Diagnostic modules GFDM

FESTO

Diagnostic modules GFDM

Key features

Overview

The diagnostic module GFDM is a diagnostic system for the continuous monitoring of the pressure, flow and cycle consumption of a pneumatic system.

By permanently comparing the measured values with reference data, it is possible to evaluate the

monitored parameters using multi-stage limit values. The monitoring parameters can also be mapped and exported to trend data report over a longer period.

Faults can thus be detected early and maintenance intervals can be planned efficiently.

The system includes sensors (a flow sensor and a pressure sensor) for recording the measured values, a controller for evaluation and one of two visualisation options.

Note

There are also accompanying services for this product. Information is available from our consultants or on the Internet at www.festo.com.

Input
Output

[l/min]

Process Quality

[l]

Energy Monitoring

[l] ≙ €

Process Cost Calculation
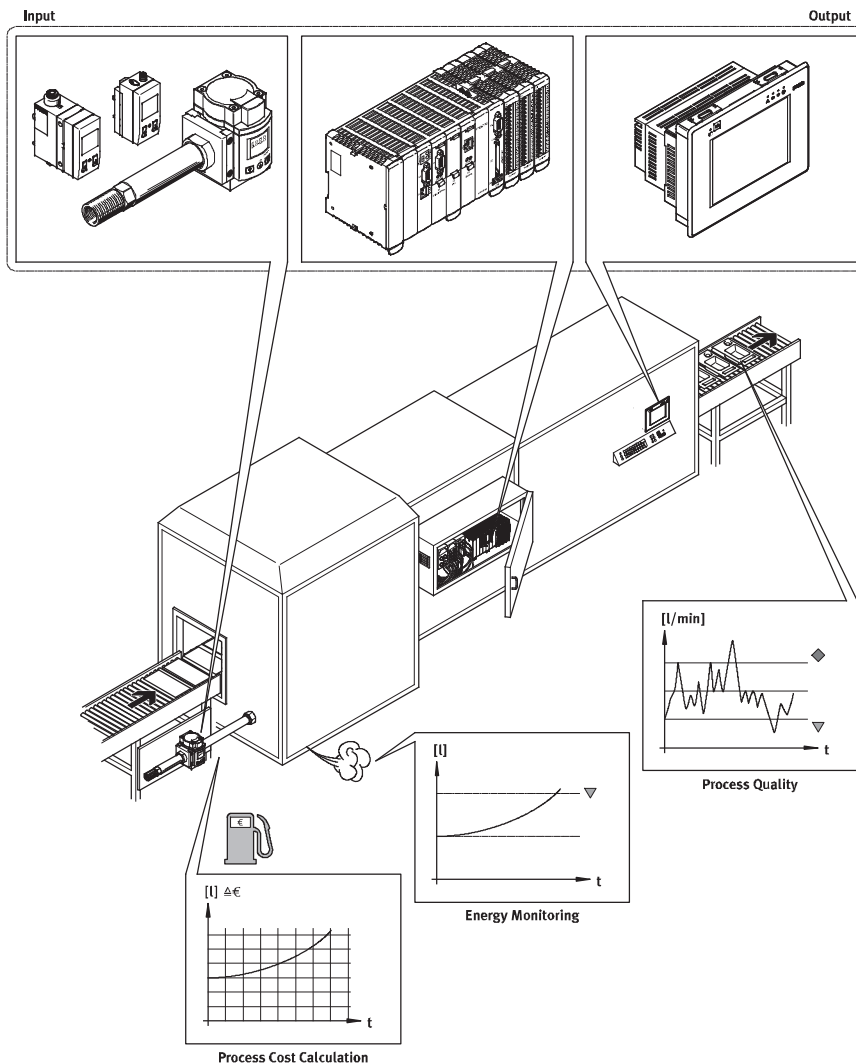
Key features

- Autonomous system, which is equally suitable for retrofitting in existing systems or for installation in new systems.
- Limit monitoring and trend information for the timely detection of deviations.

- Automatic reference data acquisition (teach-in) and easy operation.
- Trigger signals for the measurement duration of air consumption can be adapted to different processes and can be linked directly to GFDM.

- Separate monitoring of different operating states of a system such as automatic or stop.
- Monitoring of up to 16 different process sequences on one system.

- Status analysis directly for the system operator.
- Decentralised visualisation in the office using the SCADA system.

System requirements

Air quality	Flow	Trigger	Network environment
The quality of compressed air must comply with air quality class ISO 8573-1:2010 [7:4:4] as a minimum. If there is any uncertainty in this regard, Festo can offer the "Festo Air Quality Test" service.	You can prevent sensors from being affected dynamically by switching the compressor on and off in normal, buffered operation. The diagnostic module GFDM requires flow sensors with an analogue output of 4 … 20 mA to monitor the flow rate. The configurator for the GFDM offers two chosen flow sensors with different flow rate measuring ranges for selection. The flow sensor SFAB covers the 2 … 200 l/min range, while the flow sensor SFAM covers the 50 … 5,000 l/min range. Determine the flow rate at the position in your system where the flow rate is later to be monitored. Festo offers the "Festo Energy Saving Service" service for this purpose.	To measure the air consumption of cyclical process sequences, external trigger signals from a PLC are required; these determine the start and stop time for consumption measurement. They can be communicated to the controller via one or two digital signals. Alternatively, a time trigger can be used, which determines the cycle consumption for a selected period independently of the process. No additional digital signals are required in this case.	Either a front-end display FED or a PC can be used to view the results. The front-end display FED is designed to display the results directly at the system. To transfer the results to a PC over a longer distance, a TCP/IP connection via Ethernet is required.

Recommendations and instructions for installation

Bypass before installation	Controller	PLC	Digital controller outputs
Installing a bypass in the system's supply line, e.g. downstream of the service unit, means that the sensors for GFDM can be replaced during commissioning or at any other time without disrupting system operation.	The controller should be positioned as close to the PLC as possible. The following points must be observed with respect to control cabinet installation: • Power supply, electrical isolation. • Sufficient space for H-rail mounting. • Cable length of max. 2.5 m for the serial connection between the controller and operator unit (if using the front-end display FED for visualisation). • The scope of delivery only includes M12 sockets, 5-pin, for the sensor connection. The screened cable for connecting the sensors to the controller must be assembled by the user.	If you wish to assign the system status to the current operating mode (automatic, stop mode) or the current batch/product number, this information must be communicated to the controller from the PLC. An 8-bit interface is available for this purpose, which connects the digital outputs of the PLC with the inputs of the controller. A distinction can then be made between max. 16 different operating states and max. 16 different product numbers.	The digital outputs of the controller with the overall status display can be used as a traffic light signal on the system. Alternatively, the signals can be read in from a controller in order to generate warnings in a monitoring system.

Diagnostic modules GFDM

Key features

Software
Overview

The easy-to-use software was specially developed for the diagnostic module GFDM.
In addition to providing basic visualisation and data acquisition functions, the software also handles networking, data archiving or alerting tasks. It also supports the development of application-specific projects.

The software performs the following functions:
• Parameterisation of the diagnostic module.
• Recording of measured values and diagnostic results (logging).
• Visualisation of current and archived measured values and diagnostic results.
• Configurable error messages.

• Creation and saving of multiple projects.
• Open, standard OPC interface (OLE for Process Control) for data exchange in all directions.

Note

The software runs on the Windows platforms 2000, Server 2003 and XP.

For external visualisation on a standard or industrial PC, a USB port is required for the supplied dongle.
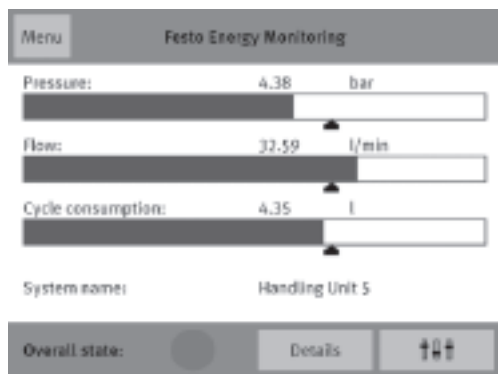
Sample views

Master view:
• Numerical display of the most recent measured values for pressure, flow and cycle consumption.

• Graphical display of the current measured values in comparison with the reference value.
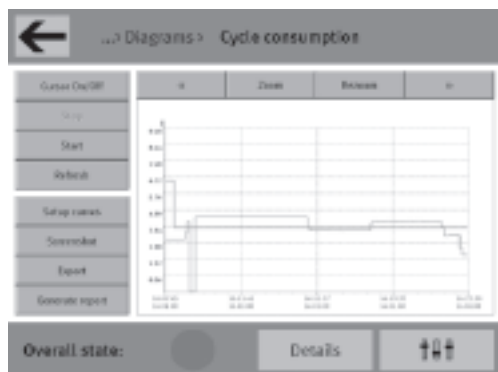
Display settings menu:
• Language selection for menu, dialogues and information.
• Unit selection for measured values.

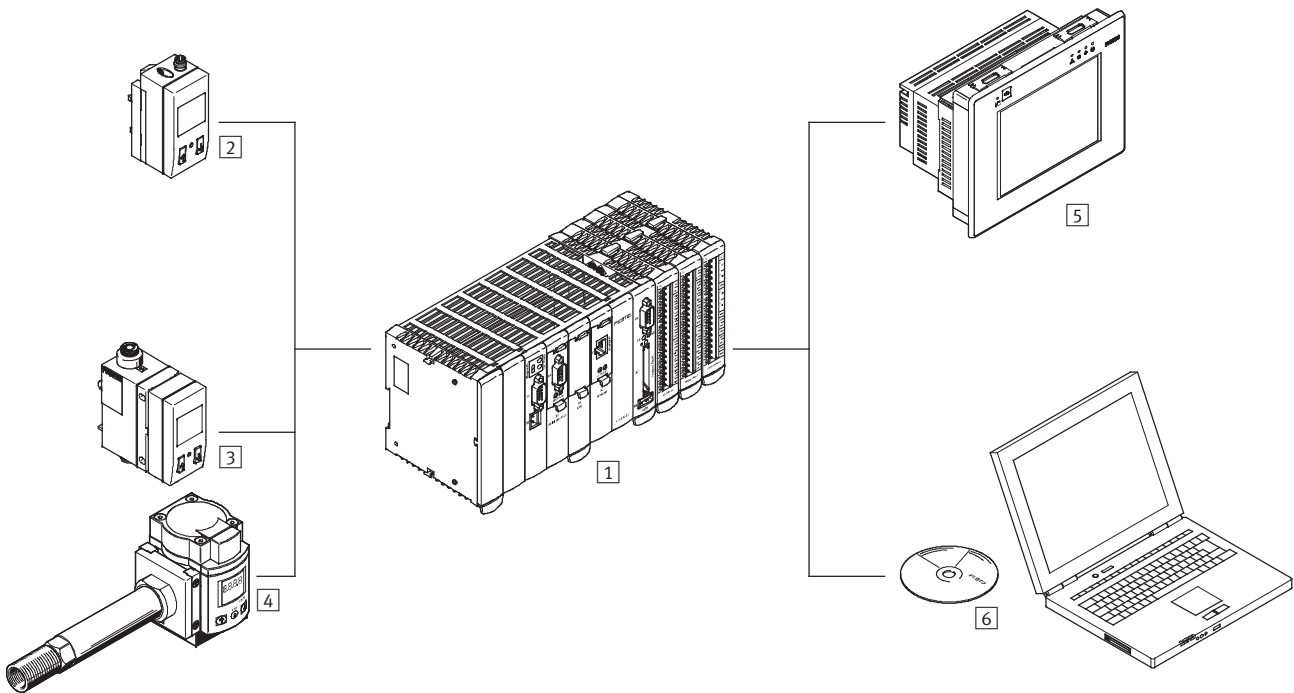Graphical display of the measured values over a period of time:

Tabular display of the measured values over a period of time:

➜ **Internet: www.festo.com/catalog/…**   Subject to change – 2012/06

Diagnostic modules GFDM

Key features

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Components of the GFDM		Technical data ➔ Page/Internet	Modular product system ➔ Page/Internet
1	Controller CECX-K-D1	6	20
2	Pressure monitoring with pressure sensor SDE1	9	
3	Flow monitoring with flow sensor SFAB	12	
4	Flow monitoring with flow sensor SFAM	15	
5	Direct visualisation with front-end display FED using software "GFDM for FED-500"	18	
6	External visualisation on a standard or industrial PC using software "GFDM for VipWin"	–	

Diagnostic modules GFDM

Technical data – Controller CECX

General technical data	
Monitoring options	Pressure
	Flow
	Cycle consumption
Measuring rate [ms]	10
Displayable unit(s)	SI units
	US units
Accuracy	±(3% o.m.v. + 0.3% FS)[1]
Reproducibility of analogue value	±(0.8% o.m.v. + 0.2% FS)[1]
Process interfacing	Digital interface
Reference data	For operating status
	For product number
Monitoring state/status	Green – normal operation
	Yellow – warning
	Orange – maintenance instruction
	Red – alarm
	Grey – no status available
Serial interface, number	1

1)   % o.m.v. = % of measured value
     % FS = % of the measuring range final value (full scale)

Electrical data	
Operating voltage [V DC]	24 +25%/–15%
Switching output	PNP
	NPN
Trigger signal	Two signals: start + stop
	One signal: stop = start
	No signal: time trigger
Update rate [s]	2
Protection class	IP20

Materials	
Note on materials	Contains paint wetting impairment substances

Technical data – Controller CECX

Digital inputs		
Number		10
Input voltage/current	[V DC]	24
Nominal value for TRUE	[V DC]	≥ 15
Nominal value for FALSE	[V DC]	≤ 5
Input signal delay		20 ms, 200 ms, adjustable
Electrical isolation		Yes, via optocoupler
Status display		LED

Analogue inputs		
Number		2
Signal range	[mA]	4 … 20
Resolution	[bit]	14
Conversion time	[ms]	1
Absolute accuracy at 25 °C	[%]	±0.01

Digital outputs		
Number		4
Contact		Transistor
Output voltage	[V DC]	24
Output current	[A]	2 (at 50% concurrence)
Short circuit proof		Yes
Electrical isolation		Yes, via optocoupler
Electrical isolation in groups		Yes, in 2 groups
Status display		LED

Analogue outputs	
Number	0

Ethernet	
Number	1
Supported protocols	OPC

Diagnostic modules GFDM

Technical data – Controller CECX

Dimensions

266.5
247.5
4
22.5 ±1
72 ±1
121 ±2
100 ±2

1	Cover for K-Bus interface	3	Mounting plate (2 included in scope of delivery)	4	H-rail (not included in scope of delivery)
2	Cover for battery				
				5	Locking catch
				6	CF card
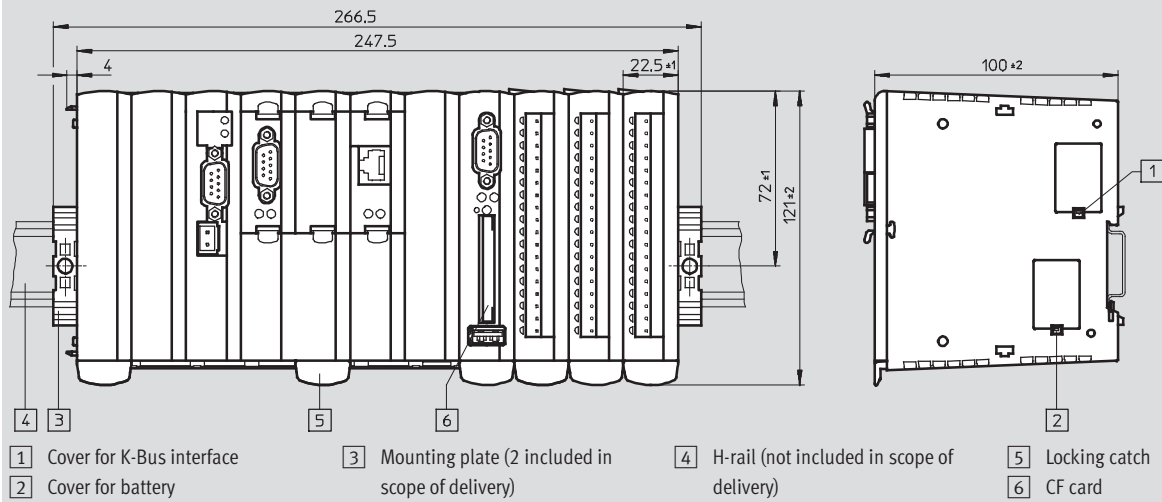
Peripherals overview
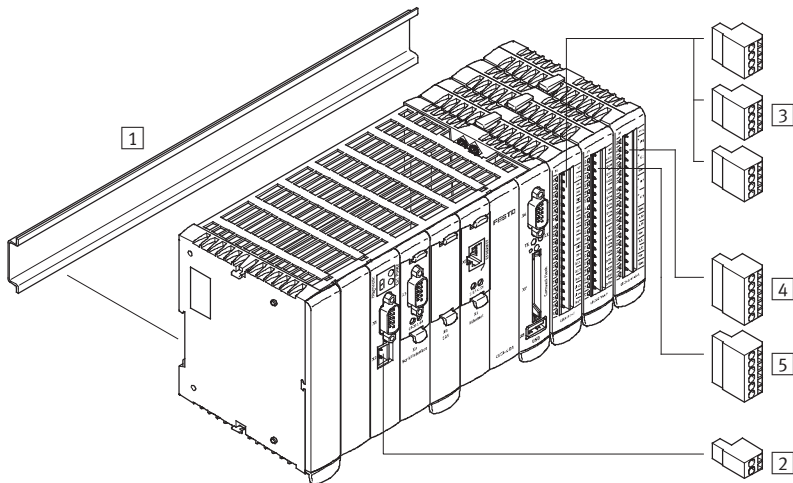
Accessories			Included in scope of delivery
1	H-rail TS3 35x7.5	For H-rail mounting	–
2	Plug NECC-L1G2-C1	2-pin, for power supply	■
3	Plug NECC-L1G4-C1	4-pin, for the digital inputs of signals of a PLC (2 lines for trigger signals, 4 lines each for operating status and product number)	■
4	Plug NECC-L1G6-C1	6-pin, for the analogue input of sensor signals (pressure and flow)	■
5	Plug NECC-L1G6-C1	6-pin, for the digital output of status signals, e.g. for the connection of an external traffic light with 4 indicators	■

Diagnostic modules GFDM, pressure monitoring

FESTO

Technical data – Pressure sensor SDE1

Variant:

Pressure monitoring P

➔ Modular product system on page 20

General technical data	
Certification	C-Tick
	cULus recognized (OL)
CE mark (see declaration of conformity)	To EU EMC Directive[1]
Note on materials	RoHS-compliant
	Free of copper and PTFE

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: 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.

Input signal/measuring element		
Measured variable		Relative pressure
Method of measurement		Piezoresistive pressure sensor with display
Pressure measuring range	[bar]	0 … 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Temperature of medium	[°C]	0 … +50
Ambient temperature	[°C]	0 … +50

Output, general		
Accuracy FS[1]	[%]	2

1) % FS = % of the measuring range final value (full scale)

Switching output		
Switching output		PNP
Switching function		Freely programmable
Switching element function		Switchable
Reproducibility of switching value	[%]	0.3
Max. output current	[mA]	150

Analogue output		
Analogue output	[mA]	4 … 20

Output, additional data	
Protection against short circuit	Pulsed

Electronic components		
Operating voltage range DC	[V]	15 … 30
Reverse polarity protection		For all electrical connections

Diagnostic modules GFDM, pressure monitoring

Technical data – Pressure sensor SDE1

FESTO

Electromechanical components	
Electrical connection	Plug M12x1, 4-pin, round design to EN 60947-5-2

Mechanical components		
Type of mounting		Via H-rail
		Via wall/surface bracket
Mounting position		Any
Pneumatic connection		G⅛
Product weight	[g]	85
Housing materials		PA, POM-reinforced

Note: This product conforms to ISO 1179-1 and ISO 228-1

Display/operation		
Display type		Illuminated LCD
Setting options		Teach-in
Threshold value setting range	[%]	2 … 99.8
Hysteresis setting range	[%]	0 … 90

Immissions/emissions	
Protection class	IP65
Corrosion resistance class CRC[1]	2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Dimensions

Download CAD Data → www.festo.com/us/cad
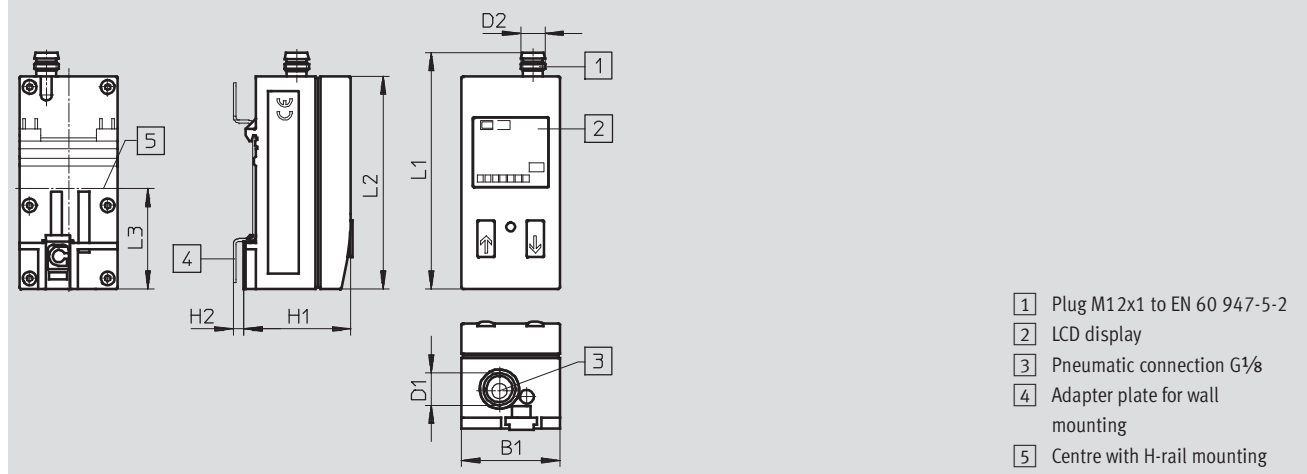
1 Plug M12x1 to EN 60 947-5-2
2 LCD display
3 Pneumatic connection G⅛
4 Adapter plate for wall mounting
5 Centre with H-rail mounting

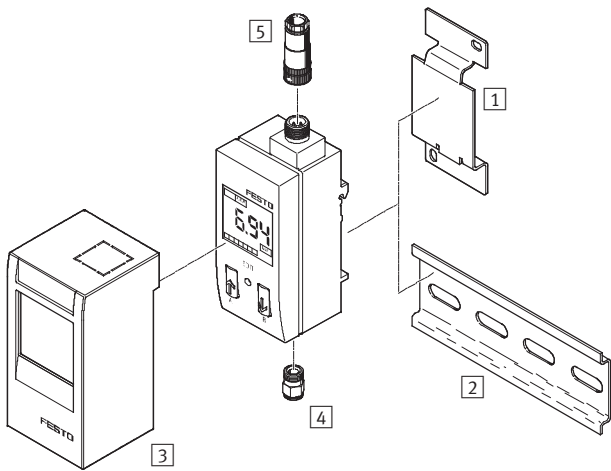| B1	D1	D2	H1	H2	L1	L2	L3
32.3	G⅛	M12	35.2	3.5	87	70	33

Note: This product conforms to ISO 1179-1 and ISO 228-1

Diagnostic modules GFDM, pressure monitoring

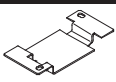Technical data – Pressure sensor SDE1

Peripherals overview

Note

The screened cable for connecting the sensor to the controller is not included in the scope of delivery.

Accessories		Included in the scope of delivery
[1] Adapter plate SDE1-…-W-…	For wall mounting	→ 11
[2] Mounting rail to DIN EN 50022	For H-rail mounting	–
[3] Protective cover SDE1-SH	Protects the SDE1 from unauthorised adjustment	→ 11
[4] Push-in fitting QS-⅛-8	For tubing O.D. of 8 mm	■
[5] Plug socket FBSD-GD-9-5POL	For electrical connection	■

Ordering data – Accessories		Part No.	Type
	Adapter plate	194297	SDE1-…-W-…
	Protective cover	537074	SDE1-SH

Diagnostic modules GFDM, flow monitoring

Technical data – Flow sensor SFAB

Variant:

Flow monitoring QA

➔ Modular product system on
page 20

General technical data	
Certification	C-Tick
	cULus recognized (OL)
CE mark (see declaration of conformity)	To EU EMC Directive[1]
Note on materials	RoHS-compliant

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: 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.

Input signal/measuring element		
Measured variable		Flow rate, consumption
Direction of flow		Unidirectional P1 ⟶ P2
Measuring principle		Thermal
Flow measuring range	[l/min]	2 ... 200
Operating pressure	[bar]	0 ... 10
Nominal pressure	[bar]	6
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
		Nitrogen
Temperature of medium	[°C]	0 ... +50
Ambient temperature	[°C]	0 ... +50
Nominal temperature	[°C]	23

Output, general[1], [2]		
Accuracy of zero point ±FS	[%]	0.3
Accuracy of margin ±FS	[%]	3
Repetition accuracy of zero point ±FS	[%]	0.2
Repetition accuracy of margin ±FS	[%]	0.8
Temperature coefficient of margin ±FS/K	[%]	≤0.1
Pressure dependence of margin ±FS/bar	[%]	0.5

1) Accuracy with nominal conditions (6 bar, 23 °C and horizontal installation position)
2) % FS = % of the measuring range final value (full scale)

Diagnostic modules GFDM, flow monitoring

Technical data – Flow sensor SFAB

Switching output		
Switching output		2x PNP or 2x NPN, adjustable
Switching function		Window comparator or threshold value comparator, adjustable
Switching element function		N/C or N/O contact, adjustable
Switch-on time		Adjustable (factory setting: approx. 80 ms)
Switch-off time		Adjustable (factory setting: approx. 80 ms)
Max. output current	[mA]	100
Voltage drop	[V]	Max. 1.5
Inductive protective circuit		Adapted to MZ, MY, ME coils

Analogue output		
Characteristic curve for flow rate	[l/min]	0 … 200
Output characteristic curve for current	[mA]	4 … 20
Rise time	[ms]	Possible settings: 15, 30, 60 (factory setting), 125, 250, 500, 999
Max. load resistance at current output	[ohms]	500

Output, additional data	
Protection against short circuit	Yes
Protection against overloading	Yes

Electronic components		
Operating voltage range	[V DC]	15 … 30
Reverse polarity protection		For all electrical connections

Electromechanical components		
Electrical connection		Straight plug, M12x1, 5-pin
Max. connecting cable length	[m]	<10

Mechanical components		
Type of mounting		Via through-hole
		Via H-rail
		Via accessories
Mounting position		Horizontal ±5°
Pneumatic connection		QS-8
Product weight	[g]	160
Housing materials		PA-reinforced

Display/operation		
Display type		Illuminated LCD, blue
Displayable units		l/min, l/h, scfm, l, m^3, scf
Setting range for flow rate threshold value		1% FS … 100% FS
Setting range for consumption	[l]	1 … 1,999.9
impulse threshold value	[m^3]	0.01 … 199.99
	[scf]	0.03 … 199.99
Hysteresis setting range		0% FS … 90% FS

Immissions/emissions		
Storage temperature	[°C]	−20 … +80
Protection class		IP65
Pressure drop	[mbar]	<100
Electrical protection class		III

Diagnostic modules GFDM, flow monitoring

Technical data – Flow sensor SFAB

Dimensions

Download CAD Data ➔ www.festo.com/us/cad

Wall or surface mounting

H-rail mounting

1	Plug M12x1 to EN 60947-5-2	2	LCD display	4	Hole for mounting screw M4	5	Adapter plate for wall mounting
		3	Pneumatic connection		

Type of mounting	B1	D1	D2	H1	H2	H3	L1	L2	L3
Wall or surface mounting	32.3	QS-8	M12x1	75.7	52.5	11	99.8	69.8	78.9
H-rail mounting				79					

Peripherals overview
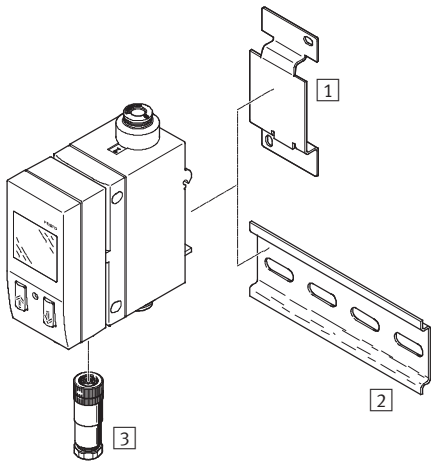
Note

The screened cable for connecting the sensor to the controller is not included in the scope of delivery.

Accessories		Included in the scope of delivery
1	Adapter plate SDE1-…-W-…	For wall mounting	➔ 14
2	Mounting rail to DIN EN 50022	For H-rail mounting	–
3	Plug socket FBSD-GD-9-5POL	For electrical connection	■

Ordering data – Accessories

		Part No.	Type
	Adapter plate	194297	SDE1-…-W-…

Diagnostic modules GFDM, flow monitoring
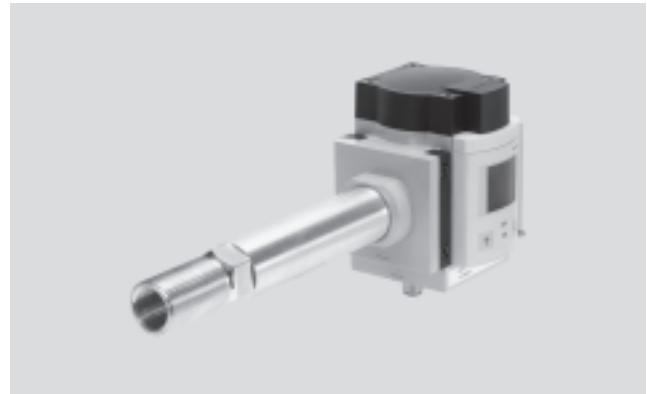
Technical data – Flow sensor SFAM

Variant:

Flow monitoring QB

➔ Modular product system on page 20

General technical data	
Certification	C-Tick
	cULus recognized (OL)
CE mark (see declaration of conformity)	To EU EMC Directive[1]
Note on materials	RoHS-compliant

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: 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.

Input signal/measuring element		
Measured variable		Flow rate, consumption
Direction of flow		Unidirectional P1 ⟶ P2
Measuring principle		Thermal
Flow measuring range	[l/min]	50 ... 5,000[1]
Operating pressure	[bar]	0 ... 16
Nominal pressure	[bar]	6
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
		Nitrogen
Note on operating/pilot medium		Operation with lubricated medium not possible
Temperature of medium	[°C]	0 ... +50
Ambient temperature	[°C]	0 ... +50
Nominal temperature	[°C]	23

1) Restricted at operating pressure < 5 bar, graph ➔ www.festo.com

Output, general[1], [2]		
Accuracy of zero point ±FS	[%]	0.3
Accuracy of margin ±FS	[%]	3
Repetition accuracy of zero point ±FS	[%]	0.2
Repetition accuracy of margin ±FS	[%]	0.8
Temperature coefficient of margin ±FS/K	[%]	≤0.1
Pressure dependence of margin ±FS/bar	[%]	0.5

1) Accuracy with nominal conditions (6 bar, 23 °C and horizontal installation position)
2) % FS = % of the measuring range final value (full scale)

Switching output		
Switching output		2x PNP or 2x NPN, adjustable
Switching function		Window comparator or threshold value comparator, adjustable
Switching element function		N/C or N/O contact, adjustable
Switch-on time		Adjustable (factory setting: approx. 60 ms)
Switch-off time		Adjustable (factory setting: approx. 60 ms)
Max. output current	[mA]	100
Voltage drop	[V]	Max. 1.5
Inductive protective circuit		Adapted to MZ, MY, ME coils

Analogue output		
Characteristic curve for flow rate	[l/min]	0 … 5,000
Output characteristic curve for current	[mA]	4 … 20
Rise time	[ms]	Possible settings: 15, 30, 60 (factory setting), 125, 250, 500, 999
Max. load resistance at current output	[ohms]	500

Output, additional data	
Protection against short circuit	Yes
Protection against overloading	Yes

Electronic components		
Operating voltage range	[V DC]	15 … 30
Reverse polarity protection		For all electrical connections

Electromechanical components		
Electrical connection		Straight plug, M12x1, 5-pin
Max. connecting cable length	[m]	<10

Mechanical components		
Type of mounting		In-line installation
		Via accessories
Mounting position		Horizontal ±5°
Pneumatic connection		G½, G¾[1]
Product weight	[g]	1,100
Housing materials		Die-cast aluminium, PA-reinforced

1) Stabilising zone with female thread G½ and male thread G¾

Display/operation		
Display type		Illuminated LCD, blue
Displayable units		l/min, scfm, l, m^3, scf
Setting range for flow rate threshold value		1% FS … 100% FS
Setting range for consumption impulse threshold value	[l]	15 … 19,999
	[m3]	1 … 19,999
	[scf]	0.5 … 1,999.9
Hysteresis setting range		0% FS … 90% FS

Immissions/emissions		
Storage temperature	[°C]	−20 … +80
Protection class		IP65
Pressure drop	[mbar]	<100
Electrical protection class		III

Diagnostic modules GFDM, flow monitoring

Technical data – Flow sensor SFAM

Dimensions

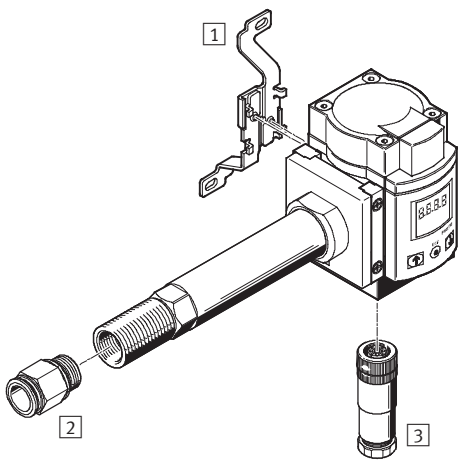Download CAD Data ➔ **www.festo.com/us/cad**

➔ Flow direction
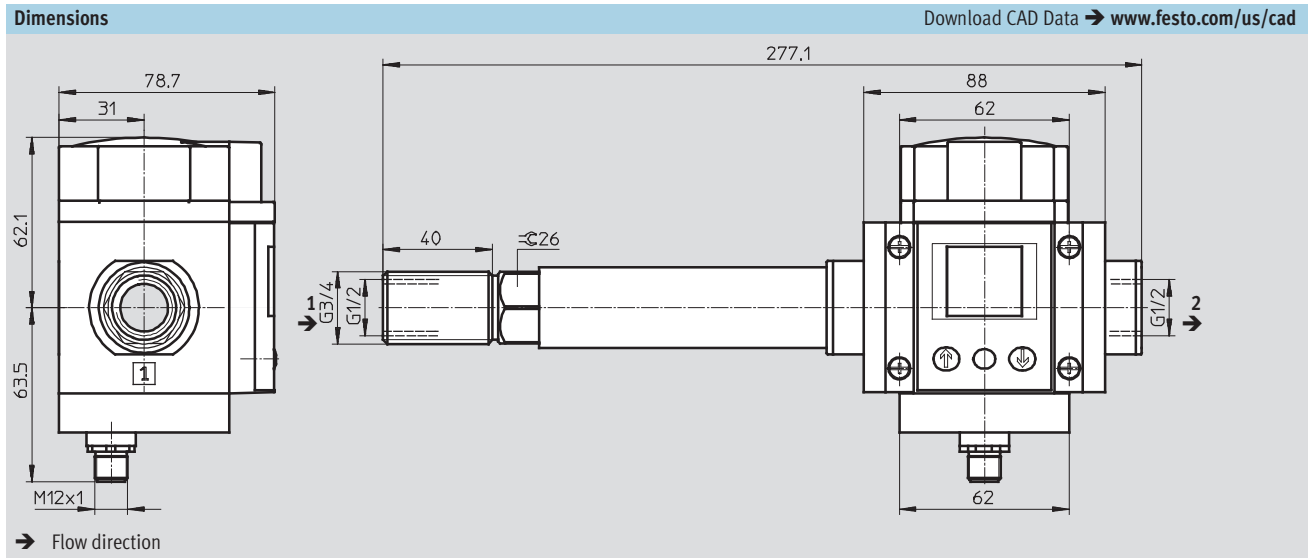
Note: This product conforms to ISO 1179-1 and ISO 228-1

Note

To comply with the specified accuracies, the SFAM must be supplied with a connection that has an inside diameter of at least 10 mm.

Peripherals overview

With connecting plates and stabilising zone

Note

The screened cable for connecting the sensor to the controller is not included in the scope of delivery.

Accessories		Included in the scope of delivery
1 Mounting bracket MS6-WB	For wall mounting	17
2 Push-in fitting QS-½-16	For tubing O.D. of 16 mm	■
3 Plug socket FBSD-GD-9-5POL	For electrical connection	■

Ordering data – Accessories		Part No.	Type
	Mounting bracket	532196	MS6-WB

Diagnostic modules GFDM – Direct visualisation

Technical data – Front-end display FED

FESTO

Variant:

Visualisation FD

➔ Modular product system on
page 20

| General technical data		
Display properties		Touchscreen
Display		Colour STN
Display size		5.6"
Display resolution		1/4 VGA, 320x240 pixels
Number of colours		256
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
Alarms		1,024
Type of mounting		Front panel mounting
Product weight	[g]	1,400

Electrical data		
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 … 30
Current consumption at nominal operating voltage	[A]	0.8
AUX interface		Sub-D socket, 9-pin
Printer interface		Sub-D socket, 15-pin, RS232
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
Accuracy of real-time clock		130 s/month
Protection class		IP65 at the front face following installation into control panel, IP20 at the back

Operating and environmental conditions		
Ambient temperature	[°C]	0 … 45
Relative air humidity	[%]	5 … 85, non-condensing
CE mark (see declaration of conformity)		To EU EMC Directive[1]
Certification		C-Tick

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: 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.
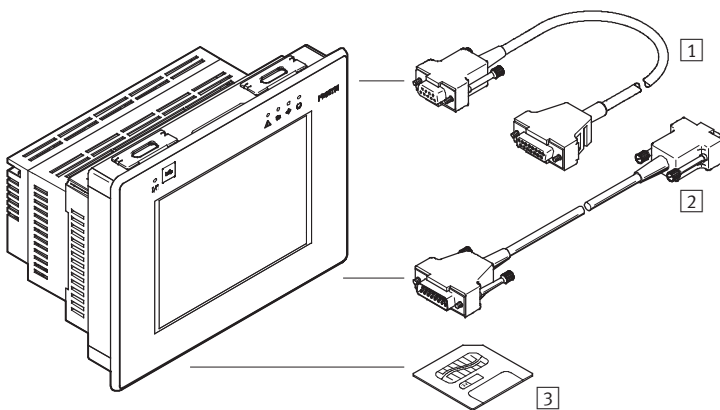
Diagnostic modules GFDM – Direct visualisation

Technical data – Front-end display FED

Dimensions

Download CAD Data ➔ **www.festo.com/us/cad**
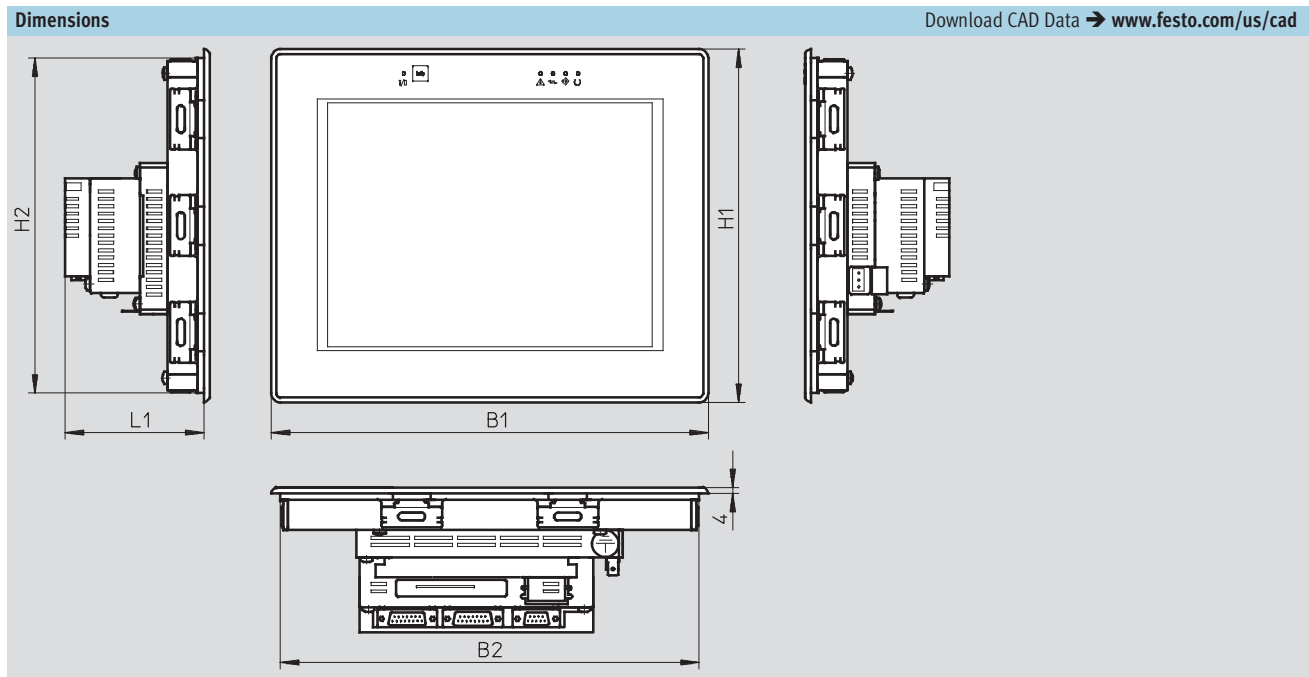
B1	B2	H1	H2	L1
187	175	147	135	90.5

Peripherals overview

Accessories		Included in scope of delivery
1	Connecting cable NEBC-S1G15-K-2.5-N-B-S1G9	For controller CECX, 2.5 m long	■
2	Programming cable FEDZ-PC	For PC, 3 m long	■
3	Memory card FEDZ-MEM32	User memory 32 MB	➔ 19
–	Mounting kit FED	Front mounting (4 pieces), front seal and 3-pin connector for power supply	■

Ordering data – Accessories

		Part No.	Type
	Memory card	**543514**	**FEDZ-MEM32**
	Fieldbus interface, Ethernet interface module for FED		

Diagnostic modules GFDM

Ordering data – Modular product system

FESTO

M	Mandatory data								

Module No.		Pressure monitoring		Controller type		Setpoint value		Visualisation
Product type		**Flow monitoring**		**Bus protocol/Activation**		**Switching output for monitoring**		
552054	GFDM	P	QA QB	S	EA	A4	N P	FD VW
Ordering example								
552054	**GFDM**	**P**	**QA**	**S**	**EA**	**A4**	**N**	**FD**

Ordering table			Conditions	Code		Enter code
M	Module No.	**552054**				
	Product type	Diagnostic module		**GFDM-**		GFDM-
	Pressure monitoring [bar]	0 … 10		**P**		P
	Flow monitoring [l/min]	2 … 200		**QA**		
		50 … 5000		**QB**		
	Controller type	Standalone (CECX-K-D1)		**-S**		-S
	Bus protocol/Activation	Input/output		**EA**		EA
	Setpoint value [mA]	4 … 20		**-A4**		-A4
	Switching output for monitoring	NPN		**N**		
		PNP		**P**		
	Visualisation	Direct (FED)		**-FD**		
		External (VipWin)		**-VW**		
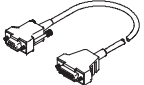
Transfer order code
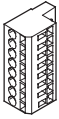
552054	–	GFDM	–	P		–	S	EA	–	A4		–	

Diagnostic modules GFDM

Accessories

Ordering data – Connecting cable NEBC						
	Electrical connection	Cable composition [mm^2]	Cable diameter [mm]	Cable length [m]	Part No.	Type
	15-pin socket, Sub-D 9-pin socket, Sub-D	3x0.34, screened	5.2	2.5	**553949**	**NEBC-S1G15-K-2,5-N-B-S1G9**

Ordering data – Plug NECC					
	Operating voltage range [V AC]	Connection cross section [mm^2]	Number of pins	Part No.	Type
	300	0.2 … 2.5	2-pin	**553857**	**NECC-L1G2-C1**
			4-pin	**553858**	**NECC-L1G4-C1**
			6-pin	**553859**	**NECC-L1G6-C1**
			8-pin	**553860**	**NECC-L1G8-C1**
			18-pin	**553861**	**NECC-L1G18-C1**

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