Series P40

Compact Position Controller for 1 or 2 Axes

- Position Controller for 1 or 2 Axes
- Manual, Single or Program operation
- LCD display with 7 menu languages
- 16 freely configurable inputs & outputs
- Optionally with 12 bit analog output
  (selectively PID or unregulated)
- Useful functions like referencing,
  tool offset and piece counter
- Simple and intuitive handling
- Integrated diagnosis mode
- Uncomplicated panel mounting

P40 - Programmable Compact Position Controller for 1 or 2 Axes

General:

The position controller of the **P40** series is used for simple positioning applications, e. g. with wood or sheet metal processing machines. The main advantage of this controller is the simple, easy and fast entry of required positions and quantities. The actual value, target value and quantity are displayed by a well legible LCD display in the control panel. After entering a target position value and a quantity, the positioning process can be started. The **P40** has an internal program memory for a maximum of 1,000 blocks.

Number of Axes:

Depending on the order, the **P40** controller can be can be supplied as single or two-axis version. The number of axes is defined by the ordering option **"Encoder Inputs"** (see type designation). For example, in the case of a **P40** with HTL encoder inputs, **"1X"** must be indicated for the single-axis version and **"11"** for the two-axis version (input indication for both axes). The same applies for the ordering option **"Analog Outputs"**.

Standard Functions:

- Adjustable positioning output signals (3 speeds)
- Display of target and actual position
- Pulse multiplication factor & encoder edge multiplier
- 7 different menu languages selectable
- Absolute or incremental positioning
- Program operation up to 1,000 blocks
- Single block operation
- Manual inching mode
- Referencing mode
- mm/Inch switchover
- Software end limit monitoring
- Tool width compensation
- Encoder monitoring
- Back gauge control
- Retract function
- Tolerance windows
- Data memory
- Loop function
- Piece counter
- Tool offset

LCD Display:

display structure 1-axis version
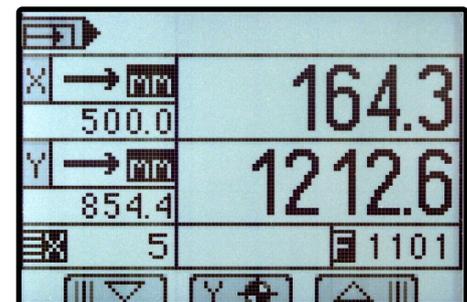
display structure 2-axis version

Signal Inputs:

Depending on the measuring system used, the inputs can be individually configured for 1 or 2 axes. Conventional square-wave signal inputs with HTL or differential TTL characteristics are available. For special applications (e. g. additional auxiliary axes), the P40 can be extended by 1 or 2 analog inputs. Combinations of digital and analog inputs are also possible, but in this case possible restrictions (see type designation) must be considered.

Signals for Positioning:

Three different versions of output signals are available for positioning:

1. Switch-off positioning with up to 3 speeds via digital outputs.
   The assignment and logic (active HIGH/LOW) can be parametrized.
2. Optionally via unregulated 12 bit analog output (±10 V)
3. Optionally via regulated 12 bit PID analog output (±10 V)

(order codes see type designation)

Digital I/Os

For diverse control commands, the **P40** controller is equipped with 16 digital PNP inputs and outputs whose pin assignment and switching logic are freely configurable via parameters.

P40 - Programmable Compact Position Controller for 1 or 2 Axes

Technical Data:

Mechanical Data

Housing	panel housing
Housing material	front plate: aluminium housing: galvanized steel sheet
Front plate dimensions	W x H = 144 x 144 mm
Panel cut out	W x H = 138 x 138 mm
Keyboard	foil, short stroke keys
Installation depth	37 mm (without connectors) 75 mm (with connectors)

Electrical Data

Display	LCD dot matrix 120 x 80 pixels with white background lighting
Hardware	32 bit microcontroller with 1 MByte Flash and 56 KByte RAM
Program memory	up to 1.000 steps (more on request)
System accuracy	± 1 increment
Power supply voltage	24 VDC +10 / -20 %
Current consumption	max. 150 mA (unloaded); permitted tot. current incl. self-consumption: 1 A
Encoder supply voltage	24 VDC or 5 VDC
Load by measuring system	max. 130 mA
Input signals (encoder)	HTL, TTL, analog (order dependent)
Signal channels	A, B, Z resp. A, A', B, B', Z, Z' or analog 0 ... 3.3 V (order designation)
External inputs	16 x digital PNP inputs with freely programmable assignment and logic
Input current / pin	max. 10 mA
Pulse time for inputs	min. 300 ms
Max. input frequency	100 kHz (higher on request)
Analog inputs	optional 1 or 2 analog inputs (12 bit) at 3.3 VDC sensor supply
Output signals	16 digital PNP outputs with freely programmable assignment and logic (active high/low)
Output current	max. 150 mA per output / 500 mA total current across all outputs; the outputs are durable short circuit proof (no multiple short circuits)
Freewheel clutch / outputs	for inductive loads integrated (clamping voltage at the output max. −45 V)
Analog outputs	optional: ± 10 V PID or ± 10 V unregulated (each 12 bit)
Connections	industry standard connectors (3.81 mm grid, lockable) and additional RJ45 sockets (depending on version)
Power down memory	E^{2}Prom (service life: 1.000.000 switching on/off cycles or 40 years)
Further options	8 = only 8 instead of 16 I/Os

Environmental Conditions

Operating temperature	0 ... +45 °C
Storage temperature	-20 ... +50 °C
Humidity	max. 80 %, non-condensing
Protection class (front)	IP43 (installed state)
Protection class (rear)	IP00

Type Designation:

P40 - _ _ _ - _ _ _ - _ _ - _ _ -
     A A A - B B B - CC - DD - E E E E

A   Version
- 000 =   standard version
- 001 =   first special version (etc.)

B   Power Supply
- 024 =   24 VDC (+10 / -20 %)

C   Encoder Inputs (per Axis)
- X = input is not available
- 1 = A, B, Z (PNP)   24 V supply / HTL, 100 kHz
- 2 = A, A', B, B', Z, Z'   24 V supply / TTL 100 kHz
- 3 = A, A', B, B', Z, Z'   5 V supply / TTL 100 kHz
- 4 = 1 analog input   3.3 V supply / 0 ... 3.3 V (12 bit)[1]
- 5 = 2 analog inputs   3.3 V supply / 0 ... 3.3 V (12 bit)[2]
- 6 = A, B, Z (PNP)   24 V supply / HTL, 100 kHz[3]
    + 1 analog input   3.3 V supply / 0 ... (customer specified)

D   Analog Outputs (per Axis)
- X = no analog output (switch-off positioning)
- 1 = 12 bit analog output ±10 V (PID regulated)[4]
- 2 = 12 bit analog output ±10 V (unregulated)

E   Options (multiple indications possible)
- X = no further options
- C = screw terminals
- 8 = 8 digital inputs / 8 digital outputs[5]
- N = digital inputs in NPN version

Restrictions:
[1] for special applications (e. g. as auxiliary axis)
[2] for special applications, analog inputs only for and on plug 2. Axis
[3] for special applications and only possible for 2. Axis
[4] not possible with „Encoder Inputs = 4 or 5"
[5] not possible for two axes and not possible with analog output

Order example:

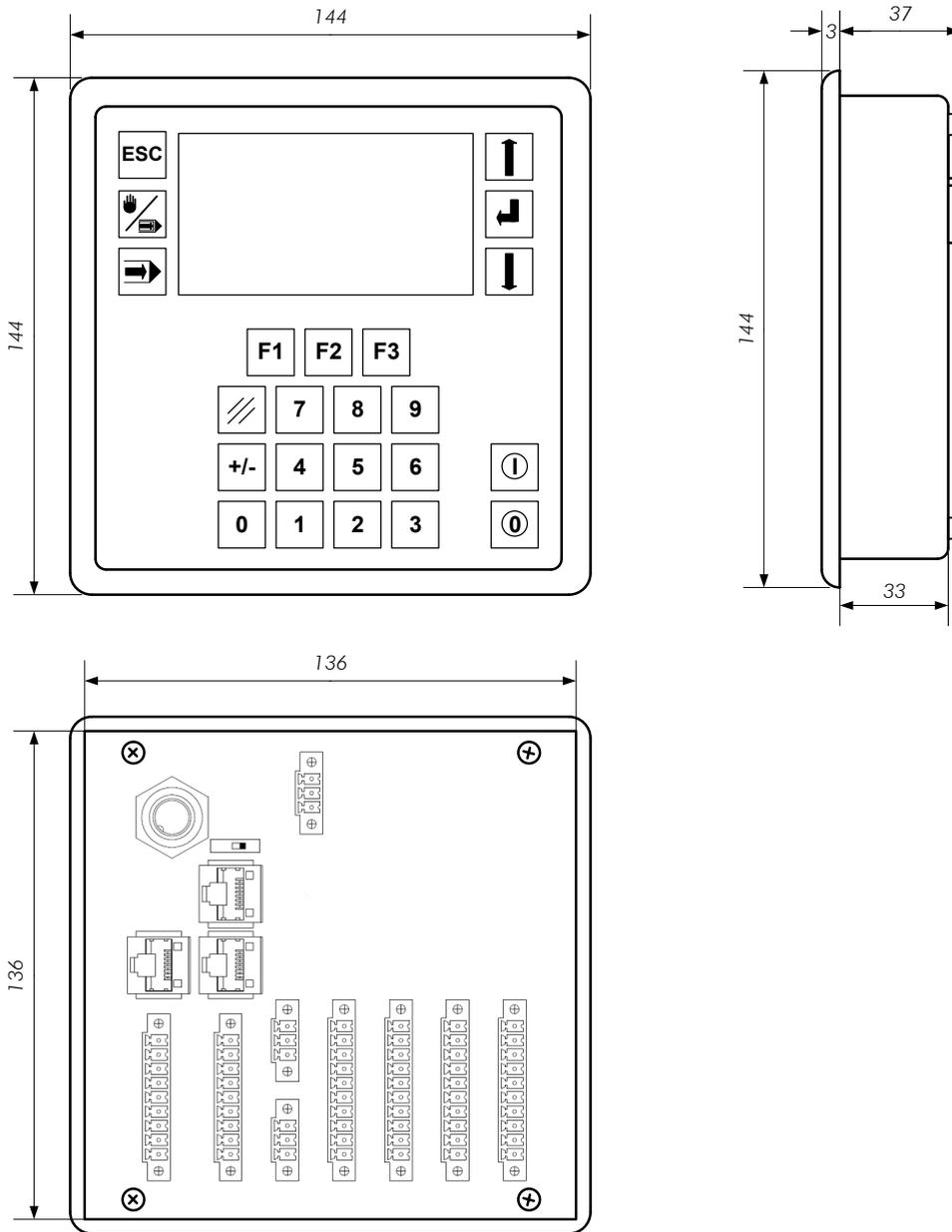P40 - 0 0 0 - 0 2 4 - 1 1 - 1 X - C X X X
    A A A - B B B - C C - D D - E E E E

Standard P40 with 24 VDC power supply, 2 HTL encoder inputs (A, B, Z) for two axes, 1 analog PID output for axis 1, digital output positioning for axis 2 and optional screw terminals

Your order:

P40 - 0 0 0 - 0 2 4 - _ _ - _ _ - _ _ _ _
    A A A - B B B - C C - D D - E E E E

P40 Dimensions:

144

144

3 37

144

33

136

136

Applications:

- Woodworking machines
- Band sawing machines
- Grinding machines
- Sheet metal shears
- Stop system
- Beveling machines

… and many other applications.

P40 Accessories:

Order Designation	Description
NG13	Power pack for AC-supply (primary: 115/230 VAC, secondary: 24 VDC/600 mA)
RP8K	Relay card with 4 shutter relays + 4 changeover relays (28 VDC/250 VAC / 12 A)
P40 Interface Cable	Interface cable for PC connection (with RJ45 plug and female 9-pin SUB-D)