FGW900 High-temperature Furnace

Product Manual

be certain.

100-231-447 A

Publication information

MANUAL PART NUMBER	PUBLICATION DATE
100-231-447 A	**May 2012**

Contents

Preface

Before You Begin

Safety first!

Before you use your MTS product or system, read and understand the safety information provided with your system. Improper installation, operation, or maintenance can result in hazardous conditions that can cause severe personal injury or death, or damage to your equipment and specimen. Again, read and understand the safety information provided with your system before you continue. It is very important that you remain aware of hazards that apply to your system.

Other MTS manuals

In addition to this manual, you may receive additional manuals in paper or electronic form.

Manuals located on the product information CD will contain information that pertains to your test system, such as:

- Hydraulic and/or mechanical accessory manuals
- Assembly drawings
- Parts lists
- Operation instructions
- Preventive maintenance tasks

Controller and application software manuals are typically included on the software CD distribution disc(s).

Conventions

Documentation Conventions

The following paragraphs describe some of the conventions that are used in your MTS manuals.

Hazard conventions

Hazard notices may be embedded in this manual. These notices contain safety information that is specific to the activity to be performed. Hazard notices immediately precede the step or procedure that may lead to an associated hazard. Read all hazard notices carefully and follow all directions and recommendations. Three different levels of hazard notices may appear in your manuals. Following are examples of all three levels.

⚠ DANGER

Danger notices indicate the presence of a hazard with a high level of risk which, if ignored, *will* result in death, severe personal injury, or substantial property damage.

⚠ WARNING

Warning notices indicate the presence of a hazard with a medium level of risk which, if ignored, *can* result in death, severe personal injury, or substantial property damage.

⚠ CAUTION

Caution notices indicate the presence of a hazard with a low level of risk which, if ignored, *could* cause moderate or minor personal injury or equipment damage, or could endanger test integrity.

Notes

Notes provide additional information about operating your system or highlight easily overlooked items. For example:

Note *Resources that are put back on the hardware lists show up at the end of the list.*

Special terms

The first occurrence of special terms is shown in *italics*.

Illustrations

Illustrations appear in this manual to clarify text. They are examples only and do not necessarily represent your actual system configuration, test application, or software.

Electronic manual conventions

This manual is available as an electronic document in the Portable Document File (PDF) format. It can be viewed on any computer that has Adobe Acrobat Reader installed.

Technical Support

How to Get Technical Support

Start with your manuals

The manuals supplied by MTS provide most of the information you need to use and maintain your equipment. If your equipment includes software, look for online help and README files that contain additional product information.

If you cannot find answers to your technical questions from these sources, you can use the Internet, e-mail, telephone, or fax to contact MTS for assistance.

Technical support methods

MTS provides a full range of support services after your system is installed. If you have any questions about a system or product, contact Technical Support in one of the following ways.

Outside the U.S.

For technical support outside the United States, contact your local sales and service office. For a list of worldwide sales and service locations and contact information, use the Global MTS link at the MTS web site:

> www.mts.com > Global MTS > (choose your region in the right-hand column) > (choose the location closest to you)

Before You Contact MTS Service Representative

MTS can help you more efficiently if you have the following information available when you contact us for support.

Know your contact number and system number

The contact number contains your company number and identifies your equipment type (such as material testing or simulation). The number is typically written on a label on your equipment before the system leaves MTS. If you do not know your MTS contact number, contact your sales engineer.

When you have more than one MTS system, the system model number and series number identifies your system. You can find your these number in your order paperwork or directly on your equipment.

Identify the problem

Describe the problem and know the answers to the following questions:

- How long and how often has the problem occurred?
- Can you reproduce the problem?
- Were any hardware or software changes made to the system before the problem started?
- What are the equipment model numbers?
- What is the controller model (if applicable)?
- What is the system configuration?

Know relevant computer information

For a computer problem, have the following information available:

- Manufacturer's name and model number
- Operating software type and service patch information
- Amount of system memory
- Amount of free space on the hard drive where the application resides
- Current status of hard-drive fragmentation
- Connection status to a corporate network

Know relevant software information

For software application problems, have the following information available:

- The software application's name, version number, build number, and (if available) software patch number. This information can typically be found in the **About** selection in the **Help** menu.
- The names of other applications on your computer, such as:
  - Anti-virus software
  - Screen savers
  - Keyboard enhancers
  - Print spoolers
  - Messaging applications

If You Contact MTS by Phone

A Call Center agent registers your call before connecting you with a technical support specialist. The agent asks you for your:

- Contact number
- Name
- Company name
- Company address
- Phone number where you can be reached

If your issue has a notification number, please provide that number. A new issue will be assigned a unique notification number.

Identify system type

To enable the Call Center agent to connect you with the most qualified technical support specialist available, identify your system as one of the following types:

- Electromechanical material test system
- Hydromechanical material test system
- Vehicle test system
- Vehicle component test system
- Aero test system

Be prepared to troubleshoot

Prepare to perform troubleshooting while on the phone:

- Call from a telephone close to the system so that you can implement suggestions made over the phone.
- Have the original operating and application software media available.
- If you are not familiar with all aspects of the equipment operation, have an experienced user nearby to assist you.

Write down relevant information

In case Technical Support must call you:

- Verify the notification number.
- Record the name of the person who helped you.
- Write down any specific instructions.

After you call

MTS logs and tracks all calls to ensure that you receive assistance for your problem or request. If you have questions about the status of your problem or have additional information to report, please contact Technical Support again and provide your original notification number.

Introduction

About This Manual

Purpose

The FGW900 High Temperature Furnace provides a high-temperature testing environment for material tests. These tests can include tension, compressing, or bending of ceramic, metal, and compound materials. This manual provides technical information about the high-temperature furnace in terms of its parts, working environment, technical parameters, temperature controller, installation, and operation.

Inappropriate Use

Before you attempt to use the FGW900 MTS High Temperature Furnace, read and understand this manual. Improper installation or operation of this product can result in hazardous conditions that can cause sever personal injury or death, and damage your equipment and specimen.

Contents

Description

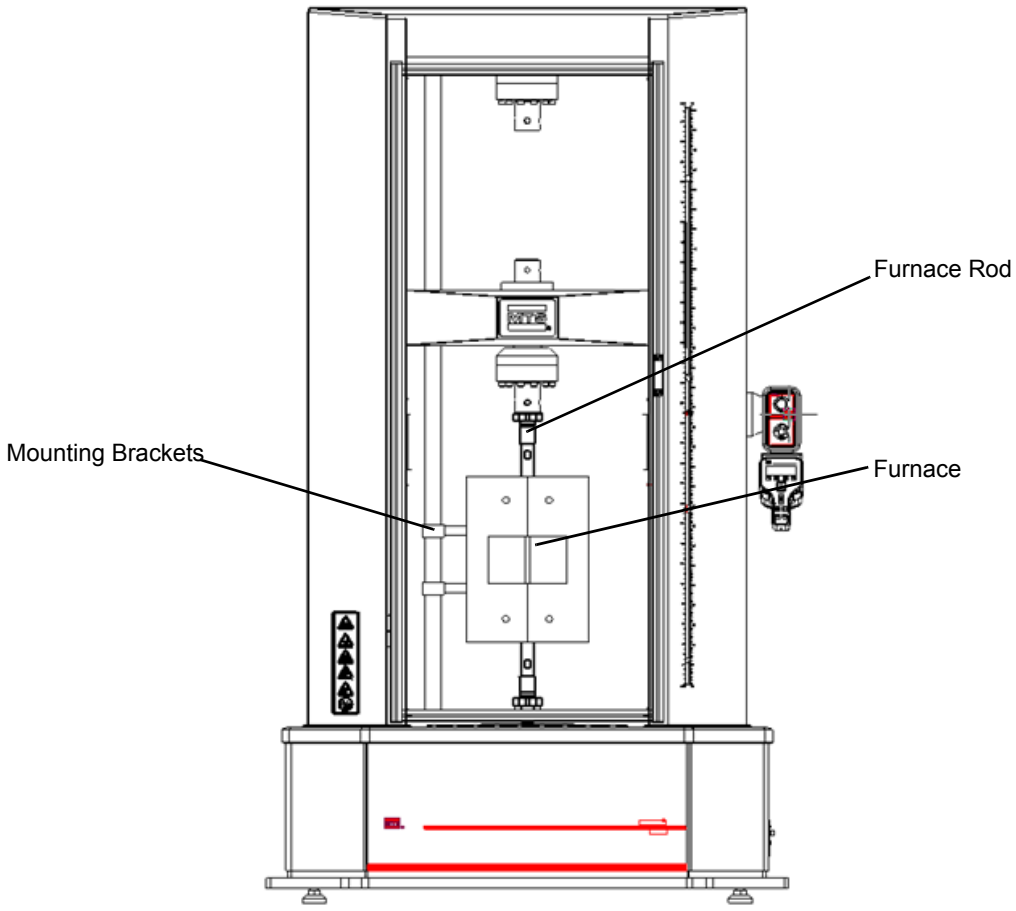
The FGW900 High Temperature Furnace is primarily used with the MTS Series C45 Electronic Universal Testing Machine and the MTS Series C64 Static-Hydraulic Universal Testing Machine. It provides the high temperature required for tension tests while providing a long-term, stable, high-temperature testing environment.

The MTS Series FGW900 High furnace let you test materials and components within a range of temperatures, from 300~ 1100°C (572 ~ 2097°F).

Heating is accomplished with electrical heating elements.

A customer-specified temperature controller (Eurotherm2408) is mounted in the electrical box.

The high temperature furnace provides stable test temperature conditions for high temperature tension tests. The high temperature furnace consists of a bracket, furnace body, temperature controller, rod**.**



Typical installation of high temperature furnace

Furnace

The high-temperature furnace opening provides quick sample and fixture installation. The furnace has ports used for connecting thermocouples and high-temperature extensometers.

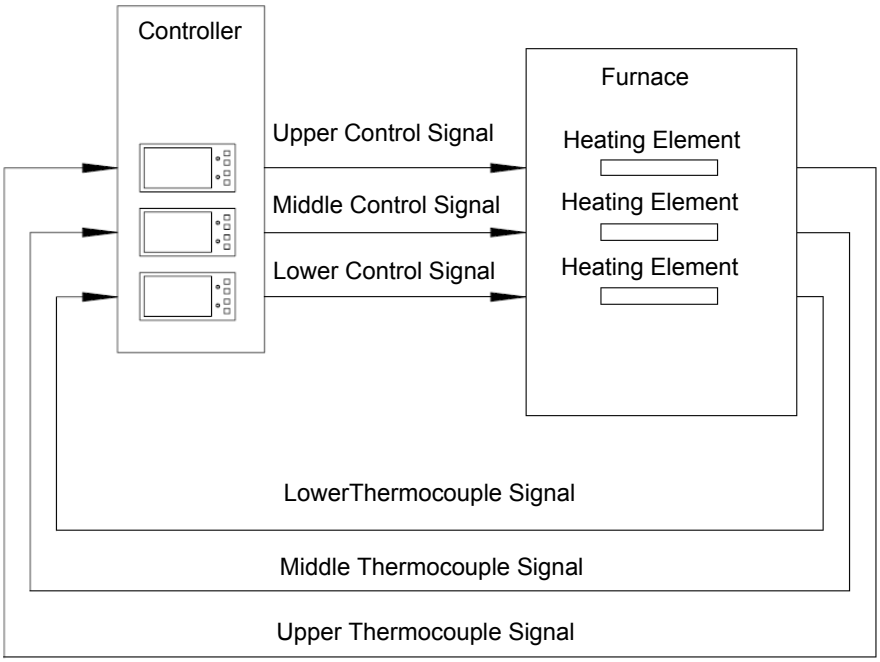
The cavity of the furnace uses thermal insulation material of multicrystal mullite fiber, allowing operation at maximum temperature for extended periods of time.

The heating body is made of electro thermal alloy wire which provides fast temperature rise, low heat loss, and long service life.

The housing is made of stainless steel in a double layer structure, ensuring a lower surface temperature.

Temperature controller

The high temperature furnace is monitored and controlled by the temperature controller. The temperature controller has three high-precision Eurotherm temperature control meters which control three heating zones. Each temperature control meter receives the input from a thermocouple and outputs power accordingly to its heating element. Solid-state relays are used to meet the requirements of high-precision temperature control.



High temperature furnace control diagram

Bracket of high temperature furnace

The bracket for the furnace has an adjustable rotary bracket that allows you toadjust the position of the furnace or easily remove it from the test space.

Operating condition requirements

Only use the high temperature furnace under the following conditions.

PARAMETER	SPECIFICATION
Condition	For indoor application only
Operating Temperature	5 ~ 40 °C (41 ~ 104 °F)
Operating Humidity	5-85%, noncondensing
Maximum Altitude	2000 m (6562 ft)
Voltage	Single-phase AC 200 ~ 240 V
Frequency	50 Hz / 60 Hz
Current	15 Amps

Technical parameters

MODEL	FGW900
Scope of application	C45, C64
Temperature scope (°C)	300 ~ 1100(572 °F to 2097 °F)
External dimension (mm)	Φ310 x 410(12.2 in x 16.1 in)
Dimension of chamber (mm)	Φ100 x 320(3.9 in x 12.6 in)
Controller size (mm)	400 x 420 x 200(15.7 in x 16.5 in x 7.9 in)
Uniform temperature zone length(mm)	100(3.9 in)
Temperature gradient	≤3°C(≤37.4 °F)
Heating method	Three-segment controllable
Temperature fluctuation	≤± 2°C(≤35.6 °F)
Precision of temperature controller	Class 0.3
Time to obtain operating temperature	≤50 min
Weight	25 kg(55.1lb)

Safety Information

Safety

Stay clear of moving equipment/avoid crush points

Stay clear of mechanical linkages, connecting cables, and hoses that move because you can get pinched, crushed, tangled, or dragged along with the equipment. High forces generated by the system can pinch, cut, or crush anything in the path of the equipment and cause serious injury. Stay clear of any potential crush points. Most test systems can produce sudden, high-force motion. Never assume that your reactions are fast enough to allow you to escape injury when a system fails.

Know the causes of unexpected crosshead motions

The high force and velocity capabilities of MTS systems can be destructive and dangerous (especially if crosshead motion is unexpected). The most likely causes of unexpected crosshead response are operator error and equipment failure due to damage or abuse (such as broken, cut, or crushed cables and hoses; shorted wires; overstressed feedback devices; and damaged components within the control loop). Eliminate any condition that could cause unexpected crosshead motion.

Do not use RF transmitters

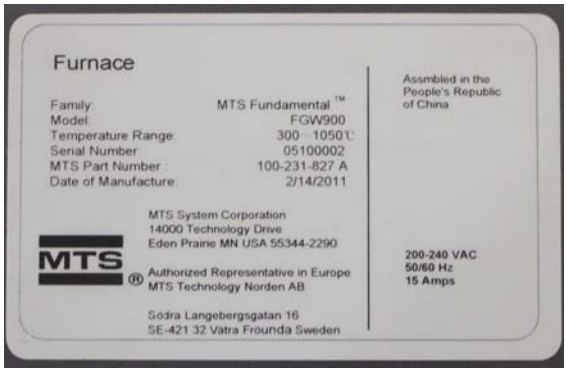
Keep radio frequency (RF) transmitters away from the workstation computers, remote terminals, and electronics consoles. Intense RF fields can cause erratic operation of the more sensitive circuits in the system.

Hazard Placard Placement

Hazard placards contain specific safety information and are affixed directly to the system so they are plainly visible.

Each placard describes a system-related hazard. When possible, international symbols (icons) are used to graphically indicate the type of hazard and the placard label indicates its severity. In some instances, the placard may contain text that describes the hazard, the potential result if the hazard is ignored, and general instructions about how to avoid the hazard.

The following labels are typically located on the chamber.

LABEL	DESCRIPTION
	High temperature Furnace ID label.

LABEL	DESCRIPTION
	Do not start, operate, or service machine until you read and understand the operator's manual. Failure to do so could result in serious injury.
	There are no customer-serviceable parts on the MTS Criterion electromechanical frames.
	Burn hazard. Hot surface. Do not touch. Allow to cool before servicing.
	Hot surface hazard. Do not touch.

Installation

The FGW900 High-Temperature Furnace is usually provided for the customer as an accessory of a main machine, and MTS service staff installs the accessory following defined steps. If it was purchased as a replacement or an additional item, install it following the steps described in this section.

Installation Overview

The following is an overview of furnace installation tasks:

1. Mount the furnace on the load frame.
2. Connect all electrical cables and jumpers.
3. Install the extensometer.

The extensometer, if used, is mounted independently and its extension rods extend into the furnace through an opening filed in the front of the furnace.

Mounting Considerations

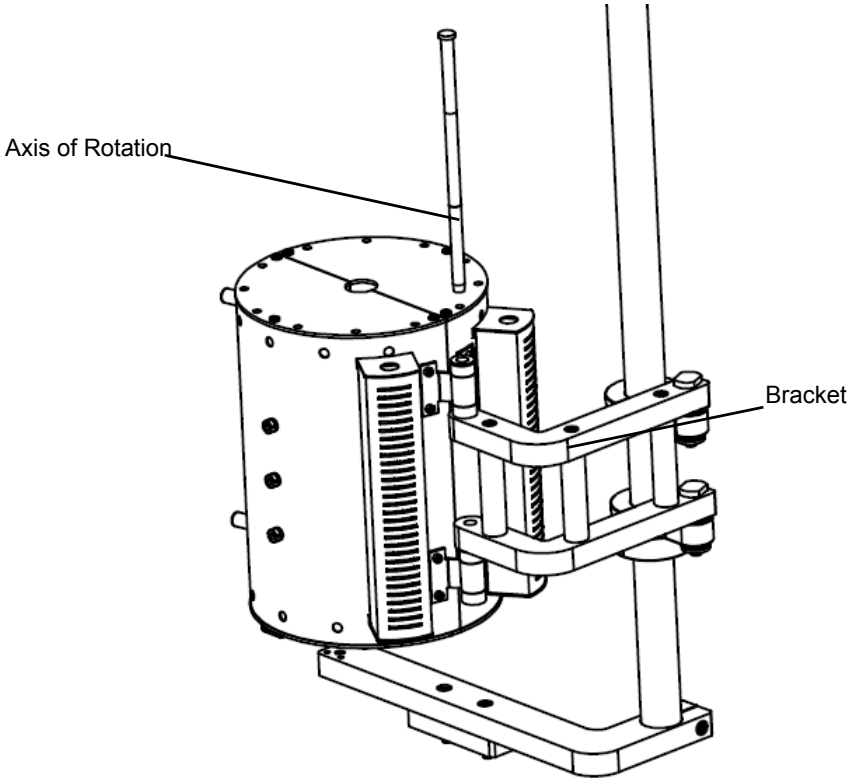
Consider the following when mounting the furnace in the load frame:

1. When mounting ensure the specimen rod axis is in coincidence with the furnace hearth axis.
2. When mounting ensure the vertical center of the specimen is in coincidence with the vertical center of the high-temperature furnace.

High temperature furnace body installation

Furnace body installation steps:

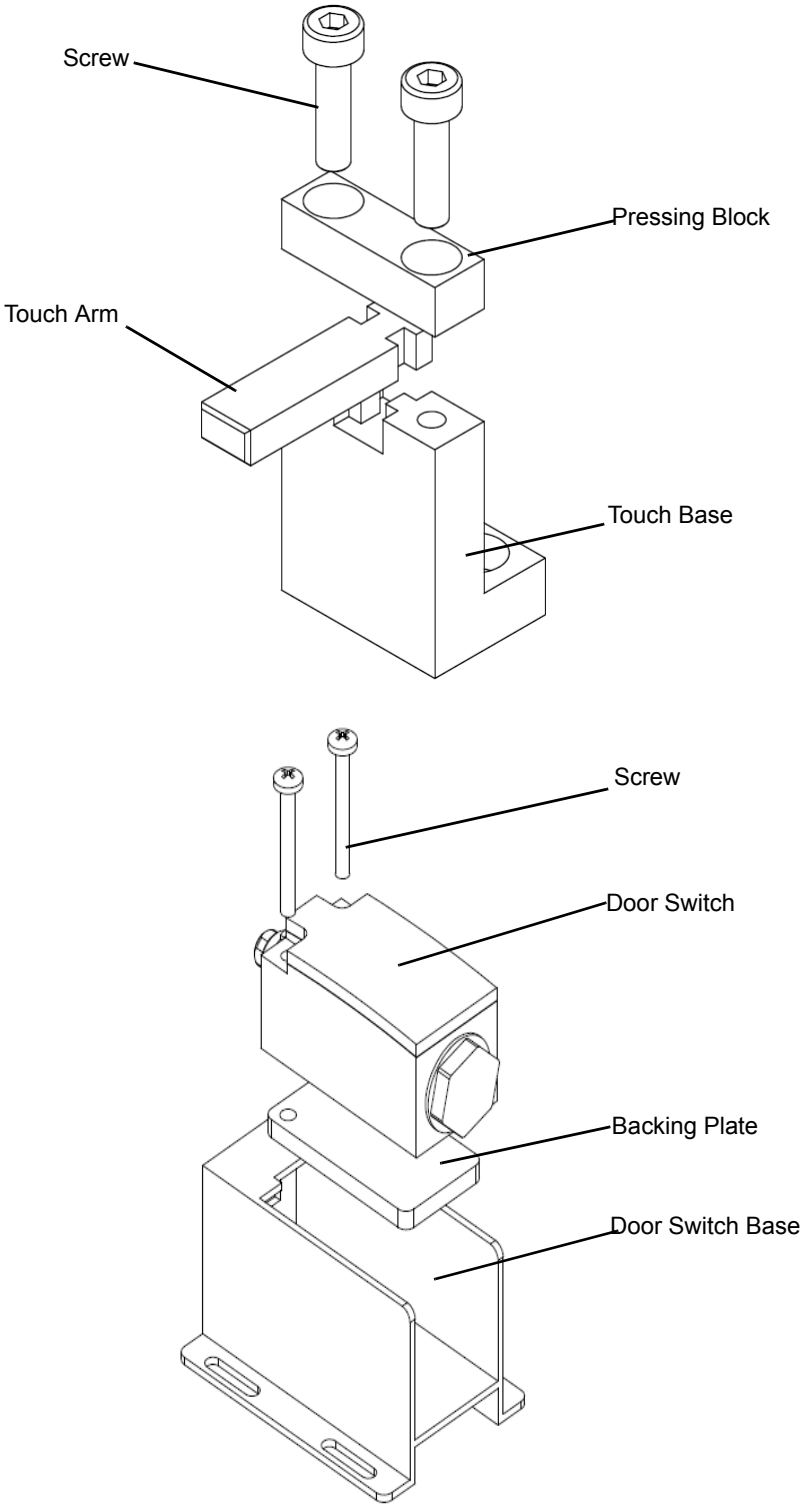
1. Unplug the furnace rotation axis from the hinge assembly of the furnace
2. Put the furnace onto the bracket
3. Align the high-temperature furnace hinge holes with the bracket mounting holes;
4. Downwards insert the rotation axis , connect the high temperature furnace with the high-temperature bracket, as shown below:



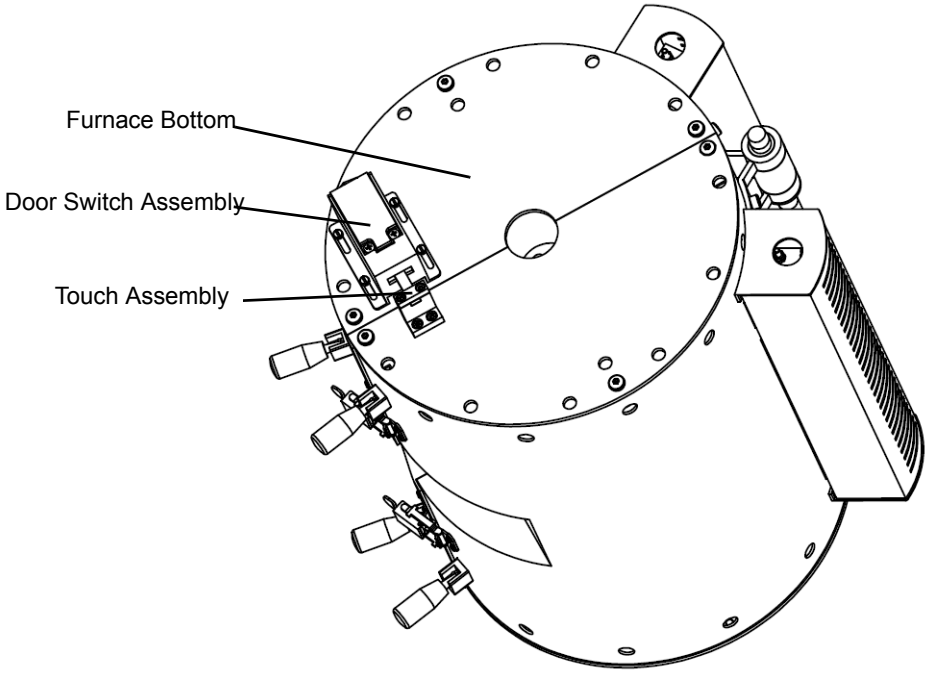
5. Furnace door switch installation

As the door switch has been adjusted in the right position in the vendor's plant, users are not allowed to arbitrarily adjust the position when installing the furnace for the first time. If need to replace the switch, you need follow the below steps:

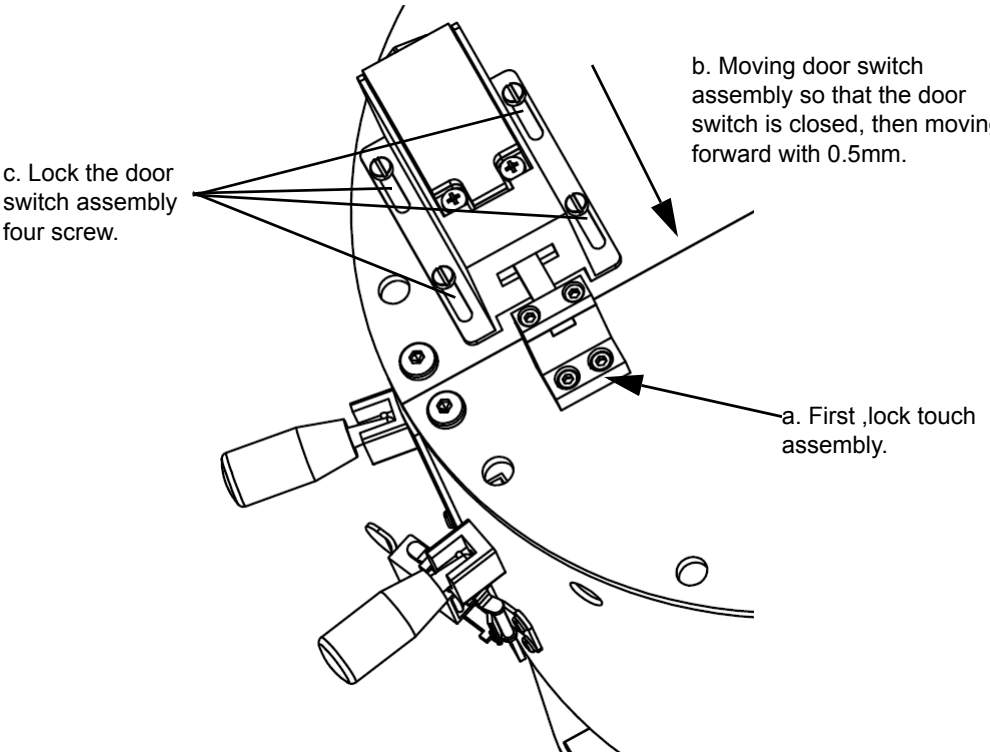
5.1 Assemble the contact block and limit switch separately based on the following figure shows:



5.2 According to the following figure shows, assemble the contact block whole piece and limit switch whole piece to the furnace bottom front position.

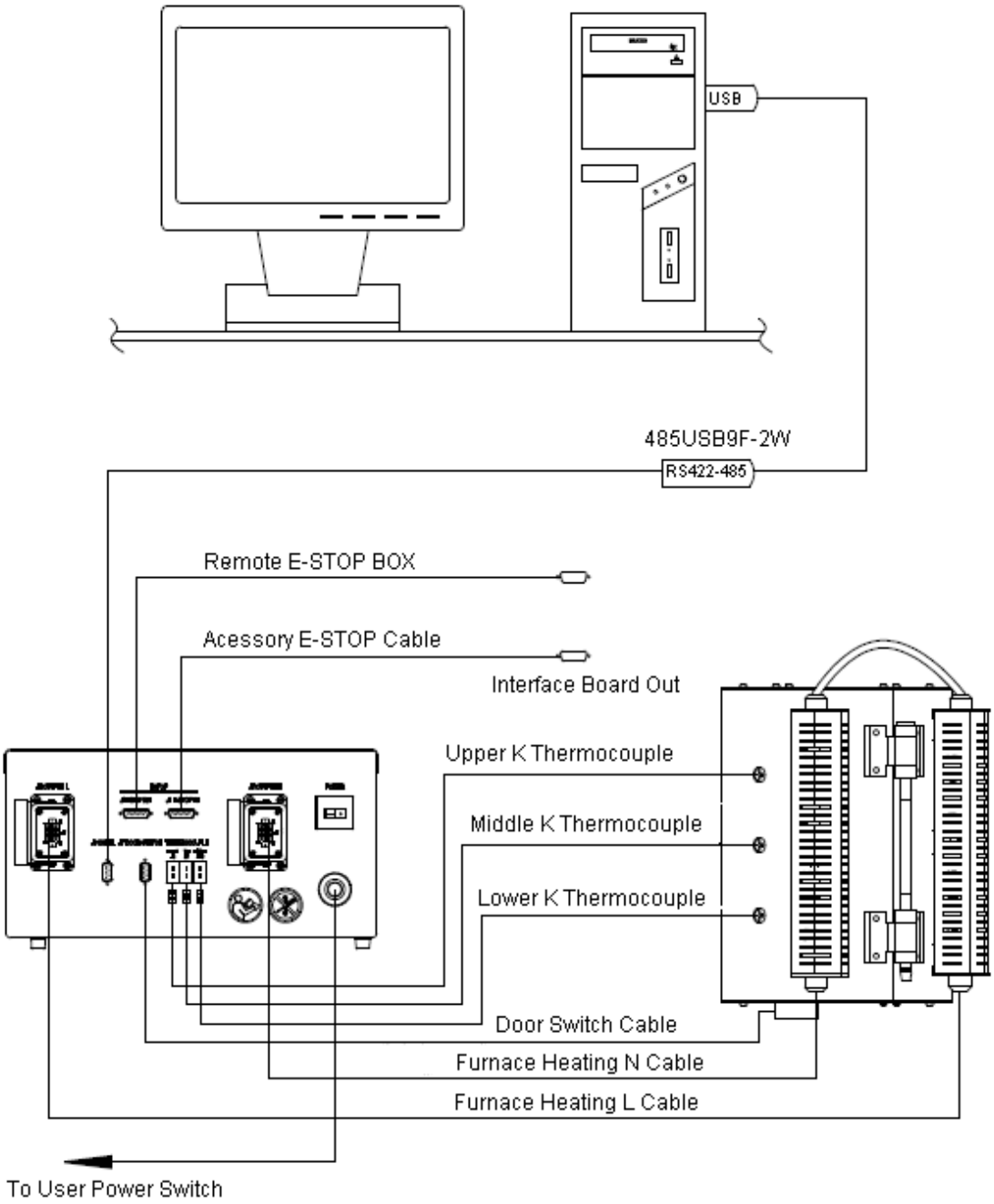


5.3 Use 2 Metric M4X10 socket head cap screws to lock the contact assembly piece, and then move the door switch assembly piece to make the door switch closed, after that, mover forward another 0.5mm to lock the four screws in the door switch assembly piece.



High-Temperature Furnace Cable Connections

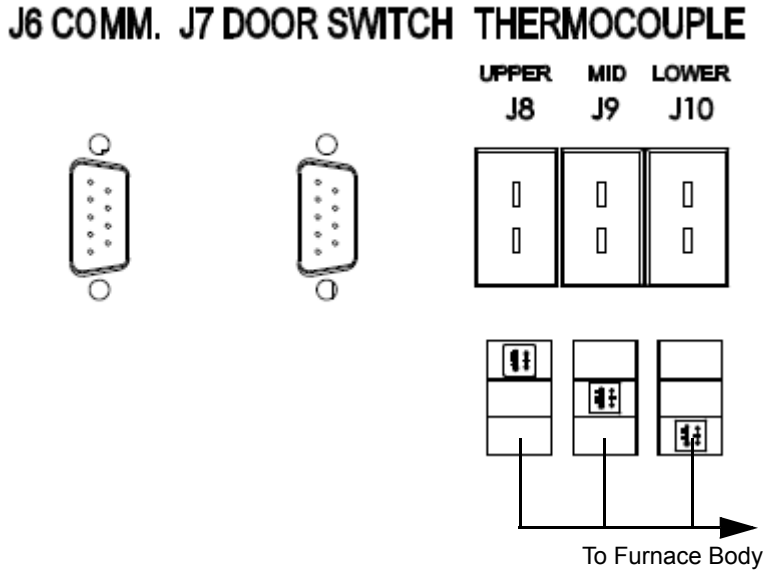
The connection between the high-temperature furnace and the temperature controller is shown as below:



Connection steps:

1. Connect the thermocouple wire

Aaccording to the label sequence of J8, J9, and J10, insert thermocouple into the upper, middle, lower jacks of the high temperature furnace side wall and tighten the fixing screws. Insert the cable that is carried by the thermocouple into the thermocouple outlet on the rear panel of the temperature controller.



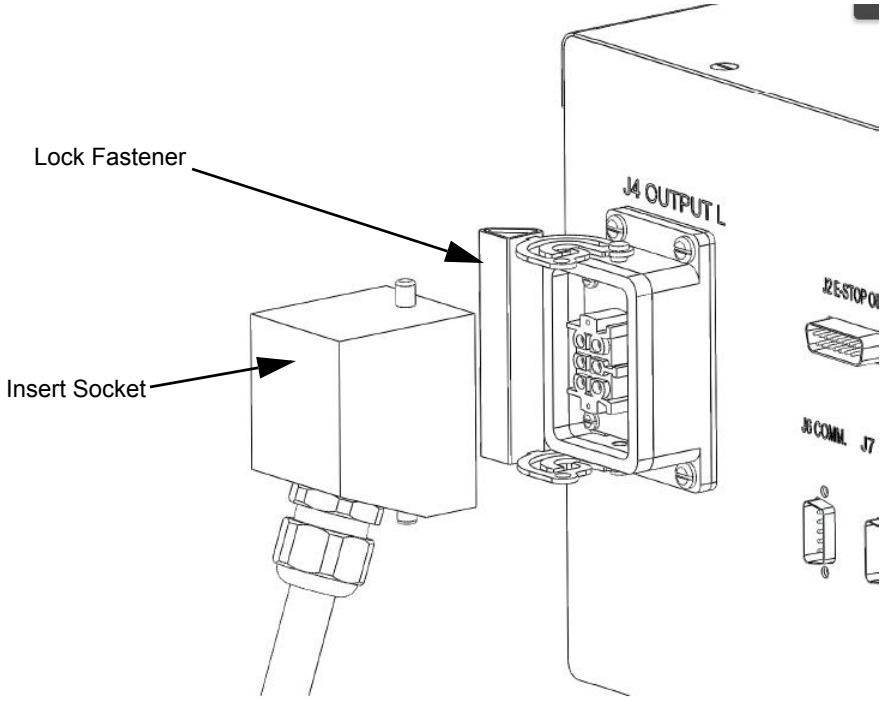
2. Connect the door switch wire

Insert one end of switch lead with plug into J7 jack of the temperature controller, then connect the other end to the limit switch contact on the furnace bottom. When installing, the furnace door switch lead has been connected together with the limit switch. Only need to insert the other end to J7 of the temperature controller.

3. Connect the output power cable between the furnace and the temperature controller.

There are two power cables that connect the furnace and the temperature controller. One is OUTPUTL, the other is OUTPUT N. The two cables have already been connected together on the furnace. When installing, simply need to follow the labels to insert one end with plug into the corresponding sockets on the rear panel of the temperature controller and then tighten the fastens.

Note *Do not insert or unplug this connectors group in the heating condition to avoid personal electric shock accidents.*

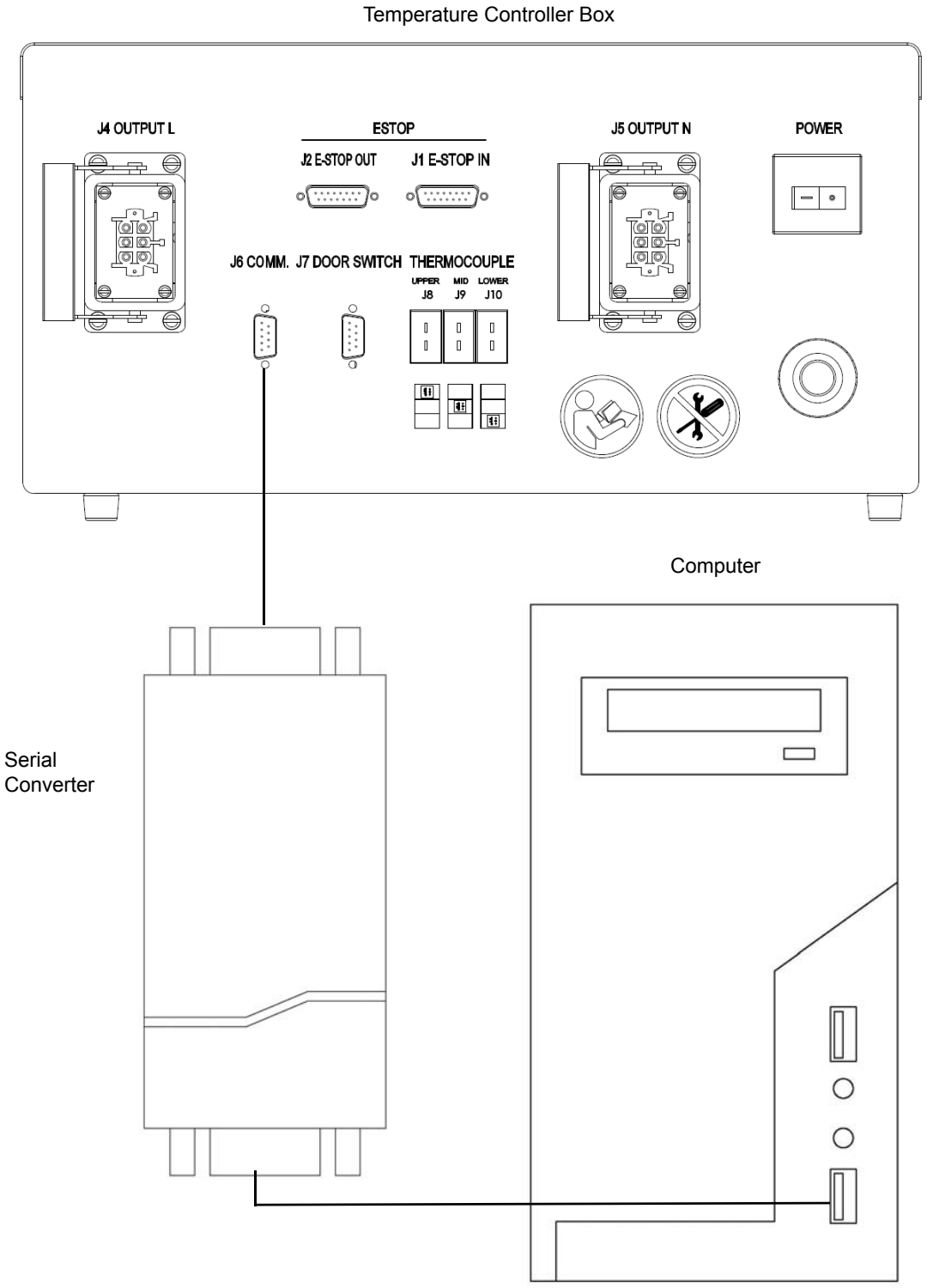


4. Connect E-STOP to the frame

When connecting insert one end of E-STOP cable with E-STOP IN label into E-STOP IN socket in the rear panel of the temperature controller, then put the other end into E-STOP jack J14 on the frame controller. More detailed information about E-STOP, see related contents in the MTS load frame manual.

5. Connect the communication cable to the computer

There is a reserved port J6 on the temperature controller of the furnace. When needs to connect the computer and the temperature controller, a MTS communication cable is required. It is through a 485 to use serial converter to achieve the connection.



Communication cable for connection

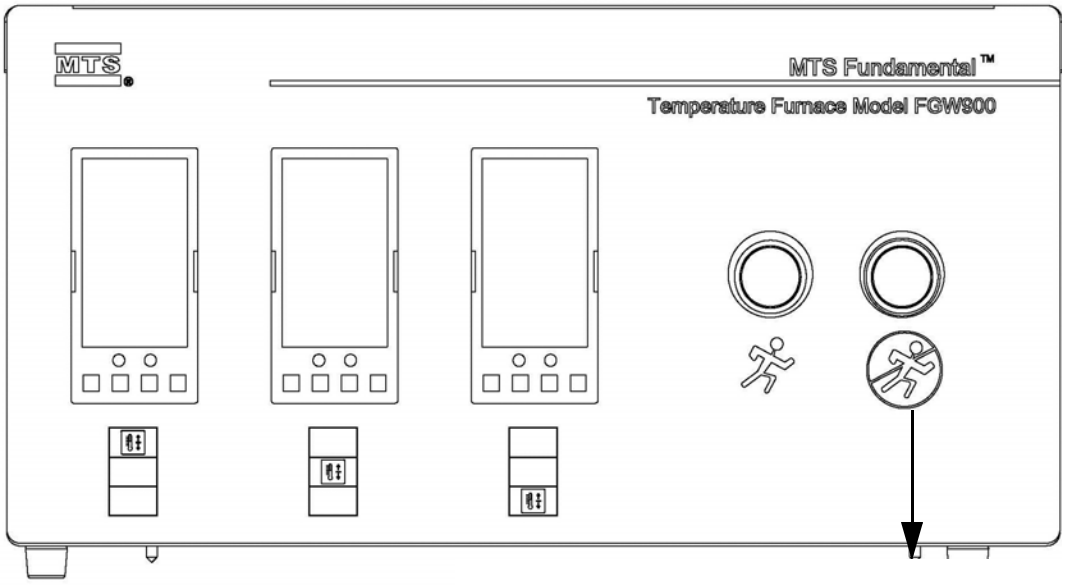
Connecting the Main Power

The input voltage of the MTS FGW900 high temperature Furnace is single phase 200-240 V, 50/60 Hz. Use the cable that is provide for power input, and connect to the customer electrical box and disconnect.

Note *Local electrical codes supercede any information found here. Electrical connections must be made by qualified personnel and is their responsibility for using the proper power disconnect that conforms to local codes and regulations when connecting the machine to the building main power.*

Electrical disconnect

The customer is responsible for providing an electrical power disconnect that is easy to operate and easy to reach. It must also meet IEC 60947-1 and IEC 60947-3 standards. Recommended circuit breaks would be ones that are of the thermal magnetic type with characteristics suitable for large inductive loads(D-type trip characteristic). If fuses are used it is recommended that they are of the time delay type with dual elements. These recommendations should be followed to avoid nuisance tripping.



Connected to the Customer Electrical Box and Disconnect

Operation

This section provides typical operating instructions for the high-temperature furnace along with safety requirements. For more details about the software and the Eurotherm temperature controller, see the software operation manual and the Eurotherm temperature controller manual.

Contents

⚠ CAUTION

Abrasion of insulation inserts produces airborne dust.

Airborne dust from the insulation can irritate the eyes, lungs, and skin.

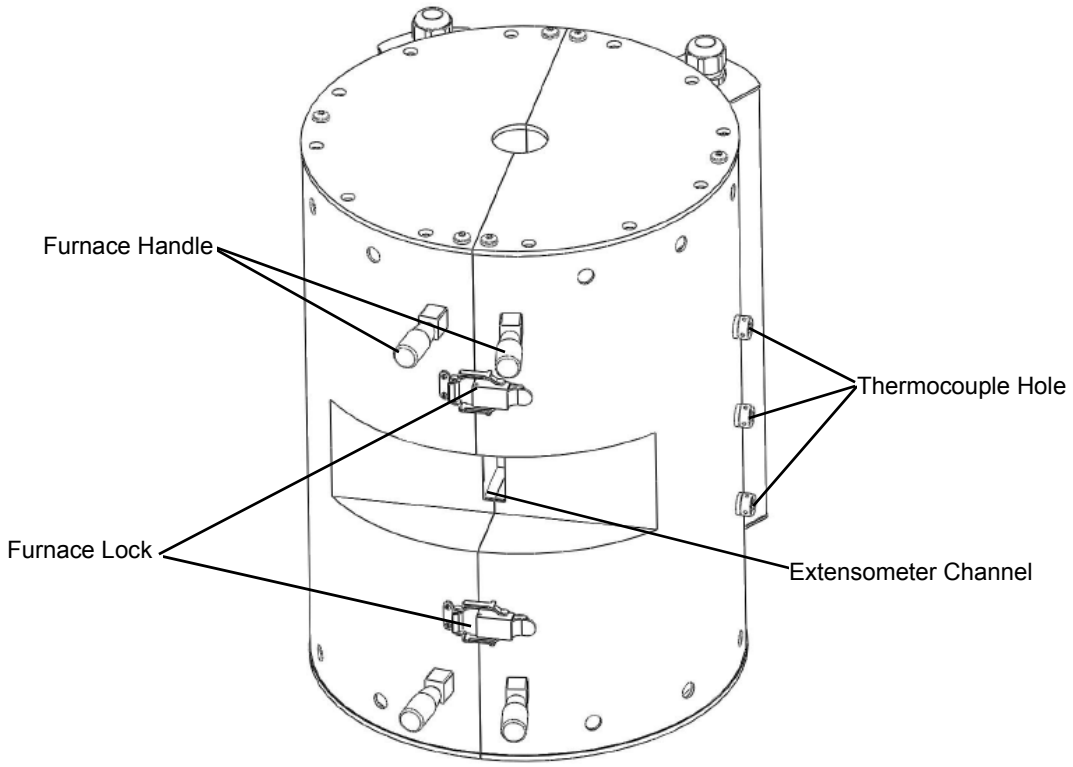
Use eye protection (goggles), gloves, and a high efficiency respirator if it is necessary to work with insulating materials.

Operation of High Temperature Furnace

Before starting test,you need assemble high temperature grip, open high temperature furnace and revolve it into test space, assemble high temperature grip into furnace body and seal pull rod hole according to requirement.

The high temperature furnace belongs to split flange high temperature furnace, of which opening/closing is realized via lock on external wall of case shell.

The bottom of the high temperature furnace is equipped with a limit protection switch, when the high temperature furnace is opened, this limit protection switch will cut off the heating power, and can not self-recovery, only when to again press the ENABLE button can be connected to the heating circuit once the door is closed again.



If you use a high-temperature extensometer (supplied separately), its extension guide rod is inserted into the furnace via the slot for the extensometer in front of the furnace and contacts the testing sample. For information about the installation and usage of the high-temperature extensometer, see the high-temperature extensometer user manual.

WARNING

Improper use can shorten the life of heater elements and insulation components.

Do not open the high-temperature furnace while it is hot or operating. Allow sufficient time for the furnace to cool before opening the furnace. Rapid cooling reduces heating element life.

WARNING

Do not use this furnace to heat materials that pose hazards of explosion, implosion, or the release of toxic or flammable gases

Explosions in the furnace can cause death or serious injury.

WARNING

Do not operate the furnace near or above flammable materials. Allow sufficient time for the test materials to cool before handling them.

Materials heated in the furnace are hot and can ignite flammable materials or cause serious burns.

Do not operate the furnace near or above flammable materials. Allow sufficient time for the test materials to cool before handling them.

WARNING

Do not use the metal shell of the thermocouple when replacing the thermocouple.

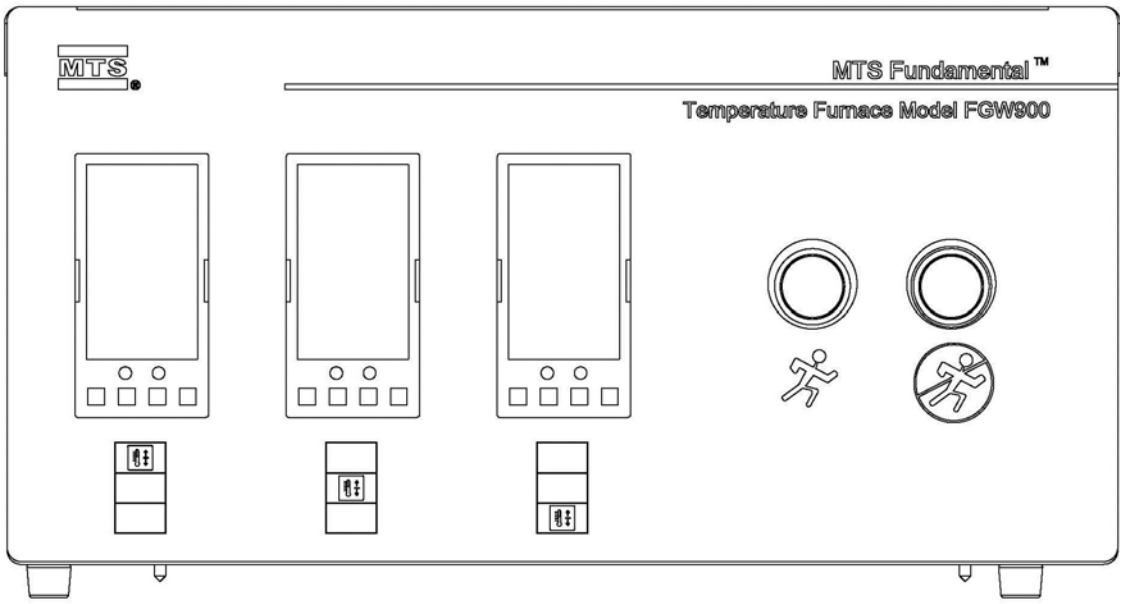
Six groups of 230V AC heating wires were buried in furnace inner wall; when thermocouple pass through the heating wires, the mental shell of thermocouple may be charged, resulting in equipment damage or electric shock injury.

Do not use the metal shell of the thermocouple; you should use a porcelain jacket tube thermocouple.

Operation of Temperature Controller

The temperature controlling system of high temperature furnace allows user to connect it with the computer and set software parameters.

The function of the switch and interface



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FUNCTION DESCRIPTION
Starts the heating 
Disables (stops) the heating 

POWER: Power switch of the temperature controller.

COMM.: Communication interface. Furnace connects with the computer via this interface. The required temperature and parameters can be set for a test via this interface. Temperature information can be read through software in real time.

The interface use 9 pins connectors and three of them are used. Pin assignments are as follows:

PIN	SIGNAL
1	No Contact
2	COMM A(+)
3	COMM B(-)
4	Communication GND
5	No Contact
6	No Contact
7	No Contact
8	No Contact
9	No Contact

E-STOP: The J1 connector should be connected to either J14 of the Frame Controller or J2 of another Accessory with an Emergency Stop board.

The J2 connector will either have a jumper plug or be connected to J1 of another Accessory with an Emergency Stop board.

J1 E-STOP pin assignments are as follows:

PIN	SIGNAL
1	ESTOP3B-
2	No Contact
3	No Contact
4	ESTOP_OUT_MONTION+
5	ESTOPB_IN+
6	ESTOP3A-
7	ESTOPB_IN-
8	ESTOPA_IN+
9	ESTOP3B+
10	ESTOP_OUT_MONTION-
11	No Contact
12	No Contact
13	ESTOPA_IN-
14	ESTOP3A+
15	No Contact

J2 E-STOP pin assignments are as follows:

PIN	SIGNAL
1	ESTOPB_OUT-
2	No Contact
3	ESTOP_OUT_MONTION-
4	ESTOP_OUT_MONTION+
5	ESTOP3B+
6	ESTOPA_OUT-
7	ESTOP3B-
8	ESTOP3A+
9	ESTOPB_OUT+
10	No Contact
11	No Contact
12	No Contact
13	ESTOP3A-
14	ESTOP_OUT+
15	No Contact

J4 pin assignments are as follows:

PIN	SIGNAL
1	Upper heating L
2	Middle heating L
3	Lower heating L
4	GND
5	No Contact
6	No Contact

High temperature furnace heating wire N (OUTPUT N): the heating wire of high-temperature furnace temperature controller N connects the plug-in components. The socket connects the heating wire on the furnace of N-line side.

J5 pin assignments are as follows:

PIN	SIGNAL
1	No Contact
2	No Contact

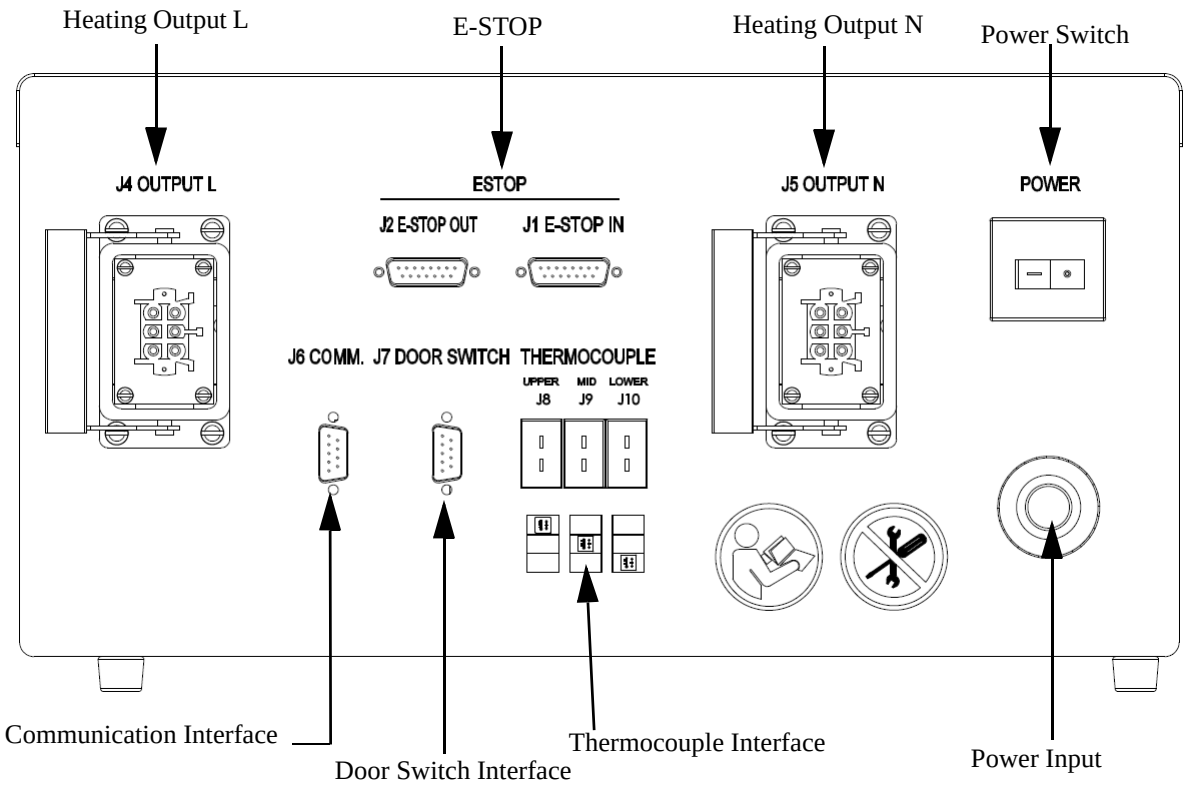
PIN	SIGNAL
3	GND
4	Upper heating N
5	Middle heating N
6	Lower heating N

The thermcouples interface (THERMCOUPLE)The three thermocouples on the furnace are connected to the socket.J8, J9, J10 plug into the upper, middle and lower segment of the thermocouple.

Furnace door switch: When the door is open, cut off the limit switch that's connected to the heating power on the furnace.

This interface is a 9-pin connector, the pin function are as follows:

PIN	SIGNAL
1	No Contact
2	Connected to the 2408 AC Pin
3	Connected to the E-STOP Pin ES1
4	No Contact
5	No Contact
6	No Contact
7	No Contact
8	No Contact
9	No Contact

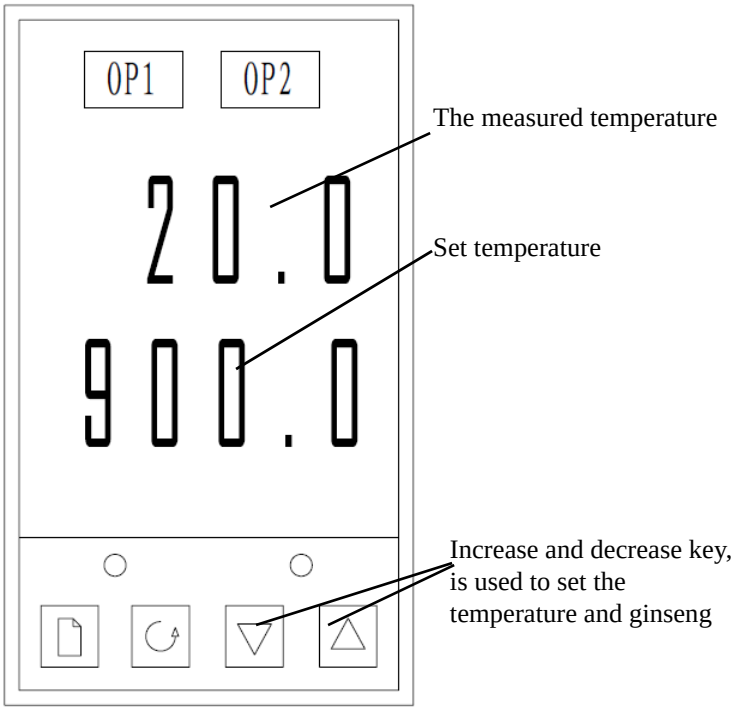


Temperature Controller Common Functions

The Furnace uses a Eurotherm2408 as temperature controller. The following describes the operation of manual settings and some of its methods and procedures. For details relating to setting test temperature and various control parameters, refer to the attached "<<Models2404/2408 PID Controllers Installation and Operation handbook>>". For setting test temperature and control parameters via software, refer to the attached software application manual.

1. Setting test temperature

Press or key directly to adjust the temperature



2. Setting PID Control Parameters:

PID control parameters are the key parameters to control the temperature. Generally, different temperatures require different PID parameters. When setting the temperature, refer to the corresponding information to enter the correct parameters. Based on parameters tables given in the Eurotherm manual to set three parameters, Pb (P parameter), ti (I parameter), and td (D parameter). The following flow chart briefly illustrates the methods to set the three parameters (PID).

Routine Maintenance

This section provides information regarding service of the high-temperature furnace.

Routine Maintenance Overview Checklist

	Recommended Service		
CALENDAR TIME USING 8 HOURS RUNNING TIME RATE PER DAY	DAILY	WEEKLY	ANNUALLY
Running time-hours	8	40	2000
Clean the furnace inside/furnace surface area	X		
Check the door swith and E-STOP		X	
Check the cable connection		X	
Check all the buttons function		X	
System Inspection			
Check the cable connection			MTS
System Cherks			
Check E-STOP			MTS
Check the door switch			MTS

⚠ WARNING

The surface of the furnace can become extremely hot.

Touching the furnace before it has cooled can severly burn skin.

Allow sufficient time for the furnace to cool off before servicing the furnace.

- When using the furnace, try not to make contact with the inner cavity of the furnace during the process of installing a test sample to avoid causing damage to the furnace cavity.
- Do not open the furnace immediately after a test is completed to avoid serious injury and prevent damage to the furnace cavity.
- Clean the furnace cavity in a timely manner with a soft brush once a test is completed in order to prolong the service life of the furnace.
- If the furnace is not used for a long period, preheat the furnace before using it again. The preheating method is as follows:

  1. Increase the temperature to 200°C and maintain that temperature for a least four hours.

  2. Increase the temperature to 400°C and maintain that temperature for a least four hours.

  3. Increase the temperature to 600°C and maintain that temperature for a least four hours.

Treatment of general fault

FAULT CONDITION	REASON	SOLUTION
SV window flashes and displays "S.br"	The input measuring signal exceeds the measuring range	1. Check whether the specifications of the sensor are properly defined 2. Check whether the signal input is broken
Heatup speed is slower than original speed	The parameter are not properly defined	Check whether the parameters of the temperature controller are properly defined
The Temperature controller can not start the furnace	The Furnace is not closed properly or there is something wrong with the Furnace door switch or cable	1.Check the furnace of see if it is closed properly 2.Check the door switch cable and the connections to the furnace door switch and the back of the temperature controller
Temperature fails to steady at setting temperature	Control parameter is imperfect or lost	Start self-adjustment to find out proper control parameter

Declaration of Conformity

MTS Systems Corporation
14000 Technology Drive
Eden Prairie, MN 55344-2290
Telephone 952-937-4000
Fax 952-937-4515

ORIGINAL

DECLARATION OF CONFORMITY IN ACCORDANCE WITH ANNEX II 1A OF COUNCIL DIRECTIVE 2006/42/EC	
Equipment Identification:	
CRITERION ELECTROMECHANICAL MATERIAL TESTING SYSTEMS	**Serial No. (select one only)**
C42, C42EL	
C43, C43EL	
C44, C44EL	
C45, C45EL	
Optional Equipment Name / Model	**Serial No. (or other similar identification. If Serial No. or identification is not available, then check X to denote delivery)**
Test Area Guard	
634.XX extensometer	
632.XX extensometer	
LX laser extensometer	
xLT Hi elongation extensometer	
Temposonics	
661.XX Load cell	
662.XX Load cell	
663.XX Torque cell	
660.2X Load cell	
660.2X delta P cell	
Fundamental Environmental Chamber	
658 Enviro Bath	
652.XX Hi-temperature furnace	
653.XX Hi-temperature furnace	
409 Temperature Controller	
647.XX Hydraulic wedge grips	
643.XX compression platens	
642.XX bend fixture	
640.XX fracture mechanics grip	
Advantage Pneumatic grip	
Advantage screw action grip	
Advantage wedge grip	
Fundamental Bollard grip	
Fundamental Cord / yarn grip	
Fundamental Roller grip	
Fundamental Scissors grip	
Fundamental Vise grip	
Advantage and Fundamental Pneumatic grip controller	

Equipment Description:
The MTS CRITERION ELECTROMECHANICAL MATERIAL TESTING SYSTEMS (C42, C43, C44 AND C45) 50 N to 100 kN with TestWorks Software is intended to perform testing of materials and components, including plastics, metals, composites, adhesives , textiles, wood and paper products, ceramics, elastomers, and foam.
Includes the following sub-systems of the machine: Frame, Motor, Amplifier, Controller, Handset and Cables.
Customer must evaluate risks due to ejected parts or materials from the test specimens. If Test Area Guard is not selected by customer, then for protection against ejected parts or materials from test specimens and to control access to the machinery, the Customer must provide a Test Area Guard to protect personnel.

Page 1 of 2 DoC Criterion January 24, 2011

Manufacturer: MTS Systems Corporation 14000 Technology Drive Eden Prairie, MN 55344-2290, U.S.A.	
Authorized Representative: Stefan Strand MTS Systems Norden AB Södra Långebergsgatan 16 SE-421 32 Västra Frölunda, Sweden	
Applicable Directive(s): Machinery Safety Directive 2006/42/EC Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC	
Harmonized or Other Standards Referenced: EN ISO 12100-2 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements EN 61326-1: Electrical equipment for measurement, control and laboratory use EMC requirements Part 1: General requirements EN 55011 Industrial, scientific and medical (ISM) radio-frequency equipment — Electromagnetic disturbance characteristics — Limits and methods of measurement Group 1: class A (non-domestic where RF is NOT used in the treatment of material)	
Technical Construction File in accordance with Annex VII Part A: A copy (electronic and paper) of the Technical Construction File for this machinery is available on request from: Authorized Representative	
We, MTS Systems Corporation, hereby declare that the machinery described above conforms with the relevant provisions of Annex I Essential Health and Safety Requirements of Directive 2006/42/EC and that the Annex VIII Conformity Assessment Procedure has been carried out.	
Place of Issue:	Eden Prairie, MN 55344, USA
Date of Issue:	
Signature:	
Name and Title:	Rich Baker, Vice President (Engineering)

MTS Systems Corporation
http://www.mts.com/en/Global/index.asp

ISO 9001 Certified QMS