Original Instructions

Installation, Operation & Maintenance Manual

Sentry ET-100 Insertion Tool

Automatic Sampling Accessories

S-AS-IOM-00458-1 11-17

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.

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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

⚠ 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.

General Description

The Sentry® ET-100 insertion tool is designed for the safe insertion and withdrawal of Sentry API-PA and API-PE automatic fixed volume sampler inline probes, under both depressurized and pressurized line conditions up to maximum flange rating.

The ET-100 insertion tool can withdraw the equipment for "pigging" or for maintenance. The equipment is inserted into the pipeline through a full bore isolation valve mounted to a pipe stub. The ET-100 insertion tool is fitted only when insertion or withdrawal of the equipment is required; it is not part of the probe operation.

When required, the ET-100 insertion tool is bolted to the underside of the main stem spool and upper side of the clamp plate flange respectively. Each ET-100 insertion tool incorporates two hydraulic rams, mounted to locating plates. The cylinder is mounted to the upper plate and the piston rods are attached to the lower plate. The cylinders are piped to no-spill push to connect flat faced quick couplers, used to attach the two flexible hydraulic hoses to the self-contained manual hydraulic pack.

For insertion or extraction of the inline equipment, the user connects the flexible pressure hoses from the manual hydraulic pump to the quick connect coupling on the hydraulic cylinders. Operating the pump forces oil into the rams, pulling the two plates together and inserting the equipment into the line. Reversing the control valve forces the plates apart, extracting the equipment.

A changeover valve fitted within the power pack allows insertion or retraction without removal of the flexible hoses.

The manual power pack incorporates a hard-piped direction control check valve, providing safe and controlled extraction under maximum process pressures.

Operation

⚠ CAUTION

The insertion tool extractor condition and operation MUST be checked prior to operational use. The extractor MUST be connected to the power pack and hydraulically powered to its full extent and hydraulically powered back to the closed position to ensure the integrity of the seals, while purging any air and fully charging with hydraulic oil. In the event the hydraulic extractor does not move as expected, check the volume of oil in the reservoir.

Figure 1. Close up view of ET-100 Insertion Tool mounted to API-PE Sampler

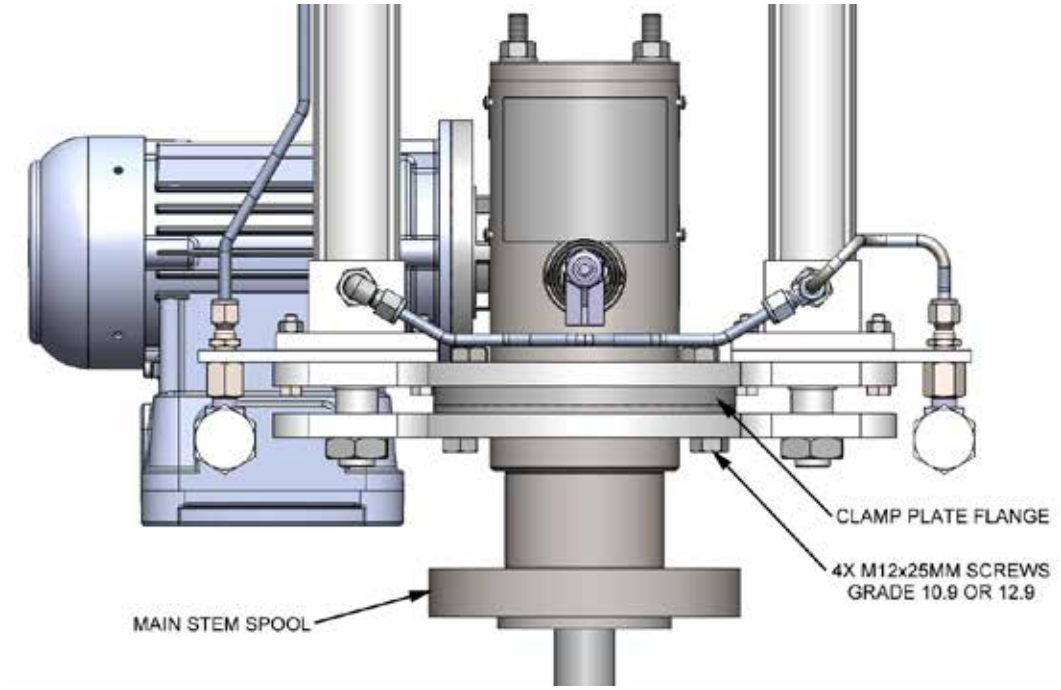


Figure 2. Isometric view of ET-100 Insertion Tool mounted to API-PE Sampler

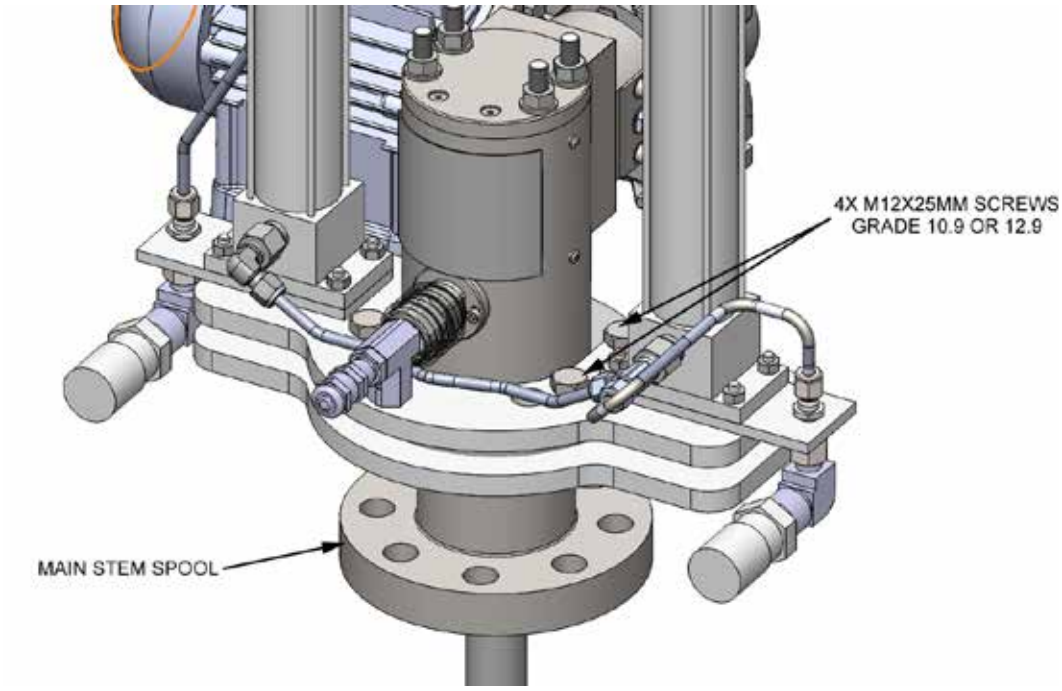


Figure 3. ET-100 Insertion Tool mounted to API-PE Sampler for withdrawal

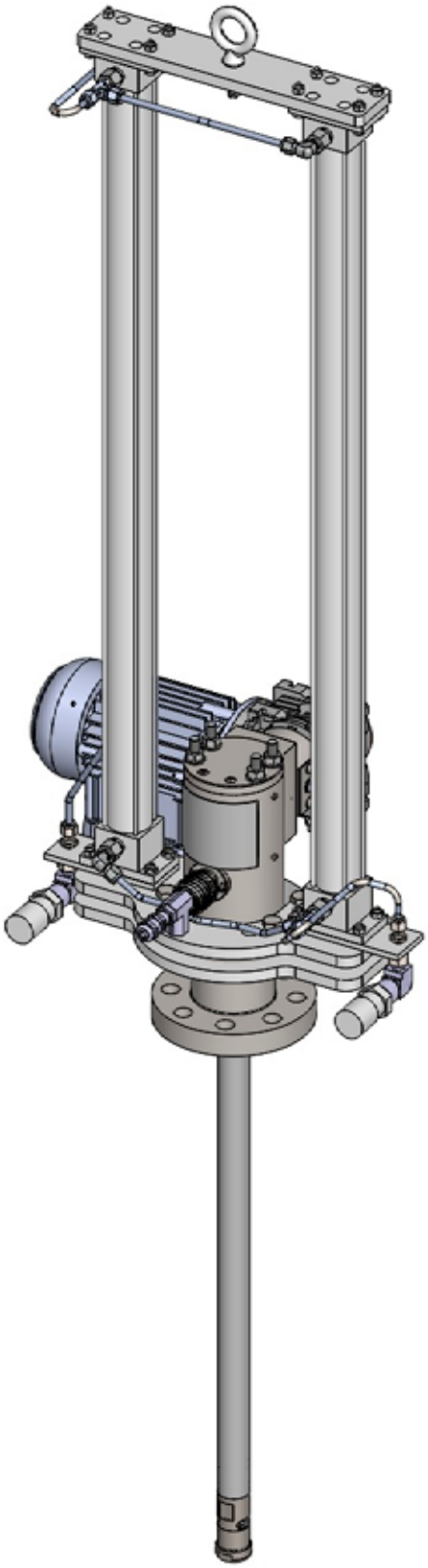
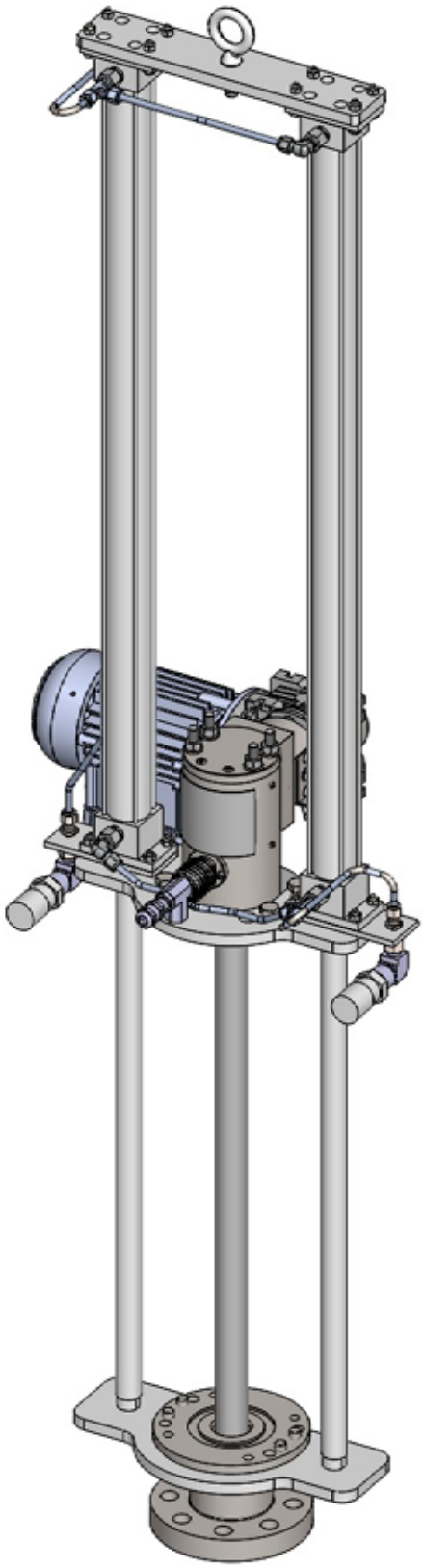


Figure 4. ET-100 Insertion Tool mounted to API-PE Sampler for insertion



Withdrawal of the Probe Sampler

1. Turn off any compressed air and electrical supply to the equipment.
2. Close all isolating valves on connections at line pressure. For Sentry API-PA and API-PE sampler probes, this means any two-way or three-way ball valves, if fitted to the probe, must be closed.
3. Disconnect all lines to the equipment – compressed air, hydraulics and sample line (as applicable).
4. Remove any housing, insulation and ancillary equipment fitted to the equipment.
5. With the aid of a suitable access platform and lifting equipment, fit the EP-100 insertion tool to the equipment as shown in Figures 3 and 4. Bolt the plates of the extractor to the seal housing using appropriate M12 x 30 mm socket head cap screws.

➲ NOTE

The correct metric series (Grade 10.9 or 12.9) bolts must be used to mount the extractor to the equipment.

6. Connect the flexible hoses to the extractor via the quick connect couplings.
7. With the extractor attached to the instrument and fully secured with correctly graded and sized screws, pressurize as though inserting the probe to prevent any movement of the probe. Carefully loosen in 2-3 turns the securing screws attaching the support tube flange to the seal housing. Complete removal of the securing screws.
8. Select the directional control valve on the power pack to reverse direction of the extractor.

➲ NOTE

Pipeline pressure, if present, may force the probe to "jolt"; however, the extractor is prevented from free movement via the direction control check valve.

9. Powering the manual hydraulic power will force the extractor, extracting the equipment from the line. Close the isolating valve on which the equipment is mounted. Depressurize and bleed the seal housing before disconnecting the extractor.
10. The equipment now may be removed from the isolating valve for maintenance.

Insertion of the Probe Sampler

The procedure for inserting the equipment into either a pressurized or non-pressurized pipeline is generally the reverse of the withdrawal procedure:

1. Remove any bolts securing the clamp plate flange to the main stem spool.
2. Push the probe through the main stem spool so the head is within the recess of the main stem spool (Refer to Figure 4 on following page).
3. With the aid of lifting equipment, securely mount the main spool stem to the isolating valve, ensuring that the bleed plug on the main stem spool is fitted and tightened.
4. Using suitable lifting equipment, fit the "open" insertion tool to the equipment's clamp plate flange and main stem spool using appropriate screws (Grade 10.9 or 12.9 M12 x 30mm). (Refer to Figures 2 and 5 for screw locations). Connect all hoses to the power pack.
5. Open the isolating valve on which the equipment is mounted.
6. Operate the pump – this will insert the probe into the pipeline.
7. Once the equipment has been fully inserted, replace and tighten the bolts that attach the clamp plate flange to the main spool stem.
8. With the aid of lifting equipment, remove the insertion tool from the equipment.

Maintenance

The Sentry ET-100 insertion tool requires little maintenance apart from filling the reservoir on the pump with hydraulic oil (DTE 68 or equivalent) and ensuring that the piping is free from air.

The hydraulic oil reservoir is filled by removing the drain hose fitting from the end of the pump body. The insertion tool may be bled of air by extending the rams to their full travel length and holding the assembly so that the compression fittings at the end of the rams are at the highest point. Bleed any air from the fittings while maintaining a slight hydraulic pressure. This procedure should be repeated for the opposite end of the rams.

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 2. Corrosion Monitoring 3. Manual Sampling 4. Sample Conditioning 5. Sampling & Analysis Systems 6. Replacement Parts (without expiration dates)	Eighteen months from date of shipment or twelve months from startup, whichever occurs first
Waters Equipment	1. Sampling & Analysis Systems 2. Replacement Parts (without expiration dates)	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.

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