

# POWERS

A WATTS INDUSTRIES CO.

## TECHNICAL INSTRUCTIONS

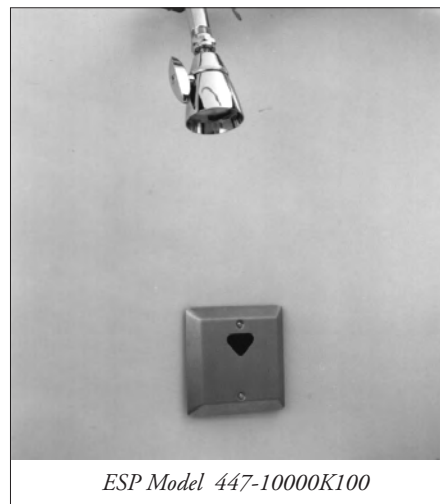
Hydroguard ESP™  
Infrared Sensor Showers

### DESCRIPTION

Hydroguard ESP infrared shower systems rely on infrared technology to sense the presence of a user and to immediately turn on a water supply. The shower automatically shuts off when the bather steps out of the invisible beam of infrared light, or when the maximum shower time has been reached. The shower time is field adjustable from 0 to 14 minutes.

All showers are supplied complete with the sensor assembly, transformer (plug in or box, as specified), solenoid valve, modular junction box and mounting hardware.

The following instructions will serve as a guide when installing the Powers ESP sensor operated showers. As always, good safety practices and care are recommended when installing electrical equipment. We suggest that you follow the procedures outlined. If additional assistance is required, please call the Powers Application Engineering Department at (847) 673 6700.



### INSTALLATION

#### Prior to Installation

#### WARNING:

- 24V AC Step down transformer must be used for single and group shower applications.
- Do not allow power transformer wires to touch during wiring, since this could cause permanent damage to the transformer. To avoid this, do not supply power to, or plug in, the transformer until all other wiring is complete.
- Since solenoid valves require water free of sand, grit, etc., to operate properly, flush water lines until water is free of those materials before connecting solenoid valve.
- All electrical wiring and plumbing should be done in accordance with national/local codes and regulations.
- We recommend the use of stainless steel screws for installation of all components.

#### TOOLS REQUIRED:

- Slotted and Phillips screwdrivers
- Drill
- Pipe wrenches
- Pipe dope/sealing compound

Powers ESP Infrared Showers are supplied with a brass Solenoid Valve, into which tempered water should be connected. A Powers thermostatic mixing valve, such as the Hydroguard Series 430, will ensure safe comfortable water is supplied to your shower system.

#### Step 1: Determine Shower Component Layout

Several components, including the shower sensor, control box, solenoid and transformer, will need to be installed to ensure proper operation of the infrared shower system.

The first location to be identified should be the shower sensor... the sensor is housed in a Stainless Steel Plate designed for surface mounting onto the shower wall. Once the sensor location is determined, you can decide on the location of the other components—the solenoid and sensor are typically located within 2 feet of the modular junction box, but you can use 4 conductor flat telephone cable and connectors to locate the components up to as far as 100' away from the sensor.

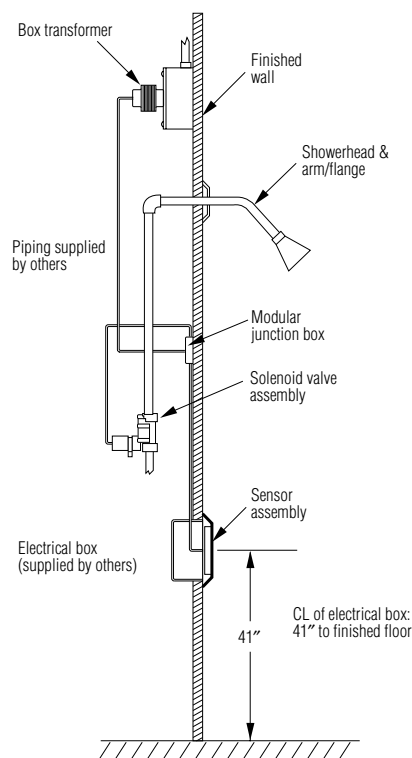


Figure 1: Typical Shower Installation

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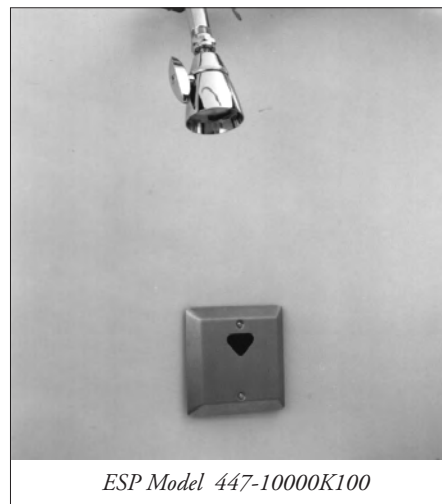
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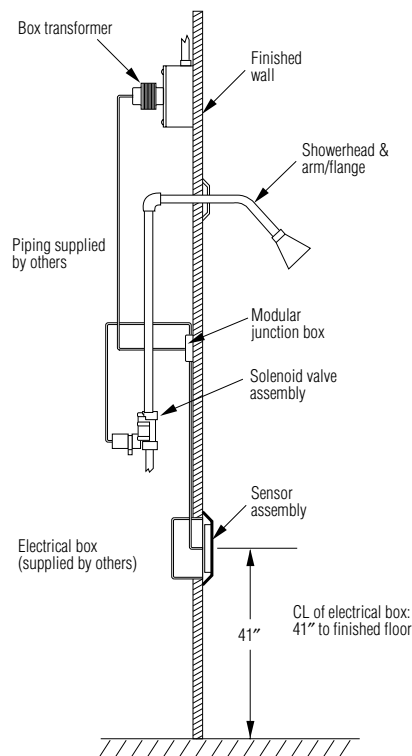


Figure 1: Typical Shower Installation

## INSTALLATION, CONTINUED

The solenoid valve should be located as close as possible to the showerhead it is servicing. Access to the valve must be provided for maintenance and servicing.

Suggested height for mounting of the sensor for adult men and women is approximately 41"... adjustments to height should be made for adolescents and children. Measure the proper height from the floor... mark shower sensor location with a pencil. Using a 5/8" drill bit, drill hole for sensor connection cord.

Once you've pushed the shower sensor cord through the hole, use the stainless steel plate as a template, marking the location of the mounting screws. The shower sensor assembly can be mounted to a 4 x 2 x 23/16" deep electrical box with screws provided, although it is not necessary to do so. If installing onto wall, drill 2 mounting holes (refer to figure 2) and install the sensor assembly.

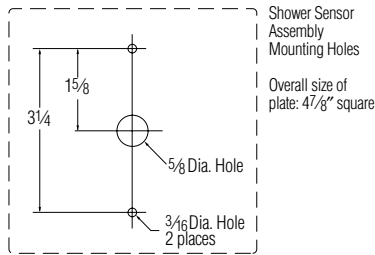


Figure 2  
Sensor Assembly Mounting Holes

Do not yet tighten screws since you may need access to the sensitivity and run time potentiometers for final adjustments.

### Step 2: Install Solenoid

To facilitate servicing, you may wish to install a service stop directly upstream of solenoid. Prior to installing solenoid, flush lines to be sure supply water is free from grit and sand. Solenoid end connections are 3/4" NPT.

Using thread sealant on male threads only (do not use teflon tape), connect supply line to solenoid, checking to be sure the flow is in the proper direction (flow arrow is marked on solenoid body). For normal operation, check to be sure the solenoid manual override is in the "off" position or water will flow regardless of sensor activation/deactivation.

Connect outlet side of solenoid to showerhead piping.

### Step 3: Install Modular Junction Box

Keeping in mind that the solenoid and sensor must be within 20' of the modular junction box (unless you're using extra cables and connectors), determine the location for mounting. Using the base of the box as a template (cover should be removed by unsnapping from base), drill two small holes for mounting of the box. Install box. (See figure 3.)

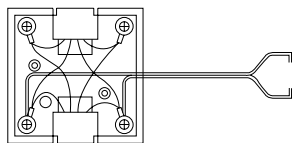


Figure 3  
Modular Junction Box

### Step 4: Transformer Installation

Transformer can be remotely located (in the chaseway, closet or in ceiling, etc.) and can typically power up to eight shower solenoids. You may wish to install a remote shut-off switch to shut down power to showers during maintenance, cleaning or repair.

For single shower applications, connect supply wires to modular junction box by loosening black and yellow screw terminals of modular junction box. Using the power cord wire supplied, connect one of the two wires to the yellow terminal, the other to the black terminal, tightening the screws for a sure connection. (Refer to figure 5.)

Replace cover onto Modular Junction Box. Insert the plug from the solenoid into one receptacle of the modular junction box, and the plug from the sensor into the other receptacle. Either plug can be inserted into either receptacle of the modular junction box.

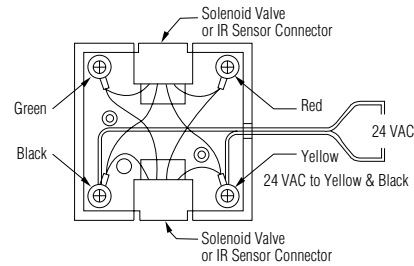


Figure 5  
Modular Junction Box—Wiring

**Plug In Transformer** (see figure 6). This type of Transformer is designed to be plugged into a 110V AC wall outlet. Transformer is supplied with a 10' wire, which can be shortened or lengthened to meet installation requirements using 22 gauge bell wire. Connect the feed wires to the screw terminals on the secondary side of the transformer. To avoid permanent damage to the transformer, sensor or solenoid valve, do not plug transformer into outlet until all wiring has been completed!

**Box Mount Transformer** (see figure 7). This type of transformer is designed to be mounted on an 110 VAC supply electrical junction box ("J" box should be mounted inside chase wall or above ceiling). Run wires from secondary side of transformer to control box enclosure. To avoid permanent damage to the transformer, sensor, or solenoid valve, do not supply power to primary side of transformer until all wiring has been completed.

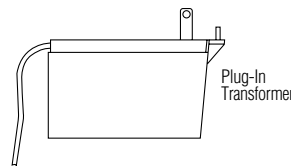


Figure 6

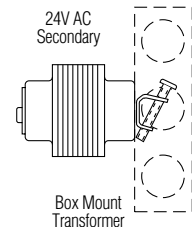


Figure 7

### Step 5: Start Up

Supply power to transformer. Activate the sensor and check to be sure the small red activation light appears in the bottom of sensor lens. (Refer to figure 8.)

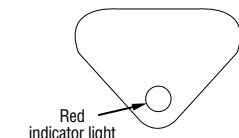


Figure 8  
Sensor Assembly Activation Light

## INSTALLATION, CONTINUED

If the light is on, the sensor is properly operating... turn on water supply and reactivate sensor. Water should come through showerhead. Once water is flowing, check all connections for leaks.

### Step 6: Sensitivity Adjustment

For single shower applications, the Sensor is factory set to provide a proper sensitivity/distance range for most applications (18" from sensor eye, depending on reflectivity of skin, lighting, etc.). If range is acceptable, proceed to step 7. If range adjustment is required, you can adjust as follows.

Remove sensor assembly from wall and look at back side. You'll see two potentiometers (see figure 9). The upper potentiometer is for adjustment of the range, from 2" to 48". Using the small screwdriver provided, rotate the potentiometer in small increments: clockwise to increase the range, counterclockwise to decrease the range. After each adjustment, check to see if range is acceptable.

**Make adjustments carefully. Over-adjustment can damage potentiometer.**

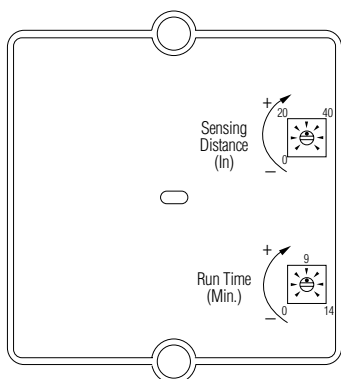


Figure 9  
Shower Sensor Potentiometers

### Step 7: Shower Time Adjustment

Although the shower will shut off when bather steps away from the infrared sensor, the shower can also be set to automatically shut off after a maximum shower time, from 0–14 minutes. The Sensor Assembly is factory set to provide the maximum shower time of 14 minutes. If that showertime is acceptable, proceed to step 8. If showertime adjustment is required, it is easily adjusted as follows.

Remove sensor assembly from wall and look at back side. You'll see two potentiometers (see figure 9): the lower one is for adjustment of the shower run time from 0 to 14 minutes. Using the small screwdriver provided, rotate the potentiometer in small increments: clockwise to increase the showertime, counterclockwise to decrease the showertime. After each adjustment, check to see if showertime is acceptable.

**Make adjustments carefully. Over-adjustment can damage potentiometer.**

For multiple shower applications utilizing the group shower control box, all timing, block out and other adjustments are programmed into the microprocessor chip...refer to your original specification form for details. Sensitivity of sensor is still adjusted at the individual sensor potentiometers.

### Step 8: Secure Sensor Assembly

Once final adjustments have been made to sensitivity and run-time potentiometers, secure the sensor assembly using the two screws supplied. We also suggest using plumber's putty gasket (not supplied) around stainless steel plate to prevent water leakage behind the wall. To clean, use a mild soap and water, paying special attention to ensure no abrasive cleaners are used on the lens, since scratching may occur.

## OPERATION

1. A continuous invisible infrared light beam is emitted from the sensor assembly.
2. The shower is activated by bather stepping within the adjustable range of sensor. Immediately after sensor activation, tempered water flows for as long as the user remains within the range, up to the set maximum shower time.
3. When the bather steps away from the sensor, the water flow stops automatically. After preset shower time, the flow of water stops to prevent water waste. It is then ready for the next user, or for reactivation by the present user.

## MAINTENANCE AND TROUBLESHOOTING

To clean the shower area but avoid turning off the main water supply, simply place dark, solid tape (perhaps black electrical tape) on top of the lens, to block out all light. The sensor should not activate until the tape is removed. Note that a mild soap may be used to clean the lens, but abrasive cleaners should be avoided.

To ensure trouble-free performance, routine maintenance is required.

- Check all electrical connections, making sure they are free of corrosion and well connected.
- Check solenoid valve to ensure that it is operating properly and is free of dirt and lime build up.
- Check to be sure the tempered water being supplied to the shower is at the proper temperature for safe comfortable bathing.

### ***If the shower does not function properly:***

1. Is the red sensor activation light on in the sensor assembly lens, upon sensor activation? If red LED is not lit after sensor is activated,
  - check to see if transformer feed wires are securely attached to terminals at modular junction box and at transformer.
  - check to see if there is power to the transformer, using a voltmeter. If power is going into the transformer but not coming out of the transformer, replace transformer.
  - if transformer is functioning properly and power is being supplied, replace sensor assembly.

**NOTE:** If object is within the range of the Sensor when unit is powered up, the Sensor will not operate until the object is removed and Sensor reactivated.

2. If sensor light is lit upon sensor activation, but no water comes from showerhead,
  - check to be sure supply line is open and water is being supplied.
  - check to see whether solenoid is functioning... check to be sure manual override is in "off" position. If system still fails to operate, repair or replace solenoid assembly (see solenoid repair information above).

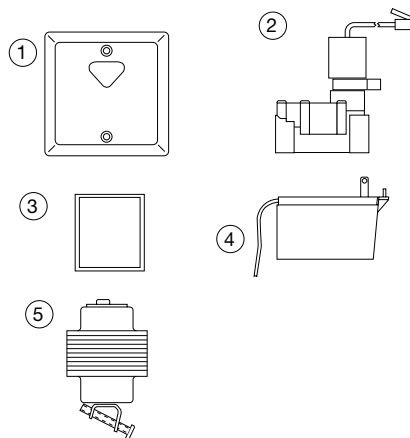
**MAINTENANCE AND TROUBLESHOOTING, CONTINUED**

- maximum run time may have been reached... sensor will remain lit although solenoid will close to stop water from flowing. If additional shower time is desired, reset run time potentiometer on back of sensor assembly.
- 3. If water is on all the time, regardless of sensor activation, unplug solenoid from control box. If water continues to run, problem is manual and can be rectified by checking the following:
  - check for debris and/or lime build-up within the solenoid, which is preventing it from closing. Dismantle, clean and flush the solenoid valve.

If, after unplugging solenoid from control box, water stops, problem is electronic. Check to see if power wires are incorrectly connected within modular junction box or group control box. Refer to instructions above and rewire, checking electrical connections.

**PARTS LIST**

No.	Description	Part No.
1	Sensor Assembly	444-141
2	Solenoid Assembly	444-175
3	Installation Kit with Modular Junction Box	444-143
4	Plug In Transformer	444-118
5	Box Transformer	444-119



**CALIFORNIA PROPOSITION 65 WARNING**

**WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (Installer: California law requires that this warning be given to the consumer.)

For more information: [www.wattsind.com/prop65](http://www.wattsind.com/prop65)



## INSTALLATION, CONTINUED

The solenoid valve should be located as close as possible to the showerhead it is servicing. Access to the valve must be provided for maintenance and servicing.

Suggested height for mounting of the sensor for adult men and women is approximately 41"... adjustments to height should be made for adolescents and children. Measure the proper height from the floor... mark shower sensor location with a pencil. Using a 5/8" drill bit, drill hole for sensor connection cord.

Once you've pushed the shower sensor cord through the hole, use the stainless steel plate as a template, marking the location of the mounting screws. The shower sensor assembly can be mounted to a 4 x 2 x 23/16" deep electrical box with screws provided, although it is not necessary to do so. If installing onto wall, drill 2 mounting holes (refer to figure 2) and install the sensor assembly.

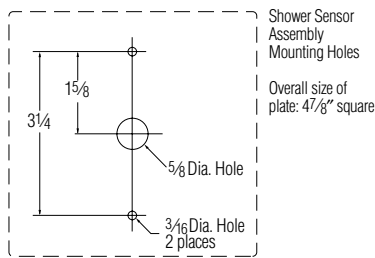


Figure 2  
Sensor Assembly Mounting Holes

Do not yet tighten screws since you may need access to the sensitivity and run time potentiometers for final adjustments.

### Step 2: Install Solenoid

To facilitate servicing, you may wish to install a service stop directly upstream of solenoid. Prior to installing solenoid, flush lines to be sure supply water is free from grit and sand. Solenoid end connections are 3/4" NPT.

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Connect outlet side of solenoid to showerhead piping.

### Step 3: Install Modular Junction Box

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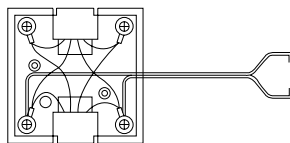


Figure 3  
Modular Junction Box

### Step 4: Transformer Installation

Transformer can be remotely located (in the chaseway, closet or in ceiling, etc.) and can typically power up to eight shower solenoids. You may wish to install a remote shut-off switch to shut down power to showers during maintenance, cleaning or repair.

For single shower applications, connect supply wires to modular junction box by loosening black and yellow screw terminals of modular junction box. Using the power cord wire supplied, connect one of the two wires to the yellow terminal, the other to the black terminal, tightening the screws for a sure connection. (Refer to figure 5.)

Replace cover onto Modular Junction Box. Insert the plug from the solenoid into one receptacle of the modular junction box, and the plug from the sensor into the other receptacle. Either plug can be inserted into either receptacle of the modular junction box.

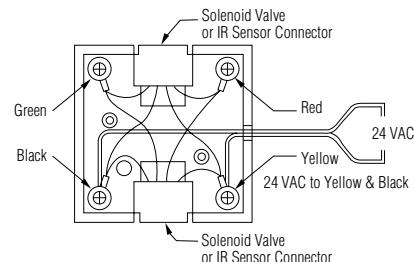


Figure 5  
Modular Junction Box—Wiring

**Plug In Transformer** (see figure 6). This type of Transformer is designed to be plugged into a 110V AC wall outlet. Transformer is supplied with a 10' wire, which can be shortened or lengthened to meet installation requirements using 22 gauge bell wire. Connect the feed wires to the screw terminals on the secondary side of the transformer. To avoid permanent damage to the transformer, sensor or solenoid valve, do not plug transformer into outlet until all wiring has been completed!

**Box Mount Transformer** (see figure 7). This type of transformer is designed to be mounted on an 110 VAC supply electrical junction box ("J" box should be mounted inside chase wall or above ceiling). Run wires from secondary side of transformer to control box enclosure. To avoid permanent damage to the transformer, sensor, or solenoid valve, do not supply power to primary side of transformer until all wiring has been completed.

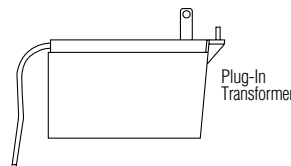


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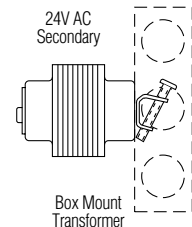


Figure 7

### Step 5: Start Up

Supply power to transformer. Activate the sensor and check to be sure the small red activation light appears in the bottom of sensor lens. (Refer to figure 8.)

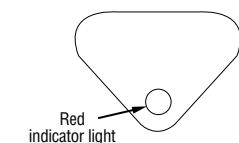


Figure 8  
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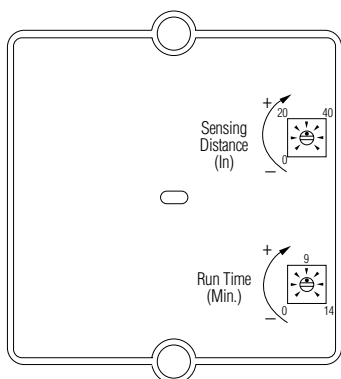


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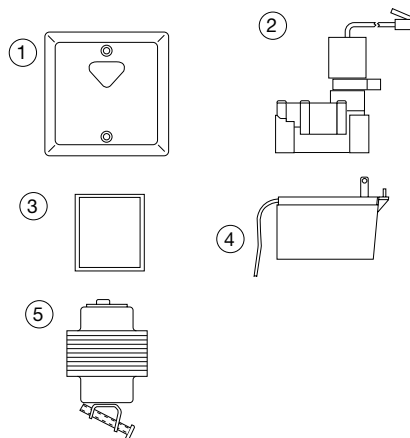
**MAINTENANCE AND TROUBLESHOOTING, CONTINUED**

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