



synchro/resolver to linear dc converter
fast tracking **high resolution**
series 430A100

FEATURES

- Linear conversion
 0V to +10V representing 0° to 360°
 0V to ±10V representing 0° to ±180°
- 6 arc minute accuracy
- 1.3 arc minute resolution
- Tracking rates to 7200°/second
- No velocity errors
- Insensitive to amplitude and frequency variations
- Insensitive to harmonic distortion
- 47 to 5000Hz reference excitation frequency

GENERAL DATA

The series 430A100 is a miniature synchro/resolver to linear DC converter featuring an accuracy of ±6.0 arc minutes. The converter measures 2.00" x 2.50" x 0.52" and weighs only 2.0 ounces.

Unlike older synchro/resolver to DC converters, the 430A100 employs a "type II" tracking converter in conjunction with a high speed DAC. This combination provides conversion that exhibits no velocity errors and only minor acceleration errors. Ratiometric conversion techniques are used to ensure high noise immunity and tolerance to long lead-length.

The 430A100 employs a field proven Solid State Scott T input. This input features: high balanced input impedances, high common mode rejection, frequency independence and over-voltage protection to 1000%. Inputs of 2.5-115V, 47-5000Hz can be specified.

LINEAR DC OUTPUT

Two linear DC output options are available; 0V to +10Vdc representing 0° to 360° or 0V to ±10Vdc representing 0° to ±180°. This output is a continuous high resolution (1.3 arc minutes) DC voltage with a full scale step response of of less than 4 μseconds.

VELOCITY OUTPUT

The Velocity output is a DC voltage proportional to the angular velocity of the synchro/resolver shaft. The scaling of this output is ±10V nominal for maximum velocity. The voltage is positive for counter-clock-wise rotation and negative for clock-wise rotation.

DYNAMIC CHARACTERISTICS

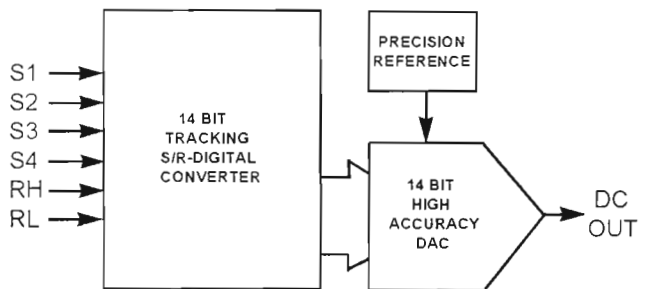
The 430A100 series is a "Type II" tracking converter with very high acceleration constants. The loop dynamics are completely independent of power supply variations within their specified ranges. As long as the maximum tracking rate is not exceeded, there will be no velocity lag and only minor acceleration lag at the DC output. Acceleration lag (in degrees) can be calculated from the following equation:

$$E_a = \frac{\text{Acceleration Rate } (^\circ/\text{sec}^2)}{\text{Acceleration Constant } (K_a)}$$

The converter dynamics is determined by it's reference excitation frequency range. Refer to the Dynamic Characteristics chart for dynamic performance for the various frequency ranges.

DYNAMIC CHARACTERISTICS			
REFERENCE FREQUENCY RANGE	TRACKING RATE	K _a	179° STEP SETTLING TIME
47-5KHz	3rps	5K	1.6 sec
360-5KHz	14rps	50K	150millisec
2K-5KHz	20rps	700K	40millisec

BLOCK DIAGRAM



SPECIFICATIONS

Parameter	Value
Linear DC Output	
Accuracy ⁽¹⁾	±6.0 arc minutes (0.1°)
Resolution	1.3 arc minutes (0.022°)
Unipolar	0 to +10Vdc representing 0° to 360°
Bipolar	0 to ±10Vdc representing 0° to ±180°
Characteristics	
Ripple and Noise	<5mV P-P
F S Settling Time	4µsec max.
Load	5mA max.. 0.01µF max.
Velocity Output	
Range	±10V for max. tracking
Polarity	Positive for increasing angle
Scale Factor Error	±20%
Reversal Error	±5%
Linearity	
0-50%	6%
0-100%	15%
Zero Offset	±3mV max.
Load	8KΩmin.
Reference Input⁽²⁾	
Voltage	2.5 to 130Vrms
Frequency	47 to 5000Hz
Impedance	400KΩ
Stator Input⁽²⁾	
Voltage L-L	2.5 to 115Vrms
Impedance	9(V _{L-L})KΩ
Power Supplies⁽³⁾	
±15V	45mA max.
+5V	15mA max.
Temp. Ranges	
Operating	0° to +70°C
Storage	-55° to +125°C

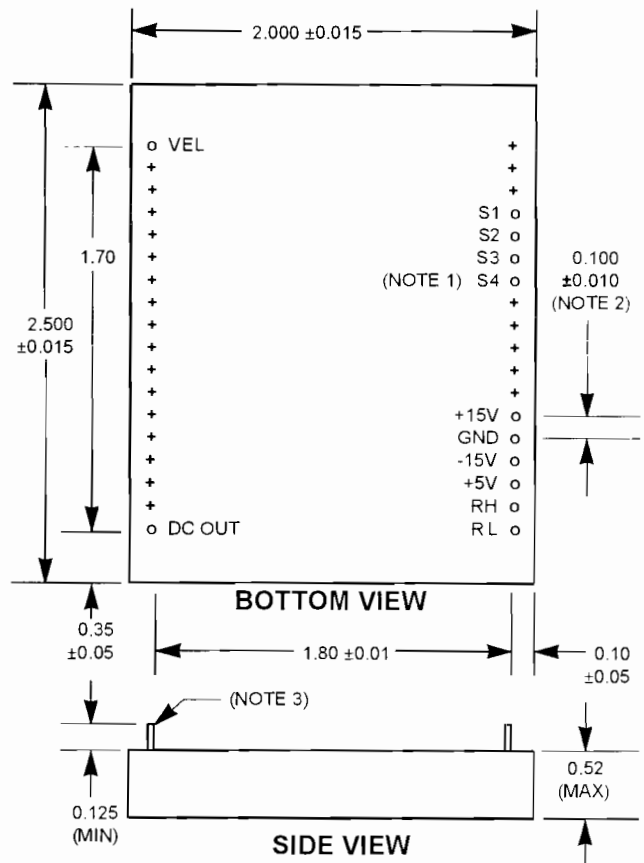
NOTES:

- Accuracy applies for:
 - +10%, -20% stator amplitude variation.
 - over specified reference voltage and frequency range.
 - over specified power supply ranges.
 - over specified operating temperature range.
- See Ordering Information for specific voltage and frequency ranges.
- Power supply tolerances are ±5%.

WARRANTY

All units are warranted against defects in materials and workmanship for 1 year from the date of shipment. Liability is expressly limited to servicing, adjusting, or replacing any CSI product returned to our factory with delivery charges prepaid. In no case shall our liability exceed the original purchase price.

MECHANICAL OUTLINE



NOTES:

- S4 pin appears on resolver input models only.
- Non-cumulative.
- Rigid 0.025 diameter pins suitable for solder-in or plug-in applications
- Dimensions are in inches.

ORDERING INFORMATION

430A SUFFIX	STATOR		REFERENCE		OUTPUT RANGE
	TYPE	VOLT	VOLTAGE	FREQ	
100	SYNC	90.0	20-130	47-5KHz	0 to +10V
101	SYNC	11.8	20-130	360-5KHz	0 to +10V
102	SYNC	90.0	20-130	360-5KHz	0 to +10V
103	RSVR	11.8	20-130	360-5KHz	0 to +10V
104	RSVR	2.5	2.5-30	360-5KHz	0 to +10V
105	RSVR	2.5	2.5-30	2K-5KHz	0 to +10V
106	SYNC	90.0	20-130	47-5KHz	0 to ±10V
107	SYNC	11.8	20-130	360-5KHz	0 to ±10V
108	SYNC	90.0	20-130	360-5KHz	0 to ±10V
109	RSVR	11.8	20-130	360-5KHz	0 to ±10V
110	RSVR	2.5	2.5-30	360-5KHz	0 to ±10V
111	RSVR	2.5	2.5-30	2K-5KHz	0 to ±10V

NOTES:

- Contact factory for non-standard input voltages and dynamic characteristics.
- Standard temperature range is 0° to +70°C; add suffix IT to part number for -25° to +85°C operation.