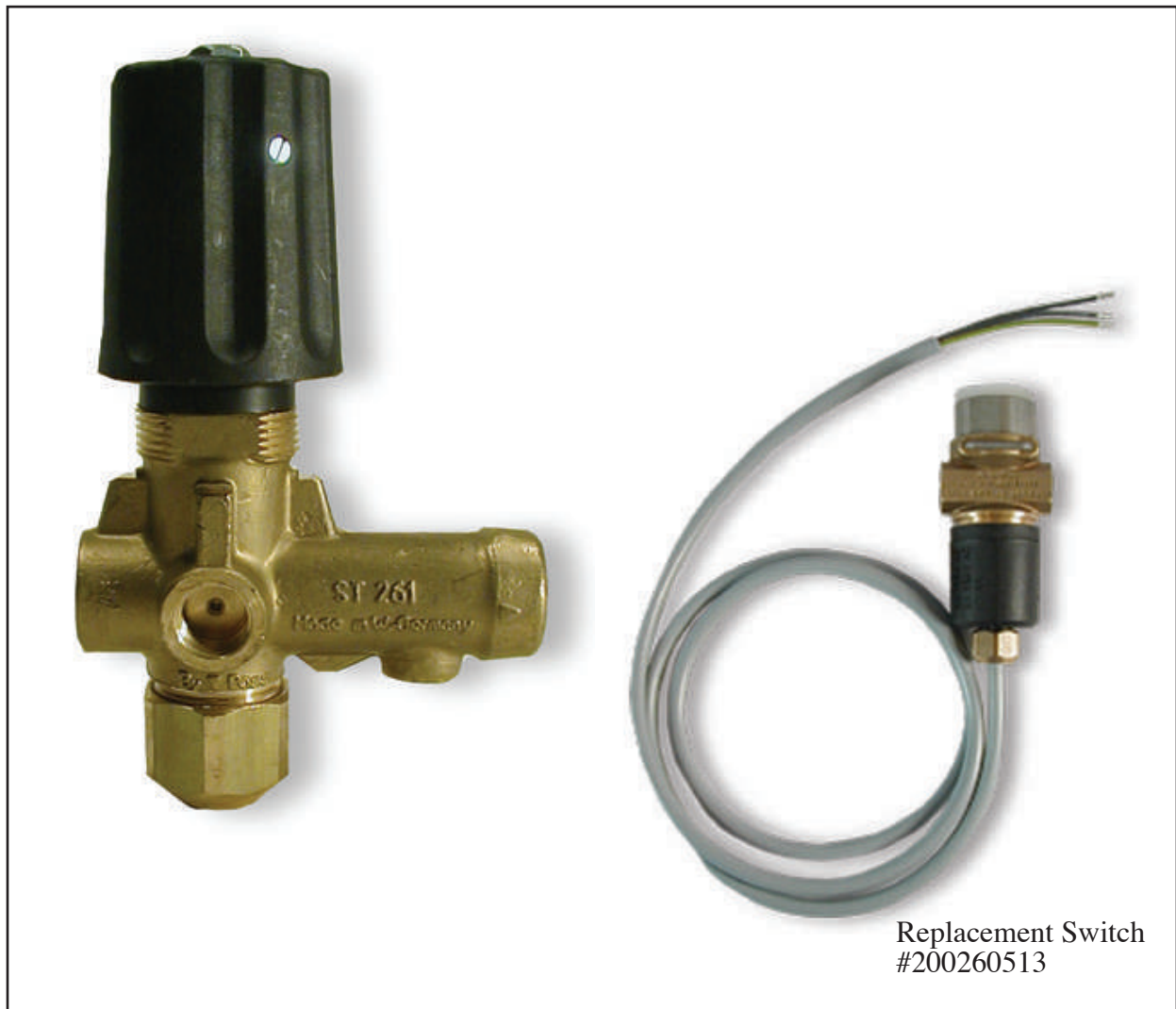
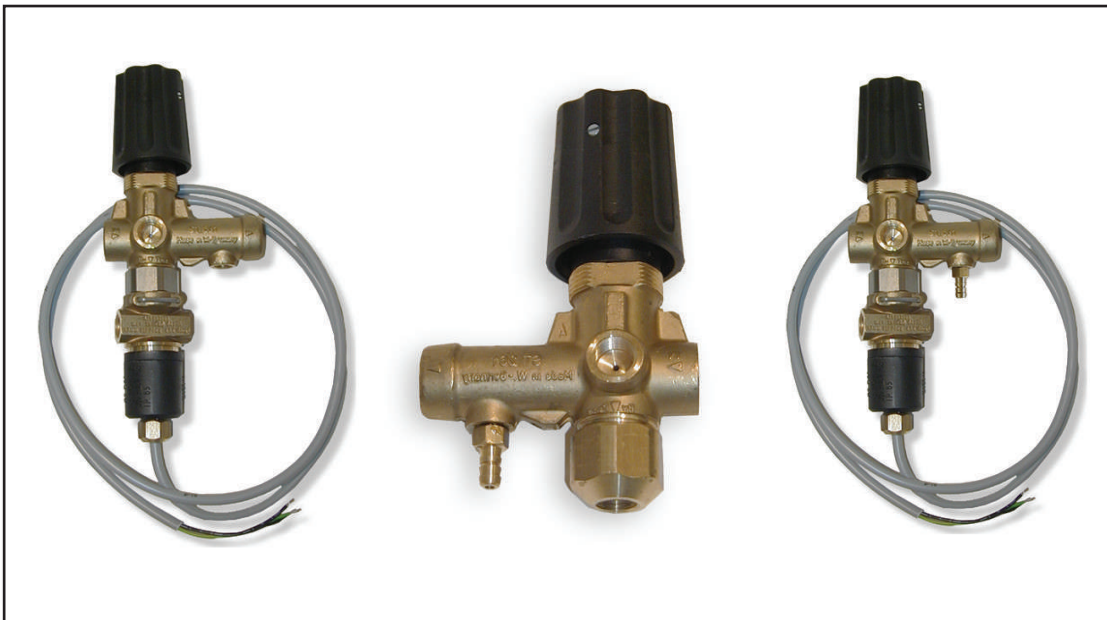


SUTTNER
A M E R I C A C O M P A N Y

ST-261 Unloader Valves

Manual





**ST-261 with
Switch Option**

**ST-261 with
Injector Option**

**ST-261 with Switch
and Injector Option**

STANDARD FEATURES (Base model ST-261, Item No. 200261500)

- * Adjustable pressure/flow
- * Tamper resistant maximum/minimum pressure setting
- * Forged brass housing, stainless steel piston, bypass valve seat and outlet check valve, chemical and heat resistant seals
- * Completely and easily rebuildable with cartridge style kit Can be rebuilt without removal from installation
- * Balanced, flow through design, minimizes pressure loss, reduces necessary fittings
- * 1/4" FNPT auxiliary port for mounting gauge, pressure relieve valve, etc

OPTIONS/ACCESSORIES:

- * Built in venturi style downstream chemical injector
- * Normally closed bypass microswitch for operating fuel solenoids, lights, timers.
- * Unloader can be panel mounted with optional nut (Item No. 010003150).
- * ST-61 metering valve for chemical injector attaches at inlet hose barb
- * ST-66 panel mount metering valve for chemical injector.

consistency of spray pressure setting Turn adjustment screw (5) counterclockwise two full turns and then clockwise again until tight. Squeeze trigger and verify desired pressure setting. Spray pressure should fall within 5% of original setting. Bypass pressure (the reading on the gauge when the trigger is released) should exceed the spray pressure by approximately 15-20%. If valve fails to repeat within specifications, repeat the steps above and assure all final settings are tight.

TO SET MINIMUM SPRAY PRESSURE: With the pump running and trigger squeezed, turn adjustment screw (5) counterclockwise with adjustable wrench to desired LOWEST pressure setting. Install one nut (1) and tighten against adjustment insert (4). Install second nut (1) and tighten securely against first. Squeeze and release trigger several times to verify consistency of pressure. Turn adjustment screw (5) clockwise two turns and then counterclockwise until tight Squeeze trigger and verify pressure. With adjustment screw (5) turned fully counterclockwise, spray pressure should fall within 5% of original minimum setting. If after adjustment, valve fails to repeat within specifications, repeat steps above and assure all final settings are tight. If desired, install pressure adjustment knob (3) and tighten set screws (2).

TROUBLESHOOTING

SYSTEM WILL NOT COME UP TO FULL DESIGNATED PRESSURE:

- * Spray nozzle worn or **nozzle** orifice is too large in relation to pump flow rate
- * Adjusted improperly Refer to pressure adjustment section for proper procedures
- * Bypass valve (within unloader) is obstructed or leaking Remove and clean bypass cartridge or replace (Use Kit no 200261526)
- * Flow rate of pump inadequate **Assure** designated flow rate of pump is adequate in relation to spray nozzle size

PRESSURE SPIKES IN DISCHARGE LINE DURING BYPASS MODE:

- * Pressure adjustment too tight. Refer to pressure adjustment section for proper adjustment procedures.
- * Restricted bypass line. Bypass line should be 1/4" inside diameter (I.D.), 12" long and of low pressure flexible hose.
- * Flow rate higher than 8 GPM. Unloader flow rate is **8 GPM** maximum.

UNLOADER CYCLES WHILE IN BYPASS MODE:

- * External leak on unloader or in downstream fittings. Inspect all high pressure lines (including gun and hose) for any signs of leakage and repair as necessary.
- * Discharge valve (within the unloader) damaged, obstructed or worn. Inspect and replace as necessary. Use Kit # 200260528.
- * Weep gun being used. The ST-261 series unloader is not designed for use with a weep gun.

ST-66. (Item No. 200066500)

Chemical flow can be metered and shut off remotely from the unloader with the ST-66. Made of high grade polymers, stainless steel and brass, it is the industry standard for panel mount chemical metering valves. With two inlets, it also allows switching from one solution to another by simply turning the knob to either side of the easy to read settings on the legend plate.

**ST-66****INJECTOR TROUBLESHOOTING****IF THERE IS NO SUCTION:**

- * Assure that soap metering valve (if applicable) is open, that intake hose is submerged. Verify that hose is not kinked, obstructed or cut and that filter (if applicable) is clean.
- * Too much Restriction. Make sure large orifice nozzle (such as a 30.0 orifice) is being used. Review "Injector Option" section above.
- * Too much lift. Place chemical container level with injector intake
- * Assure that intake check valve (located in the chemical hose barb) is clean and working correctly. Rebuild with Kit # 200060720 if necessary.

IF WATER FLOWS BACK THROUGH CHEMICAL LINE:

- * Assure that ball and spring check valve at chemical intake are installed correctly and not damaged or corroded. Rebuild with Kit # 200060720 if necessary.

MICROSWITCH OPTION

The microswitch (Item No. 200260513) is an STSP-NC A.C. switch that can be ordered separately **or** already installed. Mounted in place of the bypass fitting, the switch allows the actuation of solenoids, display lights, timers or other electrical devices. The switch is wired "Normally Closed" and is opened by the unloader piston during the bypass mode. The switch is ideal for solenoid activation, time delay shutdown systems, sequencers, and other related systems.

SWITCH SPECIFICATIONS

5 A at **125 VAC** **or** **3 A** at **250 VAC**

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>ITEM NUMBER</u>
ST-261/S	Unloader with switch	200261550
ST-261/SI	Unloader w/switch/injector (2.1)	200261610

INJECTOR OPTION

A downstream chemical injector relies on pressure loss through a restrictive orifice. On the ST-261, the orifice is built in. Restriction after the orifice must be minimized in order for injection to occur. Therefore, this system must incorporate a large orifice spray nozzle which reduces such restriction. We generally recommend the usage of a nozzle with a minimum orifice size of 30.0 (.141" diameter). Smaller nozzles may be used, but the added restriction may result in ineffective suction rates or no suction at all. In addition, remember that elbows, fittings and even hose add to the restriction within the system and may affect or eliminate the suction capabilities.

The built in downstream injector option must be properly sized for the flow rate of the cleaning system. There are three orifice options:

ORIFICE	FLOW RATE	UNLOADER NO.	SIPHON RATE
1.8mm	1.5-2.25 GPM	200261560	10-1
2.1 mm	2.25-3.35 GPM	200261570	10-1
2.4 mm	3.35-5.0 GPM	200261580	10-1

Choosing a smaller orifice size than recommended will result in a higher rate of pressure loss through the valve, although the injection feature will still function. Using a larger orifice size than recommended will eliminate siphoning capability.

Injection ratios are approximate. They vary with the lift required, downstream restriction, viscosity, temperature, etc. To determine exact siphon rate for your application, operate the injection feature for one minute and measure how much detergent is used. Subtract the amount of injected detergent from the total amount of liquid discharged and divide that number by the amount of injected detergent. Example: If the total amount of liquid discharged equals 5 gallons, and the injected detergent equals 32 ounces (.25 gallon), the exact injection ratio would be determined as follows. $5.0 - .25 = 4.75$ $\div .25 = 19$. Exact ratio equals 19 parts water to 1 part detergent.

METERING VALVES

Suttner offers two metering valves that can be used with the injection feature:

ST-61. (Item No. 200061500)

The ST-61 attaches to the chemical inlet barb without special tools
Made of a glass filled poly material,
it is practically immune to chemical attack.



ST-61

SPECIFICATIONS:

PRESSURE, MAXIMUM	3625 PSI
PRESSURE, MINIMUM	500 PSI
TEMPERATURE, MAXIMUM	175 DEGREES F
FLOW RATE, MAXIMUM	8.0 U.S. GPM
INLET CONNECTION	3/8" FNPT
OUTLET CONNECTION	3/8" FNPT
BYPASS CONNECTION	1/4" FNPT
AUXILIARY PORT	1/4" FNPT
WEIGHT (STANDARD)	21.9 OZ.
WEIGHT (INJECTOR VERSION)	22.0 OZ.
WEIGHT (SWITCH VERSION)	32.0 OZ.

INSTALLATION:

MOUNTING INSTRUCTIONS

The valve can operate in any position, but plumbing should be minimized and the pressure adjustments should be made easily accessible. Valve can be remotely panel mounted by removing the adjustment knob and utilizing optional panel mount nut (Suttner No. 010003150). Ideal installation, however, is as close to the outlet of the pump as possible. Make connections as noted below:

PRESSURE SETTING:

TOOLS NEEDED:

5000 PSI gauge
2.5 mm Allen wrench
small flathead screw driver
adjustable wrench

TO SET MAXIMUM SPRAY PRESSURE AND BYPASS PRESSURE: Refer to Parts Listing on Pg. 8. Install test gauge in auxiliary port on unloader or in discharge line after the unloader valve. With the pump operating but the spray gun off, loosen set screws (2) and remove pressure adjustment knob (3). Remove both nuts (1) and set aside. Using the 2.5 mm Allen wrench, loosen set screw (6) and turn adjusting screw (5) with adjustable wrench counterclockwise so that it is flush with top of adjusting screw insert (4). Tighten set screw (6). With adjustable wrench, turn the adjusting screw (5) clockwise until the screw insert (4) bottoms out against the nut (8). Loosen set screw (6) with 2.5 mm Allen wrench, so that adjusting screw (5) turns freely but does not turn adjusting screw insert (4). With proper nozzle installed in spraygun, squeeze trigger and turn adjusting screw (5) clockwise to desired maximum spray pressure. Then tighten set screw (6) securely and release trigger. Squeeze and release trigger several times to verify