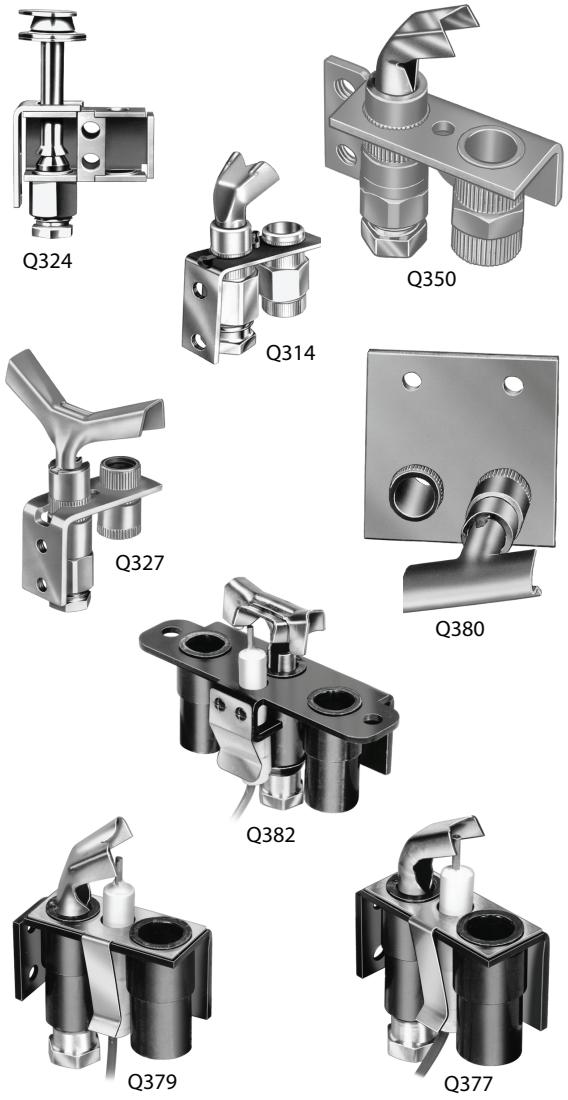
resideo

Q314, Q324, Q327, Q350, Q377, Q379, Q380 and Q382 Pilot Burners

PRODUCT DATA



APPLICATION

These pilot burners provide main burner ignition for natural and LP gas-fired equipment. Used with a 30 mV thermopile and/or thermocouple (depending on model) to provide automatic pilot safety control.

FEATURES

- Q324 and Q327 are primary aerated, spud orifice pilot burners.
- Q314, Q350, Q377 and Q379 are non-primary aerated, insert orifice pilot burners. Q382 is primary aerated with an insert orifice.
- Variety of mounting brackets available.
- Variety of tip styles to provide desired flame pattern.
- Interchangeable, color-coded orifice and inlet fittings can be ordered to convert between natural and LP gas.
- Q350, Q377, and Q380 are energy efficient pilot burners.
- Q380 is for horizontal mounting only.
- Q377, Q379 and Q382 design makes them ideal for use with any millivolt standing pilot gas valves in fireplace and space heating applications.
- Electrode assembly available for Piezo ignition on Q377, Q379 and Q382.

CONTENTS

60-2075-04

SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

Table 1. Model Specifications

Model	Primary Aerated	Type of Orifice	Pilot Tip Type	Recommended Thermocouple[a]	Recommended Thermopile[a]
Q314A	No	Insert	Target	Q309, Q340, Q390	Q313
Q324A	Yes	Spud	Multiport	Q309A	Q313
Q327A	Yes	Spud	Target	Q309A	Q313
Q350A	No	Insert	Target	Q309, Q340, Q390	None
Q377A,B	Yes	Insert	Target	None	Q313
Q379A,B	Yes	Insert	Target	None	Q313
Q380A	Yes	Insert	Target	Q309, Q340, Q390	None
Q382A,B	Yes	Insert	Target	Q335	Q313

[a]Specify lead length and model number when ordering.

Table 2. Mounting Brackets and Dimensions

Model	Mounting Brackets	Refer To Figure:
Q314	A, B, E and K	Fig. 3
	No. 11, No. 34, No. 48 and No. 64	Fig. 4
Q324	B and D	Fig. 5
	No. 3 and No. 5	Fig. 6
Q327	A, B, D and K	Fig. 7
	No. 1 and No. 2	Fig. 8
Q350	A, B, H and K	Fig. 9
	P, No. 35, No. 54 and No. 66	Fig. 10
	No. 75	Fig. 11
Q377	A, B	Fig. 12
Q379	A, B	Fig. 13
Q380	No. 1	Fig. 14
Q382	A, B	Fig. 15

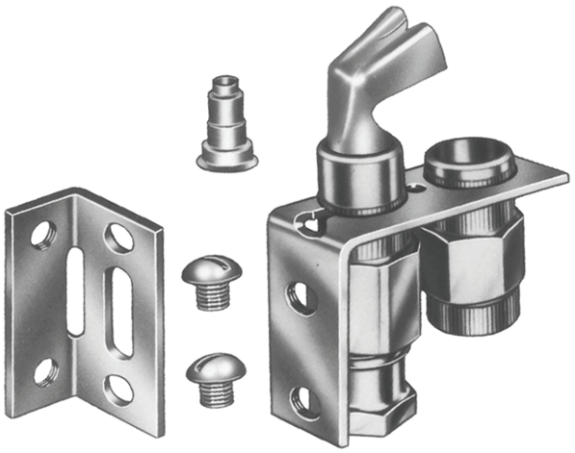


Fig. 1. Trade Pilot burner Q314A

Trade Models Available:
Q314A Pilot Burner
Q327A Pilot Burner

Q314A Pilot Burner with natural and LP gas orifices, 1/4 in. compression fitting, “F”, “K”, or “L” tip style, “B” mounting bracket, and “A" mounting bracket adapter with screws.

Q327A Pilot Burner with natural and LP gas orifices and 1/4 in. compression fitting, and “B” mounting bracket with screws.

Models:
Refer to Table 1.

Target and Tip Styles:
Refer to Fig. 2.

Mounting Brackets and Dimensions:
Refer to Table 2.

“A” Mounting Bracket Adapter Dimensions:
See Fig. 16.

Electrode Assembly for Ignition (Q377, Q379, Q382 only):
18 in. (457 mm) leadwire with 0.093 receptacle for Piezo igniter or 18 in. (457 mm) leadwire with 1/4 in. quick-connect.

Type of Gas:
Models available for natural and LP gas.

Btuh Flow (nominal for natural gas):
Q377: 500.
Q379: 1000.
Q382: 1250.

Maximum Temperature Ratings:
Target tip:
Q314, Q327, Q350, Q380: 1500°F (816°C).
Q324: 1350°F (732°C).
Q377, Q379, Q382: 1575°F (858°C).
Orifice:
Q324: 650°F (343°C).
Q314, Q327, Q350, Q380: 620°F (327°C).
Q377, Q379, Q382: 800°F (427°C).
Mounting Bracket: 1000°F (538°C).

Recommended Thermocouples:
Refer to Table 1.

Recommended Thermopiles:
Refer to Table 1.

Approvals:
International Approval Services: File no. L2025001.

Accessories (specify when ordering):
386449 Replacement 1/4 inch OD Compression Fitting.

Replacement Orifices:
See Table 3.

Table 3. Replacement Orifices

Pilot Burner	Type of Gas	Orifice Stamping	Orifice Part Number
Q377	Natural	BBR12	390686-25
Q377	LP	BBR9	390686-15
Q379	Natural	BCR18	390686-4
Q379	LP	BBR12	390686-25
Q382	Natural	BCR20	390686-5
Q382	LP	BCR13	390686-34

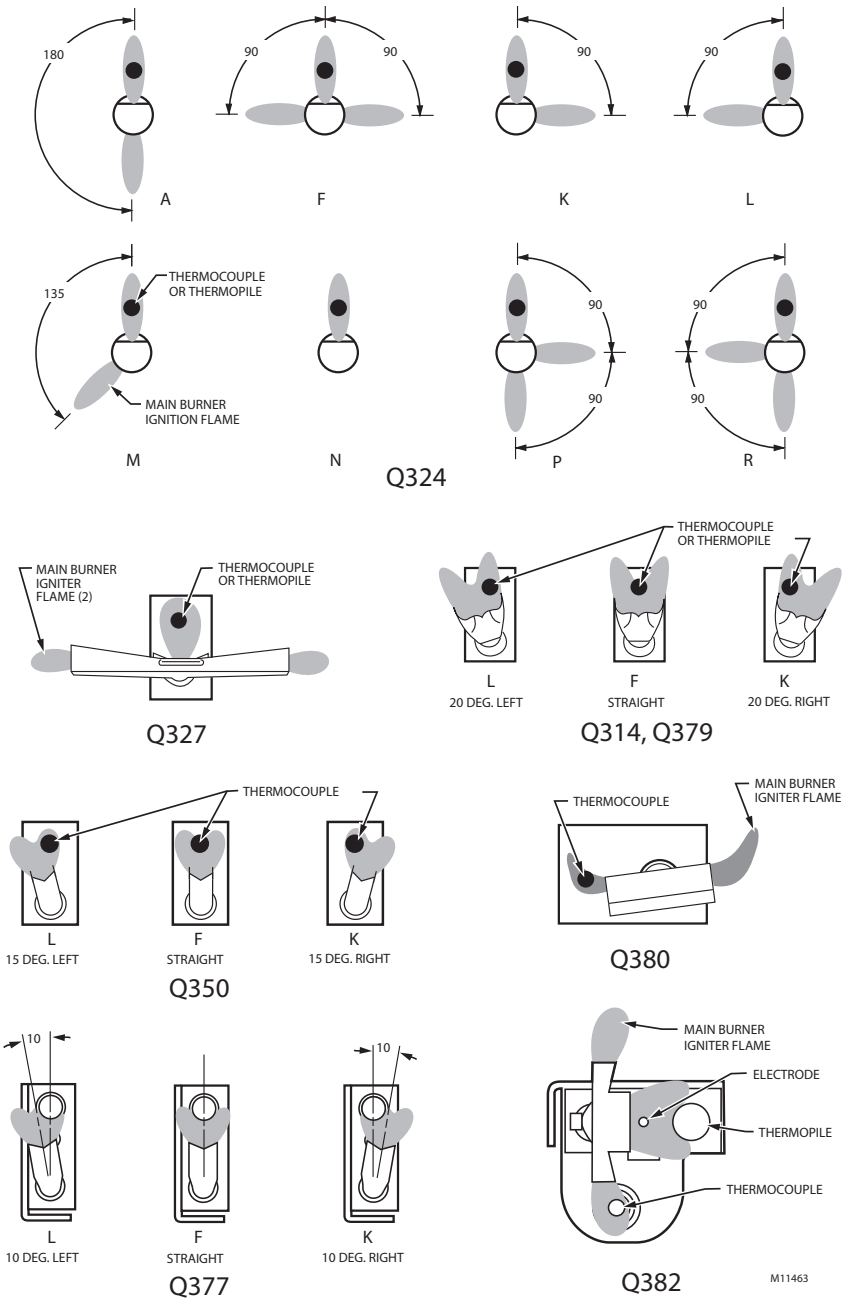
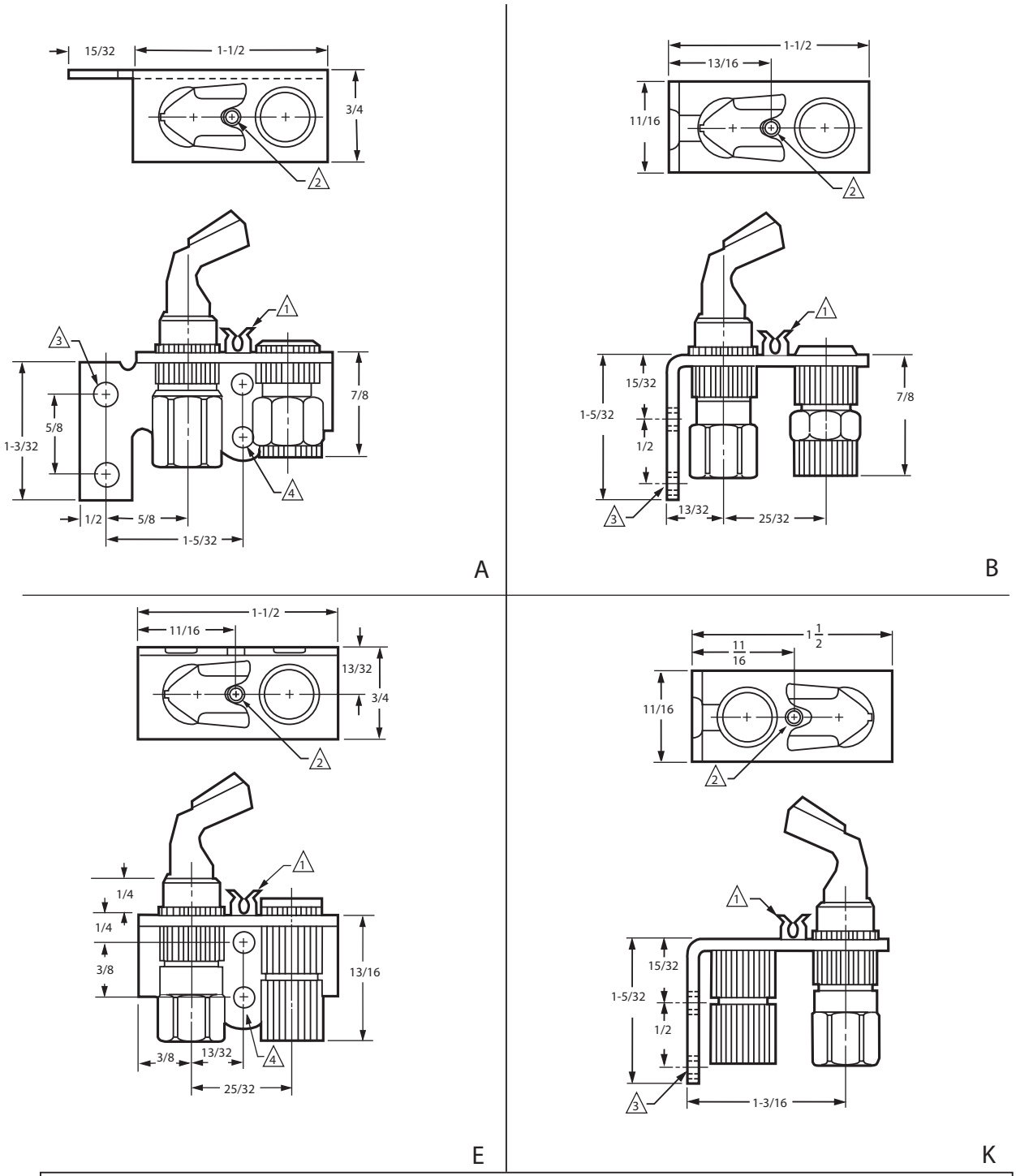


Fig. 2. Pilot Burner target and tip styles

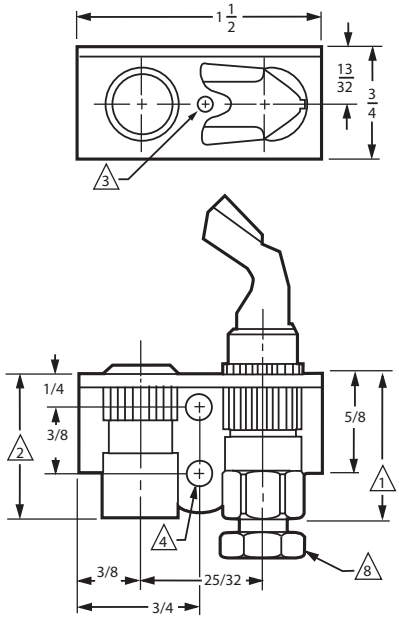


1 BLEED TUBE CLIP (OPTIONAL).
2 HOLE FOR BLEED TUBE.
3 MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
4 MOUNTING HOLE (2), 11/64 IN. DIA (4 mm) (CLEARS NO. 8 SCREW).

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M3304

Fig. 3. Q314 A,B,E and K mounting brackets and dimensions



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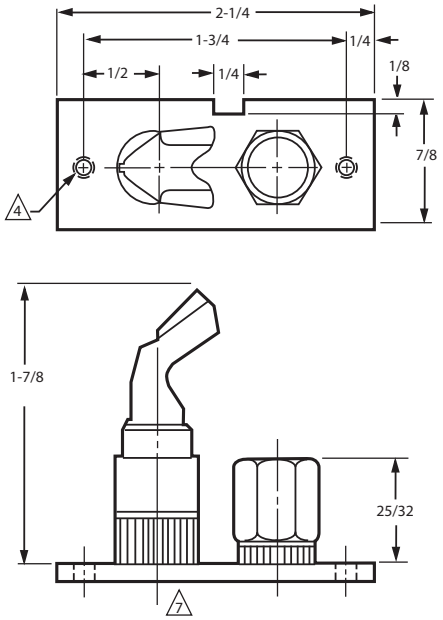

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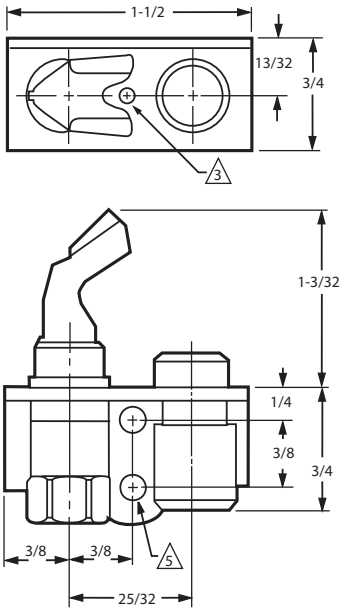

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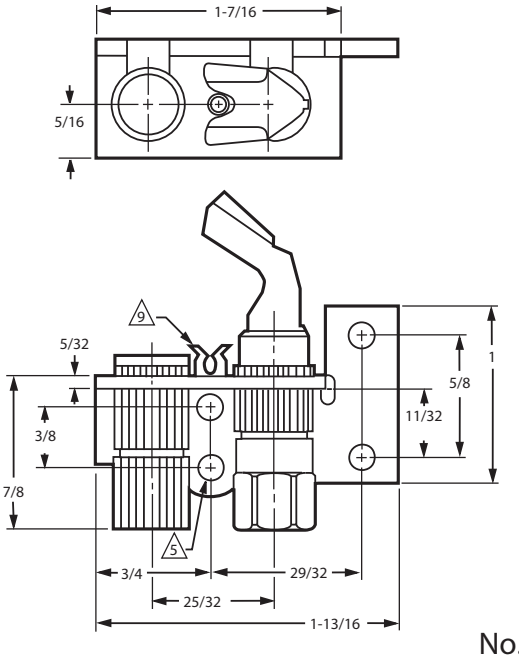
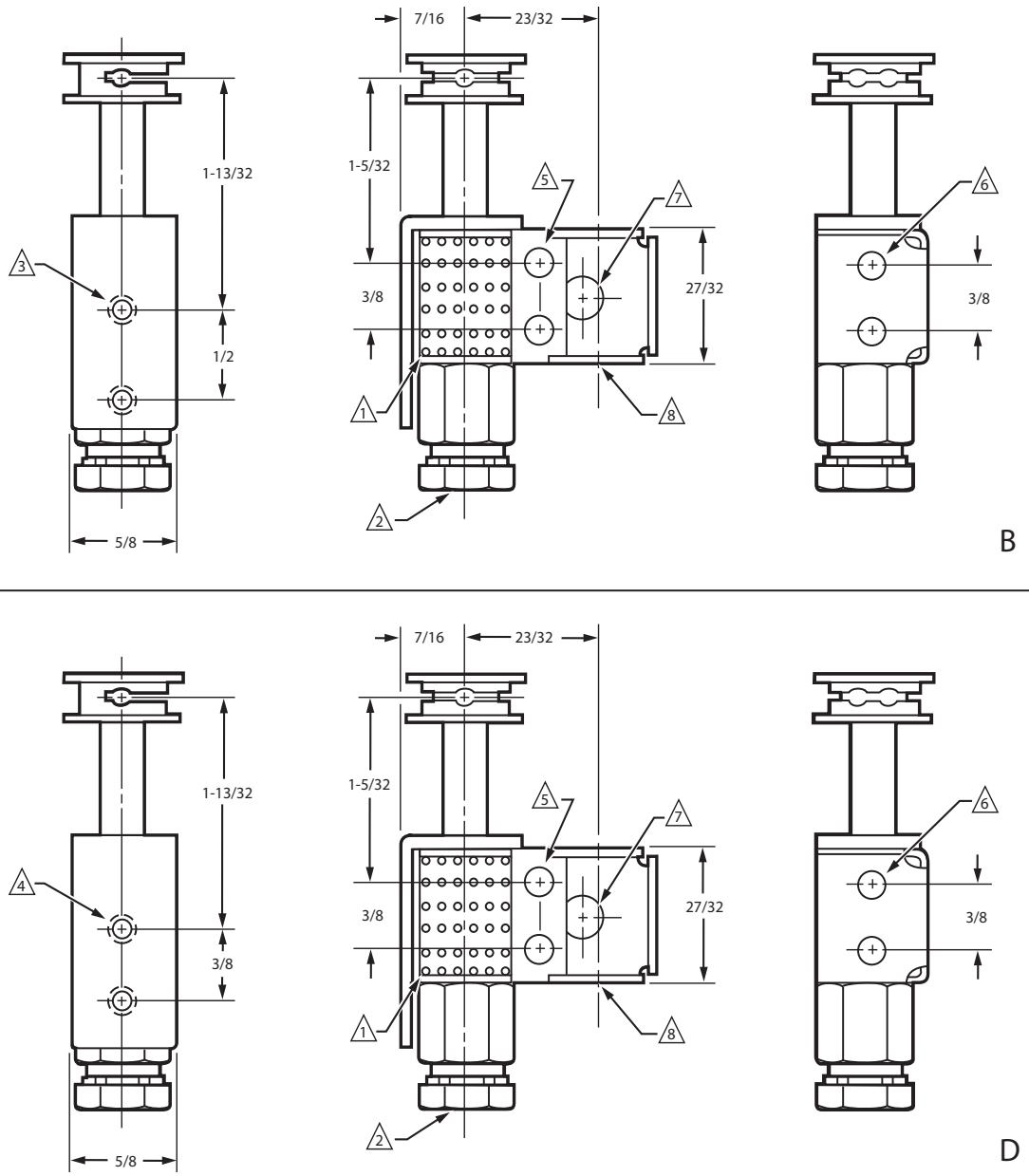


No. 64

1 7/8 IN. STANDARD, 11/16 IN. RAISED.	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
2 7/8 IN. STANDARD, 21/32 IN. RAISED.	1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
3 HOLE FOR BLEED TUBE.	1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
4 MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.	3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
5 MOUNTING HOLE (2), 11/64 IN. DIA (4 mm) (CLEARS NO. 8 SCREW).	1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
6 MOUNTING HOLE (2), 13/64 IN. DIA (5mm) (CLEARS NO. 10 SCREW).	5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
7 INLET FITTING HERE. MAY INCREASE OVERALL HEIGHT.	3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
8 1/4 IN. COMPRESSION FITTING.	7/32	5.6	1/2	12.7	25/32	19.8		
	1/4	6.4	17/32	13.5	13/16	20.6		
	9/32	7.1	9/16	14.3	27/32	21.4		

M3305

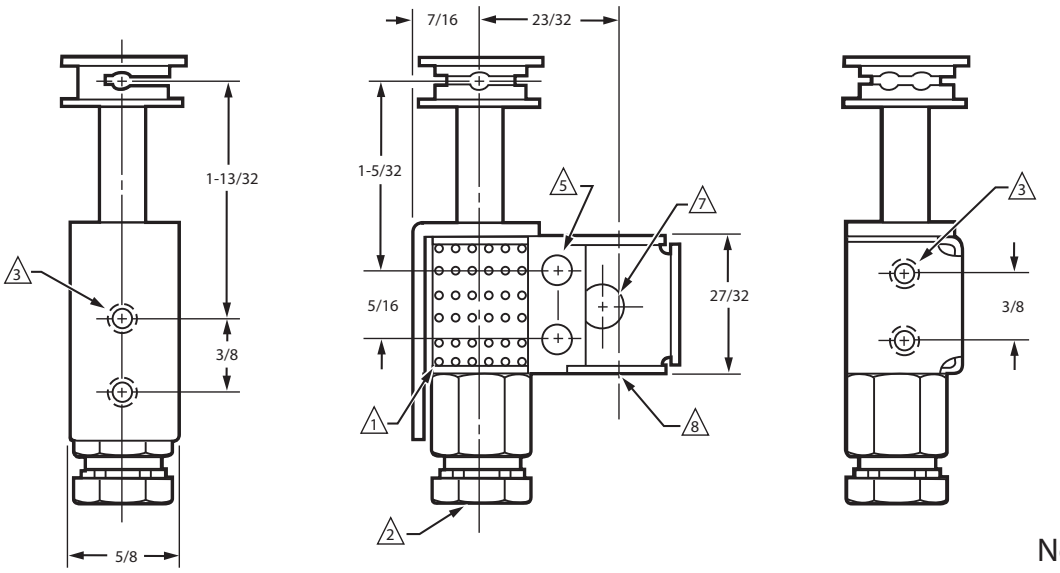
Fig. 4. Q314 No. 11, No. 34, No. 48 and No. 64 mounting brackets and dimensions

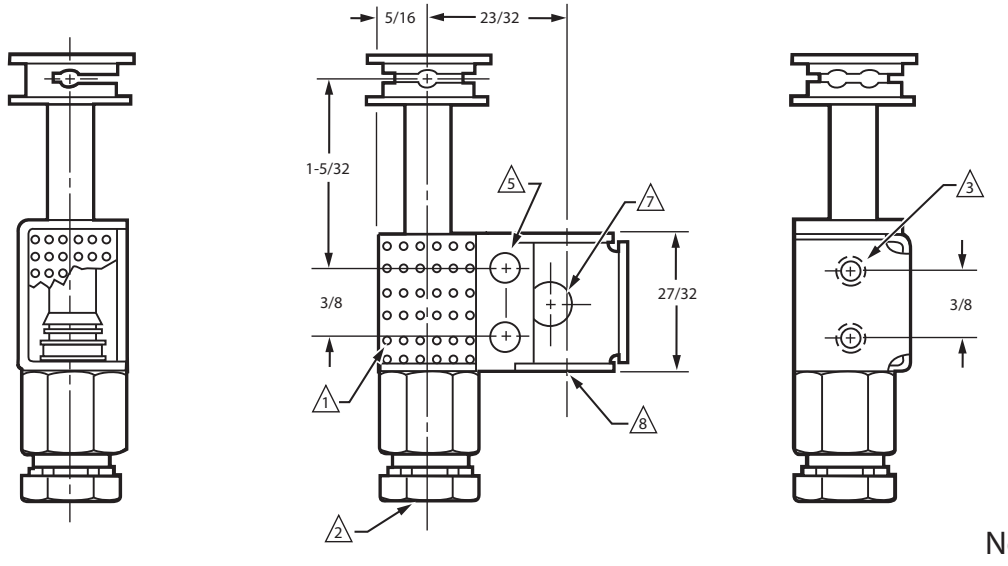


1 LINT SCREEN - OPTIONAL.	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
2 1/4 IN. COMPRESSION FITTING.	1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
3 MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.	1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
4 MOUNTING HOLE (2), TAPPED FOR 5-40 NC SCREW).	3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
5 MOUNTING HOLE (4), 11/64 IN. DIA (5.2 mm) (CLEARS NO. 8 SCREW).	1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
	5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
	3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
6 MOUNTING HOLE (2), 5/32 IN. DIA (4.0 mm).	7/32	5.6	1/2	12.7	25/32	19.8		
7 MOUNTING HOLE, 1/4 IN. DIA (6.4 mm).	1/4	6.4	17/32	13.5	13/16	20.6		
8 THERMOCOUPLE/THERMOPILE TAP, 7/16 - 27.	9/32	7.1	9/16	14.3	27/32	21.4		

M1217

Fig. 5. Q324 B and D mounting brackets and dimensions



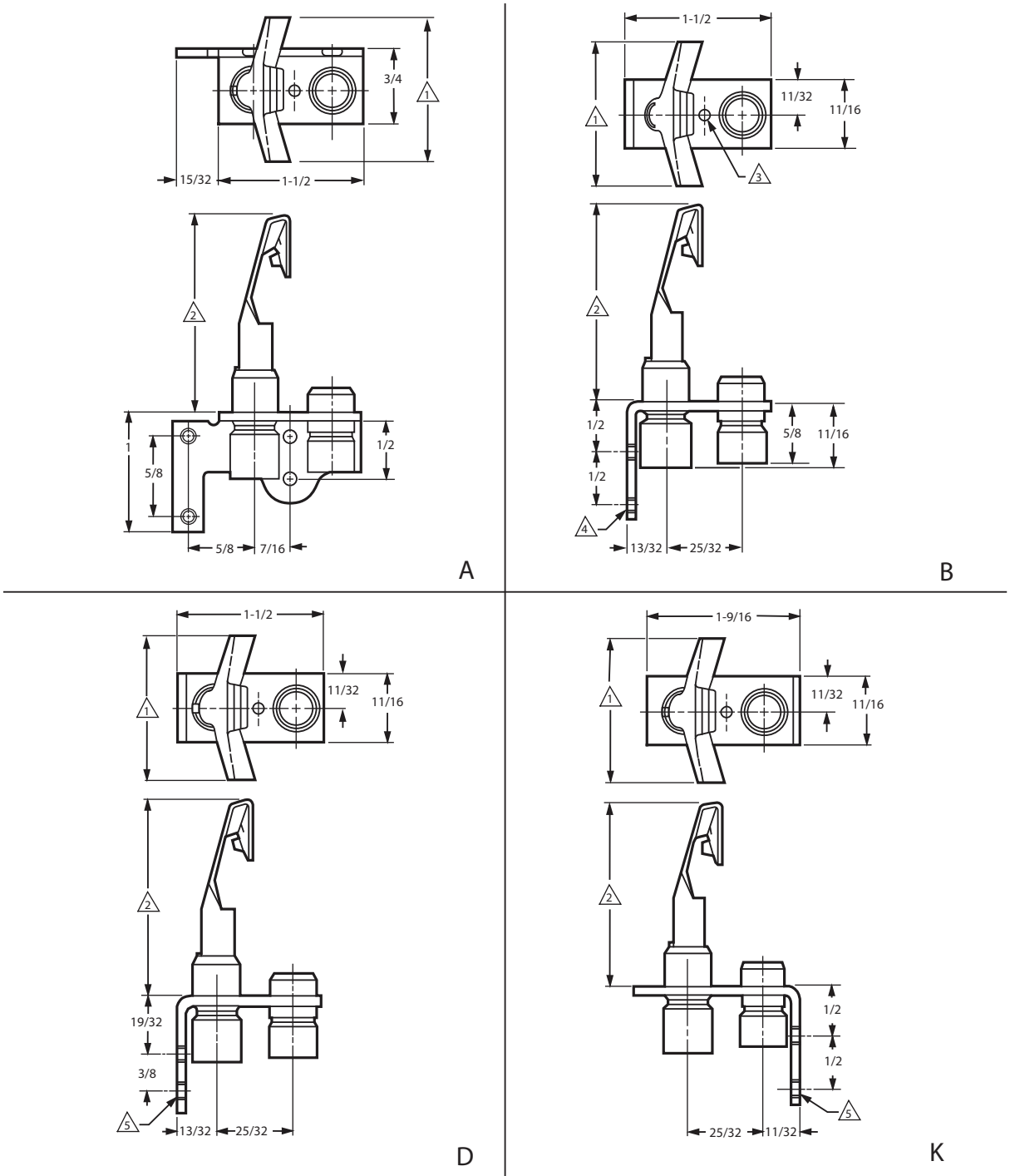


1. LINT SCREEN - OPTIONAL.
2. 1/4 IN. COMPRESSION FITTING.
3. MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
4. MOUNTING HOLE (2), TAPPED FOR 5-40 NC SCREW.
5. MOUNTING HOLE (4), 11/64 IN. DIA (5.2 mm) (CLEARS NO. 8 SCREW).
6. MOUNTING HOLE (2), 5/32 IN. DIA (4.0 mm).
7. MOUNTING HOLE, 1/4 IN. DIA (6.4 mm).
8. THERMOCOUPLE/THERMOPILE TAP, 7/16 - 27.

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1218

Fig. 6. Q324 No. 3 and No. 5 mounting brackets and dimensions

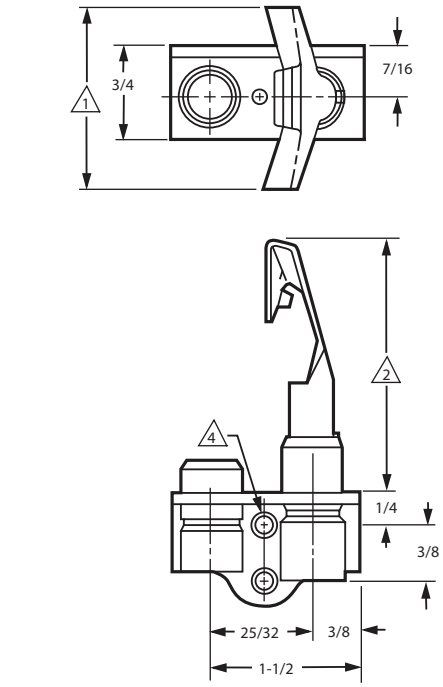


1. SPECIFY WINGSPAN 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 2 3/4, OR 3 IN.
2. 1 1/4 TO 1 3/4 DEPENDING ON WINGSPAN DIMENSION.
3. HOLE FOR BLEED TUBE.
4. MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
5. MOUNTING HOLE (2), TAPPED FOR 5-40 NC SCREW.
6. MOUNTING HOLE (2), 11/64 IN. DIA (CLEARS NO. 8 SCREW).

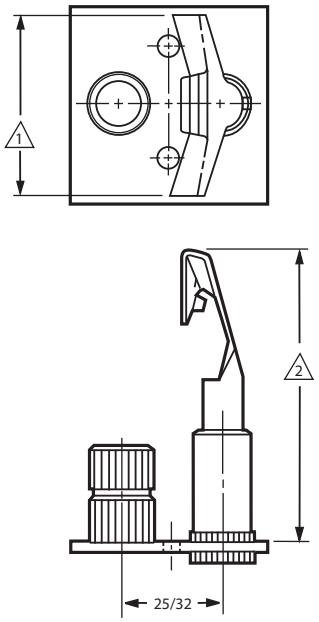
Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1256A

Fig. 7. Q327 A,B,D, and K mounting brackets and dimensions



No. 1



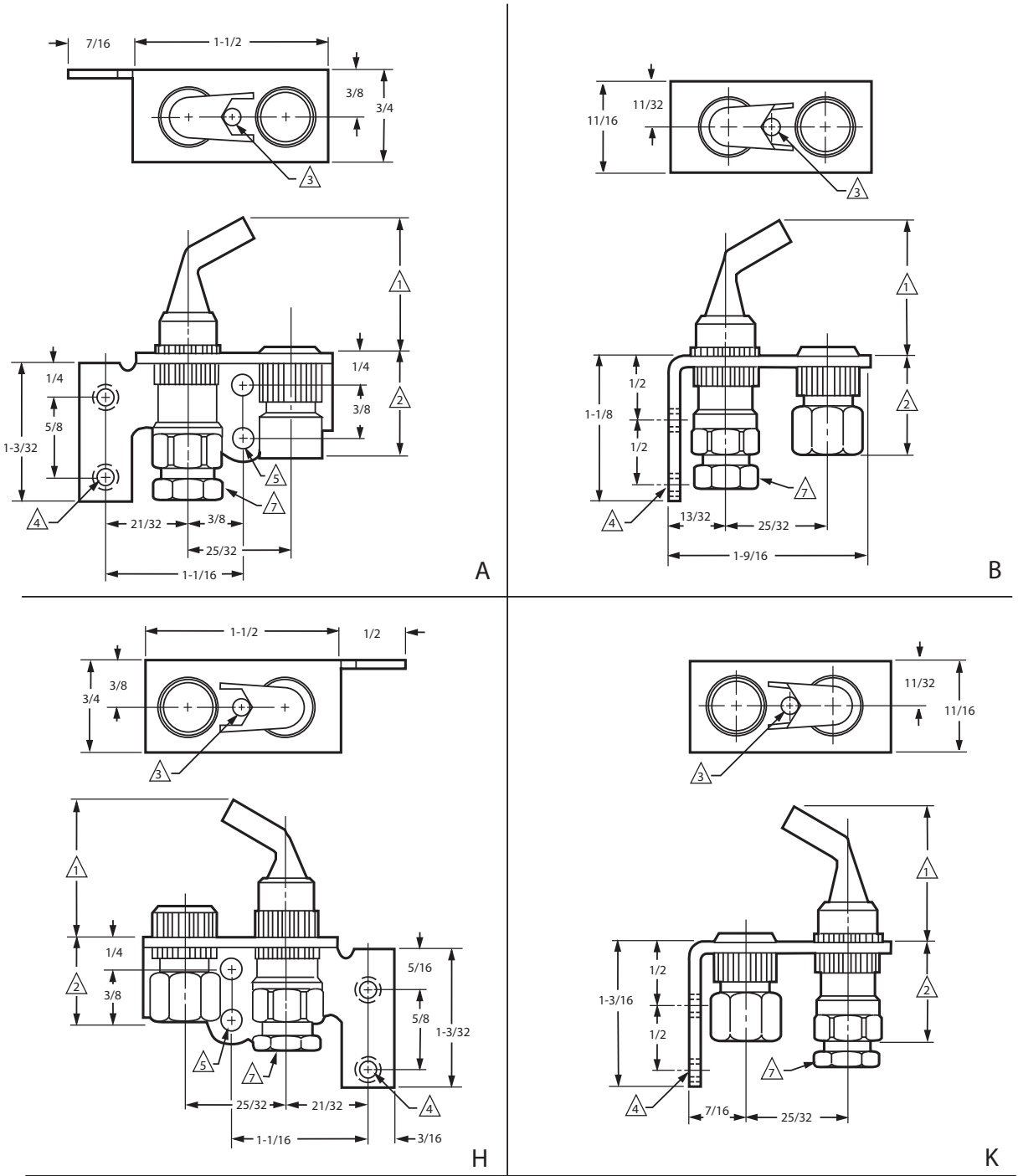
No. 2

1. SPECIFY WINGSPAN 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 2 3/4, OR 3 IN.
2. 1 1/4 TO 1 3/4 DEPENDING ON WINGSPAN DIMENSION.
3. HOLE FOR BLEED TUBE.
4. MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
5. MOUNTING HOLE (2), TAPPED FOR 5-40 NC SCREW.
6. MOUNTING HOLE (2), 11/64 IN. DIA (CLEARS NO. 8 SCREW).

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1257A

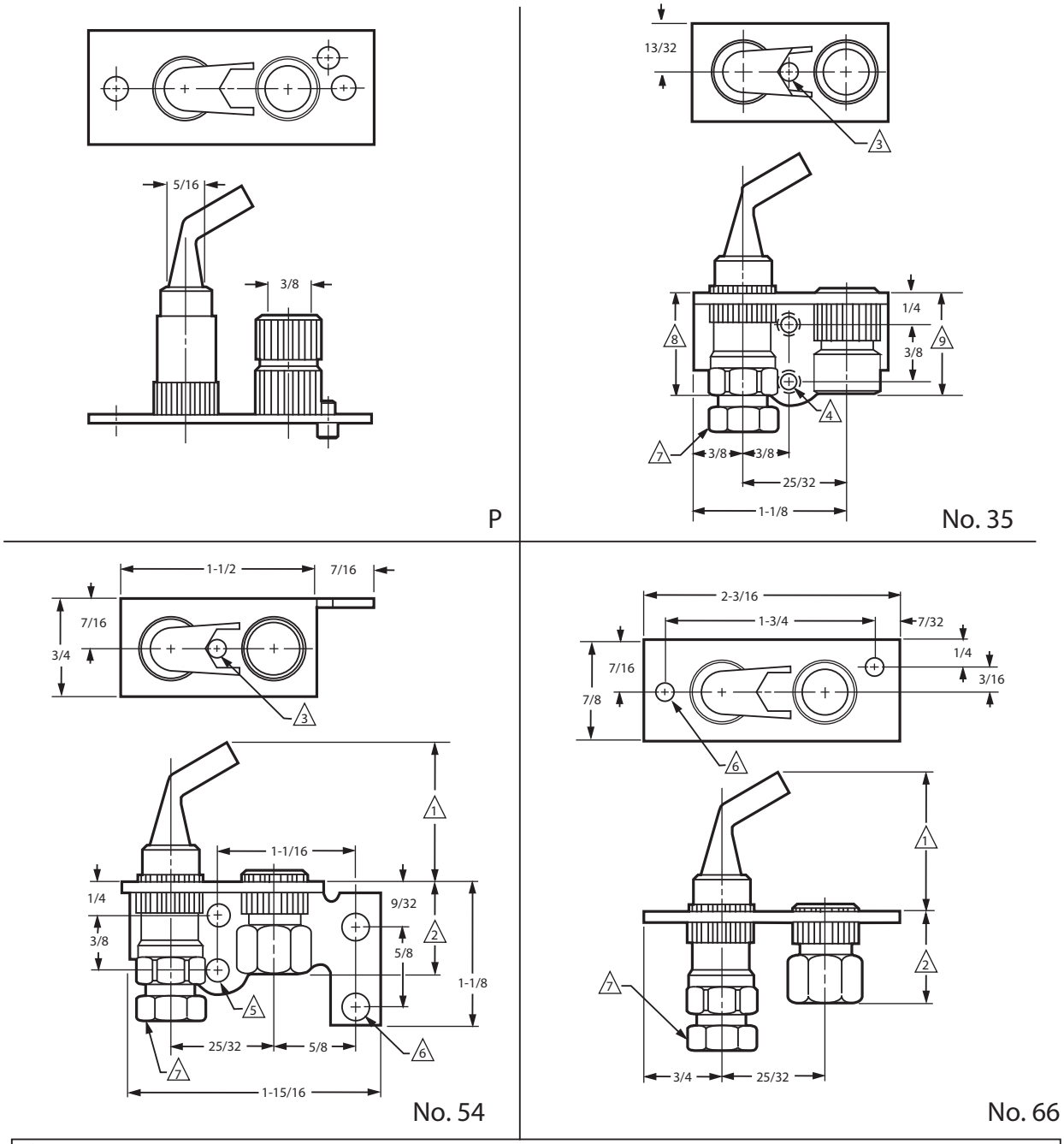
Fig. 8. Q327 No. 1 and No. 2 mounting brackets and dimensions



1 IN. STANDARD, 1-3/16 IN. RAISED.							
25/32 IN (20 mm) STANDARD, 17/32 IN. (14 mm) RAISED.							
HOLE FOR BLEED TUBE.							
MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.							
MOUNTING HOLE (2), 11/64 IN. DIA (4 mm) (CLEARS NO. 8 SCREW).							
MOUNTING HOLE (2), 13/64 IN. DIA (5 mm) (CLEARS NO. 10 SCREW).							
1/4 IN. COMPRESSION FITTING.							
7/8 IN. STANDARD, 11/16 IN. RAISED.							
7/8 IN. STANDARD, 21/32 IN. RAISED.							
Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1250A

Fig. 9. Q350 A,B,H, and K mounting brackets and dimensions

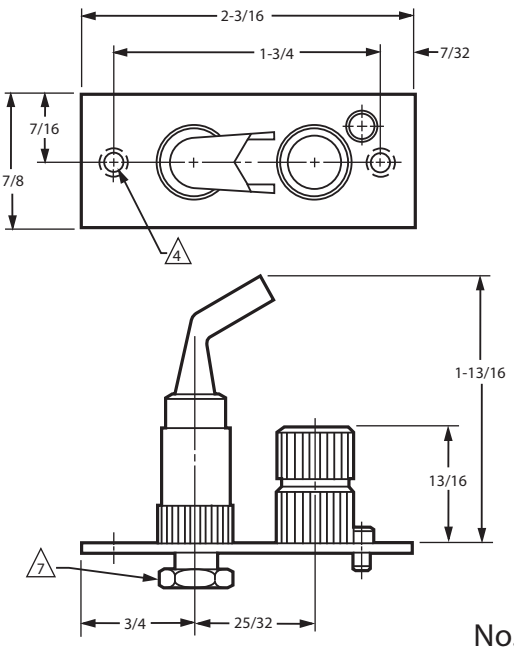


1. 1 IN. STANDARD, 1-3/16 IN. RAISED.
2. 25/32 IN (20 mm) STANDARD, 17/32 IN. (14 mm) RAISED.
3. HOLE FOR BLEED TUBE.
4. MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
5. MOUNTING HOLE (2), 11/64 IN. DIA (4 mm) (CLEARS NO. 8 SCREW).
6. MOUNTING HOLE (2), 13/64 IN. DIA (5 mm) (CLEARS NO. 10 SCREW).
7. 1/4 IN. COMPRESSION FITTING.
8. 7/8 IN. STANDARD, 11/16 IN. RAISED.
9. 7/8 IN. STANDARD, 21/32 IN. RAISED.

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1251A

Fig. 10. Q350 P, No. 35, No. 54 and No. 66 mounting brackets and dimensions



1 1 IN. STANDARD, 1-3/16 IN. RAISED.
2 25/32 IN (20 mm) STANDARD, 17/32 IN. (14 mm) RAISED.
3 HOLE FOR BLEED TUBE.
4 MOUNTING HOLE (2), TAPPED FOR 10-32 NC SCREW.
5 MOUNTING HOLE (2), 11/64 IN. DIA (4 mm) (CLEARS NO. 8 SCREW).
6 MOUNTING HOLE (2), 13/64 IN. DIA (5 mm) (CLEARS NO. 10 SCREW).
7 1/4 IN. COMPRESSION FITTING.
8 7/8 IN. STANDARD, 11/16 IN. RAISED.
9 7/8 IN. STANDARD, 21/32 IN. RAISED.

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1/32	0.8	5/16	7.9	19/32	15.1	7/8	22.2
1/16	1.6	11/32	8.7	5/8	15.9	29/32	23.0
3/32	2.4	3/8	9.5	21/32	16.7	15/16	23.8
1/8	3.2	13/32	10.3	11/16	17.5	31/32	24.6
5/32	4.0	7/16	11.1	23/32	18.3	1	25.4
3/16	4.8	15/32	11.9	3/4	19.1	2	50.8
7/32	5.6	1/2	12.7	25/32	19.8		
1/4	6.4	17/32	13.5	13/16	20.6		
9/32	7.1	9/16	14.3	27/32	21.4		

M1252A

Fig. 11. Q350 No. 75 mounting brackets and dimensions

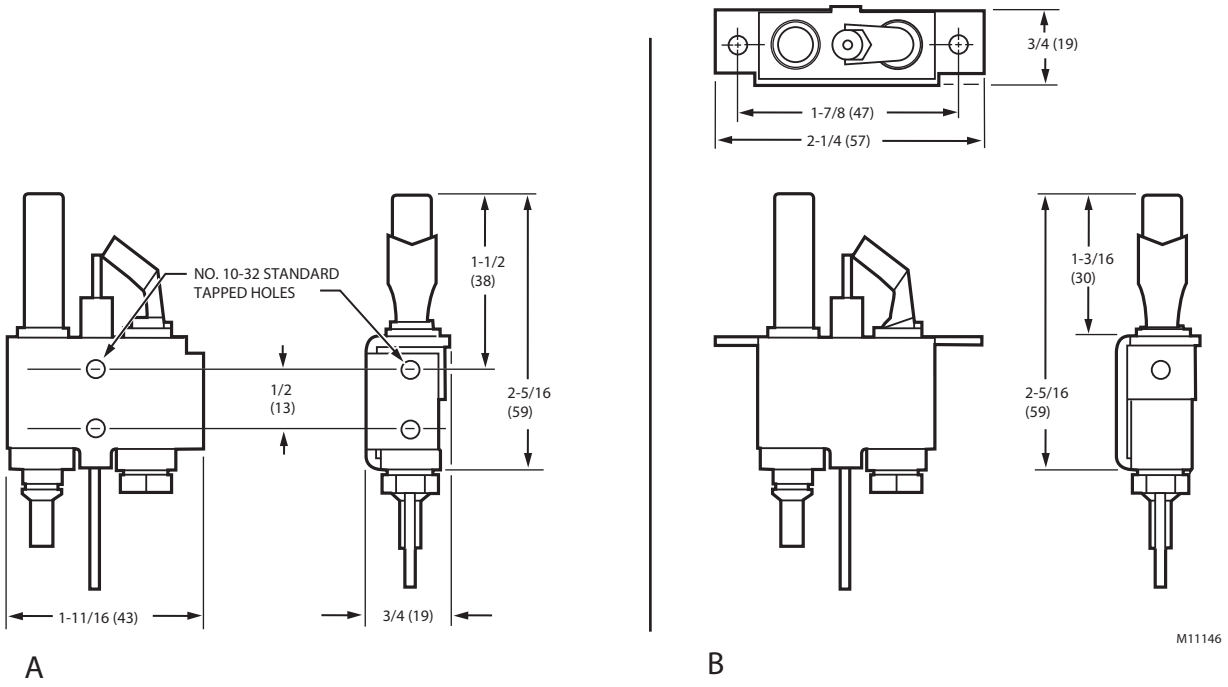


Fig. 12. Q377 mounting brackets and dimensions in in. (mm)

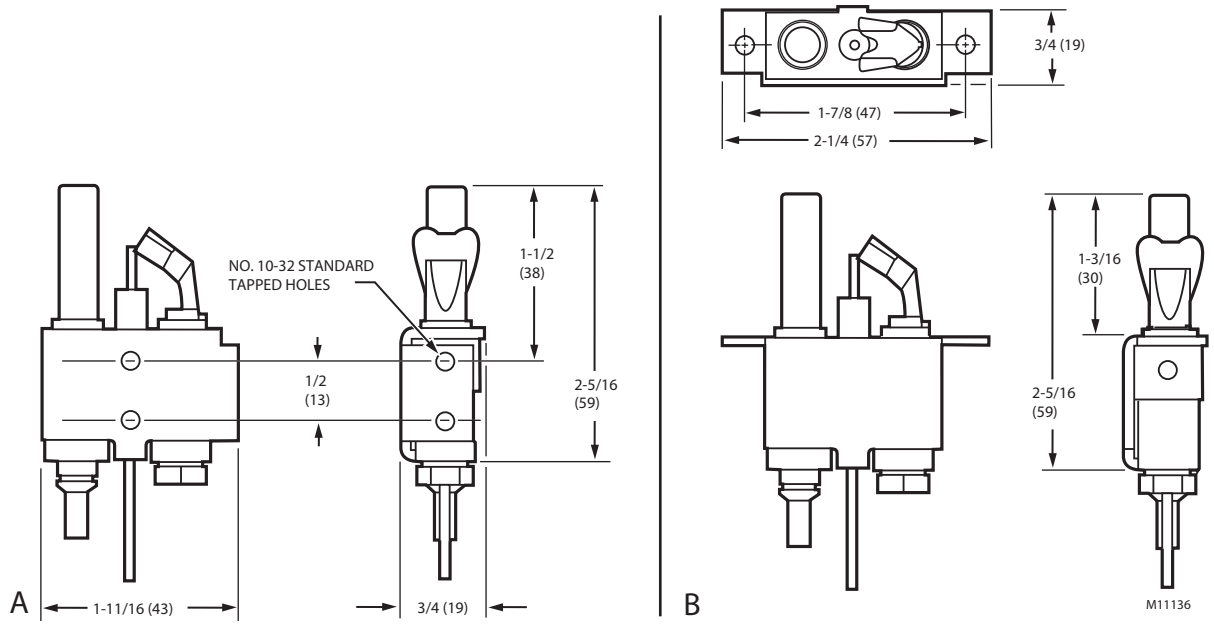


Fig. 13. Q379 mounting brackets and dimensions in in. (mm)

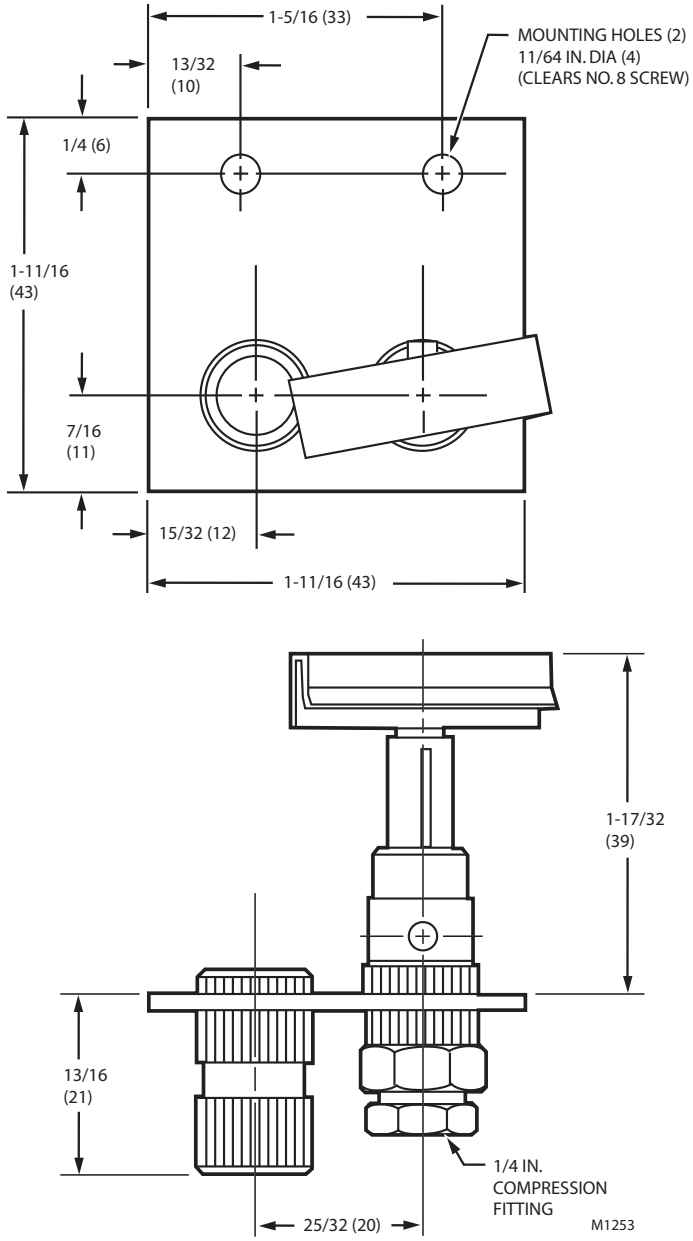


Fig. 14. Q380 No. 1 mounting bracket and dimensions

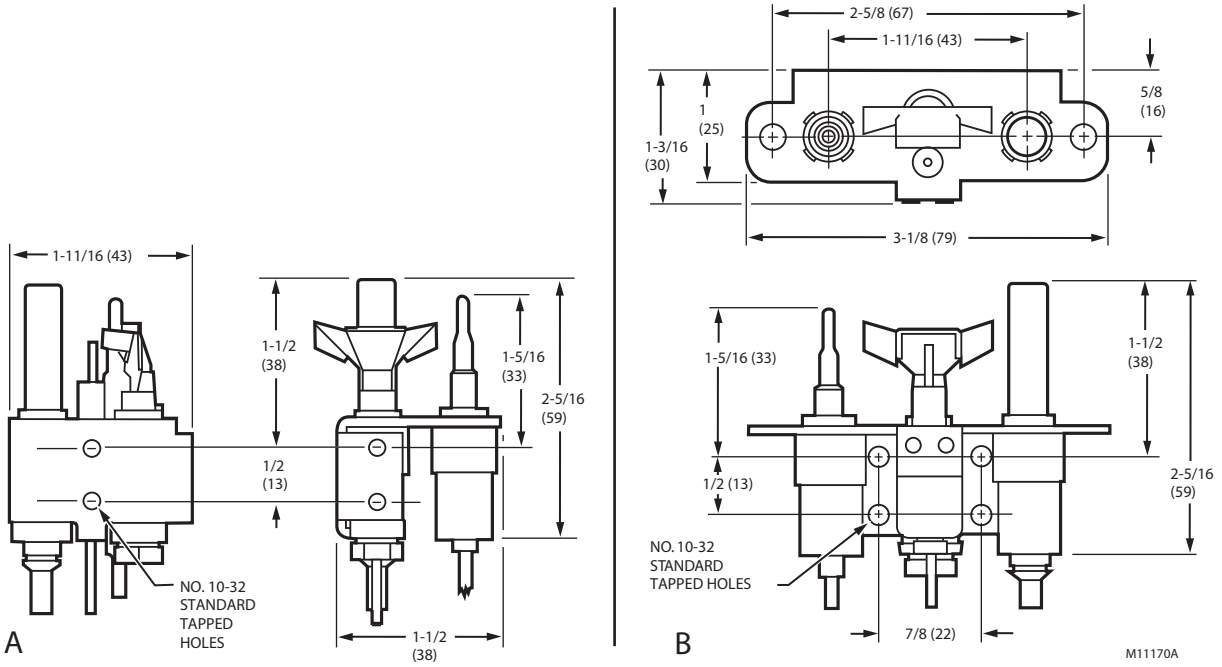


Fig. 15. Q382 mounting brackets and dimensions in in. (mm)

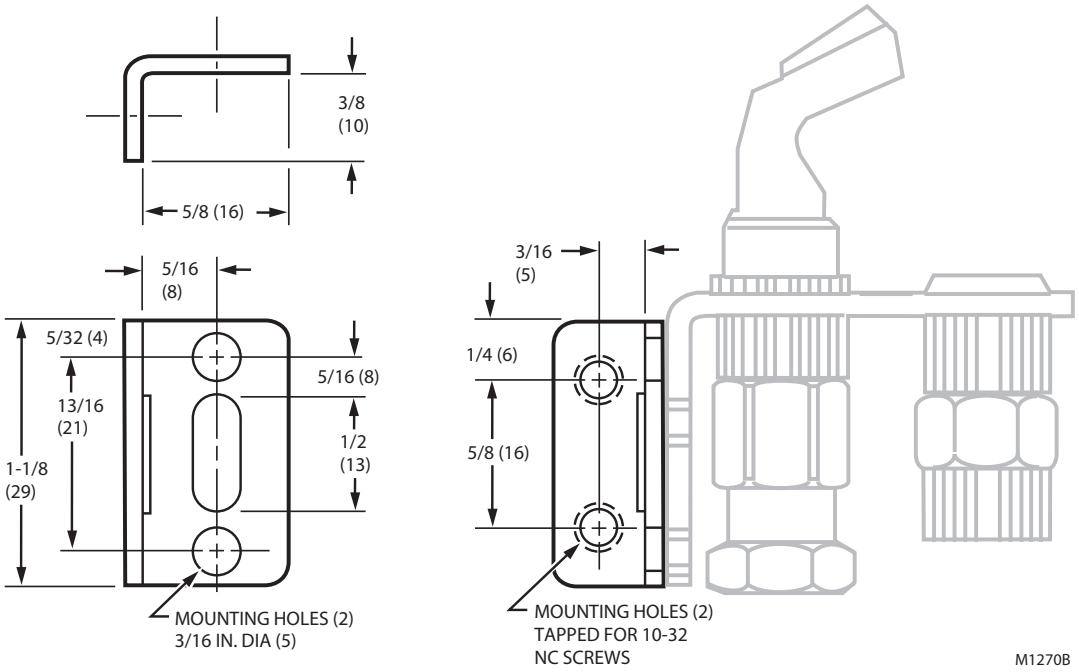


Fig. 16. Q314 "A" mounting bracket adapter dimensions

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow instructions can damage product or cause a hazardous condition.
2. Check ratings given in instructions and on product to make sure product is suitable for your application.
3. Make sure installer is a trained, experienced service technician.
4. After completing installation, use these instructions to check out product operation.

⚠ WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Follow these warnings exactly.

1. Disconnect power supply before wiring to prevent electrical shock or equipment damage.
2. To avoid dangerous accumulation of fuel gas, turn off gas supply at appliance service valve before starting Installation and perform Gas Leak Test after completion of Installation.
3. Do not bend pilot tubing at the gas control or pilot burner after compression nut has been tightened. Gas leakage at the connection may result.

Follow appliance manufacturer's instructions if available; otherwise, use instructions provided below.

Location

1. Position the pilot burner for easy access, observation, and lighting. In replacement applications, replace the pilot burner with an identical unit and position the new pilot burner in the same location and orientation as the original pilot burner.
2. Mount the pilot burner on the main burner. Mounting surfaces other than the main burner can shift, bend, or warp as furnace expands and contracts while operating. See Fig. 17.
3. Mount the pilot burner so the ignition flame remains properly positioned with respect to the main burner flame. See Fig. 18.
4. Supply the pilot flame with ample air free of combustion products.
5. Do not impinge the pilot flame on adjacent parts. Do not impinge the main burner flame on the pilot burner.
6. Do not expose the pilot flame to falling scale that could impair the ignition of the main burner.
7. Do not expose the pilot burner to main burner rollout while igniting or extinguishing.
8. Do not expose the pilot flame to drafts that push or pull the pilot flame away from the thermocouple or thermopile.

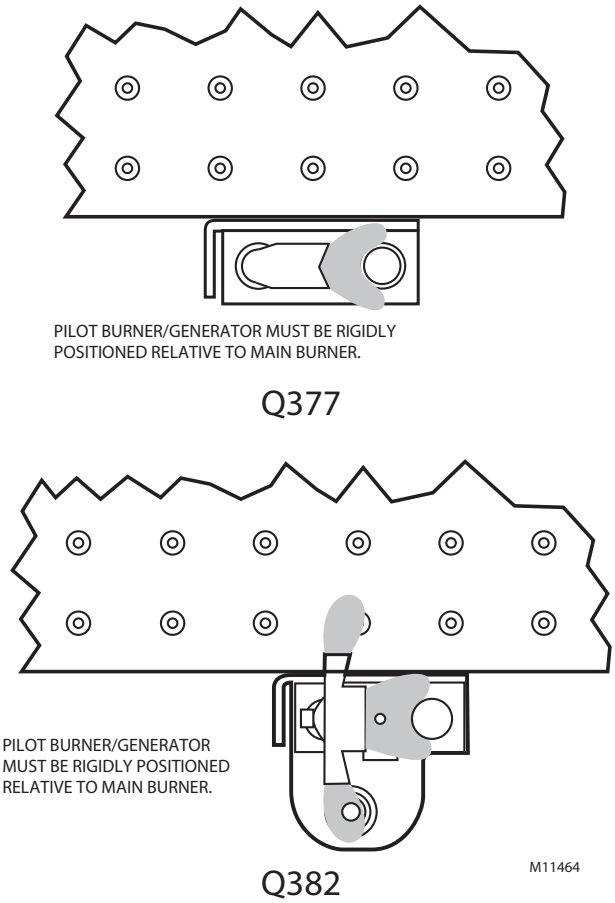


Fig. 17. Mount pilot burner on main burner (Q377 and Q382 shown)

NOTE: Q380 is for horizontal mounting only. Mounting bracket must remain vertical.

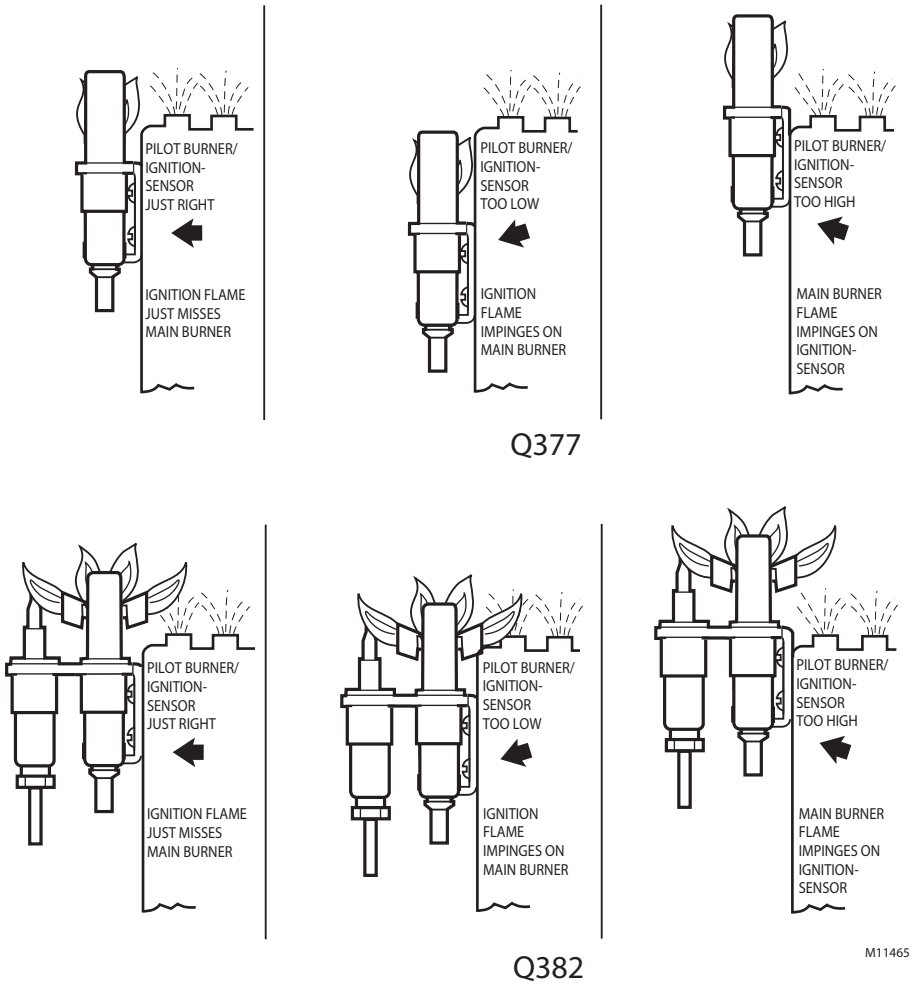


Fig. 18. Location of pilot burner (Q377 and Q382 shown)

Connect Pilot Gas Tubing

1. Cut the tubing to the desired length and bend as necessary for routing to the pilot burner. Do not make sharp bends or deform the tubing. Do not bend the tubing at the control after the compression nut has been tightened because this can result in gas leakage at the connection.
2. Square off and remove the burrs from the end of the tubing.
3. Push the tubing into the compression nut clearance hole until the tubing bottoms.

NOTE: NOTE: When replacing a pilot burner or orifice, cut off old compression fitting and replace with the new compression fitting provided with new pilot burner. Never use the old compression fitting because it may not provide a gas-tight seal. See Fig. 19.

4. While holding the tubing all the way in, engage the threads and turn until finger tight.
5. Using a wrench, turn the compression nut one turn beyond finger tight. Do not overtighten.
6. Connect the other end of the tubing to the gas control according to the gas control manufacturer instructions.

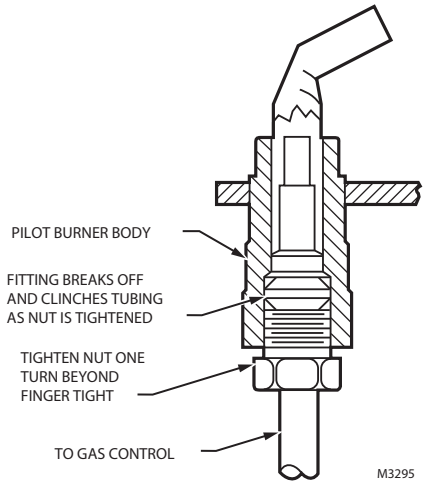


Fig. 19. Always use new compression fitting

Install Thermocouple or Thermopile

Push-in Design

1. Insert the thermocouple or thermopile tip into the hole or barrel provided beneath the pilot burner. See Fig. 20 and Fig. 21.
2. Push in firmly until the thermocouple or thermopile is locked into place.

Attachment Nut Design

1. Insert the thermocouple or thermopile tip into the hole or barrel provided beneath the pilot burner. See Fig. 21.
2. Engage the attachment nut threads and tighten until the thermocouple or thermopile is locked into place.

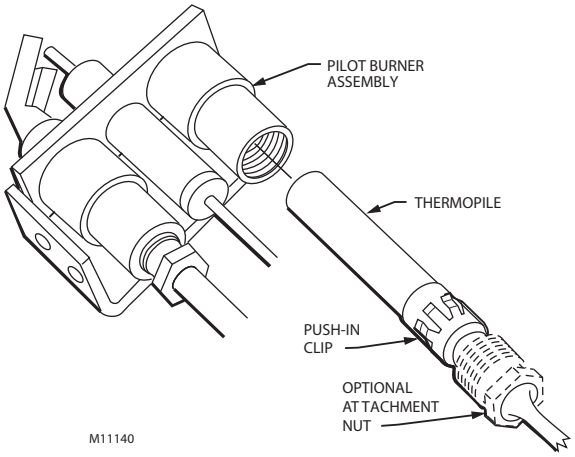


Fig. 20. Installing thermocouple or thermopile

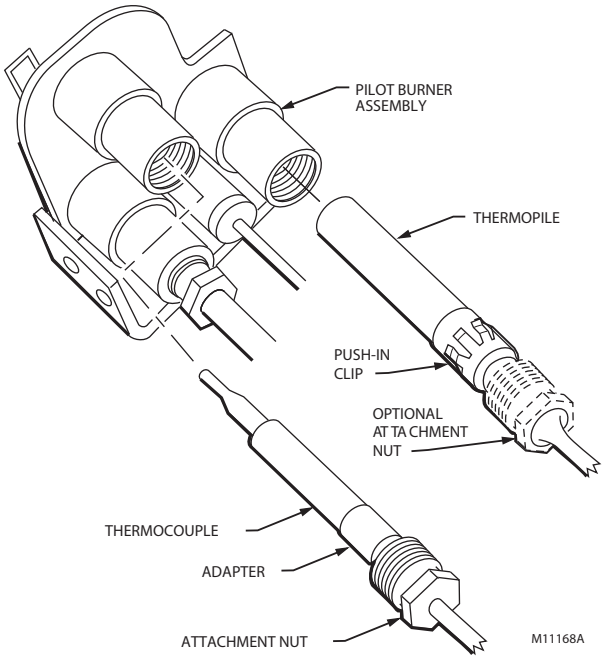


Fig. 21. Installing Q382 thermocouple and thermopile

Install Bleed Gas Tubing (if used):

1. Route the bleed gas tubing from the bleed tapping on the gas control to the pilot burner.
2. Push the clip into place as shown in Fig. 22.
3. Insert the bleed gas tubing until 3/8 inch (10 mm) of the tubing is above the pilot burner bracket. The tip of the bleed gas tubing must not extend into the pilot flame.

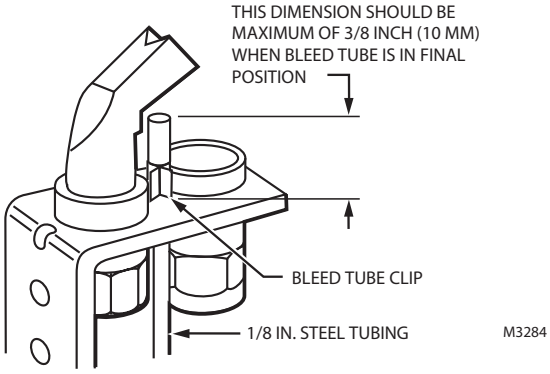


Fig. 22. Install bleed gas tubing

Install Q314 "A" Mounting Bracket Adapter

To convert the mounting bracket on a Q314 from a "B" mounting bracket to an "A" mounting bracket, install the "A" mounting bracket adapter to the pilot burner mounting bracket. Then install the pilot burner to the main burner. See Fig. 16.

Change Insert Orifice (See Fig. 23)

1. Disconnect the pilot tubing from the pilot burner and remove the insert orifice. Light force may be required to remove the orifice.
2. Cut off the old compression fitting.

NOTE: When replacing an orifice, cut off the old compression fitting and replace with a new compression fitting. Never use an old compression fitting because it may not provide a gas-tight seal. See Fig. 19.

3. Square off the end of the pilot tubing and remove all the burrs.
4. Insert the new compression nut over the pilot tubing and slide out of the way.
5. Insert the new orifice into the pilot burner and push the pilot tubing into the pilot burner until it bottoms.
6. While holding the tubing all the way in, slide the compression fitting into place and engage the threads. Turn until finger tight.
7. Using a wrench, tighten the compression fitting one turn beyond finger tight.

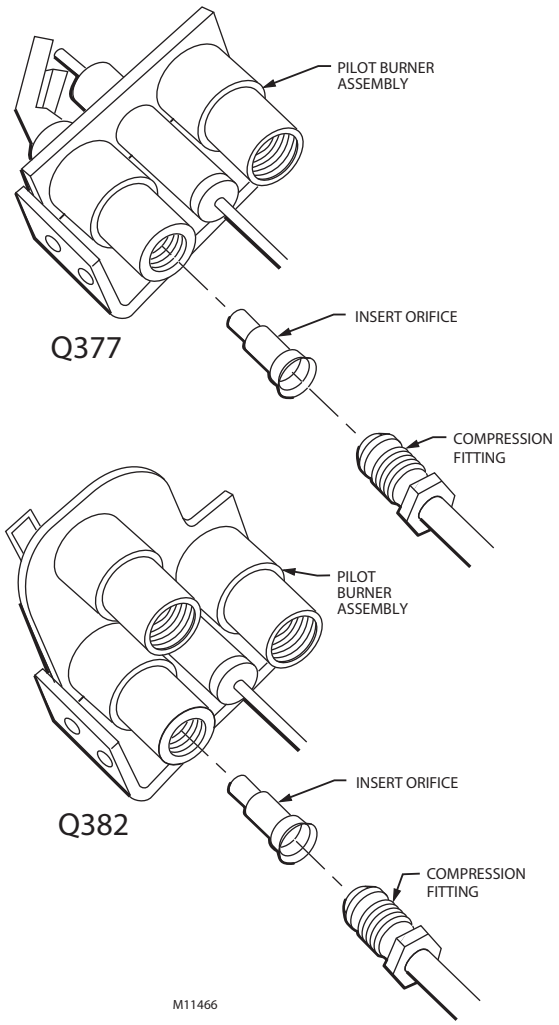


Fig. 23. Changing insert orifices (Q377 and Q382 shown)

STARTUP AND CHECKOUT

Perform Gas Leak Test

⚠ WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Check for gas leaks with soap and water solution any time work is done on a gas system.

Gas Leak Test

1. Ensure that the gas supply is turned on at the appliance service valve.
2. Paint the pipe connections upstream of the pilot burner with rich soap and water solution. Bubbles indicate a gas leak.
3. If a leak is detected, tighten the pipe connections.
4. Stand clear of the main burner while lighting to prevent injury caused from hidden leaks, which can cause flashback in the appliance vestibule. Light the main burner.
5. With the main burner in operation, paint the pipe joints (including the adapters) and gas control inlet and outlet with rich soap and water solution.
6. If another leak is detected, tighten the adapter screws, joints, and pipe connections.
7. Replace the part if the leak cannot be stopped.

Adjust Pilot Flame

The pilot flame should envelop 3/8 to 1/2 in. (10 to 13 mm) of the thermocouple or thermopile tip. See Fig. 24 To adjust the pilot flame:

1. Remove the pilot adjustment cover screw from the gas control.
2. Turn the inner pilot adjustment screw clockwise to decrease or counterclockwise to increase the pilot flame.
3. Replace the pilot adjustment cover screw and tighten firmly after completing adjustment to ensure proper operation.

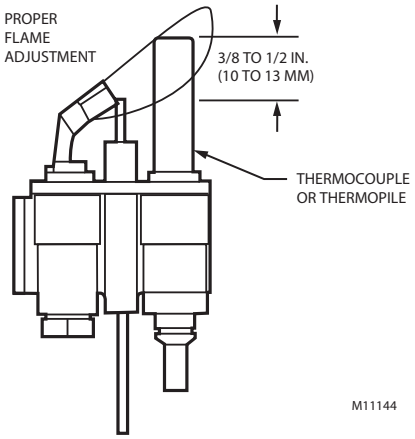


Fig. 24. Thermocouple or thermopile tip must be in pilot flame

Ignite Pilot Burner

1. Before lighting the pilot burner, turn the thermostat to its lowest setting. Wait for unburned gas to vent.

NOTE: LP gas is heavier than air and will not vent upward. Smell for LP gas next to floor. If you smell gas, shut off the main valve in the gas piping or ON LP, at the tank. Perform Gas Leak Test to recheck the connections.

2. Light the pilot burner according to the appliance manufacturer instructions.

SERVICE

⚠ WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Perform Gas Leak Test anytime work is done to the system.

Pilot Outage

1. If the pilot flame goes out during normal operation, but is properly adjusted, recheck Location instructions in the Installation section.
2. If all Location instructions are followed but pilot flame continues to go out, construct shielding to protect the pilot flame from the main burner ignition and extinction and drafts. See Fig. 25.

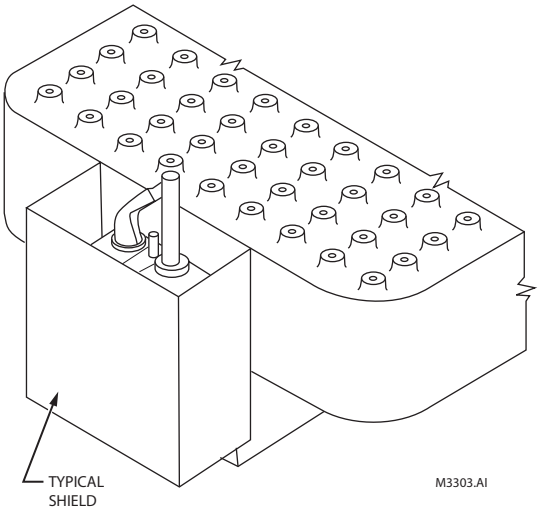


Fig. 25. Proper shielding of pilot flame (Q350 shown)

Pilotstat® Safety Control Power Unit Failure

1. Make sure the pilot flame is properly adjusted.
2. Make sure the power unit connections are clean and tight.
3. Make sure the terminal connections are clean and tight.
4. If the power unit still fails to hold in, use the W129A Millivoltmeter to obtain the open and closed circuit voltage generated by the thermocouple or thermopile.
5. Compare the measured open and closed circuit voltage values to Acceptable Range Charts in the W129A Manual.
6. If a W129A Millivoltmeter or other meter is not available, replace the thermocouple of thermopile. If this does not correct the condition, replace the power unit.

Thermocouple Or Thermopile Performance

Thermocouples and thermopiles require proper temperature differential between the hot-junction (tip) and cold-junction (base) to provide satisfactory operation of millivoltage gas controls. Thermocouples and thermopiles perform less effectively when exposed to excessive cold-junction or hot-junction temperatures.

Excessive cold-junction temperatures can be caused by heat radiation from adjacent surfaces or high ambient air temperatures. Excessive cold-junction temperatures can be eliminated by shielding the pilot flame, see Fig. 25, or constructing a baffle to direct secondary air over the pilot burner base.

Excessive hot-junction temperatures can be eliminated by proper pilot flame adjustment. To adjust pilot flame, see the instructions in the Startup and Checkout section.

Pilot Turndown Test (30 mV Pilotstat® Safety Control Systems)

The Pilot Turndown Test assures that the pilot flame ignites the main burner within four seconds from the time gas reaches the main burner. In this test, the pilot flame is just sufficient enough to hold in the Pilotstat® power unit or just above the point of flame extinction (whichever occurs at a higher pilot gas flow rate).

1. With the pilot and main burner operating, shut off the main burner by either lowering the thermostat temperature setting or turning the gas control knob to the PILOT position.

NOTE: If using a W129A Millivoltmeter, turn the pilot gas adjustment screw until the thermocouple open circuit voltage is 2 mV, omit steps 2, 3, and 4 and proceed with step 5.

2. Turn the pilot gas adjustment screw clockwise until the pilot begins to decrease in size. Then turn the pilot gas adjustment screw clockwise 1/4 turn at a time (waiting one minute between each turn to allow the thermocouple to cool) until safety shutoff power unit just drops out, causing safety shutdown.
3. Turn the pilot gas adjustment screw counterclockwise slightly.
4. Relight the pilot burner. The power unit should hold in.
5. Turn the gas control knob to the ON position and set the thermostat temperature setting above room temperature. The main burner should light within four seconds without flame rollout. If not, check the pilot burner Location instructions in the Installation section and repeat the Pilot Turndown Test.
6. Readjust the pilot burner flame. Refer to the instructions in the Startup and Checkout section.

Effective Ignition Test (750 mV Systems)

The Effective Ignition Test assures that the pilot flame ignites the main burner within four seconds from the time gas reaches the main burner. In this test, the pilot flame is just sufficient to open the main gas valve.

1. Light the main burner according to the appliance manufacturer's instructions and allow to burn at least five minutes.
2. Remove one thermostat lead (TH) at the gas control terminal.
3. Using the pilot gas adjustment screw, decrease the pilot flame until it begins to pull away from the thermopile. Allow the thermopile to cool for one minute.
4. Temporarily jumper the thermostat terminals (TH) on the gas control.
5. If the main burner ignites, reduce the pilot flame by turning the pilot adjustment screw 1/4 turn at a time until the valve fails to pull in. Allow the thermopile to cool at least one minute between each reduction in the pilot flame level.
6. Increase the pilot flame just enough to pull in the gas control main valve.
7. Jumper the thermostat terminals. The main burner lights within four seconds and without flame roll-out. If it does not, check the Location instructions in the Installation section and repeat steps 1 through 6.
8. If main burner still does not light, replace the thermopile and repeat steps 1 through 6.
9. Remove the jumper to shut off the main burner.
10. Readjust the pilot burner flame. See the instructions in the Startup and Checkout section.
11. Reconnect the thermopile lead and make sure all connections are correct and the system is functioning properly.

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