- Network connection optional
- Simple planning via the WYSIWYG editor
- FED-90 additionally with PC/printer interface
- Mains-independent real-time clock

Operator units FED, Front End Display

Key features

FED-50

FED-90

Front End Displays FED-50 and FED-90

Sturdy and multi-functional:
The Front End Display FED-50/90 acts as the interface between man and machine. It displays program sequences and provides the machine operator with a convenient way of entering data and commands.

The FED offers a sturdy hardware basis to facilitate long-term integration of its features into automation solutions. It also features a sturdy metal housing and high-quality touch-sensitive keyboard.

The keys are designed to provide the user with instant feedback when a key is pressed. Additional acknowledgement is provided via LEDs.
The keys can be assigned a wealth of functions.

Simple programming:
The user-friendly Windows software FED Designer is provided for simple programming.
This software permits graphical WYSIWYG planning, with the user immediately shown the output by the FED.

The perfect companion to FEC:
FED Designer is one of the Festo software tools (FST4, Part No. 191 440) and is also extremely compatible with the programming software for the FECs.
This means that the FST allocation list can be directly read in, permitting planning using symbolic operands.
The FED is therefore the perfect companion to FEC® controllers.

- Compatible with FEC®, IPC and SF3 controllers and other Festo products based on FEC®.
- Easy to operate terminal for controlling automation tasks at field level.
- Simple graphical display means the terminal can be used for applications which previously required more costly terminals.
- Easy to plan thanks to object-oriented programming with intuitive software.

Operator units FED, Front End Display

Key features

FED hardware

Housing/mechanical construction

The housing of the FED is of a very sturdy mechanical design. The mylar film on the front protects the keyboard and display, while the metal housing protects the electronics. Once installed in a control panel or control cabinet, the FEDs are protected to IP65.

The display is backlit to ensure accurate readings even when visibility is poor.

Power supply

The FEDs are supplied with 24 V DC, as usual in automation applications. However they will also work reliably in the range from 18 to 30 V DC.

The devices are equipped with electronic polarity reversal and overload protection.

Interfaces

A serial interface is available for programming and connecting the FED to a controller. The FED can alternatively be equipped with an Ethernet interface, with a fieldbus interface planned for the future.

The FED-90 also has an interface for a serial printer.

Real-time clock

The battery-buffered real-time clock ensures that the FED always has the right time.
This means that printouts, for example, can be scheduled. Alarms and events are stored using the system time.

The battery can be replaced by the user if necessary.

The functions of the FED

Communication
The FED can communicate serially with a controller, as well as via Ethernet and the EasyIP protocol. It then becomes part of a system with distributed and networked intelligence.
Both drivers can also be loaded (dual protocol) if the application requires this. The FED then becomes the gateway between a controller with a serial connection and an EasyIP network.
The FED-90 also masters complex disciplines such as communication via a modem and looping of PC signals to the connected controller.

Memory
The FED is equipped with a generous memory to ensure that you do not have to scrimp on words. However the FED's brain provides more than memory.
Its recipe function allows it to save data which can either be loaded onto or read from the controller. It can therefore serve as a failsafe memory extension for the FEC.
Alarms are stored in a list with timestamps, again failsafe . This ensures that the time at which errors or events occurred on the machine can always be established.
The FED also stores the entire project in its 'head' so that it can be loaded from the memory if service is required. This means that the most recent version is always available.

Security
All functions can be password protected to prevent unauthorised access. Since the service personnel usually have different authorisations to the machine operators, up to 8 password levels are available.
The project upload function can also be password protected to safeguard know-how.

Multi-lingual
Multi-lingual projects are easily handled in the FED, as is switching between languages while the unit is running.
In order to make things as user-friendly as possible, all texts can be exported and edited in a table editing program. This means that projects can be easily translated, even without the FED Designer.

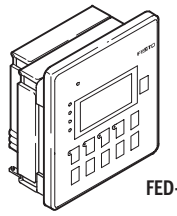
Display
The FED represents process data not only as plain text, but also with simple graphics. Bar charts are a quick way of providing information on filling levels and pressure or temperature ranges. Simple monochrome graphics and symbols can be imported. Dynamic displays can be created by linking these graphics and symbols with operands.

Completely new character sets can, if necessary, be used in the FED. These character sets can be created or changed by the user.

Operator units FED, Front End Display

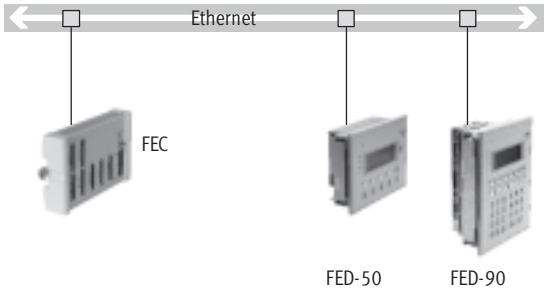
Peripherals overview

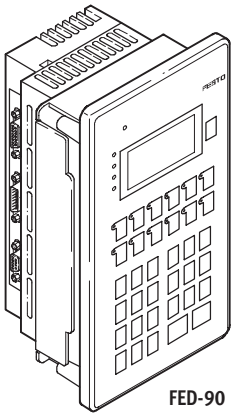
Key features



FED-50

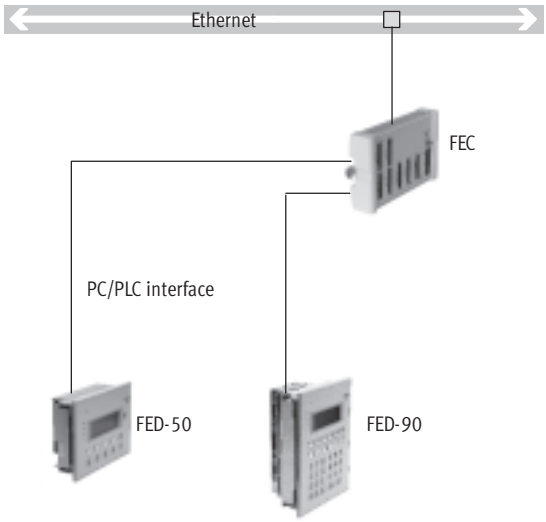
- Illuminated monochrome LCD display
- 4 lines of 20 characters each
- Graphics capability (120x32 pixels)
- 4 function keys
- 7 system keys
- 5 user LEDs
- 4 system LEDs
- Hardware RTC
- Ethernet interface (optional)
- PC/PLC interface RS-232, RS-422, RS-485, CL 20 mA
- 512 kB memory
- Mains-independent real-time clock





FED-90

- Illuminated monochrome LCD display
- 4 lines of 20 characters each
- Graphics capability (120x32 pixels)
- 12 function keys
- 23 system keys
- 13 user LEDs
- 4 system LEDs
- Hardware RTC
- Ethernet interface (optional)
- PC/PLC interface RS-232, RS-422, RS-485, CL 20 mA
- 512 kB memory
- Printer interface
- Mains-independent real-time clock



Welding environment

Control and display units FED have a high-quality metal/plastic design.

Suitable covers should be used to prevent the terminal being damaged as a result of welding spatter.

Operator units FED, Front End Display

Technical data – FED-50

Festo offers different machine operation solutions depending on the task at hand. The connection between the controller and MMI (man-machine interface) is established by means of a serial interface or alternatively via Ethernet.

The graphics-capable Front End Displays (FED) are designed for easy and cost-effective operation of machines. They can be used to perform a range of activities:

- Changing values such as times and counter values, for example
- Making changes to the machine process
- Displaying system states via numerical data fields, bar charts or text messages
- Assigning machine functions to function keys
- Displaying and storing alarms

The Front End Displays are equipped with password protection to prevent unauthorised use.

Operator units FED, Front End Display

Technical data – FED-50

FESTO

General technical data			
Type			**FED-50**
Part No.			**533 531**
PC/PLC interface			RS-232, RS-422, RS-485, CL 20 mA (active) 15-pin Sub-D plug
AUX interface			9-pin Sub-D coupling
Protection class to EN 60 529			IP65 (in assembled state)
Certification			CE
Dimensions (HxWxD)		[mm]	109x149x65
Weight		[g]	485
			PWIS-free (free of paint-wetting impairment substances)

Electromagnetic compatibility (EMC)			
Emitted interference	To EN 55 011		Class A
Radio compatibility for electromagnetic fields	0.08 ... 1 GHz, to ENV 50 140	[V/m]	10
	900 MHz, to ENV 50 204	[V/m]	10
Compatibility with interference caused by radio frequency fields	0.15 ... 80 MHz, to ENV 50 141	[V]	10
Quick charge eliminator to EN 61 000	Power supply	[kV]	2
	Signal lines	[kV]	1
Electrostatic discharge to EN 61 000	Into the air	[kV]	8

Electrical data			
Operating voltage		[V DC]	18 ... 30
Current consumption	max.	[mA]	250
Fuses			Electronic overload protection

Display			
Type			LCD
Dimensions	HxW	[mm]	21X70
	Diagonal	[inch]	2.8
Lines			4
Characters per line			20
Illumination			LED
Graphical display		[pixels]	120x32

Control panel	
Function keys	4
System keys	7
User LEDs	5
System LEDs	4
Keyboard reliability	>3 million operations

Performance data		
Programming rate	[baud]	9600 ... 38400
User memory	[kB]	512
Recipe memory	[kB]	16
Hardware clock		Yes
Alarms		1024
Loadable characters		256
Event list, buffered via battery		256
Programming software		Designer Version 6.0 (or higher)
Password protection	[levels]	8

Operator units FED, Front End Display

Technical data – FED-50

Battery[1]		
Designation[2]		CR 2430
Type		Lithium
Voltage	[V]	3
Current	[mA]	270
Service life	[year]	1

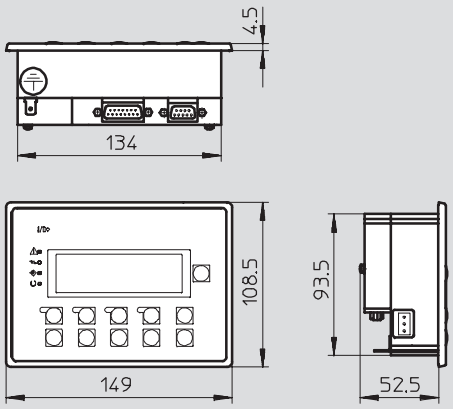
1) The batteries used must correspond to the abovementioned data at least.
2) The designation is specific to the manufacturer. If you wish to use a battery from another manufacturer, please request the corresponding type designation specifying the designation given here. Note the specifications relating to the operating temperature of the FED. The battery must comply with these specifications at least.

Ambient conditions		
Operating temperature	[°C]	0 ... +50
Storage temperature	[°C]	-20 ... +70
Relative air humidity	[% RH]	85, non-condensing
Corrosion resistance class CRC[1]		2
Vibration resistance		To DIN/IEC 68/EN 60 068, Parts 2-6 • 10 ... 57 Hz, 0.075 mm peak • 57 ... 150 Hz, 1G
Shock resistance		To DIN/IEC 68/EN 60 068, Parts 2-27 • 50 g, 11 ms, 3 pulses per axis

1) CRC2: Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Dimensions

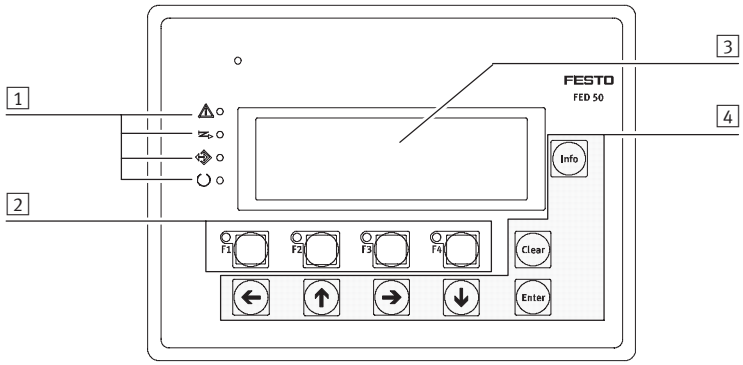
Download CAD data ➔ **www.festo.com/en/engineering**



Operator units FED, Front End Display

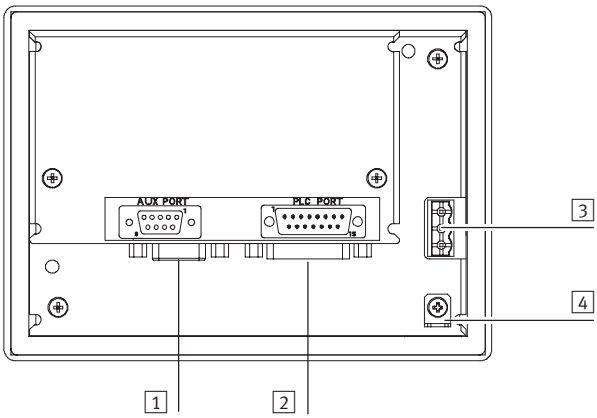
Technical data – FED-50

Display and control elements



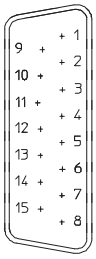
1 System LEDs
2 Function keys
3 LCD display
4 System / navigation keys

Interfaces

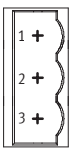


1 AUX interface
(the pin allocation depends on the communication module installed)
2 PC/PLC interface
3 Power supply
4 Earthing terminal

Pin allocation for PC/PLC interface (plug view)

View	Pin	PLC port
	1	Housing earth
	2	RXD
	3	TXD
	4	+5 V output (max. 100 mA)
	5	GND
	6	CHA-
	7	CHB-
	8	TX +20 mA
	9	TX - 20 mA
	10	RTS
	11	CTS
	12	RX +20 mA
	13	RX - 20 mA
	14	CHA+
	15	CHB+

Pin allocation for power supply (plug view)

View	Pin	Allocation
	1	Protective earth
	2	0 V
	3	+ 24 V DC

Operator units FED, Front End Display

Technical data – FED-90

Festo offers different machine operation solutions depending on the task at hand. The connection between the controller and MMI (man-machine interface) is established by means of a serial interface or alternatively via Ethernet.

The graphics-capable Front End Displays (FED) are designed for easy and cost-effective operation of machines. They can be used to perform a range of activities:

- Changing values such as times and counter values, for example
- Making changes to the machine process
- Displaying system states via numerical data fields, bar charts or text messages
- Assigning machine functions to function keys
- Displaying and storing alarms

The Front End Displays are equipped with password protection to prevent unauthorised use.

Operator units FED, Front End Display

Technical data – FED-90

FESTO

General technical data			
Type			**FED-90**
Part No.			**533 532**
PC/printer interface			RS-232, 15-pin Sub-D socket
PLC interface			RS-232, RS-422, RS-485, CL 20 mA (active) 15-pin Sub-D plug
AUX interface			9-pin Sub-D coupling
Protection class to EN 60 529			IP65 (in assembled state)
Certification			CE
Dimensions (HxWxD)		[mm]	176x141x65
Weight		[g]	895
			PWIS-free (free of paint-wetting impairment substances)

Electromagnetic compatibility (EMC)			
Emitted interference	To EN 55 011		Class A
Radio compatibility for electromagnetic fields	0.08 ... 1 GHz, to ENV 50 140	[V/m]	10
	900 MHz, to ENV 50 204	[V/m]	10
Compatibility with interference caused by radio frequency fields	0.15 ... 80 MHz, to ENV 50 141	[V]	10
Quick charge eliminator to EN 61 000	Power supply	[kV]	2
	Signal lines	[kV]	1
Electrostatic discharge to EN 61 000	Into the air	[kV]	8

Electrical data			
Operating voltage		[V DC]	18 ... 30
Current consumption	max.	[mA]	300
Fuses			Electronic overload protection

Display			
Type			LCD
Dimensions	HxW	[mm]	21X70
	Diagonal	[inch]	2.8
Lines			4
Characters per line			20
Illumination			LED
Graphical display		[pixels]	120x32

Control panel	
Function keys	12
System keys	23
User LEDs	13
System LEDs	4
Keyboard reliability	>3 million operations

Operator units FED, Front End Display

Technical data – FED-90

Performance data		
Programming rate	[baud]	9600 ...38400
User memory	[kB]	512
Recipe memory	[kB]	32
Hardware clock		Yes
Alarms		1024
Loadable characters		256
Event list, buffered via battery		256
Programming software		Designer Version 6.0 (or higher)
Password protection	[levels]	8

Battery[1)]		
Designation[2)]		CR 2430
Type		Lithium
Voltage	[V]	3
Current	[mA]	270
Service life	[year]	1

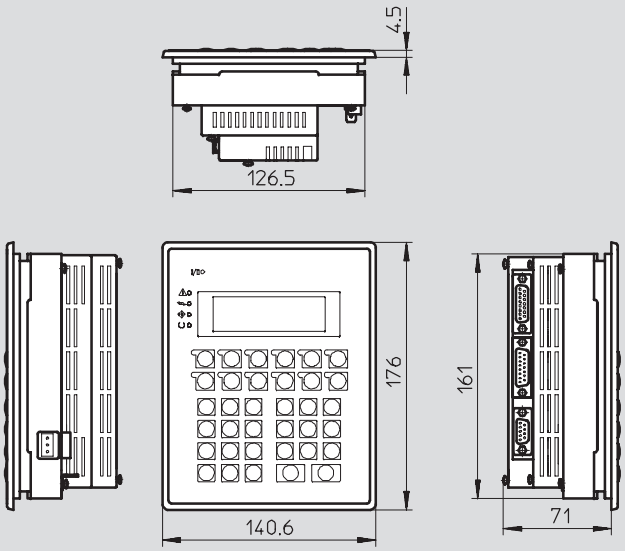
1) The batteries used must correspond to the abovementioned data at least.
2) The designation is specific to the manufacturer. If you wish to use a battery from another manufacturer, please request the corresponding type designation specifying the designation given here. Note the specifications relating to the operating temperature of the FED. The battery must comply with these specifications at least.

Ambient conditions		
Operating temperature	[°C]	0 ... +50
Storage temperature	[°C]	-20 ... +70
Relative air humidity	[% RH]	85, non-condensing
Corrosion resistance class CRC[1)]		2
Vibration resistance		To DIN/IEC 68/EN 60 068, Parts 2-6 • 10 ... 57 Hz, 0.075 mm peak • 57 ... 150 Hz, 1G
Shock resistance		To DIN/IEC 68/EN 60 068, Parts 2-27 • 50 g, 11 ms, 3 pulses per axis

1) CRC2: Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Dimensions

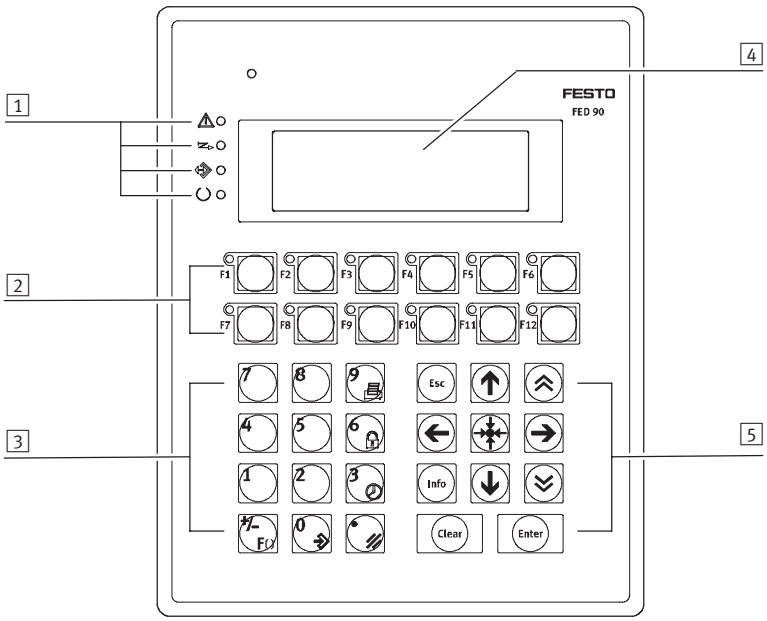
Download CAD data ➔ **www.festo.com/en/engineering**



Operator units FED, Front End Display

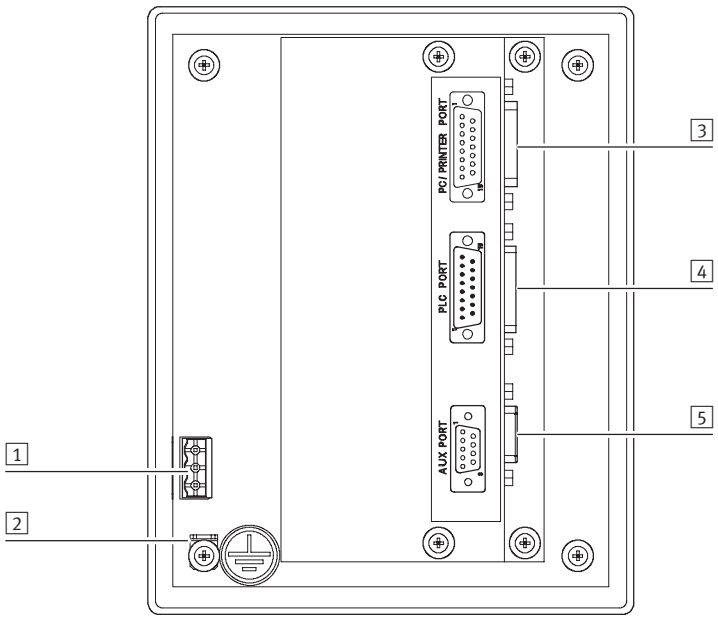
Technical data – FED-90

Display and control elements

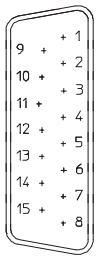


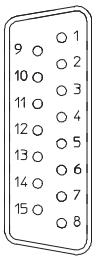
1 System LEDs
2 Function keys
3 System / numerical keys
4 LCD display
5 System / navigation keys

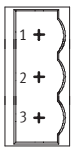
Interfaces



1 Power supply
2 Earthing terminal
3 PC/printer interface
4 PLC interface
5 AUX interface
(the pin allocation depends on the communication module installed)

Pin allocation for PLC interface (plug view)		
View	Pin	Allocation
	1	Housing earth
	2	RXD
	3	TXD
	4	+5 V output (max. 100 mA)
	5	GND
	6	CHA-
	7	CHB-
	8	TX + 20 mA
	9	TX - 20 mA
	10	RTS
	11	CTS
	12	RX + 20 mA
	13	RX - 20 mA
	14	CHA+
	15	CHB+

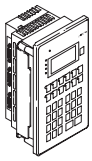
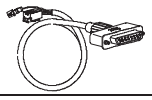
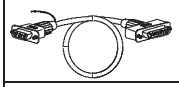
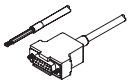
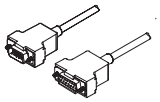
Pin allocation for PC/printer interface (socket view)		
View	Pin	Allocation
	1	Housing earth
	2	RXD
	3	TXD
	4	+5 V output (max. 100 mA)
	5	GND
	6	Reserved
	7	Reserved
	8	Reserved
	9	Reserved
	10	RTS
	11	CTS
	12	Reserved
	13	Reserved
	14	Reserved
	15	Reserved

Pin allocation for power supply (plug view)		
View	Pin	Allocation
	1	Protective earth
	2	0 V
	3	+ 24 V DC

Operator units FED, Front End Display

Technical data

FESTO

Ordering data			
	Description	Part No.	Type
	Operator unit, Front End Display	**533 531**	**FED-50**
	Operator unit, Front End Display	**533 532**	**FED-90**
	Bus connection, Ethernet interface module for FED	**533 533**	**FEDZ-IET**
	Programming cable	**533 534**	**FEDZ-PC**
	Connecting cable, FEC (RJ11, COM) to FED	**189 429**	**FEC-KBG3**
	Connecting cable, FEC (RJ12, COM and EXT) to FED	**189 432**	**FEC-KBG6**
	Connecting cable CPX-FEC to FED, 5 m for assembly with plug FBS-SUB-9-GS-1X9POL-B (Part No. 534 497)	**539 642**	**FEC-KBG7**
	Connecting cable CPX-FEC to FED, 2,5 m	**539 643**	**FEC-KBG8**