

# Silver Series EM Operator Interface Terminal

## Watlow® Offers the Silver Series EM Operator Interface Terminal to Give Your System an Easy-to-Use Interface with E-Mail Messaging

The Silver Series EM is a rugged, touchscreen operator interface terminal (OIT). Available in three sizes (4.3, 7 and 10 inch diagonal display sizes), the OIT's feature serial and Ethernet communications with multiple controllers, e-mail messaging, universal serial bus (USB host), data logging, flexible password security and multiple languages. The small bezel size and two-inch depth make mounting in tight spots easy.

The Silver Series EM programming software, EZwarePlus, is easy to use and features a large variety of built-in screen objects that makes it powerful. When creating screens, the user can call upon extensive graphics libraries, import custom graphics and add numeric displays, entry fields, analog meters, bar graphs and trend graphs with just a few mouse clicks. Screen objects are highly customizable, and the user can create libraries of their own objects for repeat use. The online simulator, Ethernet and USB support make testing and downloading fast. The EZwarePlus screen editor is part of the EZwarePlus software suite and is available as a FREE download on [www.watlow.com](http://www.watlow.com) and on the DVD-ROM found in the accessories list on page six.

The Silver Series EM OIT paired with Watlow® controllers is the perfect solution for your industrial process or machine control application.

### Features and Benefits

#### Bright, color, high resolution, graphic, touchscreen, thin film transistor (TFT) display

- Maximizes display space in the OIT footprint
- Allows application specific interface design
- Allows viewing from a distance and at an angle
- Highlights important process information with color and animation

#### User selectable portrait or landscape operation

- Fits in tight spots

#### Ethernet, serial and USB host ports

- Allows options for connecting to controllers
- Provides options for downloading projects
- Expands memory for recipe and data log storage
- Supports barcode readers, keyboard, mouse and printers
- Supports monitoring from a personal computer (PC) with free VNC Client software



#### Support for over one hundred protocols, up to three simultaneously plus multiple protocols over Ethernet

- Connects to a wide range of industrial controllers and devices
- Integrates a variety of devices to simplify complex operation tasks

#### Data logging, display and trending

- Helps operators monitor processes
- Reduces labor and increases accuracy by automating time-stamped data collection
- Stores captured data for future retrieval in multiple files
- Saves time by exporting data to Excel®-compatible comma separated value (CSV) files
- Improves process understanding by allowing live and historical data to be viewed on the OIT

#### Alarm and event e-mail notification, monitoring and recording

- Reduces downtime by helping troubleshoot equipment and processes
- Simplifies troubleshooting by recording time and date-stamped alarm and event history
- Organizes and prioritizes alarms and events in up to 255 categories and 4 priority levels

#### Recipe management

- Reduces errors by automating process setting changes

#### Offline and online simulation

- Speeds up development by making it faster and easier to test projects
- Allows faster creation of fine-tuned interfaces by speeding up iterations

#### Time or trigger-based data exchange

- Simplifies integration by allowing the OIT to copy data from one controller or OIT to another

#### Internal, piezoelectric buzzer

- Provides audible alarms and key chirp

#### Two-year warranty

- Provides product support and reliability

## Features and Benefits (cont.)

### Screen object password security with programmable hierarchy and multiple users

- Prevents errors and tampering by allowing only authorized users to access restricted items on the screen
- Allows flexible hierarchies by letting the developer assign each screen object to any of 12 groups and grant each user access to any combination of groups
- Provides password protection for upload, download and access to local setup
- Supports up to 127 users

### Screen object invisibility and/or interlock control

- Prevents errors by guiding operators

### Powerful, easy-to-use EZwarePlus, programming software

- Requires only a small investment in time to create a useful interface
- Provides the ability to learn additional features as needed
- Provides advanced interface features such as animation and pop-up windows
- Reduces development time by providing extensive graphical libraries and facilitating reuse with user-created libraries

- Simplifies development by allowing import of common graphic formats: bitmaps, JPEGs and animated GIFs

### User-programmable macros with math functions and support for floating point

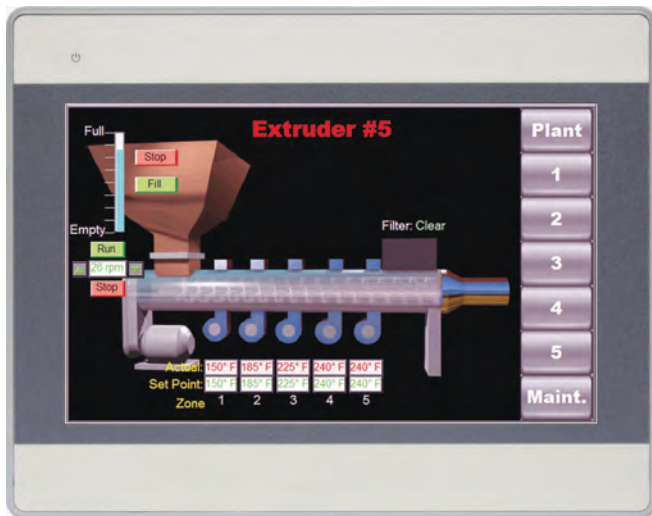
- Extends functionality
- Automates processes

### TrueType fonts with Unicode (international) characters and language switching feature

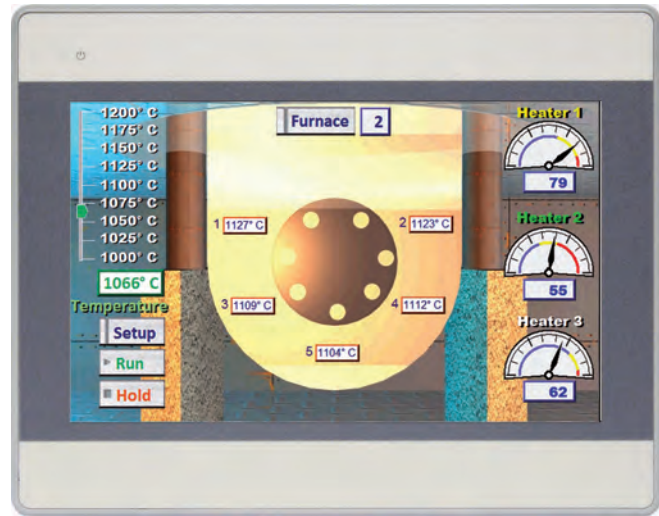
- Makes screens easy to read by allowing bold, italic, underlined, scrolling and blinking text to direct operator's eyes
- Prevents errors by communicating with users in their native languages
- Reduces development and support by allowing inclusion of up to 24 user-selectable languages in a project

### UL®, NEMA 4, CE, RoHS

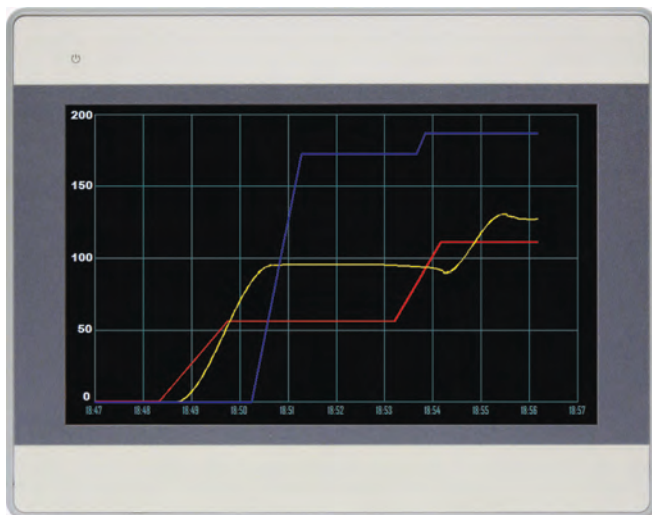
- Allows use in harsh industrial environments
- Assures prompt product acceptance



Integrate multiple devices to simplify operation of complex systems



Include the types of displays users understand such as gauges, sliders and bar graphs to make screens intuitive



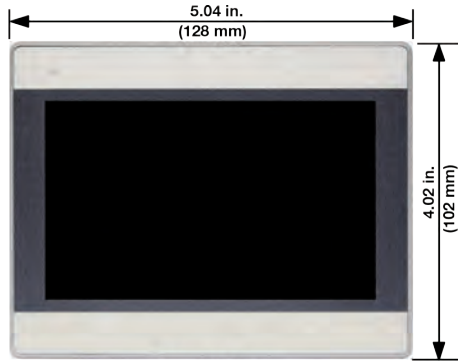
Log and graph process data for quality records and better process control



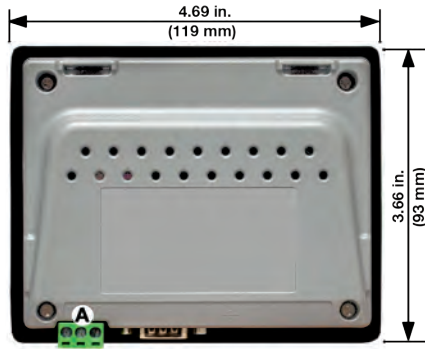
Create screens that guide work flow

## Dimension and Connection Diagrams

### Models TS00-0043-EM00



Front View



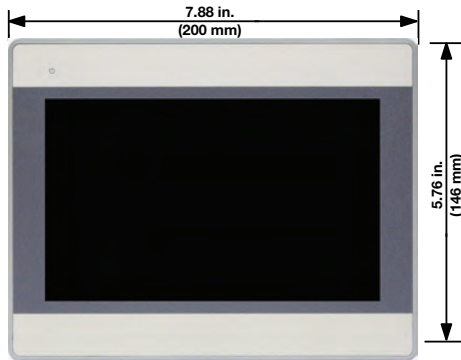
Rear View

- A Power connector
- B Serial ports
- C USB host port
- D Ethernet port

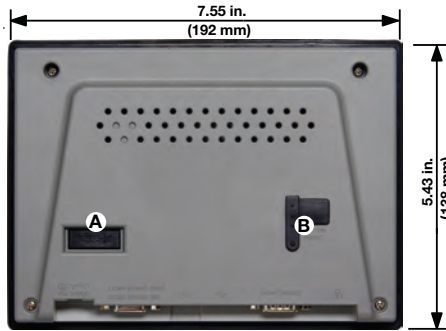


Bottom View

### Model TS00-0070-EM00



Front View



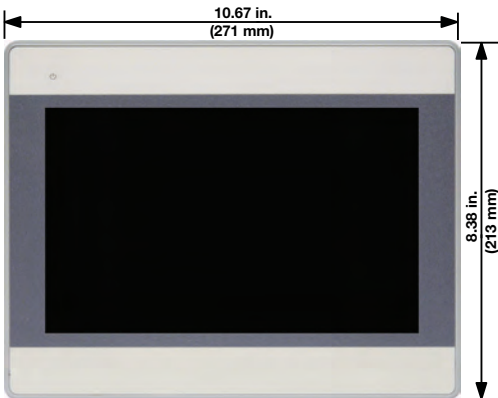
Rear View

- A Fuse
- B Switches and reset button
- C Power connector
- D Serial ports
- E USB host port
- F Ethernet port

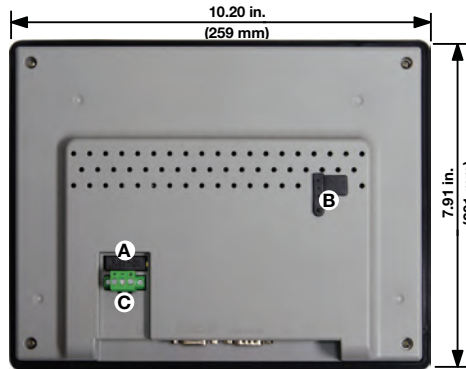


Bottom View

### Model TS00-0100-EM00



Front View



Rear View

- A Fuse
- B Switches and reset button
- C Power connector
- D Serial ports
- E Ethernet port
- F USB host port



Bottom View

## Specifications

| Feature                        | Model Number   |   |  |
|--------------------------------|--|---|--|
|                                | TS00-0043-EM00   | TS00-0070-EM00                                | TS00-0100-EM00                                 |
| Processor Type                 | 600 MHz, 32-bit, RISC, fanless                                     |   |  |
| Memory                         | 128MB Flash, 128MB DRAM  |   |  |
| Ethernet Port                  | 10/100 Base-T (RJ45)   |   |  |
| Serial Ports                   | COM1: RS-232 or RS-485 (2-wire or 4-wire)<br>COM3: RS-485 (2-wire) |   |  |
| USB Host (Type A) Version 2.0  | 1 each   |   |  |
| Real Time Clock                | Built-in   |   |  |
| Audible Alarm and Key Chirp    | Piezoelectric buzzer   |   |  |
| Display Type                   | TFT LCD  |   |  |
| Resolution (Pixels)            | 480 x 272  | 800 x 480                                     |  |
| Colors                         | 16 million   |   | 262 thousand                                   |
| LED Backlight Brightness       | 500 cd/m <sup>2</sup>  | 350 cd/m <sup>2</sup>                         | 300 cd/m <sup>2</sup>                          |
| Contrast Ratio                 | 500:1  |   |  |
| Viewing Angle                  | Top: 50°, bottom, right, left: 70°                                 | Top: 60°, bottom, right, left: 70°            | Top: 45°, bottom, right, left: 65°             |
| Backlight Longevity            | 30,000 hours   |   |  |
| Touchscreen Type               | 4-wire analog resistive  |   |  |
| Touchscreen Resolution         | Continuous   |   |  |
| Touchscreen Light Transmission | Greater than 80%   |   |  |
| Touchscreen Lifespan           | 1,000,000 activations min.   |   |  |
| Operating Temperature          | 32 to 122°F (0 to 50°C)  |   |  |
| Storage Temperature            | -4 to 140°F (-20 to 60°C)  |   |  |
| Relative Humidity              | 10 to 90% @ 40°C (non-condensing)                                  |   |  |
| Operating Shock Resistance     | 10 to 25 Hz (X, Y, Z direction 2G, 30 min.)                        |   |  |
| Environmental Ratings          | NEMA 4 (IP65) indoor only  |   |  |
| Agency                         | CE, cULus, RoHS,   |   |  |
| Enclosure                      | Plastic molded   |   |  |
| Mounting                       | Panel  |   |  |
| Dimensions Cutout (W x H)      | 4.69 x 3.66 in.<br>(119 x 93 mm)                                   | 7.55 x 5.43 in.<br>(192 x 138 mm)             | 10.20 x 7.91 in.<br>(259 x 201 mm)             |
| Dimensions Overall (W x H x D) | 5.04 x 4.02 x 1.26 in.<br>(128 x 102 x 32 mm)                      | 7.88 x 5.76 x 1.34 in.<br>(200 x 146 x 34 mm) | 10.67 x 8.38 x 1.57 in.<br>(271 x 213 x 40 mm) |
| Weight                         | 0.55 lbs (0.25 kg)   | 1.3 lbs (0.6 kg)                              | 2.9 lbs (1.3 kg)                               |
| Input Power: Voltage           | 24VDC  |   |  |
| Input Power: Current           | 300mA max.   | 350mA max.                                    | 400mA max.                                     |

## EZwarePlus Software System Requirements

### Compatible Operating Systems:

- Windows® 8, 7, Vista and XP

## EZwarePlus Software Suite

The EZwarePlus software suite includes EasyConverter, EZwarePlus screen editor, Utility Manager and Recipe Editor programs.



Utility Manager uploads and downloads projects to and from the Silver Series EM OIT, opens compiled projects in simulation and launches the other EZwarePlus programs.

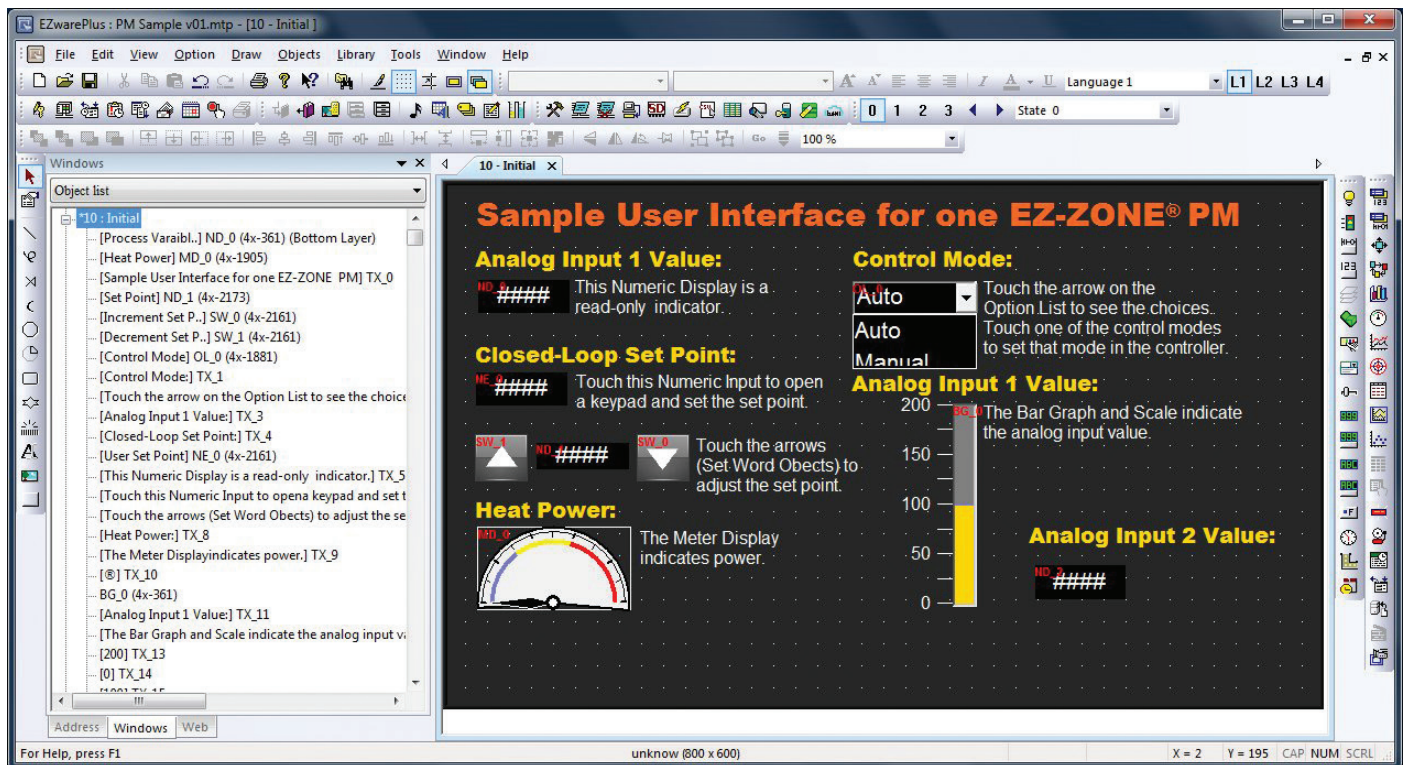
| ID | ADDRESS | Recipe Name        | Set Point 1 | High Process Alarm 1 | Set Point 2 | High Process Alarm 2 | Cor |
|----|---------|--------------------|-------------|----------------------|-------------|----------------------|-----|
| 0  | 0       | Standard Process   | 450.5       | 500                  | 487         | 525                  |     |
| 1  | 19      | Spec for Alpha Lab | 235         | 250                  | 215         | 250                  |     |
| 2  | 38      | Mil Specificatio   | 425.1       | 450                  | 375         | 425                  |     |
| 3  | 57      | FDA Test           | 140.3       | 175                  | 150.7       | 180                  |     |
| 4  | 76      | CE Test            | 50          | 65                   | 75          | 100                  |     |

The Recipe Editor configures memory files for use with Silver Series EM OITs and allows offline creation of recipes.

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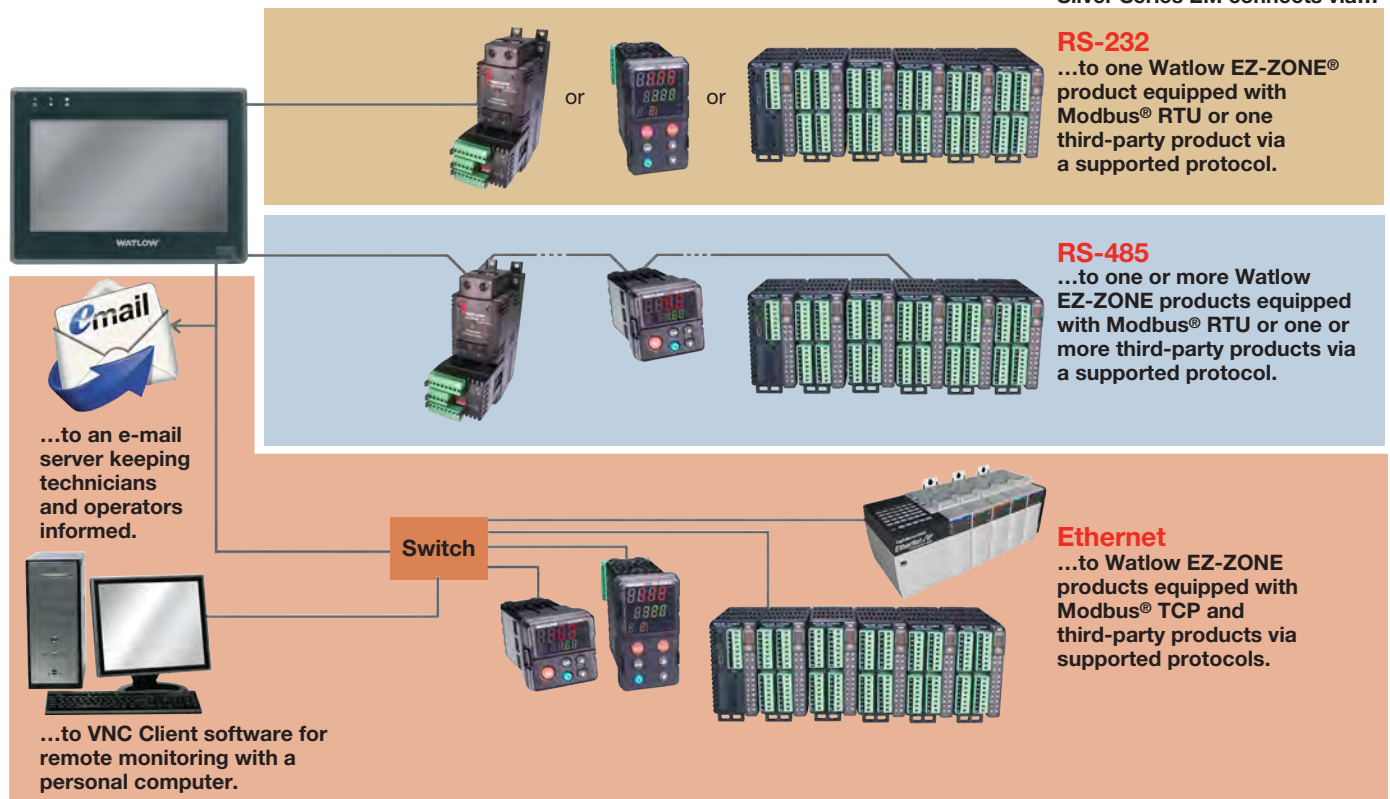
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*2011/12/14*,*00:01:22*,*920*,*65.909*,*68.476*,*74.474*,*74.088*,*88.937*,*62.009*,*82.046*,*79.539*
*2011/12/14*,*00:02:22*,*930*,*65.887*,*68.052*,*74.495*,*74.116*,*88.485*,*61.595*,*2491.178*,*78.822*
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*2011/12/14*,*00:12:22*,*840*,*65.761*,*67.513*,*73.763*,*73.810*,*88.
    
```

EasyConverter converts log files saved by the Silver Series EM OIT to file formats used by popular Windows® software such as Microsoft® Excel.



EZwarePlus provides a graphical screen designing environment with point-and-click access to features and drag-and-drop ease.

## Connectivity



## Ordering Information

| Part Number    | Description  |
|----------------|--|
| TS00-0043-EM00 | 4.3 in. (480 x 272) color TFT LCD touchscreen, USB host, two serial ports and Ethernet |
| TS00-0070-EM00 | 7 in. (800 x 480) color TFT LCD touchscreen, USB host, two serial ports and Ethernet   |
| TS00-0100-EM00 | 10 in. (800 x 480) color TFT LCD touchscreen, USB host, two serial ports and Ethernet  |

## Accessories

| Part Number    | Description   |
|----------------|---|
| 0601-0001-0000 | Controller support tools DVD-ROM with programming software and product manuals  |
| 0830-0750-0000 | Power supply, Input: 85-264VAC, Output: 24VDC, 1.7A, 40W (not Class 2)  |
| 0847-0299-0000 | Class 2 power supply, Input: 90-264VAC, Output: 24VDC, 1.3A, 31W  |
| 0219-0388-0000 | TS00-0043-EM00 communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE® controller screw terminals                  |
| 0219-0374-0000 | TS00-0070-EM00 or TS00-0100-EM00 communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE controller screw terminals |
| 0830-0782-0000 | Package of 5 ea. protective screen covers for the TS00-0043-EM00  |
| 0830-0753-0000 | Package of 5 ea. protective screen covers for the TS00-0070-EM00  |
| 0830-0754-0000 | Package of 3 ea. protective screen covers for the TS00-0100-EM00  |

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