

Order Number

Serial Number

## PRODUCT/TEST MANUAL

**2V65K1**

**DEFINITE TIME UNDER VOLTAGE RELAY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
A	22/09/99	Initial issue.

Due to RMS continuous product improvement policy this information is subject to change without notice.

<b>Document updated</b>	<b>Checked</b>	<b>Registered</b>	<b>.pdf file created</b>	<b>.pdf uploaded to web site</b>

## 1. BROAD DESCRIPTION

The 2V65 is a triple-pole unit fitted with independently adjustable voltage sensing circuits driving a common adjustable digital setting timing element. Three instantaneous output contacts (one for each phase) which operate at the same voltage level as the time delay element are also provided.

## 2. SPECIFICATIONS

Auxiliary Supply Voltage	40 - 275 V AC/DC
Auxiliary Supply Burden (at 110V)	Less than 3W during timing Less than 10W output relay picked up
<b>Digital Input (Initiate)</b>	24 V DC

### VOLTAGE SECTION

Nominal Input Voltage	110 V AC
Sensing Supply Burden	1 VA
Nominal Setting Range	70 - 100% of nominal continuously variable
Number of Poles	3
Frequency Tolerance	-6% to +2% of 50Hz
Ambient Temperature Range	-5°C to 55°C
Accuracy	±5% of maximum setting
Dropout/Pickup Ratio	approximately 95% Nominal

### TIMER SECTION

#### Accuracy

The setting and repeat accuracy is  $\pm 0.5\%$  of setting (plus the inherent minimum time).

#### Reset Time

Electronic reset time is between 20 and 50 millisecond. Output relay dropout time is less than 20 millisecond and removal of auxiliary supply will reset the relay in this time.

**INSULATION WITHSTAND** In accordance with AS2481-1981 (clause 5-4), IEC 255-5: 2KV RMS between input and frame, output and frame, and output and input. 1.2/50 5KV impulse between each terminal and earth, between circuits not normally connected together and between terminals of the same circuit.

**NOISE IMMUNITY** Withstands the high frequency interference test detailed in AS2481-1981 (clause 5-5 App. D), IEC 255-22-1.

Output contacts 3 N/O Inst Seg, 2 C/O Delayed

Output Relay Contact Ratings

#### Make and Carry Continuously

1700 VA AC resistive with maximums of 380 Volt and 8 Amp  
1700 VA DC resistive with maximums of 250 Volt and 8 Amp

#### AC Break Capacity

1700 VA AC resistive with maximums of 380 Volt and 8 Amp

## 2. SPECIFICATIONS (Cont.)

**Maximum Contact Capacity (Amps)**

Voltage	DC			AC		
	30	125	250	110	220	250
<b>Resistive</b>	10	2.4	1.2	10	7	6.6
<b>Inductive L/R 7 ms</b>	7.5	1.8	.9	7.5	5	4.4

**3. TEST EQUIPMENT REQUIRED**

DC Supply	AC Voltage Supply
AC Voltmeter	Electronic timer
Oscilloscope	High Voltage Test Equipment.

**4. ASSOCIATED DRAWINGS**

165-065-101	Wiring Diagram
660-302-201	PCB circuit diagram
660-302-301	PCB Loading
660-283-203	Power supply & Timer

**5. HIGH VOLTAGE TESTING**

- a) Apply 2KV RMS between the terminal groups as listed in A & B below for 1 minute.
- b) Apply three 5KV 1/50usec pulses of each polarity as listed in A & B below.

**GROUP A**

**GROUP B**

A1-A12, C1&C2	C3-C12,E
A1-A7,C3-C8	A8-A12,C1&C2,C9-C12,E
A1&A2,A5&A7,A11&A12,C3&C4,C7&C8, C11&C12	A3&A4,A8-A10,C1&C2,C5&C6,C9&C10,E

**6. CALIBRATION PROCEDURE**

**6.1 Auxiliary Check**

Prior to calibration check the DC levels on the following test points using TP02F as common reference, 660-302-201. Sheet 1 of 2

TP02-F	Common	TP02-B	+ 24	TP02-J	- 24
TP02-H	+ 12	TP02-L	- 12	Check	<input type="checkbox"/>

**6.2 Under Voltage Sensing Circuitry**

- a) Apply the 110 volts AC sensing voltage to terminals A phase (C1 & C2).
- b) Monitor between TP01-A and TP02-E, Adjust VR09 for a reading of 11.00 volts AC.
- c) Monitor between TP01-L and TP02-E and adjust VR02 for 8.8 volts DC.
- d) Apply 110.0 volts AC to the sense input and set VR03 to 110 V AC and adjust VR01 until TP02-K goes high.
- e) Apply 75.0 volts AC to the sense input and set VR03 to 75 V AC and adjust VR04 until TP02-K goes high.
- f) Repeat step d) and e) until scale is calibrated.

MIN	MAX	NOM	ACTUAL	UNITS
69.5	80.5	75		V
79.5	90.5	85		V
94.5	105.5	100		V
104.5	115.5	110		V

- g) Check that dropout/pickup ratio at max. scale setting is within limits.

MIN	MAX	NOM	ACTUAL	UNITS
90	98	95		%

- h) Apply the 110 volts AC sensing voltage to terminals B phase (C3 & C4).
- i) Monitor between TP01-D and TP02-E, Adjust VR10 for a reading of 11.00 volts AC.
- j) Apply 110.0 volts AC to the sense input and set VR05 to 110 V AC and adjust VR11 until TP02-G goes high.
- k) Apply 75.0 volts AC to the sense input and set VR05 to 75 V AC and adjust VR06 until TP02-G goes high.
- l) Repeat steps j) and k) until scale is calibrated.

MIN	MAX	NOM	ACTUAL	UNITS
69.5	80.5	75		V
79.5	90.5	85		V
94.5	105.5	100		V
104.5	115.5	110		V

- m) Check that dropout/pickup ratio at max. scale setting is within limits.

MIN	MAX	NOM	ACTUAL	UNITS
90	98	95		%

## 6.2 Under Voltage Sensing Circuitry (cont.)

- n) Apply the 110 volts AC sensing voltage to terminals C phase (C5 & C6).

- o) Monitor between TP01-G and TP02-E, Adjust VR12 for a reading of 11.00 volts AC.
- p) Apply 110.0 volts AC to the sense input and set VR07 to 110 V AC and adjust VR113 until TP02-C goes high.
- q) Apply 75.0 volts AC to the sense input and set VR07 to 75 V AC and adjust VR08 until TP02-C goes high.
- r) Repeat steps p) and q) until scale is calibrated.

MIN	MAX	NOM	ACTUAL	UNITS
69.5	80.5	75		V
79.5	90.5	85		V
94.5	105.5	100		V
104.5	115.5	110		V

- s) Check that dropout/pickup ratio at max. scale setting is within limits.

MIN	MAX	NOM	ACTUAL	UNITS
90	98	95		%

### 6.3 Timer Calibration

**Note : The actual time is a function of the inherent minimum operate time and the set time. This inherent minimum time will be a delay of 15 to 30 milliseconds.**

- a) Connect timing apparatus to measure interval between energisation of the initiate input and output relay contact closure.
- b) Set range switch to range A and time to 000.
- c) Record pick-up time for auxiliary voltage of 40 V.

Maximum	Actual	Unit
30	<input type="text"/>	Ms

- d) Record dropout time for auxiliary voltage of 275 V

Maximum	Actual	Unit
30	<input type="text"/>	Ms

- e) Record times for the following settings (range A)

Setting	Minimum	Maximum	Nominal	Actual	Unit
111	126	141	133	<input type="text"/>	ms
222	237	252	244	<input type="text"/>	ms
444	459	474	466	<input type="text"/>	ms
888	903	918	910	<input type="text"/>	ms

- f) Set time to 100 and set range to B.

Minimum	Maximum	Nominal	Actual	Unit
1.01	1.05	1.01	<input type="text"/>	s

### 6.3 Timer Calibration (cont.)

- f) Set range switch to C and record pick-up time.

Minimum	Maximum	Nominal	Actual	Unit
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10.01

10.05

10.01

s

**7. GENERAL & FUNCTIONAL**

- a) Check that unit operates satisfactorily over the range of 40 volts to 275 volts AC & DC auxiliary supply.
- b) With no volts applied to the "Timer Initiate Input" and an input voltage over the set value on any phase ensure that the relay output contacts are blocked.
- c) Apply 24 volts DC to the "Timer Initiate Input" and ensure that after the set time the output relays contacts operate.
- d) Check operation of the flag.
- e) Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026.

PASS

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

**8. CONNECTION DIAGRAM**

