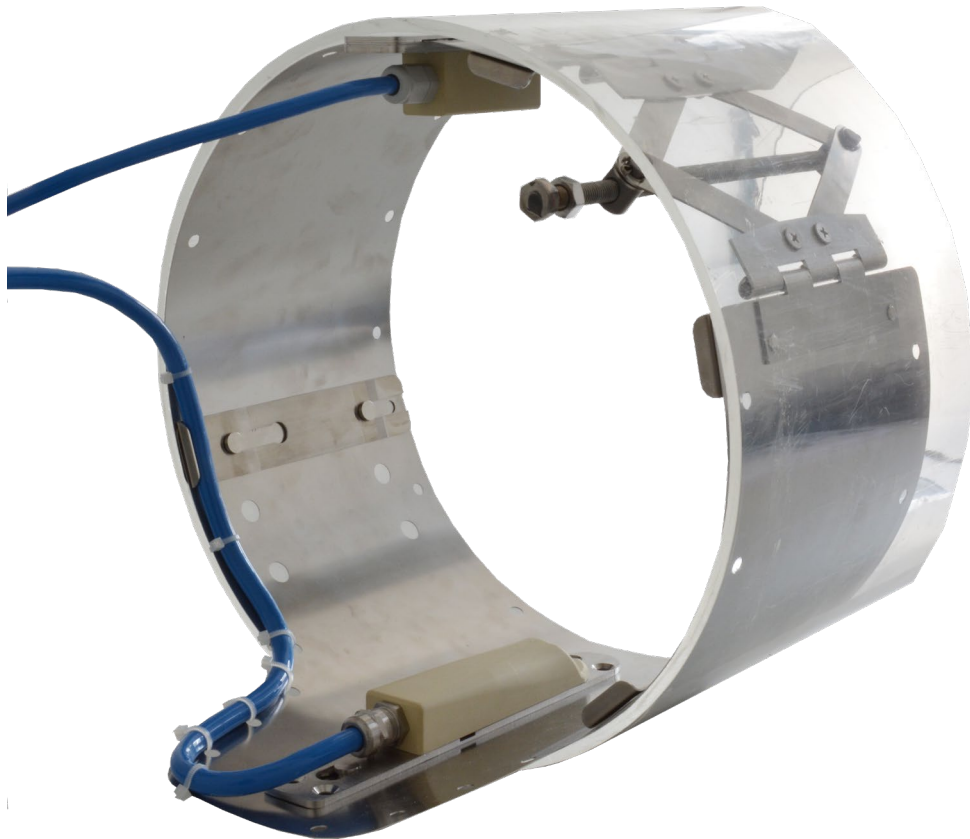


Mounting Instruction for RMS Pipe Mounting Systems



Revised Instruction Manual

Document Revision 01 / 14.11.2024

Original Instruction Manual: German / Rev. 01 / 16.10.2024

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Translation

If the device is sold to a country in the European Economic Area this technical description must be translated into the language of the country in which the device is to be used.

Should the translated text be unclear, the original instruction manual (German) must be consulted or a member company of the NIVUS-Group must be contacted for clarification.

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Names

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Revision History

Rev.	Modifications	Editor	Date
01	NIVUS addresses updated; Chap. "General", "Delivery, Storage and Transport" and "Safety Instructions" updated/added/supplemented; Chap. "14.6.1 Base sheet RMS5" supplemented; Chap. "Maintenance and Cleaning" updated/supplemented; PKM sensors added in various chapters; minor changes in wording and layout	MoG	14.11.2024
00	New creation on the basis of the German-language instruction manual	MoG	21.04.2017

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General

1 About this Manual



Important Notice

READ CAREFULLY BEFORE USE.

KEEP IN A SAFE PLACE FOR LATER REFERENCE.

This instruction manual is valid for NIVUS pipe mounting systems and serves their intended use. This instruction manual is oriented exclusively to qualified expert personnel. Read this instruction manual carefully and completely prior to installation since it contains relevant information on this product. Observe the notes and particularly follow the warning notes and safety instructions.

If you should have problems to understand information contained within this instruction manual either contact a member company of the NIVUS-Group or one of the distributors for further support. The member companies of the NIVUS-Group cannot be held responsible for damage to persons or material due to incorrectly understood information in this instruction.

1.1 Applicable Documentation

For the installation and operation of the complete system extra instruction manuals or technical descriptions may be required apart from this instruction manual.

- Installation Instruction Correlation and Doppler Sensors
- Technical Description for Correlation Sensors and external Electronic Box
- Technical Description Doppler Sensors
- Instruction Manual(s) for Transmitters/Data Loggers

These instructions are included with the respective sensors or transmitters/data loggers or can be downloaded from the NIVUS homepage.

1.2 Required Tools/Aids



Tools and aids are not included in the scope of delivery.

You will need the following tools/aids to install the pipe installation systems:




- Hammer (300 g)
- Cable tie
- Ring spanner or open-end spanner SW13 (for RMS2)
- Phillips screwdriver PZ 2
- Side cutter

Only for RMS5

You will need the following tools to modify the air-ultrasonic sensors:

- Ring spanner or open-end spanner SW22
- Phillips screwdriver PH 1

1.3 Signs and Definitions used

Representation	Meaning	Remarks
	(Action) Step	Execute action steps. Should action steps be numbered observe the specified order of the steps.
	Cross-reference	Reference to further or detailed information.
	Documentation Reference	Refers to an accompanying documentation.
>Text<	Parameter or menu	Indicates a parameter or a menu that is to be selected or is described.

Tab. 1 Structural elements within the manual

1.4 Abbreviations used

Article Names

- CS2 Cross correlation sensor full and partial filling
- CSM Cross correlation sensor Mini Sensor Family
- CSP Cross correlation sensor full and partial filling
- DSM Air-ultrasonic sensor of the Mini sensor family for partial filling
- KDA Doppler Sensor
- OCL Air-ultrasonic sensor for partial filling
- PKM Particle concentration sensor for full and partial filling
- POA Cross correlation sensor full and partial filling
- RMS Pipe mounting system

Safety Instructions

2 General: Used Symbols and Signal Words

2.1 Information on the Valuation of Accident Levels



The general warning symbol indicates the risk of personal injuries or death. In the text section the general warning symbol is used in combination with the signal words described below.

DANGER

Warning in high degree of risk



Indicates a high-risk, **imminently** hazardous situation which will result in death or serious injury if not avoided.

WARNING

Warning in medium degree of risk and personal injury



Indicates a **possible** danger with medium risk which may result in a life-threatening situation or severe bodily injury if not avoided.

CAUTION

Warning in personal injury or property damage



Indicates a possible danger with moderate risk which may result in minor or moderate personal injury or property damage if not avoided.

WARNING

Danger by electric voltage



Indicates a medium-risk, **imminently** hazardous situation caused by electric shock which will result in death or (serious) injury if not avoided.



Important Notice

Contains information that needs to be highlighted.
Indicates a potentially harmful situation that may damage the product or something in its environment if not avoided.



Note

Contains tips or information.

2.2 Warning Notices on the Device (optional)



General Warning Notice

This symbol refers the operator or user to content in this manual.

Consideration of the information contained herein is necessary to maintain the protection provided by the unit for installation and in operation.



Protective earth connection

This symbol refers to the protective conductor terminal of the device.

Depending on the type of installation, the unit may only be operated with a suitable protective earth connection in accordance with applicable laws and regulations.

3 Special safety and Precautionary Measures

When working with the NIVUS equipment, the following safety and precautionary measures must be observed and followed generally and at all times. These warnings and notes are not repeated for each description within the document.

WARNING

Check danger due to explosive gases



Before starting assembly, installation and maintenance work, be sure to check that all regulations on safety at work have been observed and that there is no possible risk of explosive gases. Use a gas warner for the check.

When working in the sewer system, make sure that no electrostatic charge can occur:

- *Avoid unnecessary movements to reduce the building-up of static charges.*
- *Discharge any static electricity present on your body before you start installing the sensor.*

Disregarding may result in personal injury or damage to the system.

WARNING

Germ Contamination



Particularly due to the use of the sensors in the waste water sector, parts can be contaminated with dangerous germs. Therefore, appropriate precautions must be taken when coming into contact with cables and sensors.

Wear protective clothing.

WARNING

Observe Occupational Safety Regulations!



Before and during mounting works, compliance with all work safety regulations must always be ensured.

Disregarding may lead to personal injury.

WARNING



Do not disable Safety Devices!

It is strictly forbidden to disable the safety devices or to change their mode of operation. Disregarding may result in personal injury or damage to the system.

CAUTION



Risk of personal injury

The sheets of the pipe mounting systems are very sharp-edged. There is a risk of cutting injuries.
Wear protective gloves.

4 Warranty

The device was functionally tested prior to shipping. When used for the intended purpose (see Chap. "6 Intended Use") and in compliance with the mounting instructions, the applicable documents (see Chap. "1.1 Applicable Documentation") and the safety information and instructions contained therein, no functional restrictions are to be expected and flawless operation should be possible.



Please also refer to the following Chapter "5 Disclaimer".



Limitation of Warranty

In case of disregarding the safety notes and instructions in this document, the companies of the NIVUS-Group reserve the right to limit the warranty.

5 Disclaimer

The companies of the NIVUS-Group assume no liability

- for consequential damages resulting from a change in this document. The companies of the NIVUS-Group reserve the right to change the contents of this document including this disclaimer without prior notice.
- for personal injury or damage to property resulting from **failure to comply** with the applicable **regulations**. For connection, commissioning and operation of the devices/sensors, all information and higher-level legal regulations of the country (in Germany e.g. the VDE regulations), such as valid Ex regulations as well as the safety and accident prevention regulations applicable to the respective individual case shall be observed.
- for personal injury or damage to property resulting from **improper handling**. For safety and warranty reasons, all work on the equipment that goes beyond the installation and connection measures may only be carried out by NIVUS personnel or by persons or companies authorised by NIVUS.
- for personal injury or damage to property resulting from the operation of the equipment in a technically **faulty** condition.
- for personal injury or damage to property resulting from **improper use**.
- for personal injury or damage to property resulting from **failure to observe** the **safety instructions** in this instruction manual.

- for missing or incorrect readings due to **improper installation or faulty parameterisation/programming** and for any consequential damage resulting therefrom.

6 Intended Use



Note

The pipe mounting systems including all components are intended exclusively for the purpose mentioned below. Any other use beyond this, any conversion or modification of the pipe mounting system without written agreement with the companies of the NIVUS-Group is considered improper use.

The companies of the NIVUS-Group are not liable for any damage resulting from this.

The operator alone bears the risk.

The pipe mounting systems are designed for the temporary installation of sensors in a pipe.

The pipe mounting systems are designed and produced according to the current state of the art and the recognised safety rules at the time of publication of this document. Nevertheless, risks of personal injury or damage to property cannot be completely ruled out.

7 Duties of the Operator



Strictly observe and comply with guidelines and requirements

In the EEA (European Economic Area), the national transposition of the Framework Directive (89/391/EEC) as well as the associated individual directives and, in particular, the Directive (2009/104/EC) concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, must be observed and complied with. In Germany, the Ordinance on Industrial Safety and Health must be complied with.

Obtain the local operating licence and observe the associated conditions. In addition, you must comply with environmental protection requirements and local legal requirements for the following:

- Safety of personnel (accident prevention regulations)
- Safety of work equipment (protective equipment and maintenance)
- Product Disposal (Waste Management Act)
- Materials Disposal (Waste Management Act)
- Cleaning (Cleaning Agents and Disposal)

Connections

As the operator, before activating the system, make sure that the local regulations (e.g. for the electrical connection) have been observed during installation and commissioning.

Keep the Instruction Manual for future Reference

Keep the instruction manual in a safe place and ensure that it is always available and can be consulted by the user of the product.

Hand over the Instruction Manual

When selling the pipe mounting system, this instruction manual must be handed over with it. The manual is part of the standard delivery.

8 Requirements for the Personnel

Installation, commissioning and maintenance may only be carried out by personnel who fulfil the following conditions:

- Qualified personnel with appropriate training.
- Authorisation by plant operator.



Qualified Personnel

in the sense of these instructions or the warnings on the product itself are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the qualifications appropriate to their job, such as

- I. Training and instruction or authorisation to switch circuits and devices/systems on and off, to earth and to label them in accordance with the standards of safety technology.*
 - II. Training or instruction in accordance with safety technology standards in maintenance and use of appropriate safety equipment.*
 - III. First Aid Training*
-

Delivery, Storage and Transport

9 Scope of Delivery

The standard delivery of the pipe mounting systems usually comprises:

- Pipe mounting system according to the order or the delivery documents (see Chap. "13 Overview Pipe Mounting Systems")
- Mounting instructions (printed copy or link to the NIVUS download centre). It contains all the necessary information for installing the pipe mounting systems.

Check other accessories according to the order and on the basis of the delivery note.

10 Inspection upon Receipt

Check the delivery for completeness and apparent intactness immediately after receipt.

Report any transport damage immediately to the delivering freight carrier. Also send a written report to NIVUS GmbH in Eppingen.

Incomplete deliveries must be addressed in writing within two weeks to your responsible representative or directly to the NIVUS GmbH in Eppingen.



Observe the two-week deadline

Complaints received later will not be recognised.

11 Return

In the event of a return, send the pipe mounting system to NIVUS GmbH in Eppingen carriage paid and in the original packaging.

Items that have not been sufficiently franked will not be accepted!

In general, a return note (incl. RMA return number) must be requested from the NIVUS customer service before returning the goods. Without this RMA number, the incoming goods cannot be assigned accordingly.



See Chap. "17 Customer Service Information".

Product Specification

12 Basic Information on the Pipe Installation Systems

These mounting instructions refer exclusively to the installation of pipe mounting systems in pipelines. The pipe mounting systems are mainly used for portable flow measurements. All pipe mounting systems are made of stainless steel 1.4404.

The pipe mounting systems are installation aids for the following wedge sensors:

- CS2
- CSM
- CSP
- KDA
- PKM
- POA

The following air-ultrasonic sensors can also be installed:

- DSM
- OCL



The structure and description of the associated sensors as well as their technical data can be found in the corresponding mounting instructions or technical descriptions.

13 Overview Pipe Mounting Systems

There are four different sets available:

- RMS2 - Pipe mounting set for pipelines DN200 to DN800
- RMS3 - Pipe mounting set for pipelines DN150 to DN300
- RMS4 – Combination of RMS2 and RMS3.
Pipe mounting set for pipelines DN150 to DN800
- RMS5 - Pipe mounting set for pipelines DN700 to DN2000

The pipe installation sets consist of the following elements:

- Scissors jack
- Base sheet
- Clamping clips
- Extension sheets
- Supplementary sheet (optional)

The individual parts of the RMS2, RMS3 and RMS4 pipe installation sets are compatible with each other.

A greater material thickness is used for the RMS5 pipe mounting set. Therefore, the RMS5 cannot be combined with the components of the other sets.

The detailed **scope of delivery** of the individual pipe mounting sets can be found in the respective overview.

13.1 Overview RMS2 Pipe Mounting System

Scope of Delivery Set RMS2:

- 1x Transport bag, blue
- 1x Base sheet
- 1x Scissors jack with tensioning knob
- 2x Extension sheet V5
- 2x Extension sheet V10
- 2x Extension sheet V15
- 8x Clamps

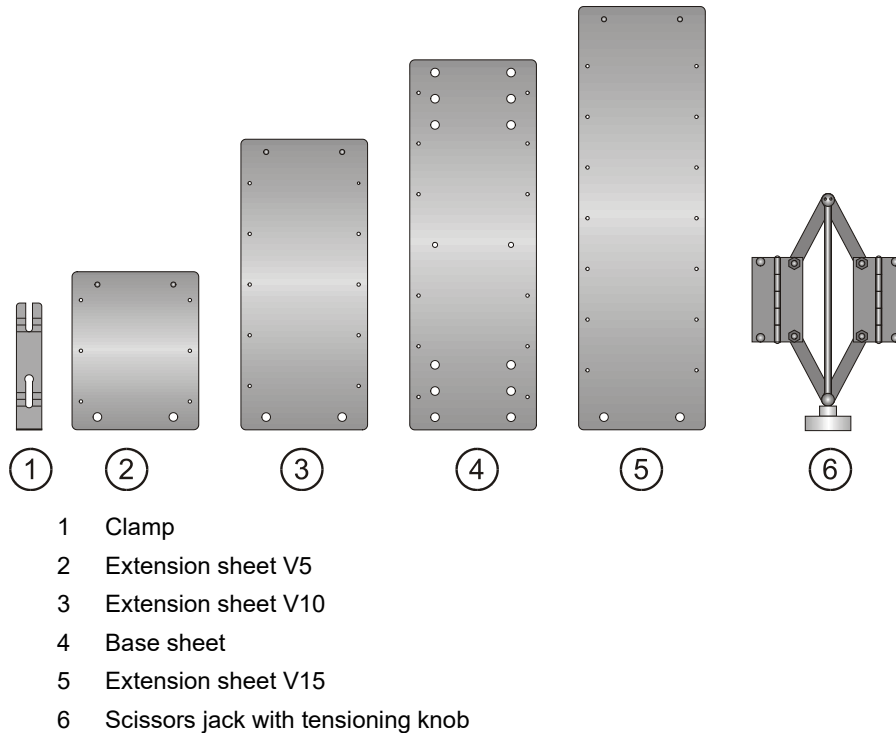


Fig. 13-1 Individual parts of the RMS2 pipe mounting system

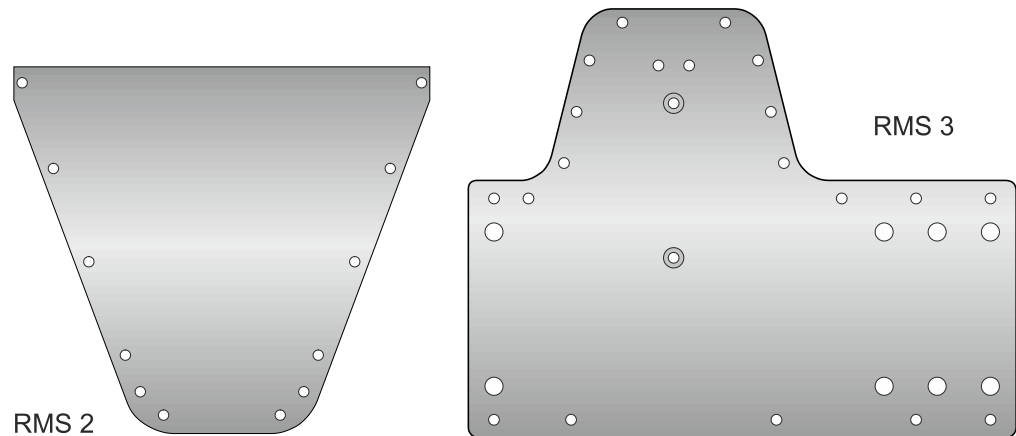


Fig. 13-2 Supplementary sheets (optional) for RMS2 and RMS3

Inside diameter [mm]	BST Base Plate	SPV Scissors Jack	V5 Extension	V5 Extension	V10 Extension	V10 Extension	V15 Extension	V15 Extension
200	X Hole outside	X	-	-	-	-	-	-
250	X Hole inside	X	X	X	-	-	-	-
300	X Hole outside	X	X	X	-	-	-	-
350	X Hole inside	X	-	-	X	X	-	-
400	X Hole outside	X	-	-	X	X	-	-
450	X Hole inside	X	X	X	X	X	-	-
500	X Hole outside	X	X	X	X	X	-	-
600	X Hole outside	X	X	X	-	-	X	X
700	X Hole outside	X	-	-	X	X	X	X
800	X Hole outside	X	X	X	X	X	X	X

Tab. 2 Selection list of required mounting sheets RMS2

Installation of the RMS2 pipe mounting system with simultaneous use of PKM and OCL sensors

If **PKM** and **OCL** sensors are used **at the same time**, one of the two separately available base sheets *ZUB0 RMS2 BSP* or *ZUB0 RMS2 BSPF* must be used instead of the BST base plate, depending on the type of PKM sensor used, in order to increase the distance between the PKM and OCL sensors:

- PKM-VxxKT + OCL: Base sheet *ZUB0 RMS2 BSP*
- PKM-VxxKL + OCL: Base sheet *ZUB0 RMS2 BSPF*

If a PKM sensor is used but **not an OCL** sensor, the BST base plate supplied with the RMS2 set can be used as normal.

13.2 Overview RMS3 Pipe Mounting System

Scope of Delivery Set RMS3:

- 1x Transport bag, blue
- 1x Base sheet
- 1x Scissors jack
- 1x Extension sheet V5
- 1x Extension sheet V10
- 4x Clamps

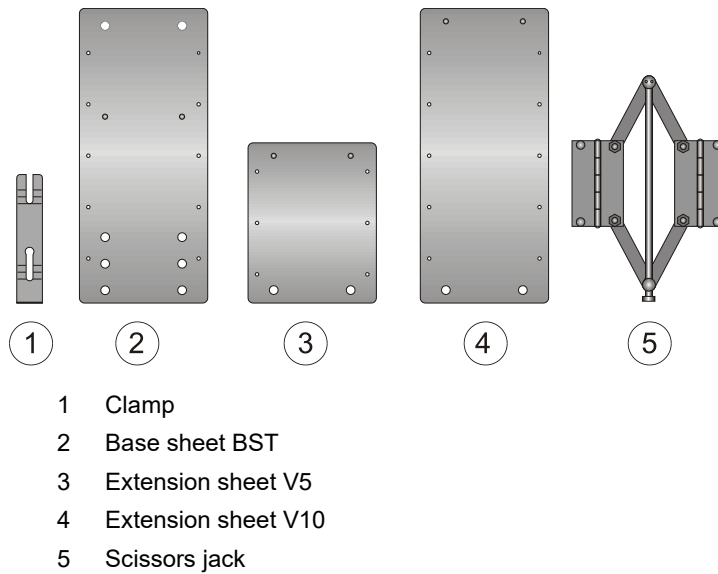


Fig. 13-3 Individual parts of the RMS3 pipe mounting system

Inside diameter [mm]	BST Base Plate	SPV Scissors Jack	V5 Extension	V10 Extension
150	X Hole inside	X	X	-
200	X Hole inside	X	-	X
250	X Hole inside	X	X	X
300	X Hole outside	X	X	X

Tab. 3 Selection list of required mounting sheets RMS3

13.3 Overview RMS4 Pipe Mounting System

The RMS4 pipe mounting system is a combination of RMS2 and RMS3.

⇒ See Tables Tab. 2 and Tab. 3.

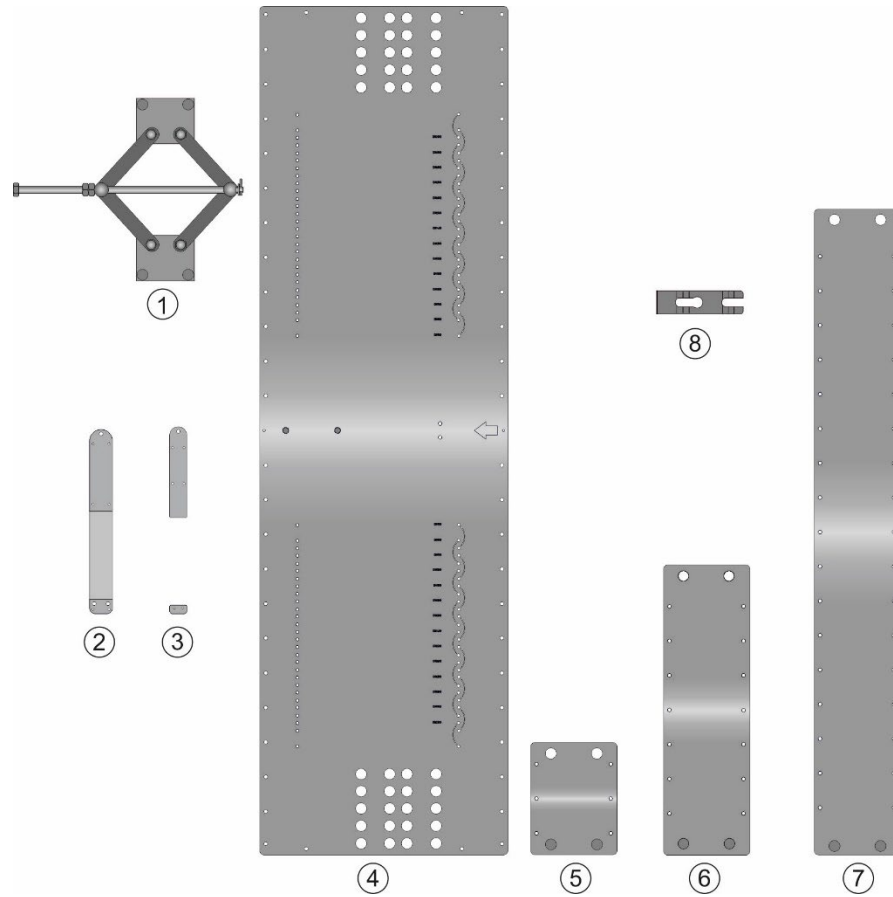
Scope of Delivery Set RMS4:

- 1x Transport bag, blue
- 1x Base sheet RMS2
- 1x Base sheet RMS3
- 1x Scissors jack RMS2
- 1x Scissors jack RMS3
- 2x Extension sheet V5
- 2x Extension sheet V10
- 2x Extension sheet V15

13.4 Overview RMS5 Pipe Mounting System

Scope of Delivery Set RMS5:

- 1x Transport bag, blue
- 1x Base sheet
- 1x Scissors jack
- 4x Extension sheet VS
- 4x Extension sheet VM
- 4x Extension sheet VL
- 10x Clamps
- 1x Spacer sheet for DSM-L0 (two-part)
- 1x Spacer sheet for OCL



- 1 Scissors jack
- 2 Spacer sheet for OCL
- 3 Spacer sheet for DSM-L0 (two-part)
- 4 Base sheet BST
- 5 Extension sheet VS
- 6 Extension sheet VM
- 7 Extension sheet VL
- 8 Clamp

Fig. 13-4 Individual parts of the RMS5 pipe mounting system

Number of sheets in system							
Inside Diameter [mm]	BST Base Sheet	Without Air-Ultrasonic Sensor			With Air-Ultrasonic Sensor		
		Short (VS)	Medium (VM)	Long (VL)	Short (VS)	Medium (VM)	Long (VL)
700	1	4	-	-	1	1	-
800	1	-	2	-	3	1	-
900	1	2	2	-	2	2	-
1000	1	4	2	-	1	3	-
1100	1	-	4	-	3	3	-
1200	1	2	4	-	2	4	-
1300	1	2	-	2	2	-	2
1400	1	4	-	2	1	1	2

Mounting Instruction

Pipe Mounting Systems

1500	1	-	2	2	3	1	2
1600	1	2	2	2	2	2	2
1700	1	4	2	2	3	3	2
1800	1	-	4	2	3	3	2
1900	1	2	4	2	2	4	2
2000	1	2	-	4	2	-	4

Tab. 4 Selection list of required mounting sheets RMS5

Installation

14 Installation Pipe Mounting Systems

14.1 Principles of Installation

WARNING***Check danger due to explosive gases***

Before starting assembly, installation and maintenance work, be sure to check that all regulations on safety at work have been observed and that there is no possible risk of explosive gases. Use a gas warner for the check.

When working in the sewer system, make sure that no electrostatic charge can occur:

- *Avoid unnecessary movements to reduce the building-up of static charges.*
- *Discharge any static electricity present on your body before you start installing the sensor.*

Disregarding may result in personal injury or damage to the system.

CAUTION***Risk of personal injury***

The sheets of the pipe mounting systems are very sharp-edged. There is a risk of cutting injuries.

Wear protective gloves.

***Securing the Pipe Mounting System***

With larger pipe diameters, it may be necessary to additionally secure the pipe installation system against being washed away due to high flow velocities.

Use stainless steel screws for this purpose.

The number of RMS sheets depends on the existing internal pipe diameter. The installation steps for the individual pipe installation systems are described in the following chapters.

The following applies to the installation of pipe mounting systems:

- Observe the selection list of mounting sheets.
- Always attach the scissors jack in the pipe crown (except when using an air-ultrasonic sensor).
- Place the base sheet on the pipe bottom.
- Attach the required number of extension sheets on the left and right between the scissors jack and the base plate (except when using an air-ultrasonic sensor).
- Mount the sheets parallel to the pipe wall.
- Insert the tension clamps flush with the mounting sheet against the direction of flow.
- Ensure sufficient contact pressure on the pipe wall to prevent the mounting system from loosening.
- For larger channel diameters, fix the pipe installation system in the pipe wall with stainless steel screws if necessary.
- There must be no gap between the mounting sheet and the sensor or between the mounting sheet and the channel bottom (risk of tressing).

14.2 Principles of Sensor Fastening

The following applies when the air-ultrasonic sensor and wedge sensor are used simultaneously:

- Position the air-ultrasonic sensor at the pipe crown.
- Align the air-ultrasonic sensor parallel to the water surface.
- Mount the scissors jack directly next to the air-ultrasonic sensor.
- Use supplementary sheet (optional for RMS2/3/4) for wedge sensor (Fig. 13-2).

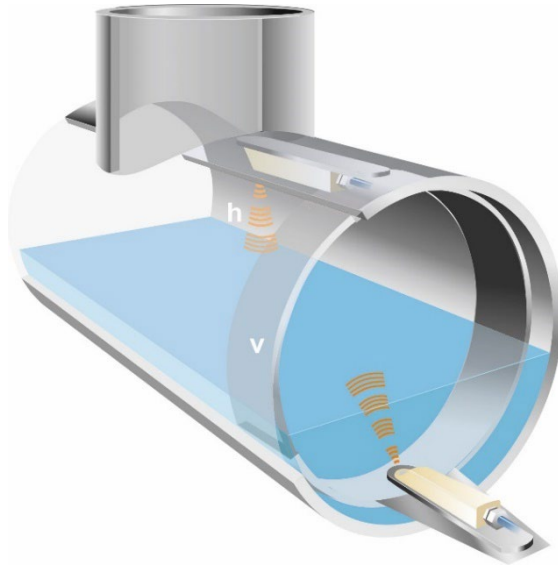
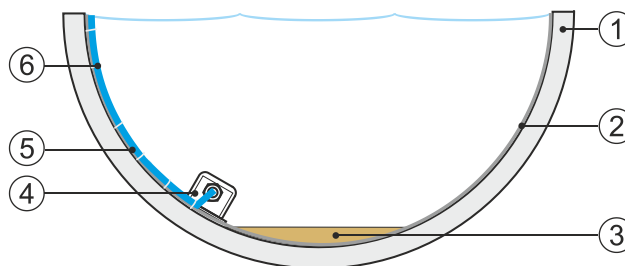


Fig. 14-1 Basic sensor fastening

For high dirt loads or heavy deposits:

- Place the wedge sensor to one side outwards (towards the step irons).
- Route the sensor cable out to the same side as the sedimentation. Do not run the cable across the channel bottom.
- Attach the sensor cable to the RMS with cable ties and guide it upwards.



- 1 Pipe wall
- 2 Pipe Mounting System
- 3 Sedimentation
- 4 Sensor
- 5 Cable
- 6 Cable tie

Fig. 14-2 Mount sensor off-centre

14.3 Installing the RMS2 Pipe Mounting System

The pipe diameter must be measured before starting installation.

The sheets of the set are listed in Tab. 2 on page 17 and their use is marked according to the pipe diameter.

- ➡ Place the components of the RMS on a flat surface.

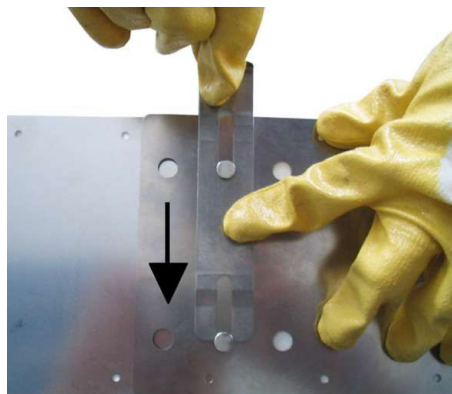
Pre-assembling the sheets



Bring the base plate and extension sheet together.



Insert the pins from the base plate into the holes in the extension sheet.



Insert the tension clamps flush with the mounting sheet against the direction of flow.

If the clamps are difficult to fasten, carefully tap the clamp into position with a hammer.

Mounting Instruction

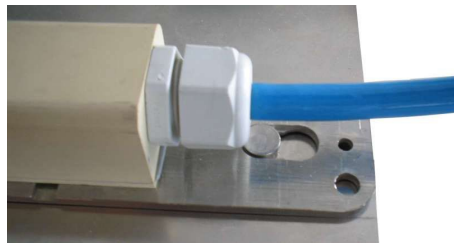
Pipe Mounting Systems

Attaching the flow velocity sensor



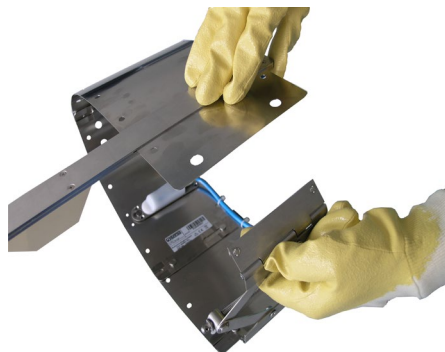
Place the flow velocity sensor with the slotted holes on the base plate.

Slide the sensor backwards on the base plate.



The sensor must be locked flush to the base plate.

Assembling the RMS completely



When the internal pipe diameter is reached:

Bring the scissors jack and extension sheet together.

Insert the pins of the clamping system into the holes of the extension plate.



Attach the scissors jack to the extension sheets on both sides using clamps.



Before fitting in the channel, turn the scissors jack fully clockwise.



Insert the entire pipe installation system into the pipe and align it.

Turn the scissors jack anti-clockwise until the pipe mounting system is clamped in the pipe.



Sensor cable

Always attach the sensor cable to the RMS with cable ties (small holes). Do not route the sensor cable through the centre of the base.

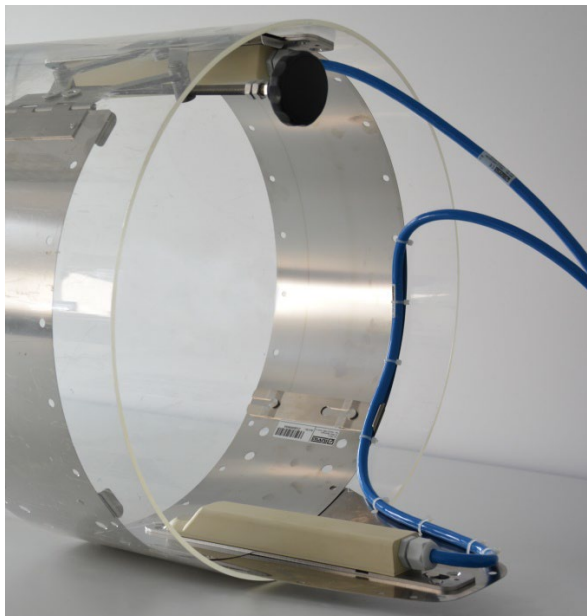


Fig. 14-3 RMS2 with mounted POA and air-ultrasonic sensor

14.4 Installing the RMS3 Pipe Mounting System

- ➡ Proceed as described for the installation of the RMS2 in chapter "14.3 Installing the RMS2 Pipe Mounting System".
 1. Measure the pipe diameter.
 2. Select sheets from the set (see Tab. 3 on page 18).
 3. Place the components on a flat surface.
 4. Plug base plate and extension sheets together.

Attaching the Mini family flow velocity sensor



CSM:

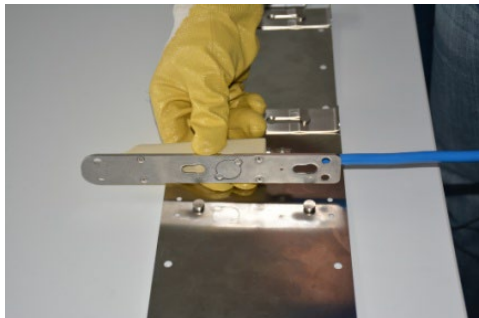
Place the CSM flow velocity sensor with the slotted holes on the base plate.

Slide the sensor backwards on the base plate until the sensor is locked in place.



Important:

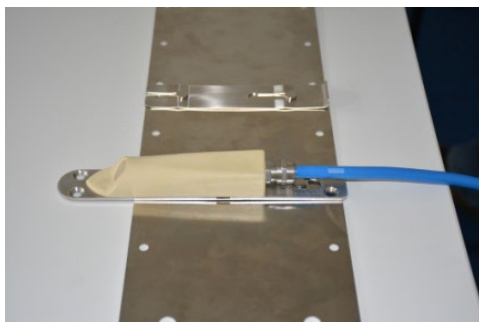
The CSM sensor is **not flush** with the base plate at the rear side.



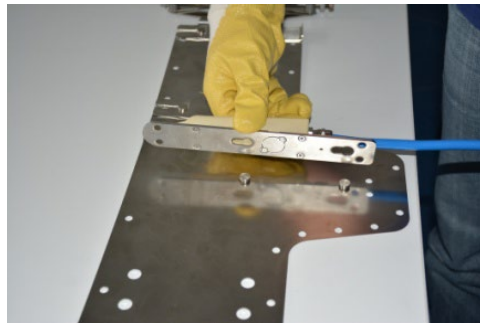
CSM-D:

Place the CSM-D flow velocity sensor with the slotted holes on the base plate.

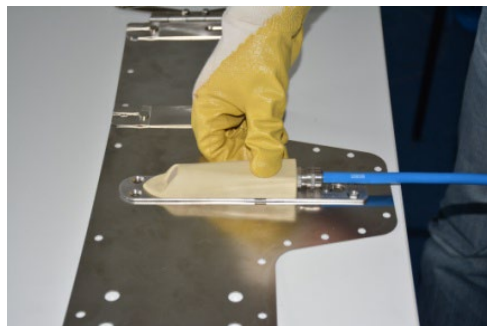
Slide the sensor backwards on the base plate.



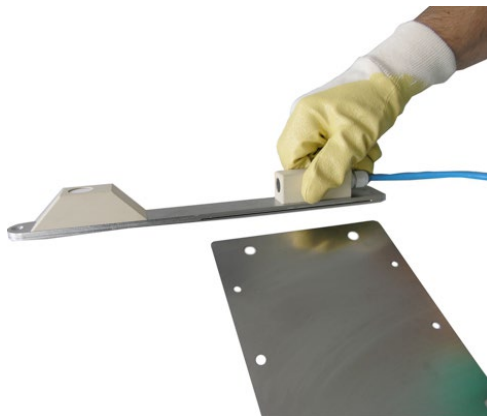
Variant flow velocity sensor and air-ultrasonic sensor



CSM-D on supplementary sheet:
Place the flow velocity sensor with the slotted holes on the supplementary sheet.



Slide the sensor backwards on the supplementary sheet until the sensor is locked in place.

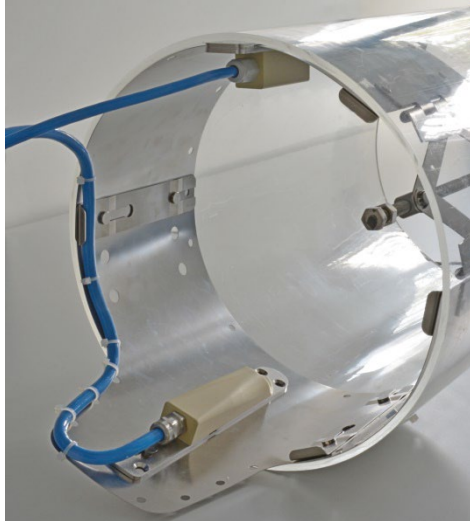


Attach the DSM air-ultrasonic sensor to the extension sheet.



Slide the extension sheet into the recess between the mounting plate and the cover sheet.

Recess see Fig. 14-10 on page 36.



Pipe mounting system RMS3 with supplementary sheet for joint mounting of wedge sensor and air-ultrasonic sensor.

The scissors jack is located on the side next to the air-ultrasonic sensor.

14.5 Installing the RMS4 Pipe Mounting System

The RMS4 is a combination of RMS2 and RMS3.

The choice of base plate and scissors jack depends on the sensor used.

The extension sheets are determined on the basis of the pipe diameter.

- ➡ Proceed as described in Chap. "14.3 Installing the RMS2 Pipe Mounting System" for RMS2 or in Chap. "14.4 Installing the RMS3 Pipe Mounting System" for RMS3.

14.6 Installing the RMS5 Pipe Mounting System



Two persons required for installation

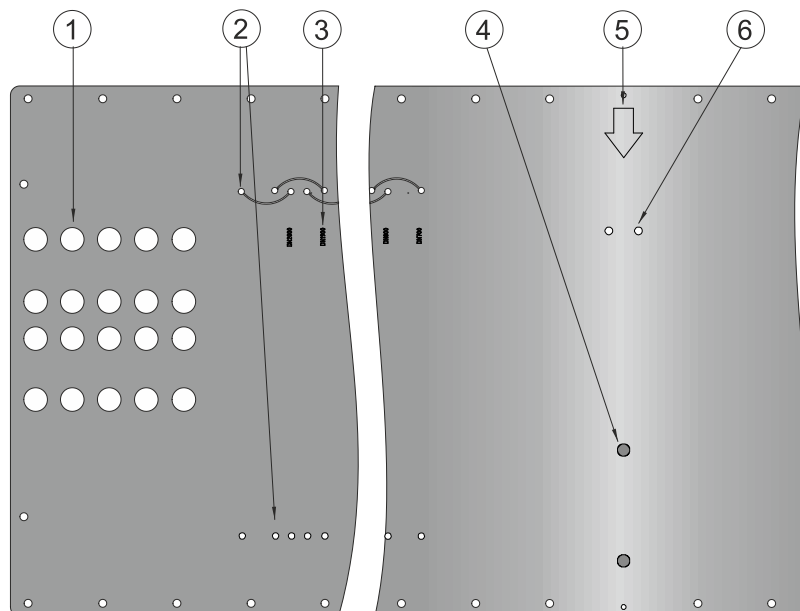
Due to the dimensions and the resulting difficulty in handling the individual components, NIVUS recommend that two people assemble and install the RMS5.

The RMS5 pipe mounting system is designed for large internal pipe diameters. For this reason, the sheets are much larger and heavier than with other pipe installation systems.

- ➡ First fit the base plate with sensors and, if necessary, with wedge supports.
- ➡ Only assemble the RMS5 completely at the measurement place.

14.6.1 Base sheet RMS5

The base plate is labelled with mounting aids.



- 1 Fastening holes for extension sheets
- 2 Mounting holes for outer sensors or wedge supports
- 3 Nominal diameter according to Gauss. Placement aid for three flow velocity sensors
- 4 Fastening for centre flow velocity sensor
- 5 Indication of the direction of flow
- 6 Optional / additional fastening with cable ties

Fig. 14-4 Mounting aids on the RMS5 base sheet

Place the sensors on the base plate

Up to 3 flow velocity sensors can be mounted on the base plate.

The centre flow velocity sensor is mounted so that the slotted holes engage in the pins of the base plate. The tip of the sensor points in the opposite direction to the arrow on the base plate (Fig. 14-4, Pos. 5).

For the following flow velocity sensors, ensure that the two rear slotted holes are used for engaging:

- CS2
- CSP
- KDA
- PKM
- POA

The position of the two outer sensors depends on the inner diameter of the pipe. The sensor position is based on the Gauss specifications. The corresponding positions for the sensors are marked on the base plate with a DN specification.

Mount external sensors horizontally

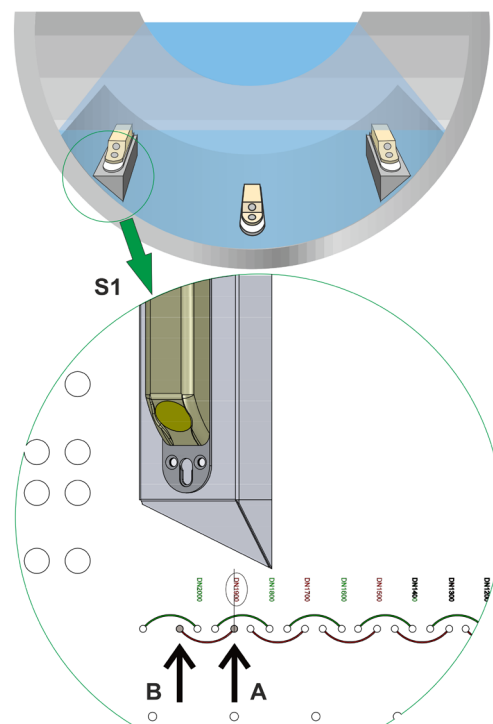
For horizontal installation of the two outer flow velocity sensors, two wedge supports (30°) must first be fitted.

The wedge supports are available from NIVUS.

➡ See Chap. "20 Spare Parts and Accessories" on page 39.

The wedge supports must be screwed to the base plate at the corresponding positions (DN markings) using the countersunk screws supplied.

The sensor must then be screwed onto the wedge base using the countersunk screws supplied.



RMS5 with three sensors.

For horizontal installation:

Mount the two outer sensors on wedge supports (30°).

Make sure that the correct fixing holes are used, depending on the internal pipe diameter: The fixing hole (A) with the DN marking is on the high wedge side, the corresponding fixing hole (B) on the low wedge side (see example S1 with the two black arrows for DN1900).

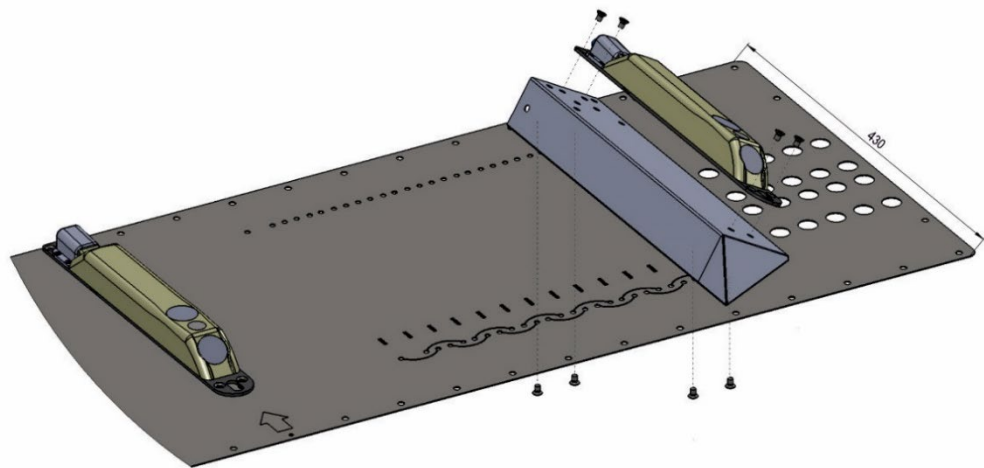
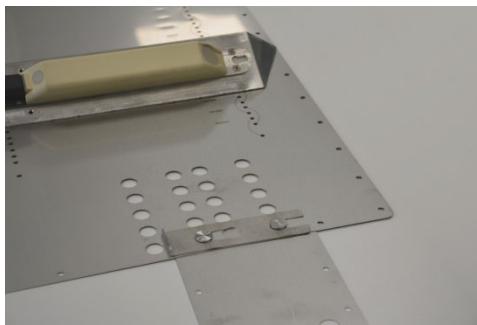


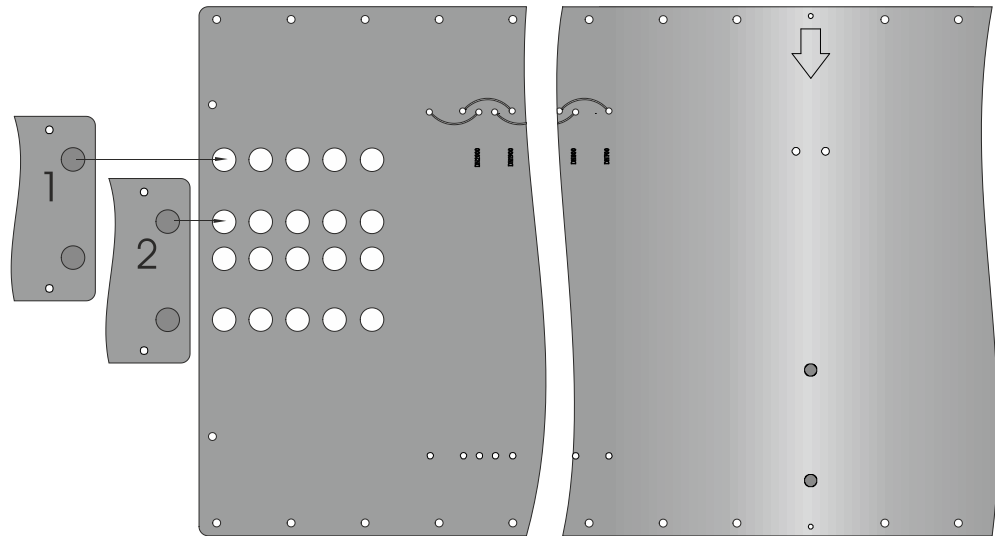
Fig. 14-5 RMS5 mounted horizontally (before installation)

14.6.2 Extension sheet RMS5



Insert the pins of the RMS5 extension sheet into the holes on the base plate and secure with the clamp.

If an air-ultrasonic sensor is to be fitted in the pipe crown, use the front pairs of holes to connect the extension sheets to the base plate.



- 1 Fastening extension sheets when using an air-ultrasonic sensor
- 2 Mounting extension sheets only flow velocity sensors

Fig. 14-6 Mounting extension sheets

14.6.3 Mounting the Scissors Jack

- Proceed as described for the RMS2 in Chapter "14.3 Installing the RMS2 Pipe Mounting System".
 1. Bring the scissors jack and extension sheet together.
 2. Insert the pins of the clamping system into the holes of the extension plate.
 3. Attach the scissors jack to the extension sheets on both sides using clamps.



Fig. 14-7 Fully assembled scissors jack

14.7 Air-ultrasonic sensors in RMS5 pipe mounting system

The OCL and DSM air-ultrasonic sensors are designed for temporary clamping in a pipe mounting system.

Slots are provided in both air-ultrasonic sensors at the factory to push the RMS sheet through.

The installation of the air-ultrasonic sensors is described in Chapter "14.4 Installing the RMS3 Pipe Mounting System" in section "Variant flow velocity sensor and air-ultrasonic sensor" on page 28.

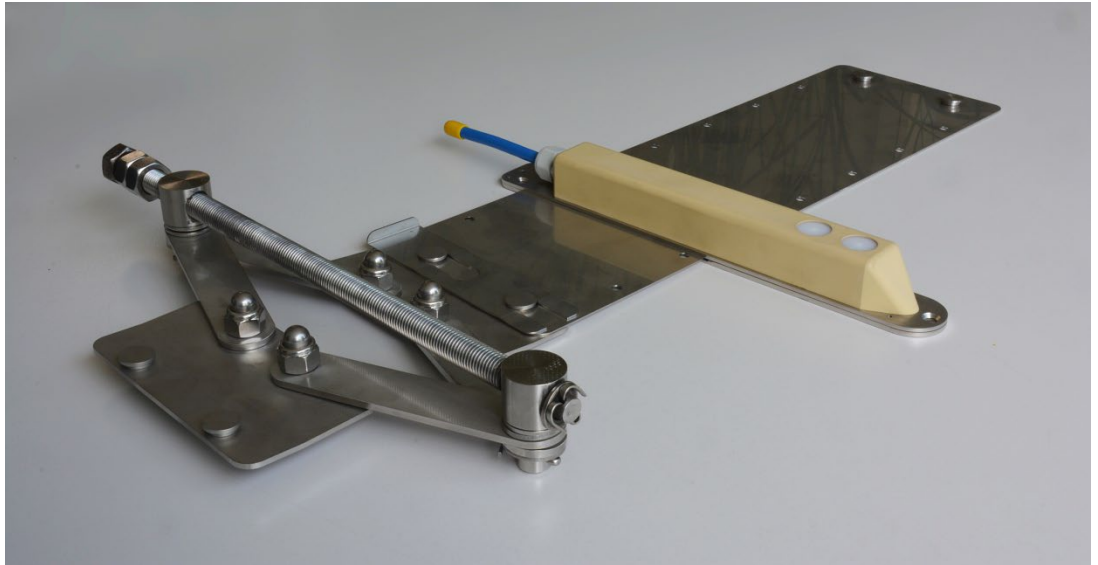


Fig. 14-8 Pre-mounted air-ultrasonic sensor on the RMS sheet

Exception:

Air-ultrasonic sensors in RMS5. The insertion area must be enlarged here.

Air-ultrasonic sensors in RMS5



Adapting Air-Ultrasonic Sensors

Before you can use an OCL or DSM air-ultrasonic sensor in the RMS5 pipe mounting system, you must adapt the sensors.

The RMS5 pipe mounting system is designed for larger pipe diameters: The individual sheets have a greater material thickness.

For this reason, the insertion areas of the OCL and DSM air-ultrasonic sensors must be larger.

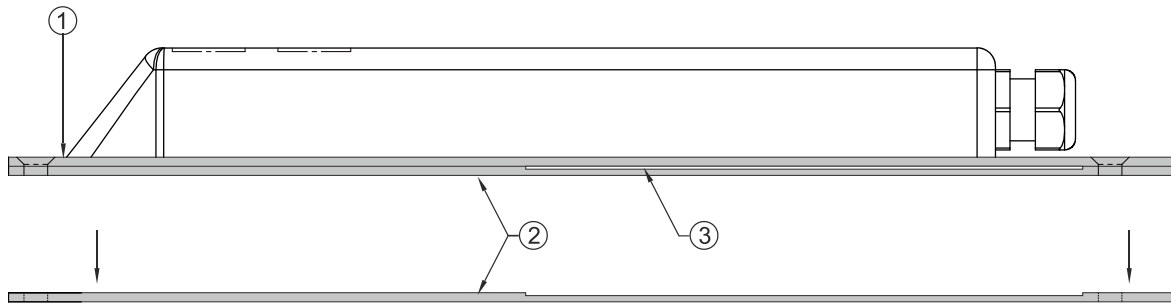
The spacer sheets for the respective air-ultrasonic sensor are included in the scope of delivery of the RMS5.

⇒ Scope of Delivery of the RMS5 see Fig. 13-4.

Converting the air-ultrasonic sensor

➡ To convert an OCL air-ultrasonic sensor, proceed as follows:

1. Loosen the cover sheet (Fig. 14-9 Pos. 2) with a Phillips screwdriver PH 1.
2. Remove the cover sheet.
3. Screw on the spacer plate for OCL.

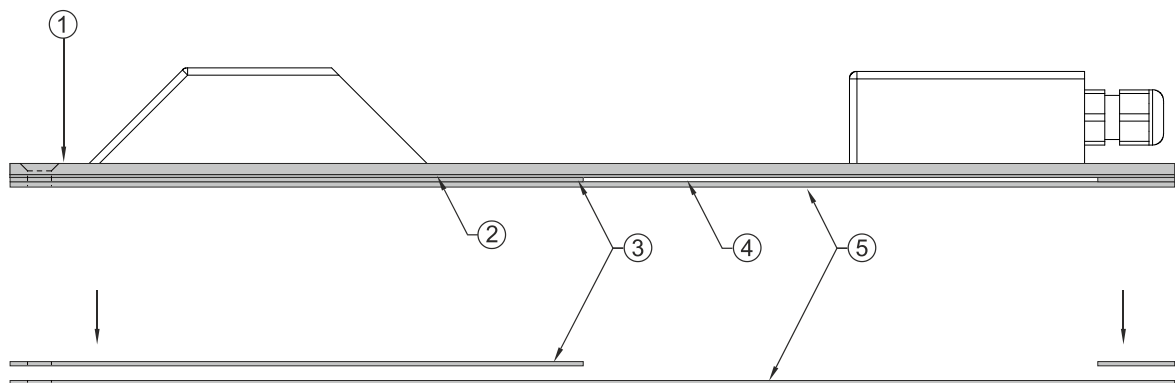


- 1 Mounting sheet
- 2 Cover sheet
- 3 Insert for the pipe mounting system

Fig. 14-9 Structure of mounting sheets air-ultrasonic sensor OCL

➡ To convert an DSM air-ultrasonic sensor, proceed as follows:

1. Loosen the cover sheet (Fig. 14-10 Pos. 5) with a Phillips screwdriver PH 1.
2. Remove the cover sheet and both spacer sheets (Fig. 14-10 Pos. 3).
3. Replace existing spacer sheets with spacer sheets for DSM from the RMS5.
4. Screw the spacer sheets back on together with the cover sheet.



- 1 Mounting sheet
- 2 Intermediate plate
- 3 Spacer sheet (two parts) short and long
- 4 Insertion area for the pipe mounting system
- 5 Cover sheet

Fig. 14-10 Structure of mounting sheets air-ultrasonic sensor DSM



Clamping plates mounted with CS2 sensors



Scissors jack mounted with air-ultrasonic sensor

Fig. 14-11 Fully assembled mounting sheets with sensors

Maintenance and Cleaning

WARNING**Germ Contamination**

Due to the possible use of the sensors in the waste water sector, parts can be contaminated with dangerous germs. Therefore, appropriate precautions must be taken when coming into contact with cables and sensors.

Wear protective clothing.

15 Maintenance

The pipe mounting systems are made of stainless steel and are therefore virtually maintenance-free.

16 Cleaning

16.1 Pipe Mounting Systems

The stainless steel pipe mounting systems are relatively robust and can be cleaned easily. If necessary, also with brushes and brooms.

16.2 Transducers

The sensors are much more sensitive than the pipe mounting systems, which is why it is essential that you observe the information in the corresponding technical descriptions when cleaning them.

17 Customer Service Information

If necessary, contact our customer service:

NIVUS GmbH – Customer Service

Phone +49 7262 9191-922
customercenter@nivus.com

18 Dismantling for Disposal

Improper disposal may be harmful to the environment.

➡ Dispose of device components and packaging materials in accordance with the applicable local environmental regulations:

1. Remove the sensors from the base plate.
2. On the RMS5, remove the wedge supports from the base plate.
3. Dispose of the stainless steel sheets from the pipe mounting systems for scrap metal recycling.

**EU WEEE Directive**

This symbol indicates that the requirements of Directive 2012/19/EU on waste electrical and electronic equipment must be observed when disposing of the device. NIVUS GmbH support and promote the recycling or environmentally sound, separate collection/disposal of waste electrical and electronic equipment to protect the environments and human health. Observe the local laws and regulations on disposal.

NIVUS GmbH is registered with the EAR, therefore public collection and return points in Germany can be used for disposal.

19 Installation of Spare Parts and Accessories

We expressly draw your attention to the fact that spare parts and accessories which have not been supplied by us have also not been tested and approved by us. The installation or use of such products may therefore negatively alter or invalidate the design properties of your measurement system. NIVUS are expressly excluded from liability for damage caused by the use of non-original parts and non-original accessories.

- ➡ You will find a selection of the accessories of the NIVUS GmbH in chapter "20 Spare Parts and Accessories".
- Further information on spare parts and accessories can be obtained from your responsible distributor/agency or directly from NIVUS GmbH.

20 Spare Parts and Accessories

Article No	Designation/Description
ZUB0 RMS2	Pipe mounting set 2 (RMS2) for the temporary installation of POA, CS2, PKM, KDA, CSM, CSP and DSM wedge sensors in pipe lines DN200 to DN800
ZUB0 RMS2 EB	Additional metal sheet for RMS2 for simultaneous installation of wedge sensors, Type POA, CS2, PKM, KDA, CSP and OCL and DSM air-ultrasonic sensors, suitable for pipe lines as from DN250
ZUB0 RMS2 BSD	Base plate for RMS2 for simultaneous installation of CSM sensor with pressure measurement cell, Type CSM-V1D0 and DSM sensor
ZUB0 RMS2 BSP	Base sheet for RMS2 for simultaneous installation of sensors Type PKM and OCL
ZUB0 RMS2 BSPF	Base sheet for RMS2 for PKM sensor 70°
ZUB0 RMS2 V05	Extension of clamping diameter by 50 mm for RMS2
ZUB0 RMS2 V10	Extension of clamping diameter by 100 mm for RMS2
ZUB0 RMS2 V15	Extension of clamping diameter by 150 mm for RMS2
ZUB0 RMS3	Pipe mounting set 3 (RMS3) for the temporary installation of POA, KDA, CSM and DSM wedge sensors in pipe lines DN150 to DN300
ZUB0 RMS3 BSD	Base sheet for RMS3 for simultaneous installation of CSM sensor with pressure measurement cell, Type CSM-V1D0 and DSM sensor, use possible as from DN160.
ZUB0 RMS4	Pipe mounting set 4 (RMS4) for the temporary installation of POA, CS2, KDA, CSM, CSP and DSM wedge sensors in pipe lines DN150 - DN800
ZUB0 RMS5	Pipe mounting set 5 (RMS5) for the temporary installation of up to 3 flow velocity sensors such as POA, CS2, KDA, CSP or CSM wedge sensors and 1x OCL or DSM level sensor in pipe lines DN700 to DN2000
ZUB0 KS00 L30 V4A	Wedge base left 30° for POA, CS2 and CSP sensor, for horizontal sensor installation in pipe, material: stainless steel 1.4571

<i>ZUB0 KS00 R30 V4A</i>	Wedge base right 30° for POA, CS2 and CSP sensors, for horizontal sensor installation in pipe, material: stainless steel 1.4571
<i>ZUB0 RMS2 BSB</i>	Base sheet RMS2
<i>ZUB0 RMS3 BSB</i>	Base sheet RMS3
<i>ZUB0 RMS5 M10</i>	Base sheet RMS5
<i>ZUB0 RMS2 SPV</i>	Scissors jack for RMS2
<i>ZUB0 RMS3 SPV</i>	Scissors jack for RMS3

Tab. 5 Spare Parts and Accessories