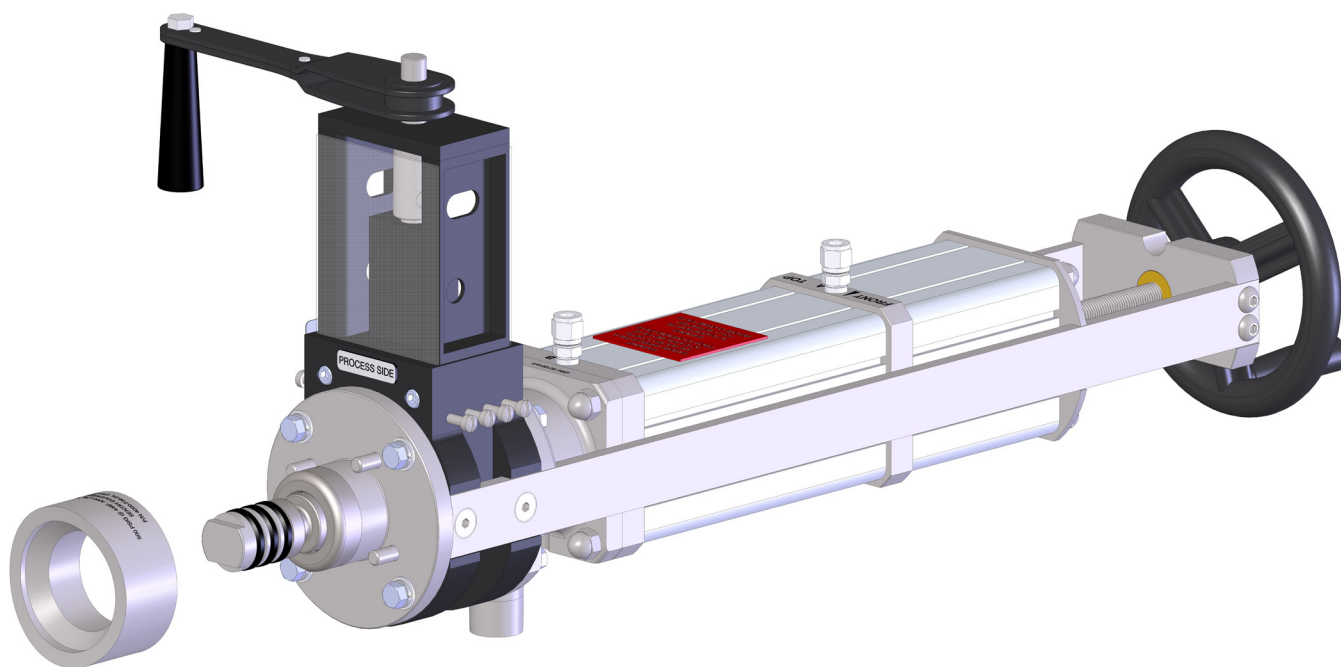


Original Instructions

Installation, Operation & Maintenance Manual

ISOLOK SAL-Q Sampler Point Samplers

S-LS-IOM-00304-6 9-17



COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =

 SENTRY



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.

Copyright

© 2017 by Sentry Equipment Corp. All rights reserved. All product and company names are property of their respective owners. This document contains proprietary information. No part of this document may be photocopied or reproduced without the prior written consent of Sentry Equipment Corp.

Limit of Liability

Sentry Equipment Corp, its employees, agents, and the authors and contributors to this document specifically disclaim all liabilities and warranties, express or implied (including warranties of merchantability and fitness for a particular purpose), for the accuracy, currency, completeness, and/or reliability of the information contained herein and/or for the fitness for any particular use and/or for the performance of any material and/or equipment selected in whole or part with the user of/or in reliance upon information contained herein. Selection of materials and/or equipment is at the sole risk of the user of this publication.

Note

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

Table of Contents

Safety Information	4
General Safety Precautions	5
General Description	6
Installation	7
Receiving.....	7
Selecting an Installation Location	7
Operation	8
Maintenance	8
Process Seals Change-Out	8
Air Cylinder Seals Change-Out	9
Troubleshooting	10
Parts & Accessories	12
Standard Warranty	13
Customer Support	14

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

DANGER

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

WARNING

WARNING indicates a hazardous situation which, if not avoided, could 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.

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

WARNING

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.

Moving parts! This equipment may contain moving parts. All drive guards and doors must be secured in place when this machine is being operated.

WARNING

Equipment rated TX. Equipment maximum surface temperature depends on operating conditions. Ensure maximum surface temperature shall stay below ignition temperature of dust or gas atmosphere where it is installed based on process conditions. Failure to comply could result in an explosion, causing serious injury or death to personnel and damage to equipment.

If the sampler is mounted directly to a non-electrically conductive surface, sampler shall be bonded to a grounding electrode. Failure to comply could result in sparking, which could lead to an explosion, causing harm to personnel and equipment.

If the sample container is removed from the sampler, do not insert any body part or other item into the sample discharge port. Crushing will occur.

NOTICE

To ensure proper sampler operation, be sure the sampler is installed in a pipe large enough for the sampler plunger to extend without impacting the pipe. Failure to comply will result in equipment damage and poor sample quality.

General Description

The Sentry® ISOLOK® SAL-Q automatic isolatable sampler is designed to obtain samples of liquid and slurry flowing in a process stream, into which extends a plunger with an annulus for sampling. The ISOLOK SAL-Q sampler has been configured specifically for use in sampling the process media at the process conditions provided by the user at time of manufacture.

Each sampler cycle consists of a plunger extension and a plunger retraction. During plunger extension, the volume of the annulus is filled with a sample of the process stream. The plunger is then retracted into the body of the sampler, thereby capturing a volume of sample. This sample is then deposited into a sample collection container.

The ISOLOK SAL-Q automatic fixed volume sampler is pneumatically operated. Pressurized air (or other gas) is used to provide the force to extend and retract the plunger. When in the retracted position, air or other inert gas may be used to assist the displacement of the sample material from the plunger annulus.

The maximum rated temperature of the ISOLOK SAL-Q sampler is defined by the plunger seals. The plunger seals are selected based on material compatibility and temperature of the process being sampled. Reference the following chart:

TX	plunger seal material	max temperature
T2	Perfluoronated elastomer (FFKM)	550°F (288°C)
T3	Filled PTFE	500°F (260°C)
	Fluoroelastomer (FKM)	400°F (204°C)
T4	ECTFE	325°F (163°C)
T5	Ethylene propylene	250°F (121°C)
	95 Duro polyurethane	230°F (110°C)
	Nitrile	225°F (107°C)
	75 Duro polyurethane	212°F (100°C)
T6	UHMW PE	200°F (93°C)

↪ NOTE:

Figures in this manual may differ from actual purchased equipment. Please refer to the drawings in the appendices of this document.

⚠ WARNING

Read these instructions completely before proceeding to assemble, install or operate this machine. This machine should be installed, operated and serviced by qualified individuals. All drive guards and doors must be secured in place when this machine is being operated. Follow proper local, state and federal regulations for proper installation and operational requirements.

Installation

Receiving

- Examine the crate and all contents for any shipping damage immediately after receipt.
- Take pictures of any suspected damage.
- Report damages to the delivery company at once. This is the responsibility of the consignee.

Selecting an Installation Location

Select a location to install the sampler where the material in the process stream is well mixed. Location of the sampler and controller is very important for accurate sampling results. They should be as close together as practical, within sight of each other, and protected from weather, traffic damage and normal work activities in the area.

When selecting a sampler location, ensure the sample collection container will clear vertical lines (or other obstructions) when mounted onto the sampler. The sampler can be used on a pipe or tank running horizontally, vertically or at an angle, but the preferred position is with the axis of the sampler horizontal.

Filtered compressed air supply, plant standard electrical power (to operate a control box) or DCS cabling to operate a suitable solenoid valve, and tradesman's hand tools are all that is required for installation.

1. The sampler is fitted onto the pipeline via a weld-on drilled and tapped adapter. When welding the adapter onto the pipeline, ensure the end of the adapter is flush with the internal diameter of the pipeline and verify the orientation and position is correct. Weld the adapter into place, making sure to protect the bore and face from weld spatter.

NOTICE

Use industry code procedures to protect adapter from distortion. Major distortion cannot be corrected and will prevent installation of sampler.

2. The sampler is best positioned on a vertical section of pipeline just after a 90-degree bend where the product is flowing upwards, but it can be placed on a horizontal pipeline where the product flow will be well mixed, such as after the discharge of a pump or a 90-degree bend. Whenever possible, the sampler should not be positioned closer than 3 meters from the discharge of a pump. When the sampler is to be positioned on the side of a horizontal pipeline, the pipe must be completely full of flowing product, with the sampler's discharge tube pointing down. It is not recommended that the sampler be placed into a partially filled pipeline, as this can give a biased or incomplete sample.
3. Place the o-ring over the hub on the adapter plate (as shown on the accompanying drawings) and slide it through the weld-on adapter. Use the provided four (4) 3/8 inch counter sunk head S/S screws to fit the adapter plate to the weld-on adapter. Ensure the heads of the screws are below the flange face and use suitable thread locking fluid.
4. Install knife gate valve assembly with attached rails to the adapter plate using the provided four (4) 3/8in hex head bolts.
5. Install sampler actuator onto knife gate valve assembly using the rails to support the unit and attach the end plate to the rails using the provided four (4) 3/8in button head bolts. Rotate the handwheel to insert the sleeve into the knife gate valve until the chamber is flush with the valve. Fasten the chamber to the knife gate valve using the provided four (4) 3/8in hex head bolts.
6. Connect all airlines, flushing lines and any required piping to the discharge tube. The sampler's installation is now complete.

NOTE

If the actuator assembly (as shown on the accompanying drawings) needs to be affixed to the gate valve assembly prior to installation, please see the accompanying sampler assembly drawing for component orientation and fastener installation details.

Operation

The ISOLOK SAL-Q sampler is directly controlled by a 1 x 5/3 double-coil, spring return solenoid valve (solenoid 1) and a 1x3-way single coil spring return solenoid valve (solenoid 2). The solenoid valves need to be operated either by the customer plant's own DCS/PLC or a sampler controller. The sampler requires two (2) standard cubic feet per minute (SCFM) at normal recommended regulated pressures of 60 psig (4.0 barg) to 100 psig (6.9 barg).

1. Connect the airlines from the 5/3 solenoid valve (solenoid 1) described above to ports B and C of the sampler, having port B be normally open. Connect the single solenoid (solenoid 2) to port A of the sampler with it normally closed.
2. The sampler is operated per the Port Energizing Scheme below. Note that port D is only for exhaust air from the neutral cylinder.

Port Energizing Scheme		
Position	Ports Pressurized	Solenoid Energized
Extend	A and C	1 and 2
Retract	B	None
Neutral (Park)	C	1

3. The Sampler can be stroked up to a maximum of 10 times per minute continuously. We recommend this minimum stroke to help lessen any product buildup that might occur on the end of the sampler. The sample volume size is directly proportional to the amount of strokes taken.
4. A technician now can program the plant's DCS/PLC or the Sentry sampler controller to obtain the desired sample over the preferred time frame. If a Sentry sampler controller has been purchased, please refer to the supplied instruction manual.

Maintenance

WARNING

Sampler must not be disassembled or removed from the gate valve until the gate valve is completely closed and any excess pressure inside the gate valve or sampler's wear sleeve has been released.

Process Seals Change-Out

To replace the process seals, withdraw the actuator assembly from the process line. The actuator assembly is still inserted through and bolted to the gate valve.

1. First, ensure the insertion/extraction tool end plate is still securely bolted to the side rails.
2. Turn off and/or disconnect the compressed air supply to the sampler's solenoid valve(s) or the sampler controller. Remove all airlines into the actuator assembly and disconnect any sample discharge and flushing lines.

3. Next, remove the four (4) 3/8 in. hex head bolts holding the sampler to the gate valve. Turn the insertion/extraction handle at the end of the actuator assembly in a counter clockwise direction. The actuator assembly should now start to withdraw from the Gate Valve. When the air cylinder's end cap has stopped against the insertion/extraction tool's end plate, the sampler's wear sleeve should be clear of the travel path of the valve's "knife," but still sealing inside the bore of the Gate Valve. Now turn the handle on top of the Gate Valve until the Gate Valve is completely closed.
4. Open any bleed port valves on the gate valve to allow any excess pressure inside the gate valve or sampler's wear sleeve to be released.
5. Remove the four (4) 3/8 inch button head screws holding the end plate to the side rails. The actuator assembly, complete with the insertion/extraction tool, now can be removed. Remove the rails and install the blanking flange on the valve.
6. Remove the four (4) 316 SS dome head nuts holding the sample chamber to the rod gland. The air cylinder assembly, complete with the process seals assembly still connected to the piston rod, now can be removed from the main sample chamber. Using a suitable spanner, separate the spool assembly by unscrewing the end process seal mount/nut while holding the piston rod with another spanner.
7. Clean the disassembled spool assembly and replace any worn parts. Fit new process seals back onto the seal mounts. Thread each seal mount back onto the M16 stud and tighten it down by gripping it with a pair of multigrips pliers while holding the end seal mount with a wrench. Refer to the accompanying actuator assembly drawing for lubricants, sealants and torque values.
8. Inspect and clean the sample chamber wear sleeve. Fine grade emery paper can be used on the bore to remove any light scratches or product build-up. If a new process seal will slide easily through the old wear sleeve with any clearance, the wear sleeve needs to be replaced. To replace it, loosen the set screw located on the side of the main sample chamber behind the sampler's discharge port, then remove the wear sleeve out the front of the sampler. Replace the wear sleeve o-rings located in the bore of the main sample chamber if required. Ensure the discharge port and flush port openings on the wear sleeve align with those in the sample chamber.
9. Insert the completed air cylinder assembly back into the wear sleeve/sample chamber and reinstall the four (4) 316 SS dome head nuts in accordance with the accompanying actuator assembly drawing. The seal/spool assembly will be tight and may require use of a suitable process compatible lubricant.
10. Slide the now fully reassembled actuator assembly back onto the side rails and insert the actuator partially back into the gate valve until the 3/8 in. tapped holes in the endplate align with the holes on the side rails. Screw in and tighten the four (4) 3/8 inch button head bolts in accordance with the accompanying actuator assembly drawing. Do not open the gate valve yet. Continued insertion is a reversal of steps 2, 3 and 4. Refer to the accompanying actuator assembly drawing for lubricants, sealants and torque values.

Air Cylinder Seals Change-Out

Change-out of the air cylinder seals is completed in much the same way as the process seals change-out; however, these seals should not need replacing as often as the process seals and should be replaced only on an as-needed basis.

1. To remove the actuator assembly from the process line, please refer to and follow steps 1-6 of the Process Seals Change-Out section of this manual.
2. Remove the four 316 SS dome head nuts and remove the cylinder end cap. Separate the barrel(s) and the piston/rod assembly from the rod gland. When servicing a neutral position actuator, the middle rod gland slides off the end of the four (4) tie rods, allowing access to the first air cylinder. Remove the worn seals from the rod gland, piston(s) and end cap. Usually only the piston and rod gland seals need replacing.

NOTE

There is no need to remove the four (4) tie rod bolts from the rod gland.

3. Clean all surfaces and fit new seals using silicone/pneumatics grease. Reassemble the air cylinder and tighten the end cap's four dome head nuts. Replace the actuator's process seal/spool assembly (see step 7 of the Process Seals Change-Out section). Replace the completed assembly back into the sample chamber. The new process seals will be tight and may require use of a suitable process compatible lubricant.
4. Fit and tighten the dome head nuts. Refer to the accompanying actuator assembly drawing for lubricants, sealants and torque values.
5. Slide the now fully reassembled actuator assembly back onto the side rails and insert the actuator back into the gate valve until the 3/8 in. tapped holes in the endplate align with the holes on the side rails. Screw in and tighten the four (4) 3/8 inch button head bolts in accordance with the accompanying actuator assembly drawing. Do not open the gate valve yet. Continued insertion is a reversal of steps 2, 3 and 4 of the Process Seals Change-Out section. Refer to the accompanying actuator assembly drawing for lubricants, sealants and torque values.

Samplers, controllers and associated equipment can be inspected by Sentry Equipment and rebuilt if required. Please send your sampler to the company, and recommendations and prices will be provided promptly after receipt and inspection. Contact Sentry Equipment for specific instructions on returning equipment for repair prior to shipment.

All returned equipment must be accompanied by a MSDS (Material Safety Data Sheet) and a signed statement that the equipment has been cleaned/decontaminated or is otherwise safe and does not impose a health hazard.

Troubleshooting

symptom	possible problem(s)	remedy
Sampler leaks product or air out of bottom ports	<ul style="list-style-type: none">▪ Worn seals▪ Incorrect installation▪ Other worn parts	<ul style="list-style-type: none">▪ Thorough inspection is required▪ Replace worn seals▪ Check any recently replaced seals against drawings for correct installation▪ Replace other worn sampler parts: Body, head, barrel or plunger
Sampler leaks product at pipe connection	<ul style="list-style-type: none">▪ Installation misaligned▪ Fastener, clamp/gasket or seals issue	<ul style="list-style-type: none">▪ Check installation for misalignment If the installation is threaded, replace locknut fastener and add commercial grade Teflon tape when reinstalling▪ If the installation is tri-clamp or instrument hub, check the clamp/gasket (TC) or o-rings/fasteners (IH) attaching the sampler to the line adapter▪ Replace seals if they are damaged or show signs of chemical attack

symptom	possible problem(s)	remedy
Sample discharge is decreasing	<ul style="list-style-type: none"> ▪ Buildup in sample spool cavity or sampler nose 	<ul style="list-style-type: none"> ▪ Check sample spool cavity for buildup; if present, add flush or air eject provision to sampler body ▪ Check sampler nose for buildup; if present on nose or pipe wall interior, remove the body from the line frequently and clean it using plant procedures
Sampler will not operate	<ul style="list-style-type: none"> ▪ Issues with power source and/or air connections 	<ul style="list-style-type: none"> ▪ Check power source and air connections; connect as required ▪ Check air lines for proper connection, as plunger must dwell retracted; air lines connected backwards will cause sampler to dwell (pause) extended into the process line ▪ Check for air bind; depending on the density of the product sampled, this sometimes can be resolved by opening a top port on the sampler ▪ Check sampler operating air pressure and process line pressures; operating air pressure must be sufficient to move the plunger against process pressure. Issue may be resolved by increasing or decreasing air to sampler or relocating sampler.
Controller does not operate	<ul style="list-style-type: none"> ▪ Issues with pneumatic and/or electric power source 	<ul style="list-style-type: none"> ▪ Verify correct 115V or other specified power to controller ▪ If using a remote contact unit, check the output signal to the controller from the flow meter; check purchase records, and if an incorrect output signal was specified, contact Sentry Equipment ▪ Secure a qualified technician to run a complete operating check of timing circuits, remote contact inputs and/or counter inputs that sequence the electric or pneumatic power valve

If any issues persist, please contact Sentry Equipment.

Parts & Accessories

Sentry Equipment recommends on-hand stocking of the following items in a quantity adequate for one or more years of normal operation. Most parts are available for immediate shipment and are confirmed upon request.

Stock Parts

Description	Part Number
Process Seals Kit – Includes all plunger seals	4000-F05-4X XNBR - Black
	4000-F05-4H HNBR - Green
	4000-F05-4D DURA - Red
Air Cylinder Seals	
Barrel Seal Kit – Includes two o-rings	4000-F02-1
Piston Seal	4000-F04-1
Rod Gland Seal Kit – Includes two o-rings and one rod seal	4000-F06-1
Wear Sleeve	4000-F09-1
Wear Sleeve Seal Kit – Includes two seals	4000-F32
Teflon Wear Ring	4000-F30
For the Neutral position sampler, add the following:	
Neutral Barrel Seal Kit – Includes two o-rings	4000-F38
Neutral Position Piston Seal	4000-F04-3
Double Gland Seal Kit – Includes one o-ring and two rod seals	4000-F37

Startup Parts

Description	Part Number
Adapter Plate O-Ring	4000-F28
Mounting Hardware	
Hex Screw Kit – Includes four bolts	4000-F24
Flat Washers	4-00411A (4)
Lock Washers	4-00412G (4)
Countersunk Screw Kit – Includes four screws	4000-F25

Commissioning Parts

Description	Part Number
Process Seals Kit – Includes all plunger seals	4000-F05-4X XNBR - Black
	4000-F05-4H HNBR - Green
	4000-F05-4D DURA - Red
Barrel Seal Kit – Includes two o-rings	4000-F02-1
Piston Seal	4000-F04-1
Rod Gland Seal Kit – Includes two o-rings and one rod seal	4000-F06-1
Wear Sleeve O-Ring Kit – Includes two o-rings	4000-F10
Adapter Plate O-Ring	4000-F27
Adapter/Adapter O-Ring	4000-F28

Teflon Wear Ring	4000-F30
Sample Chamber O-Ring Kit – Includes two o-rings	4000-F31
Wear Sleeve Seal Kit – Includes two seals	4000-F32
Double Gland Seal Kit – Includes one o-ring and two rod seals	4000-F37
Neutral Barrel Seal	4000-F38
Neutral Piston Seal	4000-F04-3
Adapter Plate O-Ring	4000-F48

Two-Year Parts Kit

Description	Part Number
Plunger Parts	
End Seal Mount	4000-F05-2
Seal Mounts	4000-F05-3 (4)
Spool Assembly Stud	4000-F08-1
Spool	
25cc	4000-F05-1-25
10cc	4000-F05-1-10
Delta Gate Valve	4000-F40-300

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:

Brand	Product Line	Warranty Period
Sentry®	<ul style="list-style-type: none"> ▪ Steam & Water Sampling Products and Systems ▪ Solid & Powder Sampling Products and Systems ▪ Gas Sampling Products and Systems ▪ Liquid & Slurry Sampling Products and Systems ▪ Corrosion Monitoring Products 	Eighteen months from date of shipment or twelve months from startup (whichever occurs first)
Waters Equipment	Steam & Water Sampling Products and Systems	Twelve months from date of shipment

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.

This page is intentionally left blank.

Serving customers
in more than 50 countries
across six continents worldwide.



sentry-equip.com

966 Blue Ribbon Circle North, Oconomowoc, WI 53066 U.S.A. | +1-262-567-7256 | support@sentry-equip.com