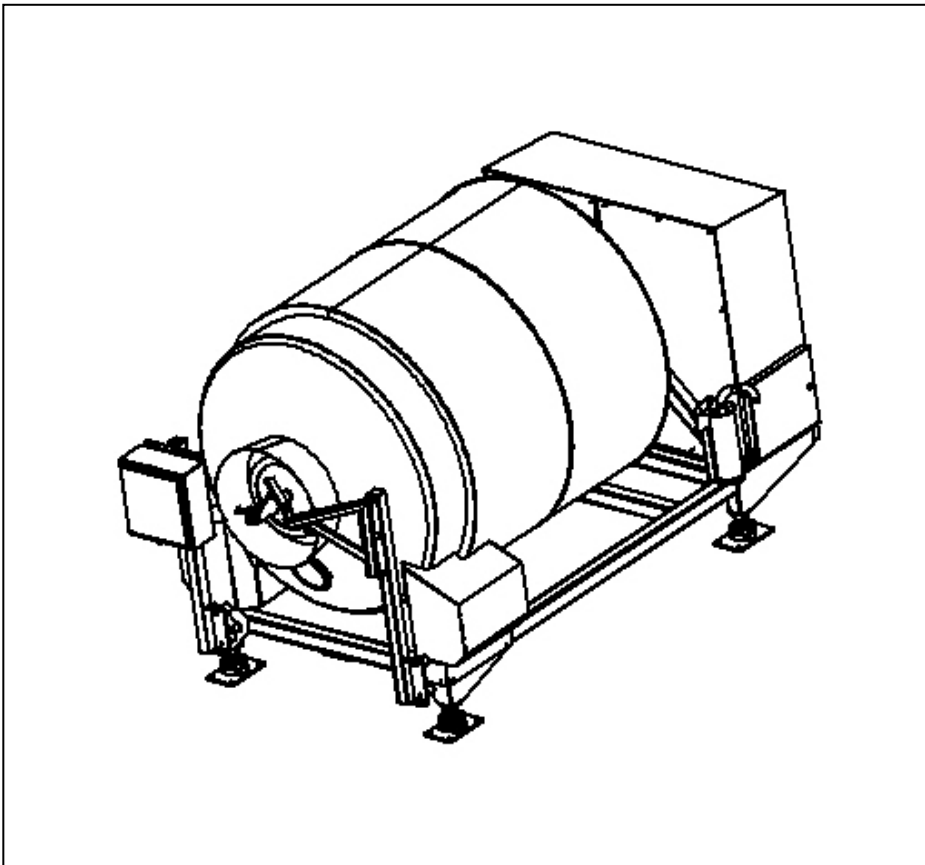


#7811

MODEL 175

GLYCOL VACUUM TUMBLER



Operation & Maintenance Manual

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Preface

This machinery is custom built for the meat processing industry and as such has inherent risks. All personnel involved in its installation, operation and maintenance should read and fully understand the contents of this manual before attempting to install, operate or maintain this equipment.



American Food Equipment Corporation
21040 Forbes Street
Hayward, CA 94545
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Safety Information

Safety Symbols

The following safety symbols are used throughout this manual. These symbols and their meanings should be fully understood by personnel prior to installing, operating or servicing the equipment.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or damage to the equipment.

**WARNING**

Turn off and lock out machine power sources(s) following the lockout/tagout procedures described in OSHA CFR 29 1910.147 Code of Federal Regulations (or equivalent).

Where references to shutting off and locking out power are made in this manual, unless indicated otherwise, ensure that the power to all systems is off and locked out with a padlock. This includes electrical, hydraulic and pneumatic circuits.

1. Do not, under any circumstances or for any reason, place hands, feet or any part of your body in or around the moving carriage when the unit is operating.
2. If it does become necessary to perform service, be absolutely certain that:
 - a. Power to all motors is off and locked out.
 - b. Main disconnect is off and/or fuses are removed from the main power source.
 - c. Stored energy in hydraulic and/or pneumatic circuits is relieved.
3. Do not install any walkways or service platforms which would allow any persons to reach dangerous nip or pinch points while the machine is operating.
4. Never reach into the hopper, trough or discharge chute. Use long handle tools to remove foreign objects or product from these areas.
5. If foreign object fall into the hopper, trough or feed screw, do not attempt retrieval while the unit is in operation. Shut off and lock out the power first.
6. Even with power disconnected, make sure no one is working inside a non-operative system while removing or installing drive belts and/or chains, or when servicing any part of the drive system.
7. After power is shutoff, the hydraulic circuit may still be energized. Disconnect the power and lock out the switches with a padlock. Bleed off any residual pressure before service any of the hydraulic components.
8. Keep hands and tools away from all product outlet and inlet areas until the machine has completely stopped and power is locked out with a padlock.
9. Some parts requiring service are heavy. Wear steel-toed shoes when servicing. Wear protective goggles to protect the eyes when cleaning.
10. Ensure that are safety guards including drive system guards are in place before operating. Replace safety stickers if they become loose, lost, fragmented, discolored or faded.
11. Use adequate ear protection when operating this equipment. Sound levels on this system may exceed 85dB.
12. No work is to be performed on this machine without the operator's knowledge.
13. Do not use this machine for a purpose other than the original intended use.

Section 1 / Overview

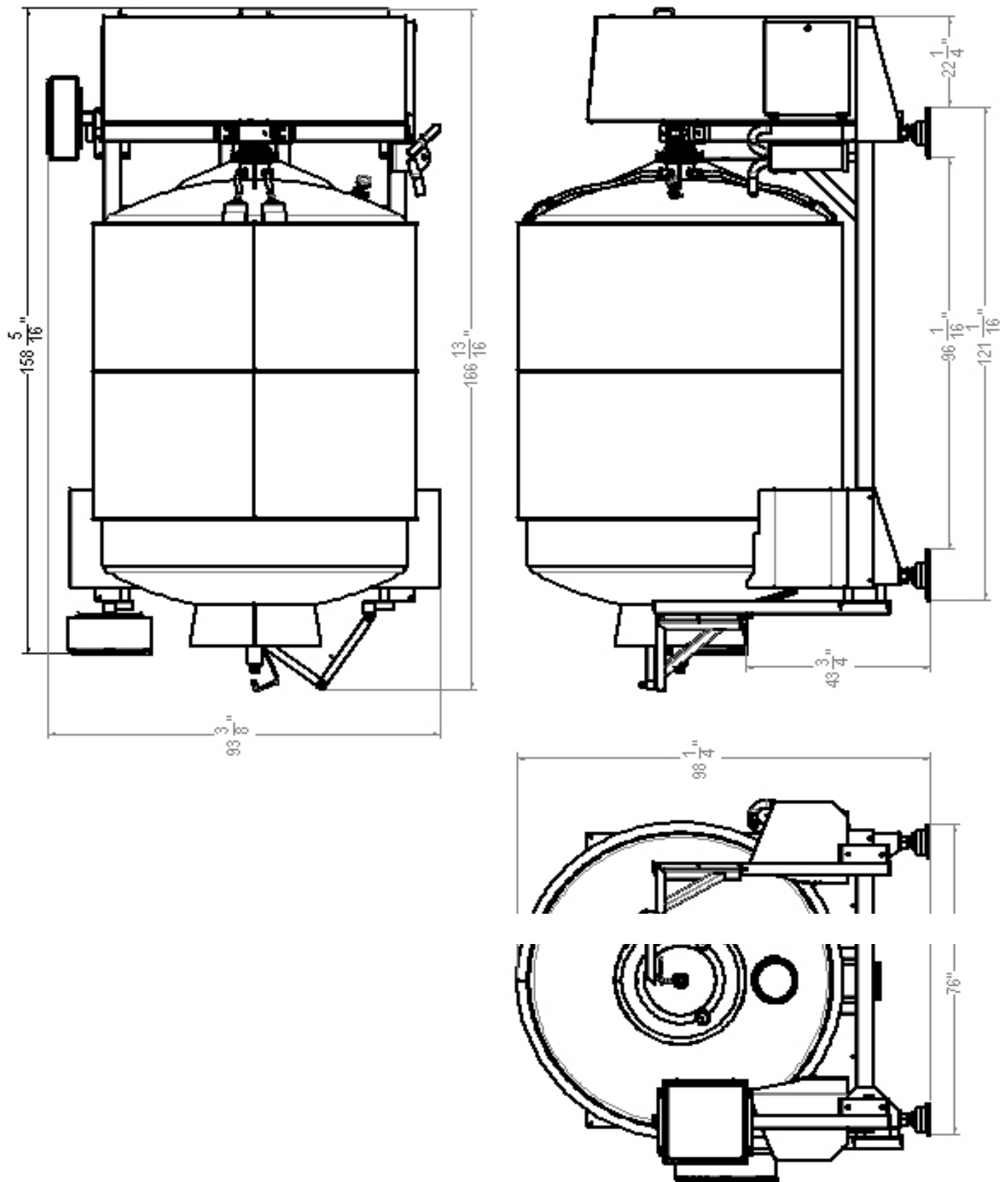
Scope

This manual covers AMFEC Model 175 Glycol Vacuum Tumbler under the following serial numbers:

AMFEC Serial Number	Customer	Warranty Date
147811 A,B,C,D	Hillshire	05/01/2016

Specifications

Envelope Drawing



Parameter	Value
Rated Capacity	5000 lbs (90 cu. Ft @ 55lbs/cu. Ft.)
Drum Diameter (max)	76 1/2 in.
Drum Length (max)	110 in.
Door Diameter (max)	18 in.
Dumper Weight (Tare)	10000 lbs
Dumper Weight (Gross)	15000 lbs

General Description

The AMFEC Model 175 Vacuum Tumbler is designed to process loads up to 5000 lbs. The design incorporates a high quality gear motor and chain driven pulley reduction to accommodate speeds from 1.4 to 14 rpm through an adjustable Variable Frequency Drive (VFD). The unit provides the option to run under vacuum for reduced processing times. The vacuum generation is provided by a high quality rotary vane vacuum pump and solid state vacuum transducer for measuring the vacuum setpoint.

The 175 Vacuum tumbler is designed to load/tumble in the CCW direction (facing the door) and discharges when rotating in the CW direction when facing the door.

Section 2/Installation

Lifting Points & Center of Gravity

Once removed from the shipping skid, the system may be lifted with appropriately rated slings in the locations shown in the lifting diagram in Figure 2. This system is designed to mount to customer-supplied load cells, interface plates and mounting hardware. Once mounted, ensure that the fasteners are torqued correctly.



DANGER

Crush hazard. Keep all personnel clear of the immediate area when lifting the unit. Use only qualified personnel experienced in rigging of large equipment. Be aware of the unit's center of gravity and sling to achieve a stable, balanced load. Use slings with working capacities in excess of the specified tare weight.

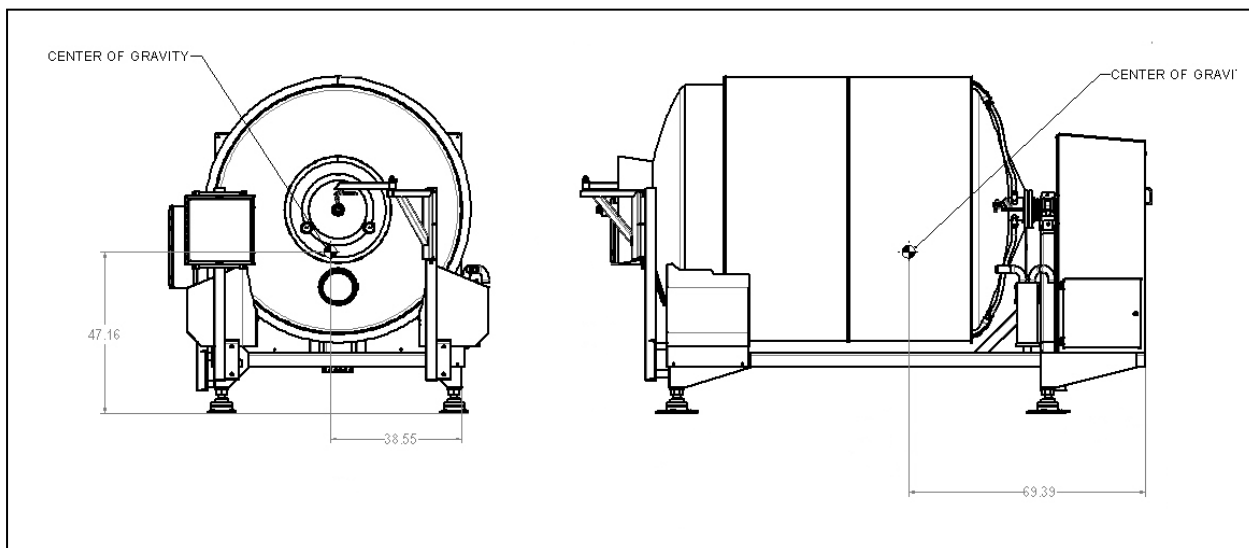


Figure 2 - Lifting Diagram

Dynamic Envelope

The model 175 vacuum tumbler door swings through an arc as door is opened as shown in Figure 3. Ensure that adequate clearances exist in and around the door swing as well as the utility panel area when installing the unit.

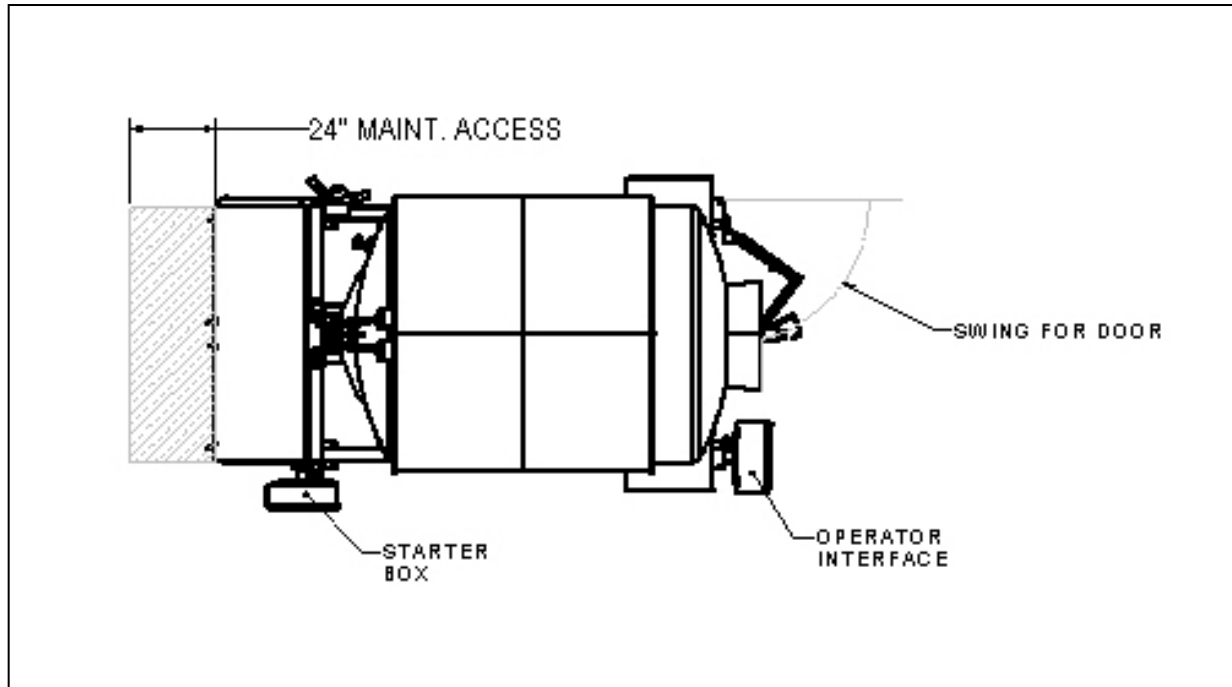


Figure 3 – Dynamic Envelope

**DANGER**

Crush Hazard. Tip Over Hazard. This system is designed to be properly anchored to the facility floor prior to operation. Failure to properly secure the unit to the floor may result in the unit moving or tipping over when in use.

Anchoring

This unit was designed to be anchored to a concrete floor. AMFEC recommends the use of Hilti Epoxy anchors when bolting the unit to the floor. Do not operate the system without properly anchoring the unit to the floor.

**DANGER**

Electrocution Hazard. Ensure that power is disconnected prior to making any electrical connections to the motors. It is the end users responsibility to provide adequately sized disconnect, fuses or breakers and to follow industry standard Tag Out/Lock Out procedures. All wiring must be in accordance with national and local regulations and should be done so only by qualified electricians.

Section 3/Operation



WARNING

Crush hazard. Use caution when working in or around an operating tumbler. Ensure that the area in and around the tumbler is clear before starting drum rotation. Do not crawl under the tumbler without tagging and locking out the power sources.

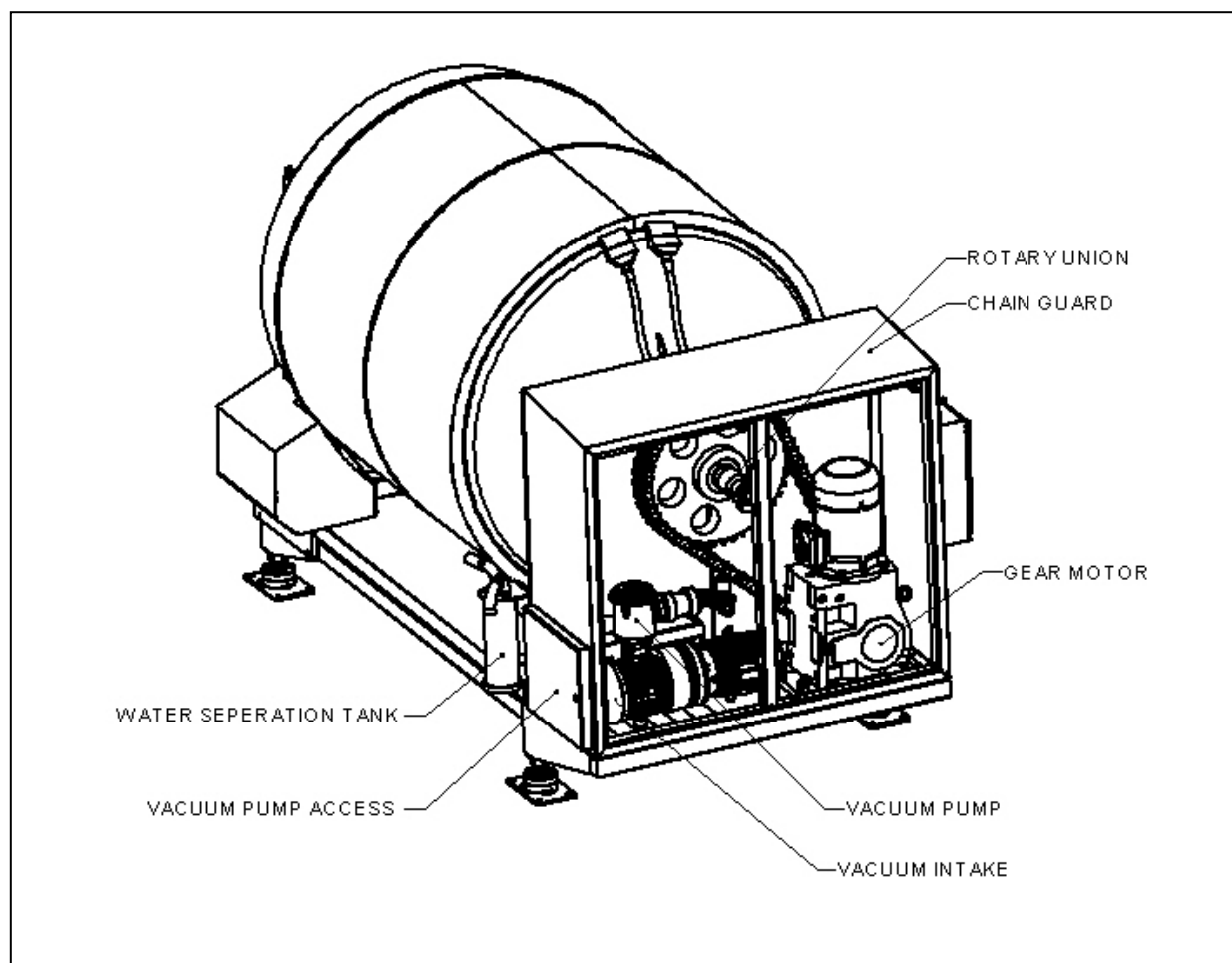


Figure 4 – Key Features

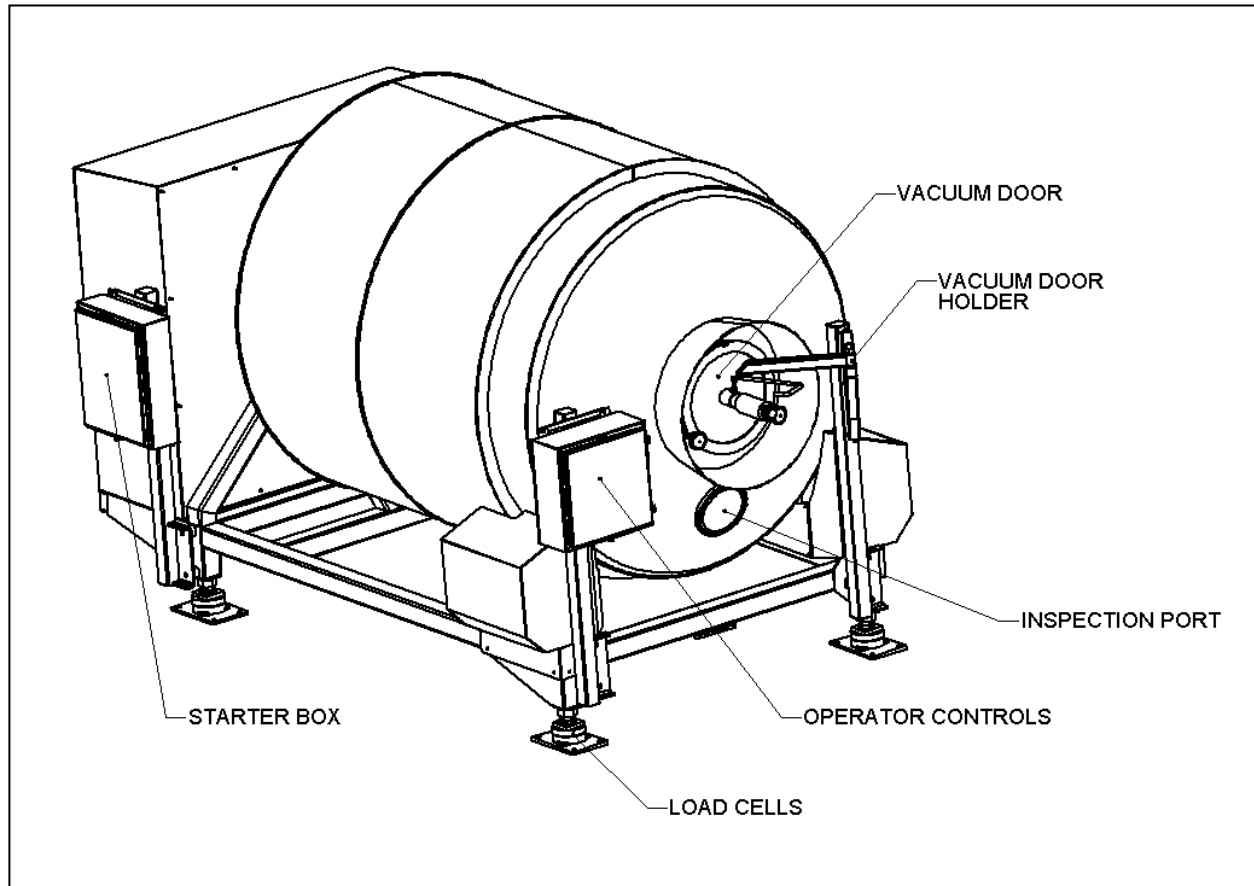


Figure 5 – Key Features

Section 4 / Operator Controls

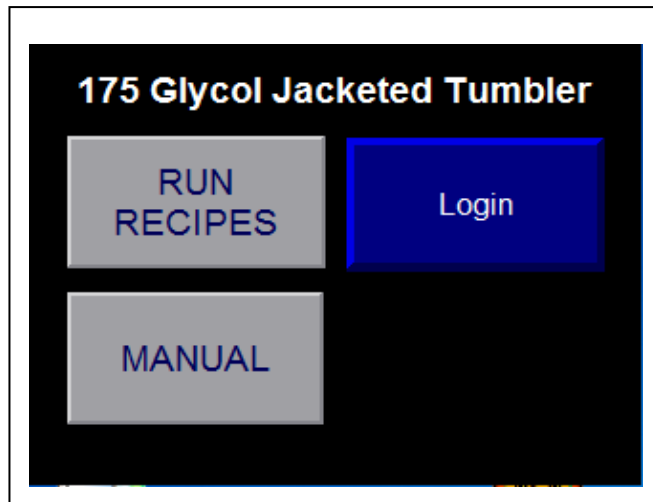
Operational Theory

The Model 175 Vacuum Tumbler provides the end user with a variety of controls via the integrated Human Machine Interface (HMI). These include setpoints for rotation speed and direction, vacuum levels, CO2 injection times and product temperature. The HMI also includes the ability to create, store and execute recipes simplifying production and increasing repeatability.

Operator HMI

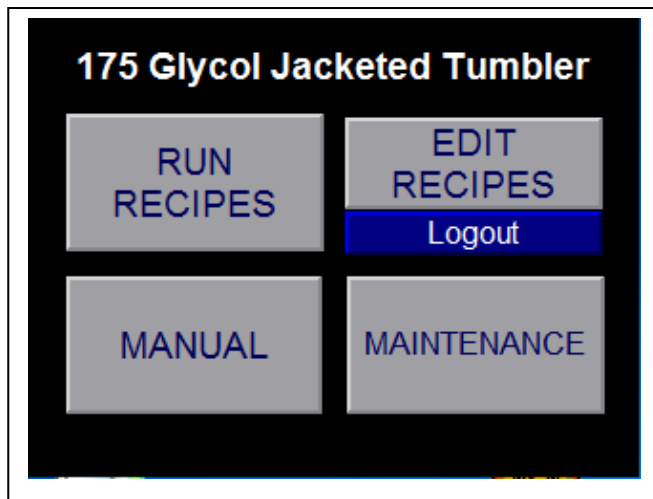


Figure 7 – Human Machine Interface (HMI)



Main Screen

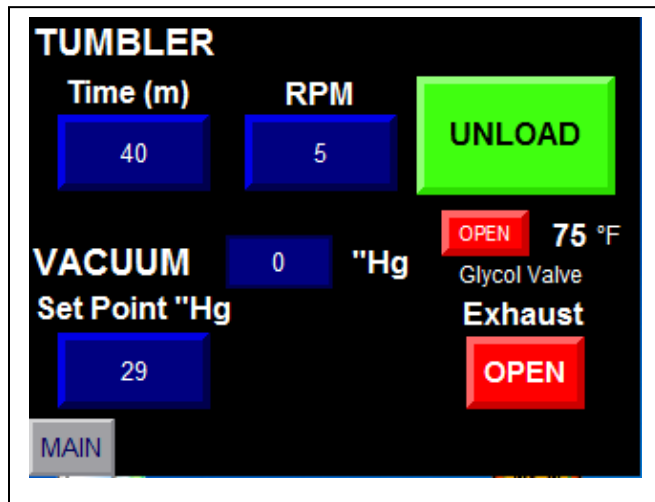
The Main Screen is where the operator chooses whether to run in Auto (i.e., run a recipe) or Manual.



Manual Mode

In order for the user to access more advanced functions such as Editing Recipes or changing machine configuration they must first log in as a Supervisor or Maintenance technician. The usernames and passwords can be found on the last page of this document.

The Manual Screen is used to directly control the drum rotation and the vacuum. Safety conditions will still be monitored and will not allow the user to perform an unsafe task.

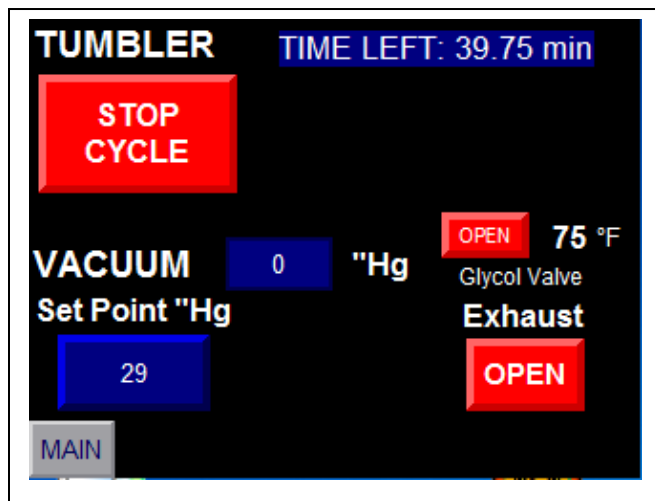


Running the Tumbler

The drum has the ability to “tumble” and “unload”. A tumble operation and unload operation rotate the drum in opposite directions.

To begin tumbling set the RPM to the desired value, then set a time that you wish the tumbler to run for. When enter is pressed from the time input keypad the machine will start to run. The time will count down and the tumbler will stop when the timer finishes or the user presses Stop Cycle.

Unload the tumbler by holding the unload button. The speed of the unload cycle is configurable from the Configuration Screen.

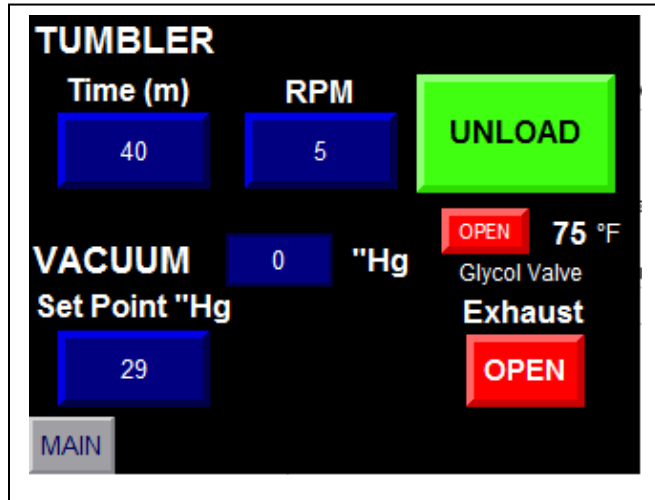


Running Vacuum

The vacuum system of the tumbler can be controlled from this screen. For the user to be able to draw a vacuum on the machine, the **Exhaust Valve** must be **closed**. The machine will not let the operator start the vacuum until the **Exhaust Valve** is closed.

The current vacuum pressure will display next to the label “VACUUM” in inches of mercury. The user can start the vacuum by changing the **setpoint**. Like the drum, the vacuum will start when **enter** is pressed. As long as the manual vacuum cycle is active, the machine will keep the vacuum pressure at or above the setpoint.

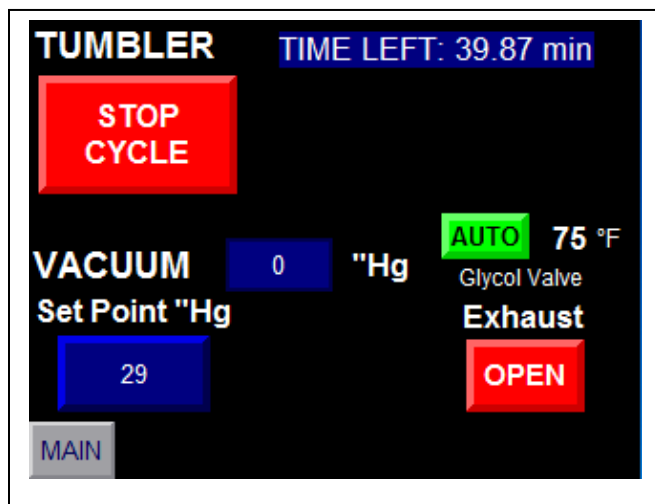
While the vacuum and drum operate almost independently, the unload cycle can not be started until the vacuum is off.

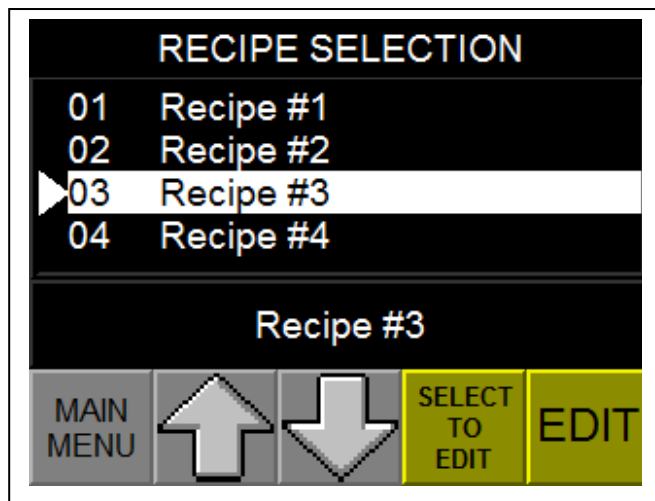


Running Cooling

The tumbler is equipped with a cooling jacket around the circumference of the body. Chilled propylene glycol is circulated through the jacket to cool the product inside. The flow of glycol is controlled by a valve that can be opened on the manual screen, but should only be operated when the tumbler is in **"Tumble"** mode to prevent isolated freezing of the product along the inside wall of the tumbler.

The indication for the valve will change from **"OPEN"** to **"AUTO"** meaning that the valve is now open and selecting auto will place the valve back in **"AUTO"** for use in the automatic recipes described below. Care should be taken while cooling a product in manual to ensure that the product does not freeze.

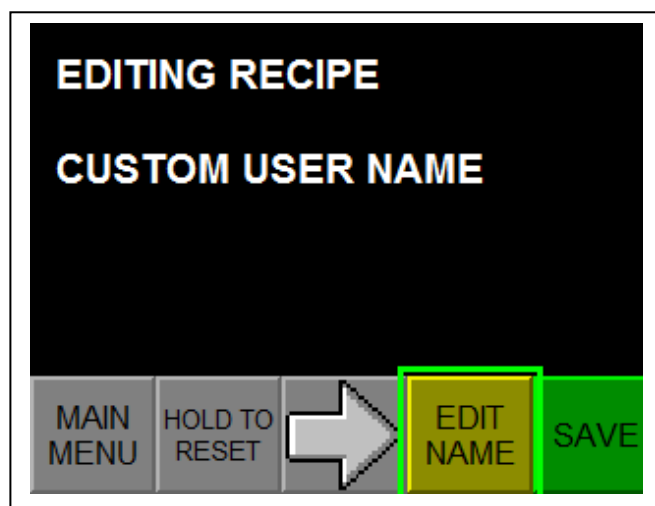




Editing Recipes

It is strongly encouraged that the operators of this machine become familiar with the concepts below. Storing different recipes is an effective way to reproduce a process. The machine can store 20 recipes each with 10 steps.

To create or modify a recipe use the EDIT RECIPES button located in the main menu.



Editing Recipes

Use the arrow keys to highlight the recipe to be edited. Press Select to Edit then Edit. Sometimes the user may want to clear-out a previously programmed recipe and start from scratch. The Hold to Reset button is very helpful for that. It clears the recipe after being held for 5 seconds.

Recipes' names can be modified to provide additional information to the user when selecting recipes.

After making changes at this stage, pressing Save is advised.

#	STEP	SPEED (RPM)	P.V.	VAC	" Hg
1	TIMED	5	10 min	ON	29
2	TEMP	4	36 Deg F	OFF	
3	REST		2 min	ON	20
4	MANUAL				
5	TIMED	8	1 min	OFF	
MAIN MENU				SAVE	

#	STEP	SPEED (RPM)	P.V.	VAC	" Hg
6	TEMP	10	33 Deg F	OFF	
7	END				
8	END				
9	END				
10	END				
MAIN MENU				SAVE	

Editing Recipes

Each recipe is capable of performing up to 10 individual tasks in order. The task types available are TIMED, TEMP, REST and MANUAL.

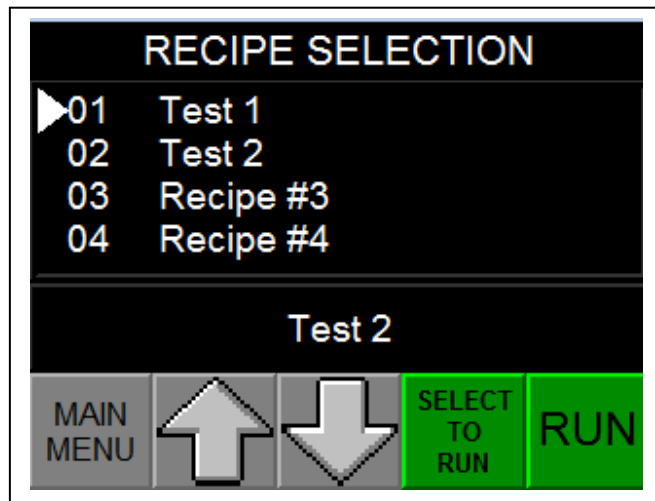
TIMED – A timed step allows the user to select motor speed, vacuum pressure, if vacuum is desired, and duration in minutes. A timed step will run for the duration specified in the P.V. column. Motor speed must be specified for each step.

VAC – When desired, turn the VAC option on for timed, temp or rest steps. The user can specify the vacuum pressure to attain in inches of mercury. The machine will not tumble product until the chamber has achieved the vacuum set-point.

TEMP – a temp step will tumble at the set speed and open the glycol valve to allow cooling of the product. A temp step will run until the product temperature measured by an internal probe falls below the setpoint entered in the step PV.

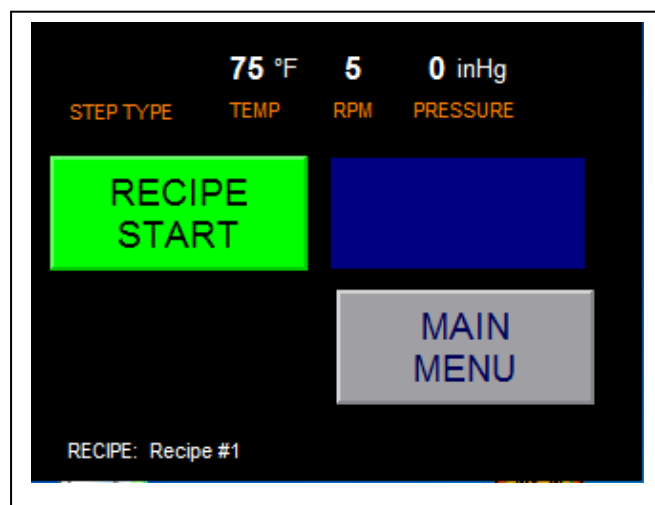
REST – a rest step will not tumble or cool for the duration specified in the P.V. column. VAC can be used if desired in a rest step.

MANUAL – All machines have the ability to incorporate a pause in the recipe sequence. During a manual step, the operator can use the manual screen to perform any manual functions. Common uses of this step include adding spices mid-recipe, visual inspection of the product, or unloading a mid-recipe sample.



Selecting Recipes

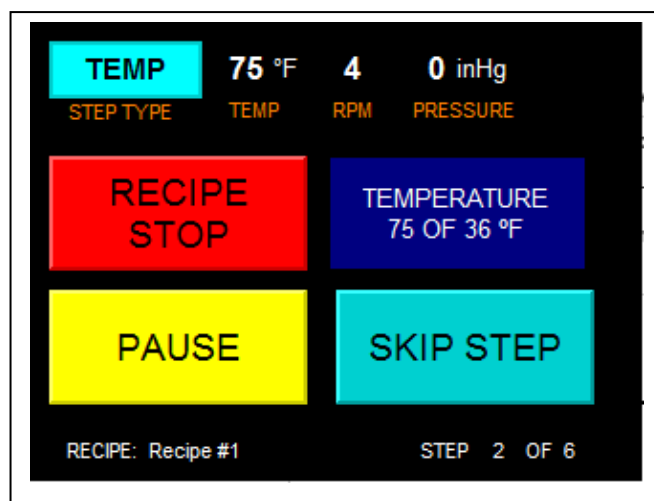
Recipe selection is the feature of this machine that will allow operators to save the most time. From this interface the user can select previously stored processes. This is great for multi-process machines. Each recipe can be tailored to a specific product.



Running Recipes

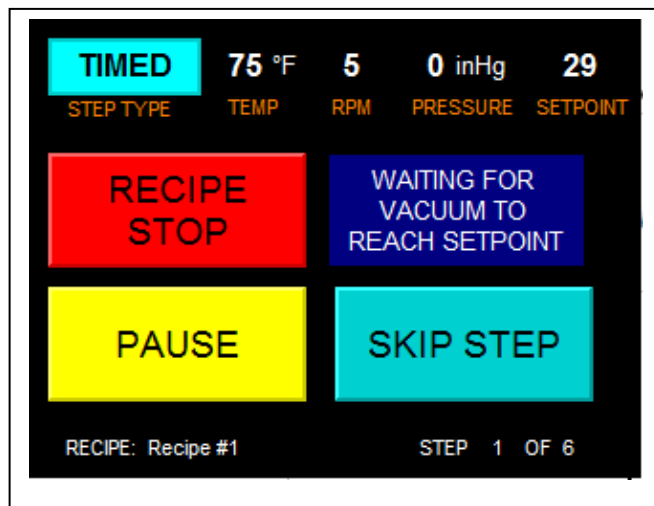
Recipe Control can allow users to run batches of pre-programmed machine sequences known as recipes.

To start a recipe that has been selected, press the **RECIPE START** button. Use the **MAIN MENU** button to exit without starting the recipe.



On Screen Info

Vital information about the recipe step will be displayed such as step type, step number, setpoints, and status.

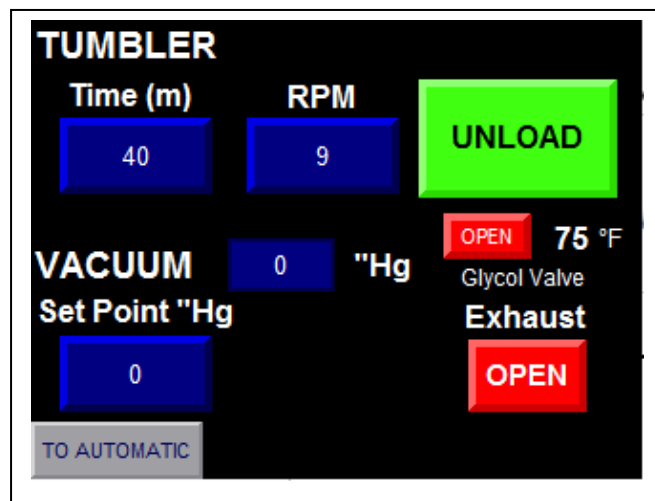


Pausing/Stopping Steps

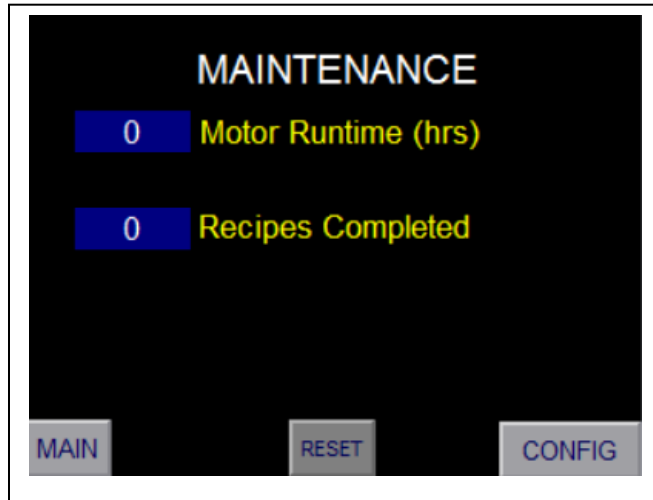
To pause a recipe in the middle of a step, press the **PAUSE** button. This allows the recipe to be resumed from where it was paused.

To skip a step of a recipe and move directly to the next recipe step, press the **SKIP STEP** button.

Pressing the **RECIPE STOP** button permanently stops the recipe. Progress cannot be recovered at this point. The recipe can only be restarted at the beginning.

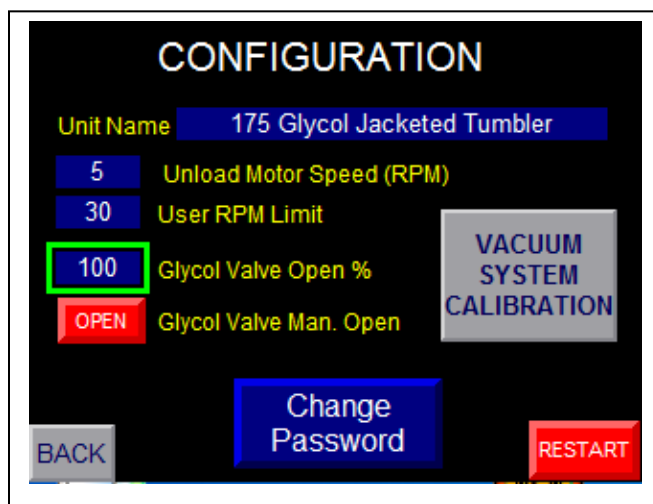


During a **MANUAL** step, the user will be able to navigate to the **manual controls page**. The user can tumble, apply vacuum and cool as desired and then return to the automatic page to resume the recipe.



Maintenance

The **Maintenance screen** is available from the **Main Screen** when logged in with the Maintenance password. From this screen, a technician can check runtime hours for the tumble motor and the number of completed recipes.



Configuration

The configuration screen allows the user to change parameters that affect the performance of the machine. The **User RPM limit** is factory set at 10, before decreasing this value, make sure that no recipe steps specify a higher RPM than the **User RPM Limit**.

The glycol valve open percentage controls the amount of cooling that the tumbler receives during a cooling step or in manual. The percentage can be decreased if too much cooling is observed.

Unload speed and the machines name are settable from here as well. Vacuum system calibration brings the user to settings that affect how the vacuum works. It is not recommended to change these settings.

Section 5/ Maintenance

Troubleshooting/FAQ



WARNING

Turn off and lock out machine power source(s) following the lockout/tagout procedures described in OSHA CFR 29 1910.147 Code of Federal Regulations (or equivalent).

Pressure Washing

This system is designed for commercial use including pressure wash cleaning on a daily basis. While every attempt has been made to use wash-down rated components, cleaning crews should avoid prolonged high pressure spray into sensitive components such as bearings and gear motors.

Cleaning Instructions

1. Empty tumbler of product by rotating the drum clockwise at a slow speed.
2. Lockout/tagout electrical power.
3. Remove any chutes from the discharge area.
4. Wash product out and towards the front of the system. Once fully washed out, re-connect power to system at disconnect.
5. As an option, the system may be stopped with the inspection port at BDC, the inspection port cover may be removed and additional access for washout will be gained.
6. Reinstall the inspection port cover and clamp.
7. Re-connect power to system.

Lubrication

This direct pivot dumper is assembled using food grade lubricants in the bearings. Due to the nature of regular high pressure wash-down, periodic inspection and re-lubrication is recommended for maximum machine life.



CAUTION

Failure to ensure lubrication of critical components on a regular basis can lead to premature failure of the components and or damage to the system. Lack of regular scheduled lubrication on these components will void the warranty.

Refer to Appendix 1 for the manufacturer's Mounted Ball Bearing Lubrication recommendation.

Section 5 / Illustrated Parts Breakdown

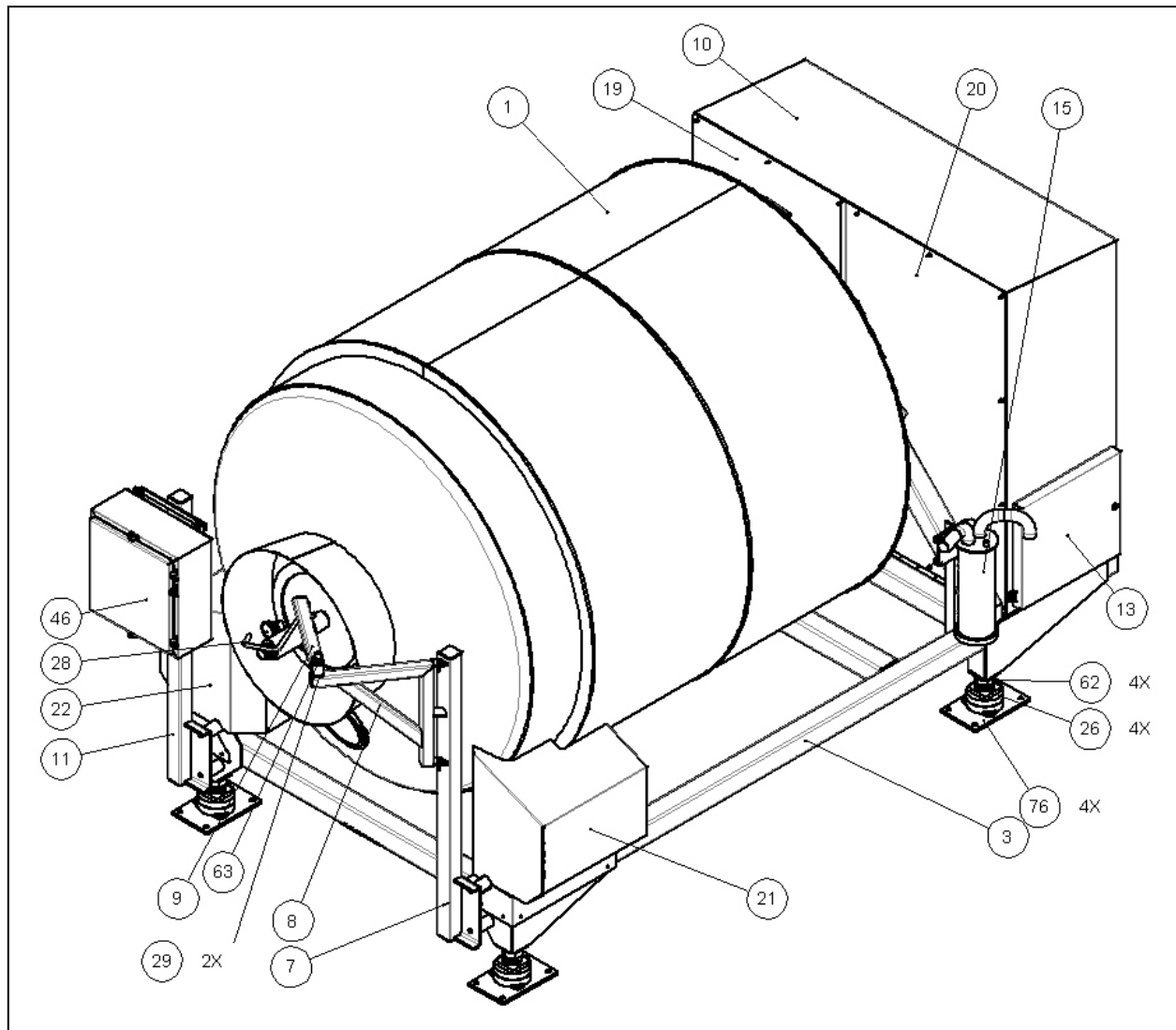


Figure 8 – Vacuum Tumbler

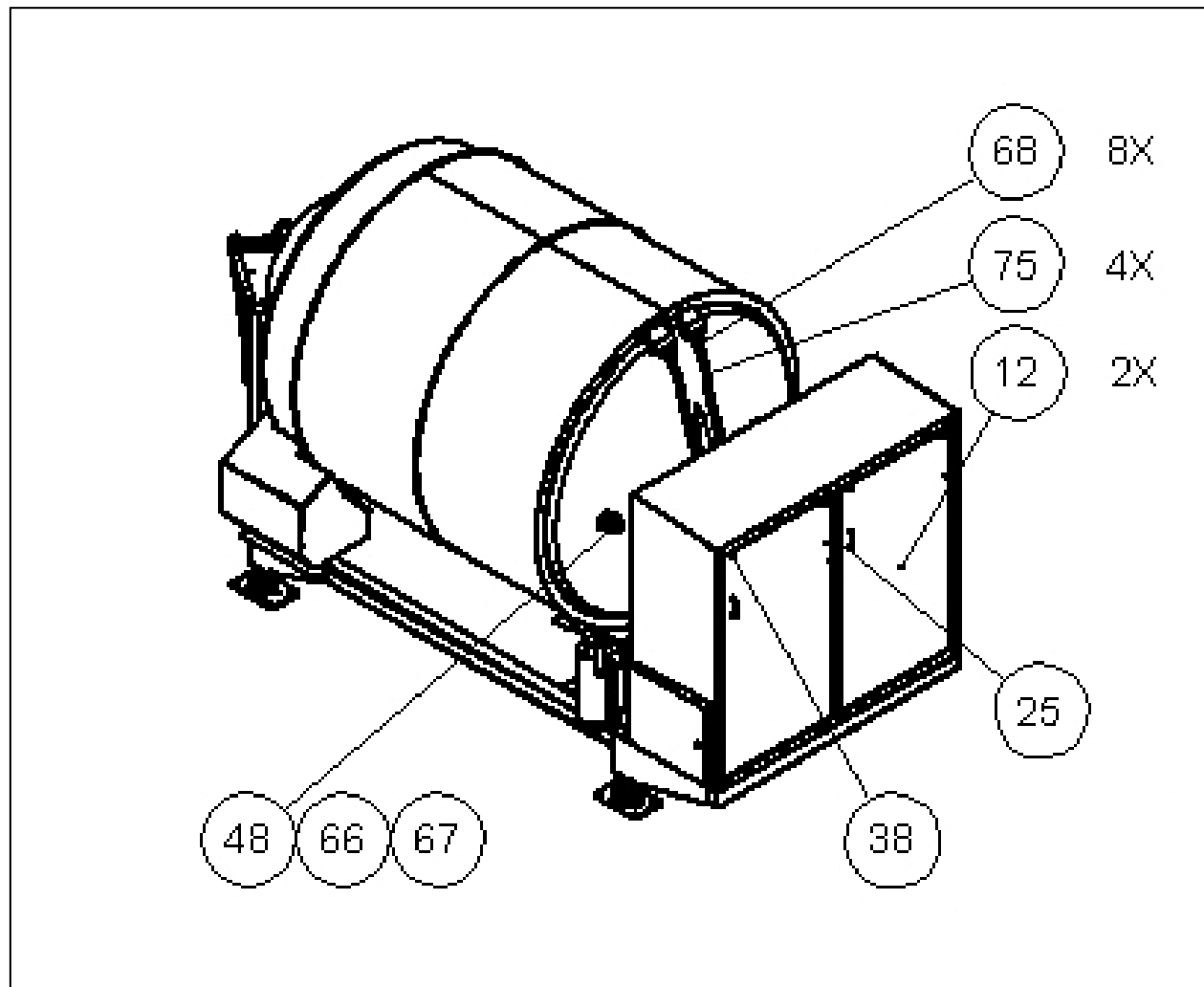


Figure 9 – Vacuum Tumbler

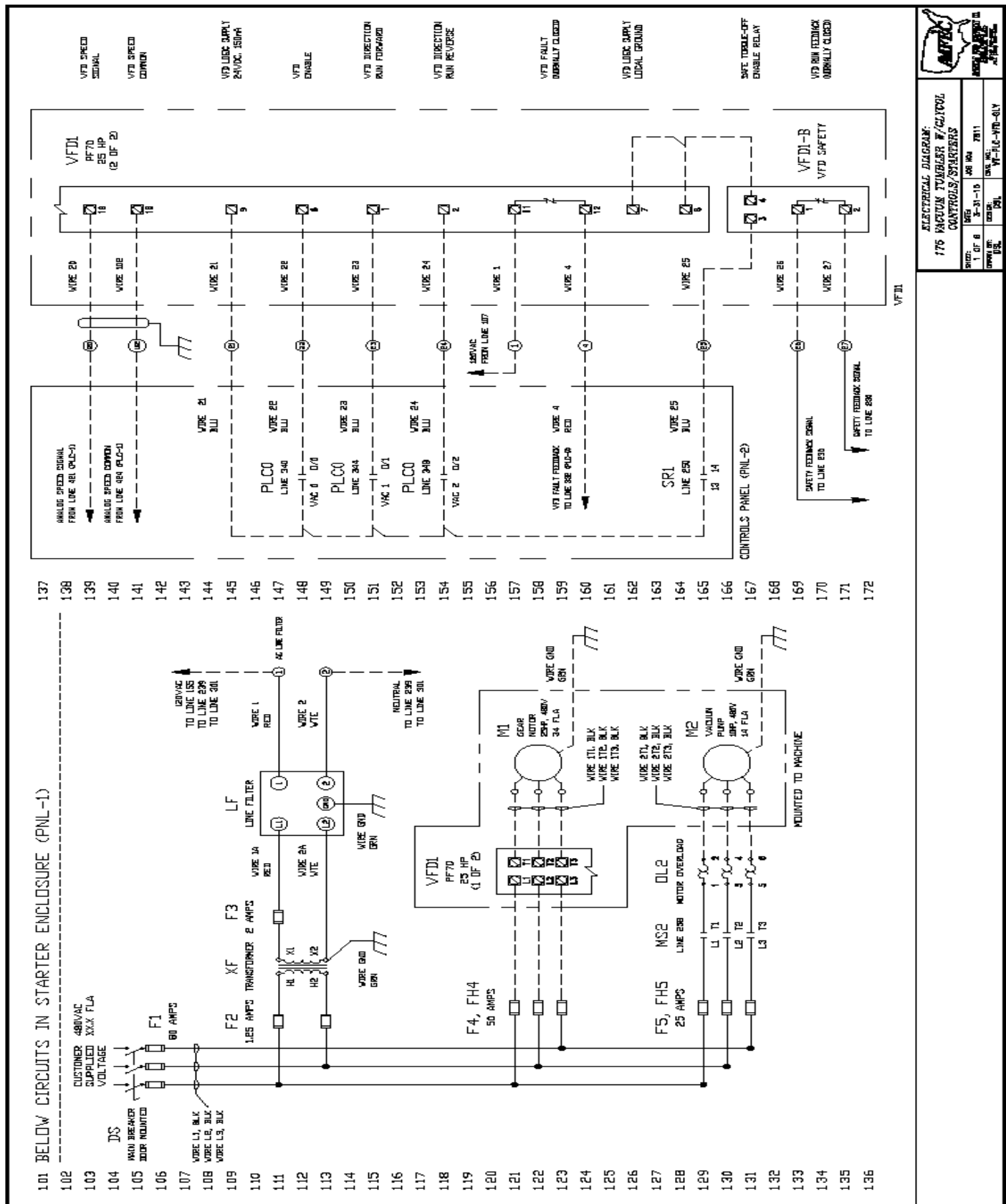
1	7811-20-001	DRUM WELDMENT		1
2	7811-20-002	SHAFT WELDMENT		1
3	7811-20-003	FRAME WELDMENT		1
4	7811-20-004	AXLE WELDMENT		2
5	7811-20-005	WHEEL ASSEMBLY		2
6	7811-20-007	DISCHARGE/VACUUM DOOR		1
7	7811-20-008	TUMBLER DOOR POST		1
8	7811-20-009	DOOR SUPPORT BRACKET		1
9	7811-20-010	DOOR SWIVEL ARM		1
10	7811-20-011	DRIVE GUARD WELDMENT		1
11	7811-20-012	CONTROL POST		1
12	7811-20-013	COVER DOOR, GEARMOTOR SIDE		2
13	7811-20-014	PUMP ACCESS DOOR		1
14	7811-20-015	CONTROL POST		1
15	7811-20-016	VACUUM FILTER CANISTER		1
16	7811-20-100	BEARING SHIM, 1/4"		4
17	7811-20-101	BEARING SHIM, 1/2"		1
18	7811-20-102	FERRULE CAP		1
19	7811-20-103	REAR DRIVE COVER, LH		1
20	7811-20-104	REAR DRIVE COVER, RH		1
21	7811-20-106	WHEEL GUARD, RH		1
22	7811-20-107	WHEEL GUARD, LH		1
23	7811-20-108	INNER TIRE COVER		2
24	7811-20-109	GLYCOL SIPHON LINE		1
25	7811-20-110	COVER DOOR JAM		1
26	SDXX031	ADJUSTABLE LOAD CELL MOUNT - 2"		4

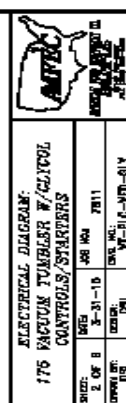
27	VTXX-3010	ROTARY UNION BODY, 1-1/2" NPT		1
28	VTXX-X009	LIFTING BAR		1
29	VTXX-X011	TUMBLER DOOR ARM BUSHING		2
30	VTXX-X020	TUMBLER DOOR LIFTING COLLAR		1
31	VTXX067	THREADED RETAINING PAWL		2
32	VTXX069	TUMBLER GRIP KNOB		2
33	VTXX070	STATIONARY RETAINING PAWL		1
34	02-03006-C	BEARING, PILLOW BLOCK, 4-7/16"		1
35	02-03090-C	BEARING, PILLOW BLOCK, 2-15/16" CTD		4
36	02-05128-4.437	BUSHING, QD, N, 4-7/16" W/ KW&SS		1
37	02-08044	RING, EXTERNAL RETAINING, 2-1/2"		1
38	02-08089	COMPRESSION LATCH		5
39	02-08107	RING, RETAINING, EXTERNAL, 4-3/8"		1
40	02-11411	GEARMOTOR, 25 HP / 30 RPM, NORD 9072		1
41	02-12238	SPROCKET, 160-2/45T, QD TYPE		1
42	02-12422-3.625	SPROCKET, 160-2/15T, 3-5/8" BORE		1
43	02-13021	CHAIN, #160 DOUBLE STRAND RIVET		1
44	02-16014	SPRING, COMPRESSION 1" LG.		2
45	03-06054	STRAIGHT COMPRESSION TUBE FITTING		6
46	04-06188	ENCLOSURE, 20" X 20" X 8"		1
47	04-06197	ENCLOSURE, 24" X 20" 6"		1
48	04-11111	RTD, TEMP SENSOR, WIRELESS, 6" STEM		1
49	06-03027-2	VALVE, BALL CHECK, 2" NPT		1
50	06-06012	VALVE, VACUUM EXHAUST, 1-1/2" NPT, 120V		1
51	06-06163	PUMP, VACUUM, 10HP/180CFM		1
	02-07063	TIRE, 18 X 8 X 12-1/8, 77080 MONARC		2

52	06-06164	FILTER, VACUUM CANISTER, 2" NPT / 10HP	1
53	07-01036	ROTARY JOINT, L.H., 2" NPT	1
54	09-10064	BUSHING, REDUCER, 2" NPT X 1-1/2" NPT	1
55	09-10076	NIPPLE, CLOSE, 1-1/2" NPT	1
56	09-10089	TEE, PIPE, 2" NPT FEMALE	1
57	09-10095	NIPPLE, CLOSE, 2" NPT	3
58	09-10125-S	ELBOW, 45, STREET, 1"	4
59	09-12027	BOLT, SOCKET HEAD CAP, #10-32 X 1-1/4" LG.	2
60	09-12065	BOLT, SOCKET HEAD CAP, 5/16"-18 UNC X 1" LG.	2
61	09-12135	BOLT, HEX, 1"-8 UNC X 3" LG.	2
62	09-13009	NUT, HEX, 2-4-1/2" UNC	4
63	09-13018	NUT, HEX, 1"-8 UNC	1
64	09-14007	WASHER, FLAT, 1/2"	2
65	09-16056	CLAMP, SANITARY TRI-CLAMP, 10"	1
66	09-16062	CLAMP, SANITARY 1-1/2	1
67	09-16063	GASKET, 1-1/2", VITON	1
68	09-20004-1-1	NIPPLE, 1-1/2" NPT TO 1-1/2" HOSE	8
69	09-20004-2-1_5	NIPPLE, 1-1/2" NPT TO 1-1/2" HOSE	1
70	09-20013	CLAMP, HOSE, 1-1/16" - 2"	1
71	09-27005	PIN, SPRING ROLL, 3/16" X 1-1/2"	2
72	10-11010	ZERK FITTING, 1/8" NPT	6
73	12-01069	BUSHING, BRONZE FLANGE, 1" I.D.	1
74	16-01012	O-RING, 1/8" DIA	2
75	20-01062	HOSE, PVC, REINFORCED 1" CLEAR	4

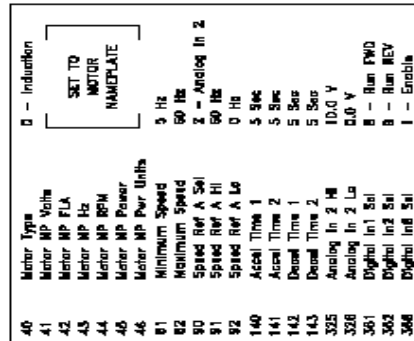
Section 6 / Electrical Controls

Electrical Schematic



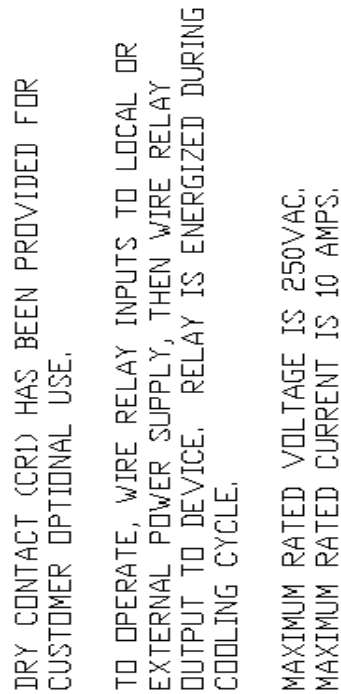




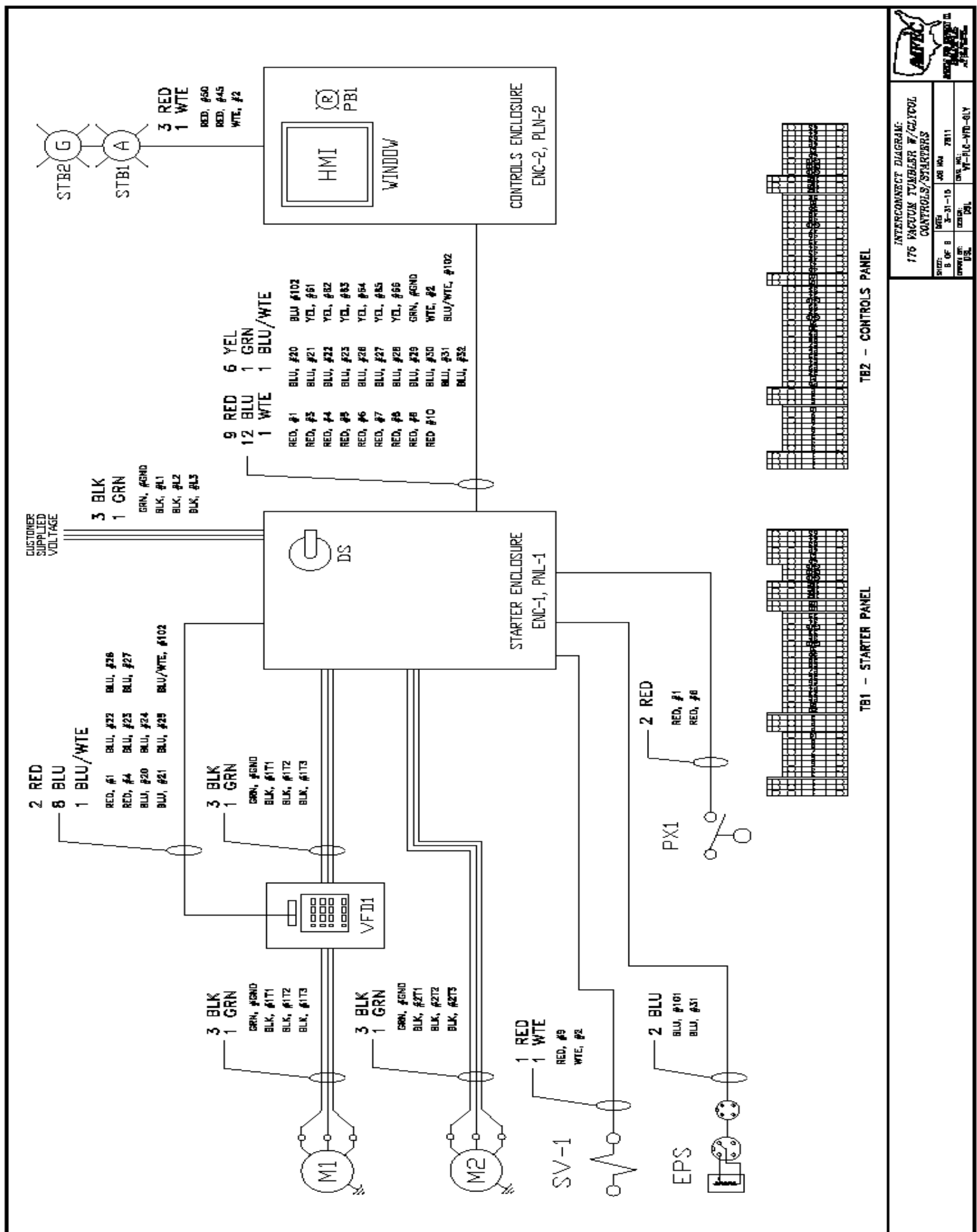


VFD SETTINGS

	ELECTRICAL DIAGRAM:	
	175 VACUUM TUMBLER W/CONTROL CONTROLS/STARTERS	
WIRE NO.	TERMINAL	WIRE NO.
4 OF 8	3-31-15	285-101
SHEET:	488 MM	28111



ELECTRICAL DIAGRAM: 175 VACUUM TUBES & CONTROL CONTROLS, STARTERS			
SHEET: 5 OF 8	DATE: 3-31-18	JOB NO: 7811	DWG. NO.: WT-PIC-VTD-014
DESIGNED BY: JUL	CHECKED BY: JUL	DATE: JUL	



INTERCONNECT DIAGRAM:			
175 VACUUM TUMBLER w/ GLYCOL CONTROLS/STARTERS			
REV:	DATE:	BY:	CHK:
1	10-31-15	AM	AM
175	175	175	175
175	175	175	175
175	175	175	175

Electrical Bill of Materials for Control Panel

REFERENCE	QTY	AMFEC PN	DESCRIPTION
ENC-2	1	04-06047	ENCLOSURE, SST, A-20H1608SSLP
PNL-2	1	04-06019	ENCLOSURE, PANEL, A-20P16, HOFFMAN
PS	1	04-11094 *	POWER SUPPLY, MURR, 95-265AC/24DC 2.5A
ES	1	04-14214	ETHERNET SWITCH, 5 PORT
PB1	1	04-01178-24 *	PUSH BUTTON, P-P, 2-POS, ILLUM. UV
PB1-B	1	04-01214 *	CONTACT BLOCK, 2 NC 800T-XA4 A-B
LP1	1	04-10008-1	LEGEND PLATES, E-STOP
F6, F7	2	04-02190 *	FUSE, 2 AMP, 250V, AGC-2
F8, F9, F10, F11, F12	5	04-02191 *	FUSE, 1 AMP, 250V, AGC-1
FH6-12	7	04-02156	TERMINAL BLOCK, FUSED W/NEON IND.
PLC-0	1	04-14125 *	PLC, Mcrlgx1100, 110VAC PWR & INPUTS
PLC-1	1	04-14090 *	PLC, Mcrlgx--00, 2IN2OUT, ANLG Module
PLC-2	1	04-14122-8 *	PLC, Mcrlgx--00, REL-OUT 8PT. EXP
SR1	1	04-07051 *	SAFETY, CNTRLR GUARDMSTR MSR127TP
ENET	2	04-14230	CABLE, ETHERNET, CAT6 600V .6M
HMI	1	04-14026	INTERFACE, OPERATOR, 2711P-T6C20D8
WINDOW	1	04-06156	WINDOW, HINGED KIT, 8 X 8
CR1	1	04-03016 *	RELAY, CONTROL, 8 PIN, 120 VOLT
SKT	1	04-03017	RELAY, CONTROL, 8-PIN, BASE
PX1	1	04-07035 *	SWITCH, PROXIMITY, SMOOTH TUBULAR
RTD	1	04-11109 *	RTD, TEMP SENSOR WIRELESS 4" STEM
RTD-B	1	04-11110 *	RTD, TEMP WIRELESS RECEIVER
EPS	1	06-07058 *	TRANSDUCER, VACUUM 0-(-1)BAR 4-20MA
EPS-B	1	06-07058-A	TRANSDUCER, VACUUM ADAPTER
EPS-C	1	06-07058-WC	TRANSDUCER, VACUUM WIRING CONNECTOR
STB	1	04-17015	McMASTER 6366T11 LIGHT MOUNTING BASE
STB1	1	04-17022	McMASTER 6366T14 GREEN CONT. LIGHT MODULE
STB2	1	04-17023	McMASTER 6366T5 AMBER STROBE LIGHT MODULE
AUX	2	04-11089	POWER RECEPTACLE, 120VAC, DIN DMRG
TB2-A	2	04-02157	END ANCHOR, TERMINAL STRIP, EA35
TB2-B	32	04-14175	TERMINAL, 2.5MM. PHX PT-2.5

TB2-C	11	04-14176	TERMINAL, 2.5MM. PHX PT-2.5 TWIN
TB2-D	1	04-14177	TERMINAL, 2.5MM. END CAP
TB2-E	4	04-14178	TERMINAL, 2.5MM. TWIN END CAP
TB2-F	6	04-14179	TERMINAL, GROUND, 2.5MM. PIT-2,5-PE
TB2-G	1	04-14180	TERMINAL, PLUG IN BRIDGE, 10
TB2-H	5	04-14190	MARKER STRIP, PHOENIX CONT TERMINAL

Recommended Spares*

Electrical Bill of Materials for Starter Panel

REFERENCE	QTY	AMFEC PN	DESCRIPTION
ENC-1	1	04-06031	ENCLOSURE, SST, A-24H2408SSLP
PNL-1	1	04-06032	ENCLOSURE, PANEL, A-24P24, HOFFMAN
DS	1	04-02068	DISCONNECT SWITCH, 100AMP, J-FUSED
XF	1	04-05011 *	TRANSFORMER, 130VA,AB,240/480-120
LF	1	04-14025	LINE CONDITIONER, 125VAC/6A 2-STAGE
PDB	1	04-02248	POWER DIST. BLOCK, FINGER SAFE,175A
VFD1	1	05-01077-NS	INVERTER, 25HP,NO S-OFF,460V,AB PF70
VFD1-B	1	05-01073 *	INVERTER, SAFE OFF MODULE
MS2	1	04-03050	STARTER, NON-REV, 100-C16D10; A-B
MS2-AC	1	04-03301	CONTACT, AUXILLARY, 1NO/NC 100-FA11
OL2	1	04-03005 *	RELAY, OVERLOAD,3.2-16,193-ED1DB
F1	3	04-02086 *	FUSE, 80 AMP, 600V, CLASS J
F2	2	04-02176 *	FUSE, 2.5 AMP, 600V, FNQ-R
F3	1	04-02057-R *	FUSE, 3 AMP, 600V, FNQ-R
F4	3	04-02070 *	FUSE, 50 AMP, 600V, CLASS J
FH4	3	04-02128	FUSE BLOCK, 31-60 AMPS, 1 POLE
F5	3	04-02133 *	FUSE, 25 AMP, 600V, CLASS J
FH5	3	04-02127	FUSE BLOCK, 0-30 AMPS, 1 POLE
TB2-A	2	04-02157	END ANCHOR, TERMINAL STRIP, EA35
TB2-B	26	04-14175	TERMINAL, 2.5MM. PHX PT-2.5
TB2-C	17	04-14176	TERMINAL, 2.5MM. PHX PT-2.5 TWIN
TB2-D	2	04-14177	TERMINAL, 2.5MM. END CAP
TB2-E	3	04-14178	TERMINAL, 2.5MM. TWIN END CAP
TB2-F	5	04-14179	TERMINAL, GROUND, 2.5MM. PIT-2,5-PE
TB2-G	1	04-14180	TERMINAL, PLUG IN BRIDGE, 10
TB2-H	4	04-14190	MARKER STRIP, PHOENIX CONT TERMINAL

Recommended Spares*