INTRODUCTION

The Volts Per Hertz Panel 3S7932MA265 is an assembly of protective devices designed for the maximum protection of the generator step-up transformer, the generator, and the auxiliary transformers and motors, from excessive volts per hertz.

1. The panel will detect abnormal high volts per hertz with the use of a static STV relay.

2. A contact will be available to initiate an alarm and start two timers to provide preset delays in (a) starting of the manual runback circuit and (b) eventual trip of the excitation breaker, providing the generator line breaker is open.

3. The excitation control will be tripped to manual when the manual control has run back to its prescribed setting.

RECEIVING AND HANDLING

Immediately upon receipt, the equipment should be carefully unpacked to avoid damage. As soon as the equipment is unpacked, it should be examined for any damage that may have been sustained in transit. If injury or rough handling is evident, a damage claim should be filed immediately with the transportation company and the nearest General Electric Sales Office should be notified promptly.

SETTINGS AND ADJUSTMENTS

The type STV relay is a single phase static volts per hertz relay. It is adjustable from 0 to 1.25% of a nominal 120 volts, 60 hertz potential source, or 1.8 to 2.5 volts per hertz. Its settings will be determined by the voltages measured at the particular station involved, but would be set to pick up at approximately 10% above the normal high potential voltage expected. The scale on the STV relay has a range from 1.8 to 2.5, and should be calibrated to pick up at 132 volts, with the dial set at 2.2. Adjust the rheostat R14 which is in the upper right hand corner of the relay, to make the correction necessary.

The relay will drop out at 96% of the pick. The timer in the STV relay is adjustable from 15 seconds, and would normally be set at 10 seconds before initiating the manual runback function.

A second timer (TH) is recommended to be set for 60 seconds and will trip either the exciter field or generator field breaker. If the high volts per hertz returns to a normal level, the breakers will not trip.

A target is provided with the STV relay. The circuit requires a nominal current of 6/10 amperes for proper operation.

The Panel must be ordered for use with 125 or 250 volt DC control voltage.

INSTALLATION

The panel should be connected directly to the generator potential transformers, so that it will be energized at any time the unit is operating.

The panel will be furnished on a 12" high by 36" wide base and it could be applied to most existing excitation controls. The normal assembly would be such that all of the wiring will be done on the back, with the STV relay being serviced from the front. The panel can be specified to have all the wiring and servicing on the front.

The panel will be interconnected with its associated circuits when it is furnished with new excitation controls.

A normally closed contact from the generator line breaker will be required for connection with this panel.

A position contact from the manual control must be available that is closed at the no load position, and is open above the no load position.

PRINCIPLES OF OPERATION

1. The static VC relay, as shown in the elementary drawing, will detect excessive volts per hertz and its
FIELD TESTS

Periodic testing of the STV relay and timing functions should be performed as follows:

1. Connect a variable voltage to the sensing terminals of the STV relay.

2. With the range dial set at the required protection level, the relay will pick up as shown in Graph No. 1.

3. The calibration adjustment (R-14) may be used to bring the range dial into calibration.

4. A quick check may be used by turning the range dial to a lower setting and recording the voltage and dial setting at which the relay picks up. The pick up should correspond to the plot on Graph No. 1.

5. Care must be used during field test not to trip or start the run back circuits. The target will not indicate unless the circuit is complete. The timer will
close the circuit to the target, and may be adjusted with (R2) for calibration. (Reference Dial Position vs - Calibration on the relay.)

6. Nominal timing of relay TH would be set for 60 seconds, and may be set as indicated on the relay.

RENEWAL PARTS
When ordering renewal parts, address the nearest General Electric Sales Office, specify the quantity required and give the rating and catalog numbers or describe the required parts in detail. In addition, give the 3S number and complete nameplate data.
CR5882-34J, -34K, AND -34M TEMPERATURE OVERLOAD RELAYS
INDUCTION TYPE WITH AMBIENT-TEMPERATURE COMPENSATION

GENERAL DESCRIPTION

The CR5882-34 relays are so designed that while
they protect the motor, they do not cause it to stop
because of variations in ambient temperature. Relays
that are uncompensated for ambient-temperature
changes vary as much as 10 per cent for a 10 C change
in ambient temperature, but the CR5882-34 com-
pensated relays have a change in rating of 2 to 3
per cent per 10 C change in ambient temperature.

DESCRIPTION OF OPERATION (SEE FIG. 1)

These relays have a magnetic structure and a coil.
The coil is in series with the motor that is being pro-
tected. A bimetallic helix, the ends of which are short-
circuited, is surrounded by the coil. The helix acts
like a short-circuited turn on a transformer. The
motor current through the coil causes the helix
to heat and deflect in one direction. Simultaneously,
a bimetallic compensating strip, which is outside
the coil, deflects in the opposite direction. The deffec-
tion of this compensating strip counteracts the effect of
the ambient temperature, so that the motor is not
stopped unnecessarily.

When the helix has deflected sufficiently, a tripping
mechanism opens the relay contacts and the motor
stops.

The current at which the relay is to trip is pre-
determined by the selection of the relay coil and by
the setting of the relay tripping mechanism.

An inertia latch prevents the mechanism from
tripping as a result of mechanical shock.

COIL SELECTION

Careful consideration is given to the characteristics
of the motor to be protected when the relay coils are
selected at the factory. The following information is
given to help in the selection of a new relay coil if it
is necessary to change the one in the relay.

Coil Rating for Continuous-rated Motors

The rating (in per cent of full-load motor amperes)
of a coil that is suitable to use for a continuous-rated
motor is determined by multiplying the service factor
and the ambient-temperature correction factor.

Service Factor

The service factor to use is 115.

Ambient-temperature Correction Factor

For a controller rated 40 C or 50 C, an average of
55 C is assumed in calculating the ambient-tempera-
ture correction factor. The ambient-temperature cor-
rection factor that has been worked out on that basis
is 1.03.

Fig. 1. Exploded view of temperature overload relay