

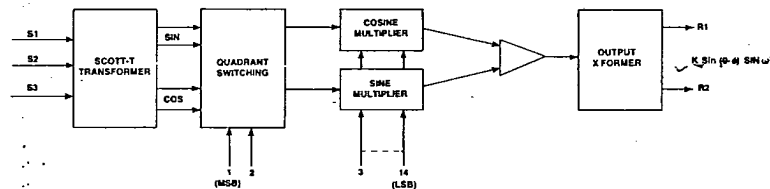
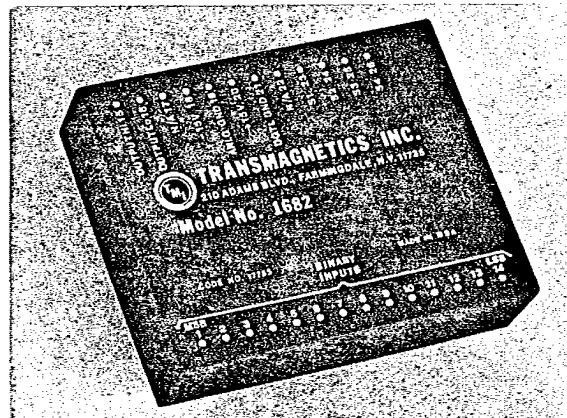
**SERIES  
1682**

Revised April 1988

# 14 BIT SOLID STATE CONTROL TRANSFORMER

**FEATURES:**

- Accuracy:  $\pm 4$  minutes of arc
- Error Angle:  $\pm 12.5^\circ$  about null
- Low power Schottky TTL inputs eliminate the need for special precautions against static electricity
- Reverse polarity protected
- Transformer isolated input and output
- Available for  $0^\circ\text{C}$  to  $+70^\circ\text{C}$  or  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$
- Hermetic sealed units on request
- Meets MIL-STD-202D, Methods 101C, 105B, 106C, 107C, 202D, 204B and 205D
- High reliability 883B units on request
- Completely protected against any possible latch-up condition due to any loss of reference, signal or power



**DESCRIPTION:**

This small, low cost solid state control transformer accepts a synchro angle together with a 14 bit digital angle and converts these into a phase sensitive AC output with magnitude proportional to the sine of the difference between the two angles. This is described by  $K \sin(\theta - \phi) \sin \omega t$ . Since this unit is primarily designed for Servo Follow-up systems, the output voltage of 5VRMS corresponds to a  $\pm 12.5^\circ$  output range around a null. Other scaling factors can be supplied. Units with demodulated outputs ( $\pm 10\text{VDC}$ ) can be supplied.

**SPECIFICATIONS:**

**Accuracy\*:**  $\pm 4$  minutes of arc  
**Resolution:** 14 bits (1 LSB = 1.3 arc minutes)  
**Digital Input ( $\phi$ ):** Parallel, Positive Logic, TTL Levels, Binary Coded Angle

**Fan In:** 1LS TTL Load

**Synchro Input ( $\theta$ ):**

INPUT CODE	INPUT	FREQ. $\pm 10\%$	(1) L-L Vrms $\pm 10\%$	(1) L-L Imped. Min
1	Synchro	400 Hz	11.8	40K
2	Synchro	400 Hz	90	40K
3	Synchro	50/400	90	40K
5	Resolver	400 Hz	11.8	40K
6	Resolver	400 Hz	26	40K

(1) Other voltages and frequencies are available.

**Output Format:**  $K \sin(\theta - \phi) \sin \omega t$ . Magnitude variation is less than 1.0% over full input range of 0 to  $360^\circ$   
**Scaling:** 0.4VRMS/degree  
**Output:** 5VRMS into a 2K ohm min. load. Output is short circuit proof and transformer isolated.  
**Range of output angle:**  $\pm 12.5^\circ$ . Other null gradients available.  
**Settling time:** 50  $\mu\text{s}$  max.  
**Power Requirements:**  $\pm 15\text{VDC}$ ,  $\pm 5\%$  at 50 ma.  $\pm 12\text{VDC}$  operation available. See part number designation  
**Potting:** For high shock or vibration applications, units should be potted. See part number designation.

\*Accuracy applies over the operating temperature range,  $\pm 5\%$  Power supply,  $\pm 10\%$  input signal and frequency variation, and 10% harmonic distortion.

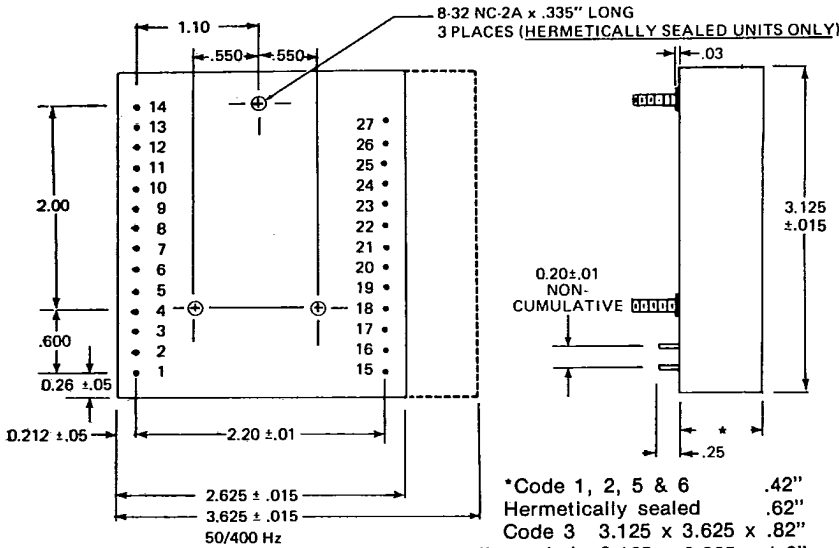
**Operating Temperature:**  
**Storage Temperature:**  
**Weight:**  
**Isolation:**

Model C: 0°C to +70°C Model M: -55°C to +105°C  
 -65°C to +125°C  
 Approx. 6 oz.  
 Line-to-line input and output are transformer isolated from each other and from D.C. power common. Insulation resistance from any AC input to output is greater than 100 megohms at 200 VDC.

**Options:**

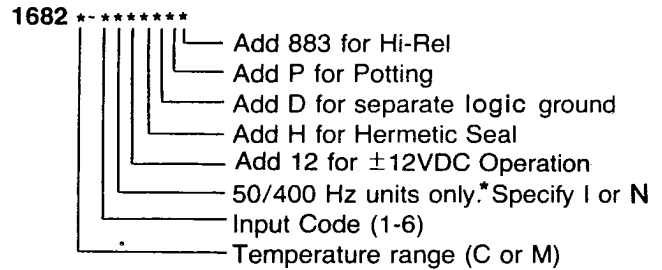
1. Analog and logic grounds are common internally. A separate digital ground is available on request. See part number designation.
2. Output can be supplied demodulated ( $\pm 10$ VDC out.)

**OUTLINE & CONNECTION**



All dimensions in inches.

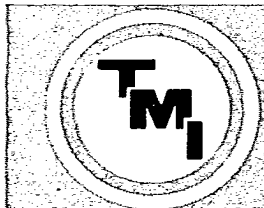
**Part Number Designation:**



\*\*"I" for internal 50/400 Hz output transformer.  
 "N" for no 50/400 Hz output transformer.  
 Output, in this case, is fed directly from Op. Amp. (Pin 15 & 16) and can size is reduced to 3.125 x 2.625 x .82.

- |                  |                                       |
|------------------|---------------------------------------|
| 1 MSB (180°)     | 15 Output Hi                          |
| 2                | 16 Output Lo                          |
| 3                | 17 N/A                                |
| 4                | 18 -15VDC                             |
| 5                | 19 Gnd. analog ( $\pm 15$ VDC return) |
| 6                | 20 +15VDC                             |
| 7 BINARY         | 21 Logic Gnd                          |
| 8 INPUTS         | 22 N/A                                |
| 9                | 23 S1                                 |
| 10               | 24 S2                                 |
| 11               | 25 S3                                 |
| 12               | 26 S4 (Resolver only)                 |
| 13               |                                       |
| 14 LSB (.02197°) |                                       |

\*When specified. Otherwise digital and analog grounds are connected internally to pin 19 with pin 21 omitted.



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