SunStar®
INFRARED GAS HEATERS

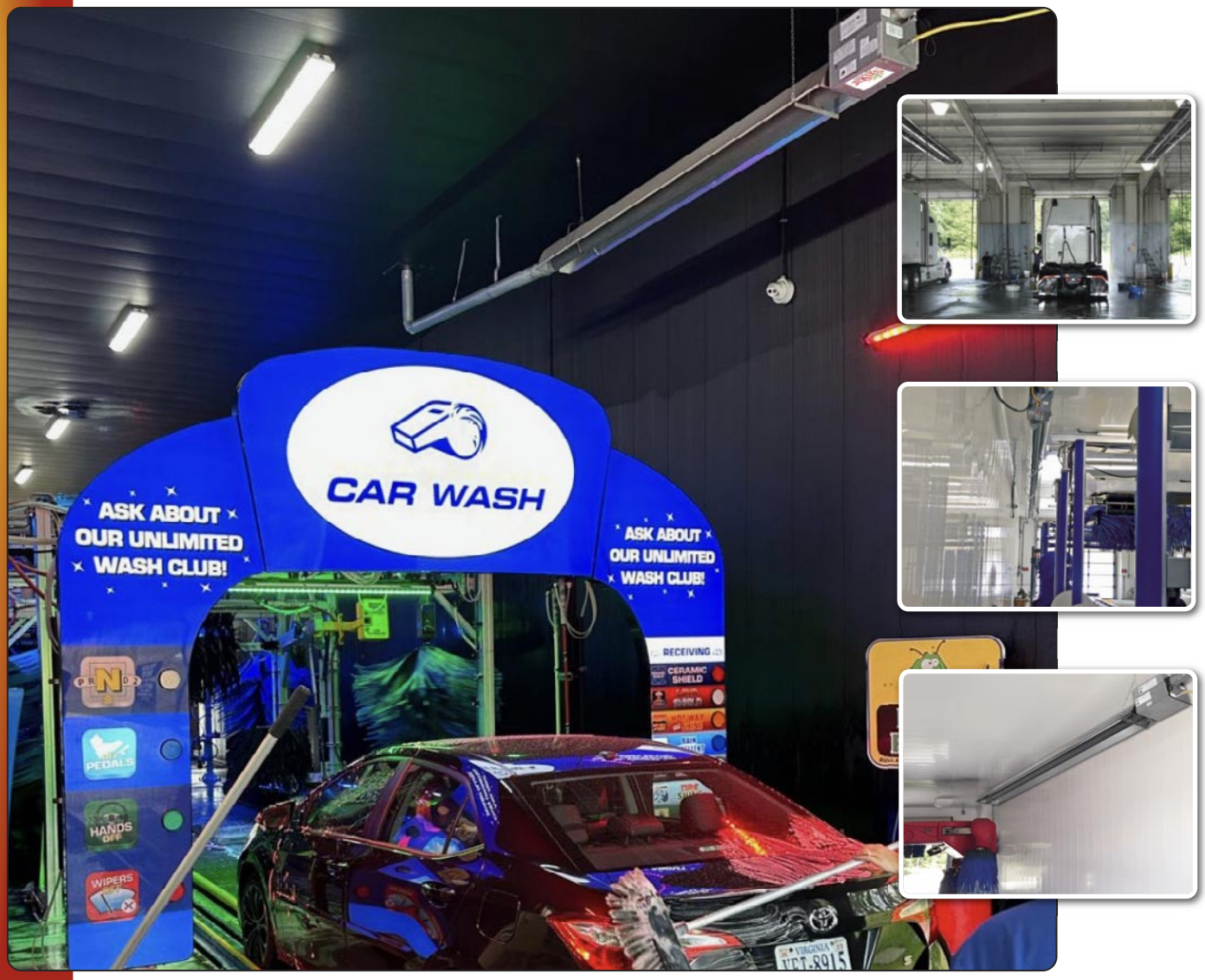
FOR HARSH ENVIRONMENTS

Infrared Gas Heating For

Car/Truck Wash Facilities

SPS/SPU SS ALC Series

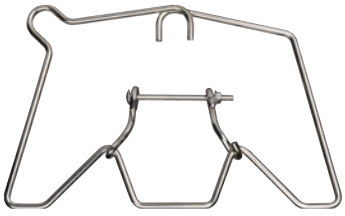
Push Through Positive Pressure Tube Heater



SPS/U SS Series With ALC Tube Option For Harsh Environments

Solutions For Commercial & Industrial Heating Since 1949

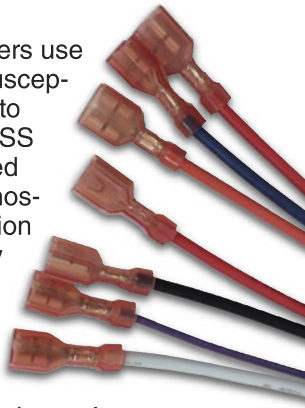
Sunstar SPS/U SS series tube heaters with ALC emitter tubes can be used in car wash and harsh environment applications. The SPS/U SS Series with its ALC (All Calorized Aluminized Steel) emitter tubes option has been used trouble-free in numerous car wash applications since 1986. The calorization process produces an emitter tube with a highly radiant emissive surface with unsurpassed corrosion resistance characteristics.



Stainless Steel Bracked and Flange for extreme environments

Other Features Of The SPS/U SS Series With ALC Option

- As standard, the SPS/U SS series burner boxes are supplied with heavy duty high temperature silicone gaskets. All compartment doors, edges and access panels have individual gaskets.
- All burner boxes are totally enclosed, stainless steel.
- All components are tested in accordance to ASTM B58 and have passed all corrosion tests.
- As standard, gas appliance manufacturers use brass electrical connectors which are susceptible to ammonia as well as susceptible to stress corrosion and cracks. All SPS/U SS burner electrical connectors are insulated and are manufactured from tin plated phosphor bronze alloy for trouble free operation in harsh environments (including poultry houses, waste treatment plants and car washes).

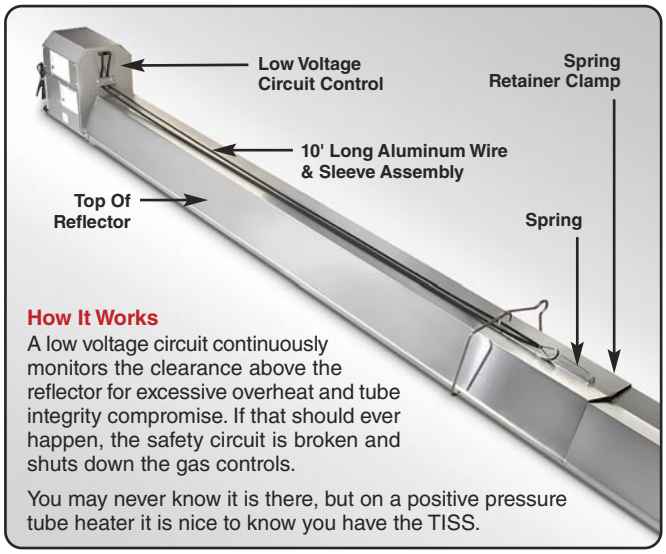


- Sunstar recommends highly efficient polished aluminum reflectors with reflectivity rating of 97.5% in car wash applications. As an option, Sunstar can provide polished stainless steel reflectors with a reflectivity rating of 80% (stainless steel absorbs radiant energy rather than reflecting it) if requested.

Additional Features Of SPS/U SS Series With ALC Option

- The SPS/U SS series provides an innovative and patented Tube Integrity Safety System (TISS) which provides an additional safety to the end user. In the unlikely event of a tube failure, TISS has been designed to automatically shut-off the heater, thus providing greater safety and peace of mind.

TISS™
Tube Integrity Safety System



How It Works

A low voltage circuit continuously monitors the clearance above the reflector for excessive overheat and tube integrity compromise. If that should ever happen, the safety circuit is broken and shuts down the gas controls.

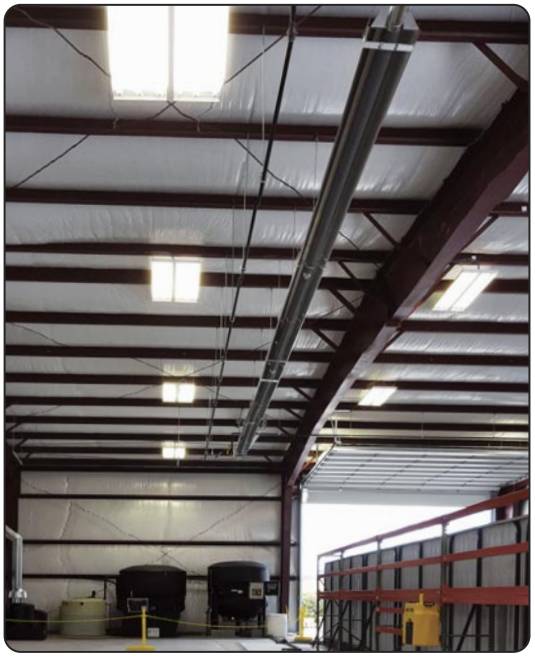
You may never know it is there, but on a positive pressure tube heater it is nice to know you have the TISS.

U.S. Patent# 8000075

A tunnel wash facility in Baltimore, MD

SPS/SPU SS Specifications

- Stainless steel control box is water resistant and approved for high pressure wash down up to 3500 PSI.
- Products of combustion are pushed through the tube.
- Highly effective aluminum reflectors with reflectivity rating of 97.5%
- Tube Integrity Safety System (TISS™).
- Heavy-duty stainless steel burner with 10-year limited warranty.
- Outside air for combustion.
- Direct spark ignition system & 100% gas shut-off safety control.
- Pre-purge and post-purge functions.
- Calorized aluminized steel (ALC) radiant emitter tubes.
- 5-year limited warranty on the emitter tubes.
- Vented or indirect vented operation.
- See Sunstar's SPS/SPU Series Spec Sheet for complete specifications.



Truck wash facility in Chicago, IL

A large Interstate truck wash facility in Calhoun, GA.

SPS/U SS MODELS	SINGLE STAGE BTU/HR INPUT	TWO STAGE BTU/HR HIGH INPUT	TWO STAGE BTU/HR LOW INPUT	TOTAL EMITTER TUBE LENGTH* 10 FT**	20 FT	30 FT	40 FT	50 FT
40	40,000	40,000	25,000	●	●			
50	50,000	50,000	30,000		●	●	●	
60	60,000	60,000	40,000		●	●	●	
75	75,000	75,000	50,000		●	●	●	
100	100,000	100,000	65,000			●	●	●

SPS/U SS MODELS	SINGLE STAGE BTU/HR INPUT	TWO STAGE BTU/HR HIGH INPUT	TWO STAGE BTU/HR LOW INPUT	TOTAL EMITTER TUBE LENGTH* 30 FT	40 FT	50 FT	60 FT	70 FT
125	125,000	125,000	80,000	●	●	●	●	
150	150,000	150,000	100,000		●	●	●	
175	175,000	175,000	110,000			●	●	●
200	200,000	200,000	125,000			●	●	●

*Indicate model number based on Btu/hr input (e.g., 100,000 Btu/hr), total emitter length, (e.g., 40 feet) and gas type (e.g., natural gas single stage input). The unit selection for a straight tube would be SPS100-40-ALC-N5 and for a U-tube would be SPU100-40-ALC-N5. **Available only on SPS models.

Exit area of an AUTOBELL® tunnel car wash facility

GAS TYPE	BURNER PRESSURE	SUPPLY PRESSURE MIN	SUPPLY PRESSURE MAX	GAS CONNECTION	VOLTAGE	AMPS	IGNITION TYPE	FLUE CONNECTION	OUTSIDE COMBUSTION AIR CONNECTION
NATURAL	3.5" W.C.	5" W.C.*	14" W.C.	1/2" MPT	120 VAC 60 HZ	1.8	DIRECT SPARK	4" ROUND	4" ROUND
PROPANE	10" W.C.	11" W.C.	14" W.C.						

CONTROL SUFFIX	TYPE OF GAS	DESCRIPTION
N5 / L5	NATURAL / PROPANE	SINGLE STAGE GAS VALVE - SINGLE STAGE INPUT
N7 / L7	NATURAL / PROPANE	TWO STAGE GAS VALVE - MODULATING INPUT - HIGH/LOW FIRE

*7" W.C. for SPS/U SS 150-200 Note: For installations higher than 2000 ft above sea level, please consult the factory regarding recommended derating of heaters.

SPS/SPU Mounting Height, Clearances & Dimensions

Minimum Recommended Mounting Heights

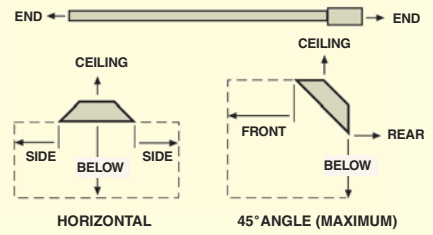
SPS/U SS MODEL	HEIGHT AT HORIZONTAL	HEIGHT AT 45° ANGLE
40	10 FEET	9 FEET
50	11 FEET	10 FEET
60, 75	13 FEET	12 FEET
100	14 FEET	13 FEET

SPS/U SS MODEL	HEIGHT AT HORIZONTAL	HEIGHT AT 45° ANGLE
125	15 FEET	13 FEET
150	15 FEET	14 FEET
175	16 FEET	15 FEET
200	18 FEET	16 FEET

This chart is intended as a guide only – for human comfort and uniform energy distribution in enclosed buildings – as heaters may be mounted at various heights and angles. In Tunnel Car Wash applications the heaters can be installed lower than shown above. Since straight tube heaters are always hotter at the burner end than at the exhaust end, always observe the minimum recommended mounting heights shown above and mount heaters as high as possible. Use SPU series for spot heating. Please consult your local Sunstar Representative for a detailed analysis of your particular infrared heating requirements.

Minimum Clearance To Combustibles – Outdoor Installations **

MINIMUM CLEARANCES TO COMBUSTIBLES



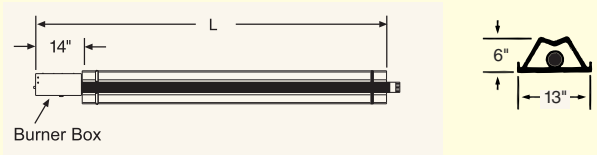
SPS/U SS MODEL MODEL NO.	SIDE	CEILING*	BELOW**	END	45° FRONT	45° REAR
40	22"	6"	52"	15"	40"	12"
50	22"	6"	56"	15"	48"	12"
60, 75	22"	6"	60"	15"	52"	12"
100	28"	6"	70"	15"	58"	12"
125	28"	6"	76"	20"	66"	12"
150	34"	6"	81"	20"	70"	12"
175	38"	6"	86"	20"	75"	12"
200	42"	6"	93"	20"	80"	12"

*When used indirect vented, clearances to ceiling must be: 12" for SPS/U SS (50-75), and 18" on SPS/U SS (100-200). If optional corner or U-bend reflectors are not used, the clearance must be 18".

**Minimum clearance below reduces by 50% once you are 25 ft. downstream from the burner box.
Note: Consult factory if reduced clearances are required.

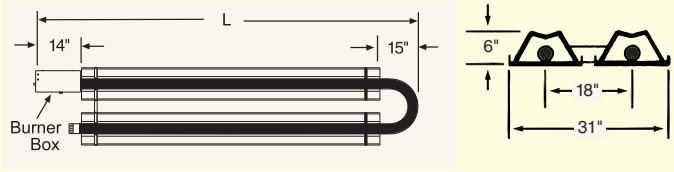
Dimensions

SPS – BOTTOM VIEW **END VIEW**



SPS SS MODEL	TOTAL TUBE LENGTH (FT)	OVERALL DIMENSION "L" (FT)
40	10'	11' 2"
40, 50, 60, 75	20'	21' 2"
50, 60, 75, 100, 125	30'	31' 2"
50, 60, 75, 100, 125, 150	40'	41' 2"
100, 125, 150, 175, 200	50'	51' 2"
125, 150, 175, 200	60'	61' 2"
175, 200	70'	71' 2"

SPU – BOTTOM VIEW **END VIEW**



SPU SS MODEL	TOTAL TUBE LENGTH (FT)	OVERALL DIMENSION "L" (FT)
40, 50, 60, 75	20'	12' 5"
50, 60, 75, 100, 125	30'	17' 5"
50, 60, 75, 100, 125, 150	40'	22' 5"
100, 125, 150, 175, 200	50'	27' 5"
125,150,175,200	60'	32' 5"
175, 200	70'	37' 2"

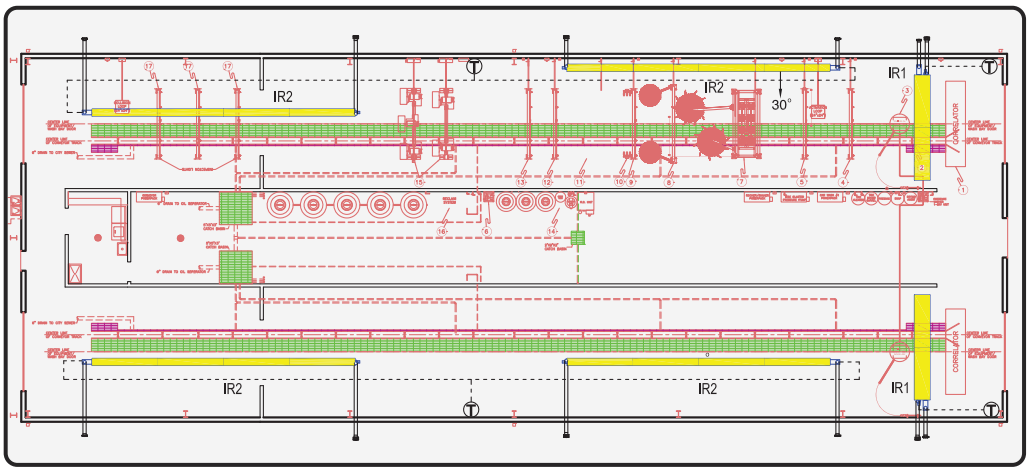
Combustion Air And Ventilation

Combustion air and venting requirements for all gas-fired heating equipment must be provided per the National Fuel Gas Code NFPA54 or the authority having jurisdiction over the installation. In contaminated atmospheres or high humidity areas, optional outside air for combustion can be supplied. Heaters can be common vented, vented, or indirect vented. Refer to the Installation and Operation Instructions for further information. A vented installation must be vented to the outside of the building with a flue pipe. An Indirect vented installation requires a minimum ventilation flow of 4 CFM per 1000 Btu/hr of total installed heater capacity on natural gas by either gravity or power ventilation (4.18 CFM per 1000 Btu/hr for propane). For indirect vented applications, building exhaust openings must be located above the level of the heaters and inlet air openings must be located below the level of the heaters.

For Your Safety

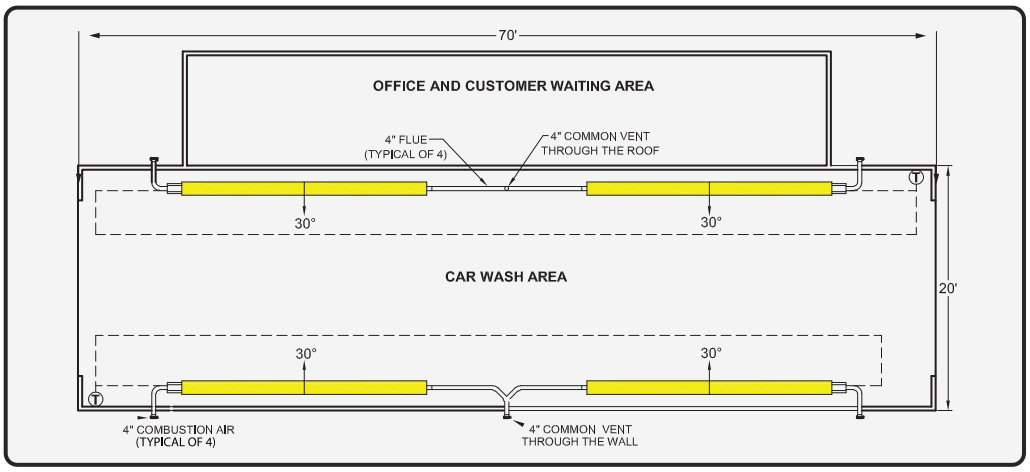
OPERATE Sunstar GAS INFRARED HEATERS WITH PROPER CARE AND OBSERVE ALL SAFETY PRECAUTIONS. Installation and service must be performed by a licensed contractor. The installation must conform to Manufacturer's Installation and Operating Instructions or local codes. In the absence of local codes, the installation must conform to the National Fuel Gas Code ANSI Z223.1 (latest edition, also known as NPFA54) or CAN / CSA-B149 installation codes (latest edition).

Typical Industrial Car Wash Design



Large auto wash building at the Port of Savannah, GA for the Mercedes Benz Preparation Center

Typical Tunnel Car Wash Design



In long tunnel car wash applications, Sunstar recommends locating the burners at opposite ends

Helpful Hints for Tunnel Car Wash Applications

Typical Tunnel Car Wash applications are designed for an inside design temperature of 40° F., with the objective of keeping the car wash equipment above the freezing temperature.

The Tunnel Car Wash design shown above is located in Minneapolis, MN. In warmer climates, a single row of heaters on one side of the Tunnel Car Wash wall will be sufficient.

Sunstar Typically recommends SPS50, SPS75 or SPS100 depending on the installation height in the Tunnel Car Wash. Since the thermostat is set at 40°F, the clearances to combustibles below or front could be reduced. In some cases, some parts of the car wash equipment needs to be shielded. Use highly reflective aluminum material or aluminum tape to shield the hoses etc., specifically within 10 ft. from the burner.

Keep in mind that approximately 80-85% of the radiant energy is dissipated within 20 ft. from the burner. There is very little energy available at the end of the straight tube.

Sunstar recommends outside combustion air to be supplied to SPS/SPU burners on all car wash applications.

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