



Installation

Mechanical Installation

NOTE: Observe the following safety guidelines before installing or removing your BASIC switch:

- Use proper eye protection and any other safety equipment as required by your installation site.
 - Check electrical power to ensure that all power has been disconnected and “locked out.”
 - Ensure the process tank or line pressures are “zero.”
 - Ensure the absence of any steam, hot water, acids and other potentially hazardous media.
 - Follow all safety precautions as specified for your installation site and local codes.
1. Before installing your switch, coat the sensor threads with plant-approved lubricant or sealant to prevent threads from binding.
 2. Extra caution should be taken not to over tighten the switch while installing.
 3. Install the switch, taking into account the orientation of the sensor as described below.
 4. Keep in mind the need for easy access, safety of personnel and a suitable switch environment. In general, install the switch so as to minimize vibration, shock, and extreme temperature fluctuations.

Sensor Orientation

The BASIC sensor is marked with the universal symbol



This surface should be flat up and level in a horizontal flow application only. Refer to Figures 1 and 2 for flow and level applications; this surface of the hex should be parallel to the direction of change in the process.

Figure 1:
Horizontal Flow

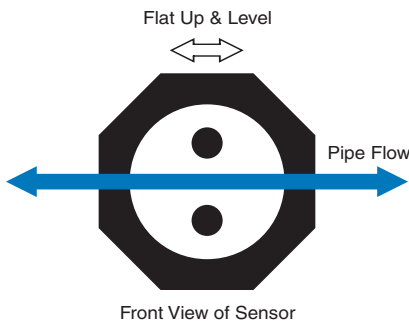
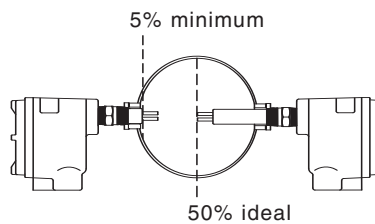


Figure 3:
Horizontal Mounting



Vertical Up/Down Mounting

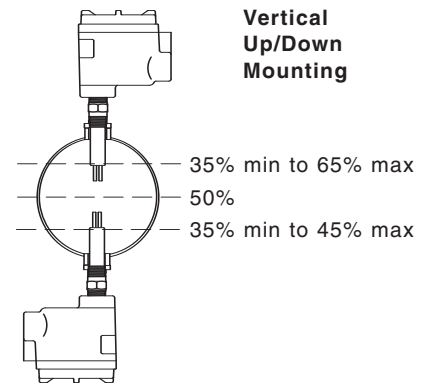


Figure 2:
Vertical Flow

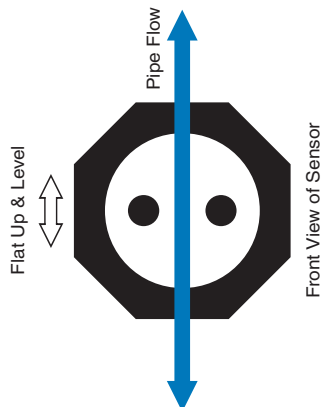
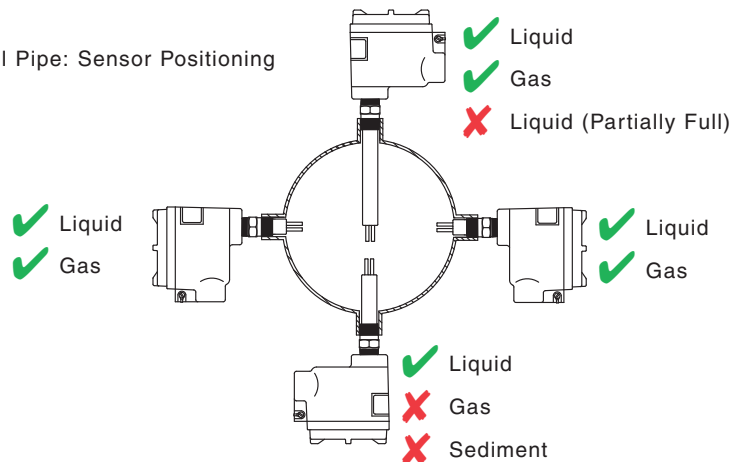


Figure 1:
Horizontal Pipe: Sensor Positioning



Quick Set-up Guide

START

*More detailed information about the features, functions, installation and operation of the **BASIC+ 400** may be found in **BASIC+ 400 Installation & Operation Manual**, Doc#IM-400-001-002.

1. Install and Wire the Switch

The **BASIC+ 400** **must** be fine-tuned *in the actual or simulated process*. Install and wire the **BASIC+ 400** as described on pg. 1 & 4 prior to completing the following steps.

2. Disable the "Smart Heater" Mode*

Disable the microprocessor's control of the heater element as follows.



fig. 1
ON = Disabled

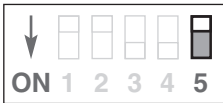
Note: Once the heat and setpoint are adjusted to the process, the "Smart Heater" should be enabled (step 7).

3. Set the Relay

Configure the relay contact to energize **ABOVE** or **BELOW** setpoint. Set relay to be energized above setpoint for failsafe applications.



fig. 2
Relay energized, green LED on, Thermal Signal is Below/Left of Setpoint



OFF = Relay energized, green LED on, Thermal Signal is Above/Right of Setpoint

4. Set Heater Power

Set the Heater Power to correspond with your application and media.

Listed flow rates are **guidelines** to enable fine adjustments (step 5).*

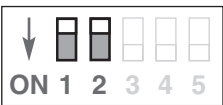
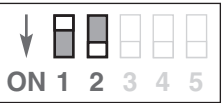
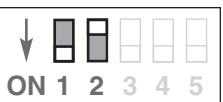


fig. 3
100% FLOW
Liquid: ≥ 5.0 fps
Gas: 100 - 200 sfps



80% FLOW
Liquid: 2 - 5 fps
Gas: ±100 sfps



60% FLOW or LEVEL
Flow: 0.01 - 2.0 fps
Level: Water-based liquids



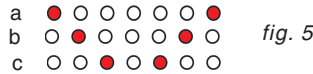
40% LEVEL
Hydrocarbon-based liquids or slurries

5. Adjust Setpoint

- IMPORTANT:**
 - The flashing **red LED** indicates Thermal Signal (process condition)*. The **green LED** indicates that the relay is energized.
 - The **green LED** is **fixed** in the center of the *Flow/Level Signal* display regardless of the Thermal Signal (process condition).
 - Setup can be done in No Flow (Dry) to alarm in Flow (Wet) or the opposite condition by varying Steps 4 & 5 below.
- SELF-TEST:** At power on all 6 **red LEDs** flash. A single **red LED** will then appear at the far right (high) position and will move toward the left (low) position as the heater warms up. Allow the switch to stabilize for 1-2 minutes.

- CONFIGURING the SETPOINT:**
 - Ensure that Dip Switch 5 is in the preferred position (Above/Below setpt.)²
 - Simultaneously press and hold (approx. 2 seconds)* ← → fig. 4

The display will cycle as shown below to indicate that the displayed range is centering on the Thermal Signal (process).



- Once the setpoint reaches the true Thermal Signal (process condition) the range will revert to the position dictated by the setup. The display will typically look like this:



The display in figure 6 indicates that the Thermal Signal is below setpoint and the relay is configured to energize **ABOVE** setpoint.

- The **setpoint** must be moved toward the **Thermal Signal**. Push and release ← until the **red LED** moves to 2 or 3 positions left of center (the closer the setpoint is to center position the faster the switch will react¹).



- Ensure that the **sensor tips** are **IN** the process media. When the process media covers the sensor tips the **red Thermal Signal LED** will move to the right, above setpoint, and the **green LED** will change state² indicating the relay is energized, as shown in fig. 8.



- Notes:
- Moving the setpoint will change the reaction time accordingly.
 - See Step 3, Set the Relay.

6. Only used when configuring with the RCM Software via Modbus.*

Except when using the RCM Software to change the Modbus address ensure that Dip Switch 4 is "OFF" (Run Mode). When Dip Switch 4 is "ON" the BASIC+ 400 is in **Modbus set-up mode** and will not react to the process.

- When Dip Switch 4 is "ON" the BASIC+ 400 is in **Modbus set-up mode**. Pressing and releasing the Right Arrow increases the unit address value; the Left Arrow decreases the unit address value. Default = 1.
- In this mode, the Thermal Signal LED will change from **blinking red** to **solid red**.



fig. 9
ON = Software Config.



OFF = Run Mode

7. Enable "Smart Heater" Mode

Move Dip Switch 3 to the OFF position.



fig. 10
OFF = Smart

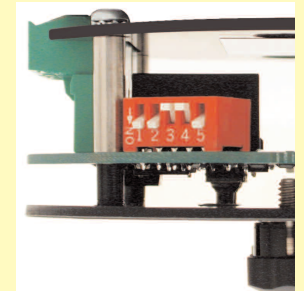
This enables the microprocessor to automatically reduce the heat to 20% when in no flow or dry conditions. Heat will be restored to desired setting once the microprocessor determines the probe is wet or flow has been restored.

8. Verify Setup

Manually change your process (Flow to No-Flow or Wet to Dry Level) and verify that the BASIC+ 400 is operating as required.

FINISH

LEGEND



Dip Switches, **BASIC+ 400** Electronics (Orientation: All diagrams and photo, display facing down)



Switch Empty space



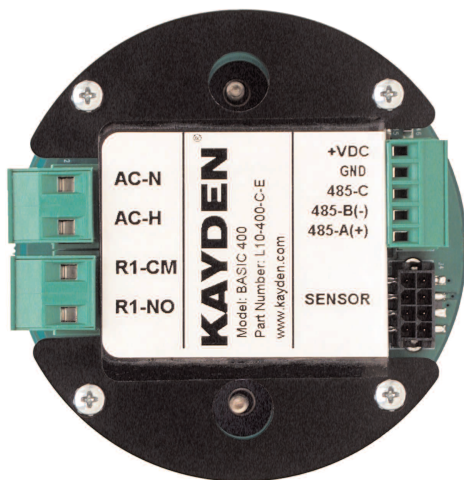
User Interface & Display

Front Panel Indicators:

- Relay Setpoint** LED is on solid when the relay is energized. LED is flashing when the Bypass Delay Timer is active (relay is energized)
- Left Arrow** Adjusts relay setpoint with respect to Flow/Level Signal
- Right Arrow** Adjusts relay setpoint with respect to Flow/Level Signal
- Flow/Level Signal** Displays Thermal Signal with respect to setpoint. The Red LED which represents Thermal Signal is flashing when in Run Mode.

The Flow/Level Signal increases (moves right) as:

- Flow** The flow rate increases
- Level** The sensor is submerged in liquid (dry to wet)
- Interface** The sensor is submerged by the second distinctly different process



Wiring Connections

Frequently Asked Questions

- **Why do all LEDs turn off when I depress the Left or Right Arrow (I have power to the switch)?**
All LEDs are off when the electronics module is in locked mode. The Front Panel (User Interface & Display) can only be locked and unlocked by using the Kayden **RCM (Remote Control and Monitoring Software)**.
- **Why is there a flashing red LED?**
 The flashing red LED indicates the Flow/Level Signal (Thermal Signal) and that the unit is functioning.
- **What does the solid green LED signify?**
 The relay is energized.
- **Why is the green LED flashing at power on?**
 The Bypass Delay Timer is activated and the relay is energized. The Bypass Delay Timer provides a power-on delay between 5 and 100 seconds. This feature enables power-on restart in low flow alarm pump applications. This Timer can be activated and adjusted on the **BASIC+ 400** only with the free Kayden RCM Software.
- **Why are the two left-most and the two right-most red LED's flashing simultaneously once per second?**
 The switch is in Fault Mode. Fault Mode indicates service is required, please contact Kayden Support.
- **Why are the two left-most and the two right-most red LED's flashing rapidly twice per second?**
 The switch is in Fault Recovery Mode, this lasts for a programmed 5 minutes. Fault Recovery Mode indicates the problem has been solved or that there is an intermittent problem, please contact Kayden Support.

Quick Set-up Guide

POWER, AC/DC

Either AC or DC voltage can be used to power the BASIC:

- For AC power, connect the HOT line to VAC-H, the NEUTRAL to VAC-N and the GROUND wire to the green grounding screw in the enclosure, also indicated by the ground symbol.
- For DC Power, connect the positive voltage to +VDC and the common or negative to COM.

RELAY OUTPUTS

The BASIC features one Setpoint with its own mechanical relay for output. The connections for the contacts of this relay are:

NOTE: For fail-safe installations, the desirable relay state is energized and the circuit closed.

R1COM	Common or pole contact for Relay 1
R1NO	Normally open contact for Relay 1 when the coil is not energized



Never power on the circuits in a potentially explosive area without first installing the enclosure cover.

Always lock the cover in place. This may be required by your local safety or electrical code.

These operating instructions include important information required for the installation and operation of this instrument. More detailed information may be found in the Installation and Operation Manual, BASIC+ 400 Series, Doc#IM-400-001-002.

MAINTENANCE

Your Kayden instrument requires very little maintenance as there are no moving parts. Kayden does however suggest general guidelines for maintenance (see the BASIC Product Manual).

CALIBRATION

The **BASIC+ 400** does not require any calibration for use as a switch. Once properly set-up, the **BASIC+ 400** will be as stable and repeatable as the process in which it is installed. It may be necessary to check or repeat the set-up procedure if the process changes dramatically over time.

KAYDEN RCM SOFTWARE

Although the Kayden RCM Software provides 2 additional commands and additional information the software is not required to setup or operate the BASIC+ 400.

Designed specifically for **Remote Configuring and Monitoring** of Kayden thermal flow, level and interface switches from a PC, the **RCM Software** is **ideal for remote locations** when activities need to be verified, or setting(s) need to be changed.

Remote connectivity lets you operate and configure your **BASIC+ 400** from a central location at your main plant site. Likewise it allows sites, spread over a region or around the world, to be managed from a central location within the enterprise. On a smaller scale, the **BASIC+ 400** may be accessed from a local computer for added insight into your process.

The Kayden RCM Software provides 2 additional features which can not be accessed via the Front Panel controls:

- 1) Bypass Delay Timer (primarily for auto re-start of pumps in fail safe applications),
- 2) Lock the Front Panel controls (to remotely disable the Front Panel setup command).

The RCM Software also includes additional graphical displays:

- 1) A graphical (line graph or strip chart) representation of the Flow/Level Signal.
- 2) Configuration screen to name and store all setup parameters.
- 3) Event Log which automatically describes and saves all fault conditions.

- Notes:
1. To communicate with your **Kayden BASIC+ 400**, you will require an RS-485 adapter such as the **Kayden SCA**.
 2. Additional copies or the latest revision of the **RCM Software** may be downloaded at our website, www.kayden.com, or call **Kayden** at 403-253-1423.



Kayden's SCA (Serial Communications Adapter) Part Number: A15-321



**Communication Cable
Part Number: A05-CC-0004(4 feet) -
0008(8 feet) -0010(10 feet)**

KAYDEN®

Flow Switch Innovation

Visit the 'Distributors' section of kayden.com to find a Distributor near you.

Kayden Instruments 3368 – 114th Avenue S.E. Calgary, Alberta, Canada T2Z 3V6

Tel: (403) 253-1423 Fax: (403) 253-1460 Web: www.kayden.com

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