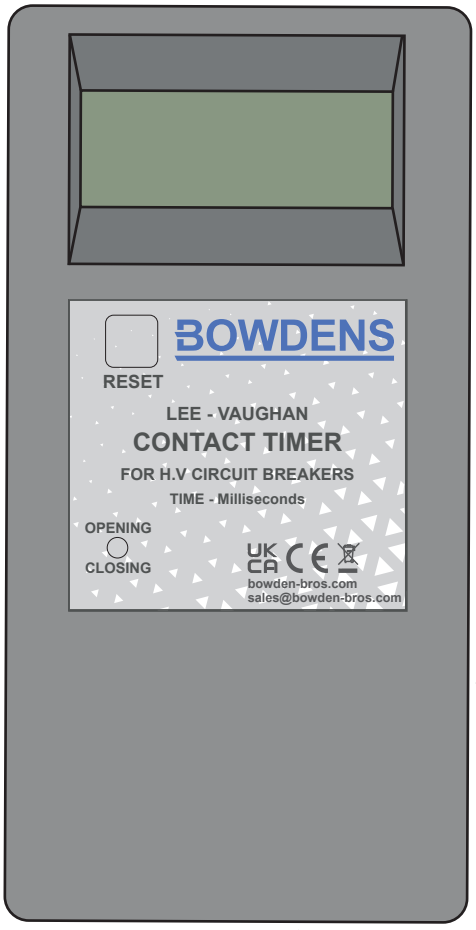
BOWDENS

LEE VAUGHAN CONTACT TIMER



A CONTACT TIMER FOR MEASURING OPENING AND CLOSING TIMES OF HIGH VOLTAGE CIRCUIT BREAKERS

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1.0 OVERVIEW

This light weight and compact instrument measures the exact circuit breaker opening or closing time from the moment the Protection Relay DC contacts 'make' to the instant that there is a loss of AC current flow in the Protection CT secondary wiring i.e. the circuit main contacts are open. The Contact Timer can be used on all high voltage circuit breakers up to 132KV.

The Contact Timer is enclosed in a tough ABS pocket-sized case. It is powered by a PP3 Alkaline battery and provides a clear read-out of time in milliseconds. Leads are provided with the instrument to make the two necessary connections between the DC trip circuit and the AC protection current transformers. The instrument can be switched on/off using the slide switch on the side of the case. As a precaution against unnecessary battery drain, the timer incorporates an auto-switch-off facility, which functions 30 minutes after the last reading. A black toggle switch on the front panel allows the change from opening time measurement to closing. A soft-touch reset allows the previous time read-out to be cleared ready for the next measurement. The Contact Timer can be adapted to measure the opening time of SF6 breakers in Ring Main units. A Switchgear Auxiliary Lead is required to achieve this facility.

2.0 OPERATION

PANEL TYPE CIRCUIT BREAKERS

To measure the opening time of this type of circuit breaker, the following connections must be made at the most easily accessible point in the circuit breaker panel.
Refer to Figure 1 in connection with the following text:

1. Remove the Contact Timer from its case and plug the clip-on Current Transformer into the sockets on the top of the case. The plugs and sockets are colour-coded red and black.

2. Clip the current transformer around any one of the Protection CT Secondary wires. The minimum current requirement in the circuit breaker Protection CT Secondary is 10 mA. On a 400/5 CT this represents 0.8A of primary current.

3. Connect the red and black crocodile clip leads across the circuit breaker trip or closing coils at a convenient point in the CB panel. Use the 'Trip Coil' for opening measurement or 'Closing Coil' for closing measurement. Polarity is not critical as the Contact Timer works on both AC and DC trip circuits. The contact timer will operate on trip circuit voltages within the range 30 – 240 Volts AC or DC. The LCD will display ‘000’ if a supply voltage is present.

4. Switch on the contact timer with the switch on the side of unit. If 'LO BAT' appears in the top left hand corner of the LCD disconnect contact timer from the circuit breaker before fitting a fresh PP3 battery.

5. Using the black toggle switch on the front panel select closing or opening for measurement required. The LCD will indicate CL to show it is set to perform a closing measurement, or OP to show it is set to perform an opening measurement. If it is still showing the time of the last measurement, press reset to clear that reading. A colon (:) will appear on the left hand side of the LCD if the black toggle switch is set to opening time indicating the presence of current in the wire where the current-transformer is clamped. The colon should be absent if closing time has been selected as the contact timer cannot start its measurement until there is no current in that wire.

6. Trip the circuit breaker electrically to 'make' the Protection Relay Trip/Close Contacts.

7. Read exact circuit breaker tripping time on the LCD. The time is shown in milliseconds.

8. Press reset button before re-testing.

3.0 CONNECTIONS

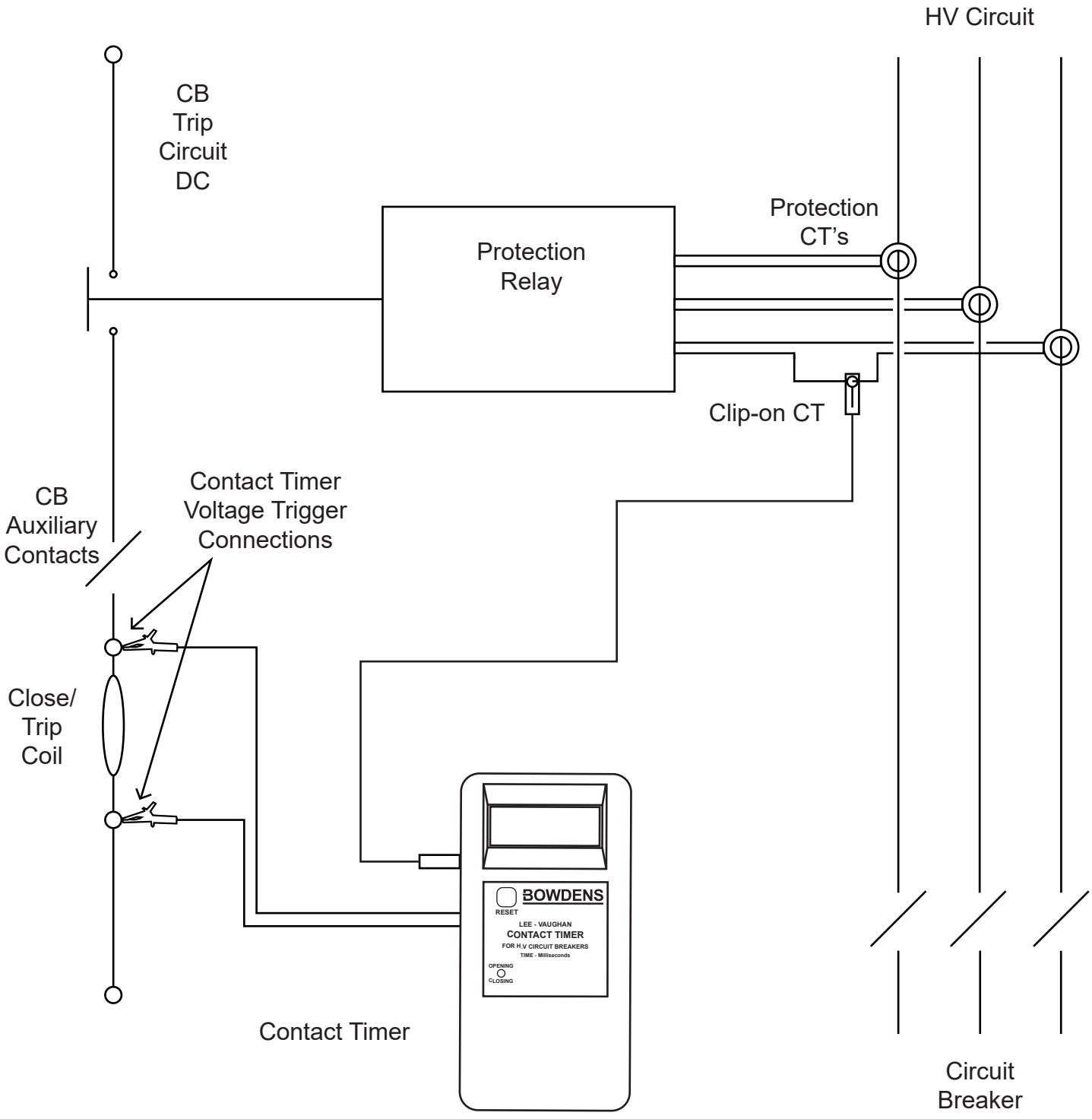

Figure 1.

4.0 SPECIFICATION

Dimensions :	80 x 150 x 30 mm (excluding the leads)
Weight :	300 grams (excluding leads)
Current range :	Protection CT ac. Current range 10mA - 5A. Accuracy cannot be guaranteed with current values below 10mA. On a 400/5 CT this represents 0.8 Amps in the primary circuit.
Time range :	0 - 999 milliseconds
Trigger voltage :	30V to 240V ac. or dc.
Battery :	1 x PP3 9V

Auto-switch off 30 minutes after last reading.

Specification subject to change without notice

VERSION 1.0

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