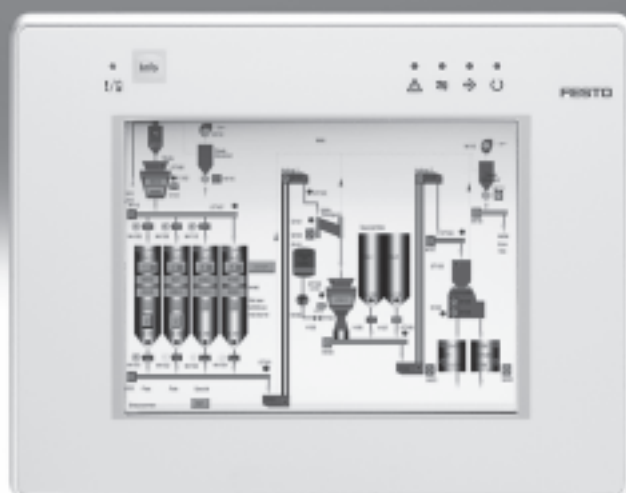


## Operator units FED

**FESTO**



# Operator units FED

Key features

**FESTO**

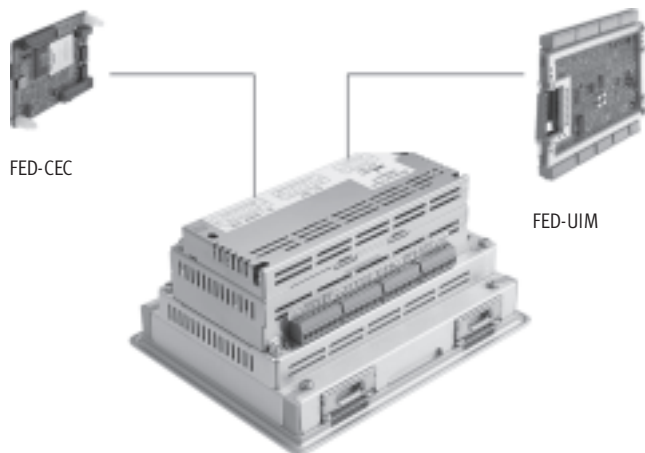
Multifunctional in use			
FED human-machine interfaces simplify the control of automation tasks at field level and set new standards in functionality and integration.	Whether for single or multi-axis control systems in handling technology or process automation, the Front End Display FED is the optimum solution.	<b>FED-40 ... FED-90:</b> The semi-graphical display of process values makes them easier to read. Straightforward designing of human-machine dialogues using the FED Designer programming tool supplied.	<b>FED-301 ... FED-5000:</b> Graphics-capable for maximum flexibility when displaying processes and data. Straightforward designing of human-machine dialogues using the FED Designer programming tool supplied. With integrated web features that support the use of standards.
Text-based Front End Displays FED-40 ... FED-90			
The FED-40 and FED-60 versions complement the proven FED-50 and FED-90 for simple dialogues using 4-line text display and operating buttons whether via a serial, fieldbus or Ethernet connection – the text panels of the FED series are 100% compatible with Festo controllers.	The following functionalities are available depending on the version: <ul style="list-style-type: none"> <li>Serial interface (FED-40 to FED-90), optional Ethernet for use in a network (not with FED-40)</li> <li>Battery backup of the alarm and event data (not with FED-40)</li> <li>FED Designer graphical design tool included</li> </ul>	<ul style="list-style-type: none"> <li>No parameterisation required; the software contains the controller data and detects the display</li> <li>Simple graphics possible, enabling scalable font size and simple representation of pictograms and bar charts</li> <li>Software for uploading projects</li> <li>Recipe handling</li> <li>Simple data acquisition</li> </ul>	<ul style="list-style-type: none"> <li>Generous program memory</li> <li>Real-time clock (not with FED-40)</li> <li>Printer port (FED-90)</li> <li>Password protection</li> <li>Alarm handling</li> <li>Keypad can be easily programmed using macros</li> <li>Multilingual projects possible</li> <li>Import and export of texts for translation</li> </ul>
FED-40: the entry-level model	FED-50: fieldbus-capable	FED-60: 10-key pad included	FED-90: all-inclusive
A serial connection is established with the controller. Operation is by means of four freely programmable function keys and seven system keys.	The FED-50 offers the functions of the FED-40 and can additionally be extended with an Ethernet or fieldbus interface. A real-time clock is standard on the FED-50 and higher.	In addition to the function and system keys, the FED-60 also features a 10-key pad. The real-time clock is also standard and a fieldbus interface can be optionally retrofitted.	Because of its larger size in comparison with the FED-60, the FED-90 can offer 12 function keys and 23 system keys. A printer interface permits direct output of the alarm and/or event list.
Front End Displays with touchscreen FED-301 to FED-5000			
The touchscreen displays FED-301 to FED-5000 with graphical user interface extend the proven text-based and key pad-equipped Front End	Displays FED-40 to FED-9 to include touch-sensitive displays in sizes from 3.8" to 15". As alternatives to CPX handhelds and integrated displays,	these Front End Displays provide a freely definable user interface. As a client/server system, the terminal receives data from web servers	connected to it and displays this data using the integrated browser functionality.

# Operator units FED

Key features

**FESTO**

## FED-CEC with CoDeSys software platform



CoDeSys makes your life easier with simple commissioning, fast programming and parameterisation – standardised programming of embedded devices to IEC 61131-3.

- Hardware-neutral software platform for quick and easy configuration, programming and commissioning of pneumatic and electric automation solutions.
- Extensive module libraries for single or multi-axis positioning motions.

- The IEC 61131-3 standard means that CoDeSys is flexible and open for all types of control tasks.
- Extremely flexible and modular: offline and online functions, as well as components for hardware configuration and visualisation. User-friendly IEC functional module extension.
- Re-use of existing application parts.

### Functions

- Can be connected to all FEC® and CoDeSys controllers from Festo, serially or via Ethernet
- Trend display
- Recipe handling
- Multilingual projects and language changeover during runtime
- Software enables uploading of projects
- Import and export of texts for translation

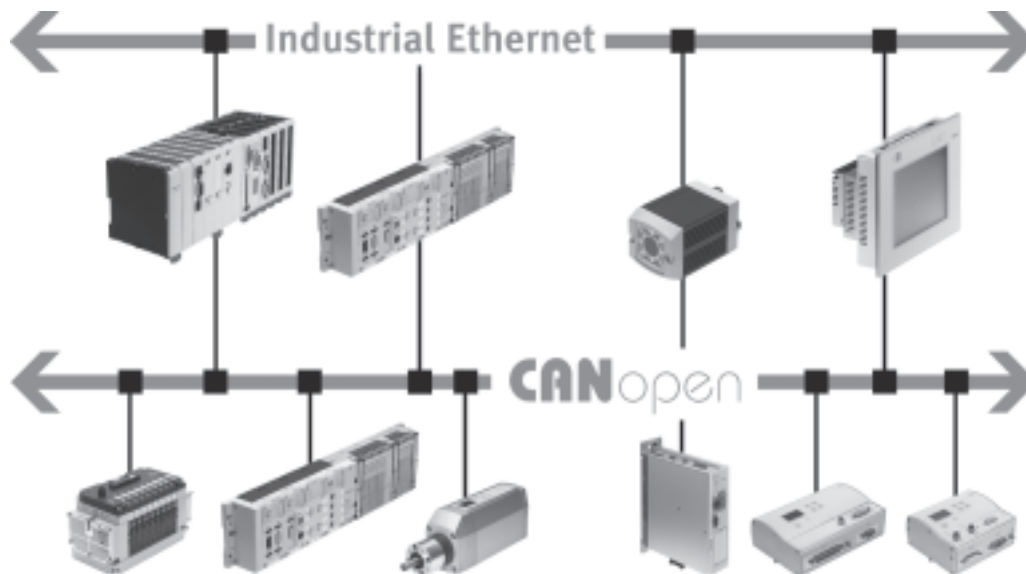
### Designing

Straightforward designing and programming with the programming tool CoDeSys provided by Festo and FED Designer.

### Key features at a glance

- Convenient FED Designer WYSIWYG design tool.
- No duplicate work thanks to import of variable declarations (allocation list) from the control software.
- Can also be used with Festo FEC® and CoDeSys controllers from Festo in a network by means of Ethernet.
- Graphics capability offers maximum flexibility when displaying processes and data.
- Shorter design times thanks to reusability of objects (libraries containing graphical elements).
- Generous memory means almost unlimited numbers of graphics and texts can be displayed.
- Display of complex processes is possible thanks to an unlimited number of variables per page.
- Extremely sturdy thanks to a metal housing to facilitate use in tough environments.

## The Front End Displays in the Festo controller landscape



# Operator units FED

Product range overview, type codes

**FESTO**

Type	Display resolution	Number of colours	Display size	Interfaces	→ Page/Internet
Text-based					
FED-40	120x32 pixels	B/W	4x20 characters	PLC, PC	5
FED-50				PLC, PC, Ethernet <sup>1)</sup>	
FED-60				PLC, PC, Ethernet <sup>1)</sup>	
FED-90				PLC, PC, printer, Ethernet <sup>1)</sup>	
Touch screen					
FED-301	1/4 VGA, 320x240 pixels	B/W	3.8"	PLC, PC, Ethernet <sup>1)</sup>	8
FED-400	480x272 pixels	256	4.3"	PLC, PC, Ethernet <sup>2)</sup>	
FED-501	1/4 VGA, 320x240 pixels	8 grey scales	5.6"	PLC, PC, printer, Ethernet <sup>1)</sup>	
FED-550		64 k	5.7"	PLC, PC, printer, Ethernet <sup>3)</sup>	
FED-700	VGA, 640x480 pixels	64 k	7.5"	PLC, PC, printer, Ethernet <sup>4)</sup>	
FED-1000			10.4"		
FED-2000	SVGA, 800x600 pixels	64 k	12.1"	PLC, PC, printer, Ethernet <sup>4)</sup>	
FED-5000	XGA, 1024x768 pixels	64 k	15"		

1) 10 MBd optional

2) 100 MBd

3) 10/100 MBd standard

4) 10/100 MBd standard, 2nd 10 MBd interface optional

## Type codes

		FED	–	2000
Function				
FED	Teach pendant			
Display size, equipment				
Text-based				
40	4 x 20 characters			
50	Equipment details ➔ Product range overview and Technical data			
60				
90				
Touch screen				
301	3.8", B/W			
400	4.3", 256 colours			
501	5.6", 8 grey scales			
550	5.7", 64 k colours			
700	7.5", 64 k colours			
1000	10.4", 64 k colours			
2000	12.1", 64 k colours			
5000	15", 64 k colours			

# Operator units FED, text-based

FESTO

Technical data

Voltage

18 ... 30 V DC

Temperature range

0 ... +50 °C



General technical data				
	FED-40	FED-50	FED-60	FED-90
Display	Monochrome LCD with backlighting			
Display size	4x20 characters			
Display resolution	120x32 pixels			
Number of colours	–			
Number of function keys	4	4	9	12
Number of system keys	7	7	10	23
Number of user LEDs	5	5	10	13
Number of system LEDs	4	4	4	4
User memory	512 KB			
Recipe memory	–	16 KB	16 KB	16 KB
Event lists	–	256	256	256
Alerts	1,024			
Type of mounting	Front panel mounting			
Installation depth [mm]	53	53	53	71
Max. front panel thickness [mm]	5			

Electrical data				
	FED-40	FED-50	FED-60	FED-90
Nominal operating voltage DC [V]	24			
Operating voltage range DC [V]	18 ... 30			
Current consumption at nominal operating voltage [A]	0.25			0.3
AUX interface	–	Sub-D socket, 9-pin		
Printer interface	–	–	–	Sub-D socket, 15-pin, RS232
Ethernet interface	–	Optional, 10 MBd		
PC interface	Sub-D plug, 15-pin, RS232			Sub-D socket, 15-pin, RS232
Programming interface	9.6 kBd	9.6 ... 38.4 kBd		
Programming software	FED Designer 6.06 or higher			
PLC interface	Sub-D plug, 15-pin, RS232			
Backup battery	–	3 V/270 mA lithium		
Real-time clock	–	Yes		
Real-time clock deviation	–	130 s/month		
Protection class	IP65 at the front following installation into control panel, IP20 at the back			

# Operator units FED, text-based

Technical data

**FESTO**

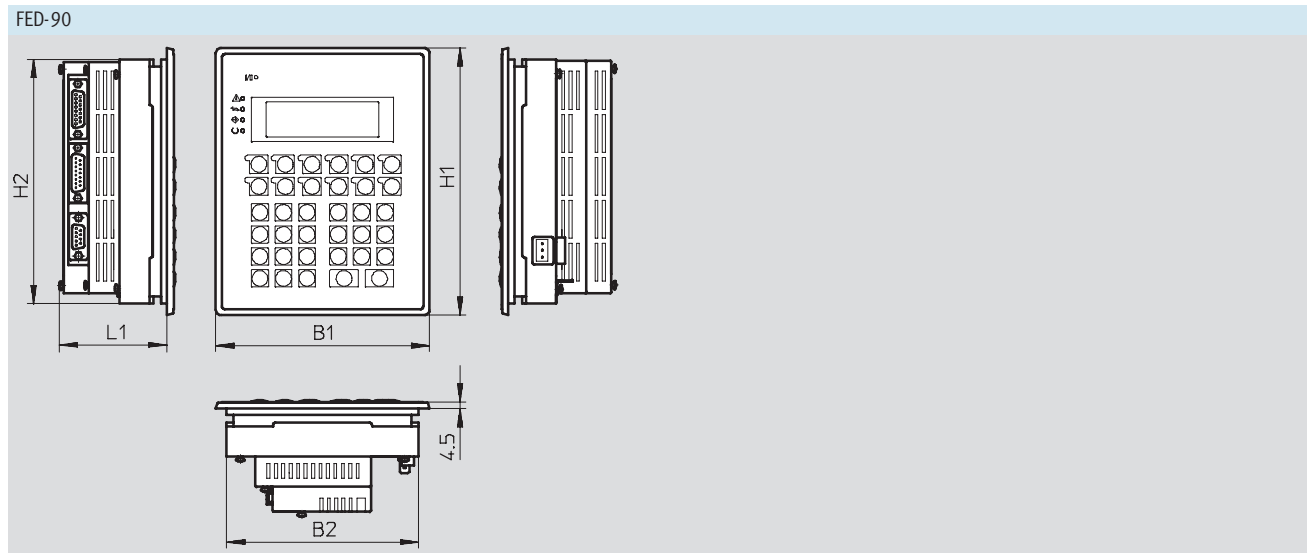
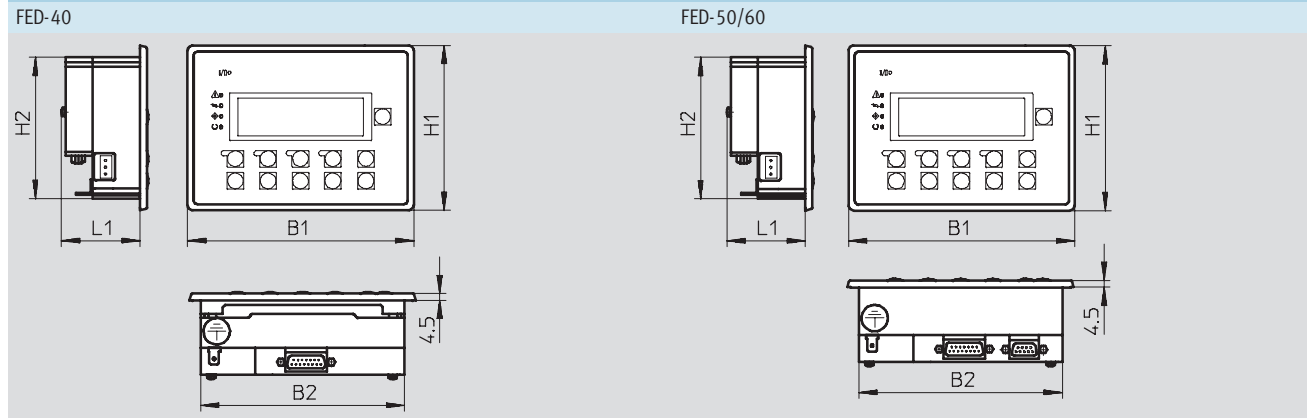
Operating and environmental conditions		
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	-20 ... +70
Relative air humidity	[%]	5 ... 85, non-condensing
CE mark (see declaration of conformity)		To EU EMC Directive <sup>1)</sup>
Certification		C-Tick
Ex certification to NEC 500		Class I, Division 2, Groups A, B, C and D

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Weight [g]					
	FED-40	FED-50	FED-60	FED-90	
Product weight	[g]	1,000	1,000	1,000	1,100

## Dimensions

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



Type	B1	B2	H1	H2	L1
FED-40	149	134	108.5	93.5	52.5
FED-50					
FED-60					
FED-90	140.6	126.6	176	161	71

# Operator units FED, text-based

Technical data



Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/system keys	Part No.	Type
120x32 pixels	B/W	4x20 characters	PLC, PC	4/7	<b>541998</b>	<b>FED-40</b>
			PLC, PC, Ethernet <sup>1)</sup>	4/7	<b>533531</b>	<b>FED-50</b>
			PLC, PC, Ethernet <sup>1)</sup>	9/10	<b>541999</b>	<b>FED-60</b>
			PLC, PC, printer, Ethernet <sup>1)</sup>	12/23	<b>533532</b>	<b>FED-90</b>

1) 10 MBd optional

## Operator units FED, touch screen

Technical data

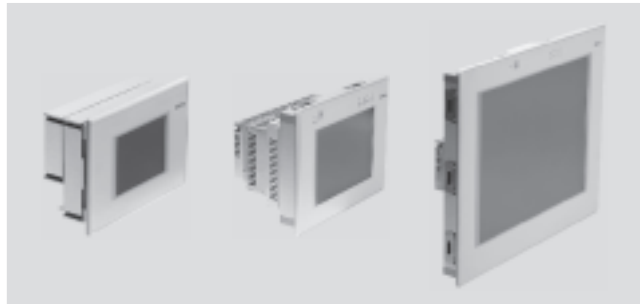
**FESTO**

Voltage

18 ... 30 V DC

Temperature range

0 ... +50 °C



General technical data				
	FED-301	FED-400	FED-501	FED-550
Display properties	Touch screen			
Display	Monochrome LCD	Colour TFT	Monochrome LCD	Colour TFT
Display size	3.8"	4.3"	5.6"	5.7"
Display resolution	1/4 VGA, 320x240 pixels	480x272 pixels	1/4 VGA, 320x240 pixels	1/4 VGA, 320x240 pixels
Number of colours	B/W	256	8 grey scales	64 k
Number of function keys	–		1	
Number of user LEDs	–		1	
Number of system LEDs	4	–	4	
User memory	512 KB	2 MB	32 MB	64 MB
Recipe memory	32 KB			
Event lists	256		1,024	
Alerts	1,024			
Type of mounting	Front panel mounting			
Installation depth [mm]	61	56	66	91
Max. front panel thickness [mm]	5			
Materials				
Note on materials	RoHS-compliant			

	FED-700	FED-1000	FED-2000	FED-5000
Display properties	Touch screen			
Display	Colour TFT			
Display size	7.5"	10.4"	12.1"	15"
Display resolution	VGA, 640x480 pixels	VGA, 640x480 pixels	SVGA, 800x600 pixels	XGA, 1024x768 pixels
Number of colours	64 k			
Number of function keys	1			
Number of user LEDs	1			
Number of system LEDs	4			
User memory	32 MB			
Recipe memory	32 KB			
Event lists	1,024			
Alerts	1,024			
Type of mounting	Front panel mounting			
Installation depth [mm]	71	91	91	101
Max. front panel thickness [mm]	5			
Materials				
Note on materials	RoHS-compliant			



## Operator units FED, touch screen

Technical data

**FESTO**

Electrical data				
	FED-301	FED-400	FED-501	FED-550
Nominal operating voltage DC [V]	24			
Operating voltage range DC [V]	18 ... 30			
Current consumption at nominal operating voltage [A]	0.4		0.6	1
AUX interface	Sub-D socket, 9-pin			
Printer interface	–		Sub-D socket, 15-pin, RS232	
Ethernet interface	Optional, 10 MBd	100 MBd	Optional, 10 MBd	RJ45 10/100 MBd
PC interface	Sub-D plug, 15-pin, RS232		Sub-D socket, 15-pin, RS232	
Programming interface	9.6 ... 38.4 kBd			
Programming software	FED Designer 6.06 or higher	FED Designer 6.09 or higher	FED Designer 6.06 or higher	FED Designer 6.09 or higher
PLC interface	Sub-D plug, 15-pin, RS232			
Backup battery	3 V/270 mA lithium			
Real-time clock	Yes			
Real-time clock deviation	130 s/month			
Protection class	IP65 at the front following installation into control panel, IP20 at the back			

	FED-700	FED-1000	FED-2000	FED-5000
Nominal operating voltage DC [V]	24			
Operating voltage range DC [V]	18 ... 30			
Current consumption at nominal operating voltage [A]	1.1	1.2	1.3	1.5
AUX interface	Sub-D socket, 9-pin			
Printer interface	Sub-D socket, 15-pin, RS232			
Ethernet interface	RJ45 10/100 MBd 2nd Ethernet interface optional, 10 MBd			
PC interface	Sub-D socket, 15-pin, RS232			
Programming interface	9.6 ... 38.4 kBd			
Programming software	FED Designer 6.06 or higher			
PLC interface	Sub-D plug, 15-pin, RS232			
Backup battery	3 V/270 mA lithium			
Real-time clock	Yes			
Real-time clock deviation	130 s/month			
Protection class	IP65 at the front following installation into control panel, IP20 at the back			

## Operator units FED, touch screen

Technical data

**FESTO**

Operating and environmental conditions				
	FED-301	FED-400	FED-501	FED-550
Ambient temperature [°C]	0 ... +50		0 ... +50	0 ... +45
Storage temperature [°C]	-20 ... +70			
Relative air humidity [%]	5 ... 85, non-condensing			
CE mark (see declaration of conformity)	To EU EMC Directive <sup>1)</sup>			
Certification	cULus listed (OL)	–	–	–
	C-Tick	–	C-Tick	–
Ex certification to NEC 500	–		Class I, Division 2, Groups A, B, C and D	–

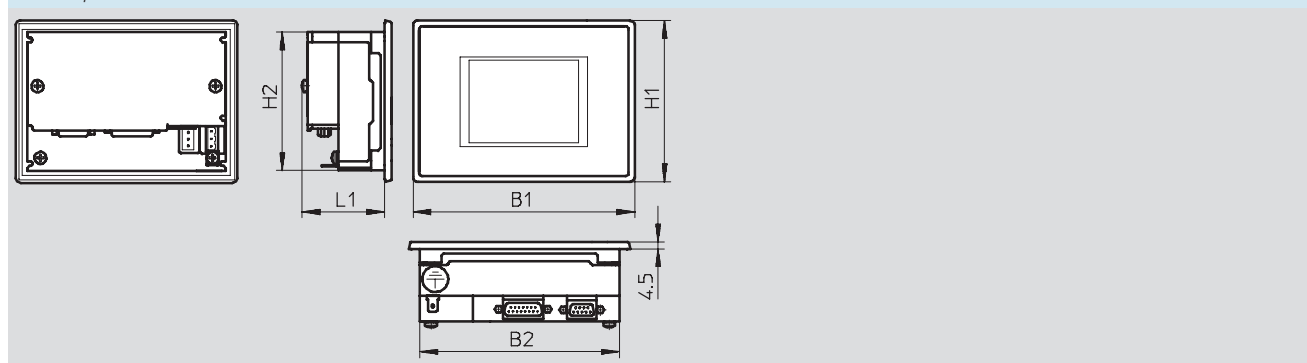
	FED-700	FED-1000	FED-2000	FED-5000
Ambient temperature [°C]	0 ... +45			
Storage temperature [°C]	-20 ... +70			
Relative air humidity [%]	5 ... 85, non-condensing			
CE mark (see declaration of conformity)	To EU EMC Directive <sup>1)</sup>			
Certification	cULus listed (OL)	–	–	cULus listed (OL)
	C-Tick	C-Tick	C-Tick	C-Tick
Ex certification to NEC 500	–	Class I, Division 2, Groups A, B, C and D		–

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Weight [g]				
	FED-301	FED-400	FED-501	FED-550
Product weight [g]	1,000	1,000	1,400	1,400

	FED-700	FED-1000	FED-2000	FED-5000
Product weight [g]	1,600	2,300	2,800	3,800

### Dimensions Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



Type	B1	B2	H1	H2	L1
FED-301	149	134	108.5	93.5	60.5
FED-400	149	136	109	96	56

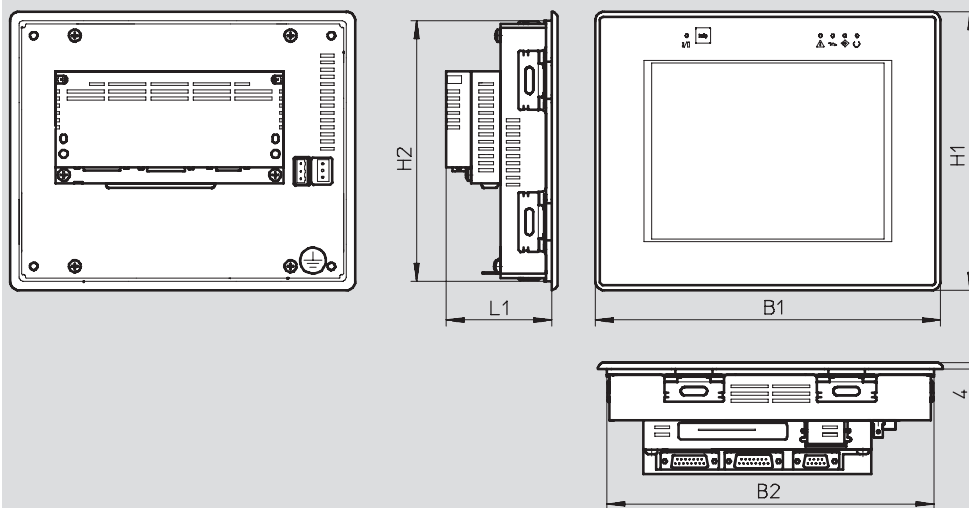
## Operator units FED, touch screen

Technical data

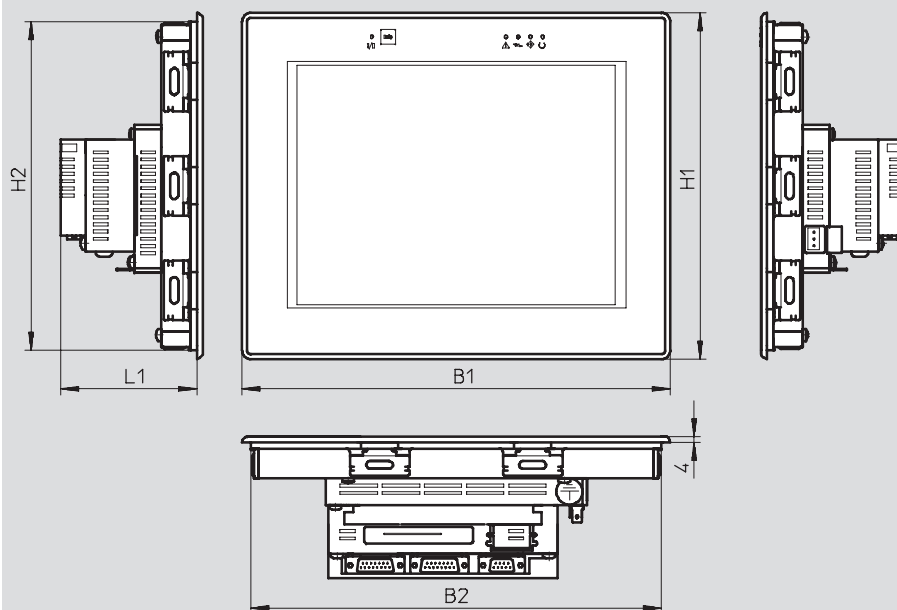
### Dimensions

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)

FED-700



FED-501/550/1000/2000/5000





Type	B1	B2	H1	H2	L1
FED-501	187	175	147	135	66
FED-550	187	176	147	136	91
FED-700	232	220	187	175	71
FED-1000	287	275	232	220	91
FED-2000	337	325	267	255	91
FED-5000	392	380	307	295	101

## Operator units FED, touch screen

Technical data

**FESTO**

Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/system keys	Part No.	Type
1/4 VGA, 320x240 pixels	B/W	3.8"	PLC, PC, Ethernet <sup>1)</sup>	–/–	<b>543438</b>	<b>FED-301</b>
480x272 pixels	256	4.3"	PLC, PC, Ethernet <sup>2)</sup>	–/–	<b>570864</b>	<b>FED-400</b> 
1/4 VGA, 320x240 pixels	8 grey scales	5.6"	PLC, PC, printer, Ethernet <sup>1)</sup>	1/–	<b>543440</b>	<b>FED-501</b>
	64 k	5.7"	PLC, PC, printer, Ethernet <sup>3)</sup>	1/–	<b>570398</b>	<b>FED-550</b> 
VGA, 640x480 pixels	64 k	7.5"	PLC, PC, printer, Ethernet <sup>4)</sup>	1/–	<b>543442</b>	<b>FED-700</b>
VGA, 640x480 pixels		10.4"		1/–	<b>543515</b>	<b>FED-1000</b>
SVGA, 800x600 pixels	64 k	12.1"	PLC, PC, printer, Ethernet <sup>4)</sup>	1/–	<b>543444</b>	<b>FED-2000</b>
XGA, 1024x768 pixels	64 k	15"		1/–	<b>543447</b>	<b>FED-5000</b>

1) 10 MBd optional

2) 100 MBd

3) 10/100 MBd standard

4) 10/100 MBd standard, 2nd 10 MBd interface optional

## Operator units FED, embedded control

Accessories

### Controller

Plug-in card with processor module for installation in the operator units FED-50 to FED-5000.

Fieldbus interfaces

**CANopen**

### Controller FED-CECCAN

Plug-in card with processor module for installation in the operator units FED-400, FED-550, FED-700, FED-1000, FED-2000 and FED-5000.



General technical data		
	FED-CEC	FED-CECCAN
CPU data	32-bit RISC processor, 24 MHz	
	Watchdog	
Programming software	CoDeSys provided by Festo	
Programming language	SFC, IL, FCH, LD and ST to IEC 61131-3	
	Additionally CFC	
Ethernet		
Connector plug	RJ45	
Number	1	
Transmission speed	[Mbps] 10	10/100
Supported protocols	TCP/IP	
	EasyIP	
Fieldbus interface		
Type	CAN	
Connection technology	Sub-D plug, 9-pin	
Transmission rate	Max. 1 Mbps, adjustable	
Materials		
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	–	RoHS-compliant

Operating and environmental conditions		
Ambient temperature [°C]	0 ... +50	
Storage temperature [°C]	–20 ... +70	
Relative air humidity [%]	5 ... 85 (non-condensing)	
CE mark (see declaration of conformity)	To EU EMC Directive <sup>1)</sup>	

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Ordering data		
	Part No.	Type
Controller	559869	FED-CEC
	570400	FED-CECCAN

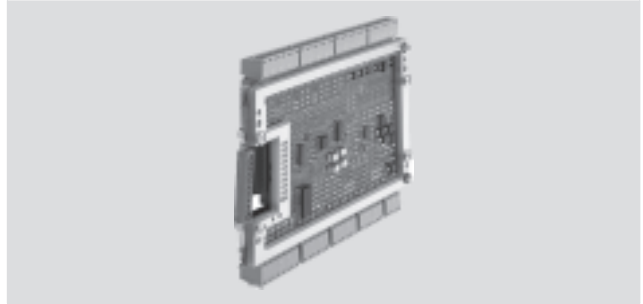
# Operator units FED, embedded control

Accessories

FESTO

## I/O module FED-UIIM

Plug-in card for installation in the operator units FED-1000, FED-2000 and FED-5000.



General technical data		
Analogue inputs		
Number		8
Resolution	[bit]	12
Signal range	[V]	0 ... 10
	[V]	±10
	[V]	0 ... 5
	[V]	±5
	[V]	0 ... 1
	[V]	±1
	[mA]	0 ... 20
	[mA]	4 ... 20
		PT 100 (–100 ... +850 °C)
		Thermoelement E, J, K, R, S, T
Absolute accuracy at 25 °C	[%]	0.1
Linearity error at 25 °C	[%]	0.1
Input resistance	[Ω]	47
Analogue outputs		
Number		4
Resolution	[bit]	12
Max. load resistance	[Ω]	470
Signal range	[V]	±10
Linearity error at 25 °C	[%]	±0.15 voltage output
	[%]	±0.2 current output
Digital inputs		
Number		20
Fast clock pulse inputs		4
Incremental encoder connection		4
Input signal delay	[ns]	200
Input voltage	[V DC]	24
Input current	[mA]	3
Input signal delay	[ms]	50
Nominal value for TRUE	[V DC]	12 ... 30
Nominal value for FALSE	[V DC]	≤ 6
Electrical isolation		Yes, via optocoupler

# Operator units FED, embedded control

Accessories

**FESTO**

General technical data		
Digital outputs		
Number		12
Contact		Transistor
Output voltage	[V DC]	12 ... 30
Output current	[mA]	500
Electrical isolation		Yes, via optocoupler
Short circuit proof		Yes
Overload proof		Yes
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	−20 ... +70
Relative air humidity	[%]	5 ... 85 (non-condensing)
CE mark (see declaration of conformity)		To EU EMC Directive <sup>1)</sup>

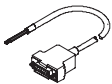
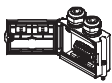
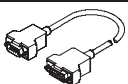
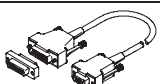
- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
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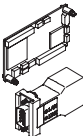

Ordering data		
	Part No.	Type
I/O module	<b>559870</b>	<b>FED-UIM</b>

## Operator units FED

Accessories

**FESTO**

Ordering data – Cables and plugs					
	Description	Electrical connection	Cable length [m]	Part No.	Type
	For connecting to control block CPX-FEC Prepared for combining with plug FBS-SUB-9-GS-1X9POL-B	Open end Sub-D socket, 15-pin	5	<b>539642</b>	<b>FEC-KBG7</b>
	Suitable for control block CPX-FEC For combining with cable FEC-KBG7	Sub-D plug, 9-pin	–	<b>534497</b>	<b>FBS-SUB-9-GS-1X9POL-B</b>
	For connecting to control block CPX-FEC	Sub-D plug, 15-pin Sub-D socket, 15-pin	2.5	<b>539643</b>	<b>FEC-KBG8</b>
	Programming cable	Sub-D plug, 15-pin Sub-D socket, 15-pin	3	<b>533534</b>	<b>FEDZ-PC</b>

Ordering data				
	Description	Electrical connection	Part No.	Type
Fieldbus interface				
	Ethernet interface module (FST controller software)	Sub-D adapter, 9-pin to RJ45	<b>533533</b>	<b>FEDZ-IET</b>
	Ethernet TCP interface module (CoDeSys controller software)	Sub-D adapter, 9-pin to RJ45	<b>543450</b>	<b>FEDZ-IET TCP</b>
Memory card				
	User memory 32 MB		<b>543514</b>	<b>FEDZ-MEM32</b>



## Product Range and Company Overview

### A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



**Custom Automation Components**  
Complete custom engineered solutions



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Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

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Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



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