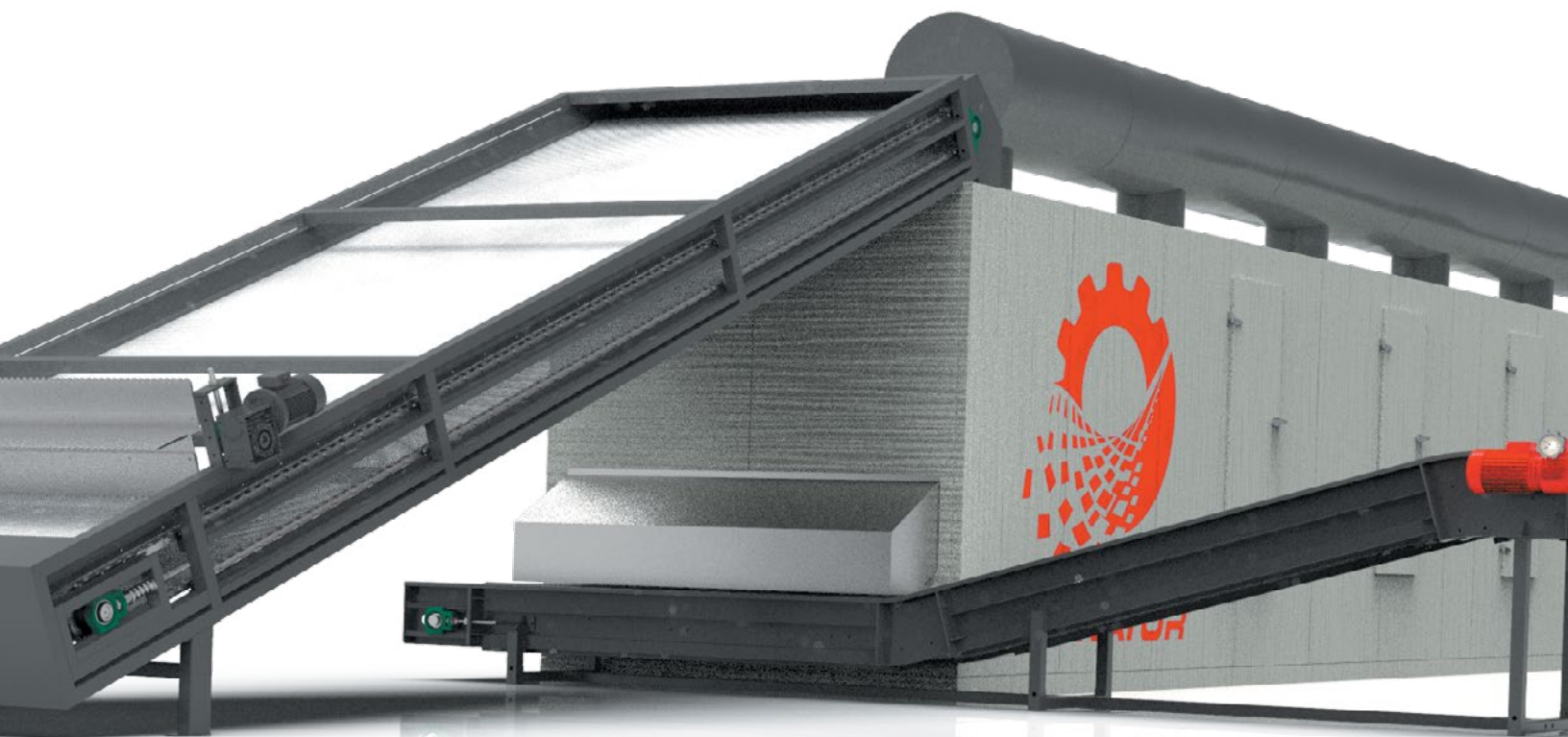


thetriminator.com



**TRIMINATOR®**

# BELT DRYER

## OWNER'S MANUAL



Read these instructions carefully before  
installation, use, or maintenance

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# 1 INTRODUCTION

Congratulations on your selection of the Trimator Belt Dryer! We want to help you to get the best results from your new dryer and to operate it safely. This manual contains the information on how to do that; please read it carefully before you use your dryer.

## 1.1 LIABILITY DISCLAIMER

The delivered equipment with its accessories is made up of individual components. This manual does not include comprehensive instructions for each component rather the system as a whole. Should you require advanced troubleshooting for individual components, the component manual should be referenced. The operator of the equipment should have sufficient qualifications to operate the parts of the system, as well as the system as a whole. The system, including burner control system, must be installed and constructed according to local regulations and requirements.

The following information must be read and understood by the users of the equipment. The users must be trained and fully qualified according to local legislation for the specific work. The users of the equipments must also be capable to recognize possible hazards in the system and in the environment where the equipment is used.

This manual contains information and instructions based on product standards and regulations, and on our best knowledge. Failure to follow these instructions can lead to damage to the equipment. Erroneous use of the equipment or the failure to follow any instructions or warnings in the manual or this disclaimer can lead to property damage, personal injury or death.

**Mosman Machinery, dba Trimator is unable to accept any liability for damage in case of:**

- **failure to follow these instructions**
- **other use than what is explained in this manual**
- **use by unqualified personnel**
- **the use of spare parts not provided by Trimator.**

Your legal rights are governed by a Limited warranty, the terms of which are incorporated herein by reference. Any modification at the product, if not approved by Trimator, is disclaimed and may void your rights under the Limited warranty.

## KEY NOTES

This manual is provided to the user as a complete and necessary part of the product. Please maintain this manual for your reference.

This manual is provided with video references which refer to videos of the same title stored in a Dropbox folder provided to the owner. These videos are intended as an addition to the manual and are only provided as helpful references, but do not supersede the legal or technical language or guidance provided in this or related components manuals and technical documentation.

The content of this manual does not only apply to the user, but also provides references for installation and maintenance personnel of the product.

The equipment must be installed by qualified personnel following the installation drawing, user's manual, etc. "Qualified personnel" refers to people with professional technical knowledge authorized by the manufacturer. Improper installation may endanger the safety, life and property, for which the manufacturer shall not be responsible.

This manual describes in detail applicable work scope, performance characteristics, technical parameters, working principles, main structure, installation commissioning, safe use and maintenance of the Trimator Belt Dryer. Before initial use of this equipment, please read this manual carefully and operate this equipment in strict compliance with the requirements in this manual.

This manual and its related content shall not be reproduced, disseminated or used without permissions.

## 1.2 SAFETY PRECAUTIONS

Your safety and the safety of others are very important. Read these instructions carefully before installation, commissioning, operation or maintenance of the device. The given instructions must be followed. Throughout this manual, the following three symbols are used to point out very important information:

### IMPORTANT SAFETY INFORMATION



Be careful. The DANGER symbol indicates a possible danger of bodily harm or lethal injury.



Pay attention. The CAUTION sign indicates a possible danger of damage to the device, components or surroundings.



**Note** Note indicates tips, hints, and other essential information.

Triminator commercial dryers are designed to dry plant material from a variety of herbal material. Other uses could result in injury to the operator or damage to the dryer and other property. Injuries and property damage from dryers can be prevented by following all instructions in this manual and on the dryer. The most common hazards are discussed below, along with the best way to protect yourself and others.



#### EXPLOSIVE AND FLAMMABLE ENVIRONMENTS

This equipment may not be installed, or operated in any environment deemed to have an explosion risk or to use this equipment to process materials that may cause explosion when heated.



#### ACIDIC ENVIRONMENTS

Do NOT place the equipment in an acidic or damp environment. Make sure the environment around the equipment is dry and clean.



#### EXPLOSIVE AND FLAMMABLE MATERIALS

Do NOT operate this equipment with materials that can cause electric arc, such as materials containing metal, or materials which could be considered explosive or flammable.



#### ELECTRICAL GROUNDING

Before use please check grounding for safety and make sure it is reliably grounded before energizing the equipment.



#### AVOID MOVING COMPONENTS

The Triminator Belt Dryer is equipped with several moving parts such as but not limited to, belts, gears, chains, rotating distribution paddles etc. Each moving component can cause serious damage, cuts and amputate fingers or hands or other limbs or digits. Keep hands, arms, and body away from moving parts whenever the dryer running. Keep hair, clothing, and jewelry away from moving parts. If you need to work around the dryer to clear or clean plant material for any reason, always shut off the moving component and employ lock-out tag out best practices to ensure safe removal or service.



## **AVOID HOT COMPONENTS**

The Triminators Belt Dryer is designed to heat material within the drying chamber. The temperature will continue to rise when the equipment is in use. There are several components within the dryer and which may be accessible on the outside which may become hot. Each hot component can cause serious damage, burns, blisters and heat related injuries. Keep hands, arms, and body away from heated parts whenever the dryer running. If you need to work around the dryer to clear or clean plant material for any reason, always shut off the dryer, verify the dryer is cool and at normal room temperature and employ lock-out tag out best practices to ensure safe removal or service.



## **CLEAR OPERATION AREA**

Before operating the Belt Dryer, carefully inspect the surrounding area and remove all obvious hazards that could cause you to trip, slip, or fall into the dryer.



## **KEEP GUARDS AND SHIELDS IN PLACE**

Guards and shields are designed to protect you from touching moving components. For your safety and the safety of others, keep all shields in place when the Dryer is running.



## **TURN ELECTRICITY AND BURNER OFF WHEN NOT OPERATING THE DRYER**

If you need to leave the Dryer for any reason, always turn off the main power to the unit and verify that the Oilon burner has been turned to the off position as well.



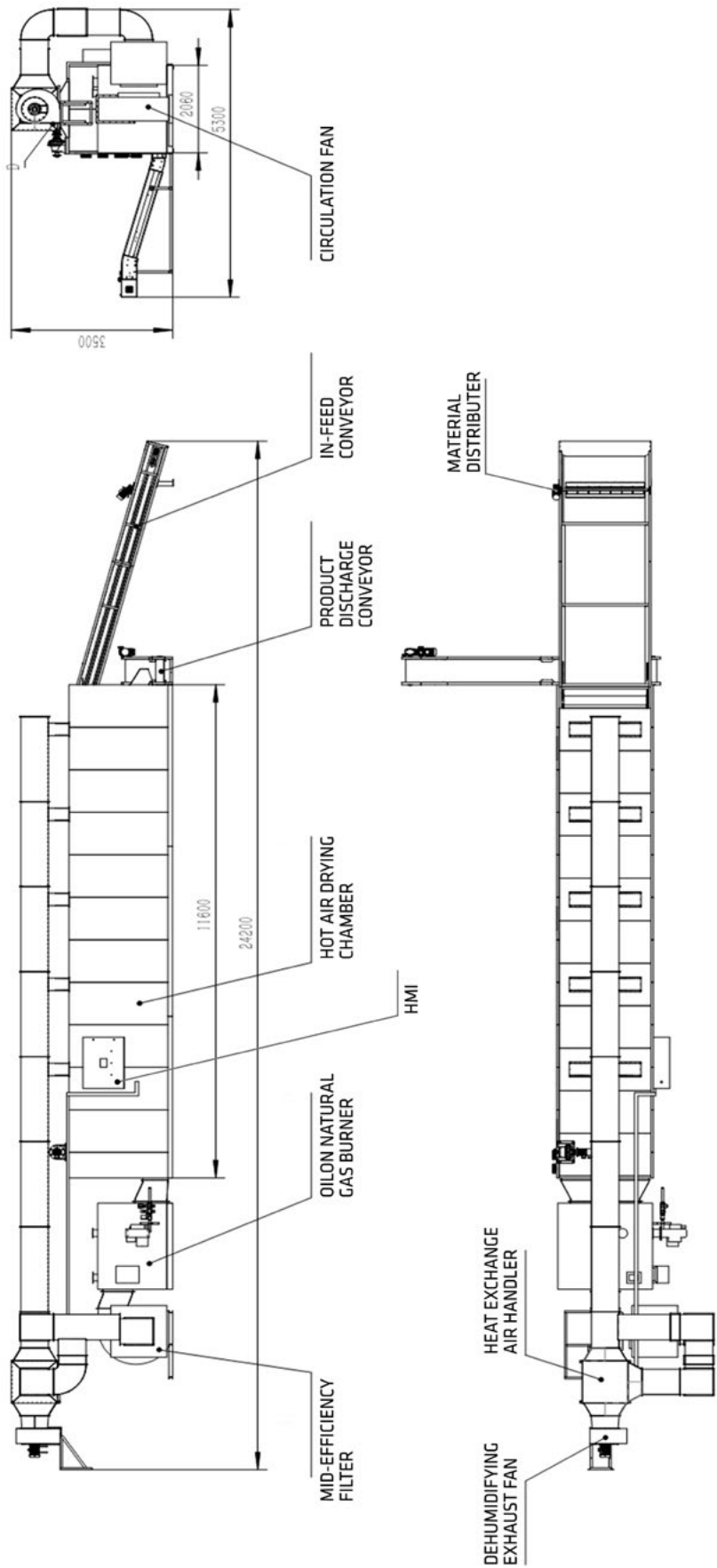
### **Note OPERATOR RESPONSIBILITY**

Know how to stop the Dryer quickly in case of emergency. Understand the use of all Operator controls. Never permit anyone to operate the Dryer without proper instructions. Do not let children operate the Dryer.

## 2 TECHNICAL DATA

Product Specifications	
Equipment Name	Triminator Belt Dryer
Model Number	16500
Frequency	60 HZ
Maximum input power (KW)	30
Speed (m/min)	Variable Speed
Dimensions (LxWxH)	18m × 2.3m × 2.3m
Weight (T)	14.87
Motor input voltage (V)	Three-phase AC 480
Materials	Stainless Steel Touchpoints, Galvanized & Painted Carbon Steel Structure.
Air consumption (m <sup>3</sup> /M)	83
Chamber temperature	0 ~ 95°C ± 10°C
Ambient temperature (°C)	Normal seasonal temperature

2.1  
EQUIPMENT  
LAYOUT



## 2.2 SYSTEM DESCRIPTION:

- **The Triminicator Belt Dryer** is comprised of a drying chamber, Oilon natural gas burner, infeed conveyor, outfeed/discharge conveyor and a heat recovery system.
- **The dimensions of the drying chamber** (length x width x height) are: 12 x 2.3 x 2.3m. Air enters the drying chamber from the bottom, allowing the hot air to pass through each layer of material evenly; The mesh transport belt is chain driven & frequency controlled, the speed of which can be set by users as per their own requirements.
- **The infeed conveyor** (length x width x height) is 6.5 x 2 x 2.8m, manual loading, equipped with automatic material spreading mechanism inside. Thickness of spread material is adjustable between 50-100mm.
- **The product discharge conveyor:** overall dimensions (length x width x height) is 4 x 0.5 x 1m, slanted discharge.
- **The heat recovery system** uses DN500 air ducts, with a 1000 x 1000 mm heat exchanger to facilitate heat recovery.
- **The equipment control system** is located on the outside of the equipment in a dedicated electrical and controls box. The human-machine interface (HMI) is located on the opposite side of the unit and connected to the electrical panel.
- Power supply of the control system: 480V three-phases AC for operation, 110V single phase AC for controls.
- **PLC:** Siemens S7-1200 series PLC is adopted. Ethernet communication interface is reserved for signal and data interaction with upper computer, cloud platform and other monitoring systems.
- **Human-machine interface:** Siemens KTP series software package with English display, friendly and convenient operation interface, makes it easy to operate either the whole equipment system or each individual movement mechanism, to check equipment operation data.

## 2.3 ELECTRICAL DISCONNECTS

- The three phase equipment is serviced by a knife blade disconnect ahead of the to the Dryer electrical panel.
- The single phase system is serviced by a 120V electrical switch prior to the Dryer electrical panel.
- Both disconnects shall be turn to the off position when servicing or maintaining the equipment.

**VIDEO REFERENCE: 1.01**

## 2.4 EQUIPMENT POWER SUPPLY AND ELECTRICAL PANEL

The equipment uses the three-phase five wire power supply system, and the equipment housing should be safely and reliably grounded. The power supply is wired to the main electrical box in line with the main knife blade disconnect for the 3-phase system.

A phase sequence protection system is included as part of the controls for the equipment. In case of a missing phase or incorrect phase sequence, the equipment cannot be operated as normal and the phases should be corrected before the system is restarted.

**VIDEO REFERENCE: 1.01**

## 2.5 CONTROLS SYSTEM

Operational indicator lamp/power indicator lamp:

The lamp is on when the power key is in the on position and power is running to the unit. The controls will not function when the lamp is off as it indicates a lack of power to the unit. The indicator lamp will turn green when the machine is in operation and red when it is faulted or in the off position.

### KEY OPERATED POWER SWITCH:

The key power switch controls power to the whole control system. Without the key in the on position the system will not operate.

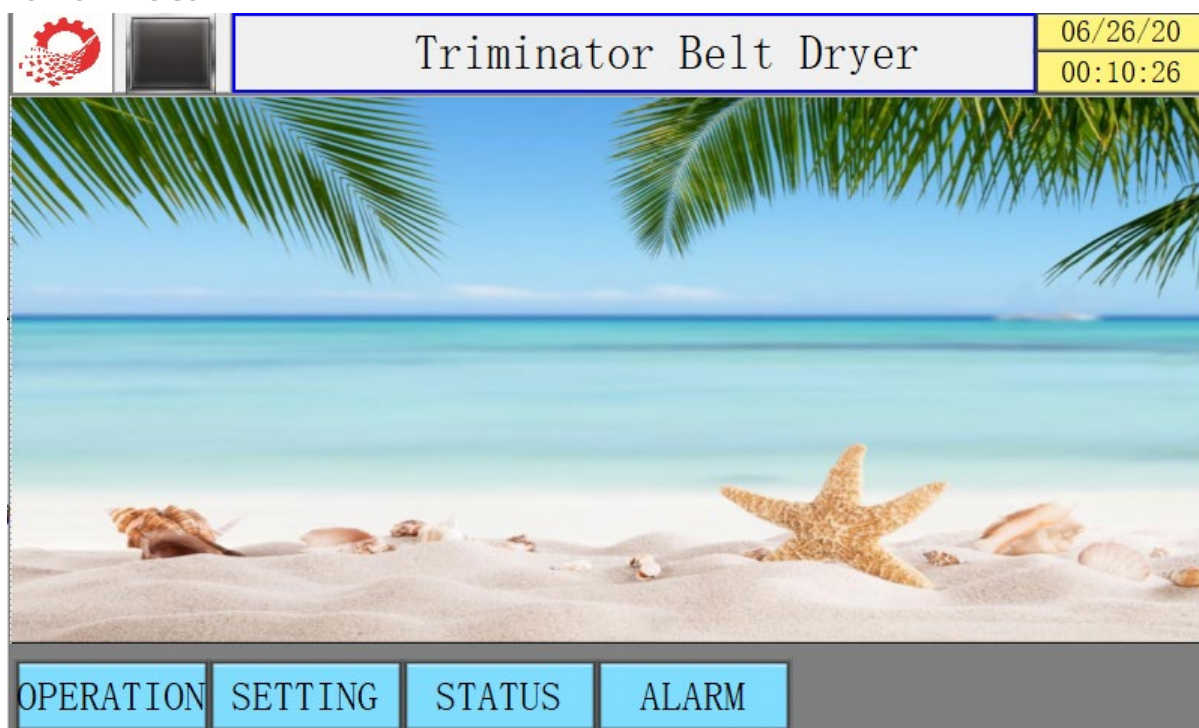
**VIDEO REFERENCE: 1.02**



## HUMAN MACHINE INTERFACE (HMI):

The main operation control system of the equipment, is managed by the touch screen HMI. It serves to start and stop different sections of the equipment.

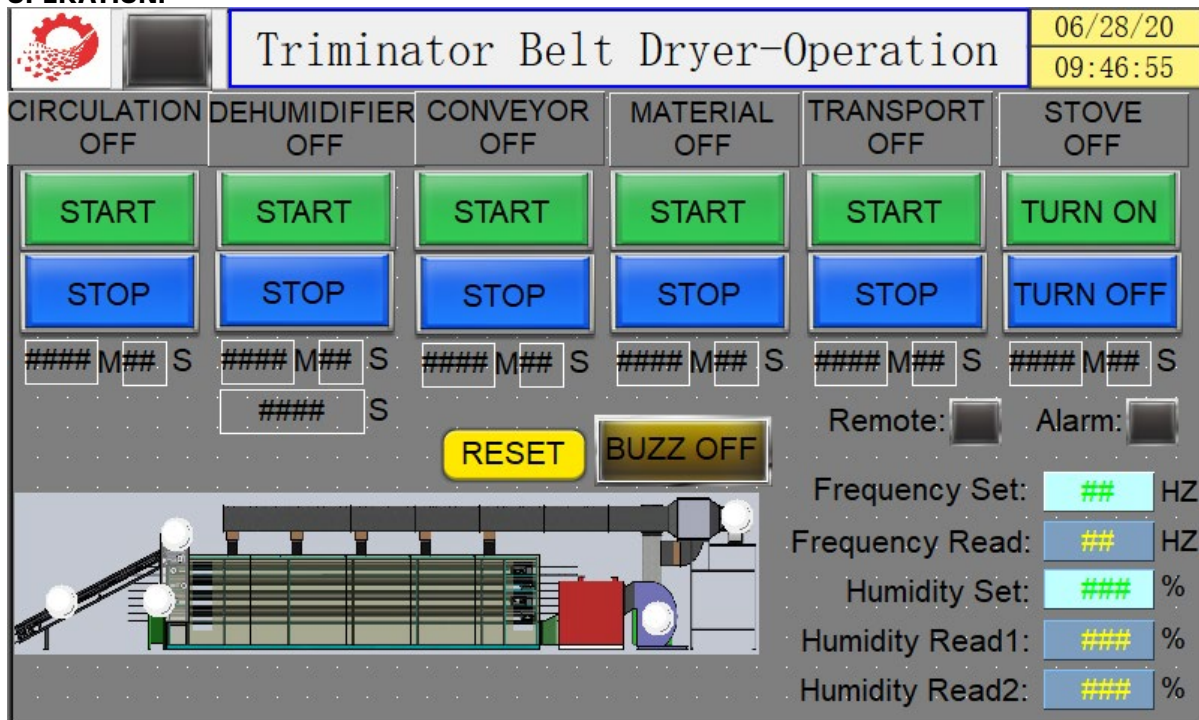
### 1 - TURN ON "POWER SWITCH" (WITH THE KEY), THE TOUCH SCREEN DISPLAYS THE FOLLOWING CONTENT:



(Picture 1)

CLICK **SETTING**, **OPERATION**, **ETC** BUTTONS TO ACCESS DIFFERENT PAGES.

### 2 - CLICK **OPERATION**, THE TOUCH SCREEN DISPLAYS THE FOLLOWING CONTENT



(Picture 2)

**OPERATION AND FUNCTION DESCRIPTIONS OF BUTTONS IN PICTURE 2:****2.1 - CIRCULATION OFF**

Click **START** below, the circulation fan is energized and shows ON in green. Click **STOP** below, the circulation fan is de-energized and stops;

**2.2 - DEHUMIDIFIER OFF**

Click **START** below, the dehumidifying exhaust fan is energized and shows ON in green. Click **STOP** below, the dehumidifying exhaust fan is de-energized and stops;

**2.3 - TRANSPORT OFF**

Click **START** below, the motor of the feed conveyor starts running. Click **STOP** below, the motor of the feed conveyor is de-energized and stops;

**2.4 - MATERIAL OFF**

Click **START** below, the motor of product discharge conveyor is energized and shows ON in green. Click **STOP** below, the motor of product discharge conveyor is de-energized and stops;

**2.5 - CONVEYOR OFF**

Click **START** below, the transport motor of the equipment start running. Click **STOP** below, the transport motor stops; Input operation frequency of the transport motor by **SET \*\*\* HZ** and read the current operation frequency of the transport motor by **READ \*\*\* HZ** ;

**2.6 - DEHUMIDIFIER MODE: MANUAL**

Click this button to select automatic or manual dehumidification; When “MANUAL” is displayed, it means manual dehumidifying, which operation steps are specified in 2.2. When “Auto” is displayed, it means automatic dehumidification. Set time interval of automatic dehumidification in **PARAMETER** ;

**2.7 - DEHUMIDIFIER TIME: 0**

Running time of circulation fan;

**2.8 - RUNTIME: 0 M**

This indicator records running time since startup;

**2.9 - BUZZ OFF**

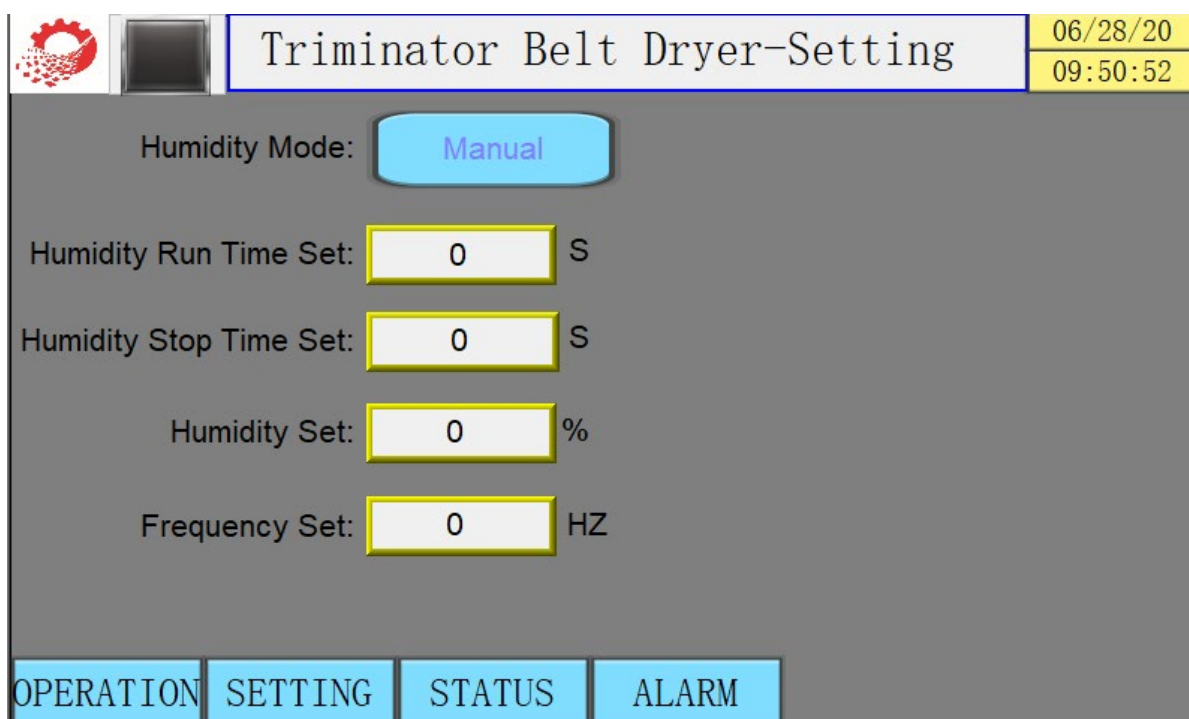
Silencing button, “OFF” means silencing is disabled, and the buzzer sounds normally. “ON” means silencing is enabled, i.e., when alarm occurs, the buzzer will not sound.

**2.10 - STOVE OFF**

Click **TURN ON** below, the burner turns on and the display shows green ON, Click **TURN OFF** below, the burner turns off; **0 M 0 S** records running time since start up

This control has been disconnected at the advice of Oilon who prefer to maintain and operate the burner independently from the rest of the control functions.

3 - CLICK **SETTING**, THE TOUCH SCREEN DISPLAYS THE FOLLOWING CONTENT:



Trimator Belt Dryer-Setting

06/28/20  
09:50:52

Humidity Mode: **Manual**

Humidity Run Time Set: **0** S

Humidity Stop Time Set: **0** S

Humidity Set: **0** %

Frequency Set: **0** HZ

OPERATION SETTING STATUS ALARM

(Picture 3)

### OPERATION AND FUNCTION DESCRIPTIONS OF BUTTONS IN PICTURE 3:

#### 3.1 - HUMIDITY RUN TIME SET

Sets automatic start and stop time interval of the dehumidifying exhaust fan, effective when the dehumidifying exhaust fan is in "AUTO" mode;

**3.2 - HUMIDITY STOP TIME SET** sets automatic stop delay time interval of the dehumidifier, effective when the dehumidifying exhaust fan is in "MANUAL" mode;

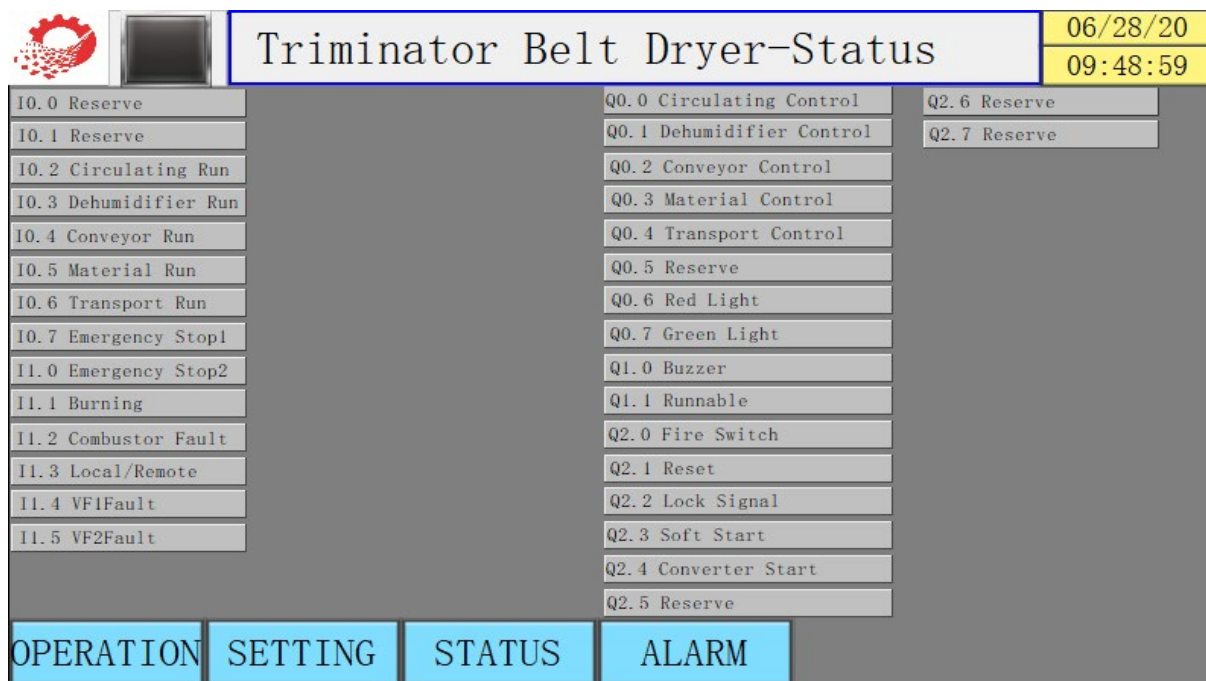
#### 3.3 - HUMIDITY SET

Drying chamber humidity setting;

#### 3.4 - FREQUENCY SET

Transport frequency setting;

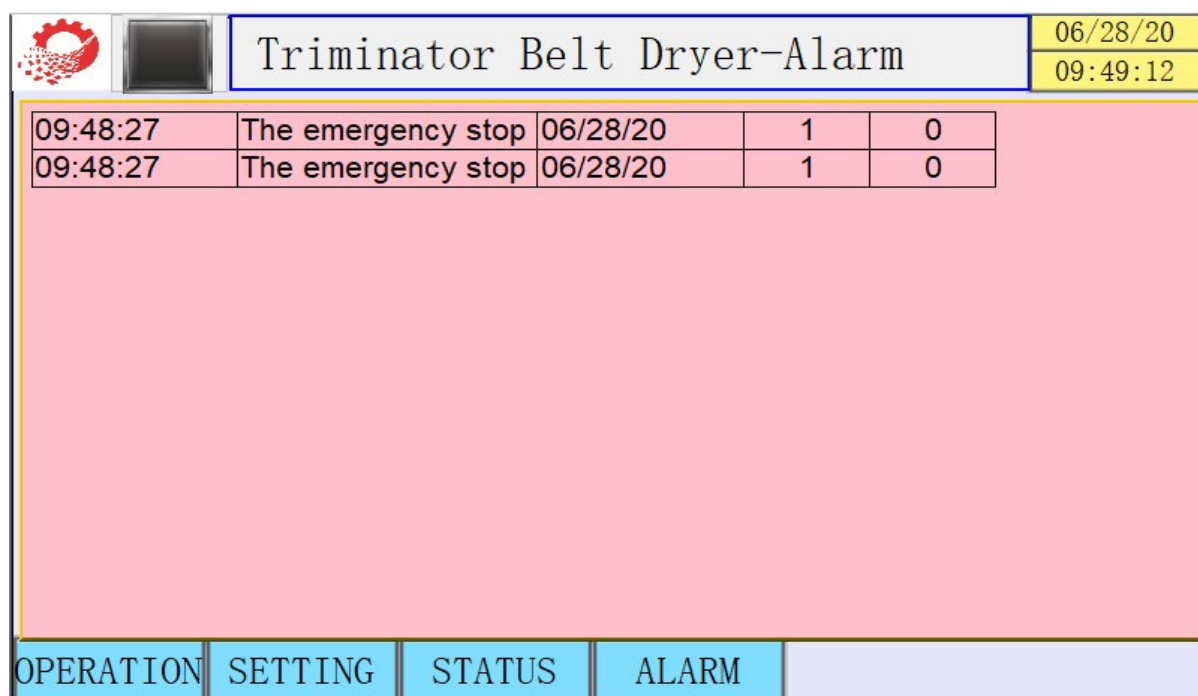
#### 4 - CLICK **STATUS** THE TOUCH SCREEN DISPLAYS THE FOLLOWING CONTENT:



(Picture 4)

4.1 Display control point information of PLC;

#### 5 - CLICK **ALARM** , THE TOUCH SCREEN DISPLAYS THE FOLLOWING CONTENT:



(Picture 5)

5.1 - Failure information, such as the date, time and description of the failure, is displayed to quickly respond to the failure and troubleshoot.

5.2 - After the problem is solved, click the "reset" button to reset the failure information and start the machine normally.

**VIDEO REFERENCE: 1.02, 1.03**

## 2.6 BURNER CONTROLS SYSTEM

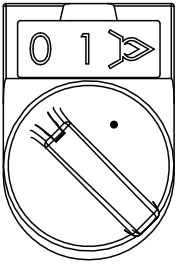
The system is equipped with an Oilon M-50 burner. The burner is controlled independently from the rest of the system controls. Basic information regarding the burner can be found below, comprehensive information regarding the burner is found in the in the Oilon Burner Manual.

### SWITCH PANEL

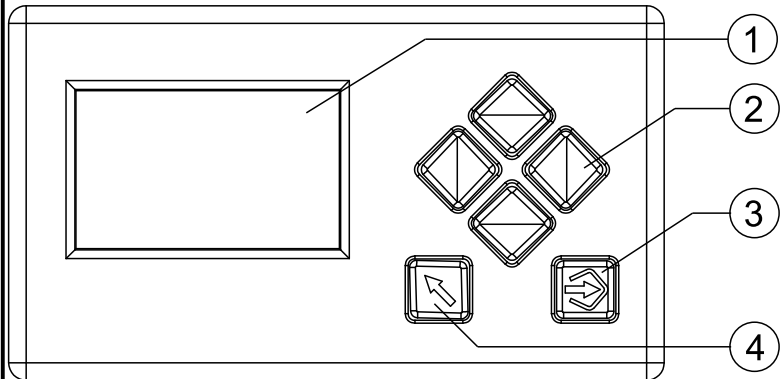
In standard delivery, the burner control system and switch panel are integrated to the burner.

The information in this section is for reference. For the burner specific data, see the electrical diagram delivered with the burner.

### CONTROL SWITCH S1

Switch	Switch position	State
	0 - STOP	Control voltage is cut off from burner automation and burner is shut down.
	1 - CONTROL	Control voltage is switched on to burner automation (burner control, servomotors). Burner control is ready for control and monitoring functions, but burner start-up by control device is prevented.
	2 / ➤ - AUTOMATIC	Burner starts as the start signal is received from control device. Burner control start-up program begins. Burner operates controlled by the capacity controller or on a manually preset load. Burner control supervises burner operation and results in a controlled shutdown or if necessary, safety shutdown and lockout. During burner operation the green LED illuminates the switch.

### A100 CONTROL PANE

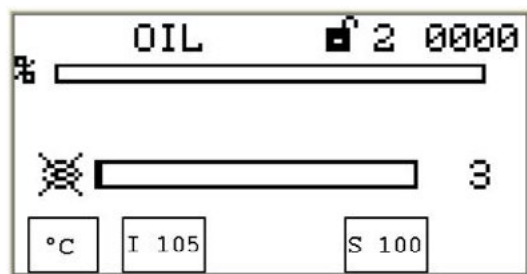
Control panel	Button
	<ol style="list-style-type: none"> <li>1. Display</li> <li>2. Arrow keys</li> <li>3. Enter</li> <li>4. Back</li> </ol>



## SETTING THE TEMPERATURE:

The load controller functions are available on the control panel.

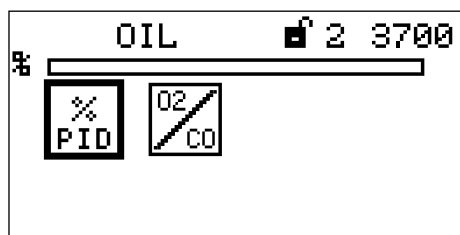
### Main menu



0000 modified ver. 1

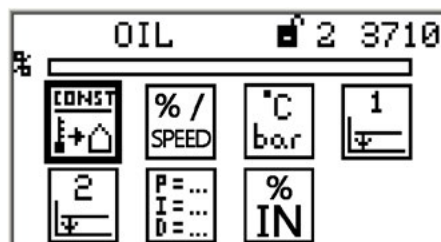
- measurement unit, °C/bar
- load controller actual value, I = 105 °C
- load controller set value, S = 100 °C

### Setting parameters for load controller



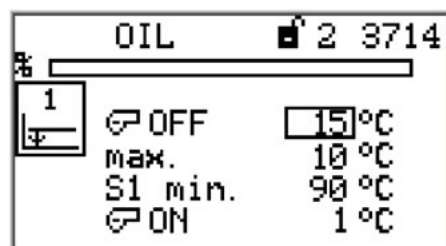
3700 ver. 4

- %-PID load controller settings



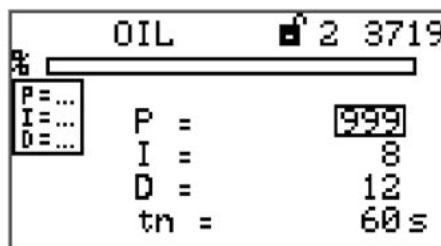
3710 modified ver. 2

- CONST, controller type selection
- °C/ bar, measurement unit
- 1 and 2 settings and limit settings
- PID terms



3714 ver. 2

- OFF, shut-off limit (in this example 15 + 90)
- max., setting (in this example 10 + 90)
- S1 min. setting (90)
- ON, start limit setting (in this example 90-1)



3719 ver. 1

- P, gain
- I, integration
- D, derivation
- tn, setting interval

**VIDEO REFERENCE: 1.04, 1.05, 1.06**

## **SETTING THE TRANSPORT CONVEYOR BELT SPEED**

Locate the VFD in the main electrical panel. The transport conveyor belt speed can be set and adjusted by rotating the nob on the VFD.

- To increase the speed of the belt the dial should be turned in the clockwise direction.
- To decrease the belt speed the VFD should be turned in the counterclockwise direction.

**VIDEO REFERENCE: 1.01**



# 3 INSTALLATION

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# 4 COMMISSIONING

Prior to commissioning the unit, the unit should be cleaned and all loose and flammable materials removed from the drying chamber. Each component should be verified and checked prior to initial start up.

Each component should be turned on individually to verify the correct and rotation of fans and motors.

Belts and conveyors should be checked to verify proper alignment and tension.

## ADJUSTING BURNER TEMPERATURE

The burner temperature and high and low limits should be verified and adjusted during the commissioning phase. To do this please reference the controls section and the Oilon burner manual.

**VIDEO REFERENCE: 1.04, 1.05, 1.06**



### ADJUSTING BELT SPEED

Belt speed adjustment is located in the electrical cabinet and is to be carried out by authorized and trained personnel only.

The man transport conveyor belt speed can be adjusted by adjusting the VFD located in the main electrical cabinet. To increase the speed of the belt the dial should be turned in the clockwise direction. To decrease the belt speed the VFD should be turned in the counterclockwise direction.

The belt speed should be matched to the temperature and material thickness to result in the desired output moisture content at discharge of the transport conveyor belt.

**VIDEO REFERENCE: 1.01**



## ADJUSTING MATERIAL HEIGHT

The material height can be adjusted by adjusting the distance between the transport conveyor and the distribution paddle. To decrease the thickness of the material on the transport conveyor lower the plastic distribution paddles towards the belt. To increase the thickness, raise the distribution paddles away from the belt.



**VIDEO REFERENCE: 1.07**

# 5 OPERATION

## 5.1 BEFORE OPERATION

Read and understand this manual. Know what the controls do and how to operate them. Familiarize yourself with the Dryer and its operation before you begin using it. Know how to quickly shut off the machine in case of an emergency.

It is not allowed to shut down the equipment by means of emergency stop or forced power off unless there is an emergency. Startup and shutdown shall strictly follow the operation procedures, or service life of the equipment will be greatly shortened. The equipment failure caused by incorrect operation is not covered under the warranty.

Operators should check for failures on the HMI and individual components at the beginning and after the end of each shift. It is strictly forbidden to operate the equipment with any failure.

**!** **Note YOUR SAFETY IS YOUR RESPONSIBILITY**

### IS YOUR DRYER READY FOR OPERATION?

- For your safety, and to maximize the service life of your equipment, it is very important to take a few moments each time before you operate the Dryer to check its condition. Be sure to take care of any problem you find before you operate the Dryer.
- Improperly maintaining this Dryer, or failing to correct a problem before operation, could cause a malfunction which could cause you to be seriously injured.
- Always perform a pre-operation inspection before each operation, and correct any problems.
- Check the General Condition of the Dryer. Verify all doors are closed.
- Verify that the three-phase voltage is normal. Normal readings should be 100 ~240V, any readings outside of this are considered abnormal and must be corrected prior to starting.
- Verify the all fans and motors are rotating in the correct direction. Correct turning directions are indicated on the fans, while motors may be determined by their local purpose as a component in the machine.
- Please check for and remove any foreign material inside the drying chamber. This includes checking the areas below the dryer belts within the chamber to verify that there is not an accumulation of materials.
- Check whether “operational” indicator lamp is lit on the operation panel before operating the equipment.

### CHECK YOUR WORK AREA

For your safety and the safety of others, always inspect the area before operating the Dryer.

#### OBJECTS:



**DANGER!**

Anything which can be grabbed by the rotating or moving components of the Dryer is a potential hazard to you and others.

Look for hazards and remove them from the work area.

### SAFE OPERATING PRECAUTIONS

Before operating the Dryer for the first time, please review both the DRYER SAFETY section and the BEFORE OPERATION section.

Even if you have operated other Dryers, take time to become familiar with how the Triminators Belt Dryer works.



**CAUTION**

Never tamper with or alter any of the controls or safety devices on the Belt Dryer



**DANGER!**

Never operate the Triminators Dryer while under the influence of drugs, alcohol or prescriptions, including over-the-counter cold/flu medications and allergy medications.

It is strictly forbidden to touch the belt, chain and other transport parts during operation of the equipment.

**!** **Note** Protective clothing and eye and/or hearing protection should be worn during operation.



For your safety, do not operate while wearing loose-fitting clothing, jewelry, etc..

Long hair should be secured in a manner that keeps it away from mechanical parts.

Rotating machinery and moving parts can entangle loose clothing, long hair or dangling jewelry resulting in serious injury or death.

The equipment shall not be started until thorough inspection and preparation have been performed to verify the system is safe to operate.

## **5.1 STARTING THE DRYER UNDER NORMAL OPERATING CONDITIONS**

When starting the dryer under normal operating conditions it is advised to start the mechanical components first to verify they are functioning normally before proceeding to starting the burner. Once all components have been verified, the burner may be turned on and the dryer brought to temperature. This enables rapid troubleshooting and repair of any trouble components as needed without waiting for the dryer to cool.

### **STARTING THE MECHANICAL COMPONENTS**

To start the dryer verify the disconnects are in on position and that there is power to the HMI and the burner. Using the HMI controls start each component and verify it is functioning normally before starting the next component. With all components operating begin with the burner start up procedure.

### **STARTING THE BURNER**

- Verify all switches on the high temperature limit panel are in the operating position.
- Verify the high limit temperature setting is 10 degrees above the set temperature on the burner.
- Switch the power switch on the burner to the 2 – AUTOMATIC position, which will start the burner.
- The burner should now fire intermittently until it reaches the set parameters shown on the A100 control panel.
- Verify temperature on the burner LCD screen.

## **5.2 SHUTTING DOWN THE DRYER UNDER NORMAL OPERATING CONDITIONS**

When shutting down the dryer under normal operating conditions it is advised to shut down the burner first to speed the cooling process. As appropriate for the material process the mechanical components may continue to run or be shut down following the shutdown of the burner.

Prior to shutting down the burner please verify all materials which are in process have been dried completely and are no longer in the drying chamber.

### **STOPPING THE BURNER:**

Switch the power switch on the burner to the 0-STOP position.

### **STOPPING THE MECHANICAL COMPONENTS**

Use the HMI controls stop each component.

## 5.3 DRYING PLANT MATERIAL



### LOADING

When loading fresh plant material, it should be spread evenly and gently on the transport conveyor belt. If material is dropped or pressed onto the belt it may damage the belt. The material should be loaded in a consistent manor which results in an even consistent layer of material on the uphill side of the distributor.

### UNLOADING

As material exits the transport conveyor it should fall directly onto the discharge conveyor. At this point the material should be tested for moisture content. The speed of this conveyor should match the output volume of the transport conveyor and can be speed adjusted on the motor of the discharge conveyor.

# 6 MAINTENANCE

## 6.1 MAINTENANCE SAFETY

Some of the most important safety precautions follow. However, we cannot warn you of every conceivable hazard that can arise in performing maintenance. Only you can decide whether or not you should perform a given task. Failure to properly follow maintenance instructions and precautions can cause you to be seriously hurt or killed. Always follow the procedures and precautions in this owner's manual. It is not allowed to shut down the equipment by means of emergency stop or forced power off unless there is an emergency. Startup and shutdown shall strictly follow the operation procedures, or service life of the equipment will be greatly shortened. The equipment failure caused by incorrect operation is not covered under the warranty.



### SAFETY PRECAUTIONS

Make sure all motors are off and power cords are unplugged before you begin any maintenance or repairs. Read the instructions before you begin, and make sure you have the tools and skills required. Main Equipment Power and disconnect should be switched off during cleaning. All equipment should be deenergized and lockout/tagout procedures should be followed prior to performing cleaning and maintenance functions.

## 6.2 MAINTENANCE SCHEDULE

### TRANSMISSION SYSTEM - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Conveyor chain	The chain is damaged due to wear and stuck foreign matters	remove the damaged parts and replace with new component	Check whether there is serious fracture and wear	Verify chain is operating freely without excessive slack. If clicking is heard readjustment is needed.	Monthly	C2082
2	Supporting cross bar	Foreign material penetrates belt and bends supporting cross bars	remove screws and rivets for installation replace with new component	do not allow foreign materials to enter during operation	Verify all rivits and connections are secure. Bars are straight	Monthly	Φ20×2×1800
3	Mesh belt	foreign material get stuck and breaks the mesh belt	remove the damaged parts and replace by riviting new mesh in place as a patch	prohibit non drying materials entering during operation	Verify no holes in mesh belt	Monthly	width1800: mesh 2×2, diameterΦ0.55
4	Gear reducer	oil shortage	replace lubricating oil	change lubricating oil as suggested	Replace the oil at the following intervals. The first time is 30 days of operation and replace every 6months thereafter.	Monthly	BWEV41-493-1.5-4P-M1
5	Electric motor	voltage outside of normal operating range	replacement	start up and check whether the voltage is normal	Maintain oils at suggested levels	Monthly	MAV2 90-4
6	Passive shaft bearing	extended operation	removal, replacement	whether there is abnormal noise	"Grease as needed (CRC SL35600 or equal)"	Monthly	UCT208
7	Drive shaft bearing	extended operation	removal, replacement	whether there is abnormal noise	"Grease as needed (CRC SL35600 or equal)"	Monthly	UCP210

## TRANSMISSION SYSTEM - MAINTENANCE SCHEDULE (CONTINUED)

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
8	Drive chain	normal operating wear	removal ,replacement	verify there is sufficient lubrication on chain to reduce chainwear	Apply Food grade lubricating spray. (CRC 03055 Food Grade Chain Lubricating Spray or equal)	Monthly	16A
9	Baffle plate	displacement	Repair and replace riveting as needed	Do not allow material other than intended to enter durring operation	Regular observation	Monthly	Manufactured Item
10	Passive gear shaft	Excessive torque	removal ,replacement	maintain proper lubrication and chain tension. Only use original motors.	Regular observation	Monthly	Manufactured Item
11	Drive gear shaft	Excessive torque	removal, replacement	maintain proper lubrication and chain tension. Only use original motors.	Regular observation	Monthly	Manufactured Item
12	Rivets						5×15
13	Chain friction strip	normal wear	removal and replacemement	Identify areas where strip is coming loose and re-attach	Regular observation	Monthly	Manufactured Item

## BODY STRUCTURE - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Insulation chamber	External force impact	removal ,replacement	Take care and not to be impacted by external force. NO Corrosive gas or liquid touch.	Keep Clean	Monthly	Manufactured Item
2	Access doors	External force impact	removal ,replacement	verify all doors and door hardware are functioning as intended	Keep Clean	Monthly	Manufactured Item
3	Skeleton	External force impact	welding or replacement	prohibit external force impact	Regular observation	Monthly	Manufactured Item
4	Rail	External force impact	welding or replacement	prohibit external force impact	Regular observation	Monthly	Manufactured Item
5	Feeder port	External force impact	welding or replacement	prohibit external force impact	Regular observation	Monthly	Manufactured Item

## DRYING CHAMBER - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Air Duct	corrosive gas or liquid	riveting or replacement	prohibit corrosive gas or liquid to touch	Regular observation	Monthly	Manufactured Item
2	Filter	external force impact	welding or replacement	prohibit corrosive gas or liquid to touch and prohibit external force impact	Clean the filter screen regularly	Monthly	Manufactured Item
3	Main Fan	lack of phase, unstable voltage, external force impact	replacement of accessories	start up and check whether the voltage is normal	Belt is too loose, tension or replace	Weekly	4-72-8C-22kw-1600
4	Dehumidifying fan	lack of phase, unstable voltage, external force impact	replacement of accessories	start up and check whether the voltage is normal	Verify whether the fan is secure and running smoothly	Weekly	4-72-5.6A-3kw-1420



## DISCHARGING CONVEYOR - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Motor	unqualified voltage access	removal, replacement	Turn on the machine and check whether the voltage is normal	Keep the motor clean and free of dust.	Monthly	MCV2-80M-4
2	Reducer	oil shortage	add lubricating oil or replace	change lubricating oil regularly	Replace oil regularly. The first time is 30 days of operation and replace every 6months	Monthly	NMRV063-TA-80B5
3	Conveyor Belt	long time wear and foreign matters get stuck,deviate,slip.	remove and replace	be attention to the tightness	Clean residual material build up	Routine inspection during operation	NA
4	Bearing	Natural wear	remove and replace	whether there is abnormal noise after start up	Monthly	Routine inspection during operation	UCP206
5	Skeleton	external force impact	welding or replacement	avoid impacts		Routine inspection during operation	Manufactured Item
6	Drive Shaft	Excessive torque	replace	The foreign matter is not allowed to enter the conveyor belt	Periodic maintenance	Routine inspection during operation	Manufactured Item
7	Passive Shaft	Excessive torque	replace	The foreign matter is not allowed to enter the conveyor belt	Periodic maintenance	Routine inspection during operation	Manufactured Item

## FEEDING SYSTEM - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Motor	unqualified voltage access	remove and replace	turn on the machine and check whether the voltage is normal	keep the motor clean and free of duct; frequently check the appearance of the motor to see if there are parts misplaced	Monthly	MLV2-80M-4
2	Reducer	oil shortage	add lubricating oil or replace	change lubricating oil regularly	replace the lubricating grease regularly. The first time is 15days of operation and replace every 3~6months	Monthly	UDLO.55
3	Material scraper	foreign matter gets stuck	remove foreign matters or relace accessories	prohibit non drying materials entering during operation	regular clamping screw	Before starting the machine	Manufactured Item
4	Bearing	natural wear	remove and replace	regularly check whether the screw is loose	"Grease as needed (CRC SL35600 or equal)"	Weekly	UCP206

## BURNER AND FURNACE - MAINTENANCE SCHEDULE

	Component	Possible Causes of Damage	Repair Instructions	Precautions	Maintenance	Inspection Interval	Parts Model
1	Burner	voltage discrepancy, electrical short circuit, alarm	check voltage,alarm code , eliminate code fault.	check propane regularly for air leakage	Shut down and close propane valve	Before starting the machine	
2	Furnace body	external force impact	welding or replacement	check propane for air leakage	Regular inspection	Before starting the machine	Manufactured Item
3	High limit cabinet	external force impact	check whether the electrical components are damaged and replace	start up the machine to check whether the circuit is normal. Prohibit the operation of non training personnel.	prohibit the operational cabinet from external force	Before starting the machine	Manufactured Item

## 6.3 CLEANING



**DANGER!**

It is important to keep the Triminators Belt Dryer clean and free from flammable and explosive materials. Material accumulation and build up should be monitored continuously and cleaned as required to maintain a safe environment. The following cleaning schedule has been provided as a guideline however it is the responsibility of the operator to maintain a safe and clean environment. All surfaces should be cleaned with food grade, non-flammable cleaning agents at the selection of the operator. Critical components are listed below, however the operator should monitor the entire environment to maintain a clean, sanitary and safe work environment.



**CAUTION**

Main Equipment Power and Disconnect should be switched off during cleaning. All equipment should be deenergized and lockout/tagout procedures should be followed prior to performing cleaning and maintenance functions.


Component	Process	Interval
Transport Conveyor Belt	Wash by hand with a soft bristle brush and food safe, non-flammable, non corrosive cleaning agent safe for use on stainless steel.	As needed
Drying Chamber	Vacuum any material accumulation from the floor and accumulation points in the drying chamber.	Once per Shift
Drying Chamber/ Transport Conveyor Belt	Clean the material collector under the brush of the discharge opening..	Once per Shift
Discharge conveyor	Wash belt by hand with food safe, non-flammable, non corrosive solvent safe for use on PVC.	Weekly
Discharge conveyor	Clean any materials stuck on the rollers and frame.	Once per Shift
HMI	Inspect and wipe down the control cabinet every shift to make sure the electric control cabinet is not contaminated.	Once per Shift
Electrical Cabinet	Inspect and clean the inside of the electrical cabinet.	Weekly
Dehumidification Fan and Ducts	Clean residues off the dehumidification fan opening and ducts, at least once a month to make sure the dehumidifying system passage clean and free from obstructions.	Monthly
Drying Chamber	Dust on top of the equipment should be cleaned with compressed air or vacuum cleaner on a regular basis.	Monthly

## 6.4 TROUBLESHOOTING

### LIST OF RAPID TROUBLESHOOTING FOR CONTINUOUS DRYERS

No.	Failure Messages	Failure Check and Troubleshooting
1	"Unable to start up properly Power failure is displayed after start up"	<ol style="list-style-type: none"> <li>1. Check whether relevant switches in the user's main breaker and disconnect are closed properly, including the power closing switches of 110V and 480V.</li> <li>2. Open the electrical cabinet and check whether switches of the leakage circuit breaker and the micro circuit breaker are closed properly.</li> <li>3. Check whether there are abnormalities in the electrical system such as a missing phase, leaking phase, wrong phase sequence, imbalanced phase voltage and etc. are existing in the power supply system. Open the electrical cabinet to check whether there are alarms from the phase sequence protector.</li> <li>4. Make sure that the key switch works properly and rotates to open position.</li> </ol>
2	Emergency stop button pressed	<ol style="list-style-type: none"> <li>1. Check whether the emergency stop button is pressed down. Release the button by rotating it as per indications on the button.</li> <li>2. Check whether the emergency stop button is functionally damaged; Measure the on-off condition of the two contact ends of the button by using the diode of a multimeter. A released button indicates connecting status, and a pressed down button indicates open status. Otherwise, it indicates that the button is damaged and need to be replaced.</li> </ol>
3	Circulating fan failure	<ol style="list-style-type: none"> <li>1. Check whether power supply system of the circulating fan works properly, and make sure that the micro circuit breaker controlling the circulating fan is under OPEN status.</li> <li>2. Check to make sure that the soft starter controlling the circulating fan works properly, and the power supplies of 110V and 480V are normal.</li> <li>3. Check whether the dehumidification fan is eccentric or blocked, etc., which may cause overload, over-current, overheating and so forth."</li> </ol>
4	Dehumidification fan failure	<ol style="list-style-type: none"> <li>1. Check whether power supply system of the dehumidification fan works properly, and make sure that the micro circuit breaker controlling the dehumidification fan is under OPEN status.</li> <li>2. Check to make sure that the soft starter controlling the circulating fan works properly, and the power supplies of 110V and 480V are normal.</li> <li>3. Check whether the thermal overload relay is released. If yes, please check the failure according to No. 2. Click the RESET button of the heat overload relay once after failure check."</li> </ol>
5	Material output motor failure	<ol style="list-style-type: none"> <li>1. Check whether power supply system of the material output motor works properly, and make sure that the micro circuit breaker controlling the motor is under OPEN status.</li> <li>2. Check whether the material output motor is eccentric or blocked, etc., which may cause overload, over-current, overheating and so forth.</li> <li>3. Check whether the thermal overload relay is released. If yes, please check the failure according to No. 2. Click the RESET button of the heat overload relay once after failure check."</li> </ol>

## LIST OF RAPID TROUBLESHOOTING FOR CONTINUOUS DRYERS (CONTINUED)

No.	Failure Messages	Failure Check and Troubleshooting
6	Material conveying and mixing motor failure	<ol style="list-style-type: none"> <li>1. Check whether power supply system of the material conveying and mixing motor works properly, and make sure that the micro circuit breaker controlling the motor is under OPEN status.</li> <li>2. Check whether the material conveying and mixing motor is eccentric or blocked,etc., which may cause overload, over-current,overheating and so forth.</li> <li>3. Check whether the thermal overload relay is released. If yes, please check the failure according to No. 2.Click the RESET button of the heat overload relay once after failure check.</li> </ol>
7	Chain conveyor motor failure	<ol style="list-style-type: none"> <li>1. Check whether power supply system of the chain conveyor motor works properly, and make sure that the micro circuit breaker controlling the motor is under OPEN status.</li> <li>2. Check whether the chain conveyor motor is eccentric or blocked,etc., which may cause overload, over-current,overheating and so forth.</li> </ol>
8	VF1 frequency converter failure	Check whether there is any failure of VF1. Troubleshooting need to be done according to the failure code shown in the VF display window. Please refer to the list of the VF alarm codes for details.
9	VF2 soft starter failure	Check whether there is any failure of the VF2 soft starter.
10	Power supply failure of furnace system	Check whether power supply system of the hot blast furnace works properly, and make sure that the micro circuit breaker of the motor is under OPEN status.
11		<p>In case that the white indicator lamp in the left picture is on, it indicates that there is an alarm for over-temperature of the furnace. It is necessary to reset the temperature limit meter by manually pressing the Reset button.</p> <p>In case that the red indicator lamp is on, it indicates that there is an alarm of failure of the burner. Press the OK button on the panel of the burner after troubleshooting.</p>

## 6.5 REQUIRED SOFTWARE FOR TROUBLESHOOTING

In order to enable remote troubleshooting of the Siemens via your own on-site tech please have the on-site tech register with Siemens and download the following version and software to their laptop. In the event of a PLC related issue the customer will be asked to connect their laptop to the PLC via an Ethernet cable.

### SIEMENS

#### REGISTER WITH SIEMENS INDUSTRIAL ONLINE SUPPORT:

Please note it may take several days for Siemens to review and approve your application and allow you access to download the appropriate software.

#### REGISTRATION LOCATION:

<https://signin.siemens.com/regpublic/ProfileWizard.aspx?layer=false&lang=en&regionKey=ww&rf=SIOS&app=SIOS&ret=https%3A%2F%2Fsupport.industry.siemens.com%2Fcs%2Fstart%3Fic%3Den-ww>

#### SIEMENS SIMATIC STEP 7 BASIC - TIA PORTAL V14 SP1

Please note there are several versions available. To troubleshoot the Triminotor Belt Dryer please download the following version: STEP 7 Basic V14SP1

#### DOWNLOAD LOCATION:

<https://support.industry.siemens.com/cs/document/109745153/simatic-step-7-including-plcsim-v14-sp1-trial-download-?dti=0&lc=en-WW>

### TEAMVIEWER

Please download TeamViewer to allow service techs to access the PLC on the Dryer via your PC laptop.

#### DOWNLOAD LOCATION:

<https://www.teamviewer.com/en/info/free-remote-access-software/>

## 6.6 VIDEO REFERENCES

For quick reference to topics covered in this manual please see the table of video references below:

Number	Title	Description	Key Topics
1.01	Electrical Component Overview	Overview of electrical disconnects, main electrical panel.	Location of equipment disconnects. PLC, Belt speed control.
1.02	Human Machine Interface Overview	Overview of HMI controls settings	Overview of each control setting
1.03	Human Machine Interface Start Up Process	Start Up Process using HMI	Summary of start up components start up
1.04	Oilon Burner Controls Overview	Burner on and off switch, position to adjust settings without turning on	Burner on and off switch, position to adjust settings without turning on
1.05	Oilon Settings Control	Overview of burner settings and adjustments	Adjust Temp set points, Adjust
1.06	High Temp Limit Safety	How the high temp limit safety works	Resetting and setting high temp set points
1.07	Adjusting the Material Distributor	How to adjust the material distributor to adjust material height	Adjusting material height
1.08	Duct Vent Positions	Standard duct vent positions	Standard duct vent positions



## 6.7 PARTS LIST

Structure	Number	Part	Part model	Material/ brand	Unit	Quantity
Transmission structure	1	conveyor chain	C2082	carbon steel	M	20
	2	supporting rod	Φ20×2×1800	hot dip Galvanzing	Piece	30
	3	mesh belt	width1800; mesh2×2, diameterΦ0.55	304	m	30
	4	Passive shaft bearing	UCT208	carbon steel	piece	2
	5	Drive shaft bearing	UCP210	carbon steel	piece	2
	6	Drive chain	16A	carbon steel	m	2
	7	Rivet	5×15	304	box	5
Discharging conveyor	8	bearing	N6846	carbon steel	piece	2
Feeding bearing base	9	bearing	UCP206	carbon steel	piece	2
Electrical cabinet	10	intermediate relay	DRM270615L	Weidmueller	Piece	2
	11	contactor	3RT60181AF01	Siemens	piece	2
	12	contactor	3RT50361AG20	Siemens	piece	2
	13	Thermal relay	3RU61161BB0	Siemens	piece	2
	14	Thermal relay	3RU61164AB0	Siemens	piece	2
	15	Fuse	PMF10×38 15A	Bussmann	piece	2
	16	Fuse	PMF10×38 5A	Bussmann	piece	2





## CUSTOMER SERVICE

For all customer service inquiries  
or to help you diagnose any issues with  
your machine, contact Trinator directly.

**1-530-265-4277**

**INFO@THETRIMINATOR.COM**

**WWW.THETRIMINATOR.COM**

### FOLLOW US



**@THETRIMINATOR**



# LIMITED WARRANTY

- A. The Company warrants to Buyer that, for a period of one (1) year from the date of delivery, the Products shall conform in all material respects to the Specifications and shall be free from defects in materials or workmanship that “materially” (as defined below) affect the proper functioning of the Products. For purposes of the immediately preceding sentence, the term “materially” shall mean a functional deficiency of more than 10.0% from the performance metrics set forth in the Sales Order and related documents. Buyer shall promptly deliver to the Company written notice of any alleged defect or claim arising under this warranty. The Company shall promptly verify the validity of such claim and provide written a response to Buyer within thirty days of receipt of the Buyer’s notice. Subject to the limitations and exclusions set forth below, the Company’s obligation under this warranty is limited to repairing or replacing, at the Company’s option, the Products to the extent necessary to remedy any qualifying defect that the Company is able to confirm using commercially reasonable efforts. The Company shall deliver written notice to Buyer setting forth whether it has confirmed the validity of any warranty claim and, if such validity is verified, the actions the Company intends to undertake to perform its warranty obligations hereunder. Such performance shall be completed within thirty (30) days of the Company’s confirmation of a qualifying defect.
- B. Notwithstanding the foregoing, this limited warranty shall not apply to the following defects, loss or damage:
- i. defects resulting from accident, neglect, misuse, tampering, or causes other than normal and intended use of the Products;
  - ii. defects resulting from Buyer’s failure to adequately prepare Buyer’s site for use of the Products or Buyer’s failure to properly install the Products;
  - iii. defects of a minor or cosmetic nature that do not materially affect the function of the Products;
  - iv. defects, loss or damage resulting from or made worse by misuse, abuse, alterations, modifications, lack of proper maintenance, improper repairs, or neglect in notifying the Company of defects in a timely, proper, or adequate manner or neglect in taking reasonable precautions to mitigate or prevent loss or damage;
  - v. defects, loss or damage resulting from or made worse by any materials supplied or work performed by anyone other than the Company or a third party contracted on behalf of the Company; or
  - vi. defects, loss or damage resulting from or made worse by acts of God, forces of nature, extreme weather, climate, air, utilities, or other conditions at Buyer’s site for the Products.
  - vii. Provided, however, that 6.b.iv-vi. above shall not exempt the Company from responsibility for warranty coverage of any defects, loss or damage to the extent that such defects, loss or damage would otherwise be covered by the limited warranty set forth in Section 6.a above and can be verified to have existed prior to being made worse as described under 6.b.iv-vi.
- C. Except as specifically set forth in this section 6, the company makes no representations or warranties of any kind, whether express, implied, or statutory, including without limitation, implied warranties of merchantability or fitness for a particular purpose, and the company hereby disclaims the same. No other oral or written representations or warranties on the part of any agent of the company shall be effective. No trade usage or prior course of dealing shall be used in the interpretation or construction of the terms and conditions in these terms of sale. In the event of any conflict between the terms and conditions set forth in these terms of sale and any other terms and conditions applicable to buyer’s purchase of the products as set forth in other company documentation or on the company’s website, the terms and conditions set forth herein shall govern.

**LIMITATION OF LIABILITY.** THE COMPANY’S OBLIGATION UNDER THIS AGREEMENT IS LIMITED TO REPAIR AND REPLACEMENT, AT THE COMPANY’S OPTION, OF DEFECTIVE OR NON-CONFORMING MATERIALS AND WORKMANSHIP IN THE PRODUCTS. THE COMPANY SHALL NOT BE LIABLE TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES – INCLUDING, WITHOUT LIMITATION, DAMAGE TO OR LOSS OF MATERIALS PROCESSED USING THE PRODUCTS OR ANY LOST PROFITS – WHETHER SUCH LIABILITY IS ASSERTED BASED ON CONTRACT OR TORT, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

