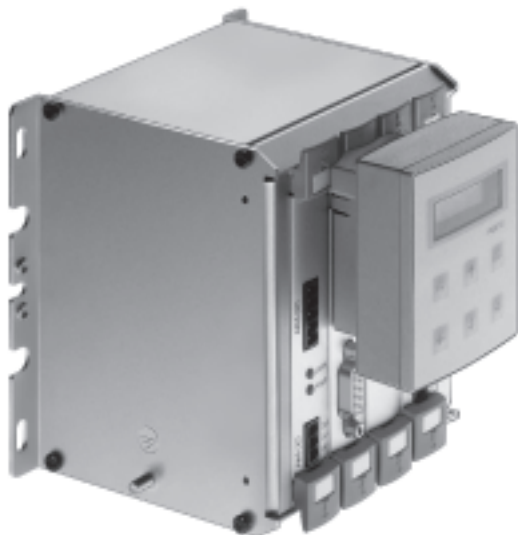


- Modular
- Flexible
- Versatile

## Axis controllers SPC200

Key features

### At a glance



**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, Device Net, 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

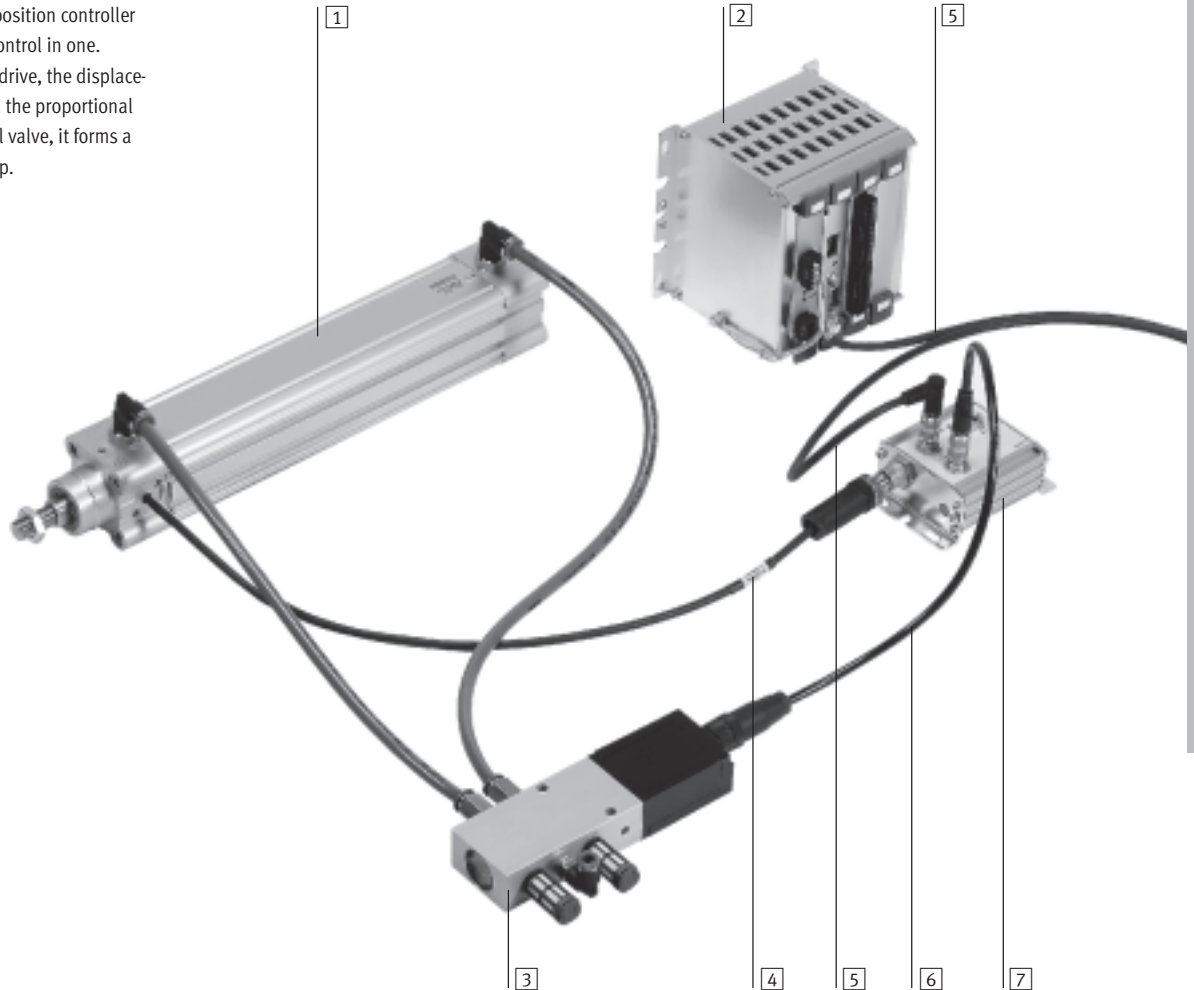
- Project archiving
- Simple commissioning
- User-friendly programming
- Comprehensive diagnostics with graphics functions

# 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.


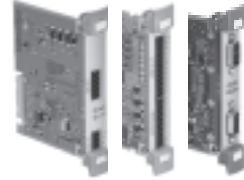





Individual components	
Type	Brief description
1 DNCI-...	The pneumatic drive, in this case DNCI with integrated displacement encoder, generates the movement. It is controlled by the SPC200.
2 SPC200-...	The axis controller with operating unit, in this case designed for a pneumatic drive, is an open and 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.

## Axis controllers SPC200

Product range overview


**FESTO**


Individual components for SPC200			
	Type	Brief description	→ Page
<b>Basic units</b>			
	SPC200-CPU-4	Basic unit with 4 card locations	5 / 1.3-6
	SPC200-CPU-6	Basic unit with 6 card locations	5 / 1.3-6
<b>Plug-in cards</b>			
	SPC200-BP	Blanking plate	5 / 1.3-7
	SPC200-PWR-AIF	Power supply unit and axis interface connection	5 / 1.3-10
	SPC200-MMI-DIAG	Diagnostics and control unit connection	5 / 1.3-11
	SPC200-DIO	Digital inputs/outputs (10I/8O)	5 / 1.3-12
	SPC200-2AI-U	Analogue setpoint specification, 2 channels, 0 ... 10 V	5 / 1.3-14
	SPC200-SCU-AIF	Sub-controller for 3rd and 4th pneumatic axes	5 / 1.3-15
	SPC-200-SMX-1	Stepper motor interface	5 / 1.3-16
	SPC200-COM-PDP	Profibus-DP interface	5 / 1.3-18
	SPC200-COM-DN2	DeviceNet interface	5 / 1.3-20
SPC200-COM-IBS	Interbus interface	5 / 1.3-22	
<b>Control unit</b>			
	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.	5 / 1.3-23
<b>Connector modules for SPC200</b>			
	Type	Brief description	→ Page
<b>Axis interface</b>			
	SPC-AIF-POT	For analogue displacement encoder (potentiometer)	5 / 1.3-24
	SPC-AIF-POT-LWG		
	SPC-AIF-MTS	– For digital displacement encoder Temposonics/AIF – For linear drive DGPI...-...-AIF	5 / 1.3-24
	SPC-AIF-INC	For standard cylinder DNCI	5 / 1.3-26
	SPC-AIF-MTS-2	For linear drive DGCI	5 / 1.3-28
<b>Power supply module</b>			
	SPC-AIF-SUP-24V	Additional power supply for the load voltage at the axis interface for cable lengths over 16 m	5 / 1.3-30

# Axis controllers SPC200

Product range overview



Basic configuration of controller packages											
Version	Brief description	Basic configuration									→ Page
		SPC200-MMI-1	SPC200-PWR-AIF	SPC200-MMI-DIAG	SPC200-DIO	SPC200-2AI-U	SPC200-SCU-AIF	SPC200-COM-PDP	SPC200-COM-IBS	SPC200-SMX-1	
SPC200/P01	For 1 or 2 pneumatic axes with control unit	■	■	■	■	-	-	-	-	-	5 / 1.3-9
SPC200/P02	For 1 or 2 pneumatic axes with control unit and 2 analogue inputs for positioning specifications	■	■	■	■	■	-	-	-	-	5 / 1.3-9
SPC200/P03	With sub-controller for 3 or 4 pneumatic axes, with control unit	■	■	■	■	-	■	-	-	-	5 / 1.3-9
SPC200/P04	With Profibus-DP interface for 1 or 2 pneumatic axes	-	■	■	-	-	-	■	-	-	5 / 1.3-9
SPC200/P05	With Profibus-DP interface for up to 4 pneumatic axes	-	■	■	-	-	■	■	-	-	5 / 1.3-9
SPC200/P06	With Interbus interface for 1 or 2 pneumatic axes	-	■	■	-	-	-	-	■	-	5 / 1.3-9
SPC200/P07	With Interbus interface for up to 4 pneumatic axes	-	■	■	-	-	■	-	■	-	5 / 1.3-9
SPC200/P08	With stepper motor interface for 1 axis and up to 2 pneumatic axes, with control unit	■	■	■	■	-	-	-	-	■	5 / 1.3-9

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-IBS	SPC200-COM-CAN	SPC200-SMX-1		
SPC200/P01	For 1 or 2 pneumatic axes with control unit	-	1)	1)	1)	1)	1)	1)	1)	1)	1)
SPC200/P02	For 1 or 2 pneumatic axes with control unit and 2 analogue inputs for positioning specifications	-	-	-	-	-	-	-	-	-	-
SPC200/P03	With sub-controller for 3 or 4 pneumatic axes, with control unit	-	-	-	-	-	-	-	-	-	-
SPC200/P04	With Profibus-DP interface for 1 or 2 pneumatic axes	2)	1)	1)	-	-	-	-	-	1)	
SPC200/P05	With Profibus-DP interface for up to 4 pneumatic axes	2)	-	-	-	-	-	-	-	-	
SPC200/P06	With Interbus interface for 1 or 2 pneumatic axes	2)	1)	1)	-	-	-	-	-	1)	
SPC200/P07	With Interbus interface for up to 4 pneumatic axes	2)	-	-	-	-	-	-	-	-	
SPC200/P08	With stepper motor interface for 1 axis and up to 2 pneumatic axes, with control unit	-	-	-	-	-	-	-	-	-	

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			→ 5 / 1.3-10 (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 <sup>1)</sup>
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 <sup>2)</sup>
	Per AIF string		Max. 16 inputs and 16 outputs <sup>3)</sup>
	Via fieldbus		Max. 64 inputs and 64 outputs
No. of start programs			2 <sup>4)</sup>
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

# Axis controllers SPC200

Technical data



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 <sup>5)</sup>
	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.

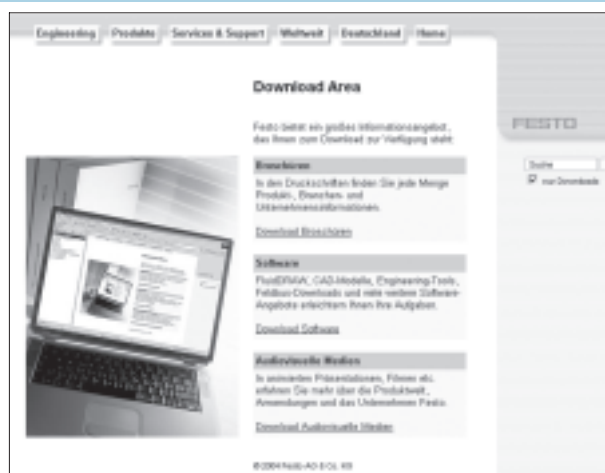
Reading the actual position and writing a digital position setpoint.

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
	For axis controller basic unit, French	194 500	P.BE-SPC200-FR
	For axis controller basic unit, Italian	194 501	P.BE-SPC200-IT
Programming software WinPISA on CD-ROM	For Windows 95, 98, 2000, NT and XP, German	170 095	P.SW-WIN-PISA-CD-DE
	For Windows 95, 98, 2000, NT and XP, English	170 096	P.SW-WIN-PISA-CD-EN
	For Windows 95, 98, 2000, NT and XP, French	194 508	P.SW-WIN-PISA-CD-FR

## Function modules

→ [www.festo.com](http://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

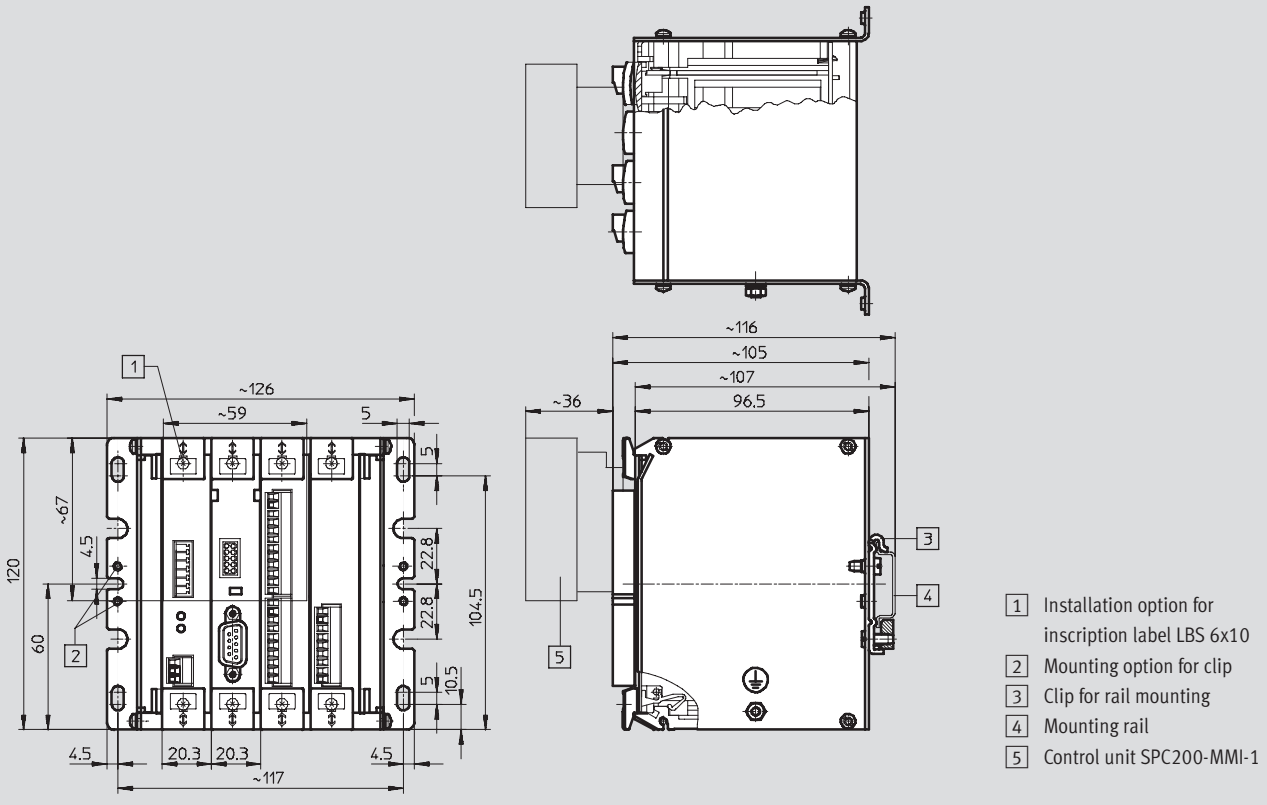


Servopneumatic positioning systems  
Axis positioning controllers  
1.3

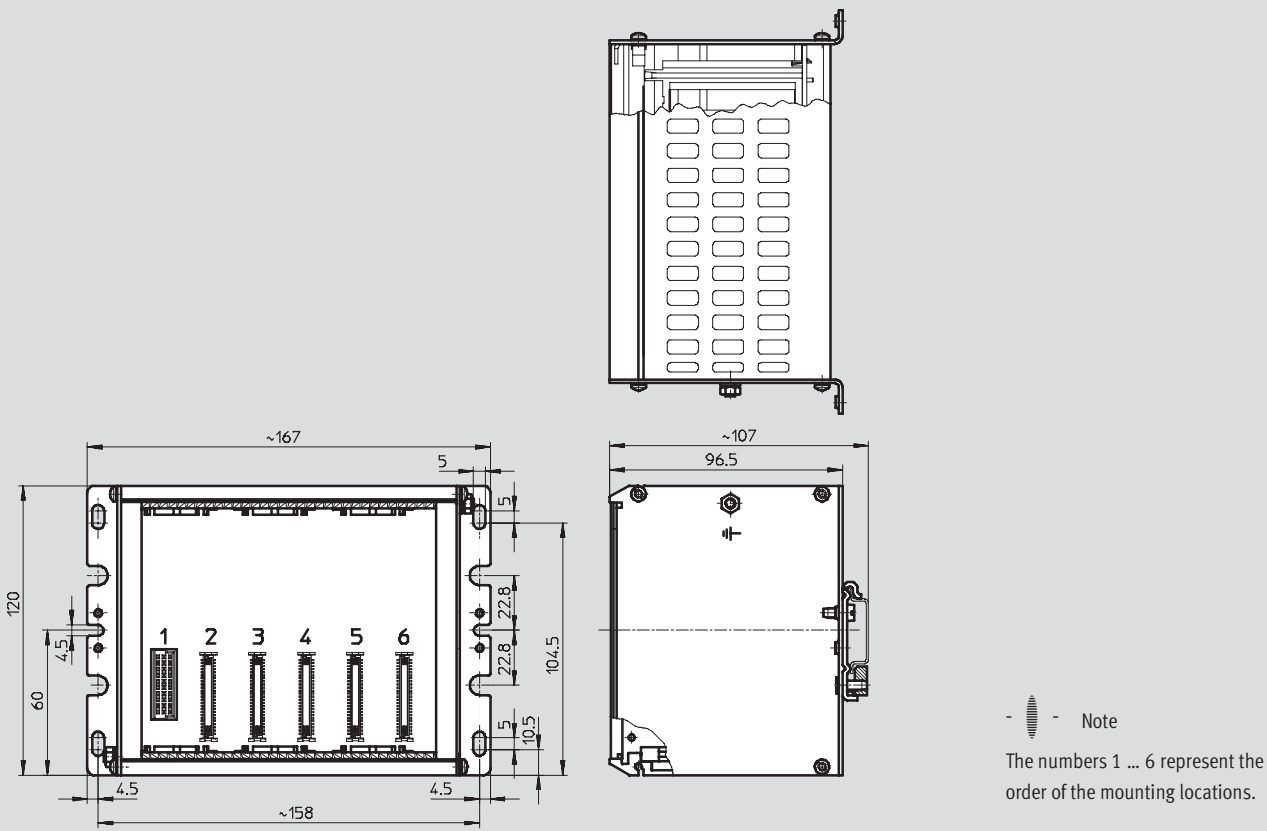
## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

SPC200-CPU-4 (rack for 4 mounting locations) using as an example: SPC200/P02



## SPC200-CPU-6 (rack for 6 mounting locations)

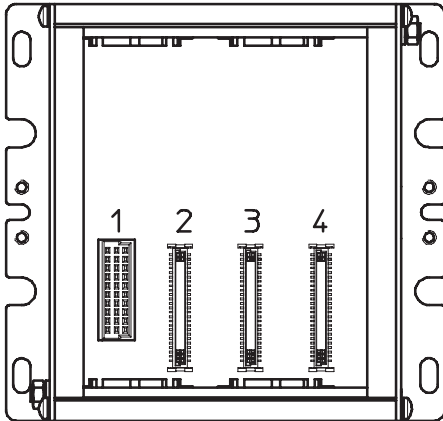




# Axis controllers SPC200

Technical data

## Order of the mounting locations



## Configured controller packages

Controller packages	Mounting location				Control unit SPC200-MMI-1 <sup>1)</sup>	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
P03	1	2	4	3	■	170 523	SPC200/P03
P04	1	2	9	7	-	187 812	SPC200/P04
P05	1	2	3	7	-	187 813	SPC200/P05
P06	1	2	9	8	-	187 814	SPC200/P06
P07	1	2	3	8	-	187 815	SPC200/P07
P08	1	2	4	6	■	187 816	SPC200/P08

1) Included in the scope of delivery

Legend			
	Type	Description	→ Page
1	SPC200-PWR-AIF	Power supply	5 / 1.3-10
2	SPC200-MMI-DIAG	Serial interface	5 / 1.3-11
3	SPC200-SCU-AIF	Sub-controller	5 / 1.3-15
4	SPC200-DIO-PNP	Digital I/O	5 / 1.3-12
5	SPC200-2AI-U	Setpoint module	5 / 1.3-14
6	SPC200-SMX-1	Stepper motor interface	5 / 1.3-16
7	SPC200-COM-PDP	Profibus-DP interface	5 / 1.3-18
8	SPC200-COM-IBS	Interbus interface	5 / 1.3-22
9	SPC200-PB	Blanking plate	5 / 1.3-6

# Axis controllers SPC200

Technical data



## Power supply SPC200-PWR-AIF

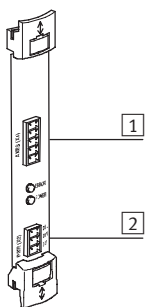
Function  
Power supply and connection of the first axis string



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]
Logic, pin 2		[A]	Max. 4.0
Feature	-		2 pneumatic axes
Axis connection	Digital inputs	[max]	16 function inputs <sup>1)</sup>
	Digital outputs	[max]	16 function outputs <sup>1)</sup>
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	→ 5 / 1.3-9		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<sup>2</sup>

Connecting cable → 5 / 1.3-32, 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-LOW (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

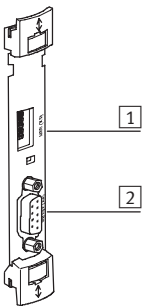
Function  
Serial interface for diagnostics and programming, connection of the control unit MMI-1



General technical data			SPC200-MMI-DIAG
Current consumption	Plug-in card	[mA]	Typically 50 <sup>1)</sup>
Serial interface	Version		RS 232 C
	Electrical isolation		Yes
	Baud rate	[baud]	9,600; 19,200; 38,400; 57,600; 115,200 <sup>2)</sup>
	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 → 5 / 1.3-9			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 → 5 / 1.3-32, 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

# Axis controllers SPC200

Technical data



## 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 <sup>1)</sup>
	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% <sup>2)</sup>
	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	→ 5 / 1.3-9		From 3 upwards

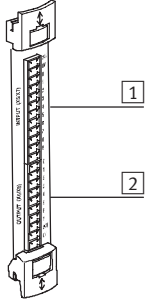
1) Via internal 24 V supply (pin 2 to PWR to plug-in card SPC200-PWR-AIF)  
2) Supplied separately, note load data

# Axis controllers SPC200

Technical data



## Pin allocation



- 1 12-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm<sup>2</sup>
- 2 10-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm<sup>2</sup>



**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) <sup>1)</sup>	CLK_B
9	I0.6	(SYNC_IN/B) <sup>1)</sup>	CLK_A
10	I0.7	STOP	STOP
11	I0.8	START/RESET <sup>2)</sup>	RESET <sup>2)</sup>
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) <sup>1)</sup>	ACK_B
7	Q0.6	(SYNC_OUT/A) <sup>1)</sup>	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



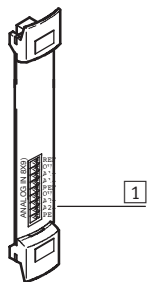
## Setpoint module SPC200-2AI-U

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	→ 5 / 1.3-9		From 3 upwards

### Pin allocation



1 9-pin terminal strip included in the scope of delivery.  
Connection cross section  
max. 1.5 mm<sup>2</sup>

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 <sub>REF</sub>
2	0 V
3	A1+; signal (+) for channel 1
4	A1-; signal (-) for channel 1
5	Reference voltage 10 V <sub>REF</sub>
6	0 V
7	A2+; signal (+) for channel 2
8	A2-; signal (-) for channel 2
9	PE

### Ordering data

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

# Axis controllers SPC200

Technical data



## Sub-controller SPC200-SCU-AIF

### Function

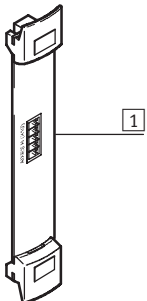
Contains the position controllers for 2 further pneumatic axes and connection for the second axis string



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 <sup>1)</sup>
	Digital outputs	[max]	16 function I/O <sup>1)</sup>
Electrical connection	Axis connection		5-pin terminal strip
CE marking symbol (see conformity declaration)			As per EU EMC directive
Weight		[g]	80
Mounting location → 5 / 1.3-9			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 → 5 / 1.3-32, no. 1

1 AXES B (X10)	
Pin	Function
1	CAN-LOW (brown)
2	CAN-LOW (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

FESTO

## Stepper motor interface SPC200-SMX-1

### Function

Stepper motor interface with clock/  
direction interface and all necessary  
sensor inputs



General technical data				SPC200-SMX-1	
Current consumption		Plug-in card	[mA]	Typically 80	
Stepper motor interface	Inputs	+ READY	[V DC]	24 <sup>1)</sup>	
		- READY		Connect via relay contact	
		Switching current	[mA]	Typically 8	
	Outputs	PULSE, DIRECTION, ENABLE, F/H STEP			
		Version			Push-pull to RS 485/RS 422 <sup>2)</sup>
		Max. line length	[m]		50
Step frequency			[Hz]	80 ... 40,000	
Frequency ramp			[kHz/s]	Max. 500	
Programmable travel			[mm]	0 ... 9,999.99	
Resolution			[steps/mm]	0.01000 ... 9,999.99999	
Sensors	Digital inputs	Number		3	
		Version		To IEC 61131-2, positive logic (PNP)	
		Voltage	[V DC]	24 ±15% <sup>3)</sup>	
		Input current	[mA]	Typically 8	
Electrical connections		Stepper motor		15-pin SUB-D, female	
		Sensors		5-pin terminal strip	
CE marking symbol (see conformity declaration)				As per EU EMC directive	
Weight			[g]	69	
Mounting location → 5 / 1.3-9				From 3 upwards	

1) Connected internally with 24 V of the sensor supply (pin 4)

2) As point to point connection

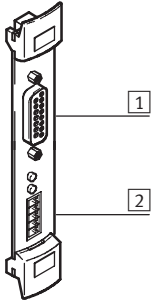
3) Note voltage range of the sensors used



# Axis controllers SPC200

Technical data

## Pin allocation



- 1 15-pin SUB-D socket for connection of the stepper motor controller
- 2 5-pin terminal strip included in the scope of delivery. Connection cross section max. 1.5 mm<sup>2</sup>

Connecting cable → 5 / 1.3-33, no. 8

Note  
 With the plug-in card SPC200-SMX-1 the SPC200 can control a stepper motor axis. Max. 3 cards SPC200-SMX-1 can be used to control stepper motor axes.

1 Amplifier (X30)	
Pin	Function
1	+ PULSE (pulse)
2	+ DIRECT. (direction)
3	+ ENABLE (gate/enable)
4	Unused
5	+ F/H STEP switching (full/half step)
6	– F/H STEP switching (full/half step)
7	Unused
8	+ READY (readiness)
9	– PULSE (pulse)
10	– DIRECT. (direction)
11	– ENABLE (gate/enable)
12	Unused
13	Unused
14	Unused
15	– READY (readiness)

2 End and reference switches	
Pin	Function
1	LIM+
2	REF
3	LIM–
4	24V
5	0V

Ordering data		Part No.	Type
Plug-in card	Stepper motor interface	175 731	SPC200-SMX-1
User documentation	For stepper motor interface, German	188 894	P.BE-SPC200-SMX-1-DE
	For stepper motor interface, English	188 895	P.BE-SPC200-SMX-1-EN
	For stepper motor interface, French	194 506	P.BE-SPC200-SMX-1-FR
	For stepper motor interface, Italian	194 507	P.BE-SPC200-SMX-1-IT

# 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 <sup>1)</sup>
	Line length		[km]	23.8 <sup>2)</sup>
Max. load capacity		[mA]	100 <sup>3)</sup>	
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 → 5 / 1.3-9			From 3 upwards <sup>4)</sup>	

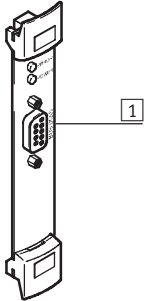
- 1) Automatic baud rate detection
- 2) Line length dependent on baud rate and type of cable
- 3) Supply voltage positive (PV5), pin 6
- 4) When using the control unit MMI-1 as of location 4

# Axis controllers SPC200

Technical data



## 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

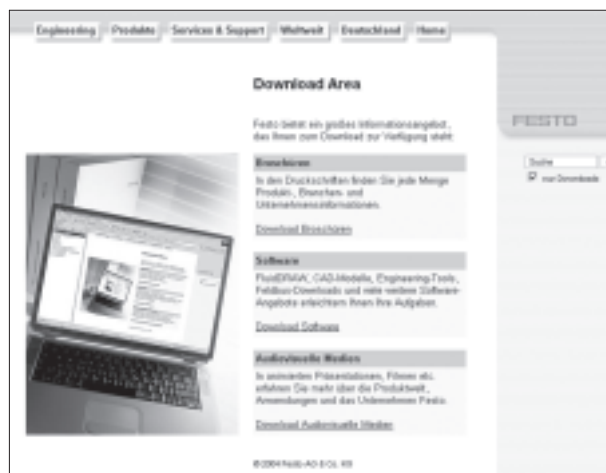
## Ordering data

		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
	For Profibus-DP interface, French	194 502	P.BE-SPC200-COM-PDP-FR
	For Profibus-DP interface, Italian	194 503	P.BE-SPC200-COM-PDP-IT
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](http://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

**FESTO**

### DeviceNet interface SPC200-COM-DN2

#### Function

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



Note

This function card replaces the following card:  
Part No. 194 017  
Type: SPC200-COM-DN2

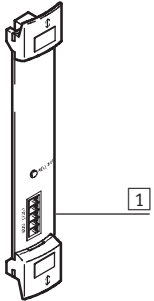


General technical data			SPC200-COM-DN2
Current consumption	Plug-in card	[mA]	Typically 50
Power supply	Fieldbus	[V DC]	11 ... 30
DeviceNet bus	Version		– Physical layer (layer 1) to ISO/DIS 11898 – Standard highspeed to 1Mbit – Data Link layer (layer 2 ) to CAN specifications V2.0 – DeviceNet, Release 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 and 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			From 3 upwards

## Axis controllers SPC200

Technical data

### Pin allocation



- 1** 5-pin terminal strip included in the scope of delivery.  
Connection cross section  
max. 1.5 mm<sup>2</sup>

 **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	<b>540 305</b>	<b>SPC200-COM-DN2</b>
User documentation	For DeviceNet interface, German	<b>196 607</b>	<b>P.BE-SPC200-COM-CANDN-DE</b>
	For DeviceNet interface, English	<b>196 608</b>	<b>P.BE-SPC200-COM-CANDN-EN</b>
	For DeviceNet interface, French	<b>196 611</b>	<b>P.BE-SPC200-COM-CANDN-FR</b>
	For DeviceNet interface, Italian	<b>196 610</b>	<b>P.BE-SPC200-COM-CANDN-IT</b>

# Axis controllers SPC200

Technical data



## Interbus interface SPC200-COM-IBS

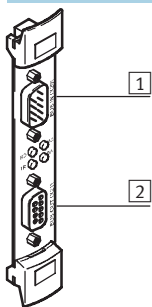
Function  
Interbus interface of the SPC200 to an  
Interbus network



General technical data			SPC200-COM-IBS
Current consumption	Plug-in card	[mA]	Typically 70
Interbus	Version		RS 422
	Electrical isolation		Yes
	Type of transmission		Serial asynchronous, full-duplex
	Protocols		Remote bus
	Max. no. of process data bits	Outputs	64
		Inputs	64
	Baud rate	[kBit/s]	500
	Line length, overall system	[km]	12.8
	Between 2 remote bus stations	[m]	400
Configuration support for the fieldbus interface			Icons for CMD software
Electrical connection	Input		9-pin SUB-D, male
	Output		9-pin SUB-D, female
CE marking symbol (see conformity declaration)			As per EU EMC directive
Weight		[g]	80
Mounting location → 5 / 1.3-9			From 3 upwards <sup>1)</sup>

1) When using the control unit MMI-1 as of location 4

## Pin allocation



1 + 2 Cable with plug acc. to Interbus standard

Note  
The card SPC200-COM-IBS facilitates the connection of the SPC200 to Interbus.  
The operating modes that are available via I/Os are emulated.

1 IN (X20)		2 OUT (X21)	
Pin	Function	Pin	Function
–	Housing/screen	–	Housing/screen
1	D0	1	D0
2	DI	2	DI
3	Load	3	Load
4	Unused	4	Unused
5	Unused	5	VCC
6	/D0	6	/D0
7	/DI	7	/DI
8	Unused	8	Unused
9	Unused	9	RBST

## Ordering data

		Part No.	Type
Plug-in card	Interbus interface	170 225	SPC200-COM-IBS
User documentation	For Interbus interface, German	188 890	P.BE-SPC200-COM-IBS-DE
	For Interbus interface, English	188 891	P.BE-SPC200-COM-IBS-EN
	For Interbus interface, French	194 504	P.BE-SPC200-COM-IBS-FR
	For Interbus interface, Italian	194 505	P.BE-SPC200-COM-IBS-IT

# Axis controllers SPC200

Technical data



## Control unit SPC200-MMI-1

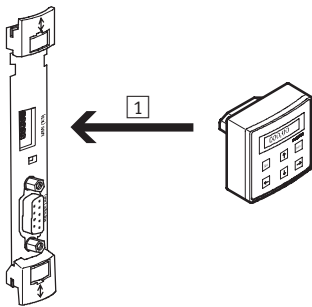
Not all functions of the axis controller SPC200 are supported. Please use WinPISA for commissioning.



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 <sup>1)</sup>
Current consumption	[mA]	30 <sup>2)</sup>
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	
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

Technical data



## Axis interface

SPC-AIF-POT

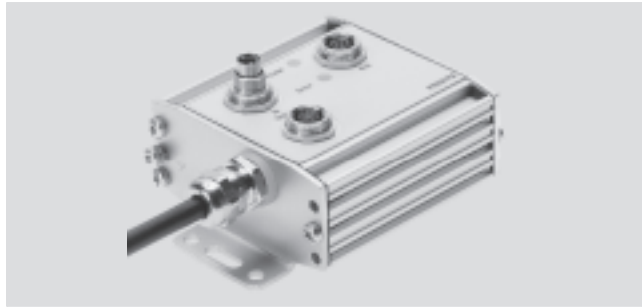
SPC-AIF-POT-LWG

SPC-AIF-MTS

### Function

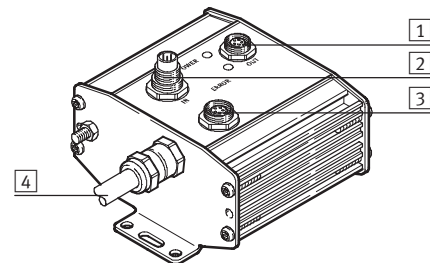
Connection of the proportional valve and the displacement encoder of a pneumatic axis to the SPC200.

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 → 5 / 1.3-32,  
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



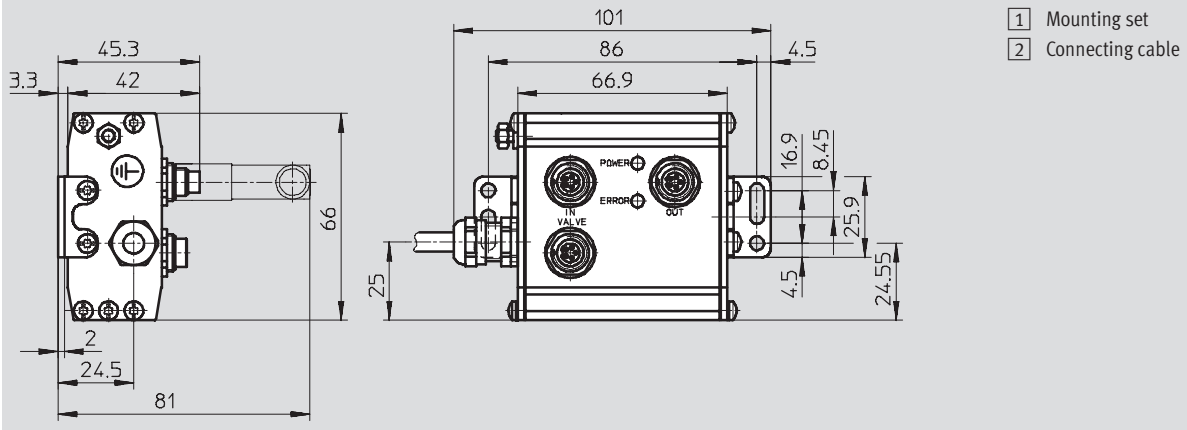
# Axis controllers SPC200

Technical data



**Dimensions** Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

SPC-AIF-POT/-LWG/-MTS



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 <sup>1)</sup>
	Mounting set for vertical fitting	540 309	SPC-HBW-SET

1) One contained in SPC200/POX

# Axis controllers SPC200

Technical data



## 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.

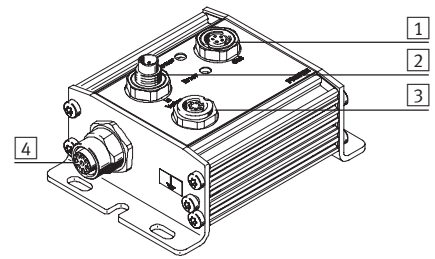


General technical data			SPC-AIF-INC
Current consumption	Axis interface	[mA]	60
	Prop. directional control valve, max.	[A]	1.1
Electrical connections	AIF IN		5-pin M9, male
	AIF OUT		5-pin M9, female
	Prop. directional control valve		7-pin M9, male
	Displacement encoder		8-pin M12, female
CE marking 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

Servopneumatic positioning systems  
Axis positioning controllers

## 1.3

### Pin allocation



Connecting cable → 5 / 1.3-32,  
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	-

# Axis controllers SPC200

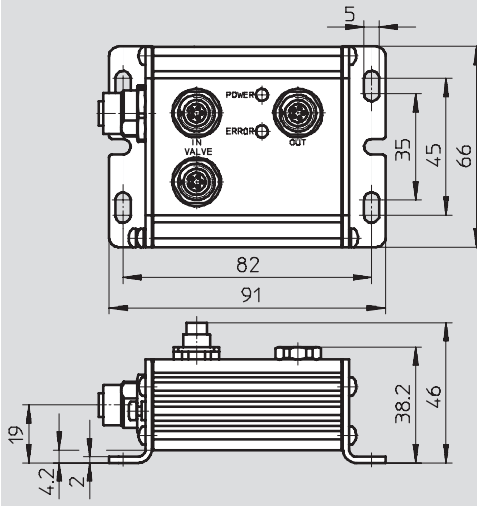
Technical data



## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

SPC-AIF-INC



## 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 <sup>1)</sup>

1) One contained in SPC200/POX

## Axis controllers SPC200

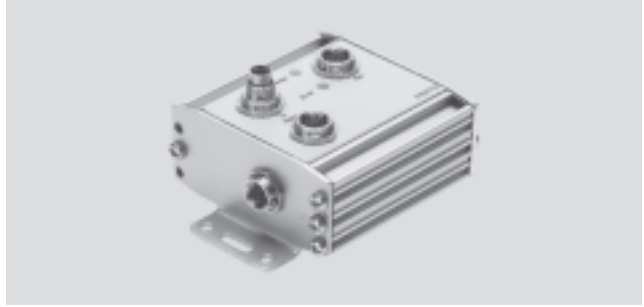
Technical data

### Axis interface SPC-AIF-MTS-2

#### Function

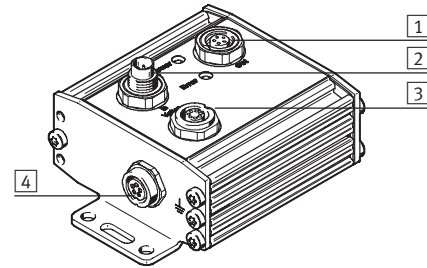
Connection of the proportional valve and the displacement encoder of a pneumatic axis to the SPC200.

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

### 1.3 Pin allocation



Connecting cable → 5 / 1.3-32,  
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

## Axis controllers SPC200

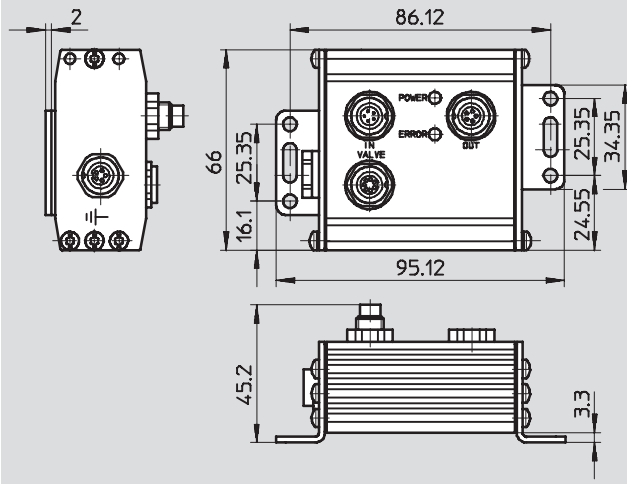
Technical data

**FESTO**

### Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

SPC-AIF-MTS-2



### 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 <sup>1)</sup>

1) One contained in SPC200/POX

# Axis controllers SPC200

Technical data



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

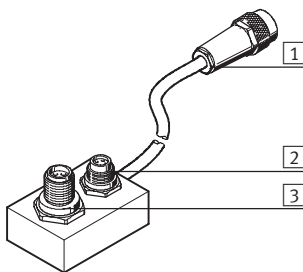
### Function

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 → 5 / 1.3-32,  
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

# Axis controllers SPC200

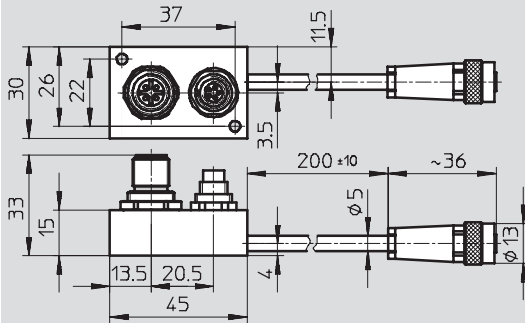
Technical data



## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

SPC-FIO-2E/2A-M8



## Ordering data

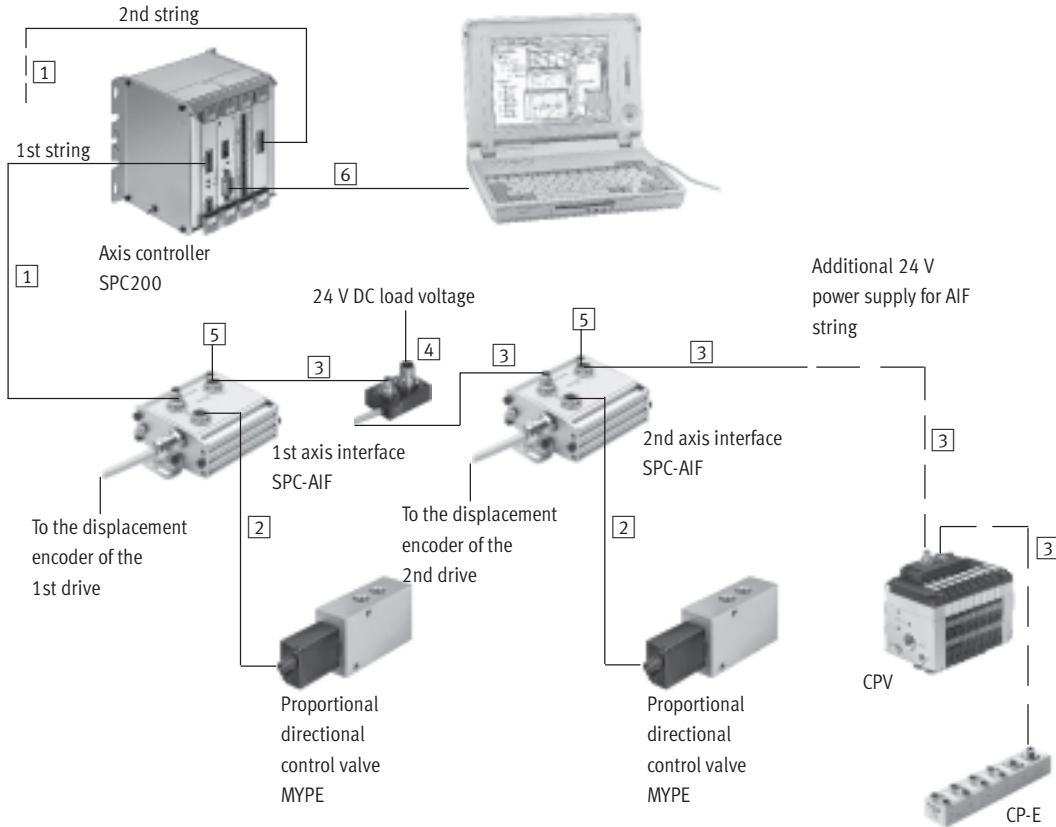
		Part No.	Type
Power supply module	Additional power supply for the load voltage	171 182	SPC-AIF-SUP-24V

# Axis controllers SPC200

Accessories



## Cables – Pneumatic drives



Servopneumatic positioning systems  
Axis positioning controllers

1.3

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

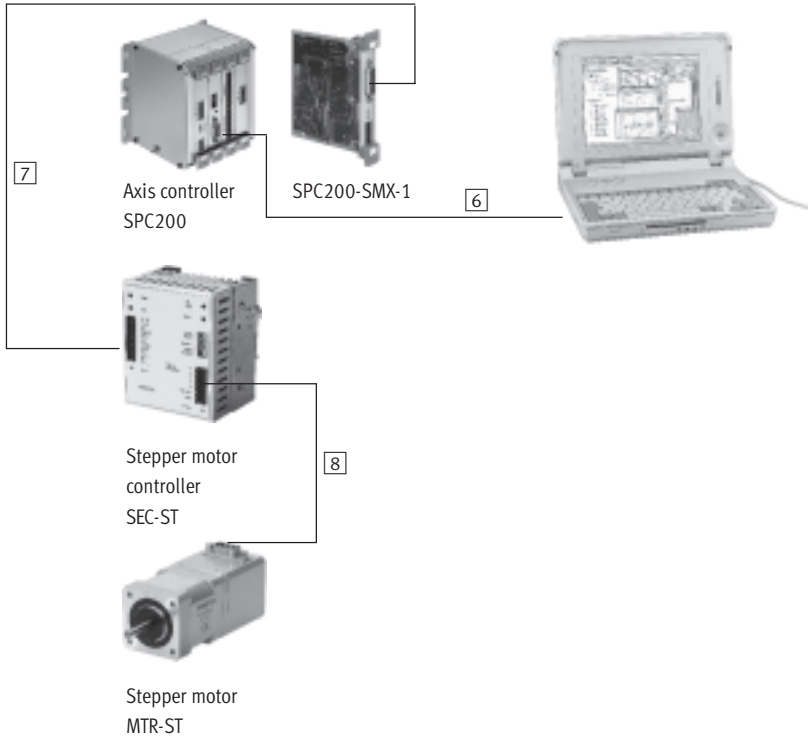
- 1) The total length of the lines must not exceed 30 m
- 2) Recommended where the total length of connecting cable is over 16 m
- 3) Must be connected at the last axis interface in the chain  
(Contained in the controller package SPC200/POX)



# Axis controllers SPC200

Accessories

## Cables – Electrical stepper motors



No.	Length [m]	Suitable for chain link trunking	Brief description	Part No.	Type
6	3	–	Programming cable	151 915	KDI-PPA-3-BU9
7	1.5	–	Control cable SPC200-SMX-1/motor controller SEC-ST	530 077	KSPC-SECST-1,5
8	5	■	Motor cable	530 071	KMTR-ST-5

