

Rotor Temperature Monitor, Type 1340



PRODUCT OVERVIEW

Protecting large industrial motors and generators against premature failure due to overheating has always been a demanding task. This is particularly true in the case of synchronous machines, where the rotating field and exciter windings are generally inaccessible in operation, and the respective winding temperatures cannot be determined with accuracy.

Now a simple and convenient solution to this problem is provided by the Type 1340 Rotor Temperature Monitor (RTM).

Based on resistance temperature detectors (RTDs) that monitor the temperature of each field coil and/or other parts of the rotor assembly, the system is designed to prevent overheating incidents requiring expensive repairs and long downtimes in critical machinery. Also, the monitoring of individual field coils gives a convenient indication of the overall health of the machine, since any significant disparities may signal an incipient fault.

The Type 1340 system is entirely brushless and contact-less and may be retrofitted to many types of industrial synchronous machine, or else incorporated during repairs and rebuilds.

DESCRIPTION

The 1340 system consists of a rotating Transmitter Unit, a stationary Infrared Detector Module, and an externally mounted Receiver Unit.

The transmitter unit is attached to the shaft or any other suitable part of the machine at the non-drive end, coaxial with the shaft centreline. The RTDs are secured to the field coils and

FEATURES

- No operator controls during operation
- Temperature range 0 – 200°C
- Measurement accuracy $\pm 2^\circ\text{C}$
- 4-channel and 8-channel versions
- High reliability
- Simple installation
- Interfaces with standard 4-20mA displays and controls

other desired locations and connected by short cable runs along the outside of the shaft, or internally via a drilled cable duct (where the latter feature is available).

The RTD outputs are processed by the embedded microcontroller and fed as a composite serial signal to the infrared output LED. A short distance optical link couples this signal to the stationary IR detector module mounted on the cover or endshield of the machine. From the detector module, the signal is conveyed by cable to the receiver unit mounted in a suitable location adjacent to the machine.

In the receiver unit the composite signal is decoded and used to control an array of current generators, one for each temperature channel. The separate 4-20 mA outputs are then used to drive local or remote temperature displays, and/or compatible data logging, control and instrumentation systems, as required.

Each of the output channels can operate with current loop resistances up to 400 Ω , which in typical installations will permit cable runs of several hundred metres.

In operation, the receiver unit performs an automatic self-test when first switched on and thereafter requires no adjustments or operator attention. The receiver unit automatically trims the output signals to minimise the influence of ambient temperature and other variables on the measurement accuracy.

TYPICAL APPLICATION

A typical application in a salient-pole brushless synchronous motor is shown diagrammatically in Fig. 1. Other temperature monitoring



configurations are readily devised to suit particular requirements. For further information please contact GNS.

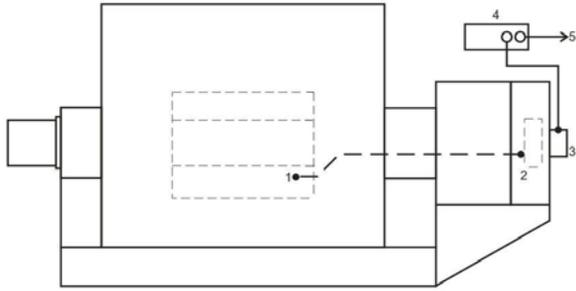


Fig. 1 - Showing the rotating and static components in a brushless synchronous motor application.
 1 - RTD on field coil; 2 - Rotating transmitter unit;
 3 - Infrared detector module; 4 - Receiver unit
 5 - Current loop outputs.

ORDERING INFORMATION

- 1340.S4 RTM 4-Channel System complete with receiver unit mounting plate, cables and User Manual
- 1340.S8 RTM 8-Channel System, otherwise as above.
- 1340.01 Receiver Unit
- 1340.10 Rotating Transmitter Unit
- 1340.11 Infrared Detector Module
- 1340.20 Receiver Mounting Plate
- 1340.30 Cable Set
- 1340.40 Pt 100 RTDs (set of 8)
- 1340.99 User Manual

OUTLINE SPECIFICATIONS¹

Parameter	Value	Units
1340.01 RECEIVER UNIT		
Electrical Characteristics		
Current loop output (typ)	4 – 20	mA
Current loop output (max)	25	mA
Current loop resistance (max)	400	Ω
Measurement Range	0 – 200	°C
Nominal Accuracy	±2	°C
Environmental		
Operating Temperature Range	0 – 40	°C
Humidity (non-condensing)	10 – 85	%
Power Source		
Supply Voltage	240	V
Supply Frequency	50	Hz
Load	40	V.A
Physical Dimensions		
Length	265	mm
Width	165	mm
Depth	51	mm
Mass	1.8	kg
1340.10 ROTATING TRANSMITTER UNIT		
Absolute Maximum Ratings		
Maximum Power Supply	50	V
Maximum RTD temperature	250	°C
Electrical Characteristics		
Number of Measurement Channels	4, 8	
DC Power Supply	15 - 45	V
Input Current (typ)	80	mA
Optical Link		
Spacing from IR Detector Unit	10 - 400	mm
Environmental		
Operating Temperature Range	0 – 100	°C
Humidity (non-condensing)	10 – 85	%

1. Typical performance at 25°C except where otherwise shown.