# Axis controllers SPC200

**FESTO**
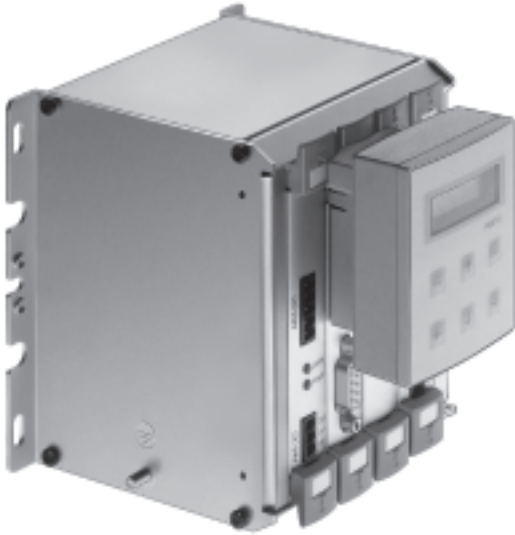
**SPC200 – the most unique positioning controller in the world for pneumatic and electrical positioning technology**

**Strength in variety**
- 1 to 4 positioning axes
- 3 different pneumatic drive families
- Stepper motor axes
- Technology mix

**Strength in modularity**
- Two housing sizes
- 9 different plug-in cards
- Combinable as required

**Multi-purpose**
- Set selection for simple applications
- Start/stop operation for demanding automation tasks
- Up to 100 programs
- Subprogram technology
- Register operations and much more

**Strength in flexibility**
- Digital inputs/outputs
- Analogue inputs
- PROFIBUS, DeviceNet, INTERBUS
- CPV valve terminals for pneumatic switching functions

**Strength in installation**
- One axis string controls
- 2 pneumatic axes
- CPV valve terminals can be connected directly to the axis string
- Pre-assembled cables
- Plugs fit only in the correct sockets

**Software WINPISA**
- Project archiving
- Simple commissioning
- User-friendly programming
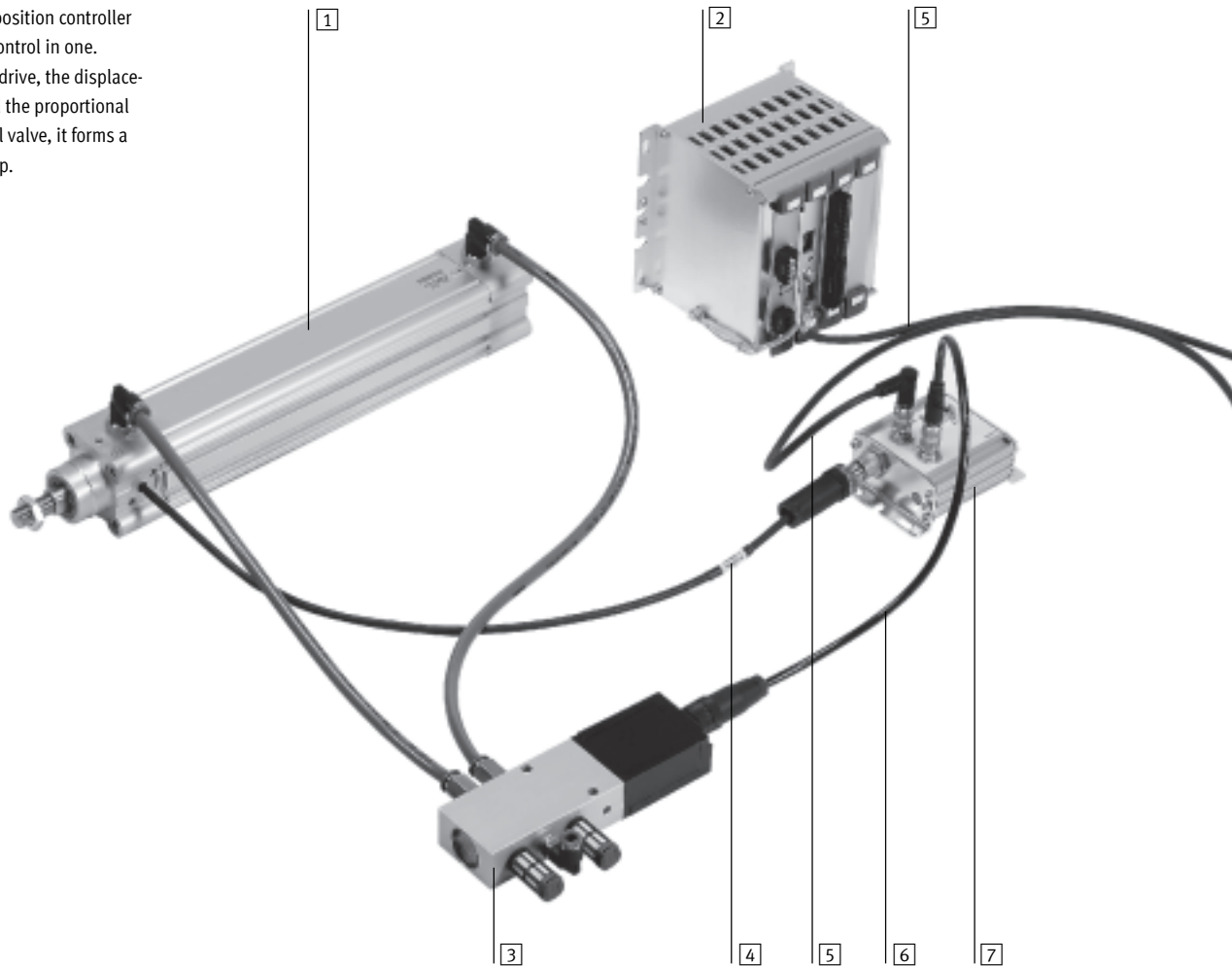- Comprehensive diagnostics with graphics functions

# Axis controllers SPC200

Key features

## In combination with the drive DNCI

The SPC200 is a position controller and positioning control in one. Together with the drive, the displacement encoder and the proportional directional control valve, it forms a closed control loop.



| Individual components | |
|---|---|
| Type | Brief description |
| [1]  DNCI-... | The pneumatic drive, in this case DNCI with integrated displacement encoder, generates the movement. It is controlled by the SPC200. |
| [2]  SPC200-... | The axis controller with operating unit, in this case designed for a pneumatic drive, is an open and closed loop controller in one. |
| [3]  MPYE-... | The proportional directional control valve is the final control element in the control loop and controls the movement of the drive in accordance with the specification of the closed loop controller in the SPC200. |
| [4]  – | Connecting cable that connects the displacement encoder with the axis interface. The cable is permanently attached to the drive. |
| [5]  KSPC-AIF-... | Connecting cable that connects the controller SPC200 with the axis interface. |
| [6]  KMPYE-AIF-... | Connecting cable that connects the proportional directional control valve with the axis interface. |
| [7]  SPC-AIF-... | The axis interface forwards the measured values from the displacement encoder to the closed loop controller in the SPC200 and the control signal from the closed loop controller to the proportional directional control valve. |

## Individual components for SPC200

| | Type | Brief description | → Page/Internet |
|---|---|---|---|
| **Basic units** | | | |
| | SPC200-CPU-4 | Basic unit with 4 card locations | 6 |
| | SPC200-CPU-6 | Basic unit with 6 card locations | 6 |
| **Plug-in cards** | | | |
| | SPC200-BP | Blanking plate | 7 |
| | SPC200-PWR-AIF | Power supply unit and axis interface connection | 10 |
| | SPC200-MMI-DIAG | Diagnostics and control unit connection | 11 |
| | SPC200-DIO | Digital inputs/outputs (10I/8O) | 12 |
| | SPC200-2AI-U | Analogue setpoint specification, 2 channels, 0 … 10 V | 14 |
| | SPC200-SCU-AIF | Sub-controller for 3rd and 4th pneumatic axes | 15 |
| | SPC200-COM-PDP | PROFIBUS-DP interface | 16 |
| | SPC200-COM-DN2 | DeviceNet interface | 18 |
| **Control unit** | | | |
| | SPC200-MMI-1 | Control unit for commissioning, programming and diagnostics. Not all functions of the axis controller SPC200 are supported. Please use WinPISA for commissioning. | 28 |

## Connector modules for SPC200

| | Type | Brief description | → Page/Internet |
|---|---|---|---|
| **Axis interface** | | | |
| | SPC-AIF-POT SPC-AIF-POT-LWG | For analogue displacement encoder (potentiometer) | 20 |
| | SPC-AIF-MTS | – For digital displacement encoder Temposonics/AIF – For linear drive DGPI…-…-AIF | 20 |
| | SPC-AIF-INC | For standard cylinder DNCI | 22 |
| | SPC-AIF-MTS-2 | For linear drive DGCI | 24 |
| **Power supply module** | | | |
| | SPC-AIF-SUP-24V | Additional power supply for the load voltage at the axis interface for cable lengths over 16 m | 26 |

# Axis controllers SPC200

Product range overview

## Basic configuration of controller packages

| Version | Brief description | Basic configuration | | | | | | | → Page/Internet |
|---|---|---|---|---|---|---|---|---|---|
| | | SPC200-MMI-1 | SPC200-PWR-AIF | SPC200-MMI-DIAG | SPC200-DIO | SPC200-2AI-U | SPC200-SCU-AIF | SPC200-COM-PDP | |
| SPC200/P01 | For 1 or 2 pneumatic axes with control unit | ■ | ■ | ■ | ■ | – | – | – | 9 |
| SPC200/P02 | For 1 or 2 pneumatic axes with control unit and 2 analogue inputs for positioning specifications | ■ | ■ | ■ | ■ | ■ | – | – | 9 |
| SPC200/P04 | With PROFIBUS-DP interface for 1 or 2 pneumatic axes | – | ■ | ■ | – | – | – | ■ | 9 |
| SPC200/P05 | With PROFIBUS-DP interface for up to 4 pneumatic axes | – | ■ | ■ | – | – | ■ | ■ | 9 |

## Expansion options for controller packages

| Version | Brief description | Expandable using ... | | | | | |
|---|---|---|---|---|---|---|---|
| | | SPC200-MMI-1 | SPC200-DIO | SPC200-2AI-U | SPC200-SCU-AIF | SPC200-COM-PDP | SPC200-COM-DN2 |
| SPC200/P01 | For 1 or 2 pneumatic axes with control unit | – | 1) | 1) | 1) | 1) | 1) |
| SPC200/P02 | For 1 or 2 pneumatic axes with control unit and 2 analogue inputs for positioning specifications | – | – | – | – | – | – |
| SPC200/P04 | With PROFIBUS-DP interface for 1 or 2 pneumatic axes | 2) | 1) | 1) | – | – | – |
| SPC200/P05 | With PROFIBUS-DP interface for up to 4 pneumatic axes | 2) | – | – | – | – | – |

1) One free card location, therefore expandable with max. one card. This must be ordered separately.
Other configurations can be produced from the individual components
2) Optional

# Axis controllers SPC200

Technical data

**Axis controller basic unit**
**SPC200-CPU-4**
**SPC200-CPU-6**

Function
Basic unit for 4 or 6 function cards,
contains closed loop position
controller for 2 pneumatic axes and
universal positioning control for
4 axes

| General technical data | | | |
|---|---|---|---|
| | | | SPC200 |
| Power supply | | | ➔ 10 (SPC200-PWR-AIF) |
| Current consumption | SPC200-CPU-4/6 incl. SPC200-PWR-AIF | [mA] | Typically 100 |
| Processor type | | | Digital signal processor |
| Operating system | | | Festo OS 4.6x[1] |
| Controller sampling time | | [ms] | Typically 1.5 |
| Control cycle | | [ms] | Typically 2 |
| Memory | Available for programs and data | [KB] | 20 |
| Data backup | | | Flash memory |
| | Backup cycles | | > 100 000 |
| No. of positioning axes | Total | | 4 |
| | Pneumatic | | Max. 4 |
| | Stepper motor | | Max. 3 |
| No. of inputs/outputs | Local | | Max. 40 inputs, 32 outputs[2] |
| | Per AIF string | | Max. 16 inputs and 16 outputs[3] |
| | Via fieldbus | | Max. 64 inputs and 64 outputs |
| No. of start programs | | | 2[4] |
| No. of position registers | | | 100 per axis |
| Operating modes | Set selection | No. of motion sets | Max. 32 via local I/O per start program |
| | | | Max. 1,000 via fieldbus interface per start program |
| | | Control signals | ENABLE, READY, STOP, RESET, RECBIT1..5, CLK_A/B, RC_A/B, ACK_A/B |
| | Start/stop | No. of programs | Max. 100 |
| | | Control signals | ENABLE, READY, START/RESET, STOP, MC_A/B, SYNC_IA/B,SYNC_OA/B |
| | | Programming | NC programming to DIN 66025 |
| | | Instruction classes | Positioning instructions |
| | | | I/O instructions |
| | | | Register instructions |
| | | | Sequence instructions |
| | | No. of NC sets | Max. 2,000 |
| | | No. of NC sets per program | Max. 1,000 |
| | | Nesting depth for subprograms | Max. 4 |

1) Status: April 2003
2) Less the used control signals of the first card
3) Either as 1 input device and 1 output device of the CP fieldbus modules or 1 input/output module SPC-FIO ...
4) At least 1 start program must be active

| General technical data | | | |
|---|---|---|---|
| | | SPC200 | |
| CE marking symbol (see conformity declaration) | | As per EU EMC directive | |
| Vibrations/shock | Vibrations | Tested to DIN/IEC 68, parts 2-6, severity level 1 | |
| | Shock | Tested to DIN/IEC 68, parts 2-27, severity level 2 | |
| Ambient conditions | Temperature range [°C] | −5 ... +50 | |
| | Protection class | IP20[5] | |
| | Relative air humidity | 95% non-condensing | |
| Weight | SPC200-CPU-4 [kg] | 0.675 | |
| | SPC200-CPU-6 [kg] | 0.85 | |

5)   With fully equipped basic unit

- ◯ -   New

Communication modules for connecting to a fieldbus, like PROFIBUS or DeviceNet, facilitate reading and writing all registers of the axis controller SPC200.

Reading the actual position and writing a digital position setpoint.

| Ordering data | | | |
|---|---|---|---|
| | | Part No. | Type |
| Axis controller basic unit | With 4 mounting locations | **170 173** | **SPC200-CPU-4** |
| | With 6 mounting locations | **170 174** | **SPC200-CPU-6** |
| Accessories | Blanking plate (plug-in card) | **170 229** | **SPC200-BP** |
| | Clip for H-rail assembly for SPC200 | **170 169** | **CP-TS-HS-35** |
| User documentation | For axis controller basic unit, German | **170 245** | **P.BE-SPC200-DE** |
| | For axis controller basic unit, English | **170 246** | **P.BE-SPC200-EN** |

## Function modules
→ www.festo.com

Function modules that support communication between third-party controllers and the PROFIBUS card of the axis controller SPC200 can be downloaded from the Download Area of the Festo website.

# Axis controllers SPC200

Technical data

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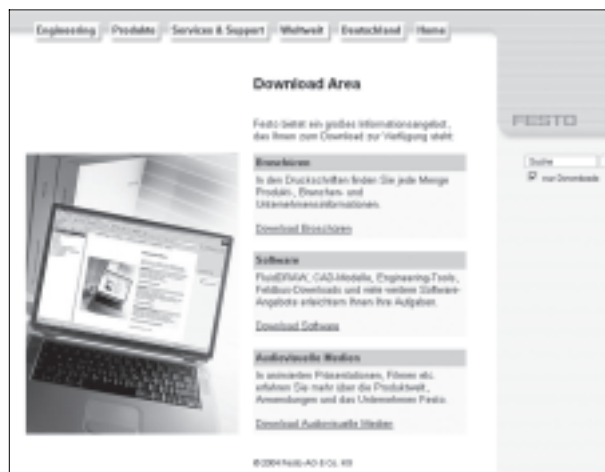
**Dimensions**  Download CAD data ➔ **www.festo.com**

SPC200-CPU-4 (rack for 4 mounting locations) using as an example: SPC200/P02
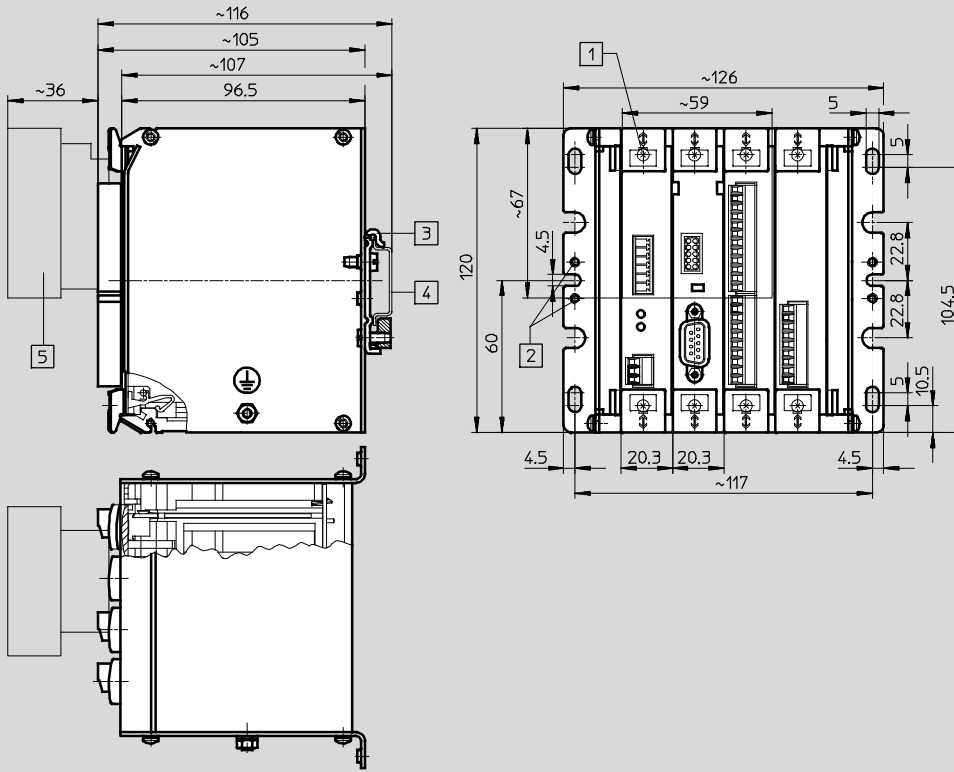
|1| Installation option for inscription label LBS 6x10
|2| Mounting option for clip
|3| Clip for rail mounting
|4| Mounting rail
|5| Control unit SPC200-MMI-1

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SPC200-CPU-6 (rack for 6 mounting locations)
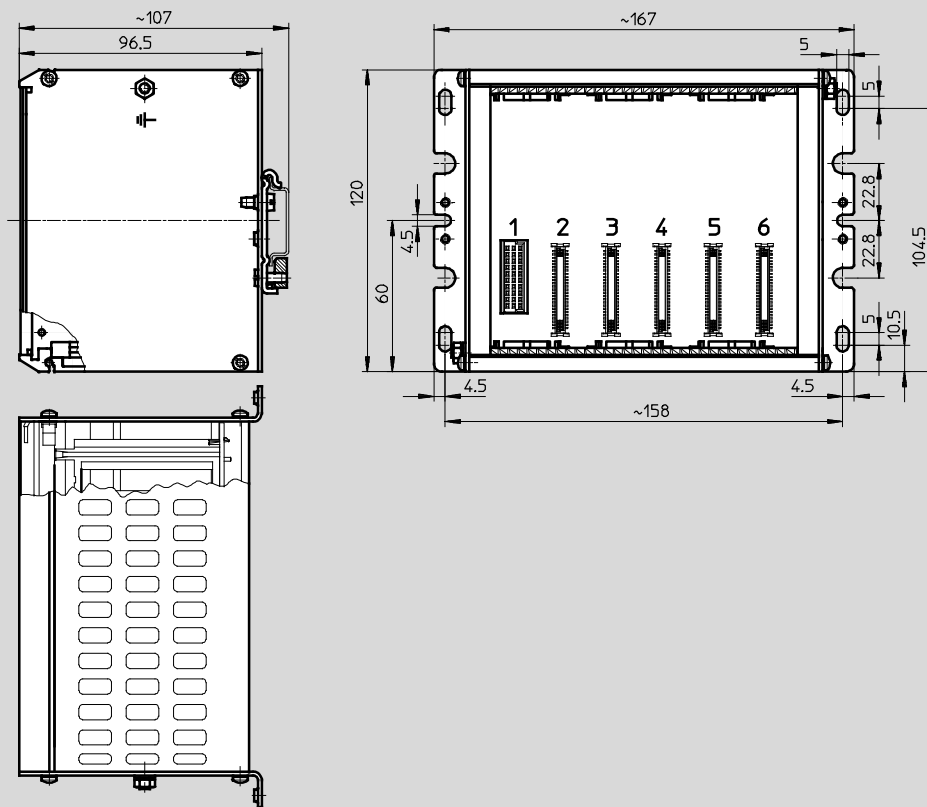
- ‡ - Note

The numbers 1 ... 6 represent the order of the mounting locations.

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# Axis controllers SPC200

Technical data

## Order of the mounting locations
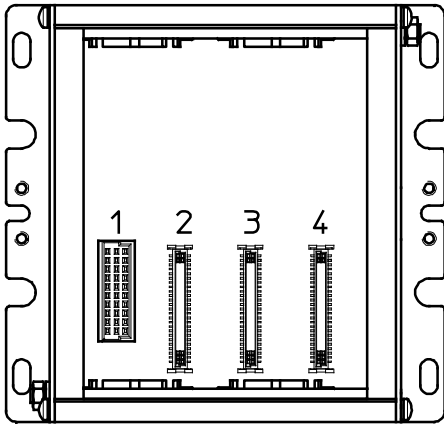


| Configured controller packages | | | | | | | |
|---|---|---|---|---|---|---|---|
| Controller packages | Mounting location | | | | Control unit SPC200-MMI-1[1] | Part No. | Type |
| | 1 | 2 | 3 | 4 | | | |
| **P01** | 1 | 2 | 4 | 9 | ■ | **170 521** | SPC200/P01 |
| **P02** | 1 | 2 | 4 | 5 | ■ | **170 522** | SPC200/P02 |
| **P04** | 1 | 2 | 9 | 7 | – | **187 812** | SPC200/P04 |
| **P05** | 1 | 2 | 3 | 7 | – | **187 813** | SPC200/P05 |

1) Included in the scope of delivery

| Legend | | | |
|---|---|---|---|
| | Type | Description | → Page/Internet |
| 1 | SPC200-PWR-AIF | Power supply | 10 |
| 2 | SPC200-MMI-DIAG | Serial interface | 11 |
| 3 | SPC200-SCU-AIF | Sub-controller | 15 |
| 4 | SPC200-DIO | Digital I/O | 12 |
| 5 | SPC200-2AI-U | Setpoint module | 14 |
| 7 | SPC200-COM-PDP | PROFIBUS DP interface | 16 |
| 9 | SPC200-PB | Blanking plate | 7 |

# Axis controllers SPC200

Technical data

**Power supply**
**SPC200-PWR-AIF**

Function
Power supply and connection of the
first axis string

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-PWR-AIF |
| Current consumption | Plug-in card | [mA] | See basic unit |
| Power supply unit (PWR) | Supply | [V DC] | 24 −5/+25% |
| | Residual ripple | [%] | 2 |
| | Power failure buffering for logic supply (pin 2) | [ms] | 10 |
| | Current consumption | Load, pin 1 [A] | Max. 5.0 |
| | | Logic, pin 2 [A] | Max. 4.0 |
| Feature | – | | 2 pneumatic axes |
| Axis connection | Digital inputs | [max] | 16 function inputs[1] |
| | Digital outputs | [max] | 16 function outputs[1] |
| Electrical connections | Power supply unit | | 3-pin terminal strip |
| | Axis connection | | 5-pin terminal strip |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Weight | | [g] | 82 |
| Mounting location ➔ 9 | | | 1 |

1)   Either as 1 input module and 1 output module of the CP modules or 1 input/output module SPC-FIO-...

## Pin allocation
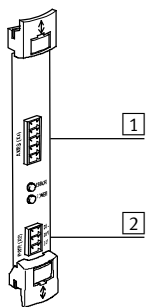
|1| Terminal strip on cable type KSPC-AIF-WD-... pre-assembled

|2| 3-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm$^2$

Connecting cable ➔ 29, no. |1|

- Note

The valves at the axis interfaces and the outputs of the CP modules are supplied via the 24 V load supply. They can therefore be switched off independently of the logic supply in an emergency stop situation.

| |1| AXES (X1) | |
|---|---|
| Pin | Function |
| 1 | CAN-LOW (brown) |
| 2 | CAN-HIGH (white) |
| 3 | 24 V (yellow) |
| 4 | 0 V (green) |
| 5 | 24 V load supply (grey) |

| |2| PWR (X2) | |
|---|---|
| Pin | Function |
| 1 | 24 V load supply (switchable) |
| 2 | 24 V supply logic |
| 3 | 0 V |

| Ordering data | | | |
|---|---|---|---|
| | | Part No. | Type |
| Plug-in card | Power supply unit and axis interface connection | **170 175** | **SPC200-PWR-AIF** |

# Axis controllers SPC200

Technical data

**Serial interface**
**SPC200-MMI-DIAG**

Function
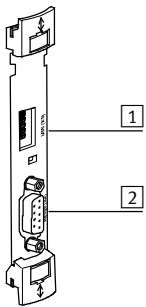Serial interface for diagnostics and programming, connection of the control unit MMI-1

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-MMI-DIAG |
| Current consumption | Plug-in card | [mA] | Typically 50[1] |
| Serial interface | Version | | RS 232 C |
| | Electrical isolation | | Yes |
| | Baud rate | [baud] | 9,600; 19,200; 38,400; 57,600; 115,200[2] |
| | Data | [bit] | 8 |
| | Stop bit | [bit] | 1 |
| | Parity | | Even parity |
| | Protocol | | No handshake |
| MMI interface | Version | | Similar to RS 232 C |
| | Electrical isolation | | No |
| Electrical connections | Serial interface | | 9-pin SUB-D, female |
| | MMI-1 | | 5 double-pin row |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Weight | | [g] | 68 |
| Mounting location ➜ 9 | | | 2 |

1) With control unit SPC200-MMI-1
2) The baud rate is 9,600 baud after each POWER ON

| Pin allocation | |
|---|---|

1 Interface for control unit
SPC200-MMI-1

2 Serial interface

Connecting cable ➜ 29, no. 7

| 2 RS232 (X4) | |
|---|---|
| Pin | Function |
| 2 | Received Data (RxD) |
| 3 | Transmitted Data (TxD) |
| 5 | Signal Ground (SNGD) |

| Ordering data | | Part No. | Type |
|---|---|---|---|
| Plug-in card | Diagnostics and control unit connection | **170 176** | **SPC200-MMI-DIAG** |

**Digital I/O module**
**SPC200-DIO**

Function
Digital input/output card (local I/O)



| General technical data | | | |
|---|---|---|---|
| | | | SPC200-DIO |
| Current consumption | Plug-in card | [mA] | Typically 50 |
| Digital inputs | Number | | 10 |
| | Sensor supply | [A] | 0.5[1] |
| | Current consumption | [mA] | 8 (at 24 V DC/"logic 1") |
| | Fuse protection for sensor supply | | Electronic short-circuit protection |
| | Delay | [ms] | 5 |
| Digital outputs | Number | | 8 |
| | Supply | [V DC] | 24 ±25%[2] |
| | Max. current-carrying capacity per output | [mA] | 250 |
| | Fuse protection for outputs | | Electronic, all outputs |
| | Max. tripping current | [A] | 2 |
| | Response time | [ms] | 1.5 |
| Version | Inputs/outputs | | To IEC 61131-2, positive logic (PNP) |
| Electrical isolation | Inputs/outputs | | No/yes |
| Electrical connections | Inputs | | 12-pin terminal strip |
| | Outputs | | 10-pin terminal strip |
| Weight | | [g] | 62 |
| Mounting location ➜ 9 | | | From 3 upwards |

1)  Via internal 24 V supply (pin 2 to PWR to plug-in card SPC200-PWR-AIF)
2)  Supplied separately, note load data

## Pin allocation
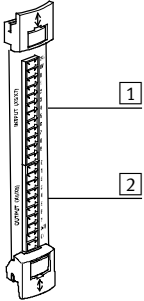
[1] 12-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm$^2$

[2] 10-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm$^2$

- Note

Inputs and outputs on the first card are reserved for necessary functions such as start, stop, etc. Up to 7 inputs and 5 outputs are freely programmable.

On the other cards, all 10 inputs and 8 outputs are freely programmable. Up to 4 I/O cards can be inserted (in 6x rack).

### [1] Input (X5/X7)

| Pin | Function | Start/stop operation | Set selection |
|-----|----------|---------------------|---------------|
| 1 | 24 V | Supply (for switch/sensor) | |
| 2 | 0 V | | |
| 3 | I0.0 | Freely programmable | RECBIT1 |
| 4 | I0.1 | Freely programmable | RECBIT2 |
| 5 | I0.2 | Freely programmable | RECBIT3 |
| 6 | I0.3 | Freely programmable | RECBIT4 |
| 7 | I0.4 | Freely programmable | RECBIT5 |
| 8 | I0.5 | (SYNC_IN/B)[1] | CLK_B |
| 9 | I0.6 | (SYNC_IN/B)[1] | CLK_A |
| 10 | I0.7 | STOP | STOP |
| 11 | I0.8 | START/RESET[2] | RESET[2] |
| 12 | I0.9 | ENABLE | ENABLE |

### [2] Output (X2)

| Pin | Function | Start/stop operation | Set selection |
|-----|----------|---------------------|---------------|
| 1 | Q0.0 | Freely programmable | – |
| 2 | Q0.1 | Freely programmable | – |
| 3 | Q0.2 | Freely programmable | – |
| 4 | Q0.3 | MC_B | RC_B |
| 5 | Q0.4 | MC_A | RC_A |
| 6 | Q0.5 | (SYNC_OUT/B)[1] | ACK_B |
| 7 | Q0.6 | (SYNC_OUT/A)[1] | ACK_A |
| 8 | Q0.7 | READY | READY |
| 9 | 24 V | Supply (load supply for outputs) | |
| 10 | 0 V | | |
| | | | |
| | | | |

1) Freely programmable, if not used
2) Reset (program reset) only in combination with 0 signal at stop input

## Ordering data

| | | Part No. | Type |
|---|---|----------|------|
| Plug-in card | Digital inputs/outputs (10I/8O) | **170 179** | **SPC200-DIO** |

# Axis controllers SPC200
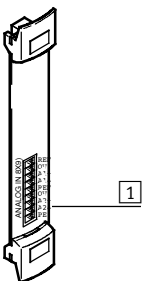
Technical data

**Setpoint module**
**SPC200-2AI-U**

Function
Analogue input card

## General technical data

| | | | SPC200-2AI-U |
|---|---|---|---|
| Current consumption | Plug-in card | [mA] | Typically 10 |
| Analogue inputs | Number | | 2 |
| | Input voltage | [V DC] | 0 … 10 |
| | Input filter, low pass | [Hz] | 16 |
| | Resolution | [bit] | 12 |
| | Non-linearity | | 3 LSB |
| | Max. amplification error | [%] | 0.2 |
| | Max. offset error | [mV] | 1.5 |
| | Absolute accuracy | [%] | < 0.3 |
| | Input resistance | [kΩ] | > 200 |
| Reference voltage | | [V DC] | 10 |
| | Absolute accuracy | [%] | 0.4 |
| | Max. current | [mA] | 8 |
| Electrical connection | | | 9-pin terminal strip |
| Weight | | [g] | 55 |
| Mounting location ➜ 9 | | | From 3 upwards |

## Pin allocation

1   9-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm$^2$

1

- Note

Max. 2 plug-in cards can be used for position specifications for up to 4 axes.
The allocation of the channel to an axis is programmable.

Only one axis can be allocated to each channel.
Offset and scaling of the setpoint specifications are also separately programmable for each channel.

## 1 Analogue IN (X9)

| Pin | Function |
|---|---|
| 1 | Reference voltage 10 $V_{REF}$ |
| 2 | 0 V |
| 3 | A1+; signal (+) for channel 1 |
| 4 | A1−; signal (−) for channel 1 |
| 5 | Reference voltage 10 $V_{REF}$ |
| 6 | 0 V |
| 7 | A2+; signal (+) for channel 2 |
| 8 | A2−; signal (−) for channel 2 |
| 9 | PE |

## Ordering data

| | | Part No. | Type |
|---|---|---|---|
| Plug-in card | Analogue setpoint specification, 2 channels, 0 … 10 V | **170 177** | **SPC200-2AI-U** |

Technical data

**Sub-controller**
**SPC200-SCU-AIF**

Function
Contains the position controllers for 2
further pneumatic axes and connec-
tion for the second axis string

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-SCU-AIF |
| Current consumption | Plug-in card | [mA] | Typically 100 |
| Axis connection | 2nd string | | 3rd and 4th pneumatic axes |
| | Digital inputs | [max] | 16 function I/O[1] |
| | Digital outputs | [max] | 16 function I/O[1] |
| Electrical connection | Axis connection | | 5-pin terminal strip |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Weight | | [g] | 80 |
| Mounting location ➔ 9 | | | From 3 upwards |

1) Either as 1 input module and 1 output module of the CP modules or 1 input/output module SPC-FIO-…

**Pin allocation**
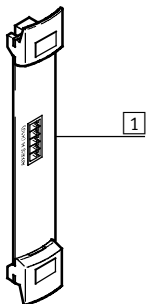
1 Terminal strip on cable
type KSPC-AIF-1-WD-…
pre-assembled

Connecting cable ➔ 29, no. 1

| 1 AXES B (X10) | |
|---|---|
| Pin | Function |
| 1 | CAN-LOW (brown) |
| 2 | CAN-HIGH (white) |
| 3 | 24 V (yellow) |
| 4 | 0 V (green) |
| 5 | 24 V load supply (grey) |

| Ordering data | | Part No. | Type |
|---|---|---|---|
| Plug-in card | Sub-controller for 3rd and 4th pneumatic axes | **178 311** | **SPC200-SCU-AIF** |

# Axis controllers SPC200

Technical data

**PROFIBUS-DP interface**
**SPC200-COM-PDP**

Function
PROFIBUS interface of the SPC200 as
slave to a PROFIBUS network

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-COM-PDP |
| Current consumption | Plug-in card | [mA] | Typically 50 |
| Profibus | Version | | RS 485 |
| | Electrical isolation | | Yes |
| | Type of transmission | | Serial asynchronous, half-duplex |
| | Protocols | | PROFIBUS DP (standard slave), to DIN 19245, 1 – 4, EN 50170 Vol. 2 |
| | Addressing range of the fieldbus interface | | 0 ... 125 |
| | Max. address volume | Outputs [Byte] | 32 |
| | | Inputs [Byte] | 32 |
| | Baud rate | [kBit/s] | 9.6 – 12,000[1] |
| | Line length | [km] | 23.8[2] |
| | Max. load capacity | [mA] | 100[3] |
| Configuration support for the fieldbus interface | | | GSD file |
| Electrical connection | PROFIBUS | | 9-pin SUB-D, female |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Weight | | [g] | 80 |
| Mounting location ➔ 9 | | | From 3 upwards[4] |

1) Automatic baud rate detection
2) Line length dependent on baud rate and type of cable
3) Supply voltage positive (PV5), pin 6
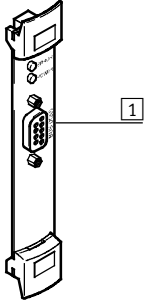4) When using the control unit MMI-1 as of location 4

## Pin allocation

[1] 9-pin plug usable acc. to
PROFIBUS standard,
type FBS-SUB-9-WS-PB-K
➔ Table below

-◯- New

Position data can be read and
written directly via PROFIBUS
(as of firmware release 2.0)

| [1] Bus (X20) | |
|---|---|
| Pin | Function |
| 1 | PE |
| 2 | Unused |
| 3 | RxD/TxD-P |
| 4 | CNTR-P |
| 5 | DGND |
| 6 | UP |
| 7 | Unused |
| 8 | RxD/TxD-N |
| 9 | Unused |

## Ordering data

| | | Part No. | Type |
|---|---|---|---|
| Plug-in card | PROFIBUS DP interface | **170 224** | **SPC200-COM-PDP** |
| Accessories | Connector plug | **533 780** | **FBS-SUB-9-WS-PB-K** |
| User documentation | For PROFIBUS DP interface, German | **188 892** | **P.BE-SPC200-COM-PDP-DE** |
| | For PROFIBUS DP interface, English | **188 893** | **P.BE-SPC200-COM-PDP-EN** |
| Software and manual | For Simatic S7 controller, German | **540 188** | **P.SW-SPC200-S7-PC-DE** |
| | For Simatic S7 controller, English | **540 189** | **P.SW-SPC200-S7-PC-EN** |

## Function modules

➔ www.festo.com

Function modules that support
communication between third-party
controllers and the PROFIBUS card of
the axis controller SPC200 can be
downloaded from the Download Area
of the Festo website.
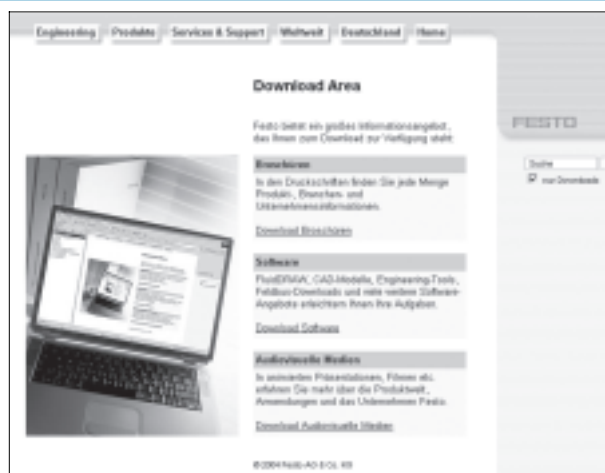
**DeviceNet interface**
**SPC200-COM-DN2**

Function
DeviceNet interface of the SPC200 as
slave to a DeviceNet network.

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-COM-DN2 |
| Current consumption | Plug-in card | [mA] | Typically 50 |
| Power supply | Fieldbus | [V DC] | 11 … 30 |
| DeviceNet bus | Version | | – Physical layer (layer 1) to ISO/DIS 11898 |
| | | | – Standard highspeed to 1 Mbit |
| | | | – Data Link layer (layer 2 ) to CAN specifications V2.0 |
| | | | – DeviceNet, Release 2.0 |
| | Electrical isolation | | Yes |
| | Protocols | | – DeviceNet-IO |
| | | | – DeviceNet-Profil |
| | Addressing range of the fieldbus interface | | 0 … 63 |
| | Baud rate | [kBit/s] | 125, 250, 500 |
| Number of outputs | Set selection | [Byte] | 2 |
| | Start/Stop | [Byte] | 2 … 8 |
| Number of inputs | Set selection | [Byte] | 4 |
| | Start/Stop | [Byte] | 2 … 8 |
| Operation characteristic | | | Reading an writing inputs and outputs |
| | | | Reading and writing all program registers of the SPC200 |
| | | | Read out the actual position |
| | | | Digital setpoint specification |
| LED display | | | Module and network status |
| Device-specific diagnosis | | | Via status bit |
| | | | Via WinPISA status display |
| Configuration support for the fieldbus interface | | | EDS file |
| Electrical connection        Open Style | | | 5-pin terminal strip |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Weight | | [g] | 80 |
| Mounting location ➜ 9 | | | From 3 upwards |

## Pin allocation

[1] 5-pin terminal strip included in the scope of delivery.
Connection cross section max. 1.5 mm$^2$

[1]

- ◌ - New

The card SPC200-COM-DN2 facilitates the connection of the SPC200 to DeviceNet.
Position data can be read and written directly via PROFIBUS (as of firmware release 4.9).

### [1] Bus (X20)

| Pin | Function |
|-----|----------|
| 1 | 0 V bus interface/logic (CAN_GND) |
| 2 | Data – (CAN_L) |
| 3 | Screen (CAN_SHLD) |
| 4 | Data + (CAN_H) |
| 5 | 24 V DC bus interface/logic (CAN_V+) |

### Ordering data

| | | Part No. | Type |
|---|---|---|---|
| Plug-in card | DeviceNet interface | **540 305** | **SPC200-COM-DN2** |
| User documentation | For DeviceNet interface, German | **196 607** | **P.BE-SPC200-COM-CANDN-DE** |
| | For DeviceNet interface, English | **196 608** | **P.BE-SPC200-COM-CANDN-EN** |

# Axis controllers SPC200

Technical data

FESTO

**Axis interface**
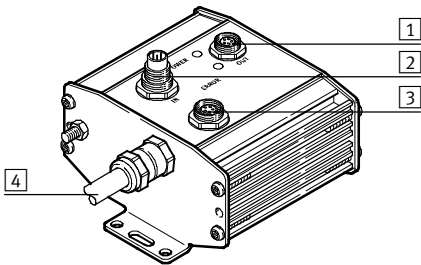**SPC-AIF-POT**
**SPC-AIF-POT-LWG**
**SPC-AIF-MTS**

Function

Connection of the proportional valve and the displacement encoder of a pneumatic axis to the SPC200.

Routing of the axis connection to the second axis interface or to a CP module
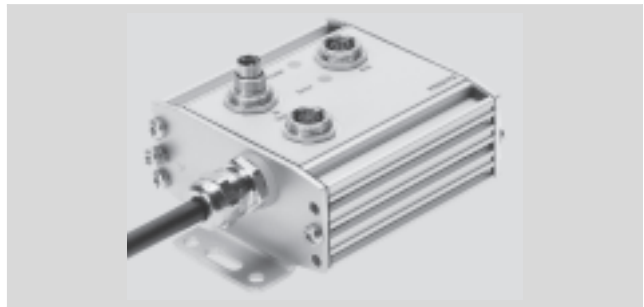
| General technical data | | | SPC-AIF-POT | SPC-AIF-POT-LWG | SPC-AIF-MTS |
|---|---|---|---|---|---|
| Current consumption | Axis interface | [mA] | 100 | 100 | 200 |
| | Prop. directional control valve, max. | [A] | 1.1 | | |
| Electrical connections | AIF IN | | 5-pin M9, male | | |
| | AIF OUT | | 5-pin M9, female | | |
| | Prop. directional control valve | | 7-pin M9, male | | |
| | Displ. encoder cable length | [m] | 0.3 | | |
| | Plug | | Type A DIN 43650 | 4-pin square plug | 6-pin round connector DIN 45322 |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive | | |
| Ambient conditions | Temperature range | [°C] | 0 ... +50 | | |
| | Protection class to IEC 60529 | | IP65 | | |
| Weight | | [g] | 300 | | |

## Pin allocation

Connecting cable ➜ 29,
no. 2/no. 3/no. 5

| 1 AIF OUT | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 2 AIF IN | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 3 Proportional directional control valve | |
|---|---|
| Pin | Function |
| 1 | +24 V |
| 2 | 0 V |
| 3 | 0 V |
| 4 | Setpoint value |
| 5 | GND |
| 6 | Unused |
| 7 | +24 V |
| PE | Screen |

| 4 Displacement encoder POT | |
|---|---|
| Pin | Function |
| 1 | +10 V (green) |
| 2 | Signal (white) |
| 3 | GND (brown) |
| PE | PE (yellow) |
| | |
| | |
| | |

| 4 Displacement encoder LWG | |
|---|---|
| Pin | Function |
| 1 | +10 V (green) |
| 2 | Signal (white) |
| 3 | GND (brown) |
| PE | PE (yellow) |
| | |
| | |
| | |

| 4 Displacement encoder MTS | |
|---|---|
| Pin | Function |
| 1 | Can LOW (white) |
| 2 | Can HIGH (yellow) |
| 3 | Unused |
| 4 | Unused |
| 5 | +24 V (green) |
| 6 | 0 V (brown) |
| PE | Screen |

## Dimensions

Download CAD data → **www.festo.com**

### SPC-AIF-POT/-LWG/-MTS
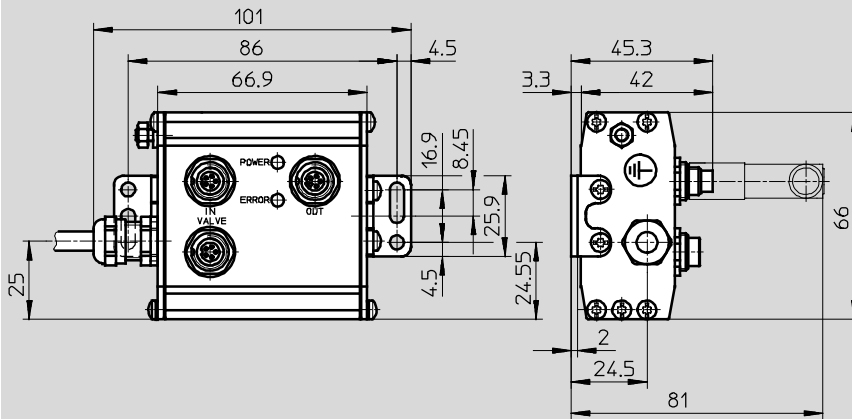


1 Mounting set
2 Connecting cable

| Ordering data | | Part No. | Type |
|---|---|---|---|
| Axis interface | For analogue displacement encoder | **170 228** | **SPC-AIF-POT** |
| | | **527 496** | **SPC-AIF-POT-LWG** |
| | For digital displacement encoder | **170 231** | **SPC-AIF-MTS** |
| Accessories | Terminating resistor for AIF string | **175 403** | **KABS-M9-R100**[1] |
| | Mounting set for vertical fitting | **540 309** | **SPC-HBW-SET** |

1) One contained in SPC200/P0X
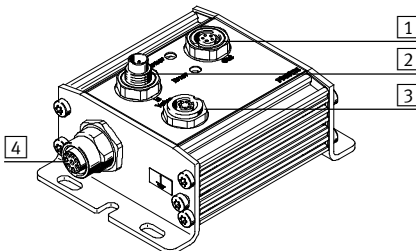
**Axis interface**
**SPC-AIF-INC**

Function
Connection of the proportional valve and the displacement encoder of a pneumatic axis to the SPC200.

Routing of the axis connection to the second axis interface or to a CP module.

| General technical data | | | |
|---|---|---|---|
| | | | SPC-AIF-INC |
| Current consumption | Axis interface | [mA] | 60 |
| | Prop. directional control valve, max. | [A] | 1.1 |
| Electrical connections | AIF IN | | 5-pin M9, male |
| | AIF OUT | | 5-pin M9, female |
| | Prop. directional control valve | | 7-pin M9, female |
| | Displacement encoder | | 8-pin M12, female |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Ambient conditions | Temperature range | [°C] | 0 ... +50 |
| | Protection class to IEC 60529 | | IP65 |
| Weight | | [g] | 240 |

**Pin allocation**

Connecting cable ➔ 29,
no. 2/no. 3/no. 5

| 1 AIF OUT | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 2 AIF IN | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 3 Proportional directional control valve | |
|---|---|
| Pin | Function |
| 1 | +24 V |
| 2 | 0 V |
| 3 | 0 V |
| 4 | Setpoint value |
| 5 | GND |
| 6 | Unused |
| 7 | +24 V |
| PE | Screen |

| 4 Displacement encoder INC | |
|---|---|
| Pin | Function |
| 1 | 5 V |
| 2 | GND |
| 3 | sin+ |
| 4 | sin– |
| 5 | cos– |
| 6 | cos+ |
| 7 | Screen |
| 8 | – |

| Dimensions | Download CAD data ➔ **www.festo.com** |
| --- | --- |
| SPC-AIF-INC | |
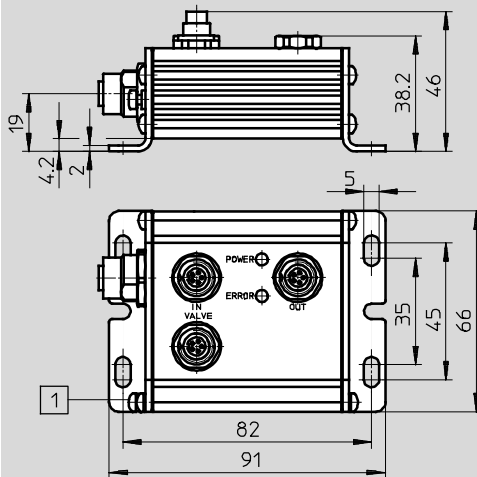


1  Earth terminal

| Ordering data | | Part No. | Type |
| --- | --- | --- | --- |
| Axis interface | For digital displacement encoder | **537 320** | **SPC-AIF-INC** |
| Accessories | Terminating resistor for AIF string | **175 403** | **KABS-M9-R100**[1] |

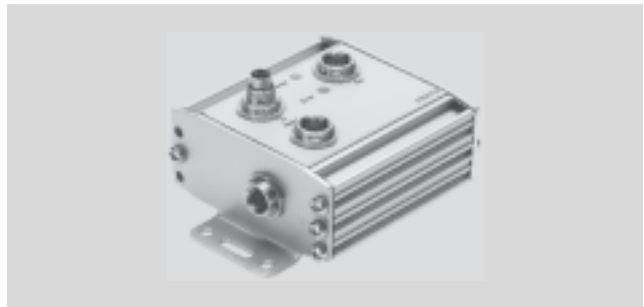1)  One contained in SPC200/P0X

# Axis controllers SPC200

Technical data

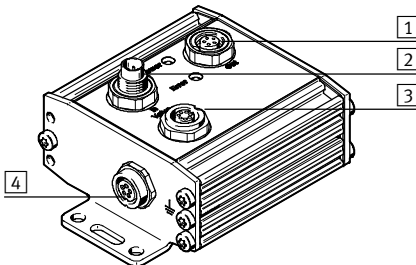**Axis interface**
**SPC-AIF-MTS-2**

Function

Connection of the proportional valve and the displacement encoder of a pneumatic axis to the SPC200.

Routing of the axis connection to the second axis interface or to a CP module.

| General technical data | | | |
|---|---|---|---|
| | | | SPC-AIF-MTS-2 |
| Current consumption | Axis interface | [mA] | 200 |
| | Prop. directional control valve, max. | [A] | 1.1 |
| Electrical connections | AIF IN | | 5-pin M9, male |
| | AIF OUT | | 5-pin M9, female |
| | Prop. directional control valve | | 7-pin M9, male |
| | Displacement encoder | | 5-pin M9, female |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Ambient conditions | Temperature range | [°C] | 0 ... +50 |
| | Protection class to IEC 60529 | | IP65 |
| Weight | | [g] | 300 |

## Pin allocation

Connecting cable → 29,
no. 2 /no. 3 /no. 5

| 1 AIF OUT | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 2 AIF IN | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply (grey) |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |
| | |
| | |

| 3 Proportional directional control valve | |
|---|---|
| Pin | Function |
| 1 | +24 V |
| 2 | 0 V |
| 3 | 0 V |
| 4 | Setpoint value |
| 5 | GND |
| 6 | Unused |
| 7 | +24 V |
| PE | Screen |

| 4 Displacement encoder DGCI | |
|---|---|
| Pin | Function |
| 1 | +24 V |
| 2 | Unused |
| 3 | 0 V |
| 4 | CAN-HIGH |
| 5 | CAN-LOW |
| PE | Screen |

## Dimensions

SPC-AIF-MTS-2

Download CAD data ➜ **www.festo.com**
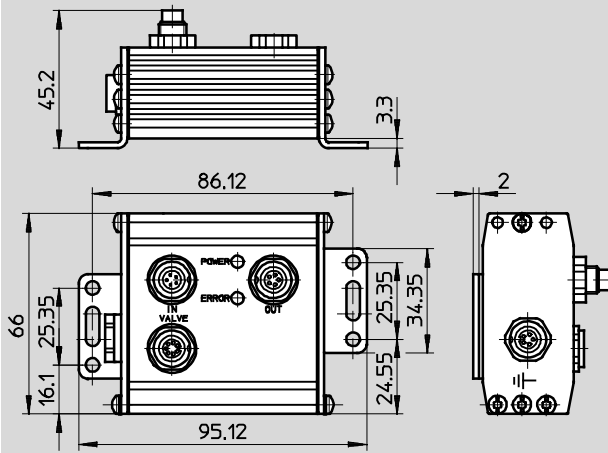


| Ordering data | | Part No. | Type |
|---|---|---|---|
| Axis interface | For digital displacement encoder | **548 128** | **SPC-AIF-MTS-2** |
| Accessories | Terminating resistor for AIF string | **175 403** | **KABS-M9-R100**[1] |

1) One contained in SPC200/P0X

# Axis controllers SPC200

Technical data

**Power supply module**
**SPC-AIF-SUP-24V**

Function
Additional power supply for the load
voltage at the axis interface string, for
cable lengths over 16 m.

| General technical data | | | |
|---|---|---|---|
| | | | SPC-AIF-SUP-24V |
| Electrical connections | AIF IN | | 5-pin M9, male |
| | AIF OUT | | 5-pin M9, female |
| | Cable length | [m] | 0.2 |
| | For load voltage | | 5-pin M12, male |
| | Voltage | [V DC] | 24 −5/+25% |
| | Current | [A] | 3 |
| Protection against polarity reversal | | | No |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Ambient conditions | Temperature range | [°C] | 0 ... +50 |
| | Protection class to DIN 60529 | | IP65 |
| Weight | | [g] | 150 |

## Pin allocation

Connecting cable → 29,
no. 3 /no. 4
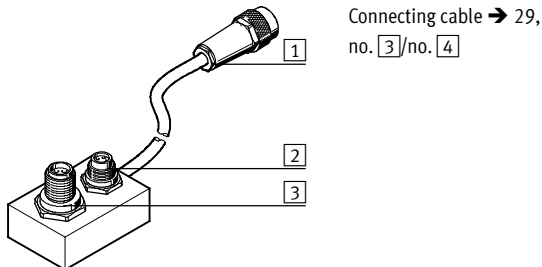
| 1 AIF OUT | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | 24 V load supply of 3 |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |

| 2 AIF IN | |
|---|---|
| Pin | Function |
| 1 | 24 V (yellow) |
| 2 | Unused |
| 3 | 0 V (green) |
| 4 | CAN-HIGH (white) |
| 5 | CAN-LOW (brown) |
| PE | Screen |

| 3 Load supply | |
|---|---|
| Pin | Function |
| 1 | Unused |
| 2 | 24 V load |
| 3 | 0 V |
| 4 | Unused |

## Dimensions

Download CAD data ➔ **www.festo.com**

SPC-FIO-2E/2A-M8
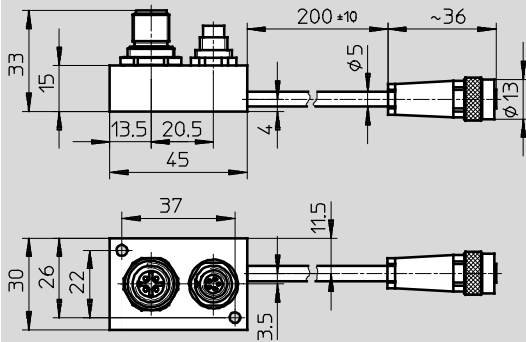


## Ordering data

| | | Part No. | Type |
|---|---|---|---|
| Power supply module | Additional power supply for the load voltage | **171 182** | **SPC-AIF-SUP-24V** |

Technical data

**Control unit**
**SPC200-MMI-1**

Not all functions of the axis controller
SPC200 are supported. Please use
WinPISA for commissioning.

| General technical data | | | |
|---|---|---|---|
| | | | SPC200-MMI-1 |
| Display | | | LCD display, 2 x 16 characters |
| Operation | | | Touch-sensitive keypad with 6 keys |
| Power supply | | [V DC] | 5[1] |
| Current consumption | | [mA] | 30[2] |
| Interface | | | [3] |
| Electrical isolation | | | No |
| Electrical connections | Interface | | 10-pin row |
| | Power supply | | 10-pin row |
| CE marking symbol (see conformity declaration) | | | As per EU EMC directive |
| Ambient conditions | Temperature range | [°C] | −5 ... +50 |
| | Protection class to IEC 60529 | | IP20 |
| Weight | | [g] | 90 |

1)  Is supplied directly via the plug-in card SPC200-MMI-DIAG
2)  Referred to 24 V supply of the SPC200-PVR card
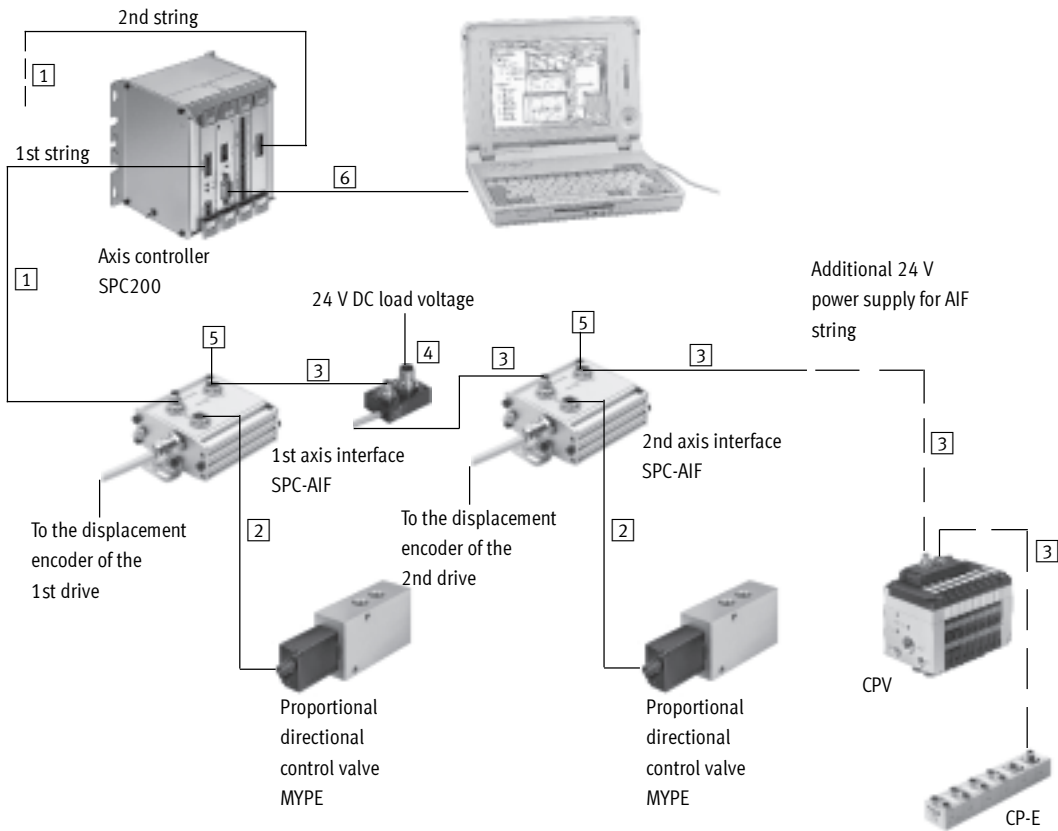3)  Similar to RS 232

| Pin allocation | |
|---|---|
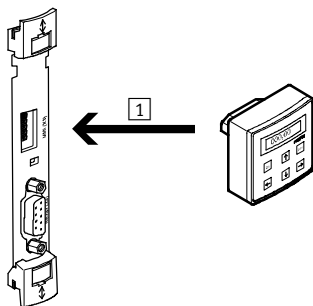
[1] Plug-in direct

| Ordering data | | | |
|---|---|---|---|
| | | Part No. | Type |
| Control unit | For commissioning, programming and diagnostics | **170 226** | **SPC200-MMI-1** |

# Axis controllers SPC200

Accessories

## Cables – Pneumatic drives



| No. | Brief description | Length [m] | Connection | Suitable for chain link trunking | Part No. | Type |
|---|---|---|---|---|---|---|
| 1 | Connecting cable for axis controller/interface[1] | 5 | angled | – | 170 236 | **KSPC-AIF-1-WD-5** |
| 1 | Connecting cable for axis controller/interface[1] | 8 | angled | – | 170 237 | **KSPC-AIF-1-WD-8** |
| 2 | Connecting cable for axis interface/valve | 0.3 | straight | – | 170 239 | **KMPYE-AIF-1-GS-GD-0,3** |
| 2 | Connecting cable for axis interface/valve | 2 | straight | – | 170 238 | **KMPYE-AIF-1-GS-GD-2** |
| 3 | Connecting cable for axis interface/function I/O[1] | 0,25 | angled | ∎ | 540 327 | **KVI-CP-3-WS-WD-0,25** |
| 3 | Connecting cable for axis interface/function I/O[1] | 0,5 | angled | ∎ | 540 328 | **KVI-CP-3-WS-WD-0,5** |
| 3 | Connecting cable for axis interface/function I/O[1] | 2 | angled | ∎ | 540 329 | **KVI-CP-3-WS-WD-2** |
| 3 | Connecting cable for axis interface/function I/O[1] | 5 | angled | ∎ | 540 330 | **KVI-CP-3-WS-WD-5** |
| 3 | Connecting cable for axis interface/function I/O[1] | 8 | angled | ∎ | 540 331 | **KVI-CP-3-WS-WD-8** |
| 3 | Connecting cable for axis interface/function I/O[1] | 2 | straight | ∎ | 540 332 | **KVI-CP-3-GS-GD-2** |
| 3 | Connecting cable for axis interface/function I/O[1] | 5 | straight | ∎ | 540 333 | **KVI-CP-3-GS-GD-5** |
| 3 | Connecting cable for axis interface/function I/O[1] | 8 | straight | ∎ | 540 334 | **KVI-CP-3-GS-GD-8** |
| 4 | Additional 24 V power supply for AIF string[2] | – | straight | – | 171 182 | **SPC-AIF-SUP-24 V** |
| 5 | Terminating resistor for AIF string[3] | – | straight | – | 175 403 | **KABS-M9-R100** |
| 6 | Programming cable | 3 | straight | – | 151 915 | **KDI-PPA-3-BU9** |

1) The total length of the lines must not exceed 30 m
2) Recommended where the total length of connecting cable is over 16 m
3) Must be connected at the last axis interface in the chain
   (Contained in the controller package SPC200/P0X)