Instruction Manual
Pressurized Curing Chamber
Models 7350, 7370
and 7375

Revision N – May 2014
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S/N: _____

AMETEK®
CHANDLER
ENGINEERING®

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General Information

Instrument Application

The Pressure Curing Chamber is used for curing tensile or compression specimens of oil well cements at elevated temperatures and at pressures above atmospheric, simulating conditions in the well.

Briefly, the procedure is to prepare the test specimens according to API Spec. 10[(1)]. The specimen slurries are poured into molds, and the molds are lowered into the pressure curing cylinder. The cylinder plug is installed, the thermocouple is inserted into the cylinder head, and the cylinder is filled with water to expel air. Heat, regulated by an Automatic Temperature Program System, and pressure are then applied to the cylinder in accordance with applicable schedules of API Spec. 10[(1)]. Maximum pressure and temperature are maintained until shortly before the end of the curing time specified. The temperature is then reduced, pressure is regulated to atmospheric, and the test specimens are removed for testing.

Equipment Description

Model Number	Maximum			Input Power		Circuit Breaker
	Temperature		Pressure	MPa	kVA	
	°F	°C	psi x1000			
7350	700	370	3	21	6	30A
7370	700	370	3	21	4.5	30A
7375*	700	370	3	21	8.5	45A

Model Number	# of Cubes	Weight				Shipping Dimensions
		Net		Ship		
		Lb	kg	Lb	Kg	W x D x H
7350	3	780	354	1080	491	41x38x79 (104x96x200cm)
7370	3	520	236	700	381	36x38x66 (91x97x200cm)
7375*	3	1030	468	1200	545	53x38x66 (134x97x167cm)

**Note: The Model 7375 is a dual cell unit*

References [1]American Petroleum Institute; API Specification 10 for Materials and Testing for Well cements, Latest Edition; Dallas, Texas.

Features

- Microprocessor-based temperature controller
- Digital temperature indicator
- Programmable multi-slope temperature controller
- High wattage heater
- Stainless steel pressure vessel (series 73)
- Metal-to-metal sealing ring
- Operating temperatures to 700°F (370°C)
- Operating pressures to 3000 psi (21 MPa)
- Stainless steel enclosure
- Cooling coil (inside of cylinder)
- Single or dual cells available

Safety features are incorporated into the curing chamber. Adjustable switches are installed in the pressure gauge for shutting off operational power, if pressure falls below, or goes above, a selected point. Over-pressure protection is furnished by a relief valve, through which water exhausts if pressure exceeds the 3000 psi (21 MPa) indicating pressure-gauge limit. A rupture disc rated at 5000 psi (34 MPa) is also incorporated as an additional safety feature.

Section 1 - Installation

Prior to operating this instrument, the technician should study the drawings accompanying the operating and maintenance instructions to become thoroughly familiar with the curing chamber operation and its parts.

Before a curing chamber leaves the factory, several tests are conducted to affirm that the assembly meets performance standards.

Unpacking the Instrument

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

Note: File an insurance claim with your freight carrier if damage has occurred during shipment. Verify that all parts received appear on the enclosed packing list. If items are missing, please notify Chandler Engineering immediately.

Help Line

On site training classes are available. For more information, contact our Sales Department at Chandler Engineering. (918) 250-7200, or visit our Website @ www.chandlereng.com.

If you encounter problems during your installation or with any phase of operation, contact our service department. We would also appreciate your suggestions on product improvements. Please call our factory at (918) 250-7200 for service, supplies, or problems and ask for one of our trained product support specialists in the sales or service departments.

Utilities Required

The utilities required to operate the typical instrument are compressed air at 100-125 psi (690-862 kPa); intermittent flow with 5 gal (20 liter) reservoir tank, and electric current of 240-volt, single-phase, 50 Hz/60 Hz. The circuit breaker needs to be sized based on the instrument rating. Refer to the table in the previous section for circuit breaker ratings.

Cooling Water: 20-80 psi/138-552 kPa; nominal flow 2 lpm. Water is used as the hydraulic medium and is wasted after each test.

Connection of Water, Air, and Electrical Services

Hose or copper tubing may be used for the water supply connections to the curing chamber. All connections are located at the rear of the cabinet. The electrical cable (supplied with instrument) is to be connected to mating receptacle. This unit is supplied with an installation kit, which includes the necessary hardware for the water, air, and electrical hook-ups.

Caution: Wiring should comply with local electrical codes. Pressure curing chamber should be securely connected to separate ground. The ground wire must have a larger diameter than that of the supply voltage conductors.

Water coming from the cooling coils, during a high-temperature test, will vaporize into steam. If the outlet tube becomes hot, a correct outlet tube must be installed. Copper tubing is recommended instead of a hose connection. This outlet also must handle discharge in the event of blow-out disc rupture.

Tools and Equipment Required

A standard maintenance or mechanics tool set is adequate for the installation, operation, and maintenance of the instrument. No special tools are required.

Safety Requirements

READ BEFORE ATTEMPTING OPERATION OF INSTRUMENT!

Any instrument that is capable of extremely high temperatures and pressures, such as a curing chamber, should always be operated with CAUTION. The instrument is designed for operator safety; however, to ensure that safety:

- Locate the instrument in a **low traffic area**.
- Post signs where the instrument is being operated, to warn non-operating personnel.
- **Read** and **understand** instructions before attempting operation; observe warning and caution notes throughout this manual.
- Observe and follow the **Warning Labels** on the instrument.
- **Never** exceed the instrument maximum pressure and temperature ratings secured on the machine.
- **Always** disconnect main power to the instrument before attempting any repair or when opening the instrument cabinet; **HIGH VOLTAGE CAN KILL!**
- Keep front access doors **closed** when operating instrument.
- A fire extinguisher, Type 8 BC should be located within 50 feet of instrument.

Note: All Chandler Engineering equipment are calibrated and tested prior to shipment.

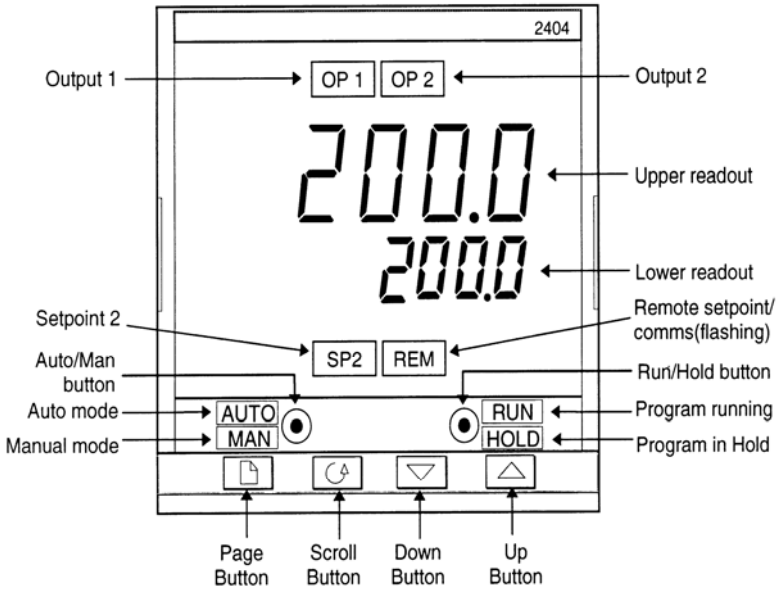
Controller Set-Up

1. Turn controller on. Press 🗎 button until the program menu appears.

2. Press the scroll button until tgt (target set point) is reached. This is the temperature at end of ramp. Press στ (UP/DOWN) button to change value.

3. Press ☟(scroll) button until dur (duration). This is the time to reach tgt set point. Press στ to change value.

4. Press 🗎(PAGE) button until the current process value is displayed.



For complete operating instructions, see the *7050/7051 Operating Instructions* included with your order.

Section 2 - Operation

Placing Molds in Pressure Cylinder

1. Line up each brass mold on the bottom plate, with center tube in place, and fill greased molds with slurry prepared in accordance with *API Spec 10(1)*. Place the cover on each mold, with slotted side down (pin in plate goes through matched hole in mold).

2. Clamp molds with "T" handle to prevent spillage of slurry.

3. Lower molds into cylinder. Unscrew and remove the "T" handle.

4. Thoroughly lubricate plug threads and seal ring with "Liqui-Moly" or similar high temperature lubricant. Lower the plug into the cylinder and screw down firmly to ensure metal-to-metal seat. Use a torque wrench to tighten set screws.

Caution: Too rapid spinning of plug handles when seating plug will cause binding of metal-to-metal seal, and plug removal will be difficult. Final two turns of plug should be spun more slowly, following instructions on drawing 07-0749.

5. Thread thermocouple fitting part way into cylinder head. Delay tightening thermocouple gland until cylinder is completely full and no air remains.

6. Open Water Inlet Valve to allow water to enter cylinder and force air trapped in cylinder to escape through thermocouple gland. When water begins to flow past gland, tighten thermocouple fitting.

Pressurizing the Cylinder

1. Open air supply valve fully.

2. Turn on pump switch.

3. Adjust air pressure to air-operated hydraulic pump by turning regulator handle clockwise until desired pressure is reached. (Refer to the control panel drawings for regulator location.)

Caution: Too rapid a pumping cycle can cause air lock in pump piston cavity.

4. When cylinder is pressurized to the desired limit, and pump slows down, adjust air pressure regulator to maintain pressure schedule.

5. Adjust the pressure switch gauge at the gauge dial by turning control knobs to the desired low and high safety cut-off pressures. Loss of pressure (water leaks) or over-pressure of cylinder will cause power switch to automatically cut off power to curing chamber.

Applying Heat to the Cylinder

1. Turn Heater switch to ON. (Current will not be supplied to the element until the **START** pad is depressed on the microprocessor controller.)

2. Program the desired schedule into the 7050 controller. Complete program and operating instructions are included in the 7050/7051 manual.

Caution: To avoid water hammer in the cooling coils, connect the air supply to the water inlet connection and blow the water from the coils before beginning a test. (Water remaining in the U-shaped cooling coils will vaporize during a high-temperature test and cause water hammer.)

Starting a Test

1. Press **AUTO/MAN** button to place controller in auto mode.

2. Press **RUN/HOLD** button to start the program.

3. Switch the heater to on.

Stop and Cool

1. Turn off the heater at the switch.

2. Press and hold the **RUN/HOLD** button until run light is off.

3. Press the **AUTO/MAN** button to place the controller in the manual mode.

4. Use στ buttons to change output value to"**0.0%**."

Cooling of Cylinder

1. Slowly "crack" the cooling water valve open and then close (open and close periodically).

2. Leave the pressure bleed valve closed and adjust the pump to maintain pressure. Water will then be pumped into the cylinder and improve cooling coil efficiency. Control the pump at the regulator to limit the amount of cold water contacting the hot cylinder.

Standard cooling procedures can be followed after the temperature reaches 500ºF (260°C) (saturated steam pressure 4.7 MPa).

The internal cooling coils provide rapid cooling and rapid reductions of pressure due to thermal contraction. The rate of pressure loss should be reduced by leaving the water inlet valve open and adjusting the regulator knob to keep pressure above 500 psi (3.5 MPa). The pressure switch gauge should be set to "**0**", in order that the switch contact will not affect the true pressure reading and permit the air-operated hydraulic pump to operate.

3. When the cylinder and plug are cooled below 200ºF (93°C), turn off the pump, open the pressure bleed and water inlet valves, and circulate water through the cylinder for more rapid cooling.

Caution: Cool cylinder as long as API Spec 10(1) schedule permits. If water circulation is stopped prematurely, heat from cylinder will cause a rise in temperature of the water remaining in the cylinder, and water can become a hazardous steam.

Emptying the Cylinder of Water

1. Close cooling water valve.

2. Open the pressure bleed valve and turn off the water inlet valve.

3. Open air-to-cylinder valve. After water has drained from the cylinder, as indicated by air coming out of the drain, close the air-to-cylinder valve.

4. Unscrew the thermocouple gland on the cylinder head and remove the thermocouple.

5. Loosen the set screws on the cylinder plug head.

6. Unscrew the cylinder plug and lift the plug from the cylinder.

7. Attach a "T" handle or eye bolt to the molds and lift them from the cylinder.

8. Transfer molds to the water bath, according to *API Spec. 10*.

Special Technique for 600°F (315°C to 750°F (400°C)

The critical temperature of water is 705°F (374°C). At this temperature, the pressure is 3205 psig (22 MPa).

Therefore, operation of the curing chamber at temperatures above (or closely approaching) critical requires a special technique because the pressure medium is no longer a liquid, but a supercritical fluid.

Caution: To avoid water hammer in the cooling coils, connect the air supply to the water inlet connection and blow water from the coils before beginning a test. (Water remaining in the U-shaped cooling coils will vaporize during a high-temperature test and cause water hammer.)

Protection of Relief Valve Seat

Close the lower pressure relief cut-off valve. The relief valve has a soft seat, a requirement for leak-tight operation, and although the valve is separated by approximately 10 feet of tubing from the hot cylinder, constant bleeding will cause the seat of the valve to melt. Bleed pressure to the desired level through the pressure bleed valve.

Section 3 – Maintenance Schedule

Component	Each Test	Monthly	3 Months	6 Months	Annual
Cylinder	Check Plug Seal Surface				Test By Qualified Factory Tech.
Temp Controller		Check Calibration			
Piping	Check For Leaks				
Molds	Check Surfaces For Nicks				
Pump			Clean Check Valves		
Pressure Gauge				Check Calibration	Cal. By Qualified Factory Tech.
Thermocouple Circuit		Calibrate			
Lubrication		Lubricate Plug Threads			
Relief Valve					Replace Seat
Pump Lubricator		Replace Oil In Lubricator			
Heaters					Test By Qual. Factory Tech.
High Pressure Filter		Clean			
Low Pressure Filter		Replace Filter			

Cleaning and Service Tips

Before each test, cement and other foreign matter should be cleaned off the plug and cylinder threads, the threads should be wiped dry, and the threads and seal ring should be lubricated with "Liqui-Moly" or similar high-temperature lubricant. The factory application of “Xylan" and the technician's application of lubricant before each test enable effortless cylinder-plug removal, even after most severe high-temperature testing.

1. The top and sealing surface of the seal ring (see cylinder assembly drawings) and mating surface of the cylinder plug should also be kept clean and lubricated to prevent metal galling.

2. If loose cement falls into the bottom of the cylinder, the waste should be removed immediately to prevent it from being forced out through the pressure bleed valve. This will erode the stem and seat shortening the valve life, and plug the connecting tubing.

3. The relief valve seat is a high-temperature plastic and may require replacement if damaged by foreign particles. The high-pressure filter in the relief valve inlet may occasionally require cleaning.

4. Add SAE 10 oil to the air lubricator on the air-operated pressure pump as required (avoid running the lubricator dry). Occasionally, this lubricator should be checked to affirm that oil is being fed into the air inlet to the pump at a rate of three to five drops per minute when the pump is operating.

Sufficient coil length was allowed by the factory to permit several gasket installations before a new coil is required. If necessary, replacement gaskets can be installed on the cooling coils as follows:

1. Cut off tip end of coil immediately above brass ferrules.

2. Remove the coil at the open cylinder end. Install replacement gaskets. Use new ferrules at tip ends. Bend copper tubes connecting to the ends of the shorter coil.

Section 4 – Troubleshooting Guide

PROBLEM	CHECK THIS	DO THIS
No Power	Fuses Or Breakers	Reset Or Replace
Will Not Heat	Heater Switch Heater Fuse Temp. Controller	Turn On Replace Check Program
Won't Hold Pressure	Pressure Bleed Valve External Leak	Close Tighten Connections
*Can't Release Pressure	Pressure Release Valve High Pressure Filter	Replace Clean Or Replace
High Pressure	Bad Relief Valve	Replace
Shut-Down Failure	Rupture Disc	Replace
Erratic Temperature	Thermocouple Socket or Plug Temperature Controller	Clean Setup
Will Not Pump	Air Supply Valve Regulator Pump Switch	Open Turn Clockwise Turn On
Won't Cool	Water Supply Cool Water Valve	Connect Open
Cylinder Plug Leaking	Plug Loose Seal Dirty	Tighten Clean And Inspect

*Special instructions for releasing pressure if high-pressure filter is plugged: disconnect the low-pressure tubing from the air-to-cylinder valve; slowly open the air-to-cylinder valve to release pressure.

Section 5 - Replacement Parts – Model 7350

Part Number	Description
07-0176	Thermocouple Assembly
07-0386	Mold Hanger Assembly
07-0781	Mounting Bracket
07-0829	Hook Hanger
07-0830	Eye Hanger
07-0845	Mold, H.T.
07-0886	Mold Cover Plate
07-0908	Winch Handwheel
07-0964	Relief Valve, 3k psi
07-1273	Cable Assembly
07-1558	Swivel Arm
C07548	Fuse, 2.5 A, 250V, 3AG, Slow-Blow
C07676	Inlet, 250V, 50A
C09111	Needle Valve, 1/4T x 1/4T, SST, Angle
C09215	Back Pressure Regulator, 50-6000 psig
C11318	Winch, Manual Crank
C15588	Controller
P-0284	Panel Regulator, 5-125 psi, .25FP
P-0308	Needle Valve, 1/4T X 1/4T, Brass
P-0317	Solenoid Valve, 120V, .250FP
P-0407	Toggle Switch
P-0409	Toggle Switch, DPDT, 3A, 125V
P-0452	Lamp
P-0458	Indicator w/Red Lens
P-0518	Hydraulic Lubricant
P-0586	Check Valve, .25FP x .25FP, SST
P-0654	Cable Assembly
P-0674	Muffler
P-0784	Rupture Disc
P-0876	Fuse, 30A, 250V
P-0877	Fuse, 1-30A, 250V
P-0908	Air-Hyd. Pump, 4600 x 100 psi
P-1130	Fuse, 1 Amp, 250V, 3AG, Slow-Blow
P-1434	Fuse, 3A, 125V, 3AG, Slow-Blow
P-1587	Grease, Liqui-Moly
P-1662	Fuse, 2A, 250V, 3AG, Fast-Blow
P-1838	Gauge, 5000 psi
P-1840	Gauge, 100 psi/700 kPa, SST
P-2265	Fuse Holder
P-2610	Fuse, 0.25A, 250V
P-3091	Screw, Zero Cross
R-0596	Insulation 1.00”T

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

Model 7370

Part Number	Description
07-0389	Heater Strap
07-0454	Gasket
07-0773	Insulation Jacket
07-0774	Thermocouple Assembly
07-0778	Internal Cooling Coil
07-0779	Thermocouple, Cylinder, Adapter
07-0845	Mold, H.T.
07-0886	Mold Cover Plate
07-0964	Relief Valve, 3k psi
07-1273	Cable Assembly
C07676	Inlet, 250V, 50A
C08262	Relay
C09111	Needle Valve, 1/4T x 1/4T, SST, Angle
7050	Controller, Eurotherm, Programmed
P-0284	Panel Regulator, 5-125 psi, .25FP
P-0308	Needle Valve, 1/4T X 1/4T, Brass
P-0317	Solenoid Valve, 120V, .250FP
P-0403	Pushbutton Switch
P-0405	Pushbutton Switch
P-0407	Toggle Switch
P-0452	Lamp
P-0458	Indicator w/Red Lens
P-0518	Hydraulic Lubricant
P-0586	Check Valve, .25FP x .25FP, SST
P-0674	Muffler
P-0784	Rupture Disc
P-0817	Filter Element
P-0876	Fuse, 30A, 250V
P-0877	Fuse Holder, 1-30A, 250V
P-0908	Air-Hyd. Pump, 4600 x 100 psi
P-1130	Fuse, 1 Amp, 250V, 3AG, Slow-Blow
P-1279	Valve, Relief, Brass
P-1349	Heater Ring, 500W, 240V 4.0”dia
P-1587	Grease, Liqui-Moly
P-1757	Gasket, Buna
P-1812	Heater, Half Circle, 750W, 120V, 9 x 3.5
P-1838	Gauge, 5000 psi
P-2265	Fuse Holder
P-2610	Fuse, 0.250A, 250V, 3AG, Time-delay
P-3107	Valve, Solenoid
R-0596	Insulation 1.00”T

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

Model 7375

Part Number	Description
07-0389	Heater Strap
07-0454	Gasket
07-0773	Insulation Jacket
07-0774	Thermocouple Assembly
07-0778	Internal Cooling Coil
07-0779	Thermocouple, Cylinder, Adapter
07-0845	Mold, H.T.
07-0886	Mold Cover Plate
07-0964	Relief Valve, 3k psi
07-0967	Oil Filter Assembly
07-1273	Cable Assembly
C07358	Filter, 1/8T x 1/8T, SST
C08262	Relay
C09111	Needle Valve, 1/4T x 1/4T, SST, Angle
C15588	Controller
P-0284	Panel Regulator, 5-125 psi, .25FP
P-0308	Needle Valve, 1/4T X 1/4T, Brass
P-0405	Toggle Switch
P-0407	Toggle Switch
P-0452	Lamp
P-0458	Indicator w/Red Lens
P-0518	Hydraulic Lubricant
P-0586	Check Valve, .25FP x .25FP, SST
P-0674	Muffler
P-0784	Rupture Disc
P-0817	Filter Element
P-0876	Fuse, 30A, 250V
P-0877	Fuse Holder, 1-30A, 250V
P-0908	Air-Hyd. Pump, 4600 x 100 psi
P-1130	Fuse, 1A, 250V, 3AG, Time-delay
P-1280	Air Filter
P-1349	Heater Ring, 500W, 240V 4.0”dia
P-1434	Fuse, 3A, 125V, 3AG Slo-Blo
P-1456	O-Ring, Buna
P-1587	Grease, Liqui-Moly
P-1812	Heater, Half Circle, 750W, 120V, 9 x 3.5
P-1838	Gauge, 5000 psi
P-2209	Switch, Pushbutton
P-2265	Fuse Holder, 3AG
P-2610	Fuse, 0.25A, 250V
R-0596	Insulation 1.00”T

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

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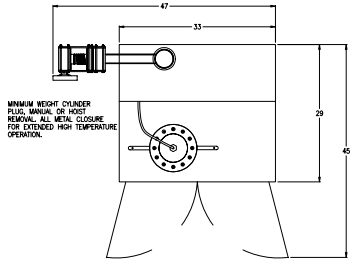
Section 6 - Drawings and Schematics

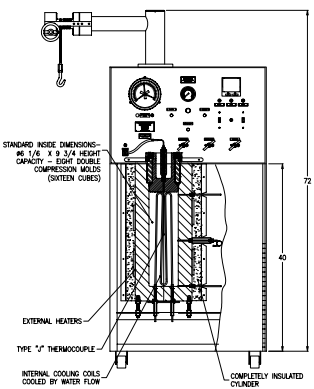
Drawing Number	Description
07-0350	Model 7350 Curing Chamber
07-0381	Assembly, Swivel Arm
07-0397	P-1279 Relief Valve Assembly
07-0700	Model 7370 Curing Chamber
07-0701	Assembly, Cylinder
07-0749	Modified Bridgeman Seal
07-0750	Model 7375 Curing Chamber
07-0834	Diagram, Piping (Model 7370)
07-0853	Panel Identification (Model 7370)
07-0860	Assembly, Double Compression Mold
07-0863	Panel Identification (Model 7375)
07-0889	Schematic, Wiring (Model 7370)
07-0896	Diagram, Piping (Model 7350)
07-0923	Schematic, Wiring (Model 7350)
07-1026	Assembly, Safety Head
07-1206	Schematic, Piping (Model 7375)
07-1207	Schematic, Wiring (Model 7375)
07-1386	Panel Identification (Model 7375)
07-1388	Wiring Schematic, Duplex w/Recorders (Model 7375)
07-1389	Plumbing Diagram, Duplex (Model 7375)

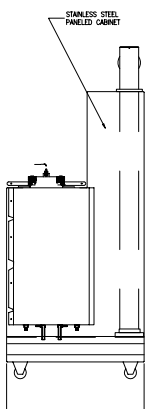
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	ISSUED	09/07/99	

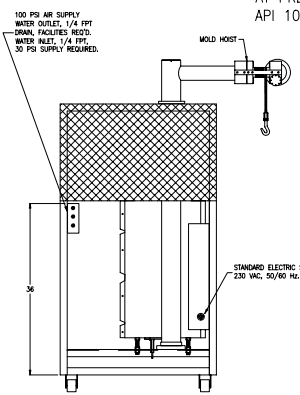


SPECIFICATIONS

1. WORKING PRESSURE; 3,000 PSI (21 MPa)
   3,000 PSI (21 MPa)RELIEF VALVE
   BLOWOUT DISC : 5000 PSI (34 MPa).
2. HEATER CAPACITY: 4500 WATTS.
3. STAINLESS STEEL CYLNDER AND TUBING.
4. INSTRUMENT CONFORMS TO RECOMMENDED PRACTICE FOR CURING CEMENT SPECIMENS AT PRESSURES ABOVE ATMOSPHERIC AS PER API 10B SCHEDULES.







-04	-03	-02	-01	PART NUMBER	– NOTED – DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.					PARTS LIST		

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

CHANDLER ENGINEERING

TITLE: MODEL 7350 CURING CHAMBER

NEXT ASSY | USED ON | APPLICATION | APPROVALS | DATE

DRAWN:	MGB	09/07/99	SIZE	S.O. NO.	DWG NO.	REV.
CHECKED:			A2		07–350	A
ENGR.:			SCALE: 1 = 1	DO NOT SCALE DRAWING	SHEET: 1 of 1	

REVISIONS					
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS	
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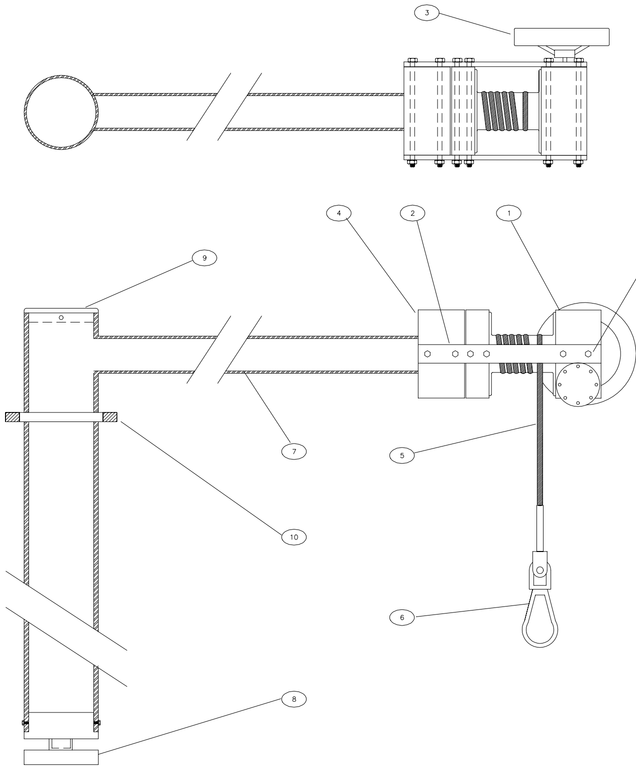


			A/R	H-0038	(5) BOLTS, (5) NUT, (5) WASHERS, 3/8-16 X 5		11
			1	07-0021	GUIDE PLATE		10
			1	07-0016	TOP CAP		9
			1	07-0018	PIVOT HEAD		8
			1	07-0382	SWIVEL ARM		7
			1	P-2158	HOOK, SNAP SWIVEL		6
			1	P-0654	CABLE ASSSEMBLY		5
			1	07-0909	COLLAR		4
			1	07-0908	HANDWHEEL, HOIST		3
			2	07-0910	SUPPORT, HOIST		2
			1	P-1918	HOIST, MOLD		1
-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.				PARTS LIST			

NEXT ASSY	USED ON
07-350-00	7350

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]

TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

APPROVALS		DATE
DRAWN:	AMW	01-23-01
CHECKED:	BD	01-23-01
ENGR.:	BD	01-23-01

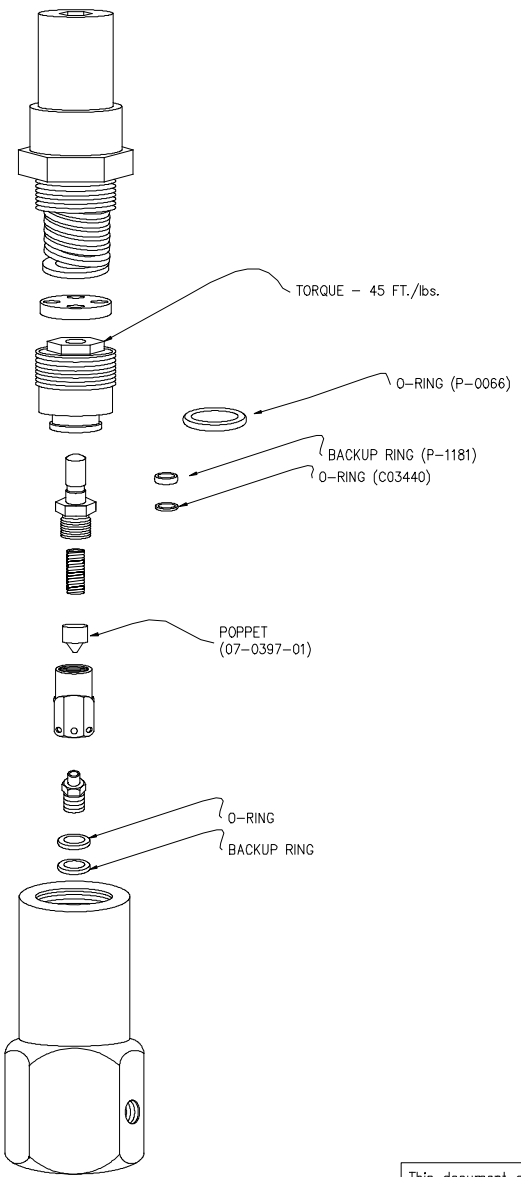
CHANDLER ENGINEERING

TITLE
ASS'Y, SWIVEL ARM

SIZE	S.O. NO.	DWG NO.	REV.
		07-0381	D

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

REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
	C	ECN T4118; UPDATED BOM	8/24/11	TC TC



5300 SERIES INSTRUCTIONS

Dissasemble valve as illustrated. Remove o-rings, poppet, and stem seal back up rings. Moisten fingers, sparingly, with *DC55 lube (MIL-L-4343) and massage new o-rings before installation. Lube o-rings, back up rings, threads, and spring ends.
Reassemble valve. Adjust to desired cracking pressure by inserting hex socket wrench in top of valve. Tighten lock nut.

*Dow Corning, Midland, Michigan

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
			1	07-0397-01	POPPET		4
			1	P-1811	RING,BACKUP,TEFLON,SPL		3
			1	P-0066	ORING,BUNA,AS113-70		2
			1	C03440	ORING,BUNA,AS006-70		1

QTY. REQD. — PARTS LIST

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]

TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

APPROVALS		DATE
DRAWN:	WES	01/04/85
CHECKED:	GDJ	01/04/85
ENGR.:	GDJ	01/04/85

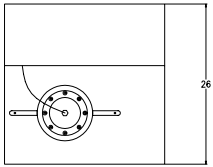
CHANDLER ENGINEERING

TITLE
ASSEMBLY
P-1279 RELIEF VALVE

SIZE	S.O. NO.	DWG NO.	REV.
A4		07-0397	C

SCALE: | DO NOT SCALE DRAWING | SHEET: 1 OF 1

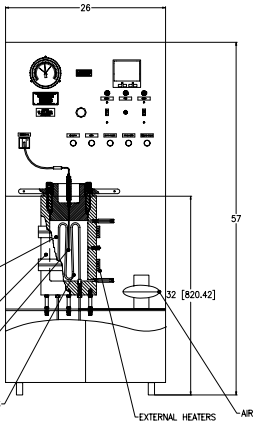
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	ISSUED		

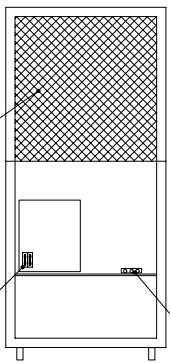


MINIMUM WEIGHT CYLINDER PLUG, MANUAL REMOVAL. ALL METAL CLOSURE FOR EXTENDED HIGH TEMPERATURE OPERATION.

SPECIFICATIONS

1. WORKING PRESSURE; 3,000 PSI (21 MPa)
   3,000 PSI (21 MPa)RELIEF VALVE
   BLOWOUT DISC : 5000 PSI (34 MPa).
2. HEATER CAPACITY: 4500 WATTS.
3. STAINLESS STEEL CYLINDER AND TUBING.
4. INSTRUMENT CONFORMS TO RECOMMENDED PRACTICE FOR CURING CEMENT SPECIMENS AT PRESSURES ABOVE ATMOSPHERIC AS PER API 10 SCHEDULES.





-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.				PARTS LIST			

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES (mm)
TOLERANCES:
1 PLACE ±.030 [.76]
2 PLACE ±.010 [.25]
3 PLACE ±.005 [.127]
ANGLES ±1/2°
SURF. FINISH 32

CHANDLER ENGINEERING

TITLE
MODEL 7370
CURING CHAMBER

NEXT ASSY | USED ON

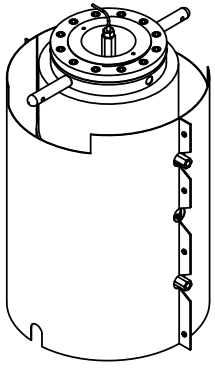
APPLICATION

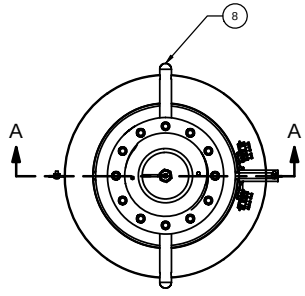
APPROVALS	DATE
DRAWN: ACB	09/07/99
CHECKED:	
ENGR.:	

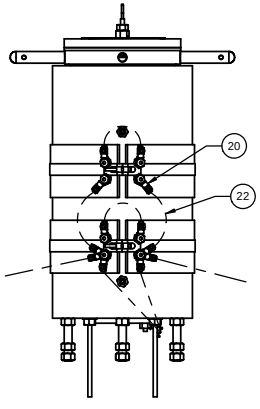
SIZE A2 | S.O. NO. | DWG NO. 07-0700 | REV. E

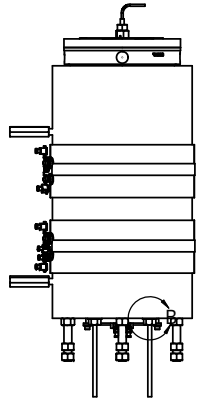
SCALE: 1 = 1 | DO NOT SCALE DRAWING | SHEET: 1 of 1

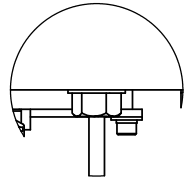
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	R	ECN T2863; ADDED ITEM 25	3/31/10	TC
	S	ECN T4195, CHG QTY OF P-1812 TO 2 SETS	10/21/11	TC



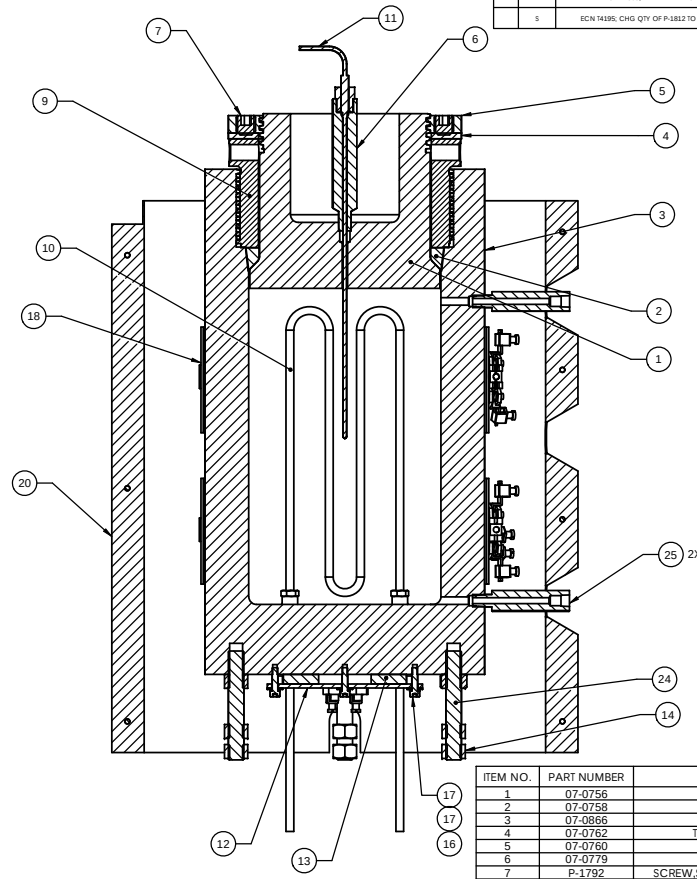








DETAIL B
SCALE 1 : 1

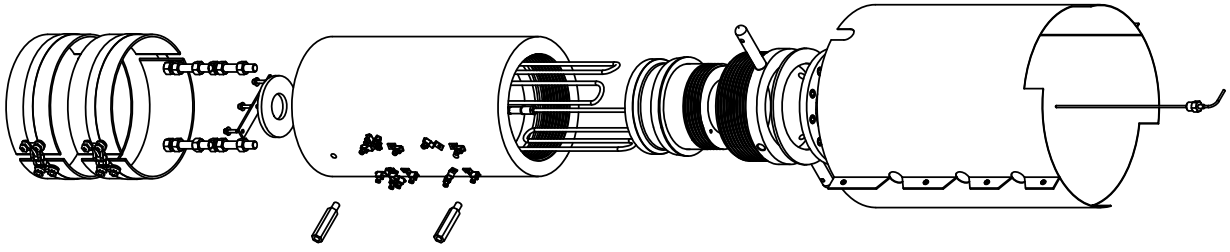


SECTION A-A
SCALE 1 : 2

NOTES:
1. PRESSURE TEST PER 07-1350.
2. TORQUE SPECS AND SEQUENCING PER 07-0749.
3. COAT WITH C12056, SUPER SILVER SEALANT.

CYLINDER DIMENSIONS:

OUTSIDE DIA.: 9" (22.9 CM)
OUTSIDE LENGTH: 16-1/4" (41.3 CM)
INSIDE DIA.: 6-3/16 (15.7 CM)
INSIDE DEPTH: 11" (27.9 CM)
WALL THICKNESS: 1-3/8" (3.5 CM)
END THICKNESS: 2-1/4" (5.7 CM)



ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	07-0756	SHAFT, SEAL	1
2	07-0758	RING, SEAL	1
3	07-0866	CYLINDER	1
4	07-0762	THRUST WASHER	1
5	07-0760	LOCKNUT	1
6	07-0779	ADAPTER	1
7	P-1792	SCREW,SKHSS,5/8-11X5/8LG,FL	12
8	07-0772	HANDLE, PLUG	2
9	07-0754	PLUG, CYLINDER	1
10	07-0778	COIL, INTERNAL COOLING	2
11	07-0774	THERMOCOUPLE	1
12	07-0389	HEATER STRAP	1
13	P-1349	HEATER, RING, 500W, 240V, 4.0 DIA	1
14	H-50-001	NUT, 1/2-13	12
15	H-10-003	WASHER,FLAT,SS,#10	3
16	H-10-002	WSHR,LOCK,SS,#10	3
17	H-10-125	SCREW,SHCS,SS,10-32 X .750,AL	3
18	P-1812	HEATER, HALF CR, 750W, 120V	2 SETS
19	P-2031	LUG ,#14-#6 CABLE,#10 STUD	14
20	07-0773	INSULATION JACKET	1
21	R-1421	WIRE, 12 AWG, TAN, HI TEMP, TGGT	10'
22	R-0596	INSULATION, 1.0T, DURA BLKT #4DNS	8.75'
24	R-0679	ST,ALL THREAD,1/2-13,CR	4
25	07-0777	ADAPTER	2

PARTS LIST

QTY. REQD.		UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES		
		TOLERANCES:		
		1 PLACE	±0.030	
		2 PLACE	±0.010	
-	-	3 PLACE	±0.005	
NEXT ASSY	USED ON	ANGLES	±1/2°	
		SURF. FINISH	32	
APPLICATION		APPROVALS	DATE	
BREAK SHARP EDGES, DEBURR				

CHANDLER ENGINEERING

TITLE: ASSY, CYLINDER

DRAWN:	TC	9/11/09	
CHECKED:	TC	9/11/09	
ENGR.:	JJM	9/11/09	

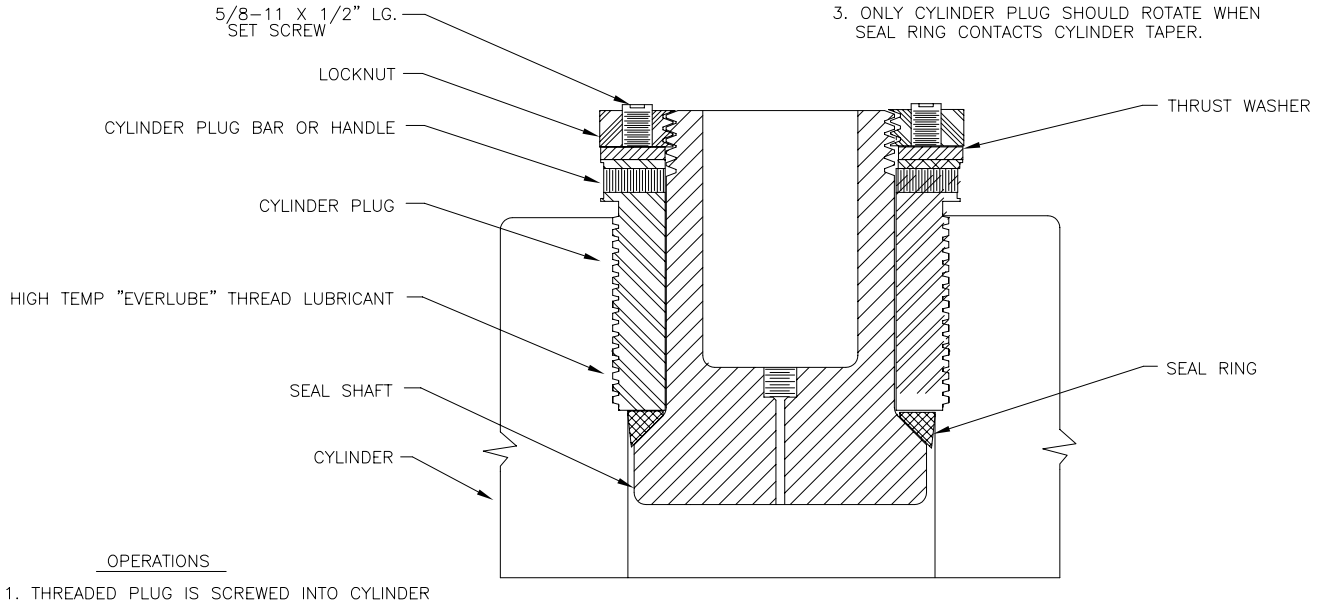
SIZE: D | DWG NO.: 07-0701 | REV.: S

SCALE: 1:12 | TITLE BLOCK REV: 2.0 | SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
ALL	D	ECN 7100; CHANGED REV LETTER	01/24.01	AMW/BD

NOTES

1. KEEP SEAL SURFACES CLEAN.
2. TIGHTEN OPPOSING SET SCREWS TO 35 ft–lbs (47N–m) TORQUE PER SHEET 2 OF 2.
3. ONLY CYLINDER PLUG SHOULD ROTATE WHEN SEAL RING CONTACTS CYLINDER TAPER.



OPERATIONS

1. THREADED PLUG IS SCREWED INTO CYLINDER UNTIL CONTACT IS MADE BETWEEN SEAL RING AND CYLINDER. BAR IS USED TO GENTLY TIGHTEN PLUG.
2. SET SCREWS ARE TIGHTENED ACCORDING TO PATTERN SHOWN ON SHEET 2 OF 2, PULLING SEAL SHAFT AGAINST SEAL RING AND MAKING INITIAL SEAL.
3. INTERNAL PRESSURE THEN FORMS A TIGHTER JOINT.

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

CHANDLER ENGINEERING

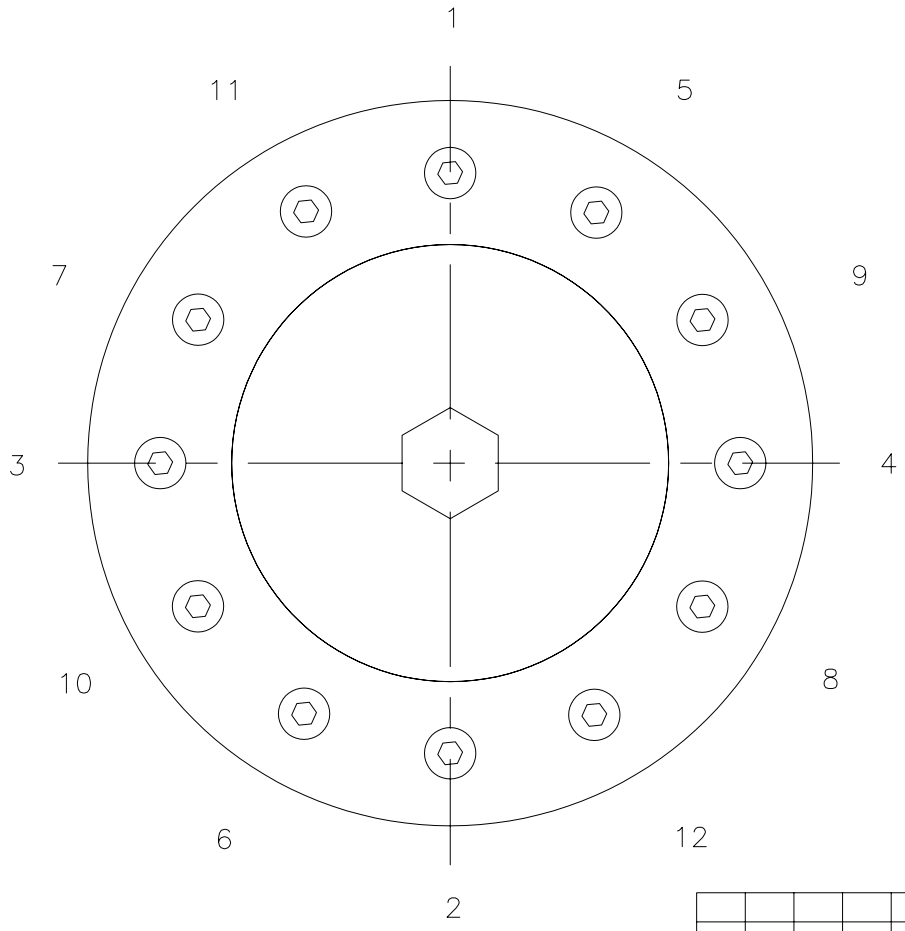
TITLE
MODIFIED BRIDGEMAN SEAL

APPROVALS	DATE
DRAWN: AEB	01/27/99
CHECKED: JH	01/28/99
ENGR.: JJM	01/28/99

SIZE	S.O. NO.	DWG NO.	REV.
A3		07–0749	D

SCALE: 1 = 1 | DO NOT SCALE DRAWING | SHEET: 1 of 2

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
ALL	C	ECN 7100; CHANGED REV LETTER	01/24/01	AMW/BD



1. TORQUE SCREWS AS PATTERN INDICATES
2. TORQUE SCREWS TO 20 ft–lbs (27 N–m) FIRST ROTATION
3. TORQUE SCREWS TO 35 ft–lbs (47 N–m) DURING SECOND ROTATION

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

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

CHANDLER ENGINEERING

TITLE
MODIFIED BRIDGEMAN SEAL

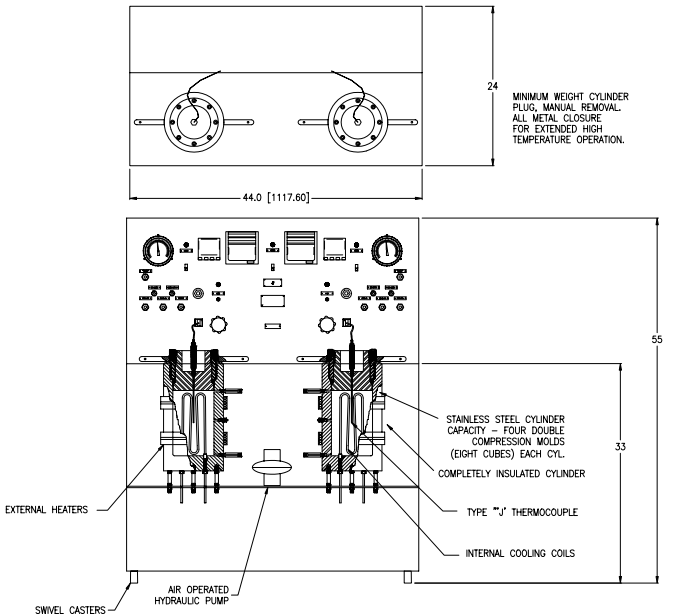
NEXT ASSY	USED ON
APPLICATION	

APPROVALS	DATE
DRAWN: AEB	01/27/99
CHECKED: JM	01/28/99
ENGR.: JM	01/28/99

SIZE	S.O. NO.	DWG NO.	REV.
A3		07–0749	D

SCALE: 1 = 1 DO NOT SCALE DRAWING SHEET: 2 of 2

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	ISSUED	09/07/99	



SPECIFICATIONS

1. WORKING PRESSURE; 3,000 PSI (21 MPa) @700°F.
   5,000 PSI (21 MPa)RELIEF VALVE
   BLOWOUT DISC : 5000 PSI (34 MPa).
2. PROVIDE DRAIN FACILITIES FOR COOLING
   AND CYLINDER WATER; 100 PSI AIR FOR PUMP.
3. STAINLESS STEEL CYLNDER AND TUBING.
4. INSTRUMENT CONFORMS TO RECOMMENDED
   PRACTICE FOR CURING CEMENT SPECIMENS
   AT PRESSURES ABOVE ATMOSPHERIC AS PER
   API 10B SCHEDULES.
5. ELECTRICAL REQUIREMENTS: 230 VAC, 50/60HZ, 30A, IPH.
6. SAFETY PRESSURE SWITCHES SHUT–OFF
   HEATERS AND PUMP IN EVENT OF LEAK.

100 PSI(700KPA) AIR SUPPLY
WATER OUTLET, 1/4 FPT
DRAIN, FACILITIES REQ'D.
WATER INLET, 1/4 FPT,
30 PSI SUPPLY REQUIRED.
STANDARD ELECTRIC SUPPLY:
230 VAC, 50/60 Hz. 30A

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.					PARTS LIST		

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

CHANDLER ENGINEERING

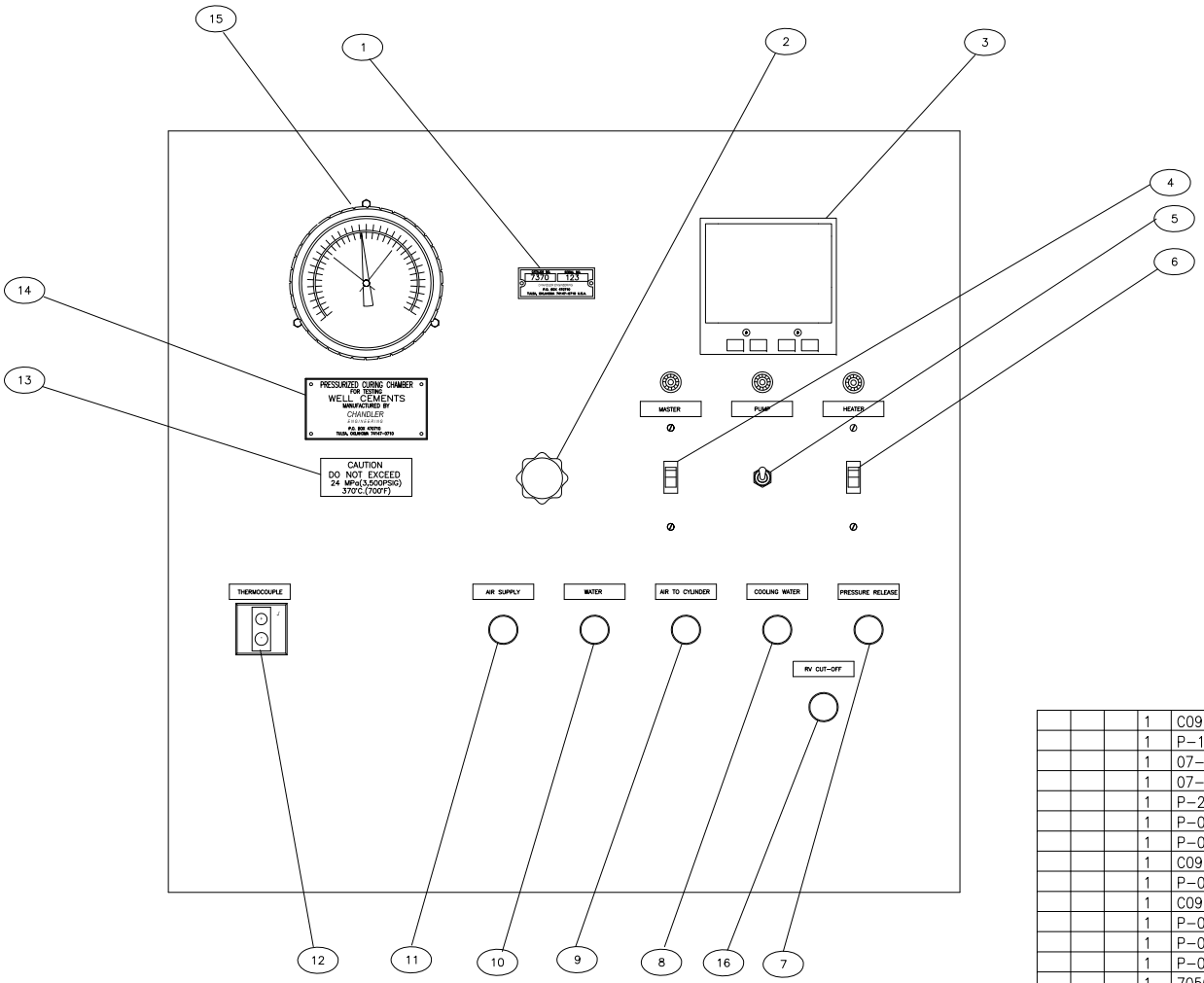
TITLE
MODEL 7375

NEXT ASSY | USED ON | APPLICATION | APPROVALS | DATE

DRAWN: AGB 09/07/99
CHECKED:
ENGR.:

SIZE A2 | S.O. NO. | DWG NO. 07-0750 | REV. A
SCALE: 1 = 1 | DO NOT SCALE DRAWING | SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
	J	ECN 7244; ADDED RELIEF CUT-OFF VALVE	01-31-01	AMW JH
	K	ECN T1947; SWITCHED ITEMS 1 & 2	10/14/08	SS TC



-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
			1	C09188	VALVE, CUT-OFF RELIEF		16
			1	P-1838	GAUGE, PRESSURE SWITCH		15
			1	07-0263	NAME PLATE		14
			1	07-0912	PLATE, RESTRICTION, PRESSURE/TEMPERARTURE		13
			1	P-2380	SOCKET, "THERMOCOUPLE"		12
			1	P-0308	VALVE, "AIR SUPPLY"		11
			1	P-0308	VALVE, "WATER INLET"		10
			1	C09111	VALVE, "AIR-TO-CYLINDER"		9
			1	P-0308	VALVE, "COOLING WATER"		8
			1	C09111	VALVE, "PRESSURE RELEASE"		7
			1	P-0403	"HEATER" SWITCH		6
			1	P-0407	"PUMP" SWITCH		5
			1	P-0405	"MASTER" SWITCH		4
			1	7050	TEMPERATURE CONTROLLER		3
			1	P-0284	AIR REGULATOR		2
			1	57-0003	SERIAL NUMBER PLATE		1

QTY. REQD. | PARTS LIST

7370 | COMPACT C.C.

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 63

APPROVALS	DATE
DRAWN: AMW	01/24/01
CHECKED: RD	01/24/01
ENGR.: RD	01/24/01

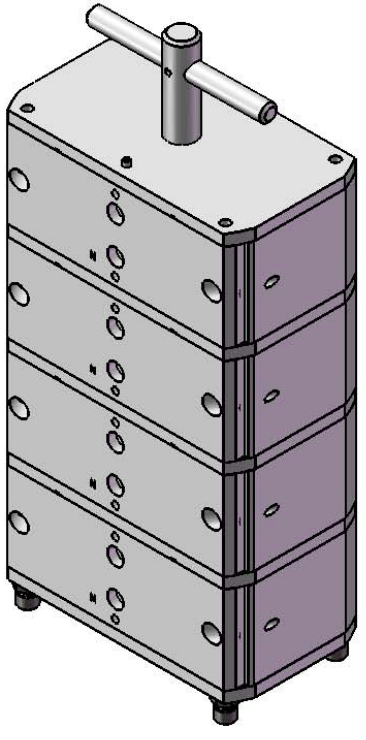
CHANDLER ENGINEERING

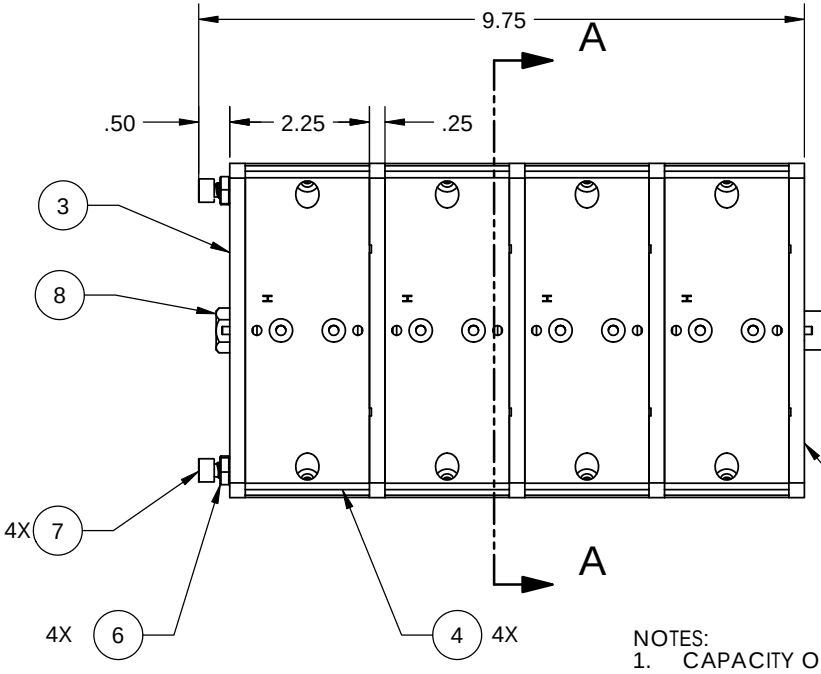
TITLE: PANEL IDENTIFICATION
COMPACT CURING CHAMBER

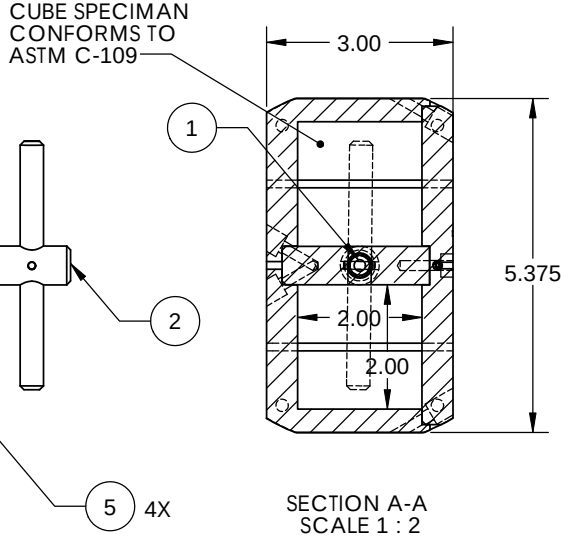
SIZE	S.O. NO.	DWG NO.	REV.
A2		07-0853	K

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

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	G	ECN T3327; H-37-003 WAS H-37-102	9/21/10	TC







SECTION A-A
SCALE 1 : 2

NOTES:
1. CAPACITY OF COMPACT CURING CHAMBER CYLINDER
4 DOUBLE COMPRESSION MOLDS (8 CUBES) (SHOWN)
8 DOUBLE COMPRESSION MOLDS (16 DUMBELLS) OR
ANY COMBINATION NOT EXCEEDING A STACKED HEIGHT
OF 11 1/8"

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	07-0797	CENTER TUBE	1
2	07-0796	HANDLE, T	1
3	07-0882	PLATE, BOTTOM	1
4	07-0845	ASSEMBLY, MOLD	4
5	07-0886	PLATE, COVER	4
6	H-25-002	NUT,SST,HX,10-32	4
7	H-25-010	SCREW,SHCS,SS,1/4-20X0.500,ALN	4
8	H-37-003	NUT,HEX,SS,3/8-16	1

.	.
.	.
.	.
NEXT ASSY	USED ON
APPLICATION	
BREAK SHARP EDGES, DEBURR	

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES

TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

APPROVALS	DATE
DRAWN: TC	8/31/07
CHECKED: TC	8/31/07
ENGR.: JJM	8/31/07

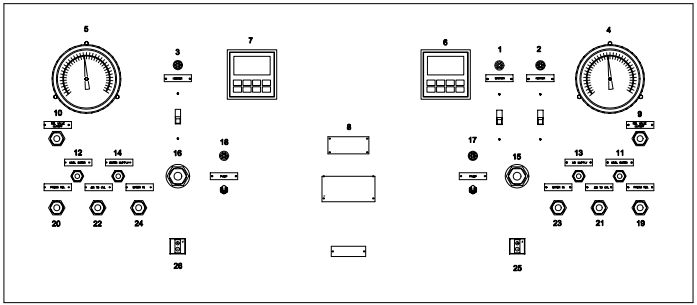
CHANDLER ENGINEERING

TITLE
MOLD ASSEMBLY

SIZE	S.O. NO.	DWG NO.	REV.
B		07-0860	G

SCALE: 1:4 | TITLE BLOCK REV: 1.0 | SHEET: 1 of 1

REVISIONS					
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS	
	B	ECN 3696	04/93		
	C	REDRAWN; ECN 7100	01-23-00	AMW	BD



LEGEND

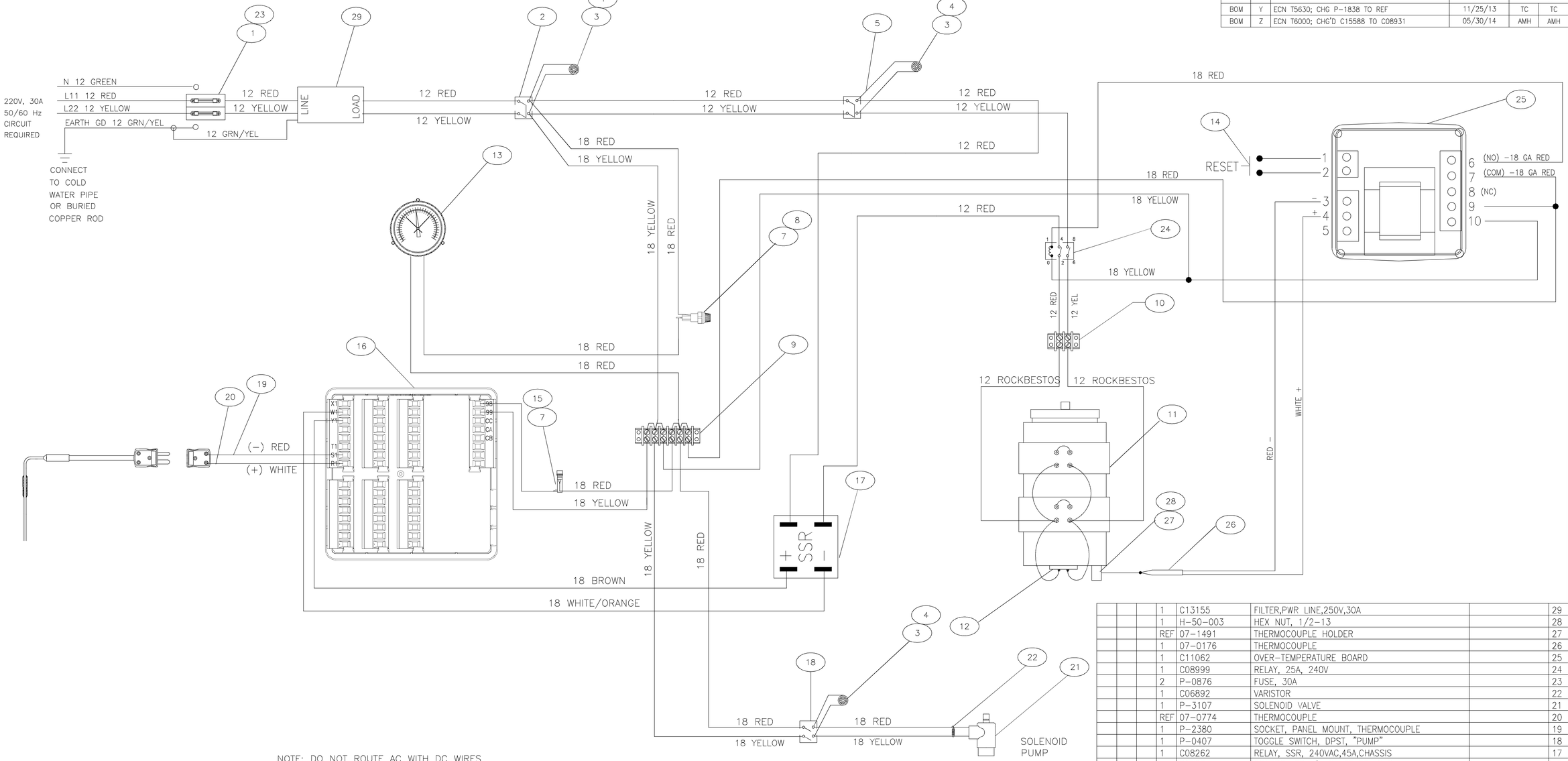
1) MASTER SWITCH
2) HEATER SWITCH - RIGHT CYL.
3) HEATER SWITCH - LEFT CYL.
4) PRESSURE GAUGE - RIGHT CYL.
5) PRESSURE GAUGE - LEFT CYL.
6) TEMP CONTROLLER - RIGHT CYL.
7) TEMP CONTROLLER - LEFT CYL.
8) PLATE - PRESSURE/TEMP RESTRICTION
9) RELIEF VALVE CUTOFF - RIGHT CYL.
10) RELIEF VALVE CUTOFF - LEFT CYL.
11) COOLING WATER - RIGHT CYL.
12) COOLING WATER - LEFT CYL.
13) AIR SUPPLY
14) WATER SUPPLY
15) REGULATOR, AIT-TO-PUMP - RIGHT HAND
16) REGULATOR, AIR-TO-PUMP - LEFT HAND
17) PUMP SWITCH - RIGHT HAND
18) PUMP SWITCH - LEFT HAND
19) PRESSURE RELEASE - RIGHT CYL.
20) PRESSURE RELEASE - LEFT CYL.
21) AIR TO CYL. - RIGHT CYL.
22) AIR TO CYL. - LEFT CYL.
23) WATER INLET - RIGHT HAND
24) WATER INLET - LEFT HAND
25) THERMOCOUPLE SOCKET - RIGHT CYL.
26) THERMOCOUPLE SOCKET - LEFT CYL.

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.				PARTS LIST			
				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 63	CHANDLER ENGINEERING		
7375				7375 DUAL COMPACT C.C.	TITLE: PANEL IDENTIFICATION		
NEXT ASSY				USED ON			

APPLICATION	APPROVALS	DATE
	DRAWN: AMW	01-23-01
	CHECKED: BD	01-23-01
	ENGR.: BD	01-23-01

SIZE	S.O. NO.	DWG NO.	REV.
A2		07-0863	C
SCALE: 1 = 1	DO NOT SCALE DRAWING	SHEET: 1 of 1	

REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
BOM	Y	ECN T5630; CHG P-1838 TO REF	11/25/13	TC TC
BOM	Z	ECN T6000; CHG'D C15588 TO C08931	05/30/14	AMH AMH



NOTE: DO NOT ROUTE AC WITH DC WIRES.
KEEP T/C WIRES SEPARATE FROM OTHER WIRING.

–04	–03	–02	–01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
			1	C13155	FILTER,PWR LINE,250V,30A		29
			1	H–50–003	HEX NUT, 1/2–13		28
			REF	07–1491	THERMOCOUPLE HOLDER		27
			1	07–0176	THERMOCOUPLE		26
			1	C11062	OVER–TEMPERATURE BOARD		25
			1	C08999	RELAY, 25A, 240V		24
			2	P–0876	FUSE, 30A		23
			1	C06892	VARISTOR		22
			1	P–3107	SOLENOID VALVE		21
			REF	07–0774	THERMOCOUPLE		20
			1	P–2380	SOCKET, PANEL MOUNT, THERMOCOUPLE		19
			1	P–0407	TOGGLE SWITCH, DPST, "PUMP"		18
			1	C08262	RELAY, SSR, 240VAC,45A,CHASSIS		17
			1	C08931	CONTROLLER,1/4 DIN,ETHERM,2404		16
			1	P–2610	FUSE, 1/4A, 3AG, SLO–BLO		15
			1	P–2209	RESET SWITCH		14
			REF	P–1838	GAUGE, PRESSURE, 5000 PSIG (34 MPa)		13
			REF	P–1349	HEATER RING, 500W, 220V		12
			REF	P–1812	HEATER, HALF–BAND, 750W, 120V		11
			1	P–0424	TERMINAL, 2 CONDUCTOR		10
			1	P–0417	TERMINAL, 6 CONDUCTOR		09
			1	P–1130	FUSE, 1A, 3AG		08
			2	P–2265	FUSE HOLDER		07
							06
			1	P–0403	"HEATER" SWITCH, 2PST		05
			3	P–0452	LAMP, NEON		04
			3	P–0458	PILOT LIGHT, RED LENS		03
			1	P–0405	"MASTER" SWITCH, 2PST		02
			1	P–0877	CUTOUT, FUSE, DOUBLE POLE		01

QTY. REQD. — PARTS LIST

NEXT ASSY: — USED ON: 7370 CURING CHAMBER

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]
TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

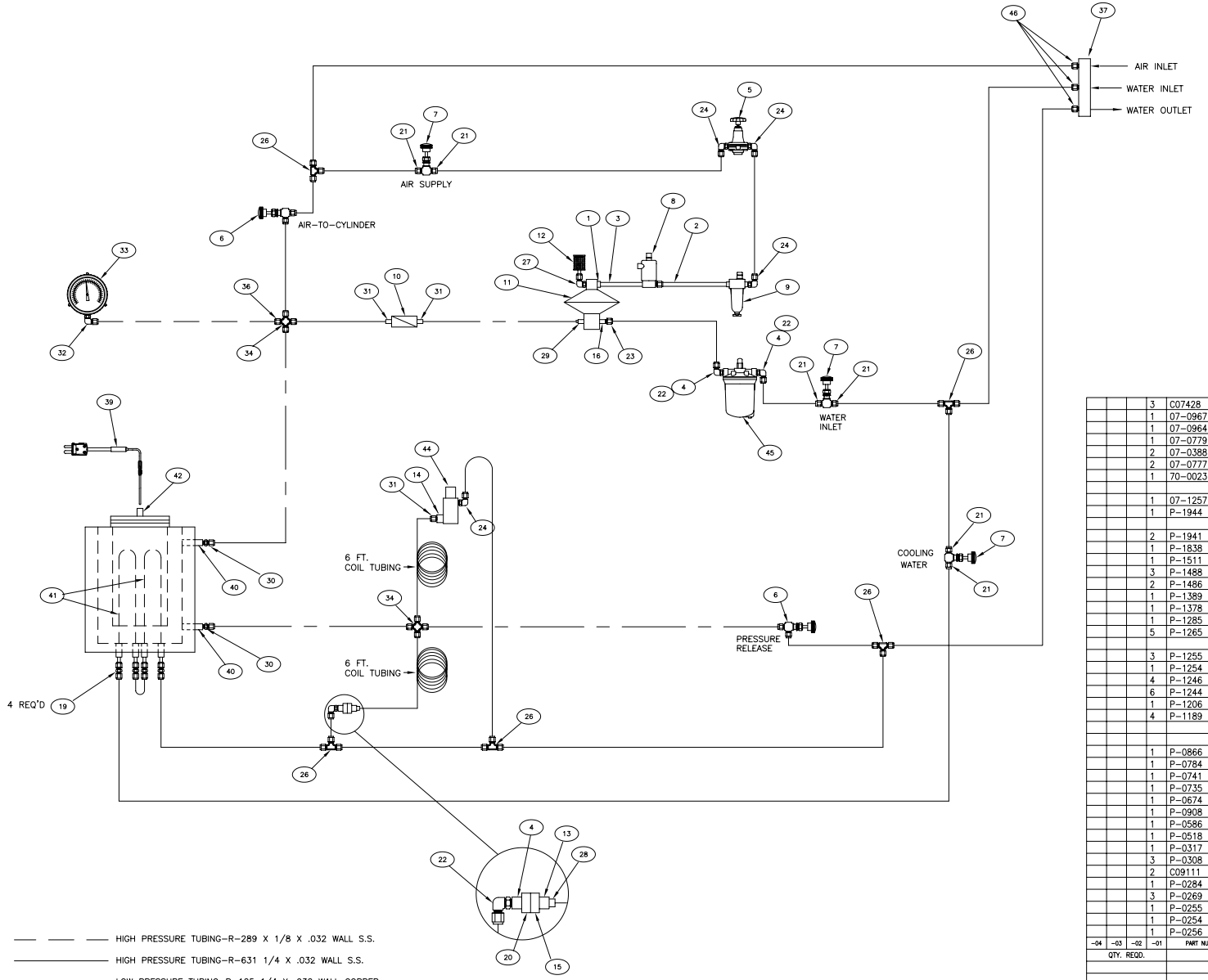
APPROVALS	DATE
DRAWN: AMW	01–19–01
CHECKED: JH	01–19–01
ENGR.: BD	01–19–01

CHANDLER ENGINEERING

TITLE: WIRING SCHEMATIC

SIZE	S.O. NO.	DWG NO.	REV.
		07–0889	Z

SCALE: NONE — DO NOT SCALE DRAWING — SHEET: 1 of 1



REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
	K	REDRAWN; ECN 7100	01-24-01	AMW BD
	L	ECN 8884; 70-0023 WAS 07-0218	3/19/04	TC JAC

-04	-03	-02	-01	QTY. REQD.	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
				3	C07428	BULKHEAD, 1/4T X 1/4T		46
				1	07-0967	OIL FILTER ASSEMBLY		45
				1	07-0964	RELIEF VALVE		44
				1	07-0779	THERMOCOUPLE ADAPTER		42
				2	07-0388	INTERNAL COOLING COIL		41
				2	07-0777	LONG ADAPTER		40
				1	70-0023	THERMOCOUPLE		39
								38
				1	07-1257	MOUNTING PLATE, WATER SERVICE		37
				1	P-1944	REDUCER, .125T X .25T	SST	36
								35
				2	P-1941	CROSS, .25T	SST	34
				1	P-1838	PRESSURE GAUGE, 5,000 PSIG (34 MPa)		33
				1	P-1511	ELBOW, .125T X .125MP	BRASS	32
				3	P-1488	TUBE CONNECTOR, .25T X .25MP	SST	31
				2	P-1486	CONNECTOR, .25T X .125MP		30
				1	P-1389	TUBE CONNECTOR, .25T X .375MP	SST	29
				1	P-1378	TUBE CONNECTOR, .25T X.125FP	SST	28
				1	P-1285	PIPE ELBOW, STREET, .50	BRASS	27
				5	P-1265	TEE, .25T		26
								25
				3	P-1255	ELBOW, .25T X .25MPT	BRASS	24
				1	P-1254	CONNECTOR, .25NPT X .25T		23
				4	P-1246	ELBOW, .25T X .125MPT		22
				6	P-1244	UNION, .25T X .125MPT	BRASS	21
				1	P-1206	TUBE, SAFETY HEAD, .5625-18M X .50MPT		20
				4	P-1189	TUBE UNION, .25		19
								18
								17
				1	P-0866	PIPE BUSHING, .25 X .375	BRASS	16
				1	P-0784	RUPTURE DISC, .25	INCONEL	15
				1	P-0741	SNUBBER, .25MP X .25FP		14
				1	P-0735	TUBE ADAPTER, .125MP X .25T	SST	13
				1	P-0674	MUFFLER, RDL, AIR EXHAUST		12
				1	P-0908	PUMP, AIR/HYDRAULIC		11
				1	P-0586	CHECK VALVE, .25FP X .25FP	SST	10
				1	P-0518	LUBRICATOR, HYDRAULIC, .33PT, .25FP X .25FP		9
				1	P-0317	SOLENOID VALVE, .25FP,.09370RF, 220V		8
				3	P-0308	NEEDLE VALVE, .25T X .25T-FLRD	BRASS	7
				2	C09111	NEEDLE VALVE, 1.4T X 1/4T	SST	6
				1	P-0284	REGULATOR, PANEL MOUNT, 5-125 PSI,.25FP		5
				3	P-0269	PIPE BUSHING, .375 X .125	BRASS	4
				1	P-0255	PIPE NIPPLE, .25 X 3		3
				1	P-0254	NIPPLE, CLOSE, .25 NPT		2
				1	P-0256	PIPE BUSHING, .50 X .25	BRASS	1

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]
TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

7350 NEXT ASSY | MODEL 7 CURING CHAMBER USED ON

APPLICATION

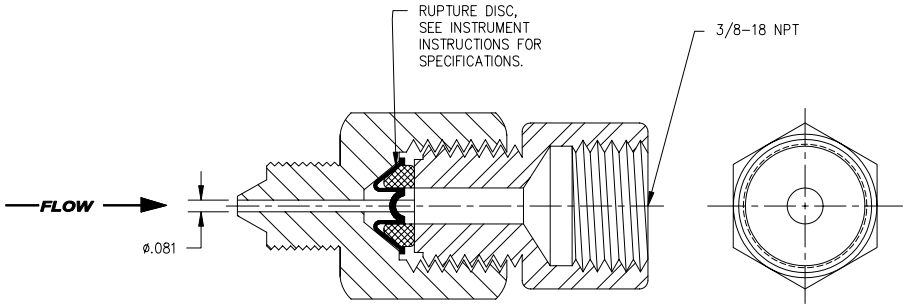
APPROVALS		DATE
DRAWN:	AMW	01-24-01
CHECKED:	BS	01-24-01
ENGR.:	BS	01-24-01

CHANDLER ENGINEERING

TITLE: PIPING DIAGRAM
CURING CHAMBER

SIZE | S.O. NO. | DWG NO. 07-0896 | REV. K
SCALE: NONE | DO NOT SCALE DRAWING | SHEET: 1 of 1

REVISIONS				
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS
	0	ISSUE	07/20/85	STD GDJ
	A	ECN 6931	08/03/00	AEB BD



-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
			1	P-1206	SAFETY HEAD ASSEMBLY	SST	1

QTY. REQD.

PARTS LIST

5617	CORROSION APPARATUS	
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]

TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63√

CHANDLER ENGINEERING

TITLE

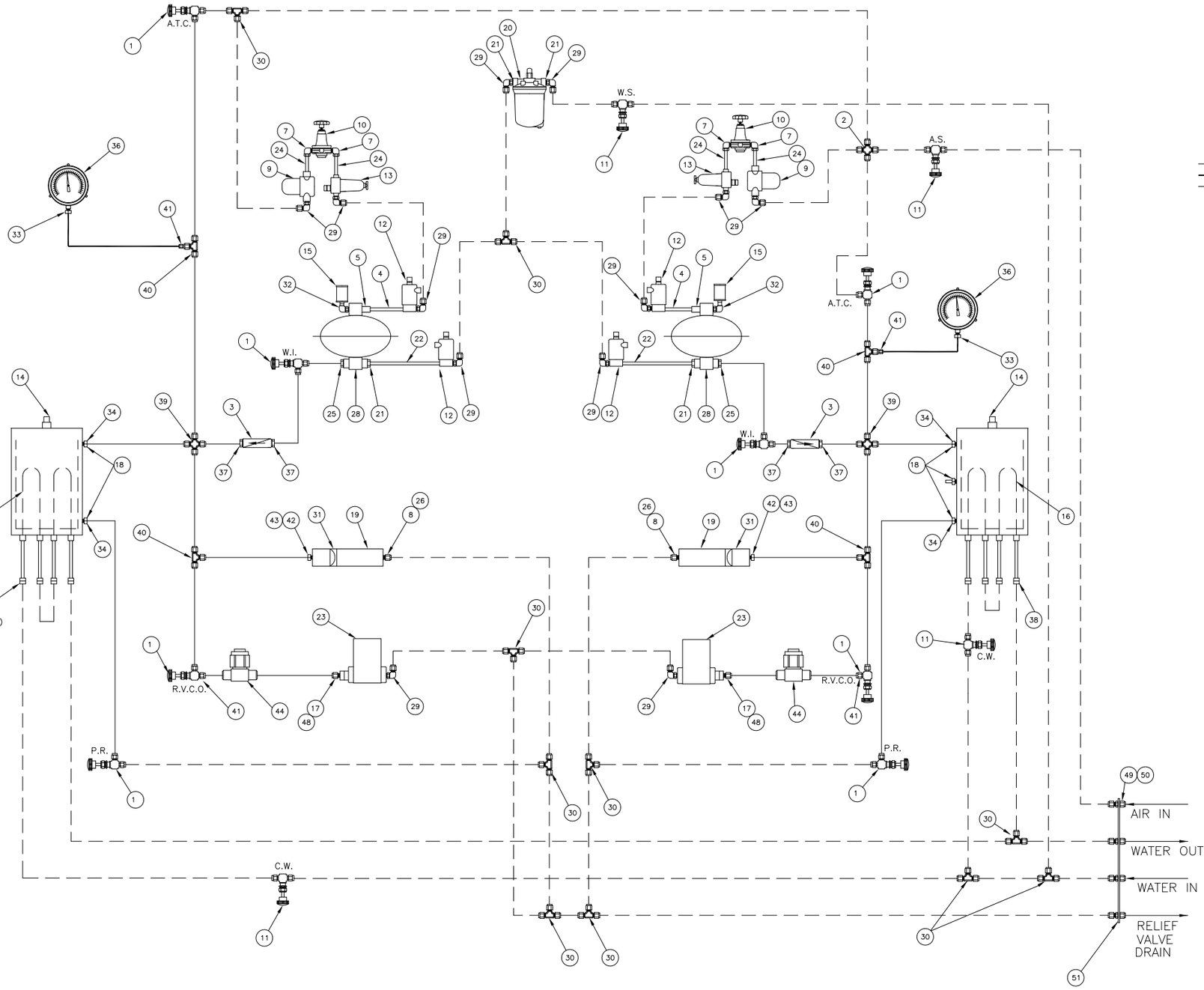
SAFETY HEAD ASSEMBLY

APPROVALS	DATE
DRAWN: GJD	07/20/85
CHECKED: BD	07/20/85
ENGR.: BD	07/20/85

SIZE	S.O. NO.	DWG NO.	REV.
A4		07-1026	A

SCALE: DO NOT SCALE DRAWING SHEET: 1 OF 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	E	ECN# 9305, UPDATE ITEM 29 & 41, ADD 48	12/07/04	JAC/TC
	F	ECN T1059, UPDATED BOM	8/1/07	JB/TC
	G	ECN T3117, REPLACE P-1485 W/ 188-13044	7/6/10	SS/TC



R-125
R-289
R-631

ITEM NO.		QTY REQD		PART NUMBER	DESCRIPTION		
51		1		07-1257	PLATE,FLUID SERVICE		
50		4		C08268	RETAINER,SST,3/4ID,BHD,SW		
49		4		P-1954	CONN,BRS,1/4FPX1/4T,BHD,SW		
48		2		187-20403	CONN,SS,1/4MPX1/8T,SW		
47		10		C08604	ELBOW, 1/4T X 1/4 MPT FESTO		
46		2		C08602	ELBOW, 1/4T X 1/8 MPT FESTO		
45		7		C08601	TEE, 1/4T FESTO		
44		2		C07358	H.P. FILTER		
43		2		P-0735	CONNECTOR, 1/4 T x 1/8 MNPT, SST		
42		2		P-1378	CONNECTOR, 1/4T x 1/8 FNPT, SST		
41		4		P-1944	REDUCER, 1/4T X 1/8T		
40		4		P-1942	TEE, 1/4 TUBE, S.S.		
39		2		P-1941	CROSS, 1/4 TUBE		
38		10		P-1189	UNION, 1/4 T		
37		2		P-1488	CONNECTOR, 1/4T X 1/4 MP		
36		2		P-1838	GAUGE, PRESSURE		
35							
34		10		P-1486	CONNECTOR, 1/4 T X 1/8 MP		
33		2		188-13044	CONN, SS ,1/8 MP X 1/8 T, SW		
32		2		P-1285	ELBOW, STREET, 1/2", BRASS		
31		2		P-1206	SAFETY HEAD		
30		10		P-1265	TEE, 1/4 TUBE, SWAGELOK, BRASS		
29		12		P-1255	ELBOW, 1/4 TUBE X 1/4 MPT, BRASS		
28		2		P-0908	PUMP		
27							
26							
25		2		P-1389	CONNECTOR, 1/4 TUBE x 3/8 MNPT		
24		4		P-1268	NIPPLE, HEX		
23		2		07-0964	RELIEF VALVE		
22		2		P-0871	NIPPLE, 1/4 MP X 3"		
21		4		P-0866	BUSHING, 1/4 MP X 3/8 MP		
20		1		P-0967	FILTER		
19		2		P-0784	RUPTURE DISC, 5250 PSI		
18		5		07-0777	ADAPTER, 1/8 FPT - 1/8 MPT, SST		
17		2		P-0741	SNUBBER, 1/4 NPT X 1/4 FPT		
16		2		07-0778	COOLING COILS		
15		2		P-0674	MUFFLER		
14		2		07-0779	ADAPTER 1/8 MP X 9/16-18		
13		2		P-0518	LUBRICATOR		
12		4		P-0317	VALVE, SOLENOID		
11		4		P-0308	VALVE		
10		2		P-0284	REGULATOR		
9		2		P-1280	FILTER		
8		2		P-0269	BUSHING, 3/8 MP X 1/8 FP		
7		2		P-1496	1/4 NPT ELBOW, STREET		
6							
5		2		P-0256	1/2 X 1/4 BUSHING, BRASS		
4		2		P-0255	1/4 X 3 LG. PIPE NIPPLE		
3		2		P-0586	CHECK VALVE		
2		1		P-1277	CROSS, 1/4 TUBE, BRS		
1		8		C09111	VALVE, NDL, SST, 1/4 T x 1/4 T		

PARTS LIST

	7375
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:	AEB	4/24/97
CHECKED:	JJM	04/24/97
ENGR.:	JJM	04/24/97

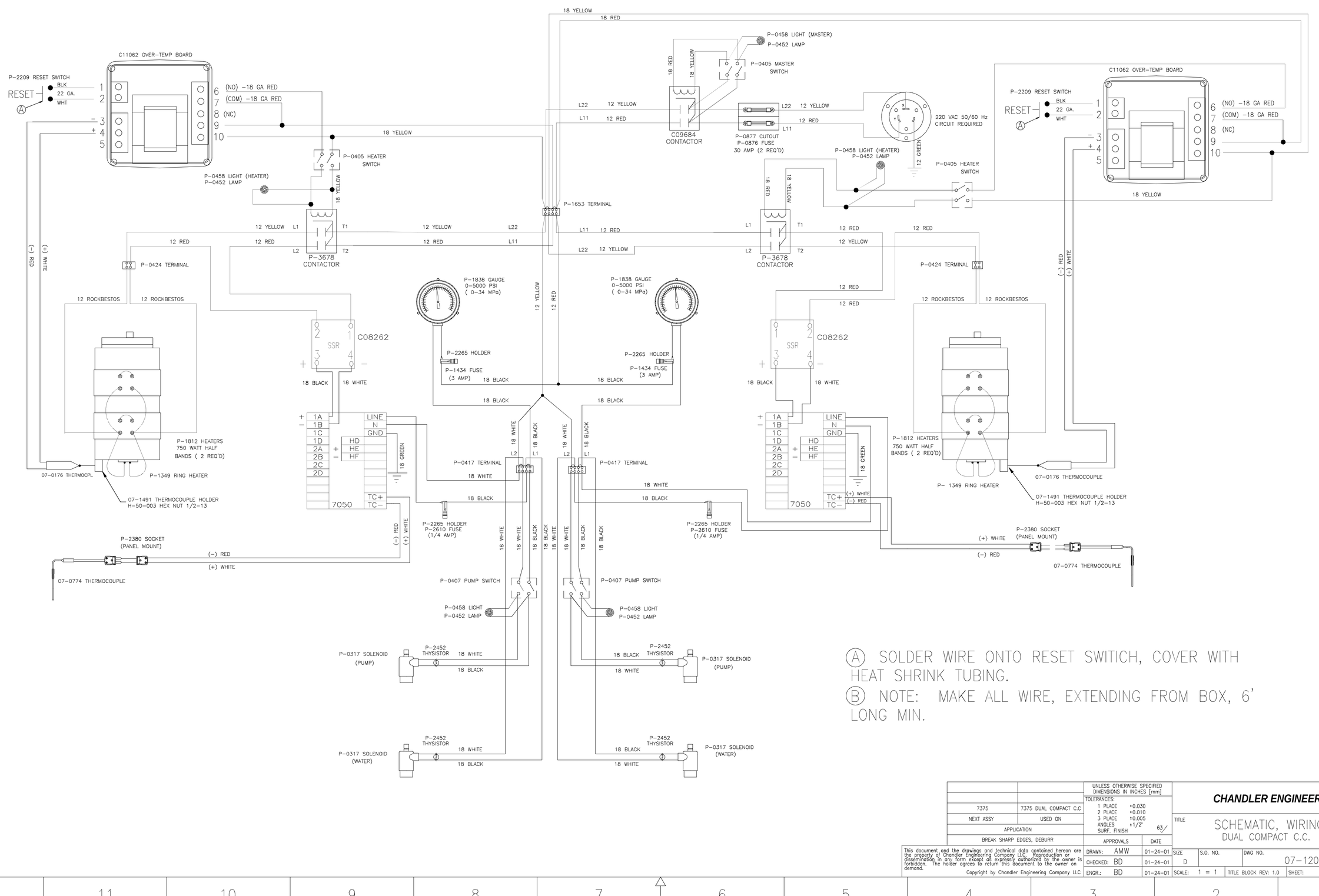
CHANDLER ENGINEERING

TITLE
PIPING SCHEMATIC
DUAL CURING CHAMBER

SIZE	S.O. NO.	DWG NO.	REV.
D		07-1206	G

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

REVISIONS					
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS	
	M	ECN T3055, UPDATE ADD NOTES	6/11/10	SS	TC
	N	ECN T5164; REMOVED P-0627 TRANSFORMER	02/19/13	AMH	TC

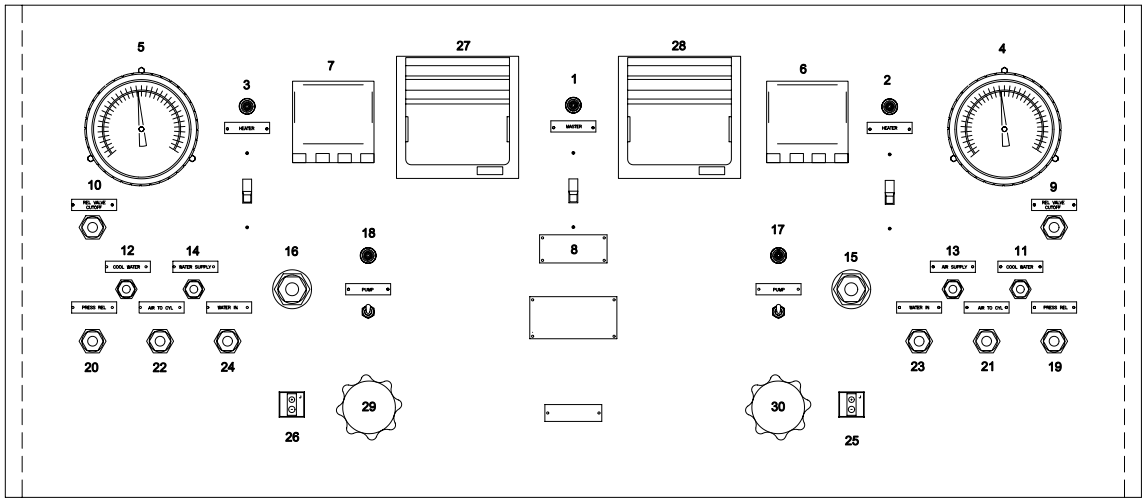


(A) SOLDER WIRE ONTO RESET SWITICH, COVER WITH HEAT SHRINK TUBING.

(B) NOTE: MAKE ALL WIRE, EXTENDING FROM BOX, 6' LONG MIN.

		UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]		CHANDLER ENGINEERING			
		TOLERANCES:					
7375	7375 DUAL COMPACT C.C	1 PLACE ±0.030 2 PLACE ±0.010 3 PLACE ±0.005		TITLE	SCHEMATIC, WIRING DUAL COMPACT C.C.		
NEXT ASSY	USED ON	ANGLES ±1/2°					
APPLICATION		SURF. FINISH 63					
BREAK SHARP EDGES, DEBURR		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: AMW	01-24-01	SIZE D	S.O. NO.	DWG NO. 07-1207	REV. N
		CHECKED: BD	01-24-01				
Copyright by Chandler Engineering Company LLC		ENGR.: BD	01-24-01	SCALE: 1 = 1	TITLE BLOCK REV: 1.0	SHEET: 1 of 1	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	C	ECN 7100; CHANGED REV LETTER	01/24/01	AMW/BD



LEGEND

1) MASTER SWITCH
2) HEATER SWITCH - RIGHT CYL.
3) HEATER SWITCH - LEFT CYL.
4) PRESSURE GAUGE - RIGHT CYL.
5) PRESSURE GAUGE - LEFT CYL.
6) TEMP CONTROLLER - RIGHT CYL.
7) TEMP CONTROLLER - LEFT CYL.
8) PLATE - PRESSURE/TEMP RESTRICTION
9) RELIEF VALVE CUTOFF - RIGHT CYL.
10) RELIEF VALVE CUTOFF - LEFT CYL.
11) COOLING WATER - RIGHT CYL.
12) COOLING WATER - LEFT CYL.
13) AIR SUPPLY
14) WATER SUPPLY
15) REGULATOR, AIT-TO-PUMP - RIGHT HAND
16) REGULATOR, AIR-TO-PUMP - LEFT HAND
17) PUMP SWITCH - RIGHT HAND
18) PUMP SWITCH - LEFT HAND
19) PRESSURE RELEASE - RIGHT CYL.
20) PRESSURE RELEASE - LEFT CYL.
21) AIR TO CYL. - RIGHT CYL.
22) AIR TO CYL. - LEFT CYL.
23) WATER INLET - RIGHT HAND
24) WATER INLET - LEFT HAND
25) THERMOCOUPLE SOCKET - RIGHT CYL.
26) THERMOCOUPLE SOCKET - LEFT CYL.
27) RECORDER - LEFT CYL.
28) RECORDER - RIGHT CYL.
29) REGULATING RELIEF VALVE - LEFT CYL.
30) REGULATING RELIEF VALVE - RIGHT CYL.

AS NOTED

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
QTY. REQD.				PARTS LIST			

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

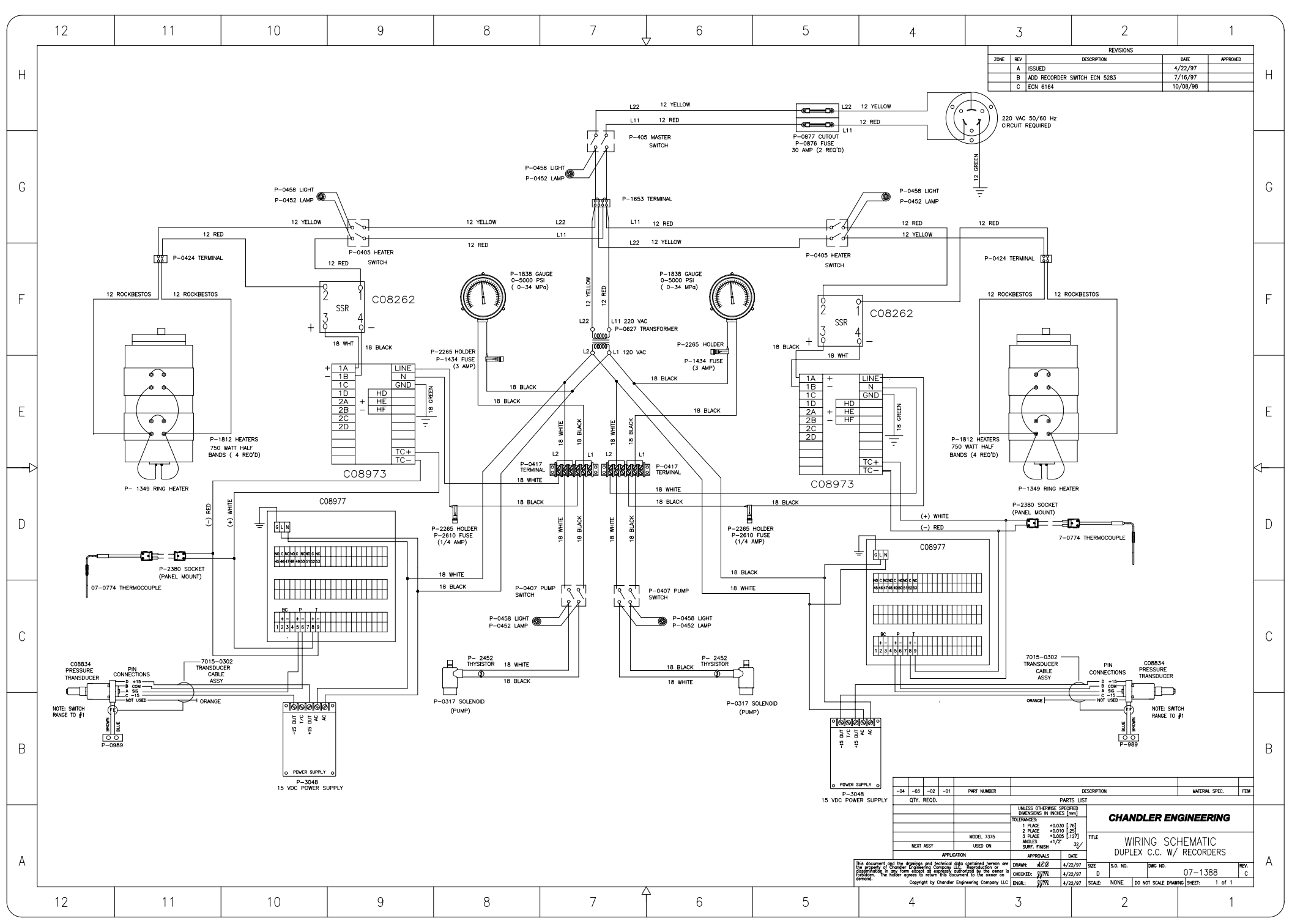
MODEL 7375
NEXT ASSY | USED ON
APPLICATION

CHANDLER ENGINEERING

TITLE: PANEL I.D., DUPLEX C. C. W/ RECORDERS

APPROVALS		DATE
DRAWN:	ACB	04/16/97
CHECKED:	JJM	04/16/97
ENGR.:	JJM	04/16/97

SIZE: D | S.O. NO. | DWG NO. 07-1386 | REV. C
SCALE: NTS | DO NOT SCALE DRAWING | SHEET: 1 of 1


REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
A ISSUED 4/22/97
B ADD RECORDER SWITCH ECN 5283 7/16/97
C ECN 6164 10/08/98
220 VAC 50/60 Hz CIRCUIT REQUIRED
P-0877 CUTOUT
P-0876 FUSE
30 AMP (2 REQ'D)
P-405 MASTER SWITCH
P-0458 LIGHT
P-0452 LAMP
P-1653 TERMINAL
P-0405 HEATER SWITCH
P-0424 TERMINAL
12 ROCKBESTOS
SSR
C08262
P-1838 GAUGE
0-5000 PSI
(0-34 MPa)
L11 220 VAC
P-0627 TRANSFORMER
L1 120 VAC
L2
P-2265 HOLDER
P-1434 FUSE
(3 AMP)
C08973
P-1812 HEATERS
750 WATT HALF
BANDS (4 REQ'D)
P- 1349 RING HEATER
P-0417 TERMINAL
C08977
P-2265 HOLDER
P-2610 FUSE
(1/4 AMP)
P-2380 SOCKET
(PANEL MOUNT)
07-0774 THERMOCOUPLE
P-0407 PUMP SWITCH
P- 2452 THYSISTOR
P-0317 SOLENOID
(PUMP)
C08834
PRESSURE
TRANSDUCER
PIN
CONNECTIONS
7015-0302
TRANSDUCER
CABLE
ASSY
NOTE: SWITCH
RANGE TO #1
P-0989
P-3048
15 VDC POWER SUPPLY
CHANDLER ENGINEERING
WIRING SCHEMATIC
DUPLEX C.C. W/ RECORDERS
PARTS LIST
DRAWN: ACB 4/22/97
CHECKED: DM 4/22/97
ENGR.: DM 4/22/97
SIZE D
DWG NO. 07-1388
REV. C
SCALE: NONE
DO NOT SCALE DRAWING
SHEET: 1 of 1
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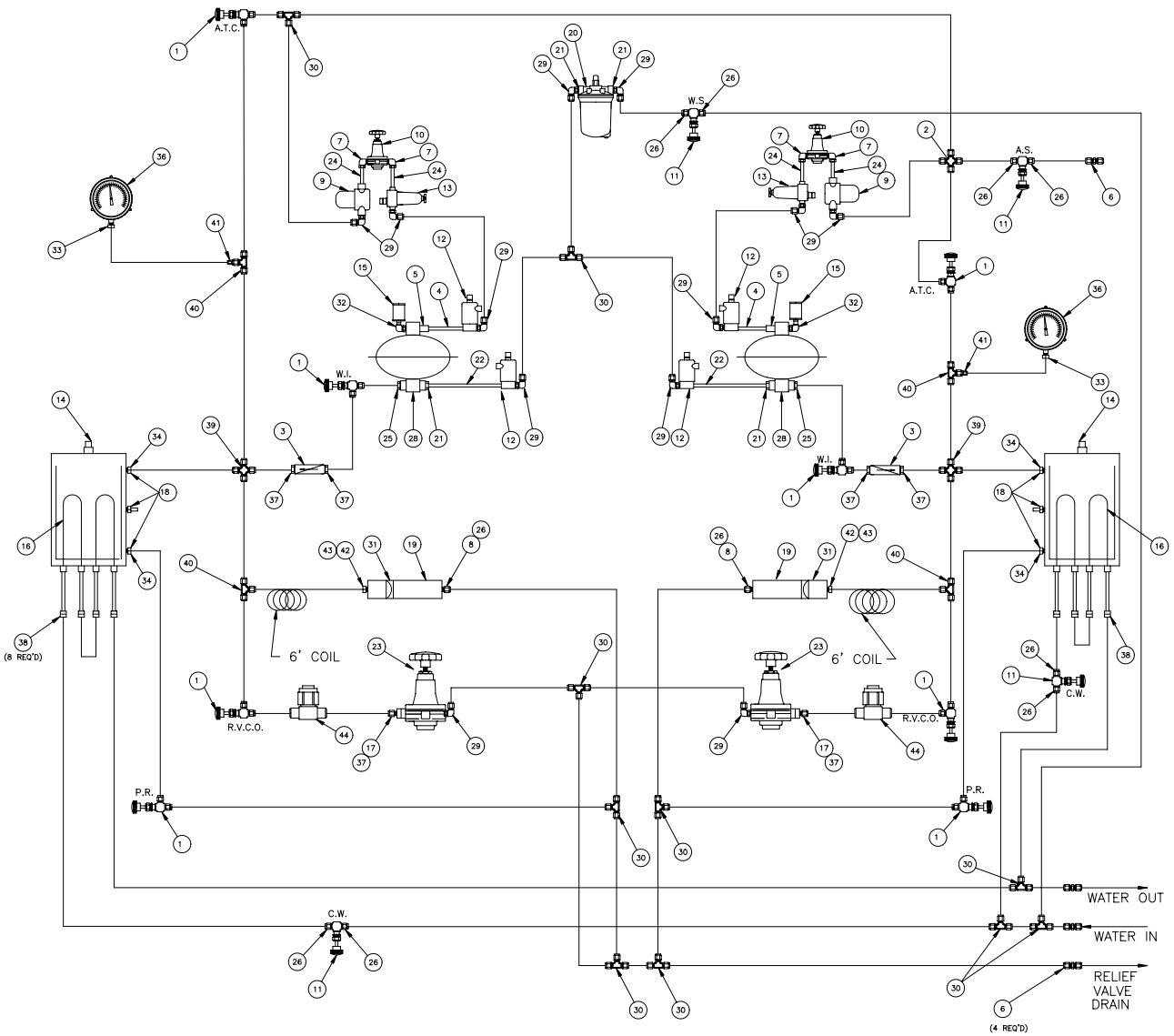
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	ISSUED	4/24/97	
	B	VALVE CHANGE ECN #5979	07/21/98	



R-125
R-289
R-631

ITEM NO.		QTY REQD		PART NUMBER	DESCRIPTION
47		10		C08604	ELBOW, 1/4T X 1/4 MPT FESTO
46		2		C08602	ELBOW, 1/4T X 1/8 MPT FESTO
45		7		C08601	TEE, 1/4T FESTO
44		2		C07358	H.P. FILTER
43		2		P-735	CONNECTOR, 1/4 T x 1/8 MNPT, SST
42		2		P-1378	CONNECTOR, 1/4T x 1/8 FNPT, SST
41		2		P-1944	REDUCER, 1/4T X 1/8T
40		4		P-1942	TEE, 1/4 TUBE, S.S.
39		2		P-1941	CROSS, 1/4 TUBE
38		10		P-1189	UNION, 1/4 T
37		6		P-1488	CONNECTOR, 1/4T X 1/4 MP
36		2		P-1838	GAUGE, PRESSURE
34		4		P-1486	CONNECTOR, 1/4 T X 1/8 MP
33		2		P-1485	CONNECTOR, 1/8 T X 1/8 MP
32		2		P-1285	ELBOW, STREET, 1/2", BRASS
31		2		P-1206	SAFETY HEAD
30		10		P-1265	TEE, 1/4 TUBE, SWAGELOK, BRASS
29		2		P-1255	ELBOW, 1/4 TUBE X 1/4 MPT, BRASS
28		2		P-908	PUMP
26		4		P-1244	CONNECTOR, 1/4 T x 1/8 MNPT, BRS
25		2		P-1389	CONNECTOR, 1/4 TUBE x 3/8 MNPT
24		4		P-1268	NIPPLE, HEX
23		2		C08836	RELIEF VALVE
22		2		P-871	NIPPLE, 1/4 MP X 3"
21		4		P-866	BUSHING, 1/4 MP X 3/8 MP
20		1		P-967	FILTER
19		2		P-784	RUPTURE DISC, 5250 PSI
18		6		7-777	ADAPTER, 1/8 FPT – 1/8 MPT, SST
17		2		P-741	SNUBBER, 1/4 NPT X 1/4 FPT
16		2		7-778	COOLING COILS
15		2		P-674	MUFFLER
14		2		7-779	ADAPTER 1/8 MP X 9/16-18
13		2		P-518	LUBRICATOR
12		4		P-317	VALVE, SOLENOID
11		4		P-308	VALVE
10		2		P-284	REGULATOR
9		2		P-1280	FILTER
8		2		P-269	BUSHING, 3/8 MP X 1/8 FP
7		2		P-1496	1/4 NPT ELBOW, STREET
6		4		C07428	BULKHEAD, 1/4 TUBE, BRS
5		2		P-256	1/2 X 1/4 BUSHING, BRASS
4		2		P-255	1/4 X 3 LG. PIPE NIPPLE
3		2		P-586	CHECK VALVE
2		1		P-1277	CROSS, 1/4 TUBE, BRS
1		8		C09111	VALVE, NDL, SST, 1/4 T x 1/4 T

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	7375 DUPLEX C. C.

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	4/24/97
CHECKED:	[illegible]	7/27
ENGR.:	[illegible]	7/27

TITLE
PLUMBING DIAGRAM
DUPLEX CURING CHAMBER

SIZE	S.O. NO.	DWG NO.	REV.
A1		07-1389	B
SCALE: NONE	DO NOT SCALE DRAWING	SHEET: 1 of 1	