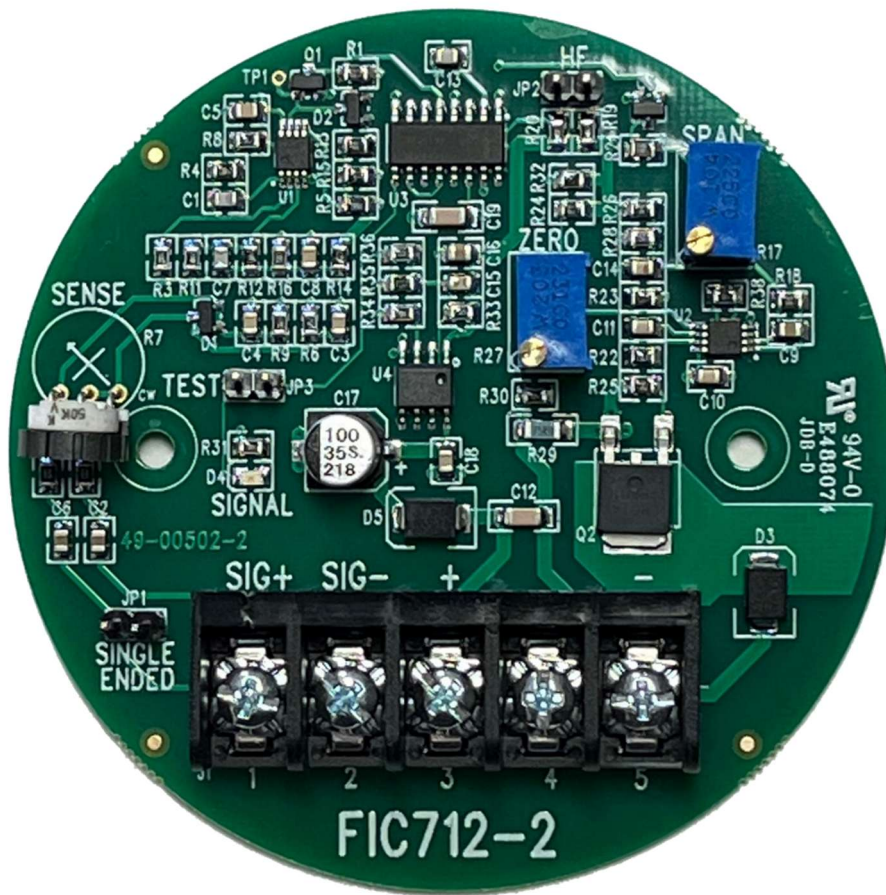


FIC712-2

Loop Powered 2 wire 4-20mA Transmitter

Installation and Operation Manual



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Revision B

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This document contains the recommended installation, operation, and maintenance procedures authorized and approved by Turbines, Inc., the manufacturer of the referenced equipment. No substitutions of specified components, improper handling or installation procedures, or use outside the specified range or capability specifications of the referenced equipment is permitted and may serve to void any warranties that might otherwise be operative or effective.

In the event installers or end users require additional assistance and/or clarification in any respect, contact the manufacturer at the address indicated below. Technical questions must be accompanied by proper product model number and serial number of subject equipment.

SPECIFICATIONS

Temperature:	Operating -40 to 85°C Storage -65 to 125°C
Input Voltage:	Minimum = 7 Vdc + (20mA X RL) Maximum = 28 Vdc + (4mA X RL) Protected against polarity reversal
Signal Input:	Frequency 0-10 KHz Amplitude 50 mV – 35 V sine or square wave Sensitivity field adjustable Impedance 50KΩ
Analog Output	4mA @ 0 Hz, 20mA @ desired full-scale frequency Full scale range -- 100 Hz-10 KHz selectable Response time -- 95% of change in 1 second Linearity -- .3% F/S Tempco -- < 2% of reading over entire temperature range
Features:	Built in test Individual LED indicators for power and signal Mounts directly on flowmeter
Enclosure:	FM Approved, CSA Certified Class I Groups B, C, D Class II Groups E, F, G Weight 1.7 lbs.

The **FIC712-2** is a 2-wire loop powered analog transmitter designed to linearly convert a frequency input to an equivalent 4-20mA current output. When it incorporates with a turbine flowmeter a current representation proportional to flow is obtainable. Data transmission in a current format exhibits excellent noise immunity and the capability of long distance transmission.

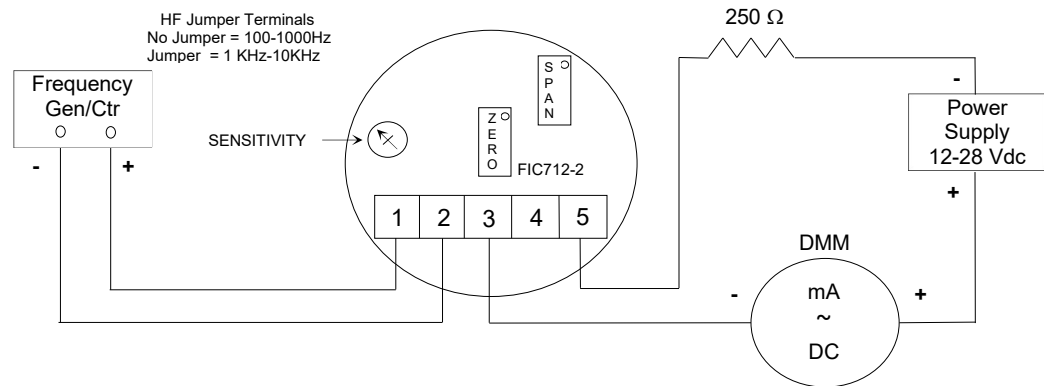
A full-scale frequency range of 100 Hz-1KHz or 1KHz-10KHz if **JP2** jumper is installed. The span adjustment establishes the frequency point at which a 20mA output is achieved. The sensitivity adjustment **R7** permits the **FIC712-2** to discriminate between a signal input and noise by increasing (CCW) or decreasing (CW) the input signal amplitude necessary to process a valid signal. The FIC712-2 can operate with a differential input configuration or single ended with **JP1** jumper installed. 'Test' jumper **JP3**, when installed, illuminates **D4** if both loop voltage and input signal are present.

Installation of the **FIC712-2** requires only 2 wires because it is a true 2-wire transmitter: input power and signal output utilize the same wires.

BENCH TEST CALIBRATION PROCEDURE

Required Equipment: Power Supply 12-28Vdc, Digital Multimeter (DMM), Frequency Generator, & Frequency Counter

Test Procedure:



- A) Connect DMM positive lead to power supply positive, connect DMM negative lead to J1-3, set DMM function to mA DC
- B) Connect power supply negative lead to 250 Ω resistor, connect other resistor leg to J1-5
- C) Connect frequency generator positive & negative leads to J1-1,2; respectively. Set output to sinewave & amplitude to zero
- D) Set JP2 for desired frequency range
- E) Turn power supply & frequency generator 'ON', DMM should indicate approximately 4.00mA
- F) Adjust 'ZERO' (R27) for 4.00mA DMM indication (record data)
- G) Set 'Sensitivity' adjust (R7) fully clockwise
- H) Adjust signal amplitude of frequency generator to 50mVp-p & frequency to maximum desired point (full scale frequency) (record data)
 - I) Adjust 'SPAN' (R17) for 20.00mA DMM indication (record data)
- J) Reduce signal amplitude of frequency generator to zero, adjust 'ZERO' (R27) for 4.00mA DMM indication if necessary
- K) Adjust signal amplitude of frequency generator to 50mVp-p, adjust 'SPAN' (R17) for 20.00mA DMM indication if necessary
- L) Adjust frequency of frequency generator to exactly 50% of maximum frequency point in step H, DMM should indicate $12.00\text{mA} \pm .06$. Repeat for 25% & 75% full scale frequencies (record data)

To check linearity @ any frequency point, incorporate the following formula:

$$(F/F_{\max} \times 16) + 4 = \text{mA}$$

Where F = Flowrate frequency in Hz

$F_{\max}$ = Frequency in Hz at which 20mA is set

Ex: Assume maximum frequency point = 2000 Hz (20.00mA)

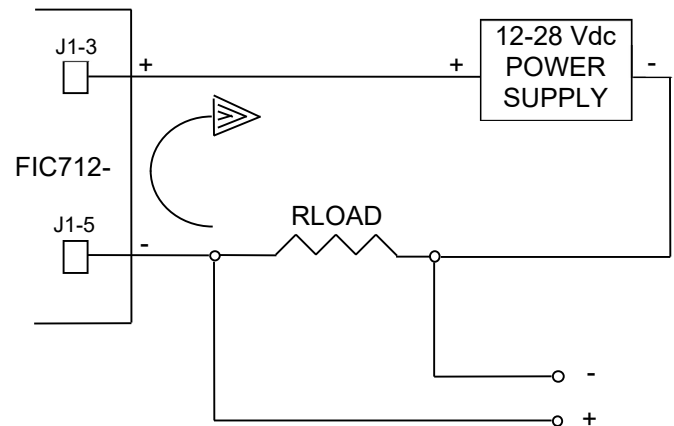
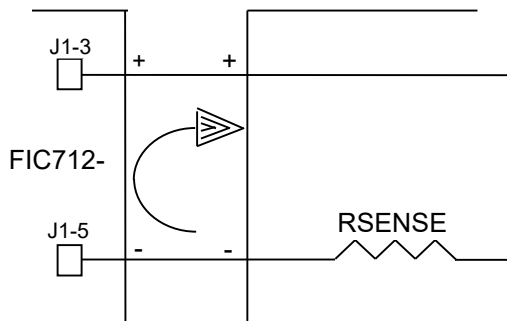
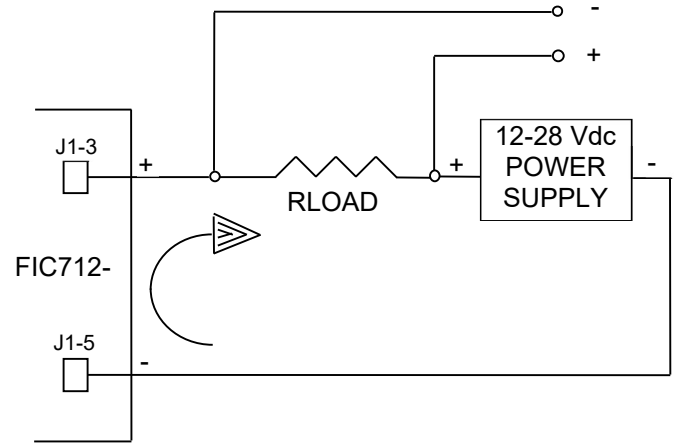
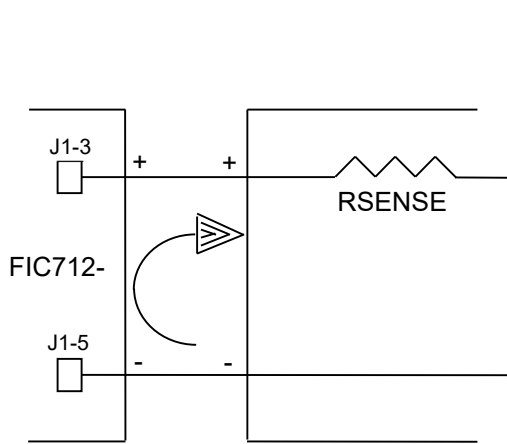
— Check for linearity @ 750 Hz point

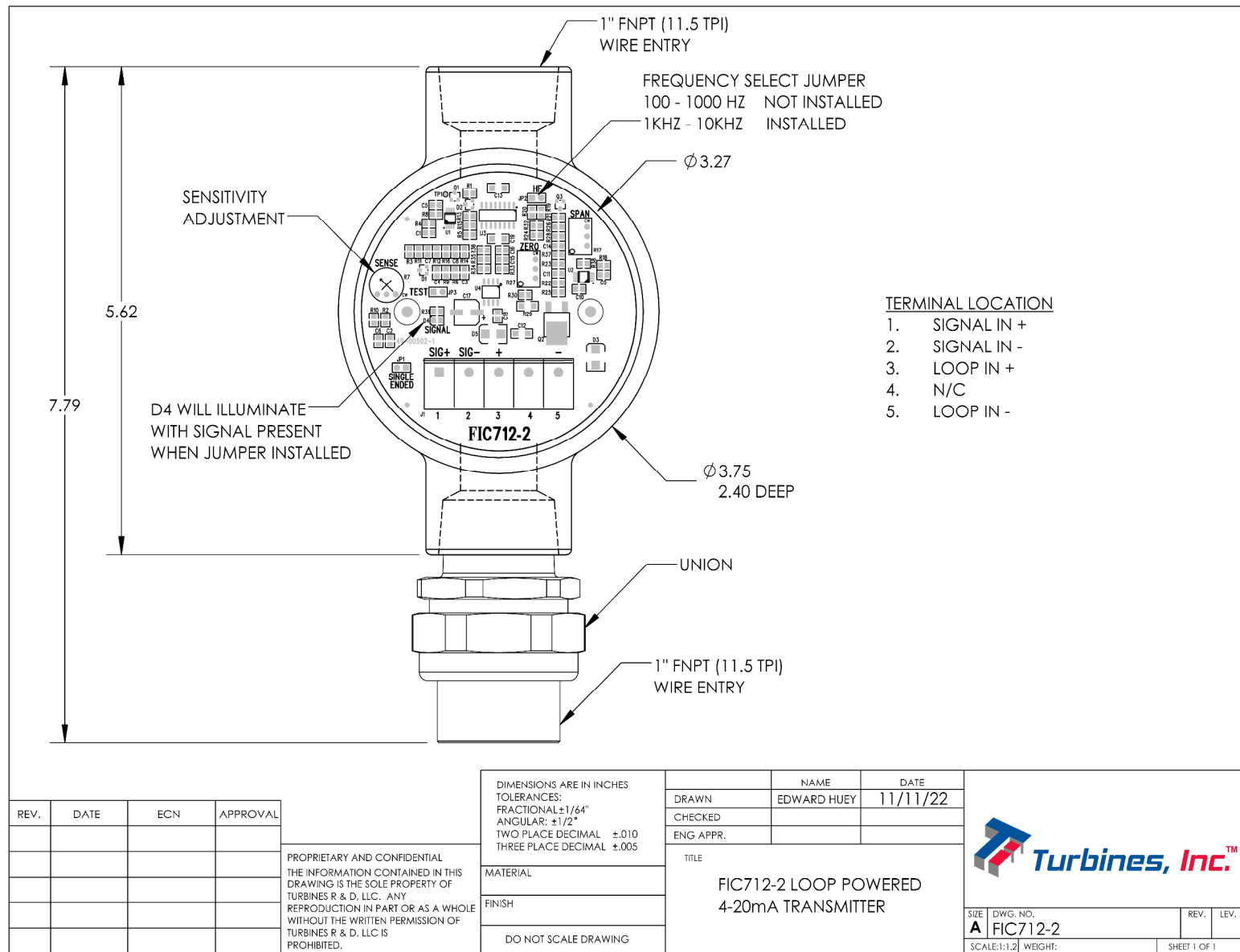
— $750/2000 = .375$

— $16 \times .375 = 6$

— $6 + 4 = 10$; DMM should indicate 10.00mA @ 750 Hz input

TYPICAL LOOP CONFIGURATIONS





Revision History

Revision	Description	Date
A	Updated Format	12/20/24
B	Changed wire entry dimension description on pg5 drawing	5/27/26