spirax sarco

INSTALLATION AND MAINTENANCE INSTRUCTIONS

IM-8-002-US **October 2016**

Steam/Water Washdown Units

Safety and Operation
Installation and Maintenance Instructions

These instructions should be read by the Company Safety Officer.

1. General

WARNING

1.1 Safety

This product must only be installed and commissioned by qualified personnel. Always operate the washdown unit as instructed. Protective clothing is required. The washdown unit should never be left unattended in an open position. Improper use, installation or maintenance can result in serious injury. Spirax Sarco is not liable for any injury that is a result of improper use, installation or maintenance.

QUALIFIED PERSONNEL

For the purposes of these operating instructions qualified personnel are persons who are experienced in the installation, commissioning and operation of this product and who are suitably qualified to perform their duties, e.g.

- Have received training or instruction in the maintenance and use of appropriate safety equipment according to current safety standards.
- Have received training in first-aid.

SAFETY TEST PROCEDURE

A safety check undertaken by qualified personnel must be carried out each time the unit is used.

The safety test and subsequent maintenance procedure ensures that live steam cannot be discharged from the nozzle.

Due to the possible presence of steam, please ensure due care and attention are observed when undertaking this task. Wear protective clothing, especially heavy-duty insulated gloves, boots, aprons and safety glasses.

Operate the unit as instructed in this manual. Before pulling the trigger, hold the nozzle firmly and adopt a body position which will prevent loss of balance due to recoil from the hose nozzle.

Turn off the cold water with the globe valve on the washdown unit, allowing only steam to enter the washdown unit. There should be no flow observed at the nozzle after a few seconds for remaining hot water to evacuate from the hose. If steam flow is detected during the test the unit must be taken out of service immediately.

Following any maintenance to the unit, the above test must be repeated.

DANGER OF INJURY

In addition to the safety procedure mentioned above, all hose and nozzle assemblies are to be inspected for visual damage or wear. If damage occurs the hose and/or nozzle assemblies must be immediately replaced for safe working prior to operation.

1.2 Use

Design

The Spirax Sarco steam / water washdown unit is designed to provide hot water economically by blending steam and cold water quickly to the required user temperature.

Operation

Before opening the cold water globe valve, operator must hold the nozzle firmly at a wide open position. Once position is met, operator should open the water globe valve turning the valve counter-clockwise. Operator should maintain nozzle at wide open position as he/she gradually opens the steam globe valve counter-clockwise to pressurize the washdown unit and until the output water temperature is reached. If this is not possible by the time the steam globe valve is fully open, the temperature control hand wheel should then be adjusted by turning the temperature control clockwise. Once desired temperature is achieved, close-tighten lock nut. (See Fig.3)

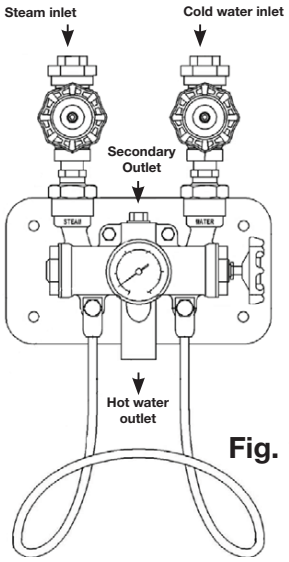

Fig. 1

If water pressure is interrupted, steam poppet spring will push the steam poppet back into its closed position for safe shut-down.

*Secondary output is to be used separately. If both outlets are used at once flow rate is reduced by 50% on both hot water outlets.

Ancillaries

Each steam/ water washdown unit is supplied with globe valves, check valves, dual scale thermometer and wash-down unit with dual output.

It is recommended that strainers are fitted upstream of the station on both the steam and water supply lines to prevent debris from entering the washdown station and causing damage. It is recommended that a steam trap be fitted upstream of the station on the steam supply line.

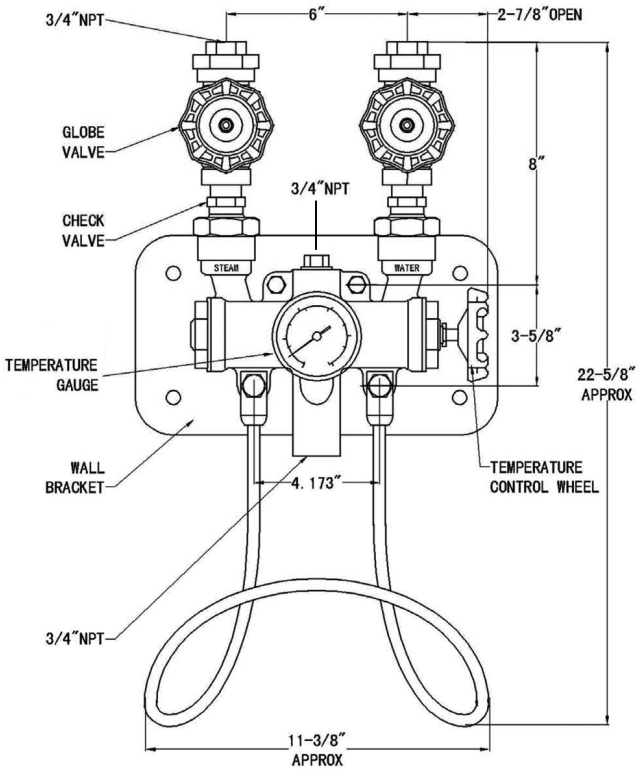

Fig. 2

Temperature Rise vs. GPM

(for reference only)

Input		Output	
***Steam**	**Water**	**Temperature Rise**	**GPM**
100 psig (6.9 bar)	60 psig (4.1 bar)	55°F (12°C)	14.0
100 psig (6.9 bar)	60 psig (4.1 bar)	100°F (37°C)	9.0
100 psig (6.9 bar)	60 psig (4.1 bar)	134°F (57°C)	7.8
*Saturated Steam Only			

1.3 Technical Data

1.3.1 Steam pressure required:
30 PSI minimum, 150 PSI maximum

1.3.2 Water pressure required:
30 PSI minimum, 110 PSI maximum

Note: Steam to water ratio 2:1

Hose Specifications

Lengths available in 25', 50' 75', and 100'. Colors available in white, black, yellow and red.

Inner Diameter	Max Pressure	Cover Color	Cover Material	Tube Material	Reinforcement
¾"	250 PSI (17.2 bar)	White	Smooth EPDM	EPDM	4 Polyester Yarn Spirals
¾"	250 PSI (17.2 bar)	Black	Smooth EPDM	EPDM	4 Polyester Yarn Spirals
¾"	300 PSI (20.6 bar)	Red	Smooth Nitrile	Nitrile	2 Polyester Yarn Spirals
¾"	400 PSI (27.5 bar)	Yellow	Smooth Nitrile	Nitrile	2 Polyester Yarn Spirals

Hoses not rated for steam

Nozzle Specifications

The standard flow nozzles we offer are durable with variable spray patterns, adjustable from fan spray to solid stream. Nozzles are available in stainless steel, aluminum, or brass. Cover colors available in Blue, Red and White.

Temperature indicating nozzles are also available. Nozzle provides accurate water temperature reading at the nozzle output. Rating: 150 psi / 200°F (93°C).

Maximum tested operating pressure of 500 psi not for use with steam.

Standard (Aluminum/Brass)	
Inlet Pressure	**Flow Rate**
*(psig)	*(gpm)
25	2.93
50	3.86
75	4.91
100	5.78
125	6.71
150	7.19

High Flow (Stainless Steel)	
Inlet Pressure	**Flow Rate**
*(psig)	*(gpm)
25	4.39
50	6.54
75	8.18
100	9.56
125	10.83
150	11.89
200	12.67
250	15.01
300	16.12
350	17.45
400	19.55
450	20.52
500	22.01

*Estimated

2. Installation

2.1 General

The steam/water-washdown unit should be carefully unpacked and the contents checked against the packing list. The installation should be completed so as to comply with all local and/or national laws pertaining to this type of appliance. Laws in some areas prohibit the use of this equipment directly off the main water supply line.

2.2 Mounting

The factory recommends mounting the unit vertically using the supplied wall-mount bracket. If other mounting hardware is used both the water and steam lines should be rigidly supported. The unit should be mounted so ample room is available for adjusting of the globe valves and for servicing the washdown unit.

2.3 Piping

Pipe work should be assembled with a suitable thread sealing medium to make a proper seal. (e.g. see ANSI/ASME B1.20.1 Pipe Thread Standard)

Steam Supply- Steam supply pipe work should be sized according to standard practice. It is recommended to install a steam trap to prevent excessive condensate backup and ensure faster start up. Shut-off valve is to be installed off the steam supply line for steam shut down.

Water Supply- Cold water supply pipe work should take into account pressure, pipe length and acceptable pressure drop. For outdoor applications or where the unit is susceptible to freezing, precautions should be taken such as heat tracing or draining after each use.
***Note:** It is recommended that the supply lines contain shut-off valves that isolate the unit to facilitate maintenance.

2.4 Installation Kit **(optional - purchased separately)**

Installation kit is purchased separately. Installation kit consist of (2) strainers, (1) steam trap, (1) Tee, (2) ¾" x 3" Nipple, (1) ¾" x ½" Reduction Bell, (1) ½" x 3" Nipple and Installation and Maintenance Instructions. See Fig. 4 (shaded area only)

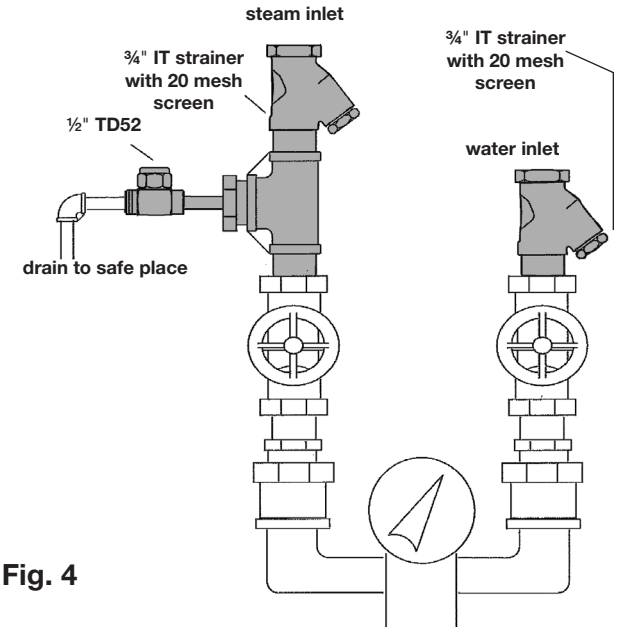

Fig. 4

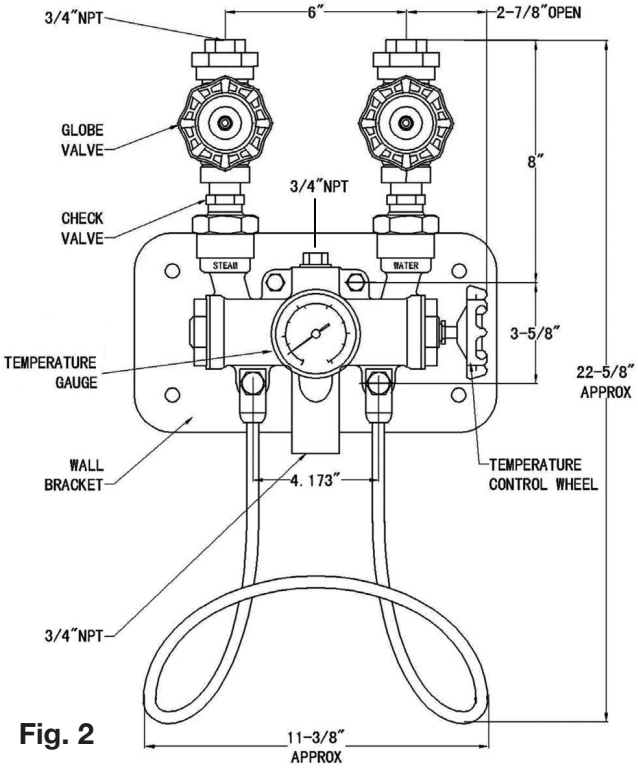

Fig. 2

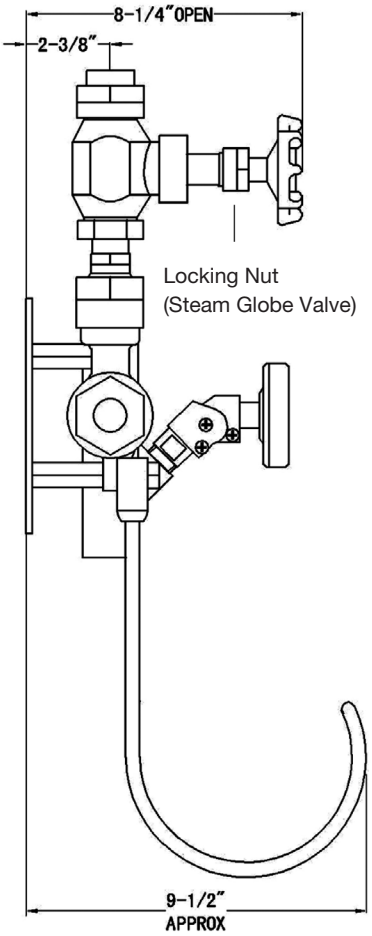

Fig. 3

2.5 Hose and Nozzle

Standard pipe threads require pipe thread sealant to make a proper seal. Hose and nozzle fittings should be assembled with a suitable thread sealing medium on the matching thread per ANSI/ASME B1.20.1 pipe thread standard. The hose may then be coiled onto the hose rack (if used) for storage. Attach the spray nozzle to the swivel at the other end of the hose. All hose and nozzle thread connections should be tightened to 37 ft-lbs.

Pre-Installation:

1. Unit requires minimum steam pressure of 30 PSI and a maximum steam pressure of 150 PSI. Pressure gauge installation (upstream, prior to steam inlet) is recommended to determine proper and constant steam pressure during all operation of washdown unit.
2. Unit requires minimum water pressure of 30 PSI, a recommended water pressure of 80 PSI, and a maximum water pressure of 150 PSI. Pressure gauge installation (upstream, prior to water inlet) is recommended to determine proper and constant water pressure during all operation of washdown unit.
3. Steam trap is highly recommended (upstream, prior to steam inlet) to relieve unit of any condensate.
4. Remove steam check valve from washdown unit body by loosening check valve nut.
5. Make sure that there is no water in steam chamber by turning washdown unit upside down and letting it drain.
6. Reinstall steam check valve and tighten check valve nut.
7. Check to make sure that both globe valves are fully closed by turning hand-wheels clockwise.
8. Check to make sure that the temperature control hand wheel is fully opened by turning it counterclockwise.
9. Washdown unit is ready to install.

Installation

1. Place the mounting plate on the wall and mark the 4 holes to be used to mount the plate to the wall.
2. Drill holes on wall and install anchor bolts (supplied). Make sure that holes are deep enough to accommodate anchor bolts so that they no not stick out too much and interfere with the mounting of the washdown unit.
3. Mount plate to wall and secure using anchor bolt nuts (supplied).
4. Mount washdown unit to plate and loosely secure with two top bolts (supplied).
5. Mount hose rack to washdown unit and secure with 2 bottom bolts (supplied).
6. Secure unit to mounting plate by tightening all 4 supporting bolts.
7. If temperature gauge was supplied, remove front plug and install temperature gauge. (Teflon tape or alternative recommended on temperature gauge thread)
8. The washdown unit is now ready for piping.
9. Install water and steam supply lines to washdown unit inlets. (Teflon tape or alternative recommended on piping thread)
10. If secondary upper hot water outlet is to be used, install line to washdown unit top secondary output outlet. (Teflon tape or alternative recommended on piping thread)
11. Attach hose to outlet of washdown unit. (Teflon tape or alternative recommended on fitting thread)
12. Attach spray nozzle to outlet of hose. (Teflon tape or alternative recommended on fitting thread)
13. Check and make sure that steam & cold water supply globe valves are in a closed position (clockwise).
14. Gradually open cold water globe valve counter-clockwise to pressurize washdown station and check for leaks. If there are visible leaks, immediately turn globe valve off (clockwise), depressurize washdown unit by spraying nozzle. Disassemble and reseal leakage points. Once complete, reassemble and restart procedure to check for leaks. If no more leaks, continue. If leaks, repeat procedure.
15. Gradually open steam globe valve counter-clockwise to pressurize washdown unit and check for leaks. If there are visible leaks, immediately turn globe valve off (clockwise), depressurize washdown unit by spraying nozzle, allow washdown unit to cool down prior to disassembly, and reseal leakage points. Once complete, reassemble and restart procedure to check for leaks. If no more leaks, continue. If leaks, repeat procedure.
16. With no visible leaks, unit is ready. Review Operation Instructions.

3. Operation

3.1 Start-up Procedures

Follow the safety test procedure in section 1. If the unit passes this test it is ready for normal operation. Do not point the spray nozzle at your body or anybody else, and hold with insulated protective gloves. Before pulling the trigger hold the spray nozzle firmly and adopt a body position, which will prevent loss of balance due to recoil from the washdown nozzle.

3.2 Setting Temperature

After verifying proper over temperature shutdown (reference Safety Test Procedures under section 1) the unit can be adjusted to the desired operating temperature. The temperature can be adjusted as follows:

a. Turn water globe valve fully open counter-clockwise.

b. Begin spray of water by pressing on lever of nozzle. Make sure to maintain spray during the course of adjustment of unit.

c. Gradually open steam globe valve counter-clockwise until output water temperature is reached. Once desired output temperature is reached, lock nut on steam globe valve should be set, turning the locking device lock nut clockwise until fully tighten.
Note: Recommended maximum temperature: 200°F (93°C)

d. If it is not possible to reach your desired temperature with the steam globe valve in a fully open position, adjust the temperature control hand wheel to reach your desired temperature by gradually closing the temperature control hand wheel clockwise until temperature is achieved. Once desired output temperature is reached, lock nut on steam globe valve should be set, turning the locking device lock nut clockwise until fully tighten.
Note: Recommended maximum temperature: 200°F (93°C)

e. If temperature output is too cold after full adjustment of temperature control hand wheel, begin to choke down water flow by slowly closing the cold water globe valve.

f. If temperature output is too hot after full adjustment of temperature control hand wheel, begin to choke down steam flow by slowly closing the steam globe valve. Once desired temperature is achieved, close top lock nut cap below hand wheel by turning clockwise (hand tight). Secure lock nut cap with lower lock nut by turning counter clockwise until tight.

g. If you close the cold water globe valve significantly and water temperature output is still sporadic, please check to see if you meet and maintain required water pressure.

3.3 Shut Down

The washdown unit should never be left unattended with the globe valves in the open position. The proper shut-down procedure is as follows:

a) While pulling the trigger, turn the steam globe valve handle fully clockwise.
b) Allow unit to run for a short period of time cooling the unit (approximately 30 seconds).
c) Turn the water globe valve handle fully clockwise.
d) Continue holding the trigger to discharge the con tents and vent the pressure from within the hose and unit until the water flow stops.

3.4 Trouble Shooting

Before investigating further it is always advisable to check the following. Ensure that the steam and water supplies are turned on and have proper running condition pressures. The fitting of pressure gages prior to the hosedown station will show whether the expected supply pressures are reaching the washdown unit.

TROUBLE SHOOTING

Symptom	Corrective Action
Nozzle delivers cold water only	Make sure steam supply valves are open and normal steam pressure is available. If still no hot water is flowing, follow maintenance procedure as specified.
Steam escapes from hose nozzle	Make sure cold water supply is on and normal water pressure is available. If steam still exits from nozzle, follow maintenance procedure as specified.
Hot water outlet temp too high	First check to make sure water supply is on and normal water pressure is available. Check for normal steam supply pressure. Note: steam pressure should normally be higher than water pressure. If water and steam supply are normal, turn off the globe valves by rotating the handle clockwise. Pull nozzle trigger several times to allow cold water to flow. Turn on the globe valves by rotating them counter clockwise. If outlet water temperature is still too high, decommission the unit and call Spirax Sarco.
Hot water outlet temp too low	First make sure steam supply valves are open and proper steam pressure is available. If steam supply is normal, follow cleaning procedure, section 5.3. Next follow cartridge test & inspection procedure. If outlet temperature is still too low, decommission the unit and call Spirax Sarco.
Outlet pressure is too low or non-existant	• Ensure all steam and water valves leading to and including the washdown unit are fully open. Re-adjust globe valves to desired temperature and check pressure again.
Leaking pipe threads	Ensure that pipe thread sealant was used when mating threads. Standard pipe threads require pipe thread sealant to make a proper seal (e.g. ANSI/ASME B1.20.1 Pipe Thread Standard)
Hose / Nozzle overheating, leaking pipe threads after the washdown unit body.	Leaks after the washdown unit body will cause the temperature of the water within the hose and nozzle to exceed above the washdown unit shutoff temperature. Ensure that pipe thread sealant was used when mating threads. Standard pipe threads require pipe thread sealant to make a proper seal (e.g. ANSI/ASME B1.20.1 Pipe Thread Standard). Immediately decommission hosedown station and replace hose and/or nozzle with properly rated factory replacement products. Reference Hose and Nozzle instructions section.
Water pressure or steam pressure sporadic	Verify you meet and can maintain the required water pressure.

4. Maintenance

4.1 Safety

4.1.1 Components
Before and after operation of the washdown unit, the hose and nozzle should be inspected for any sign of wear or damage. The washdown unit should be part of a regular maintenance program, appropriate to the operating conditions and environment.

Recommended Maintenance:
Hard Water=Every 3 months
Soft Water=Every 6 months

4.1.2 Pressure
Before attempting any maintenance of any component of the washdown unit consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain any component, eg washdown unit, hose etc. It is highly recommended that a lock out-tag out procedure be implemented for this process. Discharge contents of hose and station by pulling nozzle trigger and eliminate pressure until water flow stops. Do not assume that the system is depressurized even when a pressure gauge indicates zero.

4.1.3 Temperature
For personal protection wear protective clothing, especially heavy-duty insulated gloves, boots, aprons, and safety glasses. To prevent burn hazards it is recommended to insulate all components of the steam supply side of the washdown station.

4.2 Hose & Nozzle
Prior to replacing or servicing hose or hose couplings, follow instructions in section 5.3.1 for isolating the washdown unit and all other safety precautions as specified in this manual.

4.3 Hose
The hose should be inspected before use for evidence of wear. If there are breaks, cracks, abrasions or cuts in the outer cover whereas the reinforcement layer can be seen, the hose must be replaced immediately. In any case hoses should be replaced after 12 months of service. This is due to the natural degradation of rubber under hot water working conditions.

4.4 Repair Instructions:
CAUTION: Check and make sure that steam & cold water supply globe valves are turned off prior to disassembly. Depressurize washdown unit by spraying nozzle and allow washdown unit to cool down prior to disassembly. Unit is now ready for maintenance.

4.4.1 Check Valve Replacement:
1. Remove check valve connection nut.
2. Remove check valve from globe valve.
3. Reverse instructions to install new check valve.

4.4.2 Water Chamber Cover Plate Gaskets:
1. Remove hand wheel nut, lock washer, and name plate.
2. Gently tap hand wheel outward and then wiggle off by hand.
3. Remove water chamber cover plate.
4. Once water chamber plate is removed, stainless steel piston should slip out. Thoroughly clean piston from any debris prior to reassembly.
5. While stainless steel piston is out of washdown unit body, thoroughly clean internal piston contact wall from any debris so that piston will be able to slide smoothly back inside.
6. Remove water chamber cover plate Teflon gasket.
7. Replace water chamber cover plate

4.4.3 Steam Chamber Cover Plate Gaskets:
1. Remove steam chamber cover plate.
2. Using a small flat tip screwdriver, remove steam chamber cover plate Teflon gasket.
3. Replace steam chamber cover plate Teflon gasket.
4. Reverse instructions to reassemble.

4.4.4 Steam Poppet Replacement:
1. To replace steam poppet, the steam chamber plate must be removed. Please follow instructions above for this procedure.
2. With the steam chamber cover plate removed, the steam poppet will simply slide off. Once steam poppet is out, unscrew poppet seat using a 1 1/16” socket. Reinstall new poppet seat along with new copper o-ring. Reinstall new steam poppet. (NOTE: Steam poppet is only sold with matching seat and copper gasket. Do not mix as seat is made to fit designated steam poppet.)
3. Reverse instructions to reassemble

4.4.5 Disposal
This product is recyclable. No ecological hazard is anticipated with disposal of this product providing due care is taken.

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