

Pulp, Paper & Board
Equipment

Bulletin 1406

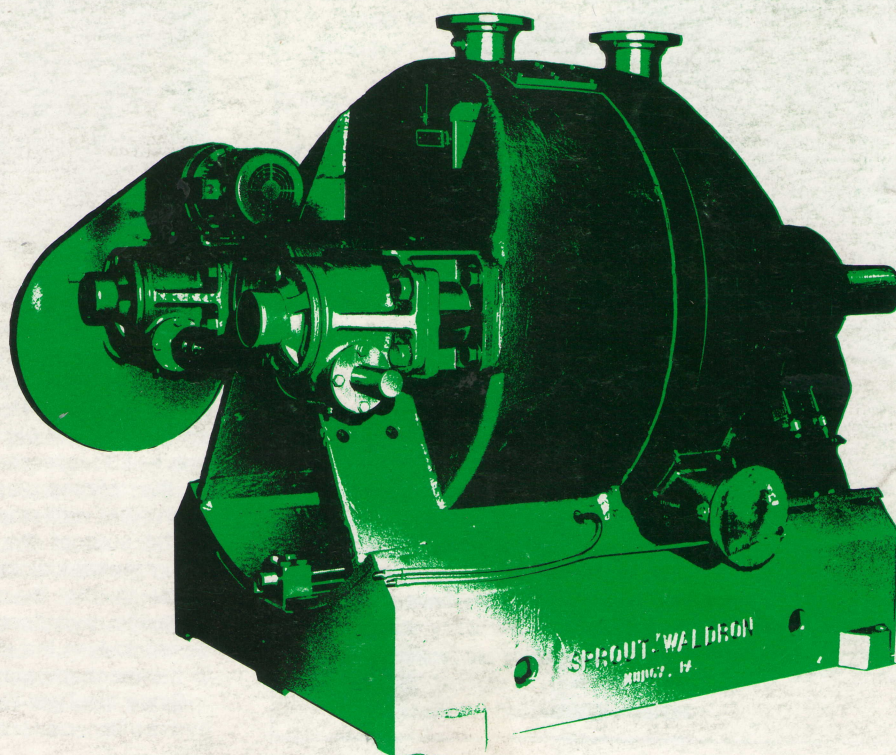
Revised 2/82

Sprout-Waldron

Twin-FloTM pressurized refiners

KOPPERS

Engineered
Products



Twin-Flo refiners develop stock to produce:

- Excellent Burst Strength
- Uniform Quality
- High Opacity
- Excellent Printability
- Good Wet End Drainage
- High Physical Strength
- Superior Sheet or Board Formation
- Excellent Tear Strength

How it works

Stock feeds through parallel inlets. The refining mechanism consists of a disc and shaft assembly rotating between two non-rotating heads—one fixed and one movable. The rotating disc is free to float axially.

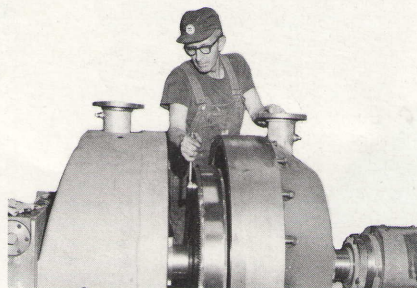
Plates are mounted on both faces of the rotor and on the rotating disc side of the non-rotating heads.

A constant-head stock chest, or a pressure compensating return loop, holds stock flow to the Twin-Flo at a pre-selected pressure.

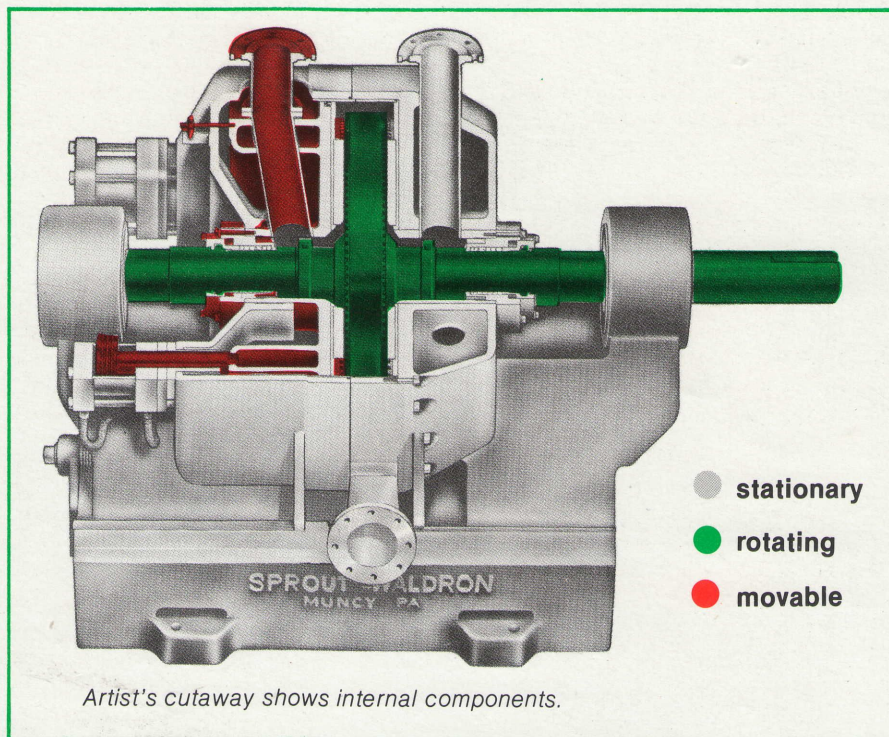
Stock pressure is equal on both sides of the rotating disc causing it to center between the two non-rotating heads. The pressure, however, causes an axial force tending to push away the movable plate holder.

In hydraulically controlled Twin-Flos, pressure from hydraulic cylinders counters this force moving the plates together. The hydraulic pressure is variable and controls the refining gap.

In electro-mechanical Twin-Flos gearmotor-driven positioners control the gap setting.



Refiner opened up to show ample work room for changing plates. Computer designed shaft slides freely and moves to the left to change plates in the right-hand section. Motor should be locked out before changing plates.

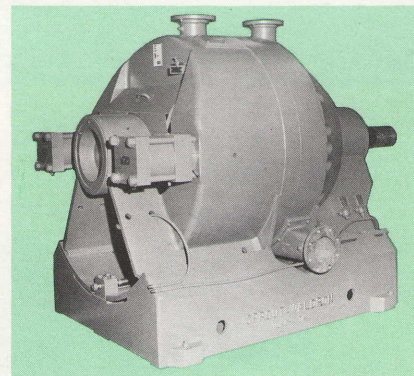


Twin-Flo features

1. Rugged, machined cast base and casings.
2. Completely stainless steel lined . . . all parts in contact with stock are stainless steel.
3. Solid stainless steel replaceable packing sleeves with tungsten carbide coated wear area.
4. Water lubricated packing glands with split follower.
5. Uses simple grease lubricated radial bearings—thrust bearings are not required.
6. Thrust contained within machine—not held by frame or base.
7. Maintains uniform stock quality.
8. Simple rugged design.
9. Unit designed for 100 psi casing pressure.
10. Coupling guard meets OSHA code.
11. Available in sizes ranging from 12" to 52" disc diameters and up to 3000 hp.
12. Available with hydraulic or electro-mechanical plate loading.

Operation of the hydraulically controlled Twin-Flo

The hydraulically controlled refiner follows downstream changes affecting flow (paper machine requirements) with accuracy. It maintains uniform stock characteristics (freeness and strength) with as much as plus or minus 15% change in flow.



Pressures Explained

Two pressures are encountered in operating the refiner. One is the hydraulic pressure caused by the pump supplying stock. A second, called mechanical pressure, is the force required to overcome friction caused by the refining plates turning against each other with stock flowing between.

The sum of the internal hydraulic and mechanical pressure is always equal to the thrust exerted by the hydraulic cylinders. Horsepower required to turn the shaft is proportional to the mechanical pressure.

Since the Twin-Flo refiner fitted with hydraulic controls is pressure

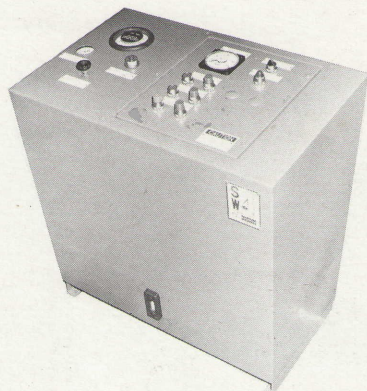
NOTICE

Photographs, illustrations, drawings and descriptions contained in this publication are not intended to depict actual operating conditions or to suggest operating procedures. They are included only as a means of highlighting the features of the machinery. Manufacturer's operating instructions and recommended safety procedures must be expressly followed during equipment installation and operation.

sensitive, varying the flow through the refiner has little effect on the work done.

For example, as the discharge valve is throttled, pressure in the refiner increases with a resulting decrease in horsepower. Unit work remains the same.

Opening the discharge valve increases the flow through the refiner. Internal pressure is lowered. Horsepower increases proportionately. Again, the unit work remains constant. The automatic throttling valve at refiner discharge may be controlled by refined stock level controller.



Model CC-4 console for hydraulically controlled refiners

Employs electrically controlled hydraulic circuitry to open and close the refiner plates.

Hydraulic pressure is adjusted by a hand operated variable pressure relief valve. The handle of the valve is located conveniently on the console. A gauge indicates the pressure. As an option, the relief valve can be motorized for remote operation.

FEATURES. Hydraulic pressure is provided by a pump located inside the console. A hydraulic oil reservoir forms the base. Oil level is indicated by a gauge on the front of the console.

Access to the interior is provided in the back by a bolted-on door. Housed in ample working space within the enclosure are the hydraulic pump, pump motor, oil filter, oil cooler heat exchanger, directional flow control valve, pressure regulating valve and necessary hose and fittings.

OPERATION. The panel is turned on by a switch on the top right hand corner of the console. Start-stop buttons are provided for the refiner motor and for the hydraulic pump motor. "Open" and "Close" selection buttons direct hydraulic flow pressure to the refiner cylinders to open or close the plates.

Refiner motor load may be read on the ammeter provided. As an option, a watt-hour meter may replace the ammeter at slight additional cost.

ALARM CONDITIONS are set up either by a pressure drop in the stock inlet header or by a pressure drop in the fresh water supply to the refiner packing glands. Pressure transmitters are furnished for both inlet and discharge. An alarm light gives instant indication of pressure malfunction.

PLATE PROTECTION. Stock pressure drop shifts the hydraulic flow control valve opening the plates automatically. Plate clashing is prevented.

ELECTRICAL COMPONENTS are mounted in an enclosed cabinet made as part of the console top. The units are prewired to terminal strips for easy field connection to external elements.

CONSTRUCTION. The all-welded enclosure is 36" across x 24" deep x 40" high with easy-to-clean sloping front.

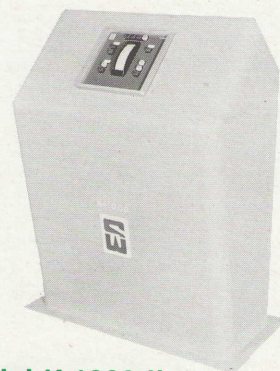


CC5 console for operating electro-mechanical refiners

Contains pushbuttons to operate motor driven plate-setting device. Includes refiner motor start-stop buttons.

Motor load meter is shown in

photograph. An alarm reset button silences remote horn when sounding to indicate stock low pressure or failure in water gland supply system. On low stock pressure, plates are opened automatically.

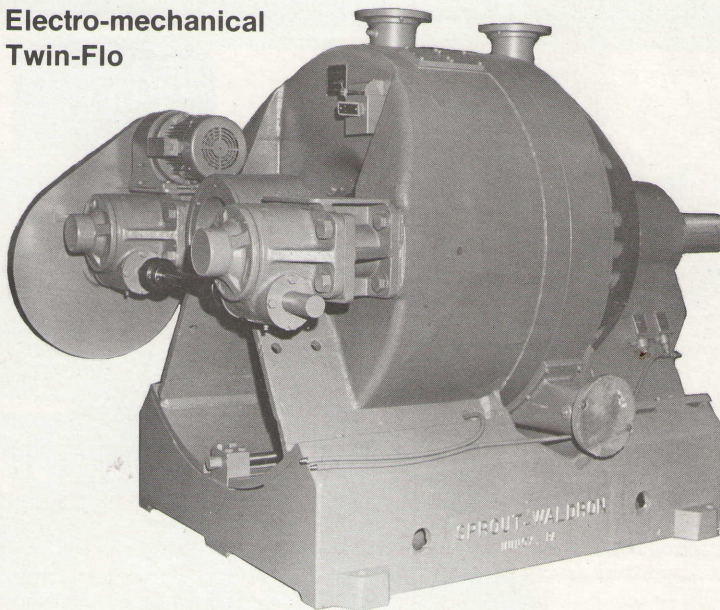


Model K-1000 II Automatic Controller

New K-1000 II Automatic Controller is a pre-engineered and factory-tested system utilizing industrial grade solid state components for maintenance-free operation. The controller features field convertibility to any of the three available control modes: Remote Manual, constant KW or HPD/T (shown).

The system consists of an Analog Display Module for central control panel or local mounting (shown), a system control module containing all control components, necessary interconnecting cables and optional reversing starter.

Electro-mechanical Twin-Flo

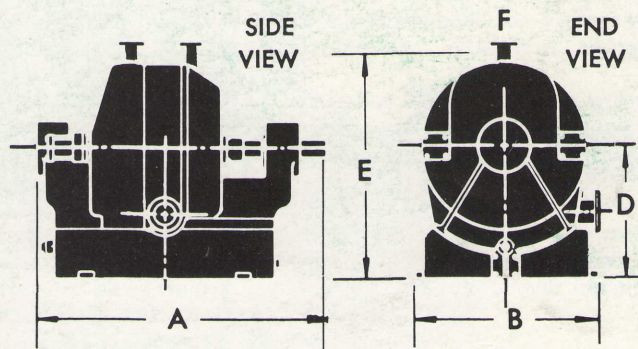


For broke refining, hot stock refining and many stock preparation applications—Twin-Flo refiners are equipped with gear motor driven positioners for plate adjustment and settings. Plates are held in precise position and do not "float-on-the-load" as with hydraulic control. The adjusting mechanism is protected by a shear pin in drive assembly.

Pressure switches monitor packing gland water pressure and stock inlet pressure for plate protection.

Mechanical Specifications

	20"	26"	34"	42"	52"
A	5'-5 $\frac{3}{4}$ "	6'-0 $\frac{7}{8}$ "	7'-1 $\frac{1}{2}$ "	8'-8 $\frac{1}{8}$ "	9'-9 $\frac{1}{2}$ "
B	2'-6 $\frac{1}{2}$ "	3'-4"	4'-2"	5'-0"	6'-4"
C	3"	4"	6"	6"	10"
D	1'-6"	1'-10 $\frac{5}{16}$ "	3'-0"	3'-6"	3'-4"
E	3'-0"	3'-11"	5'-3"	6'-2"	6'-5"
F	2 $\frac{1}{2}$ "	4"	4"	6"	8"
G	5'-6"	6'-8"	7'-2"	8'-0"	12'-0"
H	3'-0"	4'-0"	4'-0"	5'-0"	6'-0"



"C" is discharge diameter of 150 lb. flange.

"F" is inlet diameter of 150 lb. flange.

"G" is minimum centerline distance between refiners in multiple unit installations allowing 3'-0" aisle.

"H" is distance required from end of bearing to wall to remove shaft.

RECOMMENDED SPEEDS & HP

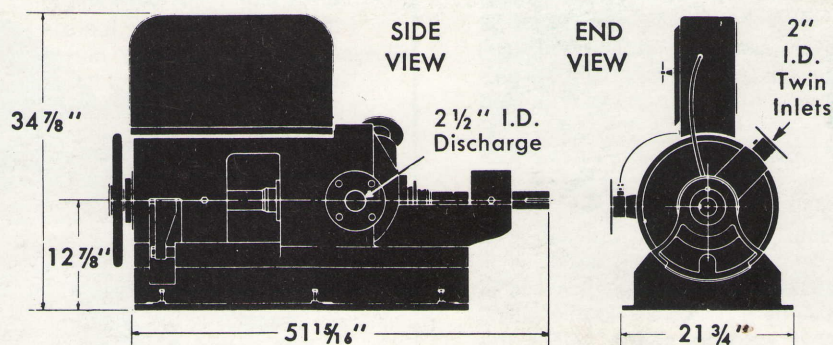
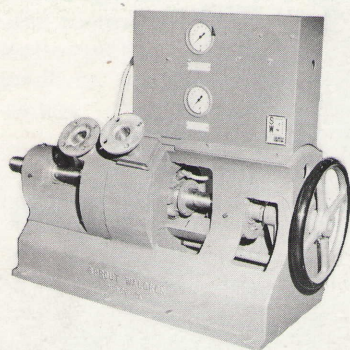
REFINER SIZE	RPM	Min. HP	Max. HP
12"	1800	75	150
20"	900	125	250
26"	720	250	450
34"	600	500	900
42"	514	1000	1750
52"	450	—	3000

APPROXIMATE WEIGHTS

REFINER SIZE	Domestic	Boxed for Export
12"	1500	1800
20"	4900	5300
26"	7700	8300
34"	13,700	14,600
42"	25,000	28,000
52"	27,000	30,000

Motor, Console, Couplings, etc. Not Included

12" pressurized refiner



For laboratory or low production use. Accepts up to 150 hp. Hand-wheel or hydraulic cylinder operated. Panel, mounted on refiner, contains pressure switches to give alarm on low stock or gland water pressure.

Dimensions are approximate. For installation, request certified print.

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