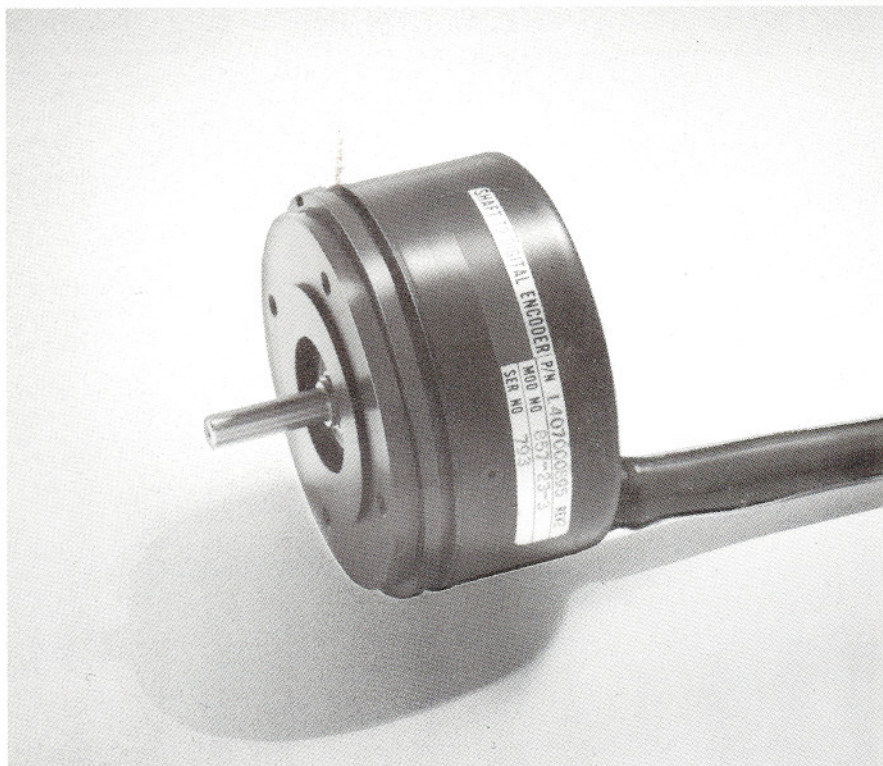


LIBRASCOPE

Magnetic Incremental Encoders and Tachometers



TECHNICAL DATA

The Incremental Magnetic Encoder (Magnetic Digital Transducer) is manufactured by the Librascope Division of The Singer Company, in several models. The encoder is a reliable generator of digital signals that represent angular shaft motion.

Signal output of the encoder sensing heads is an alternating current of the same frequency as the drive signal. The signal is dampened for logical 'zeros' and is passed for logical 'ones'. In the simplest encoder configuration, envelope detection and wave shaping produces two channels of square waves, each electrically displaced 90 degrees from the other.

Librascope Incremental Magnetic Encoders are also available with two additional channels representing the binary complements of the two basic channels. Thus, each channel and its complement may be used to set and reset a flip-flop which provides a latched square wave-output. Further details are provided in Theory of Operation Sheet "The Incremental Magnetic Encoder" available upon request.

A fifth channel is also available (in some models) for the purpose of generating a single reference pulse for each shaft revolution.

SPECIAL FEATURES

The primary advantage of the magnetic incremental encoder over other types of noncontact encoders is its unsurpassed reliability and wide temperature operating range. Service life is limited only by bearing wear primarily. Frictional contacts are not used. There are no infrared or visible light sources to decay or fail, and the magnetic sensors cannot be falsely triggered by heat.

With exceptional resistance to shock and vibration, the encoder is capable of continuous operation at high shaft speeds. Slow speeds in excess of 10,000 RPM may be

experienced for short periods of time without damage. Output signal levels are adequate for driving integrated circuits without amplification.

Magnetic incremental encoders are also significantly free from the effects of condensation and atmospheric contamination on their code discs and sensing elements.

MILITARY APPLICATIONS

A predominant use of magnetic incremental encoders has been to provide inputs for tactical display systems. Specifically, by the use of track-balls to provide digital X and Y control functions for real-time tactical combat situations. The functions are hand generated by revolving a ball against which two encoders, located 90 degrees from each other, are friction driven. The outputs from the encoders are summed in up/down counters to provide a vectored positional display on a cathode ray tube. (Theory of Operation notes and a Data Sheet on the Track-Ball are available upon request).

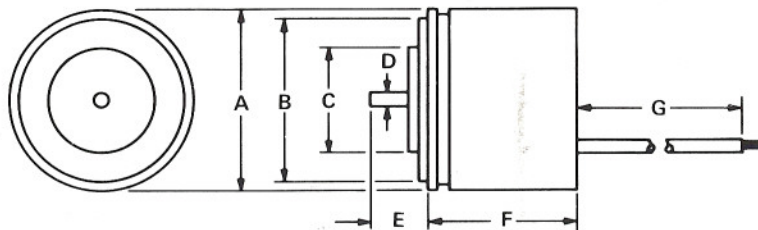
NUMERICAL CONTROL APPLICATIONS

Manufacturers of numerical control systems have discovered the trouble-free nature of magnetic encoders and are now installing them in a wide variety of systems and environments. Typical installations include process controls in the steel and glass making industries, as well as in numerically controlled machine-tool systems.

Design engineers engaged in developing numerical controls can profitably use Librascope magnetic encoder types. Industrial numerical control environments have less effect on these encoders than on other types.

Magnetic encoders are particularly useful where low-to-medium resolution is required — where trouble free and maintenance free operation is a system requirement. Librascope magnetic incremental encoders offer economical service in terms of minimum equipment downtime.

Magnetic Incremental Encoders and Tachometers

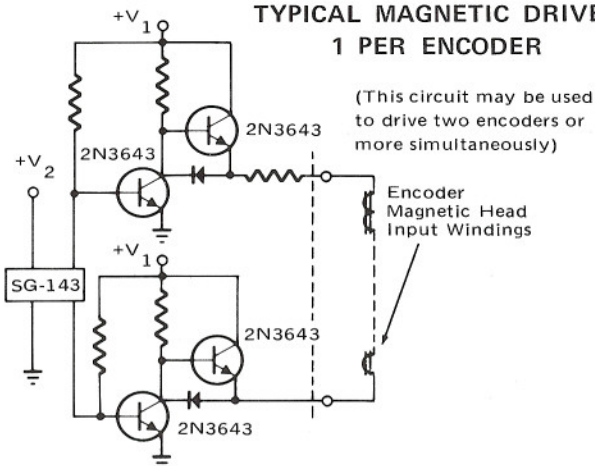


ENGINEERING SPECIFICATIONS

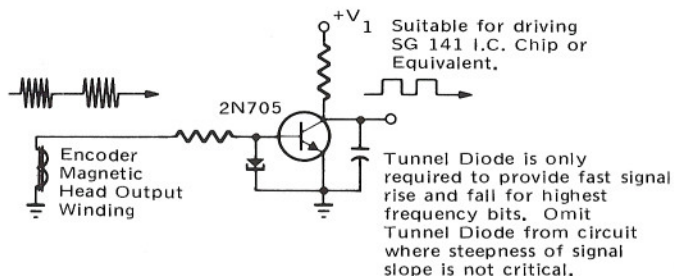
Model No.	857-23-1	858-18-039
Output channels	5	2
Pulses per channel	64	64
Resolution/360°	256	128
Input current	100 mA	100 mA
Output waveform	Modulated AC	Modulated AC
Recommended driver frequency	5 to 200 kHz	5 to 200 kHz
Dimensions, in.		
A.	2.25	1.750
B.	2.062	1.5620
C.	1.312	0.9375
D.	0.1875	0.1873
E.	0.792	0.540
F.	1.18	1.500
G.	18.0	18.0
Mounting size	23	18
Weight, ounces, max.	8	7.5
Moments of inertia	60 Gm-Cm ²	40 Gm-Cm ²
Torque, max.	0.15 in.-oz.	0.15 in.-oz.
Recommended speed, max.		
Operating	2000	2000
Slew	10,000	10,000
Shock, max.,***	50-Gs	50-Gs
Vibration, Hz**	0 to 2000	0 to 2000
Humidity, min.*	0 to 100%	0 to 100%
Temperature C.*	-55° to +105°	-55° to +105°
Min. life		
Revolutions	4 x 10 ⁹	4 x 10 ⁹
Energized ("On Time")	Unlimited	Unlimited
(Less Rotation)		

Qualified to: *MIL-STD-202, **MIL-STD-167, ***MIL-S-901C

TYPICAL MAGNETIC DRIVER, 1 PER ENCODER



TYPICAL OUTPUT CIRCUITS, 1 PER HEAD



For additional incremental Encoder see LCS Brochure.

For additional information write or telephone:

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