

Excel 15 W7760A BUILDING MANAGER

INSTALLATION INSTRUCTIONS

PRODUCT DESCRIPTION

The Excel 15 W7760A Building Manager is a freely configurable controller that can be used to monitor and control HVAC equipment and other miscellaneous loads in a distributed network. (See Fig. 1.) The optional lithium battery (not included, purchased locally) allows continuous power so trend logs and alarms can be maintained for up to four years.

The W7760A Building Manager communicates via the 78 kilobaud Echelon® LONWORKS® E-Bus Network, using a free topology transceiver (FTT).

INSTALLATION

When mounting the W7760A, allow clearance for wiring, servicing and cover removal. Avoid areas where acid fumes or other deteriorating vapors can attack the metal parts of the device, or where escaping gas or other explosive vapors are present because the W7760A enclosure is constructed of a plastic base (with wiring terminal blocks), and a plastic snap-on cover (containing electronics). The cover is designed with ventilation openings and test holes to allow proper heat dissipation and diagnostics testing without cover removal. See Fig. 2 for cover assembly mounting dimensions.

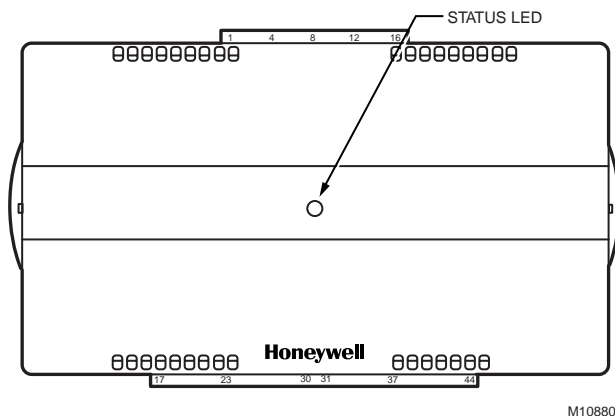


Fig. 1. Excel 15 W7760A Building Manager.

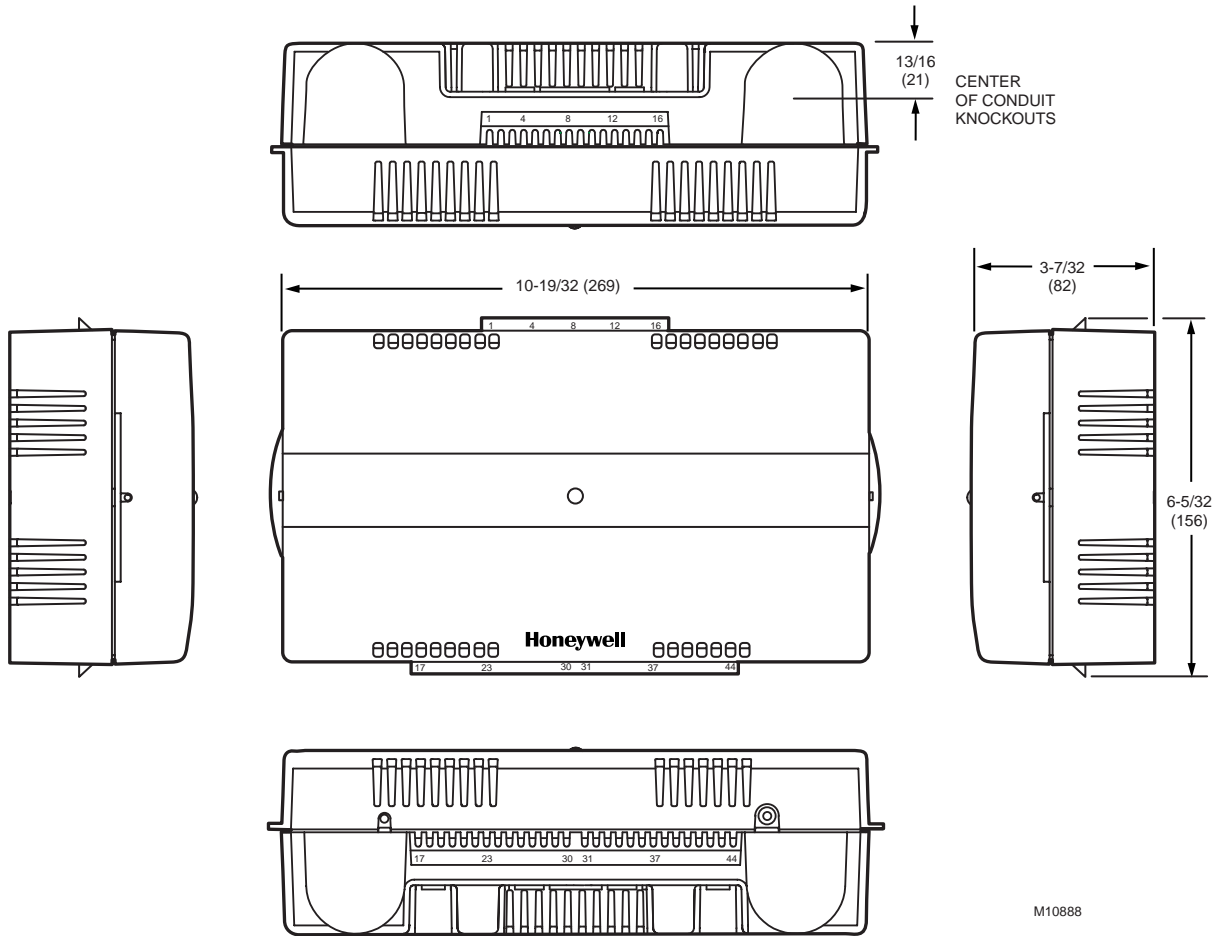
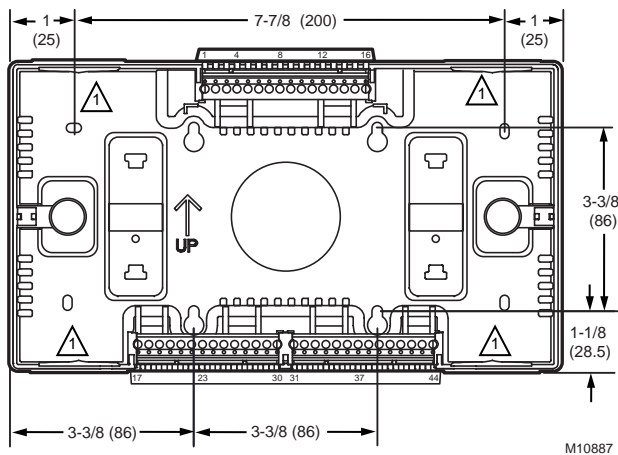


Fig. 2. W7760A cover assembly mounting dimensions in in. (mm).

The W7760A subbase mounts on a standard 4 in. x 4 in. junction box, DIN rail, panel or wall. Use four screws to mount the subbase. Use a screw type (sheet metal, self-tapping or thread forming) appropriate for the mounting surface used. See Fig. 3 for subbase mounting dimensions.

The W7760A wiring is terminated to screw terminal blocks located on the top and bottom of the subbase. See Wiring section for additional wiring information. For DIN rail mounts, purchase two DIN rail adapters, part number TKAD, from Thomas and Betts. After wiring is pulled through the junction box, mount the W7760A. See Fig. 4 through 6.



1 EACH CONDUIT HOLE HAS TWO KNOCKOUT OPENINGS:
1 IN. (25 MM) AND 3/4 IN (19 MM).

Fig. 3. W7760A subbase mounting dimensions in in. (mm).

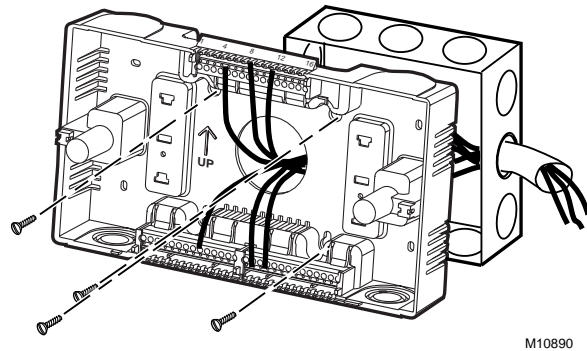


Fig. 4. W7760A junction box mount.

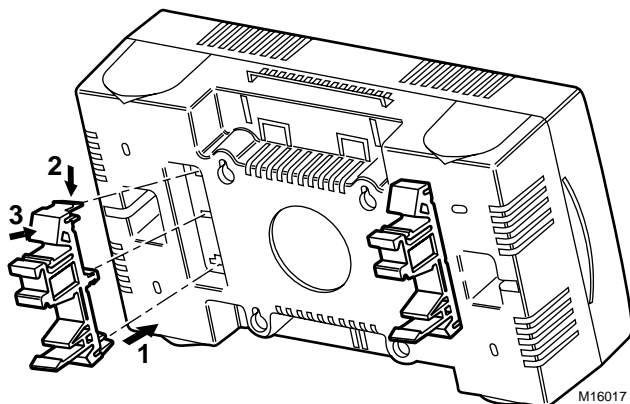


Fig. 5. W7760A DIN rail mount.

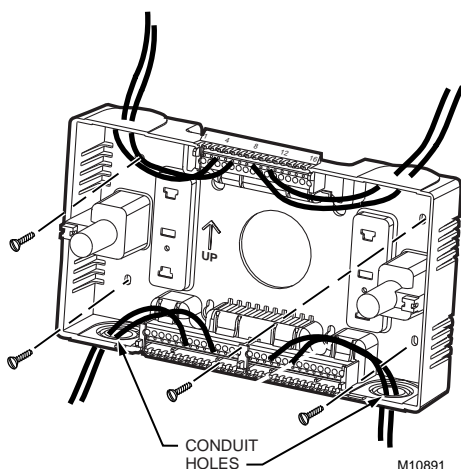


Fig. 6. W7760A wall mount.

Wiring

IMPORTANT

All wiring must agree with applicable codes, ordinances and regulations or as specified in installation wiring diagrams.

The Excel 15 W7760A Building Manager wiring is terminated at the screw terminal blocks located in the subbase.

NOTES:

- For multiple building managers operating from a single transformer, connect the same side of the transformer secondary to the same power input terminal in each device. Connect the ground terminal (1 on the W7760A) to a verified earth ground for each building manager in the group, see Fig. 8. (W7760A Building Manager configurations are not limited to two devices, but the total power draw including accessories cannot exceed 100 VA when powered by the same transformer (US only). See W7760A System Engineering, form 74-2969, for power wiring recommendations.

- Power loads from an Excel 15 W7760A Building Manager with the same transformer.
- Keep the earth ground connection (terminal 1) wire run as short as possible. Refer to Fig. 7.
- Do *not* connect the analog or digital ground terminals (4, 7, 10, 13, 16), (29, 30), and (40) to earth ground. Refer to Fig. 7.

High-Side, Low-Side Switching

Terminal 38, labeled OUT COM, is the common for digital outputs 1 through 8 and must be connected. For digital output connections for high side switching, terminal 38 is the common tie point for 24 Vac and must be connected to terminal 37. For low side switching, terminal 38 is the common tie point for 24 VAC COM and must be connected to terminal 31 or 32. See Fig. 12.

IMPORTANT

Do not mix connections for high- and low-side switching devices on the W7760A.

W7760A Triac output driven hardware must have a minimum current draw of 25 mA and a maximum current draw of 500 mA, with a maximum of three outputs at 500 mA.

Power

Provide 24 Vac power from an energy-limited Class II power source to each W7760A Building Manager.

NOTE: See W7760A Building Manager device label for power requirements.

To conform to Class II restrictions (US only), use 100 VA or smaller transformers, such as the AT88 series. More than one W7760A Building Manager can be powered with a single transformer. See Fig. 7 for power wiring details for a single device and Fig. 8 for multiple devices using one transformer.

IMPORTANT

- Use the heaviest gauge wire available based on a maximum of 14 AWG (2.0 sq mm) and a minimum of 18 AWG (1.0 sq mm), for all power and earth ground wiring.
- Screw type terminal blocks are designed to accept only one 14 AWG (2.0 sq mm) conductor.
- For connections of two or more wires, use a wire nut. Include a pigtail in the wire group and attach the pigtail to OUT COM, terminal 38. Use the appropriate gauge wire (pigtail) for the load connected to OUT COM.

LITHIUM BATTERY

For optional battery backup, a Tadiran Telecommunications Ltd. lithium utility metering battery, model number TL-5276/W, is required. Do not use a substitute for this battery model. (Battery is not included; obtained locally.)

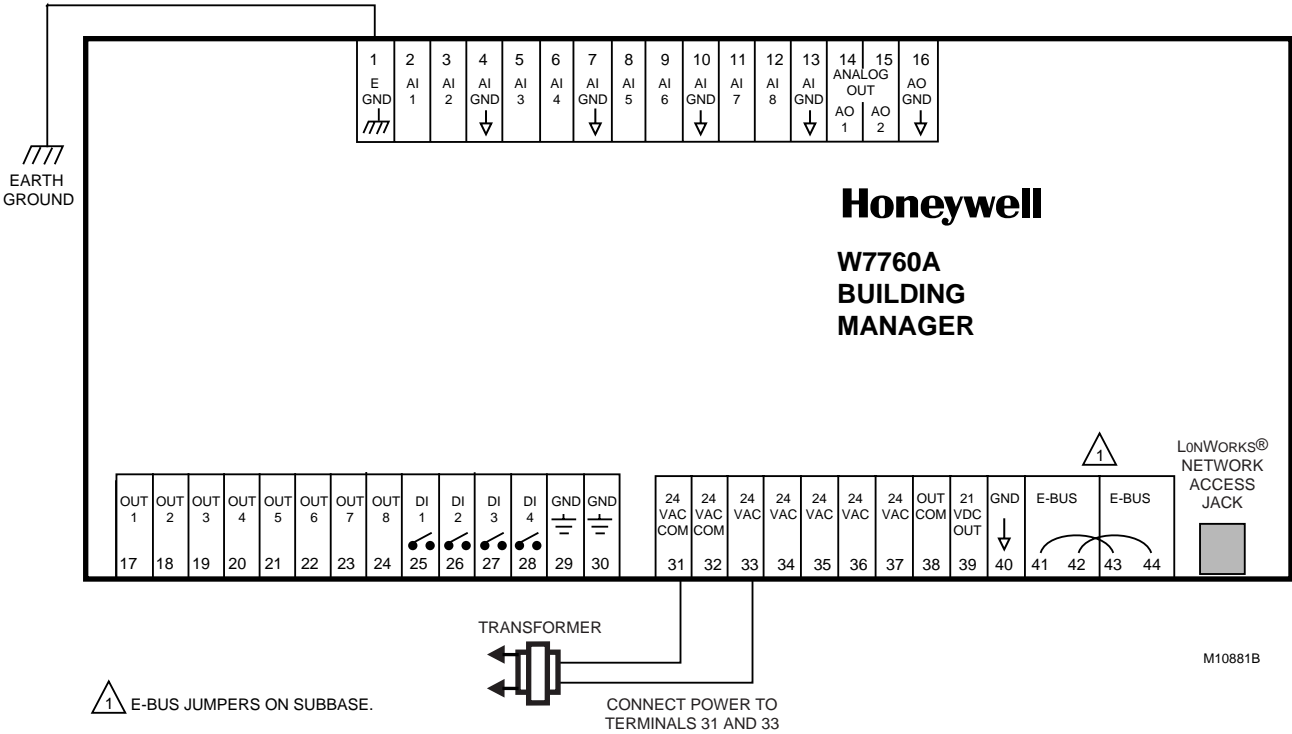


Fig. 7. One W7760A power wiring detail (per transformer).

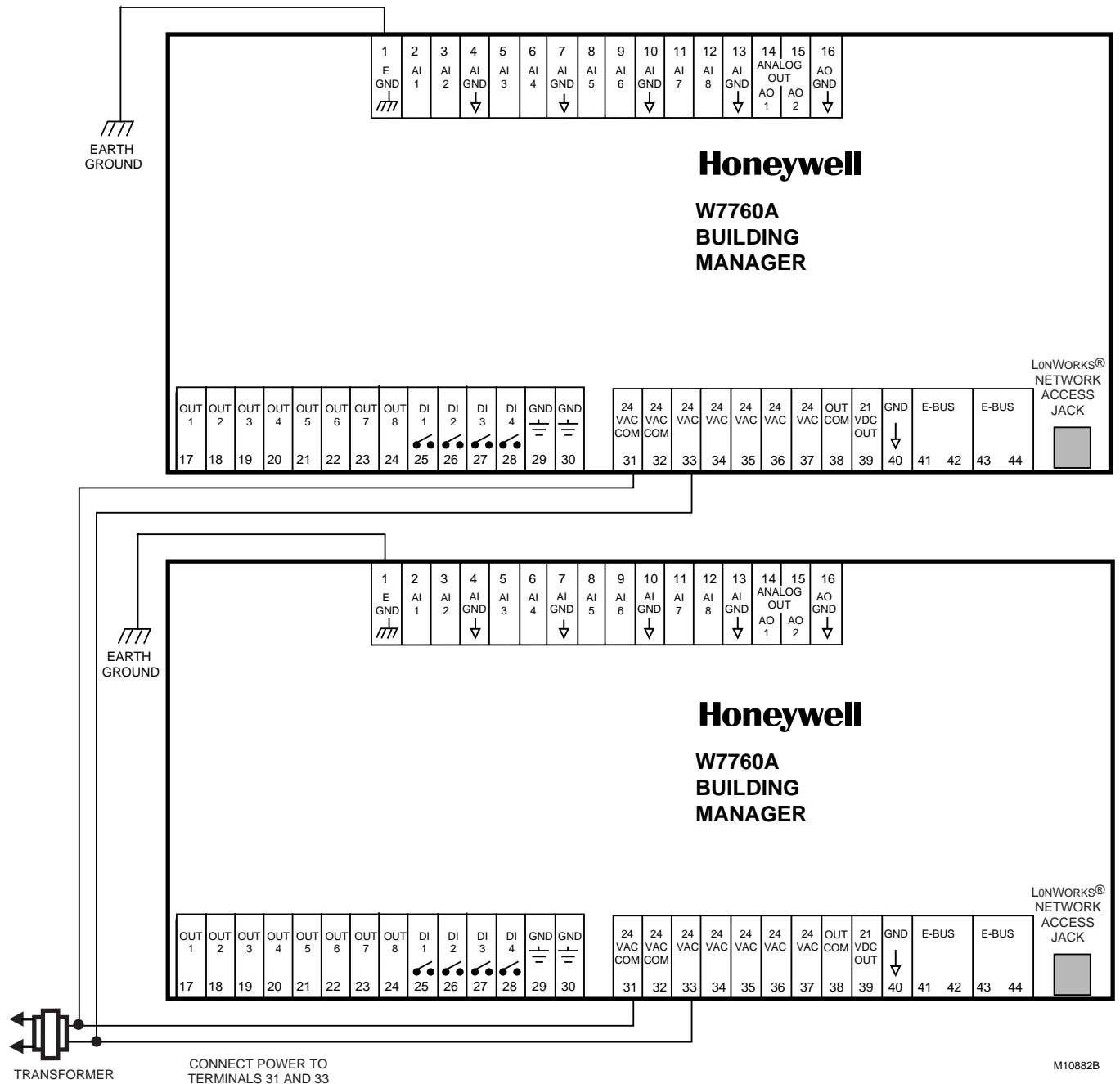


Fig. 8. Two W7760A power wiring details (per transformer).

NOTES:

- Unswitched 24 Vac power wiring can be in the same conduit as the E-Bus cable.
- Maintain at least a 3 in. (76 mm) separation between Triac outputs and E-Bus wiring throughout the installation.

See the following IMPORTANT information about Heating and Cooling Equipment (UL 1995, US only).

IMPORTANT

If the W7760A Building Manager is used on Heating and Cooling Equipment (UL 1995, US only), and the transformer primary power is more than 150 volts, connect the transformer secondary to earth ground, see Fig. 9. In this application, each transformer can power only one W7760A Excel 15 Building Manager.

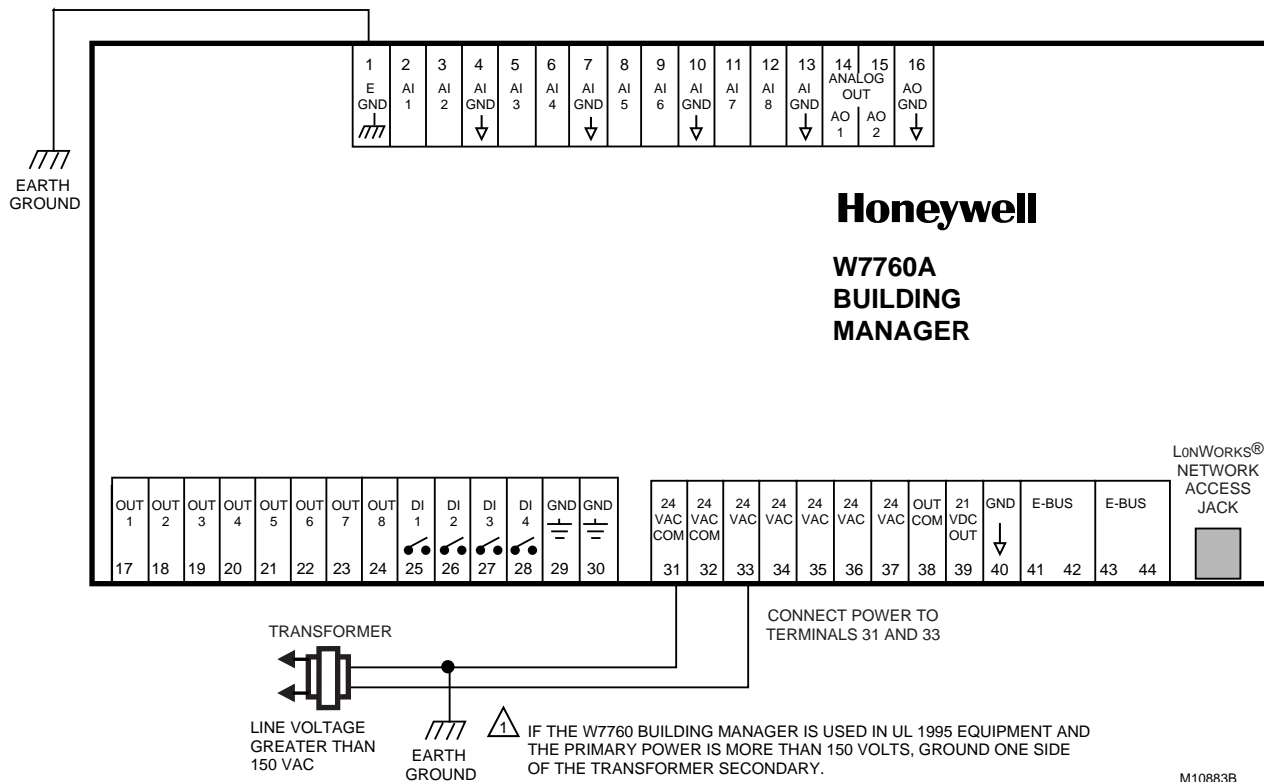


Fig. 9. Transformer power wiring details for one W7760A used in UL 1995 equipment (US only).

Communications

Refer to the E-Bus FTT Network Wiring Guidelines, form 74-2865-1, for a complete description of network topology rules and maximum wire length. If longer runs are required, add a Q7740A 2-way or Q7740B 4-way repeater to extend the LONWORKS® Bus length.

Approved cable types for LONWORKS® Bus communications wiring are Level IV, 22 AWG (0.34 sq mm) plenum and non-plenum rated unshielded, twisted pair, solid conductor wire. For nonplenum areas, use US part AK3781 (one pair) or US part AK3782 (two pair). In plenum areas, use US part AK3791 (one pair) or US part AK3792 (two pair). Also use Echelon® approved cable. Run communications wiring in a conduit, if needed, with *non-switched* 24 Vac or sensor wiring. The Free Topology Transceiver (FTT) communications bus (E-Bus) supports a polarity insensitive, free topology wiring scheme that supports star, loop, and/or bus wiring.

Pull the cable to each device on the LONWORKS® Bus and connect to communication terminals 41 and 42 for the W7760A (43 and 44 for daisy chain wiring).

Notes on Communications Wiring:

- Do not bundle output wires with sensor, digital input or communications LONWORKS® Bus wires.

- Do not use different wire types or gauges on the same LONWORKS® Bus segment. The step change in line impedance characteristics causes unpredictable reflections on the LONWORKS® Bus.
- In noisy (high EMI) environments, avoid wire runs that are parallel to noisy power cables, motor control centers, or lines containing lighting dimmer switches; keep at least 3 in. (76 mm) of separation between noisy lines and the LONWORKS® Bus cable.
- Each W7760A Building Manager can support up to 20 Excel 10 Controllers and three remote input/output (RIO) devices. Four Building Managers can coexist on a single network. For more details on network topology rules, refer to the E-Bus Wiring Guidelines, form 74-2865-1, or see Application Step 3. Lay Out Communications and Power Wiring, of the W7760A System Engineering Guide, form 74-2969.
- Make sure that neither of the LONWORKS® Bus wires is grounded.

IMPORTANT

If using one set of E-Bus terminals for In connections and one set of E-Bus terminals for Out connections and the Excel 15 is removed, the E-Bus daisy chain will be broken. To make a permanent connection, jumper terminal 41 to 43 and terminal 42 to 44 on the subbase. See Fig. 7, Note 1.

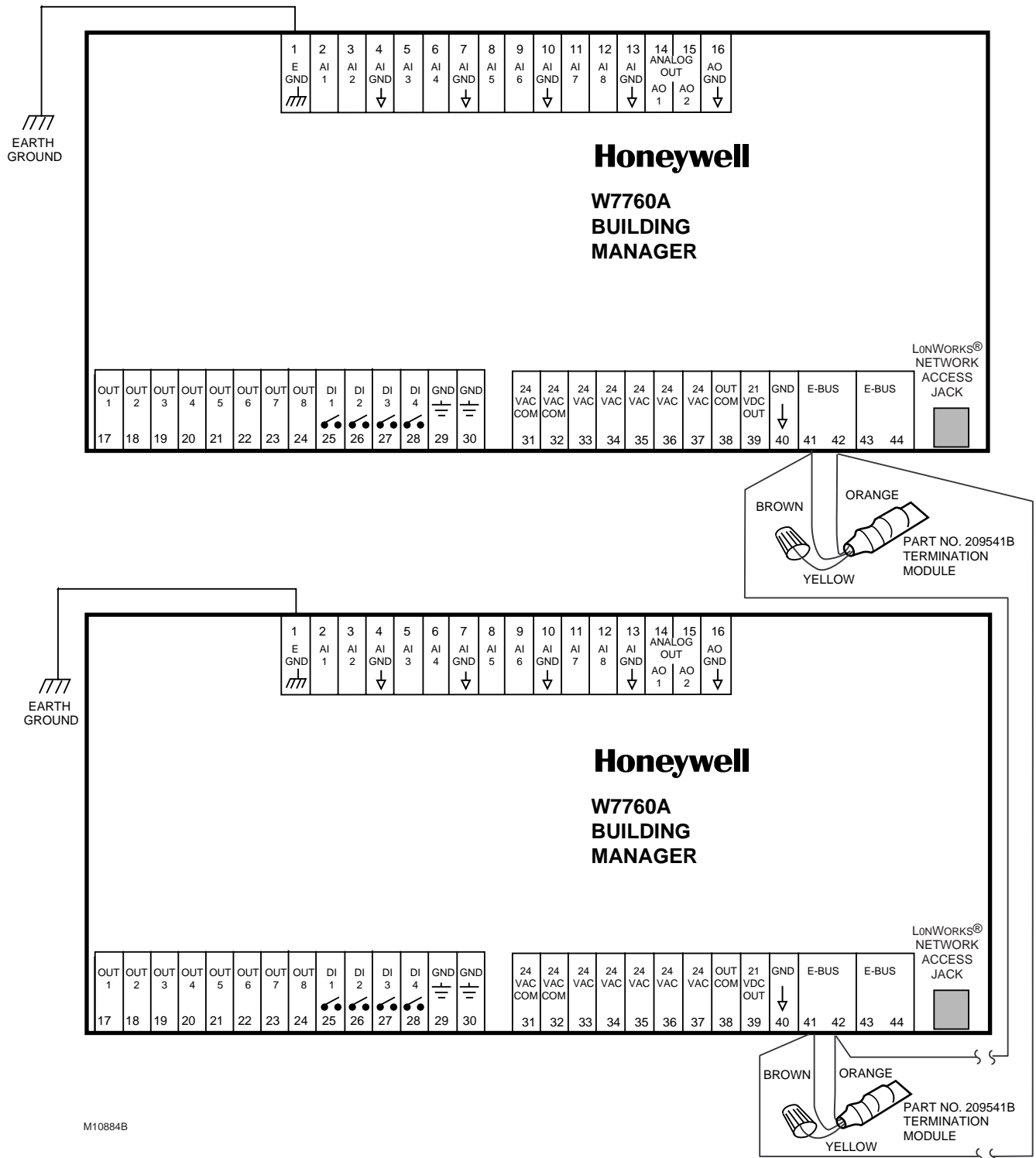


Fig. 10. Doubly terminated LonWorks® Bus termination modules.

NOTE: If a 209541B Termination Module is required at the Building Manager, connect two of the three termination module wires to the LonWorks® Bus terminals. Selecting the two appropriate wires depends on the LonWorks® Bus network topology. For example, when using a doubly terminated daisy-chained bus topology with devices on either end of a LonWorks® Bus wire run, mount the termination module on the appropriate terminals as shown in Fig. 10. Refer to the E-Bus Wiring Guidelines, form 74-2865-1, and the Excel 10 FTT Termination Module Installation Instructions, form 95-7554.

NOTE: Be sure to twist wires together when attaching two or more wires to the same terminal except when using 14 AWG (2.0 sq mm) wire. Any deviation from this guideline can result in improper electrical contact. See Fig. 11.

Wire the terminal blocks as follows:

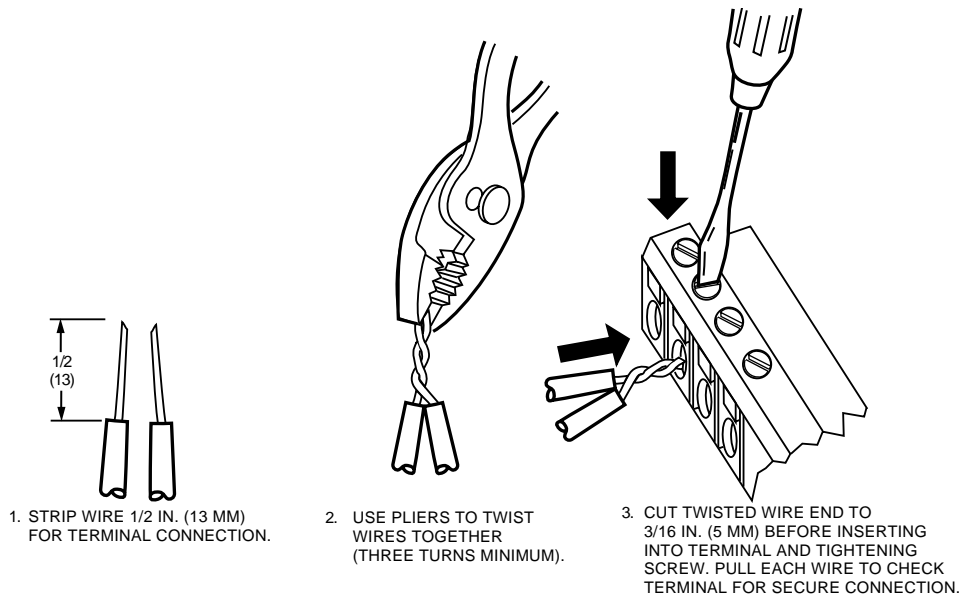
1. Strip 1/2 in. (13 mm) insulation from the conductor.
2. Insert the wire in the required terminal location and tighten the screw to complete the termination.
3. When two or more wires are inserted into one terminal location, use pliers to twist together the wires a minimum of three turns before insertion.
4. Cut twisted wire end to 3/16 in. (5 mm) before inserting into terminal and tightening screw.
5. Pull on each wire in all terminals to check for secure connections.

Wiring Details

The W7760A Building Manager has a terminal arrangement as shown in Fig. 7. Provide operator access connection to the LONWORKS® network by plugging the Serial LonTalk® Adapter (SLTA) connector into the LONWORKS® Bus jack.

NOTES:

- If an Excel 15 W7760A Building Manager is not connected to a good earth ground, the internal transient protection circuitry is compromised and cannot be protected from noise and power line spikes. This can result in a damaged circuit board and require replacing the device. For additional wiring information, see the engineering drawings at the specific job site.



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Fig. 11. Attach two or more wires at terminal blocks.

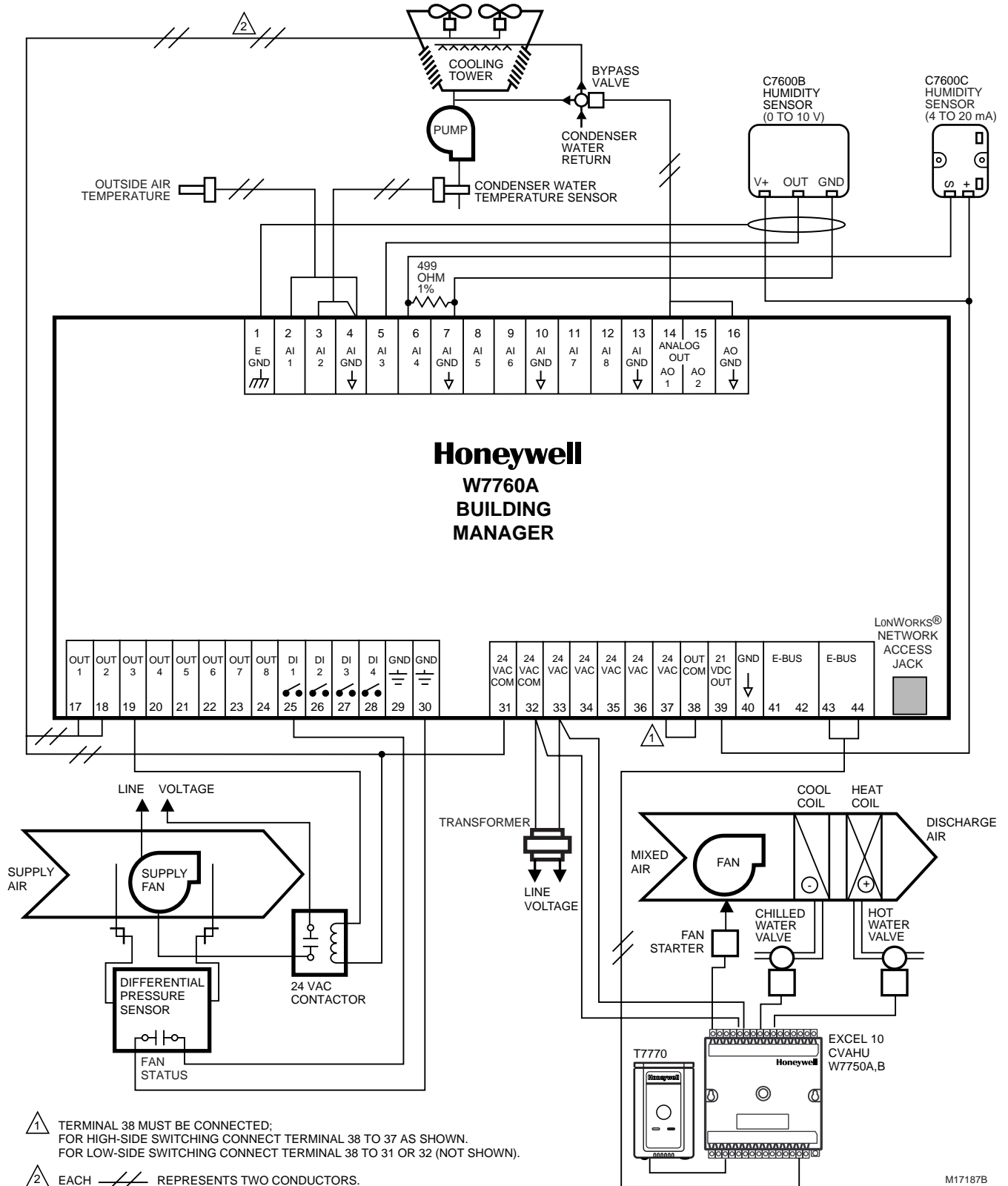


Fig. 12. Typical W7760A application (high-side switching shown).

CHECKOUT AND TEST

Step 1. Check for 24 Vac power.

- Turn on power.
- Use a meter to check for 24 Vac power at the subbase.
- If 24 Vac is not present, check the transformer for secure connections and proper operation.
- If 24 Vac is present at the subbase, turn off the power.

Step 2. Check subbase wiring:

- Inspect all wiring connections at the W7760A terminals and verify compliance with the job site engineering drawings.

NOTE: Each input and output can be tested while the cover assembly is in place by inserting a probe through the service holes.

- If any wiring changes are required, first be sure to remove power from the device before starting work.
- Pay particular attention to:
 - 24 Vac power connections. Verify that multiple devices powered by the same transformer are wired with the transformer secondary connected to the same input terminal numbers on each W7760A. See Fig. 8. (Building Manager configurations are not limited to two devices, but the total power draw, including accessories, cannot exceed 100 VA when powered by the same transformer (US only). See System Engineering, form 74-2969, for power wiring recommendations.)
 - Device wiring. Be sure that each W7760A device is wired (terminal 1) to a verified earth ground using a wire run as short as possible with the heaviest gauge wire available—based on a maximum of 14 AWG (2.0 sq mm) and a minimum of 18 AWG (1.0 sq mm)—for each building manager in the group. See Fig. 7.
 - Triac wiring. Verify that W7760A external device wiring uses the proper load power of 24 Vac for hot terminals (terminals 33 through 37).

NOTE: All wiring must comply with applicable electrical codes and ordinances or as specified in installation wiring diagrams.

Step 3. Verify termination module placement.

Be sure to follow the installation wiring for placement of the 209541B Termination Module(s). For a complete description of network topology rules, refer to the E-Bus Wiring Guidelines, form 74-2865-1, and the Excel 10 FTT Termination Module Installation Instructions, form 95-7554.

Step 4. Install cover assembly.

- Make sure wiring is complete and power is off.
- Plug the cover assembly into the subbase to activate the W7760A. See Fig. 13.

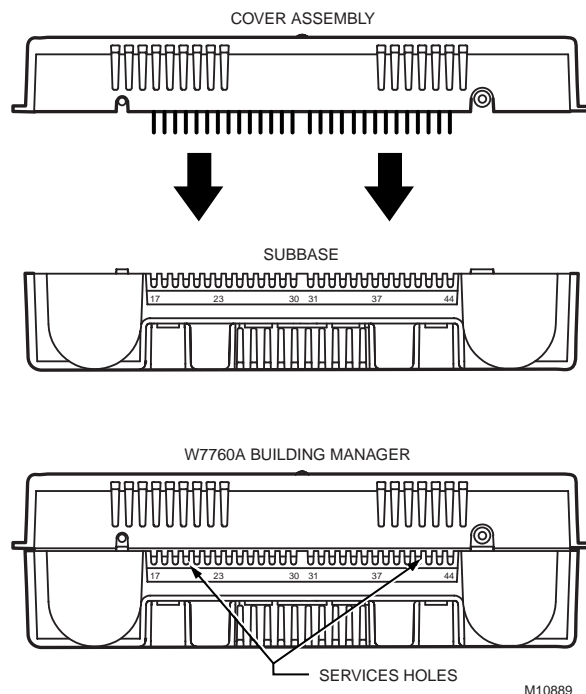


Fig. 13. Plug cover assembly into subbase.

Step 5. Startup.

STATUS LED

The W7760A Building Manager has a status LED on the front of the device. See Fig. 1. The LED provides a visual indication of the Building Manager status. When the Building Manager receives power, the LED appears in one of the following states:

- Continuously On—processor is in initialized state.
- Slow blink—controlling, normal state.
- Fast blink—alarm condition.

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