ERTEL ALSOP

THE FIRST NAME IN LIQUID FILTRATION™

OPERATING AND MAINTENANCE MANUAL EA SERIES MODEL EA-800-32-12-12-CG-A RECESSED CHAMBER FILTER PRESS

Halliburton International Corp
10891 Business Drive
Fontana, CA 92337

Customer P.O. No.: 10891
Order No.43712
Model No.: EA-800-32-12-12-CG-A
Press Serial No.: EA-800-23-0125
Date Shipped: February 8, 2008

ERTELALSOP. OUR MISSION IS CLEAR.™
P.O. BOX 3358, KINGSTON, NY 12402
TELEPHONE: 800.553.7835 845.331.4552 FAX: 845.339.1063
SALES@ERTELALSOP.COM WWW.ERTELALSOP.COM

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SECTION ONE: CUSTOMER SERVICE

CUSTOMER SERVICE:

Congratulations on your purchase of a new ErtelAlsop press. In choosing the ErtelAlsop press you have selected a filter press engineered to give you superior dependability and performance. Manufactured to exacting standards, the ErtelAlsop press combines advanced technology, functional design and high quality craftsmanship.

Our commitment to quality is equaled only by our commitment to customer service and support. Your purchase includes more than a product—it includes the resources of the company. The contacts below are listed for your reference:

Contact Name	Title	Telephone
Donna Newkirk	Customer Service	800-553-7835
Greg Haver	Sales Engineer	800-553-7835
Ken Stowell	Product Manager	918-296-0050
Bill Kearney	V.P. Sales and Marketing	800-553-7835

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SECTION TWO: SPECIFICATIONS

General Specifications

Model Number:	EA-800-32-12-12-CG-A
Serial Number:	EA-800-23-0125
Total Volume:	12 ft^3
Number of Chambers:	23
Total Filter Area:	248 ft^2
Plate Size:	800 mm x 800 mm
Plate Style:	Recessed Chamber
Plate Material:	Polypropylene
Gasket Material:	EPDM
Filter Cloth:	Polypropylene
Overall Press Length:	154”
Overall Press Width:	67”
Manifold Arrangement:	Manual PVC Ball Valves
Press Options:	Safety Lanyard-“E” Stop, Semi-Automatic Plate Shifter:
Optional equipment	
AOD Pump:	no
Dumping cake cart	yes

Controls

Control Location	Right Hand
Control Type	Manual - Control lever
Plate Shifter	Manual - Button

Hydraulics

Closing Device	A type; Air/oil
Hydraulic Clamping Pressure	41Tons/ 2900 PSI
Relief Valve Setting	3100 PSI
Hydraulic Cylinder-Size:	6 ” diameter x 16” stroke
Hydraulic Oil Recommended*:	DTE 25 Mobile or equivalent Viscosity: 150 ssu@100F

*New hydraulic oil should be filtered to 10 microns or better.

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SECTION TWO: SPECIFICATIONS

UTILITIES SPECIFICATIONS

Air Hookup

Note: All values for one press only. If more than one press is used, air consumption must be carefully reviewed for total capacity.

Standard Plant Quality Air:	Maximum particle size: 40u
Air Blow*:	1.0 scfm per ft^3 press capacity @ 40 psi (ANSI/ISA-57.3 – 1975, RI 981)
Instrument Quality Air:	Maximum particle size: 3 Oil content less than 1 ppm wet weight or v/u under normal operating conditions. Pressure dew point at least 180 F below the lowest ambient temperature. Air shall be free of all corrosive contaminants and hazardous substances.
Press Closure:	50 SCFM @ 90 PSI minimum
Semi Automatic Shifter:	3 SCFM @ 40 PSI for duration of shifting

The air processes listed with an asterisk do not occur simultaneously. The values listed are general estimates. Due to the highly variable nature of pressure filtration, accurate determination of total air requirements must be done on a case by case basis. For more detailed information contact ErtelAlsop.

Electric

Connected Power:	N/A

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SECTION THREE: SAFETY

GENERAL SAFETY INSTRUCTIONS

To ensure maximum safety, optimum performance, and to gain knowledge of the product, it is essential that any operators of the filter press read and understand the contents of this manual before operating the press. Pay particular attention to the safety symbol, which means CAUTION, WARNING OR DANGER—"personal safety instruction". Read and understand the instruction because your safety depends upon it. Failure to comply with the instruction can result in machine damage or personal injury.

The precautions mentioned in this manual are not intended to cover all of the hazards that can exist in a plant or with regard to this machine. Using safety mechanisms requires the constant attention of everyone near this (or any) machine.

A plant and related equipment are only as safe as the personnel using them. Proper equipment maintenance and use of personal safety devices will contribute much toward safety as will any number of mechanical devices.

Study this manual before attempting to install, operate or maintain this filter press.

Only competent, well-trained individuals should operate or maintain this equipment.

Explain the operation of this machine and its safety devices to a new operator before his or her operating the machine. Be certain the operator fully understands the machine, and is qualified to handle such operation.

Develop a safety checklist for the devices on this machine and perform regular maintenance to ensure proper operation.

As required by OSHA 1910.0151 (C), we also encourage the customers of its various products to install eyewash and/or safety showers adjacent to the product installation.

REMEMBER TO:

REPLACE TO OBEY ALL SAFETY AND INSTRUCTION DECALS. REPLACE ANY DAMAGED OR WORN DECALS.

USE EYE PROTECTION WHEN OPERATING EQUIPMENT

MAKE CERTAIN SAFETY GUARDS OR DEVICES ARE IN PLACE AND PROPERLY ADJUSTED PRIOR TO OPERATION OF PRESS.

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SECTION THREE: SAFETY

CAUTION: Disconnect the air supply before servicing the press. See the Air Quality Specifications in the Installation and Setup Section of this manual for detailed information.

CAUTION: Disconnect electrical power before servicing the press. See following section on proper lockout procedure.

CAUTION: Do not operate this machine unless all safety devices are in proper working order. Check all devices before starting the machine.

CAUTION: Do not stop the feed in mid-cycle! Stopping the feed in mid-cycle causes settling of the formed solids, which may plug the center feed eye. Restarting the cycle with a plugged feed eye will cause differential pressure across the plate web. This will lead to distortion of the web or total failure of the plates.

Recommended Lockout or Tag Out System Procedures:
Lockout is the preferred method of isolating machines or equipment from energy sources. The following simple procedure is provided for use in either lockout or tag out programs. This procedure may be used when there are limited number or types of machines or equipment or there is a single power source. For more complex systems, a more comprehensive procedure will need to be developed, documented and utilized.

Purpose
This procedure establishes the minimum requirements for the lockout or tag out of energy isolating devices. It LOCKOUT -TAG OUT PROCEDURE
shall be used to ensure that the machine or equipment is isolated from all potentially hazardous energy and locked out or tagged out before employees perform any servicing or maintenance activities where the unexpected energizing, start-up or release of stored energy could cause injury.

Responsibility
Appropriate employees shall be instructed in the safety significance of the lockout (or tag out) procedure. Each new or transferred employee and other employees whose work operations may be in the area shall be instructed in the purpose and use of the lockout or tag out procedure.

Preparation for Lockout or Tag Out
Make a survey to locate and identify all isolating devices to be certain which switch(s), valve(s) or other energy isolating devices apply to the equipment to be locked or tagged

SECTION THREE: SAFETY

out. More than one energy source (electrical, mechanical, or others) may be involved.

Sequence of Lockout or Tag Out System Procedure
Notify all affected employees that a lockout or tag out system is going to be used. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards.
If the machine or equipment is operating, shut it down by normal shutdown procedure.
Operate the switch, valve or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy, (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking or bleeding down.
Lockout or tag out the energy isolating devices with assigned individual lock(s) or tag(s).
After ensuring that no personnel are exposed, and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating control(s) to "Neutral" or "Off" position after test.
The equipment is now locked out or tagged out.

Restoring Machines or Equipment to Normal Production Operations
After service and/or maintenance is complete, and equipment is ready for normal production operations, check the area around the machines/equipment to ensure that no one is exposed.
After all tools have been removed from the machine/equipment, guards have been reinstalled and employees are in the clear, remove all lockout or tag out devices.
Operated the energy isolating devices to restore energy to the machine/equipment.

Procedure Involving More Than One Person
In the preceding steps, if more than one individual is required to lockout or tag out equipment, each shall place his/her own personal lockout or tag out device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tag out device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine/equipment with the key being placed in a lockout box or cabinet. Each employee will then use his/her own lock to secure the box or cabinet.

Basic Rules for Using Lockout or Tag Out System Procedure
All equipment shall be locked out or tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device where it is locked or tagged out.

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SECTION FOUR: INSTALLATION AND SETUP

General

Before beginning an installation, read and follow all of the instructions in this part of the manual. Pay close attention to the WARNING, NOTE and CAUTION statements to prevent personal injury and damage to the equipment.

Customer Service

This Installation and Start Up Section gives general guidelines for installation of the ErtelAlsop press. The customer is responsible for installation and must use his judgment and knowledge of his equipment, procedures and people to determine the best installation method. If there are any questions regarding interface, hookups, or installation, contact the Customer Service Department (see Section One) for further information. ***ErtelAlsop will not be liable for recommendations given by anyone other than ErtelAlsop.***

Process

Consult the temperature/pressure curves and chemical resistance chart in the safety section of this manual to insure safe and proper operation of the press.

Air Quality Specification

Use the following guidelines for air hookup to the filter press.

Air Blow, Core Blow use standard plant air:

Maximum particle size-40um

Air-Operated Diaphragm Pumps require “Pump Quality Air”

Maximum particle size-5um

Pressure dew point-at least 18°F below the lowest ambient temperature.

Lubricate with ISO Grade 15,5 Weight, Arctic Oil (unless lube free pump)

Air shall be free of all corrosive contaminants and hazardous substances.

Air over Oil Hydraulic System, Air-Operated Plate Shifter,

Require Instrument Quality Air (ANSI/ISA-57.3 – 1975, RI 981)

Maximum particle size –3um

Oil content to be less than 1 PPM wet weight or v/u under normal operating conditions.

Pressure dew point-at least 18°F below the lowest ambient temperature.

Air shall be free of all corrosive contaminants and hazardous substances.

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SECTION FOUR: INSTALLATION AND SETUP

Customer Interface
The following connections may be required.

Feed Connections
- Standard Slurry Feed
- Double-End Slurry Feed
- Pre-coat
- Wash
- Membrane Plate Squeeze

Discharge Connections
- Filtrate
- Launder
- Core Blow

Air
- Press Closure
- Air-Operated Plate Shifter
- Air Blow
- Core Blow
- Cake Discharge

Anchor
- Filter Press
- Electrical Panel
- Drip Tray Doors
- Pump Skid

Electric Service: N/A

Press Installation
Receiving and Handling-Inspect all equipment immediately upon receipt. If any damage occurred during shipping, notify your Customer Service Manager (see Section One) and the carrier for Claims Inspection.

Recommended Moving Procedure
Carefully remove the ErtelAlsop press from the transport vehicle. Use Screw Eyes for lifting the press. There are threaded holes at each end. A spreader bar the length of the

SECTION FOUR: INSTALLATION AND SETUP

press or two lifting devices should be used so that the lifting cables lift vertically. Use qualified riggers and appropriate equipment when lifting and moving the press.

NOTE: If your ErtelAlsop press has a plate shifter, tie down straps restraining the arch must go between the rail and the sidebar. Placing the strap on the outside of the rail could lead to damage or failure of the rail!

CAUTION: Insure that the lifting device has sufficient capacity to lift the ErtelAlsop press.

DANGER: Do not stand under the press when lifting or moving.

Storing the ErtelAlsop Press
If the ErtelAlsop press is stored for any length of time before installation, store it in a temperature range of 40-90° F, out of direct sunlight.

The cylinder should be cycled at least once a month during extended storage periods to insure that the seals stay flexible.

Foundation Requirements
Prior to the installation of the ErtelAlsop press, a level and square foundation must be prepared. Reference the press drawing for mounting details.

CAUTION: Allow suitable time for the foundation to cure before installing the ErtelAlsop press.

Mounting and Leveling the ErtelAlsop Press

1. Place the ErtelAlsop press on the foundation and level the press horizontally and vertically.
2. Install the leg bolts at both ends of the press. The legs on one end of the press will have round holes the other legs will have slots. Only tighten the bolts in the round holes.
3. Install the plates if they were shipped separately.
4. Close the press to full operating pressure.
5. Tighten the bolts in the legs with slots enough to eliminate clearance.

NOTE: It is recommended one end of every ErtelAlsop press be allowed to “float” for expansion/contraction of the side bars. Consult ErtelAlsop if further assistance is

SECTION FOUR: INSTALLATION AND SETUP

needed on this procedure.

Process Connection to the ErtelAlsop Press
Make the necessary adjustments until the press is properly mounted (leveled, squared and lagged) before continuing with these instructions.

Connect the center inlet on the ErtelAlsop press manifold to the discharge outlet of the feed pump. The feed run line should be the same size as the inlet on the manifold. The feed line must not be supported by the press.

CAUTION: Use appropriate pressure and temperature rated pipe to connect the feed pump to the ErtelAlsop press feed pipe. Consult the temperature/pressure curves and chemical resistance chart in the safety section of this manual to insure safe and proper operation of the press.

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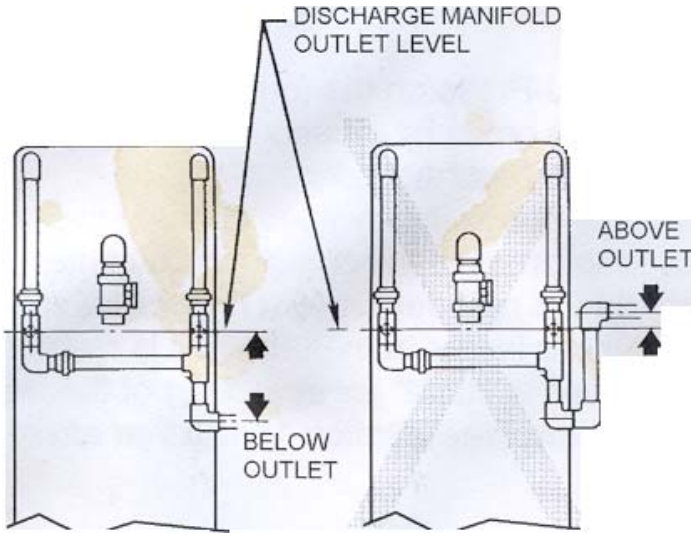
Install the drain pipe to the bottom outlet of the ErtelAlsop press manifold as shown below.



CORRECT **INCORRECT**

FIG 4-1

CAUTION: The filtrate drains from the press by gravity. Therefore the outlet of the drain pipe must be below the level of the discharge manifold outlet.

NOTE: If this arrangement is not feasible, consult ErtelAlsop to determine alternative piping, valve and pump arrangements that must be made to insure correct operation of the ErtelAlsop press.

Cold Weather and High Temperature Operation

Standard or high pressure plates (polypropylene) cannot tolerate temperature gradients or operation at temperatures of 40°F or lower. The plates must be also be within 60°F of the temperature of the slurry, and operate within the temperature range indicated on the temperature/pressure curve found in the Safety section of this manual. Under these conditions, the plates must be preheated before sludge can be pumped into the press. The plates can be preheated with warm water or warm air to raise the temperature slowly to about 45-65°F for normal operation.

1. The filter press must be piped to an external tank that can be heated, raising the

SECTION FOUR: INSTALLATION AND SETUP

temperature of the preheat filtrate slowly. Hot filtrate cannot be pumped directly, or the plates will encounter thermal shock.
2. Pump the preheat filtrate through the press for 30 minutes or until the discharge filtrate is within 10°F of the feed filtrate. The valves should be set up the same way as for the precoat with a slow rate of flow through the press, this gives the preheat filtrate a chance to heat the plates slowly.
3. Proceed with normal processing.

Cold Weather Shutdown
Following are the steps required for a cold weather shutdown (35°F or lower)

1. Immediately after the last cycle, close the press and valves for a blowdown, and run air through the plates and cloths for 30 minutes. This removes most water from the cloths.
2. Open the lower left valve to remove the filtrate from that side of the plates, blowing air for about 10 minutes to remove water from the discharge eyes.
3. Pressurize the press by closing all valves, and opening the air blow valve, pressurizing the press with air pressure to about 40 psi. After the press is pressurized, open the feed pipe valve to blow out the sludge in the pipe between the pump and the press. Do the same for the precoat pump if applicable.
4. Disconnect the inlet hose to the pump and insert a similar hose into a barrel of premixed antifreeze. Run the pump slowly with about 10 psi air pressure until some antifreeze comes out the end of the lower discharge eye. Do the same for the precoat pump if used.
5. Blow out all hoses. Drain any water in the air compressor tank if supplied.

The goal is to remove all water in anything that can freeze and break.

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SECTION FOUR: INSTALLATION AND SETUP

Head Connections (FIG 4-2)
Your ErtelAlsop filter press comes complete with head connections to provide proper feed line and outlet line sizes. Unless specially ordered otherwise they are fitted with standard size pipe flanges for ease of assembly.

Drape the head cloth over the head plate and the cloth pins at the top of the head plate to retain the cloth. Install the cloth nut

Discharge Pipes (FIG 4-2)
The discharge pipes at the four corners of the head are used for draining clear filtrate from the plate stack.
Unless specially ordered otherwise they are fitted with standard size pipe flanges for ease of assembly.

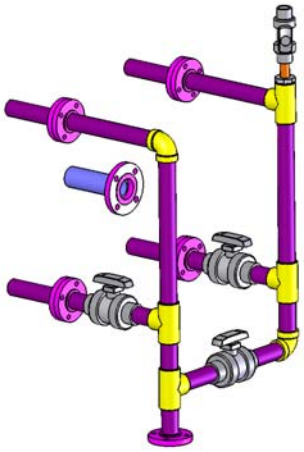

FIG 4-2

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SECTION FIVE: GENERAL DESCRIPTION

Press Frame
The press frame incorporates four primary components: the Head, the Slide Head/Follower, the Fixed Cylinder End and the Sidebars.

The Head end of the press serves as the fixed loading surface for the plate stack. It supplies the opposing force necessary for holding the plate stack together during processing. The Head also serves as the interface between the feed inlet and discharge connections.

The Fixed Cylinder End is the mounting surface for the Hydraulic Cylinder.

The Sidebars connect the Head and the Cylinder End. They support and guide the plate stack, and maintain the plate stack position for proper sealing. The Sidebars also support the Slide Head/Follower.

Follower
The Follower is the moving portion of the filter press used to compress the plate stack for filtration cycles.

Cylinder
The Cylinder moves the Follower open and closed and provides the clamping force necessary to seal the plate stack during the process cycle.

Hydraulic Power Unit Air/Oil Type-A
The Hydraulic System provides the hydraulic fluid flow to the Hydraulic Cylinder. The pump converts instrument quality air to hydraulic pressure through a ratio system that uses a large area air piston at low pressure to produce a high hydraulic pressure on a small area hydraulic piston. As the hydraulic output approaches the desired preset pressure, the pump slows down and stalls at the desired pressure.

This system provides self-compensating pressure for stack contraction or expansion. During many applications involving polypropylene filter elements, especially when filtration temperatures are high and wash temperatures low, filter stack expansion can create excessive pressures if the system were non-compensating.

Recessed Chamber Plates : See section 7

Filter Cloths: See section 7

Process Manifold
The Process Manifold Assembly consists of all the plumbing, process valves, and control valves necessary for process flow into and out of the filter press. The safe state

SECTION FIVE: GENERAL DESCRIPTION

is normally open for discharge valves and normally closed for feed valves.

Pre-coat
NOTE: The manifold supplied includes precoat capabilities. Your particular process may or may not require a pre-coat.

Pre-coat and body feed are two related applications. Both of these special applications use diatomaceous earth (commonly known as DE), cellulose, perlite or fly ash as a filter aid when the solids in the slurry are extremely fine and free-filtering. The filter aid helps trap the fine solids that otherwise might flow through the filter cloths. The processes of pre-coat and body feed increase the clarity of the filtrate, provide for higher flow rates, more consistent runs, shorter cycles, dryer cakes, better cake release, and protect and increase the life of the cloths.

Pre-coat requires the following setup:
Dosage rate of 0.1 lb/ft² filtration area
Pre-coat feed rate of 0.25 to 0.5 gal/min/ft² filtration area
Pre-coat tank size-approximately 1.5 times the holding capacity of the ErtelAlsop press.
Filtrate discharge capable of returning to the precoat tank for continuous flow.
Press discharge manifold should be “uniform-fill” type.

Uniform-fill is a filtration function used with rapidly settling solids. With rapid settling, an uneven solids distribution occurs with larger particles settling into the lower portion of the chamber before even pressure can be built up. In this case it is necessary to fill the press from bottom to top and end to end, allowing uniform distribution of the solids. If this is not done, a pressure differential can be built across the plate, and possible plate breakage can occur.

NOTE: The manifold supplied includes uniform-fill capabilities. Your particular process may or may not require uniform-fill.

Cake Chute
The Chute directs discharged cake from under the press to a single location for easy handling.

Filtration Cycle (General Information) General Rules of Filtration
Build pressure slowly. Building pressure too fast leads to cloth or cake binding.
Scrape plates between cycles if cake does not completely fall out.
Insure sufficient quantity of slurry to complete cycle.

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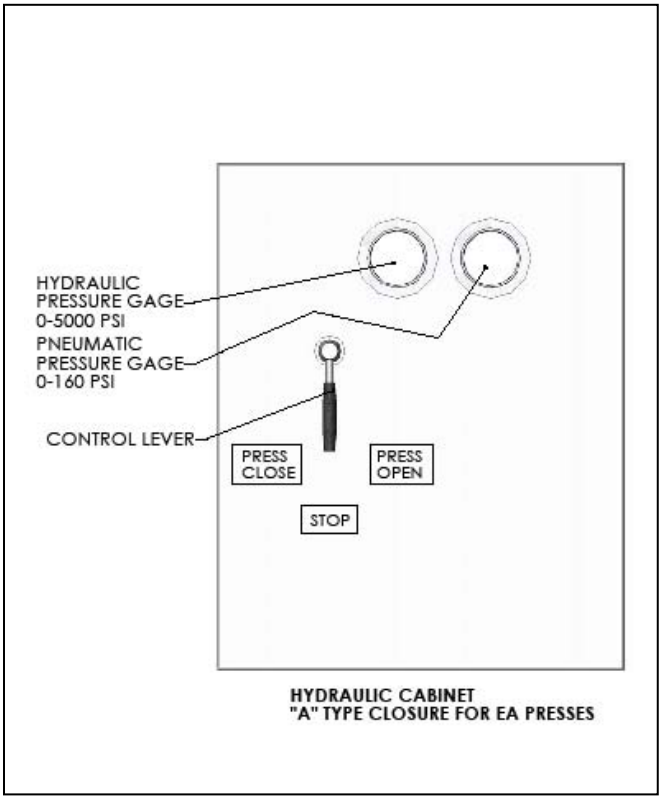
SECTION SIX: OPERATION

CLOSURE MECHANISM- AIR OVER OIL A-TYPE



HYDRAULIC CABINET
"A" TYPE CLOSURE FOR EA PRESSES

HYDRAULIC CABINET - INSIDE

CLOSING DEVICE	A TYPE; AIR/OIL
Air Requirements:	50 SCFM @ 90 PSI minimum
Normal Operating conditions:	2900 PSI hydraulic @ 77 PSI air
Relief Valve Setting	3100 PSI
Hydraulic Oil Recommended*:	DTE 25 Mobile or equivalent Viscosity: 150 ssu@100F

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CLOSING DEVICE

This closure is an air over oil type. It uses air pressure to create hydraulic pressure to extend a hydraulic cylinder to close the press. The hydraulic pressure created is 37.7 times the air pressure provided.
Normal operating conditions are 2900 PSI hydraulic @ 77 PSI air.

The hydraulic pressure and the air pressure can be read on the gages on the front of the Hydraulics cabinet. (See figure page 6-2)

Hydraulic pressure is controlled by controlling the air pressure.

The air pressure is controlled by a pressure regulator located inside the cabinet.
This is component 3B shown on the photo (page 6-2) and also on DWG 0000-0002.
This is set at the factory but it can be adjusted as necessary.

To Close Press:
Turn the control lever (see figure page 6-2) to the “PRESS CLOSE” position. The hydraulic cylinder will extend. An obvious chugging sound will be heard as the pump cycles. The cylinder will move the Follower and plate stack toward the Head End of the press. As the Follower meets resistance against the plate stack, hydraulic pressure will begin building. The hydraulic pump cycling rate will slow as it reaches the preset pressure and will stall at operating pressure.

Under normal conditions the Hydraulic gage will read about 2900 PSI and the Pneumatic Gage will read about 77 PSI, and the pump will cease cycling except intermittently/

If the press continues to cycle and Hydraulic pressure reaches 2900 PSI or more, the air pressure is set too, high forcing oil over the relief valve. This will cause overheating and damage the system. The air pressure must be reduced.
If the press stalls (chugging stops) but the hydraulic pressure is too low (below 2900 PSI).Then the air pressure is too low
If neither hydraulic nor air pressure cannot be reached the problem is probably with insufficient air supply, either quantity or pressure.

To Open Press: Turn the control lever (see figure page 6-2) to the “PRESS OPEN” position”

To Stop Press Closure: Turn the control lever (see figure page 6-2) to the “STOP” position.

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SECTION SIX: OPERATION

CAUTION: Do not start pumping slurry until the press has closed and reached clamp pressure!

CAUTION: The air supply must be left “on” at all times, and the control lever left in the “CLOSE PRESS” position during the complete process cycle. If the handle is turned to the “STOP” position, clamp pressure will be lost and leaking or squirting may occur.

EXCEPTION: If the press is equipped with the optional mechanical lock then air supply may be turned off, or the handle may be left in the “STOP” position. See instructions for mechanical lock.

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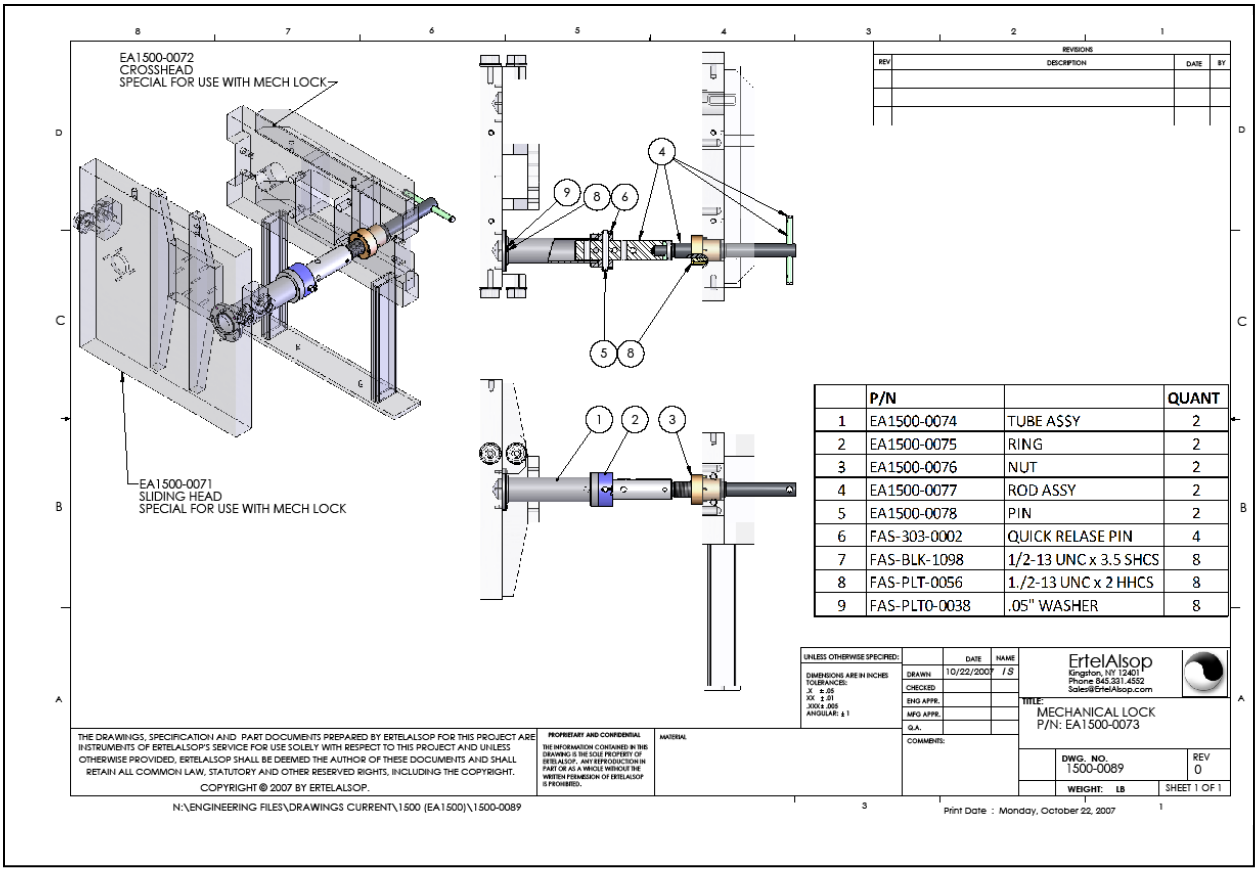
SECTION SIX: OPERATION

MECHANICAL LOCK FOR EA PRESS



	P/N		QUANT
1	EA1500-0074	TUBE ASSY	2
2	EA1500-0075	RING	2
3	EA1500-0076	NUT	2
4	EA1500-0077	ROD ASSY	2
5	EA1500-0078	PIN	2
6	FAS-303-0002	QUICK RELASE PIN	4
7	FAS-BLK-1098	1/2-13 UNC x 3.5 SHCS	8
8	FAS-PLT-0056	1./2-13 UNC x 2 HHCS	8
9	FAS-PLT0-0038	.05" WASHER	8

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
X ±.05
XX ±.01
.XXX ±.005
ANGULAR: ± 1

	DATE	NAME
DRAWN	10/22/2007	IS
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

ErtelAlsop
Kingston, NY 12401
Phone 845.331.4552
Sales@ErtelAlsop.com

TITLE: MECHANICAL LOCK
P/N: EA1500-0073

DWG. NO. 1500-0089 REV 0
WEIGHT: LB SHEET 1 OF 1

MATERIAL

N:\ENGINEERING FILES\DRAWINGS CURRENT\1500 (EA1500)\1500-0089

Print Date : Monday, October 22, 2007

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SECTION SIX: OPERATION

SETTING THE MECHANICAL LOCK

1. Turn T- handle on rod assembly (#4) counter clockwise to move it to its farthest back position. Repeat on other side.
2. Close press with hydraulic closure system.
3. Remove quick release pin (#6) from cross lock pin (#5).
4. Remove cross lock pin (#5) from locking collar (#2) and slide collar forward on rod assembly (#4) as far as possible.
5. Line up holes in collar (#2) with holes in rod assembly (#4). Use which ever holes allow the farthest forward position.
6. Insert cross lock pin (#5) thru holes in locking collar (#2) and in rod assembly (#4).
7. Lock cross lock pin (#5) in place with quick release pin (#6).
8. Repeat steps 3,4,5,6 and 7 on other side.
9. Turn T handle on rod assembly (#4) clockwise to move it forward as far as possible. Make it is tight as possible using ONLY hand force on the T handle. Do not use a cheater bar. Repeat on other side.
10. The hydraulic closure force can now be removed.

REMOVING THE MECHANICAL LOCK

1. If the hydraulic closing force was removed it must be reapplied.
2. Turn T- handle on rod assembly (#4) counter clockwise to move it to its farthest back position. Repeat on other side.
3. Remove quick release pin (#6) from cross lock pin (#5).
4. Remove cross lock pin (#5) from locking collar (#2) and slide collar (#2) back on rod assembly (#4) as far as possible.
5. Repeat step 4 and 5 on other side.
6. Open the press using the hydraulic system.

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SECTION SIX: OPERATION

FILTERING PROCESS FUNCTIONS

Close Press

See instructions on specific closure type for procedure.

CAUTION: Do not start pumping slurry until the press has closed and reached clamp pressure!

CAUTION: Hydraulic clamp pressure must be maintained during the complete process cycle. If clamp pressure is lost leaking or squirting may occur.

EXCEPTION: If the press is equipped with the optional mechanical then hydraulic pressure is not necessary.. See instructions for mechanical lock.

Pre-coat

1. Open the upper filtrate discharge valves. Close the lower filtrate discharge valves. This insures even flow across filter cloths.
2. Start the pre-coat feed pump.
3. After the filtrate runs clear, start the slurry feed pump or switch over valves on slurry lines. Velocity of slurry must be equal to or greater than the velocity of the precoat to prevent a pressure drop.
4. Turn off the pre-coat pump.

   Do not interrupt flow to the press at any time during the precoat or feed cycle. This will cause the pre-coat to fall off the filter cloths and collect at the bottom of the chambers. Poor filtration, uneven cake dryness and/or differential pressure on the plate stack may occur, resulting in plate failure.

Uniform-Fill

Close the lower filtrate discharge valves. Open the upper filtrate discharge valves.

1. Begin slurry feed.
2. When filtrate discharge begins flowing out of the press, open the lower filtrate discharge valves.

Filtration Cycle

Running the Filtration Cycle

1. Open the feed valve and all of the filtrate discharge valves.
2. Start the feed pump.

SECTION SIX: OPERATION

3. Run the feed pump until maximum feed pressure has been reached and the pump has stalled.
4. Turn off the feed pump (if manually controlled) and close the feed valve.

The cycle is now complete and the opening procedure can be performed (unless additional cake processing is performed such as air blow or core blow).

CAUTION: Do not stop the feed in mid-cycle! Stopping the feed in mid-cycle causes settling of the formed solids, which may plug the center feed eye. Restarting the cycle with a plugged feed eye will cause differential pressure across the plate web. This will lead to distortion of the web or total failure of the plates.

Air Blow
CAUTION: Air pressure must be regulated to 40 psi maximum. Failure to do so may cause adverse affects or failure of equipment.

1. Shut off slurry pump.
2. For manifolds with three discharge valves, close all filtrate discharge valves. For manifolds with four discharge valves, open the lower right filtrate discharge valve and close all other filtrate discharge valves.

WARNING: It is extremely important to insure that the valves are set properly. Failure to do so may lead to equipment failure and personal injury!

3. Close the feed valve(s).
4. Open the air valve. Run air through the press for 2-3 minutes. If this does not remove all the water, longer filtration times should be performed.
5. Open the filtrate discharge valves. Gravity will drain the press. Allow several minutes for complete drainage. The press can now be opened (or perform core blow if applicable).

Open Press
See instructions on specific closure type for procedure.

CAUTION: Make sure the feed pump has been turned off, and the pressure has been bled down!
CAUTION: If the press is equipped with the mechanical lock option it must be released before opening the press. See instructions for mechanical lock.

After the press is opened, the plates can be shifted and the press emptied.

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SEMI-AUTOMATIC PLATE SHIFTER OPERATING INSTRUCTIONS

Semi-Automatic Plate Shifter

The Semi-Automatic Plate Shifter uses an air motor to turn a sprocketed shaft, which supplies mechanical motion through a chain, to the shifter framework. A pair of cams are used to latch onto pins on the handles of the plates, one on each side. For a complete pneumatic diagram, please see Drawing 0000-0002

To operate the shifter, begin by selecting “open” on the control console. When the press is completely open, the operator depresses and releases the palm button on the shifter framework. The shifter will move toward the first plate to be shifted and stop. Depress and release the palm button again and the framework will shift the first plate toward the tail /cylinder end. Continue depressing the palm button until all of the plates are shifted, cleaning out the cake as you move through the plate stack. When the last plate has shifted, depress the palm button once more to send the plate shifter framework to its home position, at the tail /cylinder end of the press. Once shifter is “home”, the cams will extend up and you are ready for another press cycle.

Pressure adjustments

1. Pressure regulator on the arch. Pressure Regulator item #26 on Drawing # 0000-0002
   The correct pressure is about 15 PSI. There is no gage. The regulator range is 0-30 PSI . This controls the force on the plastic cams that shift the plates
   Too little pressure will make the cams stick in the down position.
   Too much pressure will cause the cams to lift the plates as they pass under them.

2. Pressure regulator for air motor. Pressure Regulator item 5A #2 on drawing # 0000-0002
   Correct pressure is about 40 PSI.
   Too little pressure will make the air motor run slow or stall.
   Too much pressure will cause excessive force on the pins on the plate handles and on the stops that limit the arch travel at extremes of travel.

3. Pressure regulator for count 2 module. Pressure Regulator item 5B on drawing # 0000-0002.
   Correct pressure is 30 psi.
   Too much pressure will make the count 2 module unstable sometimes causing the direction of travel of the arch to reverse when releasing the palm button.

If the shifter runs too fast or too slow, open or close the exhaust muffler on the double pilot air valve for the air motor.

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Recessed Chamber Plates Description

The recessed chamber plate has the following features: plate recess, feed eye, filtrate discharge eyes, filtrate ports, drainage surface and stay bosses.

Each plate recess is one half of a single chamber. Two plates pressed together create the whole chamber. The slurry passes through the feed eye, to the chambers where the solid portion of the slurry is deposited.

The drainage surface is at the most recessed point of the chamber and is made up of “pips” or “ribs.” The pips support the cloth and allow the filtrate to drain to the ports.

The filtrate ports discharge the filtrate (the liquid part of the substance being filtered) to the discharge eyes. The filtrate ports are at the four corners of the plate.

The stay bosses are approximately the total thickness of the plate. The function of the stay bosses is to stabilize the web (drainage surface) of the plate.

The plates have identification marks to aid the operator in placing or replacing plates in the press. Each plate is designed as either a one-button or three-button plate. A one-button, or non-wash plate, means that the small air/wash water ports are located near the lower and upper right corners of the plate. A three-button, or wash plate, has the small ports located near the lower and upper left corners. The alternating plate provides the porting necessary to begin the wash and air blowdown processes.

The order of the plates must follow a 1, 3, 1, 3, 1, 3…sequence, beginning at the Head End of the press, to assure proper air blowdown and wash cycles. Gasketed plates allow less leakage than non-gasketed plates due to an O-ring seal around the chamber and filtration ports. The identification marks are visible on the side edge of the plates as shallow drill marks.

The cloth is retained in a machined groove located around the outer edge of the plate recess. The sewn-in sash cord filter cloths are made by sewing a high-density polypropylene sash cord around the outer edge of the cloth. Cord diameter depends on type of cloth and relative thickness being used. In most cases, a No. 12 (3/8-inch diameter) cord is used.

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Blanking Plate

A Blanking Plate (Backup or Dummy Plate) can be inserted in the plate stack to isolate filter plates between the Backup Plate and the Follower. The Backup Plate allows a smaller batch to be processed since a smaller number of chambers are used in the process.

The Tail Plate MUST be relocated and inserted in front of the Backup Plate to form a complete chamber. Together the two plates provide the strength needed for safe press operation.

For correct press operation, proper plate sequencing 1, 3, 1, 3…must be followed when relocating the Tail Plate and Blanking Plate.

Filter Cloths

ErtelAlsop has supplied filter cloth based on criteria supplied by the customer or based on sample processing either in the ErtelAlsop laboratory or at the customer's facility. Should the process change, ErtelAlsop recommends that the cloth type be reevaluated for suitability. Information follows to help you better understand filter cloth and how it works. Detailed questions should be directed to ErtelAlsop.

Cloths for non-gasketed plates are hung over the plate, extending from top to bottom, and are held in place by eyelets, which fit over the cloth-pins on top of the plates. With the non-gasketed plate, the filter cloth provides the seal between the plates. Leakage will occur during operation even though ErtelAlsop normally supplies the non-gasketed plate cloths with latex edging. The latex will cut down the wicking action somewhat, but will not eliminate it. The gasketed plate allows less leakage than the non-gasketed plate due to an O-ring seal around the chamber and filtration ports. The gasketed cloth has a high-density sash cord sewn around the perimeter of the cloth, which is caulked into a groove on the plate.

The type of cloth used is determined by the type of process or application performed by the ErtelAlsop press, the operating environment, and the performance required by the filtration media (filter cloths)

The filter cloths come in many different materials including polypropylene, polyester, cotton and other synthetic materials. The cloths are made from either monofilament fibers, multifilament fibers, or spun fibers. The smooth surface characteristic of monofilament fibers can help to improve cake release properties. The uniform circumference of monofilaments also enables fabrics to be produced with consistent pore sizes. Multifilament and spun fibers are produced by twisting several smaller diameter monofilament fibers together to form a single strand. They are used to produce fabrics that require a very tight weave and fabrics where high flow rates are not critical. Filter cloths also come in many different styles of fabric weave.

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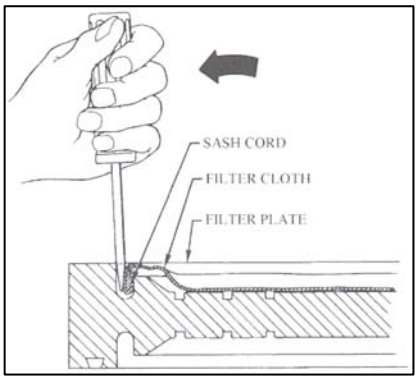
Mesh opening or pore size is also an important consideration when selecting the proper filter cloth for a particular application. The mesh opening or pore size is determined by the number of fibers, size of the fiber, and the type of weave. These factors in turn govern flow rates, particle retention, and the strength of the fabric itself.



Cloth can be finished in several ways: heat set, scoured, calendared, single-glazed and double-glazed.

Cloth Removal and Installation Non-Gasketed Plates (if applicable)

Cloth Removal

Cut the ties on the vertical sides of the plates that hold the two cloth faces together outside the plate.

1. Lift the cloth off the cloth dogs on the top of the plate.
2. Pull the cloth through the center feed eye of the plate.

Cloth Installation

1. Fold one side of the cloth and insert it through the center feed eye of the plate.
2. Lift the cloth over the cloth dogs on top of the plate.
3. Join the two edges on the sides of the filter plate with wire ties or similar clips.

SEE STEP BY STEP INSTRUCTIONS FOR INSTALLATION OF FILTER MEDIA, WHICH FOLLOW.

Cloth Removal and Installation-Gasketed Plates (if applicable)

Cloth Removal

To remove a filter cloth from a gasketed plate, insert a thin bladed screwdriver into the groove at the outer edge of the caulking and pry out a small section of the cloth. Grasp the sash cord caulking with pliers and pull the remaining cloth out of the caulking groove. Do this on both sides of the plate. Pull the cloth through the center feed eye of the plate. After the cloth is removed, inspect and remove any accumulated solids from the groove before inserting the new cloth.

Cloth Installation

The tool for installing and retaining material (O-ring caulking and sash cords) is a simple wedge of polypropylene or some other no-shattering material. This can be purchased by contacting ErtelAlsop or your authorized representative directly.

CAUTION: Do not use a metal wedge since this may damage the cord or filter cloth.

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Place the cloth against the plate and tap in a small section of the sash cord or O-ring on the top to hold the cloth in position. Line up and caulk the diagonal sections first to insure proper alignment of the cloth. Distribute the caulking on the sides, top and bottom by caulking in the center of these long sections first. Proceed to insert the balance of the caulking, insuring that the caulking is evenly distributed. Even though there may appear to be a surplus of material, this can be worked in easily.

Re-gasketing the Filter Plates (if applicable)

1. Insert the gasket starting at the bottom center of the filter plate using a wood or plastic mallet. Push the gasket into the groove around the outer edge of the plate until it mates at the center of the plate. Many installers will incorrectly stretch the gasket material. This reduces the cross section, making it easier to insert. However, by stretching the gasket material for easier installation, it has a tendency to creep and open the buffed joint of the gasket, causing leakage.
2. Cut the gasket approximately ½-inch to 1-inch longer than required, cutting the end squarely.
3. Apply one or two drops of Eastman 910 (or equivalent “Super Glue”) to one end of the gasket and quickly join it to the other end. Hold it under hand pressure for approximately 30 seconds. Then crowd the excess gasket into the groove to insure fullness of gasket material.
4. Install the discharge eye gaskets in the same manner.

Gasket life depends on many factors, such as length of filtration cycle, temperature, and excessive closing force. Gasket replacement should take place if the gasket appears to be delaminating or shredding into small pieces. Also, if excessive temperatures exist and cycles are very long, the EPDM elastomer (standard gasket material) may go into additional cure, causing it to harden slightly. If the gasket life of the EPDM elastomer is unsatisfactory, contact ErtelAlsop or your authorized representative for a suitable replacement.

NOTE: When gasketed plates are first put to use, the new gasket material may be slightly sticky or gummy and cause gaskets to pull out of the grooves when plates are separated. This condition is eliminated as product film builds up. If any gaskets demonstrate this condition, apply a silicone spray until the press has been used several times.

Membrane Plates (if applicable)

Membrane Plates have a separate operation manual.

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Plate and Cloth Maintenance

CAUTION: KEEP CLOTHS CLEAN. Use a plastic spatula to scrape cake off the surface. Cake buildup can cause bendin**g** of the press frame. Excessive bending can lead to equipment failure! Keep the cloths and plates as clean as possible, especially along the sealing surfaces. Keep the following in mind when scraping cloths:

- Use care not to cut or rip the cloth.
- Cloths deteriorate over time and become more fragile and susceptible to tearing.
- Make sure the edge of the spatula is smooth.
- Do not tap the spatula on hard objects to remove cake from the spatula surface. This may form dents or tears in the spatula surface that can tear cloths.

The filter cloth is the initial barrier that separates the solids from the liquid, therefore, the filter cloth must remain porous to provide high filtration rates. During normal operation the filter cloth may gradually become plugged with small particles. The particles enter the cloth and become lodged in the depth of the weave, leading to decreased filtering action. Indications of plugged cloth include:

- Initial high filtration pressure
- Long filtration cycles
- Wet filter cakes

Lodged particles must be removed periodically to maintain high filtration rates and dry cakes. A high-pressure, cold water spray unit with a capacity of 800-1200 psi and 2-10 gallons per minute should have sufficient capacity. A broad spray nozzle should be used at a safe distance. If the pattern is too intense at a close distance, the cloth weave may be forced apart, leaving openings that allow sludge.

If high pressure washing does not improve performance, carefully pull back a corner of the filter cloth and check the drainage area and discharge ports of the plate for solids buildup. If there is any buildup, the cloths must be removed and the plates and cloth backs cleaned. Excessive buildup causes slow filtration cycles and can lead to plate breakage.

If there is no buildup behind the cloths, slight changes in the process may have changed the dewatering characteristics. Check all process parameters and insure that

SECTION SEVEN: PLATES AND CLOTHS

there have been no changes to the slurry characteristics.

If none of the above provides a solution, a more thorough cleaning process will be required to dissolve the entrapped particulate.

Cloth Washing
A re-circulation cleaning method using a particulate dissolving solution is the most effective cloth cleaning method. This method circulates an acid, caustic, or cleaning solution through the press to dissolve built up particulate. The type of solution depends on the slurry. Contact ErtelAlsop if you need assistance determining the appropriate solution.

CAUTION: BE EXTREMELY CAREFUL WHEN HANDLING ACIDS OR CAUSTICS!
Eye protection and protective clothing is required. Should you get acid or caustic in your eyes or on your skin, rinse with water immediately and seek medical attention, if necessary. Notify your supervisor of the incident.

CAUTION: Do not acid or caustic-wash non-gasketed filter plates unless extra precautions are taken to control leakage between plates.

CAUTION: Consult the chemical resistance chart in the Safety section of this manual to insure safe and proper operation of the press.

Setup & Requirements

- Storage tank of sufficient capacity to fill the press and allow for re-circulation approximately 1.5 times the holding capacity of the press.
- A low pressure (20-30 psi) pump.
- Necessary plumbing (hoses or rigid PVC pipe) to isolate the press from the sludge stream and allow for both re-circulation to the storage tank and final draining of the spent solution. A throttling valve installed in the return line to the tank may be necessary to insure complete top and bottom press filling and wishing of the cloths.

Procedure

1. Clean filter cloths of all external material with a nylon or plastic spatula.
2. Close the press.
3. Disconnect the center feed line from the sludge pump.
4. Connect the outlet of the acid pump to the center feed line of the press.
5. Connect the filtrate discharge outlet of the press to the re-circulation tank.
6. Open the feed line to the press.

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7. Start the feed pump. It may take considerable time to fill all the chambers of the press before the solution returns to the storage tank. Continually inspect the press for leakage during filling and circulation.
8. Allow the solution to circulate for one to two hours.
9. Turn off the feed pump.
10. Perform and air blowdown to purge any remaining solution from the press.
11. Disconnect the wash system and reinstall the sludge pump and outlet lines.
12. Normal filtration cycles may be now be performed.

The plates can also be “dip washed” by immersing them in a tank of solution. The immersion method is less efficient than thorough-washing the press and will require a longer soak time. The plates will also float and require some method to keep them submerged.

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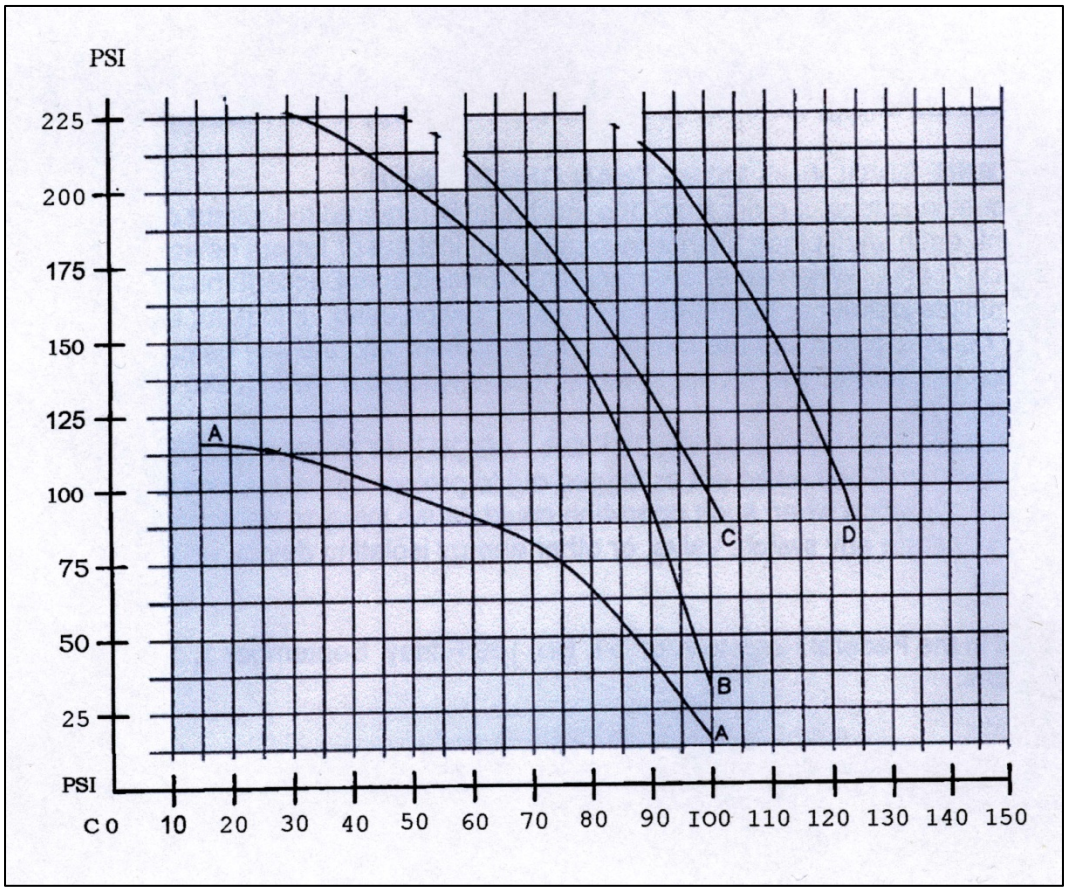
TEMPERATURE VS. PRESSURE CURVES
RECESSED CHAMBER PLATES



“A” = Low Pressure Plates, Standard 100 psi design, Polypropylene
“B” = High Pressure Plates, Polypropylene
“C” = High Pressure Plates, Glass Filled Polypropylene
“D” = High Pressure Thick Web Plates, Nylon or PVDF

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SECTION EIGHT: PREVENTATIVE MAINTENANCE

General Maintenance

An effective maintenance program is ultimately the responsibility of the customer. If properly maintained, the ErtelAlsop press will provide long and trouble-free service. You may use the following suggestions in establishing your comprehensive maintenance program:

- Read and become familiar with this general maintenance information and the troubleshooting information.
- Create a maintenance program and follow it diligently.
- Use common sense precautions to prevent damage to the press or any part of the press.

The information and tables that follow should be a starting point for a maintenance program. Different slurries and factory conditions will affect press components differently. More or less frequent maintenance may be required.

Plate and Cloth Maintenance

CAUTION: KEEP CLOTHS CLEAN. Use a plastic spatula to scrape cake off the surface. Cake buildup can cause bending of the press frame. Excessive bending can lead to equipment failure! Keep the cloths and plates as clean as possible, especially along the sealing surfaces. Keep the following in mind when scraping cloths:

Hydraulic Power Unit Maintenance

The Hydraulic Power Unit that came with your press has been filled with the correct grade of hydraulic oil and properly set for the correct closing force and relief conditions. As a general rule, no adjustments should be required.

It will be necessary to change the oil and the filter, where provided, on a regular basis. Interval lengths must be determined by application and working environment, however, the following information may be of use when setting up a program:

- Always use clean oil and new filters. Never return used oil to the reservoir or reuse a filter. Never use oil straight from the barrel, always filter it prior to filling the Hydraulic System reservoir.
- Use clean containers, hoses and funnels when transferring oil.
- Keep containers of oil tightly sealed.
- Inspect filter elements for signs of failure, which may indicate a need to decrease time between service intervals.
- Intake and return lines should be submerged in oil. If not, oil level in reservoir is too low.

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- Listen for unusual noises and change in performance. These are indicators of low oil levels, loose suction or return lines, clogged filter elements or air entrapment.

There are a limited number of tests that the average user can conduct. One simple test is to compare the same grade of clean oil with a sample from the power unit. The power unit sample should be allowed to sit overnight to promote settling of any contaminants. No foam should remain. A severe color change or a change in consistency means change the oil more often! It will always be cheaper to change the oil than to replace components.

Avoid the use of phosphate ester base, chlorinated hydrocarbon, water glycol and water based emulsion oils. This manual contains recommended specifications for hydraulic oil. ErtelAlsop cannot make recommendations as to specific manufacturers of hydraulic oil. A list of “or equal” oils is contained in the Section Three of this manual.

Under normal operating conditions, oil and filter, where provided, should be changed after 60 days and every 6 months thereafter.

Cylinder (with Boot)

Item	Frequency	Procedure
Cylinder Boot	Weekly	Inspect boot for tears or holes. Repair/replace if damaged. Note: It is important that the boot maintain a seal around the cylinder rod since certain processes may cause quick deterioration of the cylinder rod. Repair or replacement of the cylinder would be quite expensive, both in time and cost.

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Hydraulic Power Unit

Item	Frequency	Procedure
Clamp Pressure	Daily	Check for correct clamp pressure
Oil Level	Monthly	Check for proper level • Fully retract Follower • Loosen pressure tube at top of reservoir • Remove plug from “Level Inspection Elbow” on side of reservoir • If level is low, no oil will be seen in elbow • Add oil, (filtered to 10 microns or less) at elbow or inspection tube until oil level reaches elbow. • Reconnect pressure hose to top of reservoir • Re-install plug in inspection elbow
Relief Valve	Quarterly	Check for proper setting
Hydraulic Oil & Filter	Yearly	Replace oil using type specified in Specification section of this manual (filtered to 10 microns or lower) • Fully retract Follower and remove plug from “Level Inspection Elbow” on side of reservoir • Remove suction hose at manifold block (this hose connects to bottom of reservoir) • Lower suction hose into drain container • Reconnect suction hose and loosen air pressure • Add new filtered oil at elbow or inspection tube until oil reaches elbow • Reconnect pressure hose to reservoir top • Re-install plug in inspection elbow.

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Process Manifold

Item	Frequency	Procedure
Plumbing	Weekly	Inspect all plumbing connections for leakage

Plate Shifter (Semi-Automatic)

Item	Frequency	Procedure
Lift Cylinder	Weekly	Clean guide rods
Push Cylinders	Weekly	Clean guide rods
Lift Cylinder	Monthly	Operate with no plates present. Push plates should lift and lower smoothly. See Troubleshooting if necessary.
Push Cylinder	Monthly	Operate with no plates present. Push plates should extend and retract smoothly. See Troubleshooting if necessary.

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SECTION NINE: TROUBLESHOOTING

Press Operations

Refer to the Hydraulic Schematic and parts location diagrams elsewhere in this manual.

1. Press fails to close.
   A. Check gauge, if no reading, turn on air supply.
   B. Check selector switch position. Make sure it is in “close” position.
   C. Check oil level in the reservoir.

2. Press fails to reach closing pressure.
   A. Check hydraulic pressure gauge. If booster is cycling and gauge shows fluctuation, increase the setting of relief valve.

3. Press fails to open.
   A. Check gauge. If no reading, turn on air supply.
   B. Check selector switch position. Make sure it is in “open” position.
   C. If above does not resolve the problem cylinder seals may be leaking.

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SECTION NINE: TROUBLESHOOTING

Recessed Chamber Plates (Gasketed)

Trouble	Probable Cause	Corrective Action
Plate breakage	1. Clogged Feed Ports. 2. Irregular pumping of feed pumps. 3. Short batches with insufficient solids. 4. Solids built up in plate drainage areas, reducing flow to outlet. Plugged or partially plugged outlet. 5. High velocity constant pressure /flow pumps such as progressive cavity pumps used for feeding sludge to the press may cause breakage due to velocity shock on one side of the plate. 6. Improper use of backup plate. 7. Pressure loading of plates-feed valve is closed when the feed pump is started, or outlet valves are closed when the feed pump is started. 8. Careless handling of plates.	1A. Remove excess slurry remaining in feed eyes using a nylon cleaning spatula. 1B. Do not stop feed in mid-cycle. 1. Check pump to insure adequate pumping capacity and discharge pressure. Restart pump at a very low pressure and gradually build pressure. 2. Have enough slurry available to complete the filter cycle, or obtain a backup plate to shorten the cycle. 3. Inspect plate drainage areas behind cloths frequently. Some cloths may allow more solids to pass through than other style cloths. Unplug and clean outlet. 4. Use pumps with a pressure/flow curve corresponding to the filtration curve of the material being filtered. 5. Place backup plate directly behind tail plate. Do not use tail plate alone to shorten chamber size. 6. Open all valves before starting feed pumps. 7. Handle plates carefully. Do not drop on side bars during installation or cleaning.
Water leaks out between plates	1. Gaskets loose or torn. 2. Low hydraulic pressure 3. Wrinkle or hole in filter cloth. 4. Filter cake present in sealing surface.	1. Reinstall or replace. 2. Increase to required pressure. 3. Replace filter cloth. 4. Use nylon cleaning spatula to remove cake from sealing surface.
Filter cloths pull out of grooves during operation	A full cake was not developed before wash or blowdown, causing cloth to be pushed out of caulking groove.	Be sure chambers are completely full before wash or blowdown. The filter cake will then support the cloth.
Filter cloths pull out of grooves during operation, even though full cakes are being built.	Improper size sash cord for cloth or application.	Future cloths should be made with a slightly larger sash cord.

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SECTION NINE: TROUBLESHOOTING

Filtration Cycle

Trouble	Probable Cause	Corrective Action
Solids in Filtrate	1. Holes in filter cloth. 2. Filter cloth in head plate may be improperly installed. 3. Filter cloth sash cord out of groove in gasketed plates. 4. Incorrect filter cloth for application. 5. Change in feed characteristics.	1. Replace filter cloths. Be careful when scraping cake-sharp edges may tear cloth. 2. Replace. 3. Clean groove and drainage surface behind cloth and reinstall. 4.&5. Submit sample for testing.
No filter cake formed (very little flow)	1. Material not amenable to pressure filtration. 2. Filter cloths too blinded from polymer, oils, fine particulate, too high initial flow. 3. Feed pump, feed line, or suction line plugged.	1. Submit sample for testing. 2. Clean or replace filter cloths. 3. Clean as needed.
Partial filter cake formed (firm edges with liquid center)	1. Material not amenable to pressure filtration. 2. Too low air pressure to feed pump (if air driven). 3. Pump located below or too far away from filter press. 4. Filter cloths partially blinded from polymers, oils, fine particulates. 5. Ran out of feed material. 6. Premature termination of cycle. 7. Bodyfeed dosage too low, or inadequate pretreatment.	1. Consult ErtelAlsop. 2. Increase air pressure to maximum rating of filter press (last stage). 3. Relocate pump next to filter press. 4. Clean or replace filter cloths. 5. Wait until more feed material is available or obtain backup plate. 6. Allow longer time period between pump strokes at high pressure. 7. Increase bodyfeed dosage or reevaluate treatment.
Uneven filter cake formation	1. Clogged feed eye. 2. Plugged drainage surface or drain ports. 3. Filter cloths partially blinded. 4. Flow rate too low. 5. Stopped feed pump during cycle and then restarted (filter cake slumps blocking feed eye)	1. Clean at end of every cycle. 2. Remove cloth and clean. 3. Clean or replace filter cloths. 4. Increase air pressure or pump size. 5. Restart pump at low pressure and gradually build pressure.
Cycle time too long	1. Too low of solids in feed slurry. 2. Dewatering characteristics of feed material. 3. Filter cloths partially blinded. 4. Feed pump undersized—too low of flow rate. 5. Too low or air pressure to feed pump (if air drive) 6. Filter press oversized.	1. Concentrate/thicken solids in feed material. 2. Add filter aid or evaluate treatment alternatives. 3. Clean or replace filter cloths. 4. Replace with larger pump. 5. Increase air pressure to maximum rating of filter press. 6. Wait until more feed material available before running.

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Precoat

Trouble	Probable Cause	Corrective Action
Cloudy filtrate	Insufficient quantity of precoat added to press.	Need dosage rate of 0.1lb/ft² (1225 grams/m² filtration area)
Uneven distribution of pre-coat (if applicable)	1. Flow rate too low. 2. Stopped precoat pump before starting feed pump (precoat falls to bottom of chamber). 3. No precoat manifold.	1. Need 0.25 to 0.5 gal/min/ft² (31-61 liters/m² filtration area) 2. Start feed pump before stopping precoat pump. 3. Contact ErtelAlsop or your authorized representative.

General Issues

Trouble	Probable Cause	Corrective Action
Pressing start button does not start the cycle	1. Insufficient air supply to system 2. Press not properly aligned.	1. Ensure 100 psi system air pressure. 2. Follow press closing procedure.
Pump stops mid-cycle.	1. Air supply pressure dropped and clamping force lost. 2. Press closure switch in wrong position.	1. Ensure 100 psi system air pressure. 2. Ensure press is properly closed and clamped.

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SECTION TEN: RECOMMENDED SPARE PARTS

Plate Shifter Parts List

Description	**Part No.**
Air Motor Gast 4AM-NRV-70C	ELE-AIR-001
Speed Reducer, Baldor F1032-14S-B5	ELE-905-001
Take Up Bearing MTWS-216 Browning	DRV-1001
Take Up Frame 6SF16 Browning	DRV-1002
Sprocket, 40 teeth, 1.25” bore	DRV-1005
Sprocket, 32 teeth, 1.0” bore	DRV-1007
Sprocket, 20 teeth, 0.75” bore	DRV-1015
Flanged Cam Follower FCF-1-1/2-McGill	DRV-1003
Cam Valve FV-4DP Clippard	HC-0028
Palm Button Valve 4N301-312B Watts	HC-0025
Regulator 0-125 PSI	HC-0056
Regulator 0-30 PSI	HC-0053
Coiled Air Hose 1/4” (Specify Length)	TUB-PLY-0005
End fitting for 1/4” coiled hose	HC-0049

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SECTION ELEVEN: RETURN GOODS POLICY

Return Goods Procedure

1. To insure proper handling of your return, please follow these instructions:

2. All returns must have a RETURN GOODS AUTHORIZATION (RGA) NUMBER. The return cannot be accepted or properly credited without an approved RGA Number.
3. All returns must be complete, including all original warranties, manuals, documents and packaging.
4. All products must be received within 20 days of issuance of RGA Number.
5. All returned goods must be cleaned and free of dirt and debris. Any applicable MSDS of the application must accompany the returned goods. If an MSDS is not included, no work will be performed. Non-compliance may result in the product being refused and returned to the sender.
6. The **Return Goods Authorization Number must be written clearly on all boxes being returned. Non**-compliance may result in the product being refused and returned to the sender. C.O.D shipments will not be accepted.

Return Instructions

An RGA Number is required for ANY return. To obtain this number, call 800-553-7835 and ask for Customer Service. Be sure to have the following information available:

- Product Serial Number
- Order Number
- Part Number and Description if available
- Reason for the return

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SECTION TWELVE: OPTIONAL EQUIPMENT

The chart identifies items that are **S**tandard, **O**ptional, or can be **R**etrofitted to each ErtelAlsop press. *Indicates features that provide additional operator safety.

Description	Press Size (mm)					
	470	630	800	1000	1200	1500
High Pressure Construction	O	O	O	O	O	O
Gasketed Chamber Plates	SR	SR	SR	SR	SR	SR
Non-Gasketed Chamber Plates	OR	OR	OR	OR	OR	OR
Non-Gasketed Membrane Plates	OR	OR	OR	OR	OR	OR
Standard Control Panel	N/A	S	S	S	S	S
Manual Closure	S	O	O	N/A	N/A	N/A
Automatic, Air Powered Hydraulic Pump	OR	S	S	S	S	S
Regular Discharge Manifold	O	O	O	O	O	O
Air Blow Manifold	OR	OR	OR	OR	OR	OR
Automatic Pump Control System	OR	OR	OR	OR	OR	OR
Expansion Piece	O	O	O	O	O	O
Backup Plate	OR	OR	OR	OR	OR	OR
Core Blow	OR	OR	OR	OR	OR	OR
Cake Cart/Dumpster	OR	OR	OR	OR	OR	OR
Semi-Automatic Plate Shifter		O	O	O	O	O
Fully Automatic Plate Shifter		O	O	O	O	O
Drum Disposal System	OR	OR	OR			
Extended Legs and Chutes	OR	OR	OR	OR	OR	OR
Roll-off Platform		OR	OR	OR	OR	OR
Manual Drip Tray	OR	OR	OR	OR		
Powered Drip Tray		O	O	O	O	O
Operator Safety Dual Palm Buttons*	OR	OR	OR	OR	OR	OR
Safety Guard*	O	O	O	O	O	O
Light Curtain*	O	O	O	O	O	O
Splash Curtain*	O	O	O	O	O	O

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P.O. BOX 3358, KINGSTON, NY 12402
TELEPHONE: 800.553.7835 845.331.4552 FAX: 845.339.1063
SALES@ERTELALSOP.COM WWW.ERTELALSOP.COM

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SECTION TWELVE: OPTIONAL EQUIPMENT

ErtelAlsop reserves the right to change equipment specifications, options and pricing and/or discontinue models and options at any time without notice or obligation. Illustrated equipment may include optional components.

Standard Discharge Manifold
The discharge manifold consists of piping and valves, which connect the four filtrate discharge ports, located in each corner, into a common discharge pipe. The discharge manifold provides a single filtrate discharge for ease of installation. Construction can be of stainless steel, PVC, CPVC or other materials.

Air Blow-down Manifold
The air blow-down manifold consists of piping and valves which connect the four filtrate discharge ports, located in each corner, into a common discharge pipe. Air blow refers to the process of removing excess water from the cloth, cake, and discharge eyes. Following a filtration cycle, the feed line valves are closed, and the manifold valves are closed in such a way that discharge can only exit from the lower right filtrate eye. The air valve is then opened and air enters the press through the upper left port and fills the drainage area. The air passes from the back side of the cloth, through the cake, and the opposite cloth, and then out the lower right port, leaving the press via the piping system. The air forces the excess water from the cake and on the drainage surface. This helps loosen the filter cake, improves cake dryness, and drains the remaining liquid in the bottom discharge eyes.

Core Blow
Core blow refers to the process of removing excess slurry from the center, or core of the press. Core blow begins at the tail plate. Pressure builds up behind the core, and the core is blown out and returned to the slurry tank. Core blow will typically take no more than 1-2 minutes. If the core does not discharge after 1-2 minutes, the cake is most likely solid enough that core blow will not occur, and is not necessary.

For the core blow process, the tail plate of the ErtelAlsop press is counter-bored up (or down) to the center feed eye. If double-end feed is supplied, core blow will be attached to the feed. An air line and a valve can easily be attached to provide the 40 psi of pressure used to force the excess slurry in the core of the press back out the center feed inlet. Core blow should be performed after air blow-down.

Spacer (Expansion Piece)
An ErtelAlsop Press can be constructed for future additional capacity by using longer side bars and a removable expansion piece. The expansion piece occupies the space for future plates.

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SECTION TWELVE: OPTIONAL EQUIPMENT

Backup Plate
A backup plate (blanking or dummy plate) can be inserted in an ErtelAlsop press plate stack to isolate the filter plates between the backup plate and the follower. The backup plate allows a smaller batch to be processed since a smaller number of chambers are used in the process. The tail (slide head plate) plate must be relocated and inserted in front of the back-up plate to form a complete chamber and together the two plates provide the strength needed for safe press operation.

Plate Shifter
The plate shifter separates the plates to drop the cake and to clean the press.

Drip-Trays-Manual
A drip tray is a series of overlapping sheets set on a metal framework attached to the press under the plates. The drip trays catch liquid that escapes from between the plates during the fill cycle. The tray slants to one side of the press so the liquid can drop into a launder. Before the press is opened to release the filter cakes, the operator slides the sheets to the end of the press and stack them one on top of the other to prevent them from interfering with emptying the press.

Drip Trays-Powered (Bombay Doors)
The powered drip trays catch liquid that escapes from between the plate during the process cycle or when cleaning plates. The tray slants to one side of the press where the liquid runs into drain pipe. This may be plumbed to a drain or recycled to the slurry system depending on plumbing arrangements and process requirements. The trays are powered by a hydraulic or pneumatic cylinder to allow cake drop after a process cycle. The trays open vertically to allow the operator room to scrape or clean the plates.

Cake Cart (Dumpster)
ErtelAlsop can provide a cake cart for any size press for easy handling of discharged solids. The carts are furnished with large casters for easy positioning under the presses-either manually or by using a lift truck. When filled, the operator can pick up the dumpster using a fork lift truck and position the dumpster over a larger container. The dumpster can be emptied quickly and easily by pulling a release pin.

Extended Legs and Cake Chutes
For smaller presses (470mm, 630mm and 800mm) where a barrel-type disposal system is preferred over cake carts and conveyors, the Sperry Press can be fitted with extended legs. The extended legs raise the press to allow room for a single or double barrel to catch the filter cake when released from the press.
ErtelAlsop recommends that a chute be attached to the press to direct the discharged solids to the collection barrel(s).

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SECTION TWELVE: OPTIONAL EQUIPMENT

Operator Safety, Dual-Palm Buttons
ErtelAlsop can provide dual-palm button safety controls for a level of added safety. The palm buttons require that the operator use two hands to maintain pressure on the palm buttons for the follower to move.

Safety Guard
A safety guard is a wire mesh screen mounted the non-operator side of the press. The purpose of the safety guard is to prevent injuries to personnel who might approach the press from behind while the press is opening or closing, or when a shifter is operating.

Light Curtain
A light stops all press motion should an operator reach into the plate stack area. Placed on the operating side of the ErtelAlsop press, the light curtain consists of two units- a sender and a receiver. Infrared light travels between the two units. Operation will not continue until the operator is out of the light curtain area, and has pressed a restart button.

Splash Curtain
Splash curtains help contain liquid that may, under certain conditions, squirt or splash from between the filter plates during the fill cycle, or during power washing of the filter plates and cloths. The vinyl splash curtains are attached to a metal framework that is attached to the ErtelAlsop press. The curtains are typically hung on the two longest sides of the press and across the top of the press, but may be customized for other arrangements.

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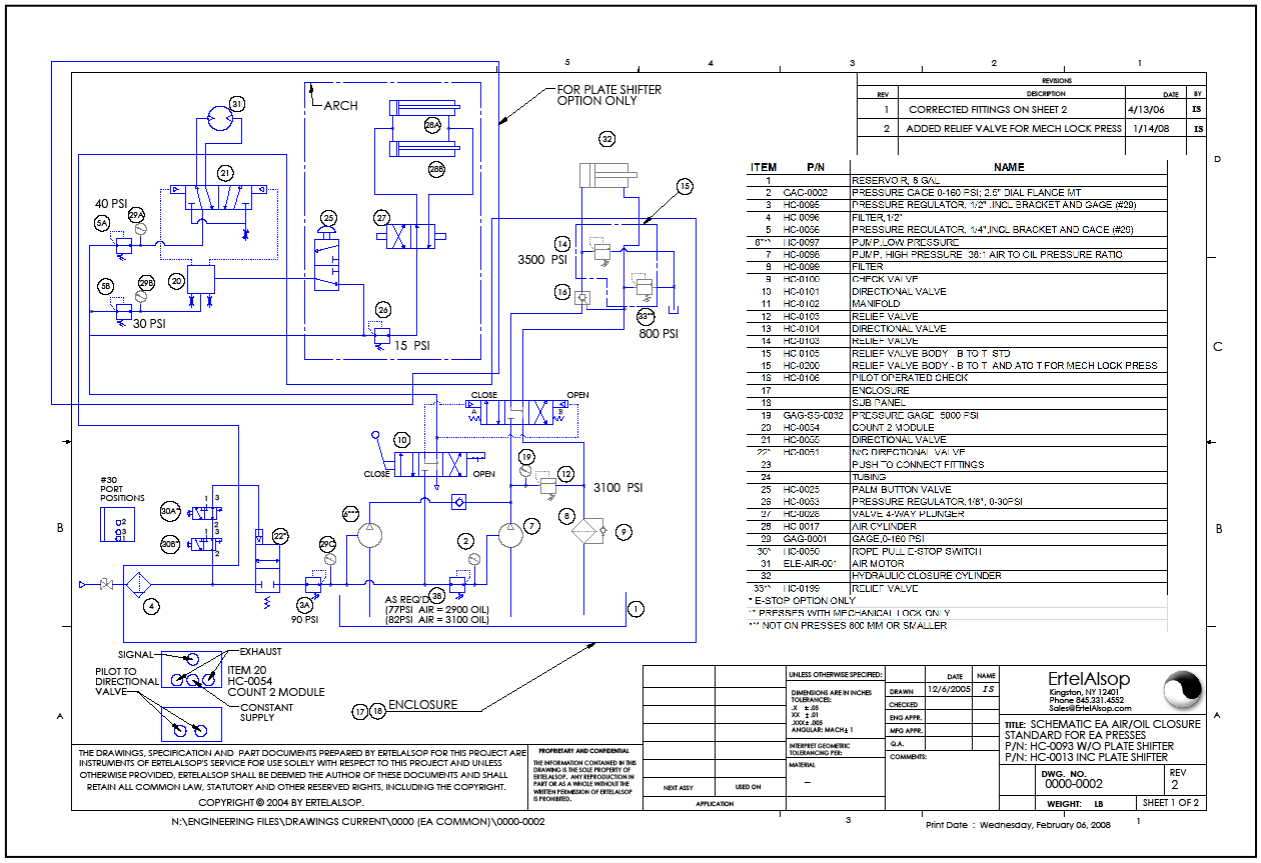
SECTION THIRTEEN: DRAWINGS



REVISIONS			
REV	DESCRIPTION	DATE	BY
1	CORRECTED FITTINGS ON SHEET 2	4/13/06	IS
2	ADDED RELIEF VALVE FOR MECH LOCK PRESS	1/14/08	IS

ITEM	P/N	NAME
1		RESERVOIR, 5 GAL
2	CAC-0002	PRESSURE CAGE 0-160 PSI; 2.5" DIAL FLANGE MT
3	HC-0095	PRESSURE REGULATOR, 1/2" ,INCL BRACKET AND GAGE (#20)
4	HC 0096	FILTER,1/2"
5	HC-0096	PRESSURE REGULATOR, 1/4",INCL BRACKET AND CAGE (#20)
6**	HC-0097	PUMP,LOW PRESSURE
7	HC-0098	PUMP, HIGH PRESSURE 38:1 AIR TO OIL PRESSURE RATIO
8	HC-0099	FILTER
9	HC-0100	CHECK VALVE
10	HC-0101	DIRECTIONAL VALVE
11	HC-0102	MANIFOLD
12	HC-0103	RELIEF VALVE
13	HC-0104	DIRECTIONAL VALVE
14	HC-0103	RELIEF VALVE
15	HC-0105	RELIEF VALVE BODY - B TO T STD
16	HC-0200	RELIEF VALVE BODY - B TO T AND ATO T FOR MECH LOCK PRESS
17	HC-0106	PILOT OPERATED CHECK
18		ENCLOSURE
19		SUB PANEL
20	GAG-SS-0032	PRESSURE GAGE 5000 PSI
21	HC-0054	COUNT 2 MODULE
22	HC-0055	DIRECTIONAL VALVE
23*	HC-0051	N/C DIRECTIONAL VALVE
24		PUSH TO CONNECT FITTINGS
25		TUBING
26	HC-0025	PALM BUTTON VALVE
27	HC-0053	PRESSURE REGULATOR,1/8", 0-30PSI
28	HC-0028	VALVE 4-WAY PLUNGER
29	HC 0017	AIR CYLINDER
30	GAG-0001	GAGE,0-160 PSI
31	HC-0050	ROPE PULL E-STOP SWITCH
32	ELE-AIR-001	AIR MOTOR
33		HYDRAULIC CLOSURE CYLINDER
34*	HC-0199	RELIEF VALVE

* E-STOP OPTION ONLY
** PRESSES WITH MECHANICAL LOCK ONLY
*** NOT ON PRESSES 800 MM OR SMALLER

	DATE	NAME
DRAWN	12/6/2005	IS
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: .X ±.05, .XX ±.01, .XXX ± .005, ANGULAR: MACH ± 1. INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL: –. NEXT ASSY | USED ON | APPLICATION

COMMENTS:

ErtelAlsop, Kingston, NY 12401, Phone 845.331.4552, Sales@ErtelAlsop.com

TITLE: SCHEMATIC EA AIR/OIL CLOSURE STANDARD FOR EA PRESSES P/N: HC-0093 W/O PLATE SHIFTER P/N: HC-0013 INC PLATE SHIFTER

DWG. NO. 0000-0002 | REV 2 | WEIGHT: LB | SHEET 1 OF 2

N:\ENGINEERING FILES\DRAWINGS CURRENT\0000 (EA COMMON)\0000-0002

Print Date : Wednesday, February 06, 2008

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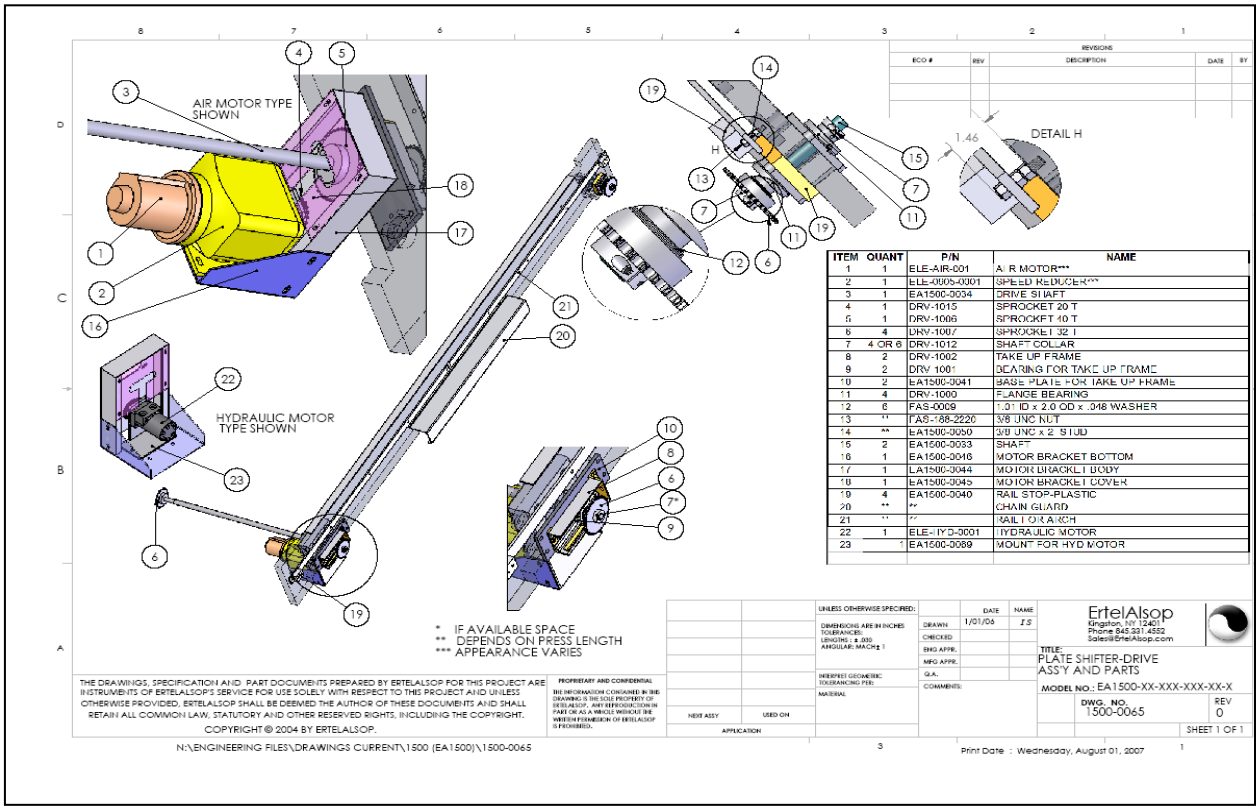
SECTION THIRTEEN: DRAWINGS



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