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NOTICE OF APPROVAL
AVIS D'APPROBATION

E-144

Ottawa, August 26, 1976

SCIENTIFIC COLUMBUS DIGILOGIC SOLID STATE WATT/WATT HOUR TRANSDUCER AND SCIENTIFIC COLUMBUS MODEL 6153 DUAL WATT HOUR REGISTER

The following Transducer Models are herein approved:

(1) DL5C5A2-6070C or -6069C, 1 element, single phase;

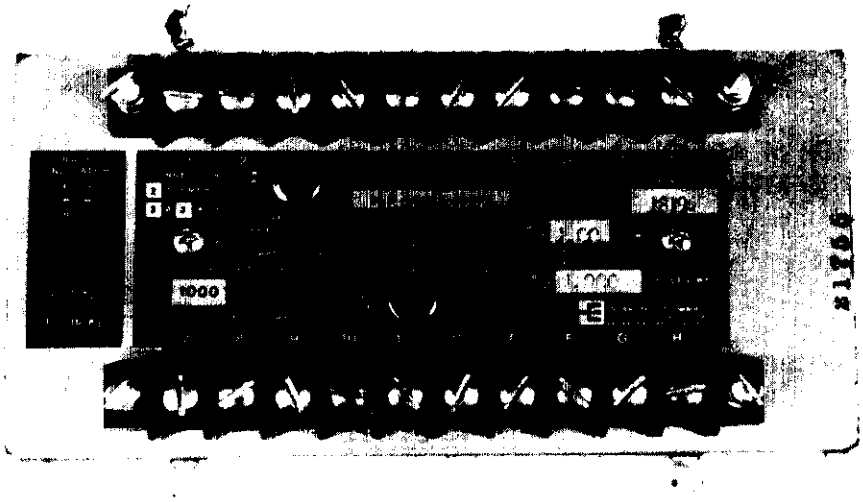
(2) DL31K5A2-6070C or -6069C, 2 element, 3 phase, 3 wire;

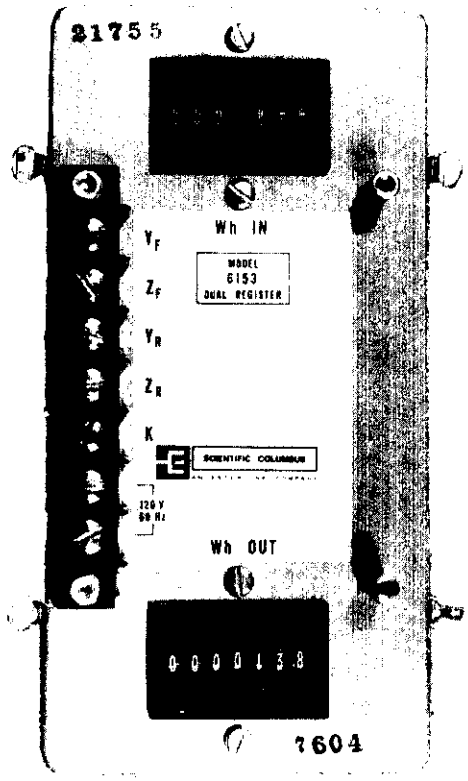
(3) DL31K52½A2-6070C or -6069C, 2½ element, 3 phase, 4 wire;

and (4) DL 342K5A2-6070C or -6069C, 3 element, 3 phase, 4 wire.

NOTES: -6070 series is unidirectional;
-6069 series is bidirectional;
-"C" suffix denotes approved modifications for Canadian use.

Rated Voltage	120 Volts
Current Range	8-1/3 - 0 - 8-1/3 amperes per element
Frequency	60 Hz
Auxiliary Power Supply	120 volts, 60 Hz, 3VA
Analog Output (K_a)	1.00 mA @ Calibrating Power (ref.Table 1)
Maximum Resistance (across analogue output terminals)	10,000 ohms *
Response Time	0.4 seconds to 99% final value
Digital Output (K_p)	1 pulse/Wh
Digital Output Contact Rating	15 VA @ 1A (maximum) or 150 V (maximum) with resistive load. Contact protection network required for inductive load.




21755
Wh IN
Y_F
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MODEL
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DUAL REGISTER
SCIENTIFIC COLUMBUS
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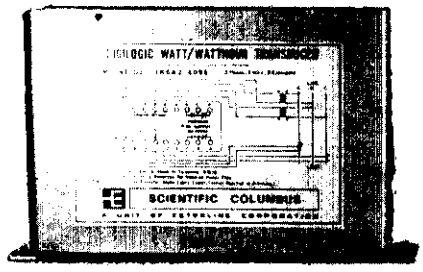
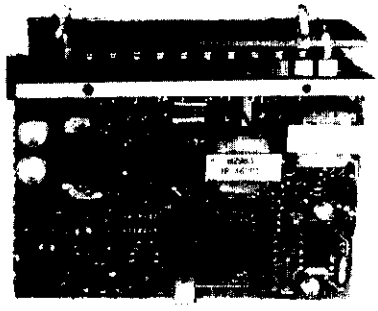
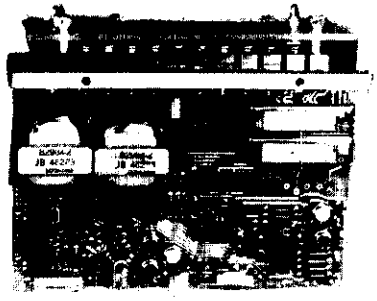
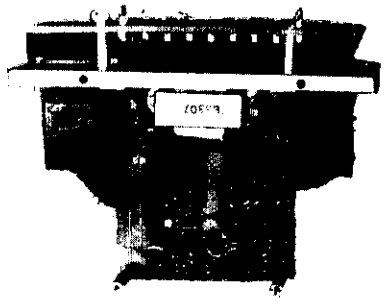

SCIENTIFIC COLUMBUS







Burdens	
Each Voltage Element	0.01 VA at 120V
Each Current Element	0.1 VA (0.2 VA on 1 element units) at 5A
Registers (Models 6153 and 6153D)**	Dual 7-digit Cyclometer, 1 Wh resolution
Register Auxiliary Power Supply	120 volts, 60 Hz

Table 1

MODEL	EL	RATED POWER (WATTS) PER ELEMENT	RATED POWER (WATTS) TOTAL	CALIBRATING POWER (WATTS) TOTAL ALL ELEMENTS
DL5C5A2	1	1000	1000	500
DL31K5A2	2	1000	2000	1000
DL31K52½A2	2½	1000	3000	1500
DL342K5A2	3	1000	3000	1500

* NOTE: The Transducer must not be energized without a proper load resistance across the analog output (observing the 10 volt compliance).

** NOTE: Although the Register Model 6153 (non-resettable) may be mounted in any orientation, the Transducer must be mounted within 30° of the orientation indicated by the red arrow on its side. Register Model 6153D (auxiliary relay output) must be specified for either horizontal (bench top) or vertical (wall or panel) mounting.

Description

The analog (watts) section of this Transducer, in operating principle and application, is basically the same as Model "DL31K5-2½A2" 2½-element Y Digilogic Solid State Watt Transducer, approved on Notice of Approval E-113 dated 2 August 1972, except that the analog output of this model has a 10-volt compliance stipulation. A further exception is the absence of a zero adjustment.

These Transducers are suitable, and approved, for import-export service and any Transducer used in this application requires verification for both directions of power flow. This holds true for both the analog and digital sections of the Transducer and for the energy register. (DC output polarity reverses with a reverse of power flow.)

The analog signal is also internally fed into a crystal-referenced integrator in the digital section of the Transducer. A high-repetition rate pulse train is thus produced, whose rate is very accurately proportional to the power input. These pulses are fed into a divide-by-2^n divider for provision of driving pulses at the desired rate to the output relay and also to the LED rate indicator. A wide range of optional output count rates is available but, because these will produce different digital output constants (K_p) the desired count rate should be selected on initial purchase or the Transducer should be returned to the factory for this modification.

If the digital output is to be fed to an electo-mechanical counter rather than to the Scientific Columbus Register Unit Model 6153, a proper external contact protection network must be used to ensure maximum contact life. This network should be connected as close as possible to the relay terminals and should consist of a resistor and capacitor in series across each contact.

The capacitor and resistor values can be calculated using the formulae:

$$C = \frac{I^2}{10} \text{ Micro Farads}$$

and

$$R = \frac{V}{10I(1 + 50/V)} \text{ Ohms,}$$

where V = Source voltage immediately prior to contact closure

and I = Contact current in amperes immediately prior to contact opening.

This Transducer has only two adjustments, W Cal and Wh Cal. These potentiometers settings are cemented and should not require adjustment unless the count rate is changed, in which case only the Wh Cal should be adjusted. The W Cal adjustment affects both the analog and digital outputs but the Wh Cal adjustment affects only the digital output.

The Scientific Columbus Register Unit, Model 6153, consists of two electronically-driven stepping motors which drive their appropriate cyclometer registers, one for each direction of energy flow. One count is registered for each transfer of the Transducer's Form C, 3-wire relay. The register will hold counts indefinitely under power failure conditions and will not give false counts when power is restored. The Model 6153 is non-resettable. It may be mounted in any orientation. Model 6153D is non-resettable with auxiliary relay output and available for either horizontal or vertical mounting.

These Transducers and registers are to be sealed with wire through holes in the four cover screws and the four terminal block cover screws. In addition, the Transducer calibration adjustments are to be provided with a suitable sealing arrangement.

Approval granted to:

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Esterline Corp.,
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Ref: G 6565-S771