

Series 321

Dual Output, Digital Countdown Timer User's Manual



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TOTAL
CUSTOMER
SATISFACTION
3 Year Warranty



Watlow's Series 321 is a dual output, digital countdown timer with an easy-to-use control and display panel. The display allows you to track remaining time and process status. On-board memory retains the most recent time setting for easy recall, even after power is removed. The interlock feature interrupts timer operation immediately when it is opened. This feature can be used as an interlock, remote off, or emergency shut-off. The housing and connectors are designed for fast and reliable installation in your product.

Features

- Square 1/8-DIN size;
- Universal mounting scheme — through the panel or flush mount;
- Standard 1/4" spade wiring terminals;
- Dual output — 6A @ 120V~ (ac) or 3A @ 240V~ (ac) mechanical relays;
- Corrosion and water resistant composite case;
- Timer display options include hours:minutes or minutes:seconds.

Dimensions

Figure 1a – Series 321 Timer and mounting collar, side view.

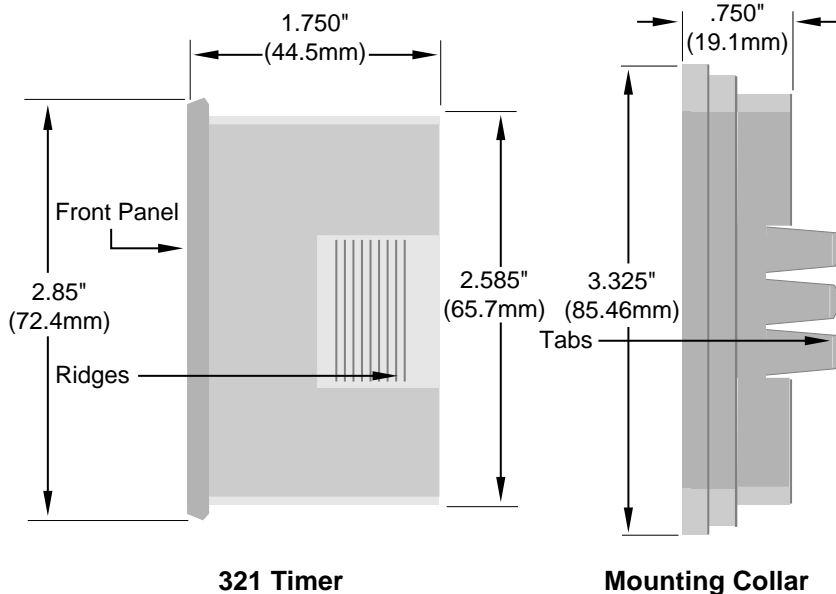
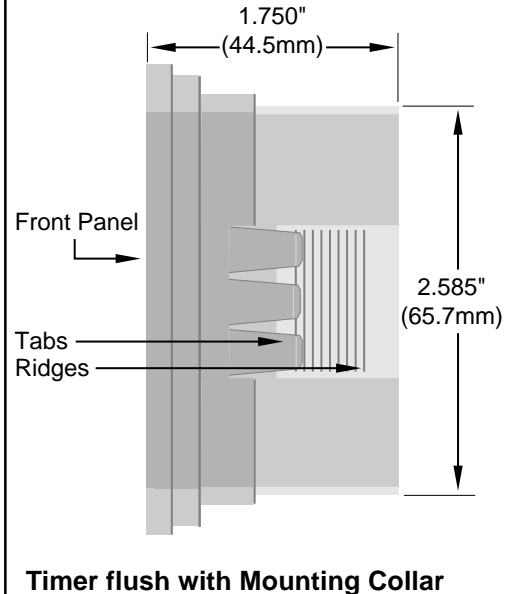
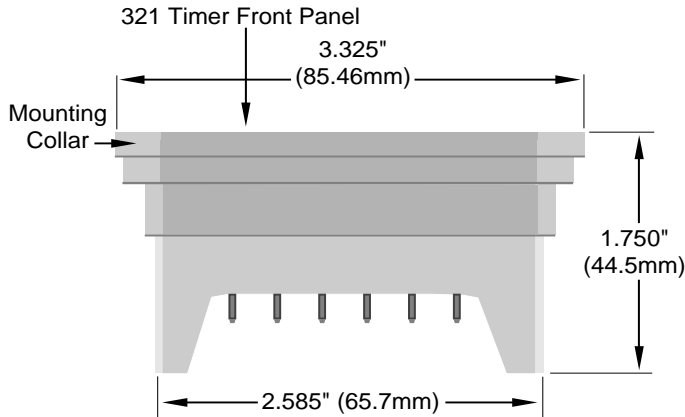


Figure 1b – Series 321 Timer inserted in the mounting collar, side view.



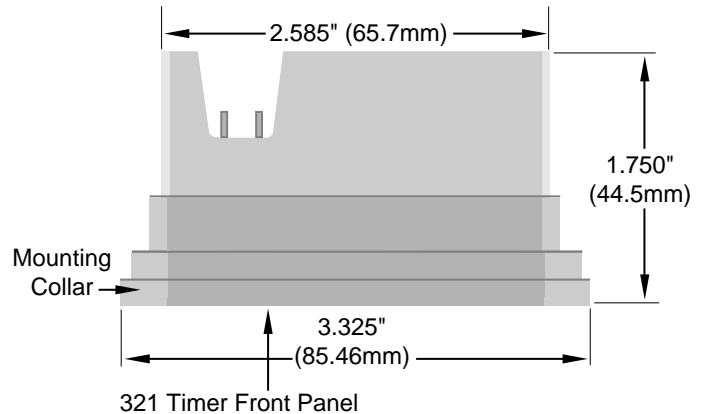
Dimensions

Figure 2a – Series 321 Timer inserted in the mounting collar, bottom view.



Dimensions

Figure 2b – Series 321 Timer inserted in the mounting collar, top view.

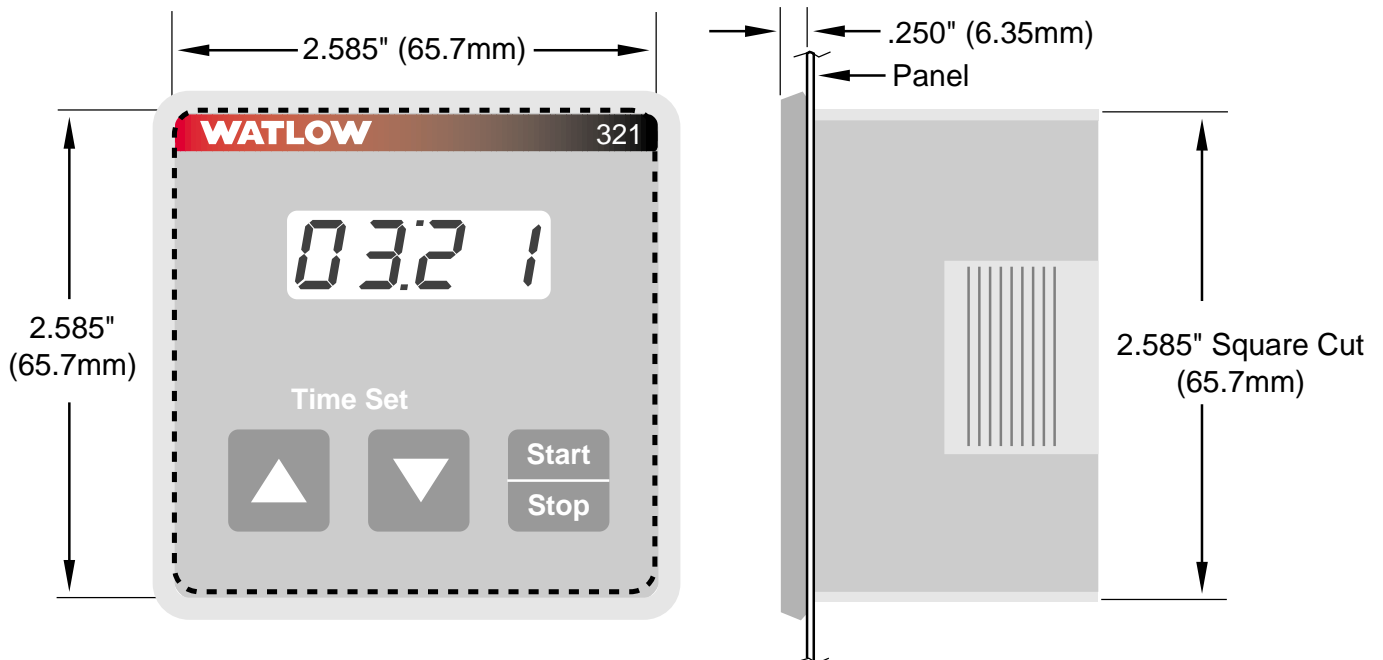


Installation

Through-the-Panel Installation Procedure:

1. Make a panel cutout using the dimensions in Figure 2c.
2. Remove the timer from its collar and set the collar aside.
3. Insert the timer into the cutout. Check to see that the gasket is not twisted and is fully seated in its channel.
4. While pressing the front of the timer against the panel, slide the mounting collar over the back of it. The tabs on the collar must line up with the ridges on the timer for secure installation - see Figure 1b.
5. The tabs on each side of the collar have teeth that latch into the ridges of the timer. Be sure to apply enough pressure to firmly install the timer.

Figure 2c – Series 321 Through-the-Panel dimensions.

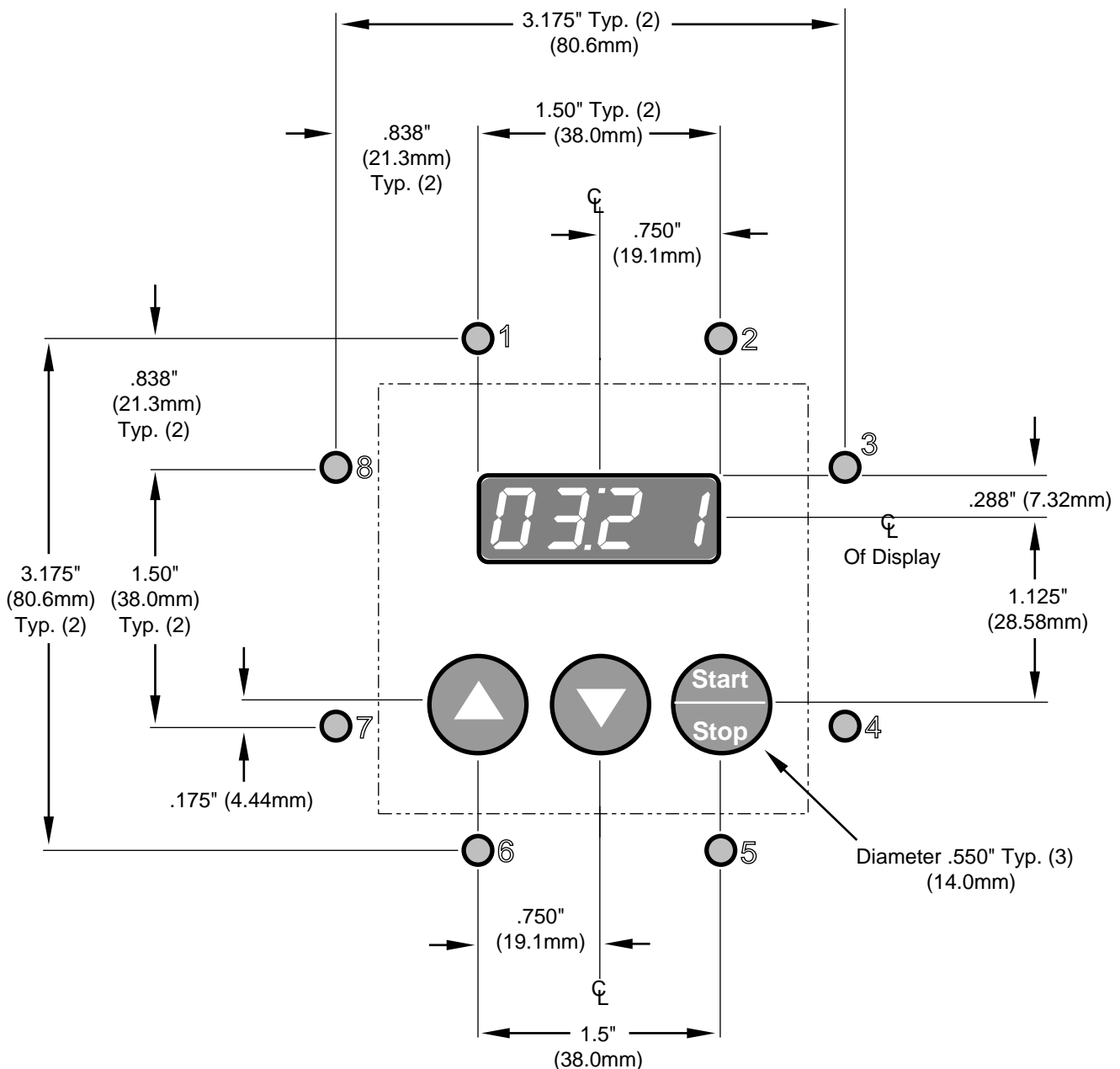


Installation

Flush-Mount Installation Procedure:

1. Make the display and three-key panel cutouts using the dimensions in Figure 3a.
2. Drill four of the eight labeled holes to allow for a #6 stud. You must use a combination of the holes labeled 1, 3, 5, and 7 or the holes labeled 2, 4, 6, and 8.
3. Press the mounting studs through the front of the holes prior to installing your decal/overlay. (NOTE: Decal/overlay is not supplied by Watlow.)
4. Remove the timer from the collar.
5. Remove the gasket and discard, then firmly reinsert the timer into the collar. The tabs on the timer must lock into the ridges on the collar — see Figure 1b.
6. Attach timer/collar to the panel by installing and tightening the nuts on the mounting studs.

Figure 3a – Series 321 Flush Mount dimensions.



Wiring

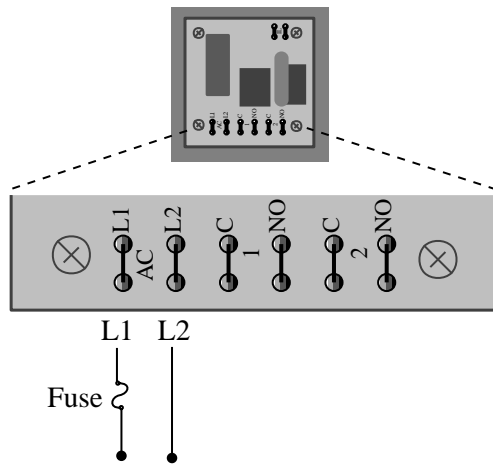
Power Wiring

Voltage Input: 120V~ (ac), nominal.

Figure 4a – Series 321 back view.

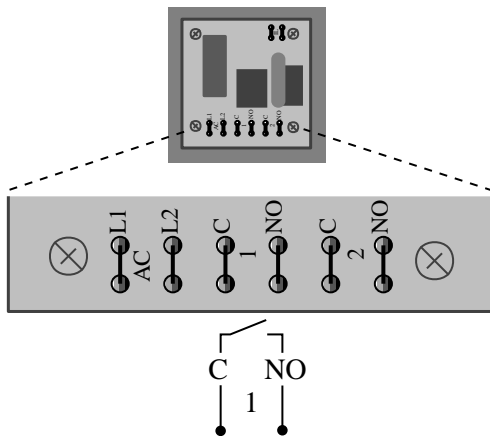


WARNING: Possibility of shock. There is no isolation.



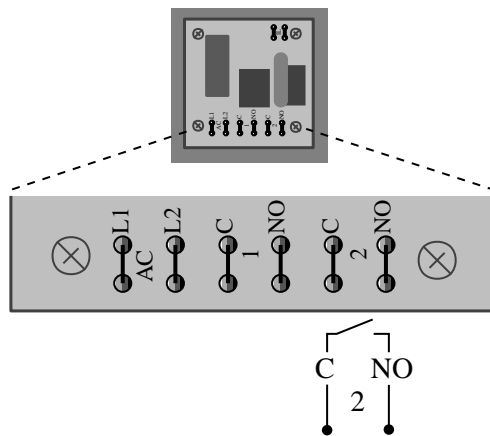
Output 1 Wiring

Figure 4b – Series 321 back view.



Output 2 Wiring

Figure 4c – Series 321 back view.



Wiring

Interlock Wiring

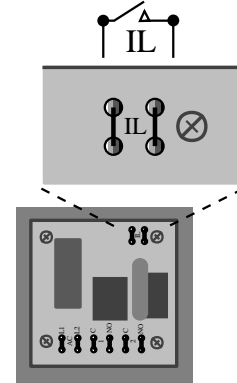
Figure 4d – Series 321 back view.



NOTE: The Interlock must be closed for the timer to initiate a timing sequence.



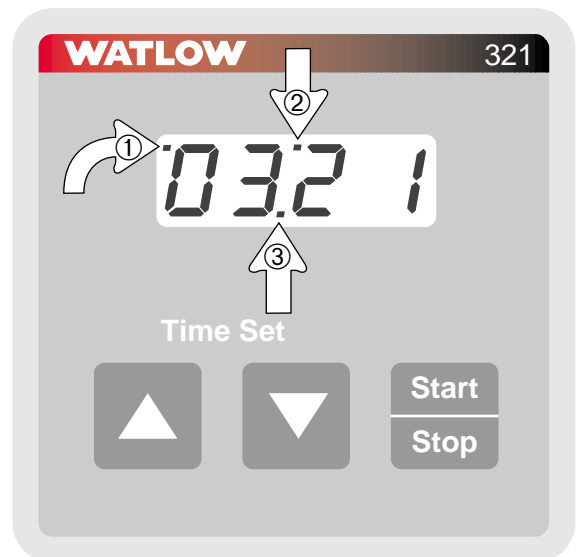
NOTE: The switch and wiring practices used for interlock operations must meet U.L. Standards.



Displays

- **Point ① is flashing:**
Interlock is in an open condition, see Figure 4e.
- **Points ② and ③ are not illuminated:**
Timer is in a Hold/Ready condition, see Figure 4e.
- **Points ② and ③ are illuminated:**
Timer is running, see Figure 4e.
- **Numeric Display is illuminated:**
The Numeric Display is always active when power is applied to the timer, see Figure 4e.

Figure 4e – Series 321 front display.



Operation

Power On

Apply power to the Series 321 — see Figure 4a. The numeric display is always active when power is applied to the timer.

Increase Time



Pressing this key increases the countdown time. If the Increase Time button is pressed when the maximum time, 9959, is displayed, the unit will wrap to the minimum number, 000, and continue increasing.

Decrease Time



This key is used to decrease the countdown time. If the Decrease Time button is pressed when the minimum time, 000, is displayed, the unit will wrap to the maximum number, 9959, and continue decreasing.



NOTE: Actuation of the Increase or Decrease keys will not be recognized when a countdown sequence is in progress.

Start/Stop



This key is used to start and stop the countdown sequence, enter a countdown time into memory, recall a countdown time from memory, and deactivate Relay 1 or Relay 2.

- Pressing this key when a countdown sequence is in progress will cause the timer countdown to stop and Relay 1 to de-energize. The unit will then go into the Hold/Ready condition.
- Pressing this key when a countdown time greater than 0 is selected and the timer is in a Hold/Ready condition will cause Relay 1 to energize and the timer to begin counting down in one second intervals.
- Pressing this key while Relay 2 is energized after completing a countdown sequence will cause Relay 2 to de-energize prior to the 30 second time out. Relay 2 will remain de-energized until next countdown sequence is completed.

Removing the Series 321

Through-the-Panel Mount Removal:

1. To remove the Series 321, you must first remove the mounting collar.
2. To remove the mounting collar, slide a thin tool, such as a putty knife, between all three mounting tabs and the ridges on both sides of the Timer at once — see Figure 1b.
3. While lifting the tabs, push on the back of the Timer and slide it out of the mounting collar.

Memory Operation

Memory Feature

The memory feature is always active.

Storing — Every time the countdown sequence is initiated, the beginning countdown time, as shown in the display, will be stored in memory. This will replace any previously stored countdown time.

Recalling — The time stored in the memory is recalled by pressing the Start/Stop key while a countdown sequence is not in process and the display is at 000. The time recalled from the memory will be shown on the display.

Modifying — Once the recalled time is shown on the display and the countdown sequence has not begun, it can be modified using the Increase or Decrease Time keys. If you modify the recalled time it will replace the stored time when the Start/Stop key is pressed.

Using — When the timer is in the Hold/Ready state and the memory time or the modified memory time is displayed, pressing the Start/Stop key will begin the countdown sequence.

Troubleshooting

- **Display is not illuminated:**
Check for proper power wiring – see Figure 4a.
- **Upper left decimal point is flashing:**
Interlock condition has opened during a countdown sequence – see Figure 4e.
- **Timer will not initiate a countdown:**
Interlock has opened.
- **Other:**
Check all wiring connections – see Page 2, Contact your Watlow Sales Agent, Contact us;
Phone: 507-454-5300
Fax: 507-452-4507
For technical support, ask for an Applications Engineer. To place an order, ask for customer service. To discuss a custom option ask for a Series 321 Product Manager.

Flush-Mount Removal:

1. Remove the four nuts on the mounting studs that you previously installed to attach the Timer to the panel.
2. Remove the Timer and mounting collar from the panel.
3. Then follow the "Through-the-Panel Mount Removal" procedure for removing the mounting collar.

Specifications

(1015)

Control Mode

- Countdown timer: hours/minutes, minutes/seconds
- Timer output modes: Output 1 energized during countdown only, Output 2 energized at completion of countdown for a period of 30 seconds

Operator Interface

- Single, four digit (seven segment) display, red
- Three tactile feedback momentary contact or push button switches

Outputs, Dual

- #1: Mechanical relay form A 6A @ 120V~ (ac), 3A @ 240V~ (ac) no RC contact suppression
- #2: Mechanical relay form A 6A @ 120V~ (ac), 3A @ 240V~ (ac) no RC contact suppression

Safety Interlock

- Dry contact closure, minimum switch open resistance: 1M ohm, maximum switch closed resistance: 500 ohms

Timer Accuracy

- + 0.1% of programmed time
- Timer resolution 1 second

Agency Approvals

- UL 917
- C-UL

Power

- 108 to 132V~ (ac), 57 to 63 Hz

Mechanical

- Square 1/8 DIN panel-mount or behind the panel flush-mount
- Width x height x depth = 2.677" x 2.677" x 1.50" (68mm x 68mm x 37.5mm)

Operating Environment

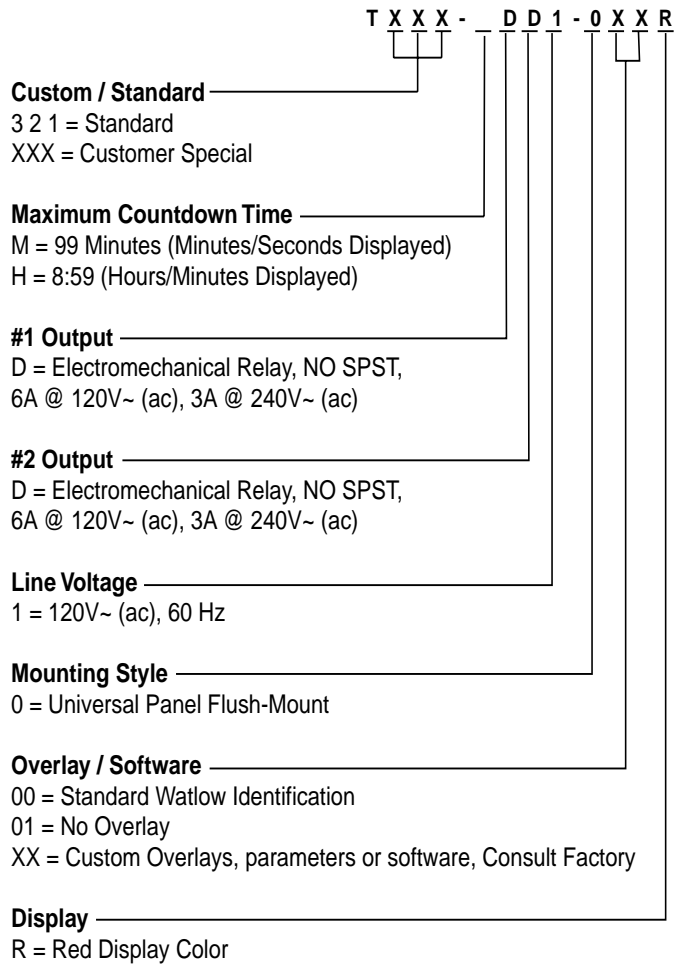
- 0 to 60°C / 32 to 140°F
- 0 to 90% RH non-condensing

Returns

1. Call Customer Service: 507-454-5300, or fax: 507-452-4507, for a Return Material Authorization (RMA) number before returning any item for repair.
2. Make sure the RMA number is on the outside of the carton and on all paperwork returned. Ship on a freight prepaid basis.
3. A restocking charge of 20% of the net price applies for all stock controls and accessories returned in like-new condition and within 120 days after shipment. Non-stock and modified stock items are not returnable.
4. If the unit is unrepairable, it will be returned to you with a letter of explanation. Repair costs will not exceed 50% of the original cost.

Ordering Information

(1016)



Recycling

To assure proper disposal, Watlow accepts used 321s. Phone (507) 454-5300 for Return Materials Authorization (RMA) number. Contact your Watlow representative for details.

Warranty

The Series 321 is warranted to be free of defects in material and workmanship for 36 months after delivery to the first purchaser for use, providing that the unit has not been misapplied. Because Watlow has no control over its use or misuse, we cannot guarantee against failure. Watlow's obligations hereunder, at Watlow's option, are limited to replacement or refund of the purchase price of a unit that upon examination proves to be defective within the warranty period. This warranty does not apply to damage resulting from transportation, alteration, misuse or abuse.