Instruction Manual
Model 5265
Static Gel Strength Analyzer
(Original Instructions)

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AMETEK®

CHANDLER ENGINEERING®

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General Information

Introduction

This manual contains installation, operation, and maintenance instructions for the Chandler Engineering Model 5265 Static Gel Strength Cement Analyzer.

Description

The 5265 Static Gel Strength Cement Analyzer (SGSA) is an instrument that measures the static gel 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 static gel strength (SGS) versus time plot.

Each 5265 autoclave connected as part of the SGSA system is equipped with an internal processor board that sends and receives an ultrasonic pulse through the slurry, performs digital signal processing of captured data and, as an option, measures the transit time of the pulse through the slurry.

After the processor board computes the SGS data, it is sent to the I/O board located on the rear of the autoclave. The I/O board is connected to the RS-232 serial communication port located on the rear of the PC or to another autoclave I/O board by a four-wire RS-485 communication cable.

Additionally, as an option, the instrument may be used to determine the compressive strength of the cement using the same algorithms and method found in the Model 4265 Ultrasonic Cement Analyzer (UCA).

Features and Benefits

The major features of the 5265 Static Gel Strength Analyzer (SGSA) are listed below:

- Easy to install and use.
- Uses PC based Chandler Model 5270 Data Acquisition System for data retrieval, analysis and storage.
- Tests stored in database may be sorted and retrieved based on user specified data base fields.
- Built-in pump and relief valve for sample pressure control.
- Optional cement compressive strength measurement (UCA).
- Optional external chiller system.

Specifications

5265

Maximum Curing Temperature:	400°F (204°C)
Maximum Curing Pressure:	20,000 psi (138 MPa)
Heater Power:	2,000 Watts

Electrical

Main Input Voltage:	208-240 VAC, 50/60 Hz, 10A
Instrument Input Voltage:	115/230 VAC, 50/60Hz, 2.5A (Includes QTY 2, 2.5 A, 250VAC, 5x20mm, Time Lag Fuses)

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	18	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:	60-122°F (16-50°C)
• Storage Temperature:	41-122°F (5-50°C)
• Operating Temperature Range:	41-122°F (5-50°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)
• Pressurizing Water:	5-150 psig (.34-10.4 bar)
• Cooling Water/EG solution:	20-80 psi (138-552 kPa)
• Drain	Suitable for hot water/steam up to 400°F (204°C)

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.

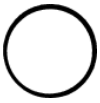
The following safety procedures are advisable:

- 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 the instrument maximum pressure and temperature ratings. The particular 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.
- Use appropriate Personal Protective Equipment such as safety glasses, latex gloves, etc.
- This is a bench top device; place the instrument on a suitable, level, and stable surface.
- Locate the instrument in a low traffic area. Allow a minimum of 12 in. (305mm) unobstructed clearance around side, back and top faces to provide for adequate ventilation. Position the back of the instrument to allow access to disconnect cords in the event of an emergency.
- Always disconnect main power to the instrument before attempting any repair.
- Have the safety officer at your location review the safety aspects of the instrument and this manual and approve the operational and installation procedures.
- 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.

- A fire extinguisher, type 8 BC, should be located within 50 feet (15 meters) of the instrument.

Before attempting to operate the instrument, the operator should read and understand this manual.

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.
	Warning, Potential Hazard
	On (Supply)
	Off (Supply)

Symbols Used in this Manual

Symbol	Meaning
	Note, Important Information
	Warning, Potential Hazard

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Section 1 – Installation

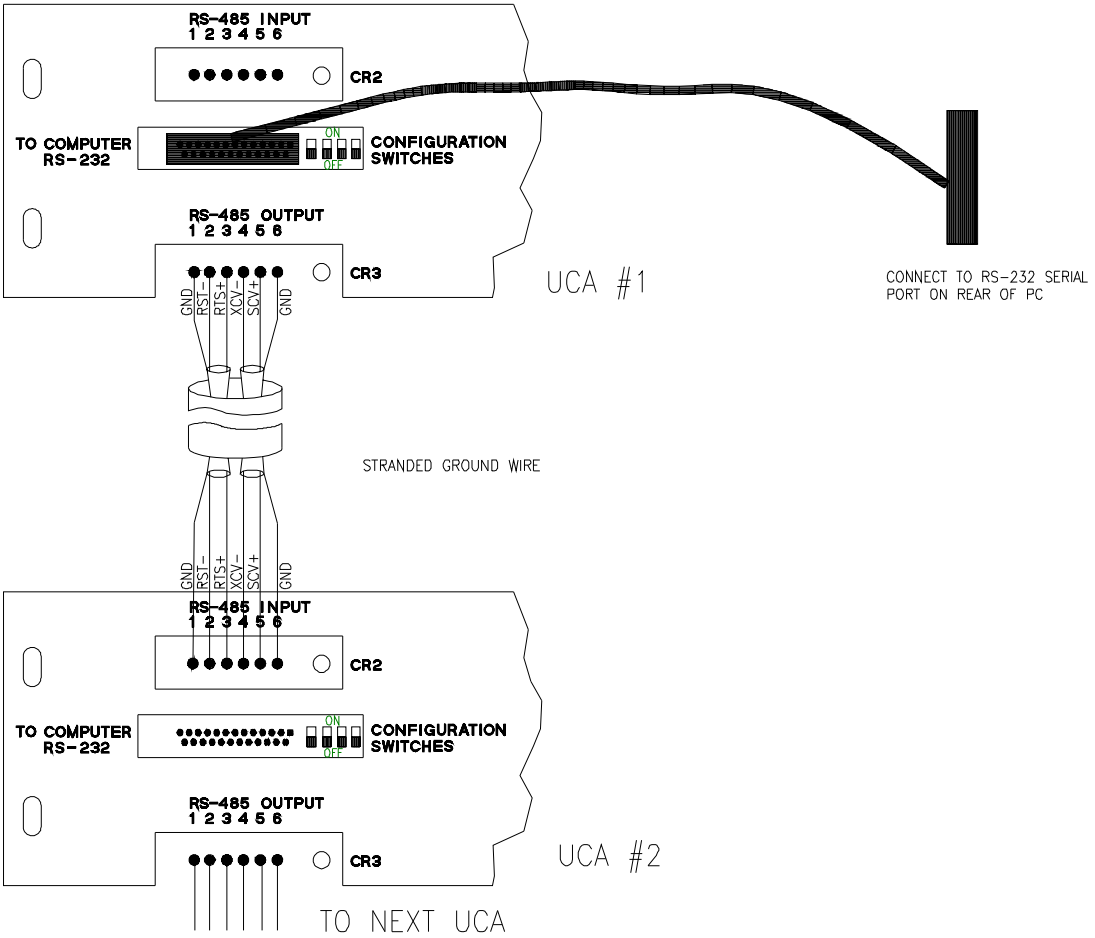
Unpacking the Instrument

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.

Re-configuration

1. Apply power to the instrument.
2. Make sure the instrument is connected to serial port COM1 on the host computer.
3. Turn ON the power to the instrument.
4. Each data channel on each instrument must have a separate address. The DIP switches at the rear of the instrument are used to configure the data channels. During normal operation each of the four switches must be set to the OFF position. During configuration of the address for the SGSA, temperature, or pressure channels, the DIP switches on the autoclave must be set according to the table below.

Channel Address Configuration				
Normal Operation				
Temperature				
Pressure				
SGSA (Gel and Transit Time)				



Connecting Serial Power

Use the configuration software (SIXBCCD.EXE) to configure the individual data channel addresses.

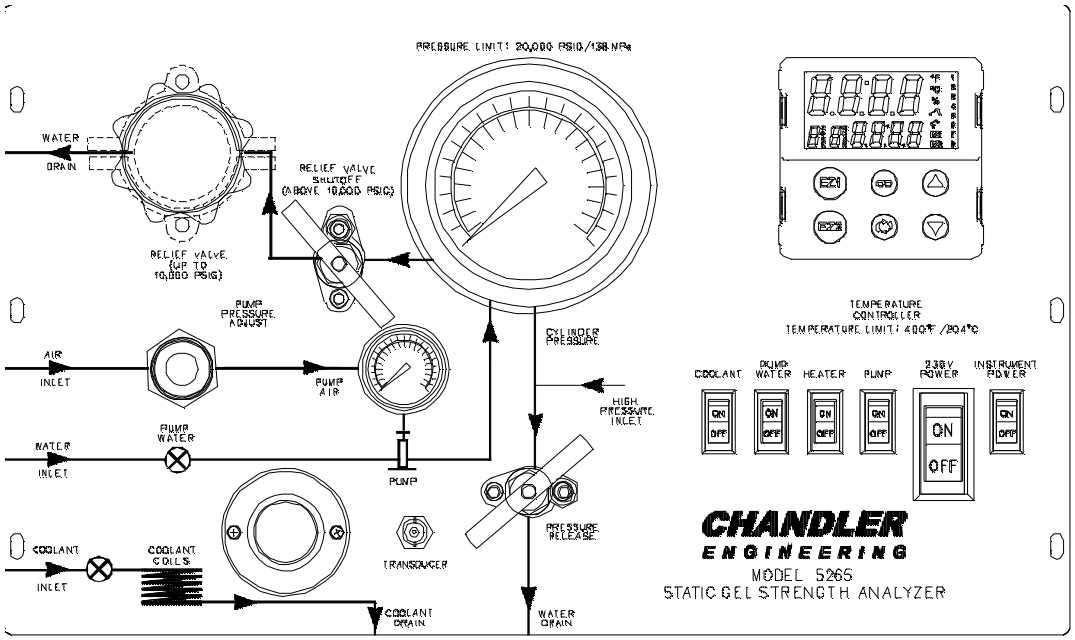
A basic schematic for connecting one autoclave to another is shown in the following figure.

One autoclave in each 5265 SGSA system must be connected to serial port COM1 on the host computer using a standard 25 pin male to 25 pin female or 25 pin male to 9 pin female RS-232 serial cable, depending on the computer.

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.



Air Inlet Gauge

This gauge displays the pressure of the air supply connected to the autoclave. The pressure should be between 50 and 100 psig (340 and 690 kPa) when the pump is not in use.

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 psig (35.5 kPa) pressure applied to the pump results in approximately a 1000 psig (7000 kPa) hydraulic pressure output from the pump.

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 psig (69,050 kPa). Turn the relief valve knob clockwise to increase pressure and counterclockwise to reduce pressure. To configure the pump and relief valve to control pressure automatically will be discussed in the section titled *Pressure Control*, discussed later in the section.

Verification of Signal Strength

You can verify the proper signal strength by running the following test:

1. Set up instrument to run a water test.
   - Starting temperature: Room temperature
   - Initial Pressure: 1,000 psig
2. Fill slurry cup with water.
3. Run test.
4. Initial gel value should be between 7000 – 7500.
5. If the initial gel value does not fall within these parameters, disassemble, inspect and clean if necessary the transducer and end cap.
6. Rerun test.

Running a Test

Relief Valve Shut-off

The relief valve is only usable up to pressures of 10,000 psig. If it is necessary to operate the autoclave at pressures above 10,000 psig, The RELIEF VALVE SHUTOFF must be turned clockwise to the closed position.

Note: Closing the relief valve shutoff valve will also isolate the internal pressure transducer. The pressure transducer will not measure pressures above 10,000 psig (69,050 kPa).

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.

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.

Coolant Switch

Used to control the flow of coolant to the heating/cooling jacket. This switch must be OFF during a test, but should be turned ON following a test to cool the heater and test cell.

If the optional chiller is used, the coolant switch has three settings: ON, OFF, AUTO. The ON setting circulates chilled fluid through the heating/cooling jacket, the OFF setting disables the heating/cooling feature, and the AUTO setting allows the temperature controller to control the chiller. After the cool-down segment of a temperature profile is complete, it is recommended to place the

coolant switch in the OFF position to avoid possible temperature oscillations at temperatures above room temperature.

Pressure Release Valve

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

Cylinder Pressure Gauge

Displays the pressure inside the test cell.

Temperature Controller

Used to control the temperature in the test cell.

Heater Switch

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.

Main Power Switch

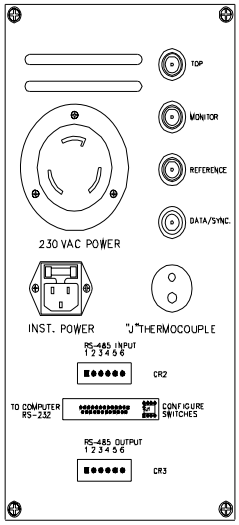
Used to turn the 220VAC power to the heater and internal solenoid valves instrument ON or OFF. Switch must be in the ON position during testing.

Instrument Power Switch

Used to turn the power to the internal instrumentation ON or OFF. Switch must be in the ON position during testing. The instrument power may be connected to an uninterruptible power supply (UPS) if desired.

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, the main power, and the fuses.



Data Cable Connector

This connection is not used on the 5265 Autoclave.

Ref Cable Connector

This connection is not used on the 5265 Autoclave.

Monitor Cable Connector

This connector is used for monitoring the ultrasonic signals within the test cell. Normally it is not used. It may be used during system testing.

Top Transducer Connector

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

J Thermocouple Connector

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 "SBr" and will not function.

Main Power Connection

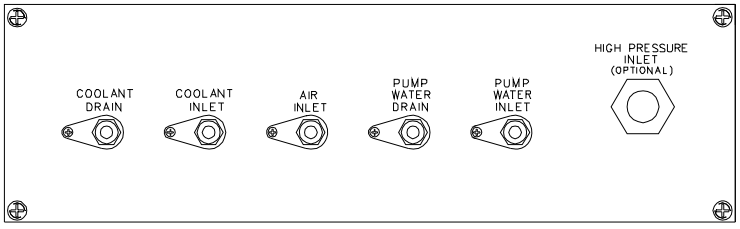
Located beside the fuses, it requires a twist lock plug to connect the power. The power required will be 208-240 VAC, 10A.

Fuses

There are two fuses (2.5A, 250VAC) 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.



Air Inlet, Pump Water Drain/Inlet

These connectors are used to connect the pneumatic and hydraulic utilities.

High Pressure Inlet (optional)

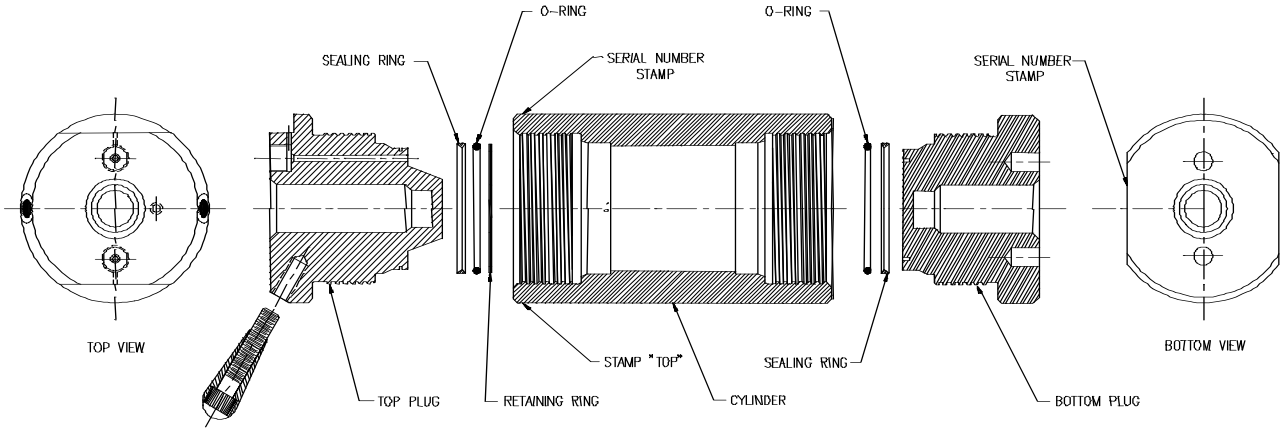
This high-pressure connector exists so that pressure may be controlled with an alternate pressure control system.

Operating the Instrument

1. Install the Model 5270 Data Acquisition Software in accordance with the instructions found in the software manual.
2. Connect power to the instrument using the cord and twist-lock connector supplied with the autoclave. It is recommended that each individual autoclave be connected to a separate circuit breaker or fuse. A 15A fuse or circuit breaker is recommended. A separate power input exists for the internal electronics. This arrangement permits the use of an uninterruptible power supply (UPS) to protect the data acquisition electronics and test data from brief power failures.
3. Connect the coolant to the connector labeled COOLANT INLET on the rear panel of the instrument as shown previously. The fitting is a 1/4-inch female NPT fitting. If water is used for cooling, the water must be clean and free of debris that could cause failure of the pump or relief valve. If in doubt, a water filter is recommended.
4. If the optional chiller is being used, connect the outlet port of the chiller system to the COOLANT INLET port and the COOLANT DRAIN port to the chiller inlet port. Configure the chiller to operate at the minimum set point temperature (41°F, 5°C).
5. Connect the pressurizing water to the connector labeled PUMP WATER INLET on the rear panel of the instrument as shown previously. The fitting is a 1/4-inch female N.P.T. fitting. The water must be clean and free of debris that could cause failure of the pump or relief valve. If in doubt, a water filter is recommended.
6. Connect the water drain line to the connector labeled PUMP WATER DRAIN on the rear panel of the instrument as shown previously. If water is used as a coolant, the COOLANT DRAIN may also be connected to the water drain line. If an external chiller is used, the COOLANT DRAIN is connected to the chiller return. The fittings are 1/4-inch female NPT fittings.

   The drain system must be capable of handling hot water up to 212°F (100°C) or brief surges of up to 400°F (204°C) steam for short periods of time during initial cooling of the instrument. If two or more autoclaves are connected to a common drain line, it is recommended that the common drain be 3/8-inch (10mm) inside diameter, minimum. It is also recommended that the drain system be all metal. Copper tubing with brass fittings is satisfactory.

7. Connect the air supply to the connector labeled AIR INLET on the rear panel of the instrument. The fitting is a 1/4-inch female N.P.T. fitting. The air should be dry and relatively free from dirt and oil. The air should be supplied at a pressure of 50-100 psi (340-690 kPa). Compressed nitrogen may also be used in place of the compressed air if necessary.



Preparing the Sample and Cell for a Test

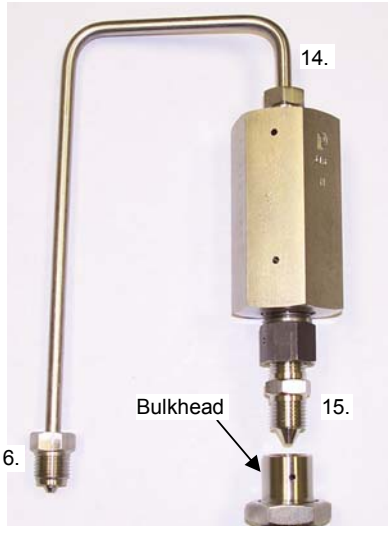
The recommended procedure for preparing the test cell and slurry for testing are outlined in the following steps:

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.
2. Apply a light coating of lithium grease to the inside cylinder and threads and also to each plug. Avoid apply grease on the flat face of the plug and base as this will affect the transducer signal. This will prevent cement from sticking to the metal and will make cleanup easier.

*Note: The test cylinder is tapered from top to bottom, with the smallest diameter at the top. This is to facilitate removal of the cement sample from the test cell. The top of the cylinder is denoted by the letter **T** stamped on the wrench flat on the top end of the cylinder.*

3. 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 and sealing ring.
4. 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, and will cause plug removal difficulty.
5. Install the transducers in the top and bottom plug using the spring and transducer support plug. Always place a thin coating of high temperature ultrasonic couplant on the sensor each time it is removed. Use the couplant sparingly. Excessive buildup of couplant can lead to instrument malfunction.
6. Mix the slurry for the test in accordance with API Spec 10 procedures. Approximately 200 mL of slurry is required to fill the cell.
7. Pour approximately 200cc of cement slurry into the greased test cell. Be careful not to get cement into the threads. If cement sets up in the threads it may make plug removal and installation difficult.

8. Continue to pour cement in test cell until level is 1/4 inch (6mm) below the circular lip in the cylinder. Use the Slurry Level Gauge to obtain the proper fill level. The slurry should touch the lower tab marked **WET** but not touch the upper tab marked **DRY**. Do not overfill the test cell, or cement will be forced into the pressure and/or thermocouple ports, and plug them.
9. Use a small amount of water to continue filling the cell up to the water fill line indicated on the slurry level gauge.
10. 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 cause more effective sealing, and will cause plug removal difficulty.
11. The test cell is ready to be installed in the heating jacket.
12. Wipe the cylinder assembly clean and place in autoclave chamber. Carefully guide the bottom transducer cable through the bottom of the heater assembly and out the front panel of the instrument. Be certain that the cylinder is not sitting on the cable. Do not crimp the cable in any way since it can change the signal characteristics. Connect the cable to the connector on the front panel.
13. Align the pressure port in the top plug with the high-pressure filter on top of the autoclave assembly. Rotate the cell clockwise to align.
14. Position the filter with the arrows (located on the side) pointing in the downward position and attach the short end of the U-tube connection to the top of the filter, as shown in the picture.
15. Attach the filter assembly into the bulkhead located on top of the instrument.
16. Connect the longer end of the tube into the top of the cylinder. Hand-tighten initially to start the threads, then use a 5/8” wrench to tighten.
17. Connect the top transducer cable to the BNC connector labeled **Top Transducer** at the back of the autoclave.
18. Install the thermocouple in the other high-pressure port in the top plug. Hand-tighten only.
19. Connect the thermocouple cable to the receptacle labeled **J Thermocouple** at the back of the autoclave.
20. Turn ON the water supply switch until water exits the thermocouple vent hole. Tighten the thermocouple connection using a 5/8-inch wrench.



Note: Use a rag or paper towel to catch water that exits the thermocouple vent.

21. The test cell and autoclave are now ready to begin a compressive strength test.

Running a Test

This section describes the steps used to control pressure and temperature in the 5265 autoclave.

Pressure Control

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 valve is turned to the ON position, 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 psig (34.5 kPa) air pressure results in approximately 1000 psig (6895 kPa) hydraulic pressure. The air pressure should not exceed 100 psig (690 kPa). Note that the pump may not be capable of achieving pressures in excess of 16,000 psig 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. Turn the PUMP switch to the OFF position. 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. Turn the PUMP PRESSURE ADJUST regulator counterclockwise until the air pressure is approximately zero.
7. Turn the PUMP switch to the ON position.
8. 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. Note that failure to apply any pressure to the slurry may result in a loss of transit time signal through the slurry.

Temperature Control

Refer to the 8050/8051 Temperature Controller Manual for information on how to program and operate the temperature controller. When the controller has been programmed and the Processor is operating properly, the test may be started by turning the HEATER switch to the ON position and selecting CM.1=AUTO on the temperature controller.

1. If the chiller is being used, place the coolant switch in the AUTO position. After the cool-down segments of a temperature profile are complete, it is recommended to place the coolant switch in the OFF position to avoid possible temperature oscillations at temperatures above room temperature.
2. To end the test, turn the HEATER switch to the OFF position.
3. Turn the Temperature Controller OFF by pressing the Advance button so that the controller displays CM.1 and pressing the up or down arrow buttons to select OFF.

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

1. Turn ON the COOLANT switch to cool the test cell. Monitor the test cell temperature using the Temperature Controller. Use the pump to maintain 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.
2. Turn the PUMP WATER switch to the OFF position.
3. Turn MAIN POWER and INSTRUMENT POWER switches OFF.
4. Close the PRESSURE RELEASE valve (clockwise). Failure to do so will result in water leakage when the U-tube or thermocouple is loosened.
5. Remove the U-shaped high-pressure tubing connecting the test cell to the high-pressure filter on the autoclave assembly.
6. Disconnect the top sensor cable.
7. Disconnect the bottom sensor cable from the front panel.
8. Remove the thermocouple or disconnect the cable.
9. Lift the test cell from the autoclave assembly. Guide the bottom transducer cable through the front panel of the instrument.

Cleaning the Test Cell

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

1. Place the test cell in a vice, topside up. Use the wrench flats and do not scratch or nick the 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. Turn the cell over and drive the cement sample out of the test cell with a hammer.
6. Clean the cement and grease from the top and bottom plugs and cylinder with solvent.
7. When all traces of cement have been removed, grease the inner surfaces of the test cell, including the seal and O-rings.
8. Replace the O-rings if they were damaged during the test.
9. The instrument is now ready to run another test.

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Section 3 – Maintenance

This section describes the basic maintenance that is required for the 5265 Autoclaves. A troubleshooting guide is also provided in the event that a problem occurs.

Maintenance

The 5265 Autoclave requires very little routine maintenance. Following the recommendations listed below will allow years of trouble free operation.

Tools Required

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

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Cleaning and Service Tips

- 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 anti-seize lubricant.
- Thoroughly clean test cell of all cement immediately after each test.
- Keep the sensor faces and cavities inside each test cell plug clean and flat.
- Always apply a thin layer of acoustic couplant to the sensor after it has been removed.
- Always recheck the transit time, using the cal bar, after cleaning the sensor and replacing the couplant.

Calibration Procedure

The temperature controller may require periodic calibration after extended use. The procedures related to calibrating the controller are found in the Model 7050/7051 controller manual.

The instrument does not require calibration for the measurement of static gel strength. The values measured are absolute and there are no user accessible adjustments.

The measurement of transit time requires periodic calibration to ensure accurate measurements. The procedure is listed as follows:

1. Remove the cell from the instrument.
2. Thoroughly clean the cell in preparation for calibration.
3. Unscrew the bottom plug until the threads are approximately 1/2 engaged.
4. Insert the foam-centering sleeve for the calibration bar.
5. Apply a small amount of acoustic couplant to the ends of the 3.5-inch calibration bar.
6. Insert the calibration bar into the cylinder and press against the bottom plug.
7. Screw the top plug into the cylinder until it engages the calibration bar. Hand-tighten only.
8. Install the cylinder assembly into the instrument. Connect the top and bottom transducer cables.
9. Using the Data Acquisition Software, enter the UCA calibration section and update the calibration values. The specifics related to calibrating using the software may be found in the Model 5270 software manual.

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

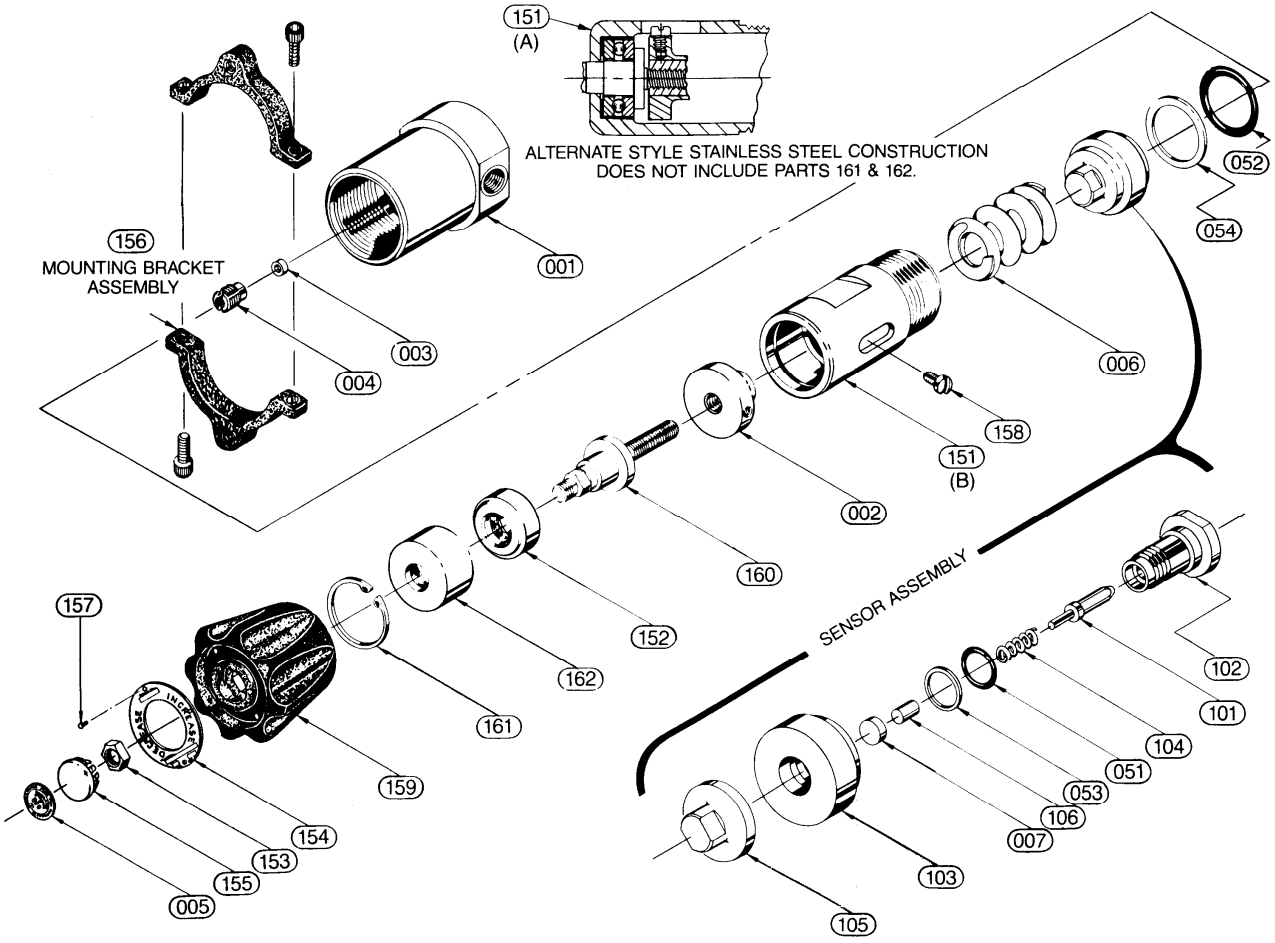
1. Unscrew the spring pad (Item 105) from the sensor (Item 102) using the 1/2" open end wrench and the large 1/2" wide screwdriver. You may wish to clamp the spring pad in a vise to perform this step.

   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.



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
MAIN POWER circuit breaker switch trips off.	Short circuit in system wiring.	Disconnect power to instrument and check for short circuits with an ohmmeter.
	Faulty MAIN 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 autoclave.	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 psig. 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.

Symptom	Possible Cause	Possible Solution
Pump operates, but will not build pressure.	CYLINDER WATER valve is not open or water is not being supplied to the instrument.	Open CYLINDER WATER valve and check flow of water to the instrument.
	High-pressure tubing or test cell has air in it.	Crack high-pressure thermocouple fitting and release any air trapped in the lines or cylinder.
	High-pressure tubing or test cell is leaking.	Check for water leakage and isolate leak.
Pump operates, but will not build pressure.	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.	CYLINDER WATER valve is open or PRESSURE RELEASE valve is open while COOLING WATER is ON.	Close CYLINDER WATER valve and/or PRESSURE RELEASE valve.
Temperature will not rise above ambient.	Blown fuse on instrument power receptacle.	Replace fuse with a 2.5A fuse.
	HEATER switch not in the ON position.	Turn heater switch to ON position.

Symptom	Possible Cause	Possible Solution
Temperature overshoots the soak value.	Temperature controller PROPORTIONAL BAND tuning parameter too low.	Increase proportional band using temperature controller tune loop.
	Temperature controller Ti tuning parameter too high.	Decrease the integral time using the temperature controller tune loop.
Measured parameters display zero when they should not.	Loose wiring.	Find and repair loose connections.
	Incorrect or missing I/O module address in software.	Use the SCAN.EXE software to map each I/O channel and make certain the software is configured to agree with the existing addresses.
	Two I/O channels have the same address.	Use the SCAN.EXE software to configure each I/O channel to have a unique address.
Transit time appears to be too small in the early portion of a test (<10 microsec/in).	Sensor may have excess couplant buildup.	Clean sensors and sensor cavities.
	Sensor may have debris under it.	Clean sensors and sensor cavities.
Loss of connection to sensor.	Dried couplant.	Clean sensor and apply new couplant, then retest the transit time with the cal bar.

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Section 6 - Replacement Parts

Part Number	Description
80-0016	Sealing Ring
80-0021	Thermocouple, Type J, 20000 psig
80-0022	Heating/Cooling Jacket, 2000 W, 50/60 Hz
80-0024	Heating Jacket End Gasket
80-0025	Heating Jacket Bottom Gasket
80-0026	Heating Jacket Centering Ring
80-0031	Anti-Rotation Bracket
80-0033	Slurry Level Gauge
80-0035	Foam Centering Sleeve
80-0050	Cable Assembly, Top & Bottom Transducer
80-0057	Calibration Bar - 3.500
83-0023	Heating Jacket Mounting Stand
83-0027	Bottom Transducer Holder
8050-5265-E	Controller,Temp,5265,F
8050-5265-M	Controller,Temp,5265,C
C05596	Bolt,HH,1/4-28X2.25
C06572	Gauge, Pressure, 100 psi
C08439	Computer Cable, 25P - 25S
C08564	Retaining Ring
C08565	O-ring, Viton
C08566	Screw,SHCS,BK,3/8-16x2.000,AL
C08570	Spring, Heater Support
C08571	Couplant, High Temp, 2 oz
C08572	Thermostat, 420 Open/380 Close
C08581	Back Pressure Regulator, 200-10 kpsi
C08582	Bulkhead Fitting, 1/4 HPT-1/4 HPT
C08584	Sensor, Ultrasonic, High Temp
C08589	Spring, Compression
C08597	QC,Brs,Socket,1/4MPT
C08606	Adapter, BNC, Male-Male
C08725	Computer Cable, 25P - 9S
C09251	Fuse,2.500A,250V,5x20,Timedelay
C09377	Pump,1/3 HP, Hydraulics Int'l
C09891	Filter,Inline,60 Micron
C09987	Kit,10kpsi,BP Reg Rebuild
C09260	Seal Kit, Hyd Int'l Pump, Hyd
C09263	Seal Kit, Hyd Int'l Pump, Air
C11293	Gauge, Pressure, 30,000 psi
07-1591	Filter Assembly, HP
P-2189	Valve, Ndl, SS, Angle
P-2197	Valve, Ndl, SS, Straight
P-3107	Solenoid Valve, 220V
P-3359	Inlet, Electrical, 20 A, 250 VAC
P-3388	Breaker, 10A, 220V

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

Section 6 - Drawings and Schematics

Drawing Number	Description
	Scan Software Setup Instructions
83-0006	Plumbing Diagram
83-0007	Wiring Diagram
83-0044	Rear Panel Layout
83-0046	Front Panel Layout
84-0057	High Temp Cable Assembly
5265-0100	Vessel Assy w/Cables

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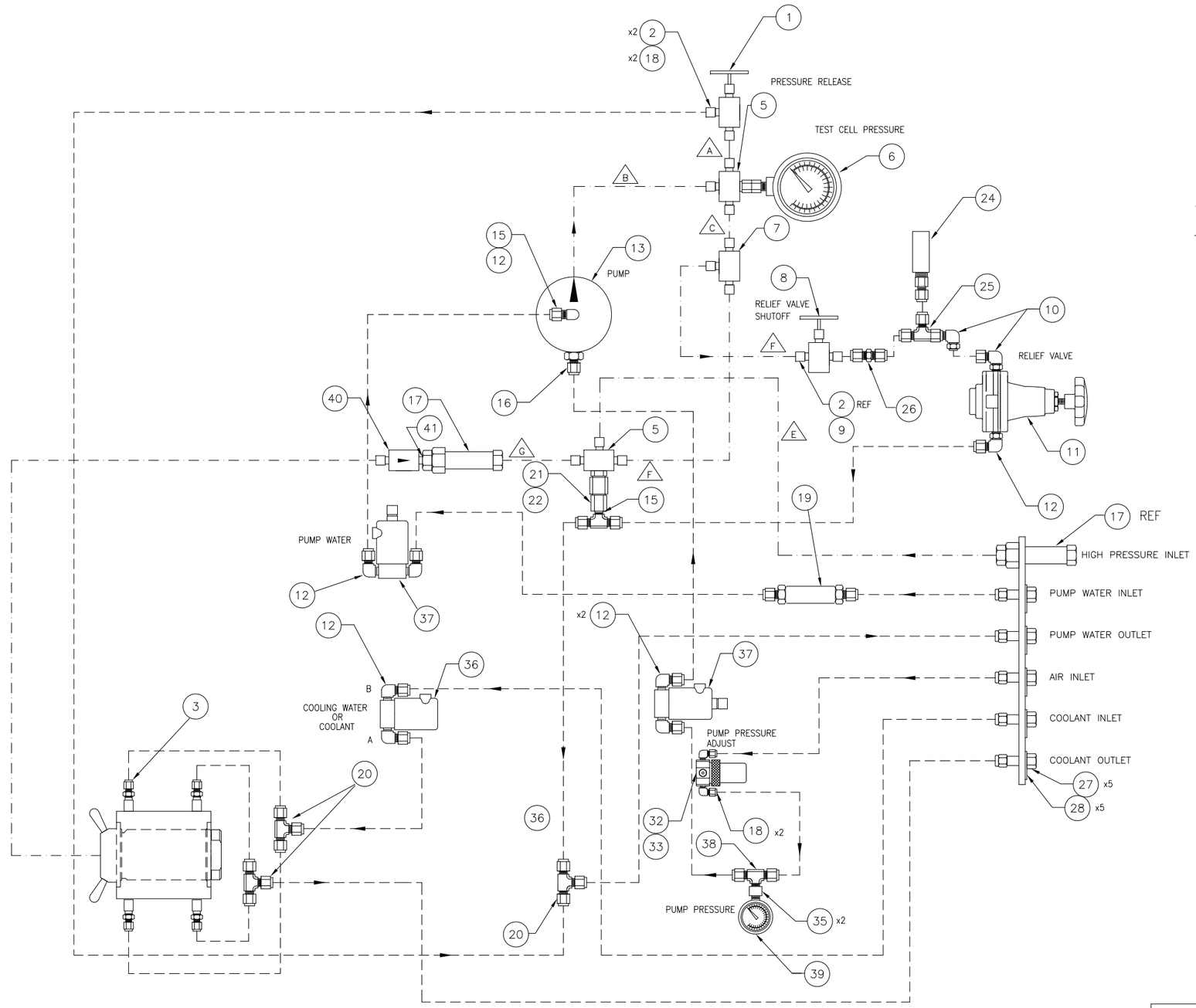
Scan Software Setup Instructions

A copy of Scan software is included with every 5270 DACS CD. The following are intended to help find and install the Scan software.

1. Insert the 5270 DACS CD into the CD player.
2. Click the “START” button located on the lower left of the Windows Desktop screen.
3. Click the “RUN” button.
4. Click the “BROWSE” button.
5. Using the pull down menu at the top, locate the drive containing the 5270 software CD.
6. Double click the “SCAN” folder.
7. Double click the “setup.exe” file.
8. Click the “OK” button and follow the install instructions.
9. The scan program is located at “C:\Program Files\Chandler Engineering – Scan”.
10. Add a shortcut on your desktop by opening the “Chandler Engineering – Scan” folder and right click the “Scan” icon. Highlight “Send To” and click “Desktop” (Create Shortcut).

NOTE: See the “HELP” menu for the online Scan Software Manual.

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	T	ECN T1061, CHANGED QTY OF ITEM 41 TO 1	7/31/07	JB/TC
	U	ECN T2372; MADE CHANGE PER ECN	07/01/09	AMH/TC
	V	ECN T3169, REPLACE ITEM 21 & 22	07/23/10	SS/TC



NOTE:

△A THRU △G REFERENCES TUBE SETS.

ITEM	QTY	NUMBER	DESCRIPTION
41	1	C08702	ADAPT,SS,1/4MHPTX1/4MHPT,HIP
40	1	P-1075	FILTER,ASSY SST 1/4 HPT
39	1	C06572	PG, 100 PSI, 1-1/2, 1/8 MP, CB
38	1	P-2293	LATCH,ADJUSTABLE GRIP
37	2	P-3107	VAL,SOL,MN,1/4FP,.09370RF,230V
36	1	C09163	CASSETTE,ROLL,CHESSEL 4103C
35	2	P-0237	COUPL,BRS,1/8FPX1/8FP
34			
33	1	P-1419	PLUG,SS,1/8MP,HP,HEX,CA
32	1	P-1887	REG,PRESS,300/100 PSI,1/8 FP
30			
29			
28	5	C08268	RETAINER,SST,3/4ID,BHD,SW
27	5	P-1954	CONN,BRS,1/4FPX1/4T,BHD,SW
26	1	187-20403	CONN,SS,1/4MPX1/8T,SW
25	1	188-02155	TEE,SS,UN,1/4FPX1/4FPX1/4FP
24	1	C08970	XDCR,PRESS,10K PSI,1-3V OUT,1%
23	1	P-2270	TEE,BRS,BR,1/4TX1/4TX1/4MPT
22	1	P-3613	DISK,RUPTURE,20000 PSI,.250,INC
21	1	69-793	SAFETY HEAD,.25 X .083 TBG
20	3	P-1265	TEE,BRS,UN,1/4TX1/4TX1/4T,SW
19	1	C09891	FILTER, INLINE,60 MICRON
18	4	P-1246	ELBOW,BRS,1/8MNPTX1/4T
17	2	C08582	CONN,1/4HPTX1/4HPT,60KPSI,BHD
16	1	P-1254	CONN,BRS, 1/4 MP x 1/4 T, SW
15	2	P-0866	BUSHG,BRS,RDCG,1/4FPX3/8MP UB
14			
13	1	C09377	PUMP, 1/3 HP, HYDRAULICS INT'L
12	8	P-1255	ELBOW,BRS,1/4MPX1/4T,SW
11	1	C08581	REG,BP,200-10KPSI,TESCOM
10	2	187-20404	ELBOW,SS,1/8TX1/4MP,SW
9	1	188-13044	CONN,SS,1/8MPX1/8T,SW
8	1	P-2192	VAL,SS,HP,NDL,ANG,1/4HP,30KPSI
7	1	P-0754	TEE,SS,1/4T,60000PSI,HIP
6	1	C11293	GAUGE,30 KPSI,4"DIA
5	2	P-0756	CROSS,SS,1/4T,60000PSI,HIP
4			
3	4	C08108	REDUCER,BRS,1/4Tx1/2T,SW
2	2	P-1059	ADAPT,SS,1/4HPTX1/8FP,HIP
1	1	P-2193	VAL,ANG SST 30000PSI 1/4HPTHIP

PART LIST

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: ACB	5/14/97
CHECKED: DJM	8/5/98
ENGR.: DJM	8/5/98

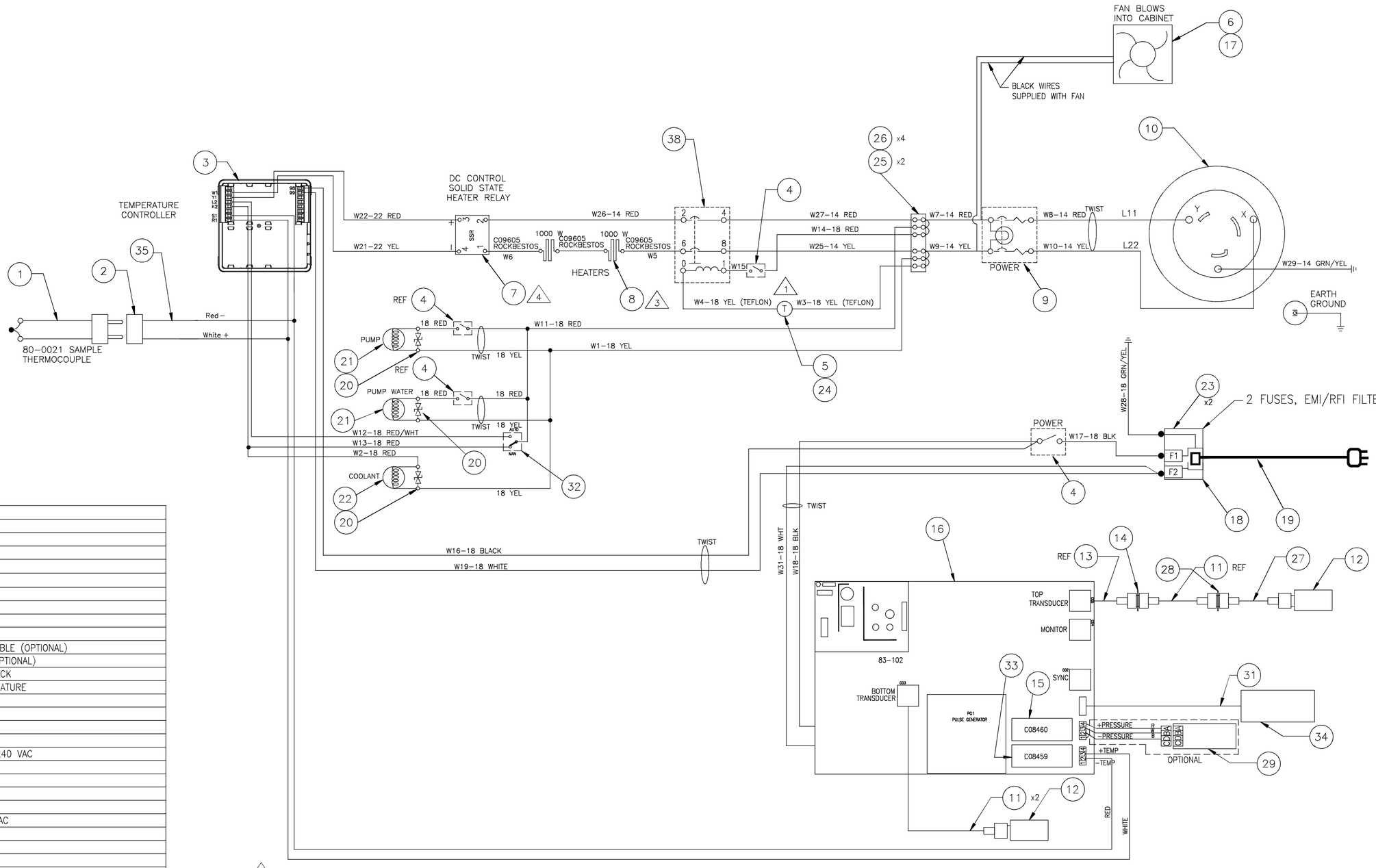
CHANDLER ENGINEERING

TITLE: PIPING DIAGRAM
STATIC GELL STRENGTH ANALYZER

SIZE	S.O. NO.	DWG NO.	REV.
D		83-0006	V

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

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	Y	ECN T5378; CHANGED TO WATLOW CONTROLLER	6/13/13	TRB
	Z	ECN T5484; CORRECTED SSR WIRING TO CONTROLLER	8/14/13	TRB

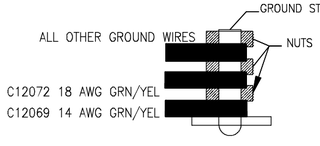


ITEM	QTY	NUMBER	DESCRIPTION
38	1	C08999	RELAY,DPST 240VAC 25A
37			
35	2'	C07251	WIRE, T/C
34	1	80-0112-01	R/S 485 I/O BOARD
33	1	C08459	I/O MODULES (TEMP)
32	1	C08126	SWITCH, 3-WAY
31	1	80-117	RS-485 I/O CABLE
30	1	7015-0302	PRESSURE TRANSDUCER CABLE (OPTIONAL)
29	1	C08970	PRESSURE TRANSDUCER (OPTIONAL)
28	1	C08606	ADPTR, BNC, STR, JACK-JACK
27	1	84-0057	ASSY, CABLE, HIGH TEMPERATURE
26	4	P-2005	JUMPER
25	2	P-417	TERMINAL STRIP
24	1		SOLDER, HMP (HIGH TEMP)
23	2	C09251	FUSE, 2.5 AMPS
22	1	C09163	SOLENOID VALVE, 2-WAY, 240 VAC
21	2	P-3107	SOLENOID VALVE, 240 VAC
20	3	C06892	THYSISTOR, 240V
19	1	P-2441	CORD SET, 120 VAC
18	1	C08968	POWER RECEPTACLE
17	1	C08889	FAN, 80 x 42 mm, 230 VAC
16	1	83-102	PC CARD ASS'Y
15	1	C08460	I/O MODULE PRESSURE
14	2	C08587	ADAPTER, BNC, BHD
13	1	80-0051	CABLE, COAXIAL, 30 INCH
12	1	C08584	TRANSDUCER, ULTRASONIC (PAIR)
11	2	80-0050	CABLE, TOP & BOTTOM TRANSDUCER
10	1	P-3359	POWER CONNECTOR, 250V, 20A
9	1	C12162	CIRCUIT BRKR, 10A, 240V, 0-1
8	1	80-0022	HEATING/COOLING JACKET
7	1	C08262	RELAY, SSR, 240VAC, 45V, CHASSIS
6	1	C08890	GUARD, FAN, 3-1/8",AC & DC
5	1	C08572	THERMOSTAT, 400°F
4	4	C12161	SWITCH, RCKR, PNL, SPST, ON-XX-OFF
3	1	C15678	CONTROLLER,1/4,1IP,1LGC,1TRIAC
2	1	P-2380	PANEL JACK, J THERMOCOUPLE
1	1	80-0021	THERMOCOUPLE, TYPE J

PART LIST

1. USE HIGH TEMPERATURE SOLDER WITH SOLDERING IRON DEDICATED TO HIGH TEMPERATURE SOLDER. THIS IS TO PREVENT CONTAMINATION OF HIGH TEMPERATURE SOLDER WITH LOW TEMPERATURE SOLDER. COVER CONNECTIONS WITH TEFLON HEAT SHRINK TUBING.
2. ALL POWER WIRING TO BE TWISTED PAIRS WHERE POSSIBLE.
3. USE RTV SEALENT (DOW CORNING 736) ON 80-0022 (HEATER)
4. APPLY THERMAL COMPOUND BEFORE MOUNTING C07932
5. APPLY ONE C12233 GROUND LABEL TO CHASSIS NEXT TO GROUND POST. SECURE EACH GROUND WIRE FROM THE POWER INLET (GREEN/YELLOW) AS SHOWN UNDER A NUT (ALL OTHER GROUND WIRES CAN BE HELD UNDER A SINGLE NUT).

GROUND STUD DIAGRAM



		UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]		CHANDLER ENGINEERING	
		TOLERANCES:			
	STATIC GEL STRENGTH	1 PLACE ±0.030 [.76]			
NEXT ASSY	USED ON	2 PLACE ±0.010 [.25]			
APPLICATION		3 PLACE ±0.005 [.127]		TITLE	SGSA WIRING DIAGRAM
		ANGLES ±1/2°			
BREAK SHARP EDGES, DEBURR		SURF. FINISH 32			
		APPROVALS	DATE		
This document and the drawings and technical data contained hereon are the property of Chandler Engineering Company LLC. Reproduction or dissemination in any form except as expressly authorized by the owner is forbidden. The holder agrees to return this document to the owner on demand.		DRAWN: AEB	5/14/97	SIZE C	S.O. NO.
		CHECKED: JJM	8/18/99	DWG NO. 83-0007	REV. Z
Copyright by Chandler Engineering Company LLC		ENGR.: JJM	8/18/99	SCALE: 1 = 1	TITLE BLOCK REV: 1.0
				SHEET: 1 of 1	

FILE NAME 083044A1.dwg | SHT. 1 of 1 | REV. A

REVISIONS				
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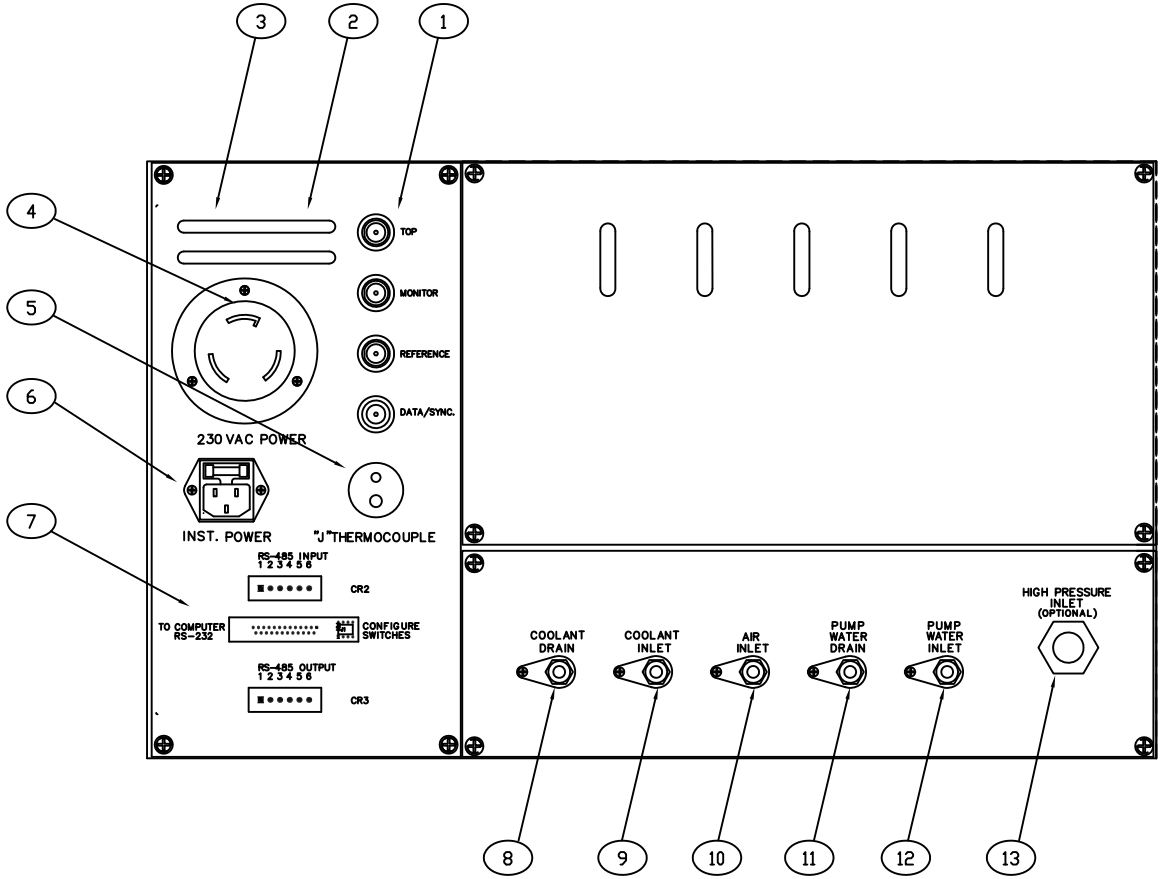


COMPONENTS

1. BNC CONNECTOR (TOP)
2. BNC CONNECTOR (MONITOR)
3. BNC CONNECTOR (SYNC)
4. 230V POWER RECEPT.
5. TYPE "J" THERMOCOUPLE RECEPT.
6. INSTRUMENT POWER RECEPTACLE
7. RS232/RS485 CONNECTIONS
8. COOLANT DRAIN CONNECTOR
9. COOLANT INLET CONNECTOR
10. AIR INLET CONNECTOR
11. PUMP WATER DRAIN CONNECTOR
12. PUMP WATER INLET CONNECTOR
13. HIGH PRESSURE INLET (OPTIONAL)

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
					AL, SHT, .125, TYPE 3003/5052		1

PARTS LIST

QTY. REQD.

NEXT ASSY | USED ON

APPLICATION

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:	AGB	7/16/97
CHECKED:		7/16/97
ENGR.:		7/16/97

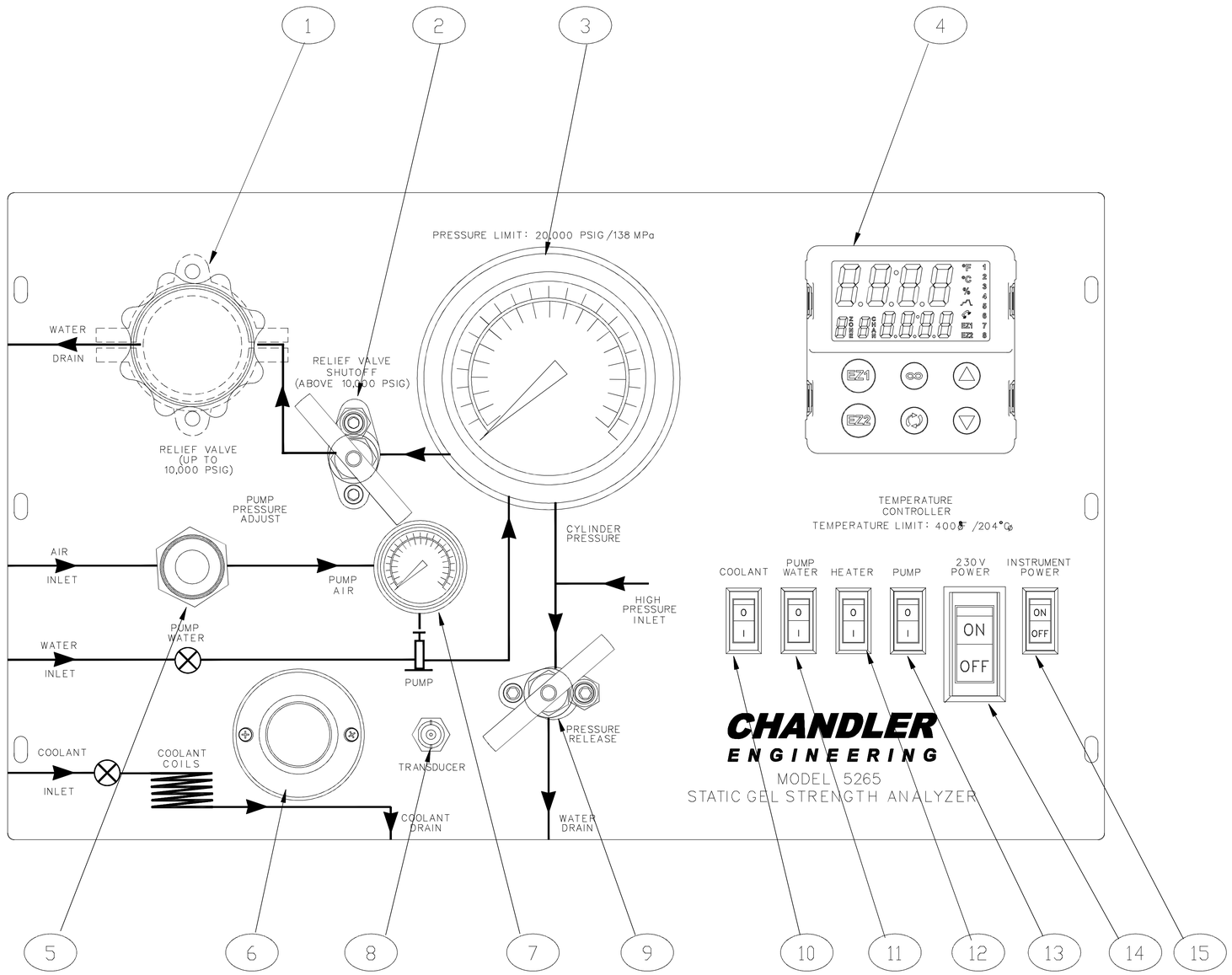
CHANDLER ENGINEERING

TITLE: REAR PANEL LAYOUT

SIZE	S.O. NO.	DWG NO.	REV.
		83-0044	A

SCALE: .5X | DO NOT SCALE DRAWING | SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	E	ECN T5378; CHANGED CONTROLLER TYPE	6/13/13	TRB
	F	ECN T5625; UPDATED SWITCH INFO	11/25/13	TC



1. C08581 – RELIEF VALVE
2. P–2192 – RELIEF VALVE SHUT–OFF
3. C11293 – PRESSURE GAUGE
4. C15678 – TEMPERATURE CONTROLLER
5. P–1887 – PUMP PRESSURE ADJUST
6. 83–0026 – TRANSDUCER CABLE RETURN
7. C06572 – PUMP PRESSURE GAUGE
8. C08587 – TRANSDUCER CONNECT
9. P–2193 – PRESSURE RELEASE VALVE
10. C12161 – COOLANT SWITCH
11. C12161 – PUMP WATER SWITCH
12. C12161 – HEATER SWITCH
13. C12166 – PUMP SWITCH
14. P–3388 – 230V POWER SWITCH
15. P–2881 – INSTRUMENT POWER SWITCH

–04	–03	–02	–01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.				PARTS LIST			
NEXT ASSY				USED ON			

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

APPLICATION

	APPROVALS	DATE
DRAWN:	AEB	5/5/97
CHECKED:	JJM	5/5/97
ENGR.:	JJM	5/5/97

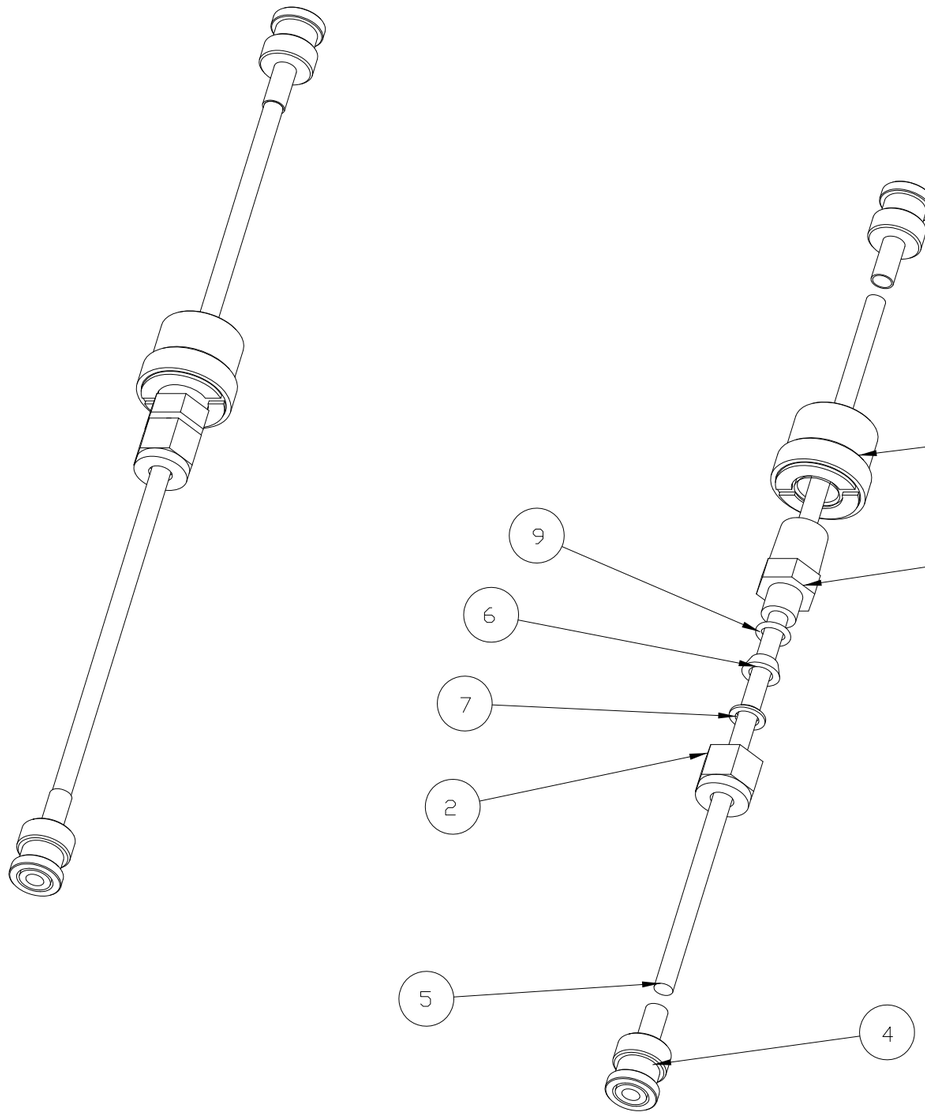
CHANDLER ENGINEERING

TITLE
FRONT PANEL LAYOUT
STATIC GELL STRENGTH TESTER

SIZE	S.O. NO.	DWG NO.	REV.
A1		83–0046	F

SCALE: 1 = 1 DO NOT SCALE DRAWING SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	ISSUED	3/16/99	JJM
	B	[6590] UPDATED	01/10/00	JJM
	C	[6696]; CHANGED ITEM 5	06/06/00	AMW/JH
	D	[7266]; REMOVED SPRING	02/15/01	AMW/BD



			1	P-0061	O-RING		9
							8
			1	C09033	FERRULE, BACK, TFE		7
			1	C09032	FERRULE, FRONT, TFE		6
			1	C09035	CABLE, COAXIAL, 8.5"L		5
			2	C08578	CONNECTOR, BNC		4
							3
			1	84-0061	FITTING, CABLE		2
			1	84-0027	SLEEVE, TOP CONNECTOR		1
-03	-02	-01		PART NUMBER	DESCRIPTION	MAT'L SPEC	ITEM
QUANTITY REQ'D				PARTS LIST			

84-0045	MODEL 4262
NEXT ASS'Y	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED, DIMENSIONS IN INCHES [mm] TOLERANCES:

.X	±0.030
.XX	±0.010
.XXX	±0.005
X°	±0.50°

APPROVAL	DATE
DRN: JJM	16-Mar-99
CHK: JJM	16-Mar-99
ENG: JJM	16-Mar-99

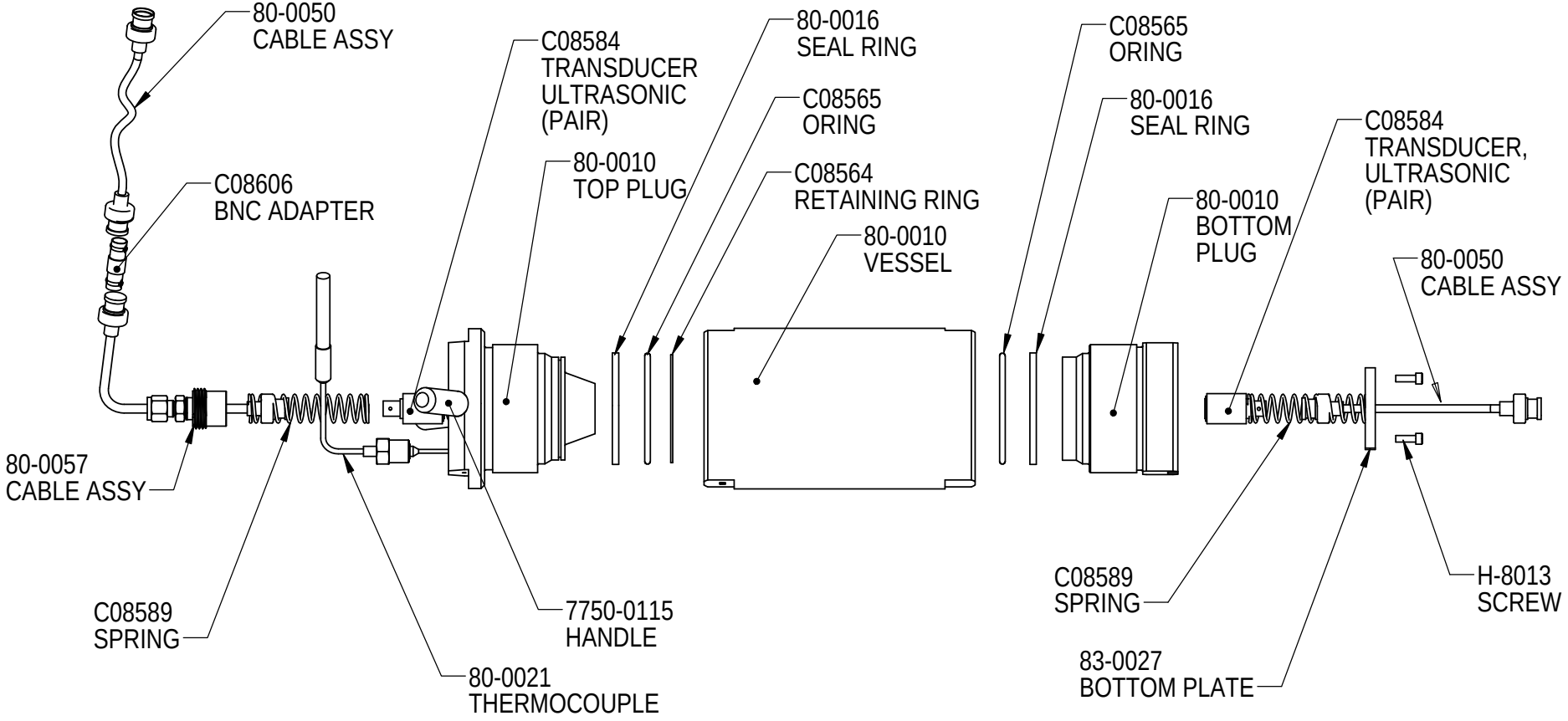
CHANDLER ENGINEERING

TITLE: ASS'Y, CABLE, HIGH TEMP

SIZE	DWG NO.	REV.
A2	84-0057	D

SCALE: 1.000 SHEET 1 OF 1

REV	DESCRIPTION	DATE	APPROVED
A	ISSUED	1/21/16	TC



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: TWC 1/21/2016
MFG: SL 01-21-16
ENGR: JJM 01-21-16
TYPE:
STRUCT:

CHANDLER ENGINEERING

VESSEL ASSY W/CABLES

PN: 5265-0100 | REV A | SIZE A
PROJ: | SHEET 1 OF 1

TITLE BLOCK REV 3