Instruction Manual
Model 4265-HT
High Temperature UCA
(Original Instructions)

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S/N _____

CHANDLER ENGINEERING®

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General Information

Introduction

This manual contains installation, operation, and maintenance instructions for the Chandler Engineering Model 4265-HT High Temperature Ultrasonic Cement Analyzer.

Description of Instrument

The 4265-HT High Temperature Ultrasonic Cement Analyzer is an instrument that measures the compressive strength of API cement under high temperature and high-pressure conditions. The instrument captures ultrasonic signals that are passed through the sample then performs post-processing of the data to determine the compressive strength versus time plot. Using PC based software (5270 DACS); the data is presented graphically as well as being stored in a data file.

Each 4265 HT connected is equipped with an internal processor board that sends and receives an ultrasonic pulse through the slurry and measures the transit time of the pulse through the slurry. Custom design, high temperature/high pressure ultrasonic transducers are used to make the transit time measurements.

Features and Benefits

The major features of the 4265-HT Ultrasonic Cement Analyzer (UCA) are listed below:

- Easy to install and use.
- Uses PC based Chandler Model 5270 Data Acquisition System for data retrieval, analysis and storage.
- Stored tests may be sorted and retrieved based on user specified database fields.
- Built-in pump and relief valve for sample pressure control.
- Optional external chiller system.

Specifications

Model 4265-HT

Maximum Curing Temperature:	600°F (316°C)
Maximum Curing Pressure:	20000 psi (138 MPa)
Heater Power:	2000 Watts

Electrical

Input Power: 208-240 VAC, 50/60 Hz, 10A

Shipping Dimensions and Weight

	Dimensions		Weight	
	in.	**cm**	**lbs.**	**Kg**
Box 1	32 x 26 x 35	81 x 66 x 89	210	95.5
Box 2	30 x 23 x 22	76 x 59 x 56	180	82

Instrument Dimensions and Weight

in.	**cm**	**lbs.**	**Kg**
21 x 18 x 19	53 x 46 x 48	130	59

Environmental and Utility

- Environment: Indoor use, altitude up to 6562ft (2000m)
- Ambient Temperature: 60-104°F (16-40°C)
- Storage Temperature: 40-122°F (5-50°C)
- Operating Temperature Range: 32-600°F (0-316°C)
- Max Relatively Humidity: 80% RH for temperatures up to 88°F (31°C) decreasing linearly to 50% RH at 104°F (40°C)
- Compressed Air: 50-100 psi (340-690 kPa)
- Cooling Water: 20-80 psi (138-552 kPa)

Safety Requirements

READ BEFORE ATTEMPTING OPERATION OF INSTRUMENT

	*If this equipment is not used in a manner consistent with the manufacturer's specifications the protection provided by the equipment may be impaired.*
	**Warning: Read before attempting operation of this instrument.** This instrument is capable of high temperatures and pressures and must always be operated with CAUTION. The instrument is designed for operator safety. To ensure that safety, it is essential the general instructions outlined below are followed. This instrument should only be operated by trained personnel that have completed the appropriate safety training.
	**Warning: High Temperatures** During a test, the instrument can become hot and cause injury if touched. Allow the cylinder to cool to below 95°F (35°C) prior to touching.

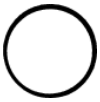
The following safety procedures are advisable:

- This is a bench top device; place the instrument on a suitable level and stable surface.
- Locate the instrument in a low traffic area and ensure the cooling vent is not obstructed.
- Allow a minimum of 5in (127mm) unobstructed clearance around side faces to provide for adequate ventilation.
- Always position the instrument in such a manner that allows easy access to the power cord.
- Always disconnect main power and instrument power to the instrument before attempting any repair.
- As the top of the instrument gets hot during service it is not recommended that top surface be obstructed.
- Post signs where the instrument is being operated to warn other personnel.
- Read and understand the instructions and caution notes before attempting operation.
- Never exceed instrument maximum pressure and temperature ratings.
- Always use the correct o-ring part number depending on the intended test temperature:
  - For test temperatures equal or below 400°F (204°C) – Use O-ring Part Number: P-3148
  - For test temperatures above 400°F (204°C) – Use O-ring Part Number: C11326
- Turn off the heater at the completion of a test. Hot water in the open cylinder or drain, when exposed to the atmosphere and heated beyond its boiling point, can cause server burns from steam.

WARNING: During a test, the top panel around test cell can become hot and cause injury.

- A fire extinguisher, type 8 BC, should be located within 50 feet (15 meters) of the instrument.
- Have the safety officer at your location or laboratory review the safety aspects of the instrument and installation and approve the operational and installation procedures.
- Where appropriate PPE when operating the instrument especially in respect to fluids being used.
- Never exceed the instrument maximum pressure and temperature ratings. The safety requirements associated with the handling and use of the medium to be tested, especially the additional requirements associated with handling potentially flammable liquids or otherwise hazardous agents are the responsibility of the customer – proper precautions must be taken to reduce the risk of fire or explosion.
- Never replace the power cord with an inadequately rated power cord.
- Observe caution notes!
- Observe and follow the warning labels on the instrument.
- In case of malfunction, unplug power cords from the voltage source.

Symbols Used on Equipment

Symbol	Meaning
	Protective Conductor Terminal
	Caution, risk of electric shock. Equipment may be powered by multiple sources. Disconnect (Lock-out) all services before servicing.
	Caution, hot surface. Do NOT touch. Allow to cool before servicing.
	Documentation must be consulted in all cases where this caution symbol is marked.
	On (Supply)
	Off (Supply)

Where to find help

In the event of problems, the local sales representatives will be able to help or the personnel at Chandler Engineering can be contacted.

- Telephone: 918-250-7200
- FAX: 918-459-0165
- E-mail: chandler.sales@ametek.com
- Website: www.chandlereng.com

Section 1 – Installation

Unpacking the Instrument

Remove the instrument from the packing crate carefully. The unit comes fully equipped with all the necessary components and any spare parts that were ordered with the unit. Ensure that no parts or tools are lost when discarding the packing materials.

After the instrument is removed from the shipping crate, the equipment and spare parts should be checked against the packing list to ensure that all parts have been received and none are damaged.

NOTE: File an insurance claim with your freight carrier if damage has occurred during shipping. Verify all parts shown on the enclosed packing list have been received. If items are missing, immediately notify Chandler Engineering.

Connecting Communication

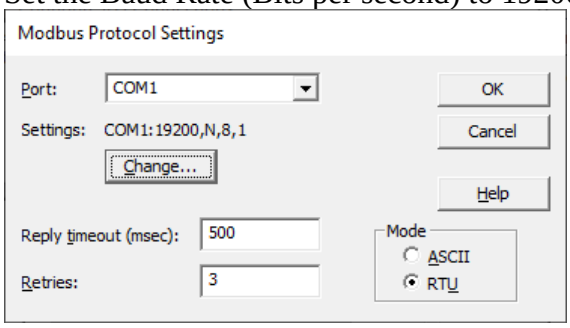
The SGSA can have different communication connections. Legacy systems use the Analog Devices protocol and have a DB25 serial connection on the rear of the instrument. Current systems use the Modbus protocol (serial or ethernet) and have DB9 (serial), USB (serial) and Ethernet connections on the rear of the instrument. Legacy systems can be retrofitted to use the Modbus protocol. If there is a USB connection on the rear of the instrument, this instrument uses the Modbus protocol, otherwise, it uses the Analog Devices protocol.

Software Configuration

The Model 5265 SGSA is operated remotely via the Chandler Engineering 5270 Data Acquisition and Control Software (5270 DACS or 5270). Version 2.10.3 or later supports reading diagnostic waveform information via Modbus. Configure 5270 as described below.
NOTE: These instructions assume that the operator has a working knowledge of the 5270 Software. Refer to the 5270 Manual (Chandler P/N 5270-0010) or the in-software Help file for more information.

Modbus Protocol (Serial; use DB9 or USB Connection)

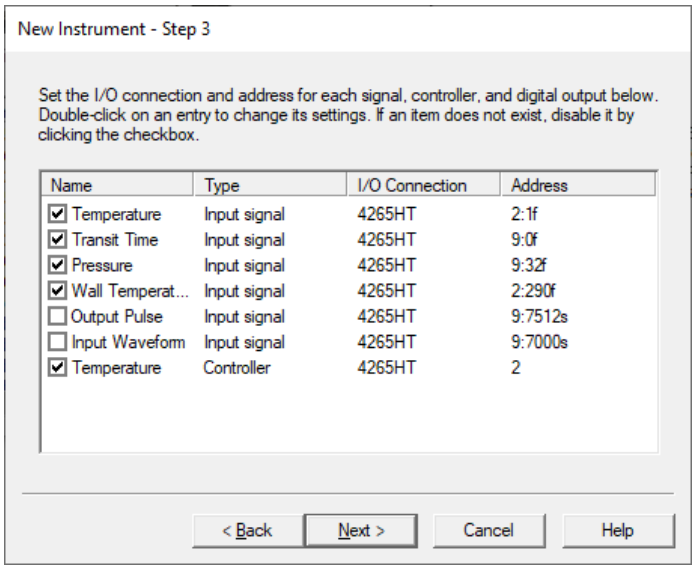
1. Configure a "Modbus" I/O Connection (Tools > Configure > I/O connection) for the instrument. For the purposes of this example, the I/O Connection is named "4265HT".
    a. Set the Timeout to 500 msec (default is 1000 msec)
    b. Set the Baud Rate (Bits per second) to 19200 (default is 9600)



2. Create a new Instrument (Tools > Configure > Instruments > New). Select the "Model 4265HT High Temp UCA" instrument.

3. Enter the desired Name and Test file prefix and click Next.

4. Configure the instrument as shown below.



NOTE: The "Output Pulse" and "Input Waveform" signals are for diagnostic purposes and are not required for normal operation. Chandler Engineering recommends that these signals be configured but disabled.

ModbusTCP Protocol (Ethernet Connection)

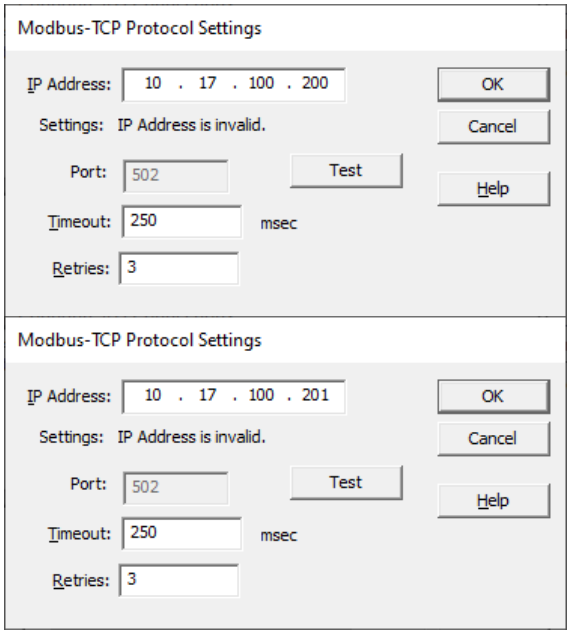
From Chandler Engineering, the 5265 SGSA is configured with the following IP Addresses:

Device	IP Address	Subnet Mask
Electronics Box	10.17.100.200	255.0.0.0
Temperature Controller	10.17.100.201	255.255.0.0

NOTE: The IP Addresses and Subnet Masks of ALL devices (Electronics Box, Temperature Controller and control PC) must be compatible. Refer to Network Configuration for more information.

1. Configure a Modbus TCP I/O Connection (Tools > Configure > I/O connection) for each device. For the purposes of this example, the following I/O Connections were created:

I/O Connection	Device	IP Address
TCP200	Electronics Box	10.17.100.200
TCP201	Temperature Controller	10.17.100.201

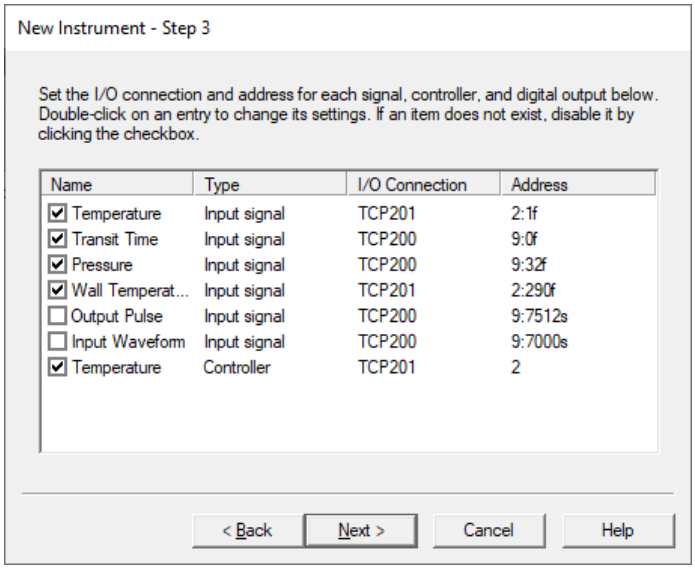


NOTE: Set the Timeout to 250 msec (default is 1000 msec) and Retries to 3 (default).

2. Create a new instrument (Tools > Configure > Instruments > New). If your instrument has a pressure transducer, select the "Model 4265HT High Temp UCA" instrument.

3. Enter the desired Name and Test file prefix and click Next.

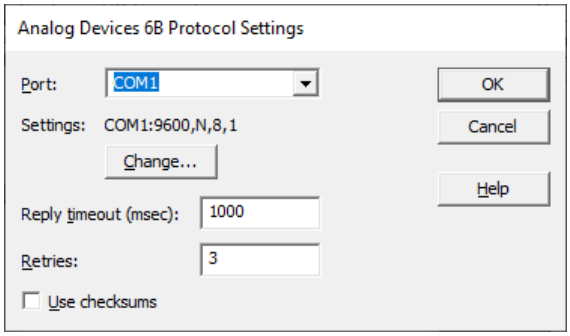
4. Configure the instrument as shown below:



NOTE: The "Output Pulse" and "Input Waveform" signals are for diagnostic purposes and are not required for normal operation. Chandler Engineering recommends that these signals be configured but disabled.

Analog Devices Protocol (Legacy Serial Connection)

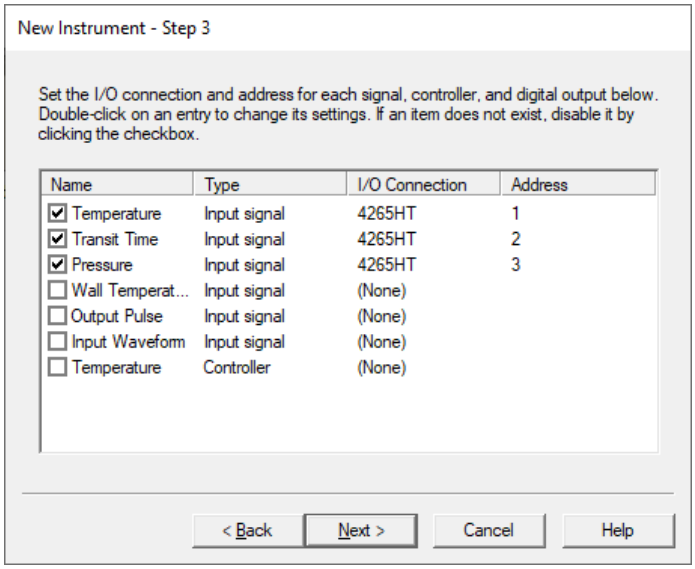
1. Configure an "Analog Devices 6B" I/O Connection (Tools > Configure > I/O connection) for the instrument. For the purposes of this example, the I/O Connection is named "4265HT". Leave the Timeout and Retries at the default value.



2. Create a new Instrument (Tools > Configure > Instruments > New). Select the "Model 4265HT High Temp UCA" instrument.

3. Enter the desired Name and Test file prefix and click Next.

4. Configure the instrument as shown below.



NOTE: For Legacy systems (Analog Devices Protocol) use the Scan software (included with 5270) to configure the individual data channel addresses.

NOTE: Wall Temperature, Output Pulse and Input Waveform Input Signals along with the Temperature Controller cannot be used with the Analog Devices Protocol.

NOTE: A separate Modbus I/O Connection is required to read the Wall Temperature and Temperature Controller.

Network Configuration

Changing the Network Configuration of the control PC usually requires Administrator privileges. Chandler Engineering recommends that the user account that is normally used on the control computer have local Administrator privileges.

From Chandler Engineering, the 4265HT is configured with the following IP Configuration:

Device	IP Address	Subnet Mask
Electronics Box	10.17.100.200	255.0.0.0
Temperature Controller	10.17.100.201	255.255.0.0

Understanding The Network Configuration

The **IP Address** is a unique address that identifies a device on the internet or local network. Each device must have its own IP address. In order for devices to communicate with each other, they must both be connected to the network and they must have IP addresses that are on the same subnet. A subnet is a logical division of a larger network. Members of one subnet are generally not able to communicate with members of another. Subnets are defined by the choices of IP addresses and Subnet Masks.

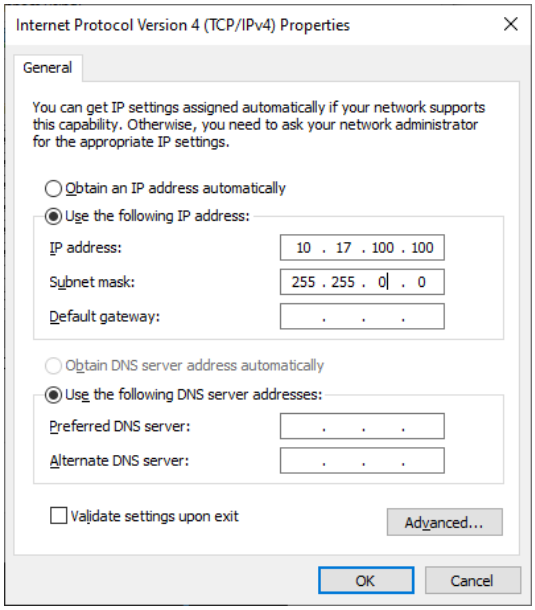
If your PC's Subnet Mask is set to 255.255.255.0 (a common setting known as a Class C Subnet Mask) then your machine can only talk to another network device whose IP address matches yours in the first three octets (the numbers between the dots in an IP address are called octets). For example, if your PC is on a Class C subnet and has an IP address of 10.17.100.100, it can talk to a device at 10.17.100.200 but not one at 10.17.99.200. If you change your Subnet Mask to 255.255.0.0 (Class B) you can talk to any device whose first two octets match yours. Be sure to ask your system administrator before doing this. Your network may be segmented for a reason.

Changing Network Configuration

Computer

To change your Computer Network Configuration on Windows 10. This procedure requires Administrator privileges.

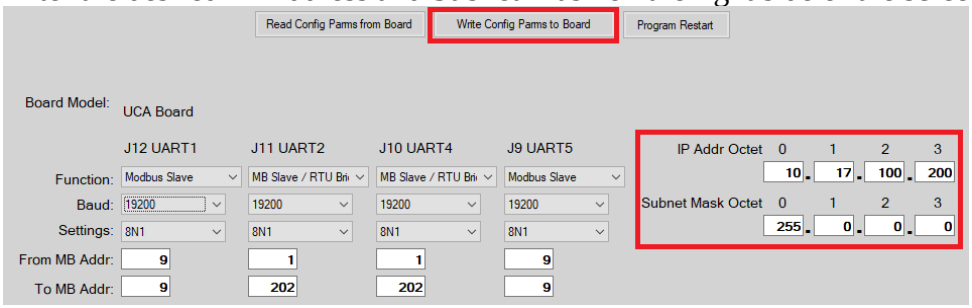
- From the Start Menu, search for "View Network Connections".
- In the window that appears, right-click on the appropriate connection and select Properties.
- In the window that appears, select "Internet Protocol Version 4 (TCP/IP v4)" and click the Properties button.
- In the window that appears, select "Use the following IP address".
- Enter the desired IP address and Subnet mask (refer to the image at right).



UltraSonic Motherboard

The UltraSonic Motherboard is the red circuit board inside the instrument. This board was designed by Chandler Engineering. The Ultrasonic Configurator software is installed with the 5270 software.

- Connect the instrument to your network (this can be a direct connection to the control computer).
- Power ON the instrument.
- Configure the 5270 instrument (or a new temporary instrument) to use a Modbus (serial) connection to the instrument.
- Open the Ultrasonic Configurator software (click "Configure Device" from the Advanced Tab of the Instrument Configuration dialog).
- Select the "Config File" tab.
- Enter the desired IP Address and Subnet Mask on the right side of the screen.



- Click the "Write Config Params to Board" button.

  NOTE: the new IP address will take affect after the next power cycle.

  NOTE: the Network Configuration of the computer must be compatible with the new IP address.

Temperature Controller

The Temperature Controller can be configured with the Eurotherm iTools software. At the time of this writing, the iTools software was available for download from the following URL: https://www.eurotherm.com/download/eurotherm-itools-v9-84/. The temperature controller uses a special Cascade Control firmware. The IDM (Interface Descriptor Module that tells iTools about the controller) is required; contact Chandler Engineering for the installer.

The Network Configuration of the controller can be read / set from the front panel of the Controller:

Read IP Address

From the Home Screen, press the Scroll button to cycle through the following menu options:

1. Set Point: use this menu to adjust the Set Point as desired prior to switching from Manual to Auto Mode
2. Dataset to Load: Load the "mG" dataset when using the instrument with the MG. Load the "SGSA" for standard 5265 SGSA tests, "uCA" for standard 4265 UCA tests or "Ht" for standard 4265HT High Temp UCA tests.
3. Version: displays the version of the configuration file
4. RTU.Addr: displays the ModbusRTU (Serial) address used by the controller. This parameter is read-only. It can be changed from the Configuration level (see below).
5. IP.A1 – IP.A4 (IP Address Octets): displays the ModbusTCP (ethernet IP address) address used by the controller. These parameters are read-only. They can be changed from the Configuration level (see below).

Set IP Address

- Enter the Configuration Level as described earlier in this manual (see Configuring the Eurotherm Controller)
- Use the Page button to scroll to the Comms menu.
- Press Scroll button, the top line of this display shows F.COm
- Press the Up button to change F.COm to O.COm
- Press the Scroll button to enter the Option Comms menu; "mAIN" appears on the top line.
- Press the Up button to change "mAIN" to "Nwrk"
- Press the Scroll button to enter the Network menu.
- Press the Scroll button several times to get to the IP.A1 through IP.A4 menu items. For an IP address of 10.17.100.201:
    - IP.A1 = 10
    - IP.A2 = 17
    - IP.A3 = 100
    - IP.A4 = 201
- Change these values as desired.

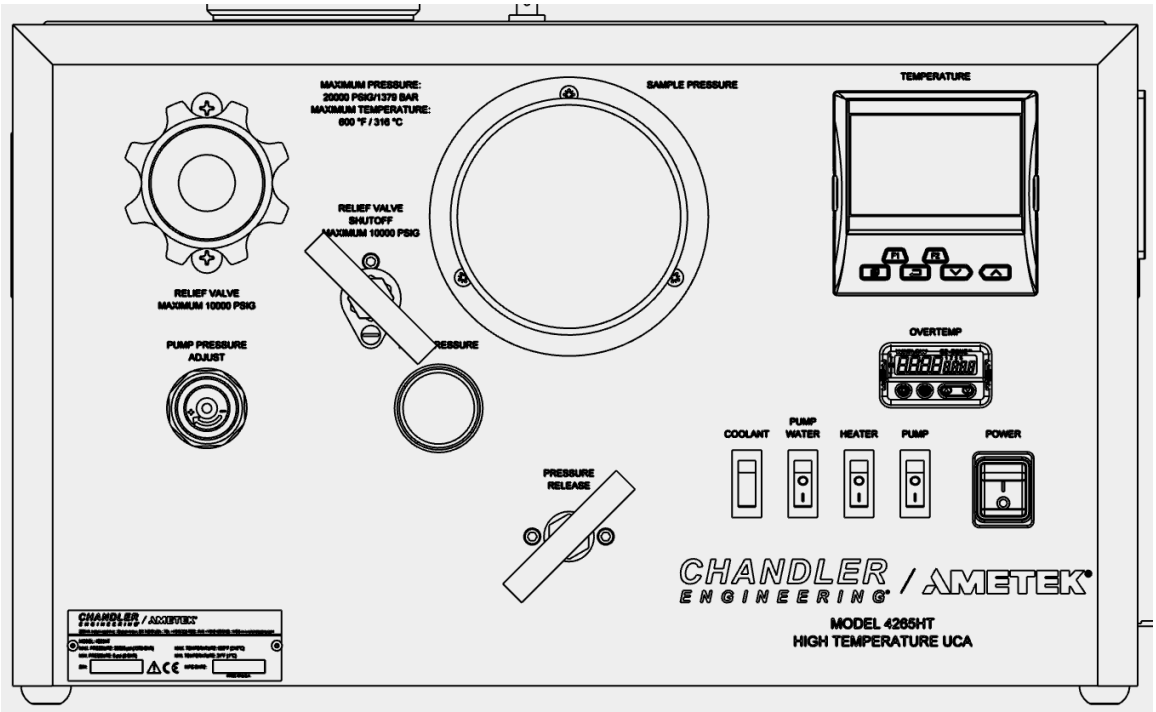
Set Subnet Mask

- Enter the Configuration Level as described earlier in this manual (see Configuring the Eurotherm Controller)
- Use the Page button to scroll to the Comms menu.
- Press Scroll button, the top line of this display shows F.COm
- Press the Up button to change F.COm to O.COm
- Press the Scroll button to enter the Option Comms menu; “mAIN” appears on the top line.
- Press the Up button to change “mAIN” to “Nwrk”
- Press the Scroll button to enter the Network menu.
- Press the Scroll button several times to get to the IP.S1 through IP.S4 menu items. For a Subnet Mask of 255.255.0.0:
    - IP.S1 = 255
    - IP.S2 = 255
    - IP.S3 = 0
    - IP.S4 = 0
- Change these values as desired.

Section 2 – Operating Instructions

Front Panel Controls

The figure below shows the front panel and all the associated controls. The description of each control will follow the figure.



Relief Valve

The relief valve or back-pressure regulator may be used to set the upper limit on the system pressure up to 10,000 psi (69.0 MPa). Turn the relief valve knob clockwise to increase pressure and counterclockwise to reduce pressure.

Relief Valve Shutoff

The relief valve is rated for use up to 10,000 psi (69.0 MPa). This valve is normally open. If it becomes necessary to test a sample at pressures above 10,000 psi (69 MPa), the RELIEF VALVE SHUTOFF must be turned clockwise to the closed position. Never open this valve with high pressure (greater than 10,000 psi) applied to the cell due to the possibility of damaging the relief valve seat.

Sample Pressure Gauge

Displays the pressure inside the test cell.

Pump Pressure Adjust Regulator

This regulator is used to control the pressure of the air supplied to the pump.

Pump Air Pressure Gauge

Indicates the pressure of the air supplied to the pump. Each 5 psi (35.5 kPa) pressure applied to the pump results in approximately a 1000 psi (7000 kPa) hydraulic pressure output from the pump.

Pressure Release Valve

This valve is used to manually release pressure from the test cell. This valve must be closed during testing except when it is necessary to manually release pressure. This valve must also be closed when removing test cell with cooling water ON or else a significant water leak will occur.

Temperature Controller

Used to control the temperature in the test cell.

Over Temperature Controller

Over Temperature protection. When the Temperature is below 650°F (343°C), "SAFE" is displayed. When the Temperature is higher, "FAIL" is displayed and the Heater is disabled.

Coolant Switch

Used to control the flow of coolant to the heating/cooling jacket with water connected to COOLANT INLET port on the Right Rear Panel. This switch has three positions. The top position is MANUAL (Coolant valve is open), the middle position is OFF (Coolant valve is closed) and the bottom position is AUTO (Coolant valve is controlled by the Temperature Controller; Coolant valve is opened if the Set Point is less than the threshold defined at the controller (default of 80°F/26°C) and the controller is in Auto mode). For test temperatures above ambient, this switch should be in the OFF or AUTO position.

Pump Water Switch

This switch is used to control the flow of water to the pump and test cell. This switch must be OFF any time the test cell is not installed. This switch must be ON to fill the tubing connected to the test cell with water or to operate the pump.

Heater Switch

This switch is used to turn the flow of current to the heater ON or OFF. Switch must be in the ON position during testing and should be in the OFF position as a safety precaution at other times.

Pump Switch

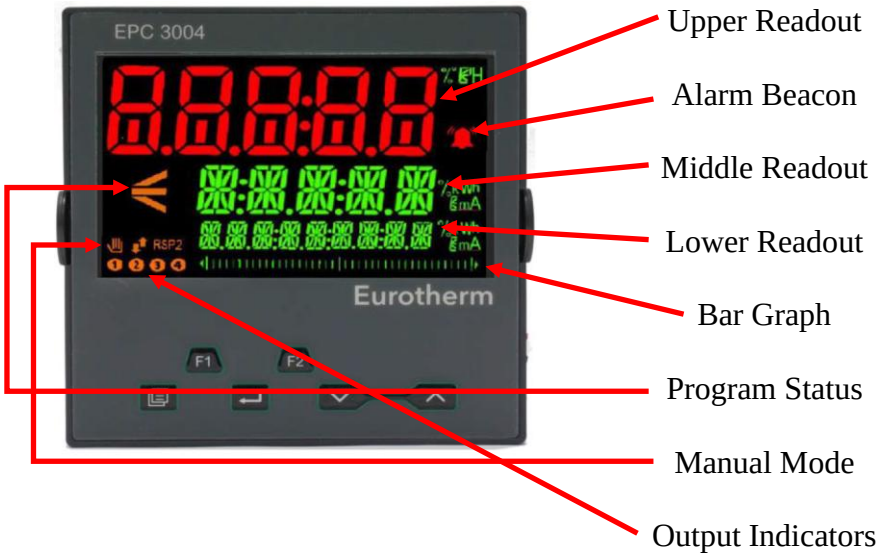
Opens or closes a solenoid valve which controls the flow of air to the pump. Turning this switch to the ON position causes the pump to increase pressure in the test cell. Turning the switch to the OFF position stops the pump from operating.

Power Switch

Used to turn the instrument ON or OFF. Switch must be in the ON position during testing.

Programming the Controller

The Model 9050 controller used with the 5265 system features user defined segment programming (8 segments maximum). Using these segments, sample temperature ramp and dwell segments are defined.



Upper Readout: Displays the current value of the sample temperature. This value is green when the controller or display is not in an Alarm state.

Alarm Beacon: Flashes when any new alarm occurs (Over Range, Under Range or Sensor Break). To acknowledge (clear) an alarm, press the Page and Scroll buttons. The Alarm Beacon will stay illuminated when an alarm is acknowledged but the alarm condition still exists.

Middle Readout: Displays the target Set Point. When in Manual Mode, the units are in % output. When in Automatic Mode, the units are in degrees.

Lower Readout: Displays the maximum sample load. The maximum can be reset by the 5270 software or through the front panel of the controller.

Bar Graph: A graphical representation of the current output power. The scale is 0 to 100% (left-to-right).

Program Status: Indicates the current Program Step:

Indicates Ramp / Step Up

Indicates Dwell (Flashing indicates Dwell End)

Indicates Ramp / Step Down.

Manual Mode:  Indicates Manual Mode has been selected. In Manual Mode, the Raise and Lower buttons operate on the Output Power. In Automatic Mode (this icon is off), the Raise and Lower buttons operate on the Set Point.

Output Indicators: Illuminate when the appropriate output is activated. Output 1 is the control signal to the Heater. The other outputs are unused.

F1: Toggles between Automatic and Manual mode. When in Manual Mode the "hand" icon  is illuminated.

F2: Program Run / Reset. Press once to Start the program. Press again to Reset the program.

Page: Used to page through the various menus in the controller.

Scroll: Used to scroll through the parameter settings within a menu page.

Note: Press Page + Scroll to return to the "Home" Display. When at the Home Display, Page + Scroll will acknowledge any alarm.

Lower / Raise: Used to change the value of a parameter. Press and hold the button for rapid changes.

Configuring the controller to perform a sample temperature program involves defining a series of ramp and dwell segments.

Once the program exists, the program is executed by pressing the ***F1*** button to select Automatic Mode (the "hand" icon will turn off) and then the ***F2*** button to start the program (the Program Status indicator will turn on).

To terminate the program, the ***F2*** button is pressed to reset the program (the Program Status indicator will turn off). Press the ***F1*** button to place the controller in manual mode (the "hand" icon will turn on).

Use the following procedure to define and run a program. These steps will program a Ramp to user-defined Temperature in a user-defined amount of time and then Dwell. This can also be done using the 5270 software.

1. Turn the system ***On***.
2. Press the "Page" button until P.SET is displayed.
3. Press "Scroll"; Observe P.NUM (Program Number) 1 is indicated.

4. Press “Scroll”; Verify that HB.STY (Holdback Style) is set to PROG.
5. Press “Scroll”; Verify that HB.TYP (Holdback Type) is set to OFF.
6. Press “Scroll”; Verify that RAMP.U (Ramp Units) is set to P.mIN (Per Minute).
7. Press “Scroll”; Verify that DWEL.U (Dwell Units) is set to mINS (Minutes).
8. Press “Scroll”; Verify that P.CYC (Program Cycles) is set to 1.
9. Press “Scroll”; Change P.END (Program End Type) is set to dwEL (Dwell). Available options are:
    a. dwEL (Dwell): Dwell at the last set point.
    b. rSEt (Reset): Reset to the set point used prior to starting the program.
    c. tRAk (Track): same effect as Dwell

10. Press “Scroll”; Observe that S.NUM (Segment Number) 1 appears.
11. Press “Scroll”; Observe that S.NAME (Segment Name) is set to “S1”. Segment Names are used when the Segment Type is set to CALL.
12. Press “Scroll”; Change S.TYPE (Segment Type) as desired. For this example, tImE (Time to Target) is used. Available options are:
    a. rAtE (Ramp at Rate to Target): Ramp the set point at a given Rate (°/min) for a given Time.
    b. tImE (Time to Target): Ramp to a given Target for a given Time.
    c. dwEL (Dwell): Dwell at the last set point for a given Time.
    d. StEP (Step to Target): Instantaneously change to the given Set Point.
    e. CALL (Call Program Number): Execute another program as a subroutine (this is not common).
    f. ENd (End Program): The very last segment of a program. Behavior is defined by the Program End Type (see above).
13. Press “Scroll”; Change TSP (Target Setpoint) to the desired initial sample temperature using the “Lower” or “Raise” buttons. This is the temperature to be achieved at the end of the ramp.
14. Press “Scroll”; Change R.TIME (Ramp Time) to the desired ramp time in hh:mm.
15. Press “Scroll”; Observe that S.NUM (Segment Number) is now 2.
16. Press “Scroll”; Observe that S.NAME (Segment Name) is now S2.
17. Press “Scroll”; Change S.TYPE (Segment Type) to “ENd”.
18. Press “Scroll”; P.NUM (Program Number) 1 is indicated.
19. Press the “Page” button twice to return to the Home display.

Left Rear Panel

The left rear panel contains all the connections for the cables that connect the autoclave to the processor. This panel also contains connections for the top transducer, the thermocouple and the main power.

Current Panel

Ultrasonic Connector

The coaxial cable attached to the top transducer must be mated to this connector prior to beginning a test.

Thermocouple

The J-type thermocouple that is attached to the top plug must be plugged into this connector prior to the beginning of a test and any time that it is necessary for the temperature controller to operate. If the thermocouple is not connected, the temperature controller will display "SBr" and will not function.

Load Sensor or Expansion

This connection is used when the appropriate add-on is purchased.

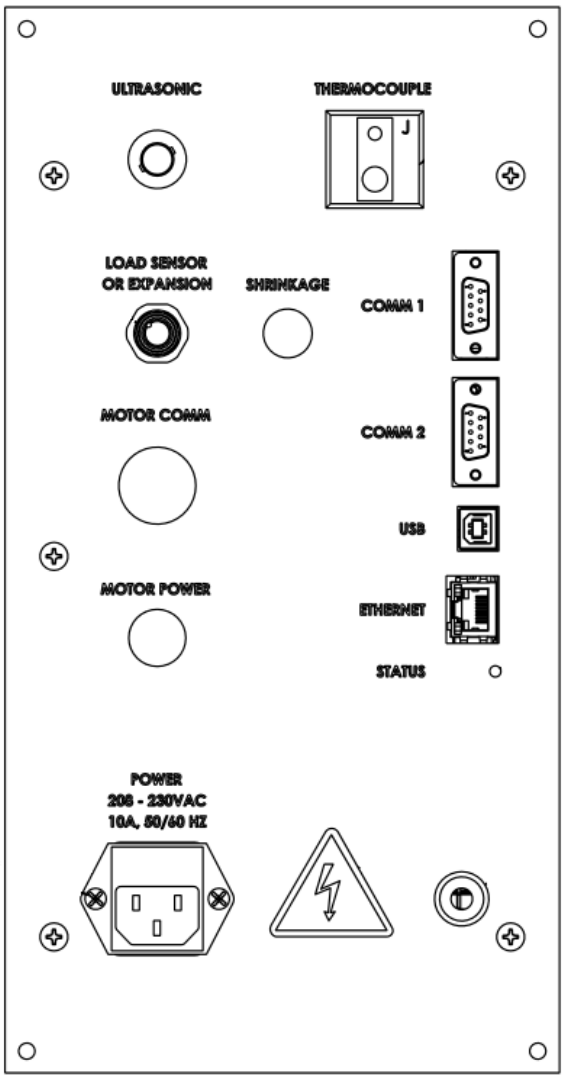
Communication Connections

Comm1, Comm2 and USB are serial (Modbus) connections. Ethernet uses ModbusTCP.

Power Connection

Requires an IEC cable to connect power. The power required is 115/230 VAC, 50/60Hz, 10A.

Note: The Shrinkage, Motor Comm and Motor Power connectors are not populated unless the appropriate add-on is purchased.



Legacy Panel

Thermocouple
The thermocouple that is attached to the top plug must be plugged into this connector prior to the beginning of a test and any time that it is necessary for the temperature controller to operate. If the thermocouple is not connected, the temperature controller will display and error and will not function.

Main Power
Located in the upper left of the back panel, it requires a twist lock plug to connect the power. The switch on the front panel of the instrument includes a 10A circuit breaker.

Instrument Power
Located beside the fuses, it includes a female receptacle plug to connect the power. The receptacle includes two, 1A, 250 VAC, 5x20mm, FAST Fuses.

UCA (RS232)
Serial communication port to the computer. Uses Analog Devices 6B protocol (9600,N,8,1)

Config Port
Diagnostic port for the instrument. Also used for configuration of the internal electronics.

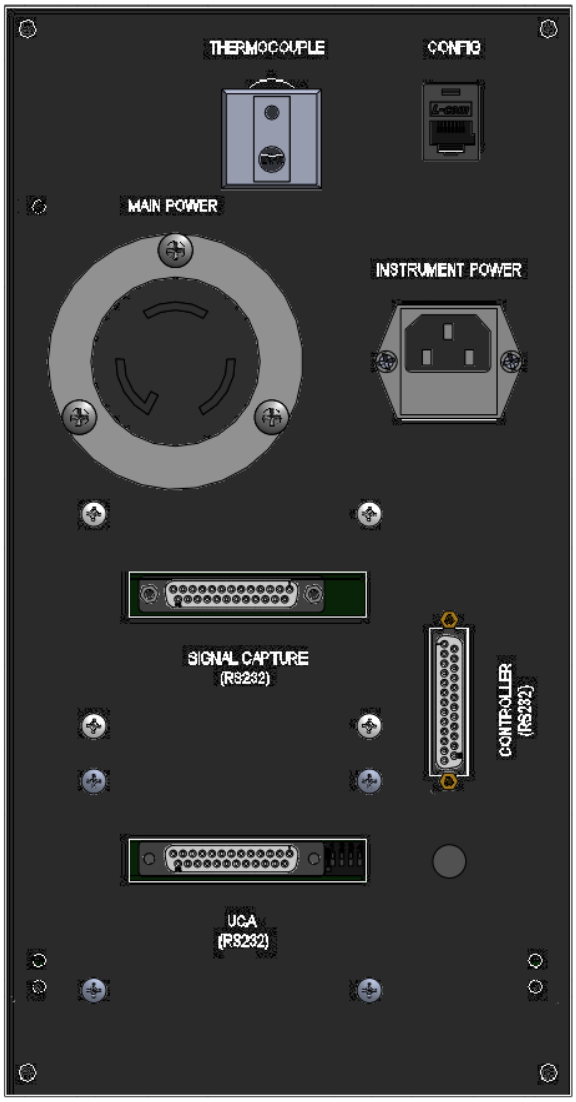


Figure 1 - Left Rear Panel

Signal Capture (RS232)
Serial communication port to the computer that contains binary data representing the ultrasonic waveform. 5270 Data Capture feature must be enabled to capture this data. Generally, this connection is not used.

Controller (RS232)
Serial communication port to the computer for interface to the temperature controller. The pressure signal is also provided by the controller via the serial interface. Uses Modbus protocol (9600,N,8,1)

Fuses
There are two fuses (1A, 250 VAC) located in the Instrument Power Receptacle. To check these fuses, remove the power cord and pry off the access panel with a small screwdriver.

Right Rear Panel

The right rear panel contains all the connections for hydraulic and pneumatic utilities.

Figure 2 - Right Rear Panel

Coolant Drain/Inlet

These ports are used to connect the instrument to cooling water.

Air Inlet

This port is used to connect the air supply to the instrument.

Water Drain/Inlet

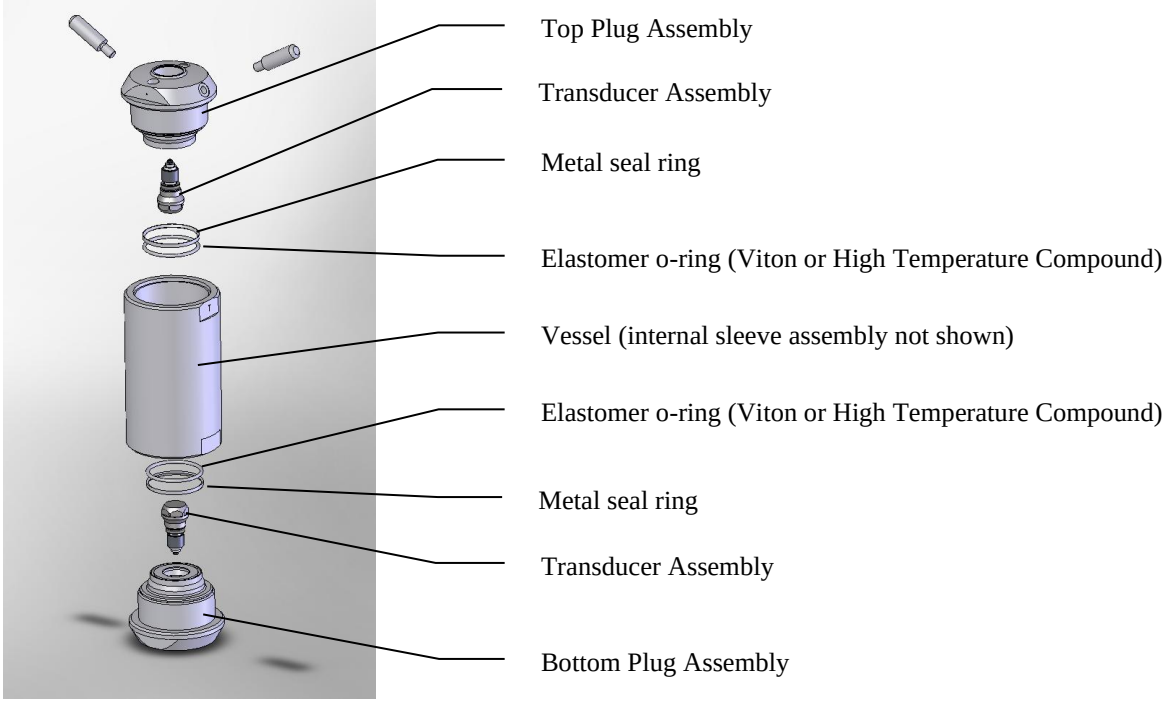
These ports are used to connect the water supply and drain to the instrument. If a chiller is not used, the water and coolant drains may be connected.

High Pressure Inlet (optional)

This high-pressure connector exists so that pressure may be controlled from an external pressure control source. The pressure transducer is connected to this port. A high-pressure tee is provided for connection to an external pressure source.

Preparing the Sample and Cell for a Test

Refer to assembly drawings 80-0300 (vessel) and 80-0376 (sleeve)



The recommended procedure for preparing the test cell and slurry for testing are outlined in the following steps:

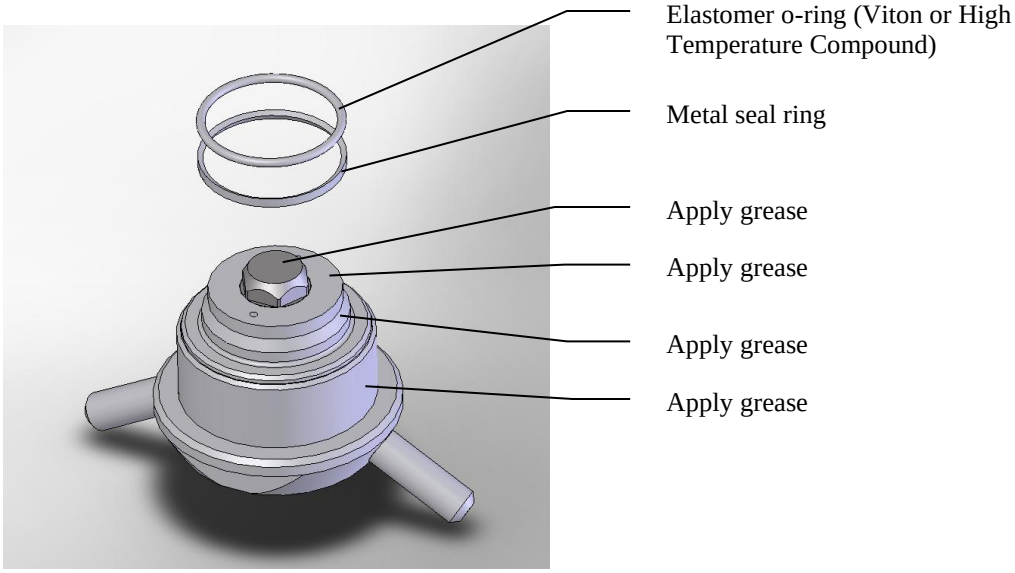
1. Always check the sealing components to make sure they are clean and in good condition. If the o-rings are deformed or hardened replace them.

WARNING: Always use the correct o-ring part number depending on the intended test temperature:

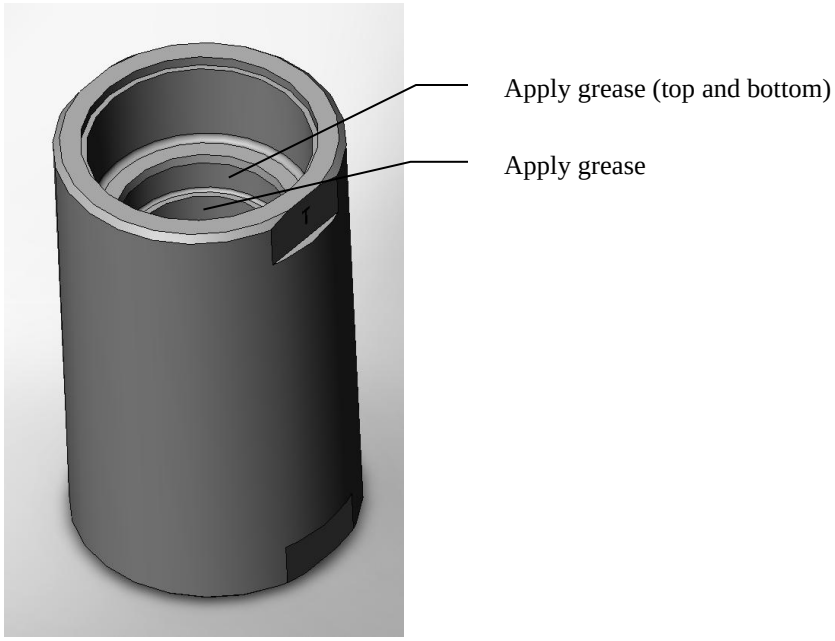
- For test temperatures equal or below 400°F (204°C) – Use o-ring Part Number: P-3148
- For test temperatures above 400°F (204°C) – Use o-ring Part Number: C11326

NOTE: The test cylinder is tapered from top to bottom, with the smallest diameter at the top. The top of the cylinder is denoted by the letter T stamped on the wrench flat on the top end of the cylinder.

2. Place the bottom plug in a vice. Install seal ring and O-ring. Apply a thin coat of high temperature grease on the o-ring, sealing ring and all surfaces that contact the cement sample (including the transducer).

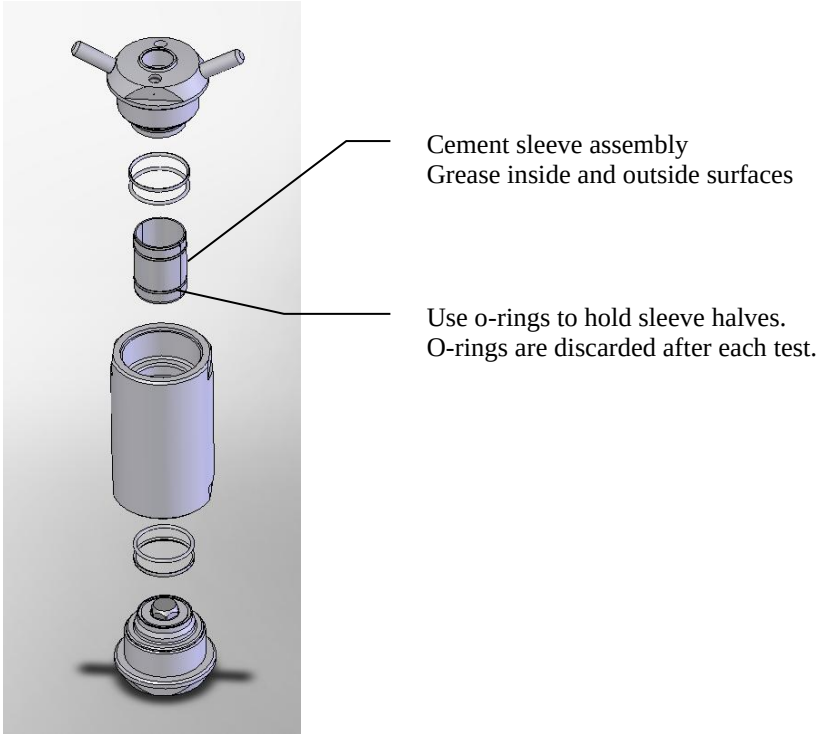


3. Screw the cylinder onto the bottom plug located in the vise with the cylinder end marked **T** at the top. It is recommended that the plug be screwed in by hand and that the plug be tightened so that it just contacts the cylinder. Further tightening after the plug has contacted the cylinder will not cause more effective sealing.
4. Apply grease to the inside of the cement sleeve assembly. Place the sleeve inside the vessel. The sleeve will fit into a machined groove in the bottom plug.



5. Mix the slurry for the test in accordance with API Spec 10 procedures.

6. Pour the cement slurry into the cement sleeve inside the test cell. Be careful not to get cement into the threads. Fill the sleeve to approximately 1/16-inch (1.5mm) below the top.



7. Apply a thin coat of high temperature grease on the o-ring, sealing ring and all surfaces that contact the cement sample (including the transducer). Screw the top plug into the top of the cylinder. It is recommended that the plug be screwed in by hand and that the plug be tightened so that it just contacts the cylinder. Further tightening after the plug has contacted the cylinder will not create more effective sealing and may cause plug removal difficulty.
8. Wipe the cylinder assembly clean and slide the assembly into the heating/cooling jacket.
9. Align the one of the pressure ports in the top plug with the high-pressure port on top of the instrument assembly. Rotate the cell clockwise to align.
10. Attach the u-tube connection to the top port on the cell. Hand-tighten initially to start the threads then use a 5/8” wrench to tighten.
11. Connect the top transducer cable to the top of the vessel assembly and connect the opposite end of the cable assembly to the BNC connector on the top panel.
12. Install the thermocouple in the other high-pressure port in the top plug.
13. Connect the thermocouple cable to the receptacle labeled THERMOCOUPLE at the back of the instrument.
14. Turn ON the water supply
15. The test cell and instrument are now ready to begin a cement test.

Running a test

This section describes the steps used to control pressure and temperature in the 4265-HT pressure vessel.

Pressure Control

NOTE: The instrument includes a 10000 psi relief valve. If tests involving pressures above 10000 psi are required, the RELIEF VALVE SHUTOFF valve must be closed. Pressure control is performed manually by periodically opening the PRESSURE RELEASE valve. Once the sample temperature has stabilized the pressure will become constant.

Follow the steps below to configure the pump and relief valve for automatic pressure control.

1. Make certain the test cell is installed properly, the HIGH PRESSURE INLET port on the rear of the instrument is plugged, the PUMP switch is in the OFF position, the PUMP WATER switch is turned to the ON, and the instrument is supplied with compressed air.
2. Turn the PUMP PRESSURE ADJUST regulator clockwise until air pressure is sufficient to raise pressure to the desired pressure set point. Each 5 psi (34.5 kPa) air pressure results in approximately 1000 psi (6895 kPa) hydraulic pressure. The air pressure should not exceed 100 psi (690 kPa). Note that the pump may not be capable of achieving pressures in excess of 16,000 psi without using heat to expand the fluid and increase pressure.
3. Turn the Relief Valve knob clockwise until the release pressure is sufficient to prevent the relief valve from opening at the desired pressure set point.
4. Turn the PUMP switch to the ON position until pressure exceeds the desired set point. Make certain the system is holding pressure before proceeding.
5. Turn the Relief Valve knob counterclockwise slowly until the test cell pressure begins to drop. Continue turning the regulator knob slowly until the pressure in the test cell equals the upper limit of the desired test pressure.
6. Slowly turn the PUMP PRESSURE ADJUST regulator knob clockwise until the pump begins to stroke. Continue to slowly turn the regulator knob clockwise until the lower limit for the control pressure is achieved.

Temperature Control

Refer to Programming the Controller for information on how to program and operate the temperature controller. When the controller has been programmed and the Processor is operating properly, the heater may be enabled by turning the HEATER switch to the ON position.

1. To start the test and the controller schedule is programmed, press the F1 button on the front of the controller.
2. To end the test, press the F1 button on the front of the controller and turn OFF the HEATER switch.

Note: Always leave the controller in the OFF mode with the HEATER switch turned OFF when the thermocouple is not installed in the cylinder.

Ending a Test

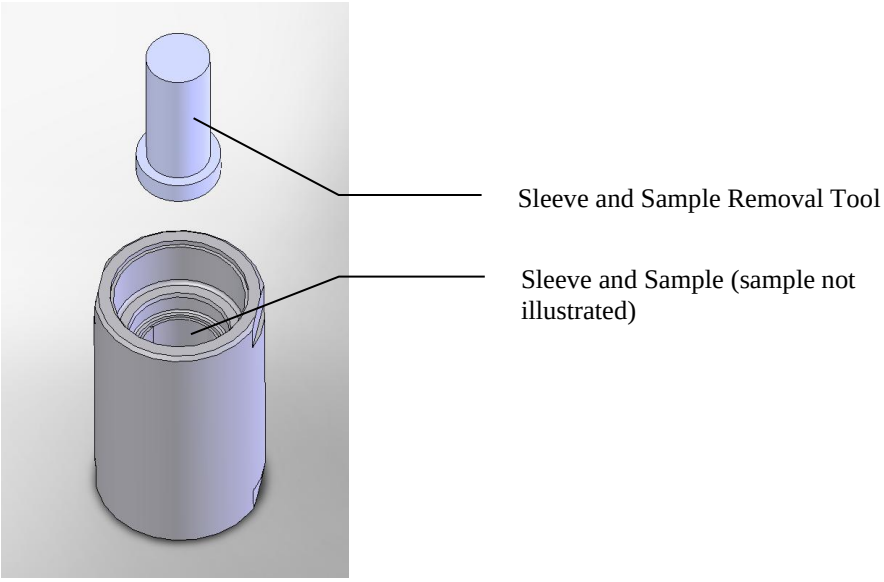
CAUTION: Allow the vessel to air cool until the temperature is less than 400°F (204°C). Turn ON the COOLANT switch to cool the test cell. Monitor the test cell temperature using the Temperature Controller. Use the pump to maintain at least 1500 psi (10.4 MPa) pressure on the test cell until the cell is cool. When the temperature is below 200°F (93°C) the pump switch may be turned to the OFF position and the PRESSURE RELEASE valve turned to the open position. Failure to maintain pressure at temperatures above 212°F (100°C) may cause water in the test cell to become steam.

1. Turn the PUMP WATER switch to the OFF position.
2. Turn MAIN POWER and INSTRUMENT POWER switches OFF.
3. Remove the u-tube connecting the test cell to the port on the instrument assembly.
4. Disconnect and remove the top sensor cable assembly.
5. Remove the thermocouple or disconnect the cable.
6. Lift the test cell from the instrument assembly.

Cleaning the Test Cell

When the test cell has been cooled and removed from the instrument, it should be cleaned according the following guidelines.

1. Place the test cell in a vice, topside up. Use the wrench flats to prevent scratching cylinder or plugs.
2. Remove the top plug and pour off any standing water on the cement sample.
3. Remove the cell from the vice and replace in the vice topside down.
4. Unscrew and remove the bottom plug of the test cell.
5. Remove the sample from the test cell. If the sample and sleeves are attached to the bottom plug, gentle force may be used to remove it.
6. If required, use the tool 80-0379 provided in the Accessory Kit, to drive the cement sample and sleeve out of the vessel. Generally, a hammer is required with the vessel on a sturdy surface.



7. Clean the cement and grease from the top and bottom plugs and cylinder with soapy water. Do not allow water to enter the transducer connectors.
8. When all traces of cement have been removed, grease the inner surfaces of the test cell, including the seal and o-rings.
9. The instrument is now ready to run another test.

Section 3 - Maintenance and Servicing

NOTE: Always disconnect both power connections prior to service.

This chapter describes the basic maintenance that is required for the 4265-HT UCA. A troubleshooting guide is also provided in the event that a problem occurs.

Maintenance

The 4265-HT UCA requires routine maintenance. Following the recommendations listed below will provide years of trouble free operation.

Tools Required

- 5/8" wrench
- 9/64" hex wrench
- Teflon tape
- Bench vise

Cleaning and Service Tips

- Always disconnect main power and instrument power to the instrument before attempting any repair.
- Cool down the equipment prior to servicing, as the surfaces will be hot.
- Clean exterior surfaces of the instrument as required using mild soap and water. Dry all surfaces thoroughly and do not soak vents, fan or back electrical panel with water.
- Keep all test cell surfaces exposed to cement coated with a thin layer of grease. This reduces the chance of corrosion and prevents cement from adhering to the metal.
- Keep cement off threads and out of the high-pressure ports on the top plug of the test cell.
- Lubricate the threads on the test cell plugs periodically with grease.
- Thoroughly clean test cell of all cement immediately after each test.
- It is the responsibility of the user to follow any local rules or regulations concerning cement slurry and water waste removal.
- It is the responsibility of the user to ensure that appropriate decontamination is carried out if hazardous material is spilled onto or into the instrument.
- It is the responsibility of the user to ensure no decontamination or cleaning agents are used which could cause a hazard as a result of a reaction with parts of the instrument or with material contained in it.
- It is the responsibility of the user to consult the manufacturer if there is any doubt about the compatibility of decontamination or cleaning agents with part of the instrument or with material contained in it.

Calibration Procedures

The temperature controller may require periodic calibration after extended use. The procedures related to calibrating the controller may be found in the controller manual.

The measurement of Transit Time requires periodic calibration to ensure accurate measurements. The instrument measures the Transit Time of the signal through the system. The system includes the cables, transducers and the sample under test. The Transit Time Calibration is to remove the "system overhead" (the travel time through everything but the sample under test). Transit Time Calibration can be performed using either the Water Method or the Steel Bar Method (80-0057 Calibration Bar). Both methods subtract the Transit Time through the known sample (Water or Calibration Bar) from the Measured Transit Time. The procedure is as follows.

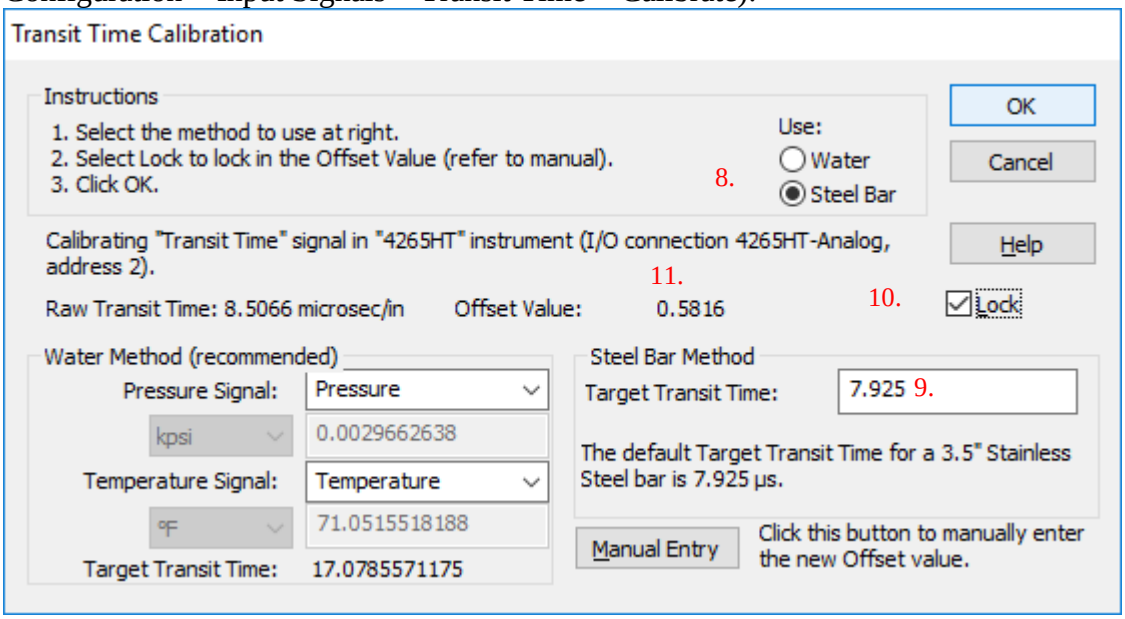
Prior to Calibration:

1. Remove the cell from the instrument.
2. Thoroughly clean the cell in preparation for calibration.
3. If using the Water Calibration method, verify that Temperature and Pressure are calibrated.

Calibration Bar Method

1. Unscrew the bottom plug until the threads are approximately 1/2 engaged.
2. Insert the foam-centering sleeve for the calibration bar.
3. Apply a small amount of acoustic couplant to the ends of the 3.5-inch calibration bar.
4. Insert the calibration bar into the cylinder and press against the bottom plug.
5. Screw the top plug into the cylinder until it engages the calibration bar. Hand-tighten only.
6. Install the cylinder assembly into the instrument. Connect the top and bottom transducer cables.

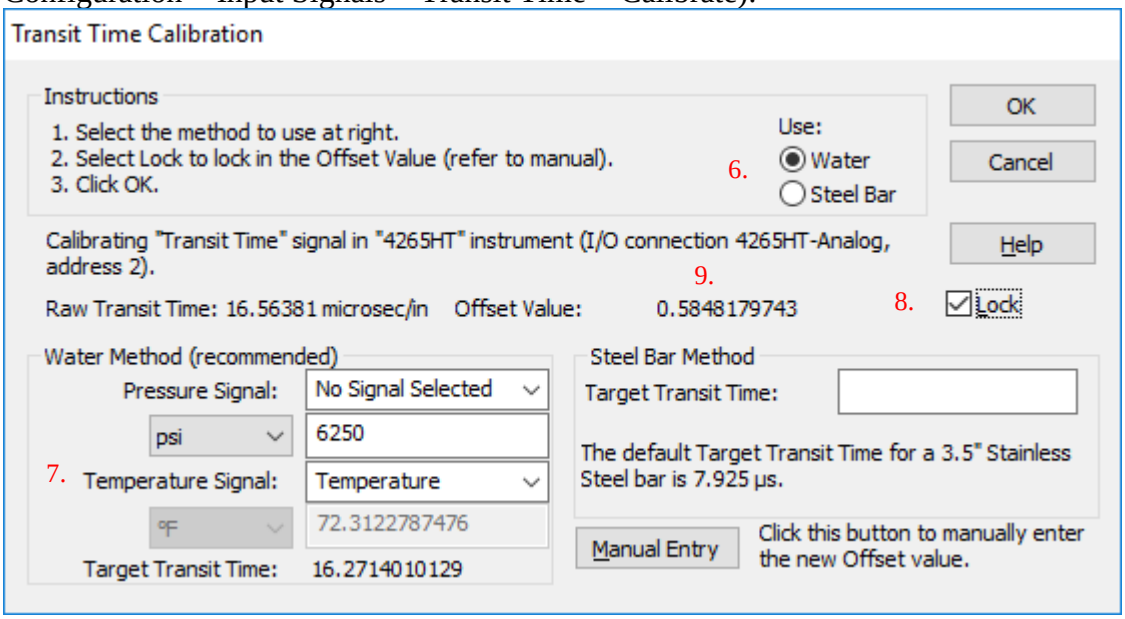
7. In the 5270 software, open the Transit Time Calibration window (Instrument Configuration > Input Signals > Transit Time > Calibrate):



8. Select the Steel Bar method.
9. Enter the default Target Transit Time of 7.925 or the known Target Transit Time if available.
10. Once the Signal is table, check the Lock check box
11. If the calibration is correct (Offset Value is POSITIVE), click the OK button.

Water Method

1. Install the cylinder assembly into the instrument.
2. Connect the top and bottom transducer cables.
3. Fill the cylinder with water.
4. Pressurize the cylinder to at least 1000 psi.
5. In the 5270 software, open the Transit Time Calibration window (Instrument Configuration > Input Signals > Transit Time > Calibrate):



6. Select the Water method (selected by default).
7. If the instrument has Temperature and Pressure Input Signals, the current readings are used. For instruments that do not have these Input Signals, the values can be entered manually.
   Note: The manually entered values must be as accurate as possible. Using 3000 psi because "it's about 3000 according to the gauge" is not accurate enough.
8. Once the signal is stable, check the Lock check box.
9. If the calibration is correct (Offset Value is POSITIVE), click the OK button.

Regulator Rebuild Instructions

Repair Kit Required: Chandler Part Number C09987 (*Refer to the figure at the end of this section.)*

Tools required:

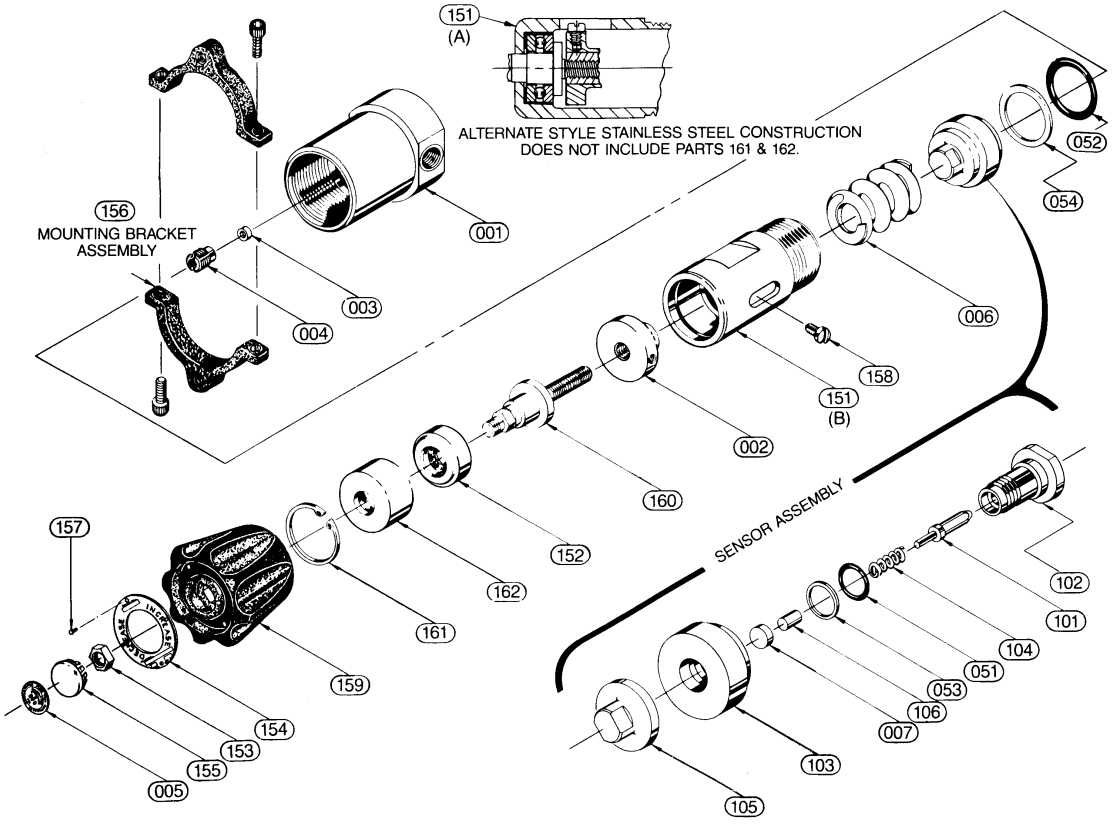
5/16" Wide Screwdriver
1/2" Wide Screwdriver
1/2" Socket Wrench
1/2" Open End Wrench or Small Adjustable Wrench
1-3/4" Open End Wrench or Large Adjustable Wrench
Needle Nose Pliers

The regulator is readily disassembled from the front panel.

Note: All disassembly can be done WITHOUT removing the regulator from the instrument.

Major Disassembly

1. Ensure all pressure is released from the instrument.
2. Rotate the regulator knob (Item 159) fully counterclockwise to remove tension from the regulator assembly.
3. Remove the hole plug (Item 155) from the regulator knob using the narrow (5/16" wide screwdriver) to pry the hole plug free.
4. Unscrew the nut (Item 153) from inside the regulator knob cavity using the 1/2" socket wrench.
5. Unscrew the bonnet (Item 151) using the 1-3/4" open end wrench. The bonnet will come off as an assembly: Bonnet (Item 151), adjusting screw (Item 160), collar (Item 002), limit screw (Item 158) and load spring (Item 006).
6. Items 161 and 162 do not exist in the stainless-steel design. The bonnet (Item 151) is a closed end component as shown in detail (A).
7. Remove the sensor assembly from the body (Item 001) using the needle nose pliers to grip and pull the sensor from the regulator body. A rocking motion may be required to free the sensor assembly.
8. Unscrew the seat retainer (Item 004) from the body Item (001) and remove the seat (Item 003).
9. Clean the seat retainer.
10. Replace the seat (Item 003). Place the beveled (chamfered) side of the seat facing out toward the sensor assembly stem. (The seat should have the chamfer facing into the seat retainer thus the chamfer will face out when retained in the regulator body.)
11. Install the seat retainer with the seat back into the body. Use a small amount of anti-seize lubricant on the seat retainer threads.



Bonnet Disassembly/Reassembly

1. Remove the limit screw (Item 158) from the spring cap (Item 002).
2. Remove all components from the bonnet.
3. Clean and lubricate the bearing using a suitable lubricant.
4. Clean the spring cap and adjusting screw threads. Place a small amount of anti-seize lubricant on the threads.
5. Clean the spring.
6. Reassemble the bonnet components. Install the limit screw.
7. Set the bonnet assembly aside for later installation.

Sensor Disassembly/Reassembly

1. Unscrew the spring pad (Item 105) from the sensor (Item 102) using the 1/2" open end wrench and the large 1/2" wide screwdriver. You may wish to clamp the spring pad in a vise to perform this step.

Caution: Small parts are present within the sensor assembly. Take care not to lose the parts.

2. Pull the spring pad away from the sensor. **Again, being careful not lose any parts!**
3. Retain the spacer (Item 106) for later use.
4. Remove the sensor components: Valve Stem (Item 101), Spring (Item 104), Spacer (Item 106), Seal (Item 007) and Sensor backup (Item 103).
5. Remove and replace the backup rings and O-rings (Items 051, 053, 052 and 054) using the new seals from the rebuild kit. Lubricate the O-rings with a suitable lubricant.
6. Replace the sensor internal components using the new internal components; Valve Stem (Item 101), Spring (Item 104) and Seal (Item 007).
7. Reuse and reinstall the original spacer (Item 106).
8. Reassemble the sensor pad, sensor backup and sensor. Place a small amount of anti-seize lubricant on the threads.
9. Discard all the used components.

Major Assembly

1. Place the sensor assembly back into the body (Item 001). Place a small amount of O-ring lubricant on the O-ring (Item 0052). Push the assembly into place using the needle nose pliers.
2. Screw the bonnet assembly with the spring into the body. Place a small amount of anti-seize lubricant on the threads.
3. Install the knob, nut and cover plug back on the regulator.

Preventative Maintenance and Inspection

- Follow calibration instructions listed above on a periodic basis.
- It is recommended that all sealing surfaces be inspected for damage prior to use. Sealing surfaces which appear to be damaged should be replaced prior to use.
- Verify that all electrical and mechanical connections are in place and in working order prior to test start-up.
- The test cell should be inspected for excessive wear while preparing for tests. Indications of corrosion (beyond surface rust), cracking or strain warrant further examination prior to use.
- In the case of problems please use the troubleshooting guide for guidance.

Section 4 - Troubleshooting Guide

The following table lists symptoms of several common problems, the possible cause of the problem, and the possible solution to the problem.

Symptom	Possible Cause	Possible Solution
POWER circuit breaker switch trips off.	Short circuit in system wiring.	Disconnect power to instrument and check for short circuits with an ohmmeter.
	Faulty POWER switch.	Replace switch.
Instrument not receiving power.	Instrument not plugged in.	Connect instrument to the correct power source.
	Blown fuse or thrown breaker on circuit supplying power to the instrument.	Check fuses and breakers on electrical supply circuit.
Pump will not operate.	Insufficient air pressure to pump.	Check air supply and make certain instrument is supplied with air between 75 and 125 psi. Check air lines for blockage. Adjust PUMP PRESSURE ADJUST regulator to a higher pressure.
	Solenoid valve controlling flow of air to pump is not functioning.	If no solenoid click is heard when the PUMP switch is turned to the ON position, a faulty solenoid valve is likely.
Pump operates, but will not build pressure.	PUMP WATER valve is not open or water is not being supplied to the instrument.	Open PUMP WATER valve and check flow of water to the instrument.
	High-pressure tubing or test cell has air in it.	Release all pressure from the system. Crack high-pressure thermocouple fitting with a 5/8-inch wrench and release any air trapped in the lines or cylinder. The vessel must be 100% full of sample and water.
	High-pressure tubing or test cell is leaking.	Check for water leakage and isolate leak.

Symptom	Possible Cause	Possible Solution
	Pressure Release valve not closed or is leaking.	Close valve or replace stem/seat, if necessary.
	Relief valve is not holding pressure.	Turn Relief valve knob clockwise.
	Relief valve is not holding pressure.	Debris may be trapped under relief valve seat. Turn relief valve knob counterclockwise all the way and turn pump ON for a few seconds to flush the debris off the seat.
	High-pressure tubing blocked by cement.	Release pressure and clear tubing.
Large amounts of water leak from the pressure or thermocouple ports in the test cell when fittings are removed.	PUMP WATER valve is open or PRESSURE RELEASE valve is open while COOLING is ON.	Turn OFF PUMP WATER switch and/or PRESSURE RELEASE valve.
Temperature will not rise above ambient.	HEATER switch not in the ON position.	Turn heater switch to ON position.
Transit time appears to be too small in the early portion of a test (<13 microsec/in).	Vessel calibration is incorrect	Calibrate the vessel using the calibration bar
Loss of transit time signal	Loose connection or damaged coaxial cable(s)	Check connections to top and bottom transducers in vessel. Replace coaxial cables or high temperature cable assemblies as required.
	Transducer shorted	Check for transducer short using ohmmeter between center electrode and plug. If shorted, replace transducer assembly.

Section 5 – Replacement Parts List

To ensure correct part replacement, always specify Model and Serial Number of instrument when ordering or corresponding.

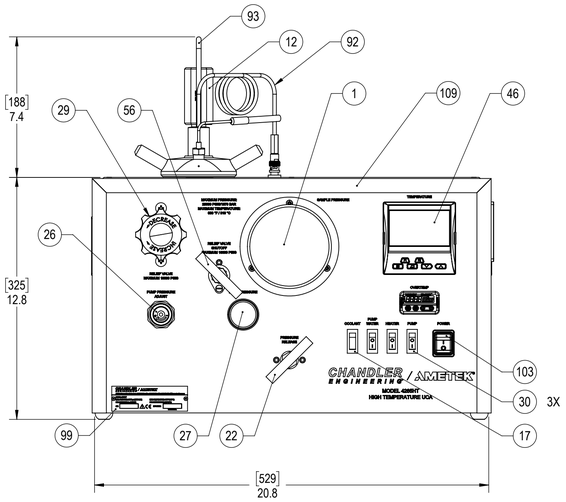
Part Number	Description
07-1591	Filter Assembly, HP
80-0021	Sample Thermocouple, Type J, 20000 psi
80-0022	Heating/Cooling Jacket, 2000 W, 50/60 Hz
80-0035	Foam Centering Sleeve
80-0057	Calibration Bar - 3.500
80-0042-08	Filter Assembly Tube
80-0310	Vessel Assembly
80-0324	Top Connector Assembly
80-0327	Bottom Connector Assembly
80-0349	Ring, High Pressure Seal
80-0376	Sleeve Assembly, Vessel Liner, Cement
80-0379	Tool, Sample Extraction
83-0202-4265HT	Processor Board Assembly, Configured, 4265HT
7750-0115	Handle, Top Plug
8053-4265HT-E	OverTemp, 4265HT, F
8053-4265HT-M	OverTemp, 4265HT, C
9050-4265HT-E	Controller,Temp,4265HT,F
9050-4265HT-M	Controller,Temp,4265HT,C
C06572	Gauge, Pressure, 100 psi
C08126	Switch,Rocker,On-Off-On
C08571	Couplant, High Temp, 2 oz
C08581	Relief Valve, Back Pressure Regulator, 200-10 kpsi
C08582	Bulkhead Fitting, 1/4 HPT-1/4 HPT
C08606	Adapter, Female to Female, BNC
C09260	Kit, Pump Rebuild, Hydraulic Section
C09263	Kit, Pump Rebuild, Air Drive
C09377	Pump, High Pressure
C09891	Filter, In-line, 60 Micron
C09987	Kit,10kpsi,BP Reg Rebuild
C10917	Retaining Ring, Transducer
C11293	Gauge, Pressure, 30,000 psi
C11326	O-ring, Vessel (for test temperatures **above** 400°F (204°C))
C11413	Grease, High Temperature
C12161	Switch, SPST, Rocker, 10A, 250V, 0-I
C16690	Power Switch, Breaker, 10A
C18437	Pressure Transducer Cable, M12
C19413	Transducer, Pressure, 20000 psi

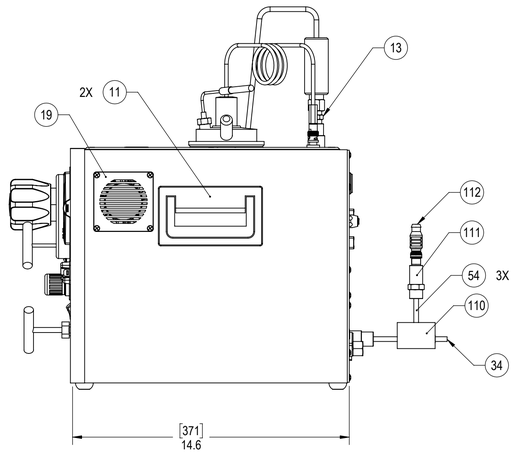
Part Number	Description
C19414	Thermocouple, Type J
P-1887	Pump Pressure Regulator, 300/100 psi
P-2192	Relief Valve Shutoff
P-2193	Pressure Release Valve,Ndl,SS
P-3107	Solenoid Valve, 220V
P-3148	O-ring, Vessel (for test temperatures **below** 400°F (204°C))

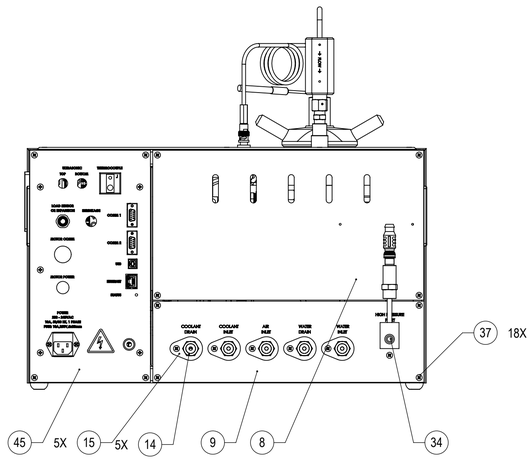
Section 6 – Drawings and Schematics

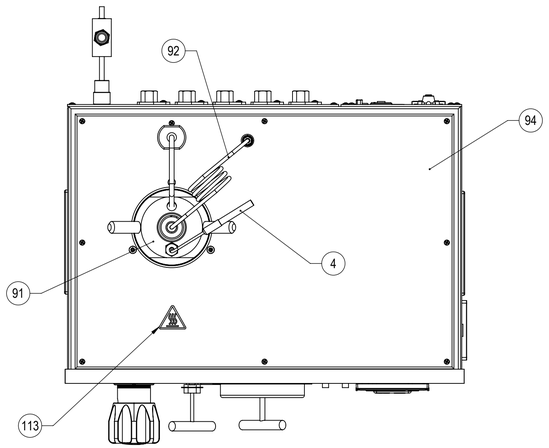
DRAWING NO.	DESCRIPTION
4265HTA	Model 4265-HT UCA Assembly
80-0305	Wiring Diagram
80-0306	Tubing Diagram
80-0310	Pressure Vessel Assembly
4265HT-FP	Front Panel Layout

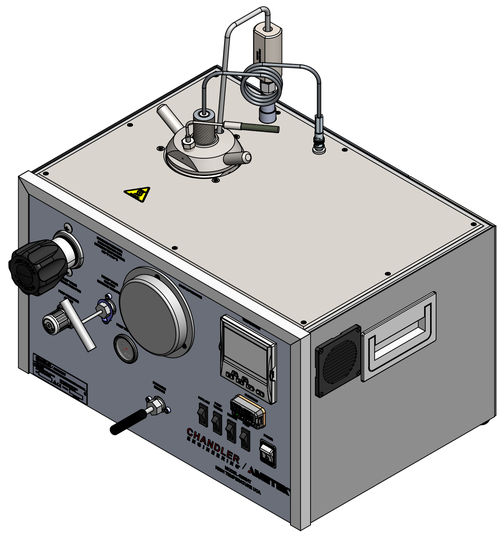
REV	DESCRIPTION	DATE	APPROVED
AE	ECN T9947; DELETED C19414 TC THAT IS ALREADY USED ON 80-0302-XXX ASSY	7/4/2024	JJM
AF	ECN T9985; UPDATE ASSEMBLY DUE TO CHANGES IN 80-0220-XX TUBE SET AND 83-0038	9/18/2024	JJM
AG	ECN 10312; ADDED 08-0306 TO MODEL	3/21/2025	JS
AH	ECN 10321; ADDED X265-WH-4265HT	3/27/2025	JS











ITEM	PART NUMBER	DESCRIPTION	QTY	UoM
1	C11293	GAUGE,30000PSI,4IN,1/4HPF,PNLMT	1	
2	83-0030	CABINET	1	
3	C08582	CONN,1/4HPTX1/4HPT,60KPSI,BHD	2	
4	80-0021	TC,SPECIAL TYPE J,2.57"L,UCA	1	
5	80-0334	PANEL,FRONT	1	
6	80-0031	ANTI-ROTATION BRACKET	1	
7	83-0038	DIVIDER,ENCLOSURE	1	
8	83-0041-02	PANEL,REAR,UPPER RIGHT	1	
9	83-0041-03	PANEL,REAR,LOWER RIGHT	1	
10	83-0128	BAFFLE SCREEN	1	
11	C10354	HANDLE,RECESSED	2	
12	07-1591	FILTER HOUSING ASSEMBLY	1	
13	C08702	ADPTR,HIP,SS,1/4HPMX1/4HPM,60K	1	
14	P-1954	CONN,BRS,1/4FPX1/4T,BHD,SW	5	
15	C08268	RETAINER,SST,3/4ID,BHD,SW	5	
16	C09251	FUSE,2.500A,250V,5X20,TIMEDELY	2	
17	C08126	SWITCH,RCKR,PNL,SPDT,ON-OFF-ON	1	
18	C08889	FAN,80X42MM,230VAC	1	
19	C08890	GUARD,FAN,3-1/8,AC&DC	1	
20	P-0756	CROSS,SS,1/4T,60000PSI	1	
21	P-0754	TEE,HIP,SS,1/4T,60000PSI	1	
22	P-2193	VALVE,NDL,SS,30000PSI,1/4HP	1	
23	C09377	PUMP,1/3 HP,HYDRAULICS INT'L	1	
24	187-20404	ELBOW,SS,1/8TX1/4MP	1	
25	P-1255	ELBOW,BR,1/4MPX1/4T	8	
26	P-1887	REG,PRESS,300/100PSI,1/8 FP	1	
27	C06572	GAUGE,100PSI,1.5",1/8NPT,CBM	1	
28	P-1233	FOOT,RUBBER,0.9687OD	4	
29	C19338	REG,SS,BACK,100-10KPSI,SPRING,1/4"NPT	1	
30	C12161	SWITCH,RCKR,PNL,SPST,10A,250V,0-1	3	
31	P-1246	ELBOW,BR,1/8MPX1/4T	3	
32	P-1059	ADPTR,SS,1/4HPTX1/8FP,HIP	2	
33	188-13044	CONN,SS,1/8MPTX1/8T,SW	1	
34	P-0915	PLUG,SS,1/4T,HP	1	
35	P-3107	VALVE,SOL,SS,1/4F,2WY,240VAC	2	
36	H-10-119	SCREW,SHCS,SS,10-32X1.000,ALN	4	
37	H-6015	SCREW,THMS,SS,6-32X0.375,PHIL	18	
38	H-6041	NUT,KEPS,SS,6-32	5	
39	H-10-003	WSHR,FLAT,SS,#10	6	
40	H-10-002	WSHR,LOCK,SS,#10	6	
41	C19507	SCREW,SHCS,SS,10-32X0.500,LOW PROFILE	6	
42	C09163	VALVE,SOL,SS,1/4F,2WY,240VAC	1	
43	P-1254	CONN,BRS,1/4 MP x 1/4 T,SW	1	
44	P-0866	BUSHG,BRS,RDCG,1/4FPX3/8MP UB	2	
45	X265-0100-4265HT	USONIC DRAWER, 4265HT	1	
46	C18824	CONTROLLER,ETHERM,EPC3004,1/4DIN,1L,1T,ET H/485,CC	1	
47	P-0756	CROSS,SS,1/4T,60000PSI	1	
48	80-0042-01	TUBE,HP,TUBE A	1	
49	80-0042-02	TUBE,HP,TUBE B	1	
50	80-0042-03	TUBE,HP,TUBE C	1	
51	80-0042-04	TUBE,HP,TUBE D	1	
52	80-0042-05	TUBE,HP,TUBE E	1	
53	80-0042-06	TUBE,HP,TUBE F	1	
54	80-0042-07	TUBE,HP,TUBE G	3	
55	80-0042-09	TUBE,HP,TUBE I	1	
56	P-2192	VALVE,NDL,SS,30-12HF4	1	
57	69-793	SAFETY HEAD,0.25X0.083TBG F/1/4A	1	
58	80-0220-01	COPPER TUBE 1	1	
59	P-1265	TEE,UNION,BR,1/4T	3	
60	80-0220-02	COPPER TUBE 2	1	
61	80-0220-03	COPPER TUBE 3	1	
62	80-0220-04	COPPER TUBE 4	1	
63	80-0220-05	COPPER TUBE 5	1	
64	80-0220-06	COPPER TUBE 6	1	
65	80-0220-07	COPPER TUBE 7	1	
66	80-0220-08	COPPER TUBE 8	1	
67	C09891	FILTER,INLINE,60 MICRON	1	
68	80-0220-09	COPPER TUBE 9	1	
69	80-0220-10	COPPER TUBE 10	1	
70	80-0220-11	COPPER TUBE 11	1	
71	80-0220-12	COPPER TUBE 12	1	
72	C19408	TEE,BRANCH,BR,1/4TX1/4TX1/8FP	1	
73	80-0220-13	COPPER TUBE 13	1	
74	80-0220-14	COPPER TUBE 14	1	
75	P-2270	TEE,BRANCH,BR,1/4TX1/4TX1/4MP	1	
76	80-0220-15	COPPER TUBE 15	1	
77	80-0220-16	COPPER TUBE 16	1	
78	80-0220-17	COPPER TUBE 17	1	
79	80-0220-18	COPPER TUBE 18	1	
80	80-0042-10T	TUBE,HP,TUBE J	1	
81	C08590	DISK,RUPTURE 22500 PSI,.250,IN	1	
82	C17764	CLAMP,BAND,SS,9/16W,5-5/8in TO 8-1/2in DIA	2	
83	80-0141	ANTI-ROTATION BRACKET	1	
84	H-4105	SCREW,FHMS,SS,4-40X0.250,PHIL	2	
85	H-6011	SCREW,FHMS,SS,6-32X0.250,PHIL	9	
86	70617-91	NUT,HEX,SS,6-32,KEPS	1	
87	H-8011	SCREW,BHMS,SS,8-32X0.375,PHIL	3	
88	80-0018	PROC,TEST,CYLINDER PRESR TEST	1	
89	H-8030	SCREW,FHMS,SS,8-32X0.375,PHIL	3	
90	80-0302-HTUCA	HEATER ASSEMBLY,HTUCA	1	

ITEM	PART NUMBER	DESCRIPTION	QTY	UoM
91	80-0310	VESSEL ASSEMBLY, HTUCA/HTSGSA	1	
92	80-0324	CONNECTOR ASSEMBLY,TOP	1	
93	80-0371	TUBE,VESSEL	1	
94	80-0351	PLATE, TOP	1	
95	C08587	ADPTR,RF,BHD,FEM TO FEM BNC	1	
96	H-25-108	SCREW,THMS,SS,1/4-20X0.625,PHL	2	
97	H-8015	SCREW,FHMS,SS,8-32X0.500,PHIL	3	
98	H-10-132	SCREW,FHMS,SS,10-32X0.500	3	
99	4265HT-0084	NPL,SN,MODEL 4254HT,CE	1	
100	H-6016	SCREW,FHMS,SS,6-32X0.375,PHIL	4	
101	80-0305	DIAGRAM,TUBING,HTUCA	1	
102	80-0309	PROC,FINAL TEST,4265HT	1	
103	C16690	BREAKER,10A,240VAC,2P,ROCKER,1/0	1	
104	C16390	CONTROLLER,LIMIT,EZ-ZONE,1/32	1	
105	H-100000	RIVET,POP,AL,0.093X0.375L	2	
106	80-0308	PROC,LAPPING,TRANSDUCER	1	
107	H-25-009	SCREW,HHMS,SS,1/4-20X0.500,HEX	8	
108	H-25-003	NUT,HEX,SS,1/4-20,KEPS	8	
109	83-0031	TRIM,FRONT PANEL,SGSA	1	
110	P-0754	TEE,HIP,SS,1/4T,60000PSI	1	
111	C19413	XDCR,PRESSURE,20K,17-4SS,F250C,4-20MA	1	
112	C18437	CABLE,M12 PLUG,STRIPPED LEADS,2M,BLK	1	
113	C15746	LABEL,WARNING,HOT SURFACE HAZARD,1.00" BASE	1	
114	4265HT-ACCESS	ACCESSORIES,MODEL 4265HT	1	
115	4265HT-INSP	FINAL INSPECTION CHECKLIST	1	
116	4265HT-SHIP	SHIPPING LIST,HIGH TEMP UCA	1	
117	CS-5003	PROC,CONTINUITY TEST	1	
118	CS-5002	PROC,DIELECTRIC TEST	1	
119	80-0306	DIAGRAM,WIRING,4265HT	1	
120	X265-WH-4265HT	HARNESS,WIRING,4265HT	1	

SPECIFICATIONS:
1. MAXIMUM PRESSURE: 1379 BAR / 20000 PSI
2. MAXIMUM TEMPERATURE: 316 °C (600 °F) USING HIGH TEMPERATURE ELASTOMER SEALS (C11326).
3. BACKPRESSURE REGULATOR RATED FOR 10000 PSI
4. FULLY COMPATIBLE WITH 5270 DATA ACQUISITION SOFTWARE

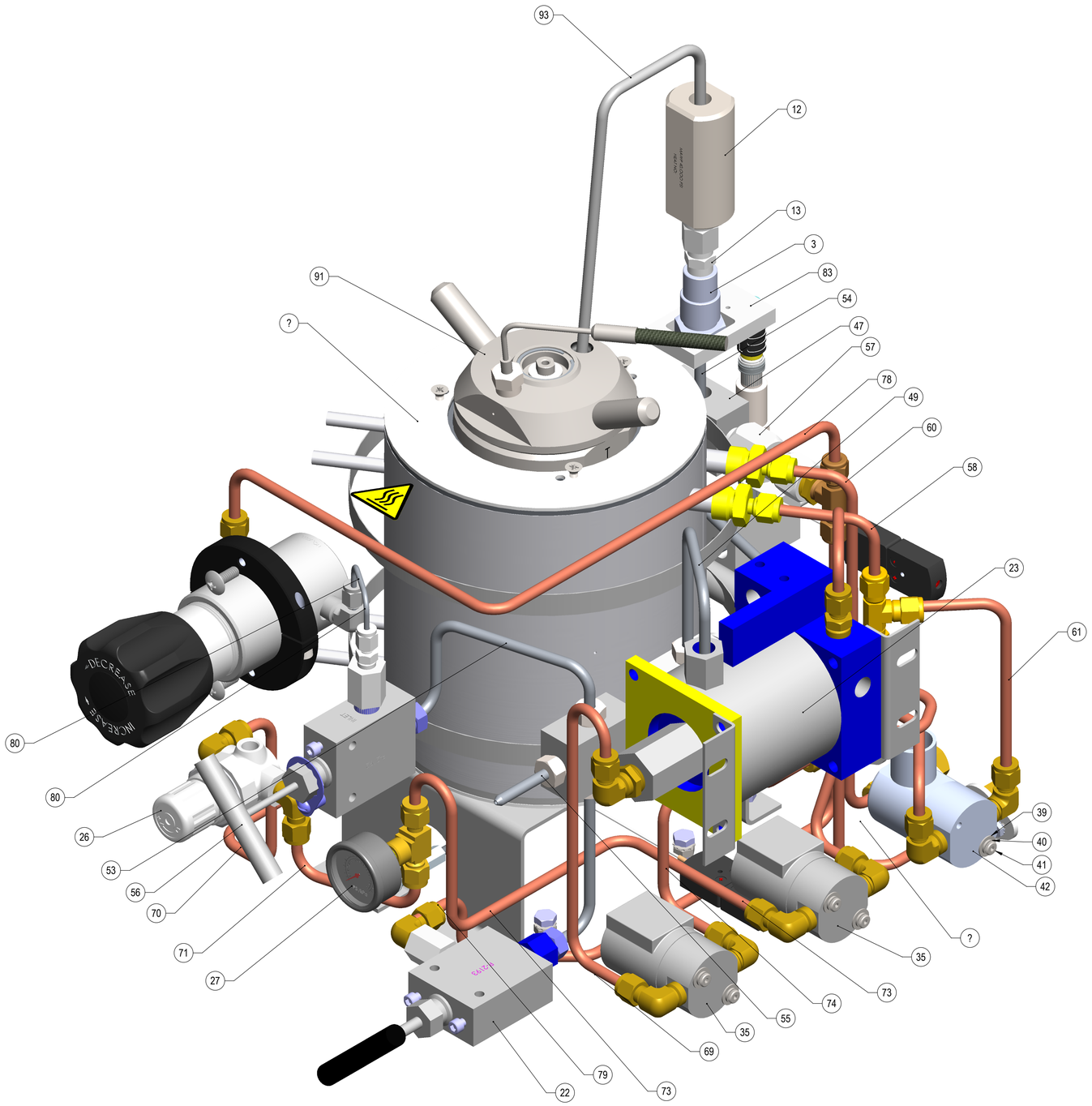
FINAL TEST:
1. ENSURE DIELECTRIC (CS-5003) AND CONTINUTITY (CS-5004) TESTS ARE RAN BEFORE FINAL TESTING.

BREAK EDGES, DEBURR
UON DIMS ARE IN INCHES
1 PLC ±0.030 2 PLC ±0.010
3 PLC ±0.005 ANGL ±1/2°
SURFACE FINISH 63 RMS
THIRD ANGLE PROJECTION

DRAWN: JJM 1/8/2024
MFG: JJM 1/8/2024
ENGR: JJM 1/8/2024
TYPE:
STRUCT:

CHANDLER ENGINEERING
4265HT ASSY
PN: 4265HTA
PROJ: 80
REV AH SIZE D
SHEET 1 OF 3

TITLE BLOCK REV 3



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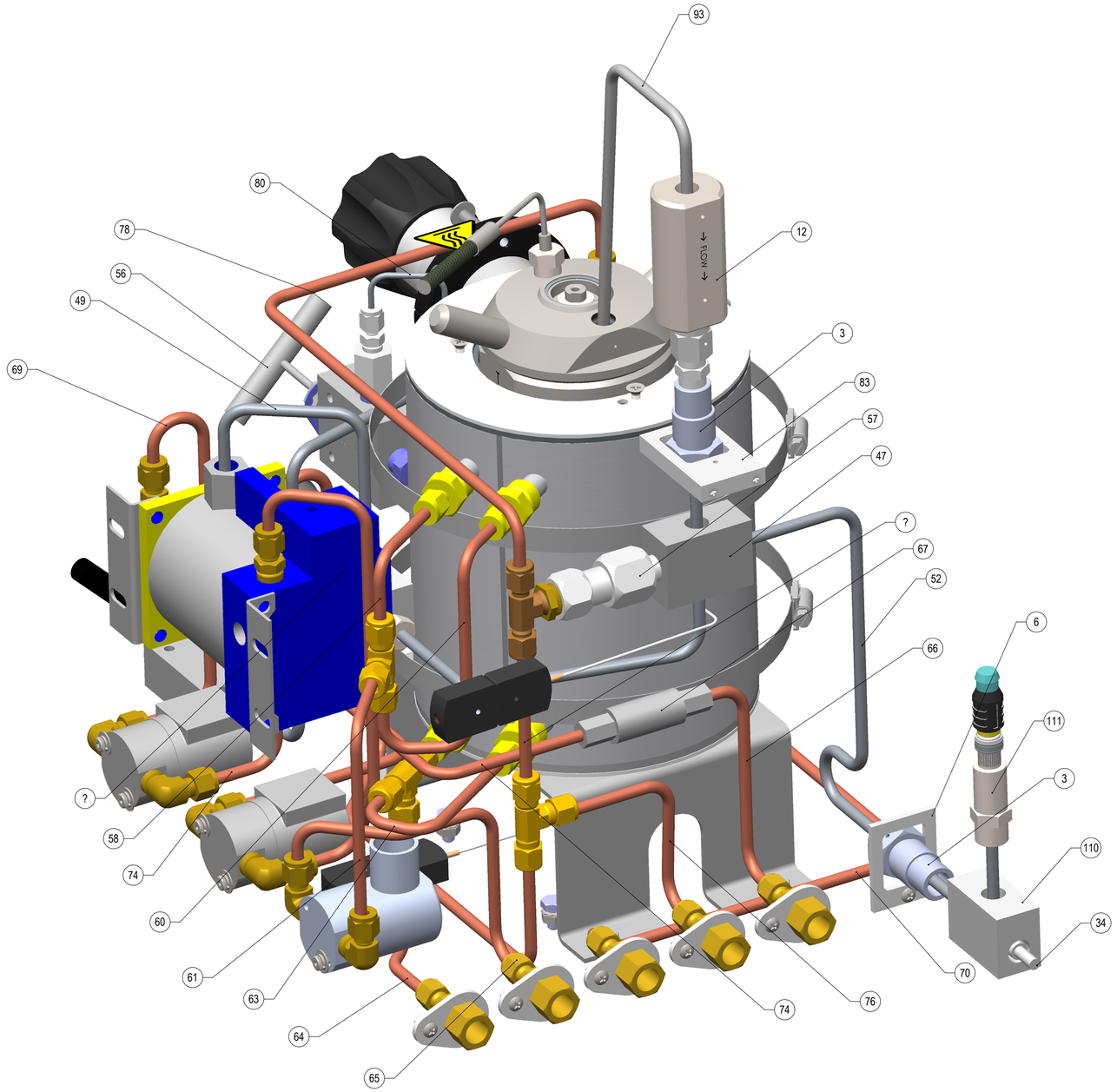
BREAK EDGES, DEBURR
UON DIMS ARE IN INCHES
1 PLC ±0.030 2 PLC ±0.010
3 PLC ±0.005 ANGL ±1/2°
SURFACE FINISH 63 RMS
THIRD ANGLE PROJECTION

DRAWN: JJM 1/8/2024
MFG: JJM 1/8/2024
ENGR: JJM 1/8/2024
TYPE:
STRUCT:

CHANDLER ENGINEERING
4265HT ASSY
PN: 4265HTA
PROJ: 80
REV AH | SIZE D
SHEET 2 OF 3

TITLE BLOCK REV 1



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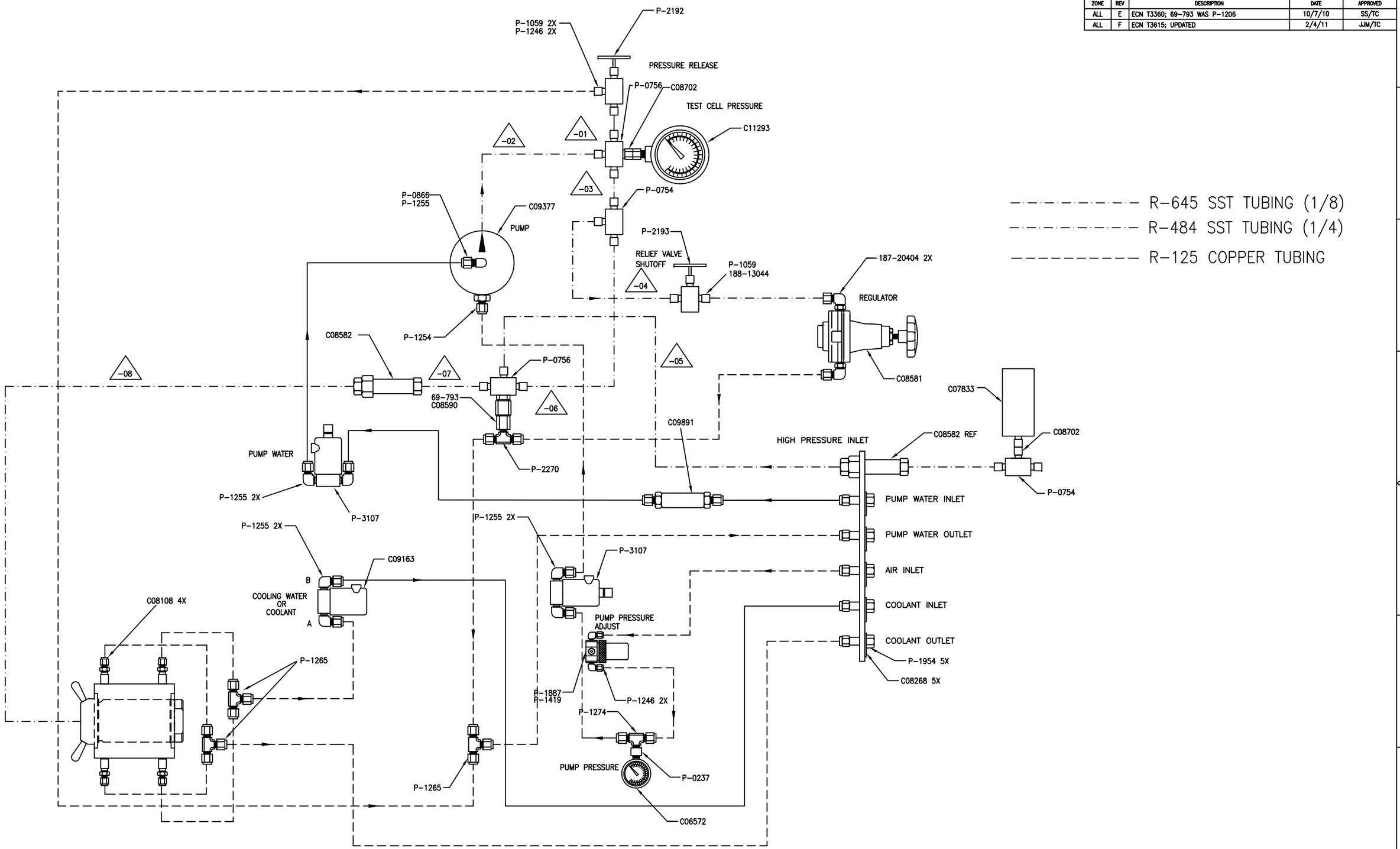
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
ALL	E	ECN T3360; 69-793 WAS P-1206	10/7/10	SS/TC
ALL	F	ECN T3615; UPDATED	2/4/11	JJM/TC

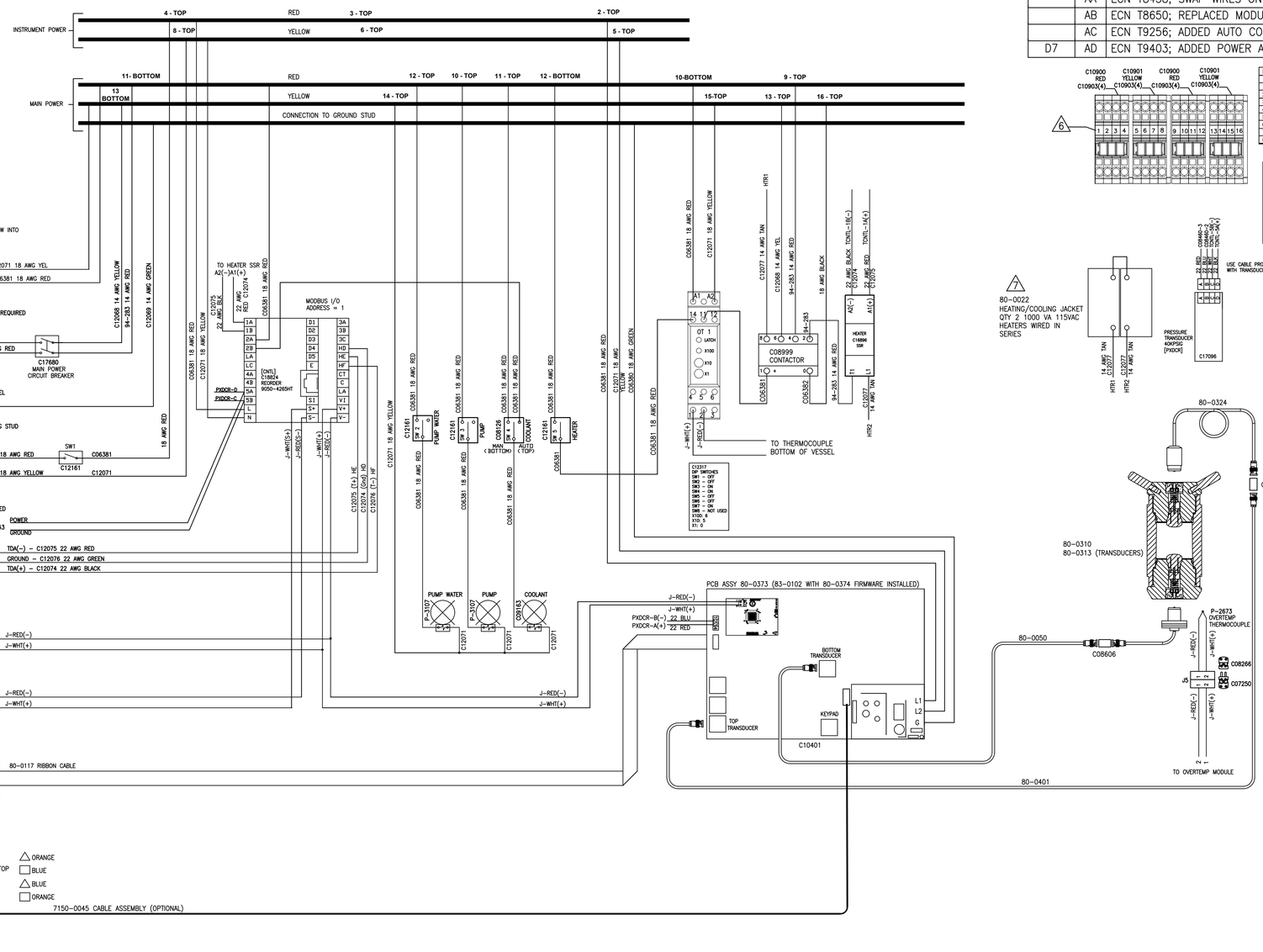


NOTE:

-01 THRU -08 REFERENCES 80-0042 TUBES.

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]	CHANDLER ENGINEERING
APPLICATION		TOLERANCES: 1 PLACE ±0.030 [.76]; 2 PLACE ±0.010 [.25]; 3 PLACE ±0.005 [.127]; ANGLES ±1/2°; SURF. FINISH 32	TITLE: HIGH TEMPERATURE UCA TUBING DIAGRAM
BREAK SHARP EDGES, DEBURR		APPROVALS / DATE	
		DRAWN: 08/25/05	SIZE C; S.O. NO.; DWG NO. 80-0305; REV. F
		CHECKED: 9/11/06	
		ENGR.: 08/25/05	SCALE: 1 = 1; TITLE BLOCK REV: 1.0; SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
	AA	ECN T8438; SWAP WIRES ON C17676 (1A & 1B)	02/07/19	JS
	AB	ECN T8650; REPLACED MODULES WITH 80-0175	09/04/19	JS
	AC	ECN T9256; ADDED AUTO COOLING BACK IN	07/01/21	JS
D7	AD	ECN T9403; ADDED POWER AND GRND CONNECTIONS	03/04/22	JS

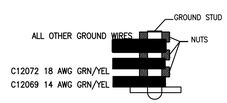


INSTRUMENT POWER		
	TOP CONNECTION	BOTTOM CONNECTION
1-RED	NOT USED	NOT USED
2-RED	L1 – PCB ASSEMBLY	NOT USED
3-RED	LINE – CONTROLLER	NOT USED
4-RED	INSTRUMENT POWER SWITCH – BOTTOM	NOT USED
5-YELLOW	L2 – PCB ASSEMBLY	NOT USED
6-YELLOW	NEUTRAL – CONTROLLER	NOT USED
7-YELLOW	NOT USED	NOT USED
8-YELLOW	INSTRUMENT POWER RECEPTICLE	NOT USED

MAIN POWER		
	TOP CONNECTION	BOTTOM CONNECTION
9-RED	CONTACTOR "4"	NOT USED
10-RED	PUMP SWITCH - BOTTOM	POWER SUPPLY LINE "1"
11-RED	COOLANT SWITCH - BOTTOM	MAIN POWER SWITCH - RED
12-RED	PUMP WATER SWITCH - BOTTOM	HEATER SWITCH - BOTTOM
13-YELLOW	CONTACTOR "6"	MAIN POWER SWITCH - YEL
14-YELLOW	SOLENOID # 1	NOT USED
15-YELLOW	POWER SUPPLY NEUTRAL "3"	NOT USED
16-YELLOW	(BLACK WIRE) CONTACTOR "0"	NOT USED

NOTES:

1. USE 600V CE COMPLIANT UL AWM TYPE 1015 WIRE (REFER TO THE WIRE PART NUMBERS PROVIDED). NO SUBSTITUTIONS ARE ALLOWED.
2. USE 80-0117 RIBBON CABLE WITH 300V OR GREATER VOLTAGE RATING.
3. ROUTE AC AND DC WIRING SEPARATELY.
4. PROVIDE WIRING TO/FROM CHASSIS TO FRONT PANEL, CONTROLLER, TRANSDUCERS TO ALLOW INSTRUMENT TO BE OPERATED WITH THE ELECTRONICS CHASSIS PULLED OUT OF INSTRUMENT.
5. 1) APPLY ONE C12233 GROUND LABEL TO CHASSIS NEXT TO GROUND POST. 2) SECURE MAINS GROUND WIRE (GREEN/YELLOW) CLOSEST TO BASE OF THE GROUND POST WITH A NUT. 3) SECURE THE INSTRUMENT GROUND WIRE (GREEN/YELLOW) NEXT TIGHTEN WITH A NUT. 4) ALL OTHER GROUND WIRES CAN BE HELD UNDER A SINGLE NUT. TORQUE SETTING FOR NUTS: 1 FT-LBS (12 IN-LBS).
6. NUMBERING IS A DRAWING AID (ACTUAL PARTS ARE NOT NUMBERED).
7. USE RTV SEALENT (DOW CORNING 736) ON THE 80-0022 (HEATER)



NEXT ASSY	USED ON
APPLICATION	
BREAK SHARP EDGES, DEBURR	

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]

TOLERANCES:
1 PLACE ±0.030 [.76]
2 PLACE ±0.010 [.25]
3 PLACE ±0.005 [.127]
ANGLES ±1/2°
SURF. FINISH 32

APPROVALS	DATE
DRAWN: JJM	08/25/05
CHECKED: RDD	09/14/05
ENGR.: WJW	3/13/18

CHANDLER ENGINEERING

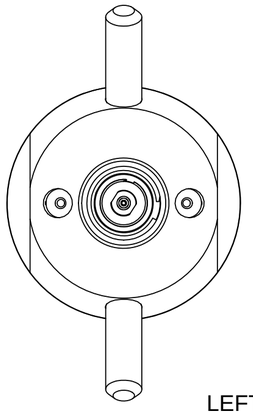
TITLE
HIGH TEMPERATURE UCA WIRING DIAGRAM

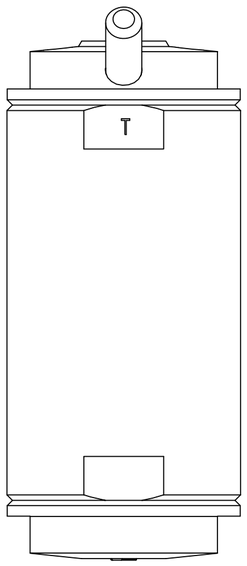
SIZE	S.O. NO.	DWG NO.	REV.
C		80-0306	AD

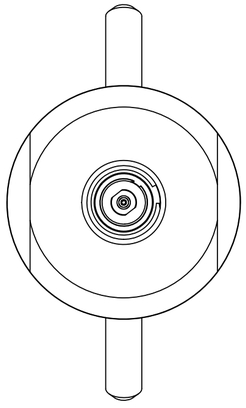
SCALE: 1 = 1 | TITLE BLOCK REV: 1.0 | SHEET: 1 of 1

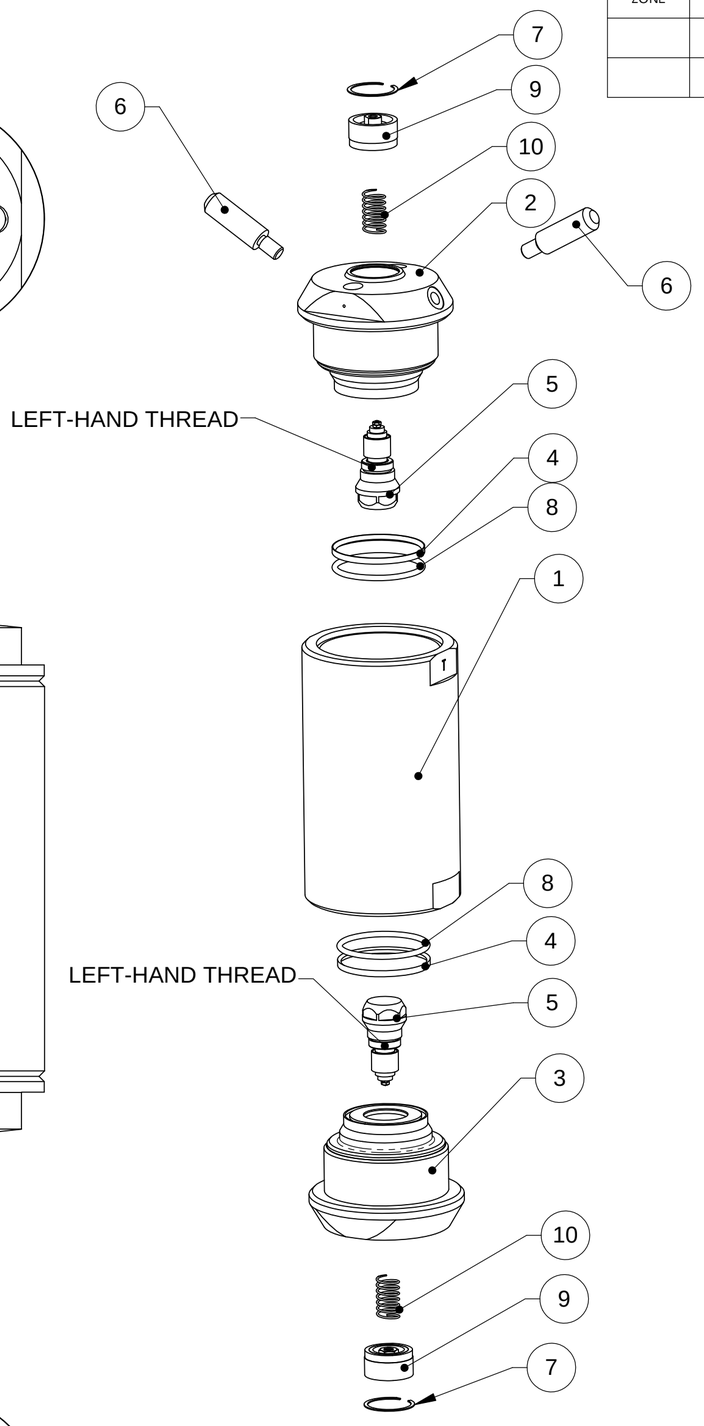
NOTES:
1. MAXIMUM PRESSURE RATING: 20000 PSIG (138.0 MPa)
2. MAXIMUM TEMPERATURE RATING: 600˚F (316˚C)
3. VERIFY THAT THE ELECTRICAL CONTACT SURFACES ON 80-0369 , TRANSDUCER MASS, SPRING ARE CLEAN. POLISH AS NECESSARY.
4. TIGHTEN TRANSDUCER ASSEMBLIES TO 40 FT-LB USING 1-INCH 1/2-INCH DRIVE, SIX-POINT SOCKET (C11447) AND 1/2-INCH BAR (C11448). DO NOT APPLY GREASE TO THE TRANSDUCER SEALING SURFACES OR THREADS.
5. VERIFY THAT HEAT NUMBERS ARE ETCHED ON PLUGS AND VESSEL.
6. HYDROTEST TEST PER 80-0350.
7. REPLACE ORINGS (P-3148 or C11326) AFTER EACH TEST.
8. APPLY THIN LAYER OF C11413 HIGH TEMPERATURE GREASE TO SURFACES THAT ARE EXPOSED TO THE CEMENT SAMPLE AND WATER.
9. USE HIGH TEMPERATURE ORINGS (C11326) WHEN TEST TEMPERATURE EXCEEDS 400˚F(204˚C), OTHERWISE USE P-3148 ORINGS.
10. CEMENT SLEEVE ASSEMBLY 80-0376 MUST BE USED WITH CEMENT TESTS AT TEMPERATURES ABOVE 400˚F(204˚C). FILL THE ANNULAR VOLUME OUTSIDE OF THE CEMENT SLEEVE ASSEMBLY WITH WATER BEFORE CLOSING THE VESSEL.

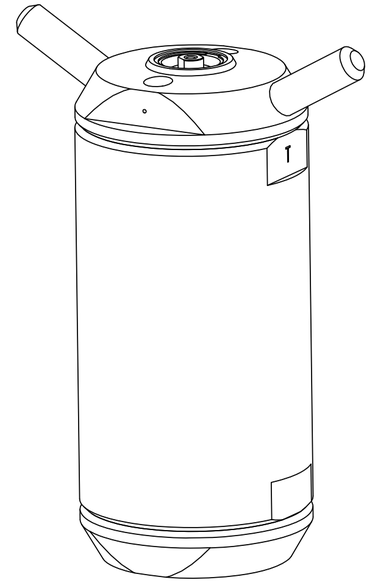
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	C	ECN T1561; ADD CLARIFICATION THAT GREASE IS NOT USED ON THE TRANSDUCER SEALING SURFACES	3/24/2008	JJM/TC
	D	ECN T5207; ADDED NOTE 3	3/8/2013	JJM











ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	80-0328	VESSEL, 4265HT	1
2	80-0311	PLUG, TOP	1
3	80-0312	PLUG, BOTTOM	1
4	80-0349	RING, SEAL, PRESSURE	2
5	80-0313	TRANSDUCER ASSEMBLY	2
6	7750-0115	HANDLE, PLUG, CYLINDER	2
7	C10917	RETAINING RING, SS	2
8	C11326	ORING, HIGH TEMP, PARKER #227	2
9	80-0369	CONNECTOR ASSEMBLY, TRANSDUCER	2
10	C11320	SPRING, COMPRESSION	2

BREAK EDGES, DEBURR
UON DIMS ARE IN INCHES
1 PLC ±0.030 2 PLC ±0.010
3 PLC ±0.005 ANGL ±1/2 °
SURFACE FINISH 63 RMS
THIRD ANGLE PROJECTION

DRAWN: JJM 03-12-13
MFG: TC 03-12-13
ENGR: JJM 03-12-13
TYPE:
STRUCT:

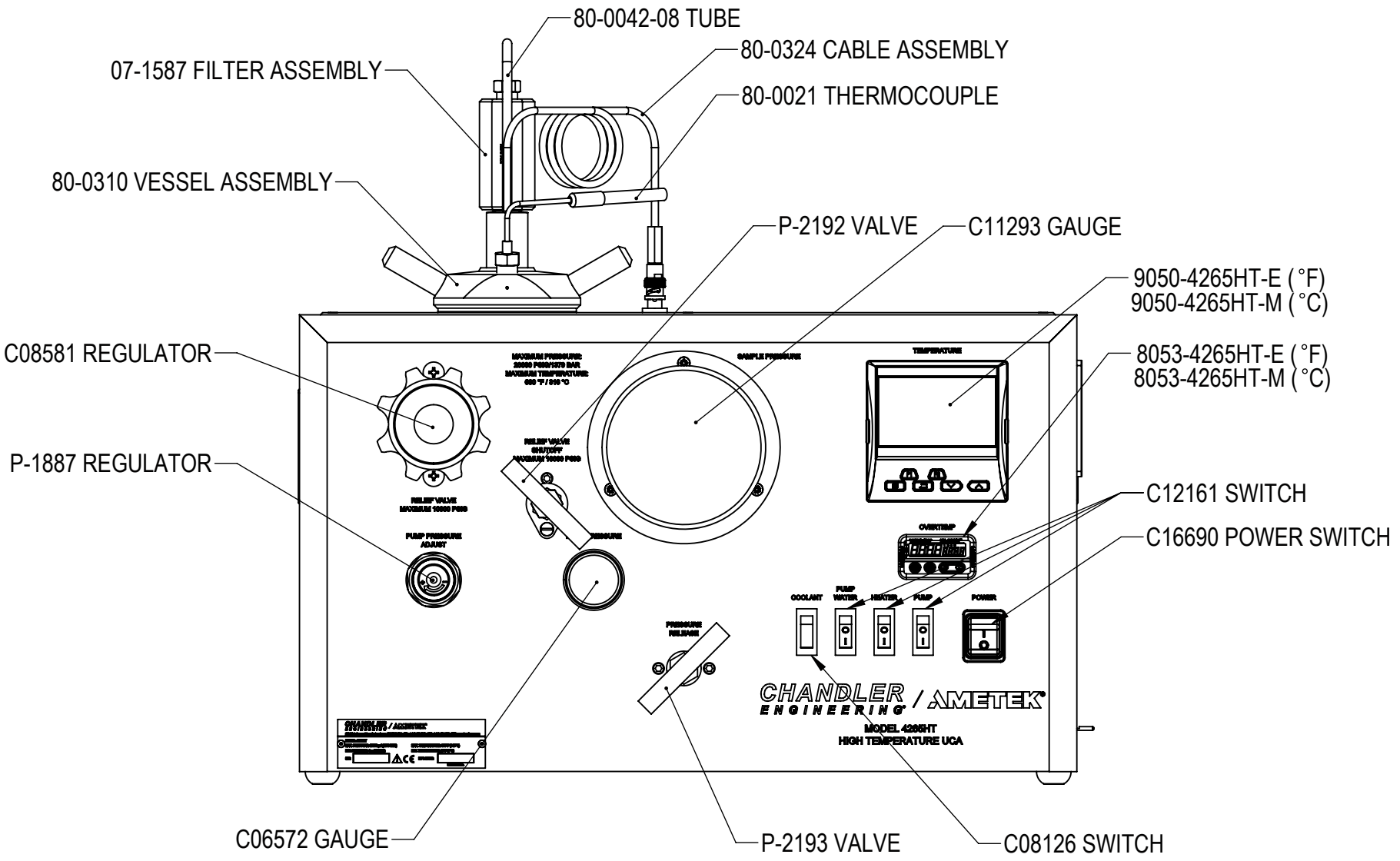
CHANDLER ENGINEERING

VESSEL ASSEMBLY, HTUCA/HTSGSA

PN: 80-0310 REV D SIZE C
PROJ: SHEET 1 OF 1

TITLE BLOCK REV 3

REV	DESCRIPTION	DATE	APPROVED
A	ISSUED	2024-02-09	JJM
B	ECN T9789; CHANGE 80-0368 TO 80-0324	2/26/2024	BW



BREAK EDGES, DEBURR
UON DIMS ARE IN INCHES
1 PLC ±0.030 2 PLC ±0.010
3 PLC ±0.005 ANGL ±1/2°
SURFACE FINISH 63 RMS
THIRD ANGLE PROJECTION

DRAWN: JJM 2/9/2024
MFG: JDS 2/13/2024
ENGR: JJM 2/9/2024
TYPE:
STRUCT:

CHANDLER ENGINEERING

FRONT PANEL LAYOUT,4265HT

PN: 4265HT-FP
PROJ: 4265HT

REV B | SIZE A
SHEET 1 OF 1

TITLE BLOCK REV 3

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Please Send Us Your Comments on This Manual

Model Number _____ Serial Number _____

Printing Date of this manual (from the Title Page) _____

Please circle a response for each of the following statements. Use:

(1)= Strongly agree (2) =Agree (3) =Neutral, no opinion (4) =Disagree (5) =Strongly disagree

a) The manual is well organized.	**1**	**2**	**3**	**4**	**5**
b) I can find the information I want.	**1**	**2**	**3**	**4**	**5**
c) The information in the manual is accurate.	**1**	**2**	**3**	**4**	**5**
d) I can easily understand the instructions.	**1**	**2**	**3**	**4**	**5**
e) The manual contains enough examples.	**1**	**2**	**3**	**4**	**5**
f) The examples are appropriate and helpful.	**1**	**2**	**3**	**4**	**5**
g) The manual layout is attractive and useful.	**1**	**2**	**3**	**4**	**5**
h) The figures are clear and helpful.	**1**	**2**	**3**	**4**	**5**

i) The sections I refer to most often are _____

_____

Other comments _____

_____

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My instrument is Chandler Model _____

Serial Number _____

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