

# Installation & Operation Manual

## Switching Relay 301P



Zoning

301P\_D

12/18

Replaces: 02/18

## Introduction

The Switching Relay 301P operates a circulator to provide heating to a hydronic heating system when the connected thermostat calls for heat. The 301P includes optional exercising to prevent circulator seizure when not in use, and optional post purge operation to maximize energy savings.



## Features

- Compatible with all low voltage thermostats
- Pump exercising
- Pump post purge
- LED for power and zone
- Top, bottom and back conduit knockouts
- Fuse protects pump
- Spare fuse included
- 20 VA transformer
- Thermal circuit breaker protects transformer
- Hinged cover
- CSA approved
- 3-year warranty

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## Important Safety Information

It is your responsibility to ensure that this thermostat is safely installed according to all applicable codes and standards. tekmar is not responsible for damages resulting from improper installation and/or maintenance.



This is a safety-alert symbol. The safety alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards.

When you see this symbol alone or with a signal word on your equipment or in this Manual, be alert to the potential for death or serious personal injury.



This pictorial alerts you to electricity, electrocution, and shock hazards.

### **WARNING**

This symbol identifies hazards which, if not avoided, could result in death or serious injury.

### **CAUTION**

This symbol identifies hazards which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

This symbol identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

## **⚠ WARNING**



Read Manual and all product labels **BEFORE** using the equipment. Do not use unless you know the safe and proper operation of this equipment. Keep this Manual available for easy access by all users. Replacement Manuals are available at [tekmarControls.com](http://tekmarControls.com)

## **⚠ WARNING**

- It is the installer's responsibility to ensure that this control is safely installed according to all applicable codes and standards.
- Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury or death.
- This control is not intended for use as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit.

## **NOTICE**

The control includes a fuse and transformer that are serviceable. Do not attempt to service any other parts of the control. Attempting to service the control voids the warranty.

## **NOTICE**

- Strip all wiring to a length of 3/8 in. or 10 mm for all terminals.
- A circuit breaker or power disconnect that provides power to the control should be located nearby and clearly labeled.
- Refer to the current and voltage ratings at the back of this manual before connecting devices to this control.

## **Radio Frequency Interference**

The installer must ensure that this control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which is determined by turning the control off and on, the user is encouraged to try to correct the interference by re-orientating or relocating the receiving antenna, relocating the receiver with respect to this control, and/or connecting the control to a different circuit from that to which the receiver is connected.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

# Installation

## Preparation

### Tools Required

- tekmar or jeweler screwdriver
- Phillips head screwdriver
- Wire stripper
- Drill (for wall anchor)
- 3/16" drill bit (for wall anchor)

### Materials Required

- 18 AWG LVT solid wire (low voltage connections)
- 14 AWG solid wire (line-voltage connections)

### Packaging Contents

- 1 Switching Relay 301P
- 1 Spare fuse (located in cover)
- 1 Installation and Operation Manual 301P\_D

## Location

### NOTICE

- Keep the control dry. Avoid potential leakage onto the control.
- Maintain relative humidity less than 90% in a non-condensing environment.
- Avoid exposure to extreme temperatures beyond 32-122°F (0-50°C).
- Install away from equipment, appliances, or other sources of electrical interference.
- Install to allow easy access for wiring, viewing, and adjusting the display screen.
- Install approximately 5 feet (1.5 m) off the finished floor.
- Locate the control near pumps if possible.
- Provide a solid backing which the enclosure can be mounted to. Example: plywood or wall studs.
- Use the conduit knockouts provided on the upper, lower, and back of the enclosure for wiring.

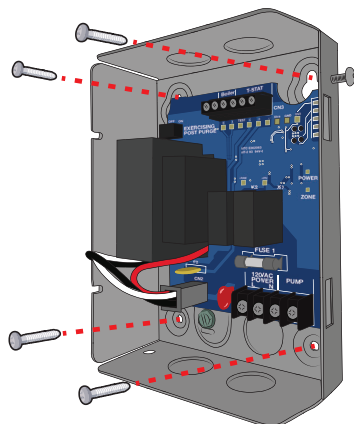
## Installing the Enclosure

### WARNING



To prevent the risk of personal injury and/or death, make sure power is not applied to the thermostat until it is fully installed and ready for final testing. All work must be done with power to the circuit being worked on turned off.

Please be aware local codes may require this thermostat to be installed or connected by an electrician.



## Mechanical

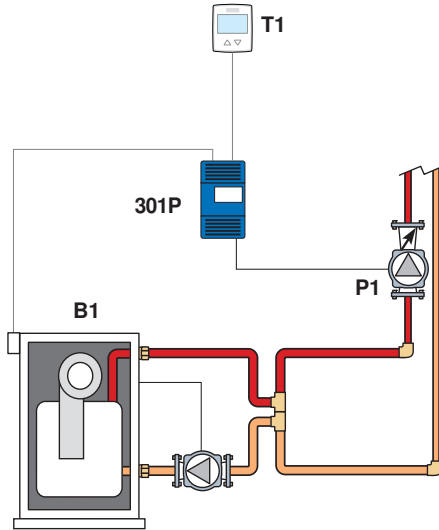
The Switching Relay 301P operates a circulator when the thermostat calls for heat. The boiler is fired whenever a zone calls for heat.

### Legend

B1 = Boiler

P1 = Pump Zone

T1 = Thermostat



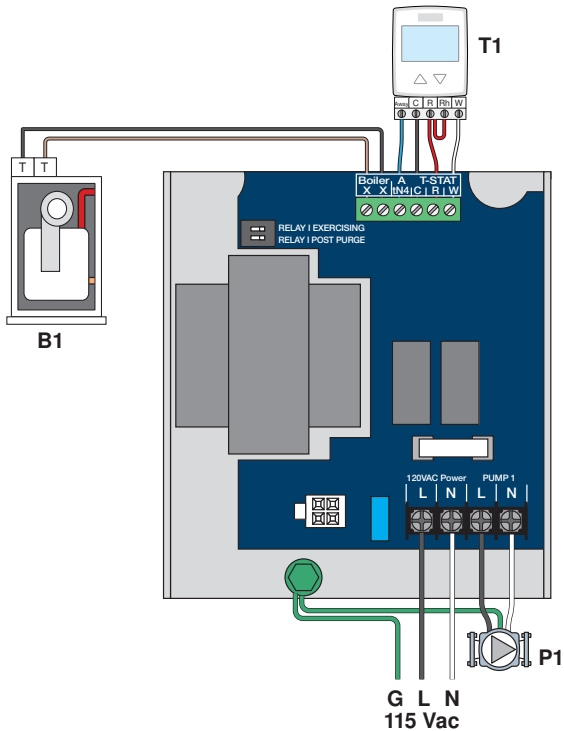
## Electrical

### Legend

B1 = Boiler

P1 = Pump Zone

T1 = Thermostat



# Sequence of Operation

## DIP Switches

### Exercising DIP Switch

ON: Each circulator pump is energized for 30 seconds every 72 hours.

OFF: Circulator pump exercising disabled.

### Post Purge DIP Switch

ON: After the last thermostat stops calling for heat, the last circulator pump remains on for 2 minutes to purge heat from the boiler to the zone.

OFF: Post purge disabled.

## Zone Pump Operation

When a thermostat calls for heat by closing the R and W terminals:

- 115 V (ac) is applied to the corresponding circulator pump.
- The corresponding zone indicator LED is turned on.

When the thermostat stops calling for heat:

- The pump is shut off immediately if the Post Purge DIP switch is off.
- The pump operates for 2 minutes if the Post Purge DIP switch is on.

## Boiler Operation

When a thermostat calls for heat by closing the R and W terminals:

- The boiler end switch XX is closed to fire the boiler.

## Indicator LED Operation

### Power

- On when 115 V (ac) is applied.
- Off when power disconnected or transformer fuse is blown.

### Zone 1

- On when the thermostat calls for heat.
- On during pump post purge after the thermostat stops calling for heat and the Post Purge DIP switch is on.
- Off when thermostat 1 not calling for heat and post purge expired.

## Technical Data

### Switching Relay 301P *One Zone*

|                      |   |
|----------------------|---|
| Literature           | 301P_C, 301P_D  |
| Control              | Microprocessor control. This is not a safety (limit) control.       |
| Packaged weight      | 2.5 lb. (1125 g)  |
| Dimensions           | 6-11/16" H x 4-15/16" W x 2-7/16" D (169 x 123 x 62 mm)             |
| Enclosure            | Cover: ABS plastic, Base: galvanized steel, NEMA Type 1             |
| Approvals            | CSA C US  |
| Ambient conditions   | Indoor use only, 32 to 122°F (0 to 50°C),<br>RH ≤90% non-condensing |
| Power supply         | 115 V (ac) ±10%, 60 Hz, 5 A   |
| Transformer          | 20 VA at 24 V (ac), 16 VA available for thermostat                  |
| Control load         | 7.5 VA at 115 V (ac)  |
| Fuse                 | T5A, 250 V slow blow, spare fuse included                           |
| Pump relay           | 230 V (ac), 5 A, 1/3 hp   |
| Boiler XX end switch | 24 V (ac), 5 A  |

## Limited Warranty and Product Return Procedure

**Limited Warranty** *The liability of tekmar under this warranty is limited. The Purchaser, by taking receipt of any tekmar product ("Product"), acknowledges the terms of the Limited Warranty in effect at the time of such Product sale and acknowledges that it has read and understands same.*

The tekmar Limited Warranty to the Purchaser on the Products sold hereunder is a manufacturer's pass-through warranty which the Purchaser is authorized to pass through to its customers. Under the Limited Warranty, each tekmar Product is warranted against defects in workmanship and materials if the Product is installed and used in compliance with tekmar's instructions, ordinary wear and tear excepted. The pass-through warranty period is for a period of twenty-four (24) months from the production date if the Product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under the Limited Warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and / or workmanship of the defective product; or to the exchange of the defective product for a warranty replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

The pass-through Limited Warranty applies only to those defective Products returned to tekmar during the warranty period. This Limited Warranty does not cover the cost of the parts or labor to remove or transport the defective Product, or to reinstall the repaired or replacement Product, all such costs and expenses being subject to Purchaser's agreement and warranty with its customers.

Any representations or warranties about the Products made by Purchaser to its customers which are different from or in excess of the tekmar Limited Warranty are the Purchaser's sole responsibility and obligation. Purchaser shall indemnify and hold tekmar harmless from and against any and all claims, liabilities and damages of any kind or nature which arise out of or are related to any such representations or warranties by Purchaser to its customers.

The pass-through Limited Warranty does not apply if the returned Product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the Product was not installed in compliance with tekmar's instructions and / or the local codes and ordinances; or if due to defective installation of the Product; or if the Product was not used in compliance with tekmar's instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH THE GOVERNING LAW ALLOWS PARTIES TO CONTRACTUALLY EXCLUDE, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DURABILITY OR DESCRIPTION OF THE PRODUCT, ITS NON-INFRINGEMENT OF ANY RELEVANT PATENTS OR TRADEMARKS, AND ITS COMPLIANCE WITH OR NON-VIOLATION OF ANY APPLICABLE ENVIRONMENTAL, HEALTH OR SAFETY LEGISLATION; THE TERM OF ANY OTHER WARRANTY NOT HEREBY CONTRACTUALLY EXCLUDED IS LIMITED SUCH THAT IT SHALL NOT EXTEND BEYOND TWENTY-FOUR (24) MONTHS FROM THE PRODUCTION DATE, TO THE EXTENT THAT SUCH LIMITATION IS ALLOWED BY THE GOVERNING LAW.

**Product Warranty Return Procedure** All Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar Representative assigned to the territory in which such Product is located. If tekmar receives an inquiry from someone other than a tekmar Representative, including an inquiry from Purchaser (if not a tekmar Representative) or Purchaser's customers, regarding a potential warranty claim, tekmar's sole obligation shall be to provide the address and other contact information regarding the appropriate Representative.

**WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.  
**For more information: [Watts.com/prop65](http://Watts.com/prop65)**

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All specifications are subject to change without notice

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