2 Specifications

2.1 Introduction

This chapter informs you about the technical data of the headbox.

All max. values mentioned in this manual are limit values. These values are the basis for the design layout and strength calculation of the components, but not assured properties in the legal sense.

Non-observance of the stated limiting values during operation of the machine is liable to endanger personnel and components and excludes liability on the part of Voith Paper for any damage resulting from this.

2.2 Ordering data

Table 2 - 1

Codeword	Hawesville
Headbox	No. 2301
Size	12000 / 33
Machine type	MasterJet F / B-H
Slice width	4372 mm (172.1 in)
Drawing No.	1.36-34830
WOS No.	141 242 / 1000 - 1967
Year of construction	2001

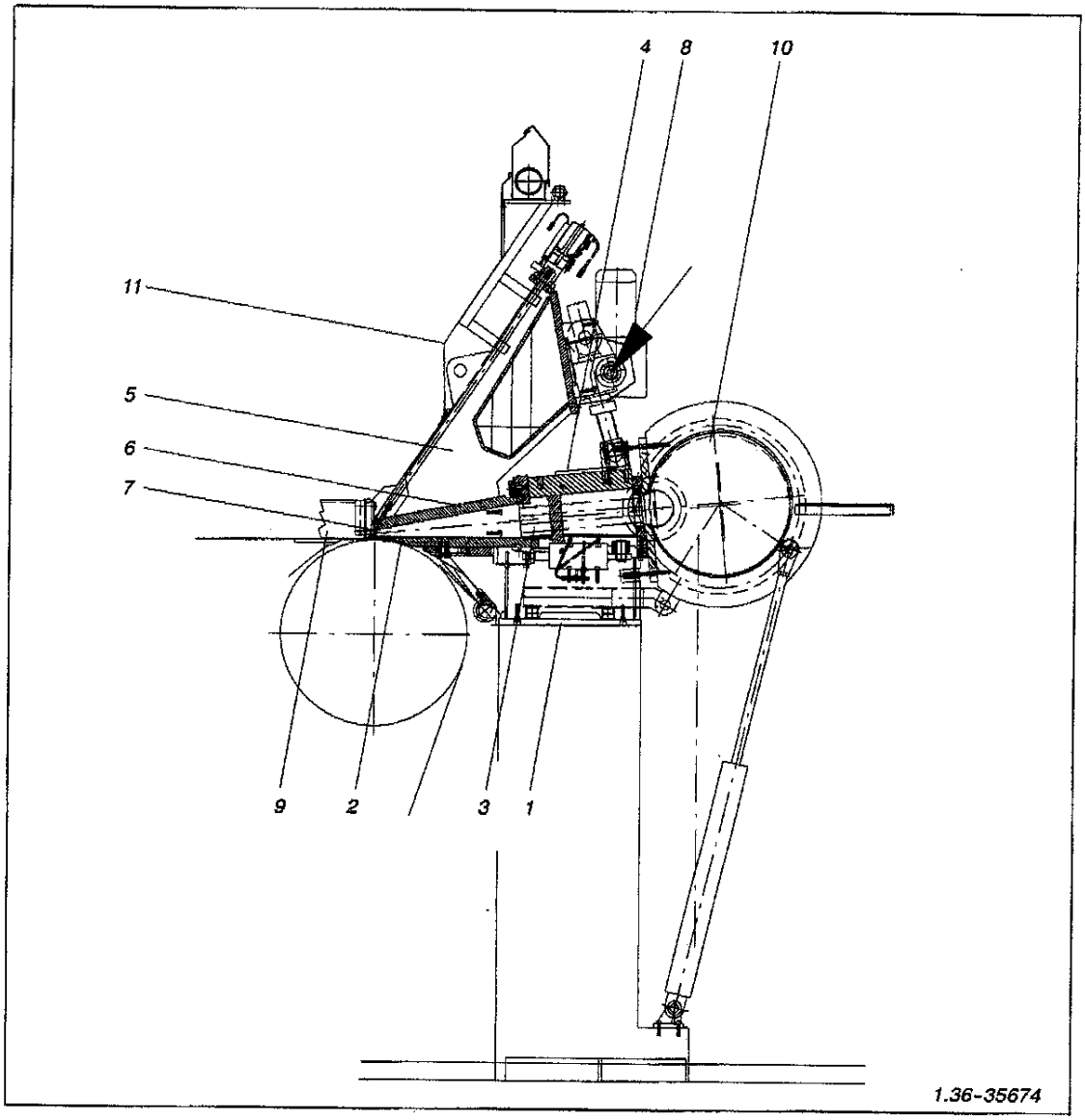
2.3 Layout data

Table 2 - 2

Hydraulic layout	**l/min**
Total flow (through the lip)	32650 - 65300
Total flow (in the supply system)	34370 - 68740
at an operating speed	579 - 762 m/min (1900 ft/min - 2500 ft/min)
Mechanical layout	
Design speed v_k	1000 m/min (3281 ft/min)
Products	Corrugating medium
Basis weight	98 - 162 g/m^2 (20 - 33 lbs)

As of: 2001-02-01
Revision:
Author: VPH psk 3457 HSn
Editor: Heller RG54
Translator: VPH pct 2163 WMI
013589 E 001 61 P4 02 MO 0 en
Codeword: Hawesville
Created with QuickSilver 1.5.3

Figure 4 - 1

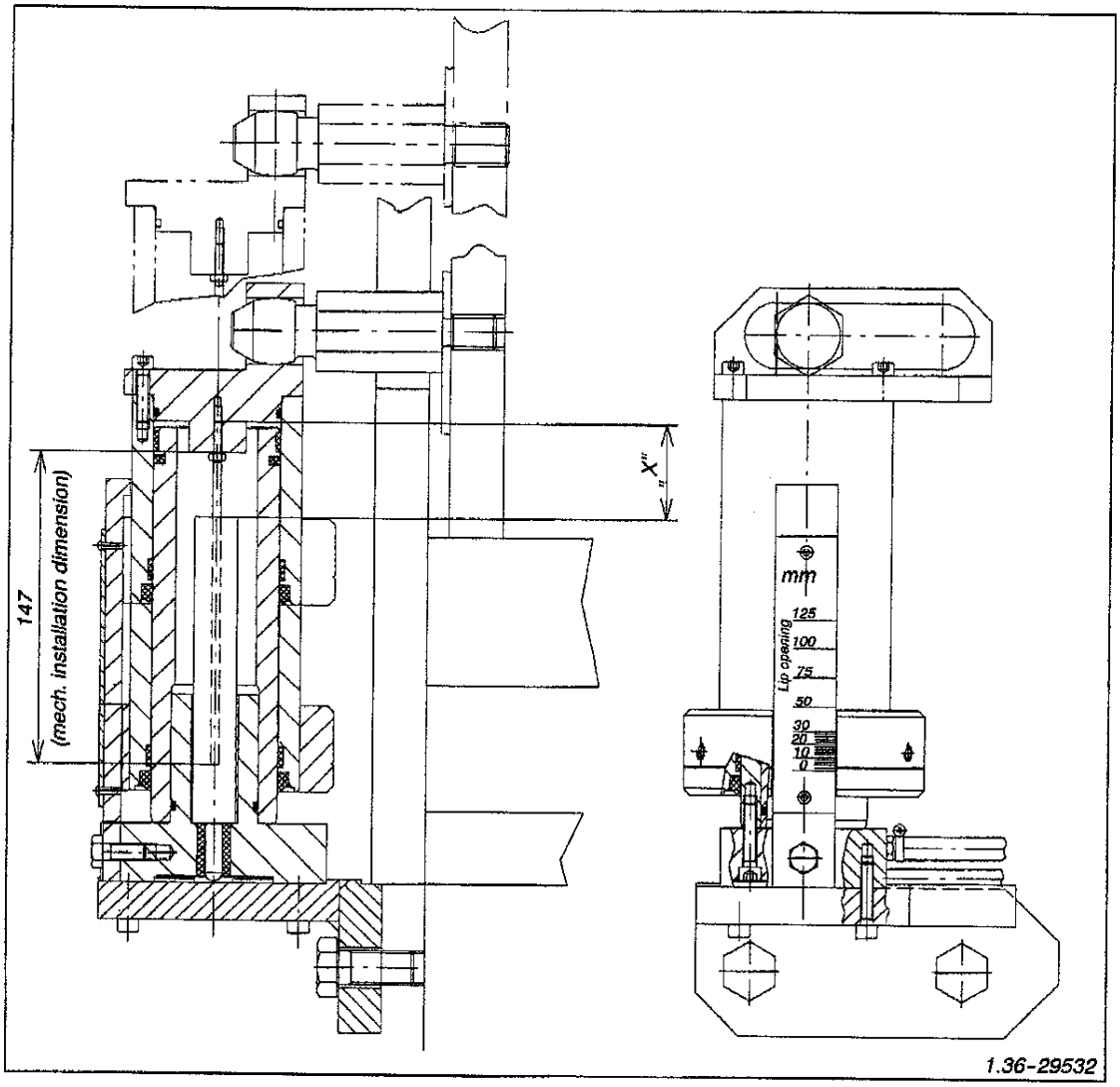


Legend for fig. 4 - 1

- ➔ *Lube point*
- *1 Apron board*
- *2 Bottom lip, horizontally adjustable*
- *3 Turbulence generator*
- *4 Side section*
- *5 Top-lip beam*
- *6 Top lip*
- *7 Slice blade*
- *8 Adjusting device for top-lip beam - vertical*
- *9 Deckle plate*
- *10 QH header can be swivelled away*
- *11 Covering*

Author: VPH psk 3457 HSo
Editor: Heitec RG54
Translator: VPH pct 2163 WMi
As of: 2001-02-01
Revision:
013089 E 001 01 P-4 02 MO 0 en
Coumbus, Hauesville
Created with QuickSilver 1.5.3

Figure 4 - 2



LVDT setting dimension:

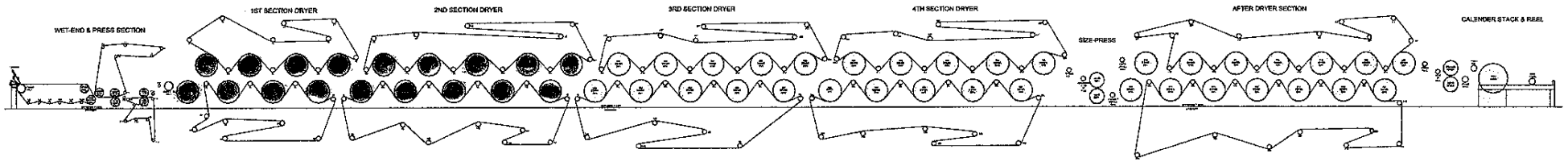
"X" = 50.57 mm (1.99 in) at 10 mm (0.394in) lip opening

"X" = 63.105 mm (2.28 in) at 20 mm (0.787 in) lip opening

As of: 2001-02-01
Revision:
Author: VPH psk 3457 HSn
Editor: Heitec RG54
Translator: VPH pct 2163 WMI
013588 E 001 61 P4 02 MO 0 en
Codeword: Hawesville
Created with QuickSilver 1.5.3

Flambeau River Papers

#3 PAPER MACHINE ROLL CONFIGURATION



Acuren Inspection
N2250 Oelke Drive
PO Box 99
Quinnesec, MI 49876
Phone: 906-779-5285
Fax: 906-779-5292
Materials Engineering and Testing
A Rockwood Company

FINAL REPORT
Nondestructive Examination

Of

#3 Paper Machine

Inspection Date:
September 19, 2017

Submitted To:
Victor Newton

Flambeau River Papers
Park Falls, WI

Submitted By:

Robert Grandahl
Project Manager
Acuren Inspection - A Rockwood Company

ACUREN
N2250 Oelke Dr.
Quinnesec, MI 49876
Phone: 906.779.5285
Fax: 906.779.5292

Company Name: Flambeau River Papers
Location: Park Falls, WI
Paper Machine #: 3
Customer Contact: Victor Newton
Date: 9/19/2017
Service Call #: 572131
PO Number: FR172015

Inspection Report on: #3 Paper Machine - Dryer Cans 1 thru 18

Dear Mr. Victor Newton

For your information Acuren Inspection has performed non-destructive testing on your #3 Paper Machine, Dryer Cans 1 thru 18.

Visual Examination Summary:
Internal and external visual examinations were performed on the listed dryer cans drive and tending side heads, shell and attached components. Cans 2, 9, 11, 12, 13, 14, and 16 had abnormal conditions noted. Please refer to the attached dryer can report pages for the results of this inspection. Cans inspected were 1 - 18.

Ultrasonic Shell Thickness Examination Summary:
Thickness scans were performed on dryer cans 1 - 18. Please review attached scans for results. No areas of concern were noted during this inspection.

Ultrasonic Bolt Examination Summary:
A flaw detection examination was performed on 100% of the drive side dryer cap screws for dryer cans 1 - 18. Tending side cap screws were not inspected due to the screw head style. No indications were noted.

Magnetic Particle Examination Summary:
A magnetic particle examination was performed on the listed dryer cans drive and tending side heads. Please refer to the attached dryer can report pages for the results of these examinations. Can inspected were 1 - 18.

It has been a pleasure working with Flambeau River Papers and we look forward to providing service for you in the future. If you have any questions or problems please feel free to call me at (906) 779-5285.

Yours truly,
Acuren Inspection

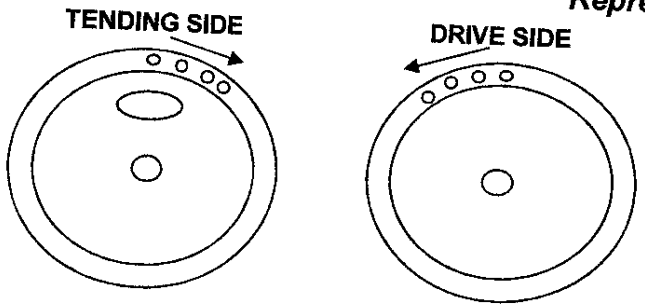
Robert Grandahl
Project Supervisor

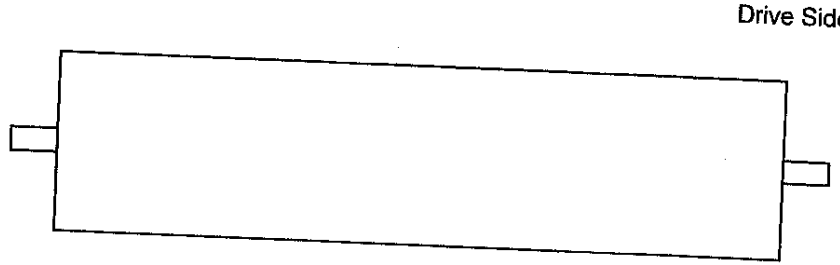
ACUREN
N2250 Oelke Dr.
Quinnesec, MI 49876
Phone: 906.779.5285
Fax: 906.779.5292

Company Name: Flambeau River Papers
Location: Park Falls, WI
Paper Machine #: 3
Customer Contact: Victor Newton
Date: 9/19/2017

Dryer Can Inspection Report on: Dryer Can #1

Representation of Indication Locations





Nameplate Data

Serial #: 09504-10
Nat'l Bd. #: 904
Manufacturer: Allis-Chalmers

MAWP: 100 psi @ 450° F
Yr. Built: 1968

Other:

Inspection Data

UT Technician: Sam Berendes
Date: 9/19/2017
Pitting Noted: None
Pitting Depth: N/A
Pitting Location: N/A
External Visual Results: No abnormal conditions noted

MT Tending Side: No relevant indications noted.
MT Drive Side: No relevant indications noted.
UT Bolts Tending Side: NA
UT Bolts Drive Side: No relevant indications noted.

Internal Visual Results: 1" of standing water noted in can, Syphon is in sound condition with correct spacing from shell, no evidence of grooving or gouges noted on the shell or heads, all spoiler bars are intact and all weights are intact if present.

COPY TO
Acuren Inspection Files, Victor Newton, Park Falls, WI

CONTACT	MT TECHNICIAN / LEVEL	MT TECHNICIAN / LEVEL
Victor Newton	**William Bowden**	**Sam Ihrig**
NDE SUPERVISOR	UT Shell Scans Technician	UT Bolt Technician
Robert Grandahl	**Sam Berendes**	**Lucas Popp**

General Information

A. The Voith reel is a surface wind type designed to produce level rolls of paper.

The drum is of heavy cast iron construction to provide minimum deflection. The finished roll hardness is adjustable by a combination of regulated hydraulic loading controls on the secondary arms and adjustable draw controls on the reel drive.

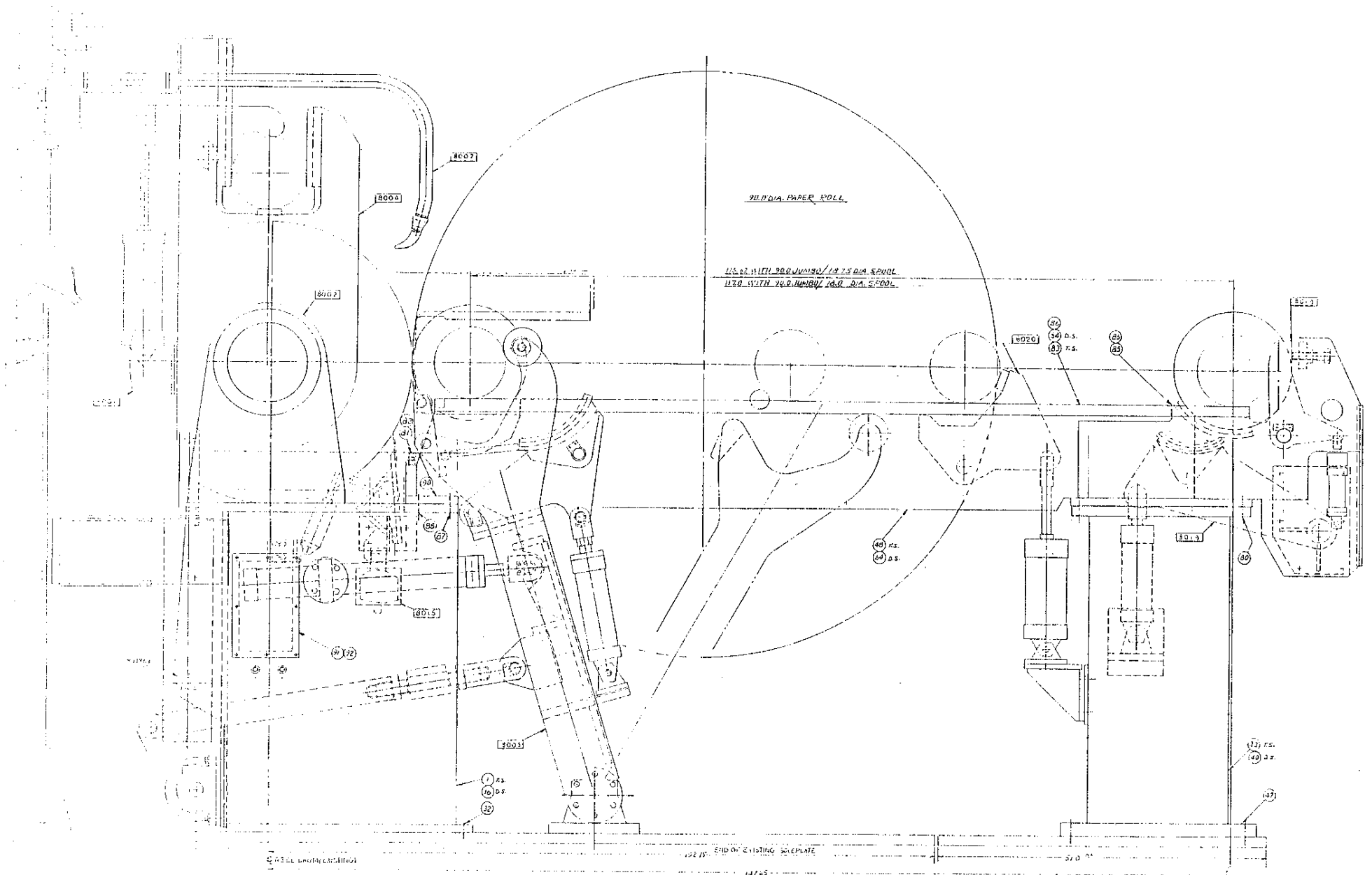
B. The following features are built into the reel:

1. A rubber tire spool starter which will accelerate an empty spool to machine speeds while in the primary arms.

2. A secondary arm brake.

3. An intermediate stop/eject station which will align the parent roll and control the travel to the end cushion stop.

4. A parent roll brake to decelerate the roll to a controlled stop.



PLAINFIELD PAPER CORP.
PAPER ROLLS WT.
2 P.U.M. TRIM REEL
C.M. (NORMAL)
GRADE SOLE OFFSET REQUIRED
WEB WEIGHT 35 LB - 36 LB

WIRE WIDTH 112.0
MAX. SPEED 3500 FPM
MAX. WINDER SPEED 7200 FPM
U.W.L. (MIN) 90.0 IN. TO 98.0 DIA. SPOOLS

8006	REEL SPOOL STARTER ASSY.	5.24-807
8012	GUARDS	5.24-959
8013	PLATFORM LOADER ASSY.	5.24-824
8014	DRIVE COMPONENTS	
8011	SOLEPLATES	5.24-827
8021	SAFETY SIGNS	5.24-805

5.24-724

Rev	Date	Name	Description	Ck.

Job No. 17 793 /Group No 18020

Ref.

Shipping Date

VOITH, INC. APPLETON, WI

Issue PUR. / MAN. / INSP. /

Quantity | Assy Code No Dim. Sheet No.

Title: INTERMEDIATE STOP ASSEMBLY — ASSEMBLY DRG. NO. 5.24-933

FLAMBEAU PAPER CORPORATION
PARK FALLS, WISCONSIN

#3 P.M. TR 110 REEL

L.H. MACHINE

GRADE : BOND, OFFSET, XEROCOPY

BASIS WEIGHT : 35 TO 135 LBS.

MAX. SPEED : 3000 F.P.M.

WIRE WIDTH : 178.0

MAX. WINDER SPEED : 7200 F.P.M.

Group Assy. Dwg. No.

MAX. JUMBO : 72.0 WITH 14.0 SPOOLS

Machine Dwg. No.

MAX. JUMBO : 90.0 WITH 18.0 SPOOLS

Issue	Ck.	Appr.		No. of Sh.	Sh. No.	Job. No. /Group No	Codeword
Jm H 7-21-86	AE	Mike	VOITH Voith Inc. Appleton, WI	6	1	17 793 /8020	PARK FALLS 3


TONNES

Honeywell
Application Report

Customer: Flambeau River Papers
Location: Park Falls, WI
Machine PM3
Application: ProFlow
Author: Mickey Held

Date: May 17, 2013 **Period Covered:** May 16, 2013

To: Jerry Slack

Cc: Randy Stoeckel
Tom Steiner
Bob Hoffman
Butch Johnson
Chris Schienebeck

Info To: Dan Velleiux
Jeff Wright
Brian Herioux
Roger Sykora
John King

New Headbox with Honeywell ProFlow dilution control Reduces CD Weight Variability on PM3

SUBJECT:

A new headbox and Honeywell Proflow dilution control was installed during the week of May 13, 2013 on number 3 paper machine at Flambeau River Papers in Park Falls, WI. The Proflow has 57 actuators with approximately 3-inch zone spacing. The purpose of this report is to document the 60% initial improvement in CD Dry Weight variability.

RESULTS:

CD Dry Weight Spread has been reduced by 60%

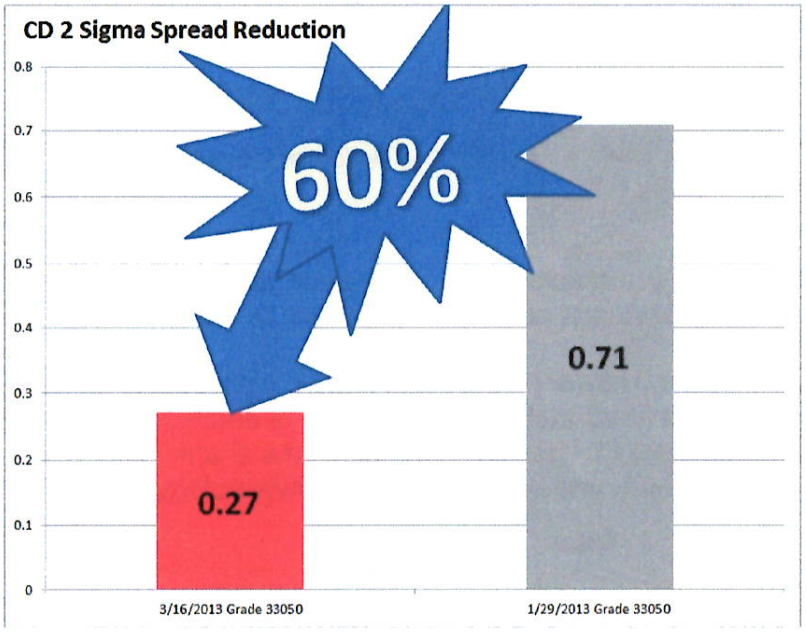


Figure 1: Before and after comparison of the CD Dry Weight Spread.

Grade 33050 baseline profile data was collected January 29, 2013 under normal operations. An equivalent data set was collected May 16, 2013 after CD control commissioning. The new headbox with Honeywell Proflow actuator control reduced variability in the Reel Dry Weight profile significantly. Figure 1 compares the January 29, 2013 2-sigma variability with May 16, 2013 data with the new headbox and Proflow actuators in control. The January 29, 2013 high-resolution profile data had a 2-sigma variability of 0.71. The current 2-sigma variability is 0.27, an **improvement in reel dry weight CD variability of 60%.**

SUMMARY & DISCUSSION:

Figure 2, below, contains an 100 scan average of the high resolution (13.2 mm) reel dry weight profile collected while running grade 33050 at steady-state before and after the headbox and Proflow control upgrade.

The improvement in the dry weight profile illustrated in Figure 2 is quite apparent. The 2-sigma spread of the CD Bin high-resolution profile has improved from 0.71 to 0.28 after the new headbox and Proflow commissioning. The spread reduction equates to a **60% reduction in CD dry weight variability**.

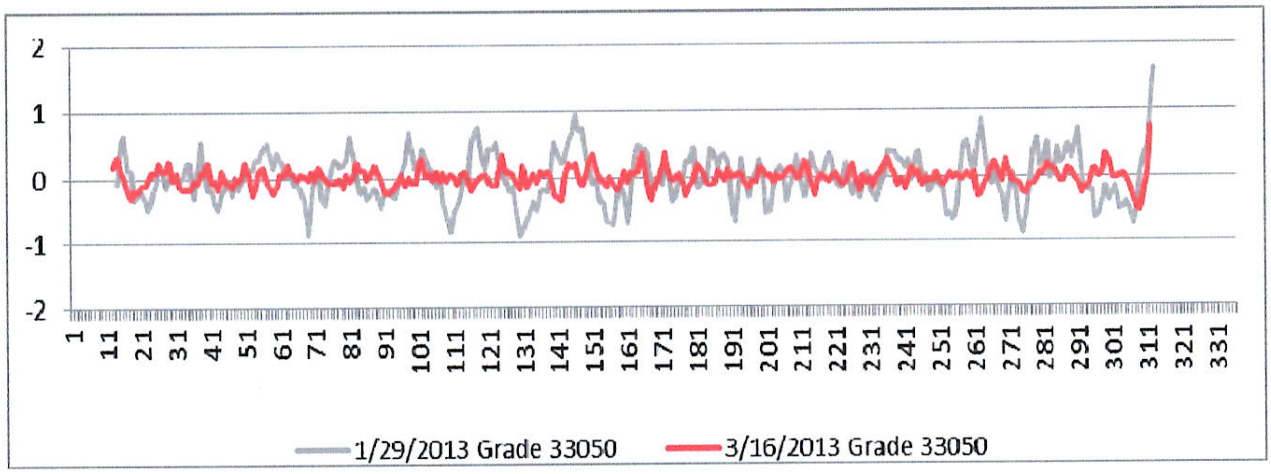


Figure 2: Before and after comparison of the dry weight profiles.

CONCLUSION:

Due to the installation of the new headbox and Proflow actuators, Flambeau River Papers has reduced its CD dry weight variation on paper produced and improved its product quality.

Honeywell looks forward to assisting Flambeau River Papers in improving its quality and production on additional applications in the future. The data used in this report was collected via mill Intellimap tuning utility and is available upon request. Please feel free to contact me at 408-202-3668 or Mickey.Held@Honeywell.com if you have any questions regarding this report.

Honeywell

(Required ... ight expenditures of $10,000 or more)

Number: RFE # FRF12-010

Date: 4/16/2012

Project Title: Number Three Headbox engineering

Total Amount $20,000.00

Project Description

A representative from Mec Fag will come to the mill to do the engineering for building a Headbox for #3 pape machine

Reason for Project

The headbox on our number three paper machine has failed beyond repair; Mec Fab is a equipment builder Canada that specializes in rebuilding wet end equipment; a new headbox is out of reach at this ti financially we are looking at replacing the existing headbox with a rebuilt used box; Mec Fab will work with the mill and design any configuration that meets the needs of the mill operationally and in the scope of our budget.

When will money be spent: May-12

Does this project:

Add to property, plant and equipment (yes) (no)
Significantly increase productivity (yes) (no)
Extend the life of a unit beyond the current estimate by at lease 25% and at least 2 years (yes) (no)
Have a life of 2 years or greater (yes) (no)
Generate wastewater (yes) (no)
Generate air emissions (yes) (no)
Disturb any potential lead based paint or asbestos containing material (yes) (no)

Approvals:

Randy Stoeckel - Mill Manager	Date 4-16-12
Tom Steiner - Controller	Date 4/16/12
Mike McKuen - Maintenance	Date 4-16-12
Kathy Lueloff - Purchasing	Date 4-16-12
Dave Wagner - Utilities	Date 4-16-12
Kristin Palecek - Environmental	Date 4-16-12

Person responsible for Project

Todd R Slocum

mecfab
1401 Graham Bell, Boucherville (Quebec), Canada, J4B 6A1 Phone: 450-655-7910 Fax: 450-655-5189

Definition of technical terms

1.	Basis weight:	Weight per unit area of paper (units are #/ft²) Conversion calculation: #/ft² = (gr/m² x 0.0022046 #/gr x 1/10.74 m²/ft²) x Ream size
2.	Ream size:	Unit area of paper Industrial sizes are: 1000 ft², 1300 ft², 3000 ft² & 3300 ft²
3.	Reel dryness:	Percentage (%) of bone fiber at reel
4.	Reel speed:	Speed of the reel (ft/min) (Reel speed 2% > Wire speed)
5.	Wire speed:	Speed of the forming wire on fourdrinier or former (ft/min)
6.	Headbox consistency:	Weight percentage (%) of pulp in a pulp and water mixture at the headbox
7.	Tray consistency:	Weight percentage (%) of pulp in a pulp and water mixture at tray
8.	Net consistency:	Difference between the headbox consistency and tray consistency
9.	Wet deckle width:	Internal width of the headbox slice or nozzle (inches)
10.	Slice opening:	Full width orifice or nozzle (inches) with a completely adjustable opening to give the desired rate of flow. (The slice geometry and opening determine the thickness of the slice jet, while the headbox pressure determines the velocity)
11.	Stock temperature:	Temperature of the pulp and water mixture at the headbox (deg F)
12.	L/b ratio range:	The important dimensions that determine the jet angle are: L = the projection of the apron (beyond the inner vertical surface) b = the slice opening (between vertical knife and top of apron lip)
13.	Flow at slice:	Flow of pulp/water mixture at the slice opening for each above specified grade
14.	USgpm/inch value:	Flow of pulp/water mixture divided by the internal width of the headbox slice
15.	Min. machine speed:	Minimum speed of the paper machine (ft/min)
16.	Max. machine speed:	Maximum speed of the paper machine (ft/min)
17.	Single pass retention:	(Amount retained in sheet) / (amount from headbox) = % 1st pass Retention
	Overall retention:	(Amount retained in sheet) / (Amount added with stock) = % Overall Retention
18.	Headbox head:	Head or pressure inside the headbox (function of velocity)
19.	Freeness at stuff box:	Measurement of pulp drainage at stuff box (before fan pump) CSF = Canadian Standard Freeness Defined as the number of mL of water collected from the side orifice of the standard tester when pulp drains through a perforated plate at 0.03% consistency and 20 Deg C (sample taken at stuff box)
20.	Fan pump flow range:	Customer to submit a copy of the fan pump curve Complementary informations as impeller diameter, HP, speed, etc.
21.	Wire width:	Width of the wire at fourdrinier or forming section (inches)
22.	Forming length:	Length of forming area of fourdrinier (inches)
23.	Sheet on wire:	Width of sheet on wire (inches)
24.	Sheet to press:	Width of sheet to press (inches)
25.	Sheet on reel:	Width of sheet to reel (inches)
26.	Wire length:	Minimum and maximum wire length (inches)

Signature: _____ Date: _____

SUCTION ROLL SPECIFICATIONS

Customer FLAMBEAU PAPER
Location PARK FALLS, WI.
Roll O.D. 36" Drilled Face 180"
Roll Type: Press ☐ Drum ☐ Couch ☒
Pickup ☐ Felt ☐ Other

LG Serial SR- 277
LG S.O. # 45030
Cust. P.O. # 88004954

Shell O.D. 36" I.D. 32 1/2" Length 192" Thickness 1 3/4"
Material: 1-N Bronze ☒ Other

Rubber Cover Thickness N/A O.D. I.D. Length
P & J Ends Dubbed? Rubber Type

Trunnion I.D. 14 1/8" Capacity Range 6000 to 9000 CFM
Vacuum 18" In. Hg Connection at: Front ☒ Rear ☐

Bearings Front 23096 Stand off —
Rear 23056K Stand off 11 1/2"
Internal 23036K CL Main Brgs. 218 7/8"

Suction Box Material: C.S. Welded ☒ S.S. Welded ☐ C.I. ☐
No. Openings: Single ☒ Dual ☐ Other
1st Box Width 10" Other
2nd Box Width — Other

Deckles Actuation: Hydraulic ☒ Mechanical ☐
Max. Deckled Face 180" Min. Deckled Face 156"

Seal Strips Matl: Polyethylene ☒ Lam. Phenolic ☐ Other
Std.(Water Lube) ☒ Plain(No Water Lube) ☐ Other
Can be pulled ☐ from Cannot be pulled ☒
Load: Air ☒ Spring ☐

Silencing Strip Yes ☐ No ☒ Load: Air ☐ Spring ☐
Can be pulled ☐ from Cannot be pulled ☐

Showers Cleaning ☒ uses 85 GPM@ 40 psi Fog ☐ uses GPM@ psi
Lo Press ☐ uses GPM@ psi Needle ☐ uses GPM@ psi

Air Pass Yes ☐ No ☒ Following ☐ Stationary ☐

Pull Block Yes ☐ No ☒ Matl: Al ☐ S.S. ☐ Other

Saveall Pan Yes ☒ No ☐ Matl: S.S. ☐ Other EXISTING

Rotation (As viewed from front) Clockwise ☒ Counterclockwise ☐

Roll Weight Total Weight ≈18,000# Front Weight Rear Weight

Nip Load: 60 pli | Grind: Straight ☒ Crown in @ •

BM # D-4589-106 Assy. Dwg. # D-4589-106 Installation Dwg. # D-4587-33

Other Data:

KJSI Project L1163
December 12, 2008

Flambeau River Paper
PM 3
Park Falls, WI

Operation & Maintenance Manual

KADANT
JOHNSON

Kadant Johnson Systems Inc., 501 Adesa Parkway, Suite A-130, Lenoir City, TN 37771 USA
865-986-8068 fax: 865-986-8069 www.kadantjohnson.com

ESCHER WYSS MANCHESTER
TWO-ROLL CALENDER
SERIAL NO. J-1170

FOR NO. 3 PAPER MACHINE
FLAMBEAU PAPER CO. - PARK FALLS, WISC.

SPECIFICATIONS

GENERAL

Machine Speed.....2700 FPM
Nip Loading..... 800 PLI Max.

Hand of Machine - From Left to Right as Viewed
From the Tending Side

ELECTRICAL CHARACTERISTICS

MOTORS	CONTROLS
460 VOLTS	115 VOLTS
3 PHASE	1 PHASE
60 HERTZ	60 HERTZ

FARREL TRI-PASS TOP ROLL

Serial No.....ARH-260-1
Diameter.....28"
Roll Face.....174"
Bearing Centers.....207"
Bearings - AA-1114-C.....SKF 23164 CAK
Weight [without bearings].....30,000 Lbs.
Initial Crown.....None

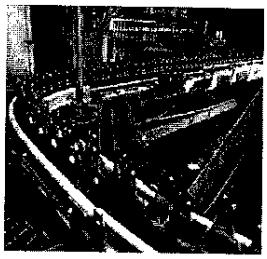
BOTTOM ROLL

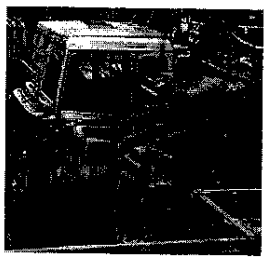
Farrel NIPCO "KL", 5 Zone Variable Crown Roll
Farrel Drawing No. DNPD-00029 [Rev. A]

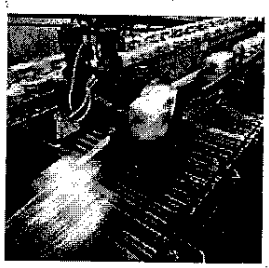
Diameter.....22"
Roll Face.....174"

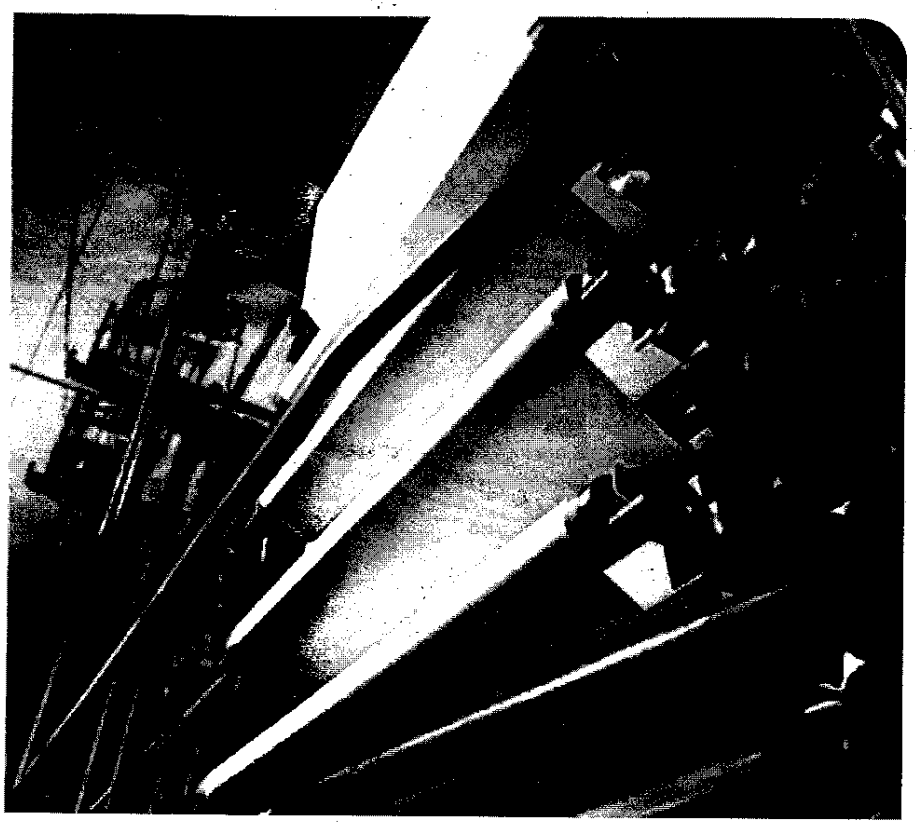
LISTEN.
THINK.
SOLVE.®

PowerFlex® 700L Liquid-Cooled Adjustable Frequency AC Drive









USER MANUAL

ALLEN-BRADLEY • ROCKWELL SOFTWARE

Rockwell Automation

II SPECIFICATIONS

GENERAL DESCRIPTION

The Black Clawson Selectifier Screen is a pressurized centrifugal screen. The screening function is accomplished by a perforated cylinder and facilitated by a rotating element consisting of air foil bars extended from a central cage. It may be driven thru a right angle gear box or by belts and sheaves.

SIZES

The Selectifier Screen is manufactured in a variety of sizes to meet the needs of the industry.

COMPONENTS OF THE SELECTIFIER SCREEN

Body Assembly

The body assembly forms the shell or outside chamber of the Selectifier. It contains stock inlet and discharge openings as well as provisions for removal of heavy trash and fiber rejects.

Screen Cylinder

The screening function is accomplished by the screen cylinder which has a perforated wall thru which the accepted stock must pass. Proper perforation size is specified for each screening condition by the Application Engineering Department.

Rotating Element

The stock flow thru the perforated cylinder is facilitated by a rotating element which consists of air foil bars supported from a central cage by arms and adjusting studs and nuts.

Drive

The rotating element is driven either through a gear box which is fastened to the bottom of the body assembly or a belt and sheave arrangement. A mechanical seal is used where the drive shaft enters the bottom of the body assembly.

Pressure Gauge Assembly (Optional)

The inlet pressure is measured by a pressure gauge assembly which consists of an indicator connected to a diaphram activated, liquid filled unit.

CAUTION: Any disassembly of the unit by the customer voids the manufacturer's warranty.

Trash Box Valve

A handwheel operated slide valve is used to isolate the heavy trash box for cleanout operations.

Reject Valve (Optional)

The flow of rejects is controlled by either a handwheel or pneumatically operated v-port valve.

Selectifier Control Panel (Optional - Available only with screens having pneumatically operated reject valves)

The main purpose of the Selectifier control panel is to automatically operate the reject valve on a timed basis. These valves have a manual adjustment to obtain the desired amount of constant bleed of rejects from the screen. Periodically the valve is forced wide open for a short period of time to release any concentration of rejects that may have accumulated in the screen or reject piping.

The panel also contains components relating to the operation of the drive motor.

There are three different models of Selectifier Screen control panels.

A) Single unit panel for operating one screen.

(Selectifier Screen continued)

B) A two unit panel for operating two screens.

C) Multi-unit panels for operating more than two screens.

The single and multiple unit panels utilize a single set cycle repeat timer which controls the frequency of purging the reject valves. With a single unit panel the cycle time setting determines how frequently the reject valve will purge. For multi-unit panels the cycle timer determines the lapse time between purging successive Selectifier Screen reject valves.

The two unit panel utilizes a duo-set repeat cycle timer for controlling the frequency of purging the reject valves. One arm is adjusted to control each screen. The sum of the two arm settings is the interval time between purges of each screen.

The purge timer controls the length of time the reject valve will stay wide open. The single unit and multi-unit panels utilize one purge timer. The valves, with the multi-unit system, purge in sequence but the purge time is the same for each valve.

The two unit panel utilizes two purge timers so each valve purge time can be controlled independently.

The multi-unit panel contains a motor driven program switch. This device is inside the panel and it automatically switches the timing and purging controls from one Selectifier Screen valve to the next. For this reason the cycle timer setting is the duration of time between purging successive valves.

All panels contain a pilot light to indicate when each purge valve is open. They also contain an automatic-manual-open selector switch for control of this valve. In automatic position the valve will purge with the timer sequence. In manual position the valve will remain closed to its constant bleed position. In open position the valve goes wide open and remains there until the switch is released and drops back to manual. This selector switch is spring return from open to manual position.

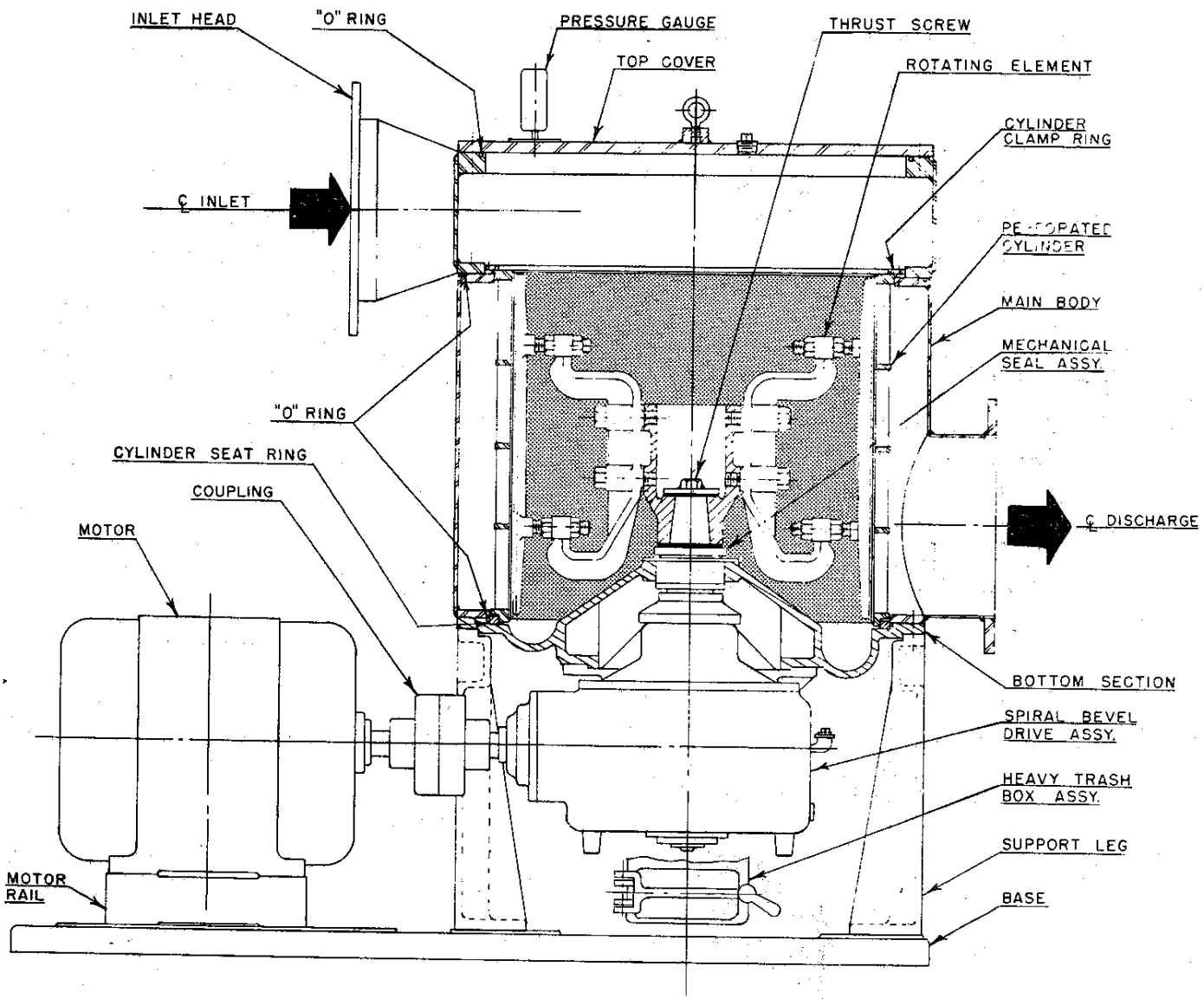
All panels contain a spring return to center stop and start selector switch for controlling the Selectifier Screen drive motor. A pilot light, for each unit, indicates that the motor is operating and an ammeter indicates its load.

Each panel contains one off-on power switch and a pilot light to indicate when the power is on. This switch controls the 110 volt power to the control panel.

Note: The motor control stop and start circuit is normally energized from the motor starter and therefore can be energized even though the 110 volt power switch is in the off position.

Note: The Selectifier control panel does not contain the magnetic starters for operating the drive motors.

GENERAL ARRANGEMENT OF PARTS



ProJet Technologies Inc

Professional High-Pressure Water Jet Fabric Cleaning Technology

ProJet Technologies Inc.
2938 State Hwy 42
Manitowoc, WI 54220 USA
E-Mail: info@projetinc.us / info@pro-jet.nl
Web Site: www.projetinc.us / www.pro-jet.nl

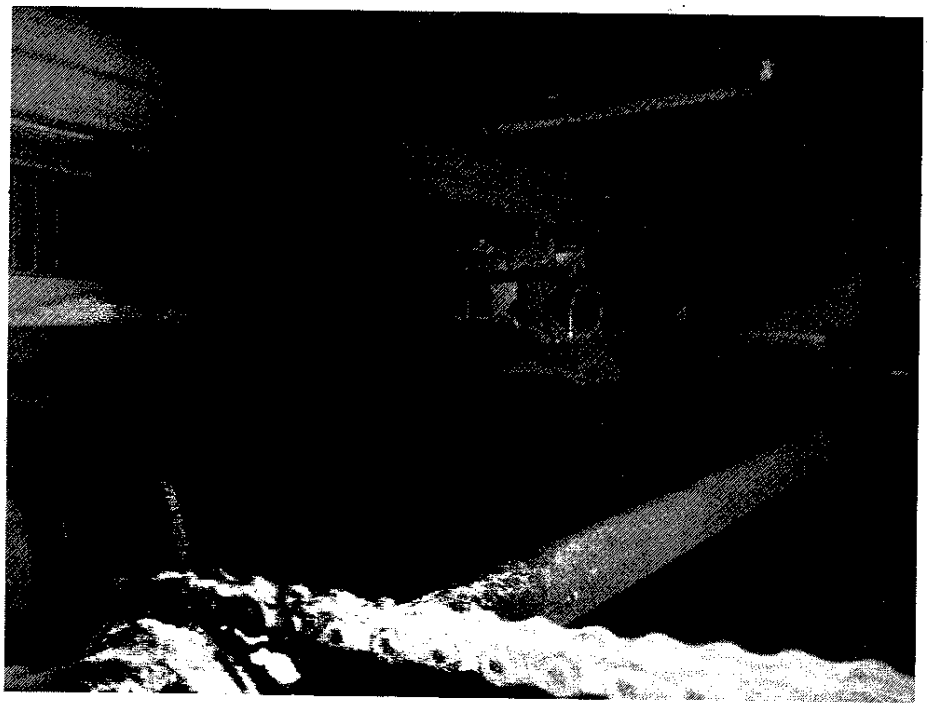
Power Dryer Fabric Cleaner

Quotation # CR/06032017/02

TECHNICAL & COMMERCIAL SPECIFICATION

Flambeau River Papers
Park Falls, WI
PM # 3

Att. Bill Bongean



Power Cleaner

1.0 Description of Dryer Fabric Power Cleaner

A clean dryer fabric, with consistently high air permeability, delivers important productivity and performance advantages for dryer section applications. The desired end result, of a clean dryer fabric, is a substantial improvement in available dryer capacity. Dryer fabric contamination is on the rise due to the increasing use of secondary fibres, recycling of coated broke, increasing use of sheet fillers, an increased use of recycled mill water supplies, and the increased use of process chemicals. Figures below show how an effective ProJet fabric cleaning system prevents contamination build-up when used continuously. The ProJet system consumes very little water, compressed air, or electrical energy. This innovative cleaning system is being applied successfully to very low basis weight product as well has heavy weight paper board applications.

1.1 Advantages of Continuous Dryer Fabric Cleaning

Applying a ProJet Wire Cleaning Solution guarantees consistently clean dryer fabrics from beginning to end of usable dryer fabric life. Consistently clean fabrics deliver the following significant manufacturing advantages:

- No chemical cleaning will be required to maintain fabric cleanliness.
- No shutdowns will be required for fabric cleaning. This will provide increased manufacturing productivity and profitability.
- Maintaining consistently high dryer fabric air permeability increases available dryer capacity.
- Better CD moisture profiles will be maintained.
- Sheet curling, caused by uneven drying, will be eliminated.
- Dryer fabric life will be substantially improved.
- Much less contamination will be deposited on dryers, doctor blades, and felt rolls.

1.2 Self Cleaning Station Features & Benefits

- Fully automatic
- Every 10 – 60 minutes, programmable
- Brush will clean air knife

Honeywell

SERVICE REPORT

Devronizer

FOR

Flambeau River Papers
Park Falls, WI
Paper Machine # 3

March 4, 2015

Randy Hook
Senior Service Specialist
Advanced Services Group

3079 Premiere Parkway
Suite 100
Duluth, Georgia 30097
(770) 689-1000

Distribution:

Flambeau River Papers	**Honeywell Regional Office**	**Honeywell-Devron**
Bob Hoffman	Jeff Wright	Dave Stake
	John Rosha	Advanced Services Group

DEVRONIZER EVALUATION

- The Devronizer was removed from the paper machine and placed on stands on the machine floor.
- The screen plate holes were plugged with fiber. The ends were approximately 70% plugged and the middle was 30% plugged as shown in the following photos.

Before Cleaning

1. System Information

The Devronizer is a custom designed steam shower system that features individual control zones in the cross direction (CD).

Devronizer is used in all paper grades and are typically applied in the paper machines on

- Fourdrinier table over the suction flat boxes,
- Over the Couch roll,
- Suction Pick up,
- In the presses.

Felt heating features may be added in some cases.

1.1. Principle of Operation – Heating with Steam

Incorporating Honeywell patented design, the **Devronizer™** represents the highest level of technological achievement based on the principle of energy (heat) transfer through the condensation of steam.

Rapidly condensing steam transfers its latent heat to the moisture within the wet web. For example, at atmospheric pressure, steam at 100°C (212°F) instantaneously releases 2256 kJ/kg (971 BTU/lb) of latent heat into the sheet. One kg of steam will raise the temperature of 100 kg of wet web by approximately 5.5°C, (1 lb of steam will raise the temperature of 100 lbs of wet web by about 10°F).

The Devronizer speeds up drying and improves sheet consolidation and runability. The final result is a more uniform moisture profile at the reel.

The Devronizer steam shower system enhances water removal in the press nip by reducing the surface tension and viscosity of water within the web and by softening fibers. The hotter the sheet, the better the dewatering (see Figure 1-1 Water Removal). The Devronizer delivers a hotter, drier sheet to the dryer section.

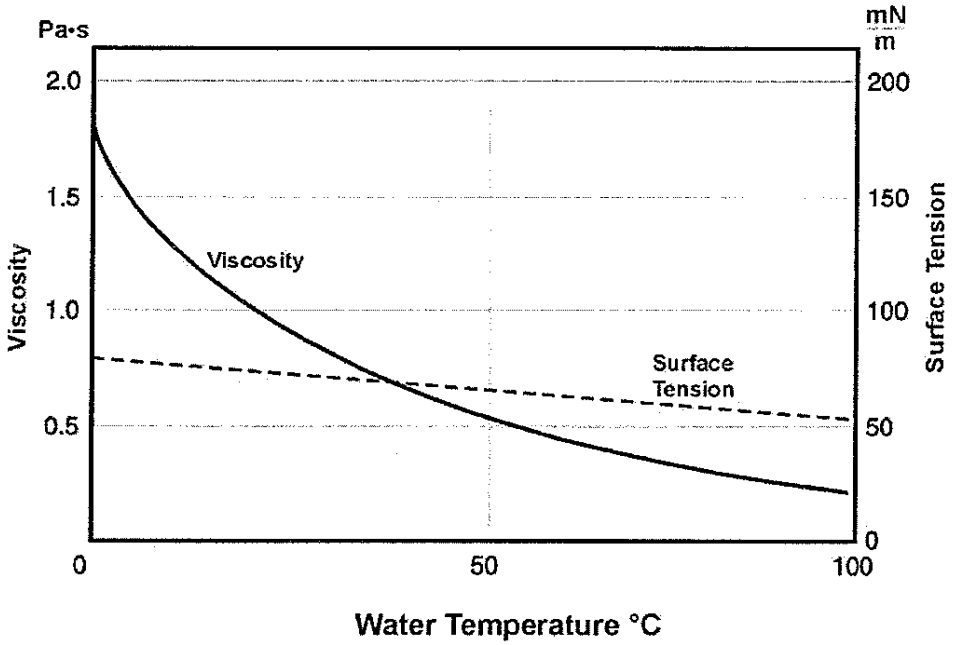


Figure 1-1 Water Removal

1.1.1. Effective Heat Transfer using Steam

Steam condenses to the sheet in an isolated area beneath the Devronizer. Since optimal heat transfer is through condensation, the Devronizer efficiency is directly related to these factors:

Steam Temperature

Optimal operation of Devronizer takes place at the steam temperature of 126-138C (260-280F) measured at the inlet to the Devronizer. A small amount of superheat in the steam ensures that steam carried to the sheet is above saturation temperature and water droplets do not form in the unit.

Sheet Temperature	A greater temperature difference between the sheet and the steam translates to more effective heating of the sheet.
Ratio of Exposed Fiber Surface to Mass	The greater the exposed fiber surface in relation to sheet mass, the better the heat transfer. Condensation takes place first on exposed fiber surfaces. Fiber interiors, which are full of water, are heated by thermal conduction and must draw heat away from the surface before more steam can condense.
Sheet Porosity	The more porous the sheet, the higher the fiber surface-to-mass ratio. Adequate steam penetration into a highly consolidated sheet requires vacuum assistance.
Sheet Moisture	Moisture within and between fibers increases sheet mass. Heat transfer is more effective when voids between fibers are dry.
Vacuum	For increased steam penetration into sheet.

1.2. System Overview

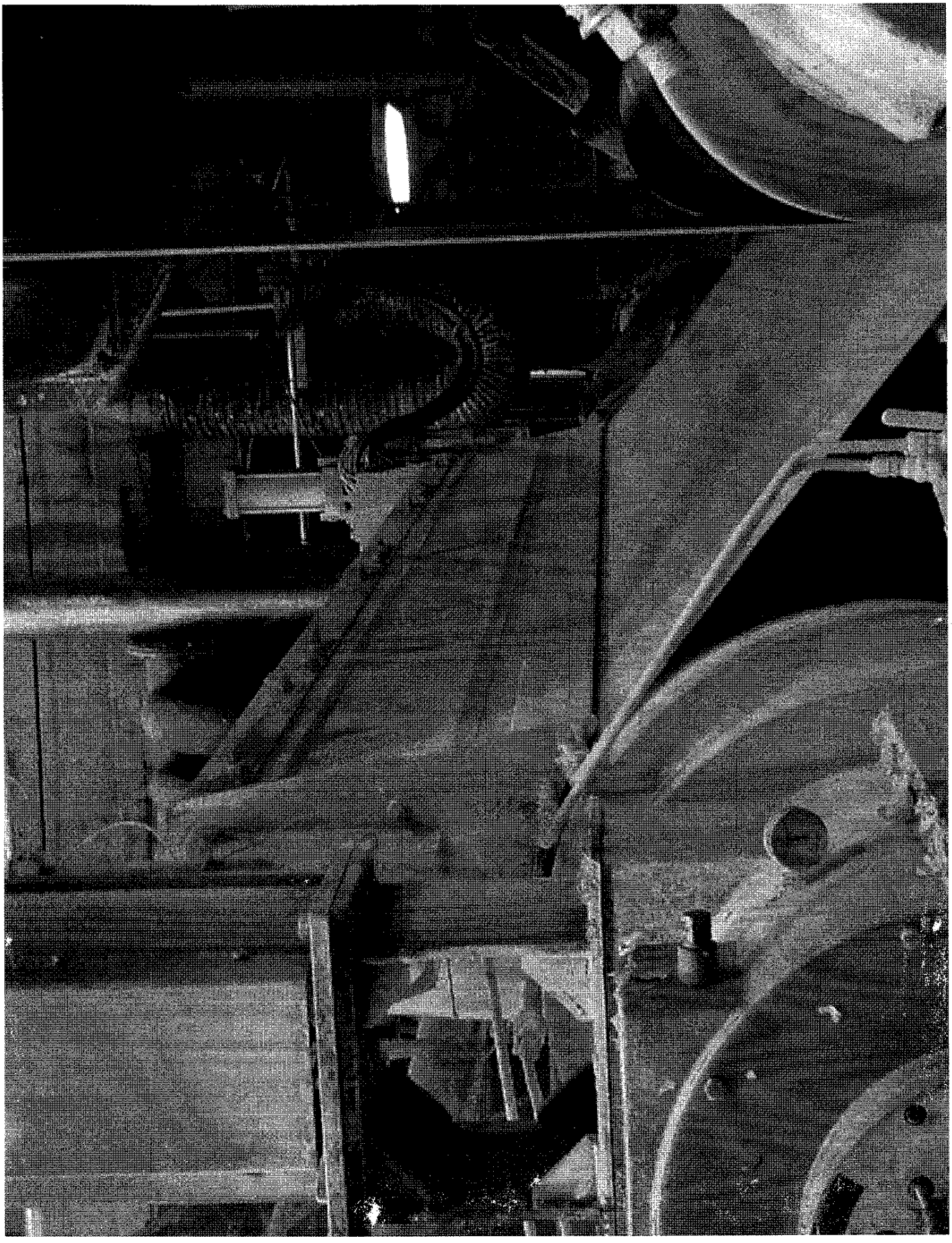
A typical installation includes the Devronizer heating zone or steambox, mounting and retraction, Steam Control Unit (SCU) and a CDWeb Manager with Intelligent Distributed Pneumatic (IDP) control interface. Refer to the engineering documentation for the site-specific information. See Figure 1-2 System Overview.

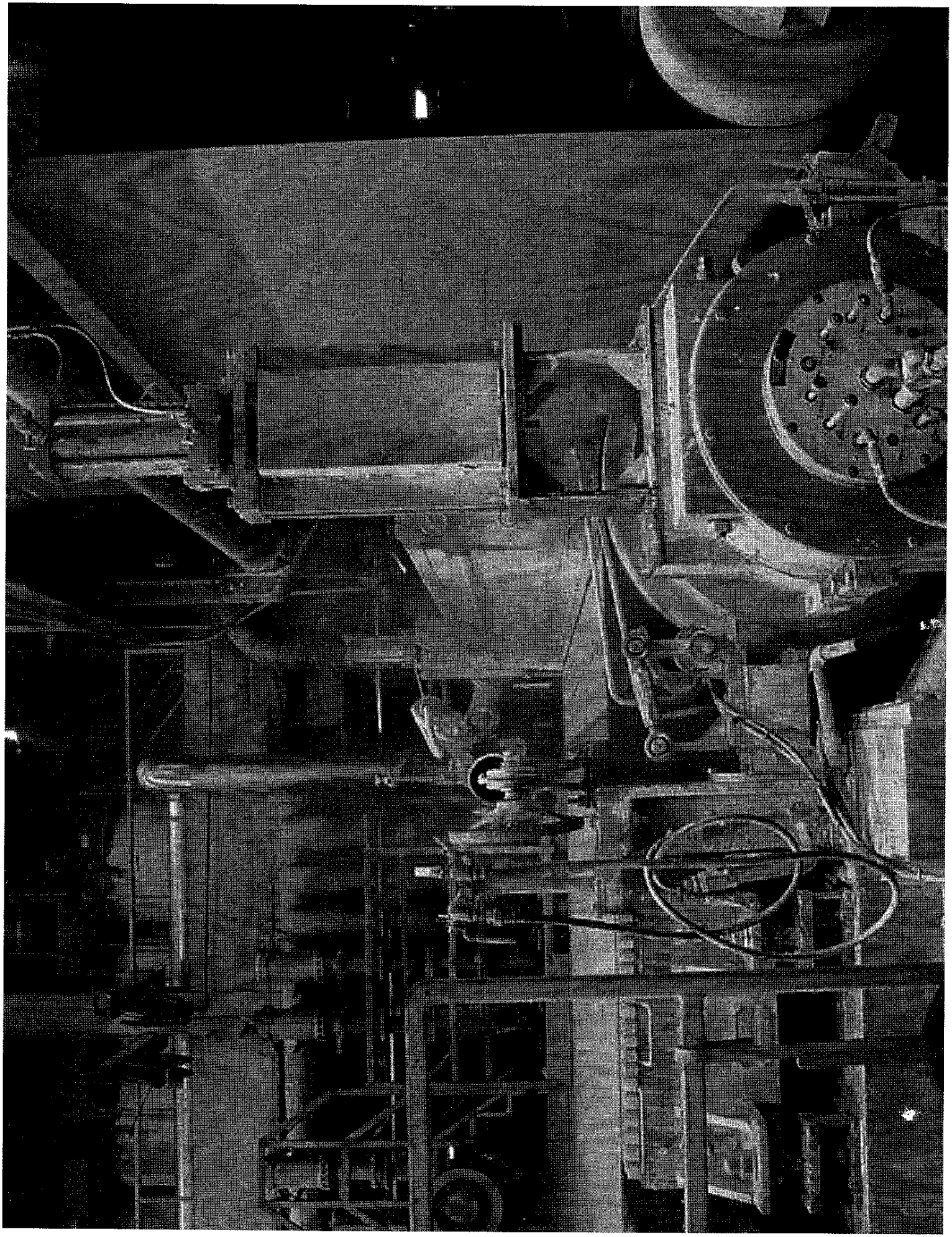
Steam is applied from the heating zone to the process. The physical equipment layout and the steam flow are custom-designed for the needs of each application.

The retraction mechanism enables cleaning and maintenance access around the Devronizer.

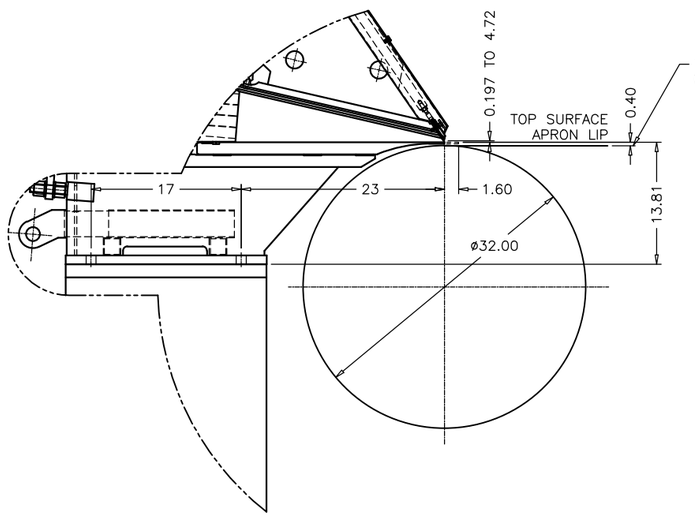
One SCU and One IDP control box may be shared by two Devronizers. This will require some extra components for the SCU. One IDP module is able to control eight zones.

The preheat (or non-profiling) Devronizer models need steam pressure and temperature control only. There is no IDP/CDWeb required, as there

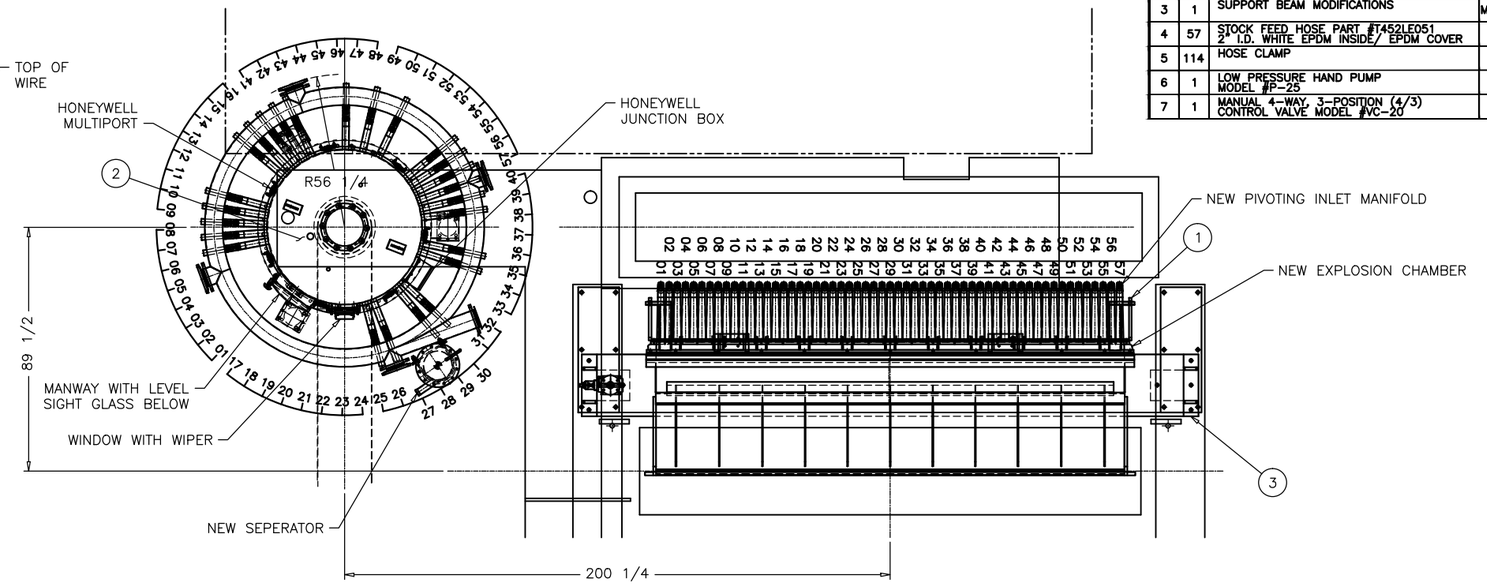




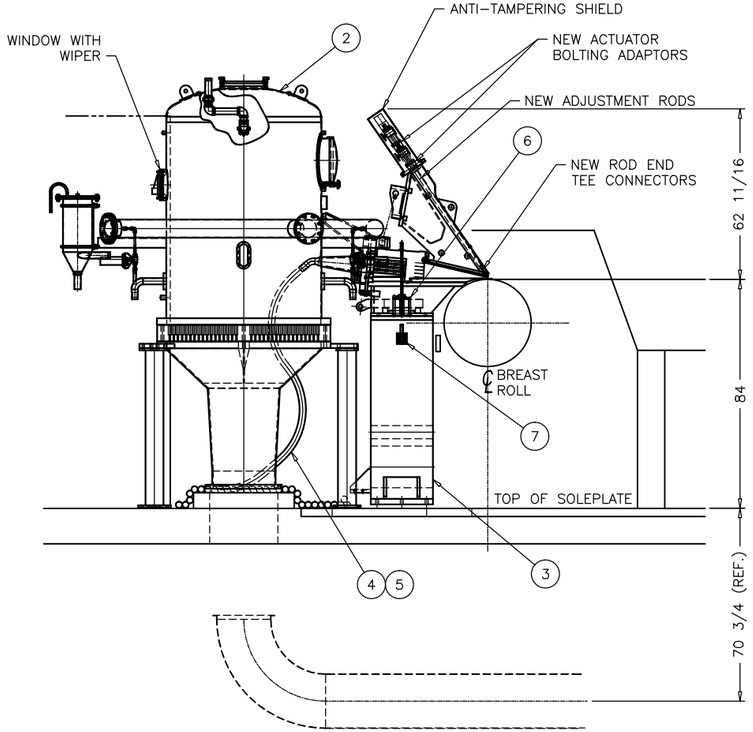
ITEM	QTY	DESCRIPTION	REFERENCE	MATERIAL	LBS.
1	1	HEADBOX MODIFICATIONS AND ADDITIONS	MF-10316-002	STN STL 316L	
2	1	NEW RADIAL DISTRIBUTOR	MF-10316-050	STN STL 316L	
3	1	SUPPORT BEAM MODIFICATIONS	MF-10316-007	STN STL 316L	
4	57	STOCK FEED HOSE PART #T452LE051 2" I.D. WHITE EPDM INSIDE/ EPDM COVER	ALFAGOMA	EPDM	
5	114	HOSE CLAMP		STN STL 316	
6	1	LOW PRESSURE HAND PUMP MODEL #P-25	ENERPAC	BY MILL	
7	1	MANUAL 4-WAY, 3-POSITION (4/3) CONTROL VALVE MODEL #VC-20	ENERPAC	BY MILL	



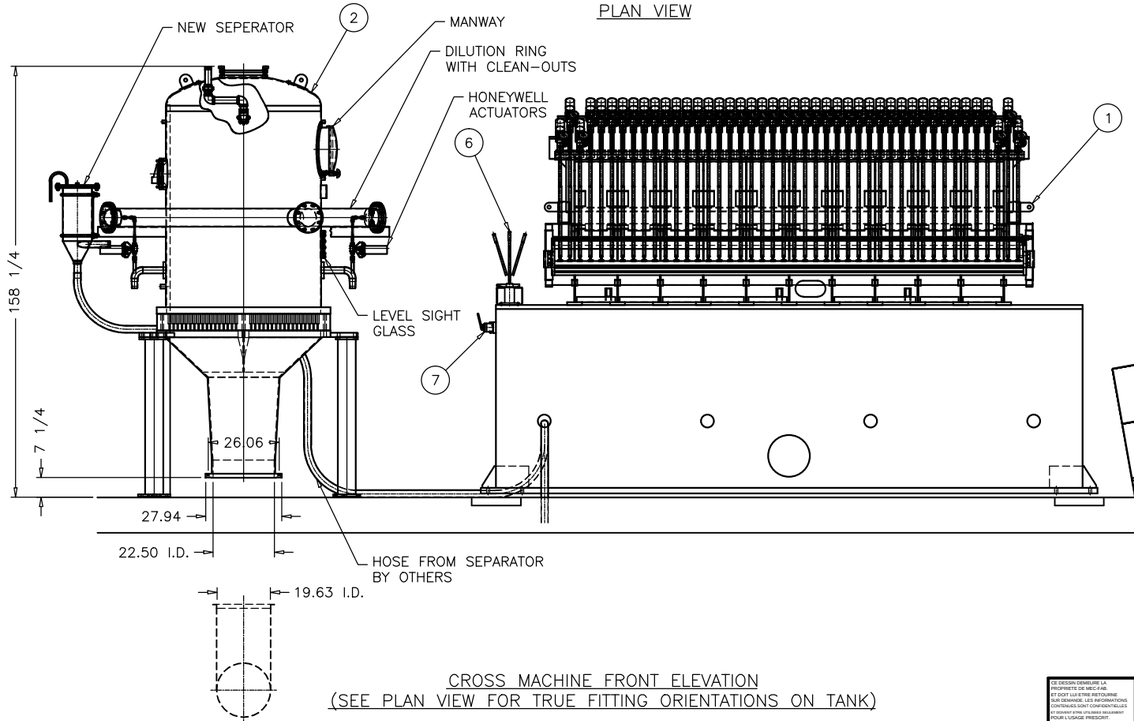
SLICE DETAIL



PLAN VIEW



TENDING SIDE ELEVATION
(SEE PLAN VIEW FOR TRUE FITTING ORIENTATIONS ON TANK)



CROSS MACHINE FRONT ELEVATION
(SEE PLAN VIEW FOR TRUE FITTING ORIENTATIONS ON TANK)

FOR APPROVAL

- ☐ APPROVED WITHOUT CHANGE, ISSUE CERTIFIED.
- ☐ APPROVED AS NOTED, ISSUE CERTIFIED.
- ☐ CORRECT DRAWING AS NOTED AND RE-SUBMIT FOR APPROVAL.

NAME:
DATE:

NOTES GENERALES

1- TOUTES LES DIMENSIONS SONT EN POUCES SAUF INDICATION CONTRAIRE.
2- TOLERANCE DE ±0.010" SAUF INDICATION CONTRAIRE.
3- RELEVER LES MESURES SOULIGNEES SUR LE RAPPORT D'INSPECTION.
4- RAPPORTER A L'INGENIERIE TOUTES DIFFERENCES ENTRE LA PIECE USINEE ET LE DESSIN.
5- LORSQUE LE FINI EST NON SPECIFIE, LAVER SEULEMENT LA SURFACE BRUTE.

GENERAL NOTES

1- ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2- BREAK SHARP EDGES AND CORNERS UNLESS NOTED OTHERWISE.
3- VERIFY THE UNDERLINED DIMENSIONS AND RECORD ON INSPECTION REPORT.
4- REPORT ANY AND ALL DISCREPANCIES BETWEEN THE DRAWING AND THE MACHINED PIECE TO ENGINEERING.
5- IF THE FINISH IS NOT SPECIFIED, WASH THE RAW SURFACE ONLY.

TOLERANCE GEOMETRIQUE / GEOMETRIC TOLERANCE

⊥	0.002	◎	0.002
▱	0.002	⌭	0.002
//	0.002	↗	0.002
—	0.002		

USINAGE/MACHINING

TOLERANCES:
DECIMAL(E): ±.010"
ANGLE: ± 0.1°
HOLE POSITION TROU: ±0.005"
NON-CUMULATIF
NOT CUMULATIVE

DIMENSIONS AND SLICE DETAIL ADDED

REV	BY	DATE
2	PMO	2013/02/12

DESSINE PAR / DRAWN BY	PMO
DATE	2013/01/17
APPROUVE PAR / APPROVED BY	ALD
DESSINE PAR / DESIGNED BY	ALD
ECHELLE / SCALE	7/16 = 12
FEUILLE / SHEET	1
COMMANDE / JOB	10316
GRANDEUR / SIZE	D

mecfab
DIV. IND. LEMIEUX INC.
1401 Graham Bell
Boucherville
Quebec, Canada, J4B 6A1
1-888-3-MECFAB

CLIENT: VILLE PROVINCE, NO MACHINE

FLAMBEAU RIVER PAPERS, PARK FALLS, WISCONSIN, #3 PM

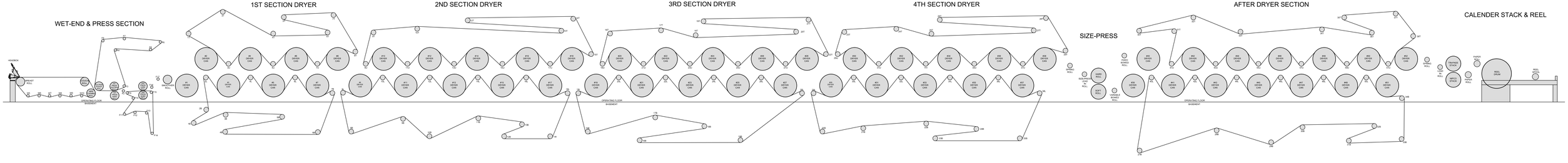
TITRE / TITLE: HEADBOX AND RADIAL DISTRIBUTOR

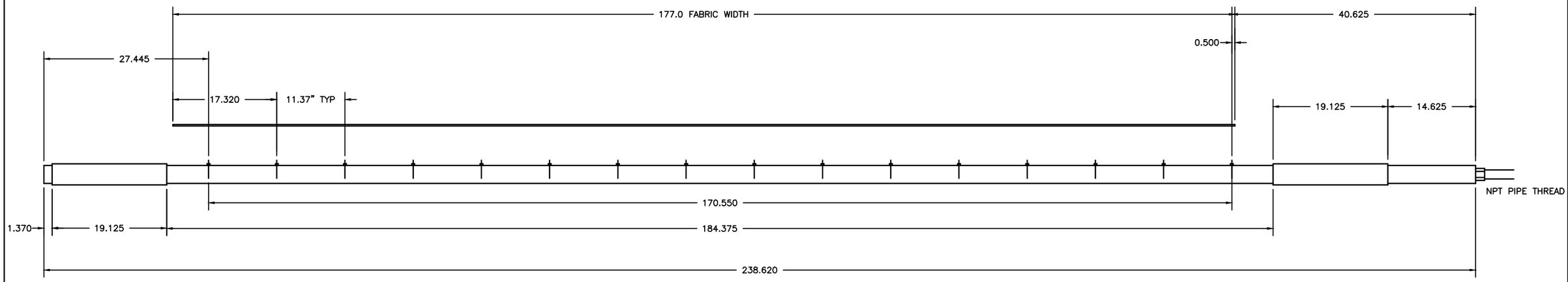
REV: 2

NO PIECE / PART NUMBER: MF-10316-001

Flambeau River Papers

#3 PAPER MACHINE ROLL CONFIGURATION





REV.	DESCRIPTION	DATE	APPR.

PRELIMINARY DESIGN

Flambeau River Papers
PARK FALLS, WI

DISCLAIMER:
ALL DIMENSIONS/EXISTING CONDITIONS SHOWN SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE. THIS DRAWING IS THE PROPERTY OF FLAMBEAU RIVER PAPERS, LLC, AND IS NOT TO BE REPRODUCED OR USED FOR ANY REASON OTHER THAN THE PURPOSE IT HAS BEEN EXPRESSLY FURNISHED.

#3 PAPER MACHINE
SECOND FELT HIGH PRESSURE
CLEANING SHOWER

DATE: 10-20-15
DRAWN BY: NLB
DESIGNED BY: -
WORK ORDER NO.

DRAWING NO.
M001