Department of consumer and corporate affairs / Ministère de la consommation et des corporations

STANDARDS BRANCH - DIRECTION DES NORMES

NOTICE OF APPROVAL

E - 113

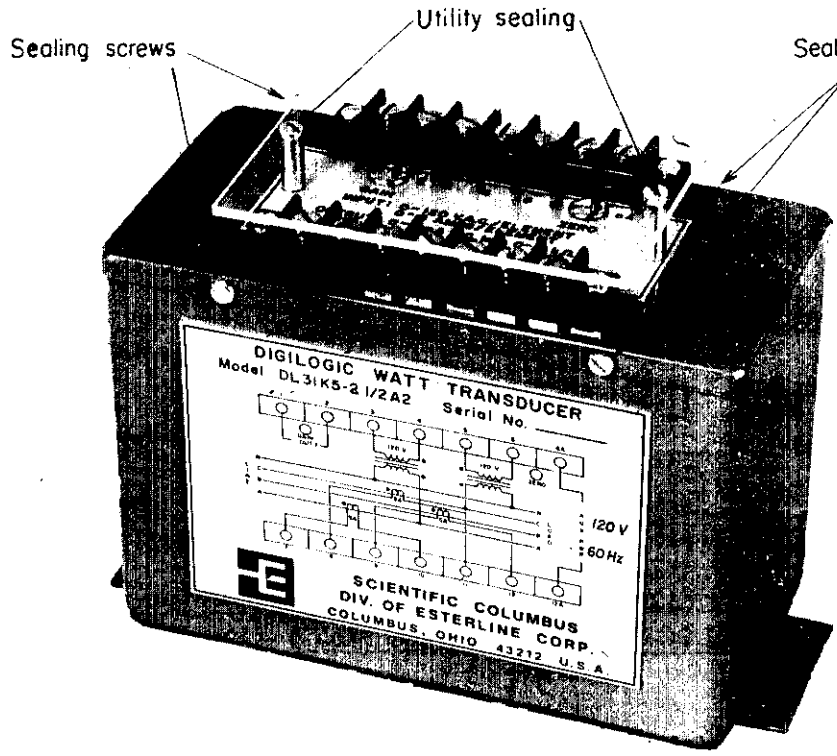
OTTAWA August 2, 1972

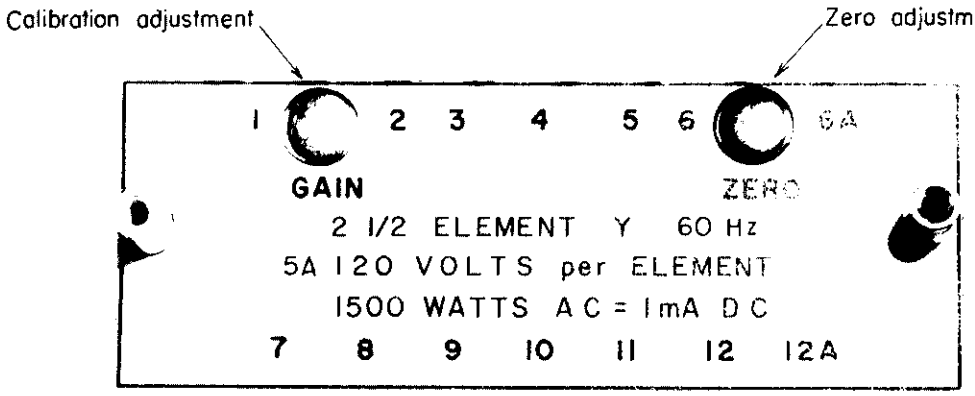
SCIENTIFIC COLUMBUS MODEL "DL31K-2½2", 2½-ELEMENT Y DIGILOGIC SOLID STATE WATT TRANSDUCER

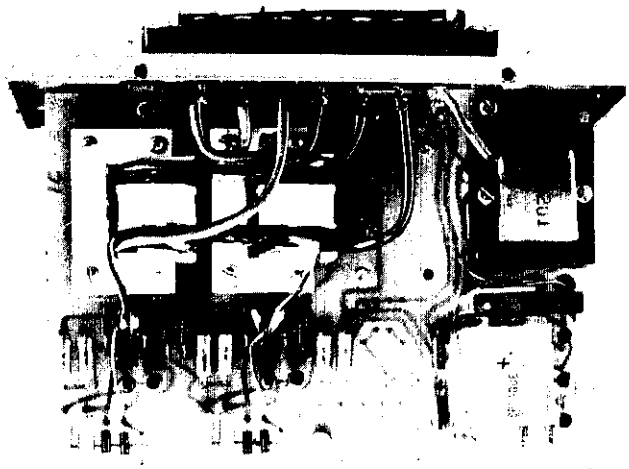
Rated Voltage	120 volts
Nominal Current	5 amperes
Maximum Current	6 amperes
Frequency	60 Hz
Nominal Input	± 1500 watts
Power Factor Range	Unrestricted
Nominal Output	1.0 .. -0 .. -1.0 milliamperes DC
Max. External Resistance	10000 ohms
Output Device	Precision Resistor
Response Time	0.4 seconds
Burden of Measuring Unit	
Each Voltage Coil	0.5 va at 120 volts
Each Current Coil	0.5 va at 5 amperes
Power Supply to unit	120 volts 60 Hz 5 watts

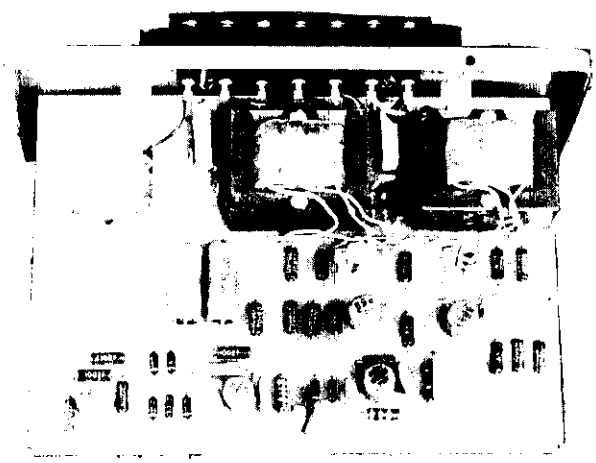
The DC output polarity with the polarities of the various instrument transformers is shown in the schematic wiring diagram on page 4 with power assumed to be flowing from left to right. If the power flow reverses, the DC output polarity will reverse also, so that these transducers are suitable for and are approved for import-export service, and any transducer used in this application requires verification for both directions of power flow.

A recording potentiometer used with a transducer in this application would normally have a raised zero.


Sealing screws
Utility sealing
Sealing screws
DIGILOGIC WATT TRANSDUCER
Model DL31K5-2 1/2A2
Serial No.
120 V
60Hz
SCIENTIFIC COLUMBUS
DIV. OF ESTERLINE CORP.
COLUMBUS, OHIO 43212 U.S.A.


Calibration adjustment
Zero adjustment
1 2 3 4 5 6 6A
GAIN
ZERO
2 1/2 ELEMENT Y 60 Hz
5A 120 VOLTS per ELEMENT
1500 WATTS AC = 1mA DC
7 8 9 10 11 12 12A





The transmission line from the transducer to the recorder may have any value up to a maximum of 10000 ohms. Line resistances up to this value have no effect on the accuracy of the transducer.

For practical purposes, the output from these transducers can be considered to be pure DC and does not require filtering, but because it is in milliamperes, it cannot be applied directly to a recording potentiometer, but by passing this current through a resistor, a drop in millivolts will be produced which can then be applied to a recording potentiometer.

This dropping resistor must be at the recorder end of the transmission line so that transmission is done with a milliampere signal as this leads to greater freedom from influences of induced or capacitive stray voltages.

NOTE: As this is the only approved method of converting the outputs of these transducers to millivolts, all installations are subject to inspection by the Standards Branch.

These transducers are similar to 2½-element Y watthour meters in that they are basically a 2-element design with the split coil wound on both elements. Thus with voltage applied to both potential coils in parallel, a given current will produce twice the milliampere output from the split coil as it does from either of the other two coils.

Thus when verifying these transducers with the current coils in series, 375 watts is sufficient to produce the full 1 milliampere output.

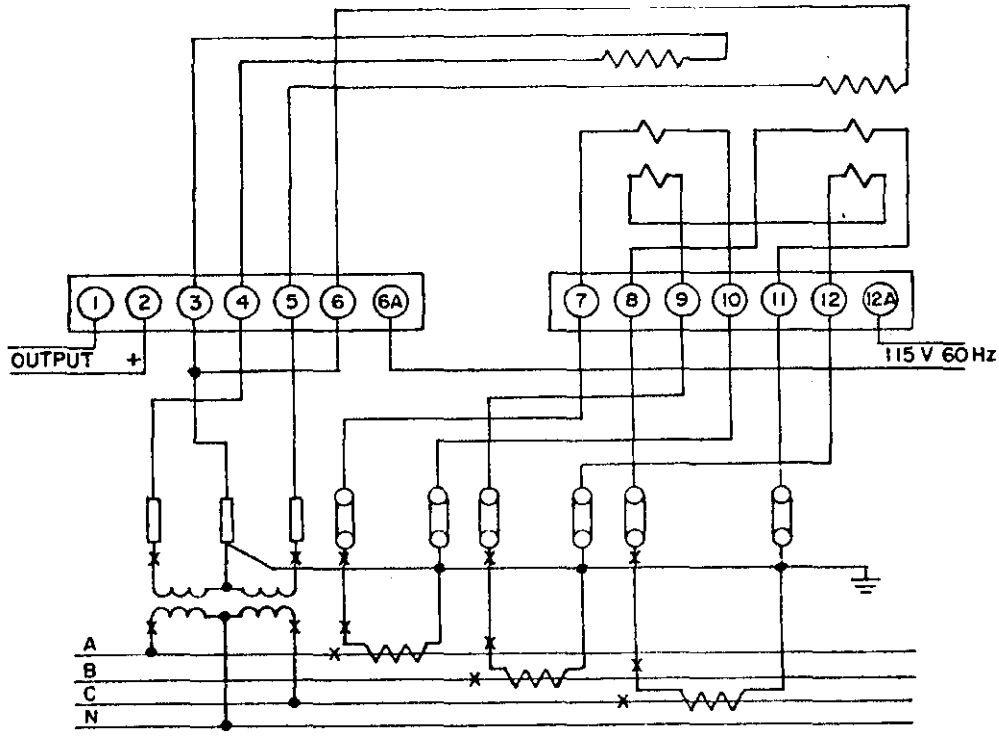
Instructions for verifying these transducers is given in Technical Electric Circular E-72-3.

Description

These transducers operate by means of what the manufacturer terms amplitude modulation/pulse width modulation when an internally generated triangular wave is changed in amplitude and width by the instantaneous product of the voltage and current in each element.

The outputs of each element are added together, amplified, rectified and filtered and appear at the output terminals as DC current.

Because of the utilization of the instantaneous product of the voltages and currents, the output milliamperes are proportional to power factor and a wattmeter may be used as a reference when verifying these devices.


1
2
3
4
5
6
6A
7
8
9
10
11
12
12A
OUTPUT +
115 V 60 Hz
A
B
C
N

These transducers have a zero and a calibration adjustment shown arrowed in the illustration on page 2.

The zero adjustment will move the calibration up and down without changing the range but the calibration adjustment has no effect on the zero.

These transducers are to be sealed with a wire through holes in the four cover screws and through holes in the plugs over the calibration and zero adjustments.

Approval granted to:

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