

MEDIA EXPANSION MEASUREMENT SYSTEM

NEW TO THE INDUSTRY

Until now, the only options for measuring filter bed expansion during backwash were home-made type devices or expensive fixed mount microprocessor based echo-time measuring equipment.

With the portable Media Expansion Measurement System, Raven offers an affordable solution for small plants on a tight budget as well as large plants with hundreds of filters.

This simple two part system includes Raven's infrared Interface Detector coupled with the Expansion Measurement Arm. It's lightweight, rugged and

easily transported throughout the plant.

EXPANSION MEASUREMENT ARM

This instrument brings precise measurements to the process. The measurement arm is mounted to the filter safety railing with a non-marring clamp. A pulley at the tip of the arm allows easy deployment and retrieval of the sensor probe. The sensor drop point can extend out to 3 feet over the filter from the rail and can easily be moved to other locations within the same filter to check for dead spots or uneven expansion.

MEASUREMENT OF FILTER BED EXPANSION

Prior to backwash, the flat bottom sensor probe is lowered to rest on top of the media bed as shown in **Stage 1** below. With the cable taught, it is fastened to the sliding marker block. This is the reference point for measuring filter bed expansion as shown below right.

At the start of the backwash, the sensor will react to the turbidity and debris being evacuated from the bed with illumination of all 20 red LED's on the face of the meter as shown in **Stage 2** below.

Upon clarification of the backwash water into the waste troughs, the operator slides the marker block, with sensor cable, away from the filter to raise the infrared sensor probe with the expanding bed. While raising the sensor probe the red LED's will begin

to go out. This is the top of the expanding media bed as shown in **Stage 3** below. The operator can lock the sliding marker at this point to allow the expanding media bed to catch up to the sensor probe. This procedure is repeated until the media has reached full expansion. The operator will be able to lock in on the top of the expanded media within 1/8 inch. At this point, the operator notes the point on the scale where the marker block is positioned and records the precise amount of expansion.

When the filter bed has settled, it is expected that it will be at a lower level than before the backwash. The probe is lowered back down on top of the bed by moving the marker block toward the filter chamber as shown in **Stage 4**. The operator can easily verify that the bed has settled to a lower point as the marker block will be in negative territory on the scale.

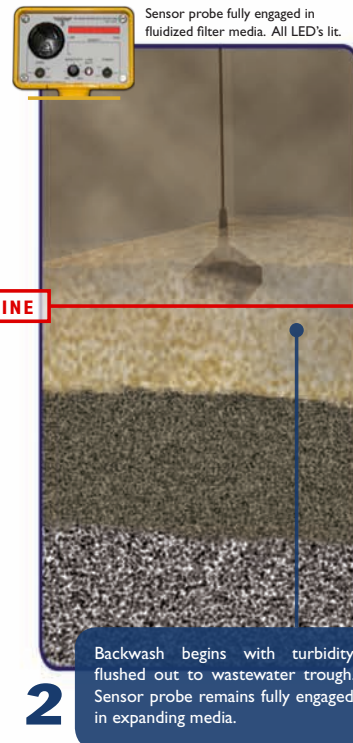
POINT OF INTEREST A pivot point connection on the measurement arm allows the operator to range the probe over 9 linear feet of expanding media in a semi-circle to verify uniformity of expansion at multiple points.

INTERFACE DETECTOR

Analyzing the dynamics of the expansion from within the media bed, the infrared sensor probe reports to the operator via the interface detector mounted on the Expansion Measurement Arm.

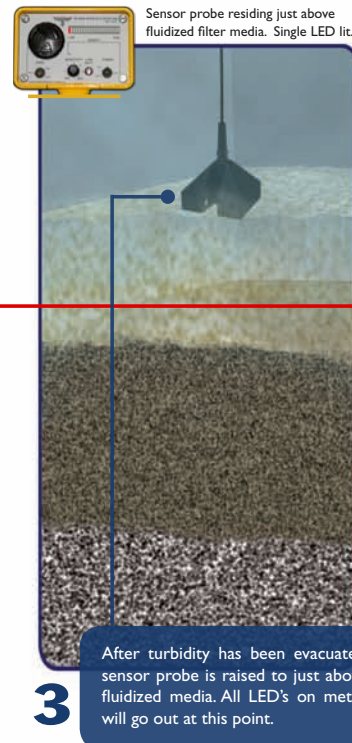
Operation of the interface detector is simple. No need to calibrate the sensor. It automatically references changes in density. A sensitivity knob fine tunes the probe. Measure the "ragged edge" on top of the expanded bed by adjusting sensitivity to "high" to determine if the top of the bed has a gradual or well defined interface. How do you interpret a gradual uneven interface over several vertical inches between the expanded bed and the wash water above?

POINT OF INTEREST Infrared sensors are uniquely suited to give more than just up or down information about the dynamics of the media bed during backwash. It's the only technology that lets you interact with the event in so many ways.



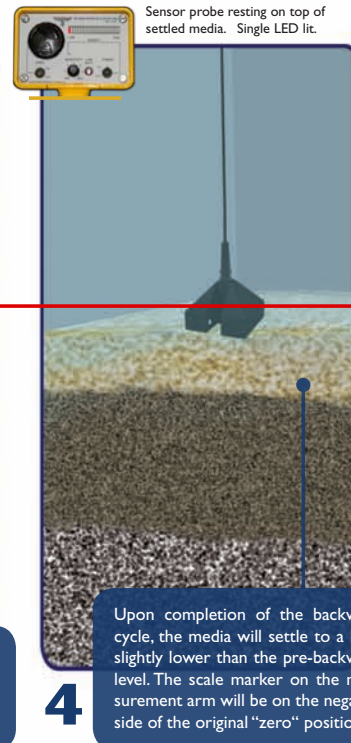
1 Prior to the backwash cycle, the infrared sensor probe is lowered to rest on the top of the media with sensor cable taught. The sliding ruler on the measurement arm is moved to the "zero" position.

1



2 Backwash begins with turbidity flushed out to wastewater trough. Sensor probe remains fully engaged in expanding media.

2



3 Upon completion of the backwash cycle, the media will settle to a level slightly lower than the pre-backwash level. The scale marker on the measurement arm will be on the negative side of the original "zero" position.

3



Sliding Marker Block

Expansion Measurement Arm

SID-10550 \$385

Sludge Interface Detector w/ 20 ft. Cable

SID-10500-20 \$909

Sludge Interface Detector w/ 30 ft. Cable

SID-10500-30 \$939