TORO®

Electric-To-Hydraulic Converter Installation Instructions Normally-Open Models: EHC-01-04, EHC-01-12 & EHC-01-16 Normally-Closed Models: EHC-08-04, EHC-08-12 & EHC-08-16

Introduction

Installation of an Electric to Hydraulic Converter (EHC) assembly module enables Normally-Open (NO) or Normally-Closed (NC) hydraulic control valves to be operated with a 24 VAC output irrigation system controller. In addition, the EHC provides a convenient method of manually operating single or multiple valves without controller assistance.

The **Normally-Open** EHC is identified by **Blue** (formerly White) control selectors and its **supply filter** assembly connected to the **left** hand tubing port. The **Normally-Closed** EHC is identified by **Green** (formerly Pink) control selectors and its **supply filter** assembly connected to the **right** hand tubing port.

The modular design of the EHC enables it to be installed in various types of controller installations. Two screw holes are provided in each module mounting plate for pedestal cabinet or wall installation. If sub-surface installation is required, the converter modules can be simply placed inside a valve box or vault-type enclosure.

CAUTION: If hydraulic converter installation site is subject to freezing temperature conditions, installation of proper thermal protection (i.e., heat-generating device) must be installed to ensure that water inside the converter does not freeze. Failure to do so will result in severe damage to the converter assembly and VOIDS THE PRODUCT WARRANTY. Please contact your Toro distributor for recommended freeze protection methods, devices and information.

Specifications

Dimensions: (See Figure 1 at right)

Operating Pressure Range:

40-150 PSI (2.81-10.56 kg/cm²)

Solenoid:

- Voltage: 19-24 V a.c., 50/60 Hz
- Current Draw: Holding .225A @ 24 VAC Inrush – .400A @ 24 VAC

• Wire leads: 18 AWG x 4 ft. (1.22 m), color-coded insulation (non-polarized)

Installing Converter Modules

The converter module(s) can be wall mounted or installed in virtually any type of appropriate enclosure (i.e., controller pedestal cabinet or valve box). Two mounting screw slots located on 8 in. (20.3 cm) centers are provided in each fouractuator module backing plate. If below grade installation is desired, the modules can be positioned in a suitably sized valve box.

Note: All solenoid wire connection made below grade must be waterproofed to prevent possible short circuit.

Regardless of installation location, a gravel drainage sump or suitable drainage area is required to accommodate valve discharge water during operation. See **Figure 2** on the following page for typical installation method.



★ Increase this dimension by number of four-actuator modules per assembly.

Installing Control Tubing

1. Route a length of Toro 1/4 in. O.D. polyethylene tubing from a filtered water source to in-line filter location.

Note: The converter requires a filtered (100 mesh or finer) water source which is **equal to or greater in pressure** than the irrigation water supplied to the valves it controls.

- 2. Remove tube retainer and cap from supply filter inlet. Slide tube retainer onto supply tube. Push tube onto barbed fitting and secure with tube retainer.
- 3. Remove tube retainer and cap from discharge port. Install a section of control tubing to discharge port and route into gravel drainage sump or location where slight water discharge will not be harmful.
- 4. Route a separate length of Toro 1/4 in. diameter control tubing from converter location to each control valve. (Do not connect control tubes at this time.) For ease of installation and future identification, label each tube at both ends with valve location or intended station number.
- 5. At actuators, install each control tube into receptacle as follows: Carefully trim end of tube to provide a clean, square edge. Insert tube end into receptacle approximately 3/8 in. (9.5 mm). Pull lightly on tube after insertion to ensure proper retention. See **Figure 2A**.

Note: Actuator(s) without a control tube must have a plug cap installed. **Supply water will discharge from actuator if not plugged**. An o-ring installed in the tube retainer cap must be removed and installed in the plug cap prior to installation. One plug cap is supplied with each module. For additional plug cap(s) order P/N 89-3401.

- 6. Pressurize supply line. Flush, pre-fill and connect valve control tubes as follows:
 - Normally-Open: Turn control selectors (color-coded blue) counterclockwise 1/4 turn to ON position. At selected actuator, turn control clockwise 1/4 turn to AUTO position; water will begin flowing through control tube.
 - Normally-Closed: At selected actuator, turn control selector (color-coded green) counterclockwise 1/4 turn to **ON** position; water will begin flowing through control tube.
 - At valve location, allow water to flow from control tube until all air and debris has been purged. Slide tube retainer onto control tube, push tube onto barbed valve fitting and secure with retainer.

Figure 2Note: This illustration depicts a Normally-Open convert-
er installation. For Normally-Closed installation, Supply
and Discharge ports are reversed.



(continued)

- Turn selected actuator to **ON** position for **Normally-Open** or **AUTO** for **Normally-Closed** to stop flow of water from actuator.
- Repeat procedure for all valves.
- When all valves have been connected, turn all actuator controls to **AUTO** position.

Installing Solenoid Control Wiring

Route solenoid wires to controller output terminal strip. Connect numbered control wires to appropriate output terminals. Splice common wires together using wire nuts to provide single common wire (as shown in **Figure 4**) and connect to controller output Common terminal.

Manual Operation

The valve actuators can be operated manually as required by simply turning the control selector to the **ON** position. The valve will remain on until the selector is turned to the **AUTO** position. See **Figure 5**.

Control Tube Removal

The actuator assembly uses a unique tube retention method which will not allow the tube to be pulled out once it has been inserted. If control tube removal is required, use the following procedure as illustrated **Figure 6**:

- 1. Unscrew tube retainer cap (counterclockwise) and remove from actuator assembly.
- Cut tube leaving a tube remnant approximately 1 in. (25 mm) long remaining in cap.
- **3**. Push tube remnant through cap or grasp remnant with pliers from inside of cap and pull through to remove.
- **4**. Reinstall tube retainer cap and <u>hand-tighten</u>. Reinstall control tube.

Winterization – Prolonged Shutdown

To prepare the hydraulic converter system for prolonged shutdown during winter months (if watering is not required), use the following procedure:

- 1. Turn system supply water off.
- 2. Remove supply filter cap to relieve inlet water pressure, then reinstall.
- 3. Normally-Open Turn all control selectors to ON position.
 - Normally-Closed Leave control selectors in Auto position.

Note: Prior to restarting system, ensure all actuator control selectors are in the **AUTO** position.



