

GRAIN STORAGE SOLUTIONS

S230884
ECN 24-033/Rev B/6-25-2024



INSTALLATION / OPERATIONS MANUAL STEPS SERIES 2 CONTROL BOX



Guardian GMS

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Sorghum EMC (Equilibrium Moisture Content)

Outside Air Relative Humidity

Outside Air Temp	46%	52%	58%	65%	72%	78%	85%	92%	99%
30	11.8	12.5	13.2	14.1	15.1	16.1	17.6	19.8	26.2
35	11.7	12.4	13.1	14.0	15.0	16.0	17.5	19.8	26.1
40	11.6	12.3	13.0	13.9	14.9	15.9	17.4	19.7	26.1
45	11.5	12.2	12.9	13.8	14.8	15.8	17.3	19.6	26.0
50	11.4	12.1	12.8	13.7	14.7	15.7	17.2	19.5	25.9
55	11.3	12.0	12.7	13.6	14.6	15.7	17.2	19.4	25.9
60	11.2	11.9	12.6	13.5	14.5	15.6	17.1	19.3	25.8
65	11.1	11.8	12.5	13.4	14.5	15.5	17.0	19.3	25.7
70	11.0	11.7	12.4	13.3	14.4	15.4	16.9	19.2	25.7
75	10.9	11.6	12.4	13.3	14.3	15.3	16.8	19.1	25.6
80	10.9	11.5	12.3	13.2	14.2	15.2	16.8	19.1	25.5
85	10.8	11.5	12.2	13.1	14.1	15.2	16.7	19.0	25.5
90	10.7	11.4	12.1	13.0	14.0	15.1	16.6	18.9	25.4
95	10.6	11.3	12.0	12.9	14.0	15.0	16.5	18.8	25.4
100	10.5	11.2	11.9	12.9	13.9	14.9	16.5	18.8	25.3
110	10.4	11.1	11.8	12.7	13.7	14.8	16.3	18.6	25.2

Pairing the Steps Sensor Bulb to the Network Continued

Steps Sensor Bulb Settings

After your Steps Sensor Bulb is included in the app, you can control it, change its settings and automate the way it works. To enter the details menu of the device, click on it's name. From there you may control the device, as well as edit its appearance and settings.

Sensor settings

Temperature Units: Setting for change of the temperature units. • Celsius • Fahrenheit

Send Status Period: Define the period (in hours), in which Steps Sensor Bulb will report its' status. Possible range: 1 ~ 24 h.

Temperature Threshold: Define the temperature Threshold in which Steps Sensor Bulb will "wake up" and send status. The value can be from 1° up to 5° or you can disable it.

Humidity Threshold: Define the humidity Threshold in which Steps Sensor Bulb will "wake up" and send status. The value can be from 0.5 up to 50% or you can disable it.

Pairing the Steps Sensor Bulb to the Network Continued

Internet/Security

WiFi Mode – Client: Allows the Steps Sensor Bulb to connect to an available WiFi network. After typing the details in the respective fields, press Connect.

WiFi Mode – Access Point: Configure Steps Sensor Bulb to create a WiFi Access point. After typing the details in the respective fields, press Create Access Point.

Restrict Login: Restrict the web interface (IP in the Wi-Fi network) of Steps Sensor Bulb with a Username and Password. After typing the details in the respective fields, press Restrict Login.

Settings

Firmware Update

Update the firmware of Steps Sensor Bulb, when a new version is released.

Time Zone and Geo-location

Enable or Disable the automatic detection of Time Zone and Geo-location.

Factory Reset

Return Steps Sensor Bulb to its factory default settings.

Device Information

Here you can see the: • Device ID - Unique ID of Steps Sensor Bulb • Device IP - The IP of Steps Sensor Bulb in your Wi-Fi network

Edit Device

From here you can edit: • Device Name • Device Room • Device Picture
When you are done, press Save Device.

Rice EMC (Equilibrium Moisture Content)

Outside Air Relative Humidity

Outside Air Temp	46%	52%	58%	65%	72%	78%	85%	92%	99%
30	12.5	13.1	13.7	14.5	15.4	16.3	17.7	19.7	25.5
35	12.2	12.8	13.4	14.2	15.1	16.1	17.4	19.5	25.3
40	11.9	12.6	13.2	14.0	14.9	15.8	17.2	19.2	25.1
45	11.7	12.3	13.0	13.8	14.7	15.6	17.0	19.0	25.0
50	11.5	12.1	12.7	13.6	14.5	15.4	16.8	18.9	24.8
55	11.3	11.9	12.5	13.4	14.3	15.2	16.6	18.7	24.6
60	11.1	11.7	12.3	13.2	14.1	15.0	16.4	18.5	24.5
65	10.9	11.5	12.2	13.0	13.9	14.9	16.2	18.3	24.4
70	10.7	11.3	12.0	12.8	13.7	14.7	16.1	18.2	24.2
75	10.5	11.1	11.8	12.6	13.6	14.5	15.9	18.0	24.1
80	10.3	11.0	11.6	12.5	13.4	14.4	15.8	17.9	24.0
85	10.2	10.8	11.5	12.3	13.3	14.2	15.6	17.8	23.9
90	10.0	10.7	11.3	12.2	13.1	14.1	15.5	17.6	23.8
95	9.9	10.5	11.2	12.0	13.0	13.9	15.4	17.5	23.6
100	9.7	10.4	11.0	11.9	12.8	13.8	15.2	17.4	23.5
110	9.5	10.1	10.8	11.6	12.6	13.6	15.0	17.2	23.3

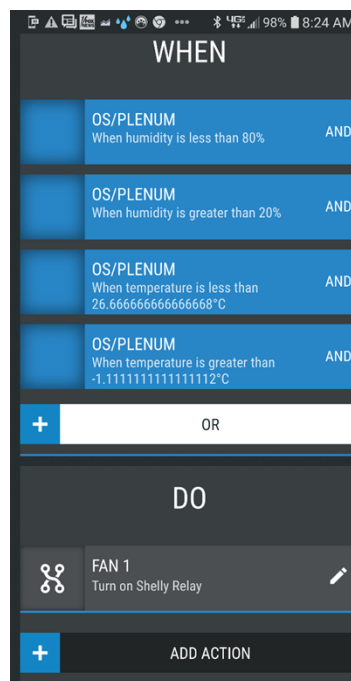
Wheat EMC (Equilibrium Moisture Content)

Outside Air Relative Humidity

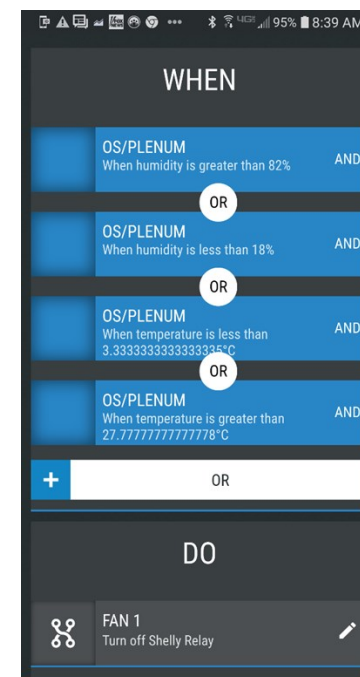
Outside Air Temp	46%	52%	58%	65%	72%	78%	85%	92%	99%
30	12.3	12.8	13.4	14.1	15.0	15.8	17.1	19.0	24.5
35	12.0	12.6	13.2	13.9	14.7	15.6	16.9	18.8	24.3
40	11.8	12.3	12.9	13.7	14.5	15.4	16.6	18.6	24.1
45	11.6	12.1	12.7	13.5	14.3	15.2	16.4	18.4	23.9
50	11.3	11.9	12.5	13.3	14.1	15.0	16.3	18.2	23.8
55	11.1	11.7	12.3	13.1	13.9	14.8	16.1	18.0	23.6
60	11.0	11.5	12.1	12.9	13.8	14.6	15.9	17.9	23.5
65	10.8	11.4	12.0	12.7	13.6	14.5	15.8	17.7	23.4
70	10.6	11.2	11.8	12.6	13.4	14.3	15.6	17.6	23.2
75	10.4	11.0	11.6	12.4	13.3	14.2	15.5	17.4	23.1
80	10.3	10.9	11.5	12.3	13.1	14.0	15.3	17.3	23.0
85	10.1	10.7	11.3	12.1	13.0	13.9	15.2	17.2	22.9
90	10.0	10.6	11.2	12.0	12.9	13.7	15.1	17.1	22.8
95	9.9	10.5	11.1	11.8	12.7	13.6	14.9	16.9	22.7
100	9.7	10.3	10.9	11.7	12.6	13.5	14.8	16.8	22.6
110	9.5	10.1	10.7	11.5	12.4	13.3	14.6	16.6	22.4

Automatic Operation based on Humidity and Temperature.

Set it up in Scenes



Fan will run when the humidity is between 80% and 20% and when the temperature is between 26.6 celuis (80 degree F) and -1.1 celuis (30 F).



The fan will turn off when the humidity is greater than 82% or less than 18% or the temperature is greater than 27.7 celeuis (82 F) or less than 3.3 celeuis (38 F).

Installation Instructions for the Steps S2 Control Box



Mount the Steps S2 Control Box on the fan housing close to the controls on the fan.



Wiring Schematic hookup for Fan Switch

Wires are from left to right

N - Neutral to power switch

L - Power to the switch, from the control circuit, 110 to 250 VAC

L1 or L - Control Circuit (power in) from motor starter

0 - Control Circuit (power out) to motor starter

CORN EMC (Equilibrium Moisture Content)

Outside Air Relative Humidity

Outside Air Temp	46%	52%	58%	65%	72%	78%	85%	92%	99%
30	13.4	14.2	15.0	15.9	17.1	18.2	19.8	22.3	29.1
35	13.0	13.8	14.6	15.6	16.7	17.8	19.5	21.9	28.9
40	12.6	13.4	14.2	15.2	16.3	17.5	19.1	21.6	28.6
45	12.3	13.1	13.9	14.9	16.0	17.2	18.8	21.4	28.4
50	12.0	12.7	13.5	14.6	15.7	16.9	18.6	21.1	28.2
55	11.6	12.4	13.3	14.3	15.4	16.6	18.3	20.9	28.0
60	11.4	12.1	13.0	14.0	15.2	16.3	18.1	20.6	27.8
65	11.1	11.9	12.7	13.8	14.9	16.1	17.8	20.4	27.6
70	10.8	11.6	12.5	13.5	14.7	15.9	17.6	20.2	27.4
75	10.6	11.4	12.2	13.3	14.5	15.6	17.4	20.0	27.3
80	10.3	11.1	12.0	13.1	14.2	15.4	17.2	19.8	27.1
85	10.1	10.9	11.8	12.8	14.0	15.2	17.0	19.6	26.9
90	9.9	10.7	11.6	12.6	13.8	15.0	16.8	19.4	26.8
95	9.7	10.5	11.4	12.4	13.6	14.9	16.6	19.3	26.7
100	9.5	10.3	11.2	12.2	13.5	14.7	16.5	19.1	26.5
110	9.1	9.9	10.8	11.9	13.1	14.3	16.1	18.8	26.3

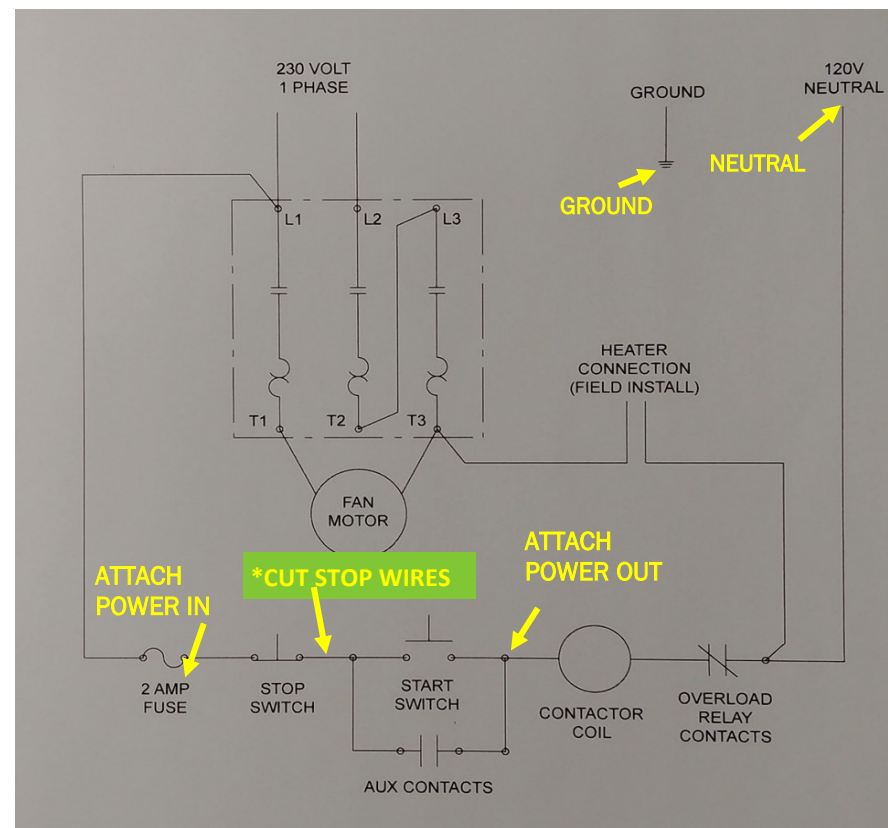
SOYBEAN EMC (Equilibrium Moisture Content)

Outside Air Relative Humidity

Outside Air Temp	46%	52%	58%	65%	72%	78%	85%	92%	99%
30	9.4	10.4	11.5	12.8	14.2	15.7	17.8	20.9	29.4
35	9.3	10.3	11.3	12.6	14.1	15.5	17.7	20.8	29.3
40	9.1	10.1	11.2	12.5	13.9	15.4	17.5	20.7	29.2
45	9.	10.	11.0	12.3	13.8	15.3	17.4	20.6	29.1
50	8.8	9.8	10.9	12.2	13.7	15.1	17.3	20.4	29.0
55	8.7	9.7	10.7	12.1	13.5	15.0	17.2	20.3	28.9
60	8.5	9.5	10.6	11.9	13.4	14.9	17.	20.2	28.8
65	8.4	9.4	10.5	11.8	13.3	14.8	16.9	20.1	28.8
70	8.2	9.3	10.3	11.7	13.2	14.6	16.8	20.0	28.7
75	8.1	9.1	10.2	11.5	13.0	14.5	16.7	19.9	28.6
80	8.	9.	10.1	11.4	12.9	14.4	16.6	19.8	28.5
85	7.8	8.9	9.9	11.3	12.8	14.3	16.5	19.7	28.4
90	7.7	8.7	9.8	11.2	12.7	14.2	16.4	19.6	28.4
95	7.6	8.6	9.7	11.0	12.6	14.1	16.3	19.5	28.3
100	7.4	8.5	9.6	10.9	12.5	14.0	16.2	19.4	28.2
110	7.2	8.3	9.3	10.7	12.2	13.8	16.0	19.2	28.1

The power wire to the switch attaches to the control circuit (Power In) on the motor starter. Power to the switch can be 90 –250 VAC and neutral. Run ground wire from motor circuit to Steps Switch terminal.

There are 2 orange wires (stop wires) and 1 yellow wire (power out) going to the control circuit on the motor starter.



Wiring Schematic—typical motor starter control circuit

The orange wires go to the stop button on the motor starter.

*** Disconnect the stop wire from the switch, attach one orange wire to the switch and the other orange wire to the disconnected stop wire.**

The black wire goes to the contactor coil. The black wire attaches to the top of the DPDT switch in the Smart Switch box.



OPERATING THE STEPS S2 Control Box



MANUAL MODE

When the switch is in the up position the Steps S2 Control Box is bypassed. To start the motor, push the start button at the motor. To stop the motor, push the stop button



AUTO MODE

When the switch is in the down position the Steps S2 Control Box has control of the motor.



OFF MODE

When the toggle is in the middle position the motor cannot operate.