



**Badger Meter**

## HR-LCD Pulse

Scaled Register

### Description

The High Resolution Pulse scaled register (HR-LCD Pulse) is a fully electronic, solid-state register with no moving parts. It is designed for use with all current Badger Meter® Recordall® Disc Series, Turbo Series and Compound Series meters. These solid-state units produce a scaled output.

**NOTE:** For more detailed information, see the user manual, *High Resolution LCD Registers*, available at [www.badgermeter.com](http://www.badgermeter.com).

### Field Programmable

The HR-LCD Pulse register comes standard as factory programmed, with the option for field programming the unit of measure, meter type, meter model, rate-of-flow time and units. Programming is performed through the IR port via a computer using the Programmer software, version 2.0.0 or greater.

### Output Resolution

The output resolution table in this document lists the minimum output resolution for all Recordall meters.

### Scaled Output

- The scaled output is a switch closure output defined as: green wire = positive, black wire = negative.
- The scaled digital output from the register has a default resolution of 1/10th of the register test circle (resolution may vary in some cases).
- The movement of the meter magnet is converted to a square wave signal that is available as a scaled output through a solid-state relay.
- The scaled output is a solid-state relay.
- The nominal pulse output width is programmable from 30...100 msec.
- Resolution of the output is defined in the registration section.
- This digital pulse output is compatible with most totalizers and batch controllers.

### Power

Power for the device can be obtained from a 9...50V DC control loop.

### Mounting

The fully potted register assembly has a bayonet mount compatible with all Recordall meters. The bayonet mount positions the register in any of four orientations for visual reading convenience. The register can be removed from the meter without disrupting water service.

### Magnetic Drive Communication

The register detects movement of the wet side meter magnet with magnetic sensors to provide reliable and dependable meter monitoring.



### Tamper-Resistant Features

Unauthorized removal of the register is inhibited by a tamper-resistant Torx® seal screw. Torx seal screws are provided. Optional proprietary tamper-proof screws are also available.

In addition, the register is resistant to magnetic tampering. The register detects any attempted tamper or register removal and displays the status indicator/alarm condition icon.

### Construction

The housing of the register is constructed of an engineered polymer enclosure and a polycarbonate lens. For long-term performance, the enclosure is fully encapsulated, weatherproof, and UV-resistant to withstand harsh environments and to protect the electronics in flooded or submerged pit applications. A patented epoxy potting comprises the register bottom. Due to this unique sealing, the register exceeds all applicable requirements of AWWA Standard C707.

### Operating Characteristics

The register is shipped in storage mode so a meter status alarm is not triggered. In storage mode, the meter model screen is displayed. Upon sensing two revolutions of the meter magnet, the register goes into normal operation mode. The display then automatically toggles between these modes:

- 9-digit consumption displays for 50 seconds
- Rate of flow displays for 5 seconds
- Meter model displays for 5 seconds

## SPECIFICATIONS

<b>Register Type</b>	Permanently sealed, electronic LCD register with scaled output, as well as a field-programmable option
<b>Register Display</b>	Status indicators, unit of measure, billing units, automatic toggle between 9-digit consumption, rate of flow, meter model
<b>Unit of Measure</b>	U.S. gallons, Imperial gallons, cubic feet, cubic meters, and liters
<b>Flow Rate</b>	Seconds, minutes, and hours
<b>Numerals</b>	7 mm (0.28 in.) high
<b>Weight</b>	11 ounces
<b>Humidity</b>	0...100% condensing
<b>Temperature</b>	Storage: -40...140° F (-40...60° C) Max. ambient for 1 hr: 150° F (66° C) Electronics & Display: 14...140° F (-10...60° C)
<b>Status Indicators</b>	Visual icons for: meter functioning correctly, meter alarm (indicates temperature limits exceeded, magnetic tamper or register removal), reverse flow, suspected leak, 30-day no usage, end of battery life
<b>Scaled Output</b>	Solid-state relay (not a dry contact)
Max. Voltage	30V DC
Current	100 mA
Pulse Width	50 ms (programmable 30...100 ms)
<b>Power</b>	
Input Voltage Range	9...50V DC supply
Max. Load Resistance (Ohms)	50 Ohms + 50 Ohms (supply voltage - 9V)
<b>Battery</b>	Lithium thionyl chloride AA cell, fully encapsulated within register housing
<b>Battery Life</b>	10 years based on default settings and typical operating range

## DIMENSIONAL DRAWINGS

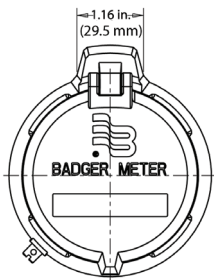


Figure 1: Top view

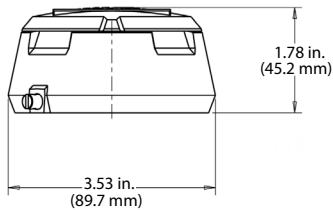


Figure 2: Front view

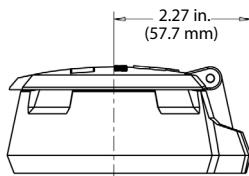


Figure 3: Left side view

## MEASUREMENT RESOLUTION

The HR-LCD Pulse default output resolutions are as noted below.

### Recordall Disc Series

Model	Size (in.)	Scaled (pulse/unit)		
		gal	ft <sup>3</sup>	m <sup>3</sup>
LP	5/8	1	10	100
M25	5/8	1	10	100
M35	3/4	1	10	100
M40	1	1	10	100
M55	1	1	10	100
M70	1	1	10	100
M120	1-1/2	0.10	1	10
M170	2	0.10	1	10

### Recordall Turbo Series

Model	Size (in.)	Scaled (pulse/unit)		
		gal	ft <sup>3</sup>	m <sup>3</sup>
T160	1-1/2	0.10	1	10
T200	2	0.10	1	10
T450	3	0.10	1	10
T1000	4	0.10	1	10
T2000	6	0.01	0.10	1
T3500	8	0.01	0.10	1
T5500	10	0.01	0.10	1
T6200	12	0.001	0.01	0.10
T6600	16	0.001	0.01	0.10
T1000	20	0.001	0.01	0.10

### Recordall Compound Series

Model	Size (in.)	Scaled (pulse/unit)		
		gal	ft <sup>3</sup>	m <sup>3</sup>
High Side T200	2	0.10	1	10
Low Side M25	2	1	10	100
High Side T450	3	0.10	1	10
Low Side M25	3	1	10	100
High Side T1000	4	0.10	1	10
Low side M35	4	1	10	100
High Side T2000	6	0.01	0.10	1
Low Side M35	6	1	10	100
High Side T3500	8	0.01	0.10	1
Low side M120	8	0.10	1	10