FIFE GUIDING SOLUTIONS

A MAXCESS BRAND

SE-22-M12

Operating Instructions

EN

Infrared Light Sensor
Edition 10/2022

MI 1102 1 -

1 INTRODUCTION

About these operating instructions

These Operating Instructions describe the installation, operation, commissioning, and maintenance of the SE-22-M12 sensor and provide important instructions for proper use.

The operating instructions must be carefully stored and must always be available at or near the customer's system during the service life of the sensor.

Translation of the original Operating Instructions:
These Operating Instructions are a translation. The original Operating Instructions were composed in German.

Target groups

These Operating Instructions are directed to both the *system construction master* as well as the *operator* who uses the sensor in production line.

Read operating instructions
The Operating Instructions must be read and used by all persons who have the responsibility of installing, commissioning, operating and maintaining the sensor.

Proper usage

The infrared light sensor SE-22-M12 is used for non-contact measurement of the lateral offset of a material web being guided in a customer system. The sensor is suitable for

- Web edge guiding and
- Web center guiding for dual application.

The sensor can be used to control both opaque and transparent materials.
A web guide controller must be used with transparent materials to calibrate the sensor to the material. For more information, see the web guide controller operating instructions.

The sensor must only be used in accordance with its intended purpose and in a technically flawless conditions.

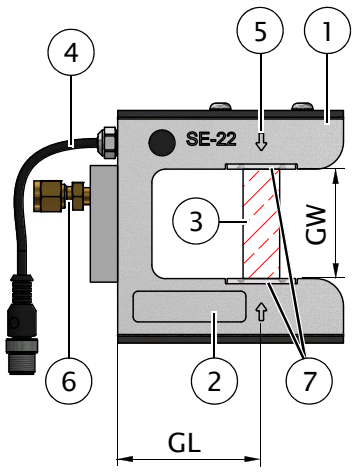
The sensor must not be changed or opened.

Einführung.fm

Improper usage

- Operation outside of the technical specifications is not permitted.
- Operation in areas where there is a danger of explosions is prohibited.
- The sensor may not be used as a support, handle or step.
- Any use other than the designated use is not permitted.

Operating principle



1 Infrared light receiver
2 Infrared light source
3 Sensor field of view
4 Connection cable
5 Center of sensor field of view
6 Air sweep connection (option)
7 Protectors

GW Gap width
GL Throat length

Figure 1.1: SE-22-M12

The SE-22-M12 sensor works with modulated infrared light in the wavelength range of 875 nm, making the sensor relatively insensitive to external sources of light.

The light source generates an infrared light. Depending on how far away the material web is in the sensor's field of view, a part of this light strikes the receiver. Based on this the receiver generates the output signal from which the precise position of the web edge is determined.

The gap width GW and throat length GL are the characteristic dimensions of the sensor.

Options

The sensor can be delivered with an air sweep connection. Depending on the type of dirt contamination, this makes it possible to keep the protectors, which cover transmitter and receiver, free of large pieces of dirt with a continuous or pulsing flow of air.

A production data acquisition to Fife D-MAXE controller extends the range of applications for the sensor inside the digital network environment. Additional sensor data can be provided to other hardware equipment if the Fife D-MAXE is linked appropriately to the network.

The protectors can be made of plastic or glass.

2 SAFETY INSTRUCTIONS

Important information

To ensure safe and problem-free operation of the SE-22-M12 sensor it must be

- properly shipped and stored,
- properly mounted and placed in operation,
- properly used and carefully maintained.

Proper operation and careful maintenance will ensure a long service life for the sensor.

Please note the following:

- The content of these operating instructions
- Any safety instructions that are printed on the unit
- The requirements of the machine manufacturer
- Applicable national, state and local requirements for accident prevention and environmental protection

Information about safety instructions

The safety instructions and symbols described in this section are used in these Operating instructions. They are used to avoid possible dangers for users and to prevent material damage.

SIGNAL WORD
Source of danger and its results.

⇨ Avoiding dangers

Signal words

The signal word **DANGER** indicates an immediate danger of serious injury or death.

The signal word **WARNING** indicates a possible danger which could lead to serious injury or death.

The signal word **CAUTION** refers to a possible danger which could lead to slight to moderate injury.

The signal word **ATTENTION** refers to a possible danger which could lead to material damage.

Sicherheit.fm

Symbols

Reference to general hazards that may result in bodily injuries

Refers to danger of injury caused by crushing

Refers to danger of injury caused by cutting

Refers to general hazards that will result in damage to the device or system

Qualified electrician
The electrical components may only be connected and disconnected by a qualified electrician!

Read operating instructions
Follow these operating instructions for proper and safe use.
Keep for future use.

Additional markings

- Bulleted list
- Instructions

1. Instructions which must be processed in the specified order

2. End of the instructions

→ Reference or cross-reference

Note:
Reference to important information.

Personnel requirements

The tasks listed in these operating instructions may only be carried out by appropriately qualified personnel commissioned by the operator. The responsibilities of the personnel for the work on the system must be clearly defined by the operator.

Transport, assembly, maintenance, troubleshooting, disassembly:
- Specialized staff
  → Mechatronics engineer, industrial mechanic, etc.

Electrical connection or disconnection:
- Specialized staff
  → Only by a qualified electrician

Control during operation:
- Specialized staff
  → Machine and system operators, etc.
- Personnel or trainees trained and supervised by the system operator

Repair:
- Specialized staff
  → Service technician of Fife-Tidland GmbH

Qualified electrician

A qualified electrician is a person whose specialist training, knowledge and experience, as well as knowledge of the relevant standards, enable him to assess and perform the work assigned to him and to recognize and avoid possible hazards.

The electrician is specially trained for the field in which he or she works and is familiar with the relevant standards and regulations.

Preventing hazards

- No changes may be made to the sensor.
- The parameters specified in Section *Technical Data* must be observed.
- Only accessories and replacement parts that have been approved by Fife Tidland may be used.
- The sensor may not be used as a support, handle or step. There is a danger that the sensor will become damaged (breaking off/snapping), resulting in personal injury.

Residual risks

Installing the product in a machine / system makes it possible to form clamping, squeezing and cutting points.

Despite a safe design and supplementary protective measures, residual risks may remain for the machine / system in which the product is installed. These risks must be recorded in a risk assessment by the machine / system builder and taken into consideration in the operating instructions.

3 INSTALLATION

Transport and storage

- The sensor and/or the unit on which the sensor is mounted must be secured against slipping during transport
- The sensor must be stored in a cool, clean, and dry place.
  → *Ambient conditions, page 6-1*
- The sensor must not be stored in the vicinity of powerful magnetic fields. The electronic components of the sensor may be damaged.

Mounting

WARNING
⇨ If a sensor is damaged, it must not be installed or placed in operation.

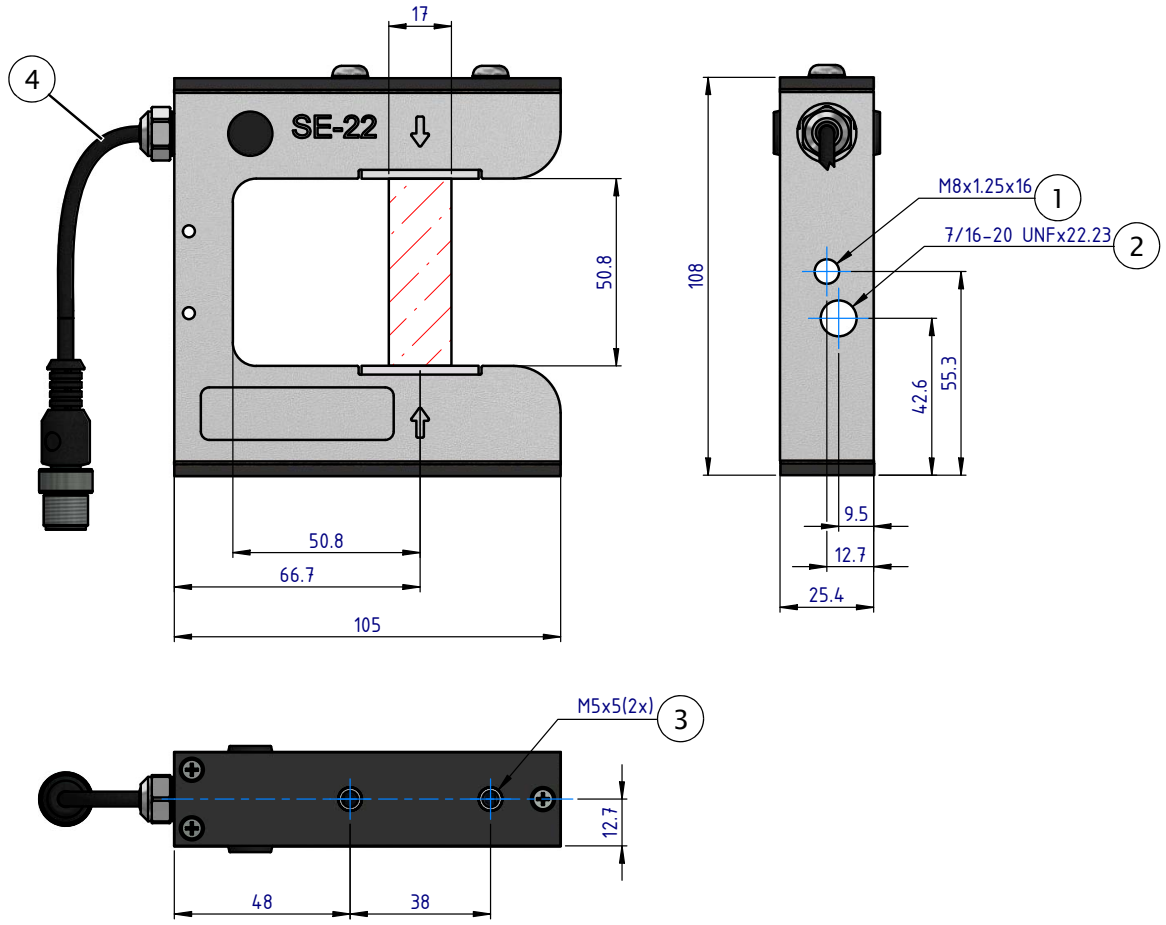
⇨ All assembly tasks on the sensor must only be performed when there is no electrical power in the system.

⇨ Assembly tasks and mechanical settings must only be performed when the machine has been stopped and secured from being turned on again.

Mounting location

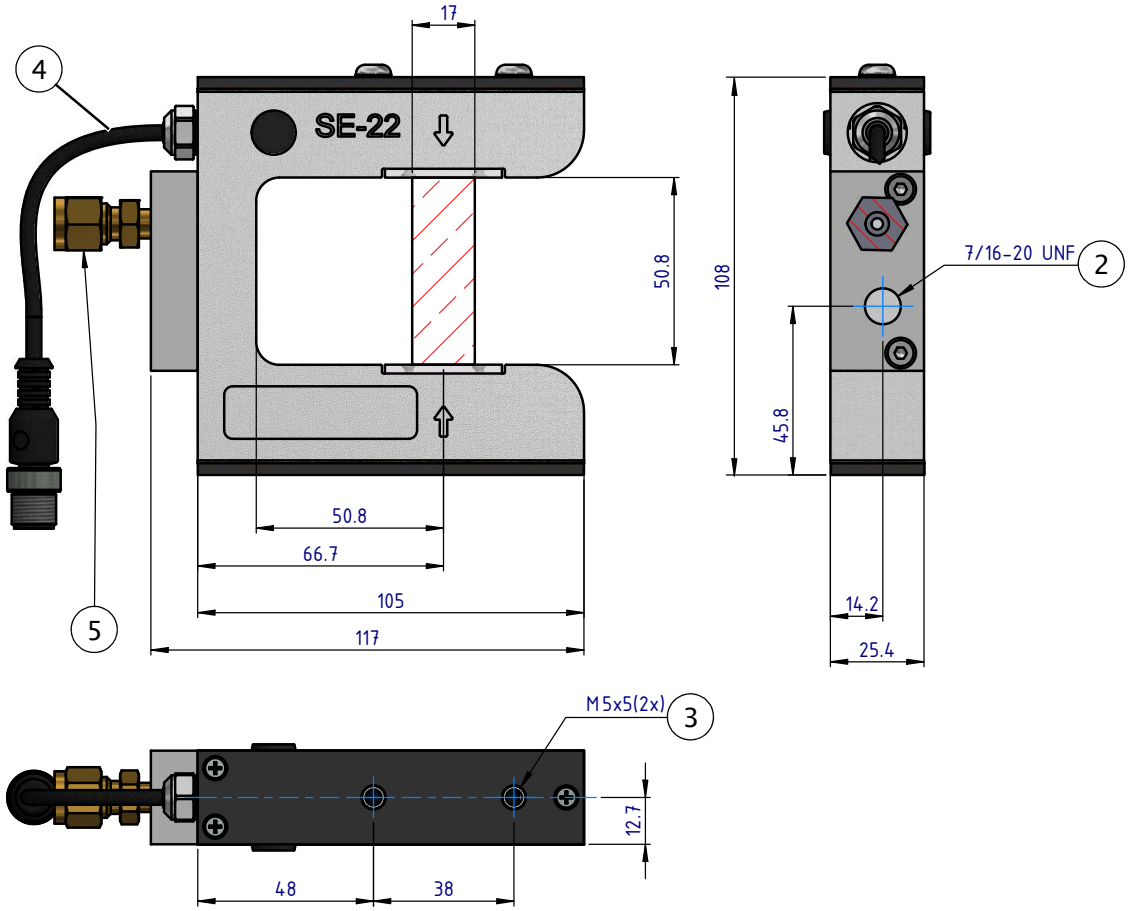
- Protection Class: IP40
- Operating temperature: 0°C ... 60°C
- Relative humidity: max. 85%, non-condensing
- Operating altitude above sea level: maximum 5000m
- Protected from vibrations
- Do not place close to strong magnetic fields:
  The electronic components may be damaged.
- Do not place close to strong electrostatic fields:
  The electronic components may be damaged.
- Not in places where there is a risk of explosions.

Dimensions



1 M8 threading for sensor bracket type M and MO
2 7/16-20 UNF threading for sensor bracket type type M and MO
3 M5 threading for sensor bracket type MB
4 Connection cable length 40 mm (without plug)

Figure 3.1: SE-22-M12 Dimensions, GW = 51 mm (standard)



2 7/16-20 UNF threading for sensor bracket type M and MO
3 M5 threading for sensor bracket type MB
4 Connection cable length 40mm (without plug)
5 Male connector for air supply: 1/4 in. Tube OD

Figure 3.2: SE-22-M12 Dimensions, with air sweep

Mechanical fastening

Drill holes are available on the housing for fastening the sensor in place. A large variety of assembly options are possible in connection with the various sensor mountings.

ATTENTION

⇨ Tighten the M5 fastening screws to a max. torque of 3Nm.

⇨ Tighten the M8 fastening screws to a max. torque of 9Nm.

⇨ Tighten the 7/16-20 UNF fastening screws to a max. torque of 12Nm.

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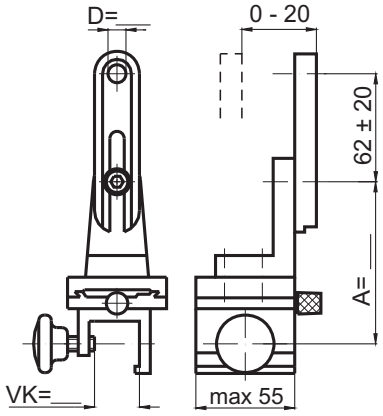
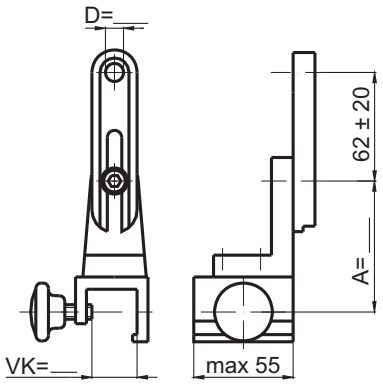


Sensor bracket type M

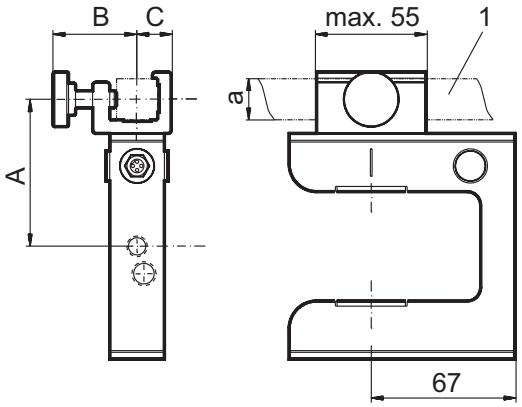
Type	A	VK	D
M-20/8	86	20	8
M-20/7/16	86	20	12
M-25/8	88	25	8
M-25/7/16	88	25	12



Sensor bracket type MO

Type	A	VK	D
MO-20/8	69	20	8
MO-20/7/16	69	20	12
MO-25/8	71	25	8
MO-25/7/16	71	25	12

Sensor bracket type MB



1 - square bar

Figure 3.3: SE-22-M12 with senor bracket type MB

Sensor bracket	Square bar		A	B	C
	x	max. length			
MB-20	20	1600	68	38	16
MB-25	25	2200	71	51	20
MB-30	32	2400	77	55	25

Electrical connection

ATTENTION
The sensor could be damaged.

⇨ The safe function of the sensor and the system is only guaranteed if it is properly installed.

⇨ Electrical connections should always be made or disconnected on the sensor while there is no electrical power in the system.

⇨ When attaching the connector with the jack on the sensor, pay close attention to the guide and groove! The connector and jack must not be connected with incorrect orientation or by force, as this will destroy the sensor.

⇨ Electrical lines must not be subjected to any mechanical loads.

- The sensor must be connected to the web guide controller according to the system diagram in the system documentation.

only for sensor cables with open wire ends

Personnel: Qualified electrician
⇨ The sensor may only be connected electrically by a qualified electrician.

- The power supply voltage must be externally fused.
  → *Power supply, page 6-2*
- The external voltage must be generated and supplied in accordance with the criteria for protective extra-low voltage (PELV).
- The negative potential must be connected to ground.
- The sensor housing must be grounded via the cable screen.

→ see also the drawing for the sensor cable in the system documentation

Installation.fm

4 OPERATION

WARNING
Danger of injury by crushing
⇨ Do not place your hands on or near moving parts (rollers, material web, etc.) during operation.

Danger of injury due to cutting on the edge of the material web
⇨ Do not place your hands on the edge of the (moving) material web during operation.

ATTENTION
The sensor could become unusable during the operation by damages.

⇨ The sensor must not be placed in operation unless it has been securely mounted.

⇨ Depending on the material of the guided web, if the web rubs on the protectors of the sensor, the protectors may become damaged. If a protector is scratched and/or unclear, the material web can no longer be reliably guided.

⇨ Depending on the material of the web that is being guided, it is possible that the web edge could grind against the inside of the sensor fork, resulting in notches and incisions on the sensor.

Calibrating the sensor inputs of the web guide controller

All settings required for operating the sensor are performed with the web guide controller.
→ Information on this topic is available in the Operating Instructions for the web guide controller.

Before the sensor is used for working with transparent material, the sensor must always be calibrated to the contrast with the web guide controller.

5 MAINTENANCE

WARNING:
Danger of injury by crushing.

⇨ Maintenance work must only be performed on the sensor when the power is turned off and the machine is stopped and protected against being turned on again.

Maintenance

The protectors should be cleaned of ambient dust and dirt at regular intervals using a neutral synthetic cleaning agent and a soft cloth. When selecting synthetic cleaning agents, note chemical resistance.
→ page *6-1*

No additional maintenance tasks are required for the sensor.

Decommissioning

1. Turn off the electrical power to the system.
2. Disconnect the signal cable from the sensor.

only for sensor cables with open wire ends
Personnel: Qualified electrician
⇨ The sensor may only be disconnected electrically by a qualified electrician.

3. Unscrew the sensor from its bracket.
4. Store the sensor in a cool, clean and dry place.
→ *Ambient conditions, page 6-1*

OR

Dispose of the sensor according to your national requirements.

Wartung.fm

6 TECHNICAL DATA

General information

Dimensions

Gap widths GW: 51 mm

Throat length GL: 51 mm

→ *Figure 3.1, page 3-2* and *Figure 3.2, page 3-3*

Weight

290g (without air supply)
350g (with air supply)

Protection class

IP40

Ambient conditions

Ambient temperature: 0°C - 60°C
Relative humidity: up to 85%, non-condensing
Operating altitude max. 5000m above sea level

Materials used

Housing: Aluminum casting alloy
EN AC-46000 (EN AC-AlSi9Cu3),
powder-coated

Properties

Light source

Modulated infrared light
Wavelength $\lambda = 875 \pm 25$ nm
Spectral bandwidth $\Delta\lambda = 37$ nm

Sensor field of view

17mm

Linearity

5% max. error (at 10% .. 90% of signal)

Web plane change

5% max. error (10% .. 90% of gap width)

Temperature error

2% (at 10°C .. 50°C)

Electrical connection

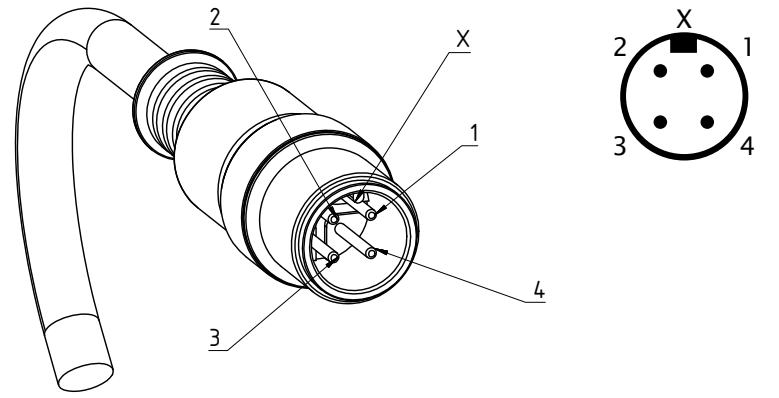
Power supply

10V ... 15V
(PELV, negative potential connected to ground
Overcurrent protection device slow-blow max. 2A)

Output signal

0 - 10mA to $\leq 400\Omega$ at 12V (10...15V) Power supply

Pin assignment



1 Power supply
2 not used
3 P-GND
4 Output signal

X Key
Housing = Shield

Figure 6.1: M12 connector

Standards

The SE-22-M12 sensor was constructed in accordance with the standards and regulations of the European Union. A Declaration of Conformity is available.

7 SERVICE

Requests for Service

When requesting service, please have a copy of the order confirmation ready with the order number.

When ordering replacement parts, please indicate, (where possible) Part Number, Drawing Number and Model description.

Please be careful to keep all documents accompanying the product in a safe place. This will allow us to help you more quickly in the event that service is required.

Adresses

To request service, or if you need replacement parts, please contact one of the following addresses.

Fife-Tidland GmbH

Max-Planck-Straße 8
65779 Kelkheim
Deutschland

Siemensstraße 13-15
48683 Ahaus
Deutschland

Telefon: +49 - 6195 - 7002 - 0
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