

# CAPM-2o Carrier Frequency Pickup Module

## Installation & Technical Guide

### Installation:

- Ensure that the flow meter sensor cavity is free of debris prior to installation.
- Screw the CAPM-2o into the flow meter by hand until the sensor nose contacts the bottom of the cavity.
- Do not screw in harder than hand tight, as a thin metal section is under the sensor nose.

Please heed the following warning:

**CAUTION: DO NOT EXCEED 7 NEWTON-METERS FORCE TO SEAT THE SENSOR, THIS IS EQUIVALENT TO HAND TIGHT. EXCESS FORCE MAY CRUSH THE SENSOR NOSE OR DAMAGE THE FLOW METER BY FORCING THE METAL SECTION UNDER THE SENSOR INTO THE MEASURING CHAMBER.**

Wiring should be installed by a qualified instrumentation technician.  
Some basic installation guidelines are reviewed overleaf.

### Description:

The **CAPM-2o** is a UL & CUL approved, intrinsically safe pickup sensor for use in Class 1, Div. 1 locations. The output signal is a frequency proportional to flow in a square wave voltage form of approximate amplitude: Supply – 1.5V. The sensor must be installed with an intrinsic safety barrier in accordance with the guidelines detailed in document # CAP2902 – *CAPM INSTALLATION IN HAZARDOUS AREA*. Recommended barriers such as Pepperl & Fuchs Z787 (12-28V) are available from AW Flow Meters.

The output is a sourcing open collector transistor (NPN Type).

An NPN sinking type is available and is designated as CAPM-2i.

### Technical Data

Supply Voltage: 10 to 30 Volt DC  
Supply Current: 20 mA @ 15 Volt, Max 35 mA  
Minimum Signal: 0.5 Hz  
Signal Output: Square wave,  $V_{High} \approx V_{CC} - 1.5V$   
 $V_{Low} \approx 0V$

Duty Cycle: 50%  
Frequency Output: Flow dependent, up to 2000 Hz  
Load: >500Ω  
Driving Capacity: 10 mA Max  
Temperature Range: -60°F to 185°F (-50°C to 85°C)

#### Connections:

A – +10 to 30 Volt DC supply voltage  
B – Ground for supply and signals  
C – Frequency signal output

**Note: If signal does not go to ground, connect external resistor, 5 K-10 Kohm, between input and ground of monitoring equipment.**

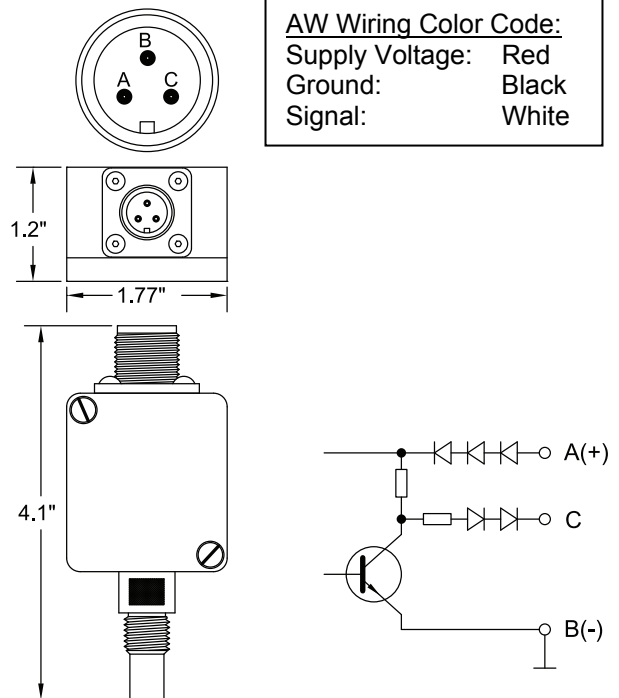


Figure 1

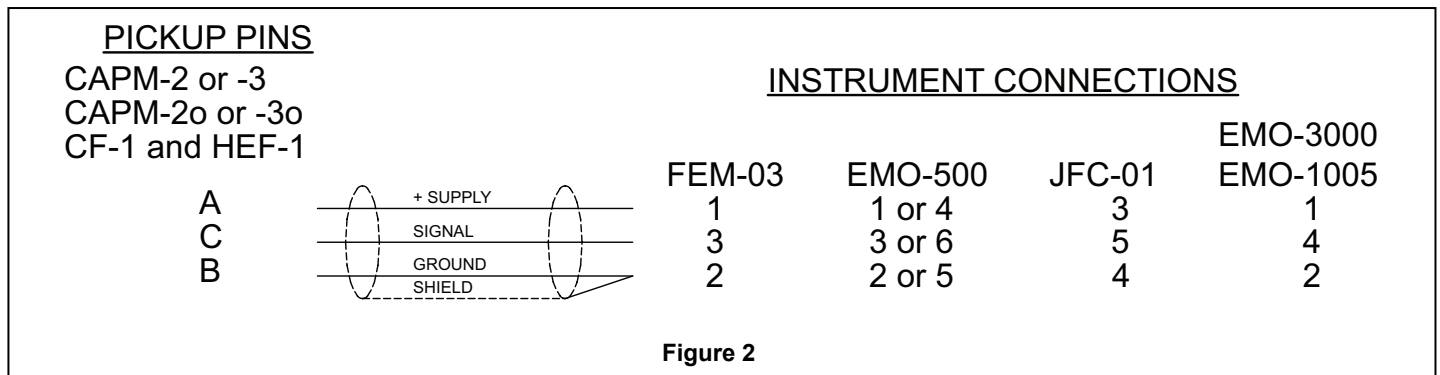
# Electrical Installation Tips for Sensors and Flow Meters

Wiring should be installed by a qualified electrician or instrumentation technician. When dealing with low voltage/power signals from pickups and transmitters, it is important to use a shielded cable between the transmitter and the signal processing unit. A shielded cable will keep most of the electromagnetic interference (EMI) from entering the signal cable and disrupting the signal before it can be processed. A 20-22 gauge 3 or 4 conductor cable with shield is acceptable. Recommended cable: Belden #88723 2 pair stranded, 22 awg Teflon coated cable. This cable is available from AW Flow Meters.

When hooking up to instrumentation, connect the shield together with the wire for the signal ground, to the **Instrument Ground** terminal.

## **NEVER CONNECT THE SHIELD TO GROUND AT BOTH ENDS.**

When hooking up to AW Flow Meters instrumentation, refer to the following drawing:



1. To prevent extraneous signal noise, ensure that a clean, central ground is established for both the flow meter and sensor.
2. Where possible, keep the signal cable at least 1 foot from any cable handling 110 Volt AC. If several signal cables are used, consider using metal conduit tubing for the signal cables for extra protection and shield from external noise and EMI. If possible, ground the conduit at one end. Ground to a water pipe or another good ground connection.
3. Place the pickup well away from motors, starters and relays. If used in a location where there are starters and other controls using relays, be sure there are diodes mounted across the coils for DC relays, and an R-C network for AC relays. This will dampen EMI from the relays when they operate.
4. Supply clean, regulated DC power with a ripple under 3% of supply

### **If the sensor appears faulty, review the following steps:**

1. Detach the wiring connector from the sensor. Using a short wire, repeatedly touch pin A to C inside the wiring connector. These simulated pulses should register at the instrument. If this does not occur, verify that the wiring connections are set up as shown in Figure 2 above and check the instrument. If using a non-AW instrument, check the specifications for signal compatibility.
2. If the pulses do register, re-attach the wiring connector to the sensor and rapidly move a screwdriver back and forth 1/16" in front of the sensor nose. If pulses register, the sensor is okay. If not, contact the factory for a return tracking number.

Note: If the sensor transmits a frequency irrespective of flow or by touch, the cable shielding and/or grounding is faulty and the equipment is behaving as an antenna.