

RMS Rainwater Harvesting Series 100 Controller

Specifications

Measurement Performance

Contacting Conductivity

Range 0-10,000 μ S/cm
Resolution 1 μ S/cm
Calibration \pm 50% of raw reading;
scalable to read in ppm

pH

Range -2 to 16 pH units
Resolution 0.01 pH units
Calibration single or dual point

Chlorine, Chlorine Dioxide or Ozone

Range 0 to 10 mg/l
Resolution 0.01 mg/l
Calibration single or dual point

Peracetic Acid

Range 0 to 1000 mg/l
Resolution 1 mg/l
Calibration single or dual point

ORP

Range \pm 1400 mV
Resolution 1 mV
Calibration single or dual point

Temperature

Range 32 to 392 F (0 to 200 C)
Resolution 1 F (1 C)
Calibration single point; degrees C or F

Electrodeless Conductivity

Ranges: 50 μ S/cm to 1mS/cm, 1 mS/cm to 10 mS/cm, 10 mS/cm to 100 mS/cm or 100 mS to 1000 mS/cm
Resolutions: 1 μ S/cm or 1 mS/cm (range dependant)
Calibration single or dual point; scalable to read in ppm or % concentration

Electrical

Input

Input power 100 – 120/220-240 VAC \pm 10%, 12A, 50/60 Hz Fuse 1.6A, 5 x 20mm
Input signals STANDARD

Digital Inputs (A-D): Isolated dry contact (relay, reed switch or Hall Effect)

(Inputs D-F for future use) 0-300 Hz ,1.5 msec minimum width

Digital Inputs (E-F): Isolated dry contact (relay, reed switch)

(Inputs D-F for future use) 0-10 Hz , 50 msec minimum width

Only Digital Inputs A-C are supported in software. D-F will be supported in the future

Input signals OPTIONAL

Digital Inputs (1-4) Isolated dry contact (relay, reed switch or Hall Effect)

0-10 Hz, 50 msec minimum width

Digital Inputs (5-6) Isolated dry contact (relay, reed switch or Hall Effect)

0-300 Hz, 1.5 msec minimum width

Point Level Switch: Isolated dry contact (relay, reed switch or Hall Effect)

Flow Feedback: Isolated dry contact (relay, reed switch or Hall Effect)

resistance, 1000 ohm maximum load.

Sensor	<u>STANDARD (1)</u>		Sensor	<u>OPTIONAL (3)</u>	
Signal	(isolated)	±1.5V	Signal	(isolated)	±1.5V
Temp	(isolated)	1K or 10K or 100K	Temp	(isolated)	1K or 10K or 100K
		ohm			ohm

Outputs

STANDARD

Mechanical relays: VAC, 10 amp (resistive), 1/8
 At 115 HP
 At 230 VAC, 6 amp (resistive), 1/8 HP

R1, R2, R3, and R4 relays are fused together as one group, total current for this group must not exceed 5.5A R5, R6, R7 and R8 relays are fused together as one group, total current for this group must not exceed 5.5A.

Relays 1-8 may be dry contact or may switch line (mains) voltage, depending upon model code; refer to Figure 4. Powered relays have both NO and NC terminals available. Only powered relays are fused.

Digital: USB
 Ethernet, 10 Base T

OPTIONAL

4-20 mA (1-4): Isolated, 500 ohm max. resistive load, internally powered

Agency Approvals

- UL ANSI/UL 61010-1:2004, 2nd Edition *
- CAN/CSA C22,2 No.61010-1:2004, 2nd Edition *
- CE Safety EN 61010-1 2nd Edition (2001) *
- CE EMC EN 61326 :1998 Annex A *

Note: For EN61000-4-3,-6 the controller met performance criteria B.

- Equipment suitable for use in establishments other than domestic, and those directly connected to a low voltage (100-240 VAC) power supply network which supplies buildings used for domestic purposes.

Mechanical

Enclosure

Material:	Molded Fiberglass
NEMA Rating:	NEMA 4X
Dimensions:	10" x 12" x 5-5/8" (25.4cm x 30.5cm x 14.5cm)
Display:	64 x 128 Pixel Backlit LCD Graphics Module
Operating Ambient Temp:	0 to 49° C (32 to 120°F)
Storage Temp:	-29 to 80°C (-20 to 176°F)
Weight	11.5 lb (5.2 kg)

Flow switch manifold

Pressure:	150 psi up to 100° F, 50 psi @140° F
Temperature:	20 to 60 °C (32 to 140°F)
Process connections:	¾" NPTF
Wetted Materials of construction:	Glass-Filled Polypropylene, PVC, FKM,

Isoplast

pH Electrode

Pressure: 0 to 100 psi
Temperature: 10 to 70 °C (50 to 158°F)
Process connections: ¾" NPTF
Wetted Materials of Construction: Glass-Filled Polypropylene, CPVC, HDPE,
ORP electrode FKM, Glass

Pressure: 0 to 100 psi
Temperature: 0 to 70 °C (32 to 158°F)
Process connections: ¾" NPTF
Wetted Materials of Construction: Glass-Filled Polypropylene, CPVC, HDPE,
FKM, Platinum, Glass

Chlorine, Chlorine Dioxide, Ozone and Peracetic Acid sensors

Pressure: 0 to 1 atm (0 to 14.7 psi)
Temperature
(Chlorine Dioxide, Ozone and
Peracetic Acid sensors): 0 to 50 °C (32 to 122 °F)
Chlorine: 0 to 45°C (32 to 113°F)
Flow Cell Inlet: ¼" NPTF
Flow Cell Outlet: ¾" NPTF
Wetted Materials of Construction: PVC, Silicone or PTFE, Nylon, Isoplast, FKM

Contacting conductivity electrode

Pressure: 0 to 10 atm (0 to 150 psi)
Temperature: 0 to 70 °C (32 to 158°F)
Process connections: ¾" NPTF
Wetted Materials of Construction: Glass-Filled Polypropylene, Graphite, FKM

CPVC Electrodeless conductivity sensor

Pressure: 0 to 10 atm (0 to 150 psi)
Temperature: 0 to 70 °C (32 to 158°F)
Process connections: ¾" NPTF
Wetted Materials of Construction: Glass-Filled Polypropylene, CPVC, FKM

PEEK Electrodeless conductivity sensor

Pressure: 0 to 10 atm (0 to 150 psi)
Temperature: 0 to 88 °C (32 to 190°F)
Process connections: 1" NPTF
Wetted Materials of Construction: PEEK

Stainless steel contacting conductivity electrode

Pressure: 0 to 10 atm (0 to 150 psi)
Temperature: 0 to 70 °C (32 to 158°F)
Process connections: ¾" NPTF
Wetted Materials of Construction: Glass-Filled Polypropylene, 316 SS, FKM
3

High pressure contacting conductivity electrode

Pressure: 0 to 20 atm (0 to 300 psi)

Temperature:	0 to 70 °C (32 to 158°F)
Process connections:	¾" NPTM
Wetted Materials of Construction:	316 SS, PEEK

High pressure/temperature contacting conductivity electrode

Pressure:	0 to 17 atm (0 to 250 psi)
Temperature:	0 to 200 °C (32 to 392°F)
Process connections:	¾" NPTM
Wetted Materials of Construction:	316 SS, PEEK

High pressure pH electrode

Pressure:	0 to 20 atm (0 to 300 psi)
Temperature:	0 to 135 °C (32 to 275°F)
Process connections:	½" NPTM
Wetted Materials of Construction:	Glass, Polymer, PTFE, 316 SS, FKM

High Pressure ORP electrode

Pressure:	0 to 20 atm (0 to 300 psi)
Temperature:	0 to 135 °C (32 to 275°F)
Process connections:	1/2" NPTM
Wetted Materials of Construction:	Platinum, Polymer, PTFE, 316 SS, FKM

High Pressure flow switch

Pressure:	0 to 20 atm (0 to 300 psi)
Temperature:	0 to 70 °C (32 to 158°F)
Process connections:	¾" NPTF
Wetted Materials of Construction:	Carbon steel, Brass, 316SS, FKM

Variables and their Limits

All menus shown may not be available. The menus that appear on your controller will vary with options installed and programmed.

Sensor Input Menu – if pH

Calibration Reminder	0-365 days
High Alarm Limit	-2 to 16
Low Alarm Limit	-2 to 16
Temperature Low Alarm Limit	0 to 70 °C (0 to 158°F)
Temperature High Alarm Limit	0 to 70 °C (0 to 158°F)

Sensor Input Menu – if ORP

Calibration Reminder	0-365 days
High Alarm Limit	-1400 to 1400 mV
Low Alarm Limit	-1400 to 1400 mV

Sensor Input Menu – if Contacting Conductivity

Calibration Reminder	0 – 365 days
ppm Conversion Factor	0.5 – 1.0
Low Alarm Limit	0 to 10,000 (units defined by user)
High Alarm Limit	0 to 30,000 (units defined by user)
Temperature Low Alarm Limit	0 to 70 °C (0 to 158°F)
Temperature High Alarm Limit	0 to 70 °C (0 to 158°F)

Sensor Input Menu – if High Temp Contacting Conductivity

Calibration Reminder	0 – 365 days
ppm Conversion Factor	0.5 – 1.0
Low Alarm Limit	0 to 10,000 (units defined by user)
High Alarm Limit	0 to 30,000 (units defined by user)
Temperature Low Alarm Limit	0 to 200 °C (32 – 392 °F)
Temperature High Alarm Limit	0 to 200 °C (32 – 392 °F)

Sensor Input Menu – if Electrodeless Conductivity

Calibration Reminder	0 – 365 days
ppm Conversion Factor	0.5 – 1.0
Low Alarm Limit	0 to full scale of range
High Alarm Limit	0 to full scale of range
Temperature Low Alarm Limit	0 to 88 °C (0 to 190°F)
Temperature High Alarm Limit	0 to 88 °C (0 to 190°F)

Flowmeter Input Menu – Analog Input Type

Flow Rate at 4 mA	0 to 1000 (units of measure defined by user)
Flow Rate at 20 mA	0 to 1000 (units of measure defined by user)

Level Input Menu – Analog Input Type

Empty mA	0 to 20 mA
Full mA	0 to 20 mA
Full volume	0 to 10,000 (units defined by user)
Low Level Alarm Limit	0.001 to 10,000 (units defined by user)

Generic 4-20 mA Input Menu

Parameter = 4 mA	-10,000 to 10,000 (units defined by user)
Parameter = 20 mA	-10,000 to 10,000 (units defined by user)
Low Alarm Limit	-100,000,000 to 100,000,000 (units defined by user)
High Alarm Limit	-100,000,000 to 100,000,000 (units defined by user)

Flowmeter Input Menu – Digital Input Type

Volume per Contact	0 to 1000 (units of measure defined by user)
K Factor	0.001 to 20,000 (Pulses per Gallon or Liter)
Total Alarm Limit	0 = no limit, otherwise >0
Rate High Alarm	>0

Rate Low Alarm >0

PosiFlow Input Menu

Alarm Time 0.1 to 10 minutes
Pump Volume per Stroke 0.000 to 100 (units of measure defined by user)

Counter Input Menu

One Count = >0
Total Alarm Limit 0 =no limit, otherwise >0
Rate High Alarm >0
Rate Low Alarm >0

Relay Output Menu – On/Off Set Point

Set Point Full scale range of the input parameter
Dead Band Full scale range of the input parameter
Output Time Limit 0 = ∞, 1 to 1440 minutes
Hand Time Limit 1 to 1440 minutes

Relay Output Menu – Time Proportional

Set Point Full scale range of the input parameter
Sample Period 1 to 1440 minutes
Proportional Band Full scale range of the input parameter
Output Time Limit 0 = ∞, 1 to 1440 minutes
Hand Time Limit 1 to 1440 minutes

Relay Output Menu – Feed with Another Relay

Output Time Limit 0 = ∞, 1 to 1440 minutes
Hand Time Limit 1 to 1440 minutes

Relay Output Menu – Feed after Another Relay (Fixed Time)

Fixed Time to Feed 0 to 1440 minutes
Hand Time Limit 1 to 1440 minutes

Relay Output Menu – Flow Based Feed

Volume to trigger Feed 1 to 99,999 (units defined by user)
Feed Time per unit Volume 1 second to 1440 minutes
Output Time Limit 0 = ∞, 1 to 1440 minutes
Hand Time Limit 1 to 1440 minutes

Relay Output Menu –Timer Based

Output On-Time 1 to 1440 min
Hand Time Limit 1 to 1440 minutes

Relay Output Menu – Feed After Another Relay (%)

% of Relay to Feed	0 to 100%
Output Time Limit	0 = ∞, 1 to 1440 minutes
Hand Time Limit	1 to 1440 minutes

Relay Output Menu – Feed as % Time

Time Period	1 – 1440 minutes
% of Period to Feed	0.1 to 100%
Output Time Limit	0 = ∞, 1 to 1440 minutes
Hand Time Limit	1 to 1440 minutes

Relay Output Menu – DI Following

On Delay	10 seconds – 1440 minutes
Off Delay	10 seconds – 1440 minutes
Output Time Limit	0 = ∞, 1 to 1440 minutes
Hand Time Limit	1 to 1440 minutes

Relay Output Menu - Alarm

On Delay Time	10 seconds to 1440 minutes, 0 = no limit
Power-up Alarm Delay Time	10 seconds to 1440 minutes, 0 = no limit
Output Time Limit	0 = ∞, 1 to 1440 minutes
Hand Time Limit	1 to 1440 minutes

4-20 mA Output Menus

(parameter selected) = 4 mA (parameter selected) = 20 mA Maximum Output Allowed
Minimum Output Allowed Input Value when Output is Max Damping
Interlock Value
Input Fault Value
Input Cal Set Value
Output Time Limit
Hand Time Limit Hand Value

Full Scale Ranges are:

Contacting Conductivity:
Electrodeless Conductivity: Or
Or
Or Temperature: pH:
ORP:
Chlorine, Chlorine Dioxide, Ozone Peracetic Acid

Full scale range of the parameter Full scale range of the parameter 0 – 100 % 0 – 100%
Full scale range of the parameter 0 – 60 seconds
0 – 100%
0 – 100%
0 – 100%
0 = ∞, 1 to 1440 minutes
1 to 1440 minutes
0 – 100%

0 to 10,000 $\mu\text{S}/\text{cm}$

0 to 1,000 $\mu\text{S}/\text{cm}$

0 to 10,000 $\mu\text{S}/\text{cm}$

0 to 100 mS/cm

0 to 1000 mS/cm

-18 to 200 $^{\circ}\text{C}$ (0 to 392 $^{\circ}\text{F}$) -2 to 16 standard units -1400 to 1400 mV

0 to 10 mg/l

0 to 1000 mg/l

Remote Alarming Menu

Alarm Delay Time

10 seconds to 1440 minutes, 0 = no delay

Power-up Alarm Delay Time

10 seconds to 1440 minutes, 0 = no delay

Data Logging Menu

Logging Interval

15 seconds to 1440 minutes

The interval possible varies with the number of parameters logged and the maximum log duration.