

INSTALLATION • OPERATION • MAINTENANCE I N S T R U C T I O N S

AC VOLTAGE AND CURRENT TRANSDUCERS

Types VE4-841 and VI4-841

GENERAL

The VE4-841 Voltage and VI4-841 Current Transducers convert the ac voltage and current from instrument transformers to dc outputs related to the RMS values of the sinusoidal inputs. These transducers are self-contained, self-powered, and completely static. Connections to the specified source and load are made per nameplate information.

OPERATION

Each voltage and current transducer has a self-contained input transformer, which provides output isolation from the source being measured, followed by a full wave diode bridge to convert the alternating current quality to direct current. The output is a load-independent current. They are 0.5 per cent intrinsic accuracy class transducers.

The standard load independent or "constant current" output transducer contains a semi-conductor amplifier which produces a direct current output unchanged by external load resistance variations from 0 to 10,000 ohms. This amplifier is a special form of an emitter-follower where the load being driven is connected in the collector return circuit. 0 to 1.0 mA dc filtered constant current output is available for both voltage and current transducers.

APPLICATIONS

All VE4-841 and VI4-841 transducers are average reading devices whose calibration is based on the ratio of the RMS value to the average value of a pure sine wave. This ratio, which is known as the form factor, is equal to 1.11 for a pure sine wave. Deviations in form factor, resulting from harmonics present in the input waveform, could degrade the output accuracy beyond that guaranteed in the specification for the transducer. For example, 3 per cent of third harmonic distortion in the sinusoid being measured can result in an additional output error of 1.0 per cent. This is a characteristic of all average responding devices.

These instructions neither cover all details or variations in equipment nor provide for all contingencies with regard to installation, operation, or maintenance. On request, Westinghouse will be glad to supply further information as to particular problems or questions which are not covered sufficiently for the purchaser's needs.

The load independent or constant current type of transducer is ideally suited for applications where ammeters and voltmeters must be located at a distance from the current or potential instrumentation transformers. Mounting the transducers at the instrument transformers permits the use of small gage wires to connect the transducer outputs to the switch-board instruments. The instruments in this case would be dc milliammeters calibrated in terms of ac voltage and current. These transducers can also be used as inexpensive telemetering transmitters where the interconnecting channel is a dc circuit having a total loop resistance of 10,000 ohms maximum.

CALIBRATION

All transducers are supplied calibrated as specified on their nameplates. However, $\pm 10\%$ of full scale adjustment capability is available through a potentiometer mounted on the terminal panel for field calibration. A locking nut is provided on the potentiometer to assure permanence of the calibration setting.

CONSTRUCTION

VE4-841 and VI4-841 transducers are completely static. The entire circuit, except for the terminal block and calibration adjustment potentiometer, is assembled on a printed circuit board which is mounted in a steel enclosure designed for rear of panel mounting. The terminal block and adjustment potentiometer are mounted on a non-metallic panel at the top of the enclosure.

REPAIR AND RENEWAL PARTS

Because these transducers are all static devices, no periodic maintenance is required.

Repair work can be done most satisfactorily at the factory, or at any authorized Instrument Repair Facility (see Service Directory 43-000). However, interchangeable parts can be furnished to customers who are equipped for doing repair work. When ordering parts, always give the complete data from the nameplate.

SPECIFICATIONS

	VE4-841 VOLTAGE TRANSDUCER	VI4-841 CURRENT TRANSDUCER
FULL SCALE INPUT (AC)	150 V	5 A
VOLTAGE BURDEN at 120 V	2.5 VA	
CURRENT BURDEN		1 VA
OVERLOAD	180 VOLTS	10 AMPS CONTINUOUS 100 AMPS FOR 1 SEC.
FULL SCALE OUTPUT (DC)	1 mA	1 mA
OUTPUT LOAD (OHMS)	0-10K	0-10K
MAX. RIPPLE PEAK-PEAK	1%	1%
FREQUENCY	50 to 70 Hz	50 to 70 Hz
ACCURACY	$\pm 0.5\%$	$\pm 0.5\%$
TEMP. RANGE	-20°C to $+60^{\circ}\text{C}$	-20°C to $+60^{\circ}\text{C}$
MAX. TEMP. INFLUENCE	$\pm 1.0\%$	$\pm 1.0\%$
RESPONSE TIME	400 ms	400 ms
CALIBRATION ADJUSTMENT	$\pm 10\%$	$\pm 10\%$
DIELECTRIC TEST	1500 V rms	1500 V rms
TRANSIENT PROTECTION	Meetings IEEE Standard 472-1974 or ANSI C37.90A-1974 for SWC (Surge Withstand Capability) *between all terminals & case and between individual circuits.	

• At Standard Reference Conditions (as defined in ASA C39.1)

* Reference: IEEE Paper No. C72-033-4 "Interim Report for Static Relay Surge Protection."

Ø With Output Terminal *2 at ground potential when used with grounded input Readout Device

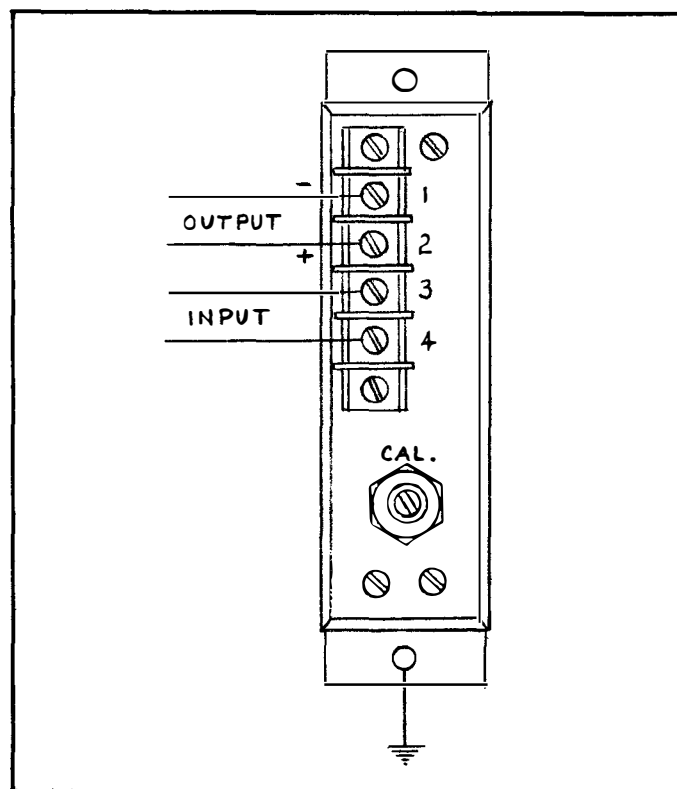


Fig. 1. VE4-841 and VI4-841
Transducer External Wiring

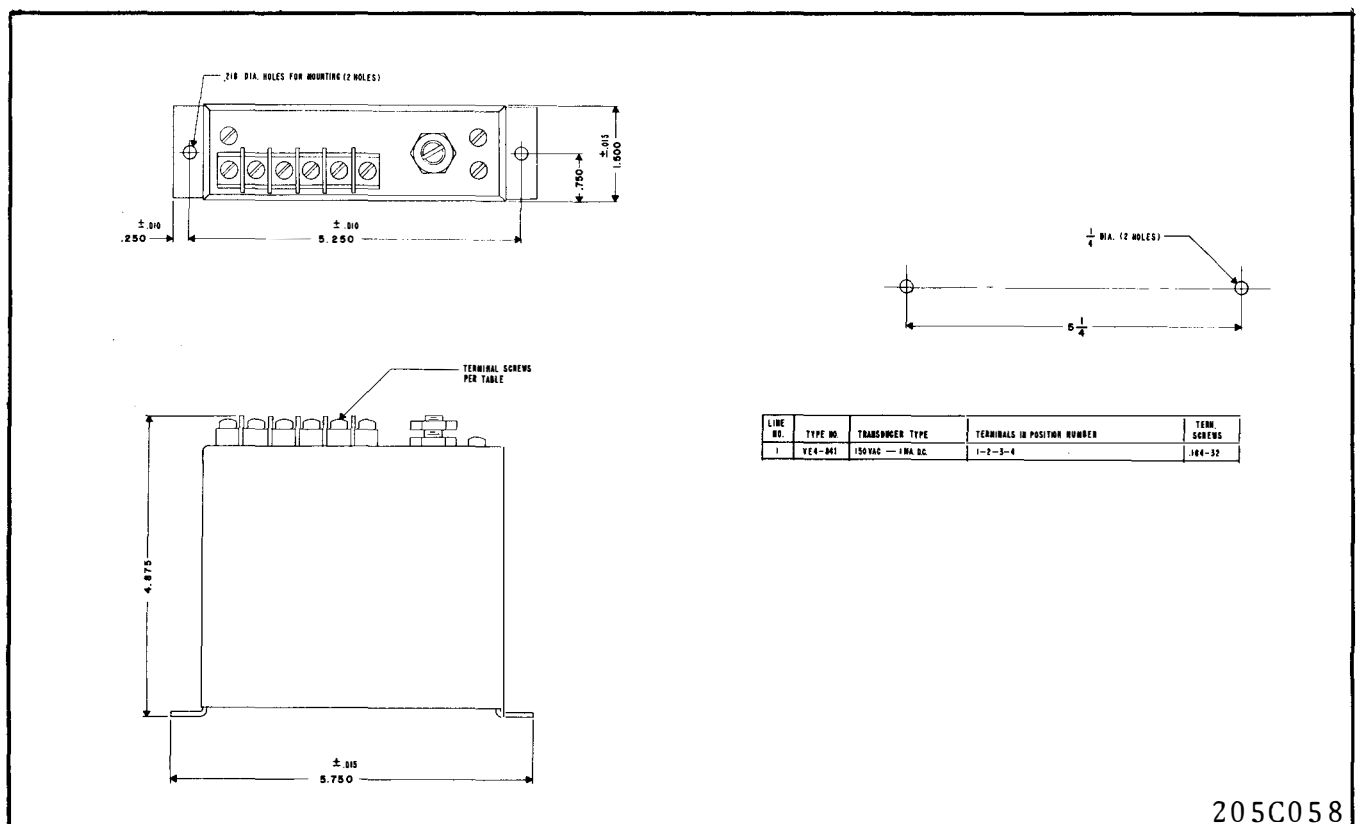


Fig. 2. Outline and Drilling Plan

205C058

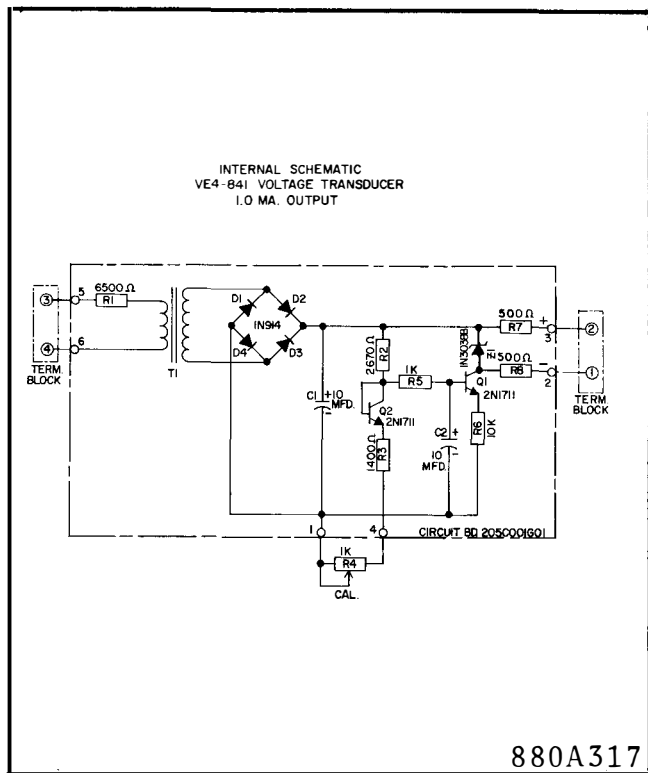


Fig. 3. VE4-841 Voltage Transducer Schematic—
1.0 mA Output

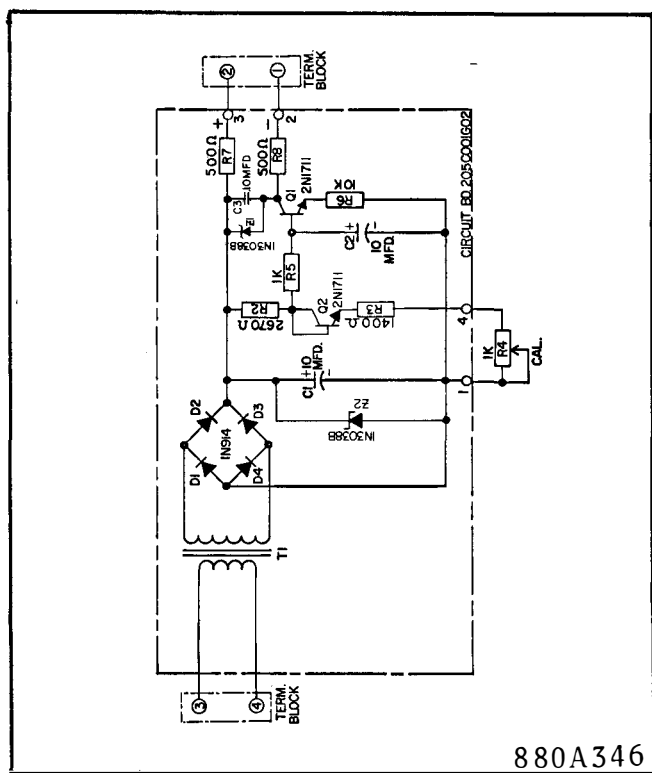


Fig. 4. VI4-841 Current Transducer Schematic—
1.0 Ma Output