

Manual

pipe::scan V1.0

June 2019 Release



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1 General

This manual contains, firstly, general information (chapter 1) and safety guidelines (chapter 2). The next chapter (chapter 3) provides a technical description of the s::can product itself as well as information regarding transport and storage of the product. In further chapters the installation (chapter 4) and the initial startup (chapter 5) are explained. Furthermore information regarding how to perform a functional check (chapter 6) and maintenance (chapter 7) can be found in this manual. Information regarding troubleshooting (chapter 8), the available accessories (chapter 9) and the technical specifications (chapter 10) complete the document.

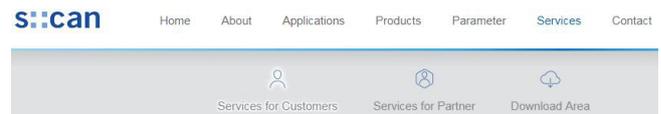
Each term in this document that is marked *italic and underlined*, can be found on the display of your controller for operation or as lettering on your s::can product.

In spite of careful elaboration this manual may contain errors or incompleteness. s::can does not assume liability for errors or loss of data due to such faults in the manual. The original manual is published in English and German by s::can. This original manual serves as the reference in case discrepancies occur in versions of the manual after translation into third languages.

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This manual, at the time of its publication (see release date printed on the top of this document), concerns the s::can products listed in chapter 3. Information and technical specifications regarding these items in s::can manuals from earlier release dates are herewith replaced by this manual.

The electronic version (pdf-document) of this manual is available on the s::can Customer Portal (Services for Customers) of the s::can Homepage (www.s-can.at).



2 Safety Guidelines



Installation, electrical connection, initial startup, operation and maintenance of any s::can product as well as complete s::can measuring systems must only be performed by qualified personnel. This qualified personnel has to be trained and authorised by the plant operator or by s::can for these activities. The qualified personnel must have read and understood this manual and have to follow the instructions contained in this manual.

For proper initial startup of complete s::can measuring systems, the manuals for the controller and software used for operation (e.g. con::lyte, con::cube, con::nect, moni::tool), the connected probes and sensors as well as the used additional devices (e.g. compressor) have to be consulted.

The operator has to obtain the local operating permits and has to comply with the joint constraints associated with these. Additionally, the local legal requirements have to be observed (e.g. regarding safety of personnel and means of labour, disposal of products and materials, cleaning, environmental constraints). Before putting the measuring device into operation, the operator has to ensure that during mounting and initial startup - in case they are executed by the operator himself - the local legislation and requirements (e.g. regarding electrical connection) are observed.

All s::can products are leaving our factory in immaculate technical and safety conditions. Inappropriate or not intended use of the product, however, can cause danger! The manufacturer is not responsible for damage caused by incorrect or unauthorised use. Any kind of manipulation of the instrument is strictly prohibited - except for the activities described in this document. Conversions and changes to the device must not be made, otherwise all certifications and guarantee / warranty become invalid. For details regarding guarantee and warranty please refer to our general conditions of business.

2.1 Declaration of Conformity

This s::can product has been developed, tested and manufactured for electromagnetic compatibility (EMC) and according to applicable European standards, as defined in the declaration of conformity.

CE-marks are applied on the device. The declaration of conformity related to this marking can be requested from s::can or your local s::can sales partner or can be downloaded from the s::can Customer Portal.

2.2 Special Hazard Warning



Because the pipe::scan is installed directly on pressurized pipes, one has to take care during mounting and demounting of the system, as well as during all maintenance activities to observe all safety notes written within this manual.



Before putting the pipe::scan into operation, always ensure that all sensors, the autobrush and the insertion nozzle are securely fixed with the metal brackets and the black enclosure is placed over the pipe::scan and fixed properly (see section 5.4).



All activities regarding installation or maintenance of pipe::scan shall be done by two persons (risk minimization). During these activities safety shoes have to be used.



3 Technical Description

3.1 Intended Use

The pipe::scan is designed for installation of one i::scan and up to three s::can sensors directly on a pressurized water pipe to measure the water quality in-situ. The water flow is directly from the pipe through the pipe::scan base unit and back into the pipe.

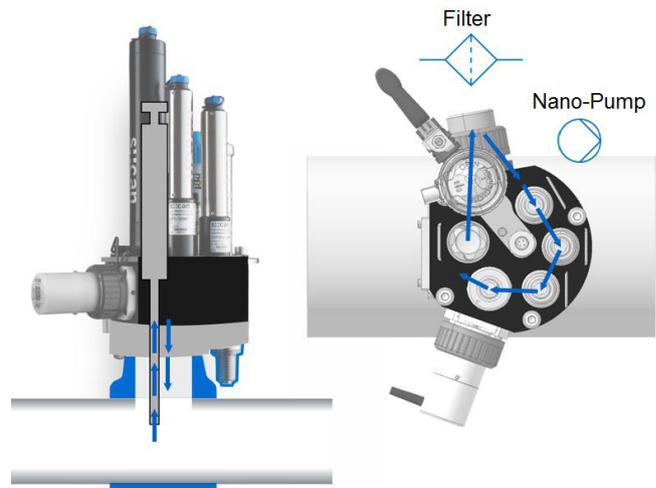
In all types of applications, the respective acceptable limits, which are provided in the technical specifications in the respective s::can manuals, have to be observed. All applications falling outside of these limits, and which are not authorised by s::can Messtechnik GmbH in written form, do not fall under the manufacturer's liability.

The device must only be used for the purpose described in this manual. Use in applications not described in this manual, or modification of the device without written agreement from s::can, is not allowed. s::can is not liable for claims following from such unauthorised use. In such a case, the risks are the sole responsibility of the operator.

3.2 Functional Principle

The water will flow from the pipe via an insertion nozzle through an inlet strainer into the flow cell of the base unit. A small pump ensures continuous water flow.

After the water has passed all measuring sensors, it will be guided back into the pipe. An automatic deaeration device removes captured air. A samples of the measured water for laboratory analysis can be taken via a manual valve.



3.3 Product

The following device variants, optional equipment and spare parts of the pipe::scan are available. Regarding detailed information of the device variants please refer to the technical specifications located at the end of this manual.

Type	Specification
F-450-PS-BASE	Complete pipe::scan flowcell base unit
P-105-PIPESCAN	pipe::scan with 3 s::can sensors (FCI, pH, conductivity, pressure, temperature)
P-106-PIPESCAN	pipe::scan with 3 s::can sensors and i::scan (FTU)
P-107-PIPESCAN	pipe::scan with 3 s::can sensors and i::scan (FTU, UV254)
P-108-PIPESCAN	pipe::scan with 3 s::can sensors and i::scan (FTU, UV254, TOC)
P-109-PIPESCAN	pipe::scan with 3 s::can sensors and i::scan (FTU, UV254, TOC, COLOR)
Optional Equipment	
F-450-PS-TOOL	Tool set for pipe::scan mounting
F-446-M-ISCAN-PS	Autobrush for i::scan
Spare Parts	
C-450-PS-HUB	Cable hub for pipe::scan
C-410-PS-CABLE	Connection cable between cable hub and con::cube
F-450-PS-P	Pressure sensor for pipe::scan
F-450-PS-PUMP	Nano pump for pipe::scan
F-450-PS-VENT	Vent valve for pipe::scan
F-450-NOZZLE	Retractable insertion nozzle for pipe::scan
F-450-ENCLOSURE	Enclosure for pipe::scan

The device is typified by a type label, as shown on the right, that contains the following information:

- Manufacturer's name and country of origin
- Several certification marks
- Device name
- Device serial number (S/N)
- Acceptable pressure range
- Environment rating (IP)
- Acceptable temperature range
- Part number (Type)
- QR code to s::can Support

s::can Made in AUSTRIA



scan Messtechnik GmbH
Brigittagasse 22-24, A-1200

pipe::scan

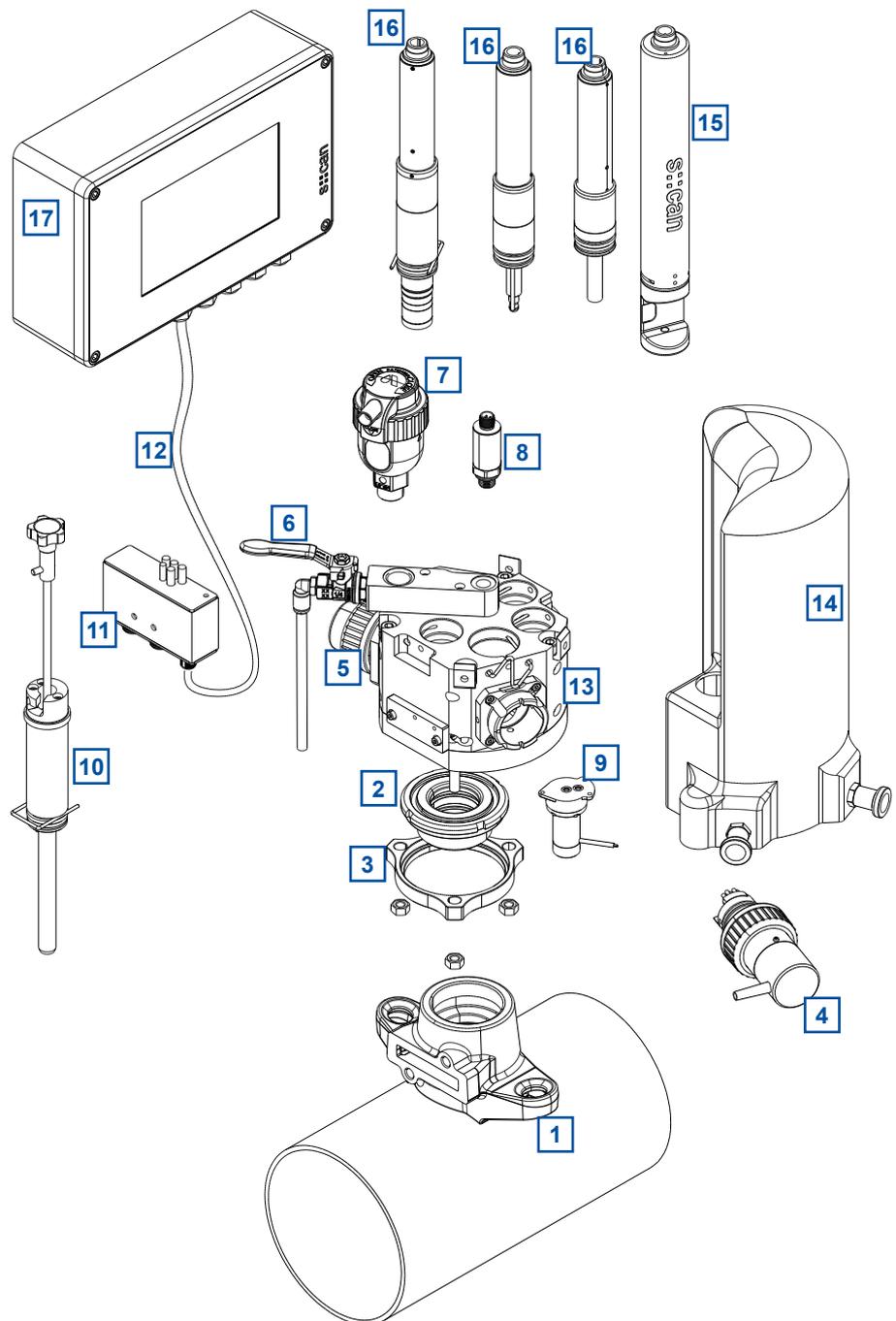
1 - 10 bar
0 - 45°C
IP67

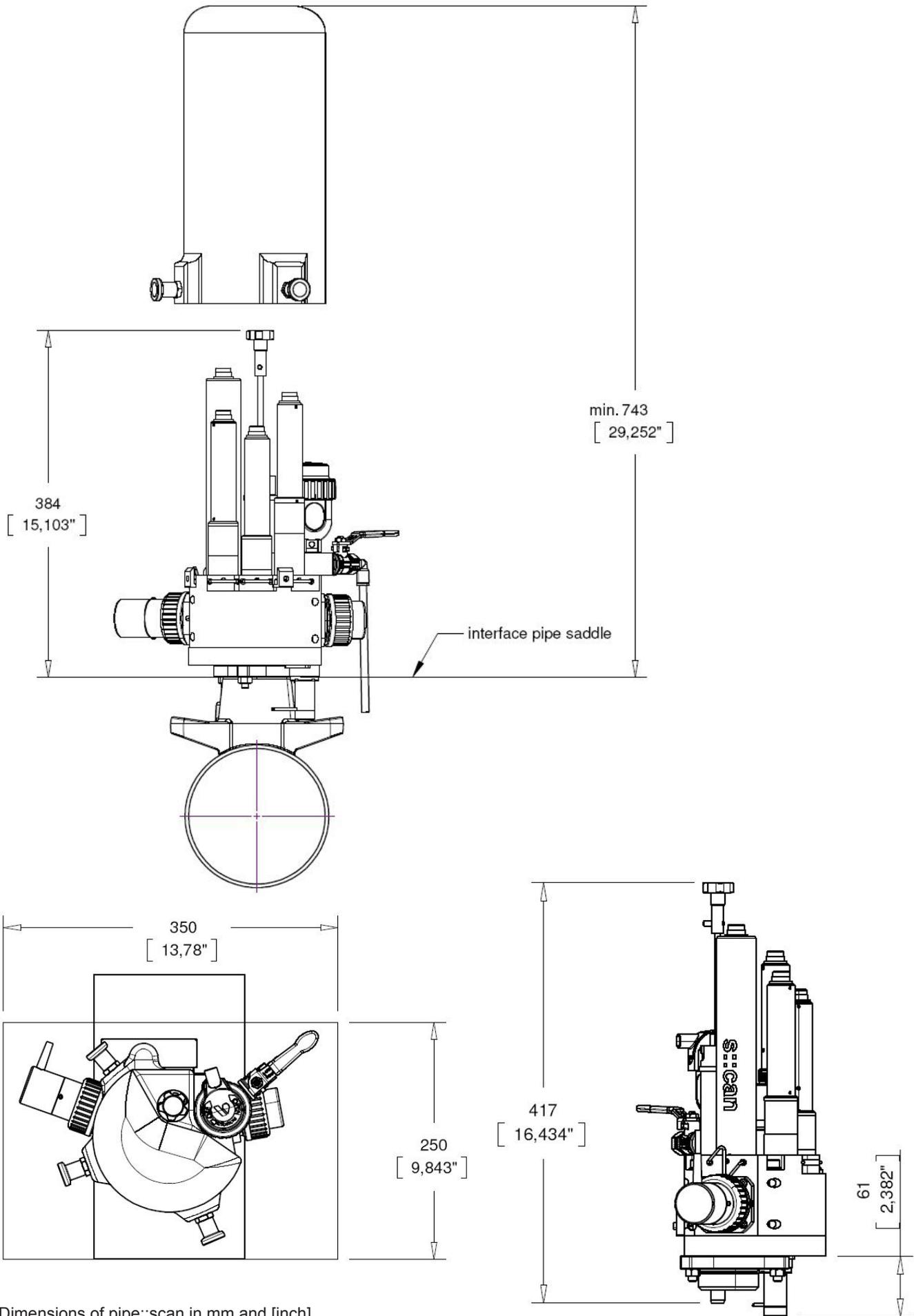



S/N: 18386101

Type:
F-450-PS-BASE

- 1 Pipe saddle
- 2 Adapter - inner part
- 3 Adapter - outer part
- 4 Autobrush
- 5 Inlet strainer
- 6 Valve for sampling
- 7 Automatic deaeration
- 8 Pressure sensor
- 9 Nano pump
- 10 Insertion nozzle
- 11 Cable hub
- 12 Connection cable
- 13 Flow cell of base unit
- 14 Enclosure
- 15 i::scan
- 16 Sensors
- 17 con::cube





Dimensions of pipe::scan in mm and [inch]

3.4 Storage and Transport

The temperature and humidity limits for device storage and transport, which are described in the section technical specifications, are to be observed at all times. The device shall not be exposed to strong impacts, mechanical loads or vibrations. The device should be kept free of corrosive or organic solvent vapours, nuclear radiation as well as strong electromagnetic radiation. Transport should be done in a packaging that protects the device (original packaging or protective covering if possible).

3.5 Scope of Delivery

Immediately upon receipt, please check the received consignment for completeness on the basis of the delivery note and check for any possible damage incurred during shipping. Please inform the delivering dispatcher and s::can immediately in case of any damages in transit.

The following parts should be included in the delivery:

- pipe::scan (part-no. F-450-PS-BASE including inner and outer adapter with o-ring, washers and nuts)
- Cable hub (part-no. C-450-PS-HUB)
- Connection cable (part-no. C-410-PS-CABLE)
- i::scan and sensors (depending on pipe::scan variant)
- Manual pipe::scan (part-no. S-37-M)

The following parts could be included in the delivery if ordered as an option:

- Cable for power supply of con::cube (part-no. C-31-xx)
- Autobrush for i::scan (part-no. F-446-M-ISCAN-PS)
- Pipe saddle (part-no. F-169-SPSET-xxxxx)
- Tool set for pipe::scan (part-no. F-450-TOOL)

In case of incompleteness please contact your s::can sales partner immediately!

3.6 Product Updates, Other

The manufacturer reserves the rights to implement, without prior notice, technical developments and modifications in the light of continuous product care.

4 Installation

4.1 Environment

The correct installation of measuring instruments is an important prerequisite for satisfactory operation. Therefore the following checklist for the installation shall be used to ensure that all sources for potential operational problems can be ruled out to the greatest possible extent during the installation, allowing the monitoring system to operate properly.

- Easy accessibility (mounting, sampling, functional check, demounting)
- Availability of sufficient space (probe / sensor, installation fitting, controller, etc.)
- Adherence to limit values (see technical specifications located at the end of this manual)
- Power supply for controller (operational reliability, voltage, power, peak free)
- Shortest possible distances between system components (probe / sensor - controller - energy supply)
- Correct dimensioning, mounting and protection of all cables and lines (non-buckling, no risk of stumbling, no damage etc.)



The pipe for mounting the pipe::scan has to be vented. The deaeration of the pipe::scan is not suitable for venting the pipeline. The pipe::scan must not be exposed to rain or direct sun light.

4.2 Requirements for Installation

For mounting and hydraulic installation of the pipe::scan using the pipe saddle fixture the following tools and materials are necessary:

- Specific equipment for pipe drilling
- Hook wrench (80 - 90 mm) to fix adapter ¹⁾
- Torque wrench (size 13) for M8 nuts of pipe::scan ¹⁾
- Cutting tool for stainless steel insertion nozzle ¹⁾
- Rasp to clean stainless steel insertion nozzle
- Fork wrench 17 mm for cover cap ¹⁾
- Screw driver for electrical installation

¹⁾ Included in installation tool set F-450-PS-TOOL

For the correct dimensioning and space required for mounting, please refer to the figure in section 3.3.

4.3 Mounting of Pipe Saddle

For mounting of the pipe::scan the pipe itself has to be opened by drilling. Therefore specific drilling tools are available. The complete procedure (mounting of the pipe saddle and drilling of the pipe) can be done under full pipe pressure without stopping the flow.



The pipe::scan has to be mounted on top of the pipe (max. +/- 2° deviation from vertical axis).



4.4 Mounting of Adapter

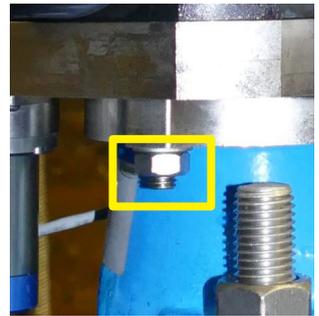
Place the outer part over the pipe saddle. Then screw the inner adapter part onto the pipe saddle. Use the hook wrench to fasten the adapter.

Ensure that the o-ring is positioned within the notch of the inner adapter part correctly.



4.5 Mounting of Base Unit

The base unit has to be placed onto the adapter and fixed by the three M8 nuts with washers (supplied in a separate bag included in delivery). Use the torque wrench to fasten the base unit (tightening torque = 18 Nm).



The pipe::scan can be rotated by 360° to ensure a suitable orientation for handling. Adjust the position as needed, before tightening the nuts.

4.6 Cutting of Insertion Nozzle

Pull out the metal bracket that fixes the insertion nozzle and take the complete part out of the base unit. Now the nozzle has to be cut to the correct length. The correct length can be calculated within the table below as sum of three individual parts:

	Type 5250	Type 5310	Type 3800
1.) Hight of used Hawle pipe saddle with 2" connection	111.5 mm	57.5 mm	78.0 mm
2.) Constant hight of	59.0 mm	59.0 mm	59.0 mm
3.) Wall thickness of your pipe	xx.x mm	xx.x mm	xx.x mm
SUM = correct length of insertion nozzle	---.- mm	---.- mm	---.- mm



Example: If Type 3800 is used and wall thickness of pipe is 10.0 mm, then the correct length is 147.0 mm.

After cutting the insertion nozzle to the correct length, ensure that the yellow label is removed completely and no glue or other dirt is on this part.

Finally the insertion nozzle has to be reinstalled into the base unit again and fixed with the metal bracket. The insertion nozzle has to be oriented in that way to fit the small metal pin (see yellow marking in the picture on the right) into the hole of the base unit.

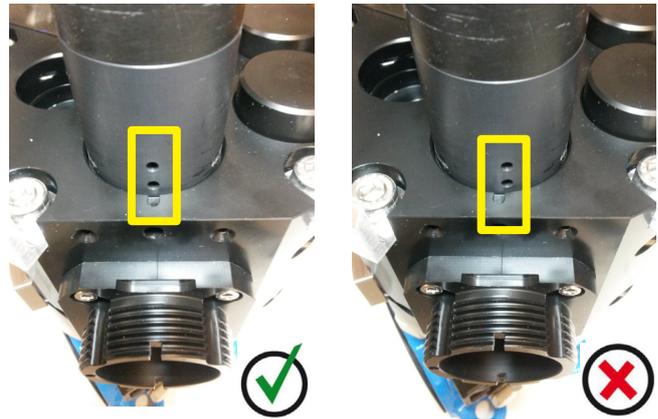


4.7 Mounting of i::scan and autobrush

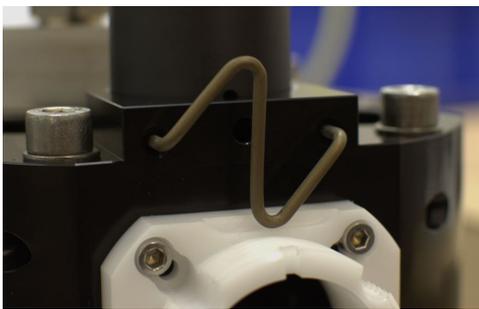
Insert the i::scan into the appropriate slot, which is located next to the insertion nozzle of the base unit and ensure that the small holes in the i::scan housing are located exactly above the small notch of the base unit (see yellow marking on the pictures). Then push the i::scan down until the upper hole is visible only. This is the position where the metal brackets can be inserted and which will align the i::scan horizontally.



If the i::scan is not positioned in the correct way (small hole and notch symmetrically) the rotating brush can be blocked, which will cause faulty parameter readings.



Now the autobrush for automatic cleaning can be mounted. Make sure that it is aligned with the notches correctly. After insertion fasten the grey union nut.



4.8 Mounting of other Sensors

The chlori::lyser is not ready for use after shipment. The chlori::lyser manual will guide you through the steps needed to prepare this sensor for measurement.

The chlori::lyser has to be installed into the first opening of the base unit, which is located opposite the i::scan. The opening is marked with a yellow label, which reminds that pressure resistant type E-520-1-S-000 with stainless steel housing can be installed into the pipe::scan only.

- Pull out the metal bracket from the base unit that fixes the plug. A flat screw driver can be used to do this, if needed.
- Remove the plug from the base unit. To remove the plug insert a flat screw driver into the small hole on the side of the base unit and move the plug out by moving the screw driver downwards. Instead of the screw driver the metal bracket can be used also.
- Remove the protective cap from the sensor, if existing.
- Insert sensor in the opening of the base unit and push sensor down carefully until O-ring snaps into the correct sensor position.
- Push the metal bracket back into the base unit to secure the sensor in place. The metal bracket can only be inserted if sensor is in the correct position.



- Ensure that all other free openings of the base unit are covered with plugs and secured by metal brackets before putting the pipe::scan into operation.
- To demount the sensor, use a flat screw driver to remove the metal bracket first and pull the sensor out.

Specific note for installation of pH::lyser:



If the sensor is not flat with the base unit after installation and therefore fixing with the metal bracket is not possible, the inner o-ring has to be removed. To that the electrode has to be removed from the sensor, to remove the o-ring (see figure on the right). This procedure is only needed for deliveries before 2019.



5 Initial Startup

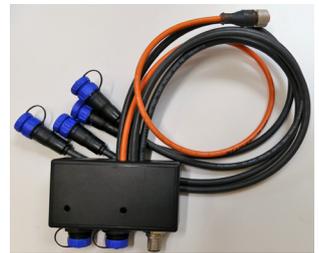
Once the assembling, mounting and hydraulic installation of the pipe::scan, the sensors and the autobrush have been completed and checked (see chapter 4) the initial startup of the monitoring system will require the following actions, in the order presented below:

- Connect the pressure sensor and all installed sensors to the cable hub of the pipe::scan (see section 5.1).
- Connect the pump, the autobrush and the connection cable to the cable hub of the pipe::scan (see section 5.2).
- Wire the connection cable of the cable hub into the terminal compartment of the con::cube (see section 5.3).
- Mount the enclosure (see section 5.4).
- Remove the shut off plate and mount the cover cap (see section 5.5).
- Put the insertion nozzle into operation (see section 5.6).
- Check water discharge (see section 5.7).
- Establish power supply to the con::cube and wait until moni::tool software has started up.
- Configure the pipe::scan monitoring station (see section 5.8 and con::cube manual).

5.1 Connection of all Sensors to the Cable Hub

The cable hub is equipped with four connection cables for the s::can sensors with sys-plugs and one orange cable with a specific plug for the pressure sensor. Connect the orange cable to the pressure sensor, which is located in the middle of the other sensors first. Then connect the other plugs to the sensors installed in the pipe::scan. The sensor cable, which is approx. 5 cm longer, shall be connected to the i::scan.

Ensure that all plugs and the connectors are dry and clean. Otherwise communication errors and / or device damage might occur.



5.2 Connection of Pump, Autobrush and Connection Cable

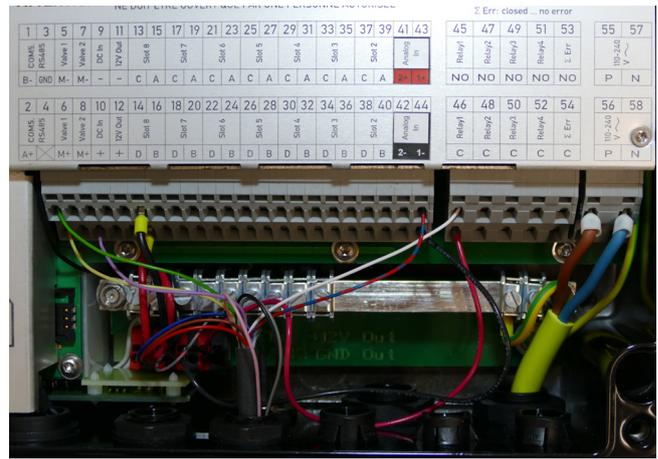
- 1 The cable of the pipe::scan pump has to be connected to the connector of the cable hub labeled with [1] in the picture on the right.
- 2 The cable of the autobrush of the i::scan has to be connected to the connector of the cable hub labeled with [2] in the picture on the right.
- 3 The black cable, used to connect the cable hub to the con::cube, has to be connected to the connector of the cable hub labeled with [3] in the picture on the right.



5.3 Connection of Cable Hub to con::cube

The connection cable of the cable hub has to be wired into the terminal compartment of the con::cube according to the figure on the right and the table below.

In addition to the eight used wires of the connection cable, two short wires (red and black) are included in delivery which are needed for bypassing terminals as explained below.



Device	Colour of wire	Labeling	Terminal no.
12V power supply permanent	brown	+ 12V Out	12 or red terminal block on bottom
12V power supply permanent	blue	- 12V Out / GND Out	11 or black terminal block on bottom
Pump	white	NO Relay 1	45
Data RS 485	green	B- COM5	1
Data RS 485	yellow	A+ COM5	2
12V power supply switch	red	+ 12V Out	12 or red terminal block on bottom
Trigger auto::brush	violet	M+ Valve 1	6
Pressure sensor	red / blue	1 + Analog In	43
Pressure sensor	grey / pink	+ 12V Out	12 or red terminal block on bottom
Black wire included in delivery		1- Analog In <---> GND Out	44 <---> 11 or black terminal block
Red wire included in delivery		C Relay <---> +12V Out	46 <---> 12 or red terminal block

The remaining cable wires (black, grey and pink) are not used.

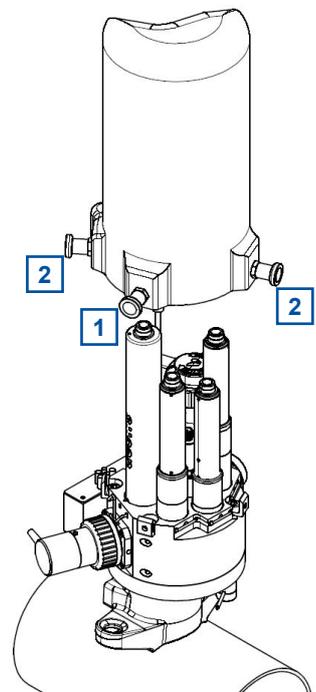
5.4 Mounting of Enclosure

The enclosure will be fixed onto the pipe::scan with three index bolts.

 Before mounting the enclosure, ensure that all sensors, the autobrush and the insertion nozzle are securely fixed with the metal brackets. Furthermore check if grey union nuts of inlet strainer and autobrush are tightened firmly.

- Lock the middle bolt [1] in place.
- Pull out the remaining two bolts [2].
- Place the enclosure over the pipe::scan and arrange the cables carefully.
- Release the two bolts [2] when the enclosure is positioned correctly.
- Finally release the third bolt [1] to have the enclosure completely fixed.

 Check that all three bolts are completely engaged before pressurising the monitoring system.



5.5 Remove Shut off Plate

Pull out the shut off plate from the pipe saddle. Mount the cover cap with the washer and screws and fix both screws with wrench size 17 (max. 40 Nm) according to the pictures below.



5.6 Put Insertion Nozzle into Operation

Push the operation nozzle down into operation position and fix it by turning 45° (bajonet lock).

5.7 Check Water Discharge

Carefully open the sample valve and check if water is coming out. Keep it open for a few seconds to ensure no air bubbles are trapped inside the pipe::scan. Close the sample valve again.

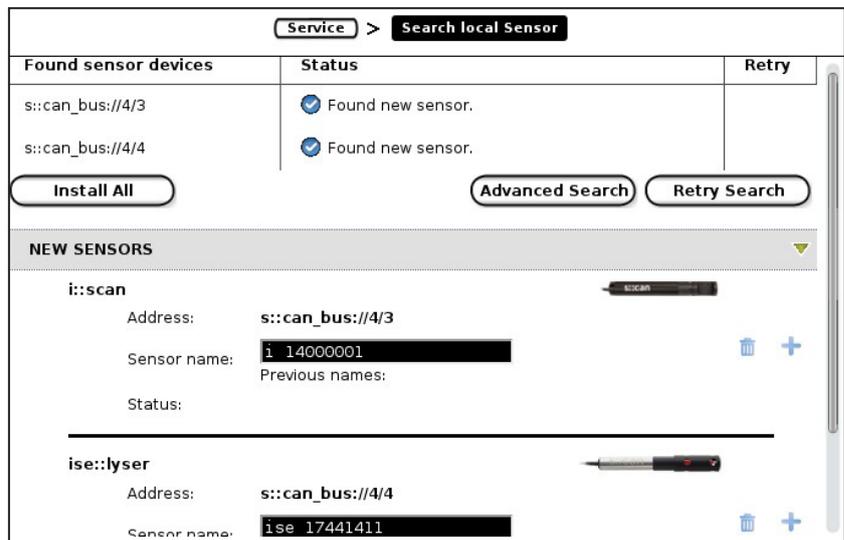
Now the pipe::scan is in operation.

5.8 Configuration of Monitoring Station on con::cube

Once the moni::tool software has started up, the following steps are needed to configure the monitoring station correctly.

5.8.1 Initialisation of Sensors

- Push the Service Tab on the moni::tool screen and logon with User Administrator and Password admin1
- Push the icon Add new sensor to start the initialisation of all sensors connected.
- Once the automatic search is finished push Install All.
- If a sensor was not found, disconnect the other sensors and repeat the sensor search.



5.8.2 Configuration of Pressure Sensor

- Start the advanced search to install the analog in module, which is needed for the 4 - 20 mA pressure sensor (see figure on the right).



- Enter the *Sensor name* (e.g. Pressure Sensor) and push the button *Save*.

Service > Advanced Search > Install Sensor
Cancel Save

Install new Sensor

<< GENERAL SETTINGS >>

Sensor name:	Pressure Sensor
Vendor:	
Model:	intern-mA-IN
Serial number:	
Parameter count:	1

- Configure the mA output of the pressure sensor as displayed in the figure on the right and push the button *Save*.

Unit: bar
Resolution: 1
Upper limit: 10
Lower limit: 0
Mode: 4...20mA
Error Mode: Limit

Service > Pressure Sensor > Parameters > Install Parameter
Cancel Save

Install Parameter

<< GENERAL SETTINGS >>

Sensor name:	Pressure Sensor
Parameter name:	Pressure
Unit:	bar
Resolution:	1
Upper limit:	10
Lower limit:	0

<< CUSTOM STATUS MAPPING >>

<< ADDITIONAL PARAMETERS >>

Mode:	4...20mA
Error Mode:	Limit

5.8.3 Configuration of Pump

The pump needs to be switched off once per day to ensure bubble free operation. This will be steered via the digital output automatically.

- Select *digitalOut1* and change the Mode to *Time control*.
- Configure the digital output of the pump. Within the figure on the right the interval cycle for a measuring interval of 2 minutes (120 s) is shown.
- The output has to be inverted by activating the checkbox *Invert*. To be able to see and change this option, the selected *Service Level* has to be *Advanced* or higher.

Service > Outputs > Digital Outputs > Assignment of digitalOut1
Cancel Save

Assignment of digitalOut1

<< GENERAL SETTINGS >>

Description:	
Mode:	Time control
Information:	The output is time controlled by the the measurement cycle. Interval defines how often, Offset defines the relative position to the start of measurement and Duration defines how long the output is 'LOW'.
Interval:	720 [cycle]
Duration:	5 [sec]
Start Time Offset:	60 [sec]

<< OUTPUT INVERTION >>

Set this option to invert the logic of the output.

Invert:	<input checked="" type="checkbox"/>
---------	-------------------------------------

5.8.4 Configuration of autobrush

The autobrush configuration is performed via *moni::tool* menu *Service >> Cleaning Devices* by click on icon *Edit*. For further details as well as further configurations (e.g. measuring interval) please refer to the *moni::tool* manual.

6 Functional Check

A functional check might be required for one of the following reasons:

- Initial startup
- Routine functional check
- Suspicion of monitoring system malfunction
- Modification of monitoring system (e.g. integration of additional sensor or device)
- Change of measuring location

The functional check of the pipe::scan includes the following steps:

- Check of water flow (see section 5.7)
- Check of inlet filter (visual check if inlet filter looks clean and undamaged)
- Check of i::scan autobrush (visual check of the brush after removing it from base unit)
- Check of individual sensors (see manual of the specific sensor)
- Check of con::cube (see manual of con::cube)

7 Maintenance



Before performing any maintenance activity, the following steps have to be performed in the order presented below:

- Unlock the insertion nozzle by turning the bajonet lock 45°. Keep hand on the insertion nozzle because the pressure in the pipe might push up the rod.
- Pull the rod of the insertion nozzle out by hand, if pipe pressure is too low.
- Unscrew both screws from the cover cap with wrench (size 17).
- Remove screws, washers and cover cap and keep these parts safe.
- Insert the shut off plate into the pipe saddle.
- Open the sampling valve to release the pressure from the pipe::scan. Only if no more water comes out, it is safe to proceed.
- Remove the enclosure by releasing the three bolts.

The following maintenance activities might be necessary:

- Cleaning or replacement of the inlet filter (unscrew the grey union nut to open the inlet filter).
- Replacement of autobrush (see specific note for further details).
- Sensor maintenance (see manual of the installed sensor).
- Replace the automatic deaeration, if leaking.
- Replacement of enclosure for security reason (fatigue of material).

Once maintenance is finished, the steps explained at the beginning of this section have to be performed in reserved order. To put the pipe::scan into operation again, see section 5.4, 5.5, 5.6 and 5.7.

7.1 Disinfection of Pipeline

Before performing a disinfection of the pipeline is performed, the pipe::scan has to be disconnected from the pipe. This can be performed easily by introducing the shut off plate (see section 5.5).

8 Troubleshooting

8.1 Typical Error Pattern

Pattern	Reason	Removal
All i::scan readings are NaN	Autobrush is blocked	<ul style="list-style-type: none"> ■ Unplug and remove autobrush ■ Check correct position of i::scan (see section 4.7) ■ Mount and plug in autobrush
Readings scattering	Deaeration incomplete air in the base unit	<ul style="list-style-type: none"> ■ Open sample valve for a few seconds
Air visible in inlet strainer		<ul style="list-style-type: none"> ■ Open sample valve for a few seconds
Chlorine readings zero	No water flow	<ul style="list-style-type: none"> ■ Disconnect and reconnect pump
Automatic deaeration is leaking		<ul style="list-style-type: none"> ■ Replace complete unit

8.2 Return Consignment (RMA)

Return consignments of the s::can monitoring system, or parts of the system, shall be done in a packaging that protects the device (original packaging or protective covering if possible). Before returning a consignment, you have to contact your s::can sales partner or s::can customer support (support@s-can.at). An RMA number will be assigned for each device, independent if the reason of the return consignment is service, repair or demo equipment.

RMA numbers can be requested from the s::can Customer Portal available on the s::can homepage directly. Return consignments without an RMA number will not be accepted. The customer always has to bear the costs for return consignment.

9 Accessories

9.1 Installation

9.1.1 Power Supply Cord

For connection of the con::cube to power supply a power supply cable is available.

Name	Specification	Remark
Part-no.	C-31-EU or C-31-US	
Cable length	2 m	
Weight	approx. 300 g	
Material	PU	jacket
Process connection	CEE-7 shockproof plug NEMA 5-15 plug	C-31-EU C-31-US
Environment rating (IP)	IP 44 IP 55	C-31-EU C-31-US



9.1.2 Autobrush

For stable measurements of i::scan an auto::brush is available.

Name	Specification	Remark
Part-no.	F-446-M-ISCAN-PS	
Power supply	12 VDC	
Power consumption	100 mA	typical
Cable length	0.35 m	with sys plug
Interface connection	sys plug (IP 67)	to cable hub
Material	POM-C stainless steel 1.4404 (316L) EPDM Polyester	housing axis o-rings brushes
Dimensions	58 x 126 mm	
Weight	240 g	
Environment rating (IP)	IP 65	
Operating temperature	0 to +40 °C (32 to 104 °F)	
Operating pressure	up to 10 bar (145 psi)	
Conformity EMC	2014/30/EU	



9.1.3 Tool Set

For proper installation of the pipe::scan a complete set of all needed tools is available.

Name	Specification	Remark
Part-no.	F-450-PS-TOOL	
Scope of delivery	Hook wrench (80 - 90 mm) Torque wrench size 13 Single head wrench size 17 Hack saw	(2.5 - 25 Nm)

9.2 Spare Parts

9.2.1 Connection Cable

If needed, the connection cable used between cable hub and con::cube is available as spare part.

Name	Specification	Remark
Part-no.	C-410-PS-CABLE	
Cable length	10 m	
Interface connection	plug open wires	to cable hub to con::cube

9.2.2 Inlet Strainer

If needed, spare parts for the inlet strainer are available within a service set.

Name	Specification	Remark
Part-no.	F-450-PS-STRAIN	
Scope of delivery	complete filter housing o-ring union nut	

9.2.3 Pressure Sensor

If needed, the pressure sensor installed in the pipe::scan is available as spare part.

Name	Specification	Remark
Part-no.	F-450-PS-P	
Scope of delivery	pressure sensor flat seal	

9.2.4 Nano Pump

If needed, the nano pump installed in the pipe::scan is available as spare part.

Name	Specification	Remark
Part-no.	F-450-PS-PUMP	
Scope of delivery	pump mounting bolts o-rings	



9.2.5 Deaerator

If needed, the automatic deaerator installed in the pipe::scan is available as spare part.

Name	Specification	Remark
Part-no.	F-450-PS-VENT	
Scope of delivery	venting valve o-ring	

9.2.6 Insertion Nozzle

If needed, the rectable insertion nozzle installed in the pipe::scan is available as spare part.

Name	Specification	Remark
Part-no.	F-450-PS-NOZZLE	
Material	stainless steel 1.4404, EPDM	
Dimensions	approx. 420 mm	total length
Weight	950 g	

9.2.7 Enclosure

For safety reasons the enclosure used for the pipe::scan should be replaced regularly and therefore is available as spare part.

Name	Specification	Remark
Part-no.	F-450-PS-ENCLOSURE	
Weight	730 g	

10 Technical Specifications

Name	Specification	Remark
Part-no.	F-450-PS-BASE	
Dimensions	220 / 450 / 340 mm 8.66 / 17.7 / 13.39 inch	W / H / D
Required space	250 / 750 / 350 mm	W / H / D
Weight	approx. 8.0 kg	
Material in contact with water	POM, stainless steel, PMMA, fine brass EN12165 and EN12164, PTFE, PA, PP, EPDM o-rings	
Material other	depends on used sensors	see sensor manual
Environment rating (IP)	IP 67	
Storage humidity	0 to 95 %	not condensing
Operation temperature	0 (non-freezing) to + 40°C (32 to 104°F)	no direct sunlight
Storage temperature base unit	-20 to 60°C (-4 to 140°F)	Device has to be acclimatised to operation temperature before initial operation
Storage temperature sensors	0 to + 45°C (32 to 113°F)	
Operation pressure	1 to 10 bar 14.5 to 145 psi	pipeline must be vented
Operation pH range	4 - 12 pH	
Installation	on top of pipe	max. +/- 2°
Mounting	on 2" Hawle pipe saddle	to be ordered seperately
Process connection	ball valve for manual sampling IG 1/4" EN10206-1	
Power supply	via con::cube	
Power consumption	14 W (typical) 35 W (max)	depending on configuration depending on configuration
Drinking water safety certificate	ACS (France)	
Conformity - EMC	EN 61326-1	
Maintenance interval	pump, valves, brush, filter and sensors have to be maintained / replaced depending on application	Enclosure has to be replaced regularly (depending on the environmental conditions)

scan Messtechnik GmbH

Brigittagasse 22-24, 1200 Vienna, Austria

Tel.: +43 (0) 1 219 73 93 - 0

Fax: +43 (0) 1 219 73 93 - 12

office@s-can.at

www.s-can.at

