

REELEX Pressure Regulation System

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REELEX Pressure Regulation System

REELEX uses very specific equipment for this system, sourced and selected for very specific characteristics to provide the maximum performance resulting in the best coil characteristics, and best electrical characteristics of the cable wound on REELEX equipment.

The [pressure regulator](#) used on REELEX G2 and G3 equipment is digital and allows for remote control by use of an analog voltage signal. In G2/G3 REELEX equipment, this can be done integrally through REELEX'S G2/G3 controller and HMI. If retrofitting to be used with legacy equipment the regulator will require a 24V power supply, either pulled from the REELEX take up (if available) or supplied from an outside source. It will also need to be adjusted at the regulator (using the regulator manufacturers supplied controls), or fed a reference voltage (0-10VDC) to correspond to a nominal pressure range of 0-70 PSI.

NOTE: The pressure regulator sourced by REELEX does not have the flow capabilities to operate the UDA directly. It is only used as a “pilot pressure” into the high relief relay, and as such **should never be used to supply pressure directly to the tolomatic cylinder on the UDA** as it will be inadequate in several ways.

The [high relief pressure relay](#) is a highly important component in the REELEX pressure regulation system. Most regulators do not have the capability to exhaust quickly enough to maintain a constant regulated pressure when they experience a downstream pressure spike; this one does.

WARNING: REELEX does not recommend going directly from any digital pressure regulator into the tensioning cylinder because a digital pressure regulator does not relieve pressure in the same way a manual pressure regulator does and can potentially result in unwanted and potentially damaging pressure spikes. Furthermore, a manual pressure regulator that is not high relief can also have

Digital Pressure Regulator

Adjustment For Use with REELEX Machines with G2/G3 Control Systems

While REELEX has honed the control system to be as “Plug-n-Play” as possible with this regulator, it still may require some minor adjustments for it to achieve maximum accuracy. The regulator is supplied with an analog voltage signal (0-5VDC) from the REELEX controller based on the pressure (1-35 PSI) selected on the HMI. The pressure at the regulator may not accurately reflect the pressure selected on the HMI at the bottom, top or entire range of selectable pressures. To determine if this is the case perform the following:

1. Power up the machine and perform a reset.
2. Using the HMI, adjust the pressure to 1 PSI
3. Check the pressure displayed on the regulator
 - a. Confirm that it is within an acceptable range of 1 PSI (the accuracy of the system is high enough that it should be able to achieve +/-0.2 PSI if desired).
 - b. If it is not in an acceptable level of precision, note the value.
4. Using the HMI, adjust the pressure to 35 PSI
5. Check the pressure displayed on the regulator
 - a. Confirm that it is within an acceptable range of 1 PSI (the accuracy of the system is high enough that it should be able to achieve +/-0.2 PSI if desired).
 - b. If it is not in an acceptable level of precision, note the value.

NOTE: If the pressure at both ends of the range are within the desired level of precision, no further adjustment or testing is required; this procedure can be ended now.

NOTE: There are three buttons on the top of the Regulator. The left button is labelled “UNLOCK” and has a down arrow on it. The center button has no label and has an “S” on it. The right button is labelled “LOCK” and has an up arrow on it.

6. Unlock the regulator
 - a. Press “S” on the regulator
 - b. If the regulator displays UNL, proceed to step 7, if the regulator displays LOC complete the remainder of step 6
 - c. Press and Hold UNLOCK until LOC begins to flash on the display

- d. Press S to confirm the unlock
7. Press S to access F_1
- a. The display will alternate between “F_1” and it's value (default 0.0).
8. If the value noted in step 3b was too high, decrease F_1 by pressing the down arrow [UNLOCK].
If the value noted in Step 3b was too low, increase F_1 by pressing the up arrow [LOCK].

NOTE: There is no negative symbol displayed on the regulator. The only way to know that you are in “negative numbers” is that the direction of the controls will be reversed. In other words, if F_1 displays 1.5 and you press the up arrow and the value displayed changes to 1.4, it is displaying negative numbers.

- a. A good rule of thumb is to change F_1 by the value that the regulator was off in step 3. For instance if the value noted in 3b was 1.9 PSI, press the down arrow until 0.9 is displayed on the regulator. If the value noted in 3b was 0.6 PSI, press the up arrow [LOCK] until 0.4 is displayed on the regulator.
9. Press S to access F_2
- a. The display will alternate between “F_2” and it's value (default 70.0).
10. If the value noted in step 5b was too high, decrease F_2 by pressing the down arrow [UNLOCK].
If the value noted in Step 5b was too low, increase F_2 by pressing the up arrow [LOCK].
- a. A good rule of thumb is to change F_2 by twice the value that the regulator was off in step 5. For instance if the value noted in 5b was 35.4 PSI, press the down arrow until 69.2 is displayed on the regulator. If the value noted in 5b was 33.8 PSI, press the up arrow [LOCK] until 72.4 is displayed on the regulator.
11. Press S to return to the pressure display
12. Repeat steps 2-10 until the results are acceptable. Two to Three iterations are all that should be needed.
13. Once the pressure is acceptable over the range, lock the regulator (optional)
- a. Press S until you are on the pressure display
 - b. Press and hold LOCK until UNL begins to flash
 - c. Press S to confirm the lock

Adjustment For Use with a Non-G2/G3 Controller

The pressure regulator can operate as a “stand alone” device as long as it is supplied with 24 VDC for power and pressurized air. In order to set the operating pressure, perform the following:

1. Unlock the regulator
 - a. Press “S” on the regulator
 - b. If the regulator displays UNL, proceed to step 2, if the regulator displays LOC complete the remainder of step 1
 - c. Press and Hold UNLOCK until LOC begins to flash on the display
 - d. Press S to confirm the unlock
2. Press S to access F_1
 - a. The display will alternate between “F_1” and it’s value (default 0.0).
3. Using the up and down buttons, adjust F_1 to the desired pressure.
4. Press S to display F_2. F_2 has no functionality in this mode.
5. Press S to return to the pressure display
6. Lock the regulator (optional)
 - a. Press S until you are on the pressure display
 - b. Press and hold LOCK until UNL begins to flash
 - c. Press S to confirm the lock

High Relief Pressure Relay

The digital pressure regulator supplies a stable “pilot” pressure to the pressure relay. The pressure relay is tasked with maintaining a consistent output pressure regardless of downstream conditions. In this regard, having a high relief feature is of utmost importance to the quality of coils produced both in general appearance/performance (no tangles) and electrical characteristics.

Adjustment of High Relief Pressure Relay

The high relief pressure relay is supposed to take a pilot pressure and multiply it by some constant to provide a stable output pressure. In this case, that constant is 1. The pressure supplied by the [Digital Pressure Regulator](#) should be reproduced at the output of the relay. While these relays are supposed to be calibrated from the factory to provide a 1:1 pilot:output ratio, they are not always spot on. Perform the following procedure to adjust the Pressure Relay.

Tools Required:

- ¼” Allen key
- Flathead Screwdriver
- Pneumatic sealant (liquid, or teflon tape)

Procedure:

1. Adjust the regulator to provide the desired pressure using the appropriate procedure outlined for either [G2/G3controls](#) or [Non-G2/G3controls](#).
2. Compare the pressure display on the Digital Regulator to the pressure on the output of the relay.

NOTE: If the pressure displayed on the gauge on the output from the relay is within spec of the pilot pressure displayed on the digital regulator then no adjustment is needed and this procedure is complete. Otherwise, proceed to step 3.

3. Remove air pressure from the system using the shut-off/dump valve upstream of the regulator and relay.

WARNING: Ensure pressure is removed before proceeding to step 4. Bodily injury may result if the system is still pressurized.

4. Remove plug from the top of the relay (if pressure is still present this plug will become a projectile, as there is pressure behind it during operation).
5. Adjust Pressure screw located directly under the plug using a flathead screwdriver.
 - a. Turn the screw clockwise to increase the output pressure relative to the pilot pressure. For instance if the pilot pressure is 15 PSI and the output pressure is 12 PSI, turn the adjustment screw clockwise.
 - b. Turn the screw counterclockwise to decrease the output pressure relative to the pilot

pressure. For instance if the pilot pressure is 15 PSI and the output pressure is 20 PSI, turn the adjustment screw counterclockwise.

6. Replace the plug in the top of the relay
7. Re-apply pressure to the system using the shut-off/dump valve upstream of the regulator and relay.
8. repeat steps 2-7 until the desired result is achieved.
9. Ensure there are no leaks around the plug over the adjustment screw using the pneumatic sealant if necessary.