

PLANT SERVICES

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Model 240 Fiber Feeder Operations... 5-5-07

Subject: 40 # Block Fiber Feeder for Continuous Mix Blending of SMA Additive

Summary

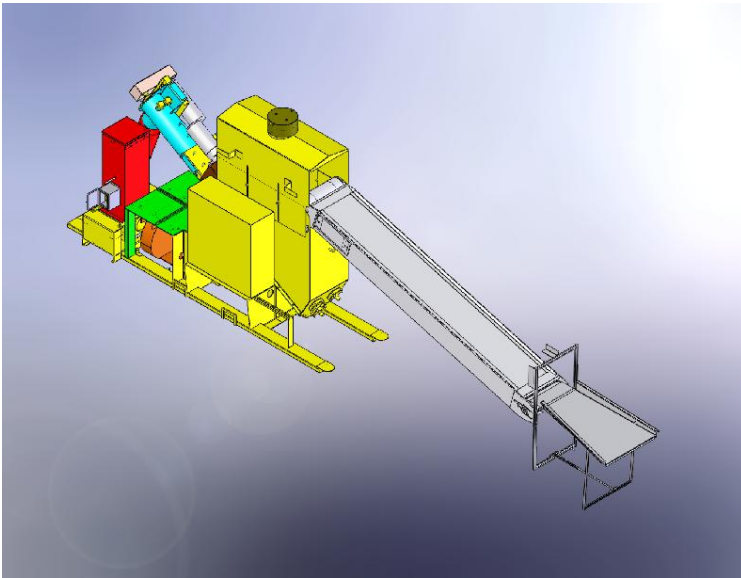
The Fiber Feeder is controlled 2 ways:

- 1) Automatically or Manually
- 2) Remotely (Plant Control Room) or Locally (at Feeder)

Normal Production Operation:

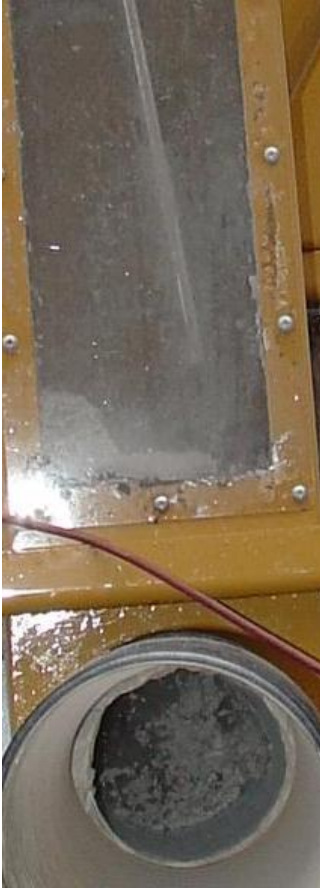
*Control Switches are placed in Automatic and Remote.

*Fiber Feeder Operator charges the hopper with fiber while the variable speed Flow Scale Auger conveys the fiber away and into the Flow Scale.



Weekly Renters Lubrication Responsibilities..Chains lubricated.. 8 Blower and Auger Bearings greased.

*As the fiber discharges from the bottom of the Flow Scale, the Blower sucks the material into itself, blows it through a 4" hose and into a spray of asphalt.



*Blower and Augers start and stop through timed sequences, as initiated by power supplied to customer's Asphalt Oil Injection Solenoid.

*Scale Auger varies in speed based on the percentage of fiber required and the Plant Rate 4-20 ma signal output.

When switched to "Remote Control" (Plant Control Room), Blower and augers are interlocked with each other and the Plant Asphalt Inject signal. Unless Local/Remote switch (located locally on Fiber Feeder Motor Control Enclosure) is positioned to "Local", the material conveying will only be allowed to run if the device it is feeding is running.

Local Control



Any of the 2 Emergency Stop switches stops all Blowers and Augers. One is placed in the Remote (Control Room) and the other is located on the Fiber Feeder.



When switched to **Remote Control**, the Fiber Feeder is controlled automatically in two ways:

- A) **Material Conveying, Sequencing and Interlocking** - Located on the Remote Control Panel is the **Motors “Auto-Off-Manual”** switch.
- In “Automatic”** - The entire Feeder system starts and stops when Customer’s Asphalt Plant Controls call for Asphalt Oil. ***Exception:** When Feeder starts automatically; Blowers starts momentarily before starting augers.* Plant Operator should insure this process is being performed correctly by observing the Flow Scale Rate indicator.
 - In “Manual”** - The same sequence applies as in Automatic. When Manual is selected, the sequence starts whether Oil Injection is being called



OR NOT.

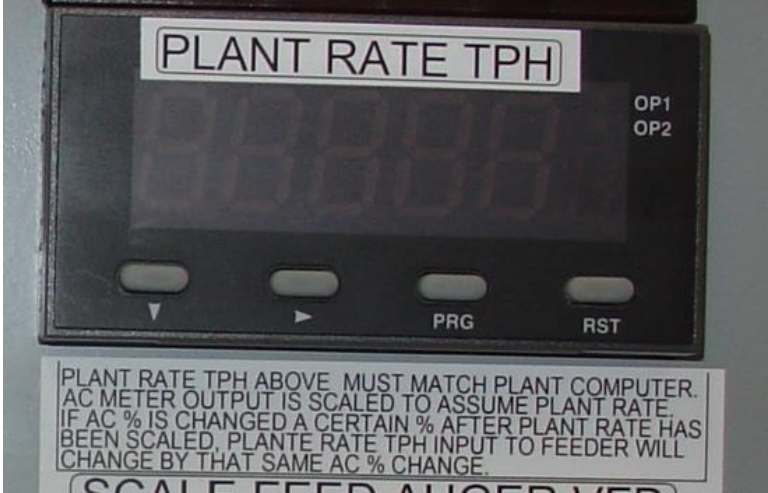
- In “Local” Control Mode** - Blowers and Augers start and stop in any sequence by engaging the appropriate Start/Stop Switch. When (if) condensation builds up in the Fiber Flow pipes leading into the mixer; the Blower should be started before feeding fiber in order to dry the fiber feed piping.
- B) **Material Blending** - The Scale Feed Auger is variable speed. It is adjusted in the “Remote” Control Panel, manually or automatically, by selecting the Blending “Automatic or Manual” indicator on the 535 Controller. (Manual mode is selected when “Manual” switch indicator is illuminated Red)
- The Automatic Flow Controller follows the *Customer’s* Plant Rate Signal and percentage of Fiber required (entered by operator).



- b. Flow Controller “Deviation Alarm” Light indicates to Plant and Feeder Operators, locally and remotely, when fiber flow deviates significantly from Target Set Point. Programmable Timed Deviation Cutout is available or plant shutdown and can be used when wired to the Plant Shut Down System.....



When RSP Toggle selects AC Meter .. The Plant Rate TPH Indicator receives a frequency input from AC Meter scaled to read



Plant TPH.

- c. The Blending Control 535 controls the speed of the Scale Auger when the VFD Keypad is set (SEQ-REF lights are illuminated) to receive 535 speed commands. The operator should set the display (Menu/OP/U1-01) so as to read desired speed, actual speed and amperage draw.



- d. The system is equipped with automatic scale overload protection. In the event the flow scale jams up with material, the flow scale will incorrectly indicate an incorrect rising flow rate. When corrected within several seconds, this jamming condition can be easily be cleared by sweeping the Jam Clearing Wand. In this event the horn will sound and the scale auger will slow down. If the jam is not cleared, the scale auger may over load or chain drive slip and maybe ruin. The Feeder operator should clear the jam as soon as possible, or if it is not possible to clear the jam quickly the operator should shut down the plant to service it.

Jam Clearing Wand with top cover removed.



The Wand has another purpose. If the operator wants to test the scale or simulate a flow rate, the operator may gently sweep the wand against the plate.

Initial Startup and preparation for Material Calibration:

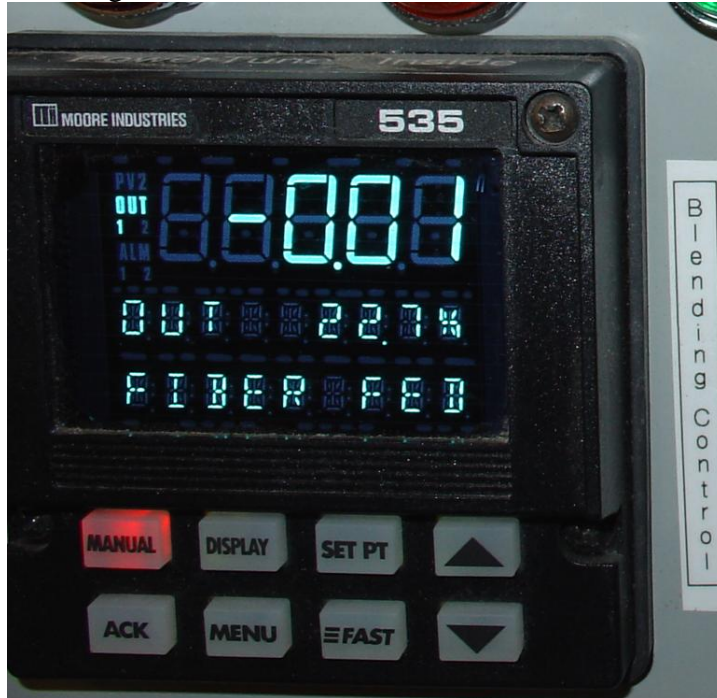
Setup Feeder; wire and plumb to plant. The Release shipping bolts from Flow Scale.

- 1) Disconnect and separate the Blower Skid from the Scale Skid
- 2) Position the Blower skid so the Blower Discharge is pointing in the direction desired
- 3) Set Scale Skid in place on firm, level ground and elevate (add planks for storage box) the Scale Discharge to same horizontal plane as Blower Intake.
- 4) Place the Scale Auger Discharge over the Scale Charging Throat. Insure the Scale does not get jolted, vibrated or shaken by the keeping the frame from contacting the Scale Skid and the Scale Discharge from mechanically touching Scale Throat. Insure the scale is not bumped or jolted during operation.
- 5) Position Scale inlet under Flow Scale Auger so as to catch all the material flow. Connect the Scale Auger Discharge to the Flow Scale Inlet Throat by enclosing the Flow Scale Inlet Throat to the Yellow Vinyl Boot with the Boot Clamp.

- 6) Insure all Safety devices are in place. Instruct your Safety Officer to inspect the operations and insure all Fiber Feeder Operators are properly trained (with written Lock out/ Tag out and Confined Space Procedure) and aware of operating status and meanings of all warning signs.
- 7) Place Remote/Local Switch to “Local”.
- 8) Use the knobs on the Yaskawa drives (located inside of the Local Motor Control Enclosure) to set the speed of the Blower and the Hopper Augers. The Blower (5.5 to 5 – motor to fan pulley dia.) should be set at 54Hz for lower flow rates at lower discharge elevations and near 72 Hz Maximum rpm at higher flow rates and higher elevations. The Hopper should run at 60hz. **The maximum speeds are preset.** Press the Display button until the *fout* light is lit which means the frequency output of the drive is displayed on the readout.



- 9) Set Scale Auger Speed to 450 rpm by adjusting the Output on the Remote Blending Control to 25%.



- 10) Start the Scale Feed Auger and then the Hopper Scale Auger.
11) Fill the Hopper with Fiber blocks.
12) Turn off the Augers once fiber reaches Blower Suction Chamber located below the Flow Scale.
13) Perform a Material Calibration as described in The Flow Scale Calibration Chapter. This calibration is typically performed by a **CRS** Technician during initial startup.

Normal First Startup of the Job: Start at Feeder- Local Control Panel

- 1) Position Remote/Local Switch to "Local"
- 2) Feeder Operator purges Fiber Feed pipe of moisture before starting the days production by turning on fan for several minutes.
- 3) With Blower "off, Feeder Operator fills augers with fiber and turns off the Augers once fiber reaches Blower Suction Chamber below the Flow Scale.
- 4) **Feeder Operator returns control to Plant Operator by returning Remote/Local Control switch to "Remote"**. Plant Operator has control when "Remote Control Acknowledgement" light illuminates on Remote Panel.
- 5) When ready to start, Plant Operator should use the necessary alarm procedures to warn plant personnel in time to safely clear themselves from the equipment.

- 6) Position the Motors Auto-Off- Manual to “Automatic”.



This will allow the customer's Asphalt Plant Controls (Asphalt Injection Solenoid 120vac) to:

- command the Blower to start slowly and come up to speed then
- The Augers start.

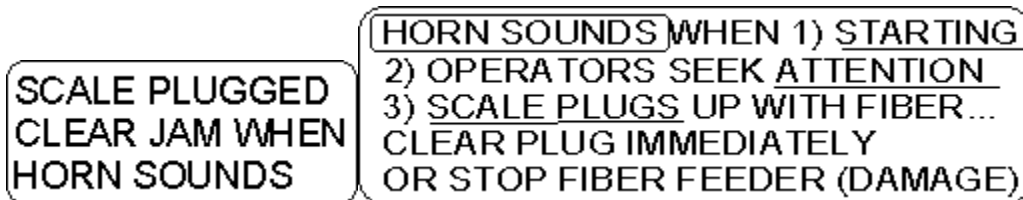
As Augers start, Feeder Operator monitors for proper flow of fiber discharging from the Flow Scale and entering the Blower Suction Chamber. With Blending Control (535 Manual Button illuminated Red); Operator adjusts the flow rate to the flow scale by Pushing Increase or Decrease.



After 2 minutes of operation; the system automatically places the Blending control in Automatic (Red Manual light extinguishes. The control can be returned to Manual by pressing the Manual Button

- 7) Fiber Feeder Operators continue charging the hopper as long as the hopper will easily accept blocks. Based on Expected Plant Rate (ie @.3% cellulose..200 tph uses 20#/s/min ..300 tph uses 30#/s/min, Fiber Feeder Operators should have reasonable idea as to how many seconds it takes for the Fiber Feeder to consume a 40# block. Fiber Feeder Operators should check Flow Scale discharge flow during startups and when “Deviation” light illuminates. If no problems are found, the Fiber Feeder Operators should make the Plant Operator aware if his charging times are significantly different than the feeding rate planned for.
- 8) **Alarm Horn Operation.** Horn sounds when: **a) Remote Control Horn button...** Plant Operator pushes Horn Button as some type of signal or attention grabbing communication between Fiber Feeder Operator and Plant Operator **b)**

Horn = Scale Jam up. Flow Scale jams up (**Silence** button on Local Control or press ACK Acknowledge button on Blending Control-535) Feeder Operator knows a Flow Scale jam is happening when Horn sounds and Flow Scale reads above 60 lbs per minute. Feeder Operator must immediately sweep Wand across flow scale throat. If Scale Auger chain drive starts jumping... **Push Emergency Stop Now** . **Silence** button on Local Control. **d) At Plant Start Up**, when Blower starts to ramp up when called to do so from Remote Control panel.



Normal Hot Stop or End of Day Shut Down:

- 1) With the Motors Auto-Off- Manual still in “Automatic”, the command from the Customer’s Asphalt Plant Controls (Asphalt Injection solenoid 120vac) shall:
 - a. stop the Augers
 - b. stop the blower a “programmable” time afterwards. The delay in stopping the blower is used to purge the piping of fiber.
 - c. The Blending Control shall now remember the speed the Scale Auger was set at. When the Feeder is started again, it shall run at that speed or manually operator adjusted to the speed operator selects. 30 to 60 seconds after startup, the Blend Control resumes automatic control
- 2) Cover the hopper Feed openings. Wet fiber and wet equipment block the flow of fiber through the machine. After any rainfall, Fiber Feeder Operators should inspect equipment and fiber for dampness and make appropriate drying corrections.



The cover is shown being hung safely out of the way during production. Replace this over the feed opening when not in use.

Tools and Accessories Provided by **CRS**:

Fiber Collection Test Bag
Test Scale

50’ Hose (do not cut hose unless you want to purchase it)
2 clamps

Remote Control Panel



OPERATING THE BLENDING CONTROLLER "535"

NOTE: The "535" is the larger readout meter on the left hand side of the control panel

TO CONTROL FEED RATE WITH "535" (AUTOMATIC) SPEED CONTROL:

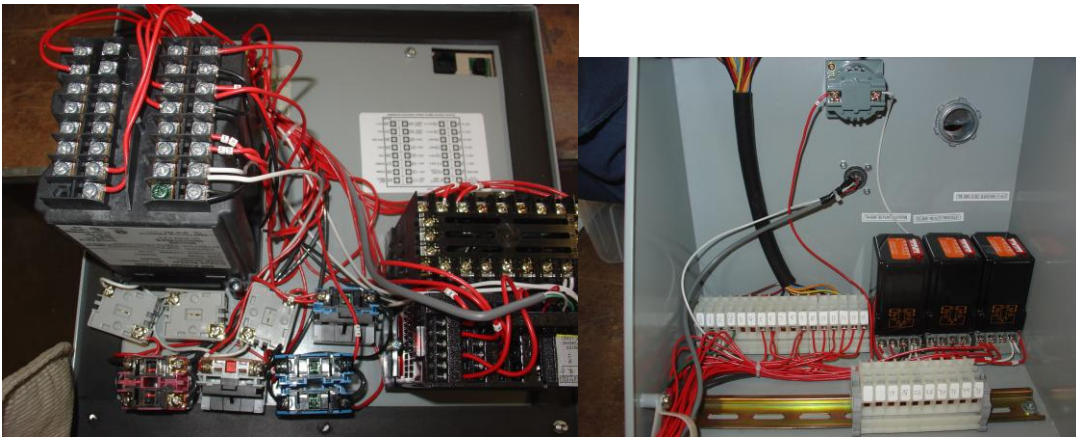
*OPERATING THE "535" TO FOLLOW A TONS PER HOUR SET POINT—
("SP")*

- 2) Press "manual" button to light red

- 3) *Press “display” button to make display read “out”*
- 4) *Set new tons per hour with up/dn arrow buttons*
- 5) *Control will now automatically adjust feed to maintain tons per hour flow rate of meter*
- D) *OPERATING THE "535" TO FOLLOW PLANT COMPUTER TONS PER HOUR SET POINT AS A PERCENT OF PRODUCTION—(“RSP” REMOTE SET POINT)*

Press “manual” (red light on)

- 1) Press “ menu” until “rsp ratio” appears on display
- 2) Change display by using up and down arrow buttons
- 3) Press “display” when done
- 4) Press “set pt” button to light red
- 5) Press manual to red light off



Relay and Timer Schedule

Remote Control Box

TRA – Asphalt Inject Starts Feeder after time delay

TRA – 60 second to Delay Deviation light from illuminating - BMR

TRC – 30 - 60 second delay to switch Blend Control 535 to Auto - BMR

Local Control Panel

R1 – Blower Called For to Run

R2 – Local Control

R3 – Scale Auger Called For to Run

R4 – Hopper Augers Called For to Run

R5 - Blower Called For to Run in Blower ON selection from Remote only

R6 – Start Feeder motor sequence from Remote, in Auto or Manual.

R7 - Start Batch Cycle

R9 – Silence Relay

R10 – Enable horn to sound during fan Run

TR1 – 30 second Blower Post Purge Time after Blower Stop command - BBR

TR2 – 7 second delay to Start up augers after the Blower has been called on to Run.

Horn sounds at this time. - BMR

TR3 – Batch Start Single Shot - BSR 1.6 sec