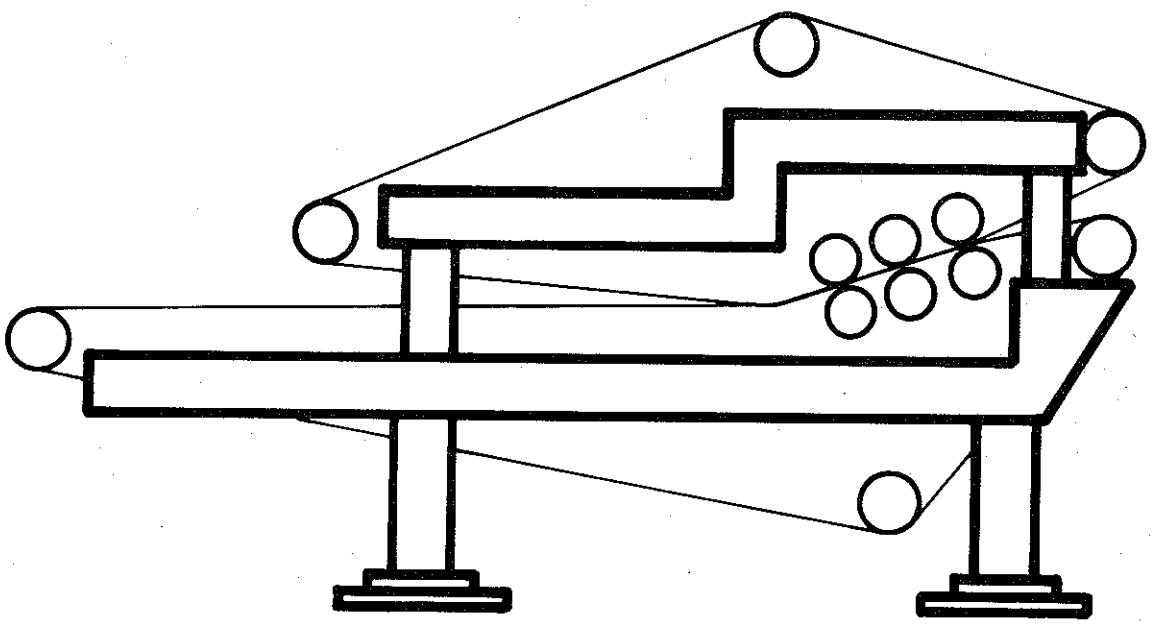
SDM

OPERATION MANUAL



ARUS-ANDRITZ

3/80

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1. Introduction

Andritz has been marketing industrial equipment for over 125 years. In Europe, Andritz employs over 2000 employees. While its principal production lies in Pulp and Paper Machines, Hydraulic Machinery, and general machine construction, Andritz has been building dewatering machines for more than 20 years. These machines are successfully operating in 15 countries. The name of Andritz Double Wire Press has become a byword for quality, particularly in the Pulp and Paper Industry.

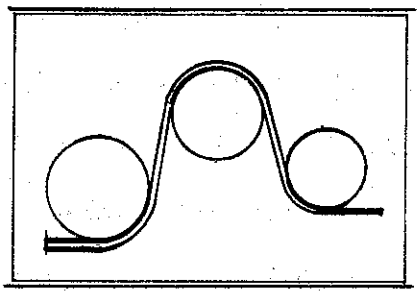
Dewatering equipment known as the "SDM" was brought to the United States through a company known as TAIT-ANDRITZ. Tait-Andritz was incorporated in the state of Ohio in June 1974. The company was located in Lubbock, Texas and operated and assembled machines in preparation for final shipment to the job site. Additionally, many components for the SDM were fabricated there.

In late 1979, the ANDRITZ relationship with the TAIT interest was dissolved and the name ARUS-ANDRITZ, INC. came into being. The plant in Lubbock, Texas was subsequently moved to the Dallas-Fort Worth metroplex. We are now located in Mansfield, Texas between Dallas and Fort Worth, centrally located for excellent transportation and supplier availability. Our new location also allows us to maintain a large inventory of spare parts. The address for ordering spare parts for your unit is:

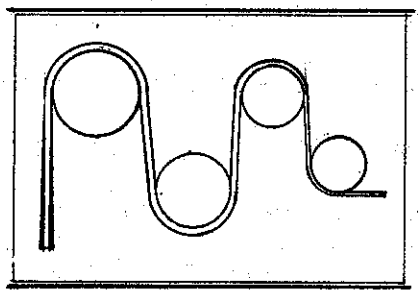
Arus-Andritz
1010 Commercial Blvd. S.
Mansfield, TX 76063

Since dewatering is such a wide field, and problems from one plant to the next vary greatly, due to different processes involved at the plant, the Andritz unit is offered in four different sizes, in which all have the ability to interchange *modules. This gives a large amount of flexability in which a machine may be manufactured to tailor fit a customers needs. Pressures as great as 50 KP/CM may be exerted in some sections of the SDM. Since the machine has this flexability, it is a great advantage to a customer whose waste water treatment process may change over a period of time. A module may be changed in three to five days that would give the customer higher through-put & cake dryness with his new waste water treatment system.

*Module



S3



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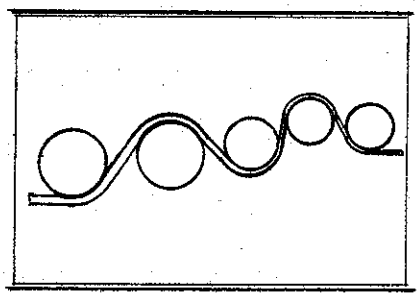

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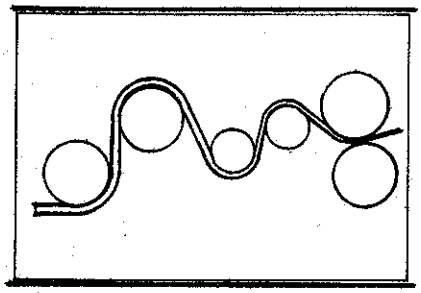
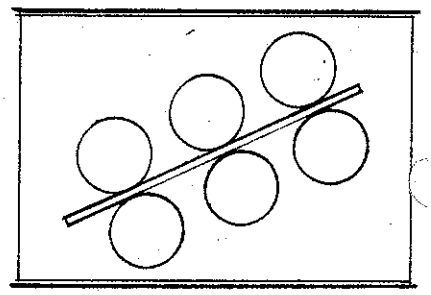


S4P

SDM MODULE SYSTEM MS



P

There are occasions when special equipment may be designed. Such machines have been used in the mining, food & chemical industry. These special changes may be in the forms of changes in design to the use of exotic materials. If your machine falls into this category, please take note of the last chapter in the handbook, which will cover any special detailing which might be necessary.

We ask that you please study this manual carefully before starting erection of the machine and its foundation. If after reading the manual you still have any questions, please feel free to contact the main Arus-ANDRITZ office, at your convenience.

Important!!!

The initial start-up of the SDM shall only be made under the supervision of a Arus-Andritz Commissioning Engineer.

In conclusion, we would like to say that we have made every effort to give you an excellent quality, trouble free product. Should you at any time have problems with your equipment, contact the main office in Mansfield,Texas, and your problem will be dealt with in the quickest possible manner.

It is in common interest with our customers that we strive hard to continue the development of our machines. It is for this reason that feed back from your operational experience will be taken most seriously, whether it is positive or negative. We will take all necessary steps to see that your machine is producing to your highest expectations.

Respectfully yours,

ARUS-ANDRITZ, INC.

2. Description of the Sludge Dewatering Machine

2.1. Dewatering System

In accordance with process engineering requirements, the individual machine components perform the following functions. (see ill. #1)

2.1.1 Sludge Headbox (1)

It is at this point where the sludge and the polymer is homogeneously mixed by means of a stainless steel mixing drum. This insures proper flocculation of the material for maximum dewatering properties. The sludge then leaves the mixing drum by static pressure and passes to the sludge chest for final distribution. Distribution in the sludge chest is done by means of distribution plates or baffels.

2.1.2 Gravity Zone (2)

This is perhaps the most important stage in sludge dewatering with a belt press. A good flocc to insure quick dewatering in this stage is very important. It is for this reason the gravity dewater section is left open. Simple visual monitoring of this stage will almost insure proper dewatering in the final stages. No mechanical pressures are being applied at this point. Even so, as much as 60% of the water will leave during this first stage.

2.1.3 Wedge Zone (3)

In this stage mechanical pressure is applied by means of a descending wedge. The bottom table rolls are fixed on a horizontal plane while the upper table rolls are mounted on a movable stainless steel bracket, allowing for changes in angle, which in return varies the pressure in the wedge. The angle formed in the wedge ranges from 1 - 2^{o}. The sludge is contained in the wedge zone by means of a lateral seal, (PVC, Aluminum). When starting up a machine, the most important detail to look for in the wedge, is to make sure that stabilization of the sludge is reached before entering the "Press" or the "S" section. If proper stabilization is not reached, this can be easily detected. Extrusions of the sludge will occur after the last table roll and prior to the high pressure "S" or "Press" section. This problem can be corrected either by changing the velocity of the wires, changing the polymer rate, changing the sludge feed rate, or changing the angle of the wedge itself. In most cases, only one of the mentioned changes need be made. It would be advisable however to systematically check out each factor and change the one which will best fit your operational needs.

WARNING: When making adjustments to the wedge, make sure that belts are not moving. Never work on machine while it is in operation.

2.1.4 Press Section (4)

This is the last stage of dewatering. It is also the stage in which the highest possible pressures are exerted. Two different basic roller configurations are offered in this section.

1. The "S" module which is surface pressure, which is achieved through a serpentine wrap.
2. The "Press" module in which line pressure is exerted. This is achieved through convergence of two opposing rolls into a nip arrangement.

Type #2 applies much higher pressures than type #1, therefore, it is suitable for highly stable sludges only. Please check latter part of handbook in reference to your particular type of machine.

Types of "S" and "Press Sections.

A. 3 "S" Execution - A module consisting of 3 "S" rolls, which can exert pressures up to 1KP/CM^2.
B. 4 "S" Execution - Same exact pressures as above. With 4 rolls, you have more time in the "S" section which will in turn produce higher throughput, along with better cake dryness.
C. "Press" Roll Execution - Through opposing rolls, line pressure may be applied, resulting in pressures up to 50KP/CM^2.

D. Combination "S" Tension - "Press" Roll Execution - This combination allows slow stabilizing sludges to stabilize in the "S" section before entering the high pressure "Press" section. With this execution, optimization of cake dryness and throughput may be reached with unstable sludges.

2.1.5 Wire Belt Tensioning Device with Parallel Guide (5)

Wire tensioning is done by means of air bellows. For exact detail on stress, please refer to wire tensioning charts in handbook or wire tensioning charts located on the machine. By adding compressed air to the air bellows, wire tensions may be brought to as high as 10KP/CM^2. To insure parallel travel of the breast roll during wire tensioning operations, a shaft assembly with a gear insert on each end interlocks the two air bellows together (no adjustment should be made to this assembly, as it is set correctly at the factory).

2.1.6 Wire Belt Cleaning Device (6)

A wire belt cleaning shower is located both on the upper and the lower belts. They will clean any particles that may adhere to the belt while in operation. All belt showers are equipped with self cleaning flat nozzles. A back flush system is incorporated into the shower system. This may be done by turning the handle at the end of the shower housing. Back flushing the showers in this manner should

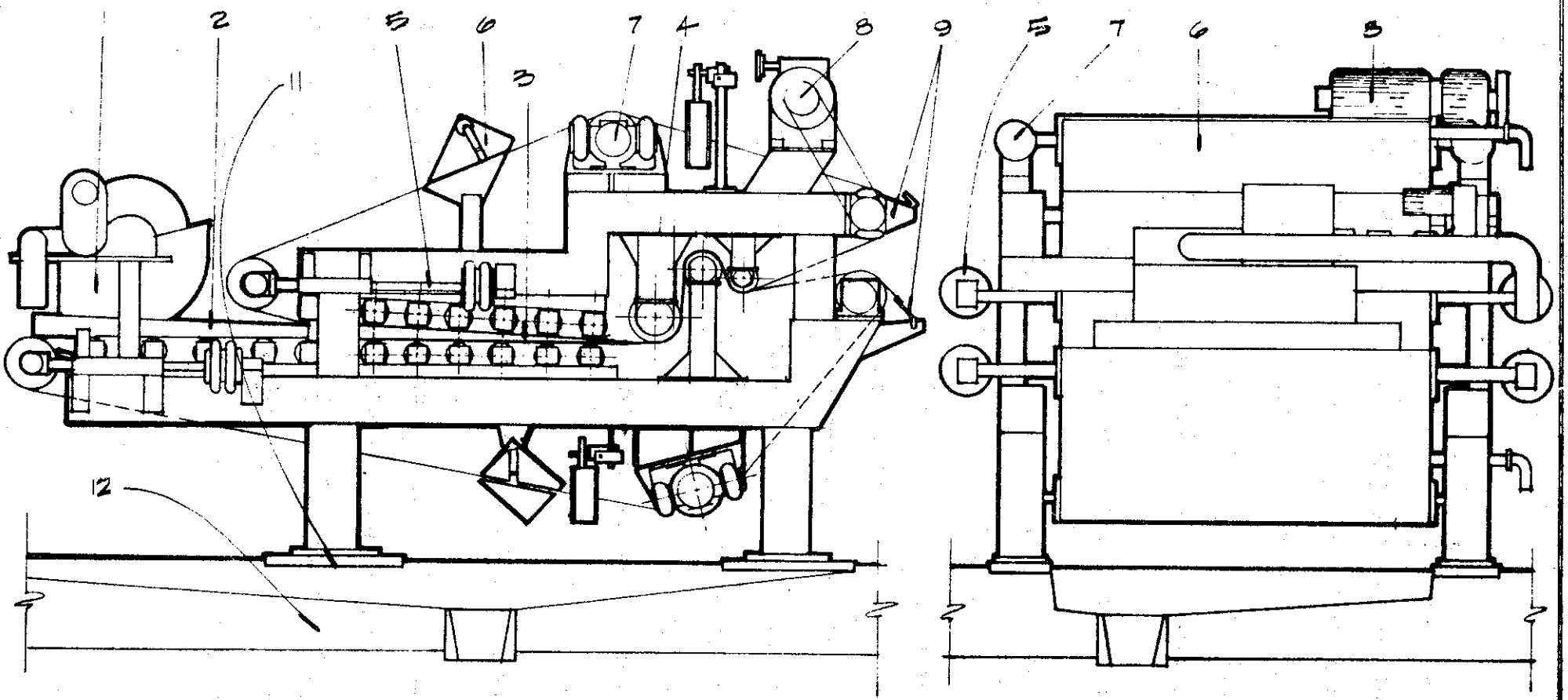
be done every two to three days. This will prevent any build-up of solid material within the shower itself. Continuous belt cleaning is not necessary in all cases. It is for this reason that timers are installed into every ARUS-ANDRITZ Control Panel. This allows the owner to cycle his shower water at timed periods to best fit his needs.

2.1.7 Wire Belt Tracking Device (7)

The wire belt tracking device is of pneumatic design. Both the upper and lower belt have a tracking system. This tracking system will keep the belt centered on the rolls at all times. Tracking is done by a rubber coated roll which is activated by two air bellows. A scanning finger monitors the location of the belt at all times and keeps the tracking roll in the needed position, for true running of the wire. (For complete instructions on the maintenance and operation of this system, please refer to the Rectec Handbook located near the end of this manual.)

2.1.8 Machine Drive (8)

The standard drive system supplied with a ARUS-ANDRITZ "Press" is an "AC" mechanical vari-speed. Drive systems such as SCR, Hydraulic, etc. may be supplied upon customer request. (For your exact operating and maintenance instructions, please refer to the drive specifications at the end of the manual.)



ARUS ANDRITZ SDM 5 DESCRIPTION

ILL. 1

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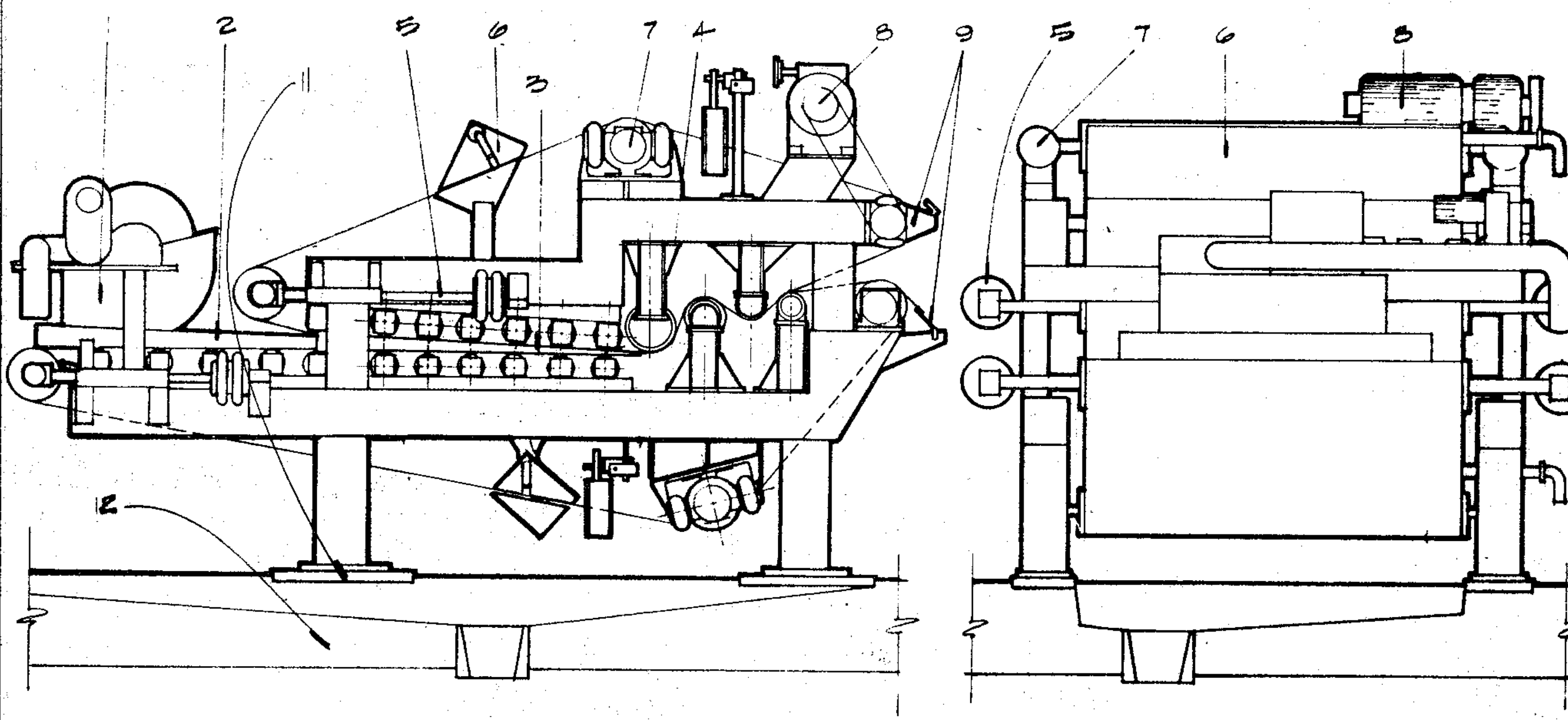

ARUS-ANDRITZ SDM 64 DESCRIPTION

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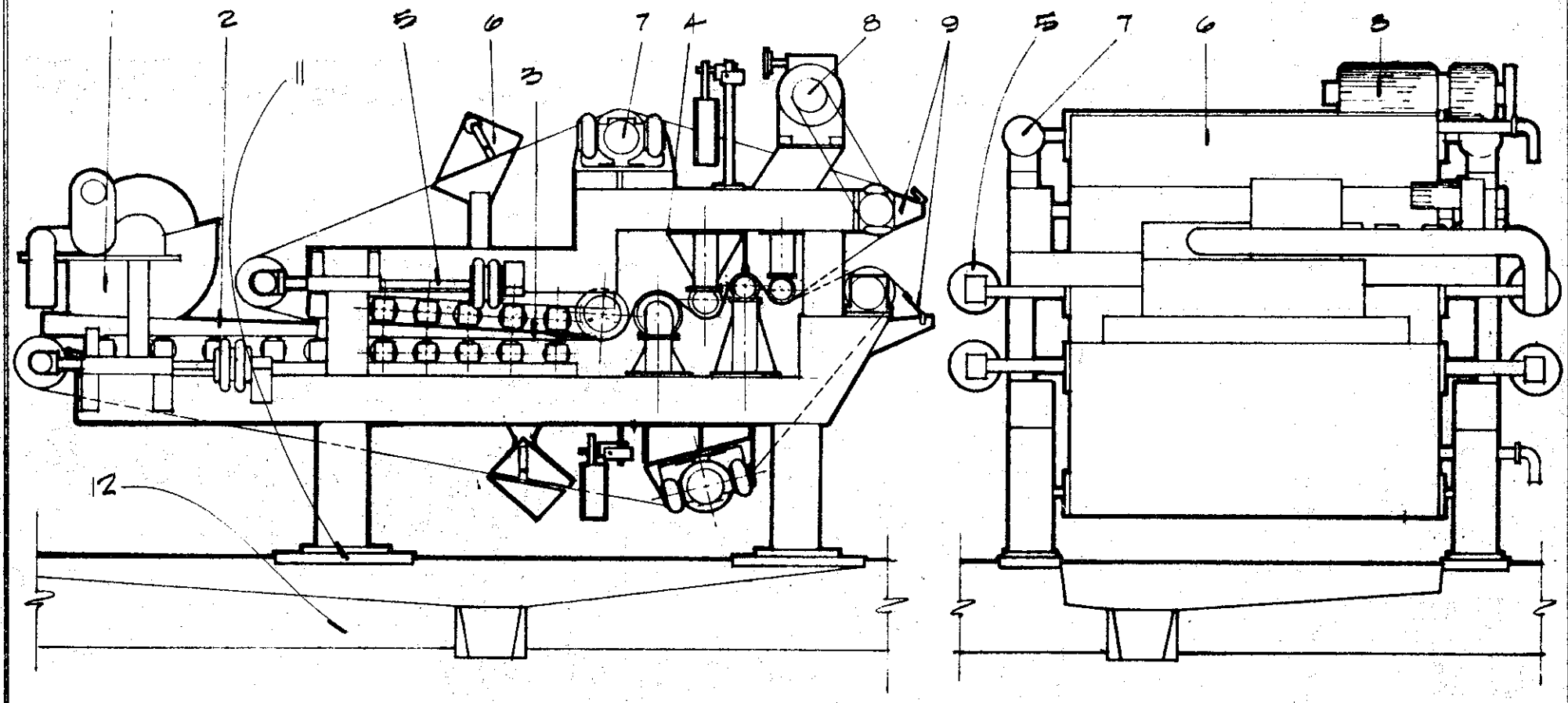

ARUS-ANDRITZ SDM 55 DESCRIPTION

ILL. 1

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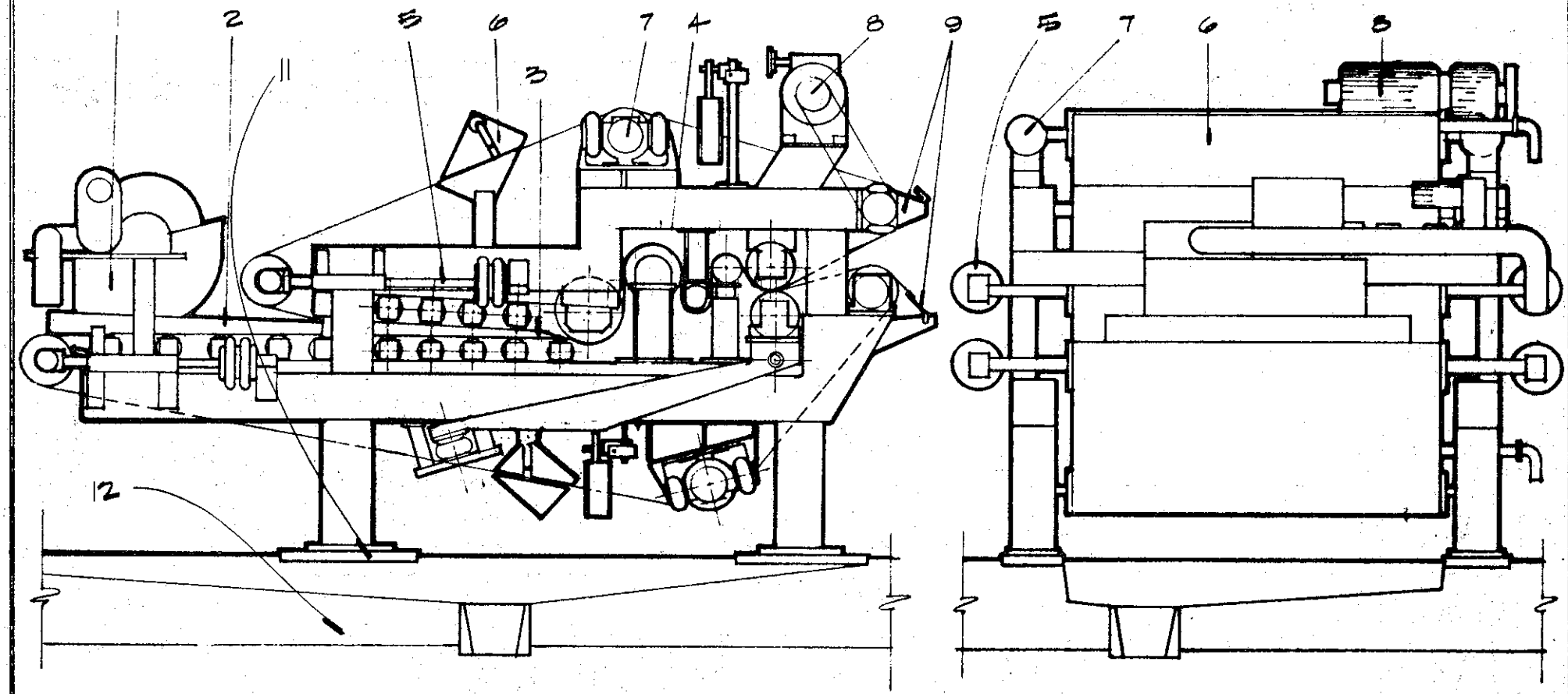

ARUS-ANDRITZ SDM S4P DESCRIPTION

ILL. 1

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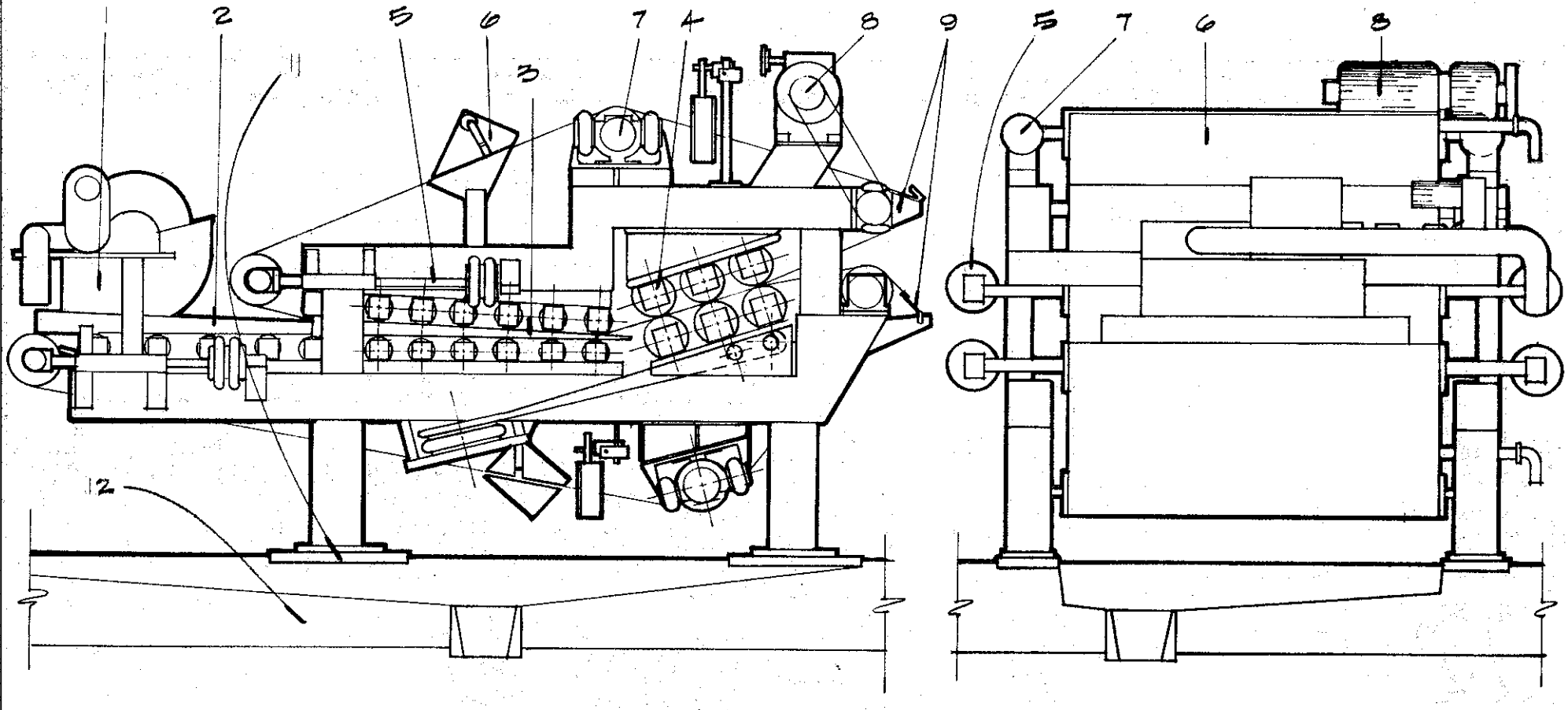


ARUS ANDRITZ SDM PRESS DESCRIPTION

ILL. 1

DRAWN BY: G.H.	DATE: 28 MARCH 77 APPROVED BY	SDM PRESS	PROJ. NO. ORDER NO.

2.1.9 Doctor Blades (9)

Doctor blades on the SDM are used to remove the cake from the wire belt. The doctor blades should be adjusted to ride very tightly on the wire in order that no material can pass under the blade and be washed into the filtrate by the belt cleaning system. Doctor blades should be checked for wear periodically. Replacement of these blades will vary, depending on the nature of the application.

2.2 Machine Frame (10)

Constructed from structural steel tubing, coated with 3 to 4mm of F.R.P. coating for high levels of corrosive resistance. The frame is the main carriage for the roller assemblies, etc. All mounting surfaces, such as bearing housings, etc., are machined for precision assembly. The frame consists of two main structures (upper and lower). The reason behind the split frame concept, is to allow the wire to be taken on and off the machine to be of endless construction. By making use of the endless wire instead of a pin or alligator seamed wire, longer wire life and better filtration is insured.

2.2.1 Foundation Plates (11)

The SDM comes with four foundation plates. Use of these plates, as later described in the manual, will insure proper

leveling of the machine. This is critical in achieving optimum dewatering and equal distribution of the slurry on the wire.

2.2.2 Concrete Foundation (12)

The concrete foundation should be designed to allow central draining of the filtrate and the wire belt cleaning water. Arus -Andritz will issue concrete foundation drawings, but please note that these drawings are only a suggestion. Other foundations may be layed out to the owners specific needs. (For more detailed information, see Chapter 3.1.)

2.3 Control Instrumentation (Ill. #2)

The SDM is equipped with various types of limits and controls for automation of the equipment. Should a failure occur such as belt tracking, loss of sludge , loss of air, etc... An alarm, both audio and visual will occur. At the same time, the functions necessary for the protection of the various equipment should also be interlocked for shutdown.

2.3.1 Wire Belt Limit Switch (Pos. #1, Ill. #2)

Should a failure of the pneumatic tracking device occur, (belt tracking) or should, for some reason, the wire walk too far to the left or right, the belt limit switch would then instantly shut down the machine, and the auxiliary equipment, which might cause potential harm if the machine is not running.

The SDM belt filter press is controlled via panel mounted, manually operated push buttons and selector switches. A selector switch energizes control panel voltage, which is used to provide circuitry through shutdown interlocks, emergency stops (on SDM & panel), system start pushbutton and finally control relay "CR2", which when energized provides control voltage to individual motor starter control pushbuttons.

The shutdown alarm circuits include air pressure monitoring switch for the pneumatic operation of SDM. This switch is used to energize control relay "CR2" which operates an audible alarm, pilot warning lamp, and opens an interlock to "CR1" should air pressure fall below present limits (45-55 P.S.I.G.).

The other alarm circuit includes two limit switches on the SDM belt filter press, which are used for belt tracing monitoring. These limit switches, when tripped by a misaligning belt, energize control relay "CR3", which operates an audible alarm, pilot warning lamp, and opens an interlock to "CR1". Once "CR1" drops out all the operating drives to the SDM shut down.

With "CR1" energized and no alarm shutdowns present, operator can energize the following:

1) Belt wash controls - relay "CR4" via H·O·A· position selector switch. In "auto" position, belt wash control relay "CR4" is cycled on and off by 2 adjustable delay timers. In "hand" position, belt wash control relay "CR4" is energized through selector switch only.

   "CR4" is used to operate a water solenoid valve installed in the wash water feed line to the SDM belt showers.

2) Main belt drive motor starter via start-stop push-button station. Motor starter is furnished and sized for motor drives used on SDM.

3) Mixing drum drive motor starter via start-stop push-button station. Motor starter is furnished and sized for motor drives used on SDM.

4) Other auxillary devices used in conjunction with belt filter press:

a) Screw of belt conveyor - pushbutton stations
b) Polymer Pump - Pushbutton station
c) Sludge Pump - " "
d) Mazorator - " "
e) Vent Fan - " "

2.3.3. EMERGENCY STEPS (POS. #3, ILL. #2)

2¼" emergency stops are located on each side of the machine for complete system shutdown.

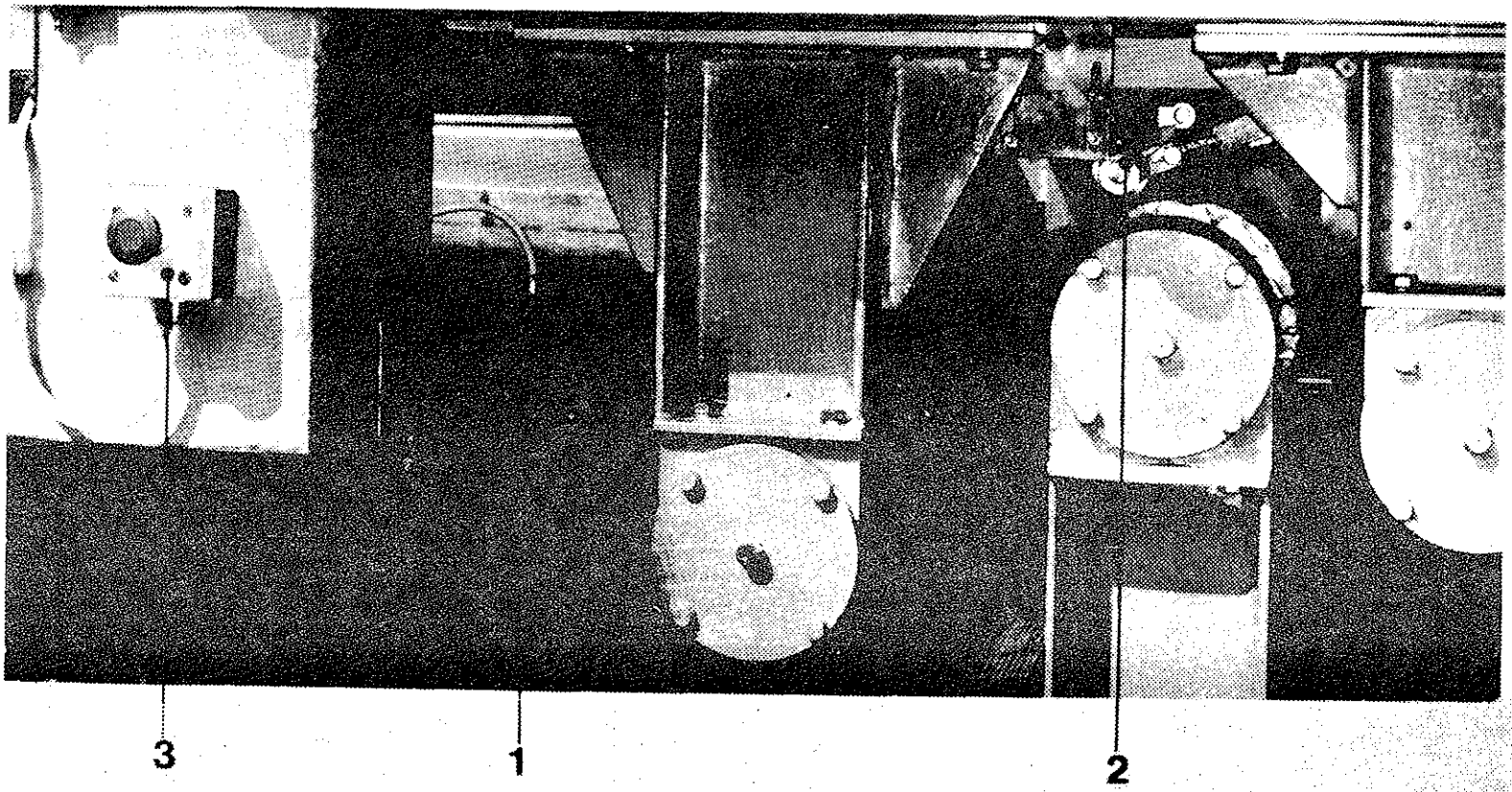
2.3.4 Safety switches for dry running of sludge and polymer pumps. When using pumps such as Moyno, it is always recommendable to use some type of dry running warning system. Pumps of this nature can quickly loose a stator through frictional heat. The most common type of protection is an automatic flow detector. This detector is a flange type mounting assembly that is inserted on the suction side of

the pump. When fluid loss occurs, alarms may be sounded, along with a shutdown of the pump and its auxiliary equipment. (Not standard supply)

2.3.5 Air Pressure Switch

This pressure switch is mounted on the incoming air supply. If air pressure is lost, the machine and its auxiliary equipment shutdown will be immediately activated. Indicator lights and buzzer will be activated by the same signal.

MACHINE SHUTDOWN DEVICES



1. SHUTDOWN LIMIT SWITCH FOR BELT
2. NO CAKE INDICATOR ROCKER SWITCH
3. EMERGENCY STOP

ILL. 2

3. Arrangement and Erection of the SDM

The Andritz SDM-SM is delivered to jobsite with four foundation plates and mounting bolts. The customer will be expected to prepare the proper foundation for the SDM-SM. Please follow closely the erection instructions on the following pages. If a question should arise during the erection of an SDM-SM that cannot be answered in the manual, please contact the main office or your local representative.

3.1 Machine Foundation (see Ill. #4)

The quality of the concrete in regards to strength must be matched to the foundation loads given in Table 2. Depending on the application, the concrete must be resistant to any chemicals which might appear in the filtrate.

IMPORTANT!!!

Exact leveling of the machine is necessary in order to achieve maximum dewatering.

The recesses for the foundation plates should be exactly as shown on certified foundation plans.

Example (setting of foundation plates)

A. Make sure that the recesses in which the foundation plates sit are approximately 2" wider on all sides than the foundation plate itself to facilitate the grouting of the plates.

3. Arrangement and Erection of the SDM.

The Andritz SDM is delivered to jobsite with four foundation plates and mounting bolts. The customer will be expected to prepare the proper foundation for the SDM. Please follow closely the erection instruction on the following pages. If a question should arise during the erection of an SDM that cannot be answered in the manual, please contact the main office or your local representative.

3.1 Machine Foundation (see Ill. #4)

The quality of the concrete in regards to strength must be matched to the foundation loads given in Table 2. Depending on the application, the concrete must be resistant to any chemicals which might appear in the filtrate.

IMPORTANT!!!

Exact leveling of the machine is necessary in order to achieve maximum dewatering.

The recesses for the foundation plates should be exactly as shown on certified foundation plants.

Example (setting of foundation plates)

A. Make sure that the recesses in which the foundation plates sit are approximately 2" wider on all sides than the foundation plate itself, so as to facilitate the grouting of the plates.

B. Place steel shims in the recess for the foundation plates to sit on. This will allow the grout to pass under the plate. Next, place the foundation plate into the recess with each of the welded on anchor plates going correctly into their pocket.

C. Set foundation plates with the aid of a builders level, keeping all of the plates exact as possible.

D. Make any fine adjustments necessary, with the aid of thin metal strips for shiming.

E. Grout the plates after exact level between all plates has been achieved. After the grout hardens, the machine may then be placed on the plates.

3.2 Erection of The Assembled Machine.

In setting the machine on the foundation, either a fixed or mobil crane may be used. For sizing the capacity of the crane, please refer to Table #3, which lists the over-all weights and dimensions. Without the use of a crane, the SDM may be moved on a horizontal plane by the use of jacks and transport rollers. When mounting the machine in this manner, one must not apply uneven pressures to any of the legs.

When lifting the machine, only use the special lifting eyes

as shown in Ill. #5. In order to keep from cracking the fiber coating during lifting operations, place wooden blocks between the frame and lifting cable.

IMPORTANT!!!

After setting the machine on the foundation pads, make sure that the machine is perfectly level. This may be done by placing steel shims between the leg of the machine and the foundation pads. For leveling check points on the machine, refer to Ill. #6. By checking these points in Ill. #6, exact leveling of the machine will be insured.

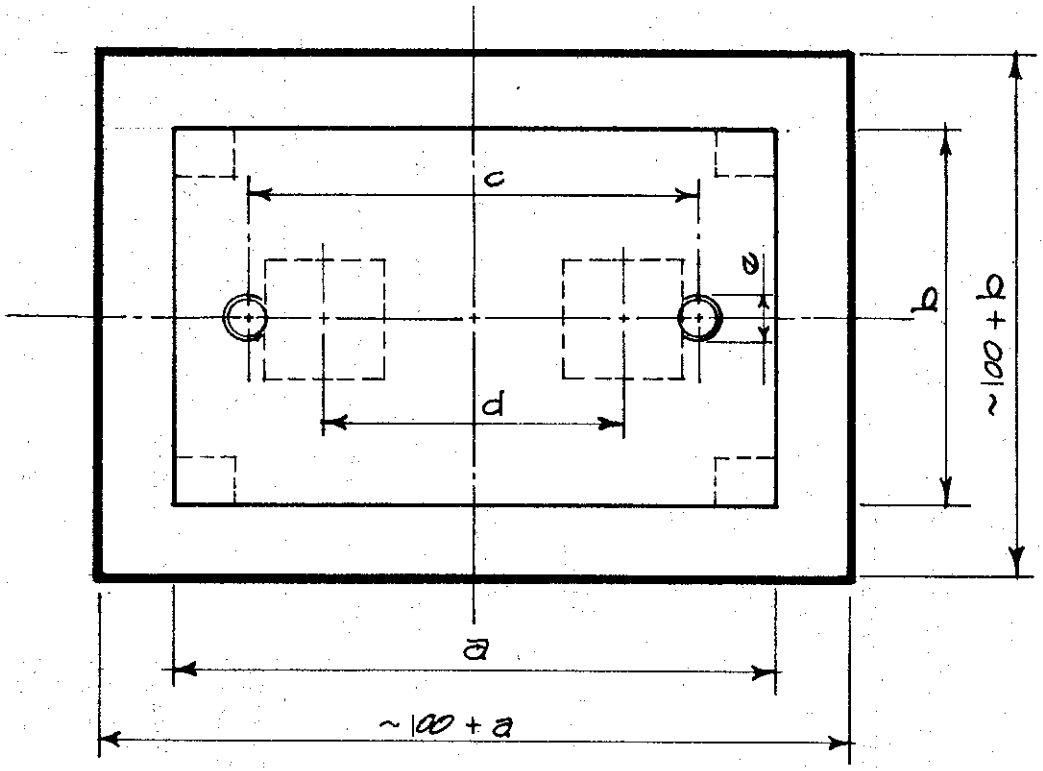
3.3 Connection & Hook-up Detailing

Please refer to Ill. #7 for reference to the location of all connections involved. Table #4 contains the working dimensions of all connections to be done in the field.

	Sludge Connection	Polymer Connection	Air	Shower (I.D. in inches)	Water Hose (O.D. in inches)
SDM 20	2½ ANSI	½" Straight	¼ Female	2	*
SDM 40	3 ANSI	½" Straight	¼ Female	2	*
SDM 60	4 ANSI	1" Straight	¼ Female	2 3/8	*
SDM 80	4 ANSI	1" Straight	¼ Female	2 3/8	*

TABLE #4

*Heavy wall hosing to be used. This dimension will vary with type of hosing selected. Hosing should be able to withstand pressures of 90 p.s.i. or greater.



TAB. 1

	a	b	c	d	e	f	INCHES
*SDM 20 *SDM 40	11"	7 7/8"	7 43/64"	5"	M 20	3/4"	
*SDM 60 *SDM 80	15 3/4"	10"	11 3/16"	7 7/8"	M 24	1"	

*DIMENSION SUBJECT TO CHANGE W/OUT NOTICE.

ILL. 3

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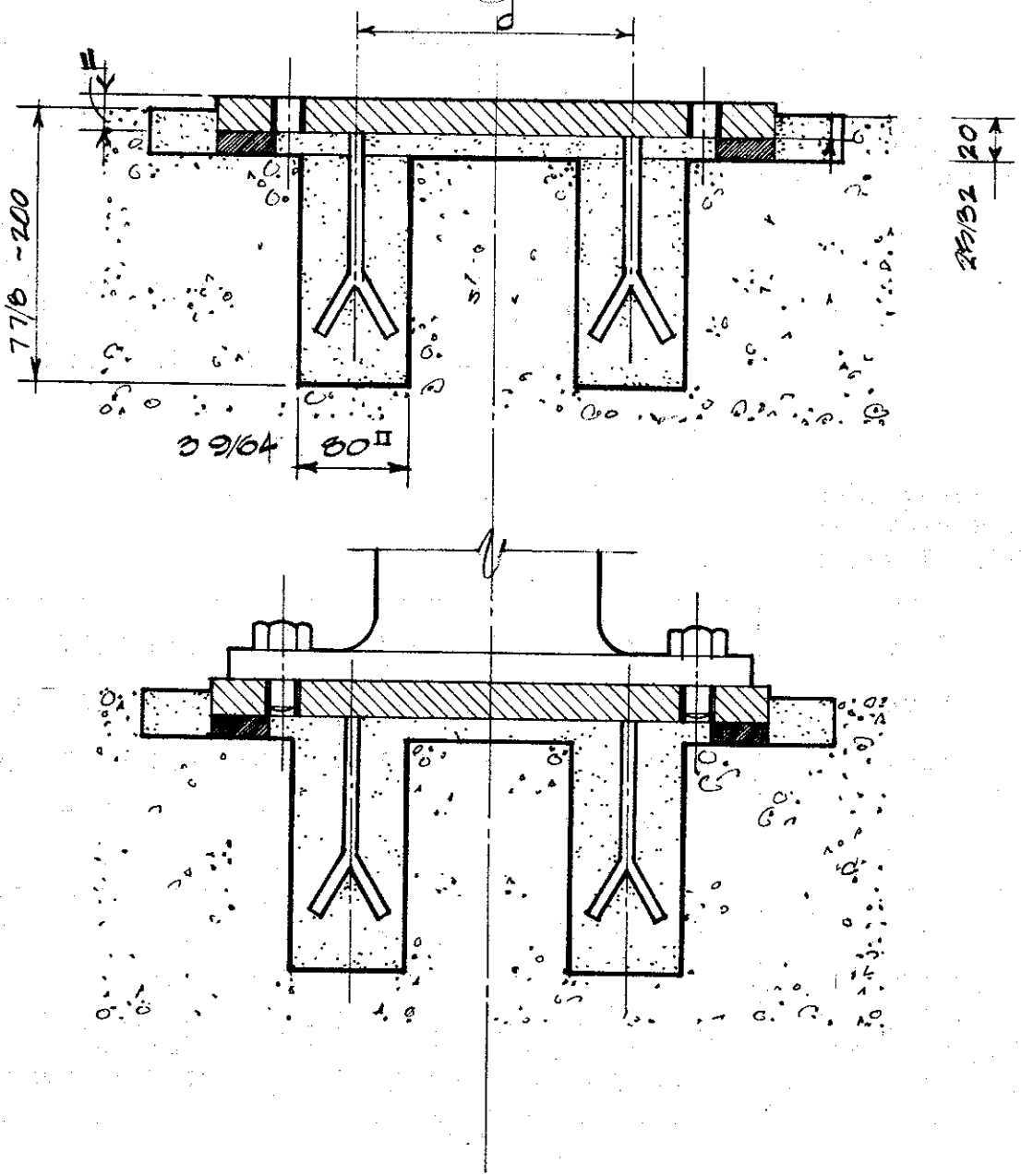


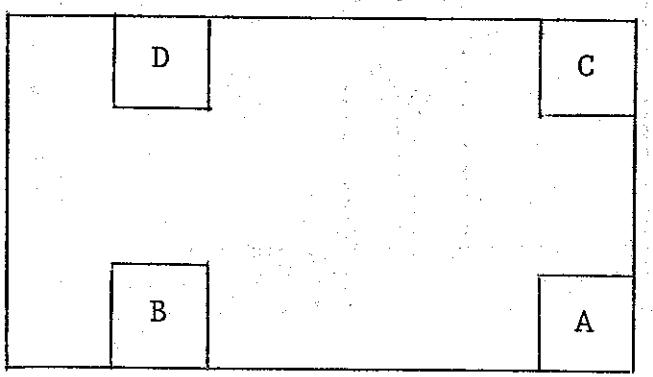
ILL. 4

DRAWN BY : G.H.	DATE : 28 MARCH 77 APPROVED BY :	FOUNDATION PLATE GROUTING DETAIL		PROJ. NO. ORDER NO.

Foundation Loadings for ARUS-ANDRITZ SDM Standard Types

	Foundation loadings during normal operation (lb)				Foundation loadings + during cantilevering (belt change) (lb)		Foundation loadings + under cantilever jacking points (lb)	
	A	B	C	D	A (C)	B (D)	E	F
SDM 20	1058	2029	1058	2029	1323	2558	706	507
SDM 40	1367	2646	1367	2646	1709	3308	937	452
SDM 60	4079	7277	4079	7277	6836	6836	2646	1985
SDM 80	6174	11025	6174	11025	11466	11466	4410	3308

+ These figures are for machines with a two cantilever system



Loading point for a right hand machine as shown
Symmetrical for a left hand machine

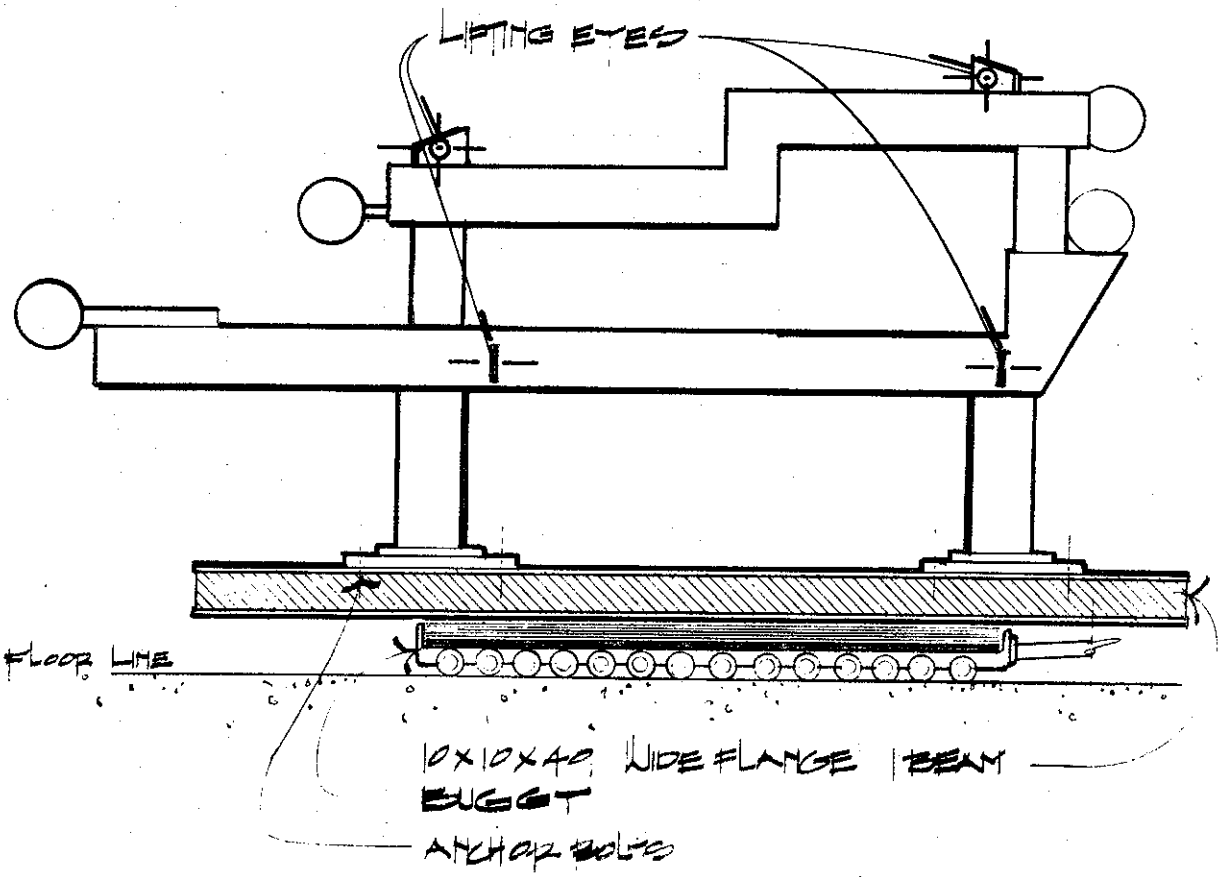
Tab. 2

Overall Dimensions & Weights for ARUS-ANDRITZ SDM Standard Types

		Weight (lb)	Length (in)	Width (in)	Height (in)
SDM 20	S	4190	150 7/8	55 1/2	71 1/4
	P	5072			
	SP	4410			
SDM 40	S	5072	150 7/8	75 3/16	71 1/4
	P	6615			
	SP	5954			
SDM 60	S	15435	186 1/4	118 1/8	78 1/2
	P	18522			
	SP	17199			
SDM 80	S	24696	186 1/4	137 7/8	88 3/8
	P	28445			
	SP	26460			

NOTE: Figures given are overall dimensions of the SDM
For transportation of SDM's, the overall dimensions will be a little larger.

Tab.3



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 5

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
1	LIFTING EYE LOC.	GH	12/13/77	M.F.
2				
3				
4				
5				
6				

Item: LIFTING POINTS FOR SDM

Drawn by	Date	Appr. by	Date	Scale
G.H.	28 MAR. 77			N.A.

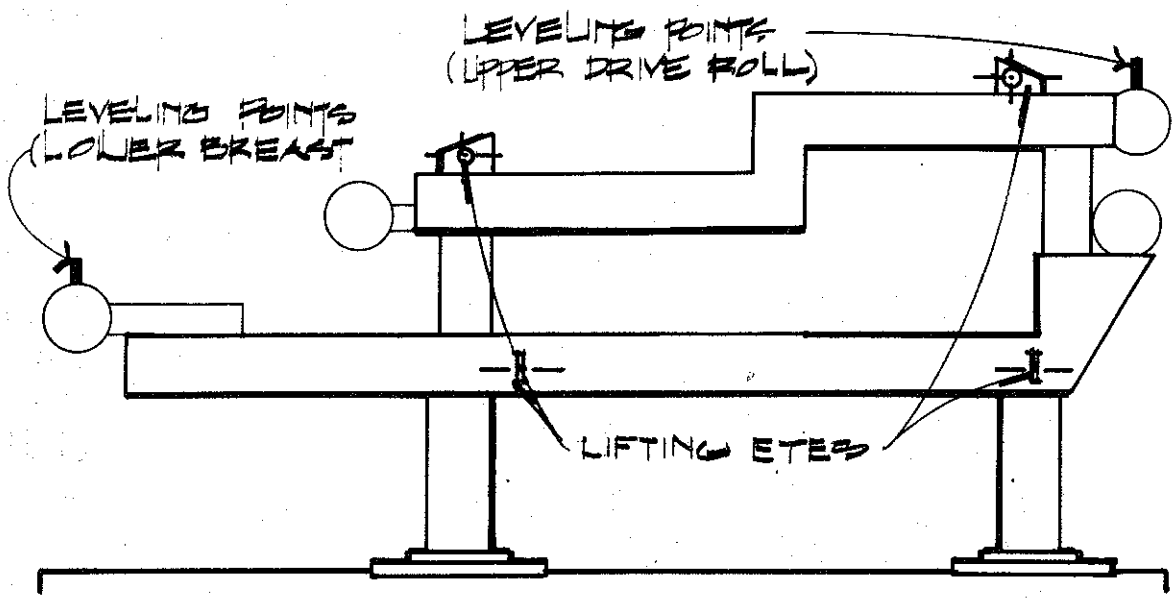
PROJECT NO.

ORDER NO.

ARUS • ANDRITZ

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 6

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
1	LIFTING EYE LOCATION	GH	12/27/77	M.F.
2				
3				
4				
5				
6				

Item: LEVELING POINTS ON SDM

Drawn by	Date	Appr. by	Date	Scale
G.H.	28MAR77			N.A.

PROJECT NO.

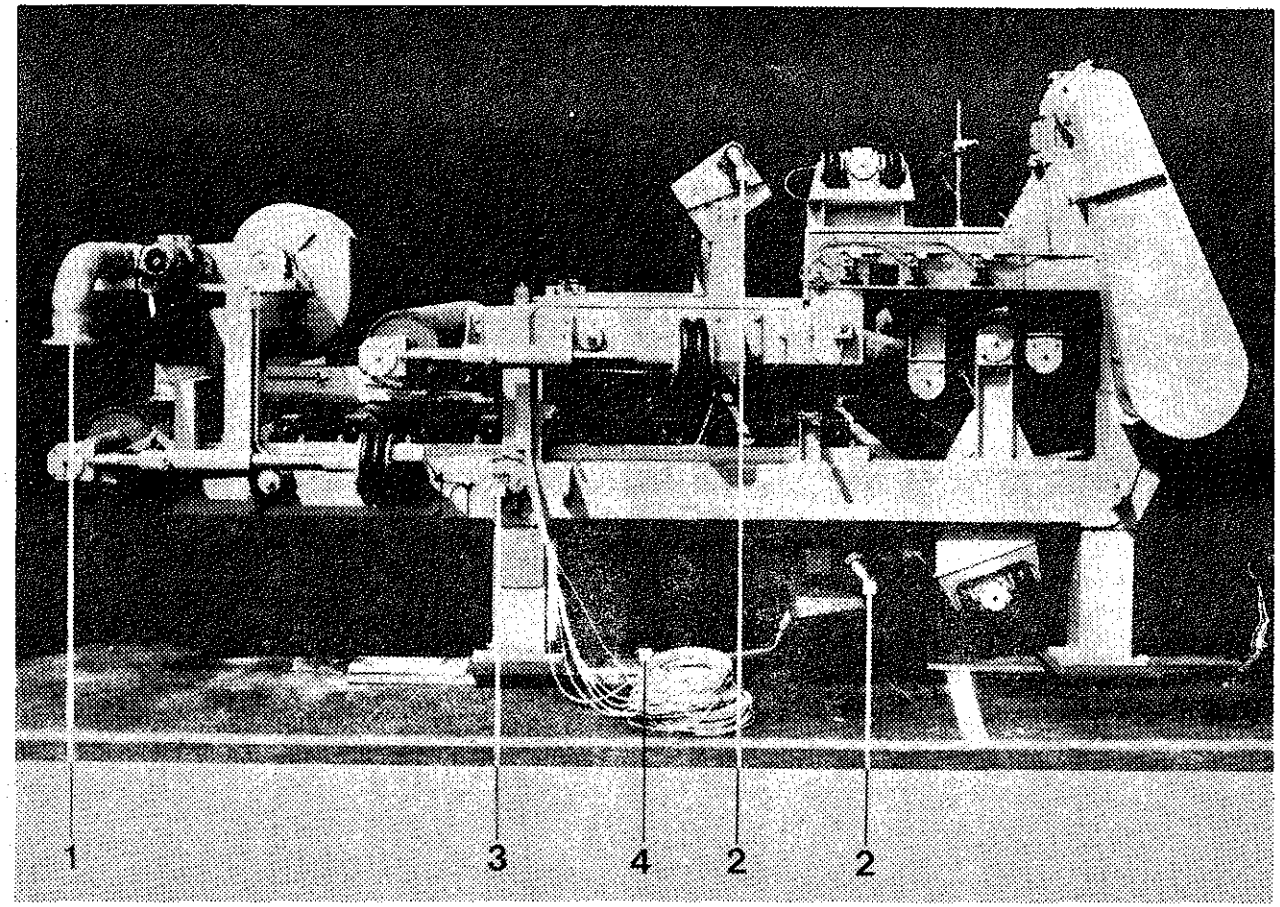
ORDER NO.

ARUS - ANDRITZ

CUSTOMER.

N21266

INLET CONNECTIONS FOR SDM

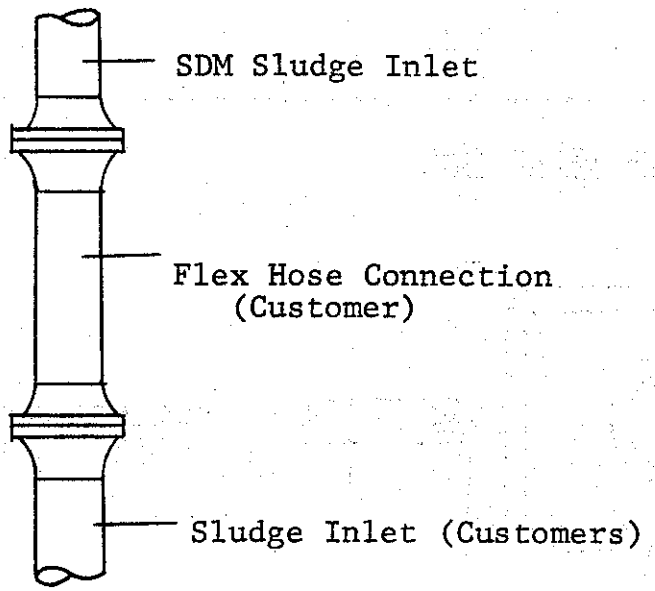


1. SLUDGE INLET
2. BELT SHOWER INLETS
3. 1/4" MAIN AIR CONNECTION
4. ELECTRICAL CONDUIT AS SHOWN FOR EUROPEAN DELIVERIES; FOR AMERICAN DELIVERIES HI & LOW VOLTAGE TERMINAL BOXES ARE LOCATED ON FRAME LEG DIRECTLY BELOW MAIN AIR CONNECTION FOR WIRING TO CONTROL PANEL

ILL. 7

3.3.1 Sludge Feed (Ill. #7, Pos. 1)

All of the piping coming into the sludge feed system should have a slope of at least 2^{o} , with a clean out valve at the lowest point. This will allow the operator to thoroughly clean the sludge piping system after a shut down. If this is not done, sludge will sit in the lines, and over a period of time, it will thicken to such a point that removing it from the system will require some type of involved cleaning process. A bypass line, located at the machine, is recommended in case the machine needs to be shut down quickly. Do not place a valve in the main sludge line if a pump such as a Moyno is being used. It is also recommended that the last two feet of a connection between the sludge pipe and the machine, be of flexible rubber hosing. This will absorb any vibrations between the piping system and the machine (see Ill. #8).

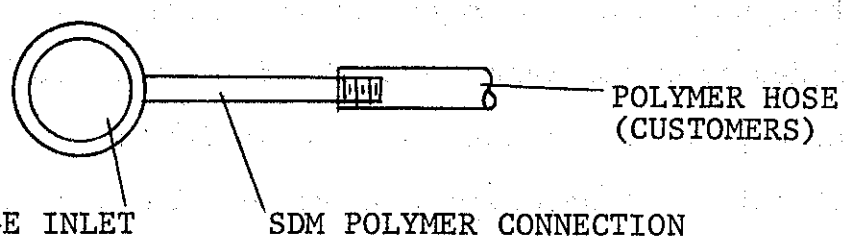


ILL. 8

3.3.2 Polymer Feed

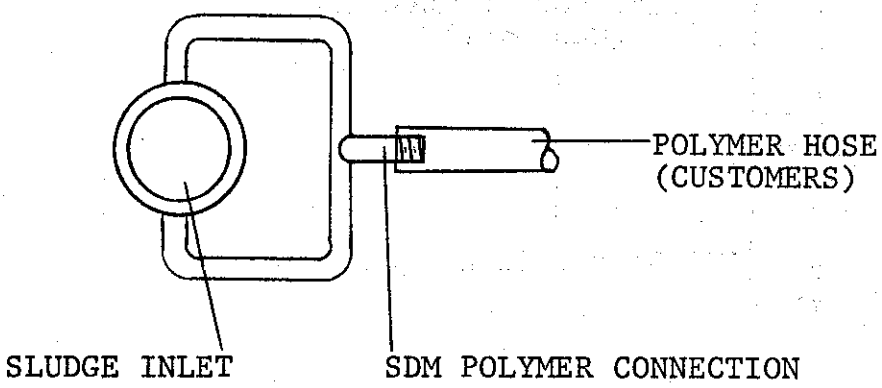
One connection for polymer feed is located at the machine. (see Ill. #9) It is recommended, however, that additional polymer injection points be incorporated elsewhere in the sludge feed system. The reason for this is that different sludges have different reaction times with the polymers. Adding downstream from the machine will insure proper mixing. If adding polymer downstream still does not insure proper mixing, dual polymer injections may be used. (See Ill. #10)

SINGLE POLYMER INJECTION



ILL. # 9

DUAL POLYMER INJECTION



ILL. # 10

The dual systems may be handled in various manners. One way would be to inject polymer both on top and on bottom of the sludge feed line. (see Ill. #10)* This would aid greatly in making maximum use of the full polymer charge. Another system found very successful with high consistency sludges (4% up) is to inject polymer at a very low feed rate, very low in consistency (0.1% or less) about 25 to 35 feet from the machine. The second injection point (which should be the bulk of the injection) should be placed at the unit itself. Other means of mixing to acquire proper flocculation are possible. Inline mixers (kinetic mixers) are very helpful on certain applications. Actual placement of spirals in the piping system is helpful. Please note that the last two suggestions should only be used after lab tests show that sludge flocculation will not break down with direct agitation.

Polymer dosing pumps should be of the metering types (Moyno or Viking). This is mainly the preference of the customer.

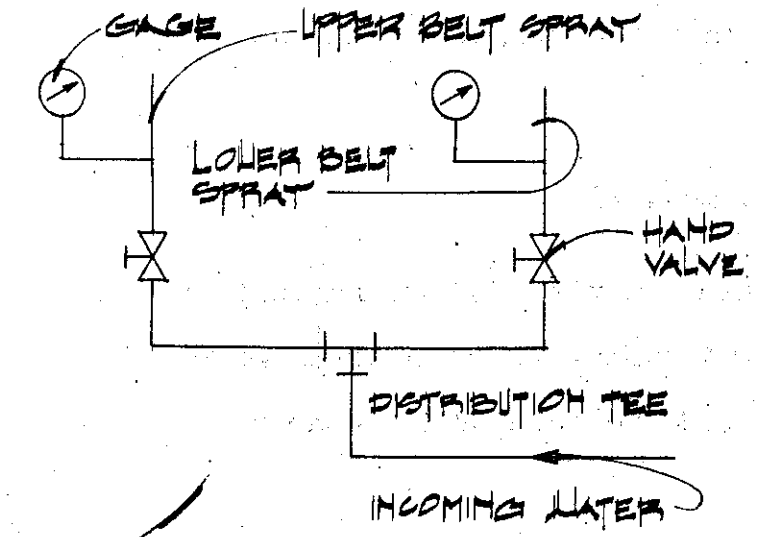
3.3.3 Belt Showers (Ill. #7, pos. 2)

Two belt showers are on the Arus-Andritz SDM (upper and lower). A simple "T" connection coming from the main water supply, may be placed in the line to feed both showers. It

is recommended that this "T" connection be located near the machine, with a valve assembly for quick shut down. Running from the "T" to the shower connection, flexable hosing should be used (refer to Ill. #11).* The shower connections on the machines are slip-over clamp type connections. (For exact dimensions, refer to charts on Table 4.)

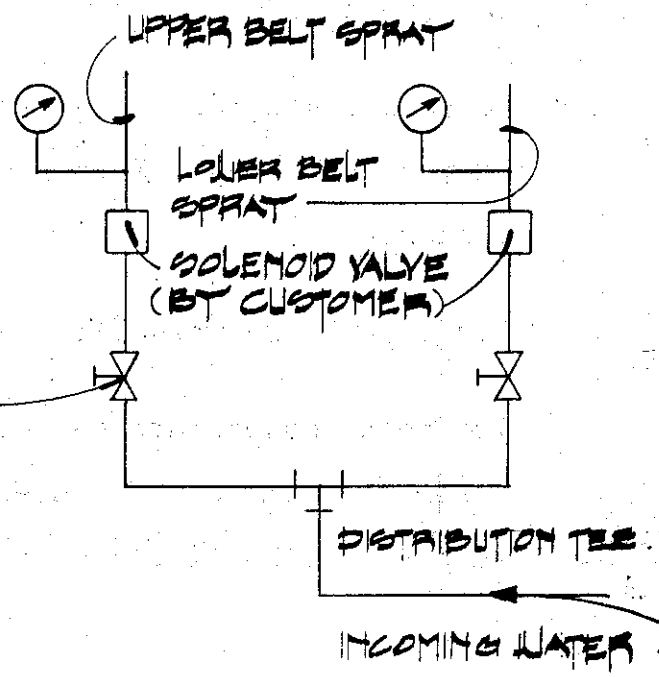
The normal operating pressure for the showers is around 60 p.s.i.g. If cake sticking occurs or the wires are not being properly cleaned, pressure up to 100 p.s.i.g. may be used. On certain applications, continuous belt cleaning is not necessary. All Arus-Andritz control panels incorporate timers for the showers. A simple *solenoid valve placed in the line will automate the shower cleaning process.(see Ill. #12) (Timers span 0-30 minutes on time, 0-30 minutes off time.)

*By owner.



CONTINUOUS WATER FEED FOR BELT SPRAY SYSTEMS

Ill. 11



INTERMITTENT WATER FEED FOR SPRAY BELT SYSTEMS

Ill. 12

3.3.4. Air Connection (Ill #7, pos. 3)

All pneumatics on the machine are completed upon leaving the factory. The only connection which the customer must make is ¼" female connection located as shown in the connection drawings. (See latter part of handbook for connection drawings.) A filter and oiler, with a pressure regulator, come on the machine. The operating pressures needed for the SDM "Press" is 90 p.s.i.g. The operational pressure required for the SDM "S" is 60 p.s.i.g.

3.3.5. Electrical Connections

All electrical functions on the machine are brought down to two enclosed terminal strips (Nema 4 construction). These terminal boxes are located as shown in the connection drawings. One terminal box contains all high voltage lines for motors (main drive, mixer drive) while the second terminal box carries all low voltage functions. (Two belt limit switches, cake control limits, emergency stops.) Electrical connections from the machine to the Arus-Andritz control panel is to be done by the owner. The Arus-Andritz control panel only carries two motor starters. One for the main drive, and one for the mixing drum. A number of start - stop stations are carried in the control. For details, please refer to drawing No. EPM 138 A & B in this section.

*Please note that the panel shown is a standard control panel. These panels may be modified in order to more closely fit a customer's needs.

*If a custom panel has been designed, your drawing will be located at the end of the handbook, along with the rest of the certified prints.

TYPICAL CONTROL PANEL COMPONENTS

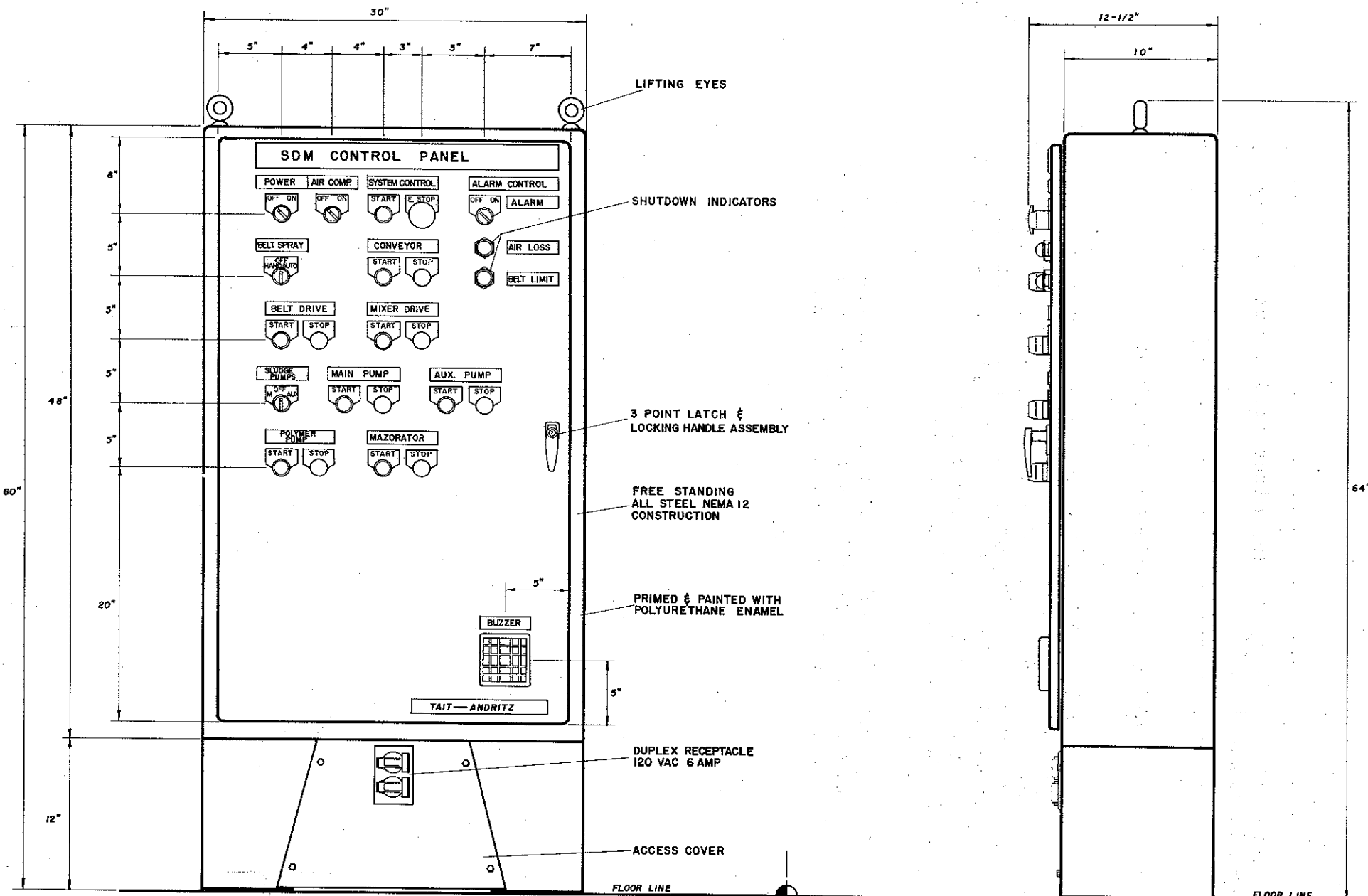
1	Nema 4 Electrical enclosure 48" X 30" X 10"
1	Heavy-Duty 3/4-KVA Isolation Transformer
1	Federal Signal electrical buzzer 120 VAC
1	Cast Alum. Duplex Receptacle Box
1	Waterproof Duplex Cover & Receptacle
4	Westinghouse Branch Circuit Protectors 480 VAC 3Ø
1	Westinghouse Control Voltage Circuit Breaker 120 VAC 1Ø
1	Buss In-Line Fuseholder and 6 amp Fuse
2	ATC 30 min. Adjustable Time Delay Relays
2	IDEC Socket Relay Bases
50	Weidmuller SAK-4 Terminal Block Sections
19	Plastic Engraved Nameplates
	1" X 2" Panduit Wiring Duct w/covers
	Paint - (optional color) urethane Enamel
	The following is Square-D equipment:
2	8636 SBO-2 Size "0" magnetic starters w/overloads
3	9999 SX-12 Aux. contact blocks
4	8501 LO-40 Control Relays 120 VAC
1	9001 KS-11B 2 Pos. Sel. Sw.
1	9001 KIL-JIR 2 Pos. Illum. Sel. Sw.
1	9001 K43-JIR 3 Pos. Illum. Sel. Sw.
1	9001 KR-5R Emergency Stop Operators
8	9001 K2L-IR Illum. Pushbutton Operators
7	9001 KR-1U Stop Button Operators
1	9001 KA-1 Contact Blocks
8	9001 KA-2 Contact Blocks
9	9001 KA-3 Contact Blocks
1	9001 KN-305 Emergency Stop Legend Plate
7	9001 KN-302 Stop Legend Plates
7	9001 KN-301 Start Legend Plates
3	9001 KU-17 Clear Sel. Sw. Covers
8	9001 KU-47 Clear Pushbutton Covers
7	9001 KU-2 RED Stop Button Covers
2	9001 KP-38A6 Pilot Light Operators

WARNING: When working on any electrical function, make sure all power is off.

ELECTRICAL COMPONENTS ON SDM-SM

2 Sq-D 9001 - KYK-14 Mushroom Stop Stations
1 Sq-D 9012 - ACW-1 Air Pressure Limit Switch
2 Micro 1LS56 Limit Switches with 6PA 3 Trip Wires
1 N4 -10 X 8 X 4 Terminal Box complete with 20 - Wiedmuller Terminal Blocks (Rated 600 VAC @ 35 AMPS)
1 Main Belt Drive (as specified)
1 Mixing Drum Drive (as specified)

* All above listed components are prewired to Nema 4 Terminal Box via oil & gasoline resistant multi-conductor cord per Drawing No. EPM138C.



FRONT VIEW

SIDE VIEW

NOTES &

ALL PUSHBUTTON OPERATORS ARE HEAVY DUTY OILTIGHT, 10AMP 600VAC RATED.
EACH OPERATOR HAS WEATHERPROOF PROTECTIVE COVERS.
START BUTTONS & SEL. SW. ARE ILLUMINATED WITH GREEN COLOR CAPS & CLEAR PROTECTIVE COVERS.
STOP BUTTONS ARE NON-ILLUMINATED WITH RED PROTECTIVE COVERS.
CONTROL RELAYS ARE 10AMP 300VAC RATED.
ALL WIRING TO CONFORM TO NATIONAL ELECTRICAL CODE.
* CUSTOM PANELS AVAILABLE UPON REQUEST.

SEE DWG. No. EPM138B FOR ELECTRICAL SCHEMATIC DETAILS.

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
1				
2				
3				
4				
5				
	DWG. No. EPM138A			

Item: STANDARD SDM CONTROL PANEL LAYOUT DETAIL

Drawn by	Date	Appr. by	Date	Scale
M.A.T.	1-11-79			3/16"=1"

PROJECT NO.

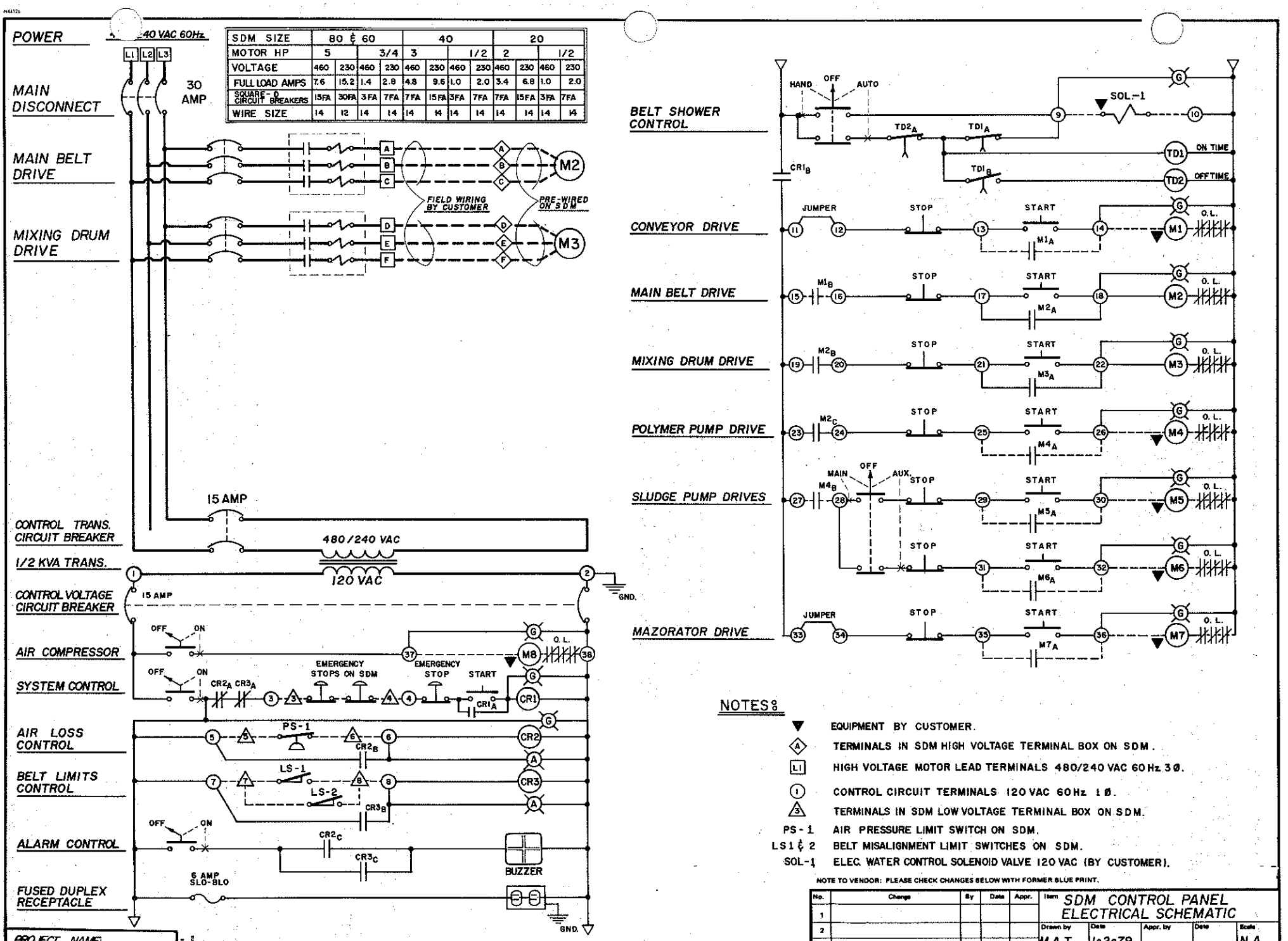
ORDER NO.

ARUS-ANDRITZ

PROJECT NAME:

CONSULTING ENGR.

dewatering processes
mechanical applications



SDM SIZE	80 & 60				40				20			
MOTOR HP	5		3/4		3		1/2		2		1/2	
VOLTAGE	460	230	460	230	460	230	460	230	460	230	460	230
FULL LOAD AMPS	7.6	15.2	1.4	2.8	4.8	9.6	1.0	2.0	3.4	6.8	1.0	2.0
SQUARE-D CIRCUIT BREAKERS	15FA	30FA	3FA	7FA	7FA	15FA	3FA	7FA	7FA	15FA	3FA	7FA
WIRE SIZE	14	12	14	14	14	14	14	14	14	14	14	14

NOTES:

- ▼ EQUIPMENT BY CUSTOMER.
- ◇A TERMINALS IN SDM HIGH VOLTAGE TERMINAL BOX ON SDM.
- L1 HIGH VOLTAGE MOTOR LEAD TERMINALS 480/240 VAC 60 Hz 3Ø.
- (1) CONTROL CIRCUIT TERMINALS 120 VAC 60 Hz 1Ø.
- △3 TERMINALS IN SDM LOW VOLTAGE TERMINAL BOX ON SDM.
- PS-1 AIR PRESSURE LIMIT SWITCH ON SDM.
- LS1 & 2 BELT MISALIGNMENT LIMIT SWITCHES ON SDM.
- SOL-1 ELEC. WATER CONTROL SOLENOID VALVE 120 VAC (BY CUSTOMER).

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
1				
2				
3				
4				
5				

DWG. No. EPM138B

Item: SDM CONTROL PANEL ELECTRICAL SCHEMATIC

Drawn by	Date	Appr. by	Date	Scale
M.A.T.	10-2-79			N.A.

PROJECT NO. | ORDER NO.

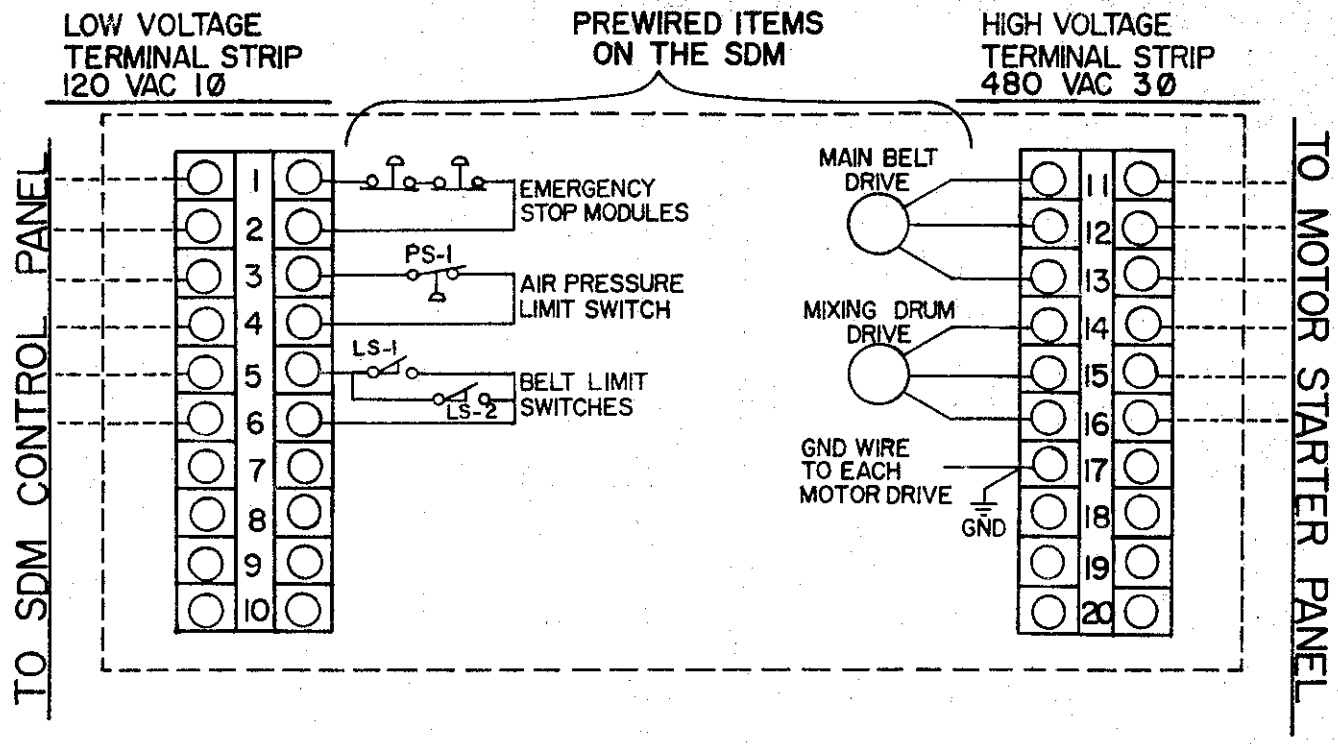
ARUS-ANDRITZ | CUSTOMER

PROJECT NAME:

CONSULTING ENGR.

dewatering processes in industrial & municipal applications

TERMINAL BOX LOCATED ON SDM



TERMINAL BOX ENCLOSURES ARE RATED NEMA 4
SEE DWG. NO. EPM 138B FOR ELECTRICAL SCHEMATIC
TERMINALS ARE RATED 600 VAC, 36 AMPS.

PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
1				
2				
3				
4				
5				
DWG. NO. EPM 138 C				

Item PREWIRED TERMINAL BOX DETAILS ON SDM WITH "AC" DRIVES

Drawn by	Date	Appr. by	Date	Scale
T.R.J.	6-7-79			

PROJECT NO. | ORDER NO.

ARUS • ANDRITZ | CUSTOMER.

N44126

4 Machine Operation

After the machine has been fine tuned for optimum performance, it is then ready to be placed on *automatic, if so desired by the customer. Only if the characteristics of the sludge itself change (consistency, sludge type, etc..) would there be a need for a manual change.

*Note that automation may be achieved many ways. An automatic system can only be designed after extensive test programs have been run on your sludge. Factors such as wire type, velocity, polymer, polymer feed rates all must be known. If previous testing has not been done by the Arus-Andritz van, it may be advisable to bring the van to your jobsite and answer many of the critical variables.

4.1 Control Panel

As mentioned in the previous section, Arus-Andritz will provide a control panel either for automatic or manual control. The standard control is for manual systems. (see EPM 138 A & B) A custom control system may be provided on request. Local control panels containing all the systems or only systems related directly to the machine functions may be provided. On occasion, it has been found that it is necessary to mount a partial control panel

directly to the machine, with all of the machine functions (belt speed, mixer alarm systems) located at this point. This system would then be tied back to a master control board at a remote location.

4.2 Operating Elements of the Arus-Andritz SDM.

The Arus-Andritz SDM is provided with several operation elements, which an operator must become familiar with. Please note that some elements may change in lieu of the various machine roll configurations.

A. S-Execution (Ill. 14)

Pos. 1 - Air filter - oiler and regulator. This is the main air connection for the Arus-Andritz SDM. (¼" female on all sizes.) This is the main regulation point for all pneumatic functions, wire tensioning, wire tracking etc... (see section 3.3.4.)

Pos. 2 - Regular - "quick release valve" for upper wire tensioning. Please refer to Ill. #21 or to diagram at machine for proper wire tensioning. A quick release slide valve is located on the regulator so that an operator can release the pressure without changing the gauge setting. When preparing for start-up, the operator only has to close the slide valve and the pressure will return to the original setting.

Pos. 3 - Same as position 2 only for the lower wire.

Pos. 4 - Regulator - "quick release valve" for pneumatic tracking device. (see RETEC information.) Same type of quick release slide valve as for belt tensioning systems. The gauge pressure for the tracking system should always be in the range of 30-45 p.s.i.g.

Pos. 5 - When mechanical speed variation is used, belt speed change must be done at this point. (Note that remote belt speed change is available upon customer request.)

Pos. 6 - 2¼" red mushroom emergency stop button, Nema "4" mount.

B. P- S P Execution (Ill. #15)

Pos. 1 - Air filter - oiler and regulator. This is the main air connection for the Arus-Andritz SDM. (¼" female on all sizes.) This is the main regulation point for all pneumatic functions, wire tensioning, wire tracking, etc... (see section 3.3.4.)

Pos. 2 - Regular - "quick release valve" for upper wire tensioning. Please refer to Ill. #21 or to diagram at machine for proper wire tensioning. A quick release slide valve is located on the regulator so that an operator can release the pressure without changing the gauge setting. When preparing for start-up, the operator only has to close the slide valve and the pressure will return to the original setting.

Pos. 3 - Same as position 2 only for the lower wire.

Pos. 4 - Regulator - "quick release valve" for pneumatic tracking device. (see RETEC information.) Same type of quick release slide valve as for belt tensioning systems. The gauge pressure for the tracking system should always be in the range of 30-45 p.s.i.g.

Pos. 5 - Regulator "quick release valve" for pressure regulation in the press zone bellow. With this regulator, one can control the pressure occuring in the nip of the press section. For information about exact allowable pressures, refer to drawings in 21A series in regards to your particular unit. This information is also available at the unit itself, near the regulator.
Note: The speed control and emergency stop is located exactly as shown in Ill. #14.

4.3 Adjustments prior to start-up.

IMPORTANT !!! We feel it necessary to mention at this point, that start-up should not be attempted unless under supervision of a Arus-Andritz engineer.

4.3.1 - Placement of wires on machine. (see section 5.5.1)

4.3.2 - Adjustment of Wedge Zone.

To prevent extrusion of sludge from wedge zone, correct

distances must be maintained between the wire belt and the wedge. This adjustment is critical in the operation of the machine. If this adjustment is not properly set, either too close or too far, wire damage may occur. Hold distances are as follows:

Fiber type sludges - 0.7 - 1 mm

Biological type sludges - 0.2 - 0.3 mm

A. Adjustment of wedge in reference to lower table rolls. The aluminum wedge must not be allowed to sit on the lower table rolls. The wedge must be placed in what is called a "floating" position. This "floating" position is achieved by means of an adjustable bolt located as shown in Ill. 16 - Pos. 4. This will prevent any frictional damages that may occur between the table rolls, the wedge, and the wire if the distance is too close.

B. Adjustment of the wedge in reference to upper table rolls. This adjustment is achieved by moving up or down the upper table rolls which are mounted to a moveable stainless steel bracket. (Ill.17, Pos. 1) In order to move this bracket for adjustment, one must loosen the fixed bolts on each side located as shown in Ill.17, Pos 2. The bracket is still held in place (after loosening of fixed bolts) by four adjustment nuts as shown in Ill.17, Pos 3 & 4. By turning the adjustment nuts, the upper table rolls will then move up

or down correspondingly. When proper adjustment is reached, the fixed bolts must then be tightened down. If the fixed bolts are not secured before start-up, the wedge will move and all adjustments will be lost.

4.3.3 Doctor blade adjustment. (Ill.18)

Before initial start-up, the doctor blades must all be checked. The most critical adjustment on the doctor blade, is making sure that the blade is exactly parallel with the roll on which it is mounted. If this is not checked, the wire cleaning will not be as efficient or possible wire damage may occur. There are several ways to realign the blade with the roll. One way would be to loosen the bolts as shown in Ill. 18, Pos. 3, and square the blade within the blade mounting assembly. After this is done, the whole assembly may then be squared to the roll. This can be done on the lower doctor blade by loosening the mounting bracket (Ill. 18, Pos. 5) and moving along the slotted holes until the blade is parallel to the roll. The upper doctor blade is adjusted in the same fashion. Simply loosen mounting brackets as shown in Ill. 18, Pos 4, and square blade with the roll. When running without sludge, it is advisable to move the blades away from the roll. This is done by a lever as shown in Ill 18, Pos 6.

4.3.4 Adjustment of Belt Tracking Regulator.

1. The Servo-regulator has been installed so that the tracking roll runs parallel to the other eight rolls on the machine when the machine is in a "neutral" position. In cases where the air bellows on the regulator are not centered, this indicates that the belts are not traveling in their correct position, so the tracking roll has changed its parallel alignment in order to retrack the belts.

2. When adjusting your regulator, place the belts into the desired running position. When this is done, push the scanning finger (Ill. 19) until it touches the wire. Make sure that the regulator is in a neutral position. This is done by loosening the scanning finger and aligning the red mark as shown in Ill. 19. The scanning finger may then be fixed into position.

3. The response time of your automatic control unit may be changed, by adjusting the scanning fingers vertical position. If the belt runs along the upper range of the scanning finger, the regulator will respond faster. If the belt runs along the lower range, the regulator response will be slower. The adjusting speed of the wire will depend on the air pressure on which the system is being run. One must always be sure that the scanning finger rides evenly

along the entire length of the wire. If unusual wear of the wires edge occurs, the tracking may not be consistent.

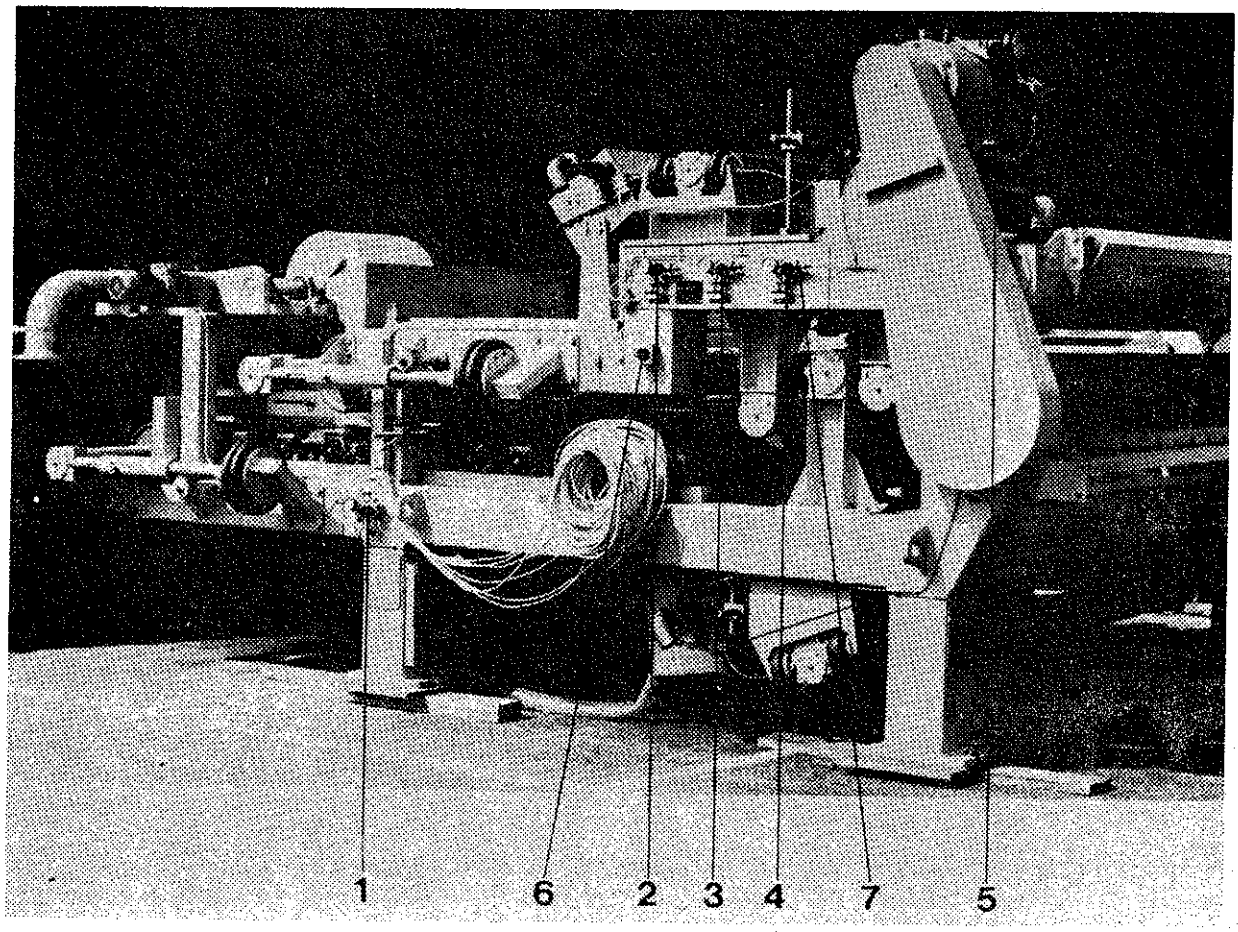
4. When the Servo regulator is performing well, the bellows for the most part should remain centered. If the tracking roll runs continually out of center, a problem could be indicated, in which all of the adjustments should be checked. Another problem where adjustment is needed, is when the tracking roll continuously moves from one extreme tracking position to the other. It is always advisable to check your tracking system after installation of a new belt.

5. Your tracking system has been fitted with special grease zerks for the bearings. In a 24 hour operation, these seals should be replaced about once a year. This should prevent any extra maintenance which might occur from water and grit entering the bearing housing.

4.3.5 Adjustment of "Press" Zone.

As shown in Ill. 20, Pos 1 & 2, there are two adjustment bolts. By using these bolts, one may set the distance between the rolls in the press nip section. It is critical that when in the press position, the rollers do not touch. If the rollers are allowed to touch, wire damage will occur in only a short while. Clearance between the two wires must be allowed. This should be a minimum of 0.3 mm.

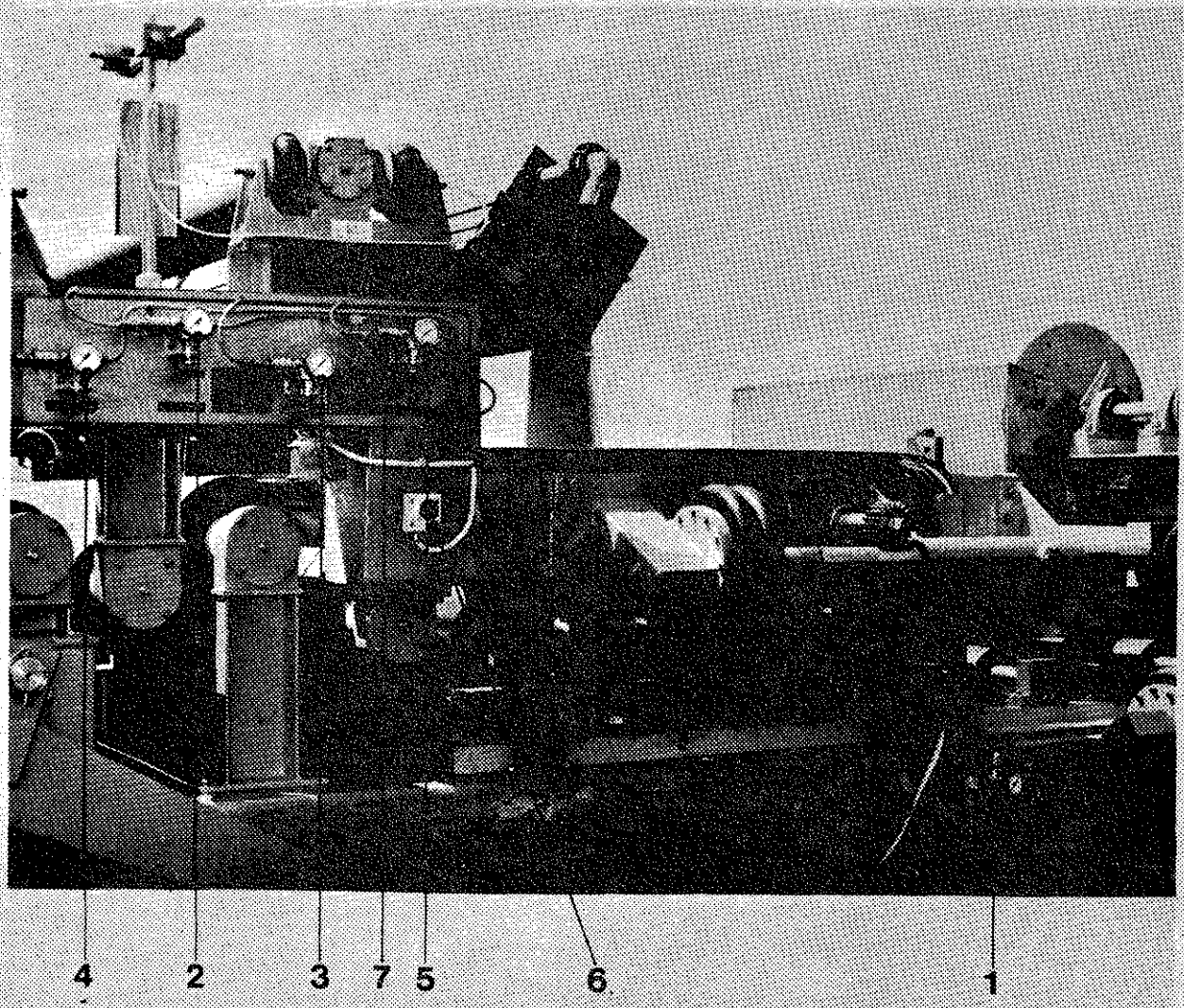
OPERATING ELEMENTS OF THE SDM "S"



1. AIR FILTER-REGULATOR
2. UPPER WIRE TENSIONING AIR PRESSURE GAUGE
3. LOWER WIRE TENSIONING AIR PRESSURE GAUGE
4. RETEC TRACKING DEVICE AIR PRESSURE GAUGE
5. MAIN BELT DRIVE MANUAL SPEED CONTROL
6. EMERGENCY STOP
7. QUICK RELEASE AIR CONNECTION

ILL. 14

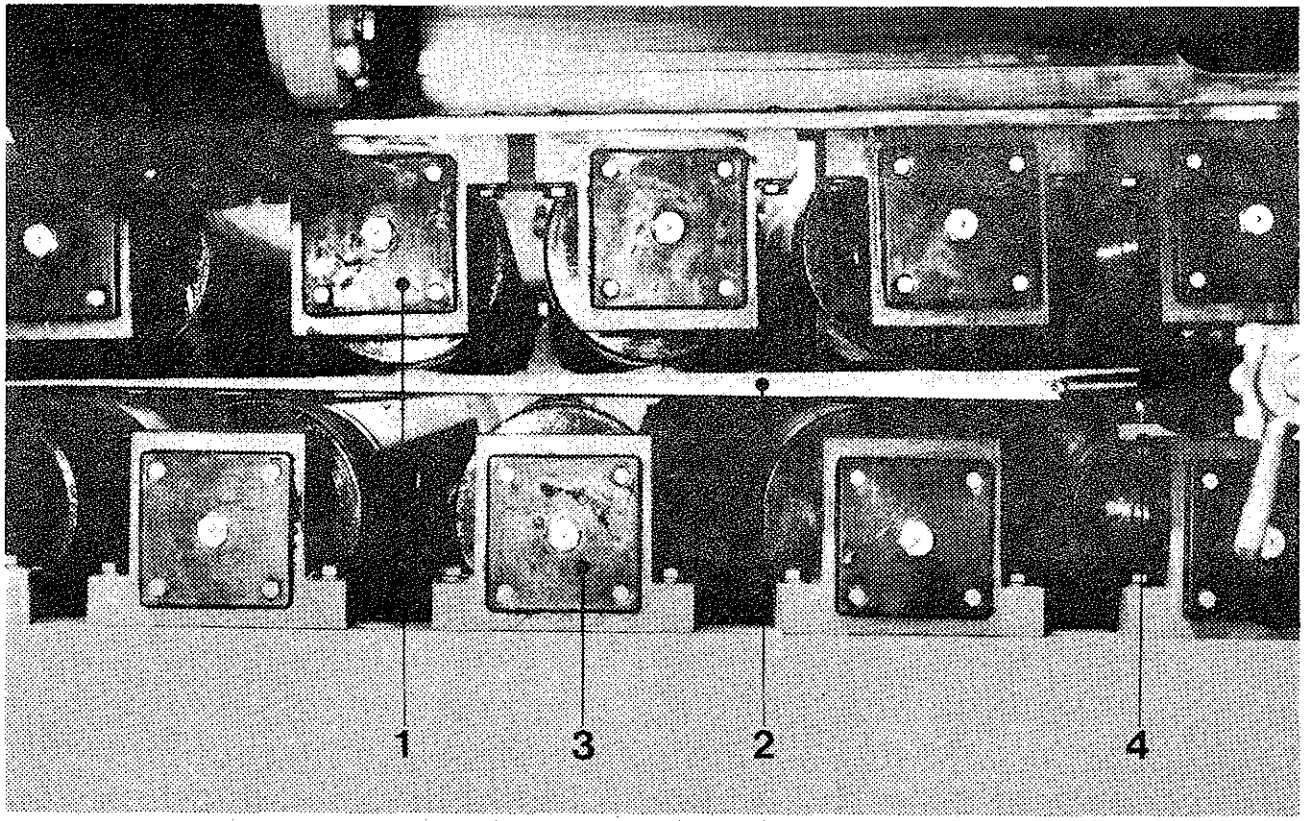
OPERATING ELEMENTS OF THE SDM PRESS



1. AIR FILTER-REGULATOR
2. UPPER WIRE TENSIONING AIR PRESSURE GUAGE
3. LOWER WIRE TENSIONING AIR PRESSURE GUAGE
4. RETEC TRACKING DEVICE AIR PRESSURE GUAGE
5. PRESS NIP AIR PRESSURE GUAGE
6. EMERGENCY STOP
7. QUICK RELEASE AIR CONNECTION

ILL.15

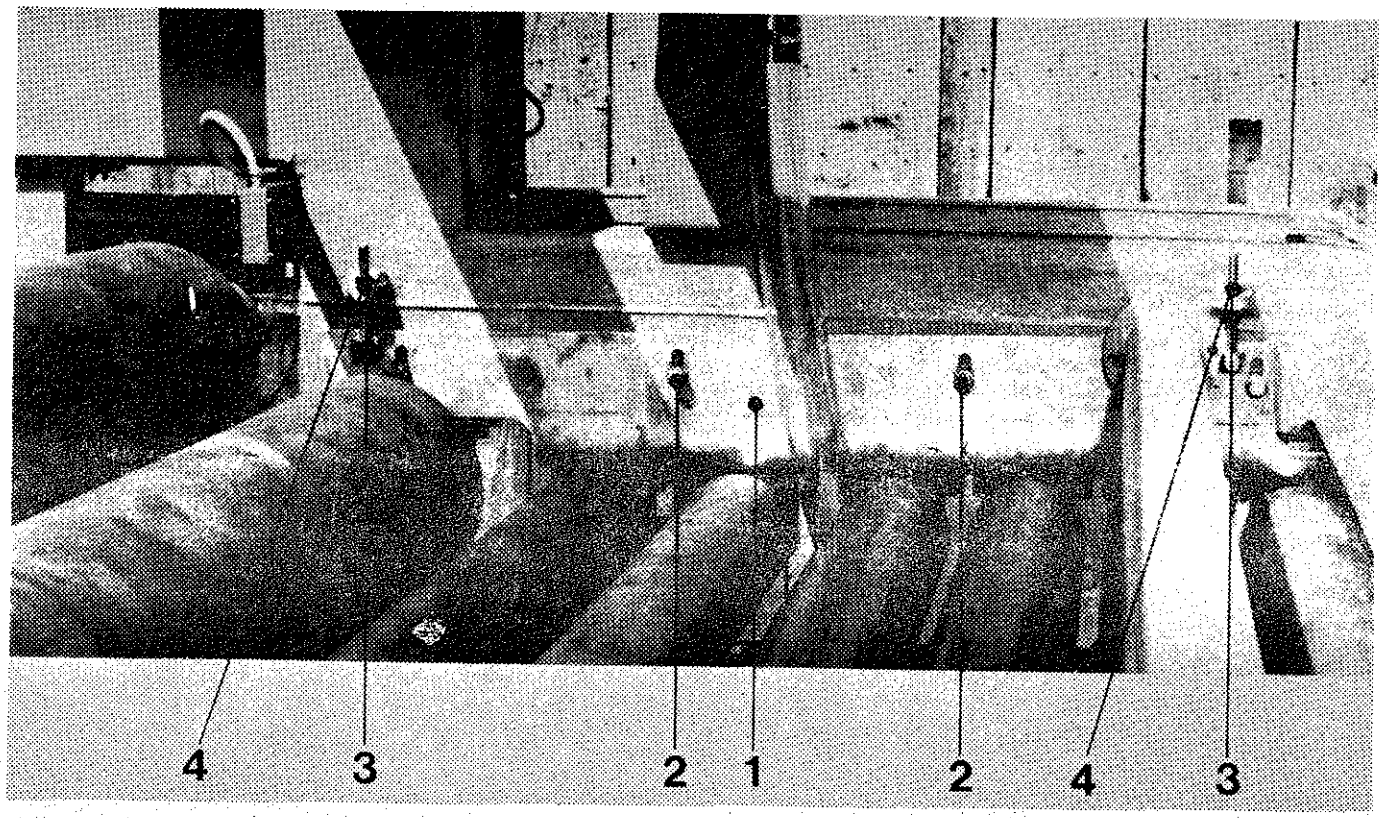
WEDGE ZONE; TABLE ROLLS



1. UPPER TABLE ROLL
2. ALUMINUM WEDGE
3. LOWER TABLE ROLL
4. WEDGE ADJUSTMENT

ILL.16

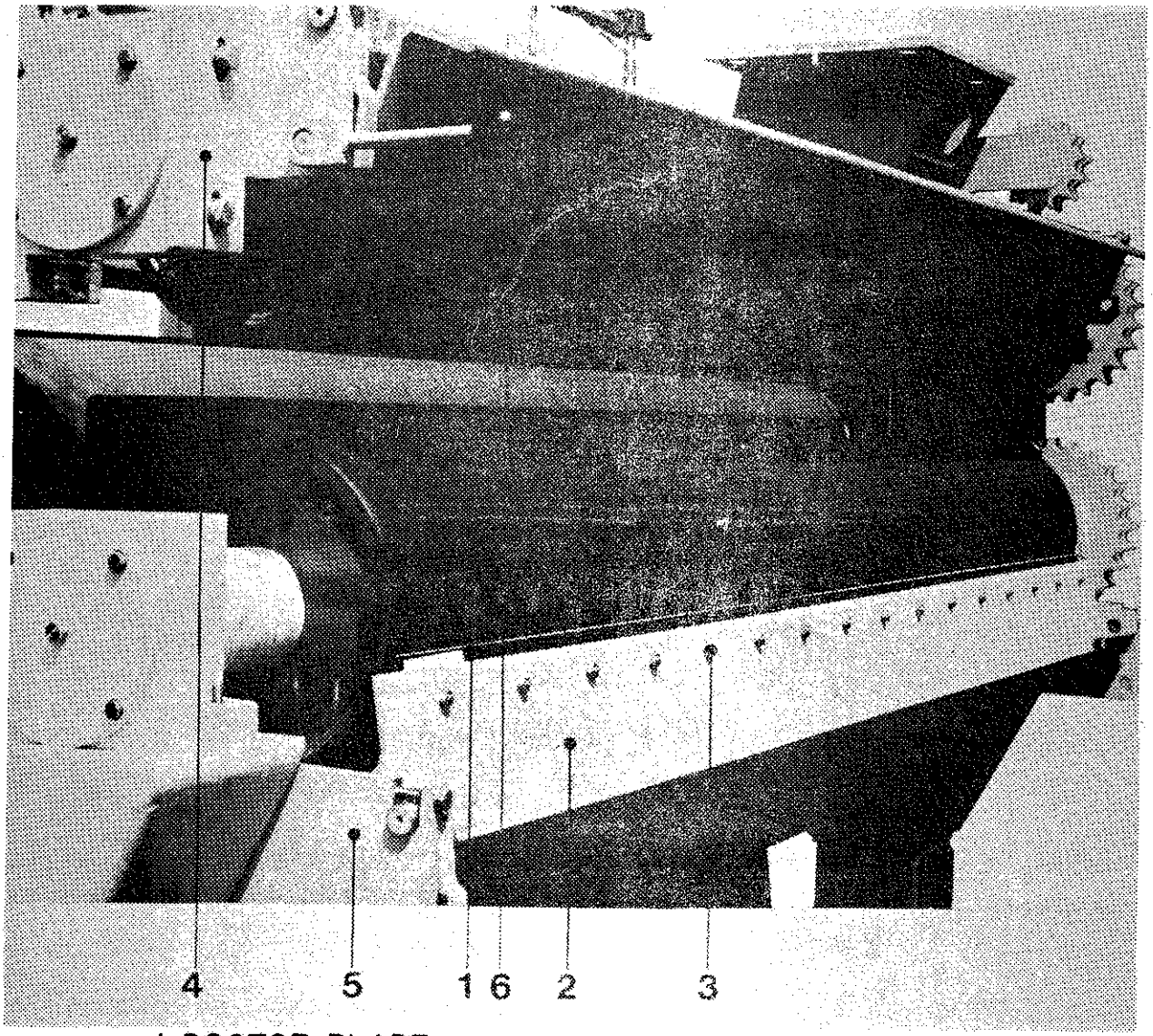
UPPER TABLE ROLL ADJUSTMENT



1. ANGLE IRON FOR TABLE ROLL ADJUSTMENT
2. BOLTS FOR ANGLE IRON
3. ADJUSTMENT BOLTS FOR ANGLE IRON
4. ADJUSTMENT NUTS FOR ANGLE IRON

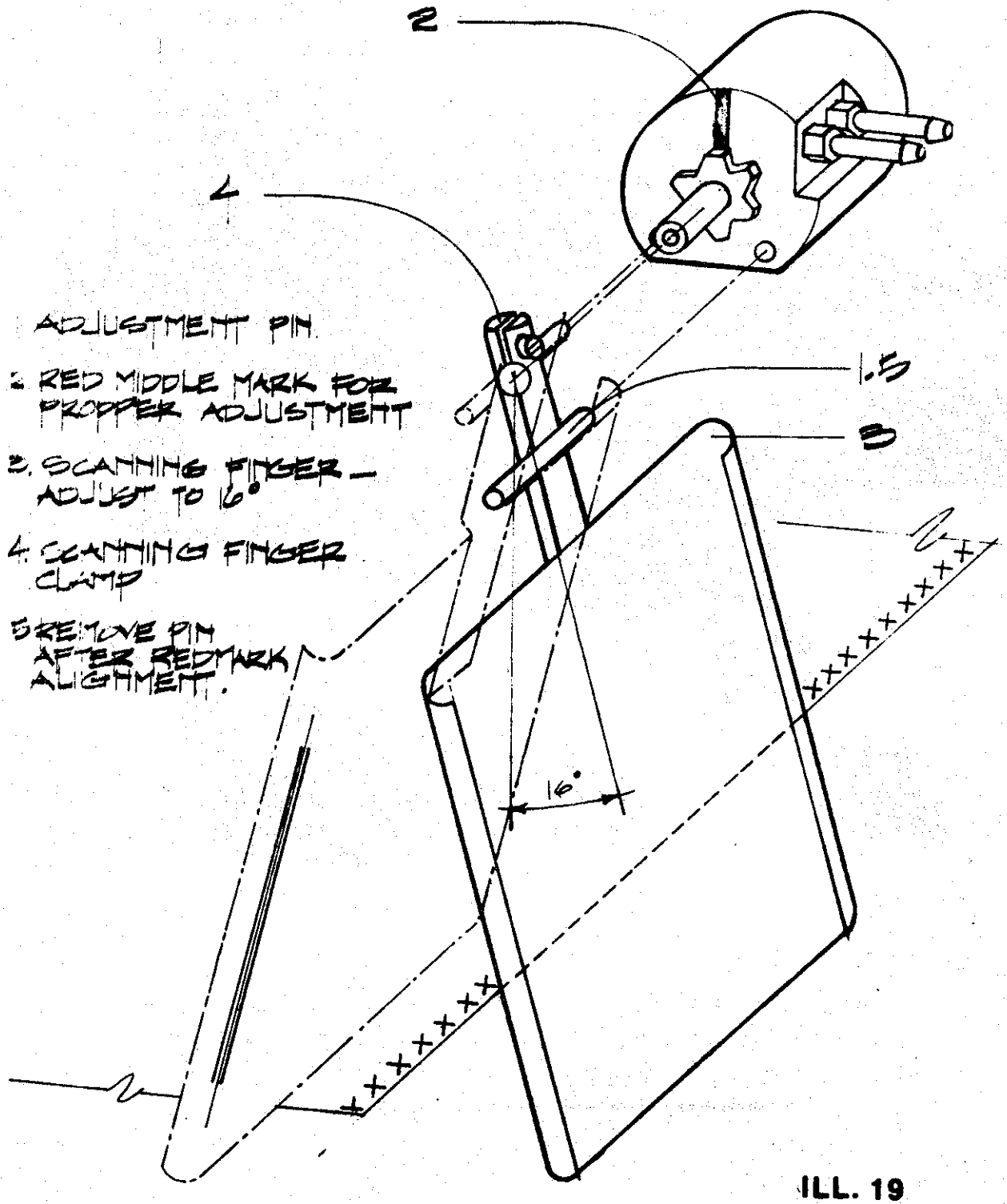
ILL.17

DRIVE ROLL DOCTOR BLADE ASSEMBLY



1. DOCTOR BLADE
2. DOCTOR BLADE MOUNTING BRACKET
3. BOLTS FOR MOUNTING DOCTOR BLADE TO BRACKET
4. UPPER DOCTOR MOUNTING BRACKET
5. LOWER DOCTOR MOUNTING BRACKET
6. DOCTOR BLADE HANDLE

ILL.18

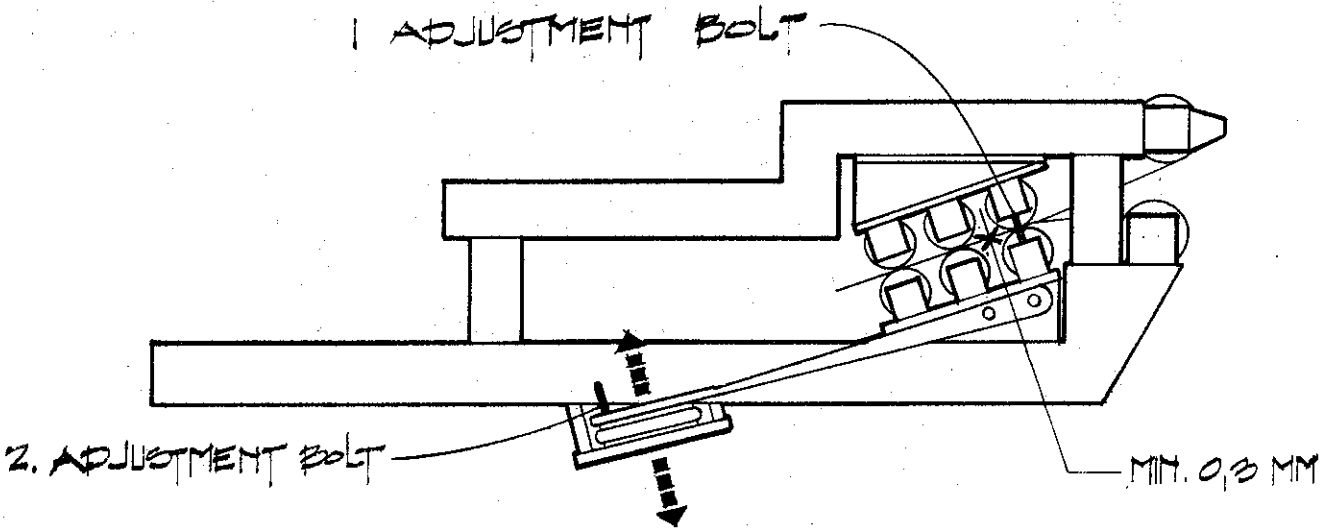


ADJUSTMENT PIN

2. RED MIDDLE MARK FOR PROPPER ADJUSTMENT
3. SCANNING FINGER — ADJUST TO 16°
4. SCANNING FINGER CLAMP
5. REMOVE PIN AFTER REDMARK ALIGHMENT.

ILL. 19

DRAWN BY: G.H.
DATE: 28 MARCH 77
APPROVED BY:
SCANNING FINGER ADJUSTMENT
PRETEC SYSTEM
DRG. NO.
ORDER NO



ADJUSTMENT OF THE PRESS ZONE

PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 20

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
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Item: PRESS ZONE

Drawn by	Date	Appr. by	Date	Scale
G.H.	28 MAR. 77			N.A.

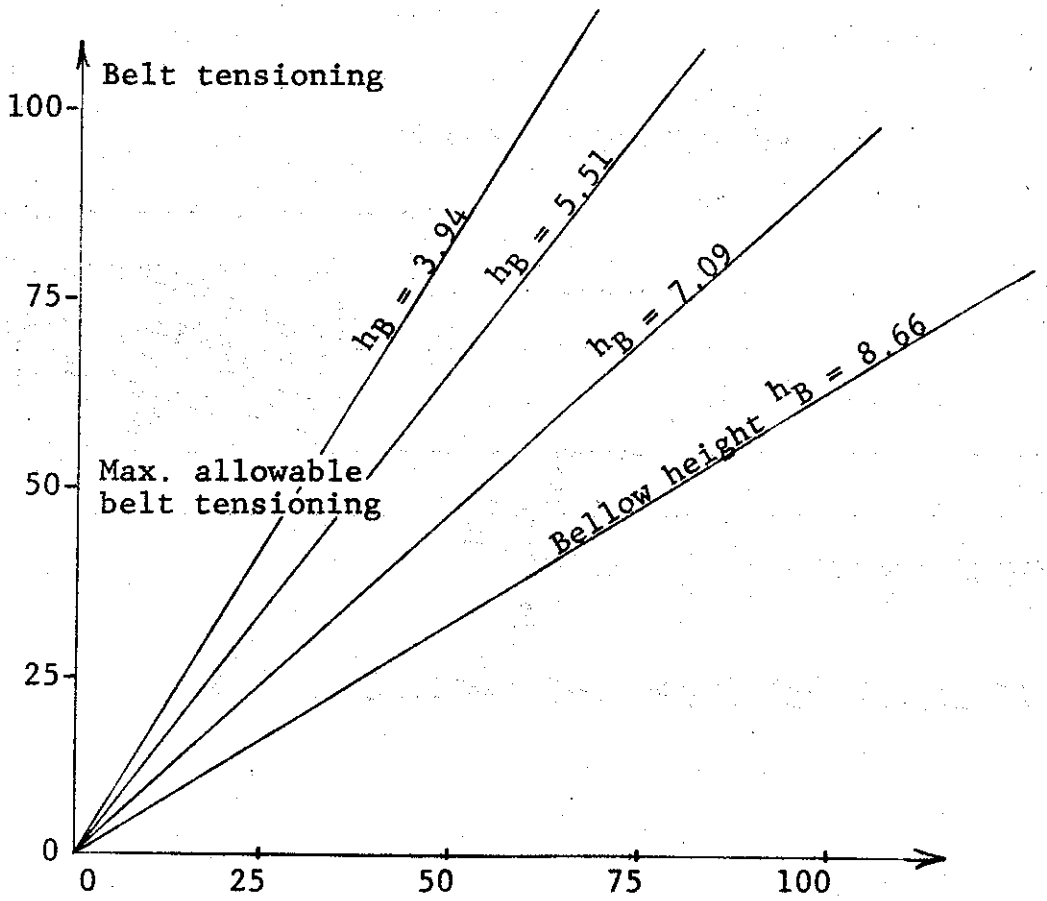
PROJECT NO.

ORDER NO.

ARUS • ANDRITZ

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
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Item: SDM "20" Belt tensioning

Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	M.F.	4/13/77	

PROJECT NO.

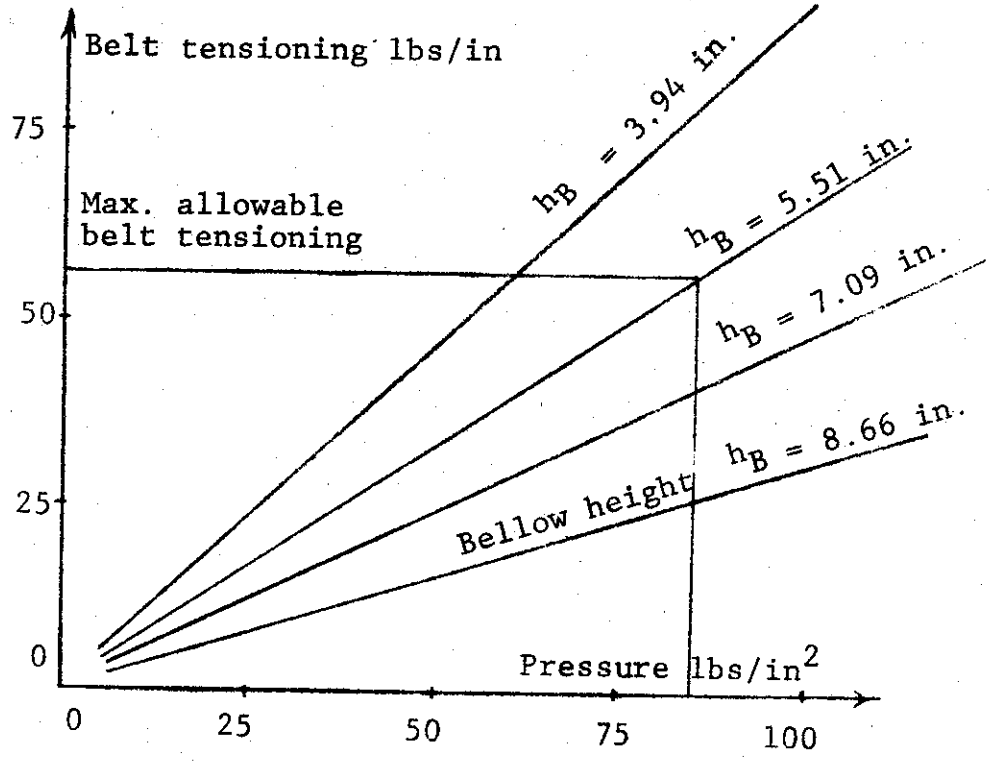
ORDER NO.

ARUS- ANDRITZ

MANSFIELD, TEXAS

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL.21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: SDM "40" Wire Tensioning

Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	TF	4/13/77	

PROJECT NO.

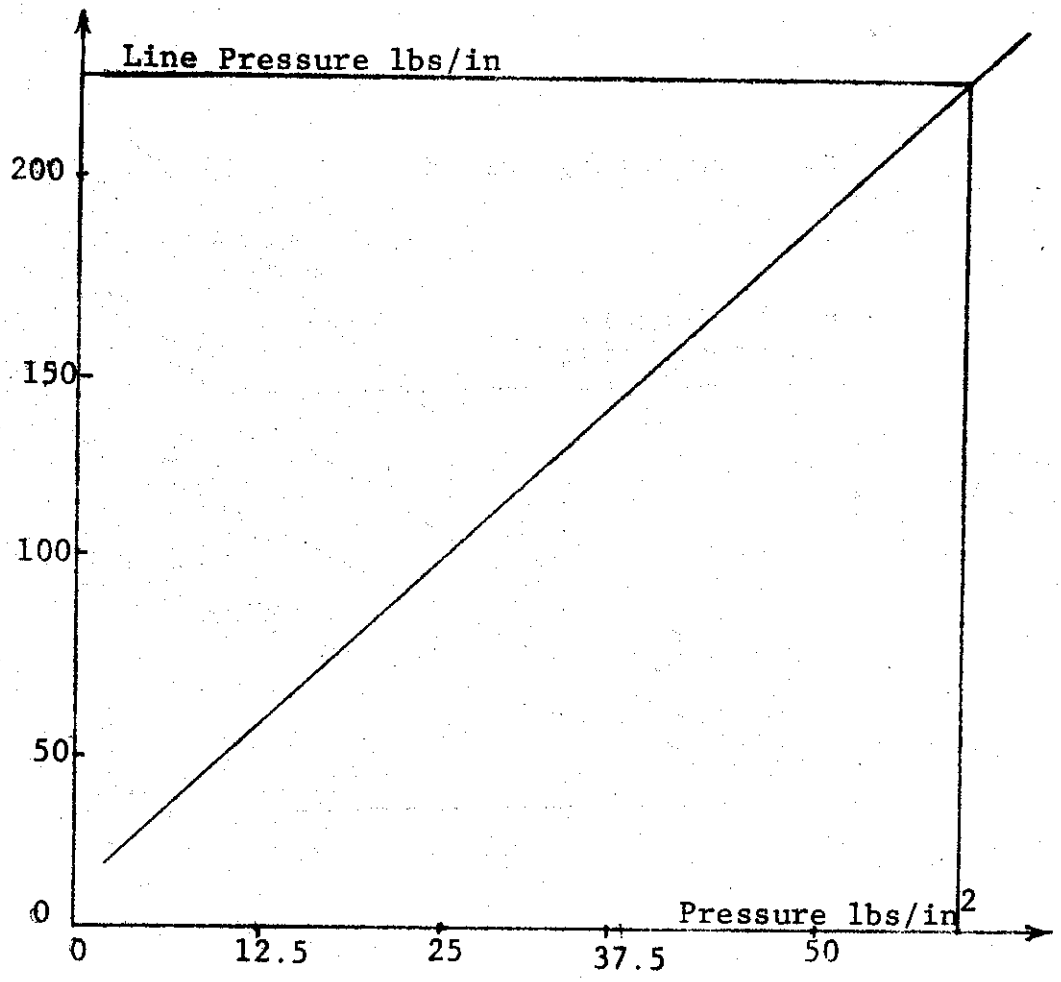
ORDER NO.

ARUS • ANDRITZ

MANSFIELD „ TEXAS

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: SDM "60" Press Zone Line Pressure

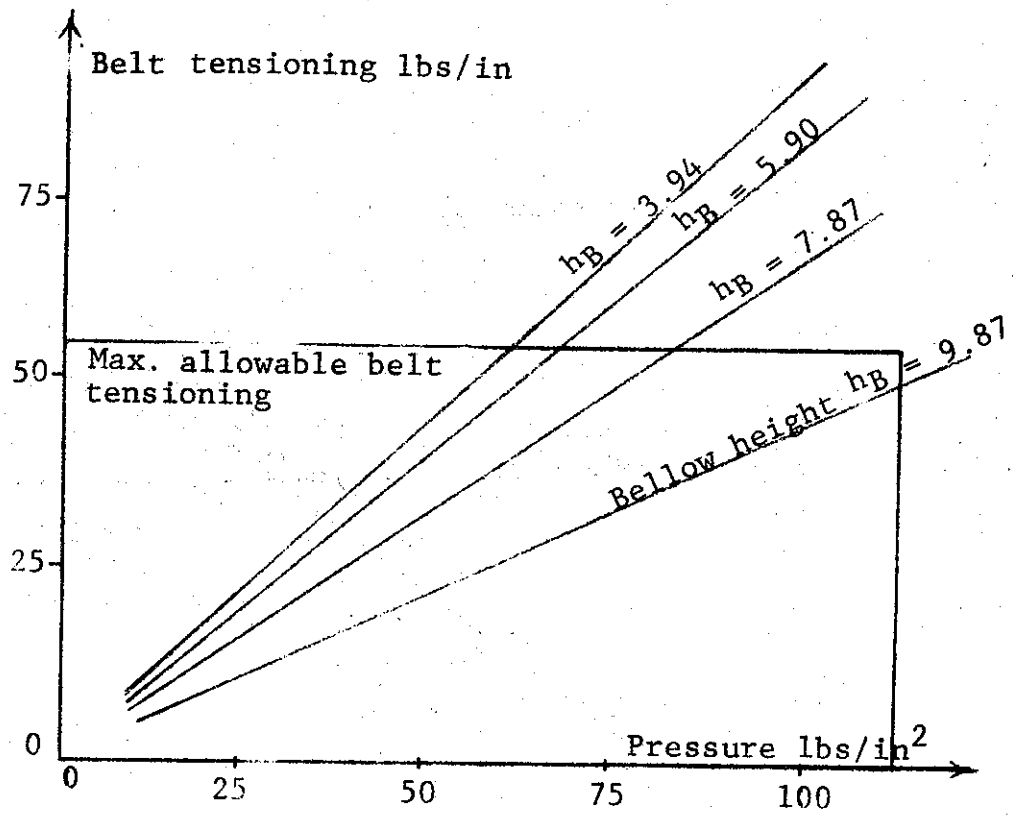
Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	[illegible]	4.13.77	

PROJECT NO. | ORDER NO.

ARUS • ANDRITZ
MANSFIELD, TEXAS

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: SDM "60" Belt Tensioning

Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	TF	4.13.77	

PROJECT NO.

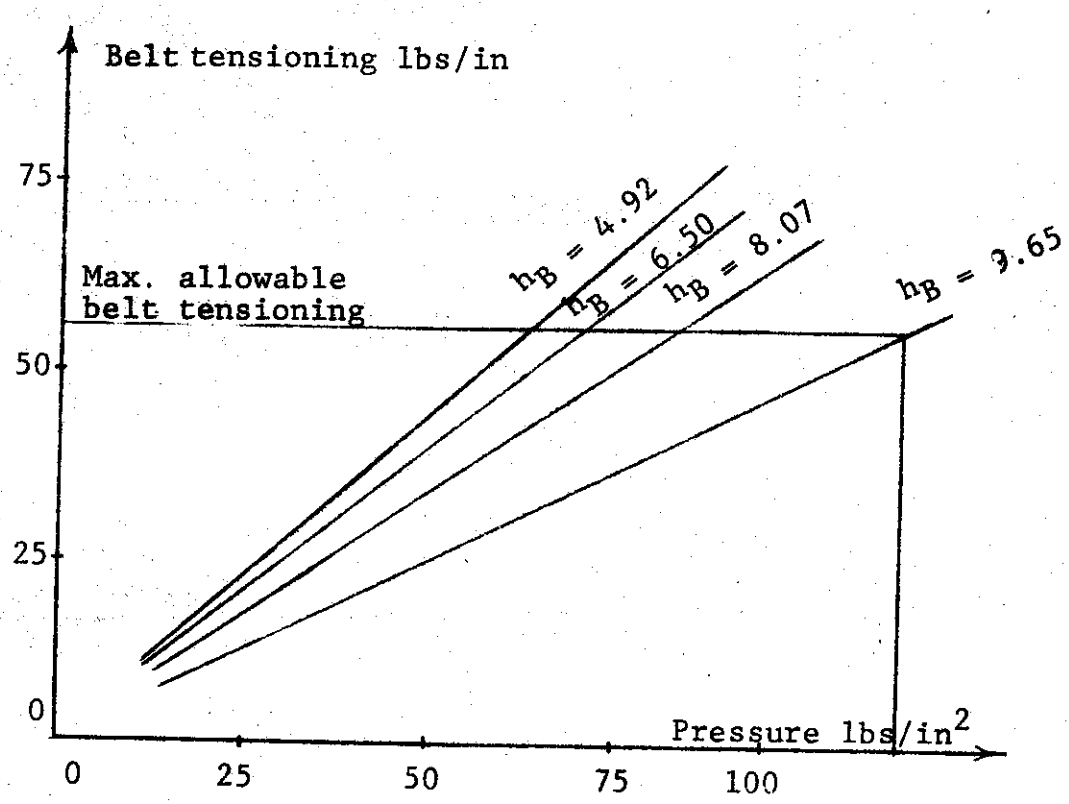
ORDER NO.

ARUS • ANDRITZ

MANSFIELD, TEXAS

CUSTOMER.

N31266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: SDM "80' Belt Tensioning

Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	MF	4.13.77	

PROJECT NO.

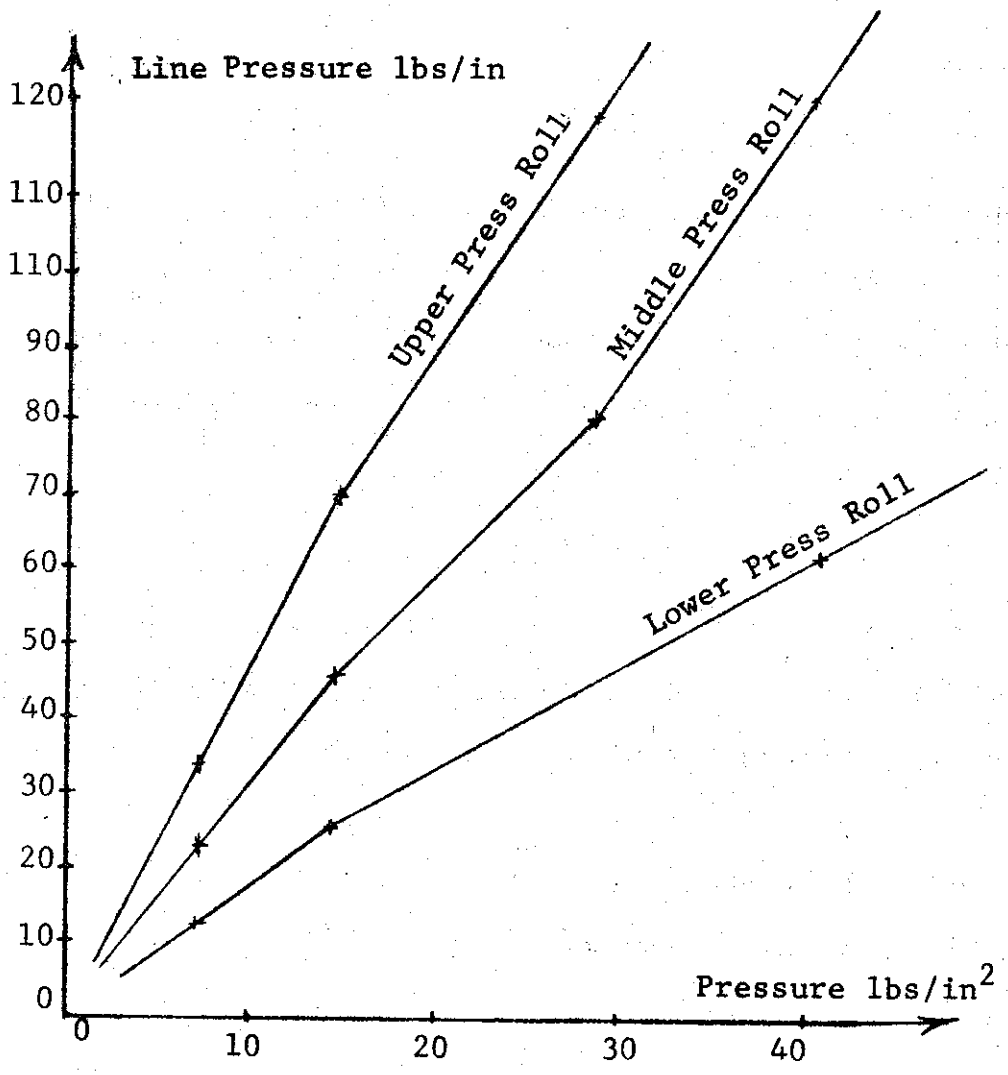
ORDER NO.

ARUS • ANDRITZ

MANSFIELD • TEXAS

CUSTOMER.

N21266



PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 21

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: SDM "80" Press Zone Line Pressure

Drawn by	Date	Appr. by	Date	Scale
N.D.	4/11/77	M.F.	4/13/77	

PROJECT NO.

ORDER NO.

ARUS • ANDRITZ

MANSFIELD, TEXAS

CUSTOMER.

N21264

4.4 Start up.

4.4.1 Start up sequence

A. Place tension on both the upper and the lower belt. (using regulator valve.)

A.1 Check the wire position along with the wedge seals.

Note. Improper adjustment of the wedge may lead to wire damage.

B. Pressurize the belt tracking system.

C. Inspect belt tracking system (most important that scanning finger is making proper contact with the wire).

D. Make sure all doctor blades are in place.

E. Switch power selector switch to "on".

F. Switch on belt showers.

G. Switch on main belt drive.

H. Switch on mixer drive.

I. Switch on polymer pump. (allow polymer to enter the main sludge line.)

J. Switch on sludge pump.

IMPORTANT !!! Allow the machine to run five minutes with sludge before closing the nips in the press zone. Never engage nips without sludge on the belts.

4.4.2 Optimizing the Dewatering Process.

When applying wire pressure on "S" execution machines, one

must not exceed the maximum allowance pressure and, one must not apply pressure to the point that sludge begins to extrude through the wire mesh. This will cause very poor capture rates. When applying nip pressure in the "Press" zone, one must not exceed maximum allowable line pressure, or allow the sludge to be pressed through the wires.

When applying wire pressure to either the "S" or the "Press", one must remember that belt tension does not depend only on the gauge pressure. It also depends on the "bellow height". Refer to Ill. 21 for exact details. Never exceed 10 kg/cm on belt pressure. Running above this range will shorten wire life. When first starting the polymer and sludge pumps, start polymer pump approximately 20% higher than needed while the sludge feed rate should be 20% lower. After running a few minutes, begin to move the pump speeds to their necessary position. Starting up in this manner will prevent the possibility of not getting proper flocculation, which could lead to a messy start-up that may require shut down of the equipment for cleaning.

When stable operation has been achieved at a given belt speed, the belts may then be accelerated to aquire higher throughput if necessary. Remember always speed up the polymer pump before adding more sludge.

An important factor to remember in proper machine operation is that most of the water must run off during the first stage of gravity dewatering. This may be done by proper flocculation. If proper flocculation is not achieved, water will be carried into the wedge section. When too much water enters the wedge, extrusions will occur. Another cause of improper draining is poor belt cleaning. On many types of sludges, the belts must be thoroughly cleaned.

4.4.3 Shut Down Sequence

On final shutdown, always allow the machine to run 10 - 15 minutes without the sludge pump running. This will give you a clean wire for the next start up.

A. Shut off sludge pump.
B. Shut off polymer pump.
C. Shut off mixing drum.
D. After machine runs for 10 - 15 minutes, shut off entire control panel.
E. Relieve pressure from wire belts and tracking system. (Use quick release slide valve, Ill. 15, Pos. 7)
F. Using the "Blow off" valve at the incoming air supply (oiler & filter), clean out any excess water.

IMPORTANT !!! On "Press" execution, always relieve air pressure on the nip rolls before turning the sludge pump off.

After the sludge and polymer pumps are off, take this time to hose off the machine, while the wires are being cleaned. Make sure that any build up on the rolls is cleaned off.

CAUTION: While cleaning machine, stay away from moving parts. Do not place hands inside of wedge section. The machine is moving very slowly, but is still very dangerous. Loose clothing should never be worn.

4.4.4 Machine Restart.

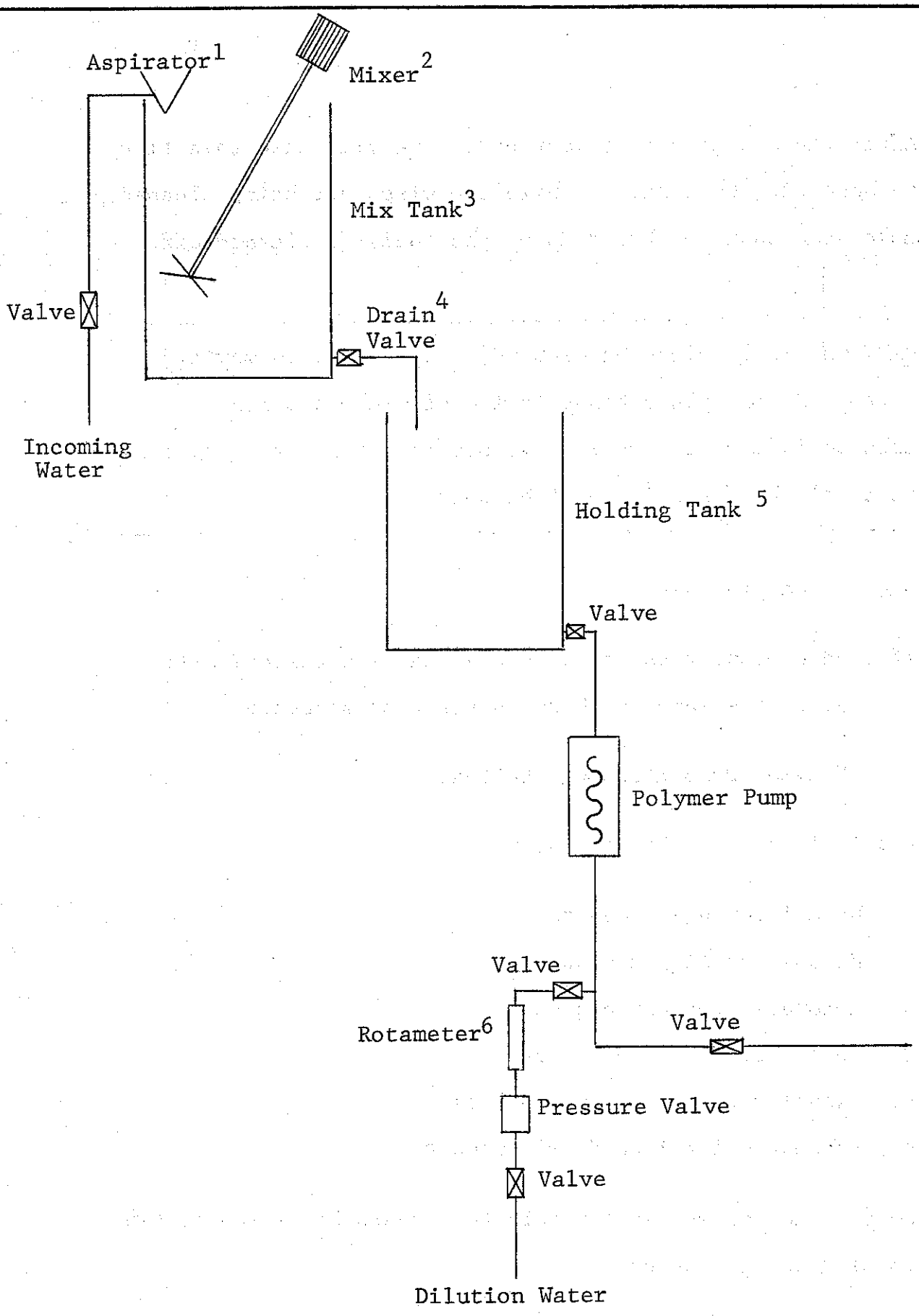
If sludge properties do not change machine restart will be exactly the same as shown in start-up sequence.

4.5 Polymer Proportioning Stations.

4.5.1 Types of polymer systems.

A. Manual for dry products.
B. Manual for liquid products
C. Automatic for dry products.
D. Automatic for liquid products.
E. Manual for liquid/dry products.
E. Automatic for liquid/dry products.

Note: The polymer system selected should be picked by owner to best fit his needs.



Manual Polymer Proportioning
Schematic Layout

ILL. 22

4.5.2 Manual Polymer Application (see Ill. #22)

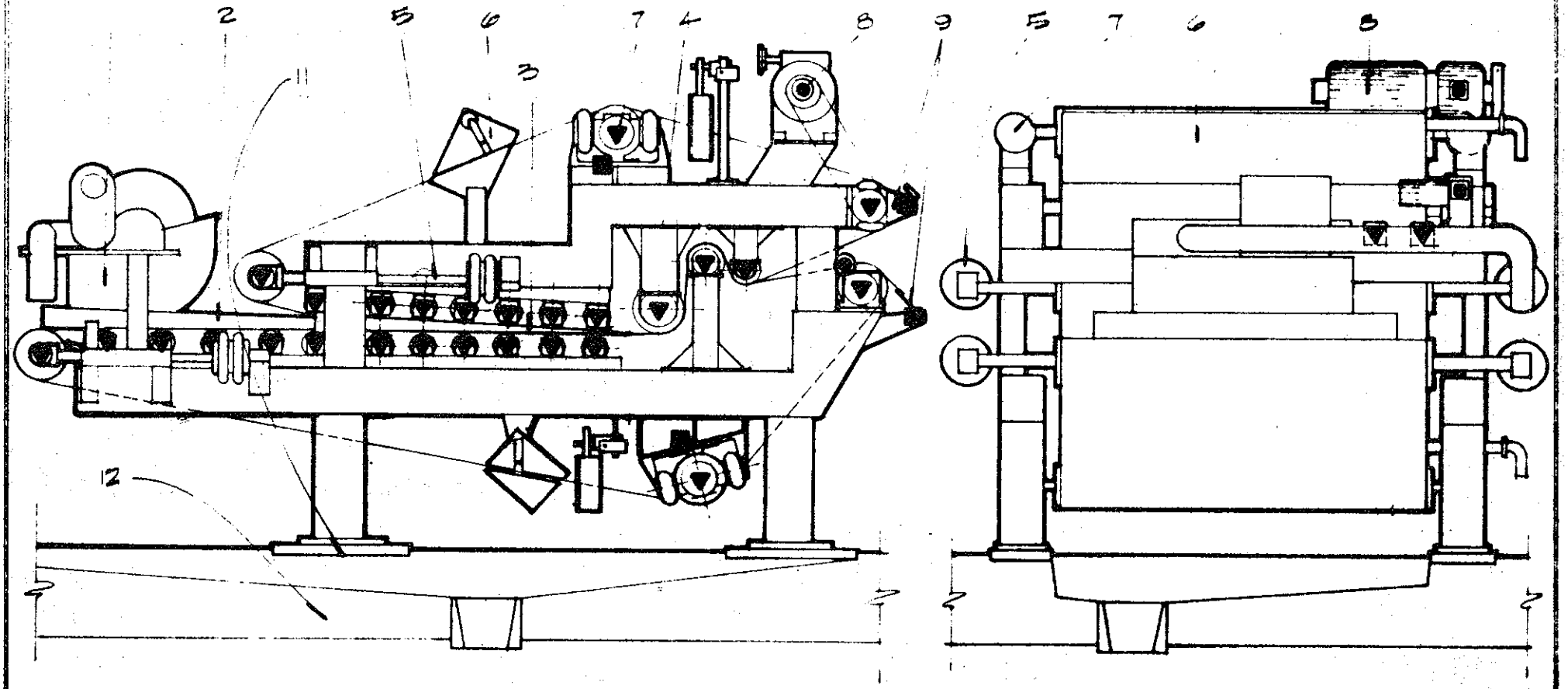
Prepare polymer at a 0.5% or 1.0% solution, depending on need and pump capacities. Note that polymers should always be mixed on a weight basis. (When using liquid polymers, please refer to manufacturers recommendations.)

Mixing Sequence Ill. #22

1. Close drain valve.
2. Begin filling tank until water is up to mixer blade.
3. Turn mixer on and continue filling tank.
4. Begin pouring the polymer into the asperator system. Do not add too much polymer. This will result in clogging.
5. When all of the dry polymer has been added, allow it to mix in the tank for 30-60 minutes.
6. Drain polymer from mixing tank to a holding tank below. If necessary, start mixing a new batch in mixing tank. (Never use polymer if not allowed to age for at least 30 minutes). When pumping the polymer to the sludge, it may be desirable to add dilution water at the rates of 1:10 or 1:20. A rotameter may be used to monitor the water flow.

4.6 Trouble Shooting

	Problem	Reason	Correction
A.	Belt limit is on	No air in tracking system.	Check air supply and valves.
		No wire tension.	Check air supply and valves.
		Sludge extrusion trips limit.	Check sludge conditioning.
B.	Air pressure limit is on.	No air pressure.	Check air supply system to the machine. Make sure that it has no leaks and that the air compressor is on.
C.	Extrusion of sludge in gravity zone.	Rubber sealing worn.	Replace rubber in gravity zone.
		Knots under wedge	Readjust spacing for wedge in headbox.
		No polymer	Check polymer system and feed rate.
D.	Drainage bad in gravity zone.	Poor flocculation	Check problem F
		Belts plugged	Check problem S
E.	Sludge flowing over headbox	Sludge flow too high	Decrease sludge and polymer flow rate.
		Bad drainage	Check problem D
F.	Poor flocculation	Too little or too much polymer	Check polymer feed rate.
		Mixing drum speed too low or too high	Adjust speed of drum.
		Dilution water feed rate incorrect.	Adjust feed rate.



ARUS ANDRITZ SDM LUBRICATION DESCRIPTION

▼ BALL BEARING GREASE (GREASE GUN) - EVERY 2 WEEKS

◉ CHAIN OIL TWICE YEARLY

■ GREASE OR OIL EVERY 2 WEEKS

▣ ADJUSTABLE GEAR MOTOR - SEE INSTR. OF MFG.

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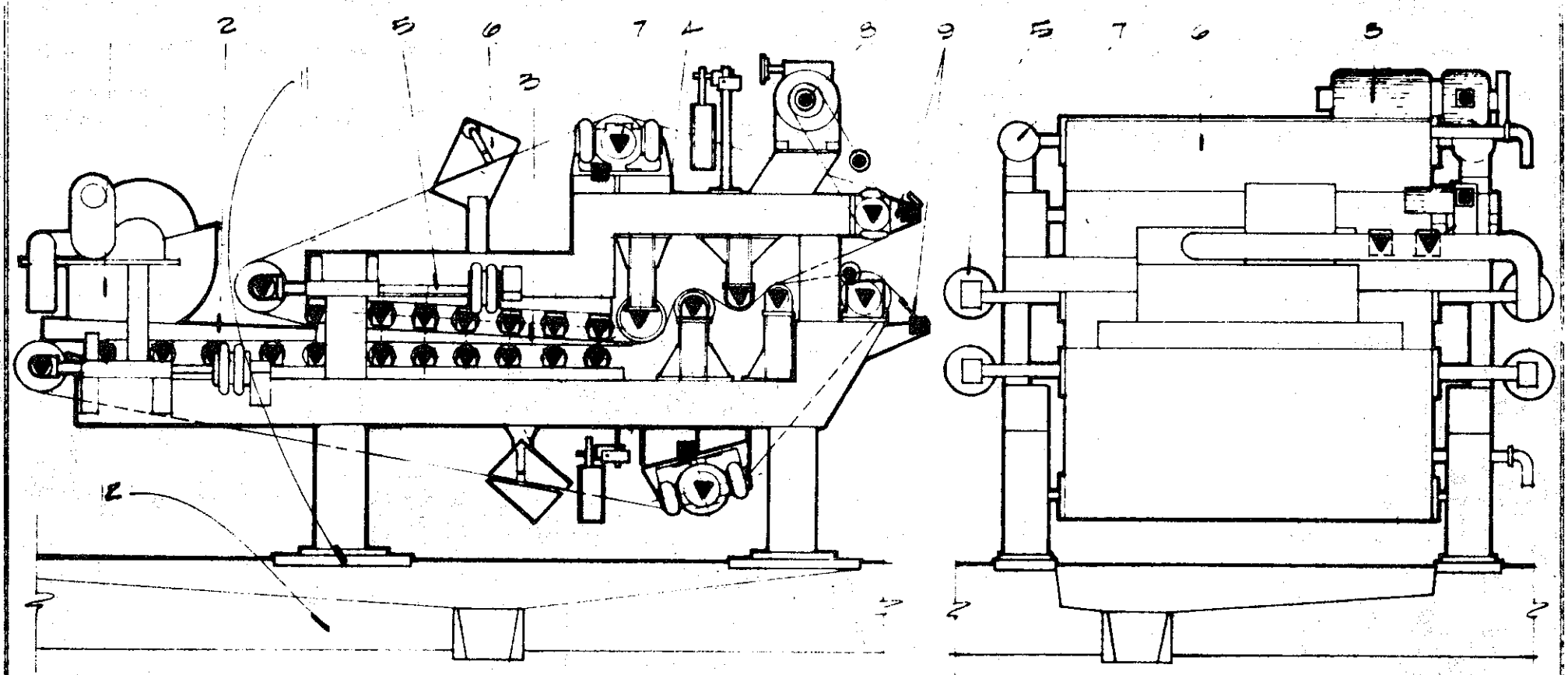

ARUS ANDRITZ SDM LUBRICATION DESCRIPTION

▼ BALL BEARING GREASE (GREASE GUN) - EVERY 2 WEEKS ◉ CHAIN OIL TWICE YEARLY

■ GREASE OR OIL EVERY 2 WEEKS ▣ ADJUSTABLE GEAR MOTOR - SEE INSTR. OF MFG.

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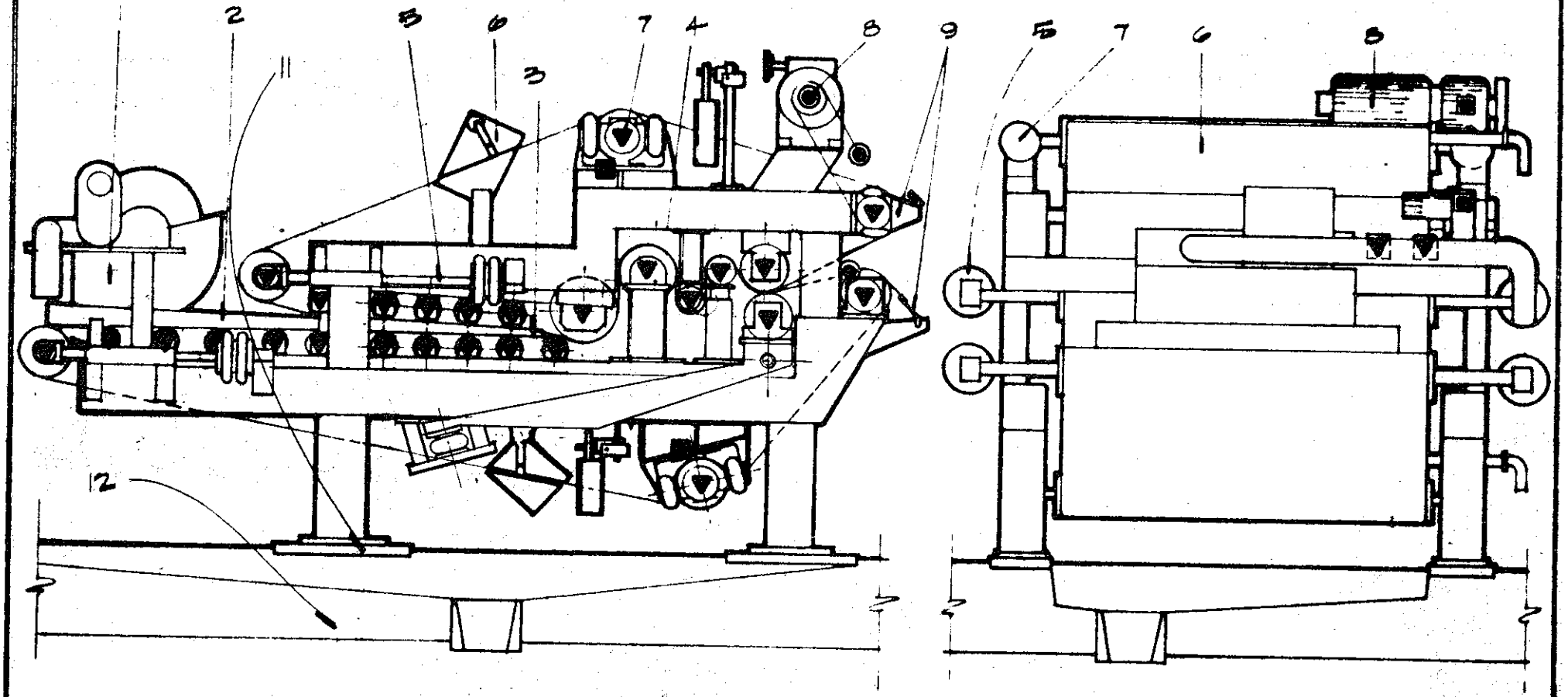

ARUS ANDRITZ SDM LUBRICATION DESCRIPTION

▼ BALL BEARING GREASE (GREASE GUN) - EVERY 2 WEEKS ◉ CHAIN OIL TWICE YEARLY

■ GREASE OR OIL EVERY 2 WEEKS ▣ ADJUSTABLE GEAR MOTOR - SEE INSTR. OF MFG.

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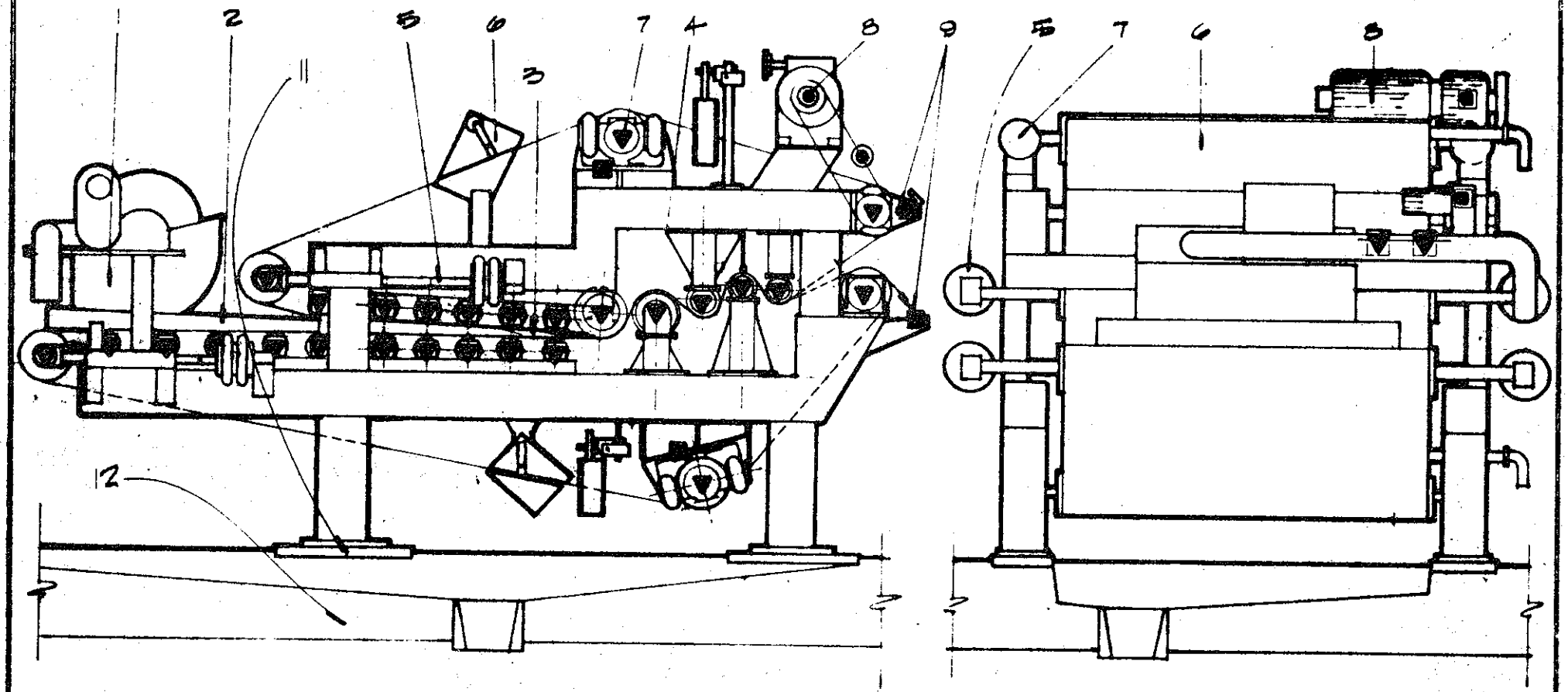
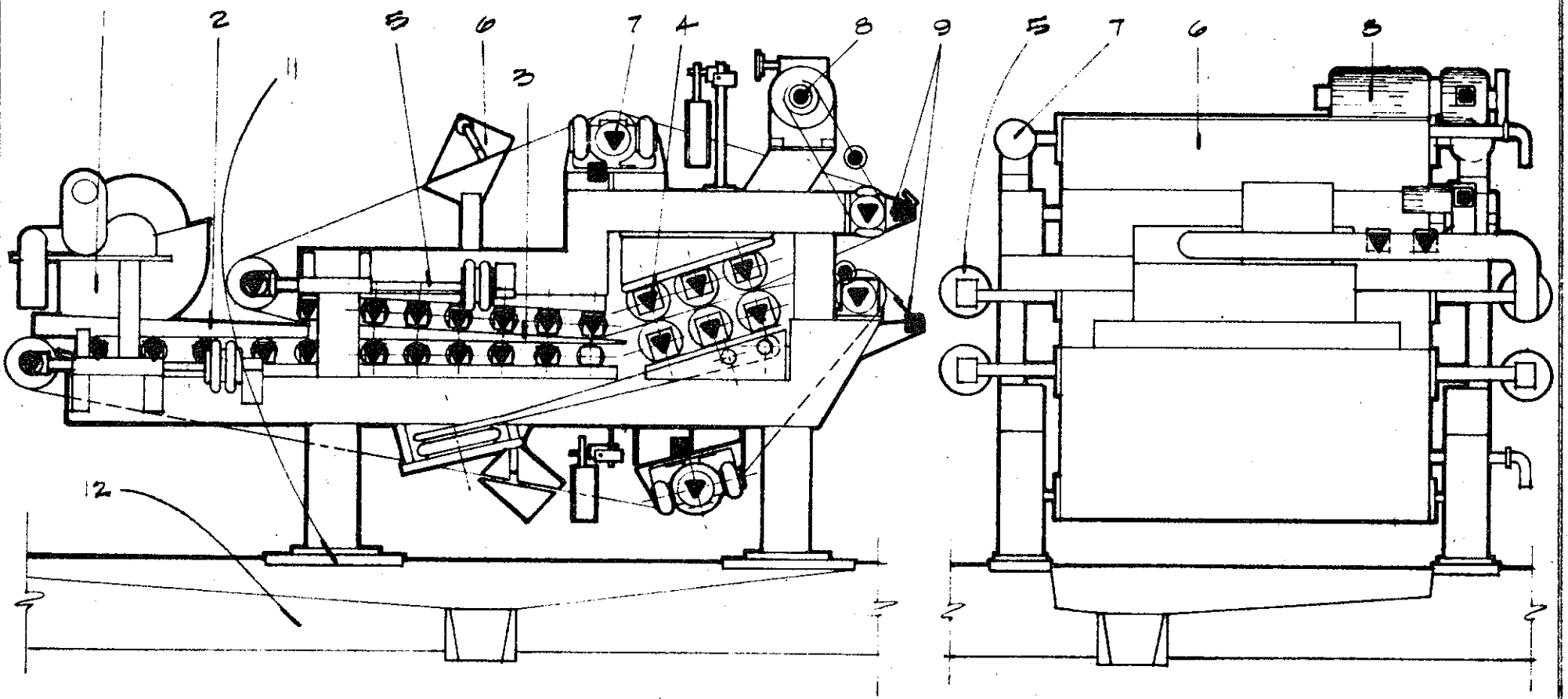


ARUS ANDRITZ SDM LUBRICRATION DESCRIPTION

▼ BALL BEARING GREASE. (GREASE GUN) · EVERY 2 WEEKS ◉ CHAIN OIL · BRUSH · TEAPOT

■ GREASE OR OIL EVERY 2 WEEKS ▣ ADJUSTABLE SEAL · WORK · SEE INSTR. OF MFG.

DRAWN BY: S.H.	DATE: 28 MARCH 77 APPROVED BY	SDM 55	ILL. 23	PROJ. NO. ORDER NO.



ARUS ANDRITZ SDM LUBRICATION DESCRIPTION

▼ BALL BEARING GREASE (GREASE GUN) - EVERY 2 WEEKS ◉ CHAIN OIL TWICE YEARLY

■ GREASE OR OIL EVERY 2 WEEKS ▣ ADJUSTABLE GEAR MOTOR - SEE INSTR. OF MFG.

DRAWN BY: G.H.	DATE: 28 MARCH 77	SDM PRESS	ILL. 23	PROJ. NO.
	APPROVED BY			ORDER NO.

	Problem	Reason	Correction
G.	Extrusion of sludge from wedge section.	Wedges worn	Replace wedges
		Angle of upper table rolls wrong.	Reset angle of table rolls.
		Poor flocculation	See problem F
		Through-put too high	Slow wire belts down on sludge feed pump.
H.	Roller lock down	No lubrication Bearing worn	Lubricate Replace bearing
I.	Bulge in wedge zone	Too much water still in sludge cake	See problem F
		Flocc breaking down under pressure.	See problem F and Reasons and Corrections G-2 and G-4.
		Belts plugged	See problem S
J.	Flocc breaking down under pressure.	Poor flocculation	See problem F
		Through-put too high	See Correction G-4
K.	Extrusion in high pressure section	Poor flocculation	See problem F
		Too much pressure on sludge by belts	Decrease belt tensions
		Press nip pressure too high	Release nip pressure and then readjust.
L.	Bulge in high-pressure section.	Too much water in cake.	See problem F
		Belts plugged	See problem S
		Nip pressure too high	See correction K-3
M.	Wire slips on drive roll	Not enough wire tension.	Increase wire tension (Do not exceed recommended belt tensions).
		Overload in "Press" or "S" section	Remove excess sludge from "Press or "S" zone and restart machine at a lower feed rate.

	Problem	Reason	Correction
N.	Cake sticking to belts.	Poor flocculation	see Problem F
		Doctor blades worn	Replace blade.
		Belt Speed too high	Slow down belt.
O.	Doctor blades wearing heavily.	Misalignment of blade	Realign doctor blade assembly to be evenly riding belt.
		Too much doctor blade pressure on belt.	Insure that the doctor blades are no tighter than necessary to clean belts.
P.	Drive system gear lock down	No oil in system	Fill with oil (Running low or without oil may cause permanent damage)
		Pullies or 'V' belt in mechanical speed variation torn.	Replace pullies and 'V' belt.
Q.	No speed variation on main drive or mixer drive.	Faulty wiring in DC or AC panel speed control or mechanical failure in drive.	Check wiring or speed controller on drive.
R.	Wire continues to track incorrectly.	Hole in tracking system line.	Replace tubing
		Tracking system out of adjustment.	Refer to RETEC catalog in back of this manual and reset.
		Tracking system not sensitive enough.	Move the contact point of the belt higher on the paddle.
		Tracking system dirty	Clean out travel racks, air system and grease racks.
		Belt has stretched or is uneven length	Adjust tracking system to accommodate belt error if belt is useable; if not, replace belt.
		Tubing to tracking unit is incorrect.	Switch leads from unit to the air bellows at the unit.

	Problem	Reason	Correction
S.	Belts plugged	Spraying nozzle clogged.	Use cleaning device located on shower.
		Low water pressure.	Check gauge on water supply and insure that it reads 60 psi min.
		Too high belt tensions pushing sludge into belt.	Lower belt tensions
		Poor flocculation	See Problem F
T.	Belts wrinkling or folding.	Poor distribution	See problem W
U.	Belt tearing along wedge.	Gravity zone or wedge zone forcing belt to ride forceably between wedge and rollers.	Readjust wedge settings.
		Knots in wedge.	See problem V
V.	Knots in wedge	Improper wedge adjustment.	Change wedge spacing
W.	Poor distribution	Improper headbox alignment.	Install rake. Install distribution baffles. Adjust baffles in headbox.
		Machine being run not full.	Increase sludge and polymer flow.
X.	Cake coming off machine is uneven.	Poor disbribution	See problem W
		Bulges in machine	See problems L, K, I, and G.
Y.	Dry running of sludge pump.	Suction pipe clogged	Check entering suction pipe for clogs.
		Suction pipe may leak	Checking entering suction pipe for leaks.
		Valve at suction side may be closed.	Check valve on suction side.

	Problem	Reason	Correction
Z.	Overload relays from drive system are on.	Drive is not properly wired electrically causing drive to be overloaded.	Check electrical wiring.
		Drive is being overloaded	Slow down belt speed or relieve pressure in the press section.
		Water has entered motor.	Remove motor, clean, and check all wiring.
		Heaters too small for load.	Replace overloads with overloads with higher ratings.

* Drawings for rake and distribution device available from Arus-Andritz on request.

Lubrication List for Arus-Andritz SDM

Lubrication Points	#	Type of oil and/or grease	Kinds of Lubrication	Interval (weeks)
Breast roll bearings	4	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1
Drive roll bearings	4	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1
S-roll bearings	6	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1
Press roll bearings	12	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1

Lubrication List for Arús-Andritz SDM

Lubrication Points	#	Type of oil and/or grease	Kinds of Lubrication	Interval (weeks)
Table roll bearings	36	Lithium Lead Base Grease ASTM Penetration 77°F Color: Gery Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1
Regulating roll bearings	4	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease Zerk	1
Scraper	3	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26
Bushing	6	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26

Lubrication List for Arus-Andritz SDM

Lubrication Points	#	Type of oil and/or grease	Kinds of Lubrication	Interval (weeks)
Chain	1	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26
Bushings for wire tensioning	4	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey BLack Viscosity of Mineral Oil 210°F 70-85	Grease	26
Guide piece & gear on wire tensioning	4	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26
Sprockets		Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26

Lubrication List for -Andritz SDM

Lubrication Points	#	Type of oil and/or grease	Kinds of Lubrication	Interval (weeks)
Slide area for tracking device	2	Lithium Lead Base Grease ASTM Penetration 77°F Color: Grey Black Viscosity of Mineral Oil 210°F 70-85	Grease	26
Main Drive	1	See Motordrive Manufacturer's Recommended Lubrication Spec. Sheet	Oil Bath	8
Mixing Drum Drive	1	See Motordrive Manufacturer's Recommended Lubrication Spec. Sheet	Oil Bath	8

TAB.5b

Description of Lubricants Used

Description of Lubricants		Application Purpose
Mobilgrease Special	Liquid pt. 177°C	Can use for bearings, bushings, and to relieve stress & strain on toher parts of machine.
Multipurpose grease		
Mobile AFT 200 or 220	Viscosity ca. 27.3c St (3.7E) at 50°C Thickening pt - 40°C	For automatic and normal drives

5. Maintenance

When machines operate on a 24 hour/day basis, it is recommended that the machine be shut down once every two weeks for general maintenance (lubrication, cleaning, etc...). For machines operating less than 24 hours/day, checks and maintenance may be done during normal shut down periods.

5.1 Lubrication Instructions

The Arus-Andritz SDM is designed for long periods of maintenance free operation. Special types of bearing seals allow for long lubrication points and intervals are indicated on the drawing and lubrication schedule. (Table 5 and 6) The lubrication data on tables 5 and 6 refer to 24 hour machine operation. If your machine is not on 24 hour operation, the lubrication intervals may be correspondingly longer. For gear drives, follow the particular manufacturers recommendation.

Note: Your machine is fitted with an oiler for all machine air systems. The oiler must be kept full at all times.

5.2 General Machine Checks.

A. Check wires before each start-up for holes and tears. If the holes or tears are caught early enough, they may be patched.

B. Check all doctor blades for any unusual wear.

C. Check all pneumatic equipment.

D. Check all rolls. (Particularly the roll coating.)

E. Check tension on the main drive chain.

F. Check wedge and wedge setting.

5.3 Cleaning of Arus-Andritz SDM

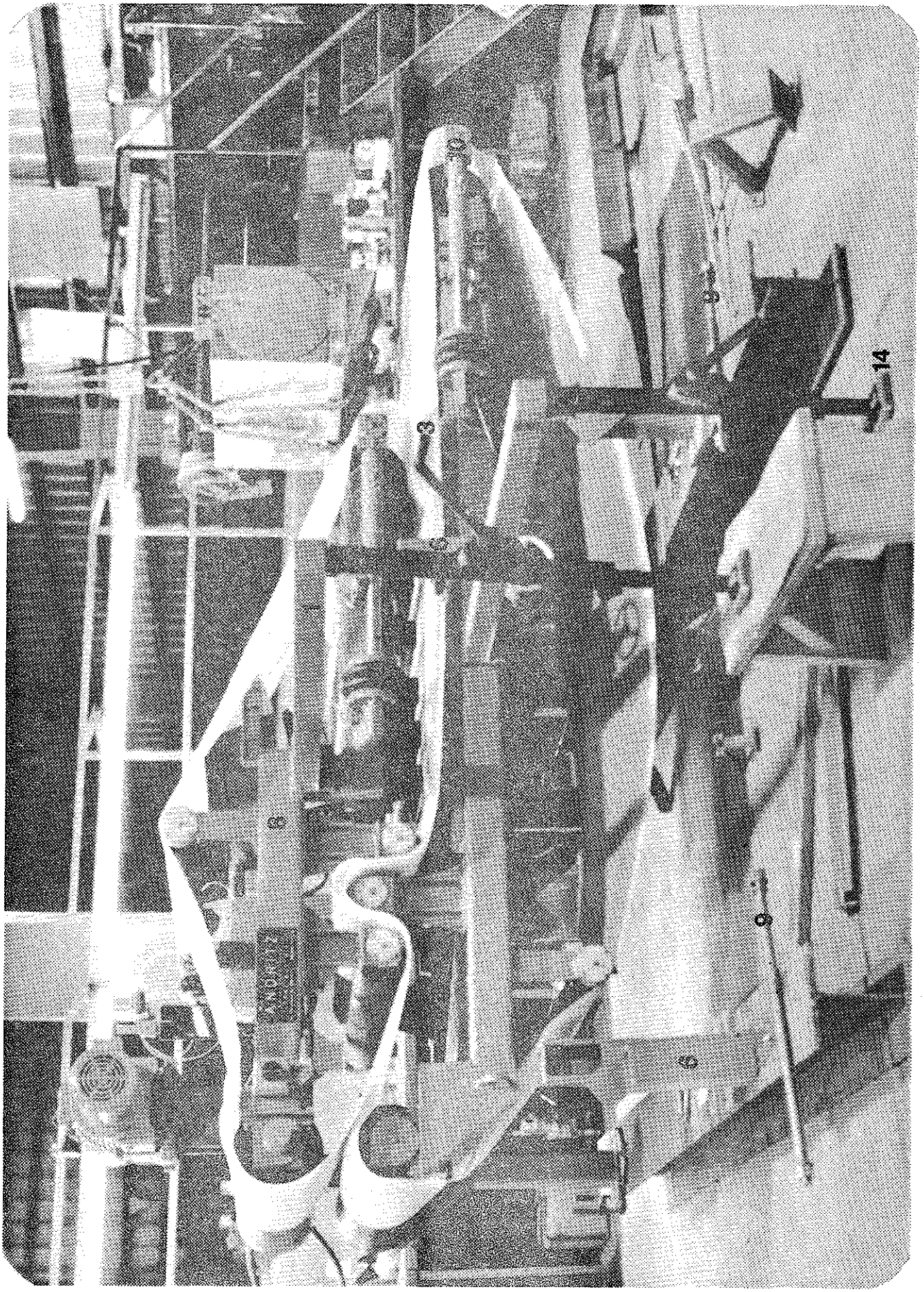
The machine is plastic coated and therefore greatly resistant to corrosion, but when cleaning, no corrossive agents should be used. In most cases, a high pressure water spray along with a soft brush will be sufficient to clean any remaining sludge after service. All of the doctor blades should be kept clean for good service. The machine should always be allowed to run for at least 10 minutes after service to thoroughly clean the wires. The belt shower should always be cleaned and back flushed with the aid of the special cleaning hand wheel located at the end of the shower housing.

5.4 Control of Auxiliary equipment.

To insure satisfactory functioning of the complete plant, all auxiliary equipment should be checked. In this case refer to the service and maintenance instructions of the individual manufacturers.

5.5 Replacement Instructions.

5.5.1 Changing of wire belts. (Ill. 24)



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Changing the wire belts on the Arus-Andritz SDM requires the use of the cantilevering system. This allows both upper and lower wires to be of seamless construction, which will greatly increase your wire life.

A. Place a wooden block 12" x 12" under the bearing point for the lower jack (Pos. 14) to obtain more or less equal distribution of the cantilever pressure on the foundation. Under the upper jack, place a wooden block with a height of approximately 32".

B. Release wire tension.

C. Changing Upper Wire

1. Remove lateral seals (wedges).
2. Loosen the two frame bolts on drive side 2 or 3 turns. Remove completely the two frame bolts at cantilever side (Pos. 9). Unscrew the nuts and withdraw the belts upwards.
3. Move the breast roll (Pos. 10) in sludge flow direction, using a crank which is to be attached onto the toothed wheel of the parallel guide (Pos. 15).
4. Upon fitting of the cantilever beams, drape the new top wire over the upper cantilever beam (Pos. 1). By means of the upper jack (Pos. 3), lift the upper frame (Pos. 8) until you can remove the two intermediate pieces (Pos. 6).

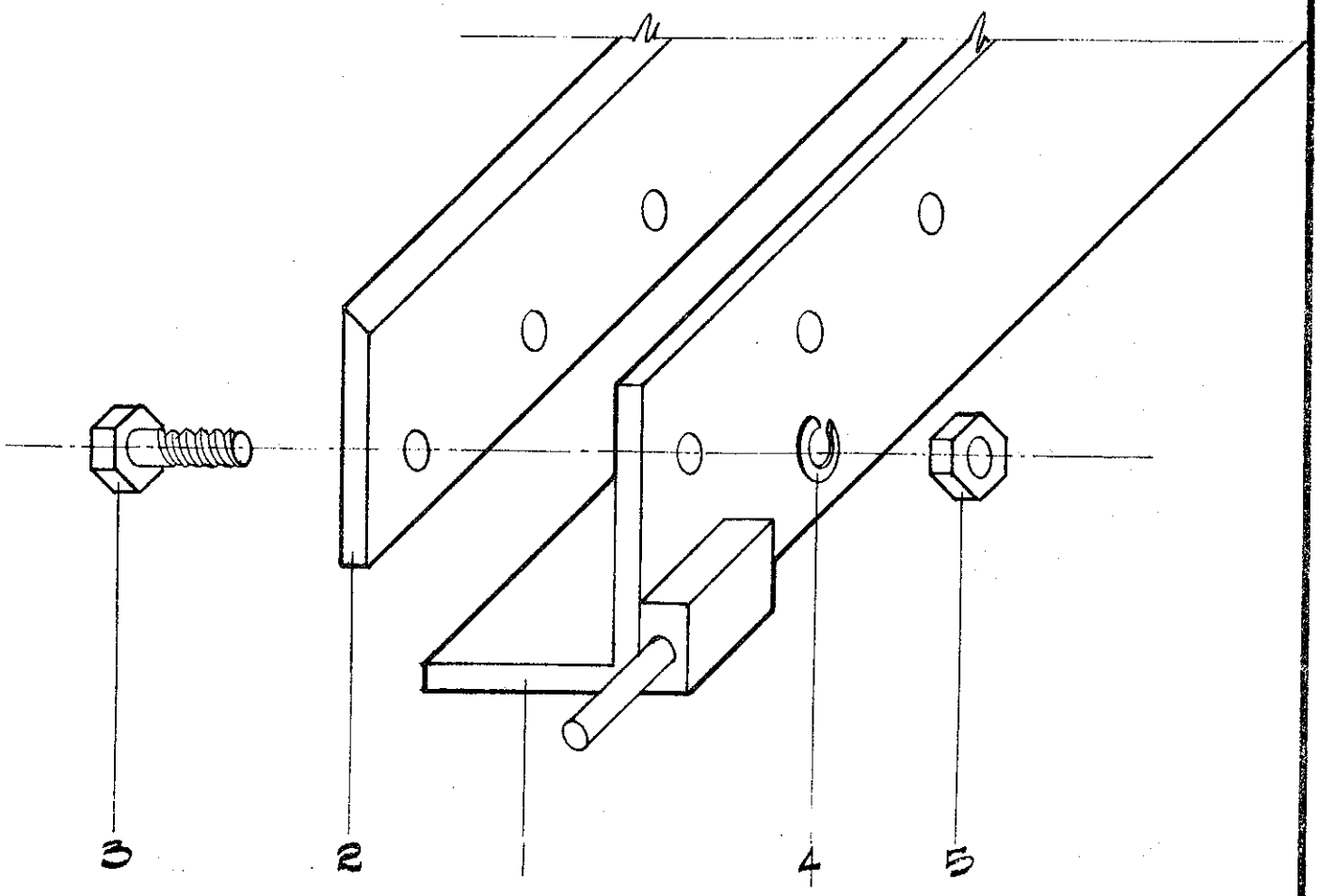
5. Remove the old wire and drape the new wire in the machine.
6. Reassemble in reverse order.

D. Changing the Bottom Wire Belt

1. Same as part 5.5.1, C-1
2. Same as part 5.5.1, C-2.
3. Remove the headbox support (Pos. 12) on cantilevering side.
4. Move the bottom breast roll (Pos. 11) in sludge flow direction, using a crank which is to be attached onto the toothed wheel of the parallel guide (Pos. 15).
5. Upon fitting the cantilever beams, drape the new bottom wire belt over the lower cantilever beam. By means of the upper jack (Pos. 3), lift the upper frame (Pos. 8) until you may withdraw the two intermediate pieces (Pos. 6). Furthermore, lift (by means of the lower jack) the lower frame from the machine legs (Pos. 13) to obtain a clear distance of approximately 3/4".
6. Remove the old wire and drape the new bottom wire in the machine.
7. Reassemble in reverse order.

5.5.2 Replacement of Doctor Blades (Ill. 25)

The main reason for poor separation of cake from the wires is due to worn doctor blades. Replacement of doctor blades



1 DOCTOR BLADE MOUNTING BRACKET
2 DOCTOR BLADE
3 BOLT
4 LOCK WASHER
5 NUT

PROJECT NAME:

CONSULTING ENGR:

dewatering processes in industrial & municipal applications

ILL. 25

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

No.	Change	By	Date	Appr.
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Item: DOCTOR BLADE ASSEMBLY

Drawn by	Date	Appr. by	Date	Scale
E.H.	28 MAR 77			N.A.

PROJECT NO. | ORDER NO.

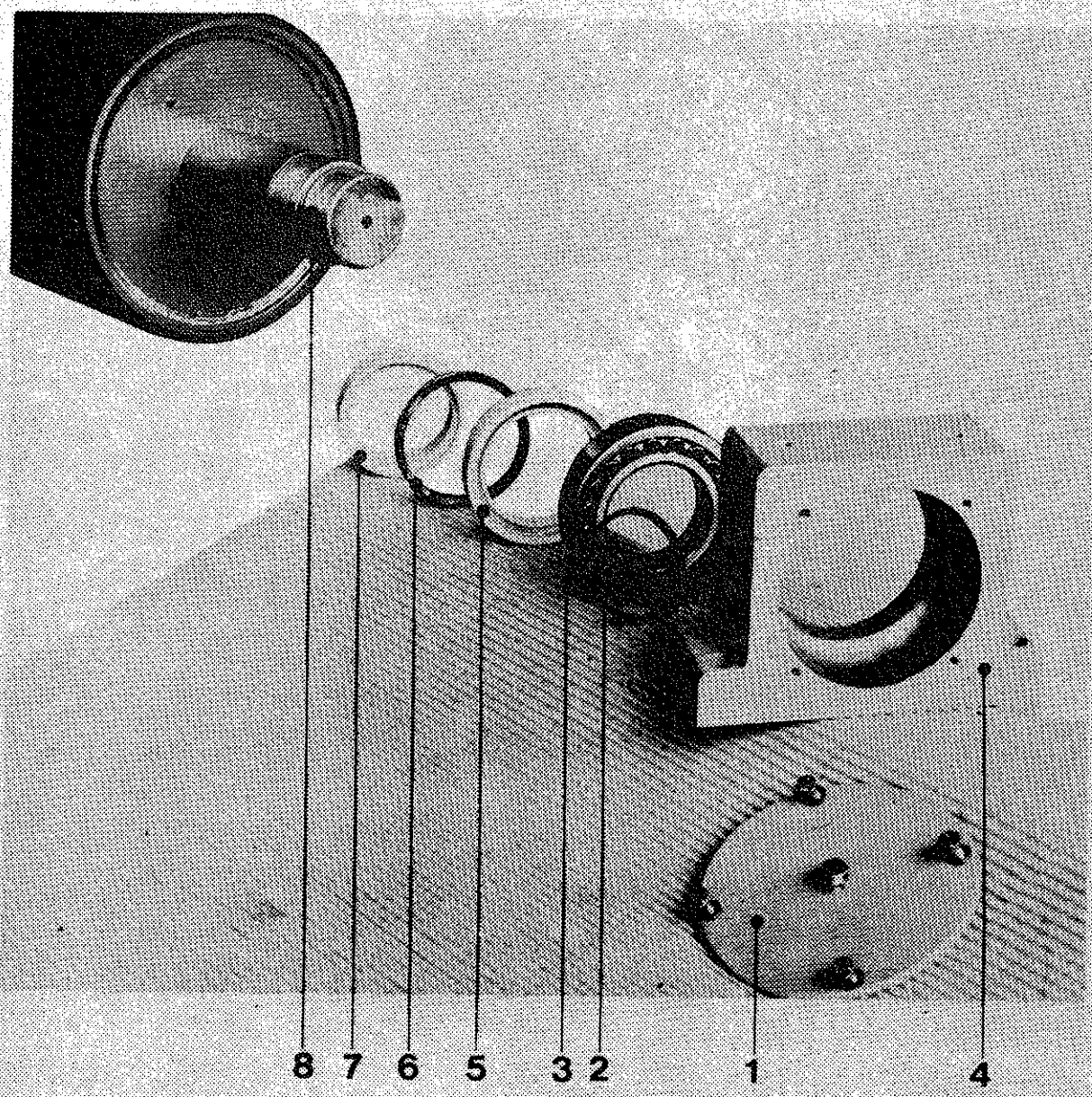
ANDRITZ

MANSFIELD, TEXAS

CUSTOMER.

N21266

LOOSE SIDE BEARING ASSEMBLY FOR DRIVE ROLLS



1. BEARING HOUSING COVER[1]
2. SNAP RING
3. PENDULUM ROLLER BEARING[2]
4. BEARING HOUSING
5. SPACER BUSHING
6. RUBBER V-RING
7. SPACER BUSHING
8. ROLL JOURNAL

ILL. 26

1. FOR DRIVE ROLLS ONLY
2. SELF-ALIGNING BEARING

is done by removing broken blade from bracket and replacing it with a new one. It is important to mount the doctor blades parallel to the doctor bar. After mounting doctor-blade, the pick-up doctor must be adjusted again. (Adjustment of pick-up doctors, see section 4.3.3).

5.5.3 Replacement of Bearings

The special type bearing seal yields a very long service life. Most damage occurs due to lack of lubrication. It is necessary to follow the lubricating instructions and to use the proper grease.

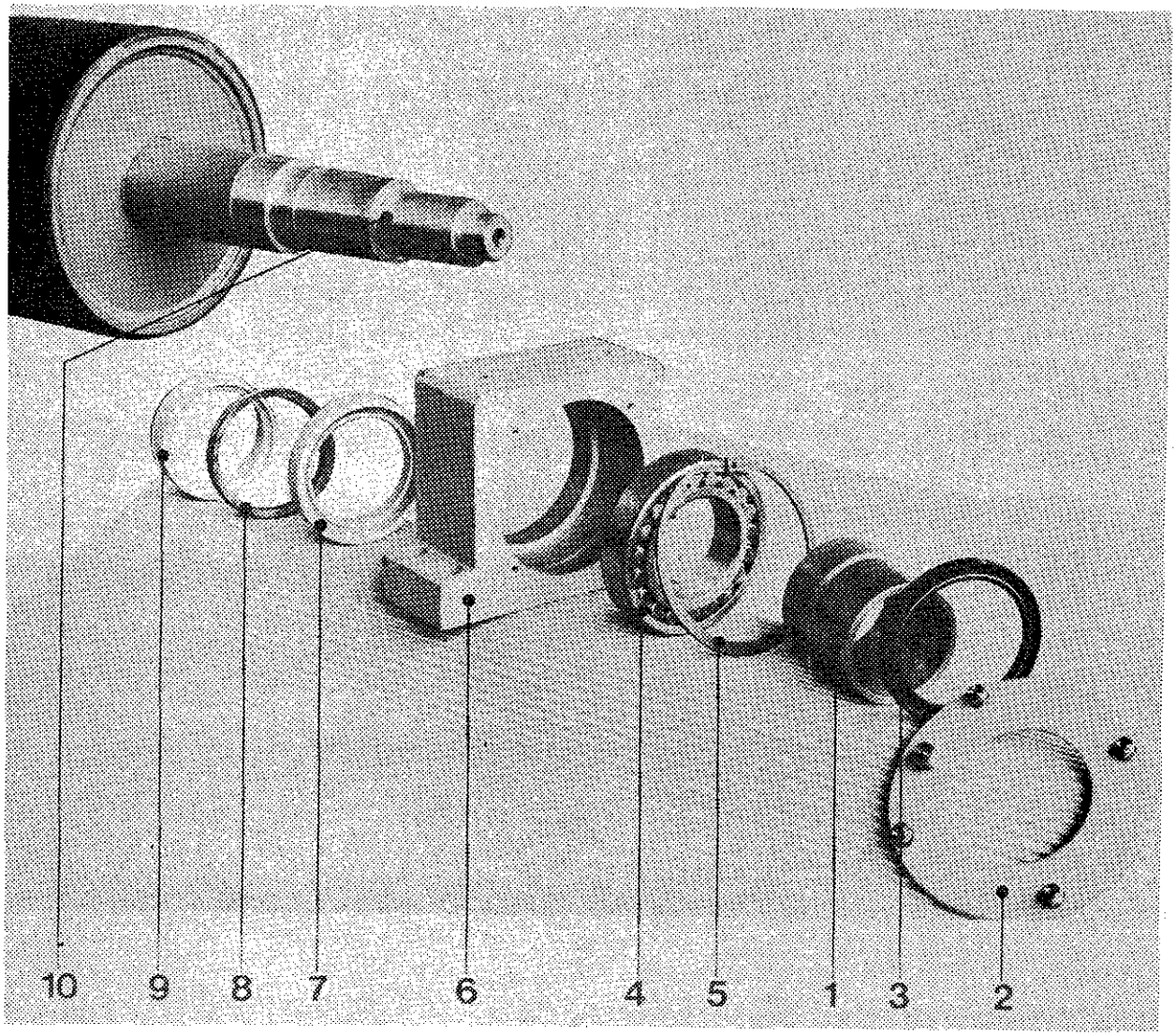
IMPORTANT!!! When mounting rollers on the machine, always place a fixed bearing on drive side.

A. Changing of a worn bearing (Ill. 26)

1. Loosen bearing housing cover (Pos. 1).
2. Remove snap ring (Pos. 2).
3. Take off bearing housing and bearing by means of pulley (Pos. 3 & 4).
4. Take off distance ring (Pos. 5).
5. Take off V-ring (Pos. 6).
6. Take off distance ring (Pos. 7).

The bearing (Pos. 3) may be pulled out from the bearing housing (Pos. 4). Re-assemble in reverse order, whereby the round spike (Pos. 8) must be cleaned and lubricated.

DRIVE SIDE BEARING ASSEMBLY FOR ROLLS

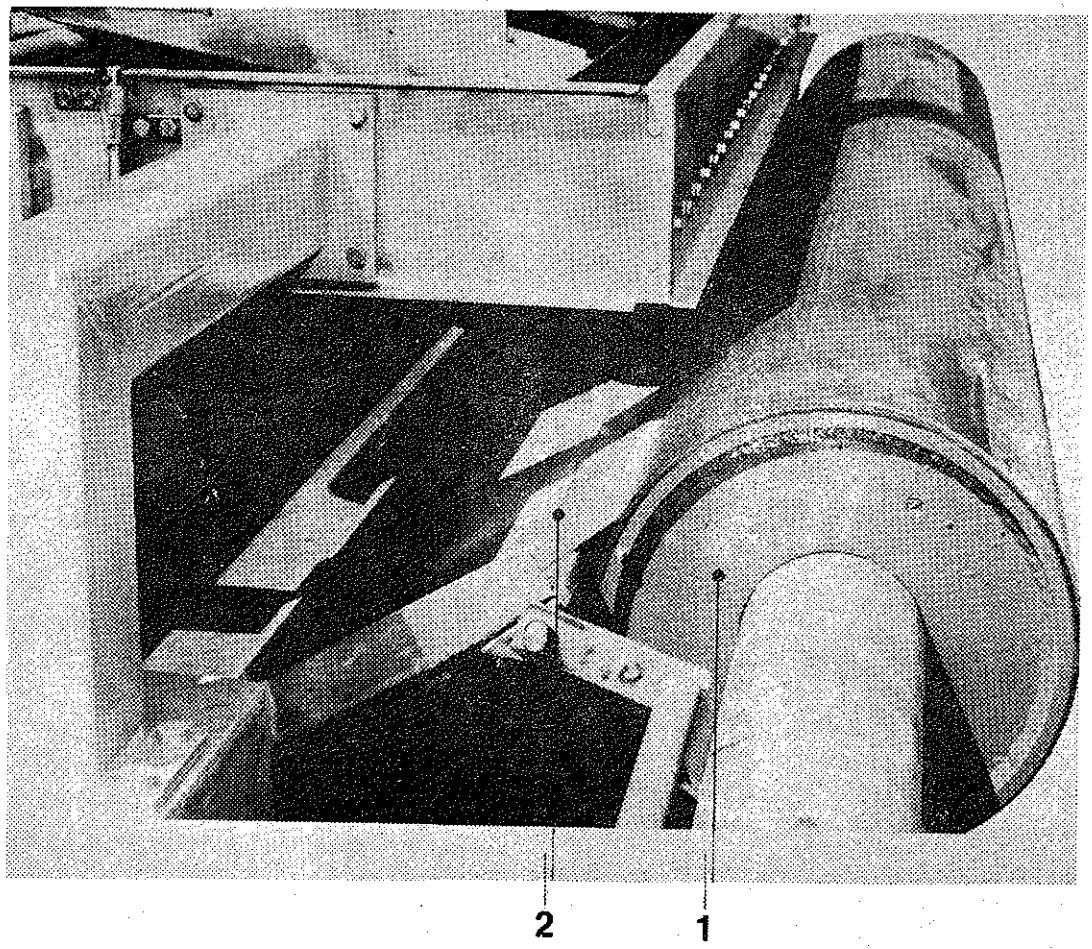


1. SPACER BUSHING
2. BEARING HOUSING COVER[1]
3. RUBBER O-RING
4. PENDULUM ROLLER BEARING[2]
5. SNAP RING
6. BEARING HOUSING
7. SPACER BUSHING
8. RUBBER V-RING
9. SPACER BUSHING
10. SHAFT

ILL. 27

1. DRIVE ROLLS ONLY
2. SELF-ALIGNING

LOWER BREAST ROLL DOCTOR BLADE



1. LOWER BREAST ROLL
2. DOCTOR BLADE

ILL. 28

B. Changing of fixed bearing (Ill. 27)

1. Take off distance bushing (Pos. 1).
2. Loosen bearing housing cover (Pos. 2).
3. Take off retaining ring (Pos. 3).
4. Take off bearing housing and bearing (Pos. 4, 5, 6), by means of a pulley.
5. Take off distance bushing (Pos. 7).
6. Take off V-ring (Pos. 8).
7. Take off distance bushing (Pos. 9). The bearing (Pos. 4) may be pulled out after removing snap ring (Pos. 5) from the bearing housing (Pos. 6).

6. Spare Parts

Table 7 shows the group assembly parts list. This system should be used when ordering spare parts. All spare parts can be ordered from Arus-Andritz,Mansfield. Listed are the following spare parts:

List of rolls	Table 8
List of bearings	Table 9
Seals	Table 10
Spray pipes	Table 11
Pneumatic parts	Table 12
Air bellows	Table 13
Pick up doctors	Table 14

Group Assembly Drawings SDM 40

Group	Drawing No.	Designation
40100	OPM 40747	Assembly drawing SDM 40 S-tension
	OPM 41013	Assembly drawing SDM 40 Press zone
40200	OPM 40540	Sludge Headbox
40300	OPM 40618	Frame
40400	2PM 30318	Breast roll
40500	1PM 30243	Drive roll
40600	2PM 29627	Regulating roll
40700	2PM 24838	Table roll
40800	1PM 40624	Wire belt tensioning device
40900	1PM 30317	Breast roll bearing
41000	1PM 30222	Drive roll bearing
41100	2PM 28841	Table roll bearing
41200		Wire belt changing device
41300	1PM 26981	Doctor for breast roll
41400	1PM 28148	Wire belt cleaning device
41500	1PM 40076	Doctor for top drive roll
41600	1PM 40525	Doctor for lower drive roll
41700	2PM 40865	Pneumatic control S-tension
41800	2PM 25108	Wire belt regulating device
41900	OPM 40125	Wedge zone

S-Tension

Group	Drawing No.	Designation
43100		S-tension rolls
43200	1PM 25329	S-tension roll bearing
43300	1PM 40427	Cake control
43400	1PM 40631	Drive for S-tension
43500	3PM 28144	Brush for S-tension (+ holder)
43600		S-tension bracket

P-Zone

44100	2PM 29642	Press roll
44200	2PM 30400	Press roll bearing
44300	2PM 40865	Pneumatic control P-zone
44400	OPM 40641	Drive for P-zone
44500	2PM 25748	Press water tray
44700	OPM 40519	Pneumatic loading and relieving device

Group Assembly Drawings SDM 60

Group	Drawing No.	Designation
30100	OPM 31252	Assembly drawing SDM 60 S-tension
	OPM 31253	Assembly drawing SDM 60 Press zone
		Assembly drawing SDM 60 S-P tension
30200	1PM 30236	Sludge headbox
30300	OPM 30370	Frame
30400	1PM 29614	Breast roll
30500	1PM 30021	Drive roll
30600	2PM 30019	Regulating roll
30700	1PM 29613	Table roll
30800	OPM 40515	Wire belt tensioning device
30900	2PM 29645	Breast roll bearing
31000	1PM 30032	Drive roll bearing
31100	2PM 40164	Table roll bearing
31200		Wire belt changing device
31300	1PM 31007	Doctor for breast roll
31400	OPM 27720	Wire belt cleaning device
31500	1PM 31254	Doctor for top drive roll
31600	1PM 30919	Doctor for lower drive roll
31700	2PM 40865	Pneumatic control S-tension
31800	2PM 29632	Wire belt regulating device
31900	OPM 40132	Wedge zone

S-Tension

Group	Drawing No.	Designation
33100		S-tension rolls
33200	1PM 30224	S-tension roll bearing
33400	OPM 25739	Drive for S-tension
33500	2PM 40008	Brushes (+ holder)
33600		S-tension brackets
33300	1PM 40206	Cake control

P-Zone

34100	2PM 30017	Press roll
34200	1PM 30040	Press roll bearing
34300	2PM 40856	Pneumatic control P-zone
34400	OPM 26071	Drive for P-zone
34500	1PM 30902	Press water tray
34700	OPM 30950	Pneumatic loading and relieving device

Group Assembly Drawings SDM 80

Group	Drawing No.	Designation
10100	OPM 31252	Assembly drawing SDM 80 S-tension
	OPM 31253	Assembly drawing SDM 80 P-zone
		Assembly drawing SDM 80 S-P tension
10200	OPM 30030	Sludge headbox
10300	OPM 30370	Frame
10400	1PM 29641	Breast roll
10500	1PM 29618	Drive roll
10600	2PM 29629	Regulating roll
10700	1PM 29616	Table roll
10800	OPM 40515	Wire belt tensioning device
10900	2PM 29654	Breast roll bearing
11000	1PM 30032	Drive roll bearing
11100	2PM 40164	Table roll bearing
11200		Wire belt changing device
11300	1PM 31007	Doctor for breast roll
11400	OPM 27720a	Wire belt cleaning device
11500	1PM 31254	Doctor for top drive roll
11600	1PM 30919	Doctor for lower drive roll
11700	2PM 40865	Pneumatic control S-tension
11800	2PM 29632	Wire belt regulating device
11900	OPM 40123	Wedge zone

S-Tension

Group	Drawing No.	Designation
13100		S-tension rolls
13200	1PM 30002	S-tension roll bearing
13300	1PM 40206	Cake control
13400	OPM 25739	Drive for S-tension
13500		Brush (+ holder)
13600		S-tension brackets

P-Zone

14100	2PM 30380	Press roll
14200	1PM 30219	Press roll bearing
14300	2PM 40865	Pneumatic control P-zone
14400	OPM 26071	Drive for P-zone
14500	1PM 30942	Press water tray
14700	OPM 40054	Pneumatic loading and relieving device

List of Rolls for SDM 40

Group No.	Pieces	Description	Dimensions	Drawing No.	Weight	Design
40400	2	Breast roll	250Ø x 1150	2PM 30318	75 kg	Steel tube with 5mm rubber cover, 99-100 shore
40500	2	Drive roll	260Ø x 1150	1PM 30243	80 kg	Steel tube with 8mm rubber cover, 88-91 shore
40600	2	Regulating roll	100Ø x 1150	2PM 29627	23.7 kg	Steel tube with 6mm rubber cover, 94-96 shore
40700	18	Table roll	70Ø x 1150	2PM 24838	10.9 kg	Stainless steel pipe
43100	1	First S-tension roll	180Ø x 1150	2PM 30247	57 kg	Steel tube with 6mm rubber cover, 99-100 shore
	1	Second S-tension roll	160Ø x 1150	2PM 40357	45 kg	Steel tube with 5mm rubber cover, 99-100 shore
	1	Third S-tension roll	142Ø x 1150	2PM 30248	40 kg	Steel tube with 5mm rubber cover, 99-100 shore
	1	Fourth S-tension roll	------	-----	-----	----------
44100	7	Press roll	120Ø x 1150	2PM 29642	90.8 kg	Steel tube with 5mm rubber cover, 99-100 shore

List of Rolls for SDM 60

Group No.	Pieces	Description	Dimensions	Drawing No.	Weight	Design
30400	2	Breast roll	305Ø x 1700	1PM 29614	245 kg	Steel tube with 5mm CU cover
30500	2	Drive roll	310Ø x 1700	1PM 30021	279 kg	Steel tube with 8mm rubber cover, 94-96 shore
30600	2	Regulating roll	160Ø x 1700	2PM 30019	120 kg	Steel tube with 9mm rubber cover, 94-96 shore
30700	18	Table roll	130Ø x 1700	1PM 29613	75 kg	Steel tube with 5mm CU cover
33100	1	First S-tension roll	255Ø x 1700	2PM 40688	160 kg	Steel tube with 7.5mm rubber cover, 99-100 shore
	1	Second S-tension roll	180Ø x 1700	2PM 25463	305 kg	Solid roll body with rubber cover 99-100 shore
	1	Third S-tension roll	160Ø x 1700	2PM 25462	240 kg	Solid roll body with rubber cover 99-100 shore
	1	Fourth S-tension roll	210Ø x 1700	2PM 25981	140 kg	Steel tube with 5mm rubber cover 99-100 shore
34100	6	Press roll	230Ø x 1700	2PM 30017	260 kg	Steel tube with 5mm rubber cover 99-100 shore

List of Rolls for SDM 80

Group No.	Pieces	Description	Dimensions	Drawing No.	Weight	Description
10400	2	Breast roll	305Ø x 2200	1PM 29641	398 kg	Steel tube with 5mm CU cover
10500	2	Drive roll	310Ø x 2200	1PM 29618	362 kg	Steel tube with 7.5mm rubber cover 89-92 shore
10600	2	Regulating roll	160Ø x 2200	2PM 29629	139 kg	Steel tube with 9mm rubber cover 94-96 shore
10700	18	Table roll	130Ø x 2200	1PM 29616	88.5 kg	Steel tube with 6mm CU cover
13100	1	First S-tension roll	255Ø x 2200	2PM 30010	251 kg	Steel tube with 7.5mm rubber cover 99-100 shore
	1	Second S-tension roll	180Ø x 2200	2PM 30004	418 kg	Solid roll body with 5 mm rubber cover 99-100 shore
	1	Third S-tension roll	160Ø x 2200	2PM 30012	332 kg	Solid roll body with 5mm rubber cover 99-100 shore
	1	Fourth S-tension roll	210Ø x 2200	2PM 40133	216 kg	Steel tube with 5mm cover 99-100 shore
14100	6	Press roll	230Ø x 2200	2PM 30380	370 kg	Steel tube with 5mm rubber cover 99-100 shore

Group No.	Description	Pieces	Type
40800	Wire belt tensioning	8 4	DU-bushes MB 3530DU DU-bushes MB 4550DU
40900	Breast roll bearing	4	Self-aligning roller bearing 22206C (30/62 Ø x 20)
41000	Drive roll bearing	4	Self-aligning roller bearing 22212C (60/110 Ø x 28)
41100	Table roll bearing	36	Self-aligning roller bearing 1204 (47/20 Ø x 14)
41800	Regulating roll bearing	4 2	Barrel-shaped roller bearing 20207 (72/35 Ø x 17) ZMP Bushes (78/72 Ø x 38.7)
43200	S-tension roll bearing	8	Self-aligning roller bearing 22308C (30/72 Ø x 19)
44200	Press roll bearing	14	Self-aligning roller bearing 22308C (40/90 Ø x 33)
44400	Drive for P-zone	1	DU-bushes MB 4550DU
44700	Pneumatic loading and relieving device	8 8	DU-bushes MB 4030DU DU-bushes MB 4050DU

Group No.	Description	Pieces	Type
30800	Wire belt tensioning	8	DU-bushes MB 4550DU
		8	DU-bushes MB 6060DU
30900	Breast roll bearing	4	Self-aligning roller bearing 22208C (80/40 Ø x 23)
31000	Drive roll bearing	4	Self-aligning roller bearing 22216C (140/80 Ø x 33)
31100	Table roll bearing	36	Pendulum-ball bearing 1205 (52/25 Ø x 15)
31800	Regulating roll bearing	4	Barrel-shaped roller bearing 20207 (72/35 Ø x 17)
		2	ZMP-bushes 78/72 Ø x 39
33200	S-tension roll bearing	8	Self-aligning roller bearing 22308C (90/40 Ø x 33)
34200	Press roll bearing	12	Self aligning roller bearing 22308C (90/40 Ø x 33)
34400	Drive for P-zone	2	DU-bushes MB 5040DU
34700	Pneumatic loading and relieving device	12	DU-bushes MB 5060DU
		4	DU-bushes MB 5040DU

List of Bearings for SDM 80

Group No.	Description	Pieces	Type
10800	Wire belt tensioning	8	DU-bushes MB 4550DU
		8	DU-bushes MB 6060DU
10900	Breast roll bearing	4	Self-aligning roller bearing 22208C (80/40 Ø x 23)
11000	Drive roll bearing	4	Self-aligning roller bearing 22216C (140/80 Ø x 33)
11100	Table roll bearing	36	Pendulum-ball bearing 1205 (52/25 Ø x 15)
11800	Regulating roll bearing	4	Barrel-shaped roller bearing 20207 (72/35 Ø x 17)
		2	ZMP-bushes 78/72 Ø x 39
13200	S-tension roll bearing	8	Self-aligning roller bearing 22310C (110/50 Ø x 40)
14200	Press roll bearing	12	Self-aligning roller bearing 22310C (110/50 Ø x 40)
14400	Drive for P-zone	2	DU-bushes MB 5040DU
14700	Pneumatic loading and relieving device	12	DU-bushes MB 6060DU
		4	DU-bushes MB 6040DU

Group No.	Description	Pieces	Type
40300	Frame	4	Rubber sealing 160 x 100 x 1.5
40800	Wire tension	8	Wiper VK V4-1106
40900	Bearing for breast roll	4	V-ring 65S
41000	Bearing for drive roll	2 4	Oil ring 68/90 Ø x 10 V-ring V-85S
41100	Bearing for table roll	36	V-ring V-38S
43200	Bearing for S-roll	8	V-ring V-60
44200	Bearing for P-roll	14	V-ring S V-80S

Seals for SDM 60

Group No.	Description	Pieces	Type
30300	Frame	4	Rubber sealing 210 x 180 x 2
30800	Wire tensioning	8	Wiper
30900	Bearing for Breast Rolls	4	V-ring V-70S
31000	Bearing for Drive Rolls	4 2	V-ring V-110S Oil ring 120/95 Ø x 12
31100	Bearing for table rolls	36	V-ring V-45S
33200	Bearing for S-rolls	8	V-ring V-90S
44200	Bearing for P-rolls	12	V-ring V-95S

Group No.	Description	Pieces	Type
10300	Frame	4	Rubber sealing 210 x 180 x 2
10800	Wire tensioning	8	Wiper V4-982 (74/60 Ø x 8)
10900	Bearing for Breast roll	2	V-ring V-70S
11000	Bearing for Drive roll	4 2	V-ring V-110S Oil ring 120/95 Ø x 12
11100	Bearing for Table roll	36	V-ring V-45S
13200	Bearing for S-roll	8	V-ring V100
14200	Bearing for P-roll	12	V-ring V120S

Spraying Pipes on the Arus-Andritz SDM

	Spraying Pipe length (mm)	Spraying Pipe Nominal Dia. (In.)	Water Pressure (psi)	No. of nozzles in spraying pipe
SDM 20	1235	2"	60	6
SDM 40	1585	2"	60	11
SDM 60	2370	2"	60	17
SDM 80	3000	2"	60	21

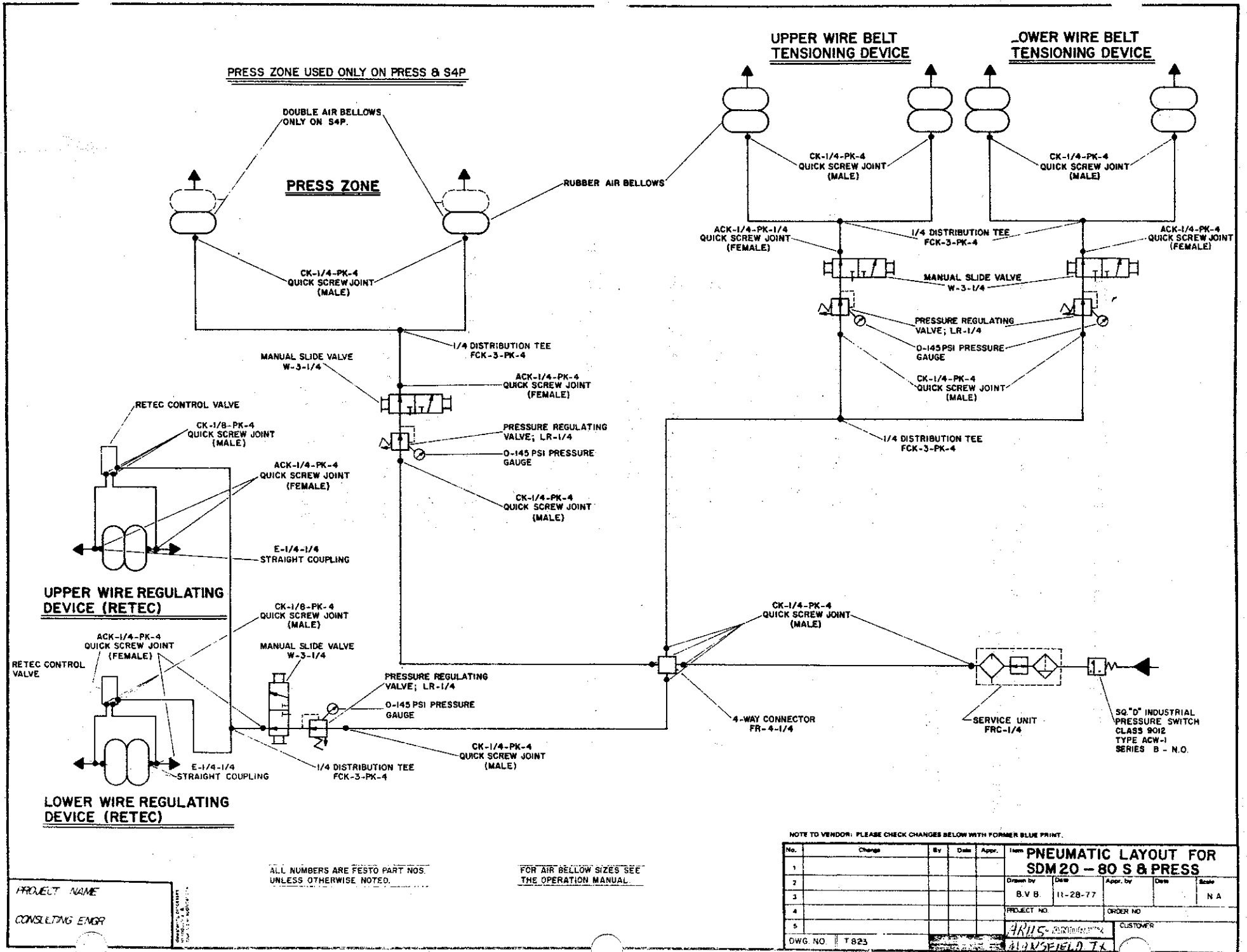
Our principle supplier of spraying pipes is the Albany Type 42. Each of these pipes have a pneumatic piston purge system for cleaning. For details see Section 8. - 'Belt Spray Assembly'.

Nozzle size: 2.5mm

Pneumatic Parts on the Arus-Andritz SDM

Pneumatic elements are supplied by the Festo Company.
(see pneumatic drawing # T-823)

No. Pieces	Description
1	Oiler FRC-¼
3	Pressure regulating valve LR-¼
3	Bracket HR-¼
3	Quick-valve W-3-¼
11	Quick connect CK-¼-PK-4
7	Quick connect ACK-¼-PK-4
4	T FCK-3-PK-4
15 mtr	Plastic tubing PK-4 blue
26	Seal O-¼
1	Stop B-¼
6	Quick connect CK-1/8-PK-4
6	Seal O-1/8
4	Double nipple E-¼-¼
4	Clamps KK-4
1	Cross FR-4-¼



ALL NUMBERS ARE FESTO PART NOS. UNLESS OTHERWISE NOTED.

FOR AIR BELLOW SIZES SEE THE OPERATION MANUAL

NOTE TO VENDOR: PLEASE CHECK CHANGES BELOW WITH FORMER BLUE PRINT.

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Item: PNEUMATIC LAYOUT FOR SDM 20 – 80 S & PRESS

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PROJECT NO. | ORDER NO.

CUSTOMER: ARMS Mansfield TX

DWG. NO. T 823

PROJECT NAME

CONSULTING ENGR

Air bellows on the Arus-Andritz SDM

The air bellows are used to keep the wire belts taut and to increase the pressure of the Press rolls. For a given pressure, a differing length of the air bellows on the wire tensioning device will create differing tensions on the wire. (See wire tensioning diagrams Ill. 21.)

	Wire Tensioning	P-Zone	P-zone on an S-P type
SDM 20	2 BO 7R	1 B 12	
SDM 40	2 BO 7R	1 B 12	
SDM 60	2 B 15R	1 B 15	
SDM 80	2 B 20R	1 B 20	2 B 12

All air bellows are stocked in Mansfield, Texas.

Doctor Blades on the Andritz SDM

The doctor blade on the drive rolls are used to remove the cake from the wire belts. Also, the lower breast roll has a doctor blade which:

a) cleans the breast roll

b) forces the water from the gravity zone into the filtrate tray.

The drive roll doctor blades are fitted with Lamort doctor blades (Material: Celeron Standard). The breast roll doctor blades are fitted with PVC doctor blades.

		Width mm	Thickness mm	Length mm	Hole Ø mm	No. of holes in blade
SDM 20	Drive roll	75	2.8	650	10	8
	Breast roll	65	5	650	10	8
SDM 40	Drive roll	75	2.8	1150	10	14
	Breast roll	65	5	1150	10	14
SDM 60	Drive roll	75	2.8	1700	12	12
	Breast roll	75	5	1700	12	12
SDM 80	Drive roll	75	2.8	2200	12	16
	Breast roll	75	5	2200	12	16

OPERATING INSTRUCTIONS

SERVO REGULATOR SRW 2oo

1. When starting the SERVO REGULATOR 2oo it should be kept in mind to have the master-, tension- and deviating rollers running parallel. Should the bearing fork of the regulator, after starting operation remain outside the middle (red marking is not matched), then the whole regulator must be shifted by the width of that range. The shifting is always done to that side to which the bearing fork is turned outside the middle position.

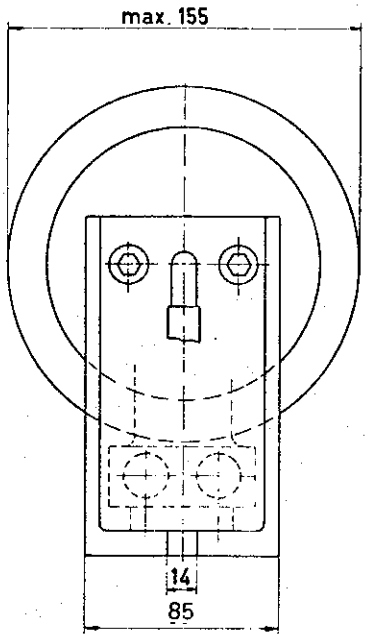
2. After fixing into place the SERVO REGULATOR 2oo, the control unit is moved close to the belt, so that the feeler plate lies in zero position and in contact with the belt. (Obtain flush position of red marking at stop on fixing pin - see schematic drawing SV 4o).

   This is the position in which the automatic control unit is fixed, then the pin is removed, and from that point on the unit can be operated.

3. The sensitivity of the control unit may be modified when in vertical position. The belt running in the upper range of the feeler plate causes the regulator's operation to set in earlier; when it runs in the lower range it will start operating later.
   The adjusting speed depends on air or water pressure. It is important to have the whole side of the feeler plate lie in contact with the belt edge, since otherwise both the feeler plate and the belt edge may wear out at an early date.

4. The SERVO REGULATOR's correct initial adjustment is accomplished if the unit keeps regulating around the middle marking, instead of one of the lateral ranges.
   Also in the normal case, the regulator should not keep moving from end position to end position.
   It is suggested to test the SERVO REGULATOR's basic adjustment before a new belt has been fitted or if the tension has been put out of adjustment.

5. Assuming a daily 24-hour operation the durability of the air-mounts we use is of more or less one year. In order to avoid any inconvenience we therefore suggest that the air-mounts be replaced after expiration of that period - independently of any possible wear-out.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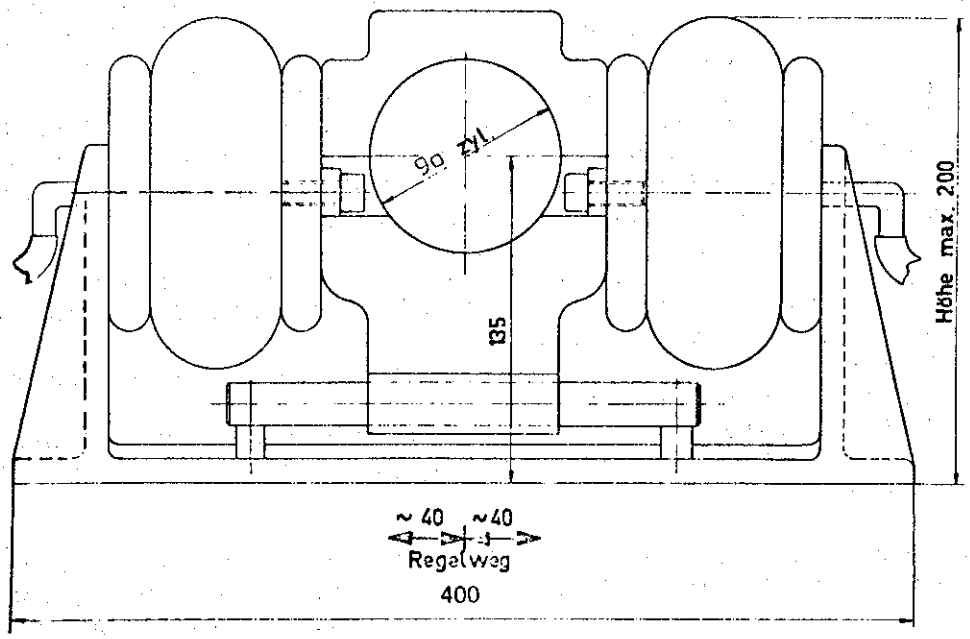
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INSTALLATION INSTRUCTION

SERVO REGULATOR SRW 2oo

1. The SERVOREGULATOR 2oo is to be installed into basic position so that the master roller will run in midposition of the unit, parallel to the other rollers of a pertinent group.
   The master roller should either be running within a belt between two rollers placed outside that belt, or outside the latter, between two rollers running inside it. This will secure a better reaction of the belt to be regulated, when the master roller is shifted.
   It is further desirable that, viewed in the direction the belt is running in, the roller following directly the master roller be located more close to the latter than the preceding one.

2. When installing the unit due care should be taken that the loop angle on the master roller is approx. 3o - 45°.
   The unit should always be placed in the half angle position of the loop angle.

   An equal level of both the regulator and the counter-support block is important.

3. The SERVO REGULATOR 2oo is equipped with two connectors for either air or water supply.

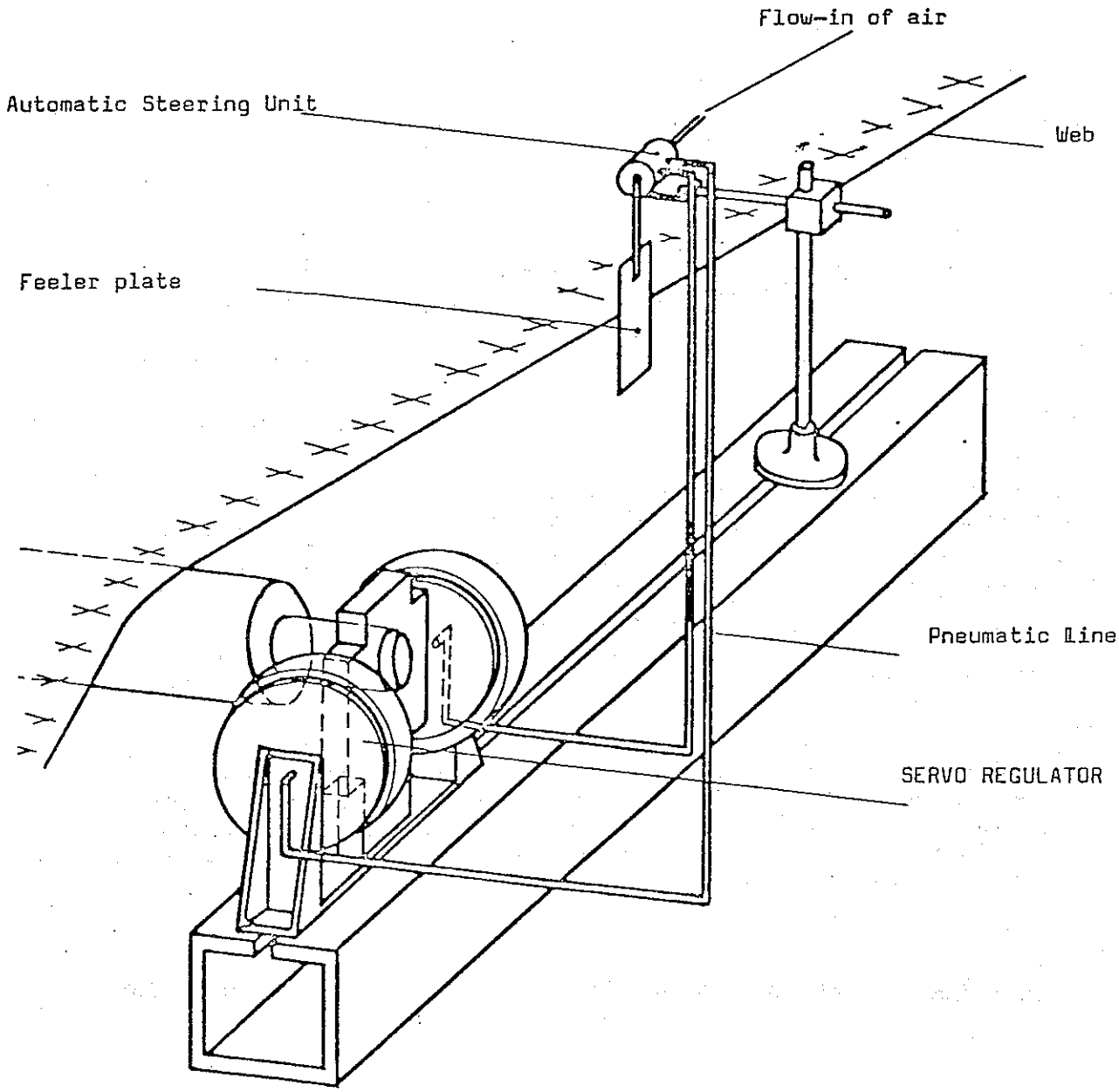
4. The automatic steering controll unit should be located either ahead or behind the regulator, but not farther than at a distance of 2.5 m from it.

5. Depending on the master roller's position and weight, the SERVO REGULATOR 2oo works by compressed air or hydraulic pressure between 1.8 - 3.5 atm. In case air propulsion is used each instrument will require a reduction station equipped with a water separator. An oil atomizer will be required to make sure that the reduced flow of air is sufficiently enriched with oil. Due care should be taken that this atomizer be installed rather close to the regulator, to prevent settling of the oil mist inside the line.

6. Standard equipment for SERVO REGULATOR 2oo includes a set of air connectors fitting a tube of Ø 8 mm or a Serto-screwing for a 6 x 1 mm nylon tube of 1/4'' G connecting worm. Profiles of 3/8'' G - 1/2'' G will be suitable for the outlets leading to the reduction station.

7. Assembling of the automatic control unit with support SV 1o or SV 3o is as follows.
The automatic controll unit should be installed close to a fixed roller located either ahead or behind the SERVO REGULATOR, in order to avoid that the feeler plate falls, by its own weight, into vertical position when the web is being untightened, which would cause, when tightened again, its lying inside it, thus damaging the web.

Chromium-plated plates are to be used for the wet part of the screen section and stainless steel plates are to be used in all other cases.

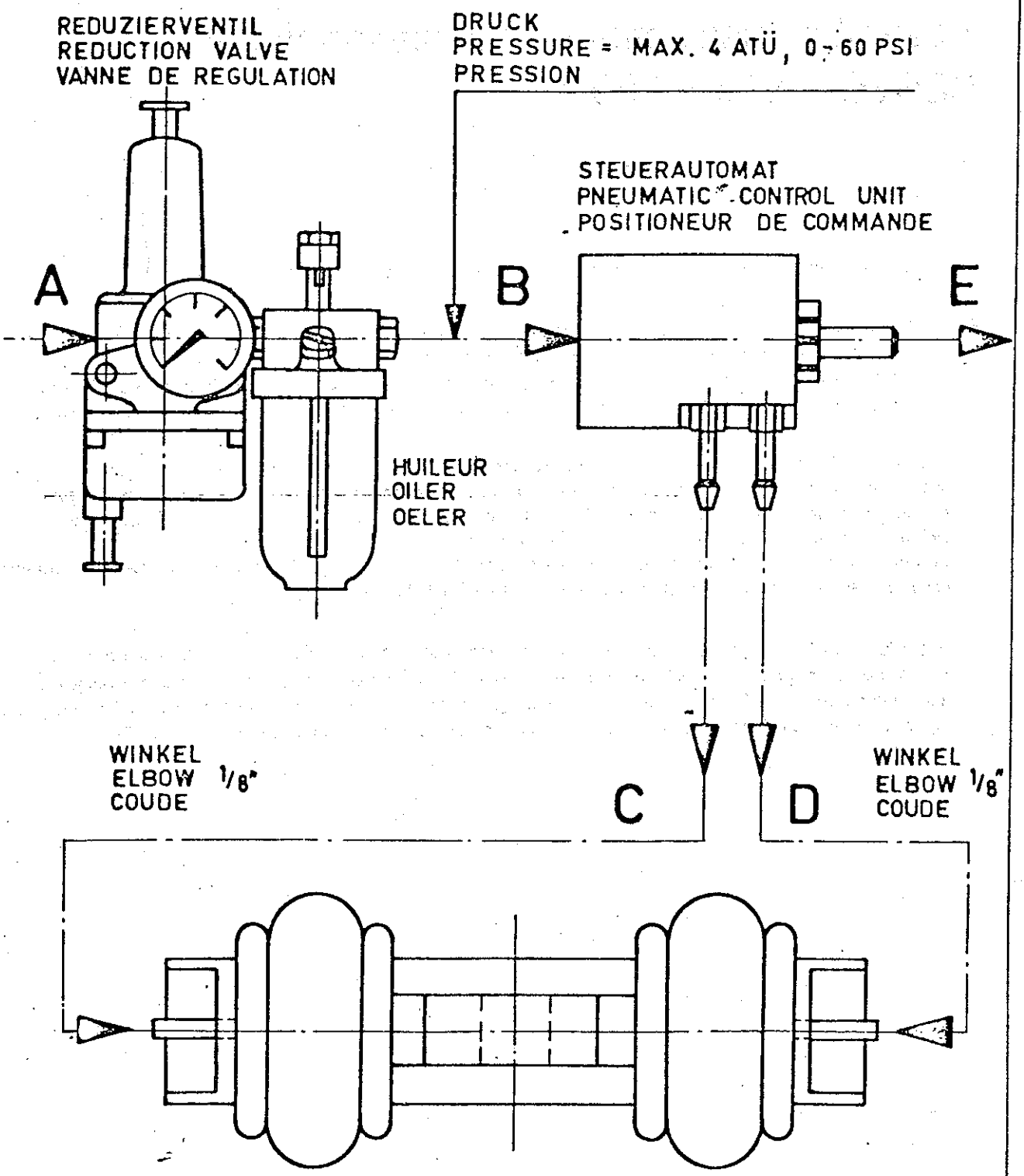

Flow-in of air
Automatic Steering Unit
Web
Feeler plate
Pneumatic Line
SERVO REGULATOR

CONNECTING INSTRUCTIONS OF PNEUMATICS

SERVO REGULATOR SRW 2oo

1. The connecting of air and water lines on SERVO REGULATOR 2oo is carried out correctly when done in accordance with the assembly diagramm SRW 2oo7.
2. Connect line "A", coming from the compressor, with pressure reduction valve.
3. Conduct line "B" from the reduction valve to the face side of the control unit.
4. From the side of the pneumatic control unit, run lines "C" and "D" respectively to the SERVO REGULATOR and connect to the air-mounts.
5. The direction of motion of the bearing fork may be altered by interchanging lines "C" and "D" on the SERVO REGULATOR.
6. Depending on the way of operation of the bearing fork a certain quantity of air or water will flow back through line "C" or "D" into the automatic control unit, and automatically reach the outside through line "E".
7. The linear speed of the support fork may be adjusted to the conditions desired by increasing the air pressure of the reduction valve. The maximum range of action of the manomter supplied together with SERVO REGULATOR 2oo is of o - 4 atm. In consideration however of the air-mounts durability it is suggested to keep the air pressure if possible between 1.5 and 2.5 atm.

<u>Attention</u>: The maximum pressure for air-mounts is of 4 atm. or 6o PSI


REDUZIERVENTIL
REDUCTION VALVE
VANNE DE REGULATION
DRUCK
PRESSURE = MAX. 4 ATÜ, 0-60 PSI
PRESSION
STEUERAUTOMAT
PNEUMATIC CONTROL UNIT
POSITIONEUR DE COMMANDE
A
B
E
HUILEUR
OILER
OELER
WINKEL
ELBOW 1/8"
COUDE
C
D
WINKEL
ELBOW 1/8"
COUDE

Assembly Instructions of scanning finger SERVO-REGULATOR

1. The assembly of scanning finger is done in accordance with assembly diagram SV 40.

2. On the back of the pneumatic control unit is a red middle mark. A further red mark is to be found on the control shaft. The two marks are to be aligned by turning the control shaft accordingly.
   In this position the air supply to the SERVO-Regulator is of equal pressure through both line "C" and line "D"; the support fork remains immobile as a result of the equal pressure in the two air chambers.

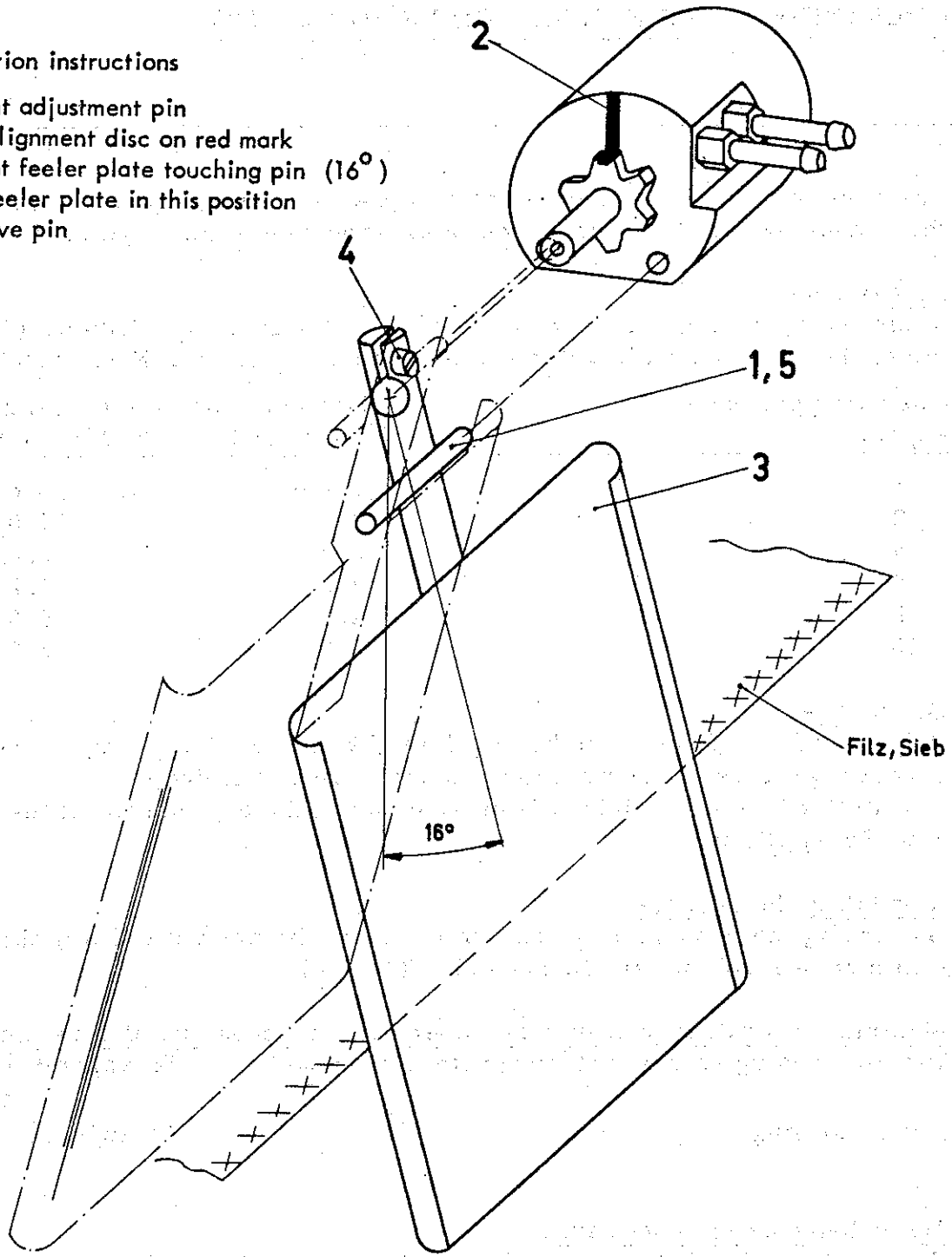
3. Loosen the clamping screw on the arm of the scanning finger and push the latter on to the control shaft. The pin diam. 6 mm is now pushed into one of the two holes provided, depending upon whether the scanning finger is to scan the r.h. or l.h. side of the web. The arm of the scanning finger is now swivelled out until it tests against the pin diam. 6 mm.
   In this position, the scanning finger deviates from the central axis by 16^{o} ; **the two red marks should now cover one another.** Secure the clamping screw and **pull out the pin!**

4. In the base of the pneumatic control unit, two threaded holes M6 are bored, so that the apparatus can be mounted on a bar or bracket over the web. The pneumatic control unit complete with fixing arrangement and hanging scanning finger can then be moved against the edge of the web until the two red markings are again in alignement. The control unit should then be secured in this position.

RETEC

Installation instructions

1 Mount adjustment pin
2 Set alignment disc on red mark
3 Mount feeler plate touching pin (16°)
4 Fix feeler plate in this position
5 Remove pin



INSTRUCTIONS FOR INSTALLATION AND OPERATION OF FINE SPRAY OILER MODEL 292

The Fine Spray Oiler enriches the compressed-air by means of a fine oil spray thus ensuring reliable lubrication of air-operated tools, cylinders, valves, etc.

Please note:
Minimum operating pressure 0.5 kp/cm^2. Minimum air volume (Nm^3/h) see table. The minimum air volume was measured with 2.8°E oil (50°C (122°F)).

Operating pressure kp/cm^2	Minimum air volume (Nm^3/h) R 1/8" - R 104"	R 3/8" - R 1/2"
1	1.8	2.6
2	2.0	3.0
4	2.8	3.6
6	3.5	4.2
8	4.1	4.5
10	4.2	5.0

Oil dosage:
If necessary oil dosage can be regulated by means of a dosing screw. Transparent sight glas for controlling required number of drops.
5 - 10 % of the oil visible will be taken up in the air current at the exit of the Fine Spray Oiler.

Regulating the passage:
By turning the passage regulator to the right the amount passing through and the minimum air volume are increased. (0 - 1)

Maximum operating pressure and operating temperature of Fine Spray Oiler:

Plastic housing with or without protective basket	16 kp/cm^2 - 10° to + 50°C (14° to 122°F)
Brass housing	25 kp/cm^2 - 10° to + 90°C (14° to 194°F)

Makrolon-plastic containers:
Do not clean plastic housings with anything other than water, petroleum or gasoline. Under no circumstances should benzol, acetone, cleaning agents containing tri or similar agents be used.
Do not pour liquids containing softeners eg. alcohol, glysantine etc. into plastic housing out of Makrolon.

Filling oil:
Before filling with oil turn off air supply, remove filler plug, then fill container up to filling mark (approx. 2/3). Close well.

Oil brands:
2.5 - 7°E (16 - 55 cSt) at 50°C (122°F) see table

Oils for Makrolon container:

Oils for light load:

BP	HP 10	2.7 E
DEA	Seraplus 2	2.4 E
Esso	Esstic 42	2.8 E
Mobil	D.T.E. Oil Light	2.9 E
Shell	Tellus Oil 27	3.0 E
Veedol	Avalon 50	3.0 E
Öl-Held	AVILUB RSL 6	3.0 E

SPECIAL INSTRUCTIONS FOR TYPE 42 NOZZLE ASSEMBLY

Each nozzle is factory assembled per drawing 42-002-002. If, for any reason, disassembly is necessary, the screw retainer (Part No. 42-201-001) must be replaced.

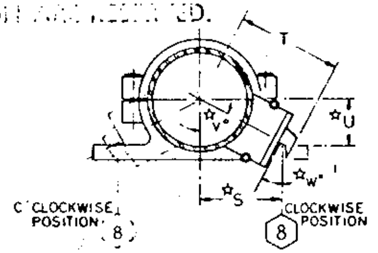
Removal of the screw retainer is accomplished by bending the tab over the hex head screw away from the screw. The screw can then be removed, which will allow access to the screws which hold the assembly together.

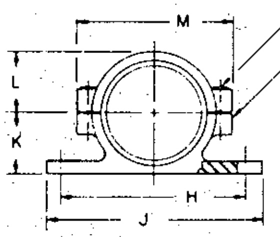
When the nozzle is reassembled, a new screw retainer should be used. The tab on the screw retainer must be bent up against the flat on the hex head screw to prevent any turning of the screw relative to the retainer. The remainder of the tab should be bent over the top of the hex head screw as shown on drawing 42-002-002.

IS THE ... ... CONTRACTED OR BY EXPRESS ... ... OF REPRODUCTION ... ED.

SHOWER SIZE	H	J	K	L	M	N	P	Q	R	☆S	T	☆U	☆V°	MAX. ALLOW. (6) SCH. 10	SCH. 40	☆W°
S-2 PIPE	4.50	5.25	1.437	1.437	3.75	1.25	.625	2.0	.812	2.27	2.75	.83	70°	130		20
B-2½ PIPE	5.375	6.50	1.687	1.687	4.25	1.25	.625	2.0	.875		3.0			180		
C-3 PIPE	6.0	7.0	2.000	2.000	5.00	1.25	.625	2.0	.938		3.3			220		
D-4 PIPE	7.75	9.0	2.562	2.562	6.50	1.25	.625	2.0	1.06		3.8			320	360	
E-6 PIPE	10.375	12.0	3.812	3.812	9.375	2.5	1.25	2.0	1.44		4.9			440		

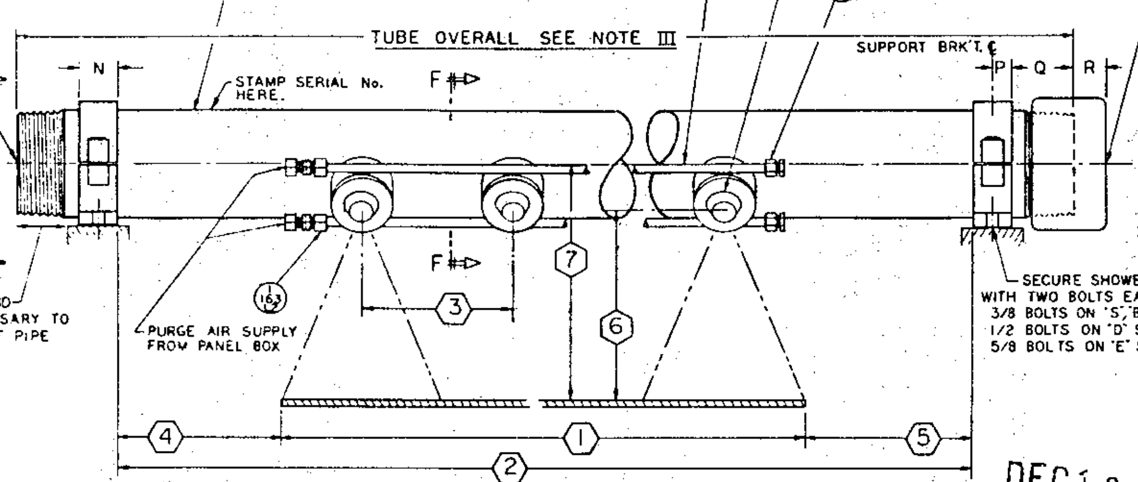
☆ FILL IN DIMENSIONS PER NOZZLE INSERT USED FROM FORM Nº 315





2" SCH. 10
2½" SCH. 10
3" SCH. 10
4" SCH. 10
4" SCH. 40
6" SCH. 10
TYPE 316 L STN. STL. PIPE

MAX. SHOWER PRESSURE 300 PSIG.
MAX. NOZZLE PRESSURE 300 PSIG
OPER. PRES. ORDERED 120 PSIG
DATE TEST ________ BY ________



STANDARD SHOWER HAS MALE NPT THREADED ENDS AND FITTING CAP AS SHOWN. ALL OTHER PIPING & FITTINGS TO BE SUPPLIED BY CUSTOMER

IF SHOWER BRACKET SUPPORTS EXTEND BEYOND BRACKETS, IT MAY BE NECESSARY TO SHIM BRACKETS FOR CLEARANCE OF PIPE FITTINGS.

DEC 13 1979

NOTES:

I - SHOWER WILL BE MADE TO STANDARD DIMENSIONS UNLESS OTHERWISE SPECIFIED.

II - INLET MAY BE LOCATED EITHER END OF SHOWER

III - NOZZLE TUBE LENGTH: DIM. 2 + 6.5 = 102

IV - END OF TUBE TO FIRST NOZZLE - INLET END -
A FANS FOR FULL COVERAGE: DIM. 4 + 3.25
B FANS FOR STD. COVERAGE: (SHOWN) DIM. 4 + 3.25 + HALF DIM. 3 =

C - OTHER NOZZLE TYPE = 11

V END OF TUBE TO LAST NOZZLE - CAPPED END -
A - FANS FOR FULL COVERAGE: DIM. 5 + 3.25 =
B - FANS FOR STD. COVERAGE: (SHOWN) DIM. 5 + 3.25 + HALF DIM. 3 =
C - OTHER NOZZLE TYPE = 11

VI FIRST TO LAST NOZZLE 80

E-SIZE SHOWER ONLY

ON NOTE III ADD 2½ INCHES TO PREVIOUSLY DERIVED FIGURE

ON NOTES IV AND V ADD 1¼ INCHES TO PREVIOUSLY DERIVED FIGURES.

INFORMATION REQUIRED

(1) SURFACE TO BE SHOWERED 830 INCHES
(2) INSIDE SHOWER BRACKETS NO BRACKETS INCHES
(3) NOZZLE SPACING 4.0 INCHES
(4) SHOWERED SURFACE TO BRACKET - INLET END - N/A INCHES
(5) SHOWERED SURFACE TO BRACKET - OPP. END - N/A INCHES
(6) NOZZLE TO SHOWERED SURFACE 4" INCHES
(7) ℄ OF SHOWER TO SHOWERED SURFACE ______ INCHES
(8) NOZZLE DIRECTION ☒ CLOCKWISE / ☐ COUNTER CLOCKWISE // 6:00 O'CLOCK

MACHINE No. SM 80 MAX. FT./MIN.
MILL TAIT-ANDRITZ
ADDRESS LUBBOCK, TX 79404
CUSTOMER ORDER No. 1363
APPLICATION
SIGNATURE

PANEL BOX No. —
NOZZLE ASM. No. 42-002-004
21 NOZZLES, INSERT Nº: 42-127-001
WILL YIELD 35 GPM AT 120 PSI (NORMAL OPERATING)
114 GPM AT 120 PSI (PURGE CYCLE)
SHOWER SERIAL No. 19710 - 19719
AES ORDER No. 79-6513
FILTER
DATE SHIPPED

10 REQ'D

GLENS FALLS, NEW YORK, U.S.A.
POINTE CLAIRE, QUEBEC, CANADA
SLOUGH, ENGLAND
ALBANY ENGINEERED SYSTEMS
A Division of Albany International

STATIONARY SHOWER W/ PISTON PURGE NOZZLES

DR BY		DATE	9-24-79
CHK BY	REJ	DWG NO.	S-42-4F
SCALE			

BROUGHTON TYPE 42 STATIONARY SHOWER
PARTS LIST

PART NO.	QTY	DESCRIPTION & MATERIAL
		"S" - SIZE 2" PIPE
42-002-004	21	PISTON PURGE NOZZLE - SEE ASM.
42-114-001	___	UNION - STAINLESS STEEL
743D	4	SOCKET HEAD CAP SCREW - STAINLESS STEEL
1163L2	2	UNION (TUBE x TUBE) - STAINLESS STEEL
1163W2	2	TUBE CAP - STAINLESS STEEL
2013J2	1	PIPE CAP (THREADED) - STAINLESS STEEL
2112A	1	2" SCH. 10 NOZZLE PIPE - STAINLESS STEEL
2147B	2	SUPPORT BRACKET - BRONZE
2928B	5.5 FT.	TUBING - STAINLESS STEEL
		"B" - SIZE 2½" PIPE
42-002-___	___	PISTON PURGE NOZZLE - SEE ASM.
42-114-001	___	UNION - STAINLESS STEEL
743G	4	SOCKET HEAD CAP SCREW - STAINLESS STEEL
1163L2	2	UNION (TUBE x TUBE) - STAINLESS STEEL
1163W2	2	TUBE CAP - STAINLESS STEEL
2013K2	1	PIPE CAP (THREADED) - STAINLESS STEEL
2112B	1	2½" SCH. 10 NOZZLE PIPE - STAINLESS STEEL
2147E	2	SUPPORT BRACKET - BRONZE
2928B	___FT.	TUBING - STAINLESS STEEL
		"C" - SIZE 3" PIPE
42-002-___	___	PISTON PURGE NOZZLE - SEE ASM.
42-114-001	___	UNION - STAINLESS STEEL
743F	4	SOCKET HEAD CAP SCREW - STAINLESS STEEL
1163L2	2	UNION (TUBE x TUBE) - STAINLESS STEEL
1163W2	2	TUBE CAP - STAINLESS STEEL
2013L2	1	PIPE CAP (THREADED) - STAINLESS STEEL
2112C	1	3" SCH. 10 NOZZLE PIPE - STAINLESS STEEL
2147H	2	SUPPORT BRACKET - BRONZE
2928B	___FT.	TUBING - STAINLESS STEEL
		"D" - SIZE 4" PIPE
42-002-___	___	PISTON PURGE NOZZLE - SEE ASM.
42-114-001	___	UNION - STAINLESS STEEL
1163L2	2	UNION (TUBE x TUBE) - STAINLESS STEEL
1163W2	2	TUBE CAP - STAINLESS STEEL
2013M2	1	PIPE CAP (THREADED) - STAINLESS STEEL
2014H	4	SOCKET HEAD CAP SCREW - STAINLESS STEEL
2112D	1	4" SCH. 10 NOZZLE PIPE - STAINLESS STEEL
2112D3		4" SCH. 40 NOZZLE PIPE - STAINLESS STEEL
2147L	2	SUPPORT BRACKET - BRONZE
2928B	___FT.	TUBING - STAINLESS STEEL
		"E" - SIZE 6" PIPE
42-002-___	___	PISTON PURGE NOZZLE - SEE ASM.
42-114-001	___	UNION - STAINLESS STEEL
1163L2	2	UNION (TUBE x TUBE) - STAINLESS STEEL
1163W2	2	TUBE CAP - STAINLESS STEEL
2013N2	1	PIPE CAP - STAINLESS STEEL
2112E	1	6" SCH. 10 NOZZLE PIPE - STAINLESS STEEL
2147N	2	SUPPORT BRACKET - BRONZE
2515F	4	SOCKET HEAD CAP SCREW - STAINLESS STEEL
2928B	___FT.	TUBING - STAINLESS STEEL

TYPE 42 PISTON PURGE NOZZLE
FLOW CHART

NOZZLE #	106	122	147	148	118	123	124	131	125	127	109	136	129	121	130	FLOW AT PURGE*	
ANGLE	JET	30°	30°	30°	40°	45°	45°	45°	45°	60°	60°	77°	90°	100°	120°		
PSI																	PSI
20	GPM .15	GPM .85	GPM 2.4	GPM 1.4	GPM .85	GPM .17	GPM .27	GPM 1.03	GPM 1.4	GPM .72	GPM 1.35	GPM .34	GPM .87	GPM 1.00	GPM 1.02	4.0	2
40	.23	1.22	3.4	2.1	1.20	.25	.40	1.44	2.02	1.00	1.89	.56	1.21	1.41	1.41	5.44	4
60	.28	1.51	4.0	2.6	1.47	.32	.50	1.76	2.50	1.22	2.29	.72	1.46	1.72	1.71	6.50	6
80	.32	1.76	4.7	3.1	1.70	.38	.58	2.02	2.91	1.39	2.63	.86	1.67	1.98	1.96	7.40	8
100	.36	1.97	5.2	3.5	1.90	.44	.66	2.26	3.27	1.55	2.93	1.0	1.86	2.21	2.17	8.17	10
120	.39	2.17	5.7	3.9	2.09	.49	.72	2.47	3.61	1.68	3.20		2.02	2.42	2.37	8.86	12
140	.42	2.35	6.2	4.2	2.26	.54	.79	2.66	3.91	1.81	3.45		2.18	2.61	2.54	9.49	14
160	.45	2.52	6.6	4.4	2.41	.58	.85	2.84	4.20	1.93	3.68		2.32	2.79	2.71	10.08	16
180	.48	2.68	7.0	4.7	2.56	.63	.90	3.01	4.47	2.04	3.89		2.45	2.95	2.86	NR	18
200	.50	2.83	7.5	5.0	2.70	.67	.96	3.17	4.73	2.14	4.10		2.58	3.11	3.01	NR	20
250	.56	3.19			3.02	.76	1.08	3.54	5.32	2.38	4.56		2.86	3.47	3.34	NR	25
300	.59	3.51			3.31	.85	1.19	3.86	5.86	2.59	4.98		3.12	3.80	3.64	NR	30
400	.68																
500	.75																
600	.88																
700	.95																

NOZZLE NUMBER 42-___-001 & -002

*Flow at Purge all Nozzles.

FORM #298
REVISED 11/30/79

ALBANY ENGINEERED SYSTEMS
GLENS FALLS, NY 12801

42 NOZZLE ASSEMBLY

DISASSEMBLY

The first step of disassembly is to remove the screw retainer, which may be an individual cover, wire lacing, or a full length cover, keeping in mind that it must be reassembled for nozzle screw retaining safety.

Once retainer is off, the flange washer screws will be visible and/or ready for removal. When the screws are removed, all nozzle parts are free for removal. See sketches attached for visual aids.

WORKING PARTS REMOVAL

Nozzle Hood with Insert

These parts are sold as one unit, which may be replaced if insert become worn or damaged.

Nozzle Piston Seal

This is a flexible seal with a stainless steel washer insert. Its main purpose is an alignment guide for the moving piston. If the inner diameter of this seal becomes worn or curled, replace.

Nozzle Piston

This is the only moving part of the nozzle and therefore, subjects its upper and lower lip seals to wear conditions. The life of these lip seals will depend directly upon the frequency of nozzle purging.

Removal of lip seals can be accomplished by prying over seats or cutting in two. During this procedure, do not deform or burr piston seats.

Installation of new seals is by stretching over seats, keeping the upper seal with its flared end up and the lower seal with its flared end down.

Light lubrication of outer diameters of seals with a silicone (equal to Dow Compound #11) will ensure proper seal life.

Nozzle Base

These bases are machined internally for seal surfaces and should be properly maintained. "When cleaning, do not pick at surfaces with sharp objects." All other parts are readily replaceable, but to replace a base would be costly and time consuming.

REASSEMBLY

Piston should be replaced into base until it bottoms out.

Piston Seal is placed over piston shank and into base.

Nozzle Hood is replaced on top of piston seal and into base. Position hood in desired direction for water discharge per application.

Flange Washer is placed over hood and down until it rests on hood lip. Insert the same number of screws, in the same positions from which they were removed.

Replace the wire lacing or screw retainer and safety features to ensure that the screws will remain tight during operation. Check all nozzles and safety retainer(s) before returning the shower to operation.