

MANUAL

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SlurrySense™

SlurrySense Operator Manual



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EUROPE/GLOBAL

Rheonics GmbH
Winterthur, Switzerland
Tel: +41 52 511 32 00

USA

Rheonics, Inc.
Sugar Land, TX, USA
Tel: +1 713 955 7305

Website: <https://rheonics.com>

Support Portal: <https://support.rheonics.com>

Sales E-Mail: info@rheonics.com

Support E-Mail: support@rheonics.com

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SLS-OP-2608	SlurrySense Operator Manual	
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1 Before You Begin

1.1 About the manual

This manual provides information regarding the operation, commissioning and maintenance of the Rheonics SlurrySense™ density and viscosity sensor with CleanWave™ self-cleaning technology.

1.2 Contact

Contact the Rheonics team to help you with any inquiry.

For sales and delivery-related questions, contact the Sales Team at info@rheonics.com.

For installation, integration, or troubleshooting, contact the Support Team at support@rheonics.com.

1.3 Who should use this document?

This manual is designed to be a complete guide for using the SlurrySense system based on Type-SR sensor probes (SRV and SRD). This document assumes the reader is familiar with the sensor operating principle and system requirements. The target group for these instructions is technical staff, who have basic knowledge in pneumatic and mechanical installations.

1.4 Warning

The operator should be trained in government and corporate safety standards that apply to their installation and use.

1.5 Nomenclature

Abbreviation	Full-term	Description
SLS	SlurrySense	Viscosity and/or density meter with CleanWave Self-Cleaning Technology
CLW	CleanWave	Pneumatic unit for self-cleaning technology
MKT	Mounting Kit	Mounting kit for SLS probe
AKT	Air Kit	FRL unit for compressed air
SME	Sensor Module Electronics	Sensor electronics
SRV	Symmetric Resonator Viscometer	Viscosity sensor
SRD	Symmetric Resonator Densitometer	Density and viscosity sensor
RCP	Rheonics Control Panel	Software for data acquisition and configuration

Table 1: Nomenclature and abbreviations

1.6 Related documentation

You can find all product documentation in the USB storage device that is shipped with the sensors. You can also find them on the website at: <https://rheonics.com/resources>.

For more information on the sensor, refer to the following documents on Rheonics website. Contact the Rheonics Support Team if you cannot find a document online.

Title	Code	Description
SRV Operator Manual	SRV-OP	SRV Sensor Operator Manual
SRD Operator Manual	SRD-OP	SRD Sensor Operator Manual
SME Operator Manual	SME-OP	Rheonics SME Sensor Module Electronics Operator Manual
RCP Software Manual	RCP-OM	Rheonics Software Installation and User Manual
Communication Protocol Manuals	Various	Modbus TCP, Modbus RTU, HART, Profinet, Ethernet/IP, etc.

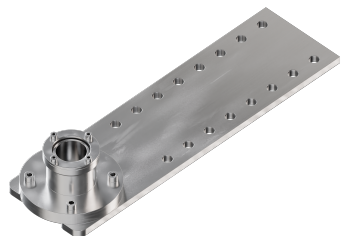
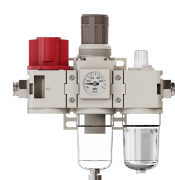
Table 2: Related documentation and manuals

2 Packaging list

Table 3: Packaging list

N°	Name	Quantity	Reference Image
1	SLS probe	1	
2	Sensor electronics	1	
3a	MKT1 Adjustable insertion depth	1	
3a.1	APC wrench	1	
3a.2	Security ring	1	
3a.3	Mounting dampers (spare)	4	
3b	MKT2 Fixed insertion depth	1	

Table 3: Packaging list

N°	Name	Quantity	Reference Image
3b.1	Heat-shrink ring (spare)	2	
3b.2	Mounting dampers (spare)	4	
3c	MKT3 Closed process mount	1	
4	Pneumatic tube 8/6 mm	10 m	
5	AKT1 FRL unit for compressed air treatment	1	

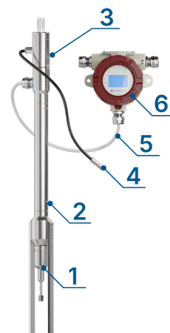
3 About the Rheonics SLS

Rheonics SlurrySense™ (SLS) is a self-cleaning sensor for density and/or viscosity, and temperature measurements based on Rheonics SRV or SRD sensors. It utilizes the self-cleaning technology CleanWave™ (CLW). This system uses compressed air to create vibrations that can continuously shake off deposits from sticky or abrasive slurries, ensuring accurate measurements and reducing the need for frequent manual cleaning and downtime. The SlurrySense with CleanWave is designed for slurries where standard SRV/SRD sensors cannot achieve reliable measurements. Using the CleanWave, reliable, low-noise data can be obtained. It can be mounted in various configurations, including adjustable or fixed insertion.

The SLS is mainly designed for measurements of slurries used in the investment casting industry and is suited for installation in open and closed tanks. Other industries where it can be used include: oil and gas (drilling mud), mining/minerals, concrete and cement mixing, battery slurry production. The SLS is a self-cleaning industrial probe with real-time condition monitoring.

Rheonics SlurrySense sensor is composed of the sensor probe, CleanWave unit, electronics, sensor cable, and air line, as shown in Figure 1.

Figure 1: SlurrySense main parts



N°	Name	Description
1	Sensor probe	Rheonics SRV or SRD sensor probe
2	SLS	Rheonics SlurrySense
3	CleanWave unit	CleanWave unit with extension tubes for standard or custom total length
4	Air inlet	8 mm push-in connector for air supply
5	Sensor cable	8-wire cable to connect the probe to the electronics
6	SME	Sensor electronics (different variants)

Table 4: SlurrySense main parts

NOTICE

The SlurrySense is shipped already assembled and uses threads and O-Ring sealings (FKM). Do not disassemble or make modifications to the SLS probe. The warranty becomes void if the product has been opened or serviced by personnel not authorized by Rheonics.

3.1 CleanWave™

CleanWave™ (CLW) is a pneumatic axial vibration module that provides self-cleaning properties to the SlurrySense sensor. The axial vibration continuously prevents deposits from settling on the sensing element, which is essential for accurate readings. Rheonics SlurrySense probe has a pneumatic line for the air inlet of the CLW module.

3.2 Technical specifications

General specifications of the SLS with CleanWave are shown on the table below.

Specification	Value
Operating temperature	5 °C (41 °F) to 60 °C (140 °F)
Probe material	Stainless steel 316L
O-ring material	FKM
Air supply	2 - 6 bar (29 - 90 psi) — 4 bar recommended 10 - 36 L/min PDP ¹ ≤ 10 °C
Air filter	≤ 5 µm
Lubrication	ISO viscosity class VG 5 - 15 1 - 3 drops/10 minutes
Weight	3.1 kg

Table 5: SLS with CleanWave specifications

¹Pressure dew point.

3.3 Dimensions

Rheonics SlurrySense is offered in two standard fixed lengths of the probe, SLS-500 and SLS-1000. The lengths refer to the total length (L), shown in Figure 2 and Figure 3. An SLS probe with a custom length (SLS-CUS) is also available for longer probes.

The total length L, in conjunction with the selected mounting method (Rheonics mounting kit (MKT) or custom setup), determines the final insertion length (A) into the tank. Refer to Table 6 for the relevant sensor dimensions.

Figure 2: SlurrySense dimensions for SLS-500

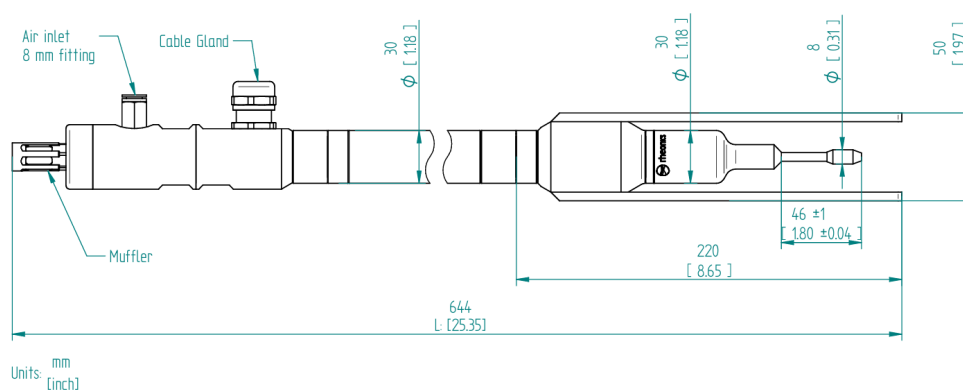
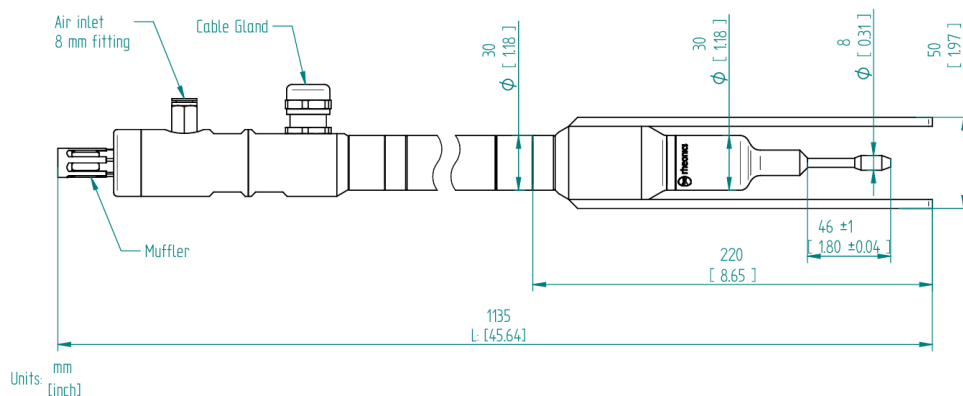


Figure 3: SlurrySense dimensions for SLS-1000



Order code	Total length (L) ± 5 mm	Insertion length (A) with MKT1/2/3 ² ± 5 mm
SLS-500	644 mm (25 in)	250 - 380 mm (10 - 15 in)
SLS-1000	1135 mm (44 in)	250 - 880 mm (10 - 38 in)
SLS-CUS	>1135 mm (>44 in)	>250 mm (>10 in)

Table 6: SlurrySense total and insertion lengths

3.4 Mounting kits

Rheonics offers Mounting Kits (MKT) for the SlurrySense to ensure secure probe attachment and proper function of the CleanWave module. The CleanWave technology is based on an axial vibration along the SLS and cannot be rigidly mounted. The Rheonics mounting kits allow the cleaning vibration in axial direction, while being sufficiently rigid in all other directions.

All mounting kits utilize the same mounting base plate for attachment to a fixed point at an open tank, such as the tank's lip, static blade, or plough. They differ, however, in the method used to clamp the probe. MKT3 allows the SLS to be mounted to a closed process through a flanged connection. Details of each mounting type are shown in the next sections.

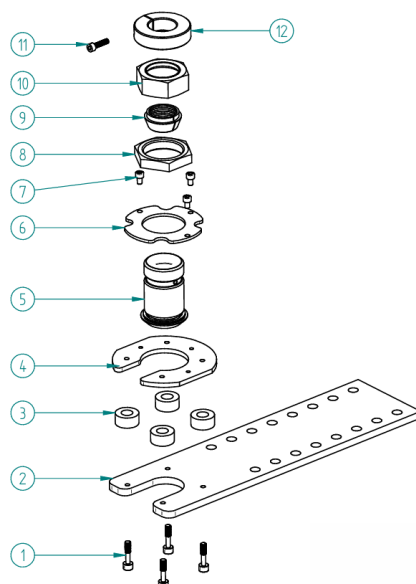
NOTICE

Customers may order the SlurrySense without a mounting kit if they desire a custom mounting solution. Installing the SLS without a mounting kit is possible, but requires the mounting to allow slight axial movement of the probe. Insufficient axial freedom may reduce CleanWave effectiveness.

3.4.1 MKT1

MKT1 is the adjustable mounting kit variant offered for the SlurrySense. The probe is fixed to the mounting kit by compressing the plastic back ferrule (8) using a nut (9). MKT1 allows a variable insertion length (A) and angular orientation of the probe by varying the position of the MKT1 mandrel (4) along the probe, even after first use. Due to the adaptable positioning of the mandrel, a security ring (10) is placed above the compression nut for safety.

Figure 4: Mounting kit MKT1



N°	Qty.	Prod. Key	Name
1	4	M6-25-CS	M6 x 25 mm captive screw
2	1	MKT-MBP	Mounting base plate

²MKT1 allows variable insertion depth; MKT2 and MKT3 have fixed insertion depth.

3	4	MKT-DP	Dampers
4	1	MKT1-DSC	MKT1 compressed disk
5	1	MB-APC	APC Mandrel
6	1	MKT1-APCR	APC ring
7	3	M5-8-CH	M5 x 8 mm cap head screw
8	1	TN-APC	55 mm threaded nut
9	1	BF-APC	Back ferrule
10	1	CN-APC	50 mm compression nut
11	3	M5-20-CH	M5 x 20 mm cap head screw
12	1	MKT1-SR	Security ring

Table 7: MKT1 parts

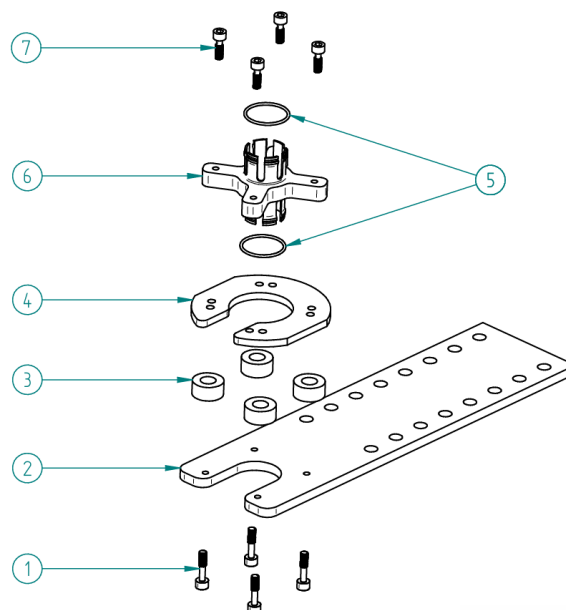
NOTICE

The MKT1 is delivered assembled, only requiring (1) threading the APC ring to the compressed disk and (2) fixing the position of the security ring. Refer to the Installation section for commissioning instructions.

3.4.2 MKT2

MKT2 is the fixed mounting kit variant offered for the SlurrySense. It uses two heat-shrink rings that contract when exposed to high temperatures. Once shrunk, the insertion length is permanently fixed; adjustment requires cutting the rings and installing new ones.

Figure 5: Mounting kit MKT2



N°	Qty.	Prod. Key	Name
1	4	M6-25-CS	M6 x 25 mm captive screw
2	1	MKT-MBP	Mounting base plate
3	4	MKT-DP	Dampers
4	1	MKT2-DSC	MKT2 compressed disk
5	2	MKT2-RG	Heat-shrink ring
6	1	MKT2-MB	MKT2 mandrel body
7	4	M6-18-CS	M6 x 18 mm captive screw

Table 8: MKT2 parts

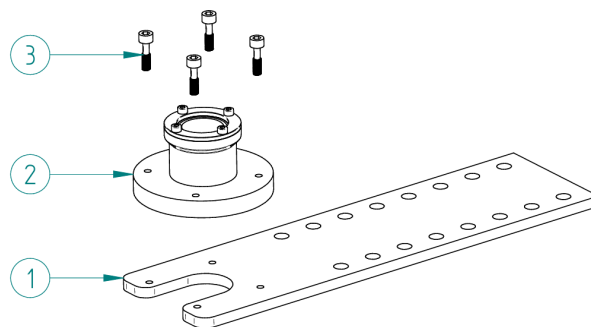
NOTICE

The MKT2 is delivered assembled, only requiring threading the mandrel to the compressed disk and the compression of the heat-shrink rings to the mandrel through heating at the desired position. Refer to the Installation section for commissioning instructions.

3.4.3 MKT3

MKT3 is an option for both closed and open processes. It can be mounted on the standard baseplate like the MKT1 and MKT2, but can also be welded to a selected flange to be connected to a closed tank or pipe. The insertion depth must be preselected.

Figure 6: Mounting kit MKT3 for open tank

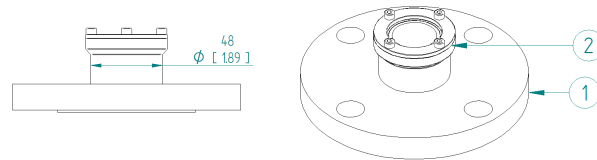


N°	Qty.	Prod. Key	Name
1	1	MKT-MBP	Mounting base plate
2	1	MKT3-ASM	MKT3 assembly
3	4	M6-22-CS	M6 x 22 mm captive screw

Table 9: MKT3 parts - open tank

For a closed tank or pipe connection, the MKT3 is welded by Rheonics to a flange selected by the customer. The MKT3 cup ($\varnothing 48$ mm) is laser-welded to the flange.

Figure 7: Mounting kit MKT3 for closed tank/pipe



N°	Qty.	Prod. Key	Name
1	1	MKT3-FL	Selected flange
2	1	MKT3-CUP	MKT3 cup

Table 10: MKT3 parts - closed process

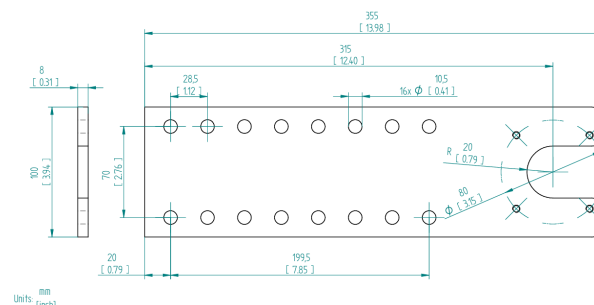
The MKT3 is delivered assembled, only requiring the attachment of the flange adapter to the base plate for the open tank version, or the fixing of the flange to the process for the closed tank/pipe version.

Refer to the Installation section for commissioning instructions.

3.4.4 Mounting base plate

The mounting base plate (Figure 8) used in the mounting kits is made of stainless steel 1.4301 (304) and has sixteen 10.5 mm holes for mounting on a fixed point using bolts; at least four bolts should be used for a secure installation. M8 bolts or similar are recommended.

Figure 8: Mounting base plate

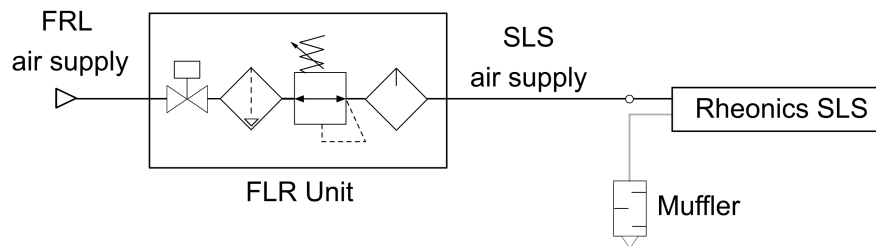


3.5 Air system

Compressed air is used to operate the CleanWave, Rheonics' pneumatic self-cleaning module that is attached to SlurrySense (SLS) probes.

A schematic showing the connections between a general compressed air supply, FRL unit and Rheonics SLS is shown in Figure 9.

Figure 9: Pneumatic diagram



The FRL and the SLS have specific air requirements for operation. Air specifications for each of them are shown in Table 11 and Table 12 respectively. Although recommended, customers may choose not to purchase an FRL unit. In that case, it is the customer's responsibility to arrange proper air supply to the SLS.

Specification	Value
Max pressure	≤ 10 bar ($\geq$ SLS operational pressure)
Temperature	5 °C (41 °F) to 60 °C (140 °F)
Air purity	ISO 8573-1 [7:4:4]

Table 11: FRL air supply specifications

Specification	Value
Operational pressure range	2 - 6 bar (29 - 90 psi) 4 bar recommended
Flow rate	10 - 36 L/min
Temperature	5 °C (41 °F) to 60 °C (140 °F)
Humidity	PDP ≤ 10 °C
Filtration	≤ 5 μ m
Lubrication	ISO viscosity class VG 5 - 15 1 - 3 drops/10 minutes 25 cm ³

Table 12: SLS air supply specifications

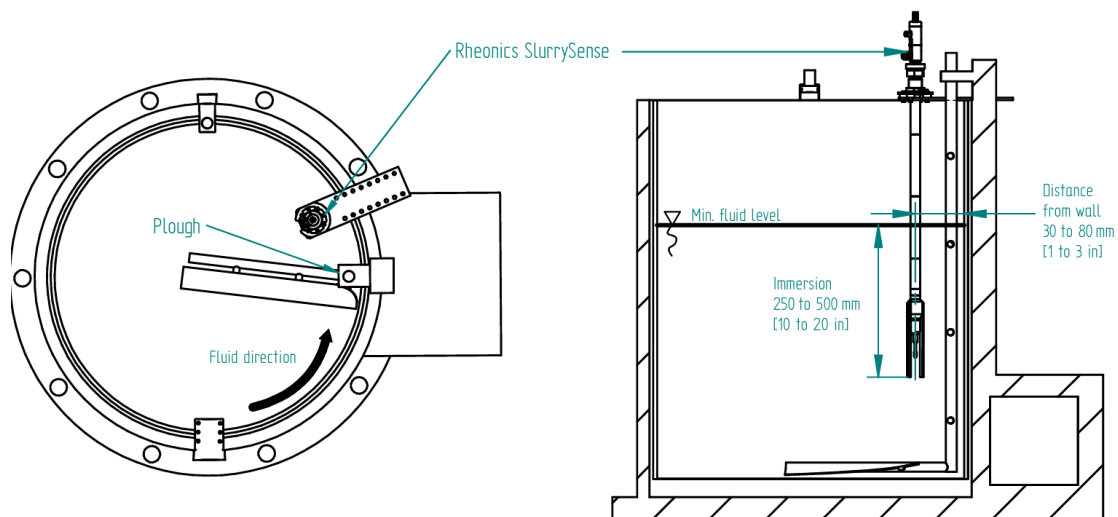
The outlet on top of the CLW unit is fitted with a muffler to release air to the environment; no connection is necessary on the air outlet.

Refer to section 5.4 for instructions on the FRL unit operation and maintenance.

4 Installation

If the SLS is installed in a slurry tank, the recommended placement is near the plough or static blade to minimize space obstruction during the process, at a distance of 30 to 80 mm (1 to 3 in) from the tank's wall and with an immersion of 250 to 500 mm (10 to 20 in) below the minimum slurry level, as shown in Figure 10. The guards of the SLS should be facing the flow, protecting the sensing element from any solid material present in the slurry.

Figure 10: Positioning of the SLS in a tank



4.1 Mounting with MKT1

Follow the instructions below to correctly mount the Rheonics SlurrySense (SLS) using the MKT1. Refer to Figure 4 and Table 7 for the names of the components used.

Table 13: MKT1 installation

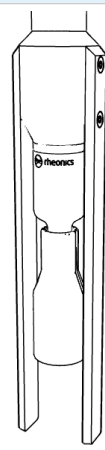
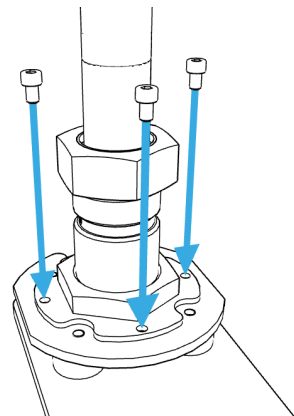
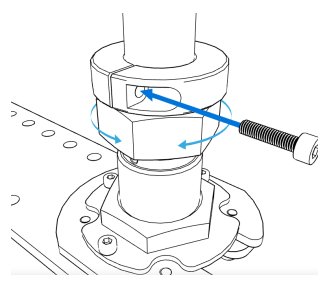
Step	Instruction	Image
1	Make sure the protective sleeve SR-HD-PS (delivered with the sensor) is placed to protect the probe during assembly.	
2	With the 3 M5x8 cap head screws M5-8-CH provided, attach the APC ring MKT1-APCR to the compressed disk MKT1-DSC on the mounting base plate MKT-MBP	
3	By loosening the security ring MKT1-SR and the 50 mm compression nut CN-APC, the insertion depth 'A' can be set. Re-tighten both parts to fix the probe in its final position, ensuring the correct flow direction. The probe is held in place by the APC; the security ring MKT1-SR acts as second containment. The APC wrench may be needed as a counter-force to loosen and tighten the compression nut CN-APC.	

Table 13: MKT1 installation

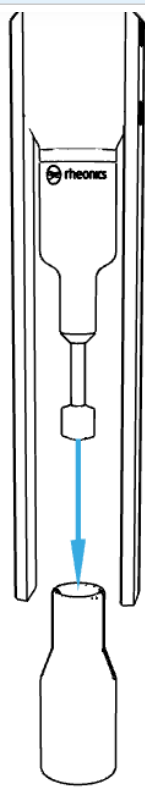
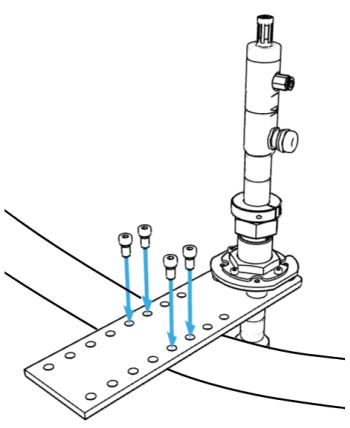
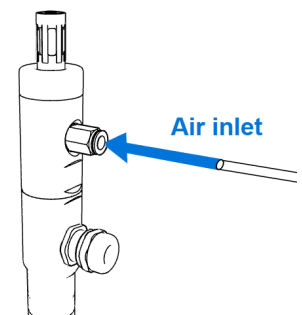
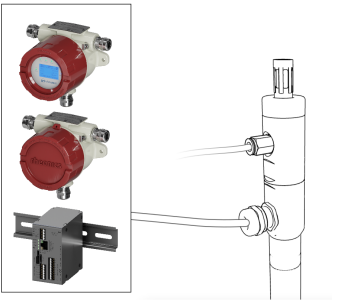
Step	Instruction	Image
4	Remove the protective sleeve SR-HD-PS. Rheonics recommends storing the SR-HD-PS to protect the sensing element whenever the SLS probe is outside of the tank.	
5	Mount the mounting base plate MKT-MBP to the tank using bolts through the 10.5 mm holes. It is recommended to use at least 4 bolts of size M8 or similar.	
6	Connect the air supply tube to the inlet 'Air IN' of the SLS.	

Table 13: MKT1 installation

Step	Instruction	Image
7	Connect the sensor cable to the SLS and to the electronics following the correct color order specified in the SME electronics manual. Power up the electronics using 24 V DC. Commissioning check step: confirm signal acquisition in RCP, check Clean Sensor Status baseline, and verify measurement output is within expected range.	

4.2 Mounting with MKT2

Follow the instructions below to correctly mount the Rheonics SlurrySense (SLS) using the MKT2. Refer to Figure 5 and Table 8 for the names of the components used.

Table 14: MKT2 installation

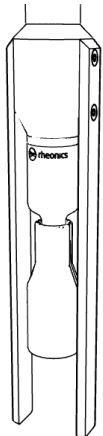
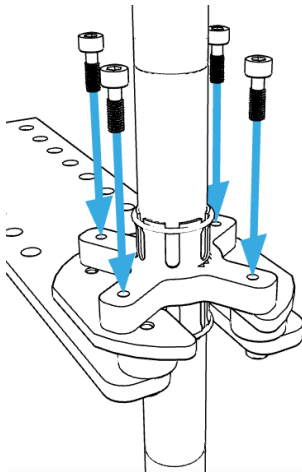
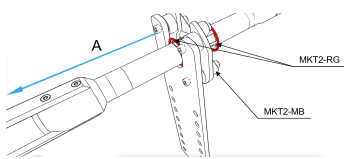
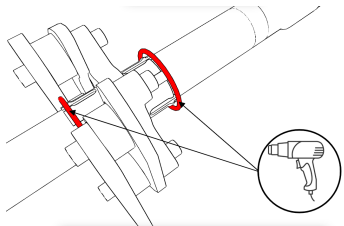
Step	Instruction	Image
1	Make sure the protective sleeve SR-HD-PS (delivered with the sensor) is placed to protect the probe during assembly.	
2	With the 4 M6 x 22 captive screws M6-22-CS provided, attach the mandrel MKT2-MB to the compressed disk MKT2-DSC. Rheonics recommends using thread locker on these screws.	
3	Place the MKT2 at the desired length along the probe; this defines the fixed insertion length (A) of the probe into the tank. Position the heat-shrink rings MKT2-RG on the grooves of the mandrel MKT2-MB. To facilitate the ring positioning, keep the MKT2 fixed with the probe horizontal.	
4	Use a hot air gun to shrink the rings. They begin to shrink at just over 45 °C and are almost fully shrunk by 100 °C. Full clamping force is only achieved at 165 °C — heat to this temperature even though visible shrinkage begins around 45 °C. Use a controlled heating method to ensure the rings are heated to at least 165 °C. Move the heat gun around the ring to shrink it evenly. Once properly shrunk, the blue paint on the rings will turn white.	

Table 14: MKT2 installation

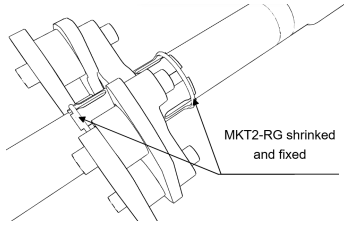
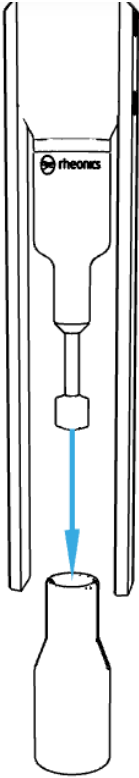
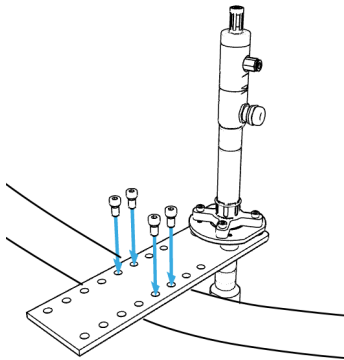
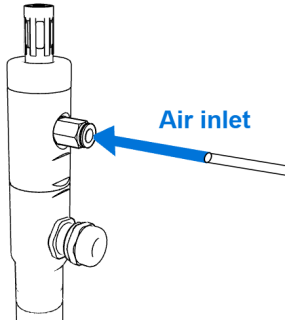
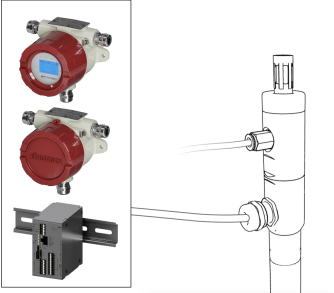
Step	Instruction	Image
5	Verify that the MKT2 is properly fixed on the probe, so that it no longer slides along the probe.	
6	Remove the protective sleeve SR-HD-PS. Rheonics recommends storing the SR-HD-PS to protect the sensing element whenever the SLS probe is outside of the tank.	
7	Mount the mounting base plate MKT-MBP to the tank using bolts on the 10.5mm holes. It is recommended to use at least 4 bolts of size M8 or similar.	

Table 14: MKT2 installation

Step	Instruction	Image
8	Connect the air supply tube to the inlet 'Air IN' of the SLS.	 A vertical cylindrical sensor with a threaded top. A blue arrow points to a side inlet labeled 'Air inlet' where a tube is being connected.
9	Connect the sensor cable to the SLS and to the electronics following the correct color order specified in the SME electronics manual. Power up the electronics using 24 V DC. Commissioning check step: confirm signal acquisition in RCP, check Clean Sensor Status baseline, and verify measurement output is within expected range.	 The same vertical sensor as in step 8, but with two cables connected to its side ports. To the left, a separate electronic control unit with two red circular components and a terminal block is shown.

4.3 Mounting with MKT3

Follow the instructions below to correctly mount the Rheonics SlurrySense (SLS) using the MKT3. Refer to Figure 6 and Table 9 for the names of the components used.

Table 15: MKT3 installation

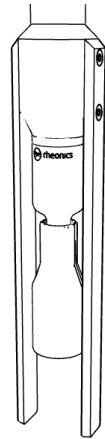
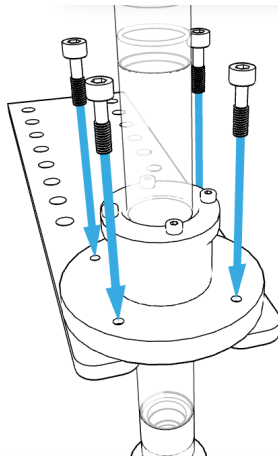
Step	Instruction	Image
1	Make sure the protective sleeve SR-HD-PS (delivered with the sensor) is placed to protect the probe during assembly.	
2	With the 4 M6 x 22 captive screws M6-22-CS provided, attach the MKT3 assembly MKT3-ASM to the mounting base plate MKT-MBP. Rheonics recommends using thread locker on these screws.	

Table 15: MKT3 installation

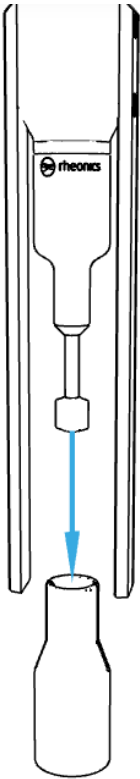
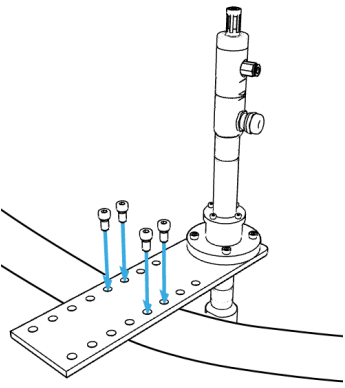
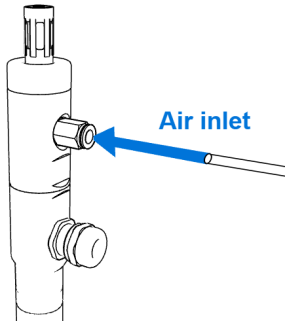
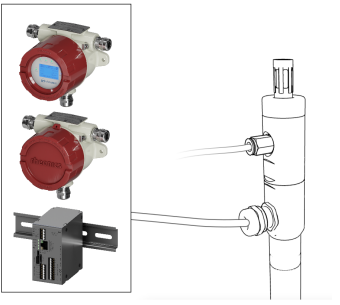
Step	Instruction	Image
3	Remove the protective sleeve SR-HD-PS. Rheonics recommends storing the SR-HD-PS to protect the sensing element whenever the SLS probe is outside of the tank.	
4	Mount the mounting base plate MKT-MBP to the tank using bolts on the 10.5mm holes. It is recommended to use at least 4 bolts of size M8 or similar.	
5	Connect the air supply tube to the inlet 'Air IN' of the SLS.	

Table 15: MKT3 installation

Step	Instruction	Image
6	Connect the sensor cable to the SLS and to the electronics following the correct color order specified in the SME electronics manual. Power up the electronics using 24 V DC. Commissioning check step: confirm signal acquisition in RCP, check Clean Sensor Status baseline, and verify measurement output is within expected range.	

5 Maintenance

Follow the instructions below to perform maintenance on the SLS.

5.1 Cleaning instructions

The SRV and SRD sensor probes, which are used in the SLS, are CIP compatible, meaning they can be cleaned in-line with solvents and water as part of the customer's standard cleaning procedure. Solvents used for cleaning must be compatible with the probe's material.

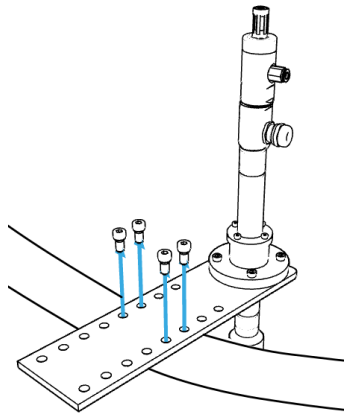
General recommendations for cleaning are:

- Check your probe's material and ensure only compatible chemicals are used. The probe may have two materials and chemicals used must therefore be compatible with both, or appropriate safeguards should be in place to ensure that cleaning chemicals do not come in contact with incompatible materials.
- Inline cleaning is generally sufficient.
- Only remove the sensor probe from the line when necessary or when line dismantling is the standard cleaning procedure. For example, manual cleaning due to clogging or adherent films.
- Cleaning can be done with appropriate solvents and/or by wiping the probe with a solvent-saturated cloth or paper. Dilute solutions such as vinegar or caustic soda may also be used, provided they are compatible with the probe material.
- Do not let fluid solidify on the probe. If this occurs, soak the probe in an appropriate solvent for several hours (2-4 hours typically) to soften the solid deposit.
- Under no circumstances should abrasives be used to clean the sensor probe since these will change its geometry, affect its calibration and cause irreversible damage.
- Never use ultrasonic cleaning methods like ultrasonic baths. They can damage the probe.

The user can validate that the sensor probe is properly cleaned using the Clean Sensor Status. This is accessible over most communication protocols or by using the RCP software. In the software, go to the Scaling tab where indicators for the cleanliness of the probe and current state (in air or fluid) can be found. For more information, check RCP-OP and Support Portal.

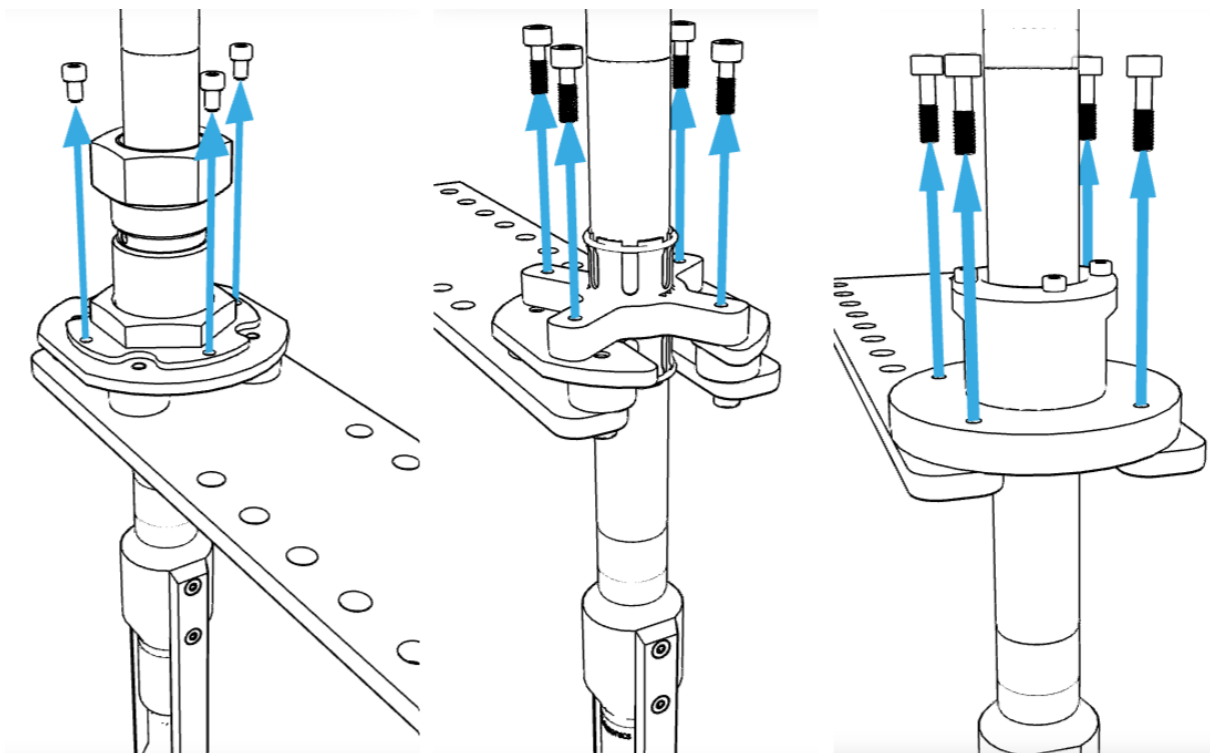
5.2 Removal instructions

The entire SLS assembly can be removed from the tank by removing the mounting base plate (Figure 11). Before removing the SLS, ensure the air supply is disconnected and system pressure is fully released.

Figure 11: SLS removal instructions

Another possibility is to remove the SLS and its corresponding mounting system from the base plate (Figure 12).

For the MKT1, three M5x8 cap head screws need to be removed; for the MKT2, four M6x18 captive screws; for MKT3, four M6x22 captive screws. Rheonics recommends using thread locker whenever reinstalling these screws.

Figure 12: MKT removal instructions

5.3 CleanWave™ replacement

The CleanWave unit can be replaced simply by loosening the thread that connects it to the SLS body. Follow the instructions below to perform the replacement.

Table 16: CLW replacement

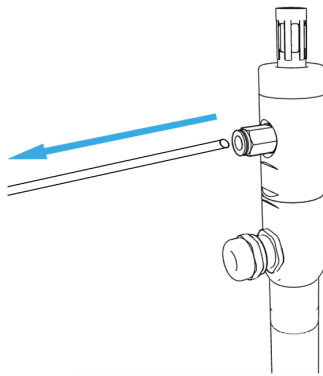
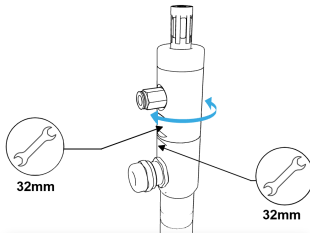
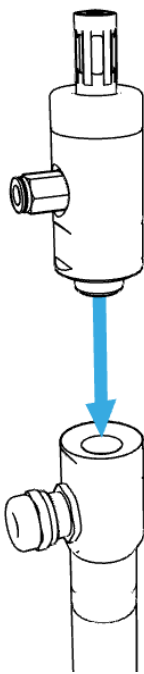
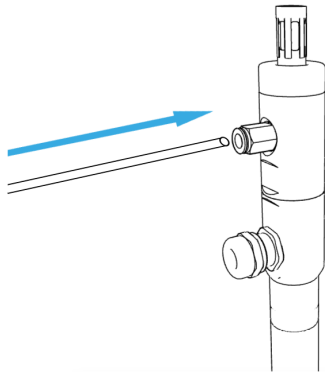
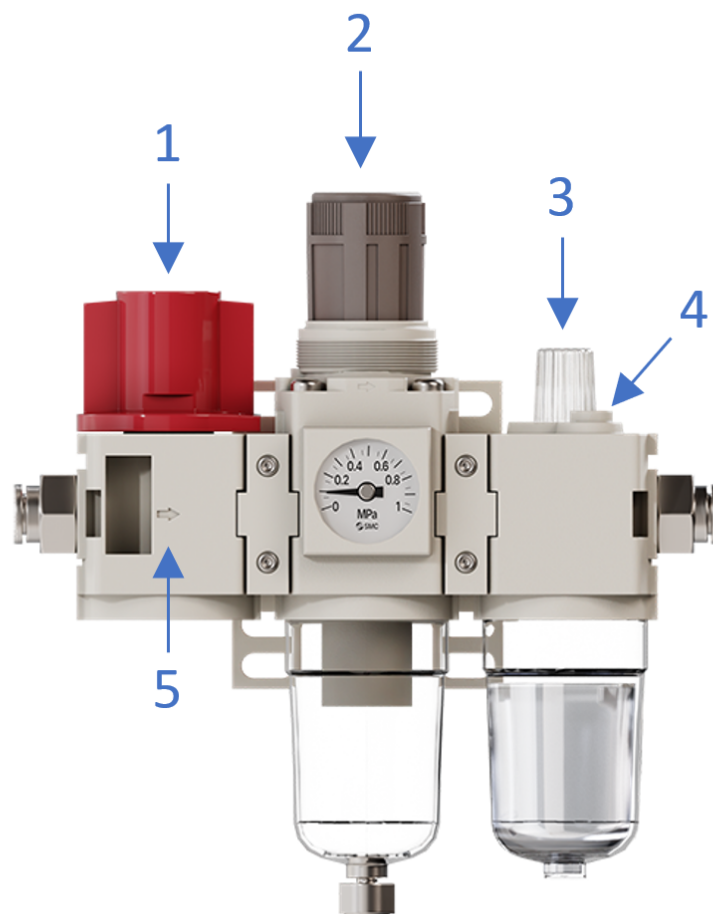
Step	Instruction	Image
1	Make sure the air line is disconnected from the CLW unit.	 A line drawing of the CleanWave unit attached to the SLS body. A blue arrow points to the left, indicating the air line being disconnected from the side port.
2	Use 32 mm wrenches to loosen the CLW unit from the SLS body.	 A line drawing of the CleanWave unit. Two 32mm wrenches are shown: one on the side port and one on the bottom flange. Blue curved arrows indicate the loosening motion.
3	Install the new CLW unit by tightening it to the SLS body. Rheonics recommends using thread locker when reinstalling the CLW unit.	 A line drawing showing the new CleanWave unit being lowered into the SLS body. A large blue arrow points downwards from the unit to the body's opening.

Table 16: CLW replacement

Step	Instruction	Image
4	Reconnect the air line.	

5.4 FRL unit operation and maintenance

Figure 13: FRL flow adjustment valve



5.4.1 Handling principles

- The red valve (1 on Figure 13) opens and closes the air supply to the FRL unit and SLS.
- The pressure can be regulated by pulling the silver knob (2 on Figure 13) on top of the filter/regulator sub-unit and rotating it.
- Install the lubricator vertically with the bowl downward. It cannot be used in a horizontal or upward orientation.
- Connect the product so that air flows following the arrow (5 on Figure 13) marked on the body of the FRL unit.
- Adjust the oil regulating valve and open or close the drain cock by hand only. Using tools can damage the product.
- Only personnel with appropriate training should operate machinery and equipment. Assembly, operation, and maintenance must be performed by a suitably trained and experienced operator.
- Do not service or remove the product until safety is confirmed: prevent falling or runaway of driven objects, cut the power and air supply, and confirm there is no residual pressure. Before restarting, take measures to prevent unexpected operation.
- Do not use the product beyond its specifications, outdoors, in direct sunlight. Shield the product from ultraviolet light and radiation with a protective cover. Do not install in areas of high humidity or high temperature.
- Do not use the product where no leakage is allowed, or if the fluid is not air.
- Polycarbonate resin is used for the bowl and sight dome. Organic solvents (thinner, acetone, alcohol, ethylene chloride), acids (sulphuric, nitric, hydrochloric), cutting oil, synthetic oils, ester-based compressor oil, alkalis, kerosene, gasoline, and thread-lock fluids are harmful. Do not use where these are present.
- Do not drop or apply impact to the product during transport or installation.

5.4.2 Adjusting the dripping amount

- Adjust the oil flow using the oil regulating valve (3 on Figure 13) on top of the sight dome while air is being supplied.
- Rotate the valve in the arrow direction shown on the product to increase the amount of oil supplied; rotate in reverse to decrease it.
- From the fully closed position, three rotations bring the valve to fully open. Do not rotate further than this.
- The numbered scale markings are guidelines for valve position only - they are not indicators of the actual dripping amount.

NOTICE

Adjust the valve by hand only - do not use tools.

5.4.3 Refilling oil

CAUTION

The lubricator cannot be replenished while pressurized. Release the internal pressure before starting lubrication, and confirm that no air is coming out of the gap.

1. Depressurize the air supply until no residual pressure remains. Loosen the lubrication plug (4 on Figure 13) by approximately one turn using a flat-blade screwdriver (-), and confirm no air escapes from the gap.
2. Remove the lubrication plug completely.
3. Supply lubricant (ISO viscosity class VG 5 - 15) up to the threaded part (A) of the bowl - the upper fill limit.
4. Check the condition of the lubrication plug O-ring, then refit the plug and screw it in gently. Because of the O-ring seal, it does not need to be over-tightened.

Recommended plug tightening torque: 0.3 +/- 0.05 N-m.

5.4.4 Troubleshooting

Table 17 below shows the most common problems that can happen in the FRL unit and possible fixes.

Table 17: FRL troubleshooting

Symptom	Possible cause	Countermeasure
Oil does not drip	Product installed opposite to the flow direction.	Reinstall correctly following the arrow on the unit's body.
	Oil level in the bowl is low.	Refill so the oil surface is above the MIN. OIL LEVEL mark.
	Flow rate is insufficient.	While supplying air, open the valve to adjust the dripping amount.
	Oil regulating valve is closed.	While supplying air, open the valve to adjust the dripping amount.
Bubble in the oil droplet	Oil level in the bowl is low.	Refill so the oil surface is above the MIN. OIL LEVEL mark.

5.5 Repair

Contact the Rheonics Support Team. The Rheonics Support Team will assess the sensor and, if a return is required, initiate an RMA process.

5.6 Storage

The SRV and SRD probes are delivered with a protective sleeve for the sensing element and a cap for the M12 connector. Keep both protective accessories in place when storing the probe.

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7 Notes/Errata

8 Revision and Approvals

Version	Nature of Changes	Approvals	Date
1.0	Original version	SK, DB, DL	03.04.26
1.1	FRL instructions added	DB, DL	05.08.26

Table 18: A summary of the document revisions.

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