

HE420A Steam Power Humidifier

PRODUCT DATA



APPLICATION

The HE420A Steam Power Humidifier uses a thermal fan interlock control to provide humidification for the whole house. The steam power humidifier is designed to work with high efficiency furnaces, heat pumps and set back thermostats.

FEATURES

- Humidifies the air without a call for heat from the thermostat so relative humidity fluctuates less, optimizing homeowner comfort.
- Ideal for homes with extensive woodwork, hardwood floors, antiques, oil paintings, leather furniture, pianos, and fine collectibles.
- Capable of humidifying a large area.
- Compact size allows easy installation.
- Minimal amount of water needed for energy efficient operation.
- Low water cut-off switch and built-in overflow protection are integral safety features.
- Automatic Flushing Timer reduces frequency of maintenance in a hard water installation.

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SPECIFICATIONS

Capacity:

HE420A: 13 gallons per day (gpd) or 49 liters per day (lpd).

Humidified Area:

For precise sizing and product selection, refer to Table 1.

Internal Heating Source:

Incoloy® sheathed element:
HE420A: 120 Vac, 1.5 kW, 12.5A.

Duct Opening (Height x Width):

8 in. x 10 1/2 in. (203 mm x 267 mm).

Dimensions:

Refer to Fig. 1.

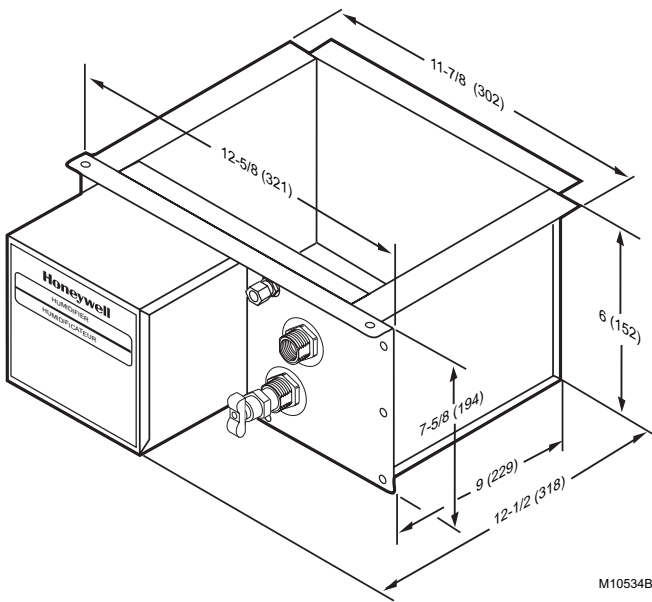


Fig. 1. Dimensions of HE420A in. (mm).

Approvals:

Underwriters Laboratories Inc.: Listing 42U8.
Canadian Underwriters Laboratories Inc.: Listing 42U8.

Models:

HE420A TRADELINE® Steam Power Humidifier package includes mounting bracket and hardware, Automatic Humidity Control, Automatic Flushing Timer with chlorine removal filter.

Table 1. Size Of Area That Can Be Humidified.

House Description	Air Changes Per Hour	HE420A Area (Up To)	
		Sq. ft	Sq. m
Loose	Two	1,415	131
Average	One	1,970	183
Tight	One-half	3,095	288

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1985 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Toronto, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

INSTALLATION

IMPORTANT

Read all the installation instructions before installing the humidifier.

Select Location and Mount

There are three typical ways of mounting the steam humidifier:

- horizontally under at least a 10 in. (254 mm) wide duct using the mounting bracket (preferred mounting);
- horizontally under a reinforced duct;
- horizontally under a duct extension using the mounting bracket.

Decide which mounting is appropriate and follow those mounting instructions. See Fig. 2 through 4.

Select a location where the humidifier can be plugged in without an extension cord. The preferred installation location is on the warm air side of the furnace. If that location is not possible, mount the humidifier a minimum of 6 ft (1.8m) upstream from the furnace filter. Depending on the location selected, additional duct reinforcement may be necessary because the humidifier weighs 18 lb. when filled with water.

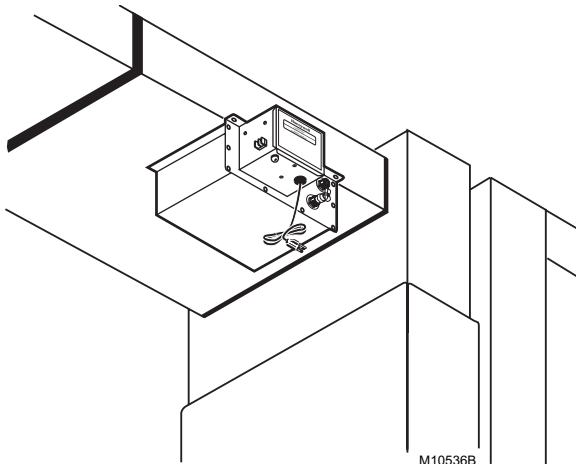


Fig. 2. Mounting humidifier horizontally under duct using mounting bracket.

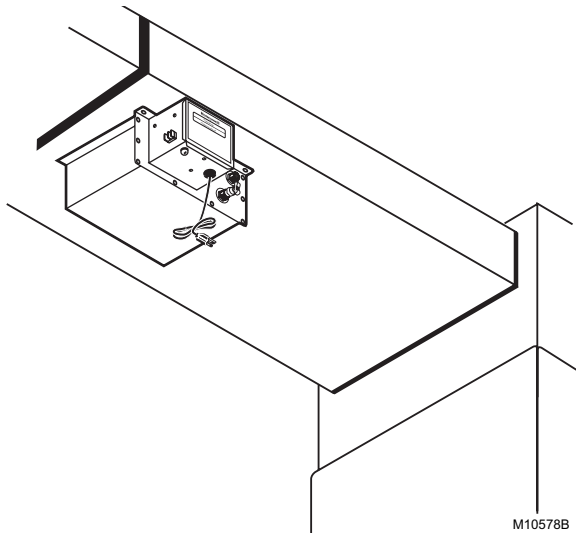


Fig. 3. Mounting humidifier horizontally under duct.

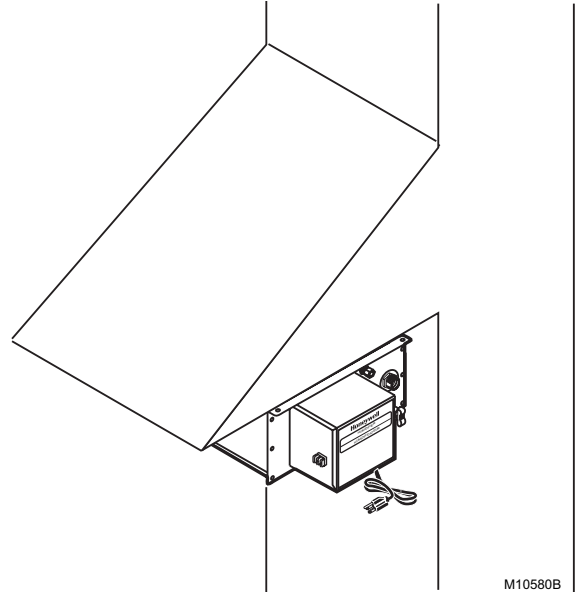


Fig. 4. Mounting humidifier horizontally under duct extension using mounting bracket.

⚠ WARNING

Electrocution, Heavy Equipment and Chemical Hazard.

Can cause death, blindness, water damage to home and heater failure.

- Do not cut into any air conditioning or electrical line.
- Mount the humidifier in a level position to avoid water damage and heater failure.
- Wear safety glasses when cutting or drilling.
- Reinforce duct as necessary to ensure stability.

⚠ CAUTION

Steam Condensation, Fire and Freezing Water Hazard.

Can cause failure of fan or limit control or result in water damage to home.

- Do not install the humidifier where the sidewalls of the return air duct are constructed of wood (i.e., floor joist).
- Do not install the humidifier where the temperature is lower than 32°F (0°C) or higher than 200°F (93°C).

Mount Horizontally Using Mounting Bracket (Preferred Mounting Method)

IMPORTANT

The duct must be at least 10 in. (254 mm) wide to use this mounting method.

The duct is the strongest when using the bracket mounting method because the least amount of duct reinforcement is required because of the bracket location. However, reinforcement may still be necessary to help support the weight of the humidifier and keep it level.

1. Position the bracket 1/2 in. (13 mm) from the edge of the duct and trace around the bracket. See Fig. 5.
2. Once the outline has been traced, remove bracket.
3. Drill a 3/8 in. (10 mm) hole within the center portion of the bracket.
4. Use tin snips to cut around the outline of the bracket.

IMPORTANT

Follow the dotted line carefully.

5. Remove the sheet metal.

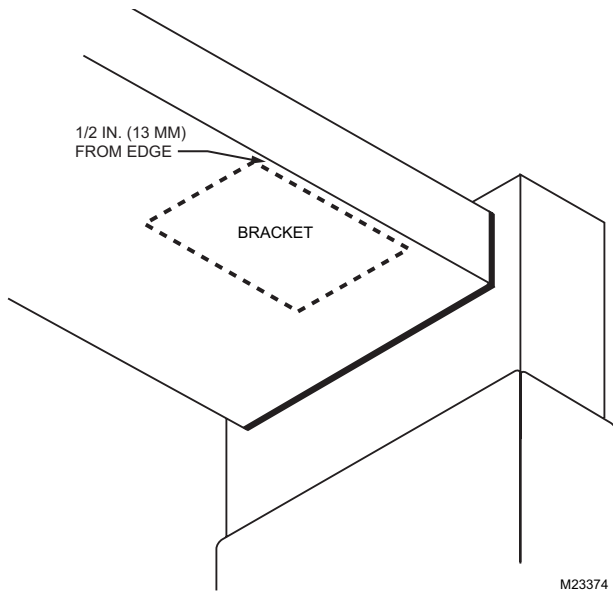


Fig. 5. Position bracket.

6. Use two 8-32 screws and nuts to attach the mounting bracket (L shaped with six holes) to the top/ front surface of the humidifier. The humidifier is now ready for mounting.

NOTE: Position the humidifier so the upward protrusion of the U is on the side toward the reservoir.

IMPORTANT

Do not mount the humidifier until the water level is adjusted. See Set The Water Level section.

7. Slide the flanges of the humidifier reservoir into the mounting bracket until the reservoir's front flange comes in contact with the edge of the duct.
8. Secure the humidifier to the duct with three no. 8 sheet metal screws.

Mount Horizontally on Reinforced Duct

This horizontal mounting method usually requires duct reinforcement to support the weight of the humidifier and keep it level. See Fig. 3. The mounting bracket is not used.

1. Position the bracket to the bottom of the duct in the desired location.
2. Once the outline has been traced, remove bracket.
3. Drill a 3/8 in. hole (10 mm) within the center portion of the shaded area.
4. Use tin snips to cut around the outline of the bracket.

IMPORTANT

Follow the dotted line carefully.

5. Remove sheet metal.

IMPORTANT

Do not mount the humidifier until the water level is adjusted. See the Set The Water Level section.

6. Slide the flanges of the humidifier reservoir into the mounting bracket.
7. Secure the humidifier to the duct with two no. 8 sheet metal screws.

Mount Horizontally on Vertical Duct

Horizontal mounting on a vertical duct requires the installation of a duct extension. See Fig. 4. Additional duct reinforcement may also be necessary to help support the weight of the humidifier and keep it level.

Create and install the duct extension. Then follow steps 1 through 8 in the Mount Horizontally Using Mounting Bracket section to complete installation.

WIRING

All wiring must comply with local codes and ordinances. For complete wiring instructions, refer to the manual "Wiring Instructions for High-Capacity Steam Humidifiers" packaged with your HE420A humidifier.

PLUMBING HUMIDIFIER



CAUTION

Chemical Hazard.

Can cause damage to environment or air conditioning system.

Do not use any refrigerant line connected to an air conditioner. Be sure to install the chlorine removal filter (provided) to prevent humidifier corrosion.

Either hard or soft water can be used in the humidifier.

IMPORTANT

Use only copper tubing to plumb the humidifier.

1. Locate the cold water pipe closest to the humidifier.
2. Install the saddle valve connector.
3. Use the valve instructions to install the valve (provided). The valve is self-piercing when installed on copper pipe.

IMPORTANT

Position the valve so water flows from the top or side to reduce the chance of clogging the valve with minerals.

Lightly clean the copper tubing ends with fine sandpaper before making any connections.

4. Install the chlorine removal filter.
5. Place the brass compression nut over the copper tubing.
6. Slide the brass ferrule over the tubing.

NOTE: Do not overtighten the compression nut. Moderate tightness prevents leaking.

7. Insert the tubing into the valve fitting and tighten the compression nut.

8. Flush the copper tubing to remove any debris that can cause problems at the float valve.
9. Route the tubing to the humidifier float valve, keeping the tube away from sharp edges.
10. Connect the remaining end of the tubing to the humidifier float valve.
11. Open the saddle valve so that the water flows slowly and gently into the water pan.

SET WATER LEVEL

Adjust the humidifier water level prior to mounting.

1. Set the humidifier reservoir on a level surface.
2. Attach the water feed line and allow the unit to fill until the float valve shuts off the incoming flow of water. The water level should be between 2-1/4 in. (57 mm) and 2-1/2 in. (64 mm) deep. If water level is correct, go to step 4.
3. Adjust the water level in small increments. Raise the water level by pushing down on the center of the float arm. Lower the water level by pressing the float down with one hand and pulling up on the center of the float arm with the other hand. See Fig. 6.



CAUTION

Flooding Hazard.

Inadequate support of the float arm can lead to valve seat damage and result in water leakage. Support the float arm during adjustment.

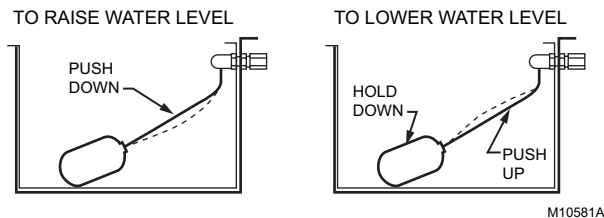


Fig. 6. Adjust water level.

4. Verify the water level by removing enough water to allow the float valve to automatically fill and shut off the water.

FINISH MOUNTING AND PLUMBING HUMIDIFIER

1. Mount humidifier as instructed in the Select Location and Mount section.
2. Route the tubing to the humidifier float valve.
3. Connect the remaining end of the tubing to the humidifier float valve.
4. Open the saddle valve so that the water flows slowly into the water pan.
5. Check the compression fittings at the saddle valve and the float valve. Tighten the fitting slightly to stop any leakage.

IMPORTANT

Keep all drain lines away from sharp edges.

6. Connect the overflow provision of the humidifier to a suitable waste drain.

NOTE: A 5/8 in. (16 mm) ID garden hose can be easily attached to the overflow fitting.

7. Support the drain line at several locations to prevent kinks. Be sure to provide support near any heat source.
8. Use a male 1-1/2 in. NPT fitting (not supplied) to connect the overflow provision of the humidifier.

INSTALLING THE AUTOMATIC FLUSHING TIMER

Refer to the "Installation Instructions for the Programmable Humidifier Automatic Flushing Timer" for complete instruction.

CHECKING THE INSTALLATION

After installation is complete, use the following procedure to check the humidifier operation:

1. Turn on the humidifier water supply.
2. Be sure the humidifier has power and plug in the humidifier.
3. Turn the Convertible Humidity Control to the Test position.
4. Check that the furnace blower comes on to circulate the moist air. The blower may take as long as fifteen minutes to turn on.
5. Reset the Automatic Humidity Control to the desired dial setting for automatic operation.

OPERATING THE HUMIDIFIER

The Honeywell HE420A Humidifier is controlled by an Automatic Humidity Control. The Automatic Humidity Control is mounted in the return air duct where it can be exposed to the air stream of the return air, and is designed to automatically adjust the humidity level based on indoor temperature and humidity, inferred or measured outdoor temperature, and the dial setting. The control allows for variations in furnace size, window insulation and average daily climate temperature.

The Automatic Humidity Control requires an initial adjustment period. Set the frost factor dial on 5 and use Table 2 to adjust the dial—only one setting at a time—increasing the dial setting if you feel you need more humidity, or reducing the setting if you see moisture on the inside of your windows. For more precise humidity adjustment, set the dial between dial settings. Allow two days for the humidity level to subside before making further adjustments. Once you have tuned in the proper setting, you should not have to further adjust it again. The control takes over and makes any future adjustments caused by varying outdoor temperatures, thus reducing moisture buildup on windows while maintaining the optimal humidity level.

The Automatic Humidity Control can also be set for manual operation. Once the control is installed in the cold air return and internally set to MANUAL, turn the dial to the expected outdoor temperature. The corresponding optimal humidity level has been calibrated for you. For example, by setting the dial to

an anticipated 20°F, the control automatically maintains the indoor relative humidity in the safe, comfortable 35% range (see Table 2).

Table 2. Automatic Humidity Control Settings.

Outside Temperature	Recommended RH
+40°F	45%
+30°F	40%
+20°F	35%
+10°F	30%
0°F	25%
-10°F	20%
-20°F	15%

Table 3. Recommended Frost Factor Settings.

Humidity Level	Recommended Adjustment
Insufficient humidity	Increase the frost factor dial by one setting.
Condensation on windows	Decrease the frost factor dial by one setting.

OPERATION

The HE420A Humidifier uses the principle that hot water creates water vapor. As dry air and vapor mix, the relative humidity of the air rises. The humidity control monitors the relative humidity and activates the humidifier accordingly.

When the humidity control calls for humidity, the humidifier underwater heater starts heating the water in the humidifier reservoir. When the water is warm enough, the humidifier activates a relay that turns on the furnace fan. The warm dry air from the furnace picks up the water vapor and circulates it through the home. The fan continues to circulate the air until the water cools down and then turns off the fan.

Humidified air feels warmer and more comfortable so you may be able to lower the thermostat heating setpoint and save money on heating fuel bills giving you a more comfortable environment that is also energy efficient.

MAINTENANCE

A regular maintenance program prolongs the life of the humidifier and provides a more comfortable environment. Frequency of cleanings depends on water conditions. Either hard or soft water can be used in the humidifier, but hard water mineral deposits are more difficult to clean.

CAUTION

Voltage Hazard.
Can cause electrical shock and equipment damage.
Disconnect power supply before installing or servicing.

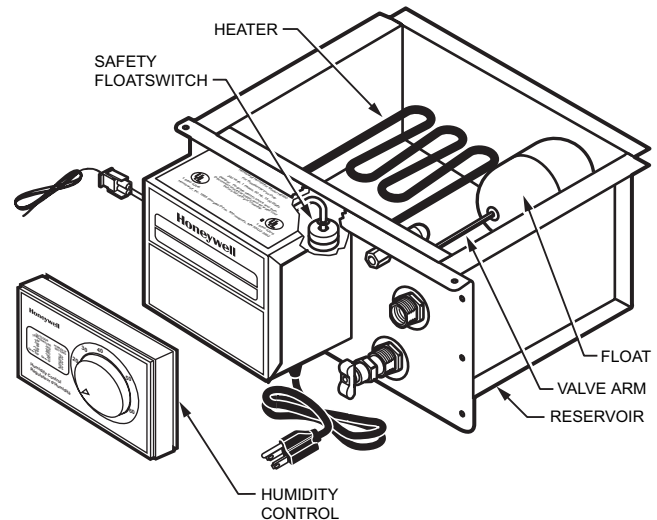
IMPORTANT

Never oil any part of the humidifier.

Every 1 to 4 Months (Depending on Water Quality)

Use the following procedure and refer to Fig. 7 to clean the humidifier:

1. Unplug the humidifier and fan control.
2. Disconnect the humidity control wires from the external screw terminals on the humidifier.
3. Turn off the water supply.



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Fig. 7. Location of humidifier parts.

4. Disconnect water feed tubing at the float valve.
5. Disconnect the overflow at the humidifier.

IMPORTANT

Allow water to cool before continuing.

6. Press and release the MANUAL button on the Automatic Flushing Timer.
 - Wait 10-30 seconds* until the flushing noise stops, indicating that the flushing cycle is complete.
 - *The number of seconds will vary depending upon how the unit is programmed. (See "Reprogramming Instructions" in the Auto Flushing Timer Installation Instructions)
 - Repeat Steps A and B until the humidifier is drained.
7. Remove the humidifier from the mounting.
8. Use running tap water to flush loose minerals from the reservoir.
9. Carefully rub off minerals from the float, heater, reservoir walls, and safety float switch.

NOTE: Steel wool or other scouring pads can be used on the reservoir walls and other parts.

10. Inspect the valve arm and float for mineral buildup and deterioration.

IMPORTANT

- Replace the float valve when it shows any signs of deterioration.
- The float valve should shut off the water at 2-3/8 in. (60 mm).

11. Reset the water level.



CAUTION

Flooding Hazard.

Inadequate support of the float arm can lead to valve seat damage resulting in water leakage.

Support the float arm during adjustment.

- a. Set the humidifier reservoir on a level surface.
 - b. Attach the water feed line and allow the unit to fill until the float valve shuts off the incoming flow of water. The water level should be between 2-1/4 in. (57 mm) and 2-1/2 in. (64 mm) deep. If water level is correct, go to step d.
 - c. Adjust the water level in small increments. Raise the water level by pushing down on the center of the float arm. Lower the water level by pressing the float down with one hand and pulling up on the center of the float arm with the other hand. See Fig. 6.
 - d. Verify the water level by removing enough water to allow the float valve to automatically fill and shut off the water.
12. Remount the humidifier.
 13. Reconnect all plumbing connections.
 14. Reconnect all electrical connections.
 15. Verify humidifier operation by following the steps in the Checkout Procedures section.

End of Humidification Season

Clean and shut off the humidifier at the end of the heating season. Use the Every 1 To 4 Months section, steps 1 through 14, to shut down for the season.

TROUBLESHOOTING

Refer to Table 4 for troubleshooting procedures.

Table 4. Troubleshooting Procedures.

Problem	What To Look For	What To Do
Low humidity	Humidifier heater is not operating.	<ul style="list-style-type: none"> • Confirm that humidifier is plugged in. • Set the humidistat higher. • Check for low water level. • Reset circuit breaker or check for blown fuse. • Check that the furnace power is on. • Check all external wiring connections. • Check the humidity control setting. • Call a professional heating contractor.
	Rapid air changes. Drafts (cold air is dry and is an added load for the humidifier).	<ul style="list-style-type: none"> • Keep doors and windows closed. • Close fireplace damper when not in use. • Keep exhaust fan running time to a minimum. • Seal around doors and windows.
High humidity	Condensation on walls.	<ul style="list-style-type: none"> • Turn off humidity control and water until condensation is completely evaporated.
	Heavy condensation on windows.	<ul style="list-style-type: none"> • Turn humidity control down low enough to eliminate condensation caused by moisture from bathing, mopping, cooking, etc. If moisture persists, more ventilation is needed.

IMPORTANT

Be sure the humidifier power is off and there is no water in the humidifier.

Vacation

When you leave on vacation, turn off the humidifier water supply and the humidity control. When you return, turn on the humidifier water supply and reset the humidity control to restart the humidifier.

CHECKOUT PROCEDURES

After winter start-up or maintenance, use the following procedure to check humidifier operation:

1. Turn on the humidifier water supply.
2. Be sure the humidifier has power and plug in the humidifier.
3. Turn the Automatic Humidity Control to the Test position.

NOTE: If relative humidity is above 45% in the home, or the outdoor temperature is above 50°F, a jumper may need to be placed across the humidistat's OUT terminals to perform this checkout.

4. Check that the furnace blower turns on to circulate the moist air. The blower may take as long as fifteen minutes to turn on.
5. Reset the Automatic Humidity Control to the desired dial setting for automatic operation.

REPLACEMENT PARTS

Refer to Fig. 14 and Table 5 when ordering replacement parts.

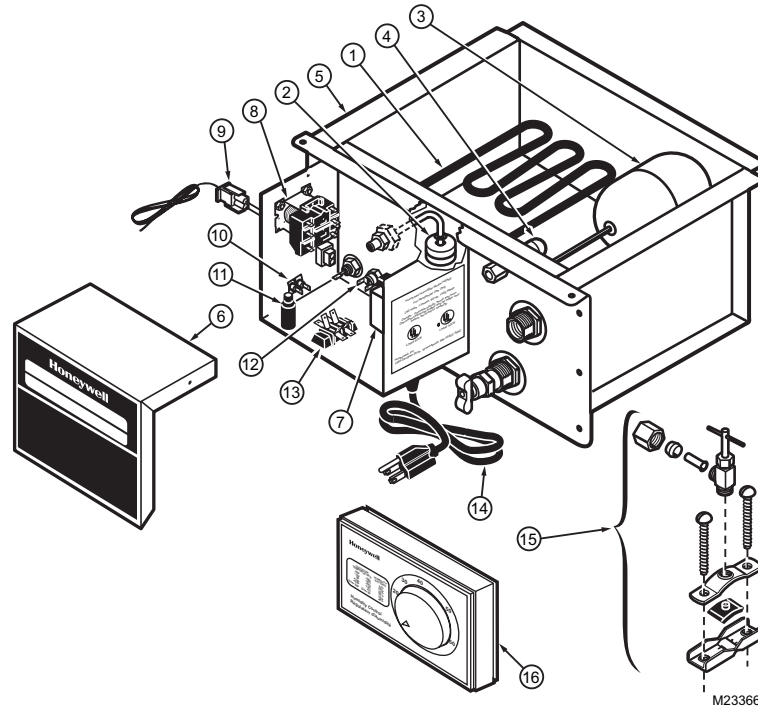


Fig. 8. Exploded view of humidifier parts.

Table 5. List of Replacement Parts for HE420A Humidifier

Exploded View Number	Description	HE420A Part Number
1	Incoloy® sheathed heating element	32000164-001
2	Safety float switch	32000149-001
3	Float for water fill valve	32000166-001
4	Water fill valve	32000167-001
5	Water pan assembly	32000152-001
6	Electrical enclosure cover	32000169-001
7	Transformer, 24 Vac	AT120B1101
8	Control relay, dpst, 24 V	50018844-001
9	Fan wiring assembly	32000156-001
10	Humidistat control terminal block	32000157-001

Exploded View Number	Description	HE420A Part Number
11	Indicator light	32000158-001
12	Thermal fan switch	32000159-001
13	Power distribution block	32000160-001
14	Power supply cord with strain relief	32000177-001
15	Saddle valve assembly	32001616-001
16	Automatic Humidity Control	H1010A1004
—	Automatic Flushing Timer	50018842-001
—	Safety Control Shutoff	50018846-001
—	SPDT Relay	50018847-001
—	Mounting Bracket Frame	50018841-001
—	Chlorine Filter	50019240-001

Automation and Control Solutions

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