

Schwank
INNOVATIVE HEATING SOLUTIONS



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radiant heaters

GAS CONVERSION KIT: SINGLE STAGE TUBE HEATERS

Model Series: **P40U, P40U-I; P40R
STS-JZ, SPW-JZ, STW-JZ, S100;
IQ, IWP, IW, ITB**

Gas-Fired Low Intensity Tube Heaters

This Kit to be installed only by a qualified service agency.

INSTRUCTIONS / OWNER'S MANUAL



WARNING

This conversion kit shall be installed and serviced only by a qualified gas service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly, a fire, an explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life. The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.

Use only the proper conversion kit supplied by the manufacturer.

Failure to comply could result in personal injury, death, fire and/or property damage.

These General Instructions must be used in conjunction with:

- The enclosed detailed instructions for the individual conversion kit for the specific model burner being converted
- The accompanying gas control conversion instructions supplied by the manufacturer of the gas control
- The Installation and Owner's manual shipped originally with the appliance being converted

Caution: the gas supply shall be shut off prior to disconnecting the electrical power, before proceeding with the conversion

Installer: Leave all instruction with the owner of the appliance .

TABLE 1: CONVERSION KIT PART #'s AND GAS ORIFICE SIZES

INPUTS 40,000 TO 150,000 Btuh (for Inputs 175,000 and 200,000 refer to TABLE 2, next page)

Tube Heater Models: P40U; P40U-I; STS-JZ; SPW-JZ; STW-JZ; S100; IQ; IWP; IW, ITB

NOTE: All Kits include detailed specific Instructions for the applicable model, and Gas Valve Conversion Kit with Pressure Regulator Spring and Cap.

Model Series	Input [Btuh]	Model #	Conversion to LPG			Conversion to NG		
			Conversion Kit #	LPG Orifice	Kit Includes Other Components	Conversion Kit #	NG Orifice	Kit Includes Other Components
P40U, P40U-I P40R	40,000	All	JS-0555-XA	49 DMS	-	JS-0555-XB	31 DMS	
All Model Series: STS-JZ; SPW-JZ; STW-JZ; S100; IQ; IWP; IW; ITB	45,000	All	JS-0556-XC	48 DMS	Equalizer Plate - 29 Holes Equalizer Plate Gaskets	JS-0556-XD	30 DMS	Equalizer Plate - 25 Holes Equalizer Plate Gaskets
	60,000	All	JS-0557-XX	42 DMS	-	JS-0558-XX	25 DMS	-
	80,000	All	JS-0559-XX	36 DMS	Burner Cup Restrictor 0.500"	JS-0560-XX	18 DMS	Burner Cup Restrictor 0.375"
	110,000	-B & -FB After Sept 1, 2014	JS-0561-XB	31 DMS	Blower Inlet Restrictor 3-1/8" Burner Cup with Vanes Air Proving Switch 1.1" w.c. Blocked Flue Switch 1.2" w.c.	JS-0562-XB	5.2 mm	Blower Inlet Restrictor 2" Burner Cup - no Vanes Air Proving Switch 0.9" w.c. Blocked Flue Switch 1.03" w.c.
	110,000	Prior to Sept 1, 2014	JS-0561-XX	31 DMS	Burner Cup Restrictor 0.500"	JS-0562-XX	5.2 mm	Burner Cup Restrictor 0.375"
	125,000	-B & -FB After Sept 1, 2014	JS-0563-XB	29 DMS	Blocked Flue Switch 1.03" w.c.	JS-0564-XB	5.8 mm	Blocked Flue Switch 1.25" w.c.
	130,000	Prior to Sept 1, 2014	JS-0563-XX	29 DMS	Burner Cup Restrictor 0.500"	JS-0564-XX	5.8 mm	Burner Cup Restrictor 0.375"
	155,000		JS-0565-XX	9/64"	Burner Cup Restrictor 0.500"	JS-0566-XX	1/4"	Burner Cup Restrictor 0.375"
175,000 & 200,000			See TABLE 2 next page					

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TABLE 2: CONVERSION KIT PART #'s AND GAS ORIFICE SIZES

INPUTS 175,000 & 200,000 Btuh

(for Inputs 40,000 to 150,000 refer to TABLE 1, previous page)

Models: STS-JZ; SPW-JZ; STW-JZ; S100; IQ; IWP; IW, ITB

Current Production: Model #'s 175-S and 200-S

Prior Production: Contact Customer Service with Model & Serial Numbers

1-877-446-3727

NOTE: All Kits include detailed specific Instructions for the applicable model, and Gas Valve Conversion Kit with Pressure Regulator Spring and Cap.

Conversion to LPG						
Model Series	Input: [Btuh]	Model #	NOTE:	Conversion Kit #	Kit Includes	
					LPG Orifice	Other Components
STS-JZ; SPW-JZ; STW-JZ; S100 IQ; IWP; IW; ITB	175,000	175-S	LP: 50 & 60 ft tube lengths ONLY - 70 ft tube for NG Only	JS-0567-AS	24 DMS	Burner Cup - Cast Air Proving Switch: 1.15" w.c. Blocked Flue Switch: 1.20" w.c. Flame Rectifier 175-S LP Equalizer Plate - 175-S LP Equalizer Plate Gaskets Burner Cup Restrictor 175-S LP
	200,000	200-S	LP: 60 & 70 ft tube lengths ONLY - 50 ft tube for NG Only	JS-0567-CS	19 DMS	Blocked Flue Switch: 1.33" w.c. Burner Cup Restrictor 200-S LP Flame Rectifier 200-S LP
Conversion to NG						
Model Series	Input: [Btuh]	Model #	NOTE:	Conversion Kit #	Kit Includes	
					NG Orifice	Other Components
STS-JZ; SPW-JZ; STW-JZ; S100 IQ; IWP; IW; ITB	175,000	175-S	NG: 50, 60, & 70 ft tube systems	JS-0567-BS	6.7 mm	Burner Cup - Fabricated Air Proving Switch: 0.85" w.c. Blocked Flue Switch: 1.41" w.c. Equalizer Plate - 60 to 200 Equalizer Plate Gaskets Burner Cup Restrictor 0.375"
	200,000	200-S	NG: 50, 60, & 70 ft tube systems	JS-0567-DS	5/16"	Blocked Flue Switch: 1.41" w.c. Burner Cup Restrictor 200-S NG

GAS PRESSURE REQUIREMENTS:

Conversion to LPG (propane gas): <ul style="list-style-type: none">• Minimum Gas Supply Pressure: 11" w.c.• Manifold Gas Pressure: 10" w.c.	Conversion to NG: <ul style="list-style-type: none">• Minimum Gas Supply Pressure: 5" w.c.• Manifold Gas Pressure: 3.5" w.c.
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HIGH ALTITUDE INSTALLATION

Model Series: P40U, P40U-I, P40R; STS-JZ; SPW-JZ; STW-JZ; S100; IQ; IWP; IW, not to be installed at altitude above: NG = 8,000 feet

Canada: The factory installed orifice for this appliance is approved for altitudes zero to 4,500 feet above sea level. To install above 4,500 feet **refer to local authority having jurisdiction.**

USA: The factory installed orifice for this appliance is approved for altitudes zero to 2,000 feet above sea level. When installed above 2,000 feet, **refer to information below**, and Table 3: Orifice Size and Part Number.

When this appliance is installed above 2,000 feet in the USA, the input must be de-rated by 4% for each 1,000 ft above sea level. The orifice must be changed according to the chart below - ensure you search the correct model. Check with your local gas utility regarding the gas supply and the de-rating of this appliance.

NOTE: Installations above 4,500 ft: Restrict the Total Combined System Length as indicated below in TABLE 3: MAXIMUM SYSTEM LENGTH RESTRICTIONS.

For installation below 4500 feet refer to the product manual for maximum system lengths.

MINIMUM VENT LENGTH: (Vented or Unvented [indirect mechanical ventilation])

- Minimum vent length of 3 ft (91 cm) is required
- NOTE: 200,000 LP: Minimum 8 ft vent length (244 cm)

MAXIMUM SYSTEM LENGTH RESTRICTIONS: *Also see Table 3 next page*

(System Length is the combined total length of: Tube Heater + Combustion Air Duct + Vent):

- Each 90° elbow in the system has an equivalent length of 5 ft.
- A maximum of 2 elbows are allowed in any portion (duct, tube heater, vent) with the exception of up to three 90° elbows in a vertical vent run through the roof
- Combustion air duct may be 4" or 5" diameter and is not to exceed lengths in table below
- Exceeding the allowable lengths in the table below can create combustion and/or condensation problems and will void CSA Certification and the heater warranty.
- Do not exceed the **Maximum System Length** regardless of the allowed maximum length of individual vent or combustion air duct. *See Table 3 next page.*
- Refer to the product manual for Maximum System Lengths below 4500 ft

TABLE 3: MAXIMUM SYSTEM LENGTH RESTRICTIONS:
INSTALLATIONS ABOVE 4500 FEET (Lower altitudes refer to Product Manual)

Input (Btuh)	Do Not Exceed Maximum Combined System Length		Max. Air Duct Length (ft) (by Duct Diameter)		Max. Vent Length (ft) Individual: 4"Ø Combined: 6"Ø (4" + 6")	Example
	4" Air Duct	5" Air Duct	4" Ø	5" Ø		
45,000 & 60,000	40 ft	60 ft	20 ft	40 ft	20 ft	150,000 Btuh Heater: Tube Heater Length 40 ft 1 x 90° elbow (vent) 5 ft Straight vent 15 ft 1 x 90° elbow (duct) 5 ft Air Duct: 4" Ø <u>13 ft</u> Combined Length 78 ft Maximum Allowed 80 ft
80,000	50 ft	70 ft	20 ft	40 ft	20 ft	
100,000	40 ft	60 ft	30 ft	50 ft	30 ft	
110,000 to 150,000	80 ft	100 ft	30 ft	50 ft	40 ft	
175,000 & 200,000	100 ft	120 ft	30 ft	50 ft	50 ft	Additional 20' for 5" Ø Air Duct

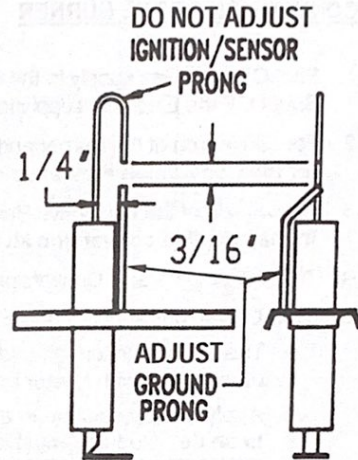
SPARK IGNITER SET UP

Confirm the Igniter gap.

Electrodes should have a gap spacing of $3/16"$ ($0.188" \pm 0.031"$ or $4.76 \text{ mm} \pm 0.81 \text{ mm}$). If this spacing is not correct, the assembly must be adjusted or replaced.

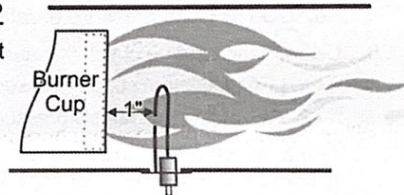
DO NOT ADJUST OR BEND THE IGNITER PRONG!!

If the gap is incorrect any adjustment must be made to the **GROUND PRONG ONLY!**



VERIFY SPARK ELECTRODE POSITION AND GAP

Proper location of the electrode assembly is important for optimum system performance. The electrode assembly should be located so that the spark gap is inside the flame envelope about 1 inch (2.5 cm) from the base of the flame at the burner cup.



VERIFY COMBUSTION

The flame should appear light blue in color, and remain "tight" to the burner cup tile surface with no "lifting off".

VERIFY THE INPUT RATE OF HEATER

- Input for PROPANE is approximately at rating indicated on the rating plate when manifold pressure is 10" w.c. Confirm that the orifice is the correct size for the model (refer to Table 1) and verify the manifold pressure with a manometer
- Input for NATURAL GAS is approximately at rating indicated on the rating plate when manifold pressure is 3.5" w.c. with the correct orifice for the model (refer to Table 1). The orifice is sized for a nominal value of 1,000 Btu/cu ft of natural gas.

The input rate can be confirmed by clocking the gas meter for 3 minutes:

$$\text{Btuh Input} = 1,000 \text{ Btu/cu. ft.} \times \text{cu. ft. metered in 3 minutes} \times 20$$

Flame Fault

If at any time the main valve fails to close completely and maintains a flame, the full time flame sense circuit will detect it and energize the combustion blower. Should the main valve later close completely removing the flame signal, the combustion blower will power off following the optional post purge period.

Fault Conditions

The LED will flash on for 1/4 second, then off for 1/4 second during a fault condition. The pause between fault codes is 3 seconds.

Error Mode	LED Indication
Internal Control Failure	Steady on
Air Flow Fault	1 flash
Flame with No Call for heat	2 flashes
Ignition Lockout	3 flashes

MOUNTING AND WIRING

The Series 35-61 is not position sensitive and can be mounted vertically or horizontally. The case may be mounted on any surface with #6 sheet metal screws. All wiring must be done in accordance with local and national electrical code. Refer to wire diagram page 35 when connecting the Series 35-61 to other components in the burner.



WARNING

The Series 35-61 DSI Control uses voltages of shock hazard potential. Wiring and initial operation must be done by a qualified service technician. The control must be secured in an area that will experience a minimum of vibration and remain below the operating temperature of 160°F. All connections should be made with UL approved 105°C rated 18 gauge, stranded, .054 thick insulated wire. Refer to wire diagram page 35 when connecting the Series 35-61 to other components in the burner.

CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. A functional checkout of a replacement control is recommended.

TERMINAL	SPADE	DESIGNATION
TH	1/4"	Thermostat Input
PSW	1/4"	Pressure Switch Input
V1	1/8"	Valve Power (MV)
IND	1/4"	Inducer Blower Output
NC	-	Alarm (Not used)
L1	1/4"	120/240 VAC Input (Hot)
24 VAC	1/4"	24 VAC Supply to Processor
V2	1/8"	Valve (MV)
GND	1/8"	Valve & System Ground
Spark	1/4"	Spark & Local Flame Sense

Schwank and InfraSave brand products:

5285 Bradco Boulevard

2 Schwank Way

Mississauga, Ontario, L4W 2A6

Waynesboro, Georgia 30830

Customer & Technical Services

Phone: 877-446-3727

e-mail: csr@schwankgroup.com

www.schwankgroup.com

www.infrasave.com