

Pulse meter IPM

For digital flow monitoring in oil circulation systems



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Read these instructions before installation or start-up of the product and keep them readily available for consultation.

EU Declaration of Conformity in accordance with Directive 2014/35/EU, Annex IV

The manufacturer hereby declares under its sole responsibility conformity of the product described below with all relevant harmonization legislation of the European Union at the time of placing on the market.

Designation: IPM digital pulse meter
Item number: A765.78*
Year of manufacture: All years of manufacture

Furthermore, the following directives and standards were applied in the respective applicable areas:

2011/65/EU: RoHS II
2014/30/EU: Electromagnetic Compatibility
2014/35/EU: Low Voltage Directive

EN 60204-1:2018 EN 61000-6-2:2005/AC:2005 EN 61000-6-4:2007/A1:2011
EN IEC 63000:2018

Walldorf, 28.07.2022

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Manufacturer: SKF Lubrication Systems Germany GmbH, Heinrich-Hertz-Str. 2-8, 69190 Walldorf, Germany

UK Declaration of Conformity pursuant to the Electrical Equipment (Safety) Regulations 2016 No. 1101, Annex IV

The manufacturer hereby declares under its sole responsibility conformity of the product described below with all relevant harmonization legislation of the United Kingdom at the time of placing on the market.

Designation: IPM digital pulse meter
Item number: A765.78*
Year of manufacture: All years of manufacture

Furthermore, the following regulations and standards were applied in the respective applicable areas:

- Electromagnetic Compatibility Ordinance 2016 No. 1091
- Electrical Equipment (Safety) Regulations 2016 No. 1101
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032

EN 60204-1:2018 EN 61000-6-2:2005/AC:2005 EN 61000-6-4:2007/A1:2011
EN IEC 63000:2018

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Masthead

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- South America -
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Warranty

The instructions contain no statements regarding the warranty or liability for defects. That information can be found in our General Terms of Payment and Delivery.

Training

We conduct detailed training in order to enable maximum safety and efficiency. We recommend taking advantage of this training. For further information, contact your authorized SKF dealer or the manufacturer.

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Safety alerts, visual presentation, and layout

While reading these instructions, you will encounter various symbols, illustrations, and text layouts intended to help you navigate and understand the instructions. Their meaning is explained below.

Safety alerts:

Activities that present specific hazards (to life and limb or possible damage to property) are indicated by safety alerts. Always be sure to follow the instructions given in the safety alerts.

DANGER

These safety alerts indicate an imminent danger. Ignoring them will result in death or serious injury

WARNING

These safety alerts indicate potentially imminent danger. Ignoring them could result in death or serious injury

CAUTION

These safety alerts indicate potentially imminent danger. Ignoring them could result in minor injury

NOTICE

These safety alerts indicate a potentially harmful situation. Ignoring them could result in damage to property or malfunctions

Illustrations:

The illustrations used depict a specific product. For other products, they may have the function of a diagram only. This does not alter the basic workings and operation of the product.

Text layout:

- **First-order bulleted lists:** Items on a bulleted list start with a solid black dot and an indent.
 - **Second-order bulleted lists:** If there is a further listing of subitems, the second-order bulleted list is used.
- 1 **Legend:** A legend explains the numbered contents of an illustration, presented as a numbered list. Items in a legend start with a number (with no dot) and an indent.
 - **Second-order legend:** In some cases, the numbered contents of an image represent more than just one object. A second-order legend is then used.
- 1. **Instruction steps:** These indicate a chronological sequence of instruction steps. The numbers of the steps are in bold and are followed by a period. If a new activity follows, the numbering starts again at “1.”
 - **Second-order instruction steps:** In some cases, it is necessary to divide up a step into a few substeps. A sequence of second-order instruction steps is then used.

1. Safety instructions

1.1 General safety instructions

- Putting the products into operation or operating them without having read the instructions is prohibited. The operator must ensure that the instructions are read and understood by all persons tasked with working on the product or who supervise or instruct such persons. Retain the instructions for further use.
- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in this manual.
- Any faults that could affect safety must be remedied according to responsibility. The supervisor must be notified immediately in case of malfunctions outside one's individual scope of responsibility.
- Unauthorized modifications and changes can have an unpredictable effect on safety and operation. Unauthorized modifications and changes are therefore prohibited. Only original SKF spare parts and SKF accessories may be used.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- The components used must be suitable for the intended use and the applicable operating conditions, e.g. max. operating pressure and ambient temperature range, and must not be subjected to torsion, shear, or bending.

1.2 General electrical safety instructions

- Electrical devices must be kept in proper condition. This must be ensured by periodic inspections in accordance with the relevant applicable standards and technical rules. The type, frequency, and scope of the inspections must be determined in accordance with the risk assessment to be carried out by the operator. Work on electrical components may be performed only by qualified electricians. Connect the electrical power only in accordance with the valid terminal diagram and in observance of the relevant regulations and the local electrical supply conditions.
- Work on electrical components may be performed only in a voltage-free state and using tools suitable for electrical work. Do not touch cables or electrical components with wet or moist hands.
- Fuses must not be bridged. Always replace defective fuses with fuses of the same type.
- Ensure proper connection of the protective conductor for products with protection class I. Observe the specified enclosure rating.
- The operator must implement appropriate measures to protect vulnerable electrical devices from the effects of lightning during use. The electrical device is not furnished with a grounding system for the dissipation of the respective electric charge and does not have the voltage strength necessary to withstand the effects of lightning.

1.3 General behaviour when handling the product

- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Keep unauthorized persons away.
- Wear personal protective equipment always.
- Precautionary operational measures and instructions for the respective work must be observed.
- In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.
- Precautionary operational measures and instructions for the respective work must be observed. Uncertainty seriously endangers safety.
- Safety-related protective and safety equipment must not be removed, modified or affected otherwise in its function and is to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then checked for correct function.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.4 Intended use

The IPM is a digital pulse meter for monitoring single flow rates in oil-circulation lubrication systems. It can be used with flow meters and flow limiters.

Use is only permitted within the scope of commercial or economic activity by professional users, in compliance with the specifications, technical data, and limits specified in this manual.

1.5 Persons authorized to use the product

Operator

A person who is qualified by training, knowledge and experience to carry out the functions and activities related to normal operation. This includes avoiding possible hazards that may arise during operation.

Specialist in electrics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise from electricity.

Specialist in mechanics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, start-up, operation, maintenance, repair and disassembly.

1.6 Foreseeable misuse

Any usage of the product other than as specified in this manual is strictly prohibited. Particularly prohibited are:

- Use of non-specified consumables, contaminated lubricants, or lubricants with air inclusions.

- Use of C3 versions in areas with aggressive, corrosive substances (e.g., high salt load).
- Use of plastic parts in areas with high exposure to ozone, UV light, or ionizing radiation.
- Use to supply, convey, or store hazardous substances and mixtures as defined in the CLP Regulation (EC 1272/2008) or GHS with acute oral, dermal, or inhalation toxicity or substances and mixtures that are marked with hazard pictograms GHS01–GHS06 and GHS08.
- Use to supply, convey, or store Group 1 fluids classified as hazards as defined in the Pressure Equipment Directive (2014/68/EU) Article 13 (1) a).
- Use to supply, convey, or store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible operating temperature.
- Use in an explosion protection zone.
- Use without proper securing against excessively high pressures, in the case of pressurized products.
- Use outside of the technical data and limits specified in this manual.

1.7 Tests

The following tests were performed prior to delivery:

- Electrical tests pursuant to EN 60204-1
- Safety and functional tests.

1.8 Referenced documents

In addition to this manual, the following documents must be observed by the respective target group:

- Company instructions and approval rules.

1.9 Prohibition of certain activities

- Alterations to the power supply board beyond replacement in case of defect

1.10 Painting plastic components and seals

The painting of any plastic components and seals of the products described is prohibited. Completely mask or remove plastic components before painting the main machine.

1.11 Safety markings on the product

NOTE

Further to the findings of the workplace risk evaluation the operating company has to attach additional markings (e. g. warnings, signs giving orders, prohibition signs or labelling as specified by CLP / GHS), where appropriate.

WARNING

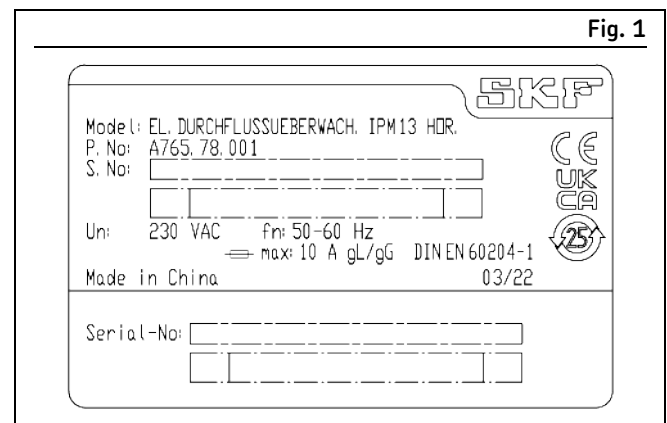


Electrical component, electric shock hazard

Disconnect the system or the corresponding components electrically from the mains before performing any work on electrical components.

1.12 Note on the type plate

The type plate provides important data such as the type designation order number, and sometimes regulatory characteristics. To avoid loss of this data in case the type plate becomes illegible, these characteristics should be entered in the manual.



1.13 Notes on CE marking



CE marking is effected following the requirements of the applied directives requiring a CE marking:

- 2014/35/EU Low Voltage Directive
- 2014/30/EC Electromagnetic Compatibility
- 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS II)

1.14 Note on Low Voltage Directive

The protection objectives of the Low Voltage Directive 2014/35/EU are met in accordance with Annex I, No. 1.5.1 of the Machinery Directive 2006/42/EC.

1.15 Note on UKCA marking



The UKCA conformity marking confirms the product's conformity with the applicable legal provisions of Great Britain.

1.16 Note on China RoHS mark



The China RoHS mark confirms that there is no danger to persons or the environment from the regulated substances contained within for the intended period of use (year number shown in the circle).

1.17 Emergency shutdown

This is done by a course of action to be defined by the operator.

1.18 Assembly, maintenance, fault, repair

Prior to the start of this work, all relevant persons must be notified of it. At a minimum, the following safety measures must be taken before any work is done:

- Unauthorized persons must be kept away
- Mark and secure the work area
- Cover adjacent live parts
- Dry any wet, slippery surfaces or cover them appropriately
- Cover hot or cold surfaces appropriately

Where applicable:

- Depressurize
- Isolate, lock and tag out
- Check to ensure live voltage is no longer present
- Ground and short-circuit

The product should be protected as much as possible from humidity, dust, and vibration, and should be installed so that it is easily accessible. Ensure an adequate distance from sources of heat or cold. Any visual monitoring devices present, such as pressure gauges, min./max. markings, or oil level gauges must be clearly visible. Observe the mounting position requirements.

Drill required holes only on non-critical, non-load-bearing parts of the operator's infrastructure. Use existing holes where possible. Avoid chafe points. Immobilize any moving or detached parts during the work. Adhere to the specified torques.

If guards or safety devices need to be removed, they must be reinstalled immediately following conclusion of work and then checked for proper function.

Check new parts for compliance with the intended use before using them.

Avoid mixing up or incorrectly assembling disassembled parts. Label parts. Clean any dirty parts.

1.19 First start-up, daily start-up

Ensure that:

- All safety devices are fully present and functional
- All connections are properly connected
- All parts are correctly installed
- All warning labels on the product are fully present, visible, and undamaged
- Illegible or missing warning labels are immediately replaced

2. Functional description

2.1 General

The IPM is a digital pulse meter for monitoring single flow rates in oil-circulation lubrication systems. It can be used with flow meters and flow limiters.

The IPM touch panel allows on-site configuration and the adjustment of individual settings for up to 45 lubrication points. The flow rate of each lubrication point is compared with its setpoint, and can be assigned a reduced value when in the starting state, in order to suppress unnecessary alarms. In addition to the local alarms for information purposes, there are five relay outputs available with 15 different alarm combinations. Due to its modular structure, the IPM can be optionally supplied

with customer-specific Ethernet ports. The IPM is ideal for upgrading existing oil flow metering systems with pulse output or static signals.



IPM 29 vertical

The control is implemented using a Siemens 1214C CPU and a KTP400 Basic Touch Panel, at which the current system states can be seen and parameters can be changed.

An exchange of signals via floating contacts takes place through the higher-level system

2.2 Display language

The display language for the visualization is English.

2.3 Control cabinet

Control cabinet: → Chapter Dimensions
Power supply: 230 V AC, N, PE, 50 Hz
Control voltage: 24 V DC
Enclosure rating: IP65

2.4 Configuration of control in the control cabinet

Program sequence control

- Siemens Simatic S7-1200, CPU 1214C DC/DC/RLY CPU
IP: 192.168.1.2

Control panel / visual presentation

- Siemens KTP400 Basic Touch panel
IP: 192.168.1.3

Programming software

- Siemens TIA Portal V16

2.5 Power disconnection

The control cabinet for monitoring the oil system is supplied with electrical power through a supply line. The control is disconnected from the mains by means of the fuse (-FC1). To prevent it being switched on unintentionally (during repair or maintenance), the FC1 fuse must be sufficiently marked. The supply line must be de-energized in order to be completely sure of one's safety.

NOTE

The five safety rules must be observed before working on electrical systems.

2.6 Description of operating modes

The IPM pulse meter can be operated in two different operating modes or with two types of sensors.

The first version monitors the gear wheels of one or more (max. 45) SKF flow meters. A flow can be determined from the pulses which is also displayed on the Touch Panel.

The other version monitors whether an oil flow is present in SKF flow limiter. Here the status is output in the Touch Panel.

2.7 Gear-type flow indicator with rate meter (Flow Meter Mode)

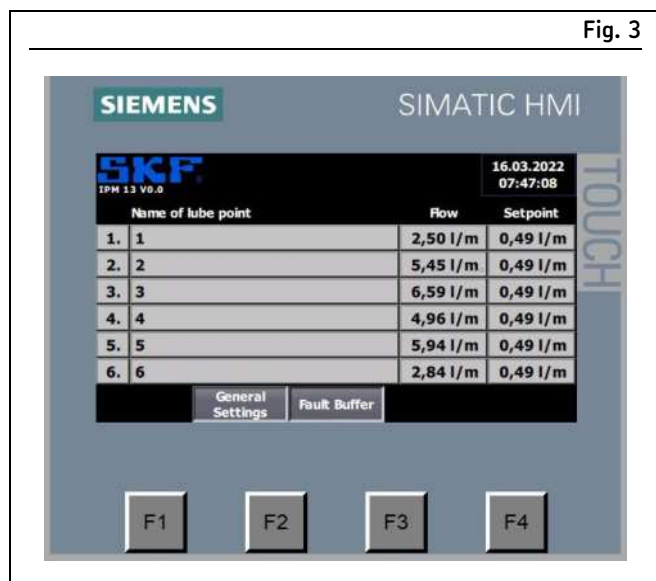


Figure 3 shows the current states and flows. The flow value is generated from the pulses which are transmitted from the gear-type flow indicator via pulses to the S7 1200.

If a fault is present at a lubrication point, then the affected line will be marked in red.

In this operating mode, it is possible to bring the IPM pulse meter into a start-up mode. An energized digital input is used to lower the flow setpoint by a freely selectable percentage. This is used to prevent false messages from the IPM at the time of system start and when the oil is still cold.

2.8 Function with static signal (flow monitoring)

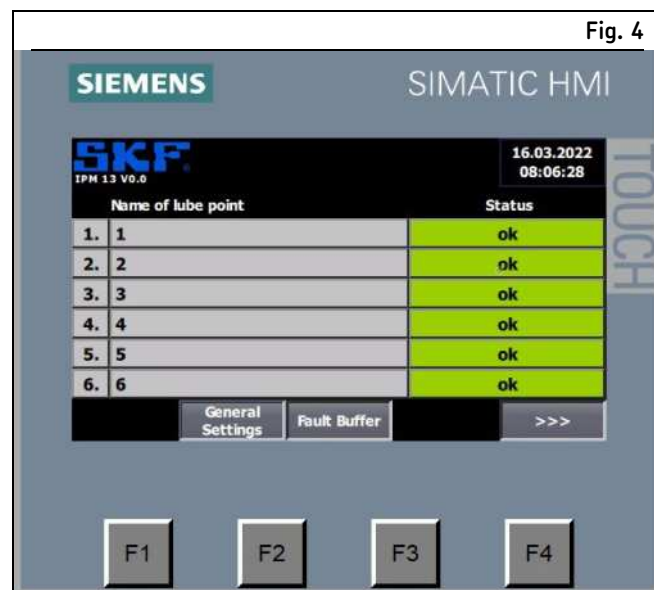


Figure 4 shows the overview screen for the lubrication points. The current state is displayed here. As soon as a fault is present at a lubrication point, the affected line will be marked in red.

3. Technical data

Table 1

Technical data for IPM

Features	Values
Type	Digital pulse meter
Mounting position	horizontal oder vertical (depending on the design)
Material	Stainless steel
Operating temperature	-20 °C ... + 60 °C
Connection	0.5 ... 6 mm ² (push-in)
Electrical connection:	
Supply voltage	110 V AC, 60 Hz/ 230 V AC, 50 Hz
Operating voltage	24 V DC ±2%
Sensor Type	PNP / NPN (2/3-cable sensor)
Number of signal inputs	13, 29 or 45
Signal output	5x NO relays (dry)
Switching voltage	Max. 250 V AC/DC
Enclosure rating	IP 65
Dimensions	
- IPM 13	550 × 200 × 175 mm 21.65 × 7.87 × 6.89 in
- IPM 29	700 × 200 × 175 mm 27.55 × 7.87 × 6.89 in
- IPM 45	900 × 200 × 175 mm 35.43 × 7.87 × 6.89 in

4. Delivery, returns, storage

4.1 Delivery

After receipt of the shipment, it must be inspected for any shipping damage and for completeness according to the shipping documents. Immediately inform the transport carrier of any shipping damage. The packaging material must be preserved until any discrepancies are resolved.

4.2 Return shipment

Before return shipment, all contaminated parts must be cleaned. If this is not possible or practical, e.g. if it would impede fault detection in the case of complaints, the medium used must always be specified. In the case of products contaminated with hazardous substances as defined by GHS or CLP regulations, the safety data sheet (SDS) must be sent with the product and the packaging must be labelled in accordance with GHS/CLP. There are no restrictions for land, air, or sea transport. The choice of packaging should be based on the specific product and the stresses to be expected during transport (e.g., necessary anti-corrosion measures in the case of shipment by sea). In the case of wooden packaging, the applicable import regulations and the IPPC standards must be observed. Required certificates must be included in the shipping documents. The following information, as a minimum, must be marked on the packaging of return shipments.



Marking of return shipments

4.3 Storage

The following conditions apply to storage:

- Dry, low-dust, vibration-free, in closed rooms
- No corrosive, aggressive substances at the storage location (e.g., UV rays, ozone)
- Protected against animals (insects, rodents)
- If possible, keep in the original product packaging
- Protected from nearby sources of heat or cold
- In the case of large temperature fluctuations or high humidity, take appropriate measures (e.g., heating) to prevent the condensation of water
- Before usage, check products for damage that may have occurred during storage. This applies in particular to parts made of plastic (due to embrittlement).

4.4 Storage temperature range

For parts not filled with lubricant, the permitted storage temperature is the same as the permitted ambient temperature range (see "Technical data").


4.5 Declaration of decontamination

If the product came in contact with harmful substances, make sure to thoroughly clean the product before returning it to us. Due to statutory provisions and for the safety of our employees and operation facilities we further need a fully completed and signed "Declaration of decontamination".


5. Assembly

Observe the safety instructions and the technical data in this manual. Additionally, during assembly pay attention to the following:

- Only qualified and authorized technical personnel may install the products described in this manual.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.
- Possibly existing visual monitoring devices, e.g. pressure gauges, MIN/MAX markings, oil inspection glasses must be clearly visible.
- Protect the product against humidity, dust and vibrations.
- Install the product in an easily accessible position. This facilitates other installations, control and maintenance work.

⚠ WARNING
**Electric shock**
Work on electrical components may be performed only by qualified electricians.
At a minimum, the following safety measures must be taken before any work on electrical components is done:

- Isolate, lock and tag out
- Check to ensure the absence of voltage
- Ground and short-circuit the product
- Cover any live parts in the surrounding area



Observe the following instructions for a safe connection:

- The electrical connection must be implemented in accordance with the specifications of the standards of the DIN VDE 0100 series or of the standards of the IEC 60364 series, respectively
- Connect the electrical lines in such a way that no mechanical forces are transferred to the product
- The pump must be secured with a suitable external fuse (see terminal diagram)

The electrical connection is established in accordance with the type of connection of the specific pump.

1. Assemble the required cables in accordance with the respective connection diagram or use preassembled cables for the connection.
2. Connect plugs with their respective bushes and secure them against becoming loose using the type of securing method specified for the quick disconnect couplings. Only this way is a safe connection and compliance with the enclosure rating secured.

NOTE

Connect the cables in such a way that no tensile forces can be transferred to the product.

5.1 Dimensions

5.1.1 Dimensions IPM 13

Fig. 6

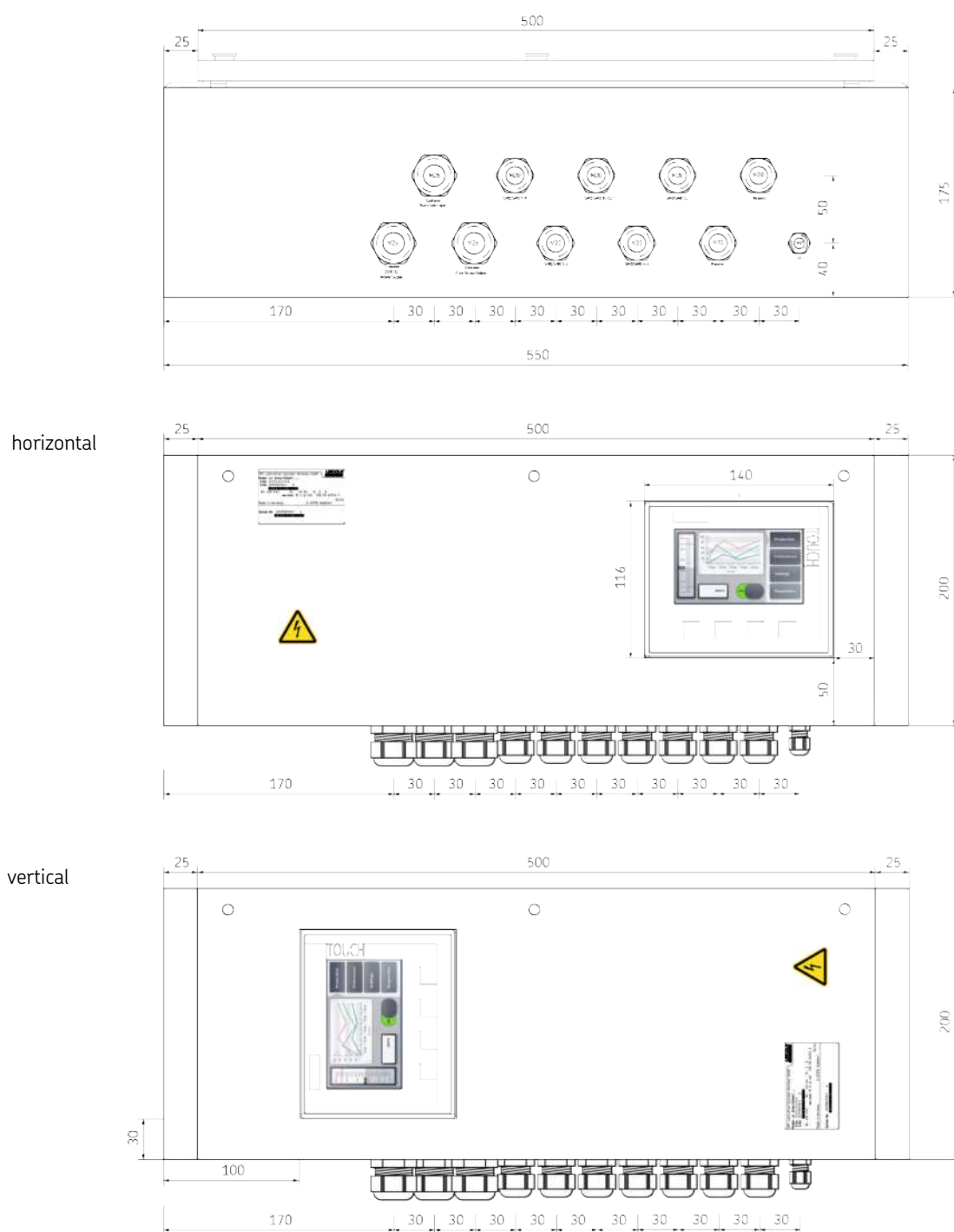


Abb. 7

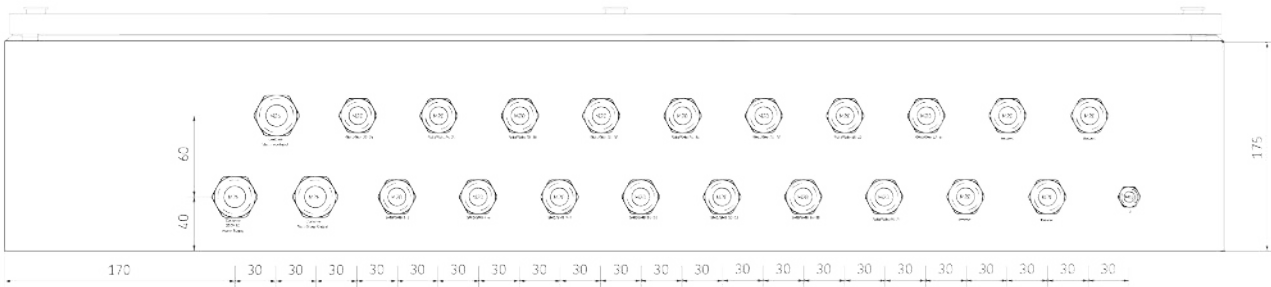
horizontal

vertical

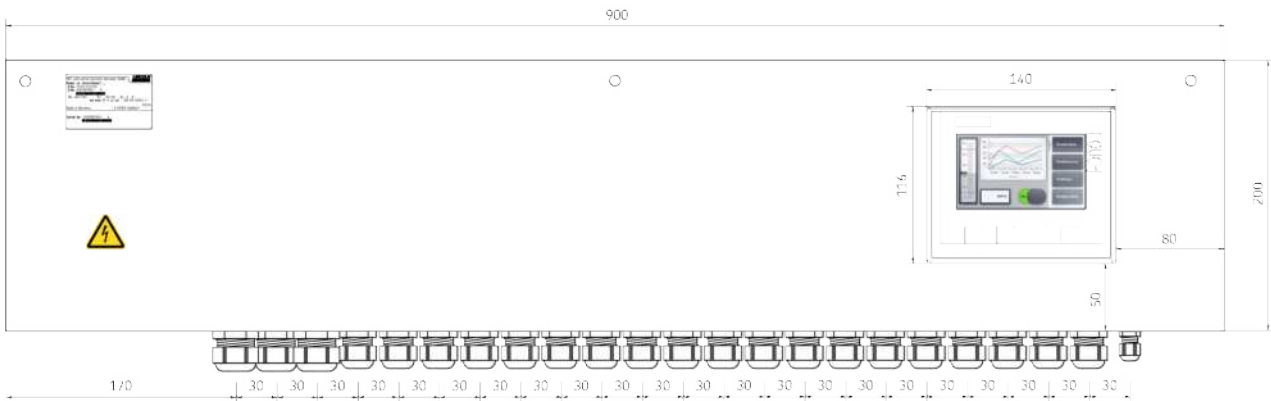
The drawing shows two views of the HX100 device. The horizontal view at the top shows a rectangular unit with a width of 700 mm and a height of 175 mm. It features a top panel with 14 ports (12 RJ45 and 2 SFP) and a bottom panel with 14 RJ45 ports. The vertical view at the bottom shows the same unit from the side, with a width of 700 mm and a height of 200 mm. It includes a display screen on the left, a warning label on the right, and a terminal block at the bottom. Dimensions for the terminal block and other components are provided in millimeters.

5.1.3 Dimensions IPM 45

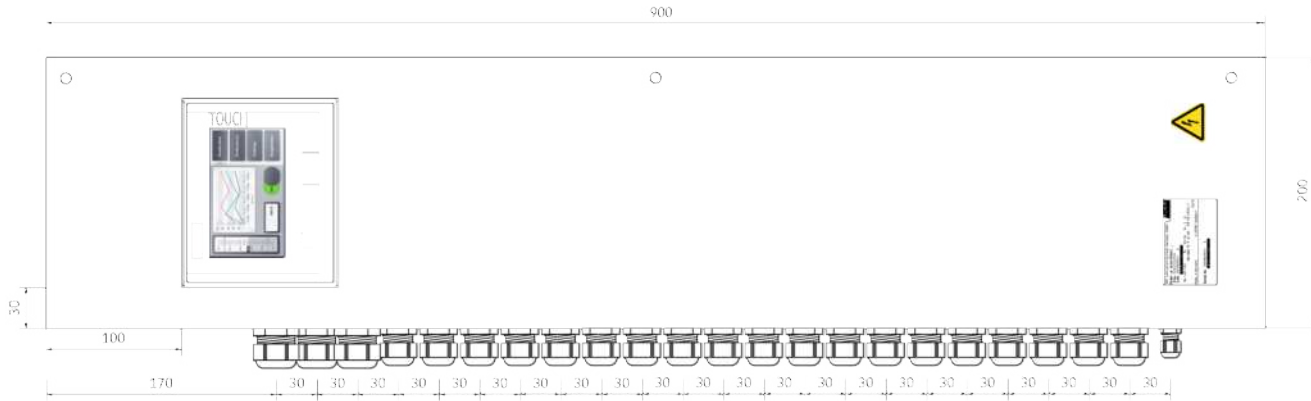
Fig. 8



horizontal

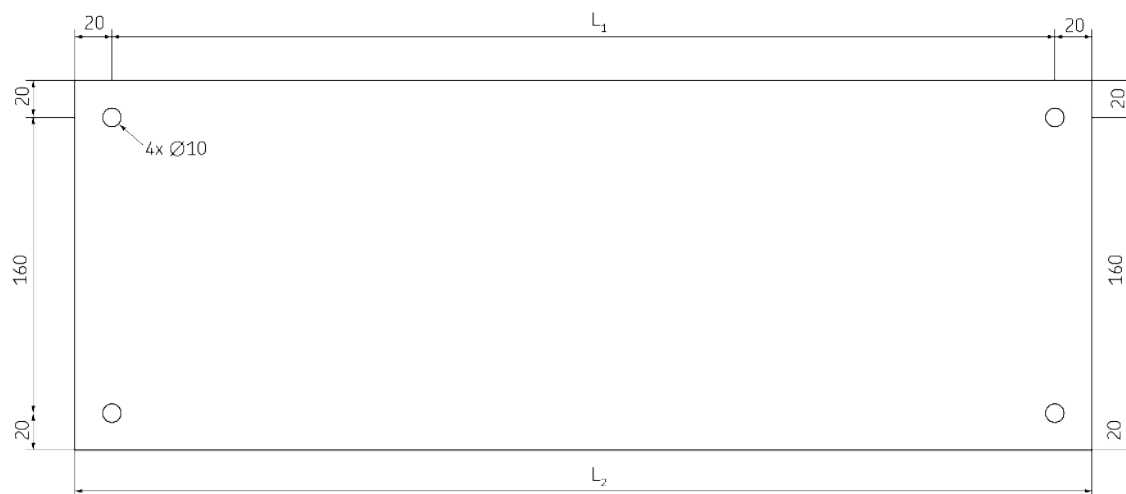


vertical



5.1.4 Dimension for mounting

Fig. 9



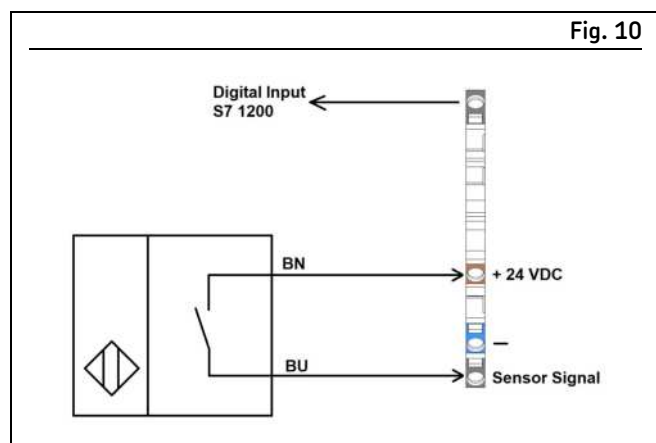
Version	L ₁	L ₂
IPM 13	510	550
IPM 29	660	700
IPM 45	860	900

5.2 Electrical connection

The IPM pulse meter is to be supplied with 230 V AC 50 Hz. The supply line is placed at terminal strip XD0.

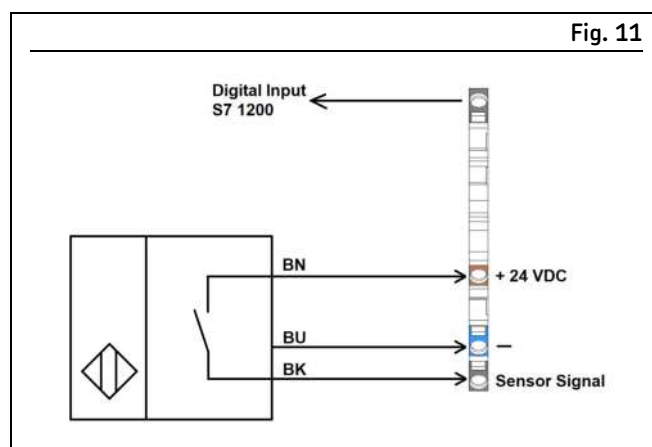
5.3 Connection diagram for sensors

Fig. 10



2-wire sensor

Fig. 11



3-wire sensor

The lines of the sensor outputs of the SKF flow meter / flow limiter must be placed on the terminal strip X3. The respective connection diagram is to be observed, depending on whether 3-wire or 2-wire sensors are installed. This can also be seen in the circuit diagram.

5.4 Start mode connection input

The previously mentioned Start mode can be controlled via a digital input when the "Flow Meter Mode" operating mode is activated. The setpoint is lowered by the set percentage when doing so.

The switching of this signal must be floating. The control voltage can be detected via the terminal X4:1. The terminal X4:2 is wired to the digital input of the S7 1200.

5.5 Alarm outputs connection diagram

The IPM pulse meter is equipped with five relay outputs. These are floating. 15 different alarm combinations can be implemented as a result. Each input sensor and/or each lubrication point can be assigned to one of the 15 output combinations. The relay outputs are wired via the terminal strip X5. The outputs are fed through the terminal X5:1. X5:2-6 are the five relay outputs. Please take the circuit diagram into account here as well.

6. Operation

6.1 Overview of the lubrication points

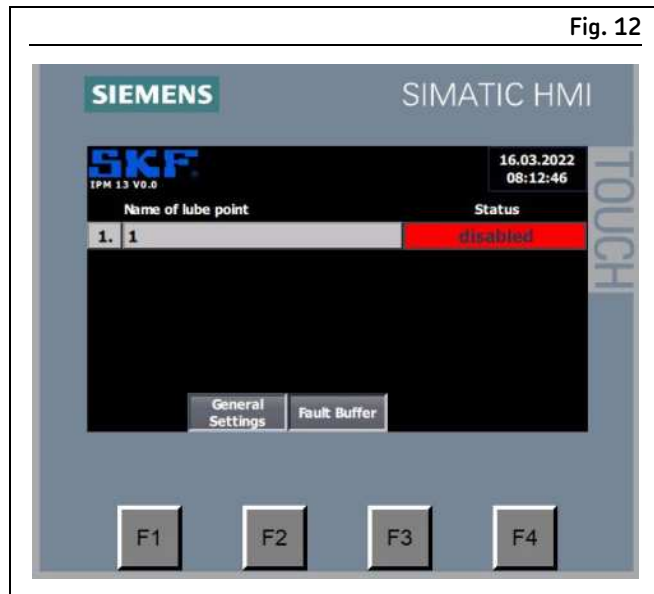
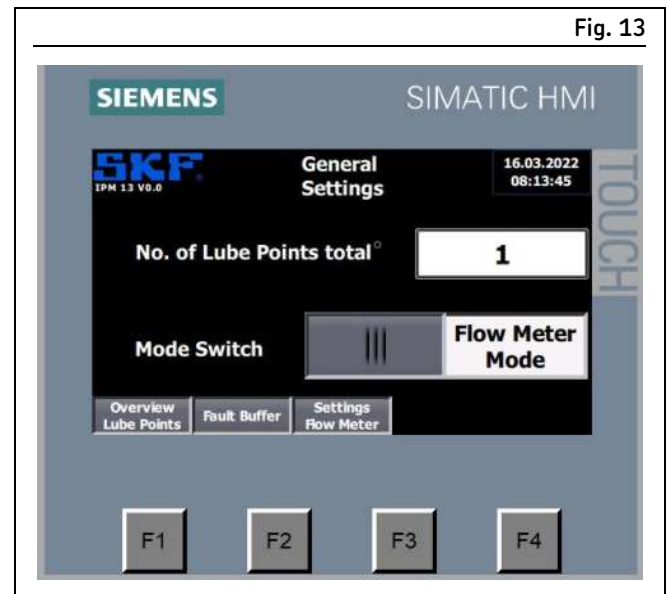


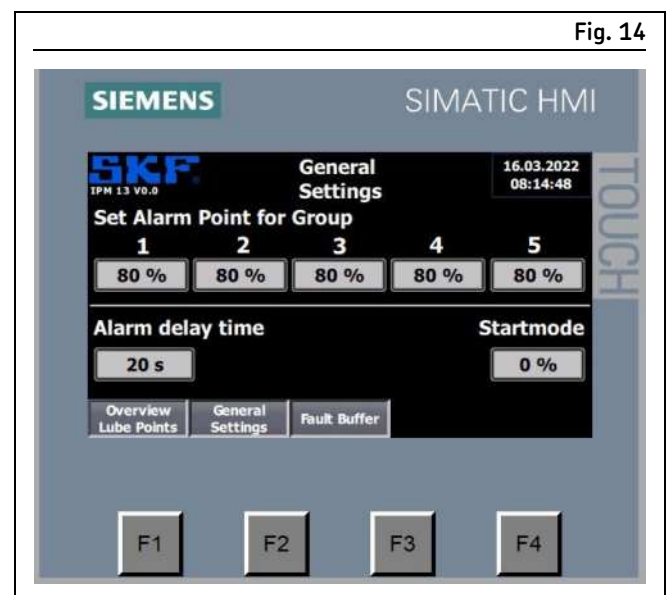
Figure 12 shows the screen when the power supply is switched on and when the panel starts. The previously mentioned overview of the lubrication points will be visible here in the future. To set the number of lubrication points, select **General Settings**.

6.2 General settings



The number of lubrication points must be entered on this screen (→ Fig. 13). The maximum number of lubrication points is 13, 29 or 45, depending on the configuration. In addition, the operating mode can be switched here, as described in Chapter 2. To access the alarm settings, click on **Settings Flow Meter** or **Settings Flow Switch**, depending on the selected operating mode.

6.3 Settings for the alarms



Setting of the alarm points for the various alarm groups with the **Flow Meter Mode** operating mode

Figure 14 shows the screen where the alarm limits of the individual alarm groups can be adjusted. The percentage value to be set defines the point at which an alarm is output via the respective group.

A delay time can also be defined in the lower line.

The percentage value for the start-up mode can also be entered on this screen. The setpoint for all lubrication points will be lowered by this value while the start-up mode is active (→ Chapter 2.7)

Fig. 15



Setting for the *Flow Switch Mode* operating mode

With this operating mode, it is not possible to set anything other than the delay time.

6.4 Setting the individual lubrication points

Fig. 16



The screen (Fig. 16) is displayed when the lubrication point is clicked on the overview screen.

Each lubrication point must be parameterized individually.

Table 2

Adjustable parameters

Parameter	Value	Explanation
Name of lubrication point	max. 14 characters	Freely selectable name (e.g. Lube Point 1)
Setpoint	Max. 99.99 l/min	Minimum setpoint (e.g. 20.50 l/min)
ml / pulse	max. 99.999 ml/pulse	Proportional factor of the SMB/SMD
Alarm Group	1 / 2 / 3 / 4 / 5 / 1+2 / 1+3 / 1+4 / 1+5 / 2+3 / 2+4 / 2+5 / 3+4 / 3+5 / 4+5 (Dropdown menu)	Alarm group for alarm output

Explanation of the parameters

The lubrication point must be activated once all of the parameters have been set. This is accomplished by clicking on **disabled**, which then switches to **enabled**. Afterwards, apply the settings with **Save**.

Once the *Flow Switch Mode* operating mode has been selected, then only the lubrication point name can be assigned and the alarm group can be selected.

6.5 Alarms and alarm memory

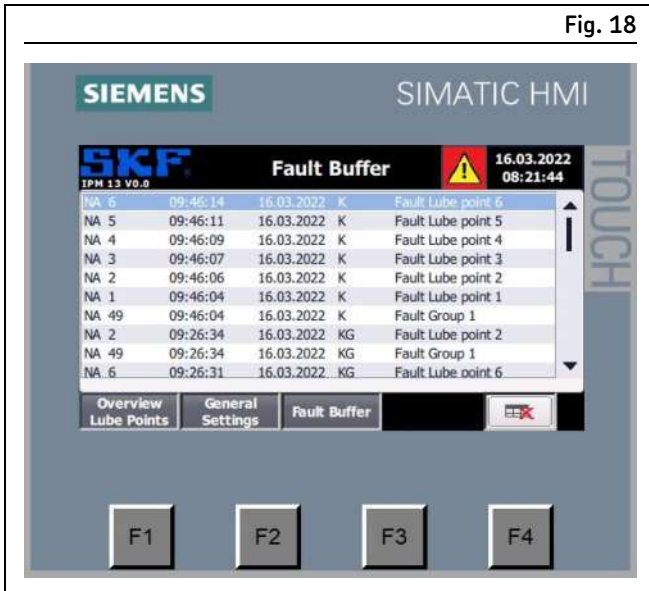
Fig. 17



Click on **Fault Buffer** to access the overview of the alarms currently in effect. If an alarm is in effect, then this will also be signaled in the header by a warning triangle.

The lubrication point with the fault and the alarm group that has been triggered are always included in the list of alarms. If the fault has been rectified and the desired delivery rate (setpoint) is once again in effect, then the alarm will be acknowledged automatically.

Fig. 18



The alarm memory is accessed by clicking once more on *Fault Buffer*. All alarms are stored there. The memory can be cleared by using the "Delete" key at the lower right.

7. First start-up

The products described do not require any special procedure for initial start-up.

8. Maintenance and repair

Careful and regular maintenance is required in order to detect and remedy possible faults in time. The operator must always determine the specific intervals according to the operating conditions, review them regularly, and adjust them where

necessary. If necessary, copy the table for regular maintenance activities.

The described products are virtually maintenance-free.

9. Cleaning

⚠ WARNING



Risk of fatal electric shock



Cleaning work may only be performed on products that have been de-energized first. When cleaning electrical components, be mindful of the IP enclosure rating.

⚠ WARNING



Serious injury from contact with or inhalation of hazardous substances



Wear personal protective equipment. Observe the safety data sheet (SDS) of the hazardous substance. Avoid contaminating other objects or the environment during cleaning.



10. Faults, causes, and remedies




Table 3

Malfunctions, causes, and remedies		
Fault	Cause	Remedy
Touchscreen does not start or is off	FC1 fuse tripped Supply line fuse tripped Loose contact on the touchscreen plug	Check the power supply Check the fuses inside Check the plug on the touchscreen
Touchscreen shows no values (just ###)	S7 1200 is not working or is faulty Profinet connection is disrupted	Contact customer service Check the Profinet connection between S7 1200 and KTP 400
No measurements are displayed	The sensor lead is not clamped in place correctly No settings for lubrication points Check the settings for lubrication points	Check the connection of the sensor
Unrealistic measurements are displayed	Incorrect settings for lubrication points Loose contact	Check the connection of the sensor Check the settings for lubrication points
Sensor is not recording the pulses of the gear	Loose contact on the sensor connection Incorrect wiring Defective sensor"	Check the connection of the sensor
Incorrect fault signals are being issued	Incorrect settings for lubrication points Loose contact	"Check the connection of the sensor Check the settings for lubrication points
"Faults are displayed, but their signals are not issued at the connection required	"Alarm group incorrectly selected in the lubrication point settings"	Check the settings for lubrication points

11. Repairs

⚠ WARNING

Risk of injury
At a minimum, the following safety measures must be taken before any repairs:

- Unauthorized persons must be kept away
- Mark and secure the work area
- Depressurize the product
- Isolate the product, and lock and tag it out
- Check to ensure live voltage is no longer present
- Ground and short-circuit the product
- Cover any adjacent live parts

12. Shutdown, disposal

12.1 Temporary shutdown

Temporary shutdowns should be done by a course of action to be defined by the operator.

12.2 Permanent shutdown, disassembly

Permanent shutdown and disassembly of the product must be planned properly by the operator and conducted in compliance with all applicable laws and regulations.

12.3 Disposal

The waste producer/operator must dispose of the various types of waste in accordance with the applicable laws and regulations of the country in question.

13. Spare parts

Spare parts may be used exclusively for replacement of identical defective parts. Modifications with spare parts on existing products are not allowed.

Fig. 19

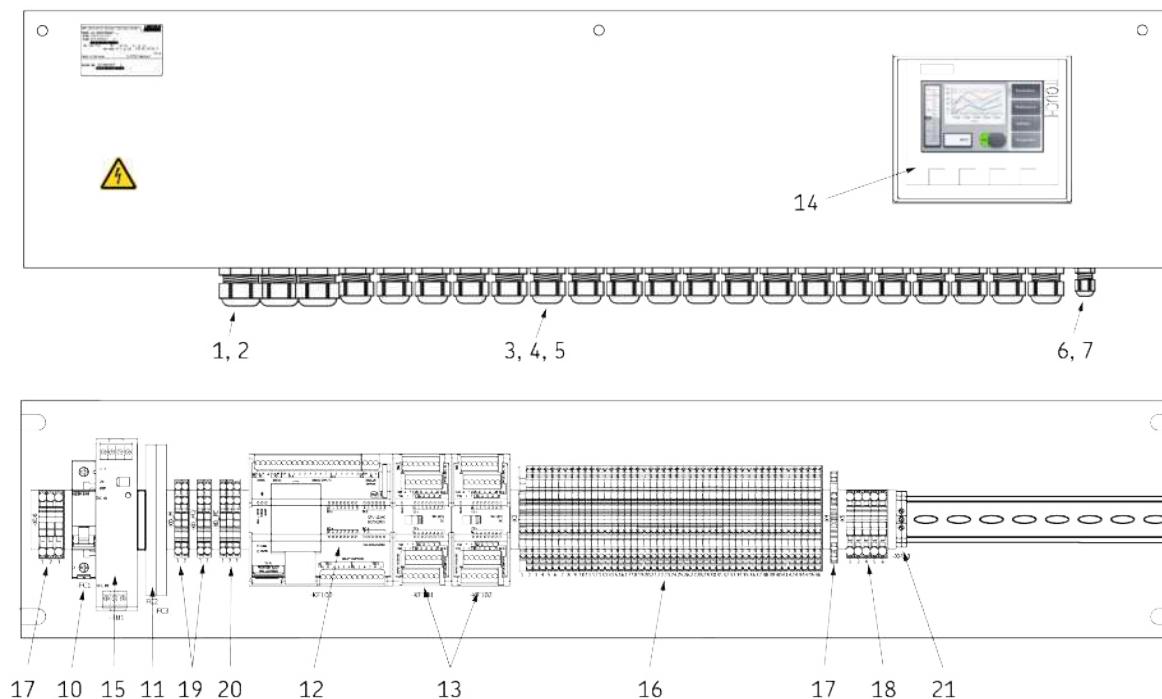


Table 4

IPM spare parts

No.	Order No.	Designation
1	237-13498-4	Screwed gland, brass, M25×1.5
2	237-13496-4	Nut SM-M 25×1.5
3	237-13498-3	Screwed gland, brass, M20×1.5
4	237-13496-3	Nut SM-M 20×1.5
5	2370-00000006	Set of multiple seals DIX-M, M20, 3x 5.3mm
6	237-13498-1	Screwed gland, brass, M12×1.5
7	237-13496-1	Nut SM-M 12×1.5
8	237-13444-6	Link
9	2370-00000265	Flat tip screwdriver
10	2360-00000330	Circuit breaker 10kA 1-pole+N b1.6
11	237-10498-2	Electronic load monitoring up to 10A
12	CPU-78001-1	CPU IPM 13 horizontal
	CPU-78002-1	CPU IPM 29 horizontal
	CPU-78003-1	CPU IPM 45 horizontal
	CPU-78004-1	CPU IPM 13 vertical
	CPU-78005-1	CPU IPM 29 vertical
	CPU-78006-1	CPU IPM 45 vertical

Table 4

IPM spare parts

No.	Order No.	Designation
13	236-11156-2	DIGITAL INPUT horizontal
	2360-00000377	DIGITAL INPUT vertical
14	HMI-78001-1	Control panel IPM 13 horizontal
	HMI-78002-1	Control panel IPM 29 horizontal
	HMI-78003-1	Control panel IPM 45 horizontal
	HMI-78004-1	Control panel IPM 13 vertical
	HMI-78005-1	Control panel IPM 29 vertical
	HMI-78006-1	Control panel IPM 45 vertical
15	236-11008-8	Power supply unit 1AC, output 24V 5A
16	237-10644-2	Sensor terminal strip
17	2370-00000165	Feed-through terminal block
18	237-11198-7	2-wire feed-through terminal block
19	237-11342-8	3-wire terminal
20	237-11342-9	3-wire protective conductor terminal
21	237-11094-2	Protective earth conductor

14. Appendix

14.1 China RoHS Table

Table 5

部件名称 (Part Name)	有毒害物质或元素 (Hazardous substances)					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
用钢和黄铜加工的零件 (Components made of machining steel and brass)	X	0	0	0	0	0
本表格依据SJ/T11364的规定编制 (This table is prepared in accordance with the provisions of SJ/T 11364.)						
0 :	表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572 规定的限量要求以下。 (Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.)					
X :	表示该有毒有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。 (Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.)					

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