Parker Hannifin Corporation
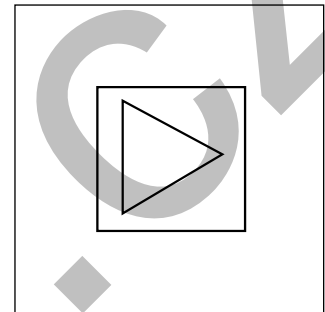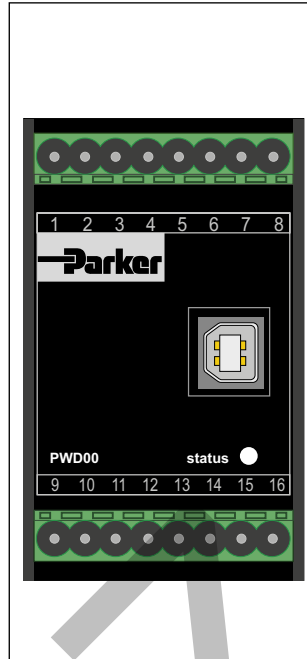
11

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*1FB). The most important features are:

- Digital circuit design
- Four parameterizable command channels
- Constant current control
- Differential input stage
- Status output
- Four-quadrant ramp function
- Enable input for solenoid driver
- Status indicator
- Parametering by USB interface
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Comfortable PC user software, free of charge: www.parker.com/isde - see "Support", or directly at www.parker.com/propxd.

C E

Ordering code

PWD	00		—	400	—	
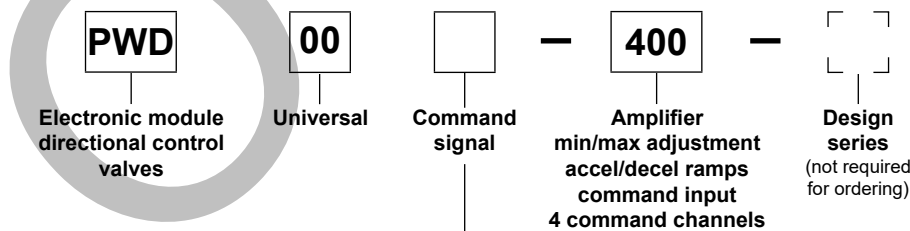
Code	Command signal
A	0...+/- 10 V
B	0...5...10 V

Electronic module directional control valves | Universal | Command signal | | Amplifier min/max adjustment accel/decel ramps command input 4 command channels | | Design series (not required for ordering) |

11

Technical data

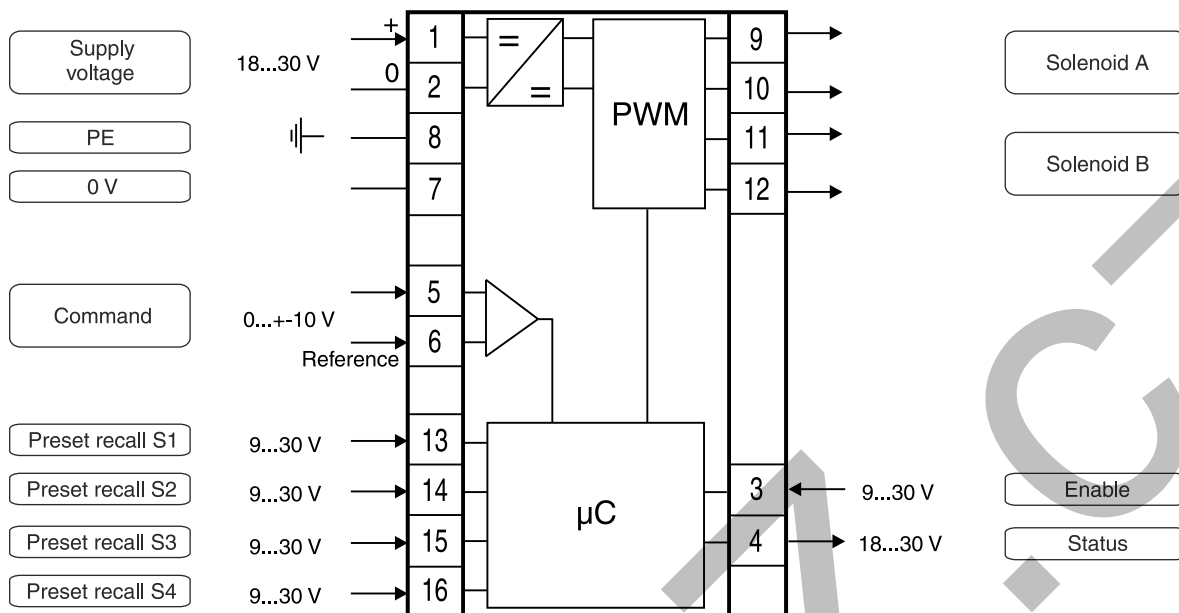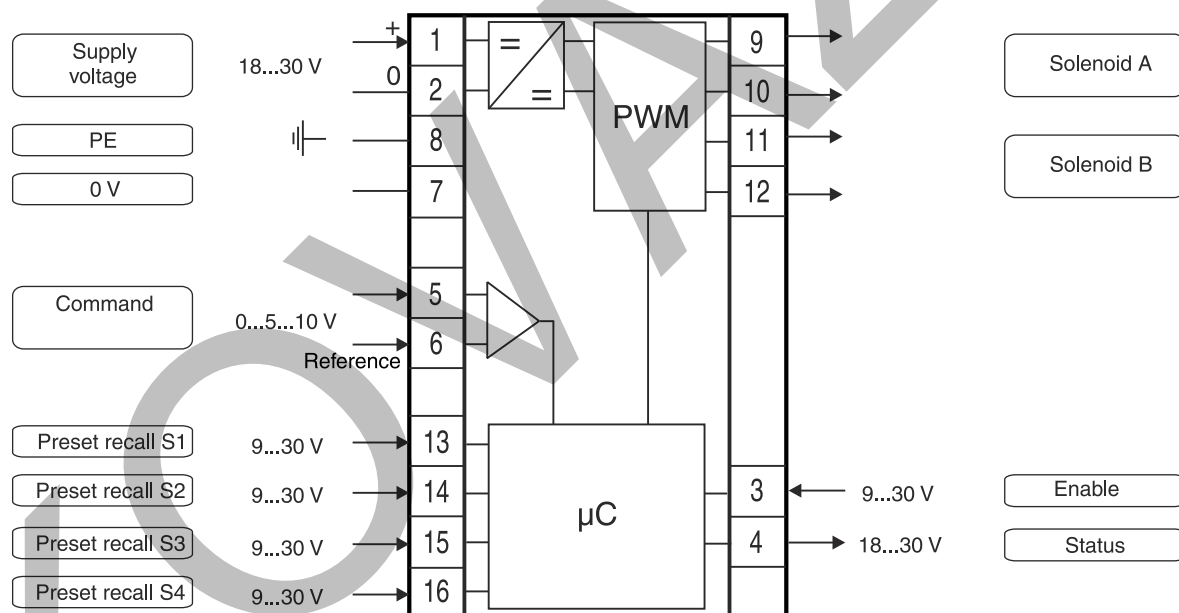| General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		unrestricted
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5 % eff., surge free [1]
Current consumption max.	[A]	2.2
Pre-fusing	[A]	2.5, 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...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Command channel signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Current	[A]	0.8 / 1.3 / 1.8 / 2.7 / 3.5
Interface		USB type B
EMC		EN IEC 61000-6-2, EN IEC 61000-6-4
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[mm²]	1.5 overall braid shield for supply voltage and solenoids (AWG16)
	[mm²]	0.5 overall braid shield for sensor and signal (AWG20)
Cable length	[m]	50

Dimensions

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

PWD00A UK.indd 05.08.22

Circuit Diagram PWD 00A-400

Supply voltage	18...30 V	+	1	= / =	PWM	9	→	Solenoid A
		0	2			10	→	
PE	⏚		8			11	→	Solenoid B
0 V			7			12	→	

Command — 0...+-10 V → 5 ▷

6 — Reference

Preset recall S1	9...30 V	→	13				
Preset recall S2	9...30 V	→	14	µC	3	← 9...30 V	Enable
Preset recall S3	9...30 V	→	15		4	→ 18...30 V	Status
Preset recall S4	9...30 V	→	16				

Circuit Diagram PWD 00B-400

Supply voltage	18...30 V	+	1	= / =	PWM	9	→	Solenoid A
		0	2			10	→	
PE	⊣⏚		8			11	→	Solenoid B
0 V			7			12	→	

Command — 0...5...10 V → 5 ▷

6 — Reference

Preset recall S1	9...30 V	→	13				
Preset recall S2	9...30 V	→	14	µC	3	← 9...30 V	Enable
Preset recall S3	9...30 V	→	15		4	→ 18...30 V	Status
Preset recall S4	9...30 V	→	16				

11

Signal flow diagram

Command
channels
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

Command

P1 Offset
Zero

Solenoid A

Solenoid B

IB Range
Solenoid
current

11

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be monitored and modified. Storage of complete parameter sets 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 other valves. Inside the electronics a nonvolatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/propxd.

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 electronics via serial USB interface
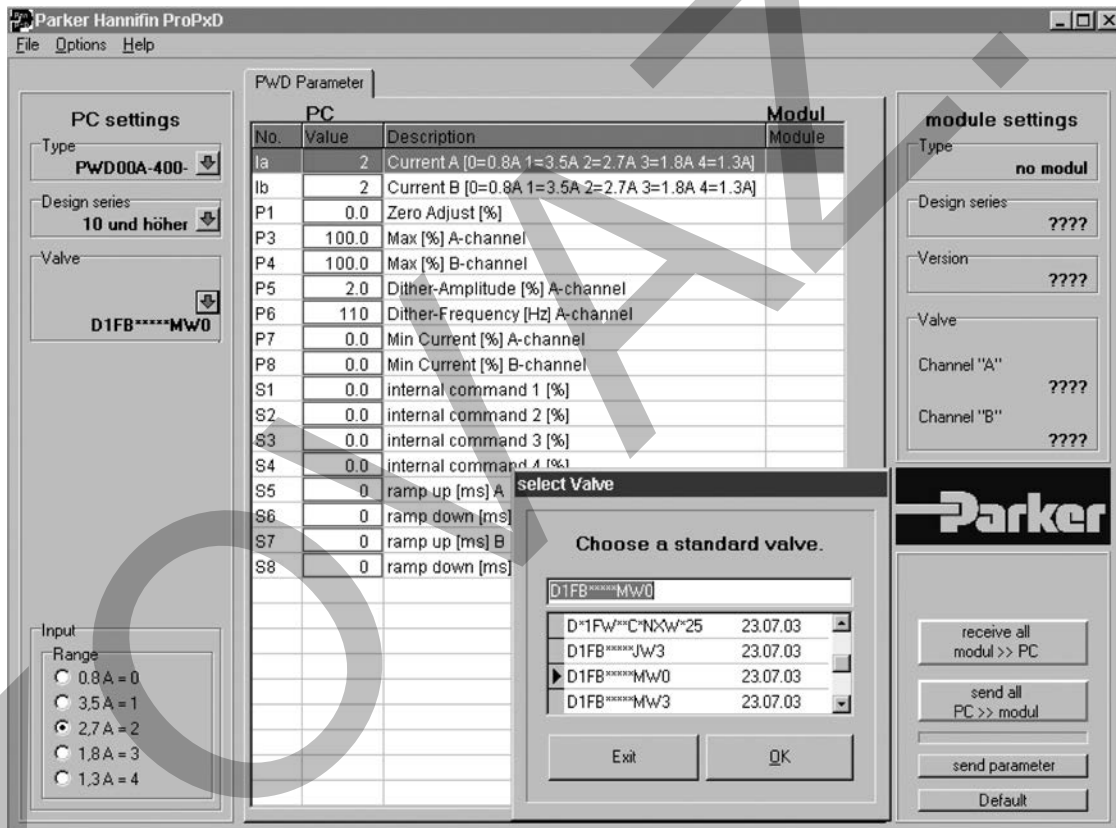
Parker Hannifin Corporation

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. 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 USB interface
- 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 PC user software, free of charge: www.parker.com/isde - see "Support", or directly at www.parker.com/propxd.

$C \in$

Ordering code

PWD	XX	A	–	40	–		–	
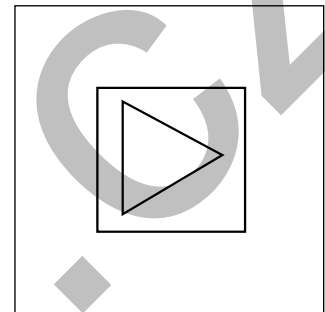
Electronic module proportional valves

Closed loop control universal

Amplifier min/max adjustment accel/decel ramps command input

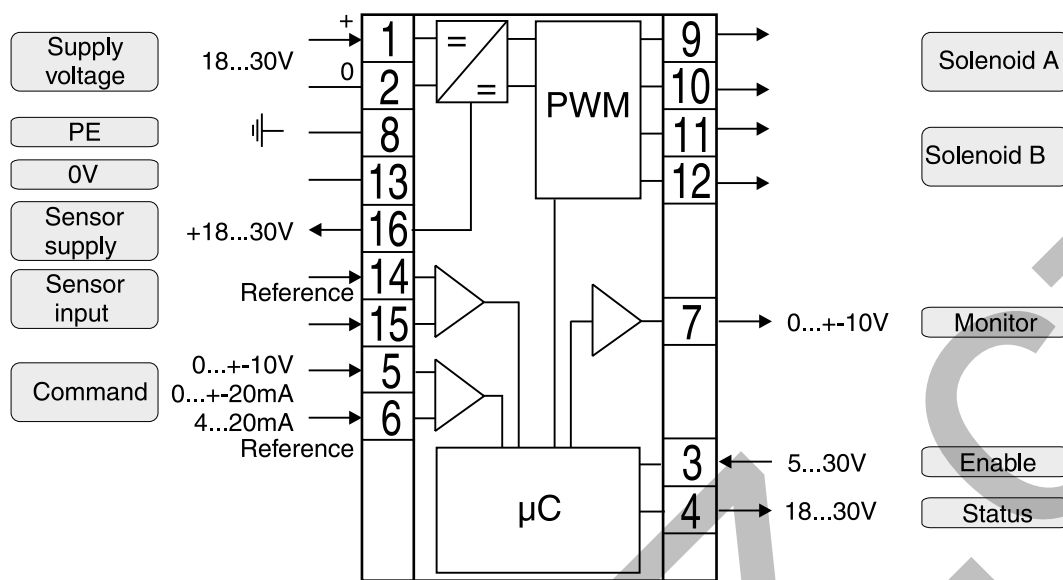Technology function

Design series (not required for ordering)

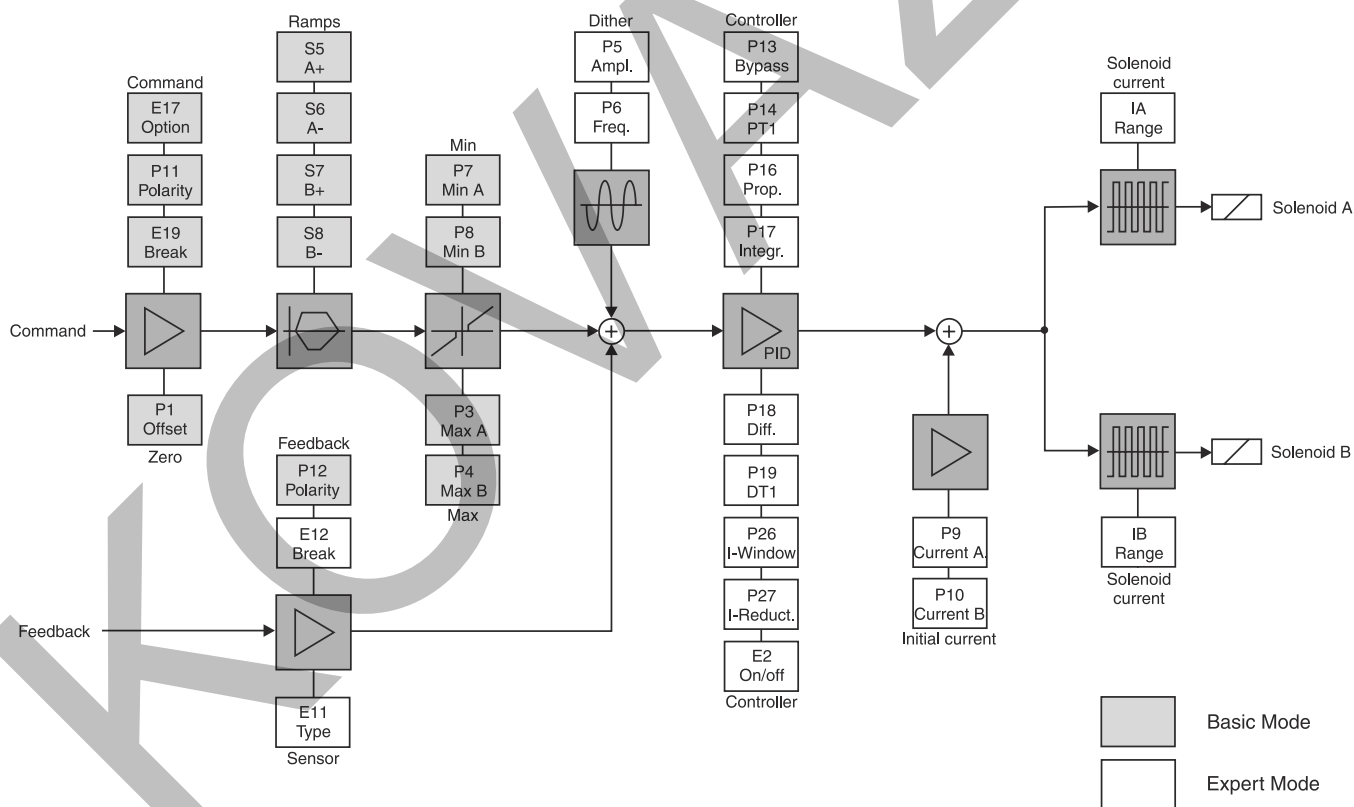| Code	Function
0	Standard
1	Linearization option

11

Technical data

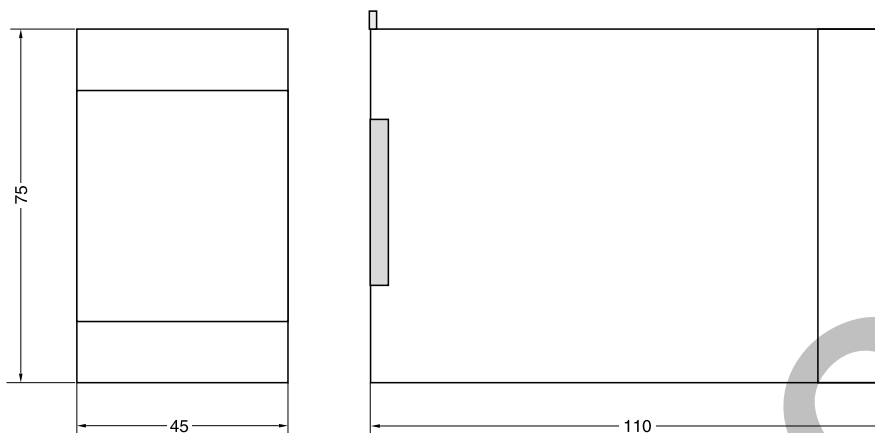| General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		unrestricted
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
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, medium lag
Command signal options	[V] [mA] [mA]	+10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm +20...0...-20, ripple <0.01 % eff., surge free, Ri = 200 Ohm 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] [V]	30 for terminals 5 and 6 against PE (terminal 8) 11 for terminals 5 and 6 against 0V (terminal 2)
Sensor supply	[V]	18...30 (Us), max. current <100 mA
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 Max Ramp Zero offset Current Initial current	[%] [%] [s] [%] [A] [%]	0...50 50...100 0...32.5 +100...-100 1.3 / 2.7 / 3.5 0...25
Interface		USB type B
EMC		EN IEC 61000-6-2, EN IEC 61000-6-4
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[mm²] [mm²]	1.5 overall braid shield for supply voltage and solenoids (AWG16) 0.5 overall braid shield for sensor and signal (AWG20)
Cable length	[m]	50
Options		
Technology function Code1		Software adjustable transfer function with 10 compensation points for linearization of valve behaviour

11

Parker

Block diagram

Signal flow diagram
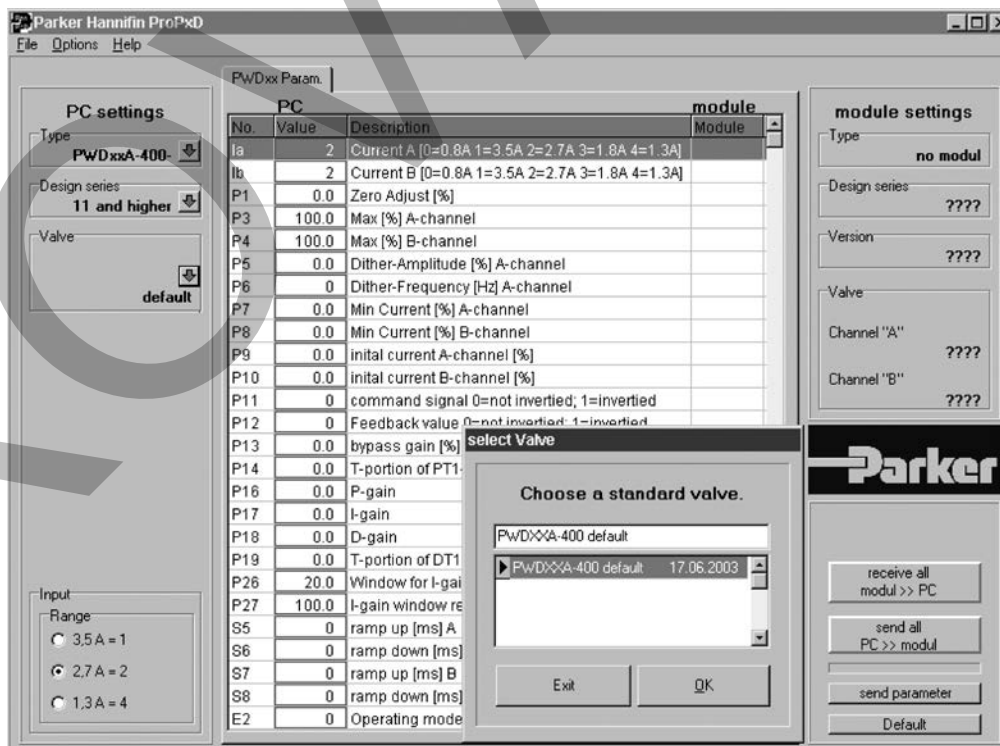
Dimensions

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be monitored and modified. Storage of complete parameter sets 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 other valves. Inside the electronics a nonvolatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/propxd.

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 electronics via USB interface

Catalogue MSG11-3500/UK
Characteristics / Ordering Code

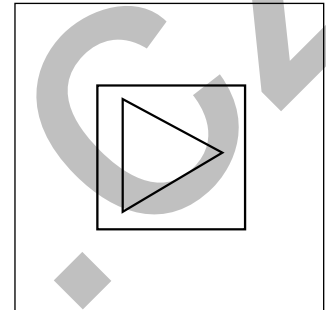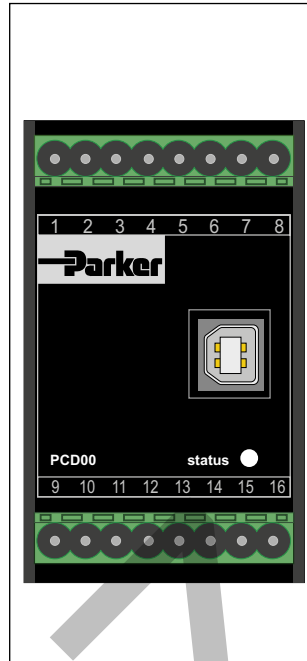E-Module for Prop. Pressure/Flow Control Valves
Series PCD00A-400

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 R*R, R*V, RE*E*W, RE06M*W, DUR, PRPM, VBY, VMY, TDA, TEA).
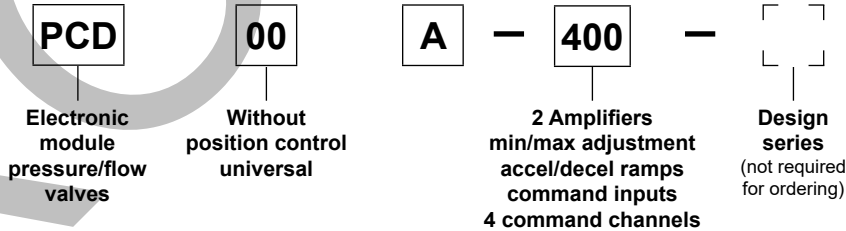
The most important features are:

- Digital circuit design
- Two independent operable amplifiers
- Four parameterizable command channels
- Constant current control
- Two input stages 0...10 V
- Status output
- Two up/down ramp functions
- Enable input for solenoid driver
- Status indicator
- Parametering by USB interface
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Comfortable PC user software, free of charge: www.parker.com/isde - see "Support", or directly at www.parker.com/propxd.

CE

Ordering code

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 channels		Design series (not required for ordering)

11

Catalogue MSG11-3500/UK
Technical Data / Block Diagram

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

Technical data
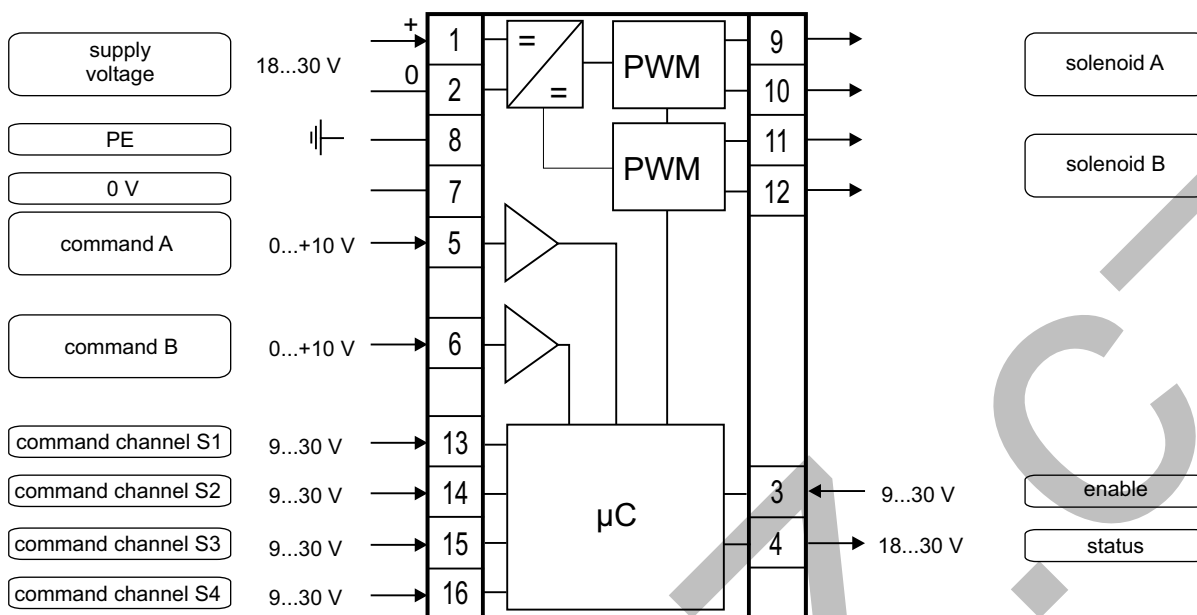
General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		unrestricted
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5 % eff., surge free [1]
Current consumption max.	[A]	5.0
Pre-fusing	[A]	6.3, 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...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Command channel signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Current	[A]	0.8 / 1.3 / 1.8 / 2.7 / 3.5
Interface		USB type B
EMC		EN IEC 61000-6-2, EN IEC 61000-6-4
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[mm²] [mm²]	1.5 overall braid shield for supply voltage and solenoids (AWG16) 0.5 overall braid shield for sensor and signal (AWG20)
Cable length	[m]	50

Dimensions

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

PCD00A UK.indd 05.08.22

Catalogue MSG11-3500/UK
Construction

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

Block diagram

supply voltage	18...30 V	+ / 0	1 / 2
PE			8
0 V			7
command A	0...+10 V		5
command B	0...+10 V		6
command channel S1	9...30 V		13
command channel S2	9...30 V		14
command channel S3	9...30 V		15
command channel S4	9...30 V		16

9, 10 → solenoid A
11, 12 → solenoid B
PWM, PWM, µC

3 ← 9...30 V enable
4 → 18...30 V status

Signal flow diagram

Command channels: S1, S2
Ramps: S5 A+, S6 A-
Min: P7 Min A
Max: P3 Max A
Dither: P5 Ampl., P6 Freq.
Solenoid current: IA Range

Command A → Solenoid A

Command channels: S3, S4
Ramps: S7 B+, S8 B-
Min: P8 Min B
Max: P4 Max B
Dither: Q5 Ampl., Q6 Freq.
Solenoid current: IB Range

Command B → Solenoid B

Catalogue MSG11-3500/UK
Interface Program

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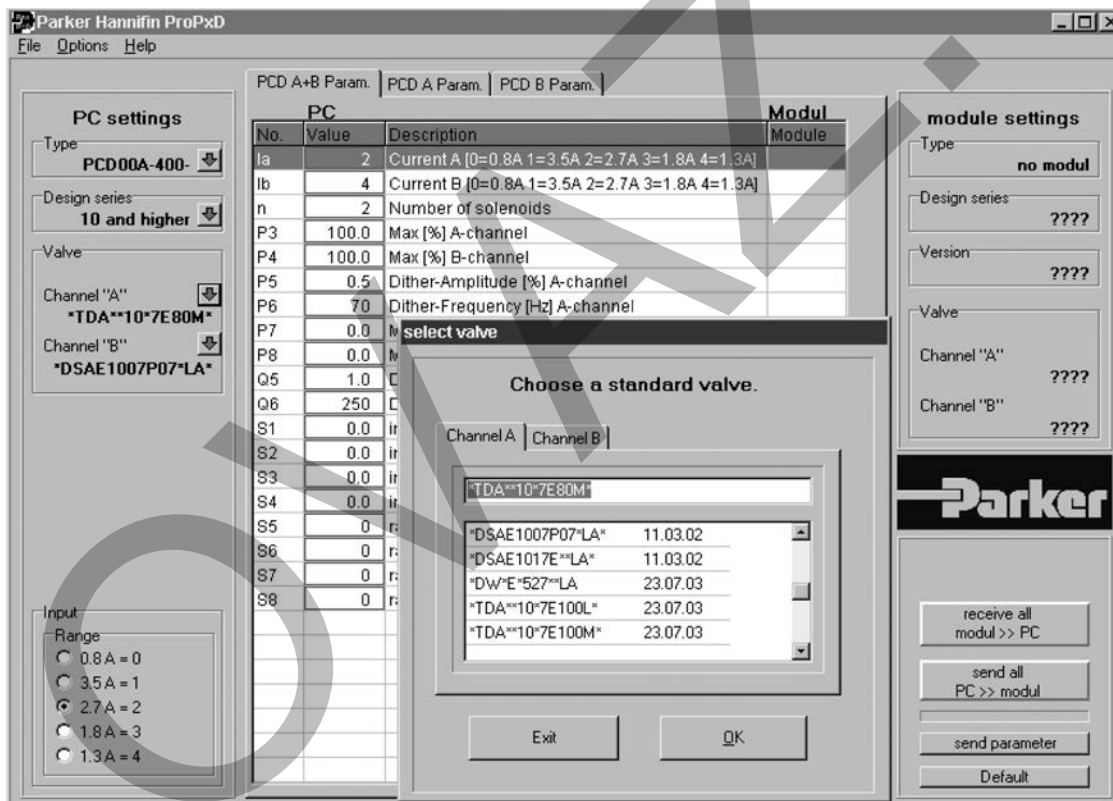**Series PCD00A-400**

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be monitored and modified. Storage of complete parameter sets 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 other valves. Inside the electronics a nonvolatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/propxd.

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
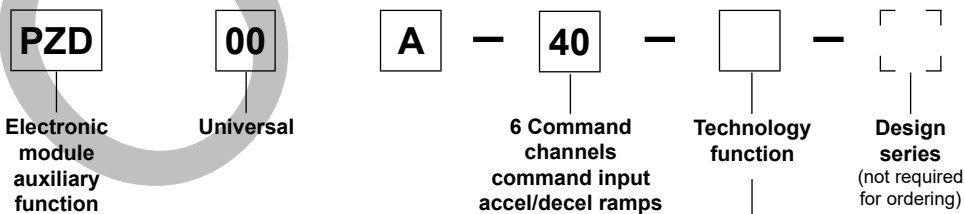- Plain communication between PC and electronics via USB interface

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 command 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 USB interface
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Optional technology function "linearization"
- Comfortable PC user software, free of charge: www.parker.com/isde - see "Support", or directly at www.parker.com/propxd.

Ordering code

| PZD | 00 | A | — | 40 | — | ☐ | — | ⌐ ¬ |

| Electronic module auxiliary function | Universal | | | 6 Command channels command input accel/decel ramps | | Technology function | | Design series (not required for ordering) |

Code	Function
0	Standard
1	Linearization option

11

Technical data

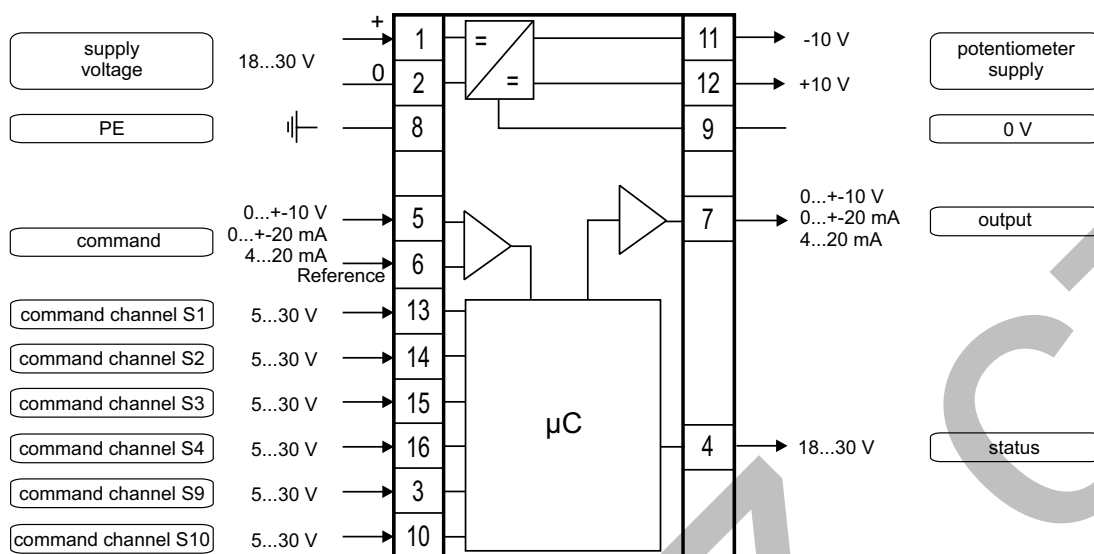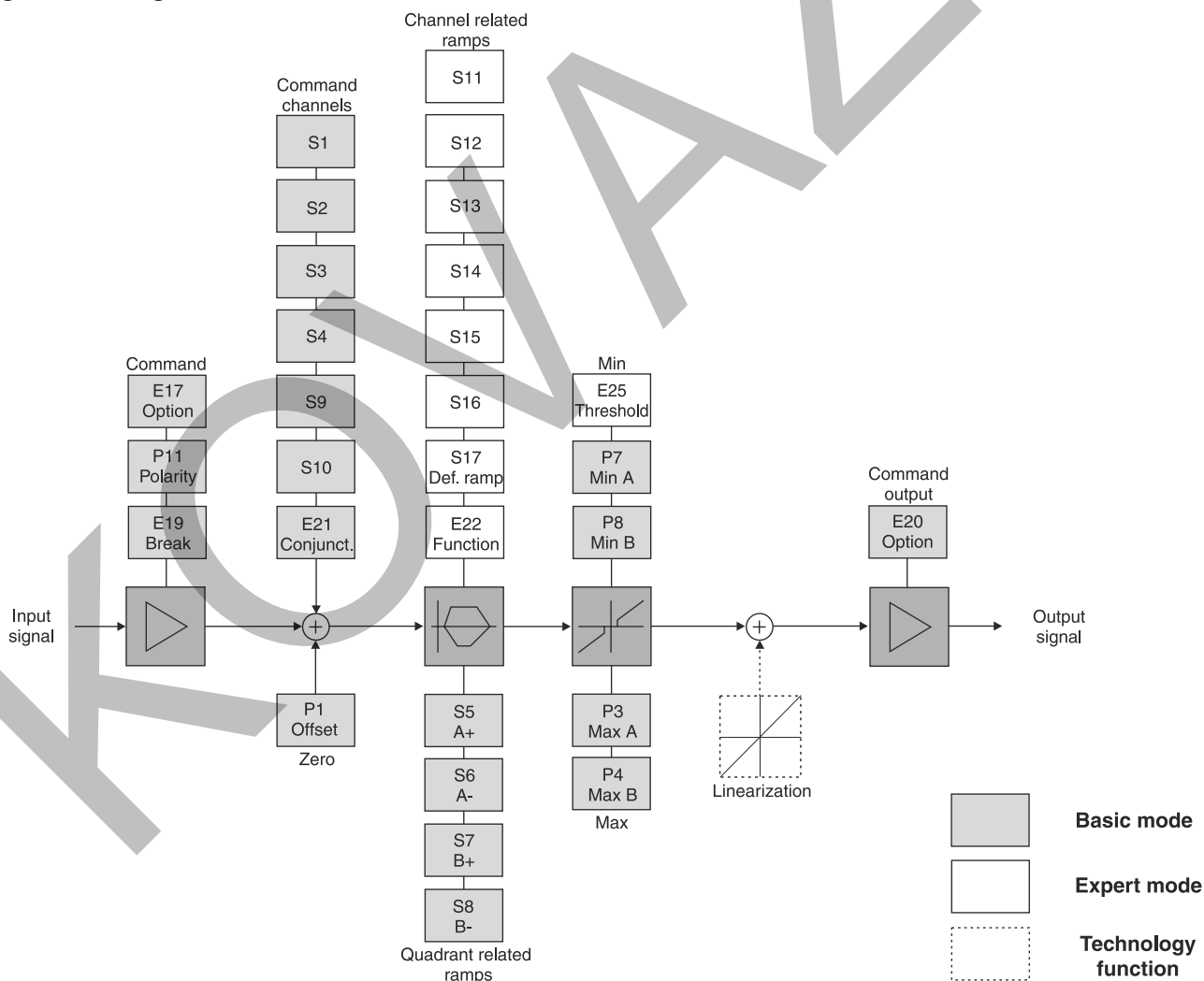| General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		unrestricted
Amb. temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
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 und 6 against PE (terminal 8)
Command channel 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		USB type B
EMC		EN IEC 61000-6-2, EN IEC 61000-6-4
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[mm²]	0.5 overall braid shield (AWG20)
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour

Dimensions

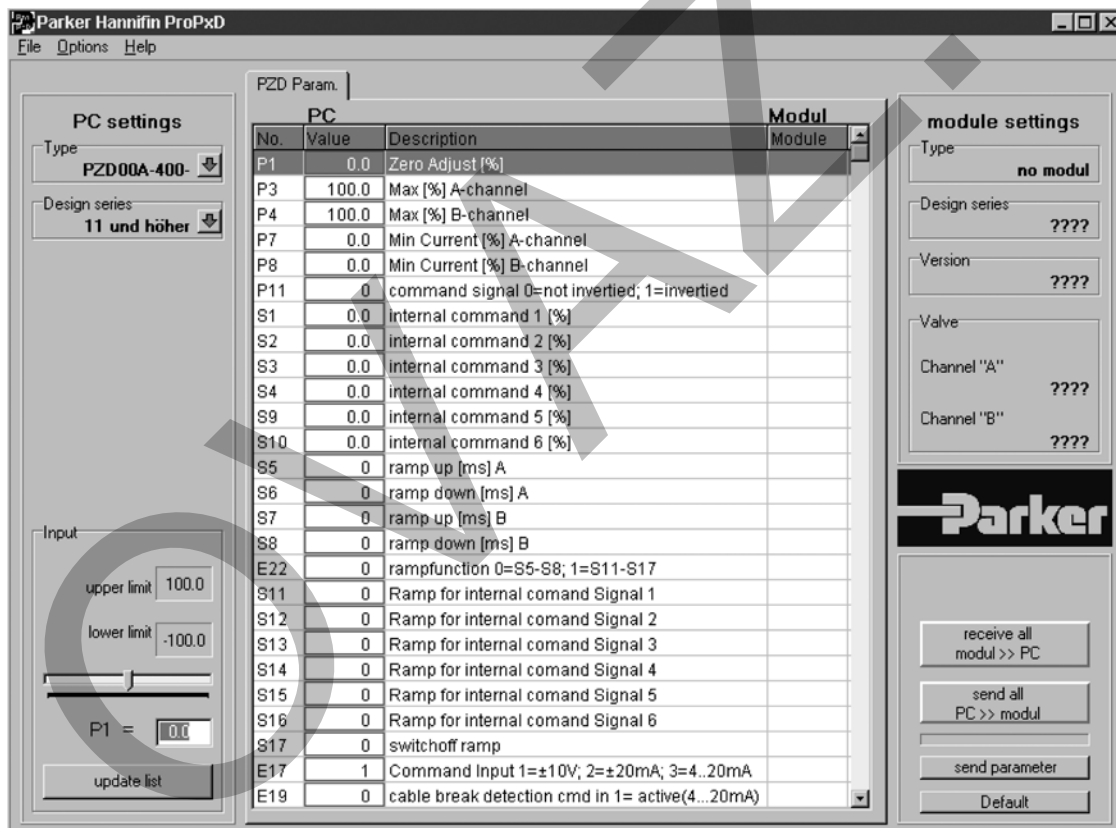## Block diagram

Signal flow diagram

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be monitored and modified. Storage of complete parameter sets 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 other valves. Inside the electronics a nonvolatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/propxd.

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
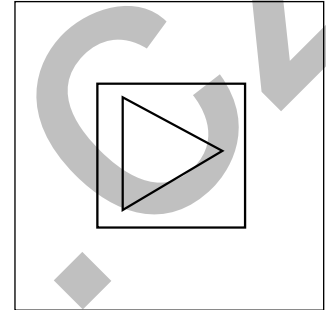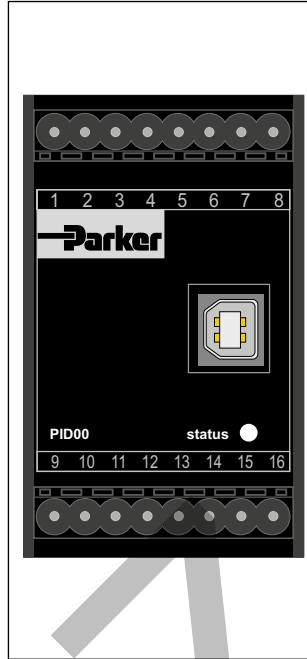- Plain communication between PC and electronics via USB interface

Parker Hannifin ProPxD

File   Options   Help

PZD Param.

PC settings

Type
PZD00A-400-

Design series
11 und höher

PC

No.	Value	Description	Module
P1	0.0	Zero Adjust [%]	
P3	100.0	Max [%] A-channel	
P4	100.0	Max [%] B-channel	
P7	0.0	Min Current [%] A-channel	
P8	0.0	Min Current [%] B-channel	
P11	0	command signal 0=not invertied; 1=invertied	
S1	0.0	internal command 1 [%]	
S2	0.0	internal command 2 [%]	
S3	0.0	internal command 3 [%]	
S4	0.0	internal command 4 [%]	
S9	0.0	internal command 5 [%]	
S10	0.0	internal command 6 [%]	
S5	0	ramp up [ms] A	
S6	0	ramp down [ms] A	
S7	0	ramp up [ms] B	
S8	0	ramp down [ms] B	
E22	0	rampfunction 0=S5-S8; 1=S11-S17	
S11	0	Ramp for internal comand Signal 1	
S12	0	Ramp for internal comand Signal 2	
S13	0	Ramp for internal comand Signal 3	
S14	0	Ramp for internal comand Signal 4	
S15	0	Ramp for internal comand Signal 5	
S16	0	Ramp for internal comand Signal 6	
S17	0	switchoff ramp	
E17	1	Command Input 1=±10V; 2=±20mA; 3=4..20mA	
E19	0	cable break detection cmd in 1= active(4...20mA)	

Input

upper limit 100.0

lower limit -100.0

P1 = 0.0

update list

module settings

Type
no modul

Design series
????

Version
????

Valve

Channel "A"
????

Channel "B"
????

receive all
modul >> PC

send all
PC >> modul

send parameter

Default

11

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.
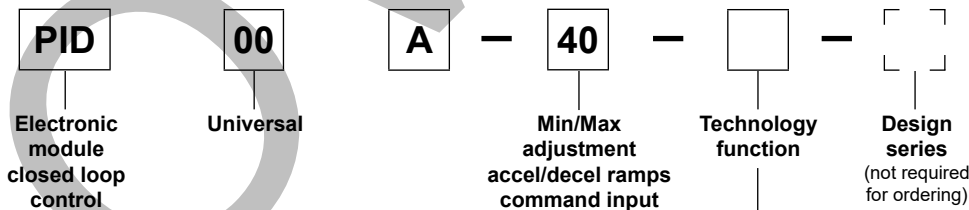
Features

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 USB interface
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Optional technology function "linearization"
- Comfortable PC user software, free of charge: www.parker.com/isde - see "Support", or directly at www.parker.com/propxd.
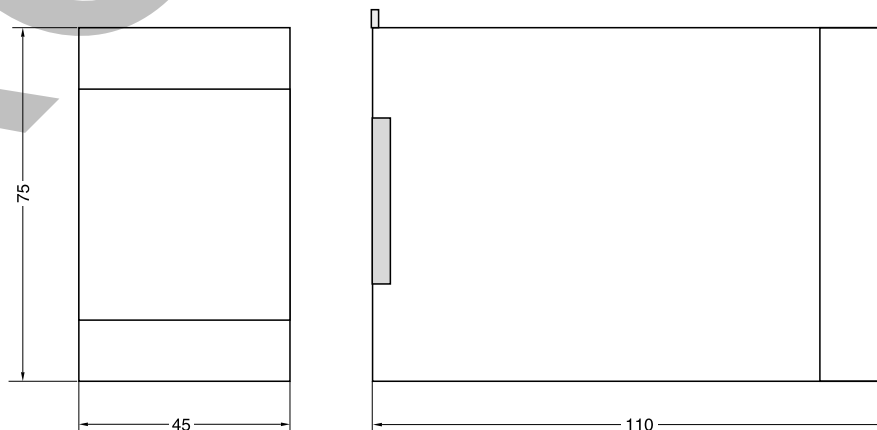
Ordering code

| PID | 00 | A | – 40 | – ☐ | – ☐ |

| Electronic module closed loop control | Universal | | Min/Max adjustment accel/decel ramps command input | Technology function | Design series (not required for ordering) |

Code	Function
0	Standard
1	Linearization option

11

Technical data

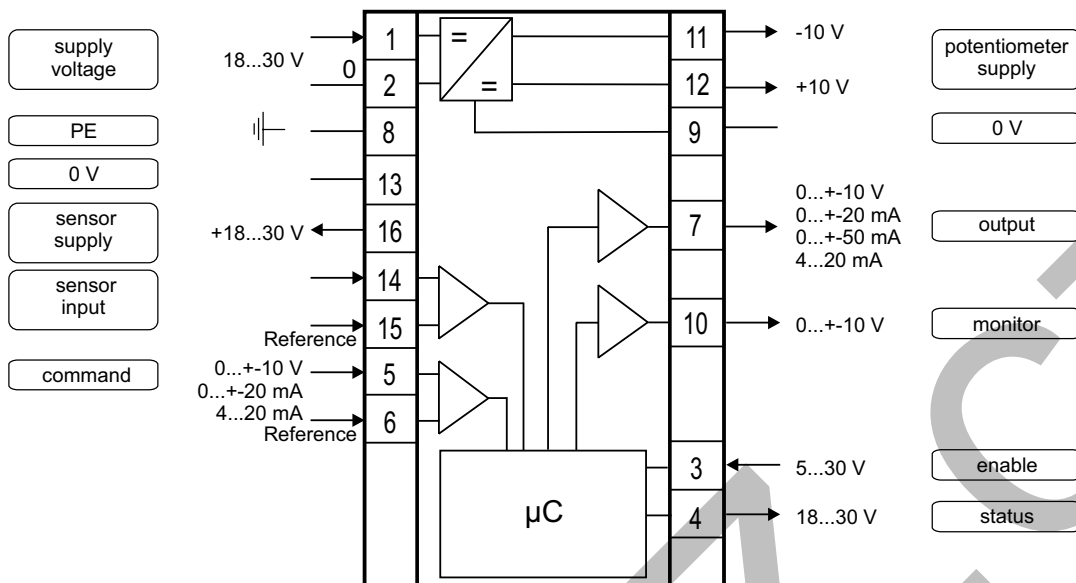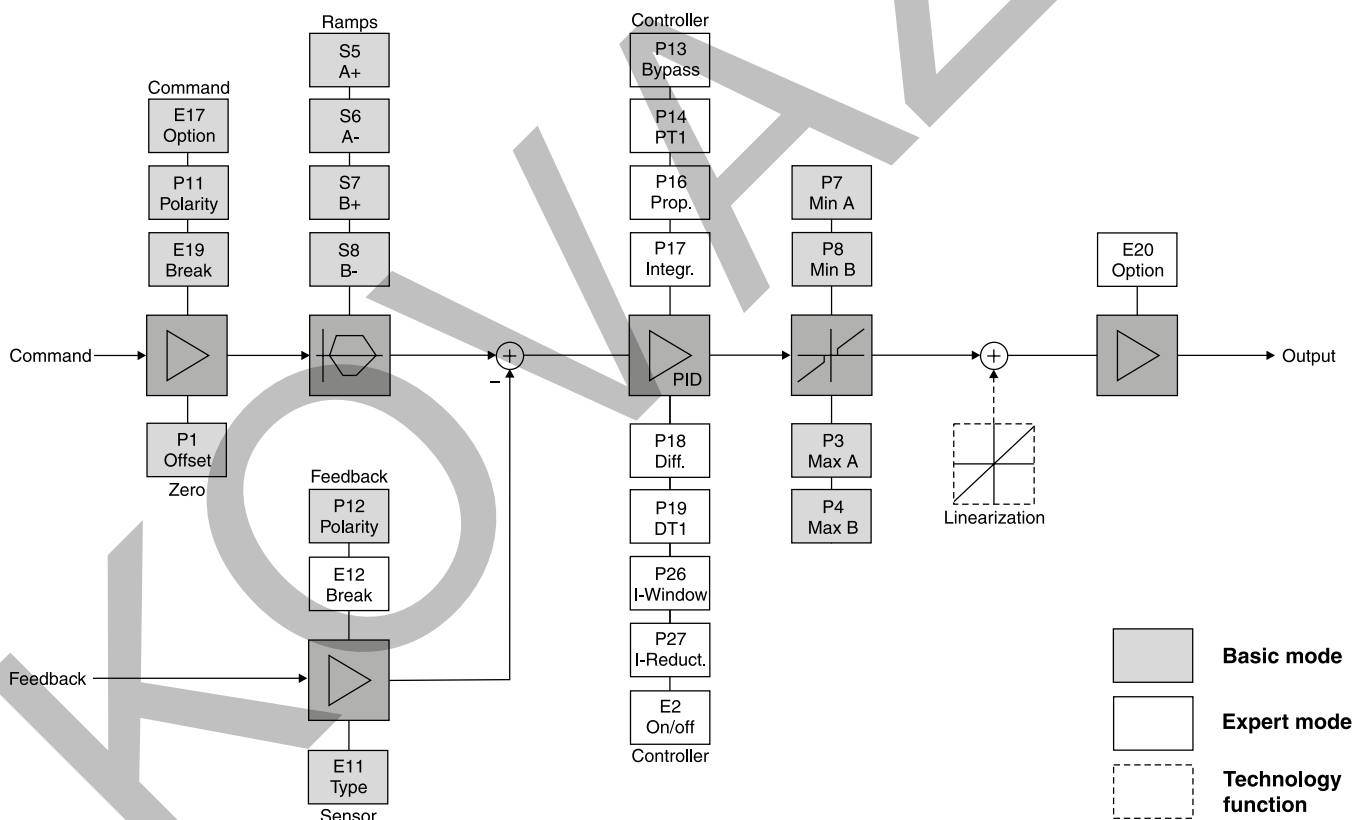| General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		unrestricted
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
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 = <250 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = <250 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...1: 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 %
Output signal options	[V]	+10...0...-10, rated max. 15 mA
	[mA]	+20...0...-20, Ro < 500 Ohm
	[mA]	+50...0...-50, Ro < 200 Ohm
	[mA]	4...12...20, Ro < 500 Ohm
Output signal resolution	[%]	0.025
Potentiometer supply	[V]	+10...0...-10 2 %, rated max. 15 mA
Sensor supply	[V]	18...30 (Us), rated max. 100 mA
Adjustment ranges Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Interface		USB type B
EMC		EN IEC 61000-6-2, EN IEC 61000-6-4
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[mm²]	0.5 overall braid shield (AWG20)
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour

Dimensions

Block diagram

Signal flow diagram

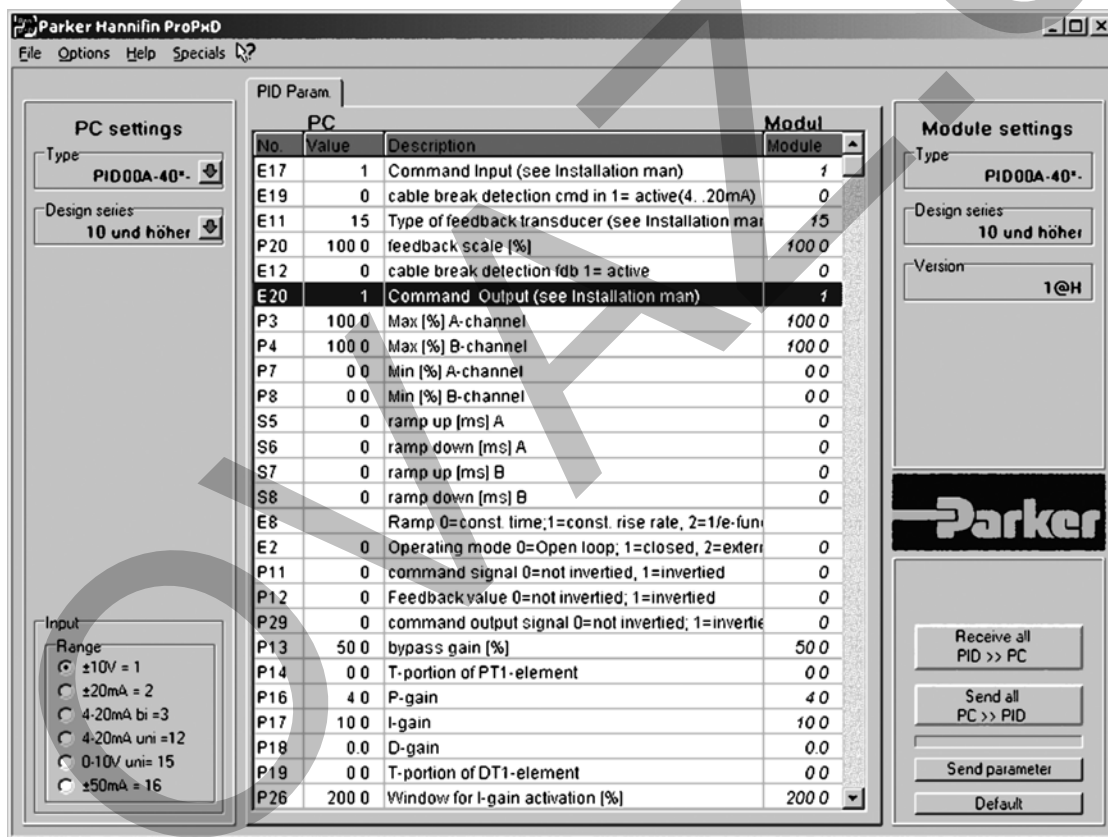|	Basic mode
	Expert mode
	Technology function

11

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be monitored and modified. Storage of complete parameter sets 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 other valves. Inside the electronics a nonvolatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/propxd.

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 electronics via USB interface

The Compax3F is a part 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.
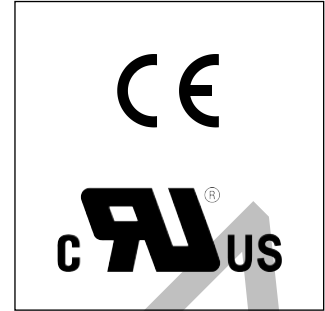
Attention:

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
- Custom-designed software packages on request

Ordering Code

C3	F001	D2	F12	☐	☐	☐

Series — Interface — Technology functions — Options
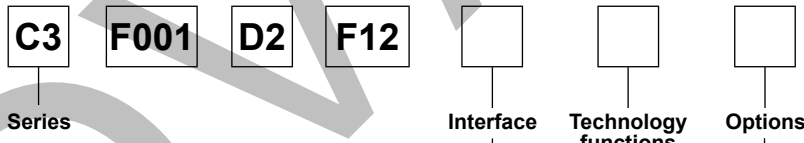
Code	Interface	T11	T30	T40
I11	Digital inputs/outputs		•	•
I12	Digital inputs/outputs	•		
I20	Profibus DP V0/V1/V2 (12 Mbit/s)	•	•	•
I21	CANopen		•	•
I22	DeviceNet		•	•
I30	PowerLink		•	•
I31	EtherCAT		•	•
I32	Profinet	•	•	•

Code	Technology functions
T11	Positioning/pressure and force control
T30	Programmable motion control according to IEC61131
T40	Electronic Cam

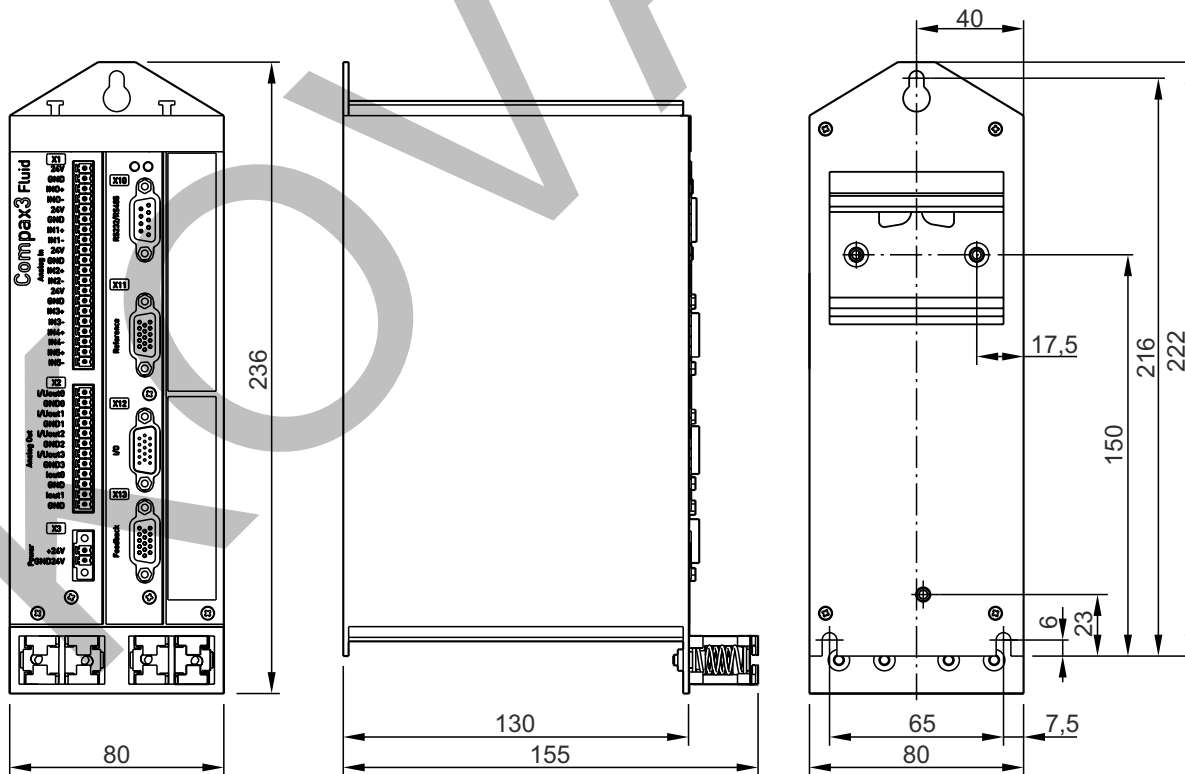| Code	Options
M00	Standards
M10	Extension 12 digital I/Os & HEDA (motion bus)
M11	HEDA (motionbus)
M12	Extension 12 digital I/Os

Connection set for Compax3F included in delivery.

Complete kit with mating plug connectors (X1, X2 and X3) for Compax3 connectors, special shield connecting terminal and snap-on foot for mounting rail

C3F UK.indd 05.08.22

11

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] Current requirements [A]	21...27, ripple <1VSS 0,8 for the device, digital outputs 100 mA each
Supported feedback-systems	• Analog 0..20 mA, 4..20 mA, ±10 V • Start-Stop-Interface • SSI-Interface • EnDat2.2-Interface • 1VSS (max. 400 kHz) Interface, 13.5 Bit / Distance coding • TTL (RS422) (max. 5 MHz), 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: 24 VDC / 10 kOhm • 4 control outputs Active HIGH / short-circuit protected / 24 V / 100 mA • 4 analog current input (14 Bit) • 2 analog voltage input (14 Bit) • 4 analog outputs (16 Bit, current or voltage) switchable in pairs

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

Bus systems	• Profibus DP V0-V2 (I20), 12 Mbit/s, PROFIdrive-Profil Drive technology • CANopen (CiADS402) (I21) • DeviceNet (I22) • PowerLink (I30) • EtherCAT (I31) • Profinet (I32)
CE compliance	• EMC interference emission/limit values for industrial utilization according to EN61 800-3 first environment (commercial and residential area), class A via integrated mains filter for up to 10m cable 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	• Climate (temperature / humidity / barometric pressure) • Class 3K3
Permissible ambient temperature	• Operation: 0 to +45 °C class 3K3 • Storage: -25 to +70 °C class 2K3 • Transport: -25 to +70 °C class 2K3
Tolerated humidity: non condensing	• Operation: <= 85 % class 2K3 • Storage: <= 95 % class 3K3 (relative humidity) • Transport: <= 95 % class 2K3
Elevation of operating site: <=1000 m above sea level for 100 % load ratings	• 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

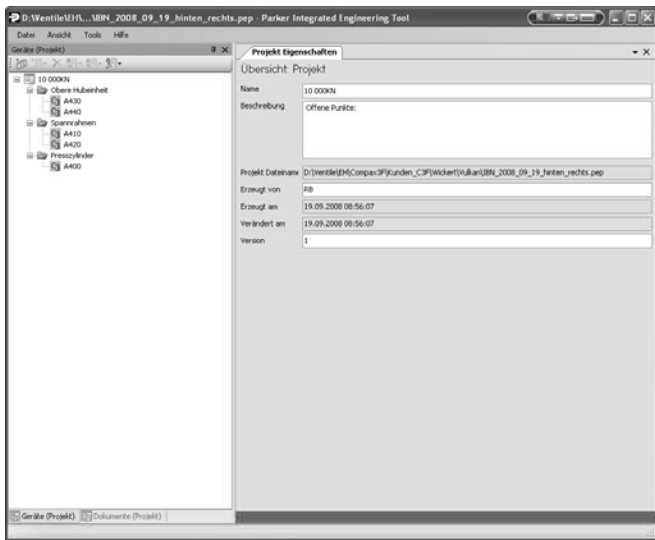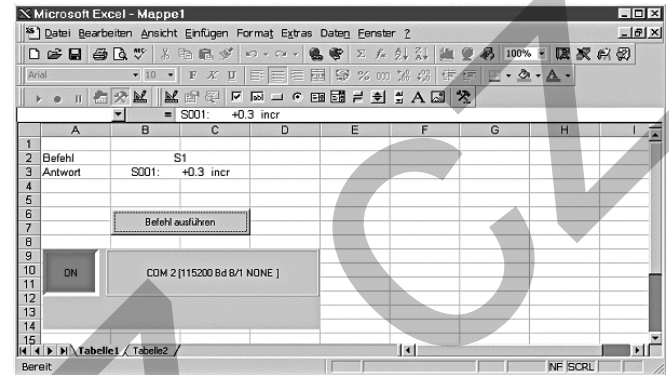C3F UK.indd 05.08.22

11

Application example

Dimensions

Project development, commissioning and programming

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

Software download, free of charge:
http://solutions.parker.com/c3_support

ActiveX plug-in for Integration with the Office enviroment

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

Interface - Field bus
- Profibus DP
- CANopen (CiADS402)
- DeviceNet
- PowerLink
- EtherCAT
- Profinet
- Address configurable via Dip switch

11

International standards in programming

- Programming system
  - CoDeSys
- Programming language
  - IEC61131-3
  - Function modules based on PLCopen
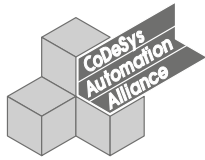
Jerk-limited set point generation, resulting in

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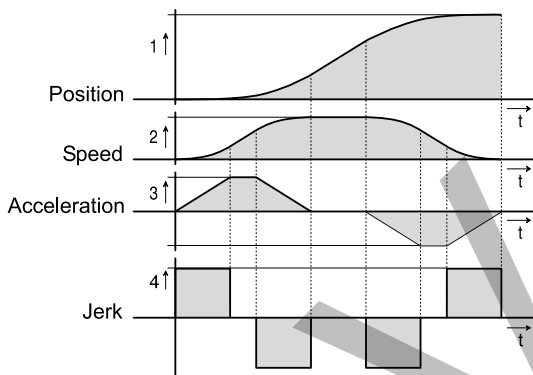
Control

a) General

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

b) Position control

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

c) Force/Pressure controller

- PID controller with feed forward control of speed

d) 2-axis synchronous run and 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
  - All functions for each valve individually available
  - Automatic configuration by component selection in the Compax3 ServoManager

e) Custom-designed software packages on request

Set up controller optimization

- Compax3F HydraulicsManager
  - All necessary technical data of Parker valves and drives are available
  - additional supported
- Test movement for automatic controller attitude
- Optimization with integrated oscilloscope function
- Automatic pre-setting of the controller for position control possible
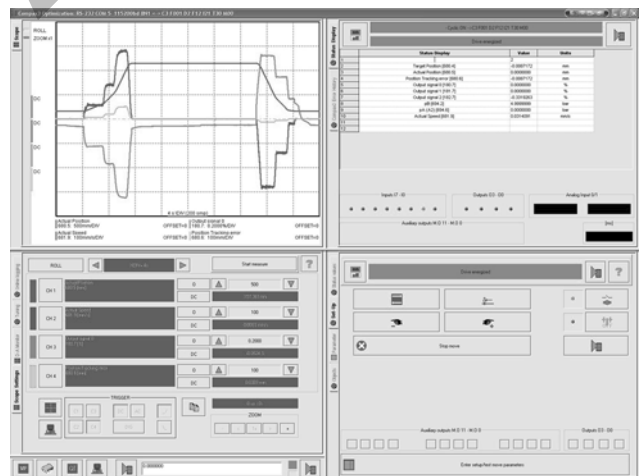
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Overview technology functions

	T11	T30	T40
Set tables for up to 31 motion profiles	x		
Absolute or relative positioning	x	x	x
Force/pressure control	x	x	x
Electronic Gearbox	x	x	x
Dynamic positioning	x	x	x
Hydraulic specific control technology	x	x	x
Reg-related positioning	x	x	x
Programmable according to IEC61131-3		x	x
Programming system CoDeSys		x	x
Up to 6500 instructions		x	x
Recipe table with 288 variables		x	x
PLCopen		x	x
Mark synchronization			x
Cam switching mechanism			x
Cam profiles			x
Coupling and decoupling function			x
Custom-designed software packages*		O	O
Digital I/Os (RS232/485)	x	x	x
Profibus	O	O	O
CANopen		O	O
DeviceNet		O	O
Ethernet Powerlink		O	O
EtherCAT		O	O
Profinet	O	O	O

x = Standard
O = Optional
* on request

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Benefits
- No programming skills necessary
- Set table with various motion
- Full controller range available
- An ideal basis for many applications in high-performance motion automation

Function range T11
- Set tables for positioning, pressure and force control up to 31 motion profiles:
  - Absolute or relative positioning
  - Force/pressure control
  - Speed control
  - Electronic gearing
- Superimposed force and pressure control
- Controller switching between position and force/pressure control

Extended Function range
- Absolute force control
- Superimposed force and pressure control
- Controller switching between position and force/pressure control
- 2-axis synchronous

Absolute or relative positioning
A motion set defines a complete motion with all settable parameters
1. Target position
2. Travel speed
3. Maximum acceleration
4. Maximum deceleration
5. Maximum jerk
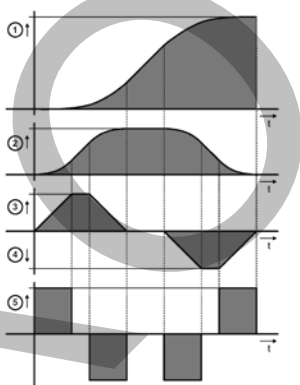
Stop movement
The Stop set interrupts the current motion set

Reg-related positioning
For registration mark-related positioning, 2 motions are defined:
- RegSearch: Search of an external signal, e.g. a registration mark on a product
- RegMove: The external signal interrupts the search movement and the second movement by an offset follows without transition
- Precision of the registration mark detection: <1µs
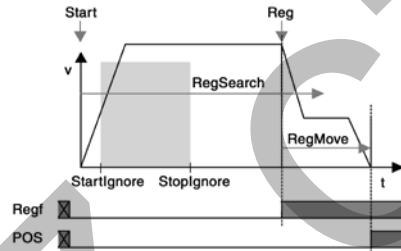
Electronic Gearbox:
Motion synchronized to a master axis with any transmission ratio. The position of a master axis can be detected via:
- ±10 V analog input
- Step/direction command Input
- the encoder input or
- HEDA, with Compax3 Master
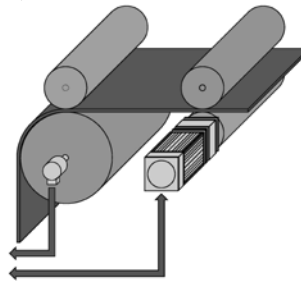
Dynamic positioning
A new motion profile can be selected during a positioning sequence - a smooth transition takes place.
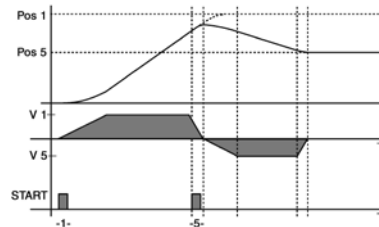
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General

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 6500 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 continous
  - 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: reading digital inputs
  - C3_Output: writing digital inputs
  - C3_ReadArray: access to recipe table
- Inputs/outputs:
  - 8 digital inputs (24 V level)
  - 4 digital outputs (24 V 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)

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.

Example of a bus interface controlled IEC61131 application

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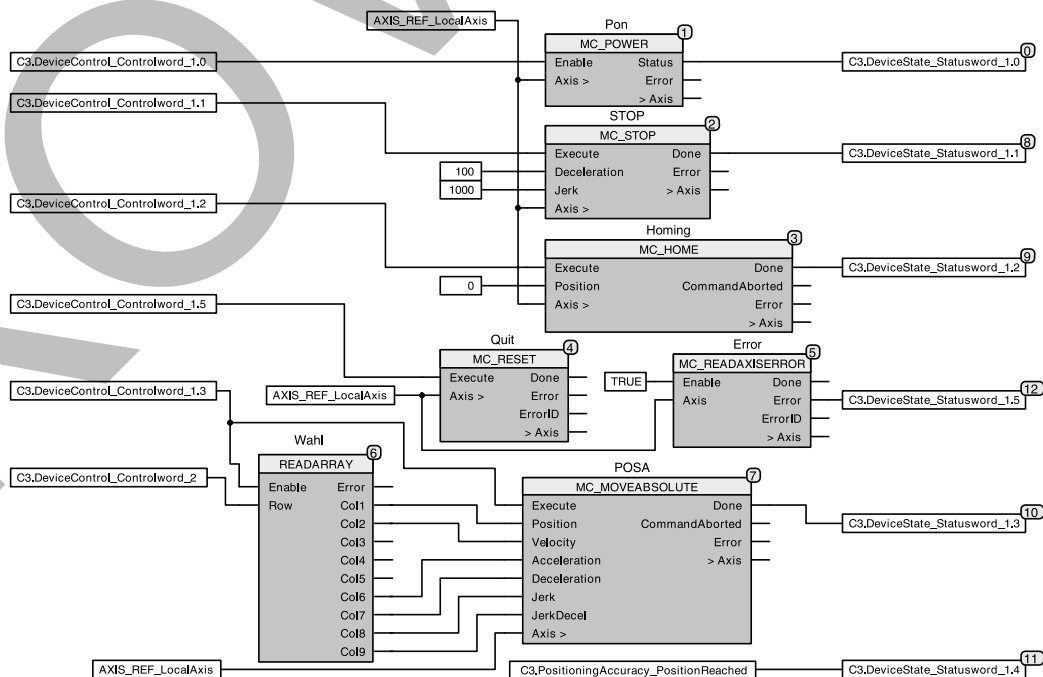
General

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
- 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-knife 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)
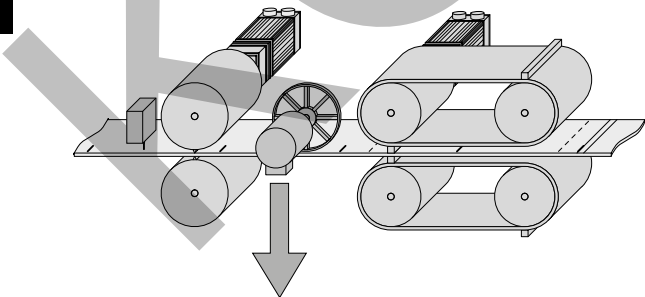- Highly-precise mark recognition (accuracy <1µs; Touch-probe)
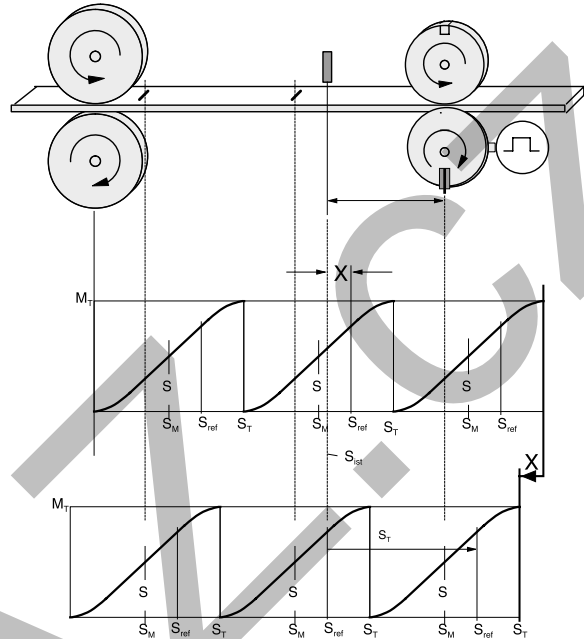
Cam switching mechanism

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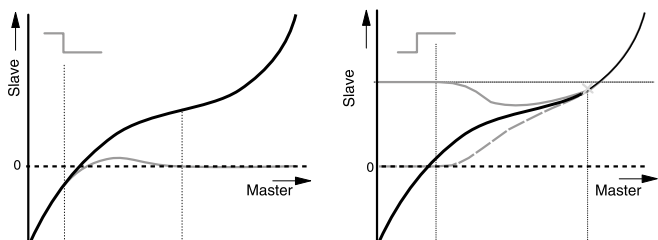- Delay-time compensated cams: Compax3 can advance the cam to compensate for delays in switching elements.
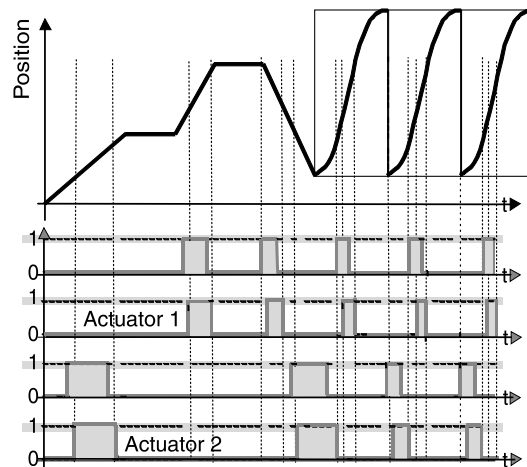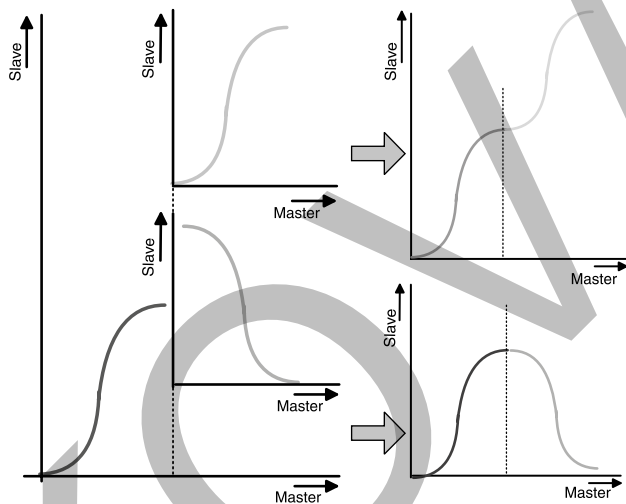

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Coupling and decoupling functions

- 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
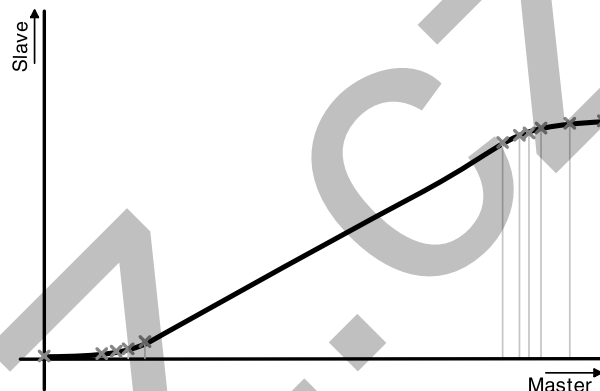- Cam memory for up to 20 curves

Cam profiles

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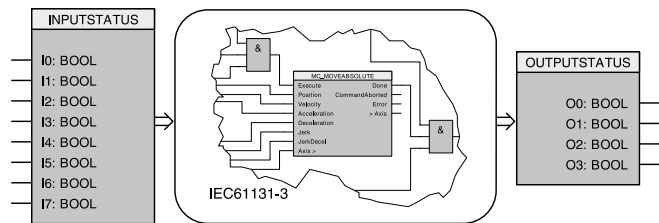- Scalable cam segments and complete cam profiles

Connection of high-level controllers

a) Control via digital inputs/outputs
Compax3 I11T30 / I11T40 / I12T11

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

b) Control via Profibus,
Compax3 I20T11 / I20T30 / I20T40

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

c) 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

d) 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

e) Control via Ethernet Powerlink,
Compax3 I30T30 / I30T40

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

f) Control via EtherCAT
Compax3 I31T30 / I31T40

EtherCAT-ratings	
Bau drate	100 Mbits (FastEthernet)
Cycle time	<200 µs; to 240 nodes

g) Control via Profinet I32T11 / I32T30 / I32T40

Profinet ratings	
Profinet version	Profinet IO (RT)
Transmission mode	100 BASE-TX (Full Duplex)
Profinet ID	C332

11

C3F UK.indd 05.08.22

Parker Hannifin Corporation

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
  - Controller pre-setting possible
- 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)
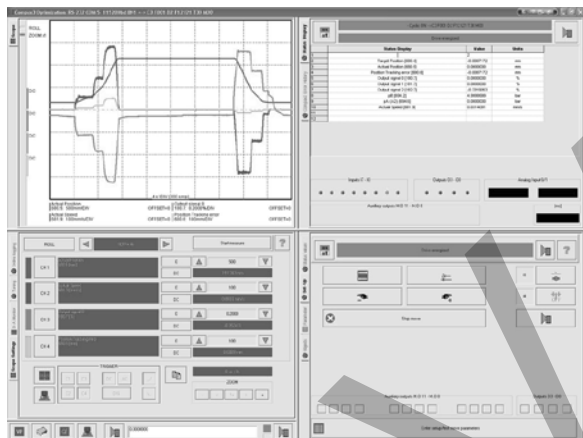

Software Tool HydraulicsManager

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

C3 HydraulicsManager valve database

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)
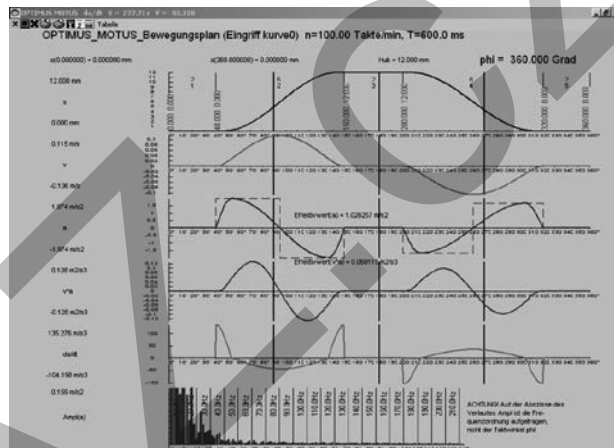
Evaluation of the motion profile
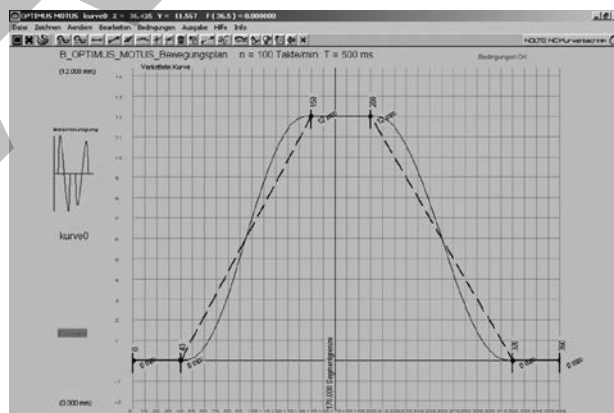
Cam generation with the integrated CamEditor

11

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

Examples

- 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)

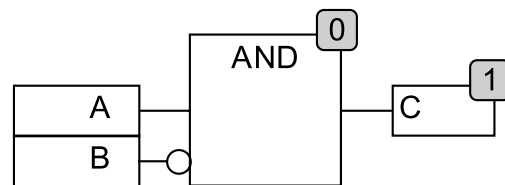```
LD   A
ANDN   B
ST   C
```

- Ladder diagram
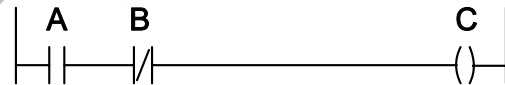


- Structured text

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

- Function plan

11

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
- Standard function modules deposited
. . . and all this free of charge
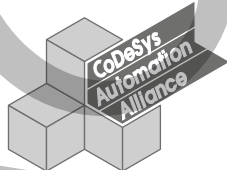
Parker is a member of the "CoDeSys Automation Alliance".

Program development in CFC
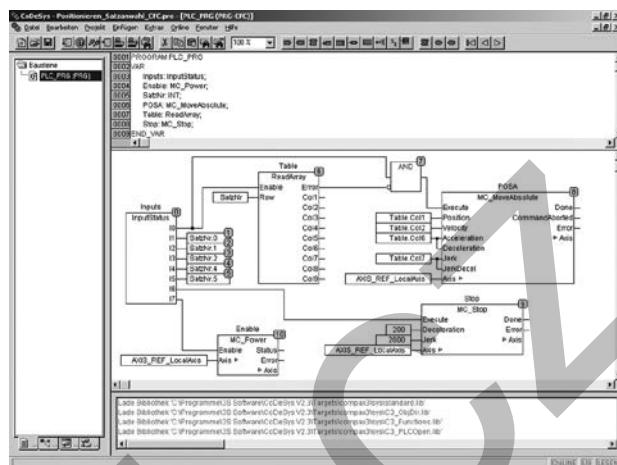
Project management

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

11

Connection set ZBH../.. (included in delivery)

Complete kit with mating plug connectors (X1, X2 and X3) for Compax3 connectors, special shield connecting terminal and snap-on foot for mounting rail.
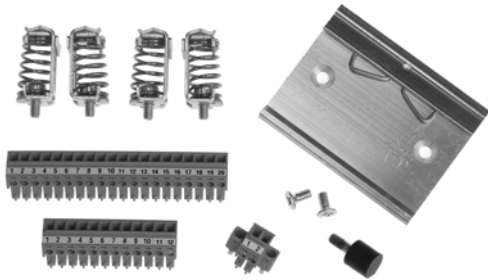
Feedback cable GBK../..

Connection to the transducer:

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 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

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).

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 or wiring of
  - Ethernet Powerlink (I30)
  - EtherCAT (I51)
  - Profinet (I32)

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)

11

C3F UK.indd 05.08.22

Connection set for Compax 3											
for C3F001 D2 F12xxx	ZBH 02/04	Z	B	H	0	2	/			0	4
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 or Ethernet Powerlink (I30), EtherCAT (I31), Profinet (I32)		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]
Feedback cable for SSI transducer and start/stop	With flying leads	G	B	K	5	3	/			...	...[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

Length code for SSK27
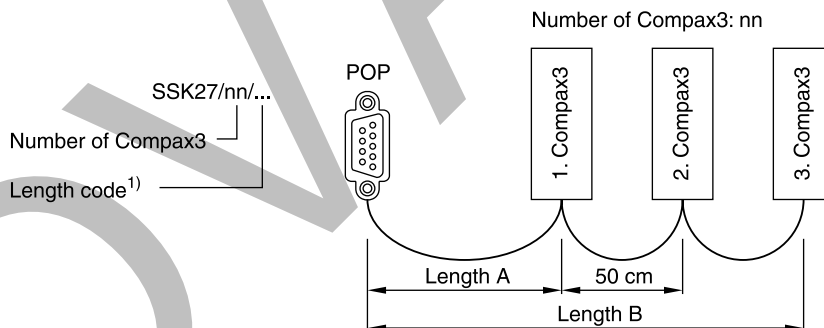
[1] Length code

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

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 3 m)

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 1.0 m)

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 50 cm, variable length A from POP with first Compax according to length code[1]
(Example: SSK27/03/01: Length 1.0 m)

[4] Colours according to DESINA

The new Parker Automation Controller PAC120 is a PLC with integrated, programmable software and EtherCAT master function. It was developed for the automation of fast and precise hydraulic processes. Together with the control module PACHC, it controls the position and force/pressure of up to 40 hydraulic axes. In combination with PACIO modules it can take over complete machine control.

Due to its extremely compact dimensions and its modular design, the PAC120 can be used in many different applications. Data exchange with other systems is firstly possible via the on-board Industrial Ethernet and OPC UA interfaces. In addition, further communication links can be realized by use of interface and bus modules. This also facilitates system integration in existing control architectures. With the on-board fieldbus options Profinet Slave, EtherCAT Slave or EtherNet/IP Adapter, the PAC120 can communicate with the machine or cell control. External EtherCAT slaves can be connected to the PAC120 by using an PACIO extender module.
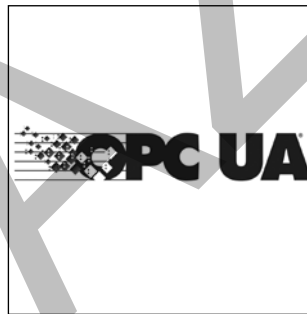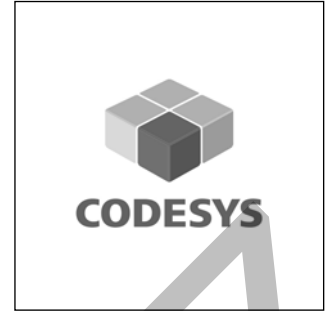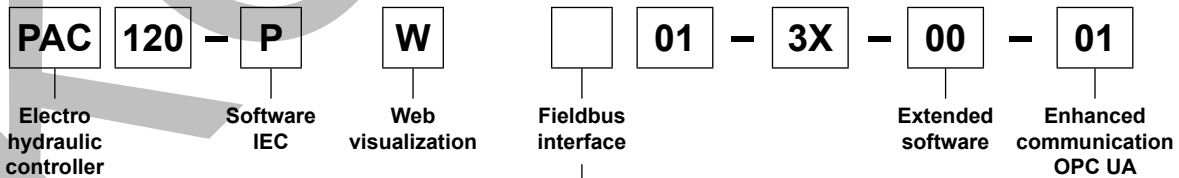
Technical features

- Fanless ARM processor technology
- CODESYS V3.5
- Connectors for Ethernet and EtherCAT
- Fieldbus options: Profinet IO/IRT Slave, EtherCAT Slave or EtherNet/IP Adapter
- OPC UA
- SD card slot and USB interface
- Digital interrupt input
- CODESYS WebVisu
- Expandable by Parker PACHC and PACIO modules

Ordering Code

PAC **120** – **P** **W** ☐ **01** – **3X** – **00** – **01**

| Electro hydraulic controller | | Software IEC | Web visualization | Fieldbus interface | | | Extended software | Enhanced communication OPC UA |

Code	Fieldbus interface
P	Profinet IO/IRT
T	EtherCAT Slave
E	EtherNet/IP Adapter

11

PAC120 UK.indd 05.08.22

Technical Data

| General	
Function	Mini-IPC with integrated CODESYS SPS and EtherCAT master function for I/O modules systems PACHC and PACIO
Housing / protection class	Aluminium strap, plastic, IP20
Mounting	35 mm DIN rail
Mounting position	Vertical, stackable
Operation temperature	0 °C...+55 °C
MTTF$_D$ value	33.6 a
Weight	0.2 kg
Electrical	
CPU	i.MX6 SoloX Freescale 1 GHz
RAM / remanent memory	256 MB / buffering in flash
Drives	256 MB internal flash memory, SD (HC) card slot
Operating system	Linux RT
Software	Application: CODESYS V3 Soft SPS with web visualization
Network	1 x Ethernet 10/100 MBit - RJ45, OPC UA
Field bus interfaces	Master: EtherCAT internal via E-Bus interface, external via extender module; 1 x CAN galvanic isolated Slave: ProfiNet IO and IRT (PAC120-*P), EtherCAT Slave (PAC120-*T), EtherNet/IP Adapter (PAC120-*E)
Integrated I/Os	1x DI 1 ms
Clock	Real-time clock with battery buffering
Power supply	24 V DC (19.2… 28.8)
E-bus current supply	3 A
Output	Ca. 3.5 W (@ 24 V DC)
Potential separation	Modules are potential separated against each other and bus
CE conformity	2004/108/EC
Insulation requirements	Protection class III according to EN 601131-2 Power circuits class 2 according to EN 601131-2 Contact protection according to EN 601131-2 (IEC 60529) Overvoltage category zone 3 according to EN601131-2 Degree of contamination 2 according to EN 50178
EMC	2014/30/EU
Noise stability	Zone B according to EN61131-2, Mounting on grounded rail in grounded control cabinet
Environmental conditions	Relative humidity 5 % … 95 % w/o dew
Storage temperature	-25 °C...+70 °C
UL certification	Certified: E-File-No. E506274

11

Development Environment CODESYS V3.5

CODESYS V3.5 is a device-independent system for programming control units designed to handle many tasks of industrial automtion technology. It conforms to standard IEC 61131-3 and supports all standardized IEC programming languages and object-orientated programming.

In conjunction with runtime system CODESYS Control Win V3 it also allows the use "multi-device" and "multi-application" programs. Owing to its component-based architecture, it supports customer-specific configurations of and extensions to the user interface.

Applications can be optimized by using industry standard PLCopen Motion Control components for motion control programming, deploying to the powerful simulation run-time for faster development and using online variable watch and trending for logic analysis.

Dimensions
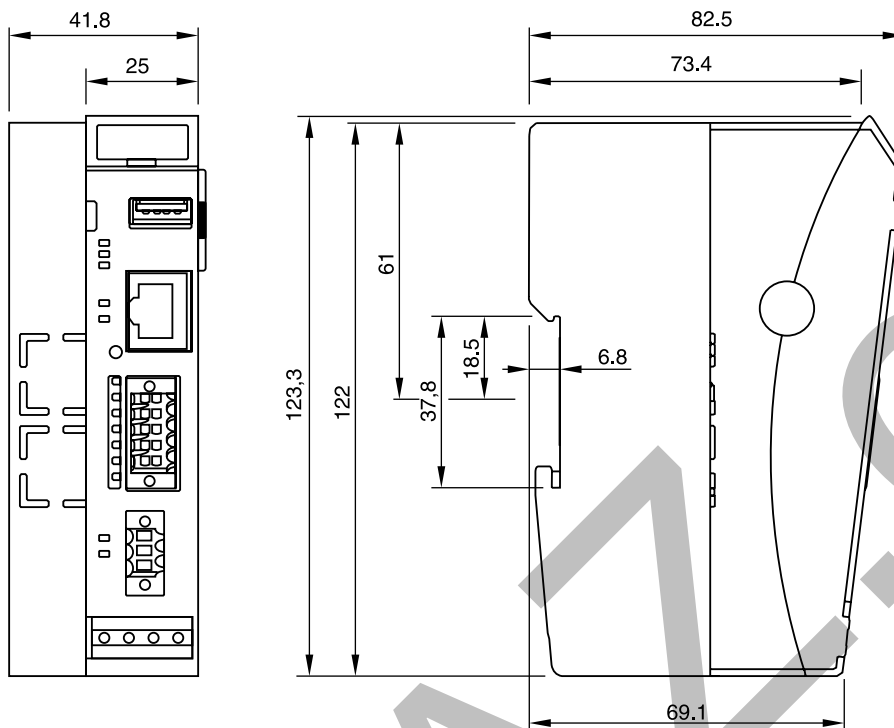
Accessories

Parker Control Module PACHC

The PACHC ist a control module for high-dynamic and precise control of 1-2 hydraulic axes. It was developed for operation at the Parker Automation Controller PAC120. The device is an EtherCAT slave and is operated at the Parker E-Bus. In conjunction with the bus coupler PACIO-400-00 it can be used in a standard EtherCAT network. The PACHC is connected to local analog sensors like pressure and force sensors and digital position feedback systems for recording actual values. Hydraulic valves are controlled via the analog outputs.

For further information see separate catalogue file for the PACHC.

Parker Remote I/O System PACIO

The PACIO System comprises a variety of modules for digital, analog and temperature signals as well as communication interfaces. The modules connect directly to the controller via the built-in EtherCAT bus for local architectures and are extended to remote locations via the extender and bus coupler modules, thus supporting both local and distributed I/O architectures. PACIO communicates natively on the EtherCAT bus, therefore it provides the full functionality and throughput of high-speed EtherCAT to meet the most demanding real-time requirements.

For further information see Parker catalogue file for the PACIOs.

The new PACHC is a control module for operation at a Parker Automation Controller (PAC) for high-dynamic and precise control of hydraulic axes. The PACHC enables position, force and pressure control as well as change-over control. In conjunction with a PAC120 it is used as Ether-CAT slave. It features analogue as well as digital sensor inputs.
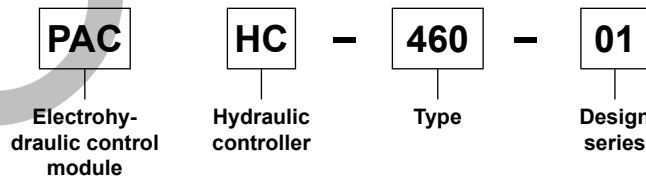
The PACHC is connected to local analogue sensors like pressure and force sensors and digital position feedback systems for recording actual values. Hydraulic valves are controlled via the analogue outputs.
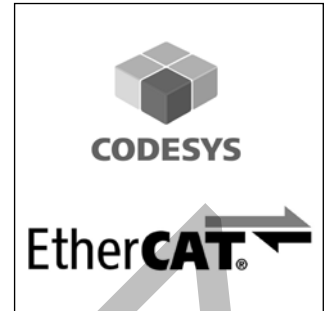
Features

- Position, force and pressure control for 1-2 axes
- Sampling time 250 µs
- Digital interfaces for position feedback systems (SSI, Encoder TTL/HTL/RS422, EnDAT)
- 4 analogue inputs (0... 10 V, 0... 20 mA)
- 4 analogue outputs (-10... 10 V, 0… 20 mA)
- Fail-safe storage of all device parameters in Flash
- Library with comprehensive motion functions
- Freely available application templates
  - Synchronization of 2 axes
  - Synchronization of 4 axes
  - Change-over position/force control
  - Table of records
- Application-specific software solutions (optional)

Ordering code

PAC	HC	–	460	–	01
Electrohy-draulic control module	Hydraulic controller		Type		Design series

11

Technical Data

Allgemein	
Function	Controller module with EtherCAT slave function for operation at Parker Automation Controller
Housing / protection class	Aluminium strap, plastic, IP20
Mounting	35 mm DIN rail
Mounting position	Vertical, stackable
Noise stability	Zone B according to EN61131-2, mounting on grounded rail in grounded control cabinet
Environmental conditions	Relative humidity 5 % … 95 % w/o dew
Storage temperature	-25 °C...+70 °C
Operation temperature	0...+55 °C
$MTTF_D$ value	51 a
Weight	0.16 kg
Electrical	
Analogue inputs Optional	4 x 0…10 V 4 x 0/4…20 mA Resolution 12 Bit Sampling rate < 62.5 µs
Analogue outputs Optional	4 x 0…10 V, -10 V, +10 V 4 x 0/4…20 mA Resolution 16 Bit Update rate ≤ 250 µs
Counter / encoder	RS422: 32 Bit, 5 MHz 5/24 V single ended: 32 Bit, 1.6 MHz SSI: 18-32 Bit, 80-1000 Kbit/s EnDAT 2.1: 100 kHz-2 MHz
Field bus interface	EtherCAT internal via E-Bus interface
Connectors	IO connector: 36-pole connector at the front EtherCAT: 10-pole interface on the left side
End module	Not required
ESI file	PACHC_V**.xml
Power supply	24 V DC (19.2 ... 28.8)
E-Bus load	< 250 mA
Potential separation	Modules are potential separated against each other and bus
CE conformity	2004/108/EC
Insulation requirements	Protection class III according to EN 601131-2 Power circuits class 2 according to EN 601131-2 Contact protection according to EN 601131-2 (IEC 60529) Overvoltage category zone 3 according to EN601131-2 Degree of contamination 2 according to EN 50178
EMC	2014/30/EU
Wiring length	< 30 m, overall braid shield
UL certification	Certified: E-File-No. E506274

11

Dimensions
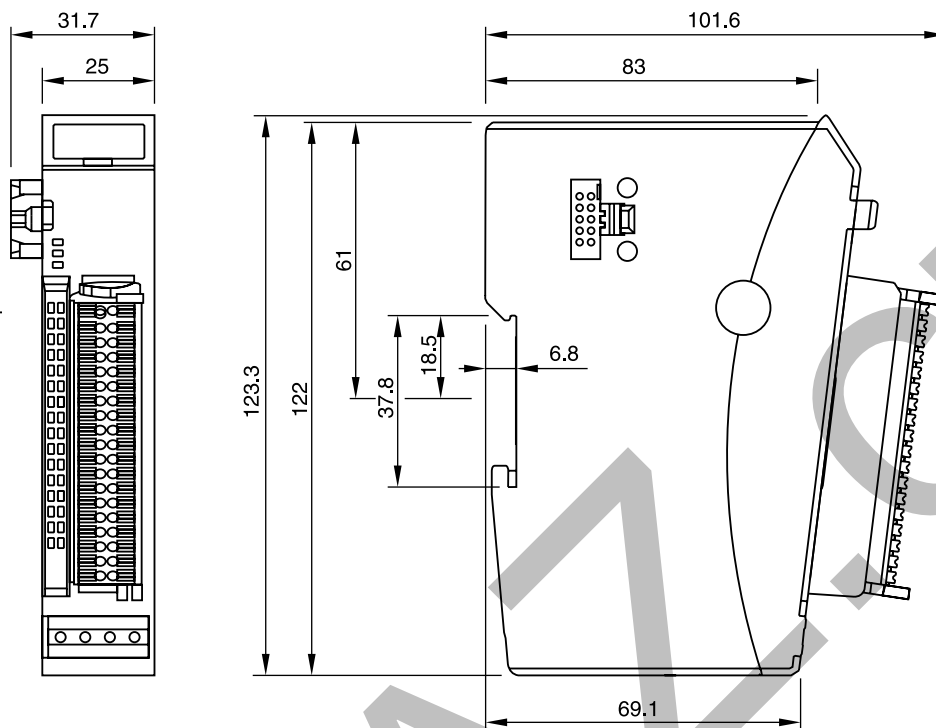
Accessories

Parker Automation Controller PAC120

The new Parker Automation Controller PAC120 is a PLC with integrated, programmable software and EtherCAT master function. It was developed for the automation of fast and precise hydraulic processes. Together with the control module PACHC, it enables the position and force/pressure control of up to 40 hydraulic axes. In combination with the PACIO modules it can take over complete control. Through its compact dimensions and its modular design, it can be used in various applications.

For further information see separate catalogue file for the PAC120.

Parker Remote I/O System PACIO

The PACIO System comprises a variety of modules for digital, analog and temperature signals as well as communication interfaces. The modules connect directly to the controller via the built-in EtherCAT bus for local architectures and are extended to remote locations via the extender and bus coupler modules, thus supporting both local and distributed I/O architectures. PACIO communicates natively on the EtherCAT bus, therefore it provides the full functionality and throughput of high-speed EtherCAT to meet the most demanding real-time requirements.

For further information see Parker catalogue 192-122003.

11

The test unit EX00-M05 is suitable for testing and commissioning of all proportional and servo proportional valves with onboard electronics that are offered in this catalogue.

For easy on-site service all necessary cables are securely located inside of the rugged case. The test unit provides all command signal sources and measuring ports for concerted and time saving control and diagnosis of the valves. For operation of the hybrid regenerative valves an additional switchable 24 V output is available.
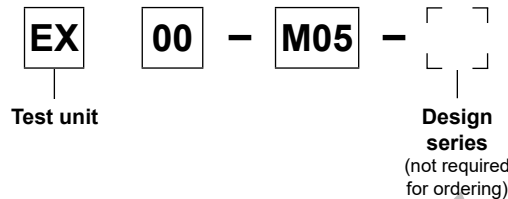
Features

- Control of valves incorporating integrated electronics and central plug acc. EN 175201-804 (6-pin + PE)
- Built-in fuses
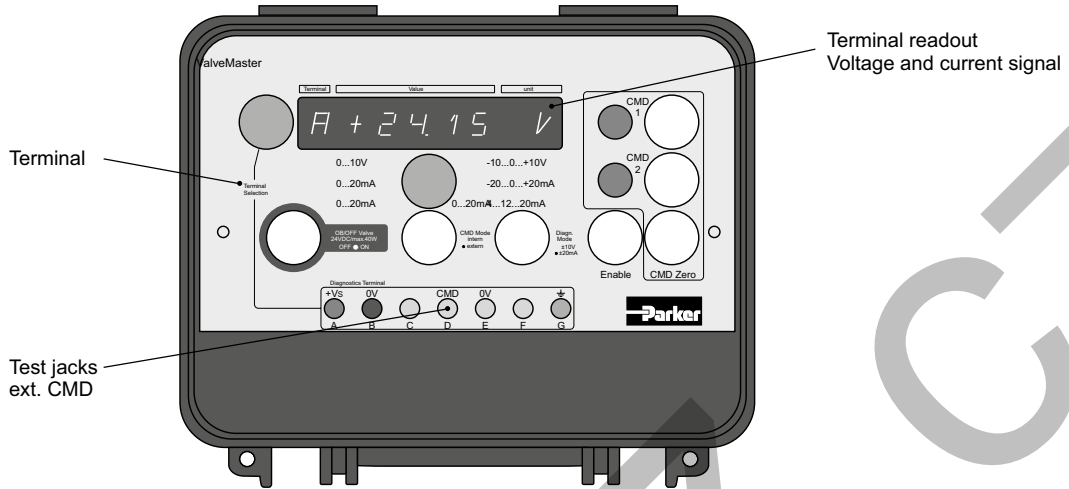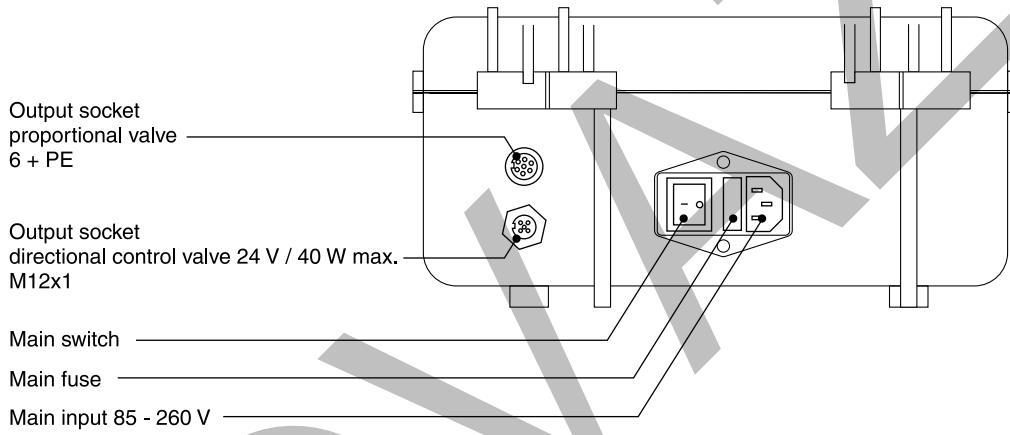- Cable set included
- Lockable rugged box

Ordering code

| **EX** | **00** | – | **M05** | – | ☐☐☐ |

Test unit

Design series
(not required for ordering)

CE

Technical data

Design		Lockable rugged box, polypropylene (break proof)	
Supply voltage	[V]	85...260, 50...60 Hz	
Power consumption	[VA]	max. 160	
Current consumption max.	[A]	1.3 at 230 V	
Main input fuse	[A]	3.15 time lag	
Required main supply fuse	[A]	16	
Protection class		IP40	
EMC		EN 61000-6-2	
Valve central connection	Valve supply [V]	24 (±5 %)	
	Command voltage [V]	0...±10 (±1 %), 0...10, 0...±20 mA, 0...20 mA, 4...12...20 mA, 4...20 mA	
	Diagnostic output	0...±10 V / 0...±20 mA	
	Enable signal [V]	7.5 (±10 %)	
Measurement terminals		For multimeter with Ri min = 10 kOhm	
Display	Display digits	4	
	Resolution	10 mV / 10 mA ; 1 digit	
Main cord	Unit site	Cable inlet connector IEC320	
	Main site	CEE 7/7 plug	
	Cable length [m]	2	
Valve cords		A - control valves	B - DC valves
	Unit site	Connector Amphenol SV70 DIN 40040	Connector M12x1 as per IEC61076-2-101
	Valve site	Female connector 6+PE acc. EN175201-804	Female connector acc. EN175301-803
	Cable length [m]	3	
Ambient temperature	[°C]	0...40	
Weight	[kg]	3.9	
Dimensions	[mm]	L 305 x B 270 x H 144	

EXM05 UK.indd 05.08.22

Parker Hannifin Corporation

Operator panel
Front

Terminal readout
Voltage and current signal

Terminal

Test jacks
ext. CMD

Rear

Output socket
proportional valve
6 + PE

Output socket
directional control valve 24 V / 40 W max.
M12x1

Main switch

Main fuse

Main input 85 - 260 V

Wiring configuration

Plug EN 175301-803

85 - 260 V

11