

## NEW AND IMPROVED

# THE MOST ELECTRICALLY EFFICIENT FLOAT GLASS HEATING ELEMENTS IN THE WORLD

### COLD ENDS LOWER IN RESISTANCE

The efficiency is obtained in the cold ends. The Starbar cold ends are 28mm in diameter. All the other float element manufacturers have 19mm diameter cold ends. The 28mm cold end provides a larger surface area over which the electrons flow, therefore lower in resistance.

The 28mm cold end is manufactured of low resistance Beta silicon carbide. It decreases in resistance with an increase in temperature. Our U.K. competitor with one piece 19mm cold end is manufactured of high resistance Alpha silicon carbide impregnated with silicon metal. It increases in resistance with an increase in temperature.

The low resistance cold end reduces the amount of the electrical power wasted in heating the roof module. The perfect cold end would have zero resistance. The Starbar cold end is close to perfection.

### LONG LIFE HOT ZONES

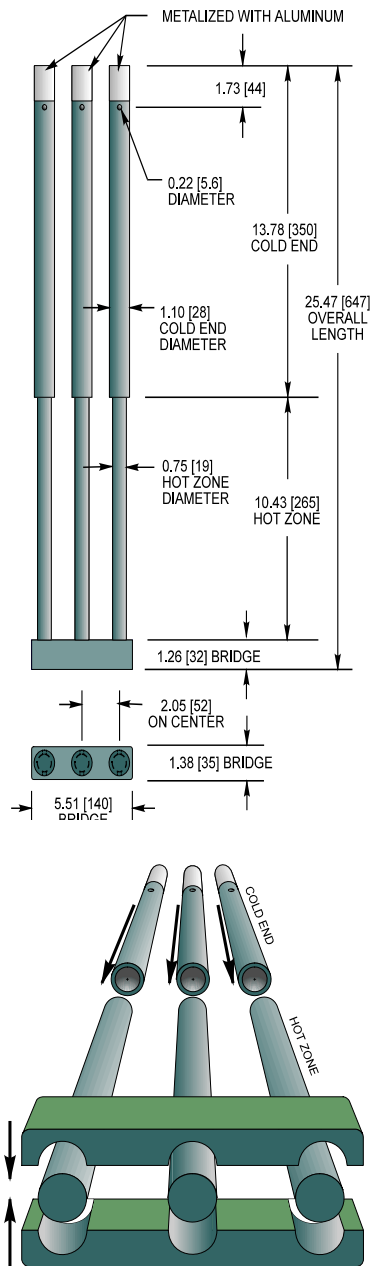
Type W three-phase Starbars hot zones are manufactured of high purity, high density, alpha silicon carbide and self-bonded by recrystallization. They have a high density of 2.50 grams per cubic centimeter. This provides high structural strength and minimum porosity, and therefore slow aging characteristics. They have an average campaign life of 15 years.

### SUPERIOR WELDS

Before welding the cold end to the hot section we counter bore the 28mm cold end to accept the 19mm hot zone. The 19mm hot zone is inserted into the bored cold end and a 360 degree weld is made. Other manufacturers with 19mm cold ends and 19mm hot zone butt weld. Our welds are stronger and more reliable.

### RELIABLE WELDS AT BRIDGE

The bridge is manufactured in 2 pieces to get a better electrical connection and superior welds to the three hot section legs.



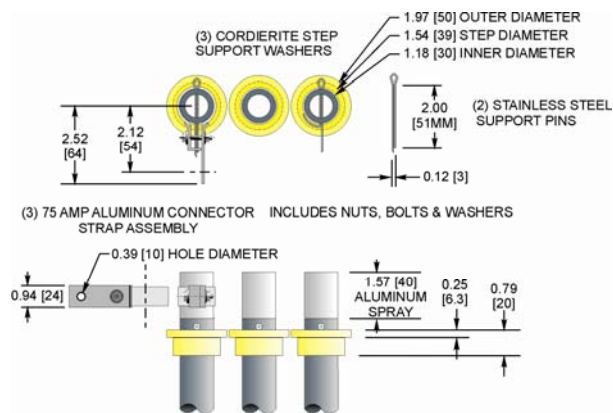
## Silicon Carbide Heating Elements



## HEATING ELEMENT DESCRIPTION

The elements are described by letters and numbers and is the part number: WDB 647x265x350x19/28 in mm or WDB25.5x10.4x13.7x0.7/1.1 in inches. W denotes a 3 phase element and DB denotes that cold end is larger in diameter than the hot zone, ie Dumb Bell.

The 647 is the overall length, the 265 is the hot zone length, the 350 is the cold end length, the 19 is the hot zone diameter and the 28 is the cold end diameter.



## ELECTRICAL POWER RATING

The float industry has established the power rating of the three phase float element at 3750 watts. This is 1250 watts for each of the 3 legs. The float element is 3 single phase elements connected at the bridge. The resistance of each leg is  $0.85\Omega \pm 20\%$ .

## ELECTRICAL CALIBRATION

This is industry established procedure for calibration of the float elements. They are self-heated by applying 69 volts 3 phase to each of the 3 legs. After about five minutes the amperes are measured and written on the cold ends. The universal ampere range is 39 to 61 amperes.

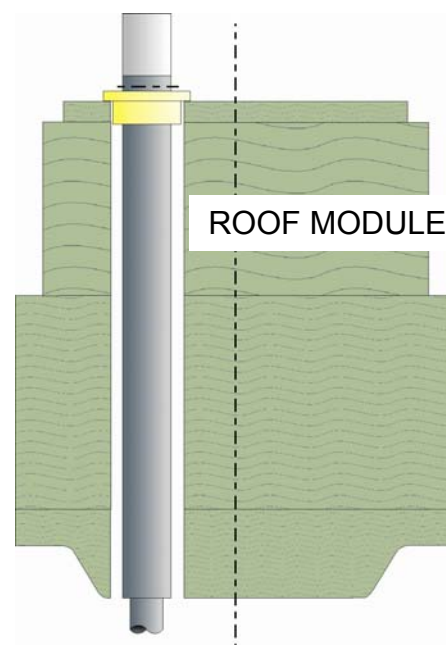
Companies specify a narrower ampere range to fit the characteristics of their electrical power supply. The ampere special ranges are typically 10 ampere such as 39 to 49, or 45 to 55 or 50-61 amperes. We offer all of the ranges.

## ELECTRICAL CONNECTIONS

Each element is provided with 3 electrical connectors. The connector is a 75 ampere flat braided aluminum strap. This is looped to make a nut and bolt type clamp.

## INSTALLING THE ELEMENT

The float elements are always hung vertically with the bridge down. The elements are pushed up through the roof module from the inside of the furnace. Three ceramic step washers are provided to fit into the roof module and over each cold end. There is a 5.6mm (0.2") hole in each cold end. Stainless steel pins are inserted into these holes to support the element. Only the two outer holes are used for the support.



## COMPANY HISTORY

I<sup>2</sup>R has been manufacturing silicon carbide heating elements since 1964 and float heating since 1986. We have sold over 50,000 float elements and millions of single phase silicon carbide elements.

We are the largest manufacturer of silicon carbide heating element in the United States. We ship silicon carbide heating elements to all the industrialized nations of the world. We are the world's expert on silicon carbide heating elements and their applications.

For further information, please contact Jack Davis at [jrdavis@isquaredrelement.com](mailto:jrdavis@isquaredrelement.com) or P: 716-542-5511 or F: 716-542-2100.

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