INSTALLATION & OPERATION MANUAL

SP720-2
Loop Powered
2 Wire Modulated Carrier Amplifier
4-20mA Transmitter

DOC#: MN-720

SPONSLER CO., INC.

Precision Industrial Flow Measuring Devices and Controls

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SPECIFICATIONS

Temperature: Operating -40 to 85°C
Storage -65 to 125°C

Input Voltage: Minimum = 7V + (20mA X RL)
Maximum = 28V + (4mA X RL)
Protected against polarity reversal

Signal Input: Frequency 0-3500Hz with 50KHz Carrier
(Requires pickup coil 1-1.3mh)

Analog Output: 4mA @ 0Hz, 20mA @ desired full scale frequency
Full scale range = 35Hz-3500Hz selectable
Response time = 95% of change in 1 second
Linearity = .3% F/S
Tempco = <2% of reading over entire temperature range

Features: LED Signal Indicator
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 SP720-2 Loop Powered 2 Wire Modulated Carrier Amplifier 4-20mA Transmitter is a unique meter mounted device designed to combine the advantages of the modulated carrier principle with the convenience and accuracy of a loop powered 4-20mA transmitter. When incorporated with a frequency-generating device such as a turbine flowmeter, data transmission in a current format proportional to flow is obtainable.

The Modulated Carrier produces a carrier frequency in conjunction with a RF pickup coil, detects and amplifies the shift in the carrier frequency (modulation) that occurs with the passage of magnetic material and generates a squarewave pulse with each shift in carrier frequency. The pulse's frequency is proportional to the input frequency and is converted linearly to a representative current output through a load. The full-scale frequency of 35-3500Hz is selectable via S1. LED D1 illuminates when a signal is present.

The Modulated Carrier principle introduces no drag on the passing magnetic device. Therefore, extension of the low end of a flowmeter's nominal linear range is realized. This parameter is particularly useful when measuring a low mass gas. Installation of the SP720-2 requires only 2 wires because it is a true 2-wire transmitter in that input power and analog output utilize the same wires.

BENCH TEST CALIBRATION PROCEDURE

Required Equipment: Power Supply 5-28 VDC, Digital Multimeter (DMM), Frequency Generator, Frequency Counter, Oscilloscope

Test Procedure:

- **A)** Connect DMM positive lead to power supply positive and the DMM negative lead to J1-3, Set DMM function to mA DC
- **B)** Connect power supply negative lead to J1-5
- **C)** Connect RF pickup coil to J1-1, 2
- **D)** Connect oscilloscope positive and negative leads to J1-1, 2 respectively
- **E)** Set S1 for desired full scale frequency range
- **F)** Turn power supply 'ON'. Observe oscilloscope displays 50KHz ± 5KHz 6Vp-p carrier sinewave
- **G)** Adjust 'ZERO' (R25) for 4.00mA DMM indication
- **H)** Disconnect oscilloscope @ J1-1,2. Connect frequency generator positive and negative leads to J1-1,2 respectively, set function to squarewave and amplitude to 5Vp-p (0-5v) and frequency to the desired full scale point
- **I)** Adjust 'SPAN' (R20) for 20.00mA DMM indication
- **J)** Reduce signal amplitude to frequency generator to zero, adjust 'ZERO' (R25) for 4.00mA DMM indication if necessary
- **K)** Adjust signal amplitude of frequency generator to 5Vp-p, adjust 'SPAN' (R20) for 20.00mA DMM indication if necessary
- **L)** Adjust frequency of frequency generator to exactly 50% of the maximum frequency point in step H, DMM should indicate 12.00mA ±.06, repeat 25%, 75% points

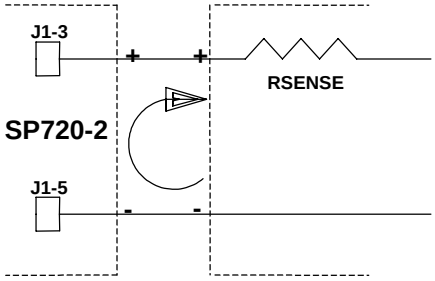
To check for linearity @ any frequency point incorporate the following formula-

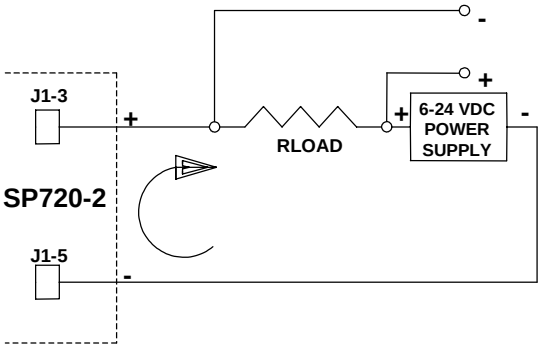
(F/F max X 16) + 4 = mA

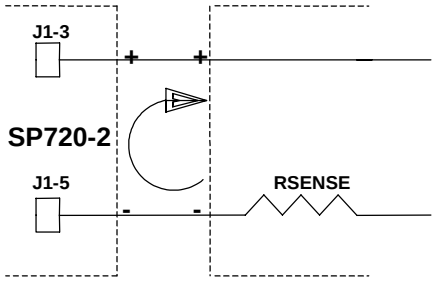
Example: Assume maximum frequency point = 2000Hz (20.00mA point)
Check for linearity @ 750Hz point

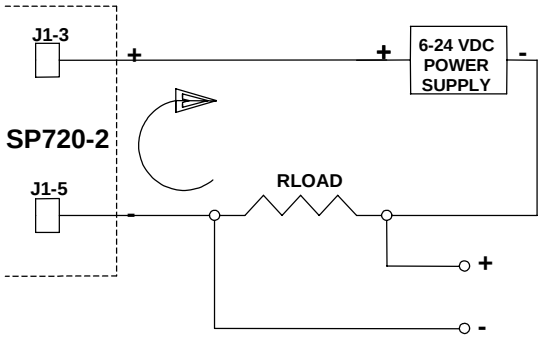
750/2000 = .375
16 X .375 = 6
6 + 4 = 10 DMM should indicate 10.00mA @ 750Hz input

TYPICAL LOOP CONFIGURATIONS

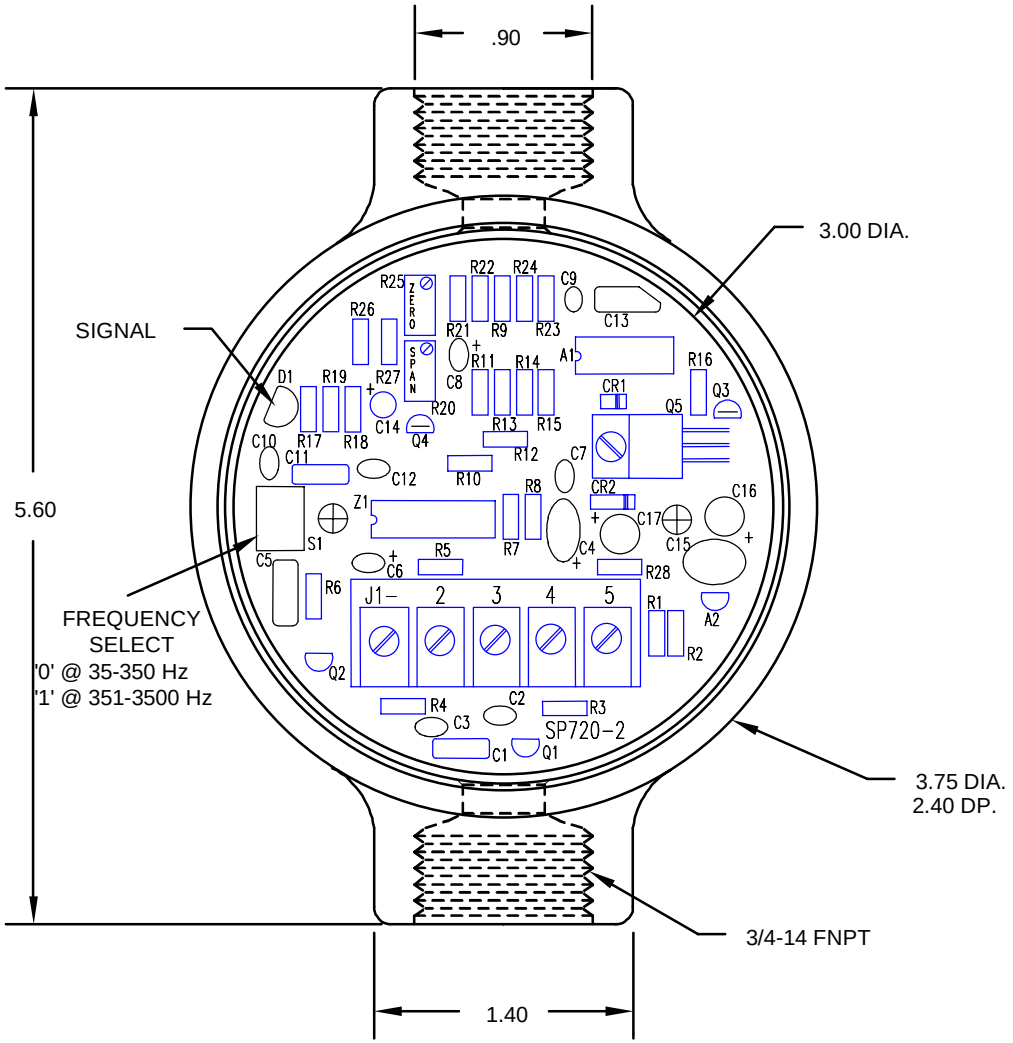








DATE	REV	REVISION RECORD	AUTH	DR	CK



TERMINAL LOCATION

1	SIGNAL IN +	
2	SIGNAL IN -	
3	LOOP IN +	4-20mA
4	N/C	
5	LOOP IN -	

NOTE: DIMIENSIONS ARE IN INCHES

SPONSLER CO., INC.		
FILE NAME: \ELECT\SP720-2.DWG		
DESCRIPTION: SP720-2 loop powered tranmsitter		DRAWN BY: TN
		DATE: 5-5-97
MATERIAL	SCALE: NONE	REVIEWED BY
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