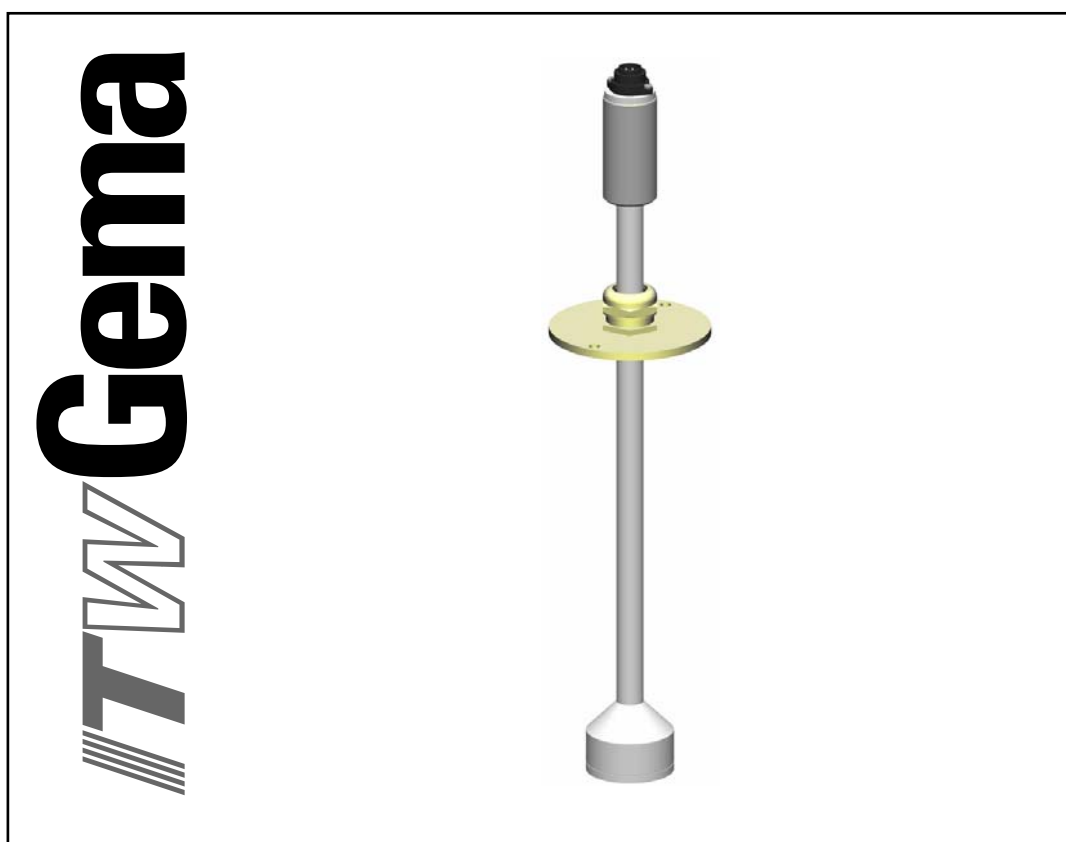

Operating instructions and spare parts list

LM02 Level sensor



Translation of the original operating instructions

Documentation LM02 Level sensor

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the LM02 Level sensor.

These safety regulations must be read and understood before the LM02 Level sensor is used.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the ITW Gema operating instructions. The general safety precautions must also be followed as well as the regulations in the operating instructions.

**DANGER!**

Danger due to live electricity or moving parts. Possible consequences: Death or serious injury

**WARNING!**

Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

**INFORMATION!**

Useful tips and other information

Conformity of use

1. The LM02 Level sensor is built to the latest specification and conforms to the recognized technical safety regulations. It is designed for the normal application of powder coating.
2. Any other use is considered as non-conform. The manufacturer is not responsible for damage resulting from improper use of this equipment; the end-user alone is responsible. If the LM02 Level sensor is to be used for other purposes or other substances outside of our guidelines then ITW Gema AG should be consulted.
3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The LM02 Level sensor should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the LM02 Level sensor has been set up and wired according to the guidelines for machinery (98/37 EG). EN 60204-1 (machine safety) must also be observed.
5. Unauthorized modifications to LM02 Level sensor exempts the manufacturer from any liability from resulting damage.
6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
7. Furthermore the country-specific safety regulations must be observed.

Product specific security measures

- The installation work, to be done by the customer, must be carried out according to local regulations
- Before starting up the plant a check must be made that no foreign objects are in the booth or in the ducting (input and exhaust air)
- It must be observed, that all components are grounded according to the local regulations, before start-up



Note:

For further security information see the more detailed ITW Gema Safety regulations!

About this manual

General information

This operating manual contains all the important information which you require for the working with the LM02 Level sensor. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the function mode of the individual system components - reciprocators, booths, powder gun controls, powder guns etc. - should be referenced to their corresponding documents.

LM02 Level sensor

Description of function

The LM02 Membrane level sensor operates according to the principle of a membrane switch. Thereby, the switch element (proximity switch) is completely separated from the material being monitored.

The level sensor is fitted vertically, so that the powder pushes the membrane upwards when the hopper is full, and the level sensor signal releases unretarded. If the powder hopper is empty, the membrane sinks down and the level sensor signal stops unretarded.



Note:

In the powder hopper may not exist an overpressure, because this can lead to an incorrect released level signal!

General information

Installation

The LM02 Level sensor is installed on the cover of the HF02 Powder Hopper. All work to be done by the customer must be carried out according to the local safety regulations.

Grounding

The cover must be completely grounded anytime. The grounding connection must be done by the customer.

Repairs

Repairs should only be carried out by trained personnel!

Technical data

LM02 Level sensor

Electrical data

LM02 Level sensor	
Input voltage	20-28 VDC
Current consumption	10 mA
Level signal	24 VDC / 100 mA
Switching delay	none
Operating temperature	+10°C - +40°C
Level sensor weight - compl.	0,7 kg
Min. density	200 g/dm ³
Max. insertion depth	ca. 380 mm
Protection type	IP54

LM02 Level sensor wiring

Color	Print pin no.
brown	2
black	3
blue	1

Pin allocation

LM02 Level sensor	
1	Power supply GND
2	Power supply +24 VDC
3	* SIG_OUT (unretarded)
4	(not connected)
5	(not connected)
6	(not connected)

* 24 V Powder Hopper full
0 V Powder Hopper empty







Start-up

Preparation for start-up

Before starting up the LM02 Level sensor, the following points must be observed:

- Observe the safety regulations!
- The level height can be adjusted with the cable lead-through on the fixing flange. The level should be first set provisionally and can then be corrected to the desired level during operation

Possible configurations

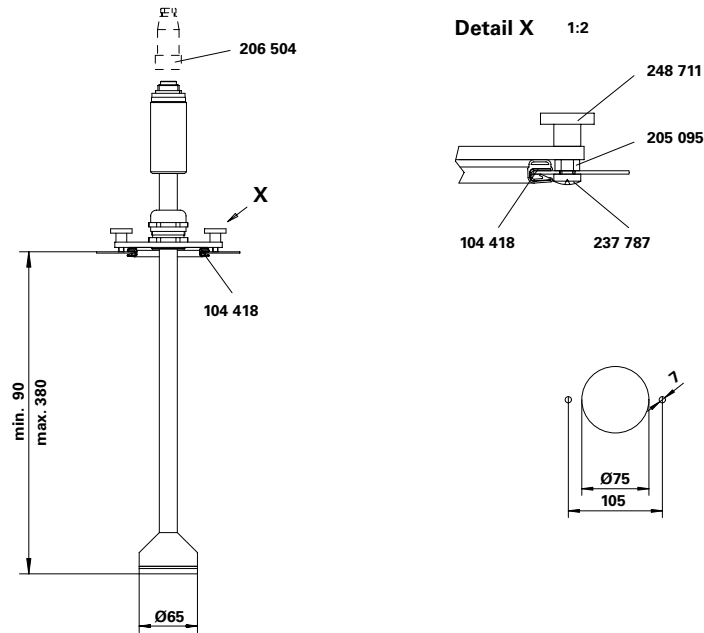
LM02 Level sensor	OptiFlex A1	Control unit
	LM02 Level sensor with external LCB (Level Control Board) control unit, twice Relay OUT	
	LM02 Level sensor with Magic Control CM-10 Plant control	
	LM02 Level sensor with OptiControl CM-20 Master control unit	
	LM02 Level sensor with integrated CM03 Master control unit	

Maintenance

The LM02 Level sensor does not require any particular maintenance. It is, however, necessary to check periodically for powder depositing on the membrane and to clean, if necessary.

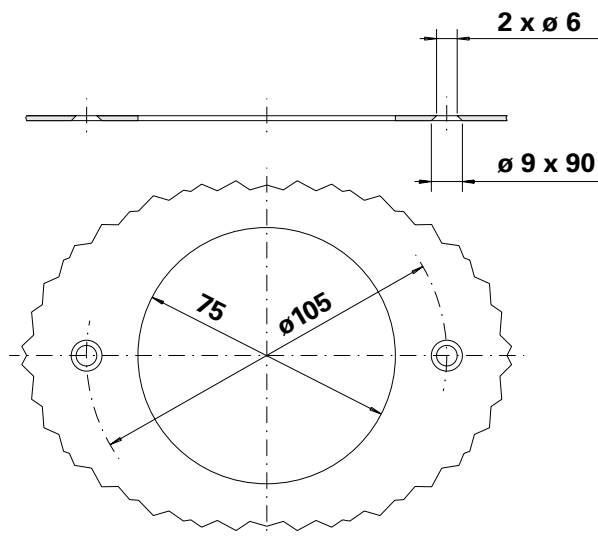
Installation

Retrofitting into existing powder hoppers



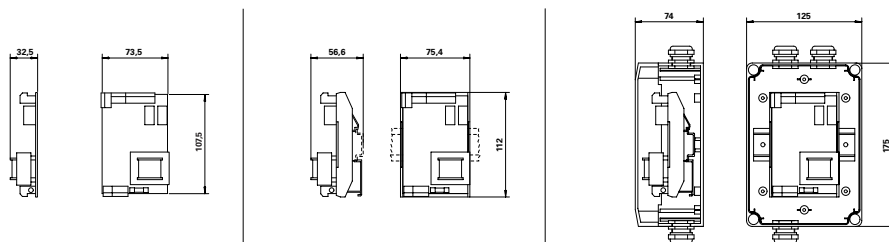
Parts required for retrofitting into existing powder hoppers

Installation opening



Installation opening

LM02 Level sensor - external control unit



LM02 Level sensor - external control unit

- LCB Level print (Level Control Board)
- LCB Level print with clamping fixture
- LCB Level print with housing

Connection possibilities

Mains connection 115/230V	Terminal X1	
P	1	
N	2	
E	3	
24 VAC / DC	Terminal X2	
P / +	1	
N / -	2	
Sensor connection connecting socket	Terminal	
	X3	X4
1	3	
2	1	
3	2	
4		
5		
6		2
E		
Interlocking	Terminal X5 Relay 1 t=3-60 sec.	Terminal X5 Relay 2 t=3-60 Sek./1-8 sec.
no current		
Powder Hopper empty (in operation)		
Powder Hopper full (in operation)		

Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- **Type** LM02 Level sensor,
Serial number 1234 5678
- **Order no.** 203 386, 1 piece, Clamp - Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this yard/meter ware is always marked with an *.

The wear parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)



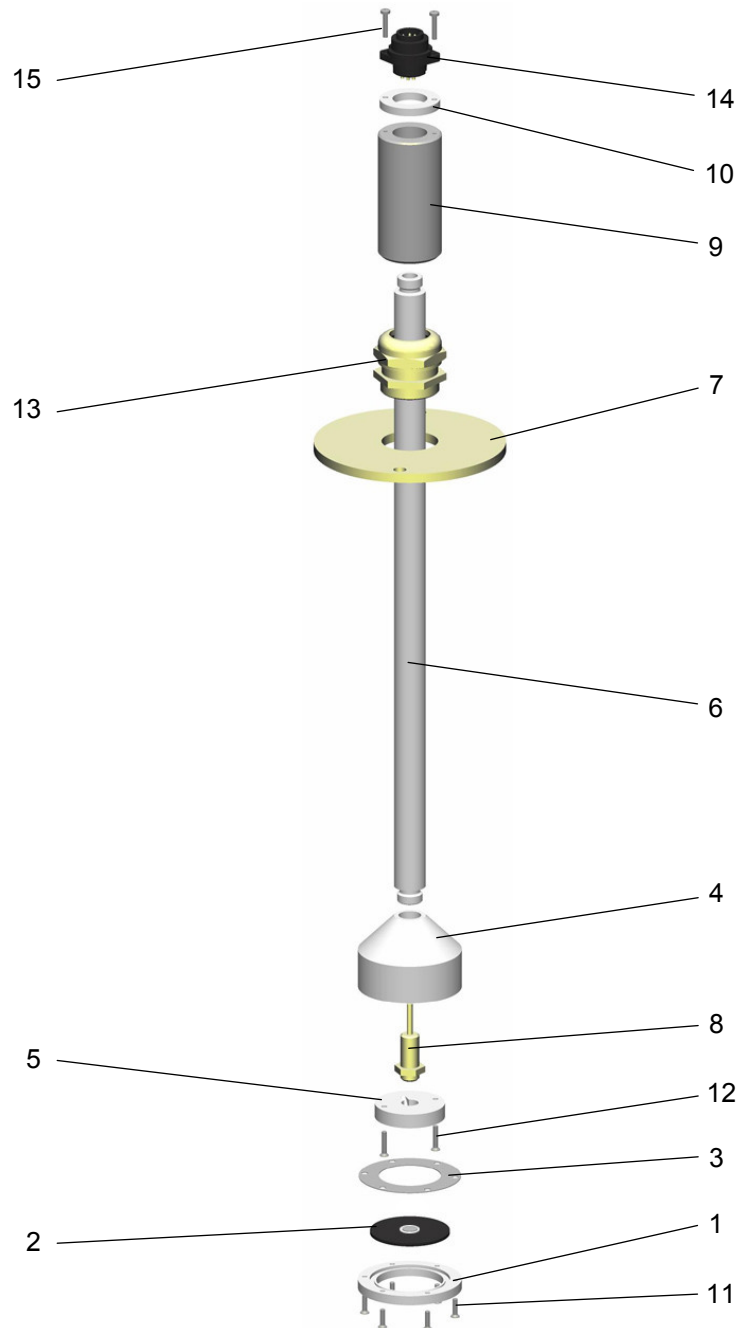
WARNING!

Only original ITW-Gema spare parts should be used, because the hazardous location approval will be preserved that way! The use of spare parts from other manufacturers will invalidate the ITW Gema guarantee conditions!

LM02 Level sensor - spare parts list

LM02 Level sensor - complete		373 591
1	Retaining ring	373 559
2	Membrane	373 583
3	Sealing ring	375 314
4	Sensor head	382 027
5	Fixing ring	381 985
6	Tube	382 035
7	Retaining disk	373 524
8	Proximity switch	262 927
9	Housing	373 516
10	Venting ring	373 613
11	Countersunk head screw - M3x12 mm	214 620
12	Countersunk head screw - M3x16 mm	263 419
13	Lead-through - PG29	204 340
14	Flanged plug - 7 pins	205 370
15	Cap screw - M3x16 mm	221 759

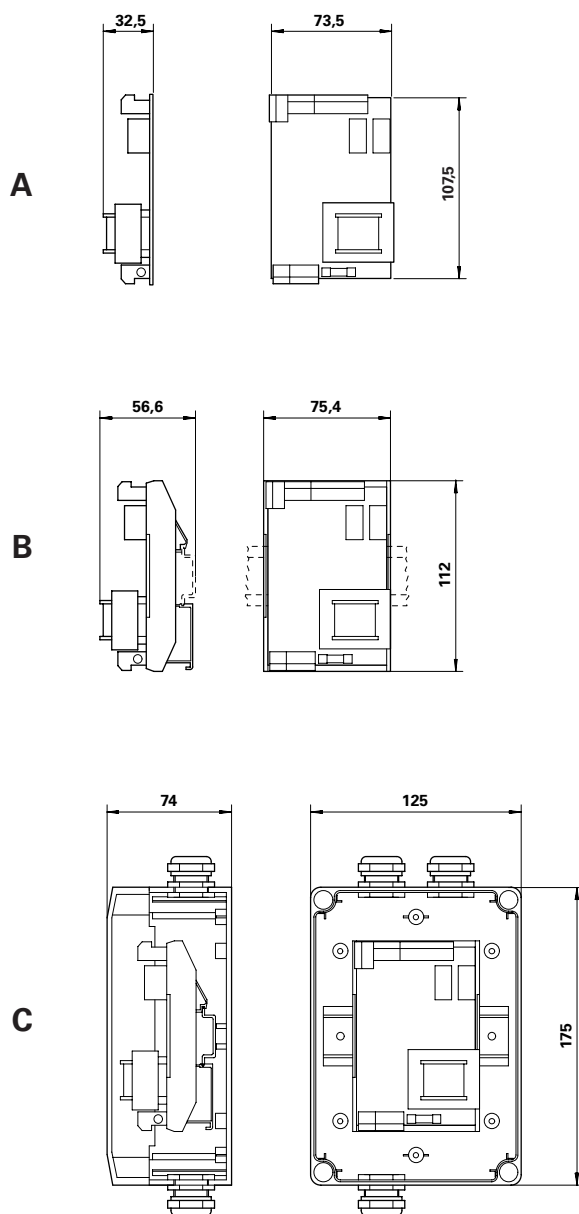
LM02 Level sensor - spare parts



LM02 Level sensor - spare parts

LM02 Level sensor - external control unit

A	LCB Level print (Level Control Board)	369 926
B	LCB Level print with clamping fixture	371 521
C	LCB Level print with housing	371 513
	Connecting cable level sensor-LCB level print (not shown)	371 696



LM02 Level sensor - control unit

