

## Horizontal Split Tube Furnace - HST / HZS

### General Information

The split tube furnace range HST (single zone) and HZS (three zone) uses free radiating wire elements embedded within the insulation of the furnace body. The benefit of this design is its flexibility; with the use of tube adapters the same furnace can be used with a variety of tube diameters.

These furnaces comprise a furnace body which is hinged and split into two halves along its length. This makes exchange of work tubes easier and also enables the tube furnace to be used with reactors or work tubes where end flanges would make insertion into a non-split furnace difficult.

This range of tube furnaces does not include an integral work tube and one must be selected as an additional item. The work tube length is dependent on the application, for example, for use with modified atmosphere or vacuum. The use of a separate work tube has the advantage of protecting the heating elements from damage or contamination.

The HZS three zone tube furnaces offer excellent uniformity which results from division of the heated length into three zones, each with its own controller and thermocouple.



### Standard features

- 1200°C maximum operating temperature
- Carbolite Gero 301 controller, with single ramp to set-point & process timer
- Accepts worktubes with outer diameters up to 110 mm
- Heated lengths, single zone 200, 300, 400, 450, 600 or 900 mm (HST)
- Heated lengths, 3-zone 600 or 900 mm (HZS)
- Horizontal furnace with a separate control module on a 2 metre conduit
- Furnace splits into two halves to accommodate work tubes or samples fixed into a test rig
- Wire elements in high quality vacuum formed insulation ensure fast heat up, excellent temperature uniformity and short cool down times
- HZS: End zone control is via back to back thermocouples
- HZS: End zones of 150 mm each end

### Options (specify these at time of order)

- A range of sophisticated digital controllers, multi-segment programmers and data loggers is available. These can be fitted with RS232, RS485 or Ethernet communications
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- A range of additional work tubes, end seals and work tube packages is available for use with modified atmosphere and/or vacuum
- Vacuum packages with a choice of rotary vane pump or turbomolecular pump are available for furnaces with tube inner diameters of 60 mm and above
- Insulation plugs, gas tight end seals and vacuum connections available

## Horizontal Split Tube Furnace - HST / HZS

- Wide choice of tube diameters and materials is available: eg quartz, ceramic, metal
- Available with 'L' stand for vertical and horizontal use
- Control module on longer 6 metre conduit
- HZS: Three equal length zones
- HZS: If programmed cooling is required, programmable controllers capable of retransmission of setpoint can be supplied

### Technical Specifications

#### HST 12/200

|  |                 |
|--|-----------------|
| Max temp (°C)                                      | 1200            |
| Number of heated zones                             | Single zone     |
| Dimensions: Max outer diameter accessory tube (mm) | 110             |
| Heated length (mm)                                 | 200             |
| Heat-up time (mins)                                | 45              |
| Dimensions: Furnace body length (mm)               | 350             |
| Tube length for use in air (mm)                    | 350             |
| Tube length for use with modified atmosphere (mm)  | 650             |
| Dimensions: External Furnace H x W x D (mm)        | 350 x 350 x 410 |
| Dimensions: Control module H x W x D (mm)          | 222 x 370 x 376 |
| Uniform length ±5°C (mm)                           | 100             |
| Max power (W)                                      | 1000            |
| Holding power (W)                                  | 800             |
| Thermocouple type                                  | N               |
| Weight (kg)  | 26              |

#### HST 12/300

|  |             |
|--|-------------|
| Max temp (°C)                                      | 1200        |
| Number of heated zones                             | Single zone |
| Dimensions: Max outer diameter accessory tube (mm) | 110         |
| Heated length (mm)                                 | 300         |
| Heat-up time (mins)                                | 45          |
| Dimensions: Furnace body length (mm)               | 450         |
| Tube length for use in air (mm)                    | 450         |
| Tube length for use with modified atmosphere (mm)  | 750         |

## Horizontal Split Tube Furnace - HST / HZS

Dimensions: External Furnace H x W x D (mm) 350 x 450 x 410

Dimensions: Control module H x W x D (mm) 222 x 370 x 376

|   |      |
|---|------|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 150  |
| Max power (W)                               | 1500 |
| Holding power (W)                           | 850  |
| Thermocouple type                           | N    |
| Weight (kg)                                 | 28   |

### HST 12/400

|  |             |
|--|-------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200        |
| Number of heated zones                             | Single zone |
| Dimensions: Max outer diameter accessory tube (mm) | 110         |
| Heated length (mm)                                 | 400         |
| Heat-up time (mins)                                | 45          |
| Dimensions: Furnace body length (mm)               | 550         |
| Tube length for use in air (mm)                    | 550         |
| Tube length for use with modified atmosphere (mm)  | 850         |

Dimensions: External Furnace H x W x D (mm) 350 x 550 x 410

Dimensions: Control module H x W x D (mm) 222 x 370 x 376

|   |      |
|---|------|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 200  |
| Max power (W)                               | 2000 |
| Holding power (W)                           | 900  |
| Thermocouple type                           | N    |
| Weight (kg)                                 | 32   |

### HST 12/450

|  |             |
|--|-------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200        |
| Number of heated zones                             | Single zone |
| Dimensions: Max outer diameter accessory tube (mm) | 110         |
| Heated length (mm)                                 | 450         |
| Heat-up time (mins)                                | 56          |
| Dimensions: Furnace body length (mm)               | 600         |
| Tube length for use in air (mm)                    | 600         |
| Tube length for use with modified atmosphere (mm)  | 900         |

## Horizontal Split Tube Furnace - HST / HZS

Dimensions: External Furnace H x W x D (mm) 360 x 600 x 445

Dimensions: Control module H x W x D (mm) 222 x 370 x 376

|   |     |
|---|-----|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 220 |
| Holding power (W)                           | 950 |
| Weight (kg)                                 | 33  |

### HST 12/600

|  |                 |
|--|-----------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200            |
| Number of heated zones                             | Single zone     |
| Dimensions: Max outer diameter accessory tube (mm) | 110             |
| Heated length (mm)                                 | 600             |
| Heat-up time (mins)                                | 47              |
| Dimensions: Furnace body length (mm)               | 750             |
| Tube length for use in air (mm)                    | 750             |
| Tube length for use with modified atmosphere (mm)  | 1050            |
| Dimensions: External Furnace H x W x D (mm)        | 350 x 750 x 410 |
| Dimensions: Control module H x W x D (mm)          | 222 x 370 x 376 |
| Uniform length $\pm 5^{\circ}\text{C}$ (mm)        | 300             |
| Max power (W)                                      | 3000            |
| Holding power (W)                                  | 1100            |
| Thermocouple type                                  | N               |
| Weight (kg)  | 38              |

### HST 12/900

|  |                  |
|--|------------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200             |
| Number of heated zones                             | Single zone      |
| Dimensions: Max outer diameter accessory tube (mm) | 110              |
| Heated length (mm)                                 | 900              |
| Heat-up time (mins)                                | 45               |
| Dimensions: Furnace body length (mm)               | 1050             |
| Tube length for use in air (mm)                    | 1050             |
| Tube length for use with modified atmosphere (mm)  | 1350             |
| Dimensions: External Furnace H x W x D (mm)        | 350 x 1050 x 410 |

## Horizontal Split Tube Furnace - HST / HZS

Dimensions: Control module H x W x D (mm) 222 x 370 x 376

|   |      |
|---|------|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 450  |
| Max power (W)                               | 4500 |
| Holding power (W)                           | 1450 |
| Thermocouple type                           | N    |
| Weight (kg)                                 | 60   |

### HZS 12/600

|  |            |
|--|------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200       |
| Number of heated zones                             | Three zone |
| Dimensions: Max outer diameter accessory tube (mm) | 110        |
| Heated length (mm)                                 | 600        |
| Heat-up time (mins)                                | 45         |
| Dimensions: Furnace body length (mm)               | 750        |
| Tube length for use in air (mm)                    | 750        |
| Tube length for use with modified atmosphere (mm)  | 1050       |

Dimensions: External Furnace H x W x D (mm) 350 x 750 x 410

Dimensions: Control module H x W x D (mm) 225 x 570 x 380

|   |      |
|---|------|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 500  |
| Max power (W)                               | 3000 |
| Holding power (W)                           | 1000 |
| Thermocouple type                           | N    |
| Weight (kg)                                 | 40   |

### HZS 12/900

|  |            |
|--|------------|
| Max temp ( $^{\circ}\text{C}$ )                    | 1200       |
| Number of heated zones                             | Three zone |
| Dimensions: Max outer diameter accessory tube (mm) | 110        |
| Heated length (mm)                                 | 900        |
| Heat-up time (mins)                                | 45         |
| Dimensions: Furnace body length (mm)               | 1050       |
| Tube length for use in air (mm)                    | 1050       |
| Tube length for use with modified atmosphere (mm)  | 1350       |

Dimensions: External Furnace H x W x D (mm) 350 x 1050 x 410

## Horizontal Split Tube Furnace - HST / HZS

Dimensions: Control module H x W x D 225 x 570 x 380

D (mm)

|   |      |
|---|------|
| Uniform length $\pm 5^{\circ}\text{C}$ (mm) | 750  |
| Max power (W)                               | 4500 |
| Holding power (W)                           | 1400 |
| Thermocouple type                           | N    |
| Weight (kg)                                 | 65   |

### Please note:

- Heat up rate when using an optional ceramic work tube must be limited to 5 °C/min
- Heat up rate is measured to 100 °C below max, using an empty tube & insulation plugs
- Holding power is measured at continuous operating temperature
- Control box width increases to 570 mm for models with three phase power supply
- Uniform length measured with insulation plugs fitted
- Maximum continuous operating temperature is 100 °C below maximum temperature