Installation, Operation & Maintenance Manual

Saf-T-Vise STV-LP1 & Saf-T-Vise STV-LP2

Insertable Tool Holders

S-CM-IOM-00505-2 3-22







Do not install, maintain, or operate this equipment without reading, understanding, and following the appropriate Sentry Equipment Corp instructions. Otherwise, injury, damage, or both may result.

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Note

The information contained in this document is subject to change without notice.

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Safety Information

Please read the entire manual before attempting to unpack, set up, or operate this product. Pay careful attention to all Warnings, Cautions, and Notes. Failure to do so could result in serious personal injury and/or equipment damage.

Use of Hazard Information

If multiple hazards exist, the signal word corresponding to the greatest hazard shall be used.

Definitions

A DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

MARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

⇒ NOTE

Information that requires special emphasis.

⇒ TIP

Alternate techniques or clarifying information.

SHALL: This word is understood to be mandatory.

SHOULD: This word is understood to be advisory.

General Safety Precautions

Product Selection, Installation, and Use

MARNING

Improper selection, installation, or use can cause personal injury or property damage. It is solely the responsibility of users, through their own analysis and testing, to select products suitable for their specific application requirements, ensure they are properly maintained, and limit their use to their intended purpose.

Follow proper local, state, and federal regulations for proper installation and operational requirements.

Always use caution and common sense when working with any chemical. Read the product label and Material Safety Data Sheets (MSDS) carefully and follow the instructions exactly.

Potential Equipment Hazards

↑ WARNING

Hot surfaces! This equipment may have very hot surfaces. If an operator contacts a hot surface, injury may occur. Use protective clothing to prevent injury. If other equipment comes in contact with a hot surface, damage to the equipment may occur. Ensure the area around this equipment is kept clear to prevent damage from occurring.

High pressures! This equipment may contain fluids at very high pressures. Prior to installing, removing or maintaining this equipment, ensure that the equipment is isolated from all connecting piping, the equipment is depressurized, the contents have been drained, and the equipment is cool.

General Description

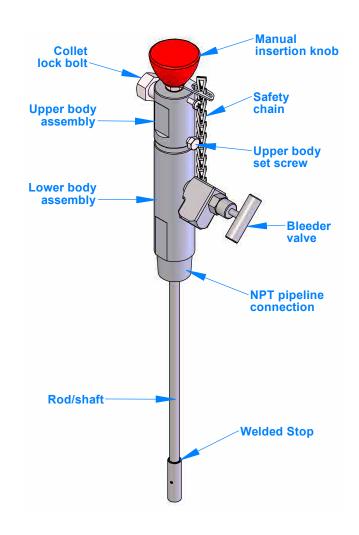
The Sentry® Saf-T-Vise STV-LP1 and Saf-T-Vise STV-LP2 Series insertable tool holders are multi-functional tools that can be equipped to monitor pipeline corrosion, inject chemical into the process, or sample the pipeline medium. The holders are engineered to specific site applications with a variety of materials and connection styles and sizes. Design pressure and temperature requirements determine the model series and sealing technology of the holder.

The holders are designed with a patented locking collet which secures the rod/shaft within the process stream until released by the operator. A process bleeder valve is standard on holders to allow depressurization of the holder after closure of the process isolation valve. The ability to fully retract the rod/shaft out of the pipeline while under pressure allows for pigging without bringing the line down.

The standard Saf-T-Vise STV-LP1 and Saf-T-Vise STV-LP2 Series models are designed to be inserted and retracted by hand, without the need for a separate tool. However, the Saf-T-Vise STV-LP2 series holder comes standard with tool threads, allowing the use of a tool for the retraction of a bent or stuck rod.

Specifications

	STV-LP1	STV-LP2	
weight	4 to 7 lb 1.8 to 3.2 kg	10 to 35 lb 4.5 to 16 kg	
materials	316 SS	316 SS; other alloys available	
insertion pressure (MOP)	750 psi at 100°F 52 bar at 38°C	1/4 in: 1000 psi at 100°F 69 bar at 38°C 3/8 in: 750 psi at 100°F 52 bar at 38°C 1/2 in: 420 psi at 100°F 29 bar at 38°C	
pressure rating (MAP)	2000 psi at 100°F 138 bar at 38°C	4000 psi at 100°F 275 bar at 38°C	
temperature rating min/max (seals)	PTFE: 0°F / 450°F -18°C / 232°C	PTFE: 0°F / 450°F -18°C / 232°C graphoil: 0°F / 1000°F -18°C / 538°C	
process connection	1 in NPT	½, ¾, 1, 1½ or 2 in NPT or flange	
insertion depth	11, 17, 23, or 29 in 28, 43, 58, or 74 cm	up to 6 ft up to 1.8 m	
rod/shaft OD	3/8 in	1/4, 3/8 or 1/2 in	
holder types	corrosion coupon, atomizer, sample or injection quill		



Installation

The Saf-T-Vise STV-LP1 and Saf-T-Vise STV-LP2 tool holders attach to a pipeline isolation valve by means of either a flanged or NPT threaded connection. A holder is installed or removed during the operation and maintenance of the equipment as detailed in the following sections.

Operation

The Saf-T-Vise STV-LP1 and Saf-T-Vise STV-LP2 tool holders are hand insertable and retractable and do not require a separate insertion and retraction tool.

MARNING

Read instructions thoroughly before installing or using equipment. Contact your representative or factory customer service if you have any questions. Failure to follow these instructions could result in serious injury or death.

Maintain a firm grip on the hand knob throughout the hand insertion & retraction procedures, and keep body away from the travel path of the rod/shaft. An unsecured rod/shaft could move outwards forcefully, causing serious injury or death.

Tools needed

- tape measure
- permanent marker
- 12" adjustable wrench
- anti-seize lubricant
- torque wrench
- Teflon tape or paste

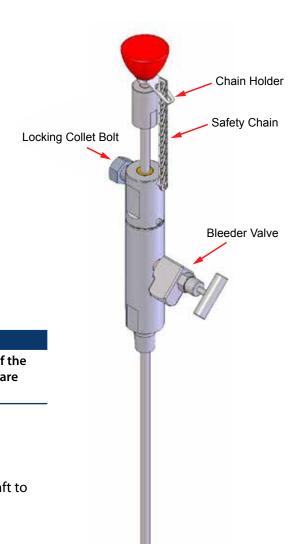
Insertion

- 1. Close and lock the process isolation valve to prevent incidental opening while installing the unit.
- 2. Determine desired insertion depth.
 - **a.** Measure from the top of pipeline isolation valve to the desired zone within the process.

⇒ TIP

Tool compensation: Coupons are generally located ¼" from the bottom of the process line, atomizers are located in the upper 1/3 of the line, and quills are placed in the middle 1/3 of the process line.

- **b.** Record measurement for use in step 3.
- **3.** Mark desired insertion depth on rod/shaft:
 - **a.** Loosen the locking collet bolt on the holder and insert the rod/shaft to the fully inserted position.
 - **b.** Retract the rod/shaft until the desired insertion depth is achieved (reference recorded measurement from step 2). Desired insertion depth is measured from the tip of the rod, compensating for attachment (see Tip), to the bottom thread or flange of the body assembly.
 - **c.** Mark the rod/shaft with a permanent marker just above the locking collet (above the NPT high pressure insertion tool/safety cap connecting threads).



- **4.** Secure holder to process isolation valve connection.
 - **a.** Retract the marked rod/shaft completely into the holder and tighten the locking collet bolt to secure the rod/shaft in the holder.
 - **b.** Apply Teflon tape or paste to the process isolation valve/holder connection
 - **c.** Secure the holder to the isolation valve.
 - **d.** Tighten the locking collet bolt to 35 ft-lb (47.45 Nm). This torque will hold a rod/shaft securely up to the design pressure of the unit.
 - **e.** Make sure that the bleeder valve is closed completely.
- **5.** Insert rod/shaft into process.
 - **a.** Slowly open the process isolation valve. Check for leaks.

⇒ NOTE

If graphoil seal leaks:

- a. Close isolation valve.
- b. Slowly open bleeder valve.
- c. Loosen set screw that secures upper body to lower body.
- d. Tighten upper body onto lower body; re-tighten set screw.
- e. Close bleeder valve.
- f. Resume installation.

⇒ NOTE (continued)

If Teflon seal leaks:

Close isolation valve, relieve pressure with bleeder valve, and contact your representative or factory customer service.

- **b.** While holding the hand knob firmly, loosen the locking collet bolt.
- **c.** Insert the rod/shaft to the desired depth (use the permanent mark made in step 3 as a reference).
- **d.** Tighten the locking collet bolt to 35 ft-lb (47.45 Nm). This torque will hold a rod/shaft securely up to the design pressure of the unit.
- **6.** Install safety chain through the chain holder; do not leave any slack in the chain.

Retraction

MARNING

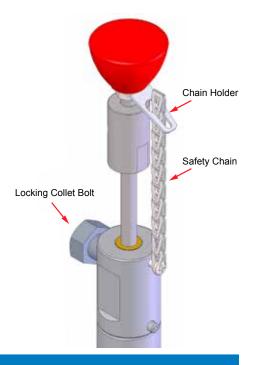
Maintain a firm grip on the hand knob throughout the hand retraction procedure, and keep body away from the travel path of the rod/shaft. An unsecured rod/shaft could move outwards forcefully, causing serious injury or death.

- 1. Remove safety chain.
 - **a.** While holding the hand knob firmly, loosen the locking collet bolt.
 - **b.** Push the tool in slightly and remove the chain.
- 2. Retract rod/shaft from pipeline.
 - **a.** Retract the rod/shaft completely into the holder.
 - **b.** Re-tighten the locking collet bolt to 35 ft-lb (47.45 Nm).
- **3.** Slowly close the process isolation valve.

⇒ NOTE

If the process isolation valve has difficulty closing, make sure that the rod/shaft is completely retracted past the isolation valve.

4. Open the bleeder valve to relieve any trapped pressure.



NOTICE

Support the rod/shaft during removal from the process isolation valve to prevent bending.

5. Remove the holder from the process isolation valve.

Maintenance

⇒ NOTE

All maintenance procedures assume the insertable tool holder has been properly removed from the line. See "" section for instructions.

Inspecting the Hand Insertion Knob

If the hand insertion knob is brittle or missing, contact the factory to order a replacement. Note the unit's thread size to ensure a correct replacement is ordered.

Prepping the Tool Holder for Reinstallation

After each use the tool holder threads should be checked and cleaned.

Tools needed

- Clean rag
- Pick or small screwdriver
- Teflon tape or paste
- Anti-seize lubricant
- 1. Use a small pick or screwdriver to remove Teflon tape from the threads of the holder and the isolation valve connection threads.
- **2.** After tape and debris are removed, wipe down the threads with a clean rag.
- **3.** Reapply Teflon tape and anti-seize lubricant to the holder threads.

Cleaning the Rod/Probe Shaft

The rod/probe shaft should be cleaned each time the tool holder is removed from the line. This helps prevent buildup on the rod/shaft and damage to the seal.

Tools needed

- Clean rag
- Cleaner/solvent
- 320 grit or finer sand paper
- Medium adjustable wrench
- Molykote 55 lubricant or other silicone/lithium lubricant
- 1. Remove the holder from the line.
- 2. Loosen the locking collet bolt and slide the rod/shaft to the fully inserted position (until the stop hits the top of the body). Leave the locking collet loose so the rod/shaft can be spun inside the body.
- **3.** Clean the exposed rod/shaft with 320 grit or finer sand paper using a rotational motion.
- **4.** When the exposed rod/shaft is cleaned of external debris, wipe the rod/shaft with a clean rag and solvent to remove any leftover debris.
- 5. Slide the rod/shaft to the fully retracted position and repeat the steps above to clean the remaining rod/shaft.

6. When the rod/shaft is thoroughly clean, wipe the rod/shaft with Molykote 55 lubricant or other silicone/lithium lubricant.

Changing a Rod/Shaft and Replacing a Seal

Tools needed

- Medium adjustable wrench
- Permanent marker
- 1/4" NPT nipple 2"-4" (5-10 cm) in length (for atomizers or quills only)
- Hex key set
- Small pick or screwdriver
- Clean rag
- Seal Installation Tool (for Teflon seals only)
 - P/N 2-07815E for 3/8" OD rod/shaft
 - P/N 2-07815F for ¼" OD rod
- New seal for holder (Teflon or graphoil as needed)
- Molykote 55 lubricant or other silicone/lithium lubricant
- Anti-seize lubricant
- 320 grit or finer sandpaper
- Cleaner/solvent
- 1. Remove the rod/shaft.
 - **a.** With the holder removed from the line, loosen the locking collet and slide the rod/shaft to the fully inserted position, leaving 1" (2.5 cm) between the top of the holder and the adapter lock nut.
 - **b.** Tighten the locking collet bolt to 35 ft-lb (47.45 Nm).
 - c. Remove adapter.
 - Coupon holder only
 - If using a flat coupon, use a permanent marker to mark the rod to show where the edge of the coupon is oriented.
 - Use a medium adjustable wrench to loosen the adapter lock nut.
 - Remove both the adapter and the lock nut.
 - Atomizer or quill
 - If using a quill or atomizer nozzle with a specific orientation, use a permanent marker to mark the shaft to show which direction the quill or nozzle is oriented.
 - If fluid inlet does not have wrench flats, use a ¼" NPT nipple threaded into the fluid inlet adapter to remove
 the adapter from the shaft. If the adapter has a multi-port valve, you can use the existing assembly to aid in
 removal.
 - **d.** Loosen the collet and slide the shaft out of the body of the holder.
- 2. Separate the upper and lower body of the holder.
 - a. Holders with Teflon seals use a socket head set screw; holders with graphoil seals use a hex head set screw.
 - **b.** Loosen (but not completely remove) the small set screw on the upper body.

NOTICE

Make sure the set screw is loose. Failure to loosen the set screw can cause permanent damage to the holder.

c. With the set screw loose, remove the upper body.

⇒ NOTE

If the upper body is difficult to remove, stop immediately and make sure that the set screw is loose.

- **3.** Replace the seal.
 - a. With the upper body removed, use a pick or small screwdriver to gently pick out the old seal.
 - **b.** Clean the seal body of the holder with a clean rag.
 - c. Insert new seal:
 - For Teflon seal:
 - Place the new Teflon seal onto the seal insertion tool with the seal opening facing away from the handle.
 - Lubricate the open-faced edge of the seal with Molykote 55 or other silicone/lithium lubricant by placing a
 dot of lubricant on your finger, then slowly rolling your finger around the outside lip of the seal, completely
 coating the outside edge.
 - Insert the Teflon seal into the holder body by pushing the tool and seal straight into the body of the holder.
 Make sure the seal tool is straight with the holder to ensure you do not side load the seal.
 - Remove the seal tool.
 - For graphoil seal:
 - Insert the graphoil seal directly into the holder body. Make sure you push the seal straight into the body of the holder to avoid side loading the seal.
- 4. Reassemble the holder.
 - a. Apply a small amount of anti-seize lubricant to the lower body threads where the upper body threads on.

NOTICE

Do not tighten the set screw until the upper and lower body of the holder are properly aligned. Tightening the set screw on the threads will permanently damage the tool.

- **b.** Loosen the set screw enough to allow for easy assembly.
- **c.** Thread the upper body of the holder onto the lower body.
 - For Teflon seal:
 - Tighten the upper body until it is snug against the lower body.
 - Tighten set screw.
 - For graphoil seal:
 - Do not tighten the set screw until after installation of the rod/shaft.
 - Thread the upper body to the lower body, but do not tighten.

⇒ NOTE

When using a graphoil seal, tightening the upper body without a rod/shaft in the holder will damage the seal and prevent insertion of the rod/shaft.

- 5. (Re)Install the rod/shaft.
 - **a.** Clean the rod/shaft before installing.
 - If reinstalling a used rod/shaft, thoroughly clean the rod/shaft with 320 grit or finer sandpaper using a rotational motion, then wipe the rod/shaft with a clean rag and solvent to remove any leftover debris.
 - If installing a new rod/shaft, wipe the new rod/shaft down with solvent and a clean rag to remove any debris.

- **b.** Add a small amount of Molykote 55 or other silicone/lithium lubricant to the rod/shaft.
- **c.** Wrap the threaded end of the rod/shaft with two (2) complete wraps of Teflon tape to protect the seal during rod/shaft insertion.
- **d.** Place the rod/shaft into the holder carefully. If the rod/shaft cannot pass through the body, make sure the locking collet is loose and oriented in the correct direction (dot on top). It is sometimes easier to completely remove the locking collet from the body. Be careful not to lose collet.

○ NOTE

Each insertion collet assembly is unique to each retrieval tool. Be sure to keep the removed assembly with the specific tool retractor.

- e. Reinstall the locking collet.
 - Locking collet with orientation dot (see photo): Once the rod/shaft is through the body of the holder, reinstall the locking collet (if removed) with the orientation dot facing the top of the tool, and tighten the collet.
 - Locking collet without orientation dot: Newer versions of the locking collet are not orientation dependent. Once the rod/shaft is through the body of the holder, reinstall the locking collet (if removed) and tighten.
- **f.** Remove the protective Teflon tape from the rod/shaft.
- **g.** For atomizer or quill shaft only, reapply new Teflon tape (2–3 wraps is adequate). Coupon holder rods do not need Teflon tape.
- 6. Finish reassembly.

For coupon holder rods only

- a. Move rod/shaft through tool so the last 1.5 inches are visible out the top of the holder.
- **b.** Tighten the locking collet bolt to 35 ft-lb (47.45 Nm).
- **c.** Reinstall the adapter and lock nut securely on the rod.
- **d.** If using a graphoil seal, gently tighten the upper body onto the lower body, and then tighten the set screw.

⇒ NOTE

If using graphoil seal, do not overtighten the upper body. This will make the rod/shaft difficult to move and cause excessive wear on the seal.

e. The tool is now ready to go back into service

For atomizer or quill shafts

- **a.** Add a very small amount of anti-seize lubricant to the shaft end (take special care not to get any anti-seize lubricant in the shaft as this could clog your nozzle tip).
- **b.** Thread the fluid adapter onto the shaft and tighten the adapter using the small ¼" nipple (or multi-port valve) if no wrench flats are present.
- **c.** If re-installing a used shaft, tighten down to the mark made earlier. If installing a new shaft, align the mark on the fluid adapter with the outlet of the atomizer tip or quill.





- **d.** If using graphoil a seal, gently tighten the upper body onto the lower body, and then tighten the set screw.
- **e.** The tool is now ready to go back into service.

Changing a Coupon/Checking Probe End

Tools needed

- Clean rag
- Cleaner/solvent
- 320 grit or finer sand paper
- Medium adjustable wrench
- Molykote 55 lubricant or other silicone/lithium lubricant
- Flat tip screwdriver
- 1. Remove tool holder from the process pipeline by following instructions for retraction.
- **2.** Remove old coupon or inspect the rod/shaft as needed.
- **3.** Clean the rod/probe shaft. See previous section for procedure.
- **4.** If using a coupon holder, attach the new coupon.
- **5.** Reinstall the tool holder into the pipeline by following instructions for insertion.

Troubleshooting

Leaks

Multi-Port Valve Leaks

- 1. Isolate and bleed down the pressure, and attempt to tighten the leak point. If leak persists, continue with next step.
- **2.** Re-tape the fittings on the multi-port valve.
 - **a.** Remove the entire holder from the process line.
 - **b.** Remove the multi-port valve from the holder.
 - **c.** Disassemble and remove all the old Teflon tape from multi-port valve and then re-tape the fittings.
 - **d.** Reassemble the multi-port valve using a small amount of anti-seize lubricant on each fitting. Do not over-tighten the fittings as this can cause a leak point.
 - e. If leak persists, continue with the next step.
- **3.** If the leak persists at a particular point, close the isolation valve, relieve pressure with bleeder valve, and contact your representative or factory customer service.

Seal Leaks

Saf-T-Vise STV-LP1 Seal Replacement:

- 1. Remove the hex plug using the stub hex socket. (The bleed valve may need to be loosened to allow the stub socket to reach the hex plug.)
- 2. Insert the threaded end of the tube or rod into the top of the LP1 body to push out the old seal and backing ring. The threaded end grips the old seal and backing ring in order to push them out of the LP1 body ID pocket.
- **3.** Install a new seal using the seal insertion hand tool.
 - a. Place the seal and backing ring on the seal insertion hand tool as shown in the image.
 - **b.** Use the stub hex socket and a 6-inch extension to start the hex plug hand tight into the LP1 body.

⇒ NOTE

Using a standard hex tool will damage the seal.

4. Torque the ID hex plug to 35 ft-lb to complete seal installation.

Teflon Seal:

If the holder is leaking from the top of the holder body where the rod/shaft and body meet, the Teflon seal is damaged and requires replacement. See section on Seal Replacement.

Graphoil Seal:

If the holder is leaking from the top of the holder body where the rod/shaft and body meet, the graphoil seal is most likely loose.

- 1. Adjust the top body to tighten the seal.
 - **a.** Loosen the set screw on the upper body. The set screw typically has a hex head.
 - **b.** Using an adjustable wrench on the top body wrench flats, turn the upper body clockwise in 1/4-turn increments until the leak stops.
 - **c.** Turn the upper body an additional 1/4 turn clockwise.
 - **d.** Re-tighten the set screw on the upper body to prevent the body from loosening.
- 2. If leak persists, the graphoil seal is damaged and requires replacement. See section on Seal Replacement.

Connection Leaks

- 1. If the holder leaks from any threaded portion, immediately isolate the holder from the line and remove process pressure.
- 2. Remove the holder from the isolation valve.
- **3.** Follow the procedure for Prepping a Holder for Reinstallation.
 - This procedure can be used for all connection points on a holder including the fluid inlet assembly, probe shaft adapters, bleeder valves, and any other connections that may be on the holder.

Bleeder Valve Leaks

If the holder leaks from the bleeder valve outlet or bleeder valve stem, the bleeder valve is damaged and should be replaced.

Contact the factory to order a replacement valve.

Locking Collet

Not locking shaft in place

If the locking collet fails to lock the rod/shaft in place with 35 ft-lb (47.45 Nm) of torque applied to the collet locking bolt, the locking collet is damaged and must be replaced. Please contact the factory.

NOTICE

Do not interchange collets between tool holders. Collets are specially machined for each tool holder individually and cannot be interchanged. Collet repair must be performed by the factory.

Rod/shaft marred by collet

- 1. Check collet orientation. If the collet has an orientation indicator dot (see photo), the indicator dot must always face toward the top of the holder. Collets without the indicator dot are not dependent on orientation.
 - **a.** If the collet is upside down, remove the locking collet bolt from the holder and gently tap the holder on a hard surface to remove the collet.
 - **b.** Reinstall the collet with the orientation indicator dot facing toward the top of the holder, and then reinstall the locking collet bolt.
- 2. Check the collet for wear.
 - A worn collet will not distribute pressure evenly on the rod/shaft and may cause damage.
 - If the collet is worn, the entire holder must be replaced immediately. Collets are matched to a body assembly during manufacturing and cannot be replaced separately.



Standard Warranty

Sentry Equipment Corp ("Seller") warrants products manufactured by it and supplied hereunder ("Products") to be free from defects in workmanship and, to the extent materials are selected by Seller, to be free from defects in materials, in each case for a period as defined in the table below:

Product Line	Product Category	Warranty Period
Sentry [®]	1. Automatic Sampling	Eighteen months from date of shipment
	2. Corrosion Monitoring	or twelve months from startup, whichever occurs first
	3. Manual Sampling	
	4. Sample Conditioning	
	5. Sampling & Analysis Systems	
	6. Replacement Parts (without expiration dates)	
Waters Equipment	1. Sampling & Analysis Systems	Twelve months from date of shipment
	2. Replacement Parts (without expiration dates)	

To view the full warranty, go to www.sentry-equip.com/warranty.

Customer Support

With proven sampling expertise since 1924, Sentry products and services provide business operations the critical insights to optimize process control and product quality. We deliver true representative sampling and analysis techniques to customers around the globe, empowering them to accurately monitor and measure processes for improved production efficiency, output, and safety. Standing behind our commitments, we are determined to tackle any application, anywhere.

We know that running an efficient operation isn't easy. It requires thorough, careful analysis of controlled, real-time data achieved through reliable, accurate, and repeatable process monitoring, and measuring. By effectively conditioning, sampling, and measuring gas, liquid, slurry, powder, solids, steam, or water within their production environments, our customers obtain the critical insights they need to control and optimize their processes.

Yet, controlling your processes also means reliable customer support throughout the life cycle of your equipment.

- Customer Service—General information, warranty claims, order management.
- Installation Service—For systems that require specialized expertise upon installation.
- Technical Support—Troubleshooting, training, and technical manuals.
- Field Service & Retrofits—When a problem needs immediate attention.
- Replacements Parts & Consumables—Order your replacement parts and consumables.
- Sentry ProShield Services—Select from four ProShield Guardian service plans providing different levels of support to protect your large system investments with regularly scheduled maintenance.

To learn more, go to www.sentry-equip.com/support.

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