mV/V & SMART TORQUE TRANSDUCERS

OPERATORS HANDBOOK (PART NO. 34267)

ISSUE 5

PART NUMBERS COVERED BY THIS HANDBOOK

PART NUMBER	DESCRIPTION
XXXXX.IND	Transducer calibrated in mV/V.
XXXXX.INDA	Transducer calibrated in mV/V with integral angle encoder.
XXXXX.LOG	Transducer calibrated with a display instrument in units of calibration. A mV/V figure is also supplied.
XXXXX.LOGA	Transducer with integral angle encoder calibrated with a display instrument in units of calibration. A mV/V figure is also supplied.

NOTE: - This handbook is not applicable to mV/V Transducers with an .ETS suffix.

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INTRODUCTION

The Transducers covered by this handbook are all four-wire bridge, millivolt per volt (mV/V), 'SMART' transducers. The 'SMART' facility allows automatic set up of the Display instrument (Pro-Log, TST, TTT) and should be ignored for other applications. Torque transducers can be supplied as Static, Rotary, Static Torque Block, Flange Mount or Annular, with the rotary transducers having the option of an integral quadrature angle encoder.

TRANSDUCER LEADS AVAILABLE:-

The following leads are available for interfacing transducers featured in this handbook to the Display instrument (Pro-Log, TST, TTT).

DESCRIPTION	PART NUMBER
Display to 10 way Transducer connector.	60216.200
Display to 6 way Transducer connector.	60217.200
Display to no connector.	60223.200

NOTE:- *Smart Torque Block (STB) and Flange Mount Transducers (FMT) have transducer leads fitted as standard.*

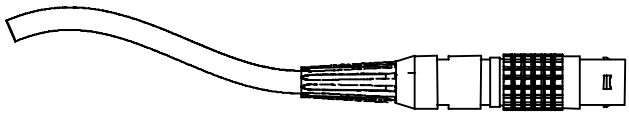
The following leads are available for interfacing transducers featured in this handbook to non – Norbar equipment.

DESCRIPTION	PART NUMBER
10 way Transducer to no connector.	60224.200
6 way Transducer to no connector.	60225.200

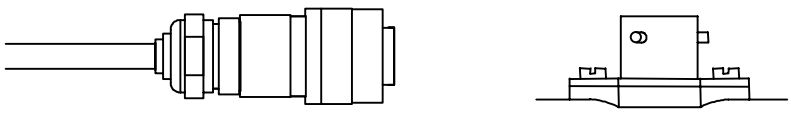
NOTE:- *The suffix after the part number indicates the length of the lead in cm, thus XXXXX.200 = 2 meters. If Transducer leads are required of a non-standard length (to the nearest meter), the new suffix must be added to the part number when ordering.*

TRANSDUCER CONNECTORS:-

LEMO



ABO5

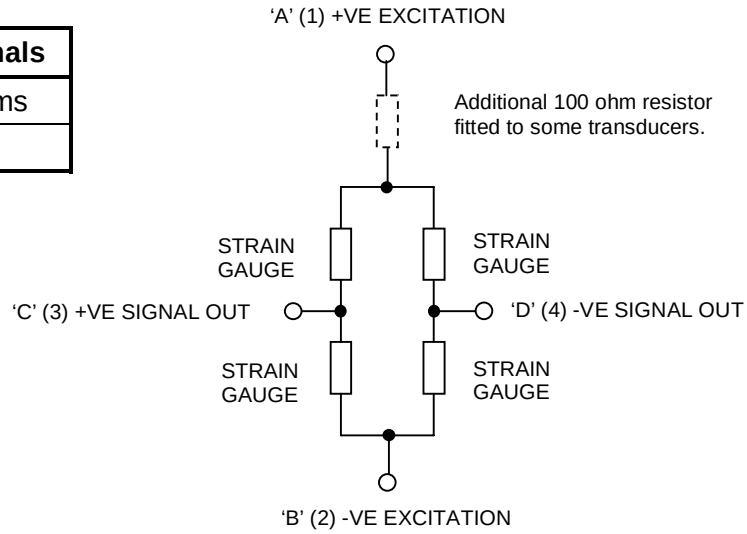


FIXING BOLT TORQUE'S FOR FMT & STB TRANSDUCERS

2-25 Nm FMT = 3 x M5 Bolts @ 5Nm
150-400 Nm FMT = 3 x M8 Bolts @ 25Nm
1500 Nm FMT = 3 x M12 Bolts @ 85 Nm
1000-3000 STB = 2 x M10 Bolts @ 50 Nm (horizontal)
or 4 x M8 Bolts @ 42 Nm (vertical)

TORQUE TRANSDUCER WIRING DIAGRAM

Nominal Resistance Between Terminals	
A & B	350 ± 2 or 450 ± 22 Ohms
C & D	350 ± 2 Ohms



NOTE: - *The differential voltage output for STATIC and ROTARY transducers goes positive for clockwise torque's, and negative for anti-clockwise torques.*

NOTE: - *Annular transducers have eight 175 ohm gauges but will still resistively conform to the above diagram. The differential voltage output of an Annular goes positive for anti - clockwise torque as it has been designed to measure reaction torque.*

PIN CONNECTIONS

PIN CONNECTIONS (10 way)	
A (1)	+VE EXCITATION
B (2)	-VE EXCITATION
C (3)	+VE SIGNAL OUT
D (4)	-VE SIGNAL OUT
E	Digital 0 volts
F	Digital 5 volts
G	Angle Signal channel A
H	Angle Signal channel B
J (9)	SCLK (Serial Clock)
K (10)	SDA (Serial Data)

NOTE: - *numbers in brackets are for LEMO style connectors fitted to the Smart Torque Block and Flange Mount Transducers.*

PIN CONNECTIONS (6 way)	
A	+VE EXCITATION
B	-VE EXCITATION
C	+VE SIGNAL OUT
D	-VE SIGNAL OUT
E	SCLK (Serial Clock)
F	SDA (Serial Data)

NOTE: - *For Annular transducers, C = -ve, and D = +ve signal out when measuring clockwise torque.*

GENERAL SPECIFICATIONS

Accuracy	See calibration certificate supplied with transducer.
Calibration units	N.m, lbf.ft or lbf.ins as standard.
Maximum Bridge Excitation	10 Volts D.C.
Zero setting tolerance	better than ± 1% F.S.D.
Operating Temperature Range	-10ºC - +50ºC.
Storage Temperature Range	-20ºC - +70ºC.
Temperature Co-efficient	< ± 0.01%/ºC. Full Scale Defection on zero. < ± 0.03%/ºC. Full Scale Defection on span.

GENERAL SPECIFICATIONS (continued)

Maximum working torsion 120% of rated capacity (except for transducers listed below).

Absolute maximum torsion 150% of rated capacity (except for transducers listed below).

Part Number	Capacity	Absolute Maximum Torsion
50615.IND or .LOG	5 lbf.ft	110 %
50618.IND or .LOG	10 lbf.ft	110 %
50622.IND or .LOG	50 lbf.ft	110 %
50625.IND or .LOG	250 lbf.ft	110 %
50663.IND or .LOG	6000 N.m	110 %
50667.IND or .LOG	1500 N.m	110 %
50668.IND or .LOG	2000 N.m	110 %
50684.IND or .LOG	3000 N.m	100 %
50604.IND or .LOG	50,000 N.m	110 %
50605.IND or .LOG	50,000 N.m	110 %

SPECIFIC DETAILS FOR ROTARY TRANSDUCERS (Part numbers 50708.XXX(X) and above)

Drive (inches)	Rotary capacity			Pulses per revolution (ppr)	Maximum speed (r.p.m.)	
	N.m	lbf.ft	lbf.ins		*Continuous	*Intermittent
¼ Hex	5	-	50	180 ± 2° (1 pulse per 2°)	5000	11,000
¼ Hex	20	15	-	180 ± 2° (1 pulse per 2°)	5000	11,000
¼ Sq	20	15	-	180 ± 2° (1 pulse per 2°)	5000	11,000
Sq	75	50	-	180 ± 2° (1 pulse per 2°)	5000	11,000
½ Sq	200	150	-	180 ± 2° (1 pulse per 2°)	2500	7600
¾ Sq	250	200	-	180 ± 2° (1 pulse per 2°)	2000	5000
¾ Sq	500	300	-	180 ± 2° (1 pulse per 2°)	2000	5000
1 Sq	1500	1000	-	180 ± 2° (1 pulse per 2°)	1000	4400

Angle power requirements +5V DC ($40mA_{max}$)

Angle output 2 channel quadrature

*Continuous is defined as 100% usage at the given speed in either direction and intermittent as 10% usage of the total time at the given speed.

Not designed for use with impact type tools.

INTERFACING TRANSDUCERS WITH NON NORBAR EQUIPMENT

Excite the transducer with an accurate, stable and low noise power supply. We recommend the power supply output is short circuit protected.

Electromagnetic compatibility is the responsibility of the system designer. To help in this task Norbar recommend the following:

(i) Use good quality screened transducer cable.

(ii) Keep transducer cable length to a minimum.

(iii) Keep transducer cable away from high voltage cables.

WARNING! Do not connect pins E or F on the 6 way (AB05) connector, pins J or K on the 10 way (AB05) connector or pins 9 & 10 on the (LEMO) connector.

WARNING! Only connect to pins E, F, G & H on the 10 way (AB05) connector if the angle encoder option is fitted and required to be used.