

Your Furnace Options

The following list shows the options that are available for your furnace. The items that were purchased for your specific system are indicated by a black box followed by the name of the option in bold type.

- Extended Onload and Offload Table
- Uninterruptable Power Supply Backup
- Gas Sampling Manifold System
- Automated Gas Sample System
- Gas Miser System
- Portable Oxygen Analyzer
- Product Sensor System (Board Tracking)
- Hand Crank
- Gas Barrier Gate
- Gas Saturator - Models 1200 or 600
- Ultrasonic Belt Cleaner
- Brush Belt Cleaner

For additional information about these options, please see Section 1-System Overview.

Your Furnace Specifications

The following specifications pertain to your model TS furnace.

The BTU TS Series Furnace is a continuous conveyor furnace used for Rapid Solder Reflow applications.

The BTU TS Series Transheat Furnace is a continuous conveyor furnace typically used for rapid reflow soldering applications requiring an air or inert atmosphere.

A. FURNACE SPECIFICATION

Maximum temperature rating (Zones I-IV):	600 °C
Operating temperature range:	200-350 °C
Maximum temperature rating (Zone V):	800 °C
Operating temperature range:	350-750 °C
Number of controlled heat zones:	5
Working Dimensions:	228mm (9") wide x 102mm (4") clearance above the belt
Heated Length:	1372 mm (54")
Belt Height Above the Floor:	914 mm (36")

The metal muffle has high thermal conductivity for uniformity of temperature across the belt. The unique design of this muffle provides for best diffusion of cover gas maximum purity with minimum volume.

FEC (fully enclosed coil) heaters are manufactured by BTU utilizing iron, chrome, aluminum alloy coil enclosed in ceramic fiber plates. Heaters are located top and bottom of the process chamber in Zones I-IV and top, bottom and sides of Zone V.

Venturi exhaust is located at the end of the second barrier on the cooling side.

B. FURNACE LAYOUT

	<u>MM</u>	<u>INCHES</u>
Entrance with Baffle Assembly and Air / N ₂ Curtain	940	37
Entrance Vestibule	152	6
Zone I	305	12
Zone II	305	12
Zone III	305	12
Zone IV	305	12
Vestibule with Heat Barrier	76	3
Zone V	150	6
BTU Heat Barrier and Venturi Exhaust	152	3
Exit Vestibule	102	4
Water Cooling #1 with Atmosphere Cooling Jets with separation joint	762	30
Water Cooling #2	1372	54
Exit with Baffle Assembly and Air / N ₂ Curtain	838	33
Frame Allowance	<u>102</u>	<u>4</u>
APPROXIMATE WORKING LENGTH	5.8M	19' 0"

Case cooling exhaust fans maintain comfortable exterior panel temperature.

Atmosphere cooling jets located in the first 305 mm (12") of water cooled section #1 to assist in rapid cooling.

Water cooling section consists of copper tubes on the outside of the metal muffle. The water cooling tubes are secured to the muffles with high conductivity aluminum heat sinks. Compared to other water jacket designs, the heat sink system has a higher heat transfer rate per unit under identical water flow rates and heat load.

Water cooling section controls (thermostatic control with temperature transducer and water flow alarm) for sections 1 and 2 are included.

Loading and Unloading

Loading Table is 762mm (30") wide, Length is 610mm 24
 Unloading Table is 762mm (30") wide, Length is 610mm 24

APPROXIMATE TOTAL FURNACE LENGTH 7.0M 23' 0"

C. CONVEYOR SYSTEM

Belt Type, Material : Nichrome V mesh
 B42-27-18
 Width : 229mm (9")
 Belt Speed Range : 76 - 457 mm/min (3-18 ipm)
 Design Belt Speed : 305mm/min (12 ipm)
 Belt Loading : 10 Kg/M2 (2 lb/ft2)

Rotary brush belt cleaner is included.

Speed Control is programmable in inches per minute with readout on the PC. Deviation from setpoint alarm is programmable. Ranges of speeds specified refers to adjustability of belt speed only and does not imply compliance with load and temperature requirements over the entire range of belt speed adjustability.

An alarm will sound when the belt stops.

D. TEMPERATURE CONTROLS

Controls are located on the right hand side as viewed from the entrance of the furnace. Furnace is controlled by the microprocessor based controller.

Zones I thru V are each controlled by:

- 1- Microprocessor control channel
- 1- Type K thermocouple
- 1- Solid State Relay

VGA color graphic monitor, computer and software for full temperature and conveyor speed, monitoring and setting, profiling and recipe storage.

CPU is mounted on a swing arm at the exit end of the furnace.

Three thermocouple ports are located at the entrance table. These ports connect to the microprocessor so that profiling thermocouples can be connected and used with the WINCON software to capture, display, printout and store profiles.

E. OVERTEMPERATURE PROTECTION

Non-indicating factory set overheat protection is provided in each zone.

When furnace temperature exceeds overheat condition, heater power is shut down.

F. ATMOSPHERE CONTROL SYSTEM

BTU Atmosphere Control System is included for operating in an air, inert or partially reducing atmosphere, up to 5% hydrogen. Flowmeters are provided as follows:
(10 - 20 PSIG)

- 1- Entrance Curtain, Air / N2
- 1- Entrance Venturi Exhaust, Air / N2
- 1- Muffle Cover Gas, Air / N2
- 1- Muffle Cover Gas, Helium up to 10% blending into N2
- 1- Heat Barrier Venturi Exhaust, Air / N2
- 1- Atmosphere Cooling Jets, Air / N2
- 1- Atmosphere Cooling Jets, Helium.
- 1- Exit Venturi Exhaust, Air / N2
- 1- Exit Curtain, Air / N2

One low pressure alarm is provided.

Atmosphere is introduced throughout the entire heated length.
An additional gas inlet is provided for helium.

Delta F Oxygen Analyzer is included. A gas sample port is located in zone IV.

G. ELECTRICAL SPECIFICATION

Connected Load: 13 KW
Operating From: *208-240* ~~480~~ volts, 3 phase,
50/60 Hz

Transformer is mounted in furnace base.
Heater Power Figure is approximate and should not be used for design purposes.
Actual loading (KVA) is determined at the time of engineering and formal notification will be sent to the purchaser.

Emergency Off Buttons are provided, one at each end of the furnace, connected to a 24V emergency off circuit.

H. PHYSICAL CHARACTERISTICS

Color: Two tone gray
Approximate Shipping Weight: 3,000 lbs

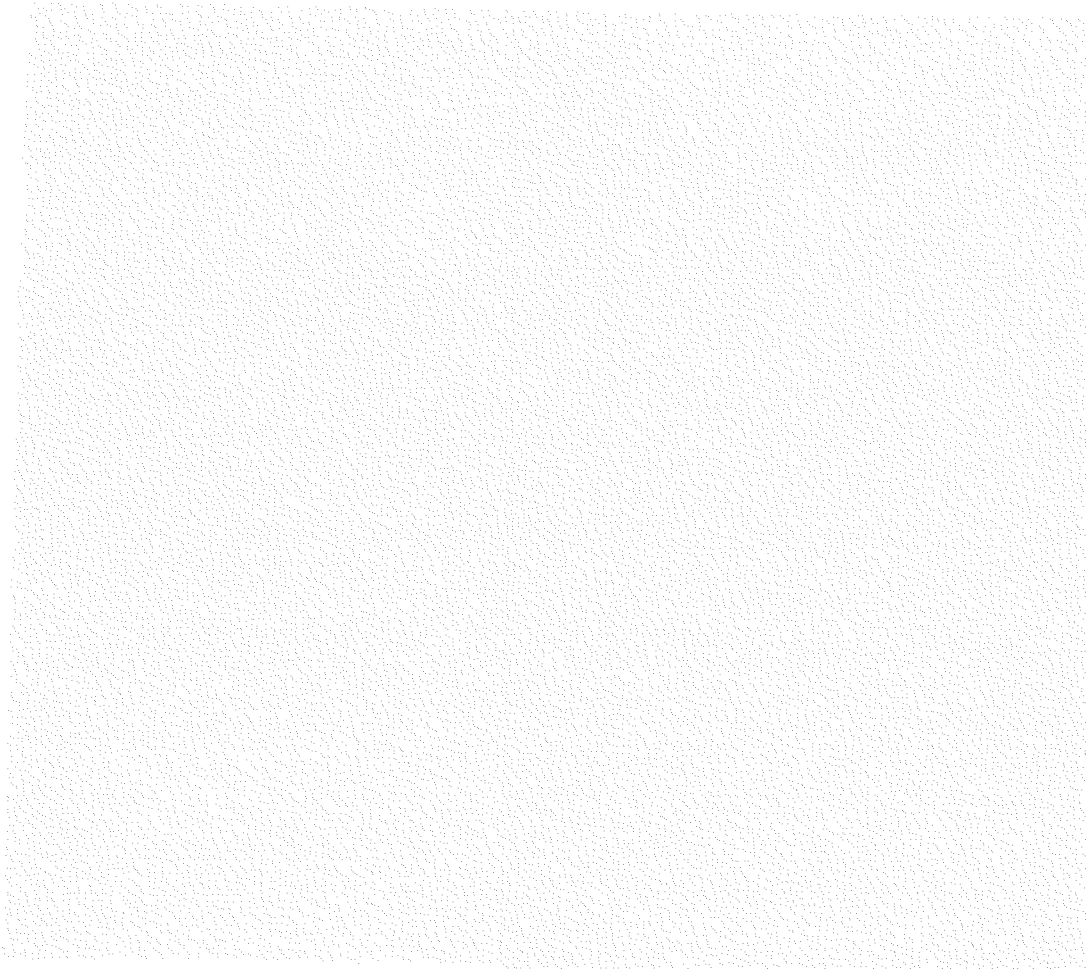
Minimum of 30 inch service aisle is required on each side of the furnace.

I. INSTRUCTIONS

Two books of instructions covering all phases of installation, operation and maintenance are included.

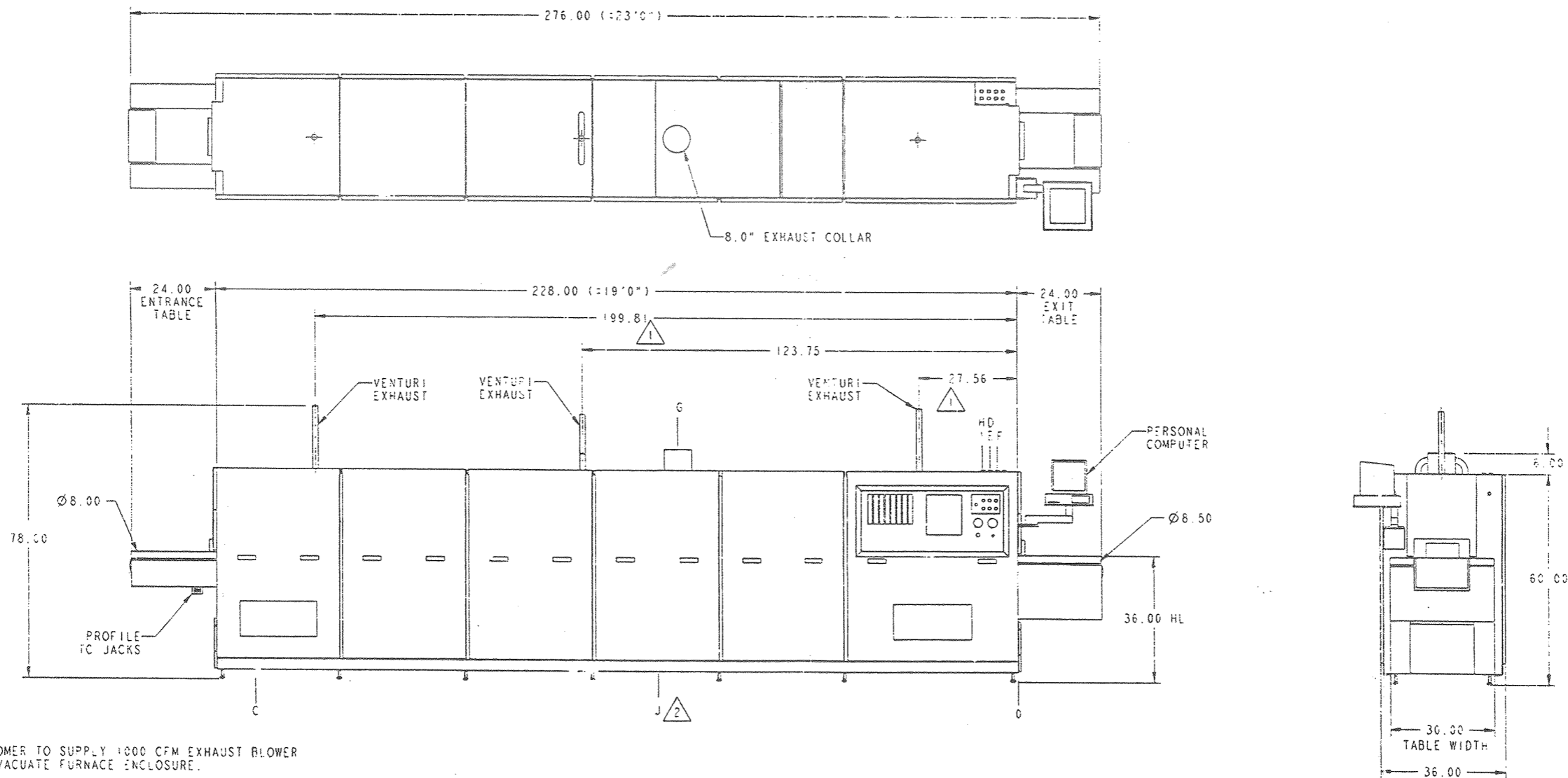
J. CLEAN ROOM PACKAGE

- a) A collar system around the muffle and furnace end panels
- b) Belt drive enclosure, non-abrasive material for belt travel
- c) Quartz tube hearth and return trays
- d) Cleanroom compatible epoxy paint
- e) Triple plastic wrap of furnace for shipment
- f) Shipping preparation under HEPA filtration
- g) Nichrome V belt
- h) Heat shield filters (panel filters)
- i) Point of use filters for plumbing
- j) Ultra sonic belt cleaner
- k) Enclosed case that goes over insulation
- l) Collar for customer connected exhaust (to exhaust enclosure around furnace)

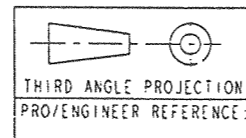


ENTRANCE TABLE OPTIONS		PURCHASER TO PROVIDE CIRCUIT BREAKER OR FUSED DISCONNECT SWITCH FOR:				MAXIMUM TEMPERATURE ZONES 1-4: 600 DEGREES CELSIUS OPERATING TEMPERATURE ZONES 1-4: 200-350 DEGREES CELSIUS MAXIMUM TEMPERATURE ZONE 5: 800 DEGREES CELSIUS OPERATING TEMPERATURE ZONE 5: 350-750 DEGREES CELSIUS			
DIMENSION "A"		480 VOLTS 35 AMPERES 3 POLES 3 WIRES 3 PHASES 25 KILOVOLT-AMPERES 50/60 HZ FURNACE CASE MUST BE GROUNDED PER LOCAL CODES							
1	24"	STANDARD							
2	36"								
3	43"								
4	60"								
5	72"								
EXIT TABLE OPTIONS		AVERAGE HEATER LOAD 19 KW				OVERHEAT T/C'S IN ZONES 1 THRU 5			
DIMENSION "B"									
1	24"	STANDARD							
2	36"								
3	48"								
4	60"								
5	72"								

REV'S/CNS		
REV	DESCRIPTION	DATE
1	REV PER ECO 308930	10-21-98
2	REV PER ECO 309011	11-4-98



NOTES:
1. CUSTOMER TO SUPPLY 1000 CFM EXHAUST BLOWER TO EVACUATE FURNACE ENCLOSURE.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS: ANGLES
.X : 0.1 : 1.0°
.XX : 0.03
.XXX : 0.010

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APPROVALS		DATE	TITLE:
DRAWN	IMPL	10-23-97	INSTALLATION DRAWING
CHECK	IMPL		TS94-554N84
ENGR.	IRH		
PROD.	C. WORAN	10/96	

SCALE: 0.063
SHEET 1 OF 1

BTU BTU International, Inc.
N. ATTLEBOROUGH, MASSACHUSETTS 01862

DWG SIZE	DWG NO.	REV
D	5091928	2