

API-Cecom Group n'fo

Technical Support Doc 1002

Factory Ranged DC Input Band Alarm Trip APD 1030



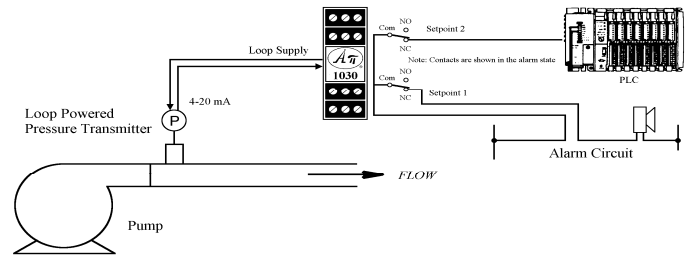
Functional Description

The APD 1030 accept a DC voltage or current input and provide a visual alarm indication and two alarm relay contact outputs. The input type, range, and alarm types are factory configured. Front-accessible potentiometers are used to adjust each alarm setpoint and deadband. Both alarm relays change state when the DC voltage or current input is outside either setpoint trip point.

PROBLEM : A pump is required to maintain line pressure within set tolerances. Excess pressure may indicate a blockage or restriction in the line, while low pressure may indicate pump failure or a major leak in the line. If the pressure exceeds or drops below the normal pressure range, a remote audible/visual alarm must be activated and a remote PLC notified.

SOLUTION : A loop powered pressure transducer is installed at the discharge side of the pump. The pressure transducer is connected to an Api Model APD 1030 DC Input, Band Alarm module .The APD 1030

provides the loop power for the 4-20 mA pressure transducer from its built-in loop excitation supply. Both alarm relays change state when the 4-20 mA input signal is outside either setpoint trip point.



Calibration procedure:

- ◆ General Note: These units are factory calibrated and ranged for the input as specified on the label. The calibration procedure listed below is based upon the above application where the input is a 4-20 mA signal and the band alarm is set so that the HI alarm trip point is 14.4 mA (65% of the input signal) and the LO alarm trip point is 9.6 mA (35% of the input signal). With the APD deadband set at the minimum value of 1% which for this specific range is 0.16 mA and since deadband is symmetrical about a relay trip/reset point the difference between the relay trip point and the relay reset point will be 0.32 mA. On the APD 1030 the HI alarm (relay trip and LED changes state from Green to Red) would trip at 14.56 mA and reset at 14.24 mA (relays reset and LED change state from Red to Green) then the LO alarm would trip at 9.44 mA (relay trip and LED change state from Green to Red) and reset at 9.76 mA (relays reset and LED changes state from Red to Green).
- 1. Equipment required:
 - a. APD 1030
 - b. Proper power supply for the unit (85-265 VAC or 9-30 VDC as specified on label)
 - c. NIST traceable calibrator/simulator (Fluke Model 787 or equivalent)
 - d. Alarm relay load visual indicator to verify APD relay trip and reset action
 - e. Connecting cables
- 2. Allow a minimum of 30 minutes of equipment warm up time for equipment temperature stabilization.
- 3. Connect the Calibrator/Simulator to the APD 1030 and set it up for the input specified on the label.
 - ◆ Example 4-20 mA input, Band Alarm, Universal power supply
- 4. Preset the APD 1030 setpoints and deadbands to the following positions:
 - a. "Deadband 1" potentiometer to its fully CCW position
 - b. "Setpoint 1" potentiometer to its fully CW position
 - c. "Deadband 2" potentiometer to its fully CCW position
 - d. "Setpoint 2" potentiometer to its fully CCW position
 - ◆ **Note:** These are twelve turn potentiometers so turn each one 13 turns in the specified direction and ensure that there is no "bounce back" from the potentiometer end of travel as these potentiometers have no "positive" end stops
- 5. HI Alarm calibration
 - a. Adjust the output from the Calibrator/Simulator to the APD 1030 so that it applies the customer specified HI trip value to the APD 1030 for our example 14.4 mA
 - b. Adjust the APD 1030 Setpoint 1 (HI trip) potentiometer CCW until the LED changes state from GREEN to RED and the relays trip.
 - c. While increasing the output from the Calibrator/Simulator verify that the LED changes state from GREEN to RED and the relay's trip at 14.56 mA and then while decreasing the output from the Calibrator/Simulator verify that the LED changes state from RED to GREEN and the relay's reset at 14.24 mA.
 - ◆ **Note:** If necessary repeat steps 4.a and 4.b. If the APD 1030 relays do not trip and reset at the proper values make an adjustment to the setpoint potentiometer and then verify the adjustment change by varying the DC input signal to the APD 1030.
- 6. LO Alarm calibration
 - a. Adjust the output from the Calibrator/Simulator to the APD 1030 so that it applies the customer specified LO trip value for our example 9.6 mA.
 - b. Adjust the APD 1030 Setpoint 2 (LO trip) potentiometer CW until the LED changes state from GREEN to RED and the relays trip.
 - c. While decreasing the output from the Calibrator/Simulator verify that the LED changes state from GREEN to RED and the relay's trip at 9.44 mA and then while increasing the output from the Calibrator/Simulator verify that the LED changes state from RED to GREEN and the relay's reset at 9.76 mA.
 - ◆ **Note:** If necessary repeat steps 5.a and 5.b. If the APD 1030 relays do not trip and reset at the proper values make an adjustment to the setpoint potentiometer and then verify the adjustment change by varying the DC input signal to the APD 1030.
- 7. Calibration is complete return APD 1030 to service