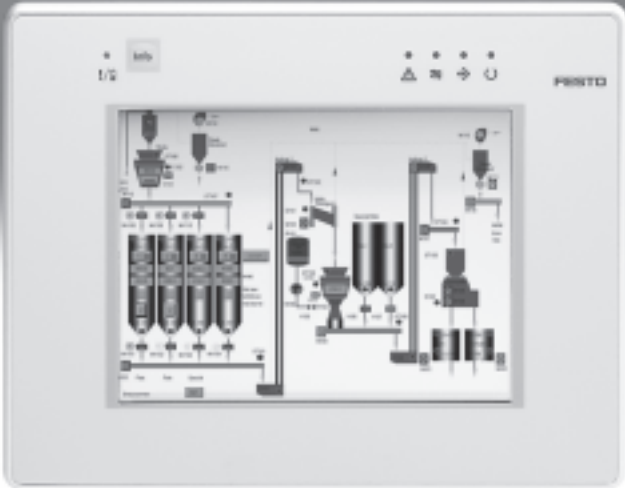


Operator units FED



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.

FED-40 ... FED-90:

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.

FED-300 ... FED-5010:

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. Also with VipWin for convenient visualisation.

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:

- Serial interface (FED-40 to FED-90), optional Ethernet for use in a network (not with FED-40)
- Battery backup of the alarm and event data (not with FED-40)
- FED Designer graphical design tool included

- No parameterisation required; the software contains the controller data and detects the display
- Simple graphics possible, enabling scalable font size and simple representation of pictograms and bar charts
- Software for uploading projects
- Recipe handling
- Simple data acquisition

- Generous program memory
- Real-time clock (not with FED-40)
- Printer port (FED-90)
- Password protection
- Alarm handling
- Keypad can be easily programmed using macros
- Multilingual projects possible
- Import and export of texts for translation

FED-40: the entry-level model

A serial connection is established with the controller. Operation is by means of four freely programmable function keys and seven system keys.

FED-50: fieldbus-capable

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.

FED-60: 10-key pad included

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.

FED-90: all-inclusive

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-300 to FED-5010

The touchscreen displays FED-300 to FED-5010 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.

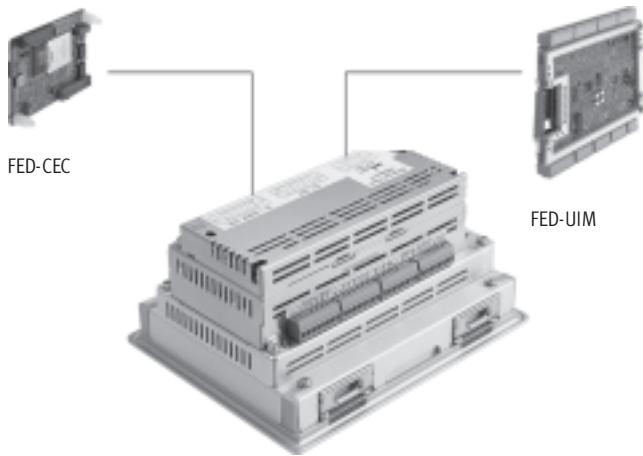
As a client/server system, the terminal receives data from web servers

connected to it and displays this data using the integrated browser functionality.

Operator units FED

Key features

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

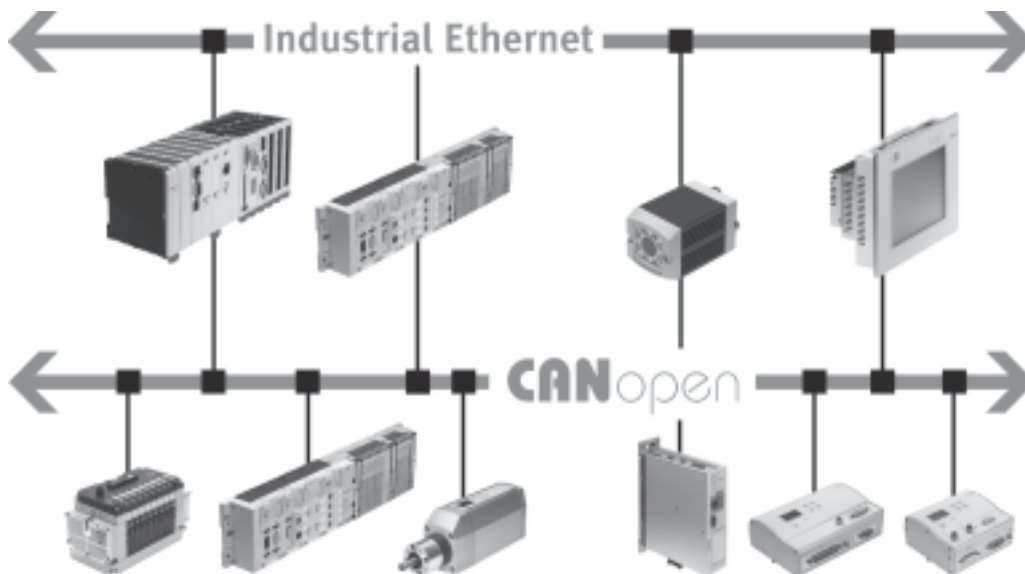
Designing

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

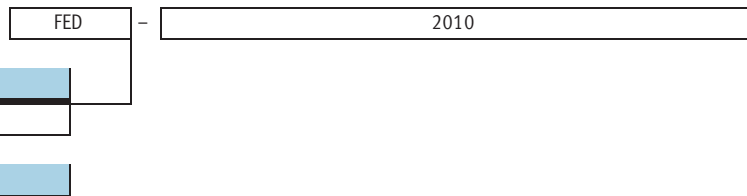
Product range overview, type codes

Type	Display resolution	Number of colours	Display size	Interfaces	→ Page/Internet
Text-based					
FED-40	120x32 pixels	B/W	4 x 20 characters	PLC, PC	5
FED-50				PLC, PC, Ethernet ¹⁾	
FED-60				PLC, PC, Ethernet ¹⁾	
FED-90				PLC, PC, printer, Ethernet ¹⁾	
Touchscreen					
FED-300	1/4 VGA, 320x240 pixels	256	3.5"	PLC, PC, Ethernet ¹⁾	7
FED-301		B/W	3.8"		
FED-500		256	5.6"	PLC, PC, printer, Ethernet ¹⁾	
FED-501		8 grey levels	5.6"		
FED-700	VGA, 640x480 pixels	64 k	7.5"	PLC, PC, printer, Ethernet ²⁾	
FED-1000			10.4"		
FED-2000	SVGA, 800x600 pixels	64 k	12.1"	PLC, PC, printer, Ethernet ²⁾	
FED-5000	XGA, 1024x768 pixels	64 k	15"		
Touchscreen, with integrated web browser					
FED-710	VGA, 640x480 pixels	64 k	7.5"	PLC, USB, printer, Ethernet ²⁾	10
FED-1010			10.4"		
FED-2010	SVGA, 800x600 pixels	64 k	12.1"	PLC, USB, printer, Ethernet ²⁾	
FED-5010	XGA, 1024x768 pixels	64 k	15"		

1) 10 MBd optional

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



Type codes



Display size, equipment	
Text-based	
40	4 x 20 characters
50	Equipment details → Product range overview and Technical data
60	
90	
Touchscreen	
300	3.5", 256 colours
301	3.8", B/W
500	5.6", 256 colours
501	5.6", 8 grey levels
700	7.5", 64 k colours
1000	10.4", 64 k colours
2000	12.1", 64 k colours
5000	15", 64 k colours
Touchscreen, with integrated web browser	
710	7.5", 64 k colours
1010	10.4", 64 k colours
2010	12.1", 64 k colours
5010	15", 64 k colours

Operator units FED, text-based

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	4 x 20 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
Alarms	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		
Accuracy of real-time clock	–	130 s/month		
Protection class	IP65 at the front following installation into control panel, IP20 at the back			

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
Certification	cULus listed (HL)
	C-Tick

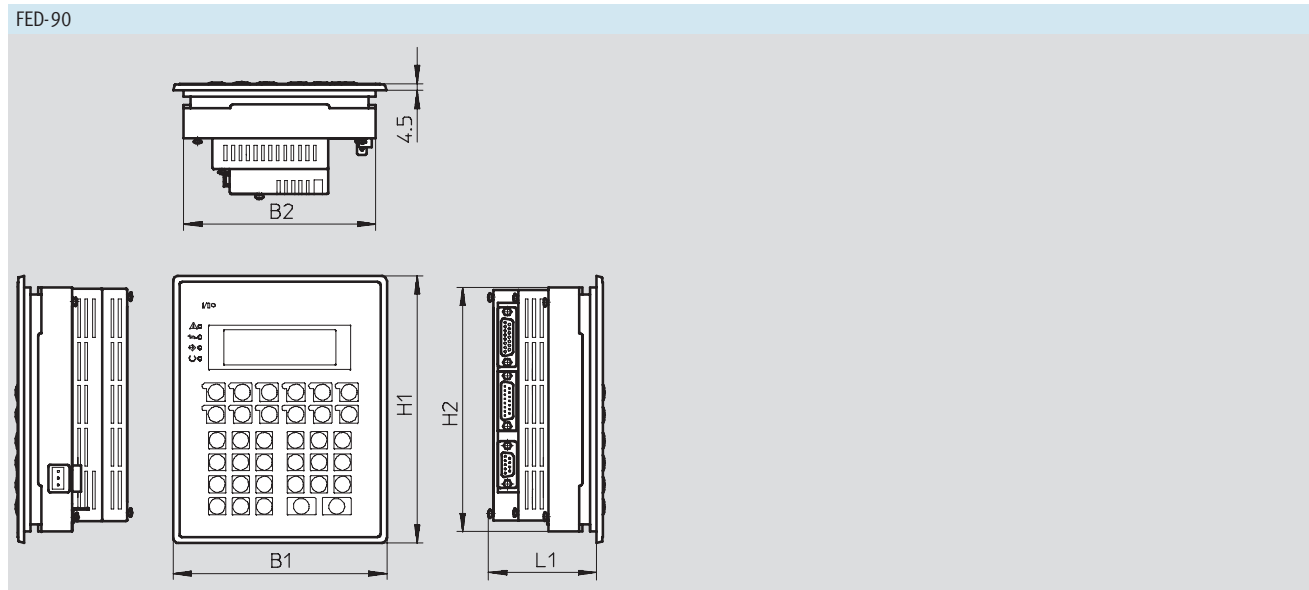
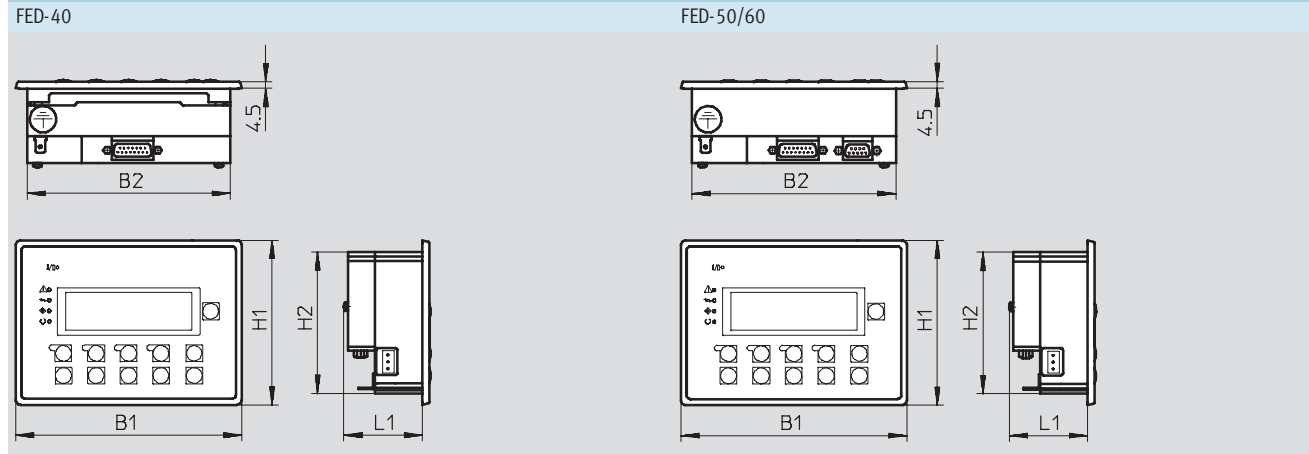
Operator units FED, text-based

Technical data

FESTO

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





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

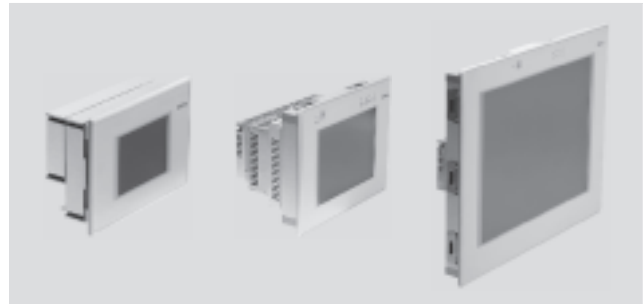
Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/ system keys	Part No.	Type
120x32 pixels	B/W	4 x 20 characters	PLC, PC	4/7	541 998	FED-40
			PLC, PC, Ethernet ¹⁾	4/7	533 531	FED-50
			PLC, PC, Ethernet ¹⁾	9/10	541 999	FED-60
			PLC, PC, printer, Ethernet ¹⁾	12/23	533 532	FED-90

1) 10 MBd optional

Operator units FED, touchscreen

Technical data

-  Voltage
18 ... 30 V DC
-  Temperature range
0 ... 50 °C



General technical data								
	FED-300	FED-301	FED-500	FED-501	FED-700	FED-1000	FED-2000	FED-5000
Type of display	Touchscreen							
Display	Colour TFT	Monochrome LCD	Colour STN	Monochrome LCD	Colour TFT			
Display size	3.5"	3.8"	5.6"	5.6"	7.5"	10.4"	12.1"	15"
Display resolution	1/4 VGA, 320x240 pixels				VGA, 640x480 pixels		SVGA, 800x600 pixels	XGA, 1024x768 pixels
Number of colours	256	B/W	256	8 grey levels	64 k			
Number of function keys	-		1	1	1	1	1	1
Number of user LEDs	-		1	1	1	1	1	1
Number of system LEDs	4	4	4	4	4	4	4	4
User memory	1 MB	512 KB	32 MB					
Recipe memory	32 KB							
Event lists	256		1,024		1,024	1,024	1,024	1,024
Alarms	1,024							
Type of mounting	Front panel mounting							
Installation depth [mm]	56	61	91	66	71	91	91	101
Max. front panel thickness [mm]	5							

Electrical data								
	FED-300	FED-301	FED-500	FED-501	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]	0.4		0.8	0.6	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	Optional, 10 MBd				RJ45 10/100 MBd 2nd Ethernet interface optional, 10 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							
PLC interface	Sub-D plug, 15-pin, RS232							
Backup battery	3 V / 270 mA lithium							
Real-time clock	Yes							
Accuracy of real-time clock	130 s/month							
Protection class	IP65 at the front following installation into control panel, IP20 at the back							

Operator units FED, touchscreen

Technical data

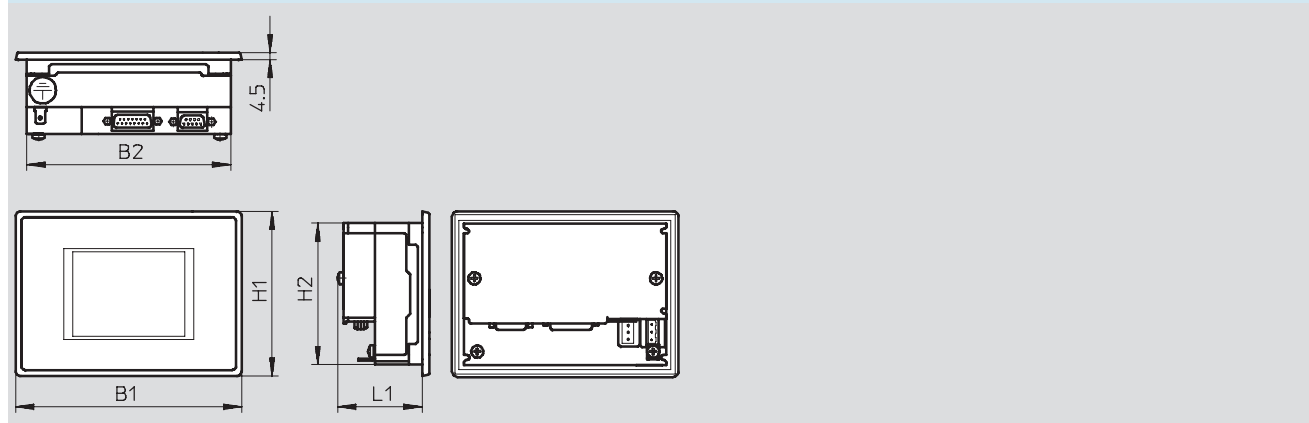


Operating and environmental conditions								
	FED-300	FED-301	FED-500	FED-501	FED-700	FED-1000	FED-2000	FED-5000
Ambient temperature [°C]	0 ... 50		0 ... 45	0 ... 50	0 ... 45			
Storage temperature [°C]	-20 ... +70							
Relative air humidity [%]	5 ... 85, non-condensing							
CE mark (see declaration of conformity)	To EU EMC Directive							
Certification	cULus listed (OL)		cULus listed (HL)		cULus listed (OL)	cULus listed (HL)	cULus listed (HL)	cULus listed (OL)
	C-Tick							

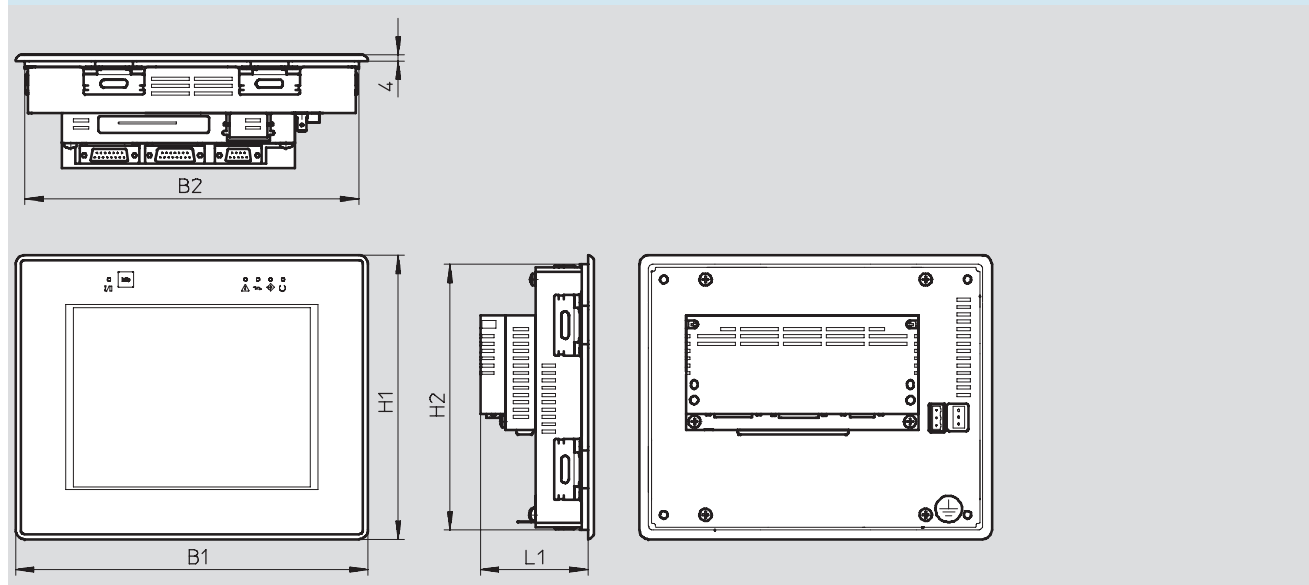
Weight [g]								
	FED-300	FED-301	FED-500	FED-501	FED-700	FED-1000	FED-2000	FED-5000
Product weight [g]	1,000		1,400		1,600	2,300	2,800	3,800

Dimensions Download CAD data → www.festo.com

FED-300/301



FED-700



Type	B1	B2	H1	H2	L1
FED-300	149	134	108.5	93.5	56
FED-301					60.5
FED-700	232	200	187	175	71

Operator units FED, touchscreen

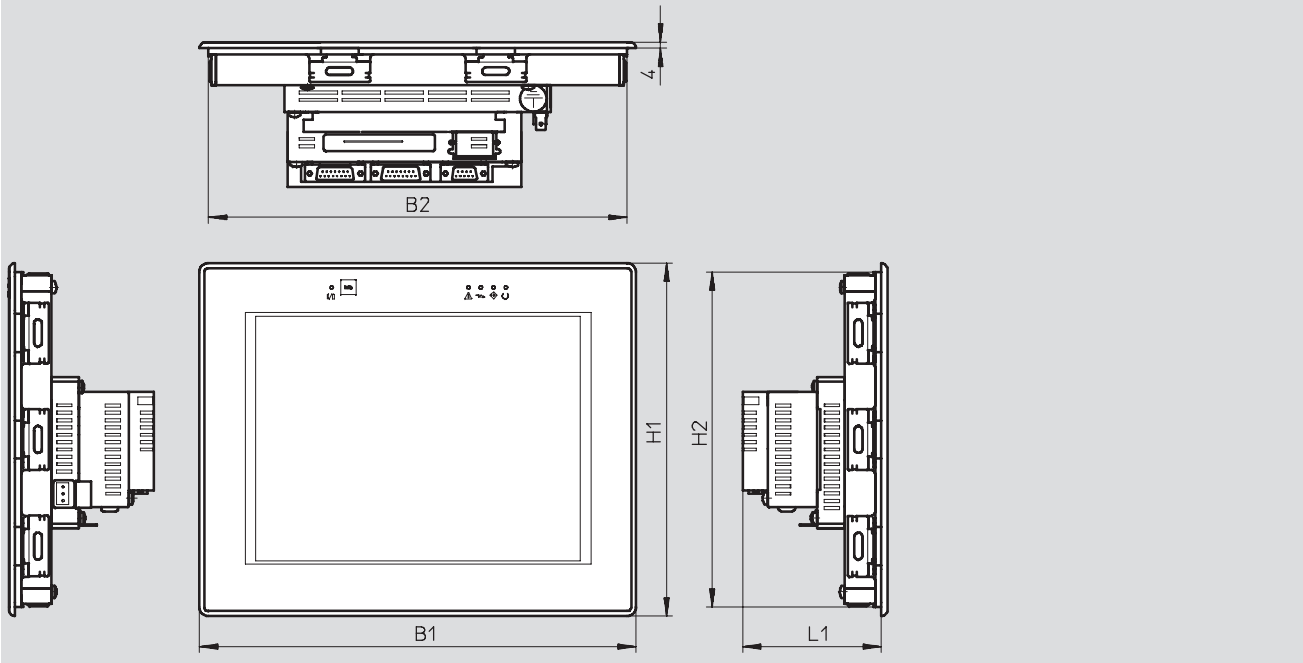
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

FED-500/501/1000/2000/5000



Type	B1	B2	H1	H2	L1
FED-500	187	175	147	135	90.5
FED-501					66
FED-1000	287	275	232	220	91
FED-2000	337	325	267	255	91
FED-5000	392	380	307	295	101

Ordering data



Display resolution	Number of colours	Display size	Interfaces	Number of function/ system keys	Part No.	Type
1/4 VGA, 320x240 pixels	256	3.5"	PLC, PC, Ethernet ¹⁾	-/-	543 439	FED-300
	B/W	3.8"		-/-	543 438	FED-301
	256 8 grey levels	5.6"	PLC, PC, printer, Ethernet ¹⁾	1/-	543 441	FED-500
		5.6"		1/-	543 440	FED-501
VGA, 640x480 pixels	64 k	7.5"	PLC, PC, printer, Ethernet ²⁾	1/-	543 442	FED-700
		10.4"		1/-	543 515	FED-1000
SVGA, 800x600 pixels	64 k	12.1"	PLC, PC, printer, Ethernet ²⁾	1/-	543 444	FED-2000
XGA, 1024x768 pixels	64 k	15"		1/-	543 447	FED-5000

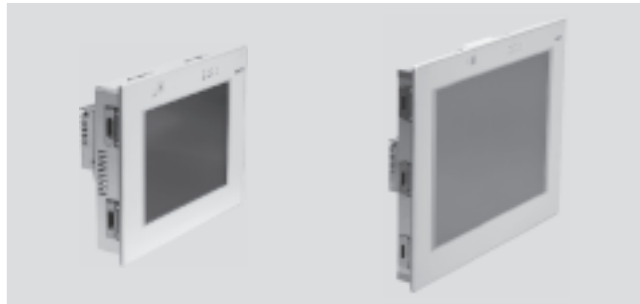
1) 10 MBd optional

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

Operator units FED, touchscreen, web browser

Technical data

-  Voltage
18 ... 30 V DC
-  Temperature range
0 ... 45 °C



General technical data					
	FED-710	FED-1010	FED-2010	FED-5010	
Type of display	Touchscreen				
Display	Colour TFT				
Display size	7.5"	10.4"	12.1"	15"	
Display resolution	VGA, 640x480 pixels		SVGA, 800x600 pixels	XGA, 1024x768 pixels	
Number of colours	64 k				
User memory	32 MB				
Type of mounting	Front panel mounting				
Installation depth [mm]	71	91	91	101	
Max. front panel thickness [mm]	5				

Electrical data					
	FED-710	FED-1010	FED-2010	FED-5010	
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				
PLC interface	Sub-D plug, 15-pin, RS232				
USB interface	Yes				
Backup battery	3 V / 270 mA lithium				
Real-time clock	Yes				
Accuracy of real-time clock	130 s/month				
Protection class	IP65 at the front following installation into control panel, IP20 at the back				

Operating and environmental conditions					
	FED-710	FED-1010	FED-2010	FED-5010	
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				
Certification	cULus listed (OL)	cULus listed (HL)	cULus listed (HL)	cULus listed (OL)	
	C-Tick				

Weight [g]					
	FED-700	FED-1000	FED-2000	FED-5000	
Product weight [g]	1,600	2,250	2,850	3,800	

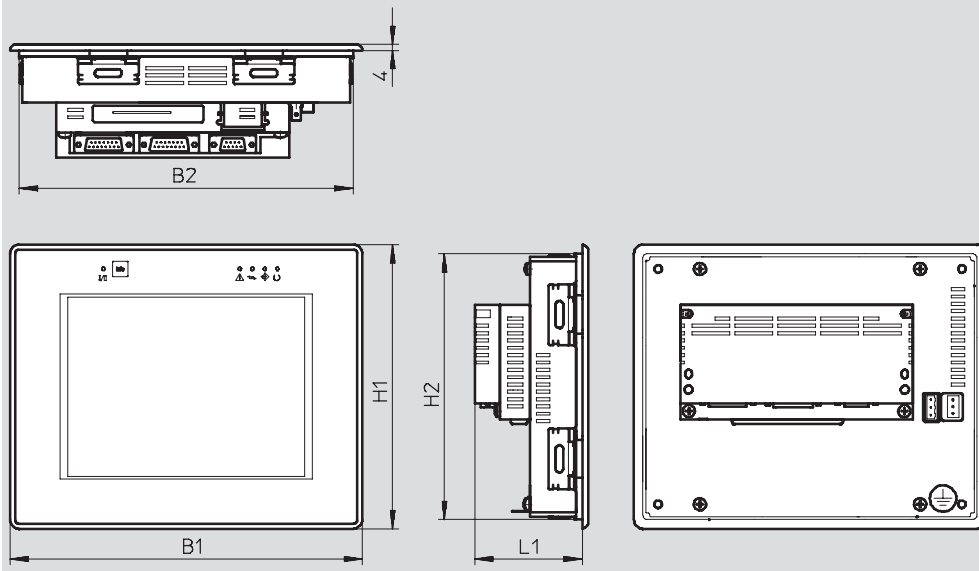
Operator units FED, touchscreen, web browser

Technical data

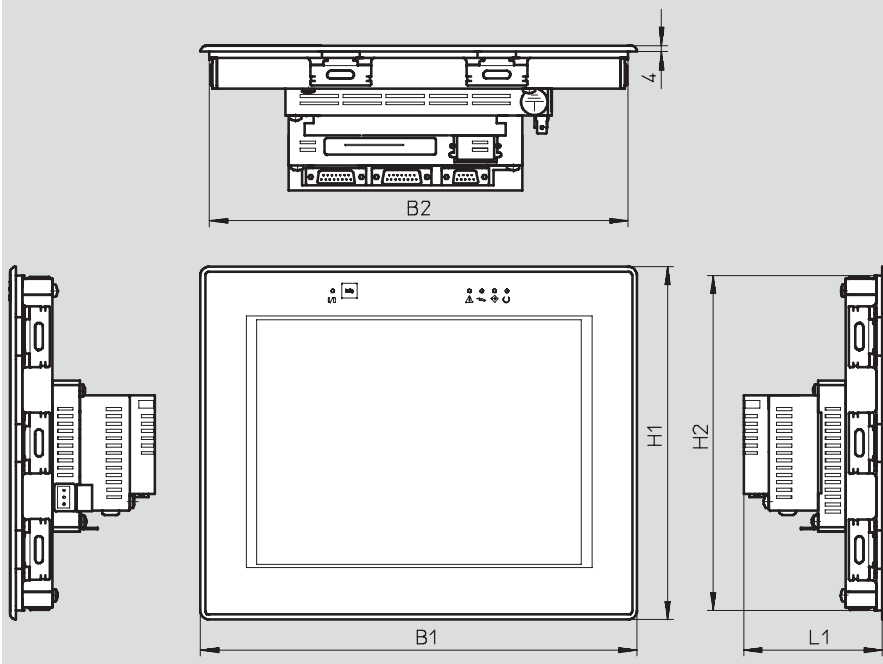
Dimensions

Download CAD data → www.festo.com

FED-710



FED-1010/2010/5010



Type	B1	B2	H1	H2	L1
FED-710	232	200	187	175	71
FED-1010	287	275	232	220	91
FED-2010	337	325	267	255	91
FED-5010	392	380	307	295	101

Operator units FED, touchscreen, web browser

Technical data

Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/ system keys	Part No.	Type
VGA, 640x480 pixels	64 k	7.5"	PLC, USB, printer, Ethernet ¹⁾	-/-	543 443	FED-710
		10.4"				543 516
SVGA, 800x600 pixels	64 k	12.1"	PLC, USB, printer, Ethernet ¹⁾	-/-	543 445	FED-2010
XGA, 1024x768 pixels	64 k	15"	PLC, USB, printer, Ethernet ¹⁾	-/-	543 448	FED-5010

1) 10/100 MBd standard, 2nd 10 MBd interface optional

Operator units FED, embedded control

Accessories

Controller FED-CEC

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

Fieldbus interfaces



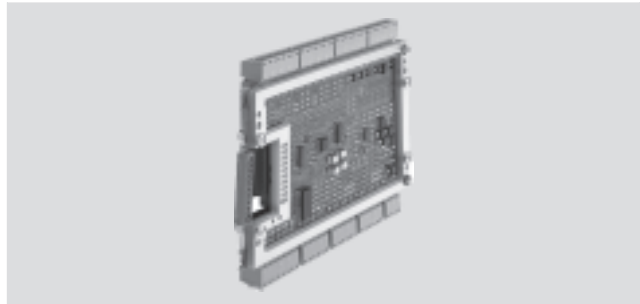
General technical data	
CPU data	32-bit RISC processor, 24 MHz
	Watchdog
Programming software	CoDeSys provided by Festo
Programming language	SFC, STL, FCH, LDR and ST to IEC 61131-3
	Additionally CFC
Ethernet	
Connector plug	RJ45
Number	1
Transmission rate	10 Mbit/s
Supported protocols	TCP/IP
	EasyIP
Fieldbus interface	
Type	CAN
Connection technology	Sub-D plug, 9-pin
Transmission rate	1 Mbit/s max., adjustable
Supported protocols	CANopen
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
Ordering data	
	Part No. Type
Controller	559 869 FED-CEC

Operator units FED, embedded control

Accessories

I/O module FED-UIIM

Plug-in card for installation in the operator units FED-500, 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
Absolute accuracy at 25 °C	[%]	0.1
Linearity error at 25 °C	[%]	0.1
Input resistance	[Ω]	47 with current
Analogue outputs		
Number		4
Resolution	[bit]	12
Max. load resistance	[Ω]	470
Signal range	[V]	±10
	[mA]	0 ... 20
	[mA]	4 ... 20
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]	≤ 6
Nominal value for FALSE	[V DC]	12 ... 30
Electrical isolation		Yes, via optocoupler

Operator units FED, embedded control

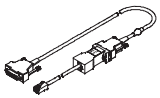
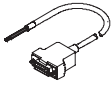
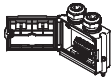
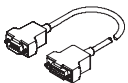
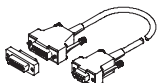
Accessories




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
Ordering data		
	Part No.	Type
I/O module	559 870	FED-UIM

Operator units FED

Accessories

FESTO

Ordering data – Cables and plugs					
	Description	Electrical connection	Cable length [m]	Part No.	Type
	For connecting to FEC Compact/Standard controller	Plug RJ12 Sub-D socket, 15-pin	1.8	189 432	FEC-KBG6
	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	539 642	FEC-KBG7
	Suitable for control block CPX-FEC for combining with cable FEC-KBG7	Sub-D plug, 9-pin	–	534 497	FBS-SUB-9-GS-1X9POL-B
	For connecting to control block CPX-FEC	Sub-D plug, 15-pin Sub-D socket, 15-pin	2.5	539 643	FEC-KBG8
	Programming cable	Sub-D plug, 15-pin Sub-D socket, 15-pin	3	533 534	FEDZ-PC

Ordering data					
	Description	Electrical connection	Part No.	Type	
Bus interface					
	Ethernet interface module (Controller software FST)	Sub-D adapter, 9-pin to RJ45	533 533	FEDZ-IET	
	Ethernet TCP interface module (Controller software CoDeSys)	Sub-D adapter, 9-pin to RJ45	543 450	FEDZ-IET TCP	
Memory card					
	User memory 32 MB		543 514	FEDZ-MEM32	