Consumer and Corporate Affairs | Consommation et corporations

Standards | Normes

NOTICE OF APPROVAL
AVIS D'APPROBATION

E-165

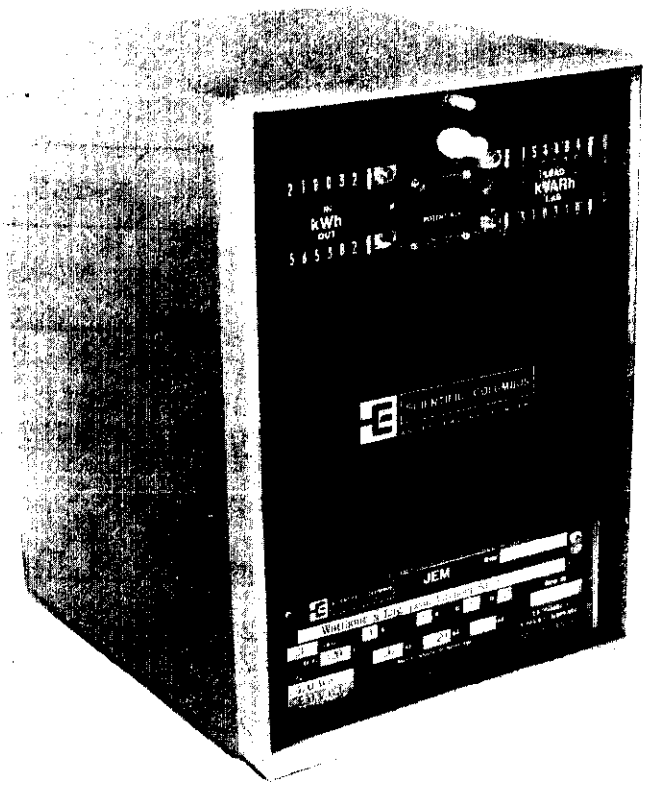
Ottawa, July 6, 1979

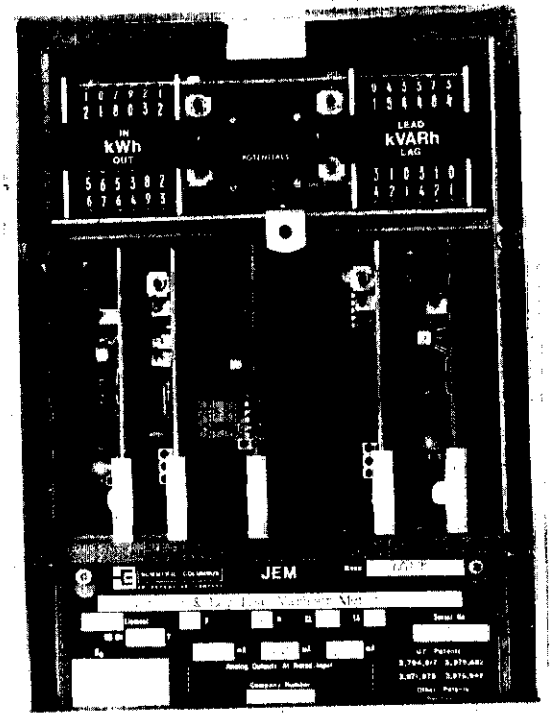
SCIENTIFIC COLUMBUS SOLID STATE JOULE
ELECTRONIC METER (JEM) MULTIFUNCTION UNITS

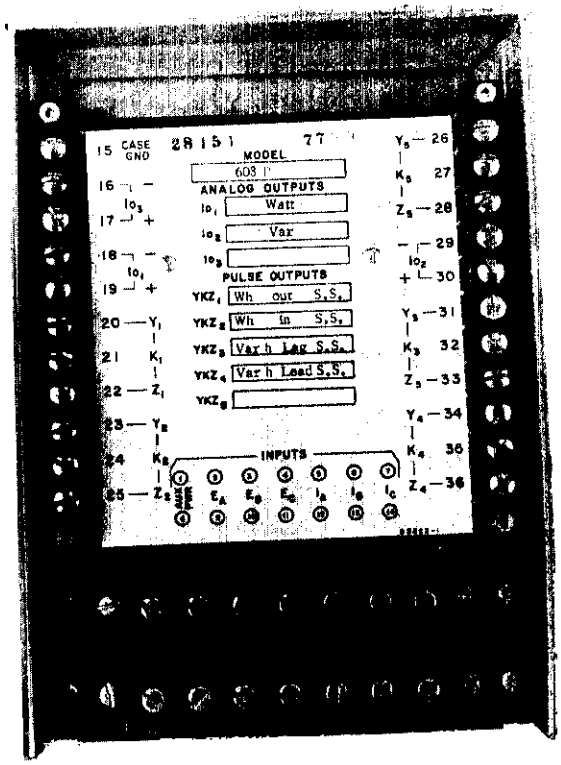
The following models are herein approved:

	2 Element	2½ Element	3 Element
Watthour (Unidirectional)	102	104	103
Varhour (Unidirectional)	112	114	113
Watthour (Bidirectional)	202	204	203
Varhour (Bidirectional, lead/lag)	212	214	213
Watthour/Q Hour	302	304	303
Watthour/Varhour (Lag)	312	314	313
± Watthour/Var (Analog only)	322	324	323
Watt/Var (Analog only)	332	334	333
Watthour/Var (analog only)	342	344	343
Watthour/Varhour (Lead)	362	364	363
± Watthour/± Varhour	602	604	603
± Watthour/Q Hour	612	614	613
Watthour/ ±Varhour	622	624	623

Input Voltages	480, 240, 120 and 69V
Nominal Current	5A
Current Range	0-10A
Frequency	60 Hz
Auxiliary Power Supply	85-135VAC 60Hz 5VA


kWh
OUT
LEAD
kVARh
LAG
JEM


IN
kWh
OUT
LEAD
kVARh
LAG
JEM


15 CASE GND
2815
77
MODEL
603
ANALOG OUTPUTS
Watt
Var
PULSE OUTPUTS
Wh out S,S,
Wh in S,S,
Var h Lag S,S,
Var h Lead S,S,
INPUTS

Analog Output (Ka)	1 Element 500 W/mA 2 Element 1000 W/mA 3 Element 1500 W/mA (The analog output can be bi-polar, reversing polarity for reverse input where applicable).
Burden - Current - Potential	0.2VA per element at 5A nominal 0.05VA per element at 120V
Power Factor	0 lag - unity - 0 lead
Response time	0.4 seconds to 99% final value
Load Resistance(Analog Output)	4167 OHMS maximum

Pulse outputs are provided which are proportional to the metered function with a wide range of pulse rates available. The standard output is solid-state in a three wire, form C configuration, NPN transistor pair. The solid-state output is photo-isolated from the internal circuits.

Six-digit registers are electro-mechanical with a maximum count speed of 4 counts/second or about 15000 counts/hour. Normally, register units pulse at the same rate as the pulse outputs, however register ratios for 1/10, 1/100 and 1/200 are available options.

Rate indicators are flashing red LED's to show relative load. The flashing rate is set independently of the pulse output.

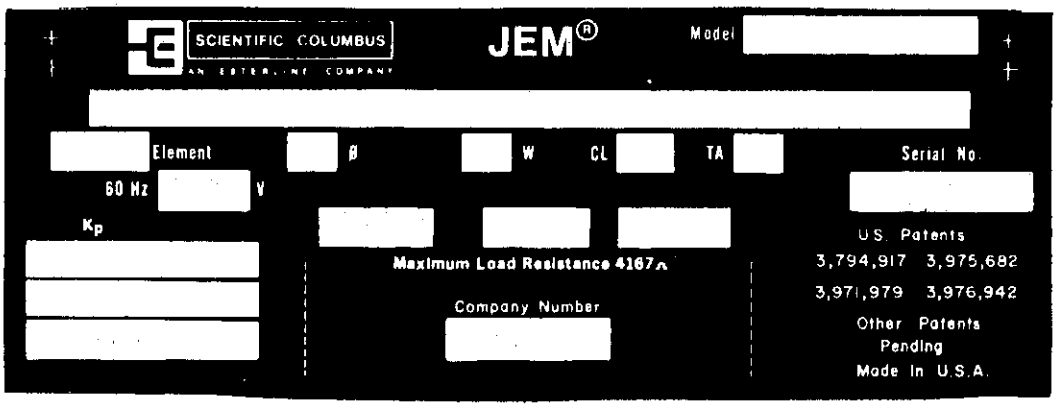
Green LED's display presence of potential input for each element.

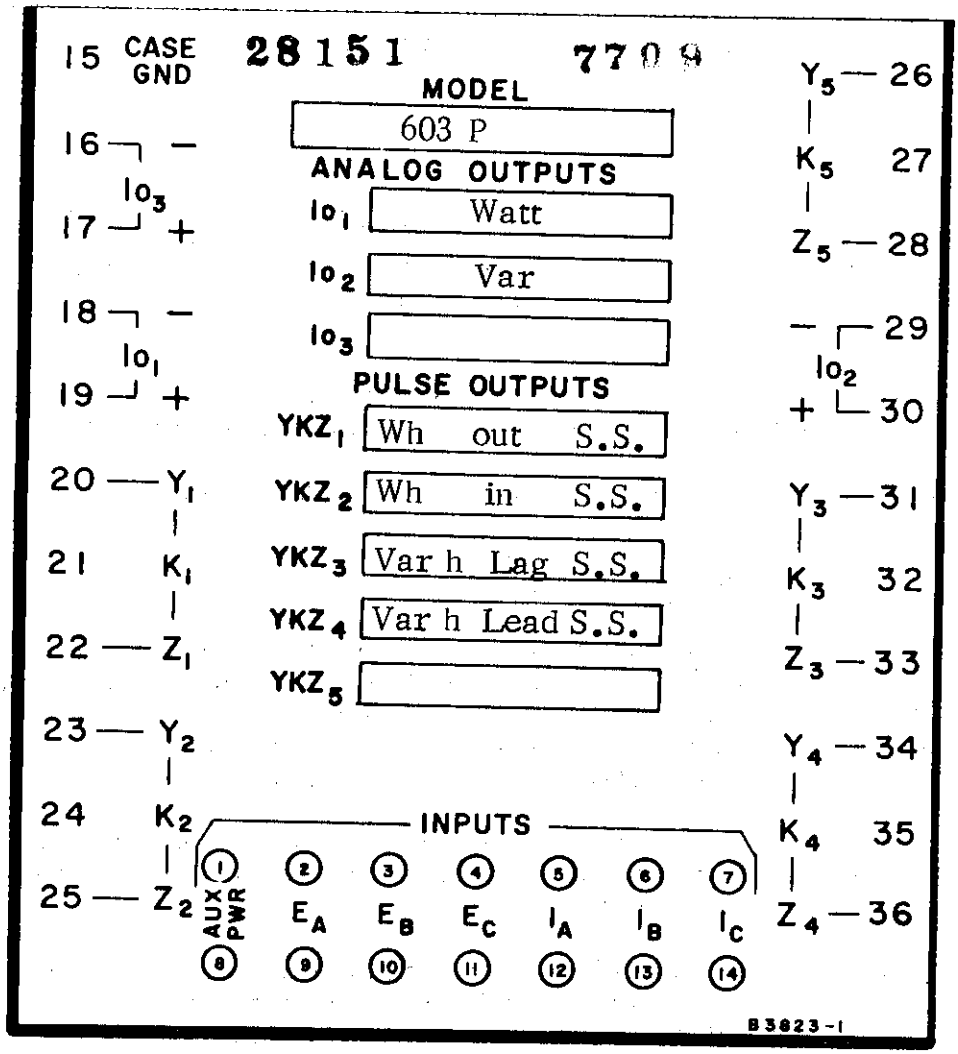
Description

The watt section uses the time-division multiplier principle which depends on the combined pulse-width-amplitude modulation of a rectangular pulse train. The average value of the pulse train is proportional to instantaneous power and is available as an analog output signal for monitoring or supervisory service.

This signal is also fed to the solid-state integrator which converts the instantaneous power signal to provide pulses directly proportional to energy or watthours.

Pulse rates are determined by selecting one of five register networks and one of seven binary divider taps giving a total range of 128:1. Standard calibration is one pulse/watthour.

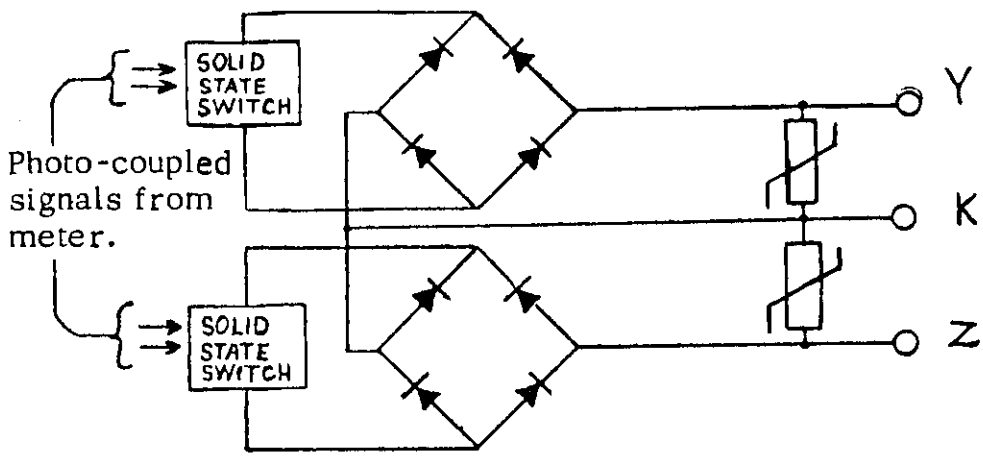

SCIENTIFIC COLUMBUS
AN ESTERLINE COMPANY
JEM®
Model
Element
Ø
W
CL
TA
Serial No.
60 Hz
V
Kp
Maximum Load Resistance 4167Ω
Company Number
U.S. Patents
3,794,917 3,975,682
3,971,979 3,976,942
Other Patents Pending
Made In U.S.A.


15 CASE GND
28151
7709
MODEL
603 P
16 −
Io3
17 +
ANALOG OUTPUTS
Io1 Watt
Io2 Var
Io3
18 −
Io1
19 +
PULSE OUTPUTS
YKZ1 Wh out S.S.
YKZ2 Wh in S.S.
YKZ3 Var h Lag S.S.
YKZ4 Var h Lead S.S.
YKZ5
20 — Y1
21 K1
22 — Z1
23 — Y2
24 K2
25 — Z2
Y5 — 26
K5 27
Z5 — 28
— 29
Io2
+ 30
Y3 — 31
K3 32
Z3 — 33
Y4 — 34
K4 35
Z4 — 36
INPUTS
1 AUX PWR
2 EA
3 EB
4 EC
5 IA
6 IB
7 IC
8 9 10 11 12 13 14
B3823-1

Output Circuit Configuration:

Internal bypassing with voltage variable resistors provides transient suppression protection for the solid state output when operation is within the specified limits.

Voltage (open circuit applied voltage)	200V D.C. or Peak AC
Saturation Voltage (on state voltage drop).	2.2V max. @ 50 mA
Current	50 mA d.c. or Peak AC max.



Subassemblies, test points and adjustments are located behind a sealable plexiglass front panel.

Register assembly will have one, two, three or four registers depending upon number of functions performed by meter.

Other subassemblies will be as follows:

Plug-In Subassembly	Colour Dot	Card Position
Power Supply/Oscillator	Black	3
Watt/QMulti., 2 el & 2½ el	Red	2/5
Watt/QMulti., 3 el	Orange	2/5
Var Multi. 2 el & 2½ el	Yellow	2
Var Multi. 3 el	Gold	2
Integrator Unidirectional	Dark Blue	1/6
Integrator Bidirectional	White	1/6

A matching colour dot is located on the meter card cage beside the appropriate subassembly slot. When a meter contains 2 of the same subassemblies, position will be indicated by locations of colour dot (left or right side). Card positions are numbered from left to right.

Input-Output Connections

Standard input-output connections are located on the rear panel. All connections are on barrier type terminal blocks with screw terminals. Meters with rear terminals will have a lucite coverplate with 4 sealing screws.

When the meter is supplied with front connections ("F" option) the input-output connections will be on a box panel extension attached to the underside of the meter. The current potential and auxiliary power input terminals are barrier blocks with screw therminal. A 25 pin "D" type connector supplies all analog and pulse outputs. Front connected meters will be provided with a suitable sealing arrangements.

Approval granted to:

Scientific Columbus Division of
Esterline Corp.,
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