USA

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1-877-742-TEST (8378)

Hydronic Performance and Balancing

Hydronic heating and cooling systems have regained popularity with the advent of in-floor radiant piping. The principles are the same no matter the size and complexity, however they are often difficult to troubleshoot unless broken down into subsystems.

Since hydronics can rely on a number of variables, understanding the way the process is working can be beneficial, especially for the uninitiated. A monitoring tool that can take a number of temperature readings simultaneously is needed. This tool can monitor boiler or chiller input and output, the set point sensor, the zone feeds, and the return blending. A self-powered data logger makes the job easy with the advantage of rapid deployment.

Commissioning tools should be easy and convenient to use. ACR Data Loggers have a 10-year battery which means charging and replacement is never needed in the field. PC software provides a printable graph showing exactly what is happening.

Challenge:

Technicians can frequently encounter situations that are not routine. Problems are often a result of more than one root cause. The only way to troubleshoot is to break down a system into smaller pieces and tackle each individually. If these sub-systems interact, the job is made more difficult as one cannot be in two places at once. In new construction there is pressure to complete tasks on time and within budget. Engineers need to find ways to prove compliance to specifications. The challenge is to make sure there is operation data to backup claims.

Are you faced with?
- Providing proof of meeting specifications in order to sign off.
- Satisfying Managers, Engineers, Architects and Owner Representatives.
- Meeting tighter schedules in order to reduce costs.

Equipment operation, zone balancing and energy efficiency are all concerns which need to be documented to satisfy requirements.

Solution:

Record temperatures to demonstrate system performance. Chiller or boiler operation can be documented by simply placing pipe surface temperature sensors at appropriate points in the system. Use a multi-channel Temperature Data Logger in order to take advantage of having the equivalent of eight data loggers in one, while also synchronizing readings.

The Thermistor (Thermal Resistor) sensors give absolute temperature values over working range of 0 to 70°C (32 to 158°F) and will measure excursions outside these values. On the next page is a graph of a malfunctioning radiant hot water boiler – a faulty mixing value caused super-heated water to loop back at the boiler and the temperature set point was never reached – the pressure safety release prevented catastrophic failure. A data logger left at the site would pick up these anomalies, giving the commissioner definitive proof.

ACR
24/7/365
10yr
Battery

Up to eight temperatures are usually taken: Boiler/Chiller In/Out, Mixing In/Out, Coil In/Out, Ambient and Outdoor. A Windows® computer running TrenderReader 2 software, is used to backup the data, producing a graph of the system response.

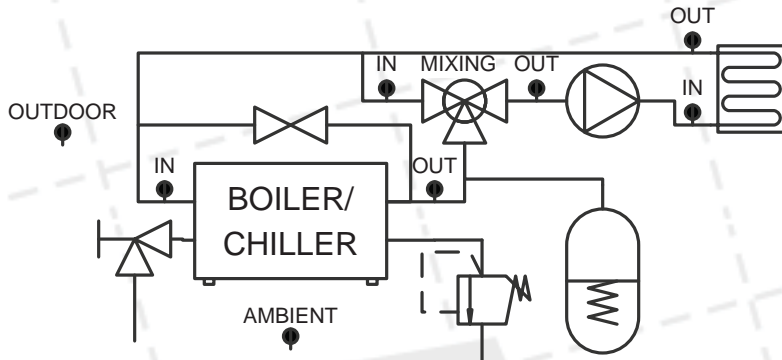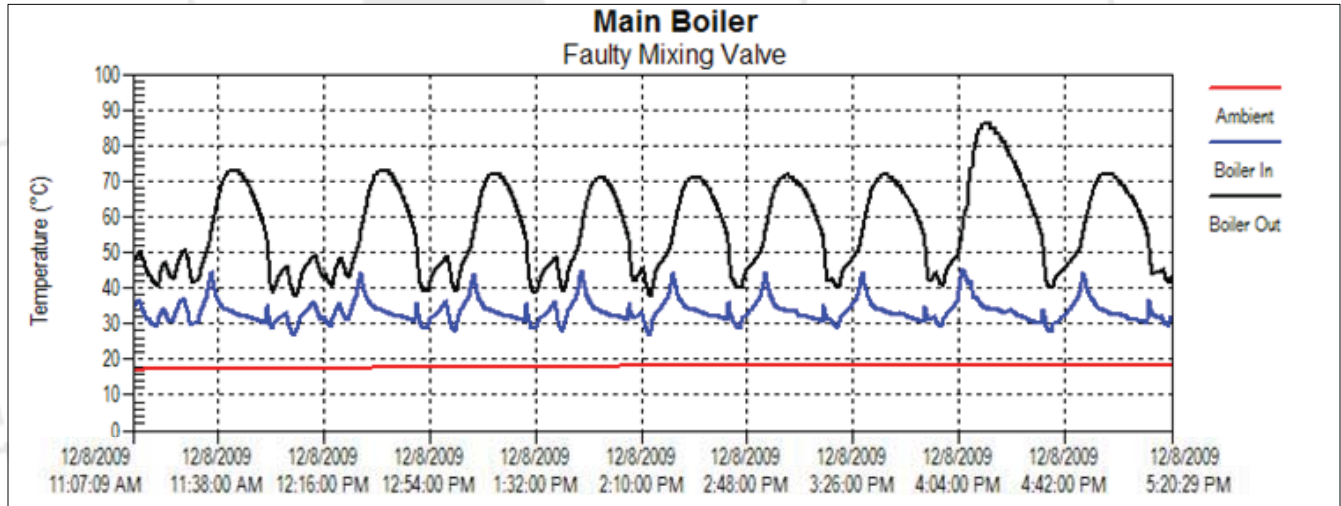Figure 1 – Simplified Piping Diagram w/ Temperature Probes.

Figure 2 – Surface Mount Probe w/Strap

In a similar manner, zones can be balanced by attaching probes at the up stream of the manifold. The temperatures zone to zone should track each other within a degree or two, all things being equal. The readings are available for printout or export to other programs either by saving file or copy/paste to the clipboard.

Deploying the data logger and downloading the information is easy...

IMPORTANT: ALWAYS WEAR SAFETY GLASSES WHEN USING USING ROTATING TOOLS

1. Attach the pipe surface probes as close to the desired reference point as possible, avoiding cable contact with combustion components. Slice or drill hole in insulation and tuck sensor underneath or use Velcro® strap supplied with Surface Mount Probe (SMP) model – see Figure 2.
2. Double-click on the corresponding Icon in TrendReader 2 software to view the real-time readings, setup the channel configuration and sample interval, then disconnect.
3. Backup the Data Logger periodically to see the recorded data in graphical form and print to include in reports, or copy and paste into documents.

TIP: For Remote Telemetry, refer to Networking and Remote Communication Overview Application Document 00-0657.

Ordering Information:

Equipment	Description	Catalog No.
SRP8-32K	Data Logger, Temperature, SmartReader Plus 8, 7 probes for 4 days	01-0015
SRP8-128K	Data Logger, Temperature, SmartReader Plus 8, 7 probes for 12 days	01-0129
SRP8-1.5M	Data Logger, Temperature, SmartReader Plus 8, 7 probes for 180 days	01-0158
ET-016-SMP	Probe, Temperature, Surface Mount, -35 to 95°C (-30 to 200°F), 6m (20ft)	35-0025
ET-016-STP	Probe, Temperature, Surface Type, 0 to 70°C (32 to 158°F), 1.5m (5ft)	35-0020
WB-100*	Enclosure, Weatherproof Box, 18x13x10cm (7.0x5.0x4.0in), 1 per Logger	01-0057
WBC-100*	Strain Relief, Enclosure, Feed Thru, up to 4 Cables (Sensor and/or Comm.)	21-0011
TR2-Serial	Software (TrendReader 2) CD & IC-101 Interface Cable	01-0225
TR2-USB	Software (TrendReader 2) CD & IC-102 Interface Cable	01-0226

Session days based on logging interval of 2 minutes. *Optional accessories for permanent installation.