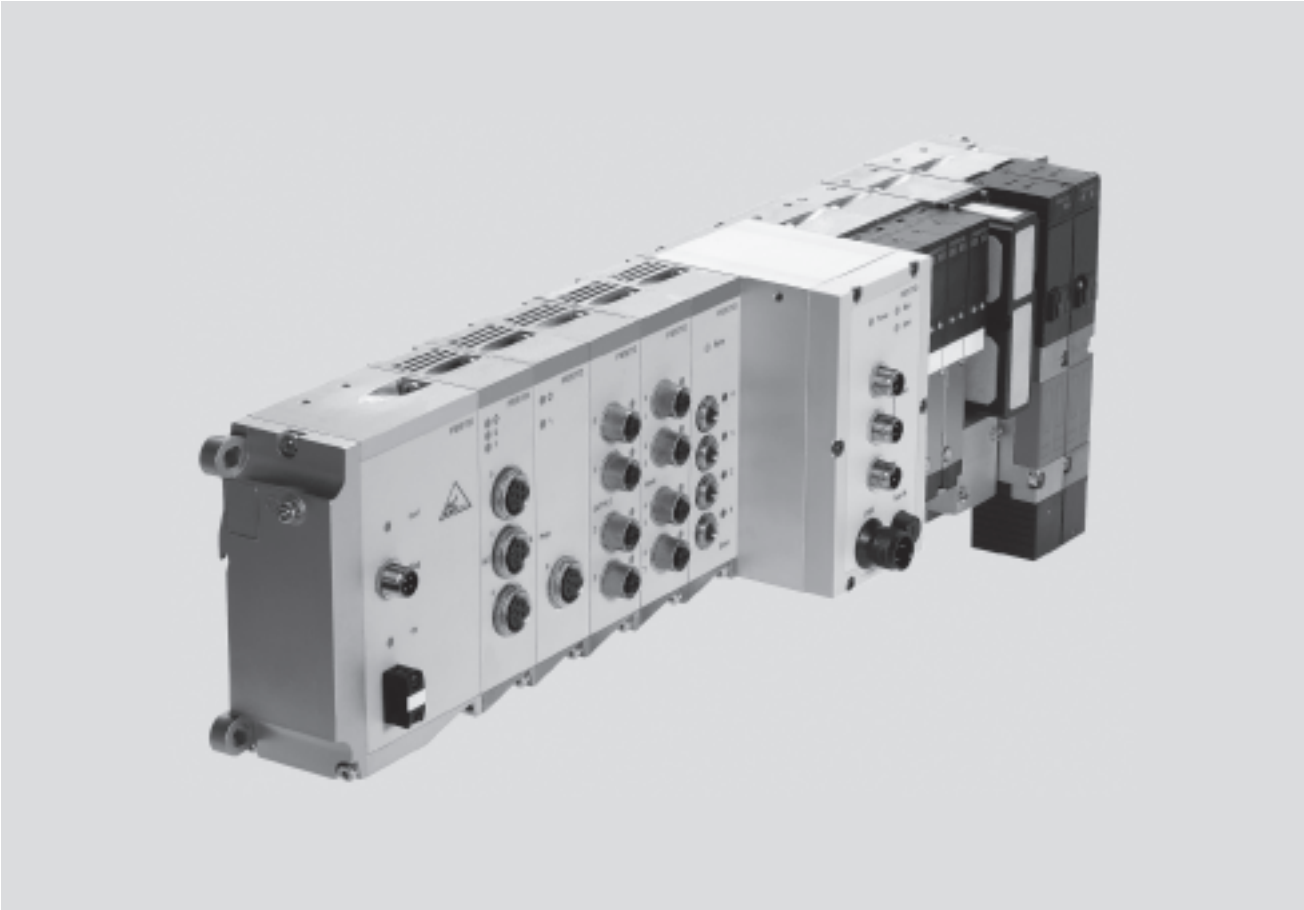
Modular electrical peripherals, for type 03/04

FESTO

- Modular valve terminal
- Programmable with integrated controller
- Open to all fieldbus protocols
- Modular electrical peripherals with digital and analogue I/Os
- Diagnosis using fieldbus
- Sturdy metal design

Modular electrical peripherals, for type 03/04

Key features



Innovative

- First modular valve terminal on the market with modular electrical peripherals
- Standardised from the individual midi valve up to multi-pin and fieldbus connections
- First programmable valve terminal with integrated controller
- Digital I/O modules, either PNP switching
- Analogue I/O in the field for short lines
- Special modules for control desks
- Interfaces for subordinate, decentralised installation systems

Modular

- Modular system offering a range of configuration options
- Expandable up to 26 solenoid coils
- Conversions and extensions are possible at any time
- Connection blocks can be extended using 3 screws M4x14
- Modular electrical peripherals with digital and analogue I/Os
- High pressure range

Reliable

- Sturdy and durable metal components
  - I/O modules
  - Connection technology
  - Valves
  - Connection blocks
- Fast troubleshooting thanks to LEDs on the valves and I/O modules
- Diagnosis using fieldbus
- Pre-assembled cables for all I/O modules
- Reliability of service through replaceable valves and modules

Easy to assemble

- Ready to install unit, already assembled and tested
- Lower costs for selection, ordering, assembly and commissioning
- Secure wall mounting or via H-rail

Modular electrical peripherals, for type 03/04

Key features

Modular electrical peripherals for valve terminal type 03/04

Modular electrical peripherals provide the required control technology for type 03 (MIDI/MAXI) and type 04 (ISO) valve terminals. Together these components form the most comprehensive system range in intelligent pneumatics and also offer the advantage of a sturdy metal design.

As well as incorporating protection class IP65, the system also provides benefits through the sturdy design of its modules and connections. Individual modules are enclosed in metal housings with push-in fittings, and are made primarily of steel. The connections between the modules are protected by special seals and each connection point is secured using 3 robust M4x14 DIN 912 screws.

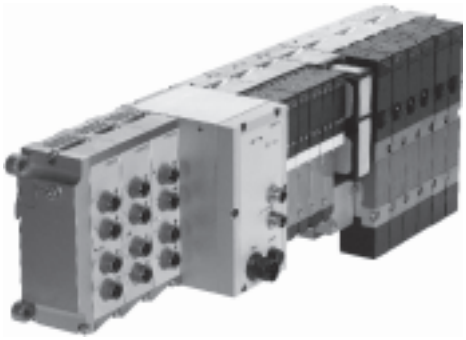
The main industrial fieldbuses are used for networking and control. Directly integrated programmable controllers (PLC) with fieldbus interface from Festo can also be used for actuation.
The module also offers various actuation and connection options for machine control.

Ongoing further development and a worldwide service and consultation network round off the performance spectrum for this system.

- Note

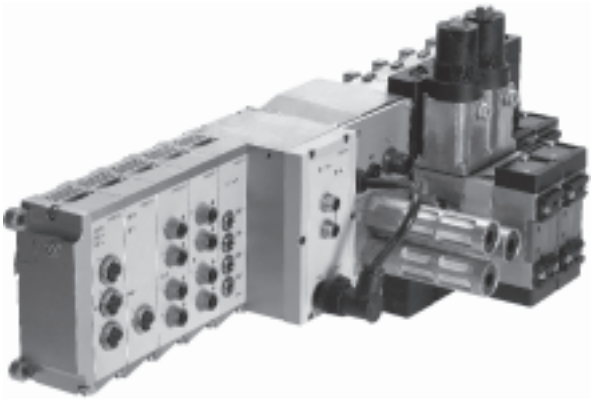
Use the menu-driven online configurator for modular electrical peripherals type 03/04 and valve terminal in the electronic catalogue on
➔ www.festo.com.

Type 03 with fieldbus connection



Type 03 with integrated programmable PLC

Type 04 with fieldbus connection



Ordering

Modular electrical peripherals type 03/04 and valve terminal are fully assembled according to your order specifications and individually tested.
The finished valve terminal consists of the electrical peripherals including the required actuator and the selected components of the MIDI/MAXI or ISO modules.

Modular electrical peripherals type 03/04 with valve terminal are ordered using two separate order codes. One order code defines the modular electrical peripherals type 03/04, while the other specifies the pneumatic components of the valve terminal.

Modular electrical peripherals type 03/04 can naturally also be configured without a valve terminal as a remote I/O and can be used on a fieldbus or with an integrated controller. For this order, you only require the order code for the electrical peripherals.

The order lists for the modular electrical peripherals type 03/04 can be found in this chapter. For information on how to order the pneumatic components see:

➔ Internet: type 03 midi maxi (valve terminal type 03)
➔ Internet: type 04 midi maxi (valve terminal type 04)

Modular electrical peripherals, for type 03/04

Key features – General

FESTO

Performance characteristics

Control block, fieldbus connection, multi-pin connection

Optimising and extending applications:
- Modules for installation-saving connection using sturdy Sub-D plugs in IP65
- Low-cost connections to input/output stations and control units
- CP modules for connecting decentralised CPV and CPA valve terminals
- Extensions and supplements can be added at any time

Easy mounting:
- On H-rail
- On mounting surface
- With covers in welding environments

Simple servicing and maintenance:
- LED display
- Manual override
- Clip-on inscription labels

Convenient diagnosis via fieldbus connection and integrated PLC:
- Status bits
- Diagnostic bits
- Integrated self-test

Input/output modules

Flexible for control systems thanks to an extensive range of connection nodes:
- Multi-pin connection
- Fieldbus connection

Stand-alone solutions with integrated PLC (control block).

Electrical digital inputs/outputs:
- Max. 12 modules in conjunction with suitable nodes
- Inputs for 24 V DC sensors, PNP
- Outputs for small-load power consumers 24 V DC

Proportional pneumatics:
- Analogue modules optimised for proportional valves, e.g. for Festo MPYE
- To detect, control/regulate universal variables (4 ... 20 mA or 0 ... 10 V DC) within the process – locally to IP65

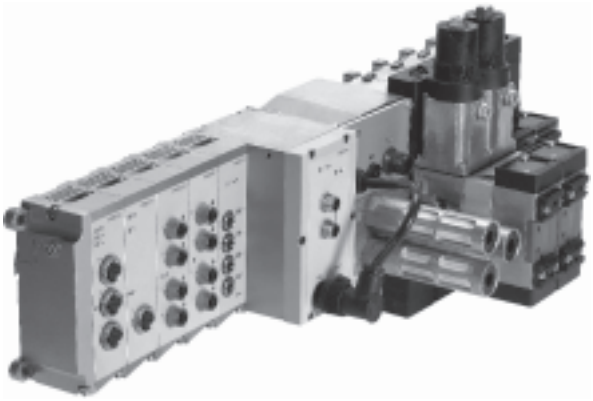
Modular electrical peripherals, for type 03/04

Key features – General

Types of pneumatic valve terminals supported

Type 03 – MIDI/MAXI valve terminals

Type 04 – ISO valve terminals



General functions of the bus nodes and control blocks

A bus node or control block is at the heart of the modular electrical peripheral system. They manage the communication connection to higher-order controllers and master interfaces and a PLC program with a full range of additional functions is executed directly in the control block. The power supply for the I/O modules and the sensors connected to them is provided by means of the bus node or control block, as is the load supply for the solenoid coils and the electronic outputs.

System monitoring and diagnosis are further important functions of the bus node or control block. The diagnostics are composed of three elements:

- Device-specific information displayed directly on the bus node or control block by means of LEDs.
- Device-specific status bits that are transferred to the control program via the network.
- Protocol-specific diagnoses.

The bus nodes or control blocks collect the most important diagnostic data in the status bits and transfer it to the higher-order controller as logical inputs.

Suitable further processing functions in the control program provide helpful information on the status of the power supply, short circuits and overload (with some of this information relating to specific modules or channels). Further protocol and node-specific diagnostic services are described in conjunction with the individual I/O modules, bus nodes and control blocks.

The control blocks are original controllers from Festo and are identical to systems with the original design in terms of both their function and their system and integration compatibility.

Modular electrical peripherals, for type 03/04

Key features – Electrical components

Supply voltage

The entire power supply for the system and the sensors and actuators connected to it is provided via an M18 mains plug.
The power supply for the electrical peripherals type 03 and 04 is split in two.
Pin 1 of the mains plug provides the sensor supply for the input modules and supplies the internal electronics of the individual modules.

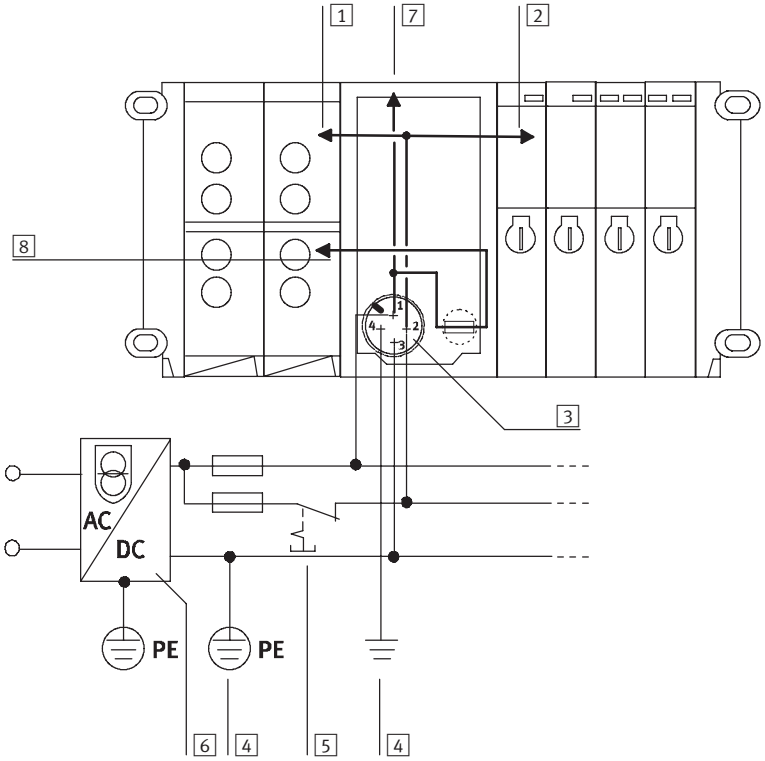
The sensor supply is protected separately from the electronics supply in the node by means of a 2 A fuse. We recommend that pin 1 be additionally protected against short circuit/overload by means of a 3.15 A external fuse.
Pin 2 of the mains plug provides the load supply for solenoid coil actuation and the electrical 24 V DC outputs.

The load supply must be externally protected against short circuit and overload by means of a 10 A strong fuse.
The load voltage of the valves and electrical outputs can be disconnected separately. The common 0 V line is connected to pin 3. Pin 4 serves as an earth terminal.

With valve terminals of the type 04, the solenoid coils are protected by an additional fuse.

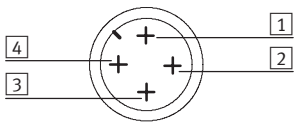
Example of circuit

Connection of a common 24 V DC power supply and the protective earth (type 03 used in the example)



1 Electrical outputs (externally fused)
2 Valves
3 Voltage supply connection for node type 03
4 Potential equalisation
5 Load voltage, can be disconnected separately
6 Power supply unit (e.g. central voltage supply)
7 24 V DC electronics
8 Electrical inputs/sensors

Pin allocation



1 24 V DC supply for electronics and inputs
2 24 V DC load supply for valves
3 0 V
4 Earth terminal

Modular electrical peripherals, for type 03/04

Key features – Diagnosis

General system diagnosis		
Diagnostic information	Description	Function
Short circuit/overload at output	Output has short-circuited or become overloaded	Monitors the electrical outputs of the output modules
V_{Valves} < 21.6 V DC	Load voltage at pin 2 (valves and outputs) of the operating voltage connection < 21.6 V DC	Monitors the tolerance of the load voltage for valves and electrical outputs
$V_{Outputs}$ < 10 V DC	Load voltage at pin 2 (valves and outputs) of the operating voltage connection < 10 V DC	Monitors the load voltage for valves and electrical outputs (no voltage, e.g. EMERGENCY-STOP)
V_{Sensor} < 10 V DC	Operating voltage at pin 1 (electronics and inputs) of the operating voltage connection < 10 V DC	Monitors the operating voltage for inputs (sensors). Indicates whether an internal fuse has tripped, either the fuse in the node or at least an electronic fuse in the input module[1].

1) An electronic fuse for input modules has been available since February 1999.

Modular electrical peripherals, for type 03/04

Key features – I/O addressing

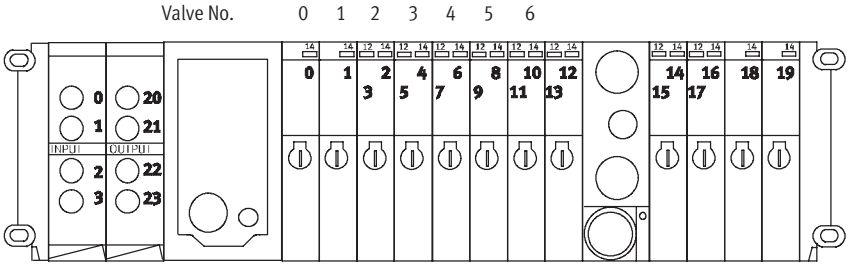
General guidelines on I/O addressing

A maximum of 12 electrical modules can be assembled. Note, however, that some modules occupy 2 or even 3 module positions, in which case the maximum number of modules that can be assembled is reduced.
All 12 module positions can generally be used as inputs or outputs, however there are various fieldbus-specific restrictions that are documented in the node description.

The number and type of inputs/outputs, and hence input/output modules, supported by the network also depends on the fieldbus node used. The number of solenoid coils is restricted to 26 and is included in the address space of the digital outputs.

Each sub-base for single solenoid valves occupies 2 outputs, and each sub-base for double solenoid valves occupies 4 outputs. Within the output addresses, the valve solenoids are counted in ascending order from left to right starting from the node. In the case of double solenoid valves, coil 14 comes before coil 12 in the counting mode.
The address space of the valves is always rounded up to a value divisible by 4.

The solenoid coils are followed by the general outputs in the address space. The individual outputs in the output modules are listed in the address space in ascending order, from top to bottom and the modules are listed from right to left starting from the node (see diagram).



Test method for activation of the solenoid coils

The fieldbus nodes generally contain two different test sequences that activate the solenoid coils independently of any fieldbus combination or higher-order controller so that the function of the assembled valves can be verified.

The solenoid coils will be activated in parallel or serial mode depending on the test sequence selected, with each coil individually activated with a constant switching frequency in a predefined order.

Modular electrical peripherals, for type 03/04

Peripherals overview – Fieldbus systems

Fieldbus systems, programmable terminal groups

FESTO

MOELLER

ABB

Allen-Bradley

INTERBUS

PROFI

SIEMENS

DeviceNet

ASA

Fieldbus variations:
Of the more than 20 different fieldbus systems (protocols) available in the market, some have emerged as the most important variants. Festo supports these by means of various fieldbus nodes (FBxx) on its valve terminals. Fieldbus systems require a powerful, central PLC and a master interface adapted to that particular fieldbus.
Fieldbus systems are generally used when several devices with many inputs/outputs, complex functions or high communication levels must be controlled. In this case, the advantages of simple cabling, easy diagnosis and maintenance outweigh the extra outlay for a fieldbus master interface and the necessary know-how.

Festo fieldbus:
A fieldbus developed by Festo with simple prompting, supported by the control systems in the FPC, SF and IPC series (Festo FB5).

Interbus, Interbus-FOC:
An open fieldbus standard, originally developed by Phoenix Contact and now in worldwide use. Important installation accessories such as bus plugs must be obtained from Phoenix or its partners (Festo FB6). Festo FB21 is required for Interbus-FOC, the Interbus variant “Rugged Line” with fibre optic cable.

Profibus DP:
An open fieldbus standard, originally developed by Siemens and in worldwide use (Festo FB13 for 12 MBd).

DeviceNet:
Open fieldbus standard based on the CAN technology originally developed for the automotive sector. DeviceNet was originally developed by Rockwell (Allen Bradley) and is now an open standard.

ASA (FIPIO):
Fieldbus used mainly in France (Festo FB16).

Modular electrical peripherals, for type 03/04

Peripherals overview – Control blocks

Control blocks

Integrated controllers in the Festo valve terminals permit the construction of stand-alone control units to IP65 – without control cabinets.

Using the slave operation mode, these valve terminals can be used for intelligent pre-processing and are therefore ideal modules for designing decentralised intelligence.

With the master operation mode, terminal groups can be designed with many options and functions, which can autonomously control a medium sized machine/system.

Control block variants

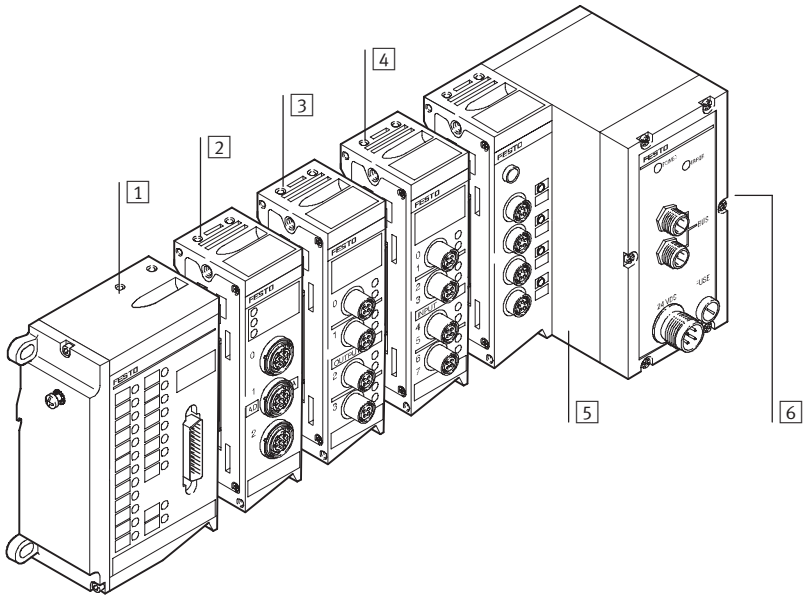
Integrated Festo PLC
A high performance miniature control system from Festo has been integrated into the SF3 valve terminal node. This provides stand-alone control of up to 128 inputs and 128 outputs.
With the Festo fieldbus, additional I/O and expanded functions can be installed and controlled.

The control block SF3 can be operated as required as a stand-alone operation, a fieldbus slave or master (with up to 31 fieldbus slaves and up to 1048 inputs and outputs).

Modular electrical peripherals, for type 03/04

Peripherals overview – Bus nodes

Equipping with bus node



1 Input/output module
2 Analogue stage
3 Output module
4 Input module
5 Bus node
6 Connection side for pneumatics

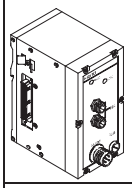
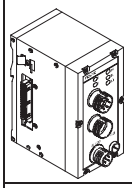
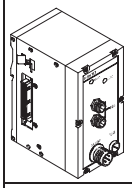
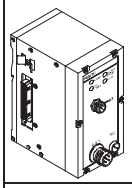
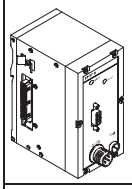
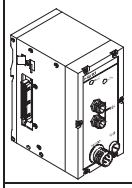
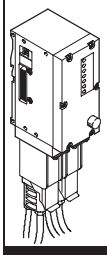
Modular electrical peripherals for type 03/04 can be equipped with bus node. In addition to controlling the valves and electrical outputs, corresponding sensor feedback can be recorded at the electrical peripherals and transmitted via the fieldbus to the control cabinet.

The following applies to bus nodes:

- Max. 26 valve solenoid coils
- Number of inputs dependent on fieldbus type
- Number of electrical outputs dependent on fieldbus type and number of pneumatic valves
- Status bits for program controlled diagnosis occupy 4 input bits
  - Undervoltage of valves
  - Undervoltage of sensors
  - Short circuit at outputs
- I/O allocation, self-configuration
- Subsequent addition of input or output modules moves the addressing (I/O allocation) forwards
- I/O allocation of inputs and outputs independent from each other
- 4-fold and 8-fold input modules connect to the next Half-Byte (nibble)
- Electrical outputs connect to the next Half-Byte (nibble) on the valves.
  Counting mode:
  Valves from left to right, then from the next Nibble electrical outputs from right to left
- Max. 12 modules are permitted on the left (electrical) side

Modular electrical peripherals, for type 03/04

Peripherals overview – Bus nodes

Fieldbus node						
View	Code	Type	Fieldbus protocol	Suitable for		➔ Page/Internet
				I/O	Analogue	
	FB5	IFB5-03	Festo fieldbus, ABB (CS31), Moeller SUCONET K	■ 60/64	–	20
	FB6	IFB6-03	Interbus	■ 60/64	■	24
	FB8	IFB8-03	Allen Bradley (1771 RIO)	■ 60/64	–	28
	F11	IFB11-03	DeviceNet, Phillips DIOS, SELECAN	■ 60/64	■	32
	F13	IFB13-03	Profibus DP, 12 MBd	■ 92/74	■	36
	F16	IFB16-03	ASA (FIPIO)	■ 60/64	–	40
	F21	IFB21-03	Interbus-FOC “Rugged Line”	■ 92/96	■	44

Modular electrical peripherals, for type 03/04

Peripherals overview – Bus nodes

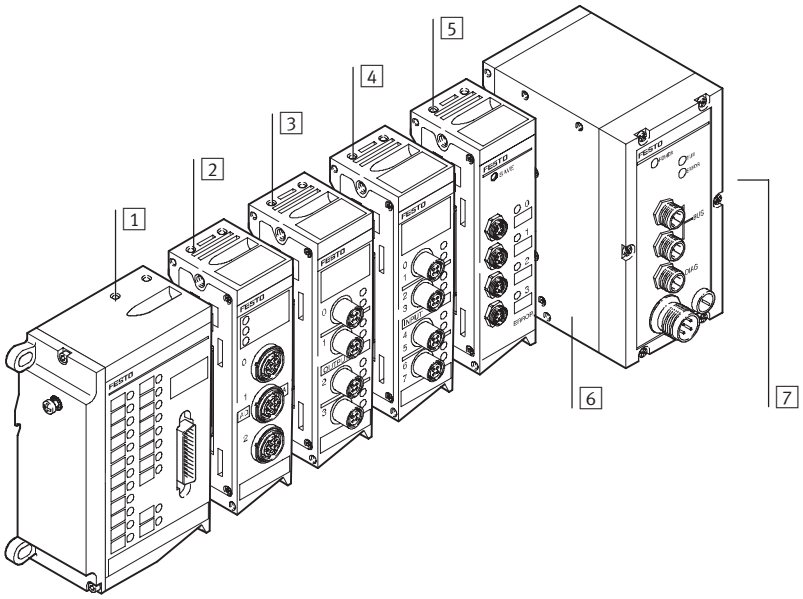
Overview – Address space for bus nodes							
	Bus protocol	Max. total		Max. digital		Max. analogue	
		Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
IFB5-03	Festo fieldbus, ABB (CS31), Moeller SUCONET K	60 bit	64 bit	60 DI	64 DO	–	–
IFB6-03	Interbus	60 bit	64 bit	60 DI	60 DO	8 AI	8 AO
IFB8-03	AB 1771 RIO	60 bit	64 bit	60 DI	64 DO	–	–
IFB11-03	DeviceNet	60 bit	64 bit	60 DI	64 DO	8 AI	8 AO
IFB13-03	Profibus DP	92 bit	74 bit	92 DI	74 DO	12 AI/AO	–
IFB16-03	ASA (FIPIO)	60 bit	64 bit	60 DI	64 DO	–	–
IFB21-03	Interbus-FOC	92 bit	74 bit	92 DI	74 DO	8 AI	8 AO

DI = Digital inputs (1 bit)
DO = Digital outputs (1 bit)
AI = Analogue inputs (16 bit)
AO = Analogue outputs (16 bit)

Modular electrical peripherals, for type 03/04

Peripherals overview – Control block

Equipping with control block



1 Input/output module
2 Analogue stage
3 Output module
4 Input module
5 Electrical interface for CP interface
6 Control block
7 Connection side for pneumatics

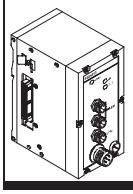
Modular electrical peripherals for type 03/04 can be equipped with various control blocks. In addition to controlling the valves and outputs, corresponding sensor feedback can be recorded at the electrical peripherals and processed autonomously with the integrated PLC. Additional expansion and networking is possible via the fieldbus.

The following applies to control blocks:

- Max. 26 valve solenoid coils
- Max. 96 local inputs
- Max. 48 local outputs
- Max. 48 analogue channels (SF3)
- CP interface for 64 inputs and 64 outputs (decentralised 2 ... 10 m per string)
- I/O allocation of inputs and outputs independent from each other
- I/O allocation, self-configuration
- 4-fold and 8-fold input modules connect to the next Half-Byte (nibble)
- Electrical outputs connect to the next Half-Byte (nibble) on the valves.
  Counting mode: Valves from left to right, then from the next Nibble electrical outputs from right to left
- Max. 12 modules are permitted on the left (electrical) side
- Subsequent addition of input or output modules or valves moves the addressing (I/O allocation) forwards

Modular electrical peripherals, for type 03/04

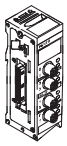
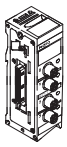
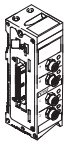
Peripherals overview – Control block

Control block							
View	Code	Type	Control block	Suitable for			➔ Page/Internet
				I/O	PROP	CP	
	SF3	ISF3-03	SF3 with Festo fieldbus	■ 128/128	■	■	48

- Programming the control block ISF3-03 with FST200 in Ladder Diagram or Statement List

Modular electrical peripherals, for type 03/04

Peripherals overview

Electronics modules with multi-pin node/bus node and control block combinations								
Electronics modules	Type	Multi-pin node			Bus node			
		MP1[1]	MP2[1]	MP4[1]	IFB5-03	IFB6-03	IFB8-03	IFB11-03
Input modules								
	**VIGE-03-FB-8-5POL** Input module for standard inputs PNP, 8-fold, 5-pin	–	–	–	■	■	■	■
	VIGE-03-FB-8,1-5POL Input module for high-speed inputs (1 ms) PNP, 8-fold, 5-pin	–	–	–	■	■	■	■
	VIGE-03-FB-8-5POL-S Input module for standard inputs PNP, 8-fold, 5-pin, with separate fuse	–	–	–	■	■	■	■
	VIGE-03-MP-8 Input module for multi-pin connection 8-fold, 4-pin	–	■	–	–	–	–	–
	**VIGE-03-FB-4-5POL** Input module for standard inputs PNP, 4-fold, 5-pin	–	–	–	■	■	■	■
	VIGE-03-MP-4 Input module for multi-pin connection 4-fold, 4-pin	–	■	–	–	–	–	–
	**VIGE-03-FB-16-SUBD-S** Input module with Sub-D plug PNP, 16-fold, 2x 15-pin socket	–	–	–	■	■	■	■
Output modules								
	**VIGA-03-FB-4-5POL** Output module for standard outputs PNP, 4-fold, 5-pin	–	–	–	■	■	■	■

1) Not for valve terminal type 04

Modular electrical peripherals, for type 03/04

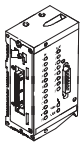
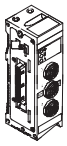
Peripherals overview

Electronics modules with multi-pin node/bus node and control block combinations					
Type	Bus node			Control block	➔ Page/Internet
	IFB13-03	IFB16-03	IFB21-03[1)]	ISF3-03[1)]	
Input modules					
VIGE-03-FB-8-5POL Input module for standard inputs PNP, 8-fold, 5-pin	■	■	■	■	54
VIGE-03-FB-8,1-5POL Input module for high-speed inputs (1 ms) PNP, 8-fold, 5-pin	■	■	■	■	54
VIGE-03-FB-8-5POL-S Input module for standard inputs PNP, 8-fold, 5-pin, with separate fuse	■	■	■	■	54
VIGE-03-MP-8 Input module for multi-pin connection 8-fold, 4-pin	–	–	–	–	type 03
VIGE-03-FB-4-5POL Input module for standard inputs PNP, 4-fold, 5-pin	■	■	■	■	54
VIGE-03-MP-4 Input module for multi-pin connection 4-fold, 4-pin	–	–	–	–	type 03
VIGE-03-FB-16-SUBD-S Input module with Sub-D plug PNP, 16-fold, 2x 15-pin socket	■	■	■	■	58
Output modules					
VIGA-03-FB-4-5POL Output module for standard outputs PNP, 4-fold, 5-pin	■	■	■	■	61

1) Not for valve terminal type 04

Modular electrical peripherals, for type 03/04

Peripherals overview

Electronics modules with multi-pin node/bus node and control block combinations								
Electronics modules	Type	Multi-pin node			Bus node			
		MP1[1]	MP2[1]	MP4[1]	IFB5-03	IFB6-03	IFB8-03	IFB11-03
Input/output modules								
	**VIEA-03-FB-12E-8A-SUBD** Input/output module PNP, 12I/8O, Sub-D	–	–	–	■	■	■	■
Analogue stage								
	**VIAU-03-FB-U** Analogue stage 3I/1O, 0 ... 10 V DC	–	–	–	–	■	–	■
	VIAU-03-FB-I Analogue stage 3I/1O, 4 ... 20 mA	–	–	–	–	■	–	■
	**VIAP-03-FB** Analogue stage for proportional valve 1I/1O	–	–	–	–	■	–	■
Electrical interface								
	**VIGCP-03-FB** Electrical interface to a CP installation system	–	–	–	–	–	■	–

1) Not for valve terminal type 04

Modular electrical peripherals, for type 03/04

Peripherals overview

Electronics modules with multi-pin node/bus node and control block combinations					
Type	Bus node			Control block	➔ Page/Internet
	IFB13-03	IFB16-03	IFB21-03[1]	ISF3-03[1]	
Input/output modules					
VIEA-03-FB-12E-8A-SUBD Input/output module PNP, 12I/8O, Sub-D	■	■	■	■	63
Analogue stage					
VIAU-03-FB-U Analogue stage 3I/1O, 0 ... 10 V DC	■	–	■	■	65
VIAU-03-FB-I Analogue stage 3I/1O, 4 ... 20 mA	■	–	■	■	65
VIAP-03-FB Analogue stage for proportional valve 1I/1O	■	–	■	■	65
Electrical interface					
VIGCP-03-FB Electrical interface to a CP installation system	–	–	–	■	69

1) Not for valve terminal type 04

Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB5-03

FESTO

MOELLER

ABB

This bus node handles communication between the modular electrical peripherals and a higher-order master.

For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.

The bus node supports three different company-specific fieldbus protocols, based on a floating RS485 connection.

The required protocol is selected by means of switch settings.

- Festo fieldbus
- ABB CS31
- Moeller SUCONET K

Application

Bus connection

The bus connection on the IFB5-03 is established by means of two 4-pin M12 plugs with four connections. The two plugs are connected internally, so that either a branch line installation can be performed with one cable, or 2 cables can be routed to the bus node, connected to the two plugs and looped through.

Implementation

The IFB5-03 supports the digital input and output modules and the solenoid coils. It does not support analogue modules.

It can service a total of 64 digital outputs, of which max. 26 can include solenoid coils, and 60 digital inputs.

Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

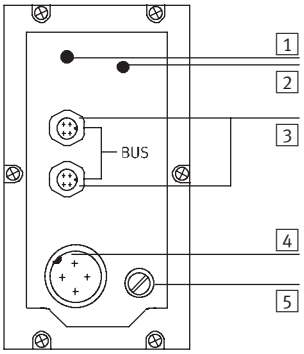
Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB5-03

General technical data			
Type			**IFB5-03**
Part No.			**18735**
Combination with analogue modules			No
Baud rates	Festo fieldbus		Set using HW switch
		[kbps]	• 31.25 • 62.50 • 187.50 • 375
	ABB CS31	[kbps]	187.50
	Moeller SUCONET K		Baud rate set automatically
		[kbps]	• 187.50 • 375
Addressing range	Festo fieldbus		1 ... 99
	ABB CS31		1 ... 60
	Moeller SUCONET K		1 ... 99
Type of communication	Festo fieldbus		Cyclic polling
	ABB CS31		I16, O16 or I/O16
	Moeller SUCONET K		Up to 32 I/O: SIS-K-06/07 Up to 64 I/O: SIS-K-10/10
Max. no. of solenoid coils			26
Max. no. of outputs incl. solenoid coils			64
Max. no. of inputs			60
LED diagnostic displays	Power		Operating status
	Bus		Error status
Device-specific diagnostics transmitted to the controller			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Certification			CE
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

Connection and display components

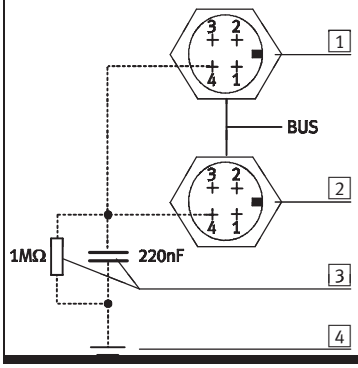
The following connection and display components can be found on the bus node cover:



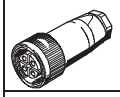
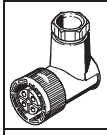
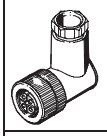
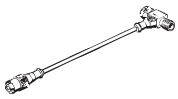
1 Green LED / Power
2 Red LED / Bus
3 Plugs for fieldbus cable
4 Operating voltage connection
5 Fuse for operating voltage of inputs

Pin allocation for fieldbus interface

Terminal allocation



	Pin	Signal
1 Plug 1	1	S+/Bus2
	2	n.c.
	3	S–/Bus2
	4	Screen/shield
2 Plug 2	1	S+/Bus1
	2	n.c.
	3	S–/Bus1
	4	Screen/shield
3 Internal network		
4 Housing/node		

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4-pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4-pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Bus connection, straight, M12, 4-pin	Pg7	**FBSD-GD-7**	**18497**
		Pg9	**FBSD-GD-9**	**18495**
		Pg13.5	**FBSD-GD-13,5**	**18496**
	Bus connection, angled, M12, 4-pin	Pg7	**FBSD-WD-7**	**18524**
		Pg9	**FBSD-WD-9**	**18525**
	T-adapter, M12	for Festo fieldbus	**FB-TA**	**18498**
	T-adapter for fieldbus, with an open ended cable		**FB-TA1**	**18499**
User documentation				
	User documentation – Bus node IFB5-03	German	**P.BE-VIFB5-03-DE**	**152755**
		English	**P.BE-VIFB5-03/05-EN**	**152765**

Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB6-03

This bus node handles communication between the modular electrical peripherals and a higher-order master.
For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.

Application

Bus connection

The bus connection is established via two 9-pin M23 connections with a typical Interbus pin allocation.

The plug and socket are labelled with Remote IN and Remote OUT in accordance with the definition for the Interbus remote bus.

Both bus cables are always routed to the bus node and looped through in accordance with the ring structure of the Interbus.

Implementation

The IFB6-03 supports the digital input and output modules and the solenoid coils. It also supports analogue modules. It can service a total of 64 digital outputs, of which max. 26 can include solenoid coils, and 60 digital inputs. The FB6 supports max. 8 analogue input channels and 8 analogue output channels.
The analogue channels are operated in multiplex mode and occupy 16 process data bits. The number of possible digital inputs and outputs is reduced by 16 bits when analogue modules are used.

- Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

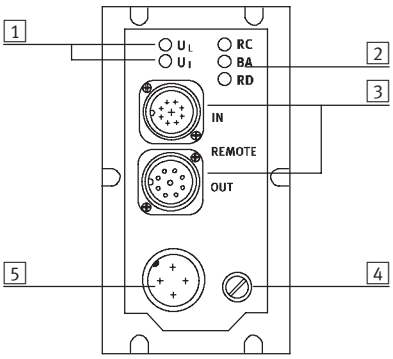
Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB6-03

General technical data			
Type			**IFB6-03**
Part No.			**18736**
Combination with analogue modules			Yes
Baud rates		[kbps]	500
ID code			1, 2 or 3 depending on expansion
No. of process data bits			16, 32, 48 or 64 depending on expansion
PCP channel			No
Configuration support			• Icon file for CMD software • Station description file with CMD software
Max. no. of solenoid coils			26
Max. no. of outputs incl. solenoid coils			64
Max. no. of inputs			60
LED diagnostic displays	UL		Operating voltage of internal electronics
	UI		Operating voltage of Interbus interface
	RC		Remotebus check
	BA		Bus active
	RD		Remotebus disable
Device-specific diagnostics transmitted to the controller			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply • Error during analogue processing
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

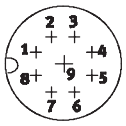
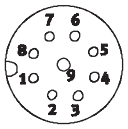
Connection and display components

The following connection and display components can be found on the bus node cover:

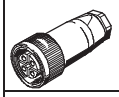
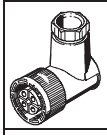
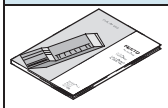


1 Power supply indicator
2 Fieldbus status indicator
3 INTERBUS interface
4 Fuse for operating voltage of inputs
5 Operating voltage connection

Pin allocation for the INTERBUS interface, non-floating installation remote bus

Terminal allocation	Pin[1)]	Signal	Designation
Incoming			
Plug view 	1	DO	Data out
	2	/DO	Data out inverse
	3	DI	Data in
	4	/DI	Data in inverse
	5	Ground	Reference conductor
	6	FE	Functional earthing
	7	+24 V DC	Installation remote bus supply
	8	+0 V	Installation remote bus supply
	Sleeve	Screen	Screening
Outgoing			
Socket view 	1	DO	Data out
	2	/DO	Data out inverse
	3	DI	Data in
	4	/DI	Data in inverse
	5	Ground	Reference conductor
	6	FE	Functional earthing Installation remote bus
	7	+24 V DC	Installation remote bus supply
	8	+0 V	Installation remote bus supply
	9	RBST	Establish bridge to pin 5
	Sleeve	Screen	Screening

1) Pins not listed here must not be connected.

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4-pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4-pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
User documentation				
	User documentation – Bus node IFB6-03	German	**P.BE-VIFB6-03-DE**	**152756**
		English	**P.BE-VIFB6-03-EN**	**152766**
		French	**P.BE-VIFB6-03-FR**	**163926**
		Spanish	**P.BE-VIFB6-03-ES**	**163906**
		Italian	**P.BE-VIFB6-03-IT**	**165426**
		Swedish	**P.BE-VIFB6-03-SV**	**165456**

Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB8-03

FESTO

Allen-Bradley

ENCOMPASS GLOBAL

This bus node handles communication between the modular electrical peripherals and a higher-order master.

For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.

The bus node supports the 1771 Remote I/O fieldbus from Allen Bradley/ Rockwell Automation.

Application

Bus connection

The FB8 bus node has 2 M12 plugs with 4 connections for connecting to the Remote interface.

The two plugs are connected internally, so that either a branch line installation can be performed with one cable, or 2 cables can be routed to the bus node, connected to the two plugs and looped through.

Implementation

The IFB8-03 supports the digital input and output modules and the solenoid coils. It does not support analogue modules.

It can service a total of 64 digital outputs, of which max. 26 can include solenoid coils, and 60 digital inputs.

The CP interface module can be connected as an alternative if the CP installation system is used, however this mode of operation does not support the direct mounting of valves and input/output modules.

Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

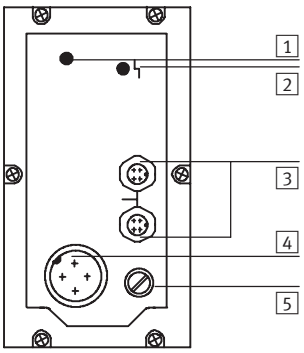
Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB8-03

General technical data			
Type			**IFB8-03**
Part No.			**18738**
Combination with analogue modules			No
Baud rates		[kbps]	Set using HW switch • 57.6 • 115.2 • 230.4
Addressing range			The maximum rack number and I/O group depends on the controller connected. With PLC-3 up to rack no. 30 group 4/5.
Emulated product			Remote Rack Quarter rack or half rack
Configuration support			Automatic configuration as a quarter or half rack
Max. no. of solenoid coils			26
Max. no. of outputs incl. solenoid coils			64
Max. no. of inputs			60
LED diagnostic displays	Power		Operating status
	Bus		Error status
Device-specific diagnostics transmitted to the controller			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

Connection and display components

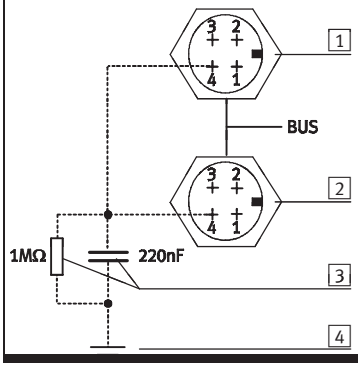
The following connection and display components can be found on the bus node cover:



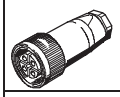
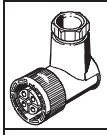
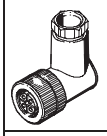
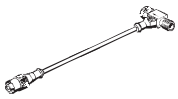
1 Red LED / Bus
2 Green LED / Power
3 RIO interface
4 Operating voltage connection
5 Fuse for operating voltage of inputs

Pin allocation for RIO interface

Terminal allocation



	Pin	Signal
1 Plug 1	1	S+/Bus2
	2	n.c.
	3	S–/Bus2
	4	Screen/shield
2 Plug 2	1	S+/Bus1
	2	n.c.
	3	S–/Bus21
	4	Screen/shield
3 Internal network		
4 Housing/node		

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4-pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4-pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Bus connection, straight, M12, 4-pin	Pg7	**FBSD-GD-7**	**18497**
		Pg9	**FBSD-GD-9**	**18495**
		Pg13.5	**FBSD-GD-13,5**	**18496**
	Bus connection, angled, M12, 4-pin	Pg7	**FBSD-WD-7**	**18524**
		Pg9	**FBSD-WD-9**	**18525**
	T-adapter, M12	for Festo fieldbus	**FB-TA**	**18498**
	T-adapter for fieldbus, with an open ended cable		**FB-TA1**	**18499**
User documentation				
	User documentation – Bus node IFB8-03	German	**P.BE-VIFB8-03-DE**	**152758**
		English	**P.BE-VIFB8-03/05-EN**	**152768**

Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB11-03

This bus node handles communication between the modular electrical peripherals and a higher-order master.
For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.

Application

Bus connection

The DeviceNet connection is established via a 5-pin M12 plug with pins that corresponds to the specific mini connector.

A DeviceNet installation with a higher degree of protection is typically laid using main and branch lines that are connected via T-pieces.

Various manufacturers such as Turck, Lumberg and Rockwell offer finished cables and terminating resistors.

The terminating resistors are attached to the two outermost T-pieces. This installation technique keeps the bus closed while a bus station is being removed.

Implementation

The IFB11-03 supports the digital input and output modules, the solenoid coils and the analogue modules. It can service a total of 60 digital inputs and 64 digital outputs, of which max. 26 can include solenoid coils. Together with the analogue modules, this bus node services max. 8 output and 8 input channels. 16 inputs and 16 outputs are always occupied if analogue modules are used, regardless of the number of analogue channels used.

Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

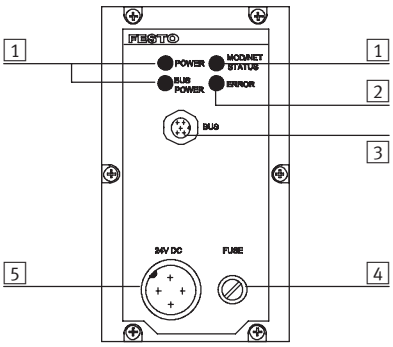
Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB11-03

General technical data			
Type			**IFB11-03**
Part No.			**18728**
Combination with analogue modules			Yes
Baud rates		[kbps]	Set using HW switch • 125 • 250 • 500
Addressing range			Set using 2 rotary switches 0 ... 63
Product type			Pneumatic valve (25 dec.)
Product code			2282/35050
Type of communication			Polling
Configuration support			EDS file and graphics symbol
Max. no. of solenoid coils			26
Max. no. of outputs and solenoid coils			64
Max. no. of inputs			60
Max. no. of analogue channels			8 output channels 8 input channels
LED diagnostic displays	Power		Operating voltage of electronics
	Bus/Power		Operating voltage of bus
	MOD/NET		Operating status
	Error		Internal error
Device-specific diagnostics via DeviceNet			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +7
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

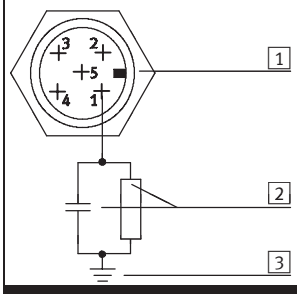
Connection and display components

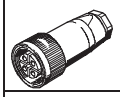
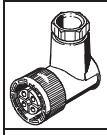
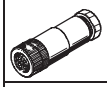
The following connection and display components can be found on the bus node cover:



1 Green LEDs
2 Red LED
3 Plug for fieldbus cable
4 Fuse for operating voltage of inputs
5 Operating voltage connection

Pin allocation for fieldbus interface

Terminal allocation		Pin	Signal
	1 Plug	1	Screen
		2	+24 V DC bus
		3	GND Bus
		4	Data+
		5	Data–
	2 Housing of the fieldbus connection module PE		
	3 Internal screen connection in the valve terminal		

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4-pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4-pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Bus connection, straight, Pg9, 5-pin		**FBSD-GD-9-5POL**	**18324**
User documentation				
	User documentation – Bus node IFB11-03	German	**P.BE-VIFB11-03-DE**	**163951**
		English	**P.BE-VIFB11-03-EN**	**163956**
		French	**P.BE-VIFB11-03-FR**	**163931**
		Italian	**P.BE-VIFB11-03-IT**	**165431**
		Swedish	**P.BE-VIFB11-03-SV**	**165461**

Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB13-03

Bus node for handling communication between the modular electrical peripherals and a higher-order master via Profibus DP.
For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.

The status of the voltage supplies and the bus communication is indicated via the LEDs Power, Power Valves and Bus Error.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical Profibus allocation (to EN 50 170).

The bus connector plug (with protection class IP65 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

An active bus terminal can be connected using the integrated DIL switch. The Sub-D interface is designed for the control of network components with a fibre optic cable connection.

- Note

A “Reverse Key” connection can be established via a 2x M12 adapter plug (B-coded).

Implementation

The IFB13-03 supports digital input and output modules and solenoid coils. Analogue modules can also be used.

- 74 digital outputs in total, of which max. 26 solenoid coils.
- Max. 92digital inputs for recording sensor signals.

The bus node supports max. 12 analogue input/output channels. Analogue modules occupy a discrete address space, separate from the digital inputs and outputs.

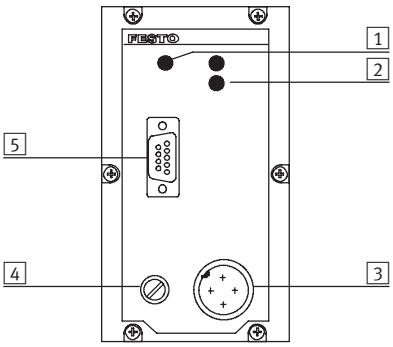
- Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

General technical data			
Type			**IFB13-03**
Part No.			**174335**
Combination with analogue modules			Yes
Baud rates			Automatic detection 9.6 kBaud ... 12 MBaud
Addressing range			Set using 2 rotary switches and a DIL switch 1 ... 125
Product family			4: Valves
Ident. number			0xFB13
Type of communication			Cyclic communication
Configuration support			GSD file and bitmaps
Max. no. of solenoid coils			26
Max. no. of outputs and solenoid coils			74
Max. no. of inputs			92
Max. no. of analogue channels			12 input/output channels
LED diagnostic displays	Power		Operating voltage of electronics
	Power V		Operating voltage of valves and outputs
	Bus Error		Communication error
Device-specific diagnostics via Profibus DP			• Short circuit/overload, outputs (channel diagnostics) • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply • Error during analogue processing
Additional functions			• Status/diagnostic bits in the process image of the inputs • Test routine for checking the valves and outputs without bus communication • Indication of the valve terminal configuration via Power V and Bus Error LEDs
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

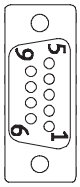
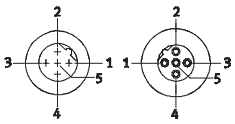
Connection and display components

The following connection and display components can be found on the bus node cover:

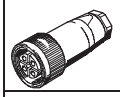
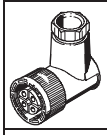
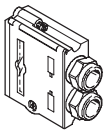
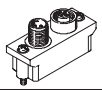
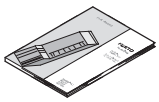


1 Green LED / Power
2 Red LED / Bus
3 Operating voltage connection
4 Fuse for operating voltage of inputs
5 Plug for fieldbus cable

Pin allocation for Profibus DP interface

	Terminal allocation		Pin	Signal	Designation
Plug, Sub-D					
	Viewed from the socket side 	Socket	1	n.c.	Not connected
			2	n.c.	Not connected
			3	RxD/TxD-P	Received/transmitted data P
			4	CNTR-P[1)]	Repeater control signal
			5	DGND	Data reference potential (M5V)
			6	VP	Supply voltage (P5V)
			7	n.c.	Not connected
			8	RxD/TxD-N	Received/transmitted data N
			9	n.c.	Not connected
			Housing	Screen	Connection to housing
Bus connection M12 adapter plug (B-coded)					
	Plug and socket 	Plug	1	n.c.	Not connected
			2	RxD/TxD-N	Received/transmitted data N
			3	n.c.	Not connected
			4	RxD/TxD-P	Received/transmitted data P
			5 and M12	Screen	Connection to FE
		Socket	1	VP	Supply voltage (P5V)
			2	RxD/TxD-N	Received/transmitted data N
			3	DGND	Data reference potential (M5V)
			4	RxD/TxD-P	Received/transmitted data P
			5 and M12	Screen	Connection to FE

1) The repeater control signal CNTR-P is realised as a TTL signal.

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4 pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4 pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Plug, Sub-D		**FBS-SUB-9-GS-DP-B**	**532216**
	Bus connection, 2x M12 adapter plug (B-coded)		**FBA-2-M12-5POL-RK**	**533118**
User documentation				
	User documentation – Bus node IFB13-03	German	**P.BE-VIFB13-03-DE**	**163953**
		English	**P.BE-VIFB13-03-EN**	**163958**
		French	**P.BE-VIFB13-03-FR**	**163933**
		Spanish	**P.BE-VIFB13-03-ES**	**163913**
		Italian	**P.BE-VIFB13-03-IT**	**165433**
		Swedish	**P.BE-VIFB13-03-SV**	**165463**

ASA

This bus node handles communication between the modular electrical peripherals and a higher-order master.
For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.
- The ASA fieldbus standard (FIPIO) works with a constant transfer rate of 1Mbit/s and is primarily supported on the master side by the Telemecanique and April controllers.
- LED displays on the bus node show the current status of communication on the bus and indicate the presence of various device errors within the valve terminal.

Application

Bus connection

The bus connection on the IFB16-03 is established via two 4-pin M12 plugs that are bridged within the bus node. This means that the bus can be interconnected in a serial arrangement with an incoming and an outgoing bus cable or connected to the bus via a branch line.
The bus address is set by means of 2 rotary switches on the bus node. The error characteristics of the outputs and the solenoid coil actuator can also be set on the node.

Implementation

The IFB16-03 supports the digital input and output modules and the solenoid coils. It can service a total of 60 digital inputs and 64 digital outputs, of which max. 26 can include solenoid coils.
The CP interface module can be connected as an alternative if the CP installation system is used, however this mode of operation does not support the direct mounting of valves.

- Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

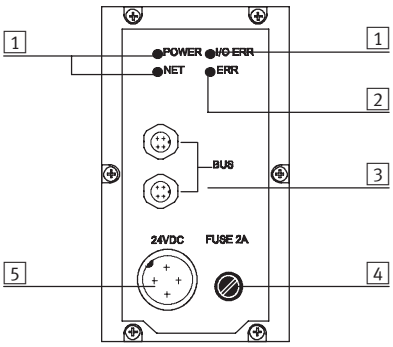
Modular electrical peripherals, for type 03/04

Technical data – Bus node IFB16-03

General technical data			
Type			IFB16-03
Part No.			18935
Combination with analogue modules			No
Baud rates		[Mbaud]	1
Addressing range			1 ... 62
Product profile			STD-P
Device reference			FSD_C8
Configuration support			Standard device profile within the configuration software
Max. no. of solenoid coils			26
Max. no. of outputs and solenoid coils			64
Max. no. of inputs			60
LED diagnostic displays	Power		Operating voltage
	NET		Status of communication
	I/O ERR		Common errors in valve terminal
	ERR		Device-specific errors
Device-specific diagnostics via FIPIO			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	200 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +60
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 85 x 125
Grid dimension		[mm]	72
Weight		[g]	1000

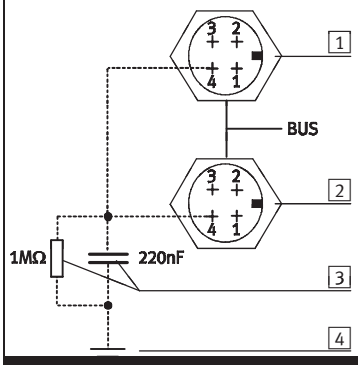
Connection and display components

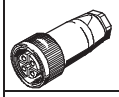
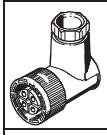
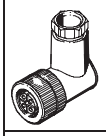
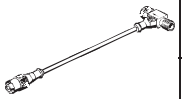
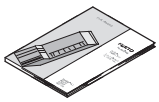
The following connection and display components can be found on the bus node cover:



1 Green LED / Power
2 Red LED / Bus
3 Plugs for fieldbus cable
4 Fuse for operating voltage of inputs
5 Operating voltage connection

Pin allocation for fieldbus interface

Terminal allocation		Pin	Signal
	1 Plug 1	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	2 Plug 2	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	3 Internal RC network		
	4 Housing/node		

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight, M18x1, 4-pin	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1, 4-pin	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Bus connection, straight	Pg7	**FBSD-GD-7**	**18497**
		Pg9	**FBSD-GD-9**	**18495**
		Pg13.5	**FBSD-GD-13,5**	**18496**
	Bus connection, angled	Pg7	**FBSD-WD-7**	**18524**
		Pg9	**FBSD-WD-9**	**18525**
	T-adapter, M12	for Festo fieldbus	**FB-TA**	**18498**
	T-adapter for fieldbus, with an open ended cable		**FB-TA1**	**18499**
User documentation				
	User documentation – Bus node IFB16-03	German	**P.BE-VIFB16-03/05-DE**	**164221**
		English	**P.BE-VIFB16-03/05-EN**	**164222**
		Spanish	**P.BE-VIFB16-03/05-ES**	**164223**
		French	**P.BE-VIFB16-03/05-FR**	**164224**
		Italian	**P.BE-VIFB16-03/05-IT**	**165436**
		Swedish	**P.BE-VIFB16-03/05-SV**	**165466**

Modular electrical peripherals, for type 03

Technical data – Bus node IFB21-03

This bus node handles communication between the modular electrical peripherals type 03 and a higher-order master.
For the modular electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the electrical outputs and valves.
- Interbus with Rugged Line fibre optic connection

Application

Bus connection

The bus connection is established via two Rugged Line fibre optic connections (power supply 5-pin, data fibre optics, typical Interbus allocation). The IFB21-03 corresponds to an Interbus remote bus station.

It supports the transfer of data via fibre optic cables with optical regulation of the individual transmission lengths and the looping through of the power supply from valve terminal to valve terminal. The power supply is connected via Quickon.

Implementation

The IFB21-03 supports the digital input and output modules and the solenoid coils. It also supports analogue modules. It can service a total of 96 digital outputs, of which max. 26 can include solenoid coils, and 92 digital inputs.
The IFB21-03 supports max. 8 analogue input channels and 8 analogue output channels. The analogue channels are operated in multiplex mode and occupy 16 process data bits.

Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

Modular electrical peripherals, for type 03

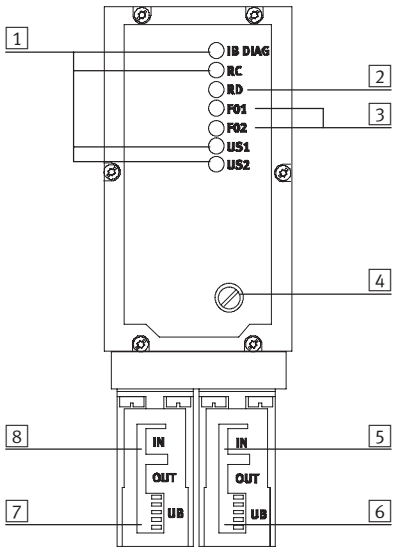
Technical data – Bus node IFB21-03

General technical data			
Type			IFB21-03
Part No.			188844[1]
Combination with analogue modules			Yes
Baud rates		[kbps]	• 500 • 2000
ID code			1, 2 or 3 depending on expansion
No. of process data bits			16, 32, 48, 64, 80 or 96 depending on expansion
PCP channel			No
Configuration support			• Icon file for CMD software • Station description file with CMD software
Max. no. of solenoid coils			26
Max. no. of outputs incl. solenoid coils			96
Max. no. of inputs			92
LED diagnostic displays	IB-DIAG		Interbus diagnostics
	RC		Remotebus check
	RD		Remotebus disable
	FO1		Diagnostics, incoming fibre optic cable length
	FO2		Diagnostics, outgoing fibre optic cable length
	US1		Diagnostics, logic voltage
	US2		Diagnostics, load voltage
Device-specific diagnostics transmitted to the controller			• Short circuit/overload, outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply • Error during analogue processing
Diagnostics via SRC			• Operating voltage US1 under 17 V DC • Load voltage of valves/outputs under 21.6 V DC • Load voltage of valves/outputs under 10 V DC • Undervoltage of sensor supply • Short circuit/overload of input module[2], 1 … 12 (module-specific) • Short circuit/overload of output module[3], 1 … 12 (module-specific)
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 … 30
	Power failure buffering	[ms]	20
Current consumption		[mA]	150 + total current consumption of inputs, internal
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	0 … +50
	Storage	[°C]	–20 … +70
Materials	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	206 x 82 x 109
Grid dimension		[mm]	72
Weight		[g]	1335

1) Only for type 03
2) Only VIGE-03-FB-8-5POL-S
3) Only VIGA-03-FB-4-5POL in NPN

Connection and display components

The following connection and display components can be found on the bus node cover:

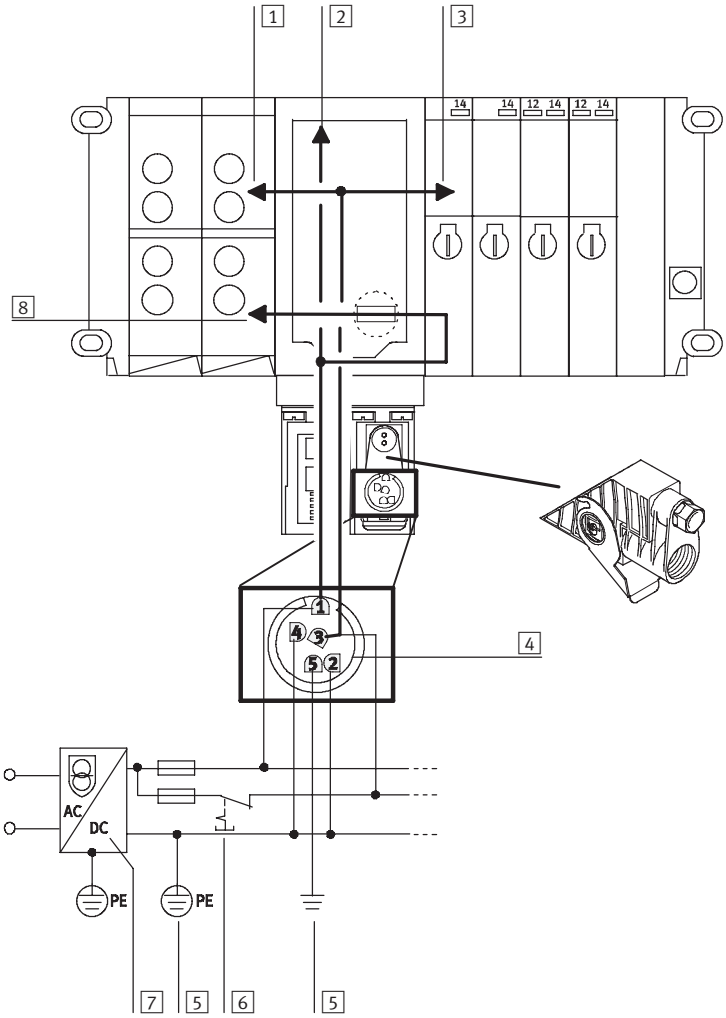


1 Green LED
2 Red LED
3 Yellow LED
4 Fuse for operating voltage of inputs
5 INTERBUS FOC interface, outgoing
6 Voltage supply connection, outgoing
7 Voltage supply connection, incoming
8 INTERBUS FOC interface, incoming

Designation			Type
Version			Fibre optic cable (polymer fibres 980/1000 µm)
Type of transmission			Serial asynchronous, full-duplex
Protocol			INTERBUS
Baud rate			500 kbps ... 2 mbps
Cable type	Power supply		IBS PW R/5 HD/F
	Fibre optic cable		PMS-LWL-RUGGED-FLEX-980/1000[1)]
	Wavelength	[µm]	Typical 650
Line length	Between 2 remote bus stations	[m]	1 ... 50
	System reserve	[db]	3
Plug connector			Rugged Line plug[1)]

1) Can be obtained from Phoenix Contact GmbH

Example of circuit



1 Electrical outputs (externally fused)
2 24 V DC electronics
3 Valves
4 Voltage supply connection for bus node
5 Potential equalisation
6 Load voltage, can be disconnected separately
7 Power supply unit (e.g. central voltage supply)
8 Electrical inputs/sensors

Ordering data

Designation			Type	Part No.
User documentation				
	User documentation – Bus node IFB21-03	German	**P.BE-VIFB21-03-DE**	**191084**
		English	**P.BE-VIFB21-03-EN**	**191085**

Modular electrical peripherals, for type 03/04

Technical data – Control block ISF3-03

FESTO

A powerful mini controller from Festo has been integrated in the ISF3-03 control block and built into a robust aluminium housing with the protection class IP65. This permits stand-alone control of up to 128 inputs and outputs.

Application

All plugs and electrical connections are designed for direct mounting on the machine outside of the control cabinet (provided that the requirements of IP65 are adhered to).
With the Festo fieldbus, additional I/Os and expanded functions can be installed and controlled. The control block ISF3-03 can be operated as required in stand-alone mode, as a fieldbus slave or fieldbus master with up to 31 fieldbus slaves.
This controller is programmed via an RS232 programming interface using the software FST200. Alternatively, a display and control unit can be directly connected on-site.
The control block ISF3-03 is a highly compact solution; a stand-alone controller for directly mounted valve terminals of the type 03/04 or for CP valves and CP I/O modules indirectly connected via the CP installation system.
The elimination of internal wiring to the controller reduces the number of connection points required, thereby shortening the installation time and eliminating sources of potential errors.
The performance of the controller technology was selected and specially customised to meet the requirements of a valve terminal. Extensive diagnostic information provides information on the status of all components mounted on the valve terminal as well as the sensors and actuators connected to it.

Operating modes

Stand-alone

Valve terminal with control block ISF3-03 for controlling a stand-alone machine. Can be used to autonomously control small stand-alone machines or system components. It can also be used to realise stand-alone subsystems with a discrete function as part of a larger system.

Master

Control block ISF3-03 with a fieldbus extension for controlling systems. The control block ISF3-03 with integrated fieldbus interface facilitates the connection of local inputs and outputs as well as further fieldbus stations. It can also be used to process automation tasks requiring a large number of electrical sensors and actuators. It can also be used to realise stand-alone subsystems with a discrete function as part of a larger system.

Modular electrical peripherals, for type 03/04

Technical data – Control block ISF3-03

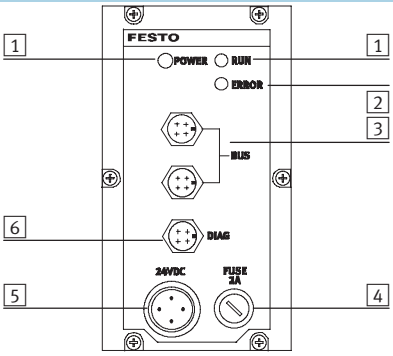
General technical data			
Type			**ISF3-03**
Part No.			**164287**
Programming device interface			4-pin round plug for PC/ABG/serial coupling (V24/RS232)
RAM and EEPROM program memory			128 kByte for program, modules, text modules and drivers (4-20 Byte = 1 instruction)
Processing time for 1024 binary instructions			Approx. 1 ms
Flags			F0.0 to F31.15 = 512, all remanent
	No. of time flags		T0 to T31 = 32 (timer preselection remanent)
	Time range		0.01 s to 655.35 s
	No. of counting flags		Z0 to Z31, all remanent
	Counting range		0 to 65535
Register			R0 to R127, R0 to R99 remanent
Special FU			Function units 0 to 4096
Arithmetic functions			+, –, *, :
Inputs	digital		128
	analogue		36
Outputs	digital		128
	analogue		12
Programmable inputs/ outputs	CP		64 digital inputs/64 digital outputs incl. solenoid coils
	Fieldbus		1048 I/O (per station, max. 128 I and 128 O)
Permissible modules			Overview
	Programs		P 0 ... P 15 (user programs)
	Program modules		BAP 0 ... 15 (user programmable)
	Functional modules		BAF 0 ... 99
	CFM No.	Application	
	0	Control block	Deletion of internal operands
	1		Location of short circuits
	2		Indirect set/reset of local outputs
	3		Indirect access to FU0 to FU4095
	4		Measurement of program runtime
	5		Reading of remanent data words
	6		Writing of remanent data words
	10		Assigning operation parameters/reading of counters/timers
	11		Interrupt-controlled enable/disable of counters/timers
	21	CP interface	Reading/writing of data CP auxiliary module
	23		Reset of all outputs accessible via CP
	25		Diagnosis of CP valve terminal, input and output modules
	27		Assigning operation parameters for CP errors
	28		Recording of CP configuration

General technical data			
Type			ISF3-03
Part No.			164287
	Functional modules		
	CFM No.	Application	
	40	Fieldbus	Requesting the fieldbus configuration
	41		Master/slave mode: Reading the parameters of a fieldbus station
	42		Master/slave mode: Writing the parameters of a fieldbus station
	43		Reset of all outputs accessible via fieldbus
	44		Fieldbus station status request
	47		Assigning operation parameters for fieldbus errors
	48		Recording of actual configuration
	49		Comparison of actual list with reference list
	50		Reading of fieldbus station information
	51		Fieldbus station reset
	60	Analogue	Loading of analogue values
	61	modules	Output of analogue values
	63		Diagnosis of analogue module
	90	Control block	Execution of assembler programs (functional modules)
	91		
	92		
	93		
	94		
	95		
	96		
	97		
	98		
	99		
Programming software			FESTO FST200
Communication	Point to point coupling		Yes
	Bus system		Festo fieldbus (master or slave), RS485
Diagnosis			Comprehensive diagnosis, evaluation using FST200 or via inputs into user program

General technical data			
Type			ISF3-03
Part No.			164287
Fieldbus interface			2x 4-pin round plug (RS485)
Protocol			Festo fieldbus
Cable length (dependent on baud rate)		[m]	Two wire cable, max. 500 ... 4000
Bus address SF master			Permanent (master/slave mode set via FST200)
Bus address SF slave			Can be set using FST200 (1 ... 31)
Bus terminal			Can be set using FST200
Communication SF slave			Max. 12 byte inputs and 12 byte outputs
Bus station as master			Control block ISF3-03 1 master Max. 31 slaves: Festo valve terminals and digital modules
Bus station as slave Data exchange (cyclic) Data exchange (acyclic)			Control block ISF3-03 Max. 12 byte inputs and 12 byte outputs, via fieldbus I/O with Festo fieldbus master (e.g. ISF3-03, FPC405, ...) Parameter field, max. 256 words
Parameter/configuration software for SF3 as master			Using a fieldbus configurator integrated in the FST200
Diagnosis			Comprehensive diagnosis, evaluation using FST200 or via inputs into user program
Operating voltage	Nominal value	[V DC]	24 polarity-safe
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Current consumption pin 1	Control block	[mA]	200
	CP modules	[mA]	560 (internal electronics) + total current consumption of inputs
Current consumption pin 2			Total of all valves switched simultaneously, see technical data on CP valves
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material	Housing		Die-cast aluminium
	Cover		Polyamide
Dimensions (HxWxD)		[mm]	132 x 82 x 125
Weight		[g]	1000

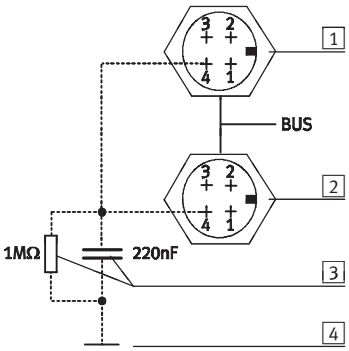
Connection and display components

The following connection and display components can be found on the control block cover:

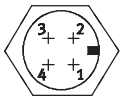


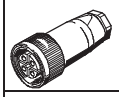
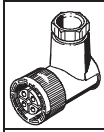
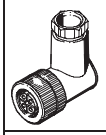
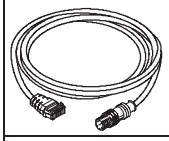
1 Green LEDs
2 Red LED
3 Plug for fieldbus cable
4 Fuse for operating voltage of inputs
5 Operating voltage connection
6 Diagnostic interface

Pin allocation for fieldbus interface

Terminal allocation		Pin	Signal
	1 Plug 1	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	2 Plug 2	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	3 Internal network		
	4 Housing/node		

Pin allocation for diagnostic interface

Terminal allocation		Pin	Signal
		1	RxD
		2	TxD
		3	GND
		4	Screen

Ordering data				
Designation			Type	Part No.
Power supply				
	Plug socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18527**
		for 2.5 mm^2	**NTSD-WD-11**	**533119**
Fieldbus connection				
	Bus connection, straight	Pg7	**FBSD-GD-7**	**18497**
		Pg9	**FBSD-GD-9**	**18495**
		Pg13.5	**FBSD-GD-13,5**	**18496**
	Bus connection, angled	Pg7	**FBSD-WD-7**	**18524**
		Pg9	**FBSD-WD-9**	**18525**
Diagnostic/data connection				
	Programming cable		**KDI-SB202-BU9**	**150268**
User documentation				
	User documentation – FST200 programming software	German	**P.BE-FST200-AWL/KOP-DE**	**165484**
		English	**P.BE-FST200-AWL/KOP-EN**	**165489**
	User documentation – Control block ISF3-03	German	**P.BE-VISF3-03-DE**	**165481**
		English	**P.BE-VISF3-03-EN**	**165486**
		Spanish	**P.BE-VISF3-03-ES**	**165496**
		French	**P.BE-VISF3-03-FR**	**165491**
		Italian	**P.BE-VISF3-03-IT**	**165446**

Modular electrical peripherals, for type 03/04

Technical data – Input module, digital, 4-/8-fold

Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
Plugs with double allocation are separated using a DUO plug or DUO cable. These modules cannot be operated on the multi-pin node with inputs.

Applications

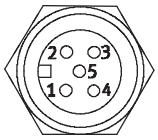
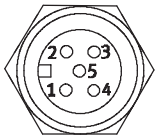
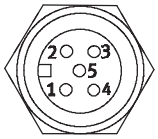
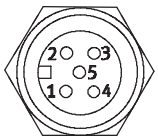
- Input modules for 24 V DC sensor signals
- M12 plug, single allocation connection technology in 4-fold modules, double allocation connection technology in 8-fold modules
- M12 plug, 5-pin
- The input statuses are indicated for each input signal at an allocated LED
- 24 V DC supply provided for all connected sensors
- Module width: 36 mm

General technical data					
Type Part No.			VIGE-03-FB-8-5POL 175555	VIGE-03-FB-4-5POL 175557	VIGE-03-FB-8,1-5POL 175559
Input type			Standard inputs, PNP	Input plug with single allocation, PNP	High-speed inputs, PNP
No. of inputs			8	4	8
No. of occupied module positions			1		
Sensor connection type			4xM12, 5-pin, socket with double allocation	4xM12, 5-pin, socket with single allocation	4xM12, 5-pin, socket with double allocation
Max. power supply per channel		[A]	2		
Max. sensor supply per module		[A]	2		
Fuse protection for sensor supply			Central fuse 2 A, in system supply		
Current consumption of module		[mA]	Typical 12		
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node		
Switching level	Signal 0	[V DC]	≤5 DC		
	Signal 1	[V DC]	≥10 DC		
Input delay		[ms]	3		0.6
Switching logic			PNP (for input signals with positive logic)		
Input characteristic curve			To IEC 1131-2		
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage	[°C]	–20 ... +70		
Material			Die-cast aluminium		
Dimensions		[mm]	132 x 36 x 70		
Grid dimension		[mm]	36		
Weight		[g]	360		

Modular electrical peripherals, for type 03/04

Technical data – Input module, digital, 4-/8-fold

General technical data			
Type			VIGE-03-FB-8-5POL-S
Part No.			188521
Input type			With separate fuse, PNP
No. of inputs			8
No. of occupied module positions			1
Sensor connection type			4xM12, 5-pin, socket with double allocation
Max. power supply per channel		[A]	2
Max. sensor supply per module		[A]	0.5
Fuse protection for sensor supply			Internal electrical fuse
Current consumption of module		[mA]	Typical 12
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node
Switching level	Signal 0	[V DC]	≤6
	Signal 1	[V DC]	≤8.6
Input delay		[ms]	3
Switching logic			PNP (for input signals with positive logic)
Input characteristic curve			To IEC 1131-2
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions		[mm]	132 x 36 x 70
Grid dimension		[mm]	36
Weight		[g]	360

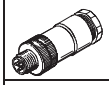
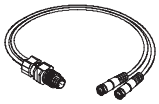
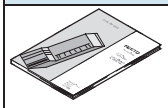
Pin allocation							
Terminal allocation	4-fold				8-fold		
	Pin	Signal	LED		Pin	Signal	LED
5-pin input modules							
	1	+24 V	0		1	+24 V	0
	2	n.c.			2	Ix+1	
	3	0 V			3	0 V	1
	4	Ix			4	Ix	
	5	Earth terminal			5	Earth terminal	
	1	+24 V	1		1	+24 V	2
	2	n.c.			2	Ix+3	
	3	0 V			3	0 V	3
	4	Ix+1			4	Ix+2	
	5	Earth terminal			5	Earth terminal	
	1	+24 V	2		1	+24 V	4
	2	n.c.			2	Ix+5	
	3	0 V			3	0 V	5
	4	Ix+2			4	Ix+4	
	5	Earth terminal			5	Earth terminal	
	1	+24 V	3		1	+24 V	6
	2	n.c.			2	Ix+7	
	3	0 V			3	0 V	7
	4	Ix+3			4	Ix+6	
	5	Earth terminal			5	Earth terminal	

Ix Input x

Modular electrical peripherals, for type 03/04

Accessories – Input module, digital, 4-/8-fold

Ordering data

Designation			Type	Part No.
Sensor plug				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175487**
		4-pin, PG7	**SEA-GS-7**	**18666**
		4-pin, 2.5 mm^2 OD	**SEA-4GS-7-2,5**	**192008**
	Plug for 2 sensor cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18779**
		5-pin	**SEA-5GS-11-DUO**	**192010**
DUO cable				
	DUO cable	2x straight socket	**KM12-DUO-M8-GDGD**	**18685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18687**
User documentation				
	Manual for input/output modules	German	**P.BE-VIEA-03-DE**	**371189**
		English	**P.BE-VIEA-03-EN**	**371190**
		French	**P.BE-VIEA-03-FR**	**377786**
		Spanish	**P.BE-VIEA-03-ES**	**371191**
		Italian	**P.BE-VIEA-03-IT**	**371192**
		Swedish	**P.BE-VIEA-03-SV**	**371193**

Modular electrical peripherals, for type 03/04

Technical data – Input module, digital, 16-fold

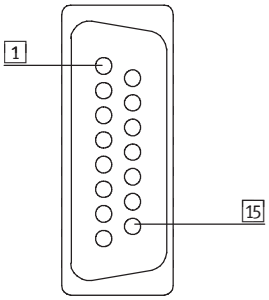
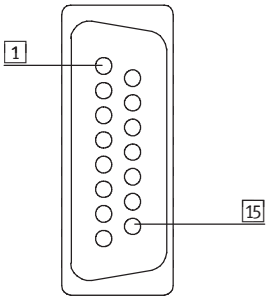
Function

Sensor signals in groups of up to 8 or 12 are recorded by multi-pin distributors and forwarded to the module via a multi-pin cable.

Applications

- Input modules for 24 V DC sensor signals
- 2 connector plugs, Sub-D 15-pin socket
- Ready for installation for multi-pin distributors with up to 8 or 12 inputs
- Allocation of the plug variables
  - 8 inputs on top and 8 inputs on bottom
  - 12 inputs on top and 4 inputs on bottom
- The input statuses are indicated for each input signal at an assigned LED
- 24 V DC voltage supplied separately for both plugs, with separate electronic fuse
- Module width: 36 mm

General technical data			
Type			VIGE-03-FB-16-SUBD-S
Part No.			192549
No. of inputs			16
No. of occupied module positions			2
Sensor connection type			2x Sub-D, 15-pin socket
Max. sensor supply per connection		[A]	0.5
Max. sensor supply per module		[A]	1
Fuse protection for sensor supply			Separate electronic fuse for each connection
Current consumption of module		[mA]	12
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node
Switching level	Signal 0	[V DC]	≤6
	Signal 1	[V DC]	≥8.6
Input delay		[ms]	3
Switching logic			PNP (for input signals with positive logic)
Input characteristic curve			To IEC 1131-2
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions (HxWxD)		[mm]	132 x 36 x 56
Grid dimension		[mm]	36
Weight		[g]	360

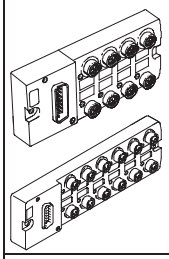
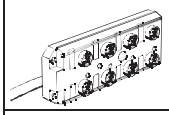
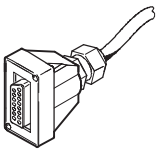
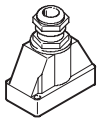
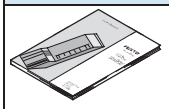
Pin allocation		
Terminal allocation	Pin	Signal
	1	Ix
	2	Ix+1
	3	Ix+2
	4	Ix+3
	5	Ix+4
	6	Ix+5
	7	Ix+6
	8	Ix+7
	9	Ix+8[1)]
	10	Ix+9[1)]
	11	Ix+10[1)]
	12	Ix+11[1)]
	13	24 V DC sensor supply
	14	0 V
	15	PE housing
	1	Ix+8[1)]
	2	Ix+9[1)]
	3	Ix+10[1)]
	4	Ix+11[1)]
	5	Ix+12
	6	Ix+13
	7	Ix+14
	8	Ix+15
	9	Free
	10	Free
	11	Free
	12	Free
	13	24 V DC sensor supply
	14	0 V
	15	PE housing

Ix Input x

1) Two sets of inputs signals, connect to either of the two plugs.

Modular electrical peripherals, for type 03/04

Accessories – Input module, digital, 16-fold

Ordering data				
Designation			Type	Part No.
Multi-pin distributors				Technical data ➔ 71
	Multi-pin distributor, 3-pin M8 plug	8 I/Os	**MPV-E/A08-M8**	**177669**
		12 I/Os	**MPV-E/A12-M8**	**177670**
	Multi-pin distributor with connecting cable, 5-pin M12 plug	8 I/Os	**MPV-E/A08-M12**	**177671**
Cables and plugs				
	Plug socket with cable, open at one end	5 m	**KMPV-SUB-D-15-5**	**177673**
		10 m	**KMPV-SUB-D-15-10**	**177674**
	Plug socket Sub-D, plug		**SD-SUB-D-ST15**	**192768**
User documentation				
	Manual for input/output modules	German	**P.BE-VIEA-03-DE**	**371189**
		English	**P.BE-VIEA-03-EN**	**371190**
		French	**P.BE-VIEA-03-FR**	**377786**
		Spanish	**P.BE-VIEA-03-ES**	**371191**
		Italian	**P.BE-VIEA-03-IT**	**371192**
		Swedish	**P.BE-VIEA-03-SV**	**371193**

Modular electrical peripherals, for type 03/04

Technical data – Output module, digital

FESTO

Function

The electrical outputs control actuators such as individual valves, hydraulic valves, heating controllers and many more.

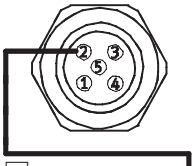
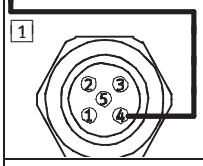
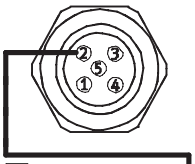
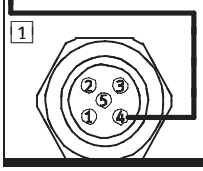
Note

Valves with M12 central plug, optimum control.

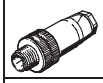
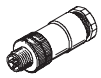
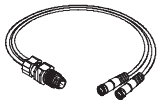
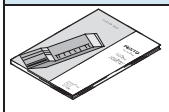
Applications

- Output module with 4 outputs 24 V DC
- M12 connection technology, with 5-pin sockets
- LED display of the switching status per channel
- Short circuit and overload detection per output
  - Separate malfunction display for each channel by means of red LED
  - Diagnostic message about system status to controller

General technical data			
Type			VIGA-03-FB-4-5POL
Part No.			175641
Output type			Standard outputs, PNP
No. of outputs			4
No. of occupied module positions			1
Output connection type			4xM12, 5-pin, socket with double allocation
Max. output current	per channel	[A]	0.5
	per module	[A]	2.0
Operating voltage		[V DC]	24 ±25%
Load voltage connection		[V DC]	24 ±10%
Parallel connection possible			Yes, within the module only
Fuse protection for output line			Electronic fuse per channel 0.5 A
Current consumption of module		[mA]	9
Overload/short circuit protection			Per channel
Switching logic			To IEC 1131-2
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions (HxWxD)		[mm]	132 x 36 x 69
Grid dimension		[mm]	36
Weight		[g]	360

Pin allocation – Standard			
Terminal allocation	LED	Pin	Signal
	0	1	n.c.
		2	Ox+1
		3	0 V
		4	Ox
		5	Earth terminal
	1	1	n.c.
		2	n.c.
		3	0 V
		4	Ox+1
		5	Earth terminal
	2	1	n.c.
		2	Ox+3
		3	0 V
		4	Ox+2
		5	Earth terminal
	3	1	n.c.
		2	n.c.
		3	0 V
		4	Ox+3
		5	Earth terminal

[1] Internal connection in module
Ox Output x

Ordering data				
Designation			Type	Part No.
Sensor plug				
	Plug, straight socket, M12	5-pin, Pg7	**SEA-M12-5GS-PG7**	**175487**
	Plug for 2 sensor cables, M12, PG11	5-pin	**SEA-5GS-11-DUO**	**192010**
DUO cable				
	DUO cable	2x straight socket	**KM12-DUO-M8-GDGD**	**18685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18687**
User documentation				
	Manual for input/output modules	German	**P.BE-VIEA-03-DE**	**371189**
		English	**P.BE-VIEA-03-EN**	**371190**
		French	**P.BE-VIEA-03-FR**	**377786**
		Spanish	**P.BE-VIEA-03-ES**	**371191**
		Italian	**P.BE-VIEA-03-IT**	**371192**
		Swedish	**P.BE-VIEA-03-SV**	**371193**

Modular electrical peripherals, for type 03/04

Technical data – Input/output module

Function

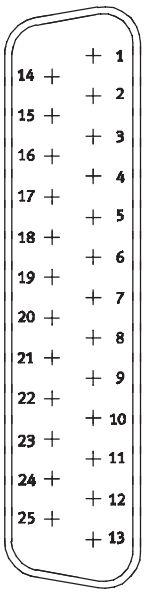
Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
The electrical outputs control actuators such as individual valves, lamps and a host of other devices.
The I/O module occupies 3 module positions.
Its electrical isolation makes it suitable as a coupling connection to external circuits.

Applications

The I/O module combines 12 inputs and 8 outputs in one module with a width of 72 mm. The connection is established via a pre-assembled 25-pin Sub-D plug with multi-pin cable. 24 V DC internal supply to the sensor connections. The switching status displays for the inputs/outputs are shown on assigned LEDs.
4 outputs are combined into a group and supplied externally with 24 V DC.
The inputs and outputs are electrically isolated from the node.

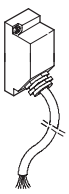
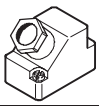
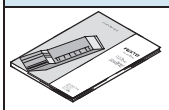
General technical data			
Type			VIEA-03-FB-12E-8A-SUBD
Part No.			174483
Number	Inputs		12
	Outputs		8
No. of occupied module positions			3
Sensor connection and output type			25-pin multi-pin cable and Sub-D plug connector
Max. power supply per channel		[A]	2
Max. sensor supply per module		[A]	2
Fuse protection for sensor supply			Central fuse 2 A, in system supply
Current consumption of module			Typically 8 mA (inputs) 5 mA (outputs) per group of four
Capacity per digital output		[A]	0.5 internal electronic fuse
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node
Switching level	Signal 0	[V DC]	≤ 5
	Signal 1	[V DC]	≥ 11
Input delay		[ms]	5
Switching logic			PNP (for input signals with positive logic)
Input characteristic curve			To IEC 1131-2
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions (HxWxD)		[mm]	132 x 78 x 78
Grid dimension		[mm]	72
Weight		[g]	700

Pin allocation

Terminal allocation – Plug on I/O module	Pin	Signal	Core colour of data cable KEA-1-25P-...
	1	Ix	white
	2	Ix+1	green
	3	Ix+2	yellow
	4	Ix+3	grey
	5	Ix+4	pink
	6	Ix+5	blue
	7	Ix+6	red
	8	Ix+7	magenta
	9	Ix+8	grey-pink
	10	Ix+9	red-blue
	11	Ix+10	white-green
	12	Ix+11	brown-green
	13	0 V of inputs	white-yellow
	14	Ox	yellow-brown
	15	Ox+1	white-grey
	16	Ox+2	grey-brown
	17	Ox+3	white-pink
	18	Ox+4	pink-brown
	19	Ox+5	white-blue
	20	Ox+6	brown-blue
	21	Ox+7	white-red
	22	24 V DC (for the outputs Ox ... Ox+3)	brown-red
	23	24 V DC (for the outputs Ox+4 ... Ox+7)	white-black
	24	0 V (for the outputs Ox ... Ox+3)	brown
	25	0 V (for the outputs Ox+4 ... Ox+7)	black

Ix Input x
Ox Output x

Ordering data

Designation			Type	Part No.
Cables and plugs				
	Connecting cable	5 m	**KEA-1-25P-5**	**177413**
		10 m	**KEA-1-25P-10**	**177414**
		x length	**KEA-1-25P-X**	**177415**
	Plug socket Sub-D, socket		**SD-SUB-D-BU25**	**18709**
User documentation				
	Manual for input/output modules	German	**P.BE-VIEA-03-DE**	**371189**
		English	**P.BE-VIEA-03-EN**	**371190**
		French	**P.BE-VIEA-03-FR**	**377786**
		Spanish	**P.BE-VIEA-03-ES**	**371191**
		Italian	**P.BE-VIEA-03-IT**	**371192**
		Swedish	**P.BE-VIEA-03-SV**	**371193**

Modular electrical peripherals, for type 03/04

Technical data – Analogue stage

FESTO

Function

Analogue signals, as well as digital inputs and outputs, are required in many areas of automation. Special analogue stages are provided for these tasks which are capable of processing both analogue input signals, e.g. setpoint specifications and feedback on actual values (temperature, pressure, flow rate, fill-level, etc.), as well as analogue outputs for controlling actuators. The analogue stages are specially prepared for the connection of proportional valves[1].

Applications

- 6-pin push-in connectors to DIN 45 332
- Diagnostic LED to indicate readiness for service and overload
- Voltage supplied for all connected sensors

Three analogue stages are available for different fields of application:

- VIAP-03-FB, optimised for proportional valves
  - 1 analogue input (4 ... 20 mA)
  - 1 analogue output (4 ... 20 mA)
- VIAU-03-FB-I, universal module for current signals
  - 3 analogue inputs (4 ... 20 mA)
  - 1 analogue output (4 ... 20 mA)
- VIAU-03-FB-U, universal module for voltage signals
  - 3 analogue inputs (0 ... 10 V)
  - 1 analogue output (0 ... 10 V)

VIAP-03-FB VIAU-03-FB-...

1) Not suited for MPPES

General technical data					
Type			VIAP-03-FB[1]	VIAU-03-FB-I[1]	VIAU-03-FB-U[1]
Part No.			18691	164239	18692
Number	Inputs		1	3	3
	Outputs		1	1	1
Sensor connection type			1x 6-pin socket, DIN 45322	3x 6-pin socket, DIN 45322	
Max. sensor supply per module		[A]	2		0.5
Fuse protection for sensor supply			Central fuse 2 A, in system supply		
Current consumption of module		[mA]	64		
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node		
Actuator supply voltage		[V DC]	24 ±10%, external		
Actuator supply, average continuous loading capability		[A]	Max. 0.5	Max. 1	
Analogue current inputs	Signal range		4 ... 20 mA		0 ... 10 V DC
	Resolution	[bit]	11		12
	No. of units		2 048		4 096
	Absolute precision	[%]	0.45		0.4
	Input resistance	[kΩ]	0.050		≥ 20
	Max. permissible input current	[mA]	65		
	Input voltage	[V DC]	–		30
Input signal cut-off frequency		[Hz]	100	116	
Linearity	Differential non-linearity		2 LSB		
	Integral non-linearity		3 LSB		

1) Not suited for MPPES

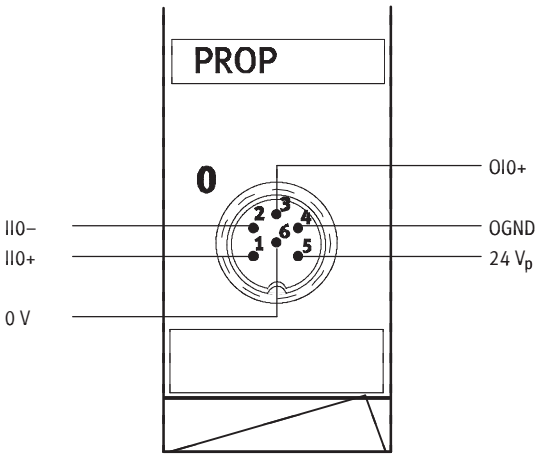
General technical data					
Type			VIAP-03-FB[1]	VIAU-03-FB-I[1]	VIAU-03-FB-U[1]
Part No.			18691	164239	18692
Analogue current inputs/outputs	Signal range		4 ... 20 mA		0 ... 10 V DC
	Resolution	[bit]	12		
	No. of units		4 096		
	Absolute precision	[%]	0.5		0.45
	Load resistance (load)	[kΩ]	≤ 0.250		≥ 3.3
Linearity	Differential non-linearity		2 LSB		
	Integral non-linearity		4 LSB		
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage	[°C]	–20 ... +70		
Material			Die-cast aluminium		
Dimensions (HxWxD)		[mm]	132 x 42 x 70		
Grid dimension		[mm]	36		
Weight		[g]	360		

1) Not suited for MPPES

Pin allocation

Terminal allocation

Analogue stage VIAP-03-FB



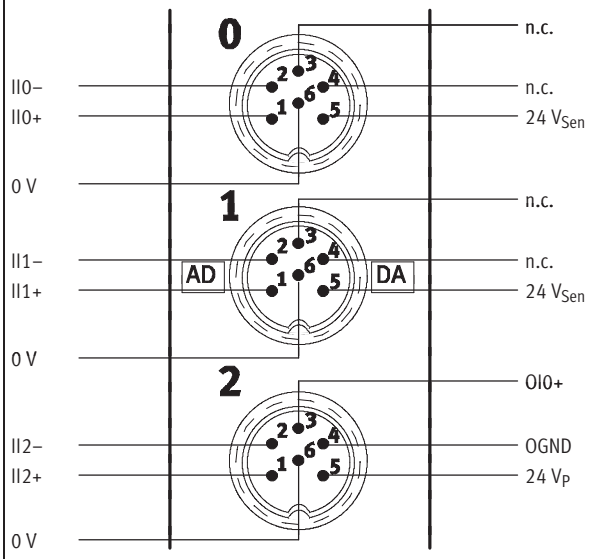
Signal	Signal designation
II0+	Positive current, input signal
II0–	Negative current, input signal
OI0+	Positive current, output signal
OGND	Current output signal
24 V_p	24 V DC actuator supply voltage
0 V	0 V actuator supply voltage
Housing	Cable screening connection

Modular electrical peripherals, for type 03/04

Technical data – Analogue stage

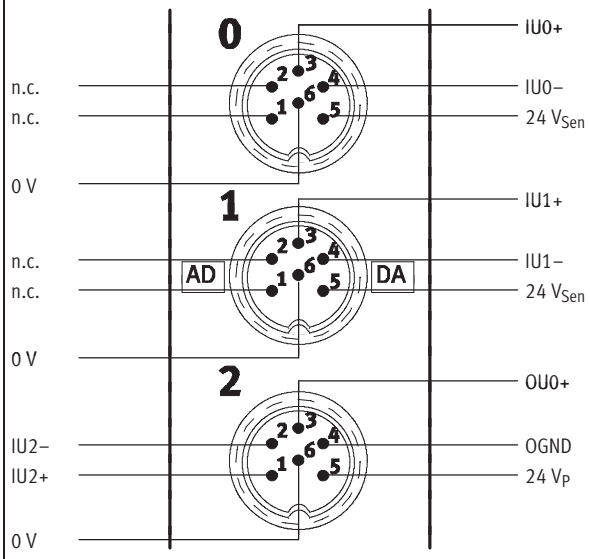
Pin allocation

Analogue stage VIAU-03-FB-I (current signals)



Terminal allocation	Signal	Signal designation
	IIx+	Positive current, input signal
	IIx–	Negative current, input signal
	OI0+	Positive current, output signal
	OGND	Current output signal
	24 V_{Sen}	24 V DC sensor supply voltage
	24 V_p	24 V DC actuator supply voltage
	0 V	0 V actuator/sensor supply voltage
	Housing	Cable screening connection

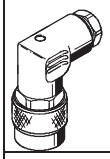
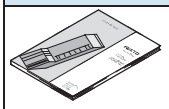
Analogue stage VIAU-03-FB-U (voltage signals)



Terminal allocation	Signal	Signal designation
	IUx+	Positive voltage, input signal
	IUx–	Negative voltage, input signal
	OU0+	Positive voltage, output signal
	OGND	Voltage output signal
	24 V_{Sen}	24 V DC sensor supply voltage
	24 V_p	24 V DC actuator supply voltage
	0 V	0 V actuator/sensor supply voltage
	Housing	Cable screening connection

Modular electrical peripherals, for type 03/04

Accessories – Analogue stage

Ordering data				
Designation			Type	Part No.
Connecting cables				
	Connecting cable for Festo proportional pressure regulator, plug/socket pre-assembled at both ends	5 m	**KVIA-MPPE-5**	**163882**
		10 m	**KVIA-MPPE-10**	**163883**
	Connecting cable for Festo proportional directional control valve, plug/socket pre-assembled at both ends	5 m	**KVIA-MPYE-5**	**161984**
		10 m	**KVIA-MPYE-10**	**161985**
	Connecting cable for other signal modules, open cable end	5 m	**KVIA-5**	**163960**
		10 m	**KVIA-10**	**163961**
User documentation				
	User documentation – Analogue stage	German	**P.BE-VIAX-03/05-DE**	**163946**
		English	**P.BE-VIAX-03/05-EN**	**163947**
		French	**P.BE-VIAX-03/05-FR**	**163948**
		Spanish	**P.BE-VIAX-03/05-ES**	**163949**
		Italian	**P.BE-VIAX-03/05-IT**	**165379**
		Swedish	**P.BE-VIAX-03/05-SV**	**165539**

Modular electrical peripherals, for type 03/04

Technical data – Electrical interface for CP interface

Function

The CP interface electrical interface module establishes the connection to a CP installation system. I/O data from the CP installation system is transferred to the connected bus node, and then to the higher-order controller via the fieldbus.
As well as transmitting the communication data, the max. 4 CP strings also transmit the supply voltage to the connected sensors and the load supply to the valves. The two circuits are isolated and are supplied with power by the connected bus node or control block.

Applications

The following bus nodes/control blocks support the CP interface electrical interface.

Bus nodes:
- IFB8-03 1771 Remote I/O
- IFB16-03 ASA (FIPIO) bus

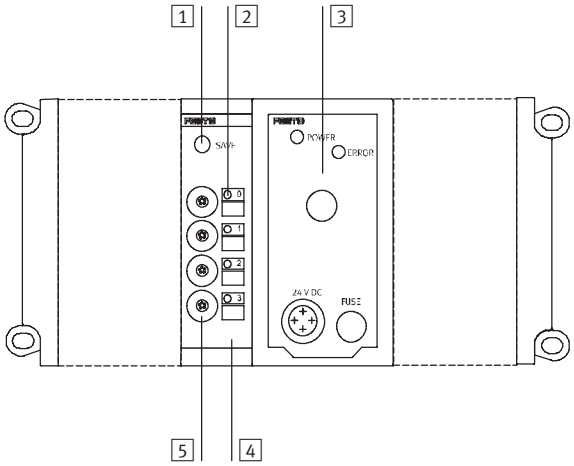
The CP interface electrical interface occupies one bus node exclusively. Additional local valves or further electrical I/O modules cannot be connected.

Control blocks:
- ISF3-03 Festo machine controller

Further local valves or electrical I/Os can be connected.

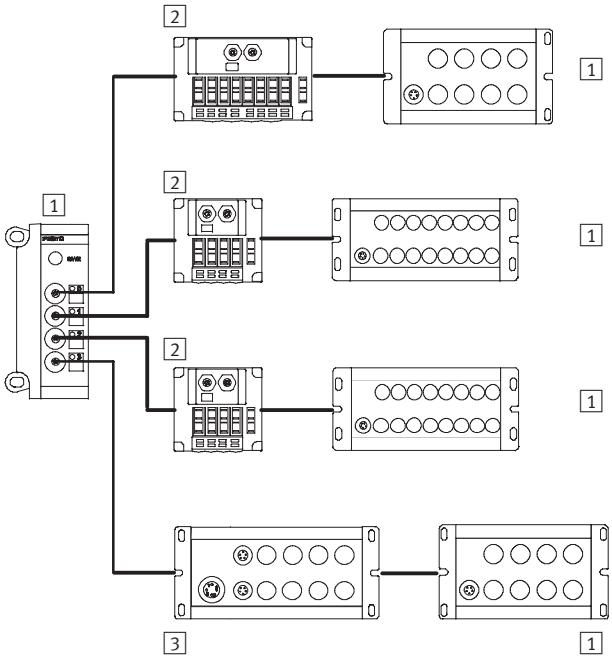
General technical data			
Type			**VIGCP-03-FB**
Part No.			**18229**
Brief description			CP interface
Max. no. of CP modules per string			1 output module or valve terminal and 1 input module
Number	CP strings		4
	Outputs		64
	Inputs		64
	Occupied module positions		1
Supply voltage of sensors		[V DC]	24 ±25%, coming from bus node
Actuator supply voltage		[V DC]	24 ±10%, coming from bus node
Cycle time		[ms]	< 5 at full expansion
Current consumption		[mA]	90
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	+5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions (HxWxD)		[mm]	132 x 36 x 53
Grid dimension		[mm]	36
Weight		[g]	310

Connection and display components



1 SAVE key
2 String error LEDs
3 Control block ISF3-03
4 Inscription areas
5 CP connections for up to 4 strings (0 ... 3)

Example of circuit



1 CP input module
2 Valve terminals type 10 CPV and type 12 CPA, Compact Performance
3 CP output module

You will find further information
➔ Internet: type 10 for valve terminal type 10 CPV, Compact Performance
➔ Internet: type 12 for valve terminal type 12 CPA, Compact Performance
➔ Internet: ctec for electrical installation system, for CPV/CPA

Ordering data

Designation			Type	Part No.
Cables				
	Connecting cable WS-WD, angled plug-angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540328**
		2 m	**KVI-CP-3-WS-WD-2**	**540329**
		5 m	**KVI-CP-3-WS-WD-5**	**540330**
		8 m	**KVI-CP-3-WS-WD-8**	**540331**
	Connecting cable GS-GD, straight plug-straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540332**
		5 m	**KVI-CP-3-GS-GD-5**	**540333**
		8 m	**KVI-CP-3-GS-GD-8**	**540334**

Modular electrical peripherals, for type 03/04

Technical data – Multi-pin distributor

Function

MPV multi-pin distributors are suitable for the distribution of input and output signals to PNP sensors and solenoid valves via the M12/M8 plugs. The multi-pin distributors, in conjunction with the input module VIGE-03-FB-16-SUBD-S (➔ 58), collect the sensor signals directly in the machine and forward them to the input module on the 15-pin Sub-D sockets via a multi-pin cable.

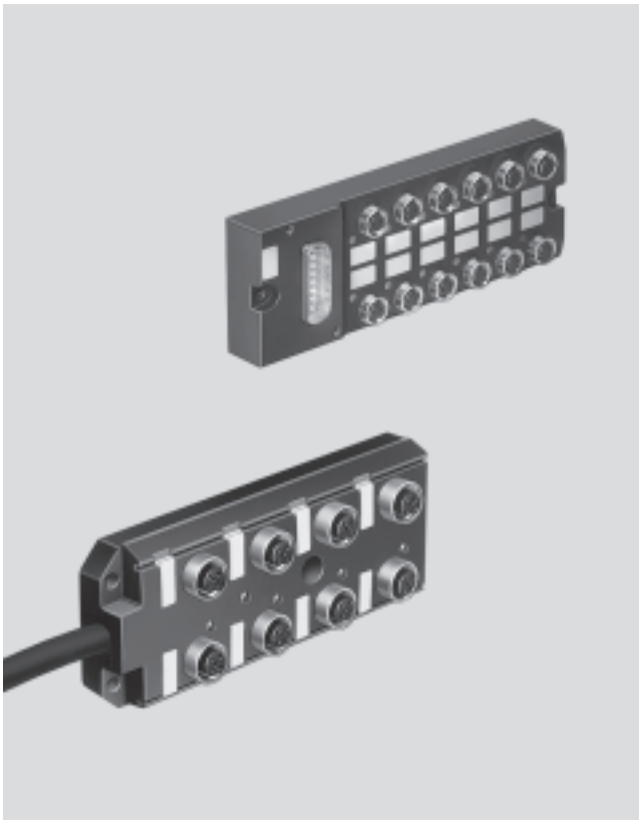
- LED for signal status display
- Only one cable to installation location
- A broad range of accessories

Type MPV-E/A...-M8

The multi-pin distributor facilitates the connection of max. 8 or 12 input signals to 3-pin M8x1 plugs.
The connecting cable KMPV-SUB-D-15-..., pre-assembled at one end, with the 15-pin Sub-D socket is connected to the multi-pin distributor.
The open end of the cable is fitted with the plug socket SD-SUB-D-ST15 and connected to the input module.

Type MPV-E/A08-M12

Connection of max. 8 input signals to 5-pin M12 plug.
The connecting cable is permanently attached to the multi-pin distributor.
The open end of the cable is fitted with the plug socket SD-SUB-D-ST15 and connected to the input module.
Switching status display via yellow LED. Sensor voltage display via green LED.

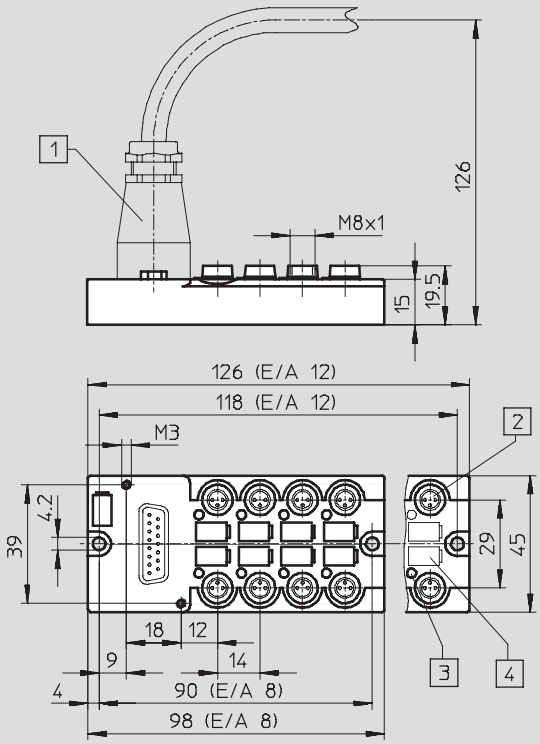


General technical data					
Type Part No.			MPV-E/A08-M8 177669	MPV-E/A12-M8 177670	MPV-E/A08-M12 177671
No. of inputs/outputs			8	12	8
Type of mounting			2 through-holes or on H-rail[1]		3 through-holes
Connection			M8x1, 3-pin		M12x1, 5-pin
Permissible voltage		[V DC]	10 ... 30		10 ... 30
Current-carrying capacity		[A]	Max. 1 per module slot Total current: max. 4		Max. 4 per module slot Total current: max. 12
Protection class to EN 60529			IP65 (fully assembled)		IP67 (fully assembled)
Temperature range	Operation	[°C]	–20 ... +80		–20 ... +80
	Storage	[°C]	–20 ... +80		–20 ... +80
Materials	Housing		Polyamide		Polyurethane
	Sockets		Brass, gold plated		Galvanised brass
	Cable		–		Polyurethane, polyvinyl chloride
Weight		[g]	100[2]	120[2]	200[2]

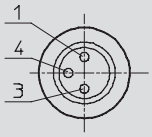
1) With adapter CP-TS-HS-35
2) Without cable

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

MPV-E/A...-M8

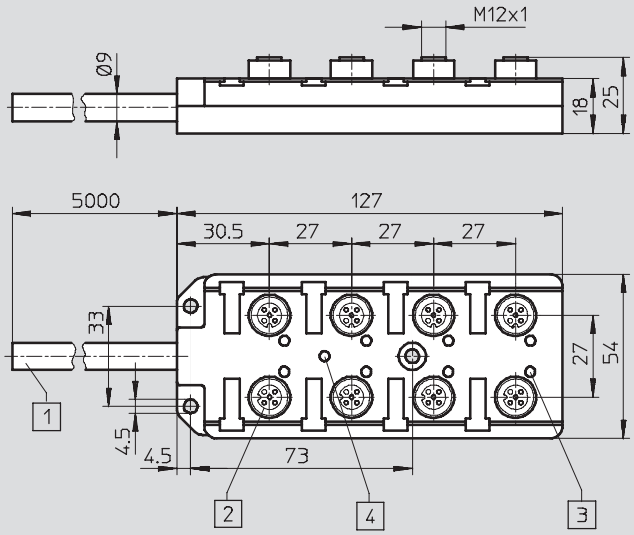


1 Multi-pin connection
2 3-pin socket, M8x1
3 Switching status display, yellow
4 Inscription label (type IBS-6x10)

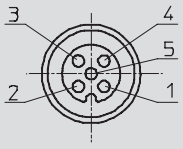


1 24 V DC
3 0 V
4 Signal line (1 ... 8) or (1 ... 12)

MPV-E/A08-M12

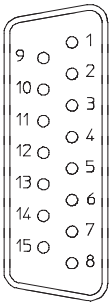


1 Connecting cable, 5 m
2 5-pin socket, M12 x 1
3 Switching status display, yellow
4 Voltage display, green



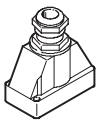
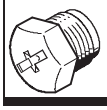
1 24 V DC
2 n.c.
3 0 V
4 Signal line (1 ... 8)
5 Earth

Pin allocation



MPV-E/A...-M8 Cable with 15-pin Sub-D plug			MPV-E/A08-M12 Signal line pins 1 through 12	
Pin	M8 socket location	Core colour	M12 socket location	Core colour
1	0/4	white	1/4	white
2	1/4	brown	2/4	green
3	2/4	green	3/4	yellow
4	3/4	yellow	4/4	grey
5	4/4	grey	5/4	pink
6	5/4	pink	6/4	red
7	6/4	blue	7/4	black
8	7/4	red	8/4	magenta
9	8/4	black	24 V DC	brown
10	9/4	magenta	0 V	blue
11	10/4	grey-pink	PE	green-yellow
12	11/4	red-blue		
13	24 V DC	white-green		
14	0 V	brown-green		
15	0 V	white-yellow		

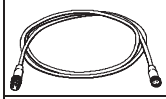
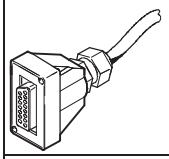
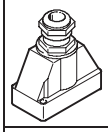
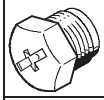
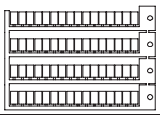
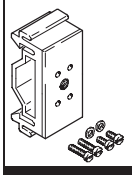
Ordering data for MPV-E/A08-M12

	Designation		Type	Part No.
Plugs and cables				
	Connecting cable for sensors, M12-M12	2.5 m	**KM12-M12-GSGD-2,5**	**18684**
		5 m	**KM12-M12-GSGD-5**	**18686**
	Plug socket[1)]		**SD-SUB-D-ST15**	**192768**
Protective cover				
	Cover caps (10 pieces) for unused terminals		**ISK-M12**	**165592**

1) A Sub-D plug socket is required to establish a connection between the multi-pin distributor and input module VIGE-03-FB-16-SUBD-S.

Modular electrical peripherals, for type 03/04

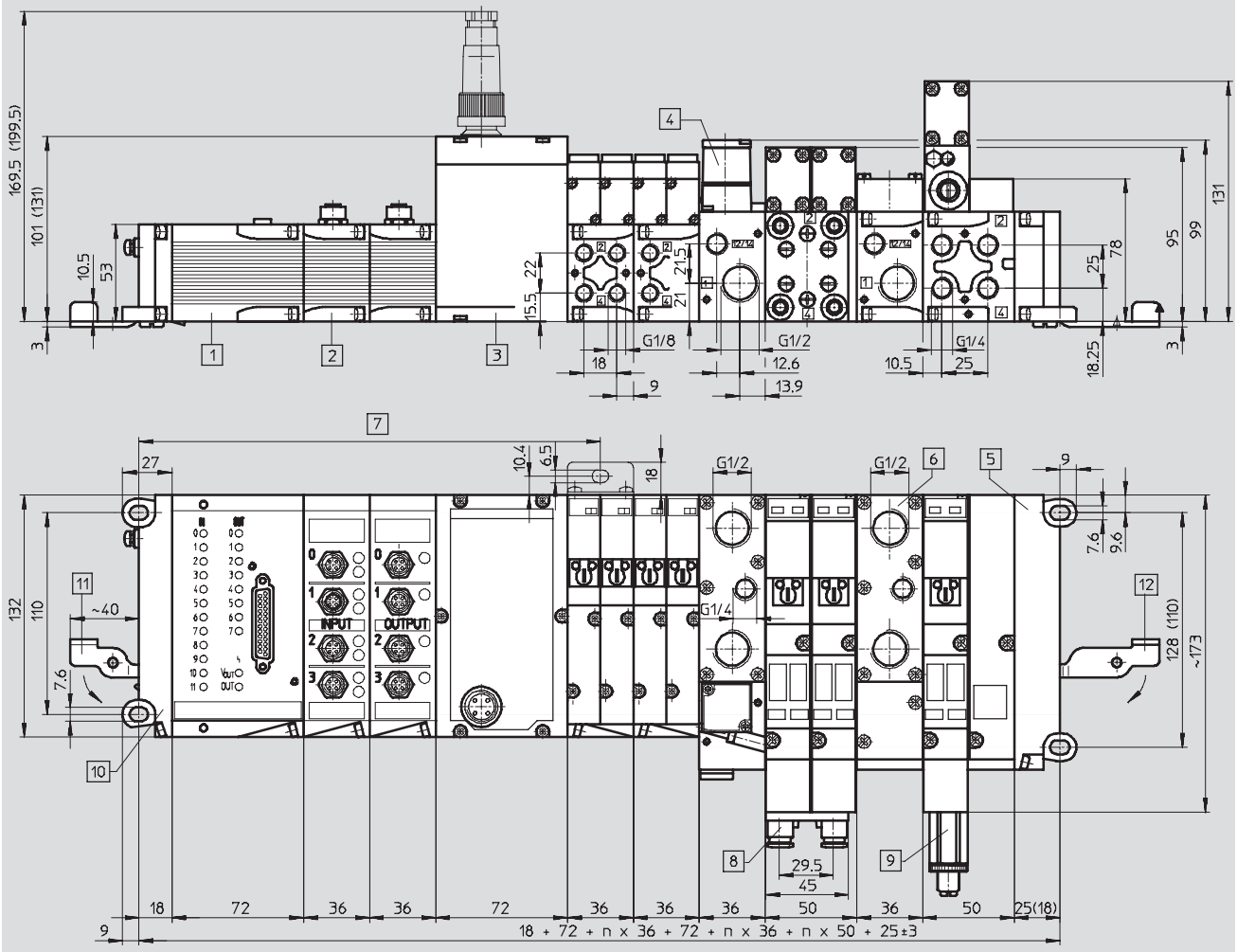
Accessories – Multi-pin distributor

Ordering data for MPV-E/A...-M8				
Designation			Type	Part No.
Plugs and cables				
	Connecting cable for sensors, M8-M8	2.5 m	**KM8-M8-GSGD-2,5**	**165610**
		5 m	**KM8-M8-GSGD-5**	**165611**
	Plug socket with cable, open at one end[1]	5 m	**KMPV-SUB-D-15-5**	**177673**
		10 m	**KMPV-SUB-D-15-10**	**177674**
	Plug socket[1]		**SD-SUB-D-ST15**	**192768**
Protective cover				
	Cover caps (10 pieces) for unused terminals		**ISK-M8**	**177672**
Designation				
	Inscription labels, pack of 64		**IBS-6x10**	**18576**
Mounting				
	Attachment for H-rail mounting, 2 pieces		**CP-TS-HS-35**	**170169**

1) A plug socket with cable and a Sub-D plug socket are required to establish a connection between the multi-pin distributor and input module VIGE-03-FB-16-SUBD-S.

Dimensions – Electrical peripherals with valve terminal type 03 Download CAD data ➔ **www.festo.com**

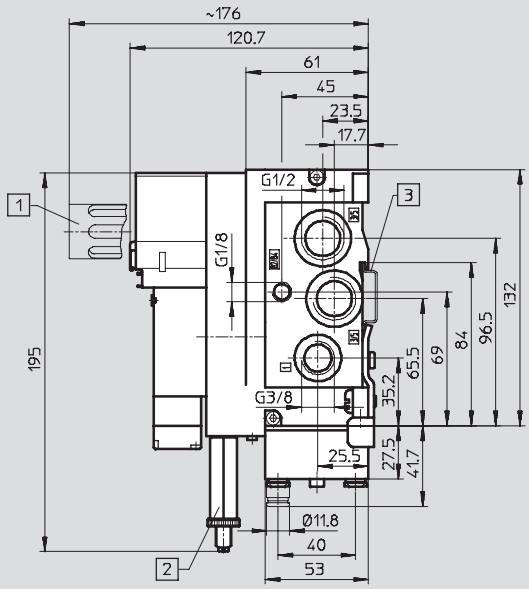
with bus node/control block



1 Input/output module
2 Input module
3 Fieldbus/control block (type ISF3-03 dimensions in brackets)
4 Adapter plate MIDI/MAXI with pressure regulating valve for pilot pressure
5 End plate, right-hand (dimensions for MIDI valves in brackets)
6 Compressed-air supply plate
7 Mounting bracket for wall mounting required approx. every 200 mm
8 One-way flow control valve
9 Pressure regulating valve
10 End plate, left-hand
11 Swivel lever IBGH-03-4.0 (opened out) for connection to mounting rail
12 Swivel lever IBGH-03-7.0 (opened out) for connection to mounting rail

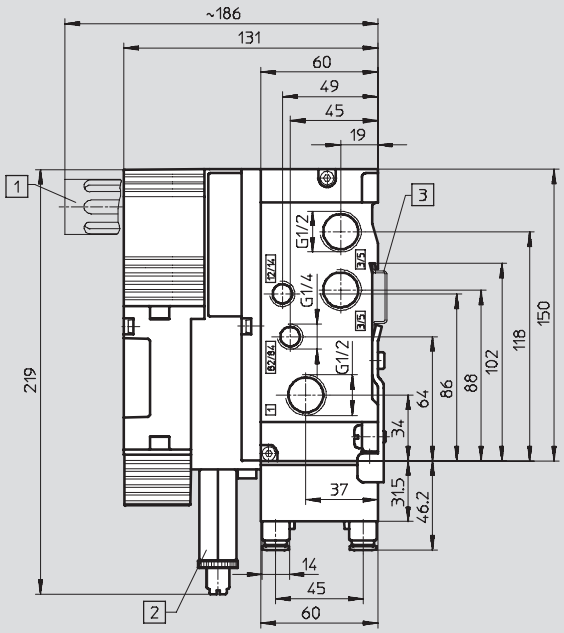
Dimensions – End plates for valve terminal 03 Download CAD data ➔ **www.festo.com**

MIDI valves



1 Silencer
2 Pressure regulating valve
3 H-rail

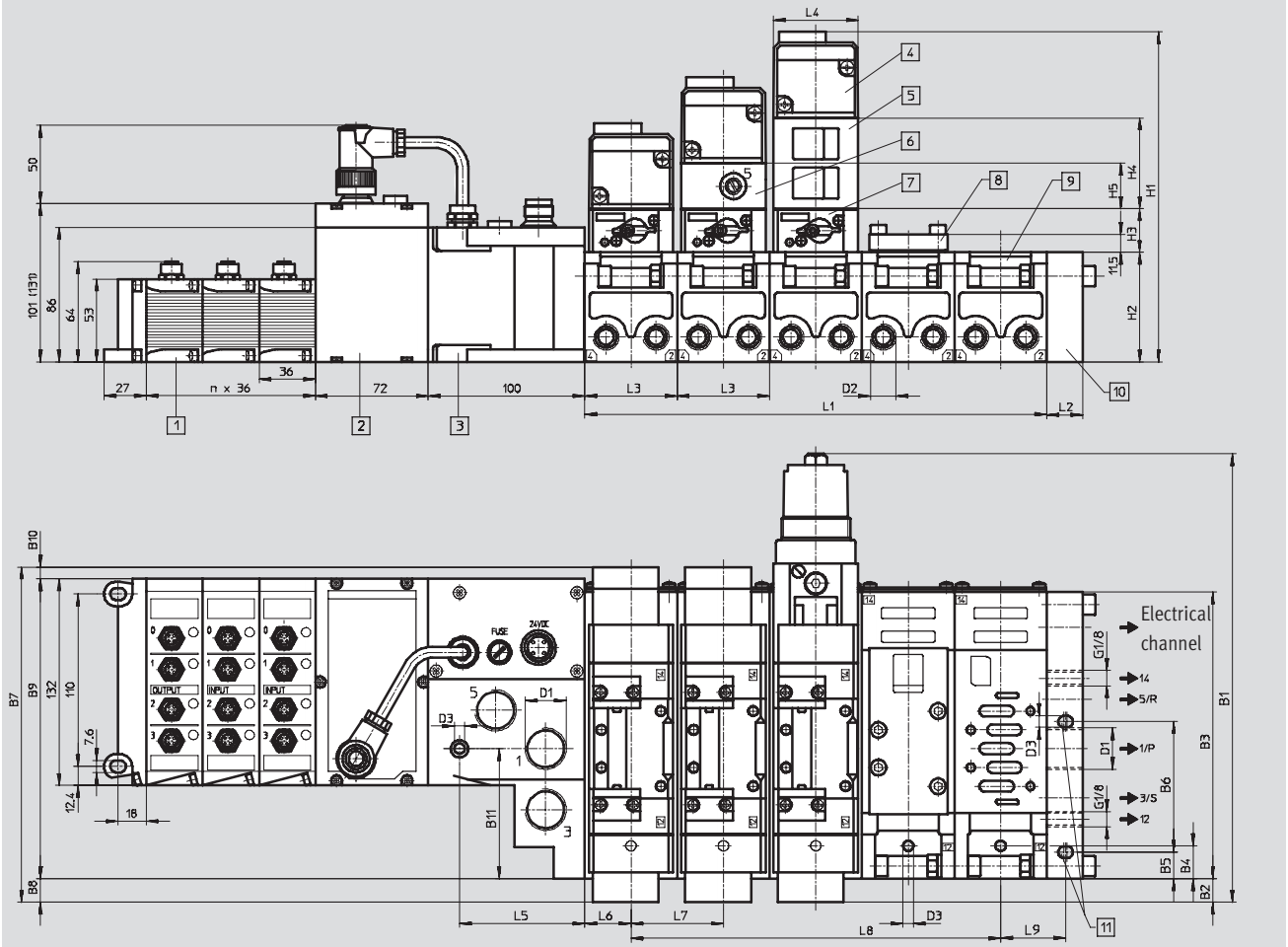
MAXI valves



1 Silencer
2 Pressure regulating valve
3 H-rail

Dimensions – Electrical peripherals with valve terminal type 04 Download CAD data ➔ **www.festo.com**

with bus node/control block



1 Output module
2 Fieldbus node (control block type ISF3-03 dimensions in brackets)
3 Adapter plate
4 ISO valve
5 Intermediate pressure regulator plate
6 Throttle plate
7 Intermediate solenoid plate
8 Blanking plate
9 Manifold sub-base
10 End plate
11 Mounting hole (only with VIFB-04-D-1)

Type	~B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	D1	D2	D3 ∅
VIFB-04-D-1-B	251	33	149	7	17	80	198.5	33	153	12.4	56.9	G½	G¼	6.6
VIFB-04-D-2-B	287	15	183	21	–	–	214	15	191.5	7.5	83	G¾	G⅜	6.6
VIFB-04-D-3-B	315	6	230	27	–	–	241.5	6	231.6	3.9	79.5	G1	G½	9

Type	H1	H2	H3	H4	H5	L1[1)]	L2	L3	L4	L5	L6	L7	L8[1)]	L9
VIFB-04-D-1-B	181.7	64	27	45	25.5	m x 43	22	43	42	80	9.5	43	(m–1) x 43	44.5
VIFB-04-D-2-B	210.8	70	27.8	58	29	m x 59	23	59	54	80	29.5	59	(m–1) x 59	–
VIFB-04-D-3-B	235	82	28	63	40	m x 72	28	72	70	52	36	72	(m–1) x 72	–

1) m = Number of valves

Modular electrical peripherals, for type 03/04

Accessories

Product range overview – Connections for bus nodesand control blocks									
Designation	Type	FB5	FB6	FB8	FB11	FB13	FB16	FB21	SF3
Fieldbus connection									
Bus connection, straight, Pg7	**FBSD-GD-7**	■	–	■	–	–	■	–	■
Bus connection, straight, Pg9	**FBSD-GD-9**	■	–	■	–	–	■	–	■
Bus connection, straight, Pg9, 5-pin	**FBSD-GD-9-5POL**	–	–	–	■	–	–	–	–
Bus connection, straight, Pg13.5	**FBSD-GD-13,5**	■	–	■	–	–	■	–	■
Bus connection, angled, Pg7	**FBSD-WD-7**	■	–	■	–	–	■	–	■
Bus connection, angled, Pg9	**FBSD-WD-9**	■	–	■	–	–	■	–	■
Plug, Sub-D	**FBS-SUB-9-GS-DP-B**	–	–	–	–	■	–	–	–
Bus connection, 2x M12 adapter plug (B-coded)	**FBA-2-M12-5POL-RK**	–	–	–	–	■	–	–	–
T-adapter for fieldbus, with pre-assembled socket component	**FB-TA**	■	–	■	–	–	■	–	–
T-adapter for fieldbus, with free cable end	**FB-TA1**	■	–	■	–	–	■	–	–
Interbus standard round plug[1)]		–	■	–	–	–	–	–	–
Interbus “Rugged Line” FOC plug[1)]		–	–	–	–	–	–	■	–
Power supply									
Plug socket, straight, for 1.5 mm^2	**NTSD-GD-9**	■	■	■	■	■	■	–	■
Plug socket, straight, for 2.5 mm^2	**NTSD-GD-13,5**	■	■	■	■	■	■	–	■
Plug socket, angled, for 1.5 mm^2	**NTSD-WD-9**	■	■	■	■	■	■	–	■
Plug socket, angled, for 2.5 mm^2	**NTSD-WD-11**	■	■	■	■	■	■	–	■
Diagnostic/data connection									
Programming cable	**KDI-SB202-BU9**	–	–	–	–	–	–	–	■

1) Not a Festo product, order from Phoenix Contact

Product range overview – Electrical connection technology for modules					
Designation	Type	Input module		Output module	Input/output module
		4-/8-fold VIGE-...	16-fold VIGE-...	VIGA-...	VIEA-...
Plugs and sockets					
Plug, straight socket, M12, 4-pin, Pg7	**SEA-GS-7**	■	–	■	–
Plug, straight socket, M12, 4-pin, 2.5 mm^2 OD	**SEA-4GS-7-2,5**	■	–	■	–
Plug, straight socket, M12, 5-pin, Pg7	**SEA-M12-5GS-PG7**[1)]	■	–	■	–
Plug for 2 sensor cables, M12, Pg11, 4-pin	**SEA-GS-11-DUO**	■	–	■	–
Plug for 2 sensor cables, M12, Pg11, 5-pin	**SEA-5GS-11-DUO**[1)]	■	–	■	–
Plug socket Sub-D, plug	**SD-SUB-D-ST15**	–	■	–	–
Plug socket Sub-D, socket	**SD-SUB-D-BU25**	–	–	–	■
Cables					
Connecting cable, 5 m	**KEA-1-25P-5**	–	–	–	■
Connecting cable, 10 m	**KEA-1-25P-10**	–	–	–	■
Connecting cable, x length	**KEA-1-25P-X**	–	–	–	■
DUO cable, 2x straight socket	**KM12-DUO-M8-GDGD**	■	–	■	–
DUO cable, 2x straight/angled socket	**KM12-DUO-M8-GDWD**	■	–	■	–
DUO cable, 2x angled socket	**KM12-DUO-M8-WDWD**	■	–	■	–
Plug socket with cable, open at one end, 5 m	**KMPV-SUB-D-15-5**	–	■	–	–
Plug socket with cable, open at one end, 10 m	**KMPV-SUB-D-15-10**	–	■	–	–

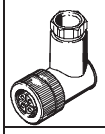
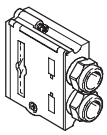
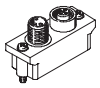
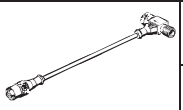
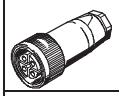
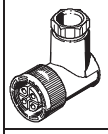
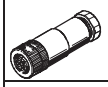
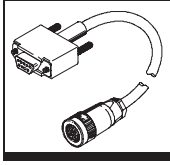
1) 5-pin cable, cannot be used with 4-pin connectors

Product range overview – Electrical connection technology for modules				
Designation	Type	Analogue stage		Electrical interface
		VIAP-...	VIAU-...	VIGCP-...
Cables				
Connecting cable, angled plug, angled socket, 0.25 m	**KVI-CP-3-WS-WD-0,25**	–	–	■
Connecting cable, angled plug, angled socket, 0.5 m	**KVI-CP-3-WS-WD-0,5**	–	–	■
Connecting cable, angled plug, angled socket, 2 m	**KVI-CP-3-WS-WD-2**	–	–	■
Connecting cable, angled plug, angled socket, 5 m	**KVI-CP-3-WS-WD-5**	–	–	■
Connecting cable, angled plug, angled socket, 8 m	**KVI-CP-3-WS-WD-8**	–	–	■
Connecting cable, straight plug, straight socket, 2 m	**KVI-CP-3-GS-GD-2**	–	–	■
Connecting cable, straight plug, straight socket, 5 m	**KVI-CP-3-GS-GD-5**	–	–	■
Connecting cable, straight plug, straight socket, 8 m	**KVI-CP-3-GS-GD-8**	–	–	■
Connecting cable for Festo proportional pressure regulator, 5 m	**KVIA-MPPE-5**	■	■	–
Connecting cable for Festo proportional pressure regulator, 10 m	**KVIA-MPPE-10**	■	■	–
Connecting cable for Festo proportional directional control valve, 5 m	**KVIA-MPYE-5**	■	■	–
Connecting cable for Festo proportional directional control valve, 10 m	**KVIA-MPYE-10**	■	■	–
Connecting cable for other signal modules, open cable end, 5 m	**KVIA-5**	■	■	–
Connecting cable for other signal modules, open cable end, 10 m	**KVIA-10**	■	■	–

1) 5-pin cable, cannot be used with 4-pin connectors

Modular electrical peripherals, for type 03/04

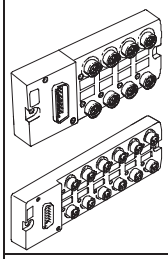
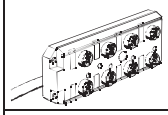
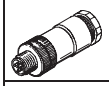
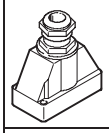
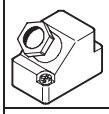
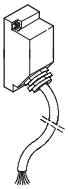
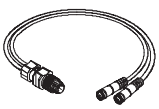
Accessories

Ordering data				
Designation			Type	Part No.
Fieldbus connection				
	Bus connection, straight, M12	Pg7, 4-pin	**FBSD-GD-7**	**18497**
		Pg9, 4-pin	**FBSD-GD-9**	**18495**
		Pg9, 5-pin	**FBSD-GD-9-5POL**	**18324**
		Pg13.5, 4-pin	**FBSD-GD-13,5**	**18496**
	Bus connection, angled, M12	Pg7, 4-pin	**FBSD-WD-7**	**18524**
		Pg9, 4-pin	**FBSD-WD-9**	**18525**
	Plug socket Sub-D, IP65, 9-pin	for Profibus DP	**FBS-SUB-9-GS-DP-B**	**532216**
	Bus connection socket, straight, Sub-D, 9-pin (B-coded, ReverseKey)	2xM12 adapter 5-pin for Profibus DP	**FBA-2-M12-5POL-RK**	**533118**
	T-adapter, M12	for Festo fieldbus	**FB-TA**	**18498**
	T-adapter for fieldbus, with an open ended cable		**FB-TA1**	**18499**
Power supply				
	Plug socket, straight, M18x1	4-pin for 1.5 mm^2	**NTSD-GD-9**	**18493**
		4-pin for 2.5 mm^2	**NTSD-GD-13,5**	**18526**
	Plug socket, angled, M18x1	4-pin for 1.5 mm^2	**NTSD-WD-9**	**18527**
		4-pin for 2.5 mm^2	**NTSD-WD-11**	**533119**
	Plug socket, straight, M12	4-pin, Pg7	**FBSD-GD-7**	**18497**
		4-pin, Pg9	**FBSD-GD-9**	**18495**
	Plug socket, angled, M12	4-pin, Pg7	**FBSD-WD-7**	**18524**
		4-pin, Pg9	**FBSD-WD-9**	**18525**
Diagnostic/data connection				
	Programming cable		**KDI-SB202-BU9**	**150268**

Modular electrical peripherals, for type 03/04

Accessories

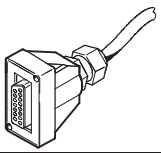
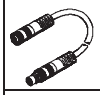
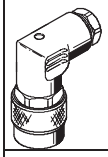
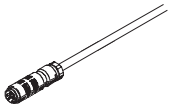
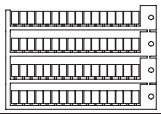
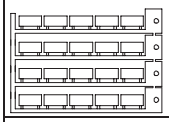
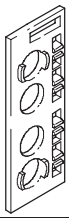
FESTO

Ordering data				
Designation			Type	Part No.
Multi-pin distributors				
	Multi-pin distributor, 3-pin M8 plug	8 I/Os	**MPV-E/A08-M8**	**177669**
		12 I/Os	**MPV-E/A12-M8**	**177670**
	Multi-pin distributor with connecting cable, 5-pin M12 plug	8 I/Os	**MPV-E/A08-M12**	**177671**
Plugs and sockets				
	Plug, straight socket, M12, 5-pin	5-pin, Pg7	**SEA-M12-5GS-PG7**[1]	**175487**
	Plug, straight socket, M12, 4-pin	4-pin, Pg7	**SEA-GS-7**	**18666**
		4-pin, Pg9	**SEA-GS-9**	**18778**
		2.5 mm^2 OD	**SEA-4GS-7-2,5**	**192008**
	Plug for 2 sensor cables, M12	4-pin, Pg11	**SEA-GS-11-DUO**	**18779**
		5-pin, Pg11	**SEA-5GS-11-DUO**[1]	**192010**
	Plug socket Sub-D, plug, 15-pin		**SD-SUB-D-ST15**	**192768**
	Plug socket Sub-D, socket, 25-pin		**SD-SUB-D-BU25**	**18709**
Cables				
	Connecting cable, 25-wire	5 m	**KEA-1-25P-5**	**177413**
		10 m	**KEA-1-25P-10**	**177414**
		x length	**KEA-1-25P-X**	**177415**
	DUO cable, straight plug, M12, 4-pin, 2xM12, 3-pin	2x straight socket	**KM12-DUO-M8-GDGD**	**18685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18687**
	Connecting cable for sensores, M12, 4-pin	1 m, straight plug, angled socket	**KM12-M12-GSWD-1-4**	**185499**
		2.5 m, straight plug, straight socket	**KM12-M12-GSGD-2,5**	**18684**
		5 mstraight plug, straight socket	**KM12-M12-GSGD-5**	**18686**
	Connecting cable for sensores, M8, 3-pin	1 m, straight plug, straight socket	**KM8-M8-GSGD-1**	**175489**
		2.5 m, straight plug, straight socket	**KM8-M8-GSGD-2,5**	**165610**
		5 m, straight plug, straight socket	**KM8-M8-GSGD-5**	**165611**

1) 5-pin cable, cannot be used with 4-pin connectors

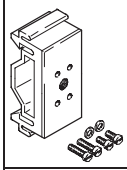
Modular electrical peripherals, for type 03/04

Accessories

Ordering data				
Designation			Type	Part No.
Cables				
	Plug socket with cable, open at one end, 15-wire	5 m	**KMPV-SUB-D-15-5**	**177673**
		10 m	**KMPV-SUB-D-15-10**	**177674**
	Connecting cable WS-WD, angled plug-angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540328**
		2 m	**KVI-CP-3-WS-WD-2**	**540329**
		5 m	**KVI-CP-3-WS-WD-5**	**540330**
		8 m	**KVI-CP-3-WS-WD-8**	**540331**
	Connecting cable GS-GD, straight plug-straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540332**
		5 m	**KVI-CP-3-GS-GD-5**	**540333**
		8 m	**KVI-CP-3-GS-GD-8**	**540334**
	Connecting cable for Festo proportional pressure regulator	5 m	**KVIA-MPPE-5**	**163882**
		10 m	**KVIA-MPPE-10**	**163883**
	Connecting cable for Festo proportional directional control valve	5 m	**KVIA-MPYE-5**	**161984**
		10 m	**KVIA-MPYE-10**	**161985**
	Connecting cable for other signal modules, open cable end	5 m	**KVIA-5**	**163960**
		10 m	**KVIA-10**	**163961**
Inscription labels and label holders				
	Inscription labels, 6x10, 64 pieces in frames		**IBS-6x10**	**18576**
	Inscription labels, 9x20, 20 pieces in frames		**IBS-9x20**	**18182**
	Holders for inscription labels for I/O modules, pack of 5		**IBT-03-E/A**	**18183**

Modular electrical peripherals, for type 03/04

Accessories

Ordering data				
Designation			Type	Part No.
General accessories				
	Screw-type lock, 1 pieces	for standard Sub-D	**UNC 4-40/M3x5**	**340960**
	Tamper proof cap (10 pieces) for unassigned connections	for MPV-E/A08-M12	**ISK-M12**	**165592**
		for MPV-E/A...-M8	**ISK-M8**	**177672**
	Mounting for H-rail, 2 pieces	for MPV-E/A...-M8	**CP-TS-HS-35**	**170169**
Programming software				
	Programming software FST200 with manual for control block ISF3-03	German	**P.BE-FST200-AWL/KOP-DE**	**165484**
		English	**P.BE-FST200-AWL/KOP-EN**	**165489**