

April 2022

Spence™ Electronic Time Controller (ETC)

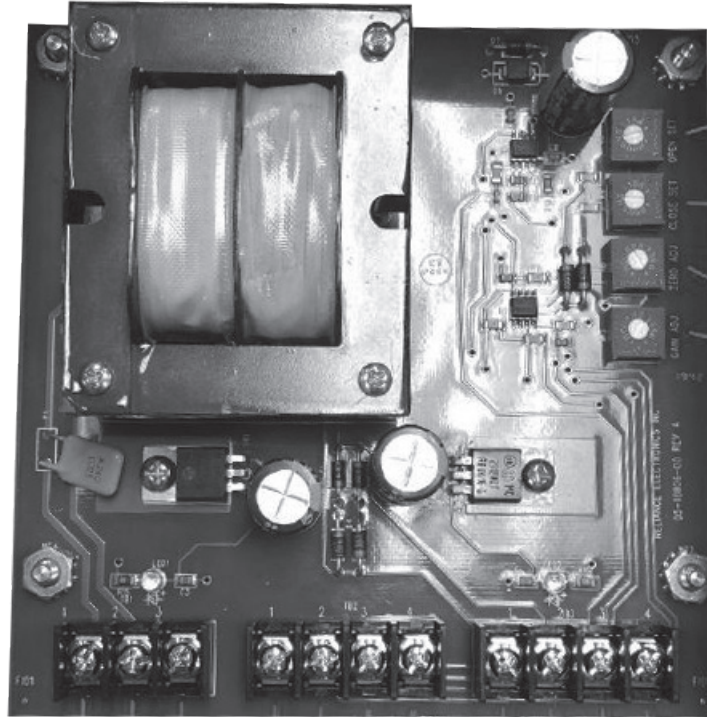


Figure 1. Electronic Time Controller

Introduction

The Electronic Time Controller (ETC) is designed to supply a control signal to the Type VH210 Pilot to provide a controlled slow opening and/or closing function.

In steam systems, it is essential to turn steam on slowly to prevent shocking the piping system, which could result in damaged or broken piping and equipment. This control, when used with the Type VH210 Pilot mounted to a Main Valve, will perform this operation automatically, eliminating the need for a technician to slowly open a supply valve manually. In some applications, slow shut down is also needed.

Features

- **NEMA 1 Enclosure** - Protects electronic components from industrial environments.
- **Rapid Response** - Reacts to direct changes in 0 to 10 VDC or 4 to 20 mA signals.
- **Multi Variable Control** - Pressure and Temperature control when integrated with additional Spence main valve and pilot.

Specifications

This section lists the specifications for the Electronic Time Controller (ETC).

Electronic Data	Applications
4 to 20 mA or 0 to 10 VDC Input Signals 24 VAC 50 to 60 Hz Power Supply 17 VA/12 W Power Consumption	Building Control Systems SCADA PLC Upgrading Type E Main Installations for Automated Control

Principle of Operation

Prior to start up, proceed as follows:

1. Verify the ETC power switch is in the “Off” position.
2. Open the ETC, and locate the setting controls for Start Up and Shut Down, See Figure 3.
3. Determine the required start up and shut down time for the installation and set the two controls.

Note

The controller start up timing will set the time to fully open the Type VH210 Pilot. The VH210 should start in the closed position with 0 VDC applied. Under many conditions, the actual system may come up to full pressure before the Type VH210 Pilot is fully open. Because of this, on the initial setting, the start up time should be set longer than what is expected, by approximately 30%. Once the system start up time is verified, the ETC can be adjusted if needed.

4. Verify the ETC action switch (or external switch) is in the “Shut Down” position. If an external switch is being used, then the ETC action switch should be in the “Start Up” position.
5. Set the ETC power switch to the “On” position.

For normal start up, verify steam supply to the Regulator is on, then set the ETC action switch (or external switch) to “Start Up”.

For normal shut down, set the ETC action switch to “Shut Down”. If an external switch is being used, do not change the ETC action switch, but instead set the external switch to “Shut Down”.

External Switch operation is:

1. Close = Opening Cycle
2. Open = Closing Cycle

Note

It is possible to reverse the operation of the switch. To do this, remove the jumper from Terminals 3 and 4, connect the switch on Terminals 2 and 4.

Installation

1. Refer to the Main Valve’s SIOI for their recommended installation.
2. The ETC has a temperature limitation of 20°F to 120°F and it should not be located in an excessively moist area.
3. Connect the ETC to the Type VH210 Pilot using 18 AWG or larger wiring. Refer to Figures 2 and 3. No separate power is required to operate the Type VH210 Pilot.
4. Connect the ETC to a 110 VAC 60 Hz supply using 14 AWG or larger wiring. The ETC will draw a maximum of 1/2 A during normal operation. Refer to local building codes for acceptable wiring practices.

Setup

1. Verify the opening and closing time adjustments are turned fully CCW.
2. Install a jumper wire as shown (if not already installed).
3. Connect a switch as shown, verify that it is in its OFF or OPEN position.
4. Connect a Voltmeter to the “+V” and “Gnd” terminals shown.
5. Connect a 110 VAC source to the terminals shown.

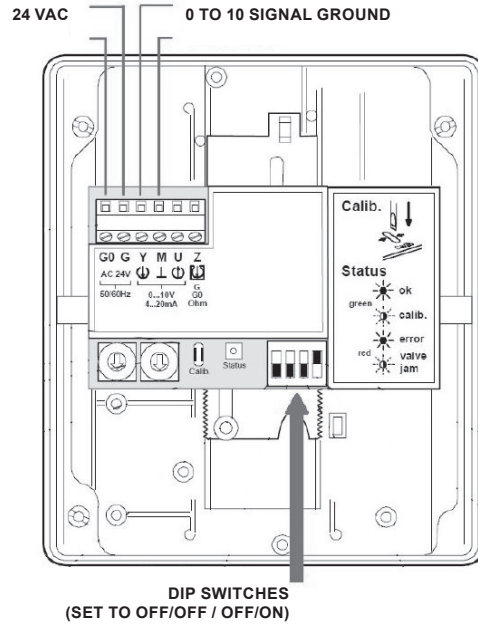


Figure 2. Type VH210 Settings and Connections

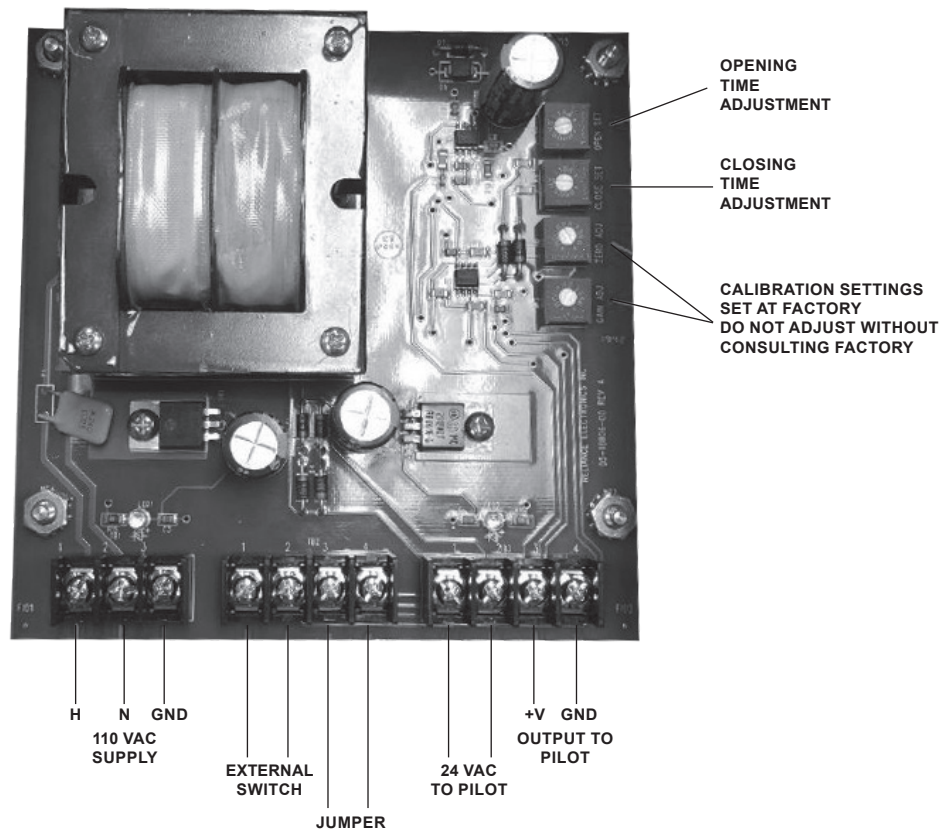


Figure 3. Electronic Time Controller Settings and Connections

Calibration

1. Turn the 110 VAC power on.
2. Adjust the “Zero Adjustment” until the voltmeter reads zero volts (+/-0.05).
3. Activate the external switch, then wait approximately 5 minutes to allow the controller to reach its maximum output voltage.
4. Adjust the “Gain Adjustment” until the voltmeter reads 10 volts (+0/-0.5).
5. Deactivate the external switch, then wait approximately 5 minutes to allow the controller to return to its minimum output voltage.
6. Readjust the “Zero Adjustment” if necessary.

Testing

1. With the power still on, activate the external switch.
2. Time how long it takes for the voltmeter to read 9.8 volts. The time should be 2 to 4 minutes.
3. Deactivate the external switch.
4. Time how long it takes for the voltmeter to read 0.2 volts. The time should be 1 to 3 minutes.
5. Remove the voltmeter, set it for AC voltage, and connect it to the 24 VAC terminals shown. The voltmeter should read 24 volts (+/-1).
6. Turn the power off and disconnect all wiring except for the jumper.

Maintenance

The ETC requires no routine maintenance.

For maintenance of Main Valve, Types D and VH210 Pilots, refer to their respective Instruction Manuals for details.

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section on page 2.

Review the description to the right of each specification and the information in each referenced table or figure. Specify your choice whenever a selection is offered.

Ordering Guide

Input Signal (Select One)

- 4 to 20 mA
- 0 to 10 VDC

 [SpenceValve.com](https://www.SpenceValve.com)

Emerson

Americas

McKinney, Texas 75069 USA
T +1 800 558 5853
+1 972 548 3574

Europe

Bologna 40013, Italy
T +39 051 419 0611

Asia Pacific

Singapore 128461, Singapore
T +65 6777 8211

Middle East and Africa

Dubai, United Arab Emirates
T +971 4 811 8100

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