

# Kumsung In / Out Trash Rake

Manual for

Operation and Maintenance

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## Operation and Maintenance Manual for Trash Rake

1. Indicating needle of volt meter shall be within 380V ~ 400V
2. Ammeter shall be 0 when the motor is stopped, full load current shall be less than 7.5A during the motor is operating.( Based on 5 HP Motor)  
3~4 Ampere shall be indicated during normal operation.
3. When main MCCB is ON, V meter is operated (Indicating 380 V)
4. Check the power lamp is on when MCCB is on. In case of Off state, fuse melted down is to be checked. Replace with 4A Fuse if disconnected.
5. Push “Operation button“ to start when “Power lamp” is ON.

### Selector Switch:

- 1) Continuous operation – Trash remover will be operated continuously until the “Stop” button is pressed.
  - 2) Timer operation – Trash remover will be operated for the “Operation setting time” and standby for the “Standstill setting time”
6. Stop: To stop the motor, press “Stop” button.
  7. Timer handling
    - a) To increase the operation time, turn the upper switch clockwise  
Maximum can be set to 0– 60 min. Time adjustment range is  
One (1) sec to ten (10) hours.
    - b) Maximum can be set to 0– 60 min. , Time adjustment range is  
One (1) sec to ten (10) hours.
  8. Lamp
    - a) Power source: Indicating Lamp ON when Main NFB & earth leakage breaker are closed.

- b) Motor Overload: Operates when the current flows over the set value.
- c) Torque overload: Indicating Lamp On when abnormally operated due to overload torque.

d) Spare Lamp

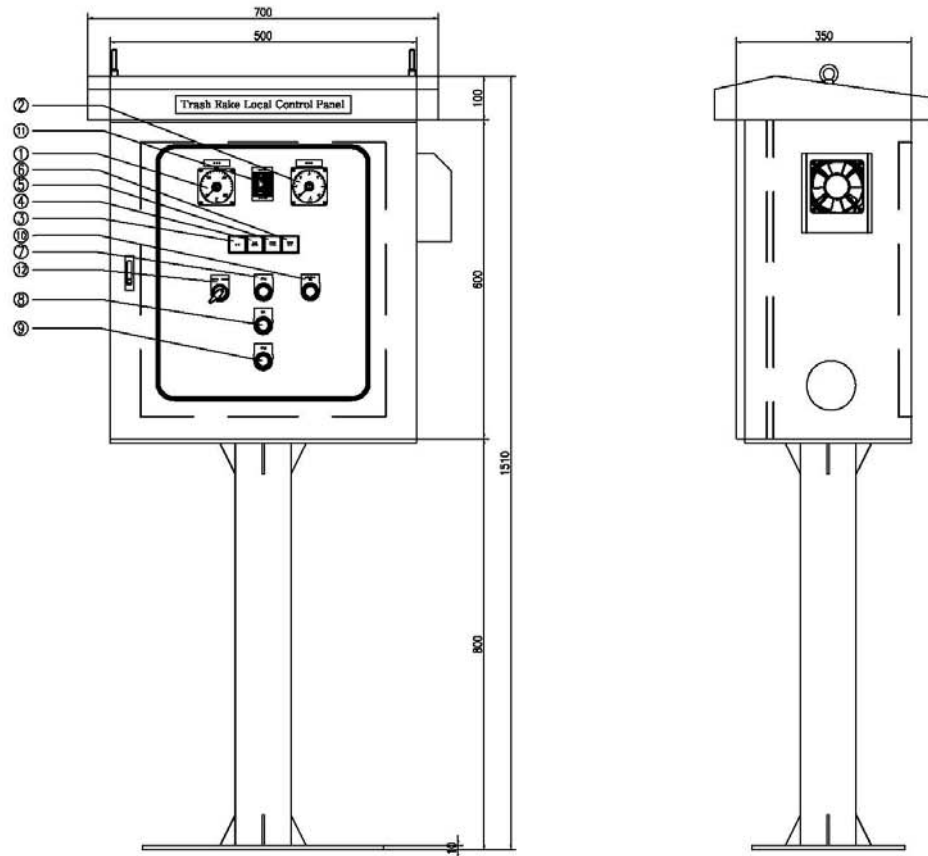
9. When " Motor Overload " lamp is on, press " Motor Overload Push Button" at the front Panel (box).

10. When "Overload Torque" lamp is on, open main MCCB to find the cause.  
After trouble shooting, close MCCB to start again.

11. How to set EOCR SS-60RY7

- a) Operating current setting
  - shall be interlocked with Motor rated current and protect the machine load. Under stop position, check the actual load current using digital indication tool under normal load condition. Set Load Knob at 110% ~ 125% of rated operating current.
- b) Delayed start time setting – Motor shall be started at the max time.  
Then check the current and measure the time the starting current becomes rated current. D-time knob shall be set 1 -2 seconds longer than actual measured value.
- c) Operation time – Time from over current started to relay operated shall be set by O-Time Knob.

Fig. 1. Lay out of local control panel



- ① Voltmeter
- ② Ammeter
- ③ Power source Lamp
- ④ Motor Overload Lamp
- ⑤ Torque Overload Lamp
- ⑥ Spare Lamp
- ⑦ Operation Button
- ⑧ Stop Button
- ⑨ Reverse Rotation Button
- ⑩ Spare Button
- ⑪ Timer
- ⑫ Operation Selection Switch, Continuous / Timer

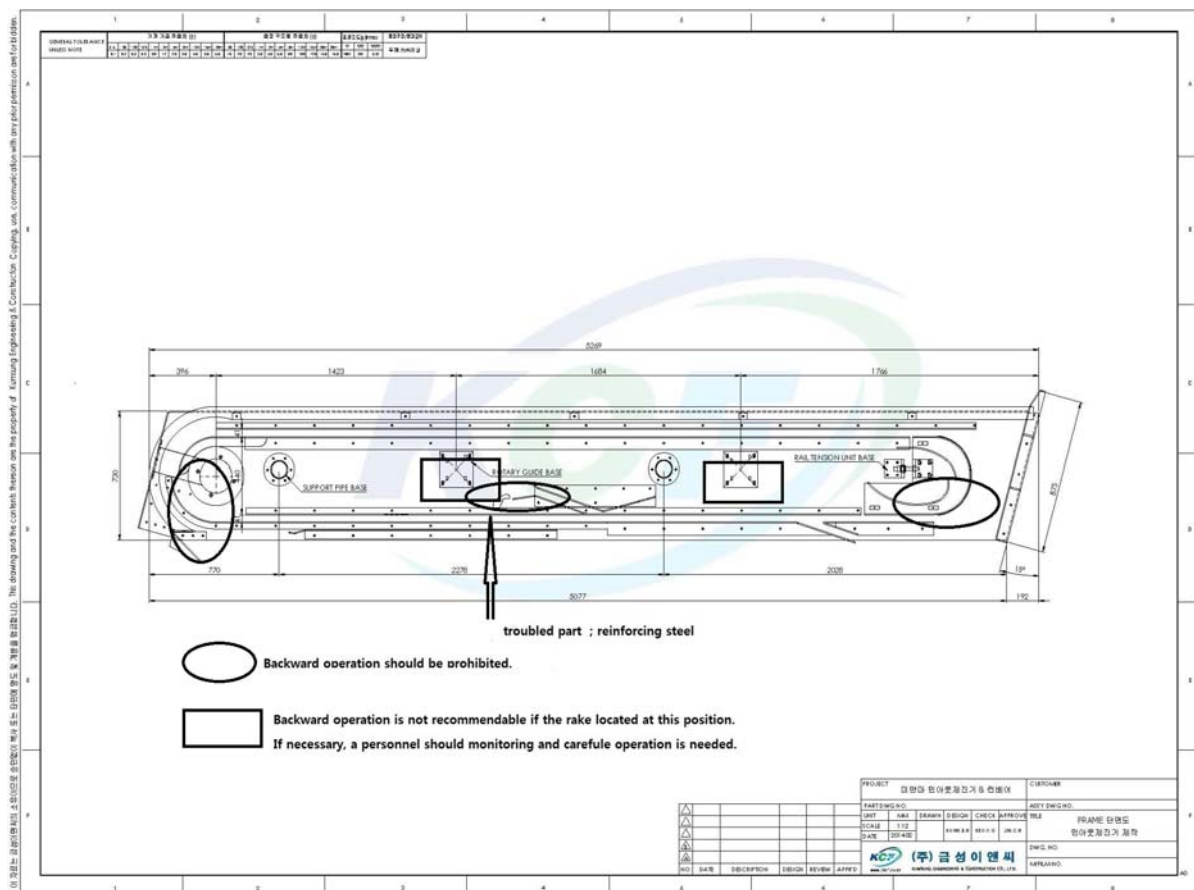
## 12. Operation, Stop and Reverse (Backward) rotation

When operation is not available due to insertion or hitch of foreign substances, check the condition and press “Reverse Rotation “button for restoration. After restoration, start operation again.

However, “Reverse Rotation shall be carefully done 2-3 times within a short time .

Refer to below Fig. 1 for the “Restricted Zone of Backward Operation”

Fig. 2. Restricted Zone of Backward Operation



\*\* Automatic Backward Operation is totally prohibited at the start and during the operation of trash remover.

### 13. Simple Repair of Screens

In case of “Out-Positioned Screens”– a typical trouble caused by careless backward operation of In/Out Trash Remover, follow the “Repair Directive” for the repair of the screen.

#### “ Repair Directive”

- 1) Unfasten the bolt for the out-positioned screen (Refer to Fig. 3 & 4)
- 2) Take out the screen from the Trash Remover.

Please use crane to avoid any further possible damage.

- 3) Check whether the screen is bent or not. If it is bent, make it flat and straight using hammer.
- 4) Using crane, put the lower end of screen at the hole in the bottom of the trash remover. After then insert the screen to the groove located at the “Rotary Screen Supporter”.( Refer to Fig. 5)
- 5) Fasten the bolt at the top of the screen
- 6) Check the whole screen clearances and confirm the screens are put into the hole .
- 7) Check the other parts whether there is any deformed parts or not from the careless backward operation.
- 8) If everything is OK, then restart the trash remover.

Fig. 3. Out -Positioned Screen



Fig. 4 How to Repair / Replacement of screen

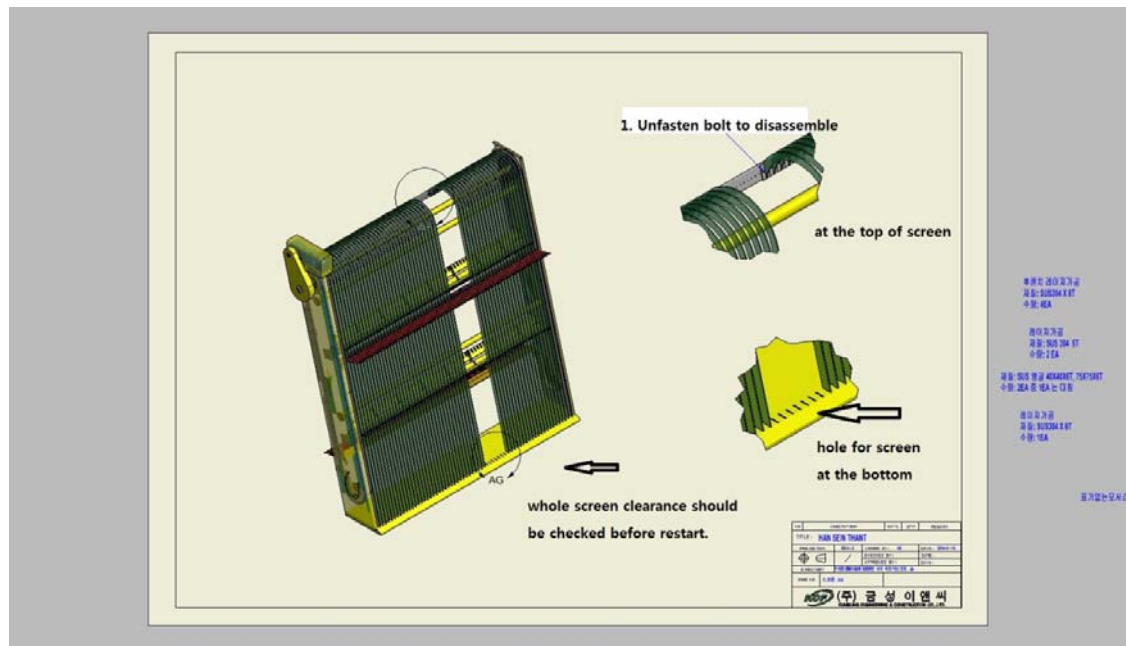
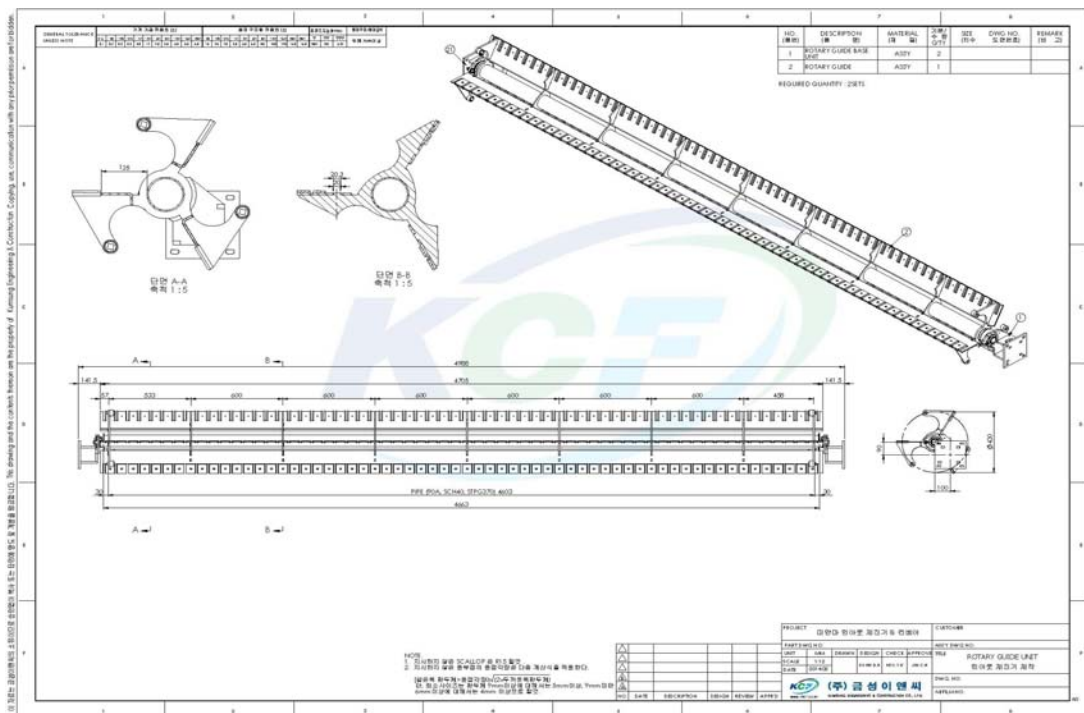


Fig. 5 Rotary Screen Supporter



## **2) Check points during operation**

a) Operation of Trash rake shall be done at Operating panel.

b) Operation, Stop and Reverse Rotation is possible.

When operation is not available due to insertion or hitch of foreign substances, check the condition and press “ Reverse Rotation”

button for restoration. After restoration, start operation again.

However, “Reverse Rotation shall be carefully done 2-3 times within a short time.

c) Electrical overload relay is used for protection device of Trash Rake. In case the operation is stopped by the overload relay, the cause for overload should be removed before restart operation.

d) Standby status of Trash Rake for a long time may cause solidification of Rake with earth and sand. To avoid this, periodical check and operation shall be done once a week.

## **3) Check and adjustment**

Check shall be done as per the check list periodically. Before start, enough oil shall be checked and adjustment of equipments shall be done if needed.

a) Check point of trash rake

Check any abnormal sound, overheat, normality of volt and current.

The max. temperature rise of motor shall not be higher by 40 °C than peripheral temperature.

b) Check point for speed reducer and adjustment.

If temperature rise during operation- difference between measured temperature and peripheral temperature is over than 40°C or



abnormal sound is made, operation shall be stopped for a thorough overhaul. Leakage at oil seal part shall be checked and maintained the oil quantity within the proper range.

c) Check point for electrical roller chain and adjustment

Before operation starts, wearing condition of sprocket, lubrication and deflection of chain shall be checked.

In general, chain deflection is 4% of length span. However higher chain deflection than 4% of span shall not make problem if lower part of the deflected chains did not contact the frame.

If needed, chain can be adjusted with chain tension adjust device.

d) Before operation starts, check the link plate and chain roller.

In case of chain deflection is severe, the chains shall be adjusted with Chain tension adjust device.

e) Check the damage or bending due to overload during operation by insertion or hitch of foreign substances.

#### **4) Check by period.**

a) Check during standby period.

In case of standby status of trash rake shall be long after rainy season, periodical ( once a month is recommended) check is required.

b) Annual Check

Annual check shall be done before rainy season start, integrated Operation is recommended.

c) Usual Check

Usual check shall be done once a week or two after annual check until rainy season starts. Once rainy season is finished, check for the paint condition for anti corrosion.

d) Check point for operation

- Check before operation ; check the mal function of handling or start up.
- Check during operation : Monitoring & check to find any mal function.
- Check after operation : After operation is finished, check abnormities. ,

## 5) Check List

item	contents	Test method	criteria	Solutions
General	Cleaning	Visual Test	No attachment of foreign substances	Removal of foreign substances
Integrated operation	Operating conditions	Visual Test	No abnormal sound/noise during operation	Refer to item & contents
Motor	Current	Ammeter	Within rated current A	Contact maker
	Temperature.	Probe, thermometer	Can be touched for 2 (two) Seconds ( below 70 °c)	Contact maker
	Vibrating sound	Probe, Test by listing	No abnormality in sound and vibrating.	Contact maker
Speed Reducer	Lubricant	Visual Test	No color change and proper quantity	Adjust the quantity of lubricant
	Oil leakage	Visual Test	No leakage	Contact maker
	Temperature	Probe, thermometer	Can be touched for 2 (two) Seconds ( below 60 °c)	Contact maker
	Vibrating sound	Test by Hearing	No abnormality in sound and vibrating.	Contact maker

Motor Driven Chain	Oil supply	Visual Test	No wearing and quiet electric power transf	Oil shall be used for coating
	Tension	Measurng	Chain deflection within 4% of span between shaft	Re - tensioning
	Wearing	Visual Test	No abnormal wearing	Replacement
	Bending	Visual Test	Smooth round	Replacement
	Rust	Visual test	No rusts	Derusting
Proximity switch	Detection distance	Measuring	Gap : 0.5mm – 1.6mm (standard : 0.8mm )	Adjust the position

## 6) Trouble shooting and Restoration procedure

Contents	Check or Repair	Electric system Flow chart	Display restoration
Trash rake overload	Check the cause of motor overload . Malfunction of motor or proximity switch system f	Seal of panel or Reset	Restoration button on panel shall be Pressed.
Trash rake Over torque	Check the setting value of AMD is Within 1.6 or not. Insertion or hitch of foreign substances shall be solved through reverse rotating.		Same as above
Trash rake short circuit	Check the motor cable. Check the power source system.	Seal of panel or Reset / Restart .	Same as above
Emergency stop	When risks are found, operation of entire equipment shall be stopped and the dangerous factor shall be removed.		Same as above
Remarks	To avoid the hazard due to sudden operation of trash rake at the time of restoration under automatic operation mode, COS at the panel shall be “ Independent mode” before restoration. After equipment is commissioned under independent mode , automatic operation will be started.		