

Operating manual

Immersion probe

Heavy-Duty Line

PTM50 Heavy-Duty



Translation of original operating manual

PLS-TEC

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1 About the document

1.1 Purpose and content of the operating manual

This operating manual provides all the information required for the product in the various phases of its life cycle.

This operating manual contains information on the following: set-up and function, transport and storage, assembly, commissioning, cleaning and maintenance, return, decommissioning, disassembly and disposal.

1.2 Reading and storing the operating manual

The requirement for safe work is compliance with all specified safety notes, warnings and instructions. In addition, the local accident prevention regulations, general safety regulations and local environmental regulations applicable to the operating area of the product must be observed.

Read this operating manual carefully before starting any work! The operating manual is an integral part of the product and must be kept in the immediate vicinity of the product and accessible to personnel at all times.

If the product is passed on to third parties, also pass on this operating manual.

1.3 Non-observance of the operating manual

PLS-TEC accepts no liability for personal injury or property damage caused by failure to observe the operating manual.

This applies in particular to damage caused by:

- improper use
- assignment of unqualified personnel
- use of unauthorised components
- unauthorised modifications
- improper assembly
- poorly or not performed maintenance and repairs
- use of unauthorised spare parts
- operation of a defective product



1.4 Symbols and illustrations used in the operating manual



1.4.1 Warnings and notices



In this manual, warnings are labelled with symbols. A warning is introduced by a signal word that expresses the extent of the hazard.


Always observe the warnings and act with caution to avoid accidents, personal injury and property damage.

Warnings

 DANGER	
	The signal word DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 WARNING	
	The signal word WARNING indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

 CAUTION	
	The signal word CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor injury.

NOTICE	
	The signal word DANGER indicates a potentially harmful situation which, if not avoided, will result in property damage.

Tips and recommendations



IMPORTANT!

The word **IMPORTANT** highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

2 Safety

2.1 Intended use

The immersion probe PTM50 Heavy-Duty is a transmission measurement probe and is intended for fiber-optic process coupling to a spectrometer.

The immersion probe is installed in a process line or in a bypass and is suitable for liquid and gaseous process media.

The immersion probe may only be operated within the permissible operating limits. Operating limits: [↗ Order-specific data and documents: Specification sheet](#)

The immersion probe may only be used for process media for which the materials used are suitable. Materials used: [↗ Order-specific data and documents: Specification sheet](#)

The collimators and optical fibers supplied must be suitable for the area of application. As standard, the optical fibers supplied are solarisation sensitive and **not** suitable for UV radiation (< 220 nm). The optical fiber must be solarisation resistant to UV radiation. [↗ Order-specific data and documents: Specification sheet](#)

By default, the optical fibers supplied are **not** suitable for pulsed lasers or high-performance lasers. When using the immersion probe with a pulsed laser or high-performance laser, consult PLS-TEC.

The immersion probe fulfils the requirements of the Pressure Equipment Directive 2014/68/EU.

The immersion probe was developed for installation in a superordinate system. The new risks arising from the installation must be assessed by the operator of the overall system and must be taken into account accordingly in the system documentation.

Misuse

Any use other than or beyond this is considered improper use. PLS-TEC is not liable for any resulting personal injury or property damage.

2.2 Use in hazardous areas

The immersion probes of the type PTM50 Heavy-Duty are only to be regarded as viewing windows according to DIN IEC EN 60079. These immersion probes can therefore be installed and used in all EX zones.

All materials used in these immersion probes comply with the DIN IEC EN 60079-0 standard. For details of the materials used, please see the material certificates supplied (EN 10204).

When using the immersion probes PTM50 Heavy-Duty, the operator must ensure that the optical radiation power introduced by them, e.g. by a spectrometer, remains within the limits specified by the standard DIN IEC EN 60079-28.

General information:

- When installing immersion probes in hazardous areas / EX zones, the operator

must observe all regional guidelines and regulations.

- The immersion probes must be grounded. Use the grounding connection on the immersion probe for this purpose.

2.3 Modifications and conversions

Modifications and conversions to the product, an accessory or one of the components may result in unforeseen dangers.

Written authorisation must be obtained from PLS-TEC before performing any technical modifications and conversions on the product or any of its components.

2.4 Personnel – activities and qualifications

Only qualified specialist personnel authorised by the operator may perform work on and with the product. The specialist personnel must know and understand the operating manual and the necessary operating instructions.

The specialist personnel working on and with the product must fulfil the following requirements:

- Has completed training as a plant mechanic, plant fitter, assembly mechanic, assembly fitter or has comparable technical training.
- Has additional knowledge and experience.
- Knows the respective technical terms and regulations.
- Can assess the work assigned to them, recognise potential hazards and take appropriate safety measures.

2.5 Personal protective equipment

No specific personal protective equipment is required for handling the immersion probe.

However, it may be necessary to wear personal protective equipment due to the risk assessment at the place of use of the immersion probe.

2.6 For your safety



Risk of bursting due to unauthorised operating conditions!

If the immersion probe is operated under impermissible operating conditions, the immersion probe may burst and cause serious injury.

- › Only operate the immersion probe under permissible operating conditions.
- › Avoid pressures surges.
- › Avoid sudden temperature fluctuations.



Leaking process medium!

If process medium escapes from the immersion probe, this may result in environmental damage, property damage and serious injury, depending on the process medium.

- › Before commissioning the immersion probe, check the immersion probe for tightness.
- › If process medium escapes, decommission the immersion probe immediately.



Damaged immersion probe!

If the immersion probe is damaged, process medium can escape and cause environmental damage, property damage and serious injury.

- › Decommission the damaged immersion probe immediately.
- › Return the damaged immersion probe to PLS-TEC.

[↗ Page 16, chapter 11](#)

3 Set-up and function

3.1 Set-up

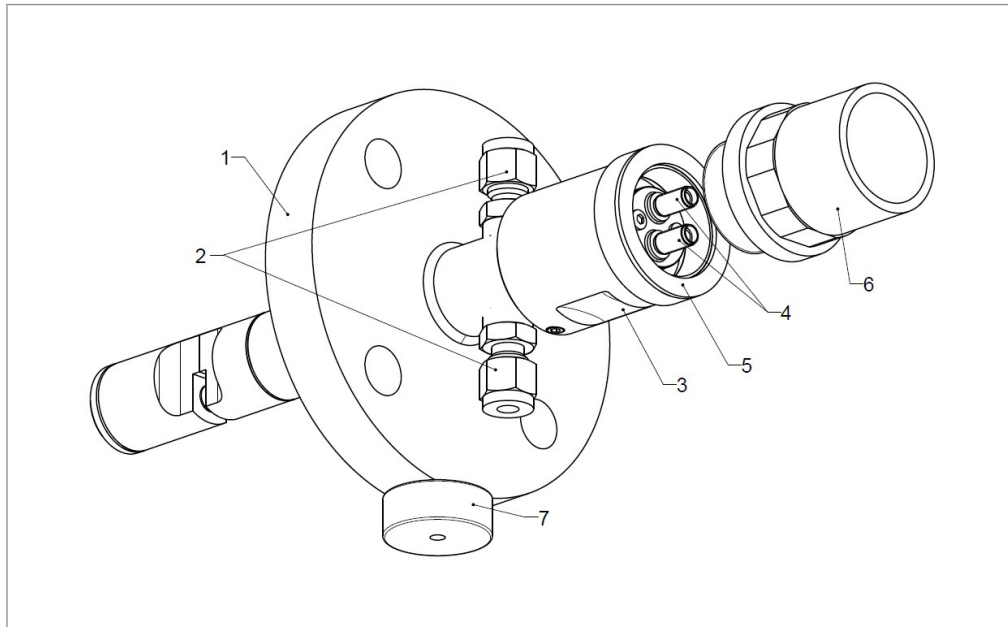


Fig. 1: Set-up of immersion probe PTM50 with special versions

- 1 Connection flange
- 2 Connections for flushing (special version)
- 3 Connection for protection adapter
- 4 Connections for fiber optics
- 5 Flat gasket for protection adapter
- 6 Protection adapter
- 7 RFID tag (special version)

3.2 Function

The PTM50 Heavy-Duty immersion probe is a transmission measurement probe and is either mounted directly in a process line or in a container. The immersion probe is connected to a spectrometer via two optical fibers, making it suitable for continuous analysis.

The signal sent by the spectrometer is transmitted into the immersion probe and, via an optical fiber and a collimator with a lens, through the process medium to the opposite collimator with an optical fiber. From this optical fiber, the signal is returned to the spectrometer.

4 Goods receipt, unpacking, transport and storage

4.1 Goods receipt

Check the delivery immediately upon receipt for completeness and transport damage.

In case of externally recognisable transport damage, proceed as follows:

- Do not accept delivery or only accept delivery with reservations.
- Note the extent of the damage on the transport documents or on the carrier's delivery note.
- Initiate complaint.



IMPORTANT!

Complain about any defect as soon as it is recognised. Claims for damages can only be asserted within the applicable complaint periods.

4.2 Unpacking and transport

1. Check the scope of delivery against the delivery note.
2. Report incomplete and incorrect delivery to PLS-TEC.
3. Separate the packaging according to type and size and dispose of for further use or recycling. Observe national and regional laws and guidelines.

Immersion probe

The immersion probe is supplied in a transport case.

Always transport the immersion probe in the transport case.

Optional optical fiber

Optical fibers longer than 5 m are supplied on a cable reel.

- Store optical fibers on the cable reel.
- Only unroll the optical fiber for installation.

Only return optical fibers after consultation with PLS-TEC.

4.3 Storage

For storage, observe the following:

- Always store the immersion probe in the transport case.
- Always store optical fibers supplied on a cable reel on the cable reel.
- Do not store outdoors.

- Store in a dry and dust-free place.
- Store at room temperature.
- Protect from sunlight.
- If stored for longer than 3 months, regularly check the general condition of all components.

5 Scope of delivery and identification

5.1 Scope of delivery

For the version, options and accessories, see the specification sheet.

[↗ Order-specific data and documents: Specification sheet](#)

5.2 Identification

The following information is lasered on the outside of the flange: Logo, Type, serial number, nominal diameter, pressure rating and CE mark.



Fig. 2: Example: Information on the outside of the flange

- 1 Logo
- 2 Type
- 3 Serial number
- 4 Nominal diameter, pressure rating
- 5 CE mark



Optional optical fiber

A serial number is printed on every optical fiber.

The information on the outside of the flange and the serial numbers for the optical fibers are given in the specification sheet. [↗ Order-specific data and documents: Specification sheet](#)

6 Assembly

6.1 Assembling the immersion probe in a piping system or container

 WARNING	
	<p>Risk of bursting due to unauthorised operating conditions!</p> <p>If the immersion probe is operated under impermissible operating conditions, the immersion probe may burst and cause serious injury.</p> <ul style="list-style-type: none">› Only operate the immersion probe under permissible operating conditions.› Avoid pressures surges.› Avoid sudden temperature fluctuations.

The immersion probe can be assembled either directly into a process line or in a container. As long as the immersion probe is operated under the permissible operating conditions and pressure surges and sudden temperature fluctuations are avoided, PLS-TEC has no further specifications for the assembly of the immersion probe.

The system operator and/or the company commissioned by the system operator for planning and assembly are responsible for the proper and safe assembly of the immersion probe.

6.2 Notices on handling optional optical fibers

The optical fibers are made of quartz glass. The fibers are rather stiff and can break. The fibers are protected against external influences with a flexible protective tube (mono-coil).

The following points must be observed to ensure that the optical fibers function properly:

- If the optical fiber was supplied on a cable reel, first unroll the optical fiber for installation.
- Check the optical fibers supplied for the area of application. As standard, the optical fibers supplied are solarisation sensitive and **not** suitable for UV radiation (< 220 nm). The optical fiber must be solarisation resistant to UV radiation. [↗ Order-specific data and documents: Specification sheet](#)
- Do not bend the optical fiber below a minimum bending radius of 40 cm.
- Do not exceed the maximum permissible temperature of the optical fiber. [↗ Order-specific data and documents: Specification sheet](#)
- Do not lay optical fibers across sharp corners and edges.
- Do not crush optical fibers.
- Do not lay optical fibers on the ground if the optical fiber could be driven over or

stepped on.

- Do not strain or compress optical fibers. Install the optical fibers strain-free.
- Only pull the optical fibers by the sleeve. Never pull on the optical fiber.
- The ends of the optical fibers are protected either by a collimator or a protective cap. Do not remove the protective cap until immediately before connecting to the spectrometer. Protect open optical fiber ends, e.g. with a protective cap.
- Do not expose optical fibers to chemical media.

6.3 Connecting the spectrometer to the immersion probe

Connect the immersion probe according to the spectrometer documentation.

6.4 Connecting the customer flushing

The immersion probe is optionally equipped with connections for connecting the customer flushing. Flushing connection: [↗ Page 10, Fig. 1](#)

Contaminated flushing media can falsify the measurement result. Highly purified compressed air or nitrogen is usually used as the flushing medium.

7 Commissioning and operation

7.1 Required tests before commissioning

The immersion probe fulfils the requirements of the Pressure Equipment Directive 2014/68/EU.

Test after installing the immersion probe according to the system operator's specifications. The applicable regulations and technical rules must be complied with.


7.2 Operation

The immersion probe does not offer any operating options. It is operated via the spectrometer. Operate the spectrometer according to the spectrometer documentation.

8 Cleaning and maintenance

8.1 Cleaning

Clean according to the system operator's specifications. Observe the following notice "Improper cleaning".

NOTICE	
	<p>Improper cleaning!</p> <p>Improper cleaning of the immersion probe may result in damage to the immersion probe.</p> <ul style="list-style-type: none"> › Clean within the permissible operating limits. › If cleaning agents are used, make sure that the materials used, such as seals/gaskets etc., are resistant to the ingredients. › Do not clean optical fibers.

8.2 Maintenance

The maintenance interval generally depends on local conditions such as ambient conditions, operating conditions and process medium and may deviate from the specified maintenance intervals.

Additional maintenance work may be required based on the use of the immersion probe. Comply with applicable regulations and technical rules.

Typical interval	Works	To be carried out by
Every 6 months	<p>External tests:</p> <ul style="list-style-type: none"> • Visual inspections of the immersion probe. • Visual inspection of the surrounding flanges, seals/gaskets and screw connections. • Check the screw connections for tight fit. 	<p>Specialist personnel according to Chapter 2.4</p> <p>↗ Page 8</p>

Table 1: Maintenance schedule

9 Customer service

Our customer service is available for technical inquiries. Information about the responsible contact person can be obtained at any time by telephone, fax, e-mail or via the internet, see manufacturer's address on page 2.



IMPORTANT!

For quick processing, note the type and serial number of the Immersion probe before calling. [↗ Page 12, chapter 5.2](#)

10 Spare parts and repair

Spare parts: [↗ Order-specific data and documents](#)

The spare parts listed in the specification sheet may be replaced. All other components, such as the optical holder, must not be replaced.

WARNING



Incorrect spare parts!

Incorrect spare parts may result in damage and/or malfunctions and injuries.

› Only use original spare parts or spare parts authorised by PLS-TEC.

11 Return

The requirements for a safe return may vary depending on the device or component and country-specific legislation.

Consult PLS-TEC before sending the device or component in for repair or inspection.

Returned devices or components will only be accepted by PLS-TEC if the following conditions are met:

- Device or component is completely cleaned and free of process medium.
- Fully completed and signed contamination sheet is enclosed.

Enclose the following additional information with the return:

- Data sheet of the process medium
- Description of the error that has occurred
- Special instructions, if applicable.

12 Decommissioning, disassembly and disposal

12.1 Decommissioning the immersion probe

Requirements

- Respective area of the piping system or container is depressurised
 - Respective area of the piping system or container is empty, no flow
1. Switch off the spectrometer according to the spectrometer documentation.
 2. If present, switch off the flushing device.
 3. Disconnect the flushing from the immersion probe.
 4. Disconnect the optical fiber from the immersion probe.
 5. Protect the ends of the optical fibers with protective caps, for example.

12.2 Disassembling the immersion probe from the piping system or container

Requirements

- The immersion probe is decommissioned. [↗ Page 17, chapter 12.1](#)
1. Remove the collimators from the immersion probe. For disassembly, follow the reverse order to assembly. [↗ Page 13, chapter 6.1](#)
 2. Disassemble the immersion probe from the piping system.
 3. Store the immersion probe and optical fibers properly.
[↗ Page 11, chapter 4.3](#)

12.3 Disposal

Recycle individual parts according to type and materials. Dispose of non-recyclable materials in an environmentally friendly manner. Observe local and national laws and guidelines.

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