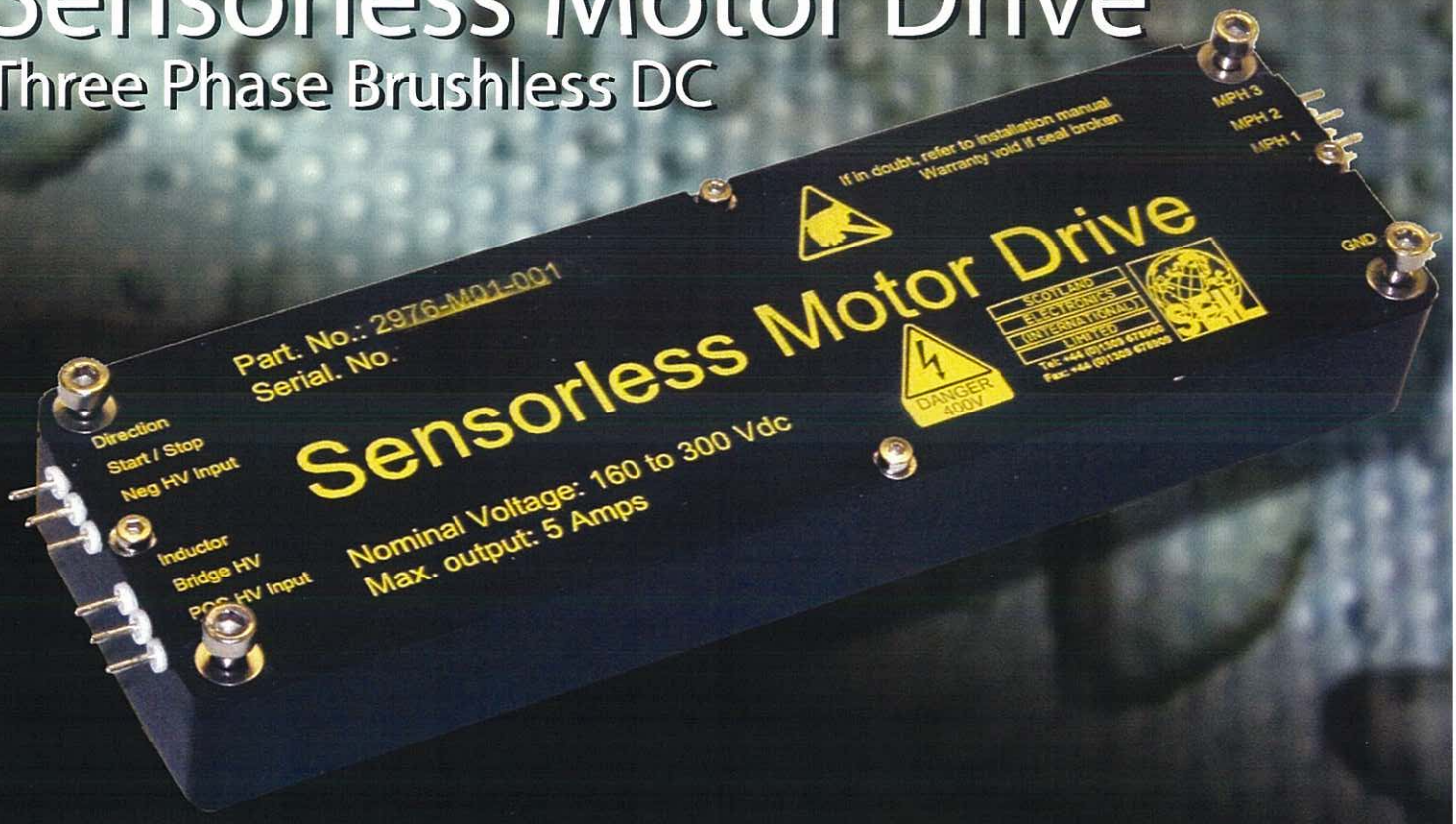
Sensorless Motor Drive

Three Phase Brushless DC



Continuous Drive Applications for Harsh Environments

Industrial, Military and Downhole temperature versions available

The Standard three phase sensorless motor drive was designed and epitomised to drive a range of high performance geared brushless three phase motors. Typically these are used in harsh environments, military and space applications.

The motor drive can be set and used to drive most brushless motors.

SCOTLAND ELECTRONICS (INTERNATIONAL) LIMITED
SEIL
DEMANDING MOTION CONTROL

Scotland Electronics (International) Limited
Nova House, The Enterprise Park,
Forres, Moray, Scotland, UK, IV36 2AB
Tel: +44 (0)1309 678900 Fax: +44 (0)1309 678909
E-mail: sales@scotlandelectronics.co.uk
Internet: www.scotlandelectronics.co.uk
Registered in Scotland: SC 0113309

Typical applications include hydraulic pump drives, cooling system drives, spinning prism and mirror systems etc. in fact, anywhere where high reliability constant rotation with start stop motor control is required to produce mechanical power.

For more information on the typical applications of the Sensorless Brushless Three Phase Motor Drive and for details on our full range of standard servo amplifiers and motor drive products, or for information regarding custom applications or requirements please contact Scotland Electronics (International) Ltd, (SEIL).

BSI REGISTERED UKAS ENVIRONMENTAL MANAGEMENT EMS 52930
ISO 14001:2010

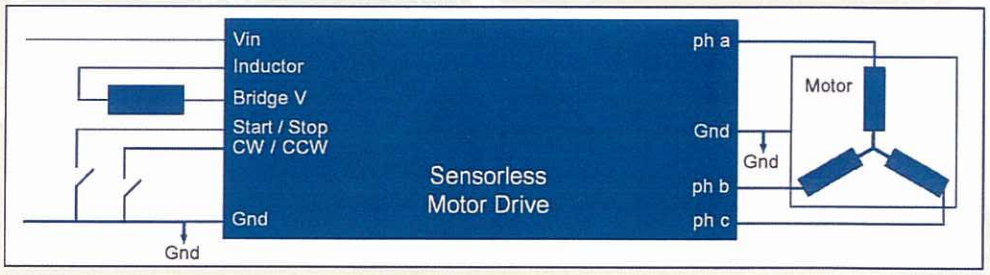
BSI REGISTERED UKAS ENVIRONMENTAL MANAGEMENT FM 54518
ISO 9001:2010

Scotland Electronics (International) Ltd
Sensorless Motor Drive

The sensorless configuration gives the advantage of minimised connections to the motor. Only the three motor phases need to be connected to the brush less motor. No feedback wires are required. This eases the connection problem when the electronics are situated in a chamber at atmospheric pressure and are connected by high-pressure electrical feed-through terminals to the motor, working in a high temperature high-pressure environment typical of down-hole type installations.

By careful control of the power dissipation in the semiconductor devices the unit is able to operate almost to the limit of the maximum of the junction temperatures with good reliability.

Block Diagram



A variety of control schemes can be provided, from simple ON/OFF control by logic signal or contact closure to full speed control over an isolated serial link. Direction control CW/CCW can be under control of a logic signal or contact closure. This can also be controlled from a serial link. Please note that with a sensorless drive it is normal to have a stop rotation prior to commanding the reverse direction; logic is built into the drive to ensure that a stop signal is provided before the unit will accept a change in direction.

Sensorless Drives normally require to be started off load, but techniques have been employed which may allow motor starting under load in certain conditions.

Power to the unit is used to drive the internal power supplies. Dependent on application, raw power can be fed directly to the bridge or it can be fed via an external inductor, which will then allow the internal circuity to provide a controlled soft start-up.

The unit is provided in a modular anodised aluminium enclosure whose dimensions have been selected so that it can be fitted into a standard 52mm coiled tubing within a normal atmospheric pressure container. The base plate is the cold wall interface, which allows easy mounting to a low thermal impedance heat-sinking path. External solder pins are used for ease of system connections but alternative connection schemes can be provided. Construction techniques used are designed to withstand high vibration and shock.

Specifications:

- ❒ Temperature range -40 to +125^{o}C
- ❒ Extended high temperature range available
- ❒ Vibration capability to 20 - 2000Hz to 25G vms
- ❒ CE approved
- ❒ Designed to Mil standards
- ❒ Diemensions: 150mm (L) x 45mm (B) x 20mm (H)
  5.9in (L) x 1.8in (B) x 0.8in (H)
  (Sized to fit 50mm coiled tubing for down hole applications)
- ❒ Weight: 8oz (225g)
- ❒ DC Input Voltage range of 100 - 300v
- ❒ Up to 5 Amps peak current
- ❒ 1 KW drive power
- ❒ Voltage mode operation with current limit
- ❒ Self generated internal housekeeping power supplies
- ❒ Customised options providing motor speed, motor current and temperature measurement are available
- ❒ Simple System Interface or Serial Link Control:
  - Two TTL level line control run and direction
  - Start / Stop Run control
  - CW / CCW Directional Control lines