

• CANopen field bus coupler: 650mA/5V, 1650mA/5V

• Digital input terminals: 2-, 4-, and 8-channel

• Analog input terminals: 2-channel (0-10V), 4-channel (0-20mA)

• Digital output terminals: 2-, 4-, and 8-channel

• Analog output terminals: 2-channel (0-10V, 0-20mA, +/-10V)
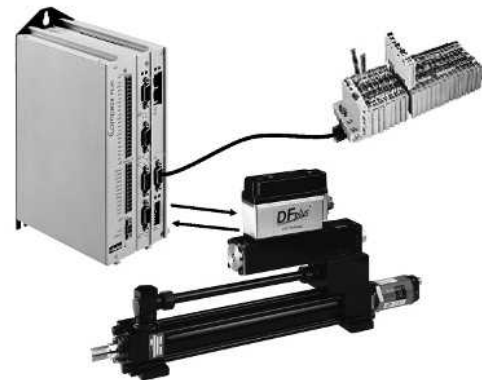
Simple, wizard-guided configuration and commissioning Compax3 ServoManager
Software Tool C3 ServoManager

Configuration is carried out on a PC using the Compax3 ServoManager.

- Wizard-guided configuration
  - Automatic querying of all necessary entries
  - Graphically supported selection
- Setup mode
  - Moving individual axes
  - Predefined profiles
  - Convenient operation
  - Storage of defined profiles
- Integrated 4-channel oscilloscope
  - Signal tracing directly on the PC
  - Various modes (single/normal/auto/roll)
  - Zoom function
  - Export as image or table (for example to Excel)
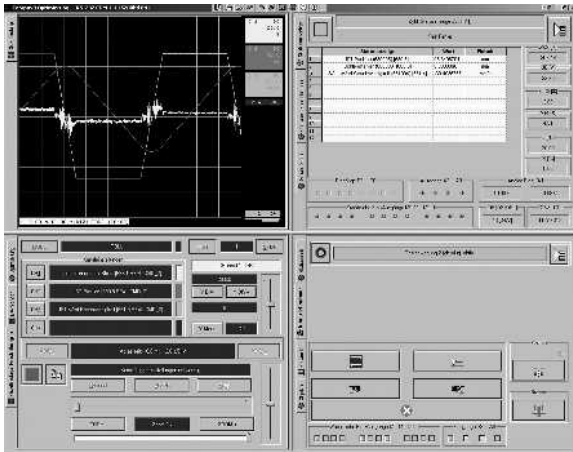
C3 ServoManager with oscilloscope

Software Tool HydraulicsManager

- Simple set up of customer valves, cylinders and drives.
- Technical data of all Parker valves, cylinders and drives available.

C3 HydraulicsManager valve database

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Cam creation with CamDesigner
Software Tool CamDesigner

- Standardized Nolte cam generating tool with:
  - Standard or extended range of functions
  - Evaluation of the motion profiles
  - Verification of the drive sizing
- Transition laws from VDI directive 2143:
  - Selection of motion laws
  - The CamDesigner basic version features 15 motion laws (based on the dwell-to-dwell (interpolation method)
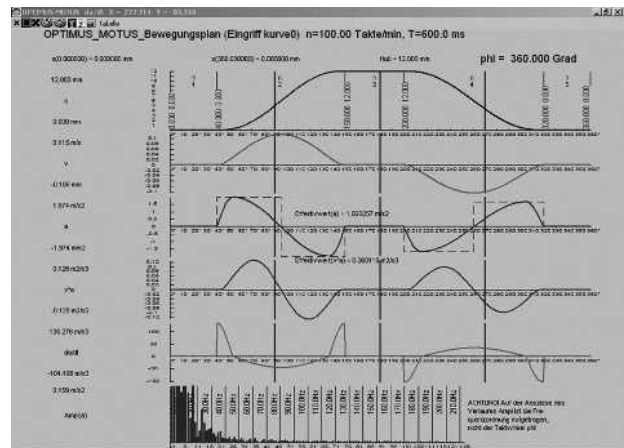
Evaluation of the motion profile
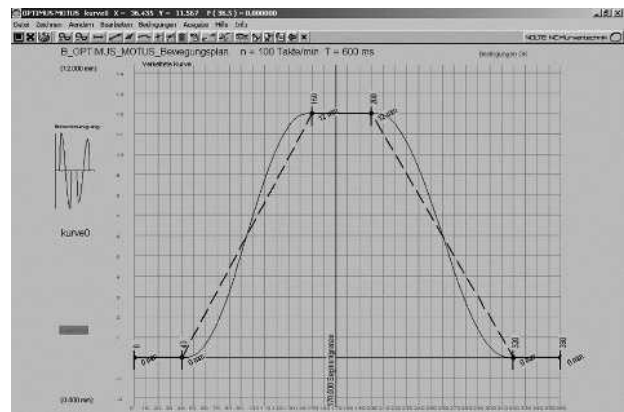
Cam generation with the integrated CamEditor

Advantages offered by international standards in programming
IEC61131-3 Programming language

IEC61131-3 is the only company- and product-independent programming language with worldwide support for industrial automation devices.

- IEC61131-3 includes graphical and textual programming languages:
  - Instruction list
  - Structured text
  - Ladder diagram
  - Sequential function chart
  - Function block diagram

• Integrated standards offer:
  - A trusted programming environment
  - Standardized programming
• Integrated standards reduce:
  - The overhead of development
  - Maintenance costs
  - Software upkeep
  - Training overhead
• Integrated standards increase:
  - Productivity
  - Software quality
  - Concentration on core competence

Program development in IL

```
0001 FUNCTION_BLOCK AWL_EXAMPLE
0002 (* Sinus und CoSinus einer Zahl berechnen *)
0003 VAR_INPUT
0004    r1: REAL := 0.0;
0005 END_VAR
0006 VAR_OUTPUT
0007    sinus: REAL;
0008    cosinus: REAL := 9.9;
0009 END_VAR
```

```
0001    (* Den Sinus einer Zahl berechnen und mit 1000 multiplizieren *)
0002 LD    r1
0003 SIN
0004 MUL       1000.0
0005 ST    sinus
0006 (* Den Cosinus einer Zahl berechnen und mit 1000 multiplizieren *)
0007 LD    r1
0008 COS
0009 MUL       1000.0
0010 ST    cosinus
0011
0012 (* Die Zahl weiterschalten *)
0013 LD    r1
0014 ADD       0.1
0015 ST    r1
0016
```

Instruction list (IL)
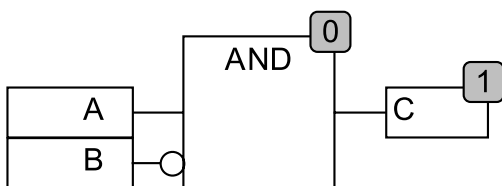
```
LD          A
ANDN        B
ST          C
```

Ladder diagram
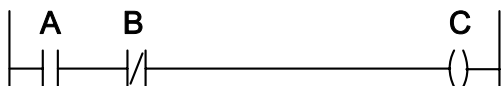
Structured text

```
C := A AND NOT B
```

Function plan

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Function modules based on PLCopen

PLCopen is a product- and company independent organization that plays a significant role in supporting the IEC61131-3 programming language. Its specific tasks also include defining basic processes relevant to motion. The PLCopen organization consists of both users and manufacturers of automation components.

Parker Hannifin is an active member of the "Motion Control" task force. This is a great advantage for the users of Parker drive technology, since they are constantly able to profit directly from the latest developments in PLCopen.

Professional development tool CoDeSys

CoDeSys is a development environment for programming that saves a significant amount of time as applications are created.

• One of the most powerful development environments available, established world-wide
• Universal programming platform for various devices
• Visual elements
• Library management for user-defined applications
• Context-sensitive help wizard
• Data exchange between devices from different manufacturers
• Complete online functionality
• Sophisticated technological features
• . . . and all this for no additional cost

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Program development in CFC
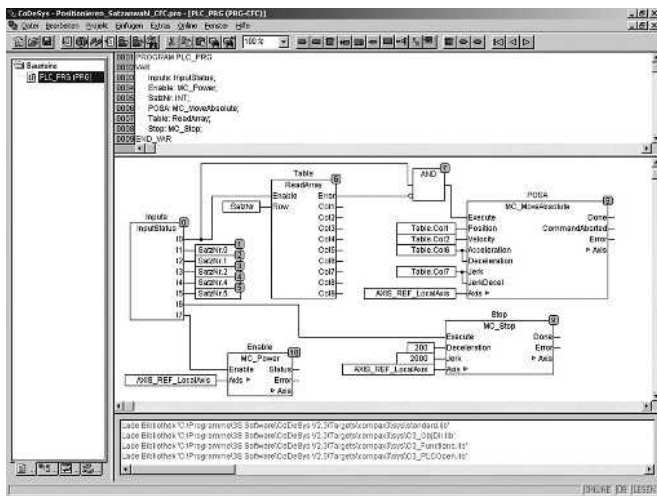
Project management

Saving an entire project (source file) including symbols and comments to make service calls easier, because there is no need for any project data on the device itself

- Archiving projects as ZIP files
- Creating user-specific libraries that can be reused as tested sections of programs
  - These libraries can be protected
  - Examples include winders, synchronization components etc.
- Various user levels make it possible to lock sections of the program with passwords
- Depending on the task at hand, users can select from among 5 IEC languages plus CFC. These languages can also be mixed

Parker is a member of the "CoDeSys Automation Alliance".

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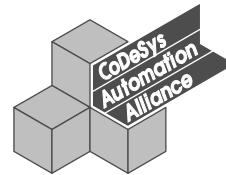
Dimensions
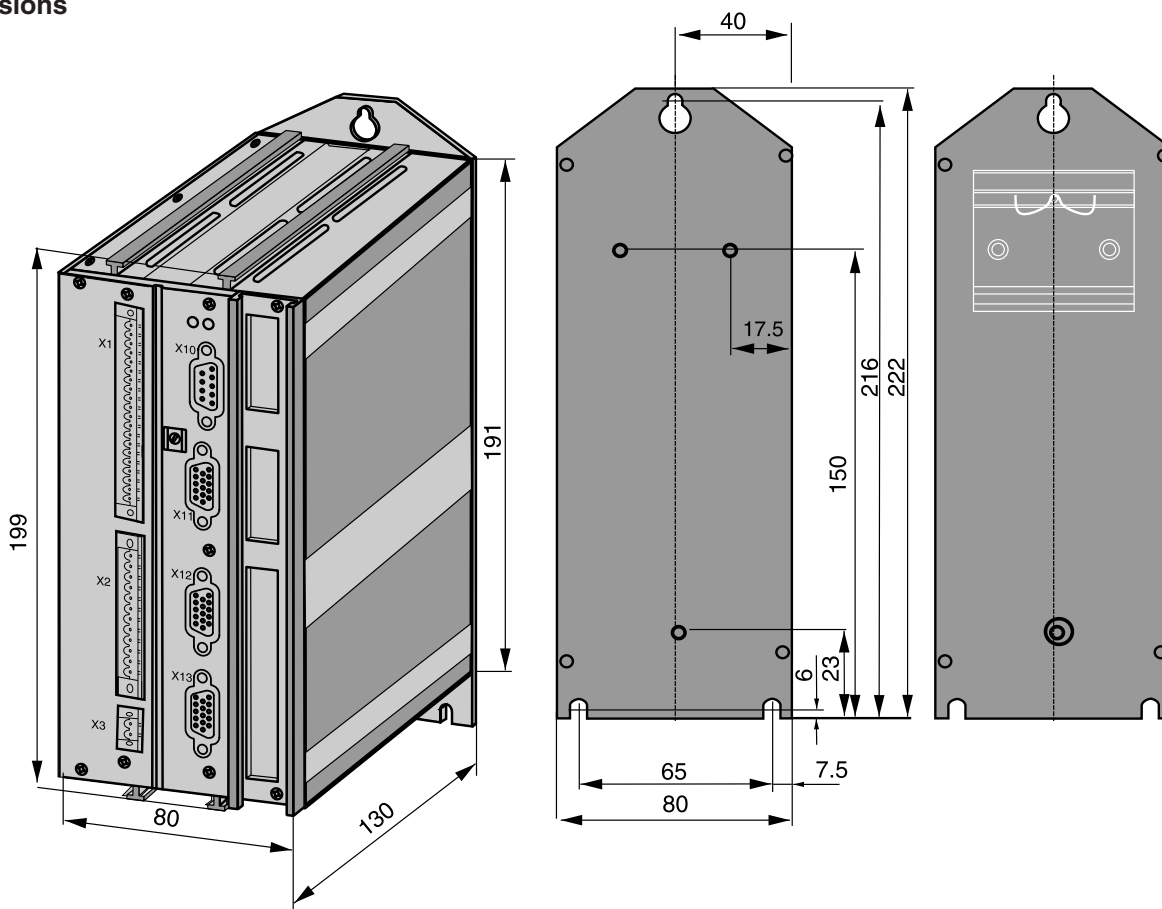
Connection set ZBH02/04

Complete kit with mating plug connectors (X1, X2 and X3) for Compax3 connectors and special shield connecting terminal

Feedback cable GBK../..

• Connection to the Motor:

Under the designation "REK.. + GBK.." (Feedback cable) we can deliver feedback connecting cables in various lengths to order.

• Prefabricated with plug and cable eye
• The plugs of the Parker motor and feedback cables contain a special surface area screening.
• Cable plans, if you wish to make up your own cables

Terminal block EAM06/..

• For additional wiring of the inputs and outputs:
• Available with or without LED display
• Can be mounted in the control cabinet on a supporting rail
• Connection EAM06/.. via SSK23/..to X11, SSK24/.. to X12

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

RS232 cable SSK01/..

(in various lengths).
Configuration:
Via a PC with the aid of the Compax3 ServoManager.
Communication:
Communication with Compax3 either via RS232 or via RS485 in order to read or write into objects.

Profibus plug BUS08/01

• BUS08/01 with 2 cable inputs (1x BUS08/01 incoming, 1x BUS08/01 continuing) and screw terminals, as well as a switch for activating the terminating resistor. Set to ON for first and last bus node terminating resistor activated.
• **Profibus cable: SSL01/.. not prefabricated**
• Special cable in any length for Profibus wiring (colors according to DESINA).

Operating module BDM01/01

• For display and diagnosis purposes:
• Can be plugged in during operation
• Power supply via Compax3 servo control
• For displaying and changing values

HEDA Bus

• HEDA bus terminal connector (RJ45) BUS07/01:
• For the first and last Compax3 in the HEDA bus.
• HEDA cable: SSK28/.. prefabricated in various lengths:
• Cable for HEDA bus wiring from Compax3-to-Compax3 or PC-to-Compax3 powerPLmC.

CANbus plug BUS10/01

• BUS10/01 with 2 cable inputs (1x BUS10/01 incoming, 1x BUS10/01 continuing) and screw terminals, as well as a switch for activating the terminating resistor. Set to ON for first and last bus node terminating resistor activated

CANbus cable SSL02/.. not prefabricated

• Special cable in any length for CANbus wiring (colours according to DESINA)

External Inputs/Outputs PIO...

For Compax3 I21 from technology function T30 onwards via CANopen:
• Integration of additional external input and output modules (digital and analog)

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Connection set for Compax 3										
for C3F001 D2 F12xxx	ZBH 02/04	Z	B	H	0	2	/		0	4
Operating module										
Operating module		B	D	M	0	1	/		0	1
Terminal block										
for I/Os without luminous indicator	for X11, X12	E	A	M	0	6	/		0	1
for I/Os with luminous indicator	for X12	E	A	M	0	6	/		0	2
Interface cables and connectors										
PC-Compax3 (RS232)		S	S	K	0	1	/		...	...[1]
on X11/X13 (Transducer)	With flying leads	S	S	K	2	1	/		...	...[1]
on X12 (I/O digital)	With flying leads	S	S	K	2	2	/		...	...[1]
on X11(Ref/Analog)	For I/O terminal	S	S	K	2	3	/		...	...[1]
on X12 (I/Os digital)	For I/O terminal	S	S	K	2	4	/		...	...[1]
PC - POP (RS232)		S	S	K	2	5	/		...	...[1]
Compax3 - POP (RS485)		S	S	K	2	7	/	../	...	...[3]
Compax3 HEDA - Compax3 HEDA or PC - C3powerPLmC		S	S	K	2	8	/		...	...[2]
Compax3 X11 - Compax3 X11 (Encoder coupling of 2 axes)		S	S	K	2	9	/		...	...[1]
HEDA bus terminal connector (for the 1st and the last Compax3 in the HEDA Bus)		B	U	S	0	7	/		0	1
Feedback cable for Balluff SSI transducer and start/stop		G	B	K	4	0	/		...	...[1]
Profibus cable [4]	Not prefabricated	S	S	L	0	1	/		...	...[1]
Profibus connector		B	U	S	0	8	/		0	1
CAN-Bus cable [4]	Not prefabricated	S	S	L	0	2	/		...	...[1]
CAN-Bus connector		B	U	S	1	0	/		0	1

[1] Length code

Length code 1 (Example: SSK01/09: Length 25m)

Length [m]	1.0	2.5	5.0	7.5	10.0	12.5	15	20	25	30	50
Code	01	02	03	04	05	06	07	08	09	10	14

[2] Length code for SSK28

Length code 2 (Example: SSK28/22: Length 3m)

| Length [m]	0.25	0.5	1.0	3.0	5.0	10.0
Code	20	21	01	22	03	05

[3] Length code for SSK27

Length A: Cable or connection from POP with **one** Compax3 (POP - 1.Compax3), variable length according to length code[1]
(Example: SSK27/01/01: Length 1.0m)

Length B: Cable or connection from POP with **more than one** Compax3 (nn > 01) (1.Compax3 - 2.Compax3 - …), length between Compax connectors is fixed to 50cm, variable length A from POP with first Compax according to length code[1]
(Example: SSK27/03/01: Length 1.0m)

[4] Colours according to DESINA

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Length code for SSK27
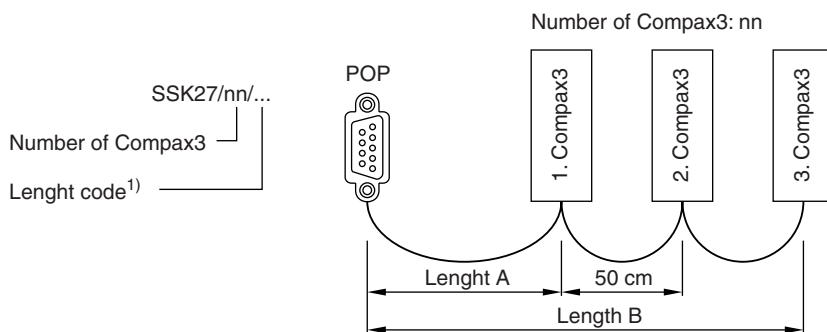
Decentralized Input terminals								
PIO 2DI 24V DC 3.0ms	2-Channel Digital-Input terminal		P	I	O	4	0	0
PIO 4DI 24V DC 3.0ms	4-Channel Digital-Input terminal		P	I	O	4	0	2
PIO 8DI 24V DC 3.0ms	8-Channel Digital-Input terminal		P	I	O	4	3	0
PIO 2AI DC ±10V	2-Channel Analog-Input terminal	(± 10V Differential input)	P	I	O	4	5	6
PIO 4AI 0-10V DC S.E.	4-Channel Analog-Input terminal	(0-10V Signal voltage)	P	I	O	4	6	8
PIO 2AI 0-20mA	2-Channel Analog-Input terminal	(0 - 20mA Differential input)	P	I	O	4	8	0
Decentralized Output terminals								
PIO 2DO 24V DC 0.5A	2-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	0	1
PIO 4DO 24V DC 0.5A	4-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	0	4
PIO 8DO 24V DC 0.5A	8-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	3	0
PIO 2AO 0-10V DC	2-Channel Analog-Output terminal	(0-10V Signal voltage)	P	I	O	5	5	0
PIO 4AO 0-20mA	2-Channel Analog-Output terminal	(0-20mA Signal voltage)	P	I	O	5	5	2
PIO 2AO DC ±10V	2-Channel Analog-Output terminal	(±10V Signal voltage)	P	I	O	5	5	6
CANopen Fieldbus coupler								
CANopen Standard			P	I	O	3	3	7
CANopen ECO			P	I	O	3	4	7

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Single-phase power units providing direct current are preferable and suitable for the power supply to electronic modules and proportional valves. The windings of these transformers are separated for safety and provided with isolated screened windings with earthing.

Features

- Safety transformer to EN 60742 with integrated fuse
- Primary and secondary windings fitted with shielded windings with earth connection
- Optimal voltage accommodation with ±10V tappings
- Low ripple of 5% at full load
- Integrated LED operational indicator of output voltage

CE

Characteristics

Nominal input voltage	[VAC]	110/230
Regulation/Tappings at	[V]	+/-10
Frequency	[Hz]	50/60
Operating temperature	[°C]	-20 to +60
Nominal output voltage	[VDC]	24
Output voltage at zero load	[VDC]	30.5
Output voltage at full load	[VDC]	22.4
Ripple	[%]	below 5
Protection		IP 00
Construction		VBG 4
Regulations / Test voltages		EN 60742

Ordering code

EX	00	—	☐	10
Electronic module			**Module type**	**Design series**
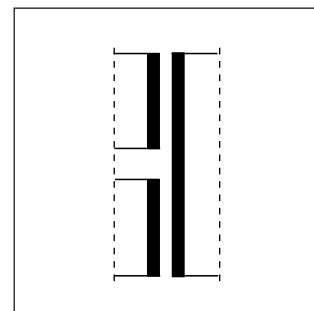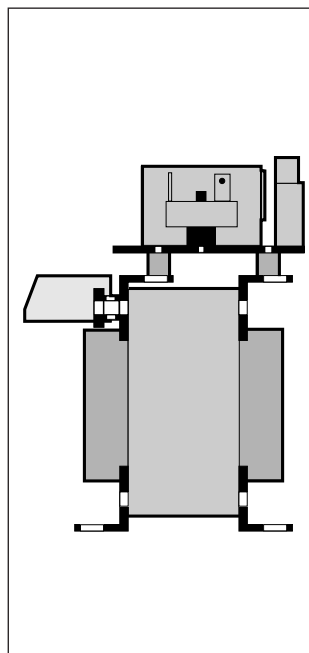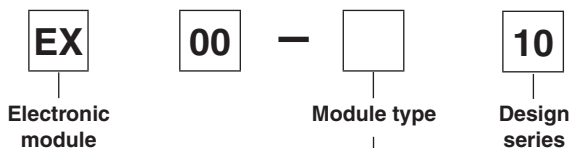
Code	Power (VA)	Nominal current/ In (A) AC [1]	Nominal current/ Out (A) DC
N08	**240VA**	**3.4/1.6**	**10.0**

[1] at 110/230V AC

Bold letters =
Short-term availability

Block diagram
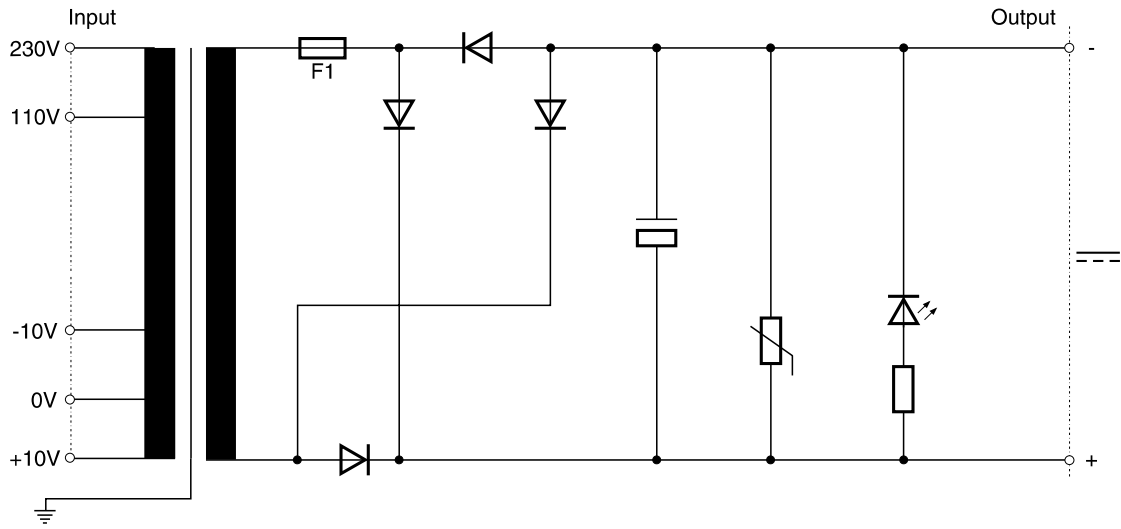
Dimensions
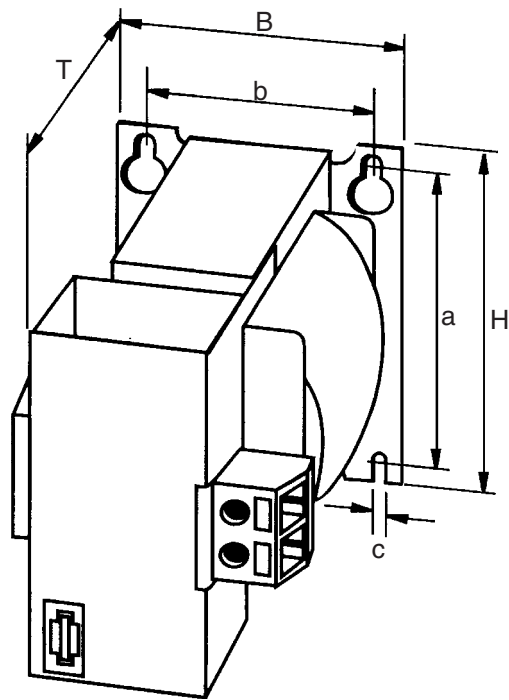
Code	H	B	T	a	b	c	kg
EX00-N08	120	113	173	90	94.5	5.8	6.3

Note

To guarantee air convection the module has to be mounted in a hanging position.

The test unit EX00-M03 is suitable for the control of proportional valves incorporating integrated electronics. It provides commissioning and function tests independently of the machine control system. The test unit is provided with all necessary signal and measurement taps, making it possible to proceed initial operation and diagnosis.

Features

- Control of valves incorporating integrated electronics and central plug acc. DIN 43563 (6p.+PE)*
- Mains connection selectable 230/115VAC
- Built-in fuses
- Cord set included
- Integrated digital voltmeter with
- test point selector switch
- Test jacks
- Rugged metal enclosure with handles

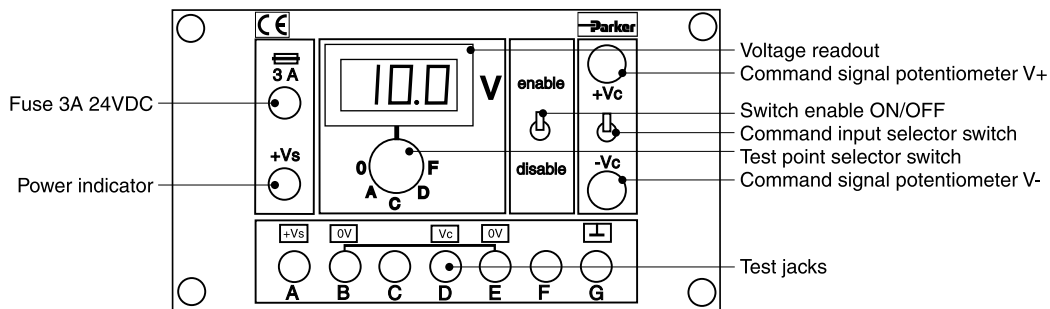* not usable for D*FP valve series

CE

EMC

EN 50081-1
EN 50082-2

Technical data

Design			Aluminium die cast enclosure
Supply voltage		[V]	115/230, 50...60Hz
Power consumption		[VA]	max. 80
Current consumption max.		[A]	0.7 / 0.35
Mains input fuse		[A]	2 time lag
Valve output fuse		[A]	3 time lag
Required mains supply fuse		[A]	16
Protection class			IP40
Valve central connection			
	Valve supply	[V]	24 (±20%)
	Command voltage	[V]	0...±10 (±1%)
	Diagnostic output	[V]	0...±10
	Enable signal	[V]	7.5 (±10%)
Measurement terminals			For multimeter with Ri min = 10kOhm
Display			
	Display digits		3
	Resolution	[mV]	100
Mains cord			
	Unit site		Cold inlet connector IEC320
	Mains site		CEE 7/7 plug
	Cord length	[m]	2
Valve cord			
	Unit site		Cable mount inlet DIN 40 040 Amphenol SV70
	Valve site		Cable mount outlet DIN 43 563
	Cord length	[m]	3
Ambient temperature		[°C]	0...40
Weight		[kg]	3.2
Dimensions		[mm]	L 220 x B 120 x H 90 (without handles)

EXM03_UK.INDD CM_18.01.08.1

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Ordering code

EX	00	—	M03	

Test unit   **Series**

Operator panel
Front

Fuse 3A 24VDC

Power indicator

Voltage readout
Command signal potentiometer V+
Switch enable ON/OFF
Command input selector switch
Test point selector switch
Command signal potentiometer V-

Test jacks

Rear

Valve control output socket

Voltage selector / mains fuse
Mains switch
Mains input 230/115 VAC

Wiring configuration