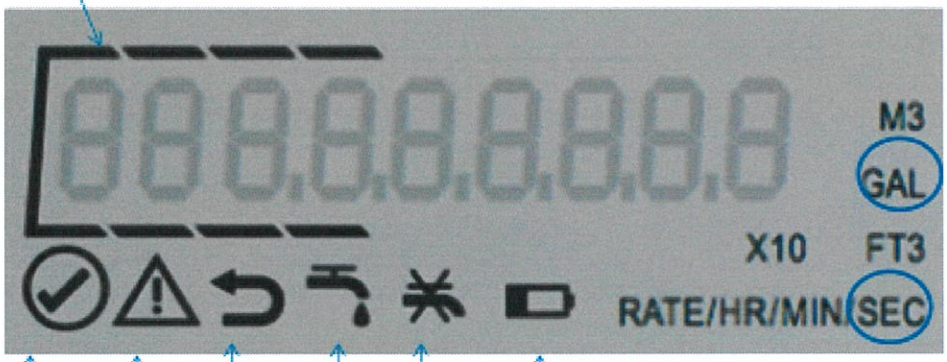
E-Series Indicators and Alarms



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Exception/Alarm (& Detection Method)	BADGER FLOW/ENDPOINT HEALTH ALARMS Description	Recommended Action
No Recent Flow Calculated by BEACON or detected by the endpoint	AMI meters: No flow detected during the past 72 hours. Auto clears with usage.	Notification.
Leak Detected Calculated by BEACON or detected by the endpoint	AMI meters: Indicates locations where flow has been detected every hour in a 24-hour period. Once the leak is corrected, the alert will clear after the next regular endpoint transmission.	Investigate. Corrective action may be required.
Backflow Detected by the encoder and BEACON	AMI meters: A condition in which reverse water flow of more than 1 gallon has been reported in the past 30 days. Clears when no backflow is detected for 30 consecutive days. On meter cards, total backflow volume for the past 30 days is cumulative. If a compound meter is involved, the total includes backflows across all encoder registers at that location service point.	Investigate. Corrective action may be required.
Continuous Flow Calculated by BEACON or detected by the endpoint	Indicates locations that the utility has tagged as places where water runs continuously on purpose. For example, manufacturing facilities and cooling towers.	Notification.
Endpoint Tamper Flag set by the endpoint	An exception triggered by a break in communication between an endpoint and an encoder. Typically occurs when the wire between the meter and endpoint has been cut or disconnected. After connection is re-established, the exception will clear. RTR encoders connected to ORION SE/ME endpoints require reprogramming to clear the tamper.	Check connections and wiring between encoder and endpoint. If tamper remains after wiring and connections have been checked and/or fixed, try a different endpoint. If tamper still persists, try a different encoder.
Endpoint Programmed Flag set by the endpoint	Indicates endpoint parameters have been changed. This notification will last 35 days. Endpoints affected: • ORION ME/SE, ORION Cellular	Notification.
Endpoint Low Battery ORION Cellular endpoints, BEACON handles the calculation.	An alarm triggered when an algorithm detects low battery strength.	Replace the endpoint.

Meter/Encoder Programmed	A flag set when HRE encoder parameters have been changed. Possible parameters that can be changed are: Meter Type, Meter Model/Size, Unit of Measure, Billing Units, Digits from Encoder, Rate of Flow Units and Rate of Flow Time.	These parameters must be configured properly for accurate customer billing. If these parameters have been changed, or need to be changed, contact Technical Support for the proper conversion factors.
Meter/Encoder End of Life	This alarm is triggered when the system detects low battery strength or activates after 19 years and 6 months on HR-E LCD encoders or E-Series meters.	Replace encoder or meter.
Encoder Removal	When an HR-E LCD encoder is removed from the meter it is attached to, this alarm is triggered.	Investigate to ensure that the encoder is mounted in place. This alarm could mean that someone has removed the encoder in an attempt to steal water.
Meter/Encoder Temperature	This alarm indicates an HR-E LCD encoder on an E-Series meter is approaching the limit of its rated operating temperature (34 – 140° F). The alarm will automatically clear after 35 days if the condition has not recurred.	Insulate meters and piping, or install in warmer areas if possible.
Encoder Magnet Tamper	This alarm indicates the presence of a powerful magnet that is preventing accurate readings from HR-E-LCD encoders. The alarm will automatically clear after 35 days if the condition has not recurred.	Check for magnetic sources near the register. If possible, move the magnetic source or the encoder.
Meter Exceeding Max Flow	An alarm triggered when flow is so high that an E-Series meter cannot obtain accurate readings. No consumption is displayed until flow is within the specified range. Once triggered, the alarm is displayed on meter cards for 35 days.	Ensure meter is properly sized and resize if necessary.
Meter Sensor Error	When there is a problem with the sensor on an E-Series meter that prevents readings from being properly obtained this alarm is triggered. The alarm remains active for 35 days unless whatever triggered it continues. Typically, the meter will continue to function, sending consumption data to the endpoint.	Replace meter if alarm does not clear after 35 days.
Meter Empty Pipe	This alarm is triggered when there is (almost) no water in the pipe, a condition that prevents accurate readings from being obtained by E-Series meters. No reading will be displayed or sent to the endpoint until the condition clears.	If possible, install the meter in such a way that ensures the pipe is always full.
Encoder Communication Errors	Triggered when BEACON receives data from an encoder but a reading cannot be obtained. This could indicate an encoder malfunction or that the dial is temporarily stuck. The condition automatically clears when a new reading is obtained. Endpoints affected: • ORION CE/ME/SE/Cellular, GALAXY	Investigate. Corrective action may be required.

Status Indicators

Status indicators are sent as part of the encoder message to AMR/AMI systems that are capable of receiving an extended message, such as ORION Cellular, Fixed Network (SE) and Migratable (ME) endpoints. The details can also be read through an IR interface.

Status indicators appear in the display as symbols that illuminate when the condition is active and dim when the condition is eliminated.

All HR-E LCD encoders are delivered in storage mode so that a meter alarm is not triggered. During storage mode, the meter model displays on the encoder. As water begins to flow through the meter, the encoder switches from storage mode to normal operation upon sensing two (2) revolutions of the meter magnet.

The following chart indicates the HR-E LCD encoder conditions when connected to a Badger Meter ORION Cellular, Fixed Network or Migratable endpoint. The chart does *not* apply to ORION Classic (CE) or GALAXY endpoints, or HR-E LCD encoders programmed to a resolution lower than a 9-digit output. The HR-E LCD encoder displays the information, but the extra information is not reported through the endpoints.

Status Indicator	Icon	Status Description	HR-E LCD Display	HR-E LCD with ORION Cellular or Fixed Network* and Migratable* Endpoints *Firmware version 1.8 or higher required
Meter functioning correctly		Encoder operating correctly.	Continuous display on encoder as long as no other status indicators are triggered.	Indicator status not sent to the endpoint.
Encoder alarm		Several potential conditions may exist, including: Encoder removal Temperature limit exceeded (34…140° F) Magnetic tamper	Encoder alarm remains active for 35 days. The alarm automatically clears after 35 days if any of the 3 conditions has not recurred.	Encoder alarm sent to the endpoint.
Reverse flow		Encoder detects reverse flow.	Reverse flow alarm remains active for 35 days. The alarm automatically clears after 35 days if reverse flow condition has not recurred.	Encoder detects reverse flow and sends alarm message to the endpoint.
Suspected leak		Encoder detects 24 hours without one 15-minute interval of no flow.	The alarm clears automatically when a 15-minute no-flow interval occurs.	Encoder detects suspected leak and sends alarm message to the endpoint. If condition clears before message is sent to the endpoint, it is not reported.
30 day no usage		No measured flow in past 30 days.	The alarm is automatically cleared once flow occurs.	Encoder detects 30 days no usage and sends alarm to the endpoint.
End of life battery indicator		Indicated battery life based on pre-calculated consumption.	Alarm activated at 19 years and does not clear.	Encoder sends alarm to the endpoint.