

INSTALLATION & OPERATION MANUAL

SP712-2 REV. C Loop Powered 4-20mA Transmitter

DOC#: MN-712-C



LIQUID CONTROLS SPONSLE, INC.

FLOW MEASURING DEVICES AND CONTROLS

A Unit of the IDEX Corporation

105 Albrecht Drive • Lake Bluff, IL 60044

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SPECIFICATIONS

Temperature:	Operating -40 to 85°C Storage -65 to 125°C
Input Voltage:	Minimum = 7 V + (20mA X RL) Maximum = 28 V + (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 50K
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:	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 SP712-2 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.

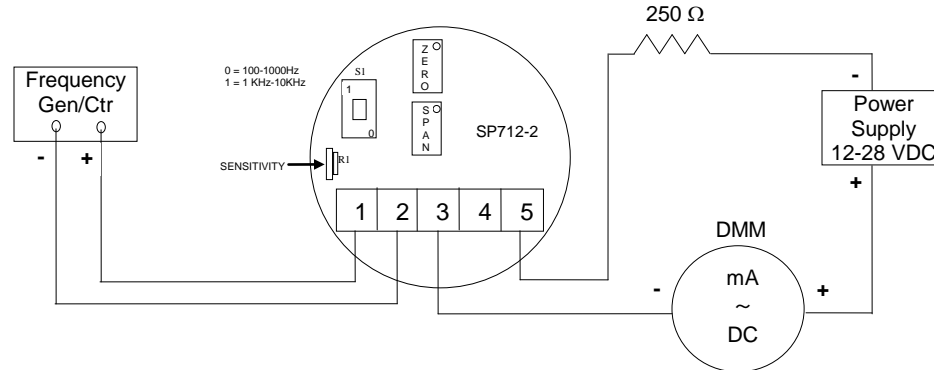
A full-scale frequency range of 100 Hz-10 KHz is selectable, via S1. The span adjustment establishes the frequency point at which a 20mA output is achieved. The sensitivity adjustment permits the SP712-2 to discriminate between a signal input and noise by increasing (CCW) or decreasing (CW) the input signal amplitude necessary to process a valid signal. 'Test' S2 when depressed, illuminates D1 if loop voltage and input signal both are present.

Installation of the SP712-2 requires only 2 wires because it is a true 2-wire transmitter: input power and signal output utilizes the same wires.

BENCH TEST CALIBRATION PROCEDURE

Required Equipment: Power Supply 12-28v, 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 S1 for desired frequency range
- E) Turn power supply & frequency generator 'ON', DMM should indicate approximately 4.00mA
- F) Adjust 'ZERO' (R25) for 4.00mA DMM indication (record data)
- G) Set 'Sensitivity' adjust (R1) fully clockwise
- H) Adjust signal amplitude of frequency generator to 50mv & frequency to maximum desired point (full scale frequency) (record data)
- I) Adjust 'SPAN' (R19) for 20.00mA DMM indication (record data)
- J) Reduce signal amplitude of frequency generator to zero, adjust 'ZERO' (R25) for 4.00mA DMM indication if necessary
- K) Adjust signal amplitude of frequency generator to 50mv, adjust 'SPAN' (R19) 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 12.00mA \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)

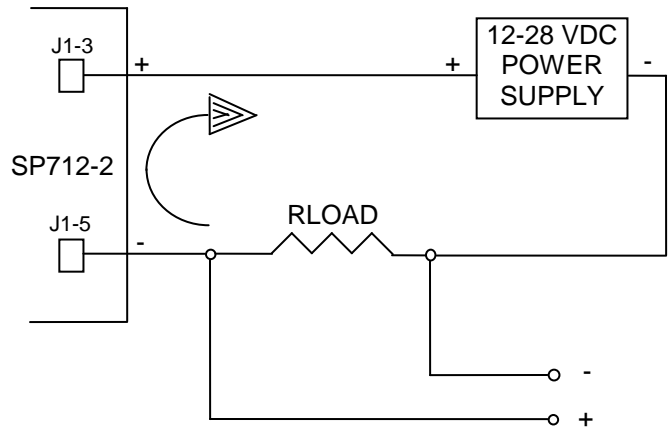
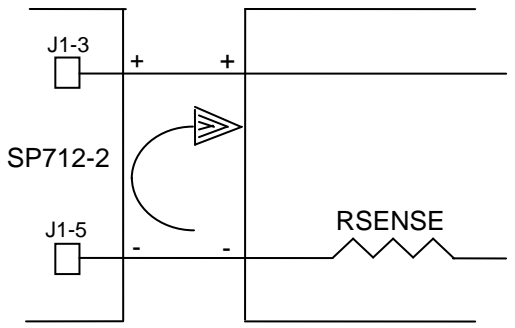
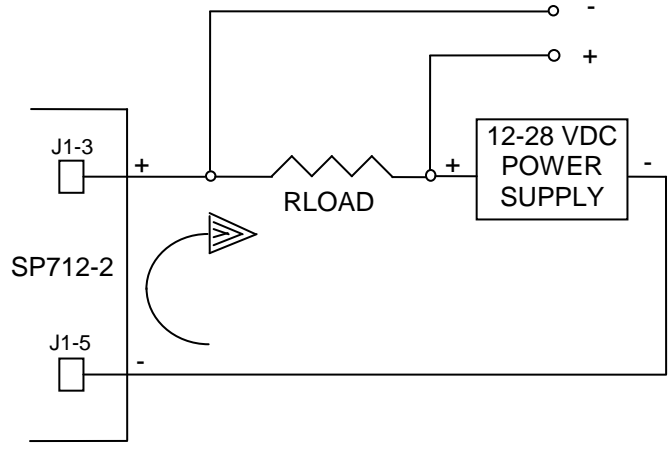
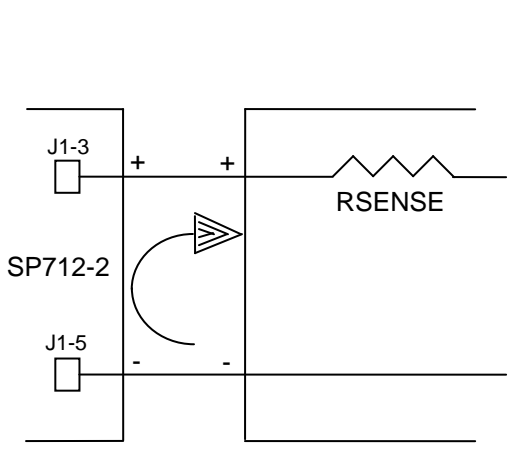
Ex. Assume maximum frequency point = 2000 Hz (20.00mA) Check for linearity @ 750 Hz point

$$750/2000 = .375$$

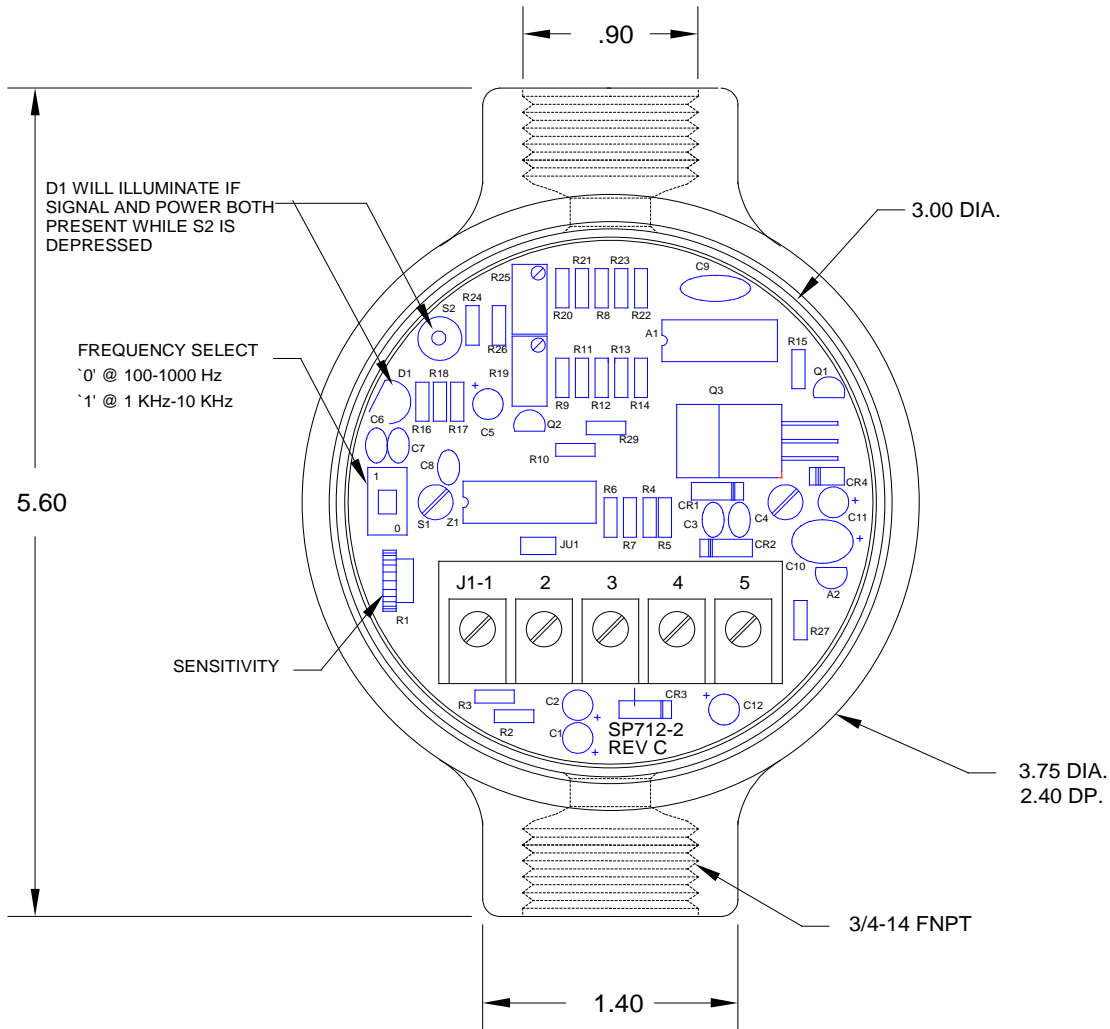
$$16 \times .375 = 6$$

$$6 + 4 = 10; \text{ DMM should indicate } 10.00\text{mA @ } 750 \text{ Hz input}$$

TYPICAL LOOP CONFIGURATIONS



DATE	REV	REVISION RECORD	AUTH	DR	CK



D1 WILL ILLUMINATE IF SIGNAL AND POWER BOTH PRESENT WHILE S2 IS DEPRESSED

FREQUENCY SELECT
 '0' @ 100-1000 Hz
 '1' @ 1 KHz-10 KHz

SENSITIVITY

TERMINAL LOCATION

- 1 SIGNAL IN +
- 2 SIGNAL IN -
- 3 LOOP IN +
- 4 N/C
- 5 LOOP IN -

NOTE: DIMENSIONS ARE IN INCHES

SPONSLER, INC.			
FILE	SELECTSP712.DWG		
DESCRIPTION	SP712-2 LOOP POWERED 4-20mA TRANSMITTER	DRAWN BY	TN
MATERIAL		DATE	5-5-97
COD	DRAWING NUMBER	SCALE	REVIEWED B
		NONE	DATE
EM	SP712-2	REV. #	APPR. BY
		DATE	

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