

SITRANS FP

Primary elements according to ISO 5167 for differential flow measurement SITRANS FPS200

Operating Instructions

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Legal information

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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1 Introduction

1.1 Document history

The overview below summarizes the most important changes in the documentation when compared to the previous edition.

Edition	Note
04/2019	First edition
08/2019	Chapter "Nameplate layout" updated

1.2 Correct usage

The primary element is used to measure the volume or mass flow rate of gases, steam and liquids. The device may only be used for the purposes specified in these instructions. The operating safety may be revoked for improper or other than intended use. The manufacturer is not liable for resulting damage. The chemical material compatibility towards the medium must be reviewed and confirmed as compatible by the customer.

2 General information

2.1 Safety information

This device left the factory free from safety problems. In order to maintain this status and to ensure safe operation of the device, please observe the safety information and warnings contained in this instruction.

- The device/system may only be set up and used in conjunction with this documentation.
- Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance by qualified personnel.
- This device may only be used for the applications described in the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.
- You are obliged to respect the test certificates, provisions and laws applicable in your country during connection, assembly and operation of the device/system.
- The device can be operated both at high pressure and with aggressive and hazardous media. Therefore, improper use of this device may lead to serious injury and/or considerable damage to property. Especially, it must be noted when the device was in use and is to be exchanged.
- Commissioning and operation of a device/system may only be performed by qualified personnel. This personnel has to see to it that appropriate power supply is used (see nameplate), that ensures that in normal operation or in case of default of the device or of components, no hazardous voltages may damage the device. Improper use of this device may lead to serious injury and/or considerable damage to property.

2.2 Qualified personnel

The installation and operating must be completed by qualified personnel. Qualified personnel includes persons familiar with the installation, assembly, commissioning and operation of the product and who have the appropriate qualifications for their activities such as:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, for media under high pressure or aggressive or hazardous media.
- For explosion-proof devices: They are authorized, trained, or instructed in carrying out work on electrical circuits for hazardous systems.
- They are authorized, trained or instructed in safety standards for maintenance and use of appropriate safety equipment.
- Training in first aid.

2.3 Requirements for special usage

For clarity reasons, this notice does not contain all detailed information of all types of products and may not consider every possible application or maintenance.

Attention: If you need more information or have particular problems which are not covered sufficiently by the operating instructions, get in touch with Siemens directly (see last page). You may find contact information in the Internet.

The contents of these instructions shall not become part of or modify any prior or existing agreement, commitment or legal relationship. All obligations on behalf of Siemens are contained in the respective sales contract which also contains the complete and solely applicable warranty conditions. Any statements contained herein do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of printing. We reserve the right to make technical changes in the course of further development.

2.4 Special warnings

Exceeding pressure: Appropriate measures are to be taken to secure that the allowed operation pressure according to the stamp on the nameplate is not exceeded. Therefore, appropriate pressure relief valves have to be used.

Normal usage: On acceptance and within the required control intervals, a compression test under overpressure and a leakage test have to be conducted for the whole system.

Exceeding or underrunning of the allowed operation temperature limits: Appropriate measures are to be taken to secure that the allowed operation temperature limits are not exceeded. The pressure equipment may have to be prohibited from exceeding the allowed temperature by temperature limiter.

Damage: Please observe that the product is not dropped and that it is not affected by excess forces.

Too many load cycles: The pressure devices are constructed for a static operation. Appropriate measures are to be taken to observe the specifications which are defined in EN 13480-3; 10.2 c).

Opening under pressure: Appropriate measures are to be taken to secure that the valves of the product are not opened under pressure.

Fire near the product: Appropriate measures are to be taken to secure that the corrosion protection or the coating are not damaged to avoid corrosion and to guarantee the durability of the device. In case the device is damaged by fire or any other influence, immediately, the device product has to be taken out of operation and to be presented to an expert. In case of explosive gases, a fire has to be avoided in any case by appropriate measures.

Improper mounting of the flow computer: Please observe that the components of the product are mounted properly.

Improper mounting of the device: Please observe that the device and its components are mounted properly.

Improper mounting of the tubes: In any case, the installation and operation has to be carried out only by qualified personal. A low-stress assembling has to be observed.

Assembling of pieces of equipment, valves etc.: In case of assembling of pieces of equipment and when starting the working load, the pressure devices shall not be exposed to any loads which may endanger the operating safety. Especially, additional static and dynamic loads are not allowed.

Welding of pieces of equipment: Please observe that no welding, heat treatment or other interventions concerning the safety are affected. Necessary reparations have to be approved by the manufacturer.

Falling components: Locking of components especially when assembling; assembling only by qualified personal wearing safety equipment.

Bruises during installation: Locking of components especially when assembling; assembling only by qualified personal wearing safety equipment.

Overhanging components: Wear safety equipment, identification marking of secure lanes.

Corrosion: Check stability of the tube with your medium. Please observe that the product is used and installed as intended.

Electricity: Caution of voltage! Switch off the device before interfering in the wiring.

Electric shock/electric charging: Assembling and operation only by qualified personal and taking into account the delivered documents.

Source of heat: Identification of safe ways as well as isolation/housing.

Damage in operation: Controlling of plausible measuring results (for example "sensor break").

Other risks: Please observe that the operating instructions of the manufacturer are respected at all times. Especially, pressure devices have to be used for the specified media.

3 Checking the consignment

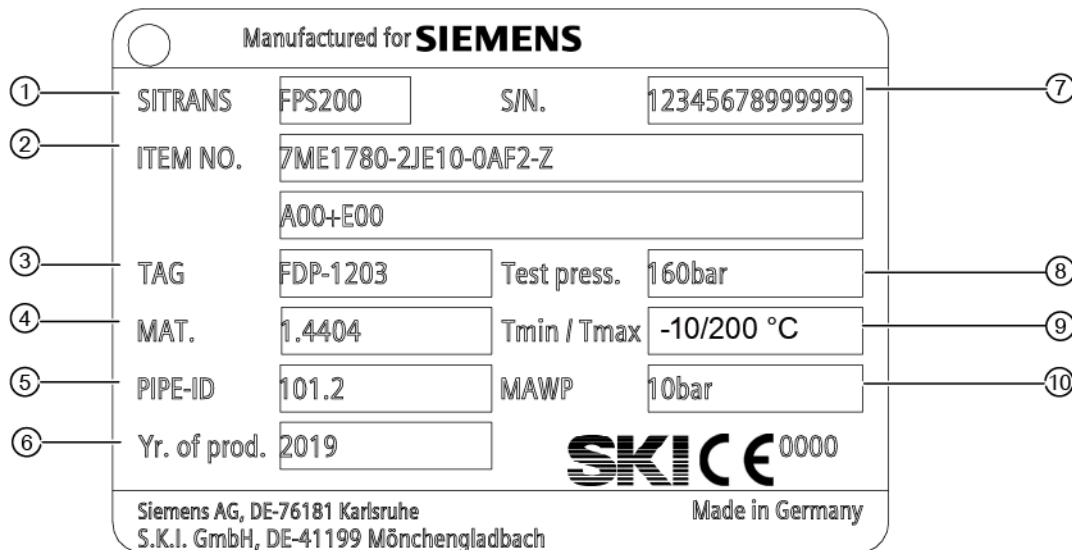
1. Check the packaging and the delivered items for visible damages.
2. Report any claims for damages immediately to the shipping company.
3. Retain damaged parts for clarification.
4. Check the scope of delivery by comparing your order to the shipping documents for correctness and completeness.



Bild 1-1 Product family

4 Nameplate layout

Example



①	Product name	⑥	Manufacture date
②	Article number	⑦	Serial number
③	Tag	⑧	Maximum allowable test pressure
④	Material	⑨	Maximum allowable operating temperature
⑤	Pipe inner diameter	⑩	Maximum allowable operating pressure

5 Installing/connecting

5.1 General information

The following national regulations have to be observed at installation, especially:

- The regulations of the pressure equipment directive 2014/68/EU (if relevant).
- Further applicable standards as AD 2000 or DIN EN 13480 (if relevant).
- EC machinery directive 2006/42/EC (if relevant).
- Before assembling/disassembling, the tube or the pipe has to be unpressurized.
- Before assembling/disassembling, the tube has to be cleaned in case of media that may be toxic or hazardous to health.

The primary element is calculated for specific pipe lines and operating data. Check before installation if the data from the calculation according to ISO 5167 matches the actual operating data.

Verify before assembling if the necessary upstream and downstream conditions are respected and verify the required mounting position (see 4.2.1 In- and outlet routes).

Loose shut off valves (if delivered) have to be mounted on the pressure tapping nozzles of the primary element or for steam applications on the condensate vessels.

All differential pressure lines must be placed with a sufficient drop/incline to the process from the differential pressure transmitter. (See 4.6 Installation positioning and piping).

- With steam and liquids, a pressure release has to be provided at the highest point.
- With gas, drainage has to be provided at the lowest point.

When connecting the differential pressure circuits between first cutoff of the flow meter and the valve manifold of the transmitter, the correct allocation of the pins (+) respectively (-) must be respected.

If devices have not been subjected to a pressure test in the factory, measuring flanges, covers with pre-welding flanges and measuring sections with flange-connected blinds are usually only delivered pre-installed. The screws and bolts must be finally tightened with the corresponding correct tightening torques.

Observe that the primary elements must be transported with appropriate lifting gear to avoid any damages (see 4.3 Transport to measuring point).

5.2 Positioning of the device

5.2.1 In- and outlet routes

To warrant an even flow profile, the primary element must be applied at a sufficient distance from the pipe bends or pipe bottlenecks. The required supply routes for different installation interferences can be taken from ISO 5167. The requirements from ISO 5167 to the pipes must be met (weld seams, roughness, etc.).

5.2.2 Homogeneity

The medium must be a homogeneous fluid. There must not be any change of the physical condition (liquid/gas/steam) and the process line and differential pressure lines must always be filled completely.

5.3 Transport to measuring point

Observe that the primary elements must be transported with appropriate lifting gear to avoid any damage. At transportation, pressure tapping nozzles and fittings may not be subject to heavy loads. Any damage during

transportation must be avoided. In particular, pressure tapping nozzles, fittings, flange finish and painting have to be protected against scratching or other damage.

5.4 Size/Dimensions

Observe the dimension drawings of the primary elements. The serial number-specific dimension drawing can be found in [PIA Life Cycle Portal](#).

5.5 Installation notes

5.5.1 Installation of primary element for flange connection (sandwich or with end flanges)

Observe alignment of the primary elements, the inflow side is marked usually on the fitting ring by "+".

5.5.1.1 Primary element with end flanges

The installation of the primary element between flanges has to be done with two seals which are adapted to pressure, temperature and media. These seals are not part of delivery. The seals must not protrude into the pipe.

At horizontal assembly, the lower flange screws are installed loosely first, then the seal is inserted from above. The last screws can be mounted and lightly tightened. Center the primary element. Finally, tighten the screw bolts. Torques are determined by the type of screws and the seal. Information on this is available from the seal or screw manufacturer.

5.5.1.2 Primary elements in sandwich-build

The installation of the primary element between flanges has to be done with two seals which are adapted to pressure, temperature and media. These seals are not part of delivery. Neither seals nor fitting ring must not protrude into the pipe. Therefore, the inner diameter of the fitting rings is designed a little larger for sandwich versions according to DIN 19205. Fitting rings with even sealing surface are centered by the flange screws.

At horizontal assembly, the lower flange screws are installed loosely first, then the fitting ring and seals are inserted from above. The remaining screws are installed and slightly tightened. Place the fitting ring centrally (may be measured from the outer flange diameter). Finally, tighten the screw bolts considering the appropriate torque. Information on this is available from the seal or screw manufacturer.

5.5.2 Measuring sections

The primary element has to be adjusted that the inlet marked with "+" points in direction of the inflow. The inlet is longer than the outlet. The following assembling corresponds to the procedure of primary elements with end flanges.

5.5.3 Plug-in orifices

Flange Removal

The device is delivered with measuring flanges. The device may have to be disassembled for welding in the flange due to danger of improper heating. Welding in and inspecting the flange weld must be performed according to the state-of-the-art and under adherence of the applicable welding provisions (for example AD 2000). The removal flanges must correspond to DIN 19214 or ANSI B 16.36.

D-D/2-Tapping

According to ISO 5167, the following conditions must be met for D-D/2-tapping:

- Distance between orifice plate and "+"-tapping: $0.9 D \dots 1.1 D$
- Distance between orifice plate and "-"-tapping:
 - $0.48 D \dots 0.52 D$ for $\beta < 0.6$
 - $0.49 D \dots 0.51 D$ for $\beta > 0.6$

Both distances are measured from the front of the orifice plate (the plus side). The centre line of pressure tapping must intersect the centre of the pipe axis under an angle of 90° if possible, but in any case it has to be within 3° to the perpendicular line. The diameter of the pressure tapping bores must be less than $0.13 D$ and less than 13 mm.

5.5.4 Installation of primary element for welding-In

Welding in and inspection of the weld of the primary element is, according to the state-of-the-art, under adherence of the applicable welding provisions. Any required pressure tests must be performed after any required heat treatment and inspection of the weld seams. The requirements from ISO 5167 to the pipes must be met (weld seams, roughness, etc.).

5.6 Installation position and piping

5.6.1 Primary element with possibility of direct connection of the transmitter

The easiest and cheapest connection between the primary element and the transmitter is a primary element with possibility of direct assembling. This assembling type is favored by standard orifices. In this case, a "sandwich" is built by a 3- or 5-valve manifold and a transmitter which is fixed by 8 screws (4 on each side) under precondition that the allowed temperatures on the diaphragm of the transmitter are not succeeded. The plus side of the transmitter has to be connected with the plus side of the primary element. Both sealing surfaces (the one between primary element and valve manifold as well as the one between the valve manifold and the transmitter) have to be furnished one-sided with seal-rings inserted in the nuts. These seal-rings are part of the delivery. Therefore, an installation of differential pressure pipes is not necessary.

Assembling in horizontal pipes

- For flow rate measurement in gases, the differential pressure transmitter should be installed above the center-line of the pipe at all times. An upwards vertical installation is preferred.
- For flow rate measurement in liquids, the differential pressure transmitter should be installed below the center-line of the pipe at all times. A downwards vertical installation is preferred.
- For flow rate measurement in steam, the differential pressure transmitter should be installed within the center-line of the pipe at all times. The differential pressure transmitter has to be mounted below the connection of the differential pressure.

Assembling in vertical pipes

The differential pressure connections are always mounted horizontally. In case the equipment for direct assembling is tilted, the transmitter has to be installed.

- Above the connections of the differential pressure (for gases).
- Below the connections of the differential pressure (for liquids and steam).

5.6.2 Installation position and piping for measurement in liquids

For **flow rate measurement in liquids**, the primary element should be installed that the pressure tapping nozzles in horizontal pipes is allocated below the horizontal central-line of the pipe. Independent of the piping (horizontal or vertical) the primary element (not always part of delivery) should be installed below the pipe at all times. The differential pressure pipes have to be strictly monotonic decreasing from the primary element to the differential pressure transmitter. The decline should indicate at least 4°. If the differential pressure pipe is accurately dimensioned it is guaranteed that no air pockets falsify the measurement in those pipes.

For **measurements with solids shares**, such as contaminated liquids, installation of separators and discharge valves is sensible to catch and remove deposits.

For **flow measurement in vertical pipes**, a de-aeration is absolutely necessary before initial operation especially at assembly position with a downwards flow to avoid partial filling of the pipe during the measurement.

5.6.3 Installation position and piping for measurement in gases

For **flow rate measurement in gases**, the primary element should be installed that the pressure tapping nozzles in horizontal pipes is allocated above the horizontal central-line of the pipe. Independent of the piping (horizontal or vertical) the primary element (not always part of delivery) should be installed above the pipe at all times. The differential pressure pipes have to be strictly monotonic increasing from the primary element to the differential pressure transmitter. The incline should indicate at least 4°. If the differential pressure pipe is accurately dimensioned it is guaranteed that no enclosed humidity falsify the measurement in those pipes.

For **flow rate measurement in humid gases**, installation of separators and discharge valves is sensible to catch and remove the condensate.

5.6.4 Installation position and piping for measurement in steam

For **flow rate measurement in steam** use two condensation vessels. They must be at the same height. Usually, the condensation vessels as well as the initial shut-off valves are part of the delivery of primary elements for steam. Dependent on pressure and temperature, initial shut-off valves for the connection of the differential pressure pipes dispose of a cutting-ring or a welding connection. The differential pressure transmitter (not always included in the delivery) should be installed below the pipe. The differential pressure pipes have to be strictly monotonic decreasing from the primary element to the differential pressure transmitter. The decline should indicate at least 4°. If the differential pressure pipe is accurately dimensioned it is guaranteed that no air pockets falsify the measurement in those pipes.

To guarantee a correct measurement, the lines between the differential pressure transmitter and condensate vessels must be completely filled with water on either side (water seal).

Usually, the filling is effected by filling valves. To fasten the assembling, we recommend a 5-valve-manifold for measurements in steam because the filling valves are integrative part of these equipments. For maintenance works, additional valves as well as blowout valves can be used.

5.7 Check of the installation

After assembling, we recommend to confirm with another qualified person. Especially, the following points should be checked:

- Is the primary element damaged?
- Is the identification of the primary element correct?
- Do the temperature and pressure of the process, the ambient temperature, the scope of measurement, ... correspond to the specification of the device?
- Is the indication of the flow direction on the primary element corresponding to the real flow direction?
- Is the right positioning for the transmitter being chosen (according to the transmitter type, use and specifications of the medium)?
- Is the right sealing according to process conditions being used?
- Are all screws tightened up?
- Are the differential pressure pipes assembled correctly and connected correctly between primary element and differential pressure transmitter (+ and -)?
- Are all screws of the differential pressure pipes and the shut-off-valves tightened up?

(This list may not be complete.)

5.8 Disassembly

Before disassembly of primary elements, the process has to be stopped. Overpressure has to be avoided. Furthermore, general information (See chapter 1) has to be observed. The influence of the disassembly of the primary element on the whole system has to be considered.

For primary elements in compact design with directly mounted transmitter, this has to be separated electronically and if necessary disassembled.

For all other primary elements the existing differential pressure piping has to be removed first.

Furthermore, all valves have to be closed to avoid possible contamination. Seals, screws and other mounting material can only be used once. When disassembling any damage to the primary element has to be strictly avoided, especially concerning the sealing. The tubes should not be under tension.

5.8.1 Disassembly of primary elements for flange connection (sandwich or with end flanges) and measuring systems

At horizontal assembly, first the flange screws are loosened and the upper flange-screws are to be removed. Then the primary element may be held by means of transportation and the lower flange screws can be removed.

At vertical mounted primary elements, the order of disassembly may be chosen as you like.

5.8.2 Disassembly of plug-in orifices

Plug-in orifices may be disassembled similar to chapter 4.8.1 after removal of the screws.

Welded parts (for example measuring flanges or D-D/2-tappings) have to be separated mechanically if necessary.

This is not necessary for the disassembly of plug-in orifices.

5.8.3 Disassembly of welded primary elements

Welded primary elements have to be separated mechanically.

6 Commissioning

6.1 Usage of further components

6.1.1 Condensate vessels (for steam applications, if included in the scope of delivery)

Usage

Usage of condensate vessels is recommended for gaseous media that turn liquid in the differential pressure lines when cooling off. This is the case especially for steam. Depending on pressure and temperature, it may occur as well with other media (for example alcohols).

Function, installation and commissioning

During installation, observe that the two condensate vessels are at the same height; otherwise, zero-point calibration is difficult.

The condensate vessels, including the differential pressure lines to the differential pressure transmitter, must be filled with water/condensate before commissioning the measurement. They may be filled in different manners:

- Through fill sockets at the condensate vessels (if present).
- Through the condensate drain valves or vent of the differential pressure transmitter.

For this, the differential pressure lines must be connected to the water supply, e.g. by a hose screw connection. After commissioning of the steam line, wait until the differential pressure lines and condensate vessels have filled with condensation on their own. All valves at the valve block must be closed for this.

Attention!

Overheating of the differential pressure transmitter must be avoided. Depending on steam temperature, the temperature at the valve block must be monitored. Close the shut off valves in the differential pressure lines when there is any danger of overheating.

The condensate vessels ensure that the differential pressure lines are always filled with water and that no hot steam can reach the diaphragm of the differential pressure transmitter. Condensing steam ensures that the water column is retained. Excess condensation flows back and evaporates again. Using condensate vessels in steam applications considerably reduces fluctuations of the water column. The even measuring signal and increased zero stability warrant even measuring accuracy. The water column transfers the effective pressure DP to the transmitter.

Note!

In any case, wait for a stable condition to be reached after filling and commissioning of the steel supply, before setting the zero point.

6.1.2 Shut off valves (if included in the scope of supply)

Use

Shut off valves are used for initial shutoff of the measuring point. For high-pressure and high-temperature applications double initial shutoff may be recommended or prescribed depending on national regulations.

Function

Initial shutoff serves separation of the measuring system from the measuring line close to the process in case of a leak or maintenance work at the differential pressure lines.

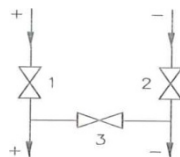
Installation and commissioning

After completion of installation, the shut off valves must be closed. In the scope of commissioning, first carefully open the shut off valves and check the entire measuring system for leaks.

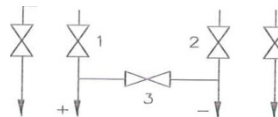
6.1.3 Valve block (if included in the scope of supply)

Versions

3-fold valve block
(Chart)



5-fold valve block
(Chart)



Valve Use

- 1 and 2 Separation of the differential pressure transmitter from the process
- 3 Pressure balancing valve (zero-point setting of the differential pressure transmitter)
- 4, 5 Venting (for liquids and steam)
Drainage (for gases)
Complete emptying of the differential pressure lines (e.g. for maintenance work)

Use

The valve block separates the differential pressure transmitter from the process or is used for regular zero-point setting of the differential pressure transmitter.

Function

If the differential pressure transmitter must be removed from the measuring point (e.g. for replacement or repair) closing of all three valves permits separating the transmitter completely from the process and removing it.

Commissioning

In the scope of commissioning, a zero point adjustment of the pressure transmitter must be provided for in all cases. At initial commissioning, all valves should be closed when starting up the process. Then the valves of the plus and minus sides must be opened carefully. The equalizer valve remains closed. Then ensure that effective pressure lines, valve block and transmitter are completely vented (for liquids and steam) or drained (for gas).

Zero Point adjustment

For zero point adjustment, first close the valve of the minus side and then open the equalizer valve so that both the minus and the plus sides of the transmitter are subject to the same static pressure. In this condition, the zero-point adjustment of the differential pressure transmitter can be performed (see transmitter's operating instructions). After zero-point adjustment, the measuring system is commissioned again in reverse order. Zero-point setting should be inspected or corrected at regular intervals. The measuring system should also be inspected for complete venting or drainage at regular intervals.

Venting/Drainage

For 5-fold valve blocks, the additional valves are used for venting or drainage or complete emptying of the differential pressure lines, e.g. for maintenance work. For steam applications, the valves are used to blow off the differential pressure lines.

Note!

Complete venting/drainage of the differential pressure transmitter is always performed using the corresponding devices at the side of the transmitter flanges that lay opposite to the valve block.

Attention!

If all three valves at the valve block are opened simultaneously, the present differential pressure permits a medium flow through the valve block. This can lead to overheating of the valve block and the differential pressure transmitter in hot media. Therefore, simultaneous opening of all three valves must be avoided absolutely in operation.

7 Troubleshooting

Pos.	Description of faults	Possible cause
Primary element		
1	No or too low differential pressure	The primary element is not mounting in direction of the flow.
		Connections of differential pressure between primary element and transmitter are inverted (the inlet side of the primary element is not connected with the plus side of the transmitter and the outlet side of the primary element is not connected with the minus side of the transmitter).
		Initial shut-off plus and/or minus side is not opened.
		Counterbalance valve is not closed.
		Leakage in the differential pressure lines.
		Upstream and downstream distances are too short.
		Air pockets in the system/differential pressure lines or the transmitter (<i>see measurements of steam and liquids</i>).
		Condensate in the system/differential pressure lines or the transmitter (<i>see measurements of gases</i>).
		Primary element not mounted aligned centrally.
		Condensate vessels not mounted on the same height (different heights in the condensate columns, only at steam applications)
2	Exceeding scope of measurement	Upstream and downstream distances are too short.
		Initial shut-off in the differential pressure line at the minus side is not opened.
		Primary element not mounted aligned centrally.
		Condensate vessels not mounted on the same height (different heights in the condensate columns, only at steam applications).
3	Air pockets in the primary element/pressure line and/or transmitter (<i>in case of measurement of liquids</i>)	Default of the mounting of the primary element or the transmitter.
		Improper venting (see the operation instructions of the differential pressure transmitter).
		Differential pressure lines without grade (<i>in case of measurement of steam and liquids</i>).

		Transmitter not mounted below the primary element (<i>in case of measurement of steam and liquids</i>).
4	Condensate in the primary element/pressure line and/or transmitter (<i>in case of measurement of gases</i>)	Default of the mounting of the primary element.
5	Leakage	A substitution of seals is only necessary in special cases, e.g. if aggressive or corrosive media are not compatible with the material of the seals.
Differential pressure transmitter		
6	No or wrong output signal	Default of the mounting of the differential pressure transmitter (see operating instruction of the differential pressure transmitter).
		Wrong connection of the differential pressure transmitter (see operating instruction of the differential pressure transmitter).
		Improper parameter assignment of the differential pressure transmitter (see calculation of the differential pressure of the primary element).
		Zero-point calibration of the transmitter not successful.
		Measuring cells charged with hot condensate/steam (<i>only when measuring steam</i>).

Note!

Differential pressure transmitters do not require any other maintenance works if used appropriately. When having standard revisions of the material it is recommended to examine the differential pressure transmitter intensively to ensure the functionality (material/edge sharpness, traces of tool wear).

8 Appendix

8.1 Certificates

You can find certificates on the Internet at Certificates

(<http://www.siemens.com/processinstrumentation/certificates>) or on an included DVD.

8.2 Technical support

If this documentation does not provide complete answers to any technical questions you may have, contact Technical Support at:

- Support request (<http://www.siemens.com/automation/support-request>)
- More information about our Technical Support is available at
Technical support (<http://www.siemens.com/automation/csi/service>)