



HARSH ENVIRONMENT INSTRUMENTS

Norbar has worked closely with the oil and gas industry to produce a range of torque instruments and transducers suitable for use in the harshest environments such as ship decks, oil rigs and refineries. Norbar uses a variety of corrosion resistant materials, high specification connectors and sealing techniques meaning that products in our HE range can be used in such environments without impairing their performance or life span. Although originally designed to meet the needs of the oil and gas industry, Norbar’s HE range is the ideal choice whenever it is necessary to apply or measure torque outdoors in potentially wet or dusty conditions.

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HARSH ENVIRONMENT INSTRUMENT

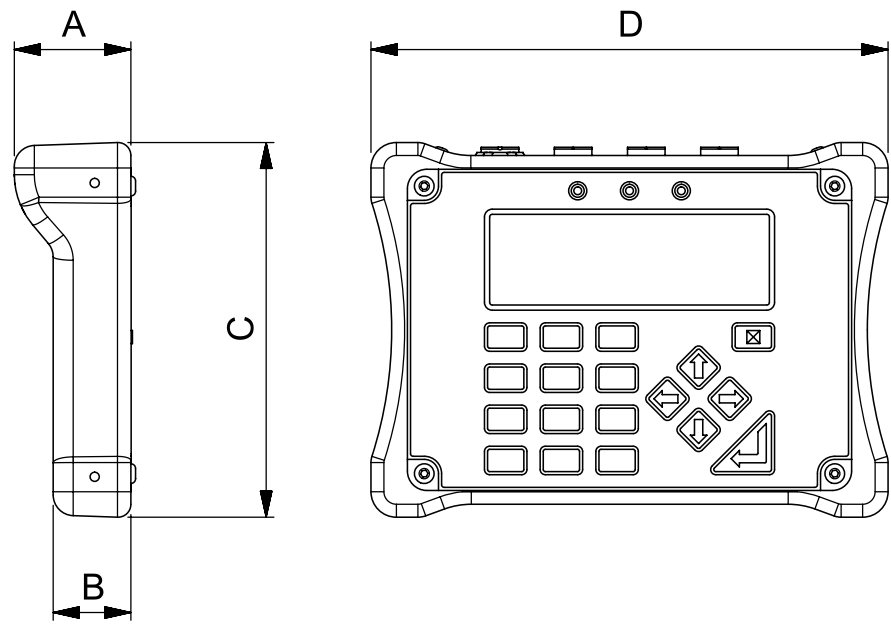


TTL-HE is a portable torque measuring instrument designed for use in harsh environments. The TTL-HE operating on battery power with one of the 'HE' range of transducers connected, has an ingress protection rating of IP65/IP67. Typical operating environments are where high humidity, water or salt water spray and dust may be an issue. Features include; 10 measurement modes, 13 units of torque (with additional user units feature), 12 pairs of limits and text displayed in 11 languages.

- Instrument accuracy of $\pm 0.05\%$ ($\pm 0.1\%$ when below 10% of transducer capacity)
- System accuracy with a typical Norbar transducer, $\pm 0.5\%$ from 20% of transducer capacity
- IP65/67 rated
- Bi-directional calibration
- Battery power use in harsh environments (mains supply for charging)
- All features are in common with TST and TTT instruments
- Supplied in IP67 rated carry case
- 5 digit resolution for all Norbar transducers
- 240 x 64 pixel dot matrix display with update rate of twice per second
- Please contact Norbar for full details of available transducers

4 HARSH ENVIRONMENT RANGE

43217 TTL-HE Instrument (inc. IP67 rated carry case)
Supplied with clockwise and counter-clockwise calibration.



Model	TTL-HE	
Part Number	43217	
Dimensions (mm)	A	45
	B	30
	C	145
	D	200
Weight (kg)	4.9	

TTL-HE INSTRUMENT AND TRANSDUCER KITS



4 TTL-HE INSTRUMENT AND TRANSDUCER KITS

60287.LOG	5,000 N·m M/M TTL-HE Kit, inc. Lead (Class 4)
60295.LOG	10,000 N·m M/M TTL-HE Kit, inc. Lead (Class 5)
60296.LOG	15,000 N·m M/M TTL-HE Kit, inc. Lead (Class 6)
60289.LOG	40,000 N·m M/M TTL-HE Kit, inc. Lead (Class 7)

Note: Kits for use with Intervention Tool Test Pots



HARSH ENVIRONMENT TRANSDUCERS



The accuracy and quality of the Norbar torque transducers has made them the first choice of many calibration laboratories throughout the world. The Harsh Environment range of transducers has been specifically designed for use with the Norbar TTL-HE instrument.

- Class 1 accuracy over the 'Primary' classification range ($\pm 0.5\%$ of reading from 20 to 100% of full scale)
- IP65/IP67 rated
- Stainless steel design with Smart intelligence
- Bi-direction calibration as standard



4	STATIC TRANSDUCERS
50787.xxx	300 - 3,000 N·m, 1½" M/F sq. dr.
50751.xxx*	300 - 3,000 N·m, 1½" M/M sq. dr.
50705.xxx	500 - 5,000 N·m, 1½" M/F sq. dr.
50729.LOG	500 - 5,000 N·m, 1½" M/M sq. dr.
50706.xxx	500 - 5,000 lbf-ft, 1½" M/F sq. dr.
50728.xxx	1,000 - 10,000 N·m, 2½" M/F sq. dr.
50788.xxx	1,000 - 10,000 N·m, 2½" M/ 2" M sq. dr.
50789.xxx	1,500 - 15,000 N·m, 2½" M/ 2½" M sq. dr.
50726.xxx	2,500 - 25,000 N·m, 3½" M/M sq. dr.
50727.xxx	4,000 - 40,000 N·m, 3½" M/M sq. dr.
50743.xxx*	10,000 - 100,000 lbf-ft, 3½" M/M sq. dr.

* Suitable for use in Hydraulic Test Pots.
 * UKAS accredited calibration up to 80,000 lbf-ft. A non-accredited value at 100,000 lbf-ft is extrapolated and provided for reference only. Static Transducers 3,000 N·m and above supplied in carry case.

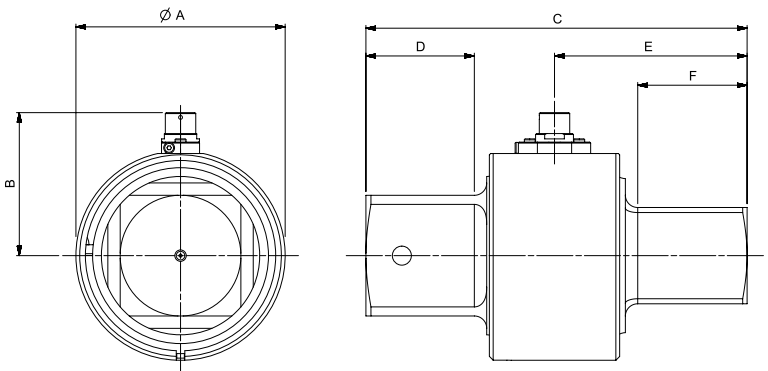
Designed for use with the Harsh Environment Instrument range (TTL-HE) of products

4	INSTRUMENTATION LEADS
60245.200	TTL-HE to HE Transducer
60250.200	TTL-HE to Norbar Static & Annular Transducers
60263.200	TTL-HE to Rotary Transducers
60266.200	HE Transducer to TTT, TST and T-Box 2
60261.200	Serial Data Lead for TTL-HE

Other lengths can be ordered at an additional cost.
 Note: The system should be calibrated with the increased length lead, as calibration may be affected.
 Note: The maximum permissible cable length 15 m for Transducer Leads, 7 m if using 60266 with a T-Box™ XL. Contact Norbar for further details.

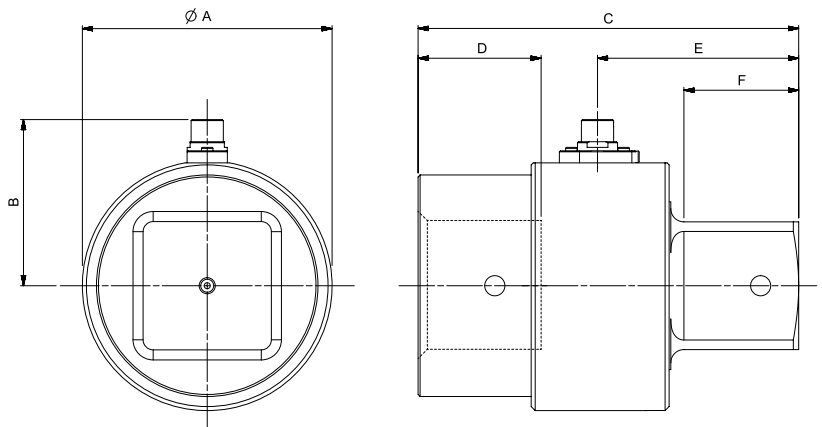
Static Transducers - Male to Male (M/M) Square Drives

Model	3,000 N·m 5,000 N·m	10,000 N·m	15,000 N·m	25,000 N·m 40,000 N·m 100,000 lbf-ft
Part Number	50751.xxx 50729.xxx	50788.xxx	50789.xxx	50726.xxx 50727.xxx 50743.xxx
Dimensions (mm)	ØA	95	110	164
	B	68	75	103
	C	168	200	225
	D	38	57	57
	E	84	101	101
	F	38	57	58
Weight (kg)	3.4 (3,000 N·m) 5.0 (5,000 N·m)	11.4	11.4	21.5 (25,000 N·m) 22.0 (40,000 N·m) 25.0 (100,000 lbf-ft)



Static Transducers - Male to Female (M/F) Square Drives

Model	3,000 N·m 5,000 N·m 5,000 lbf-ft	10,000 N·m	
Part Number	50787.xxx 50705.xxx 50706.xxx	50728.xxx	
Dimensions (mm)	ØA	95	110
	B	68	83
	C	160	189
	D	41	59
	E	84	100
	F	38	57
Weight (kg)	5.0	9.1	





INTERVENTION TOOL TEST POTS



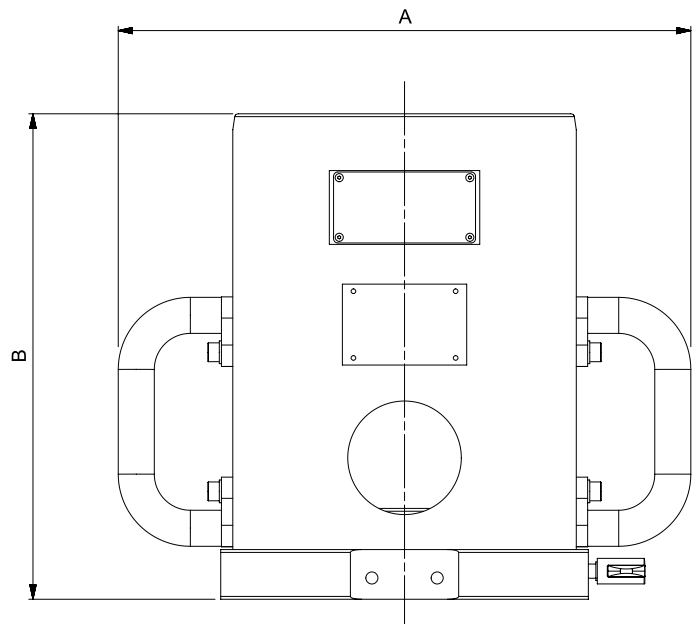
From left to right Intervention Tool Test Pots 80019, 80024, 80025 and 80020

These reaction pots allow for the accurate testing of API rotary intervention tools.

- Conform to ISO 13628-8:2002 and API 17D
- Customer specific solutions also available
- Lightweight construction, major components made in aluminium
- Incorporated lifting handles
- Eye bolts provided on larger units

4	INTERVENTION TOOL TEST POTS
80019	ISO 13628-8:2002 Class 4 Intervention Tool Test Pot
80024	ISO 13628-8:2002 Class 5 Intervention Tool Test Pot
80025	ISO 13628-8:2002 Class 6 Intervention Tool Test Pot
80020	API 17D Class 7 Intervention Tool Test Pot
81018	Deck Mount Kit for API Verification Pot

Model	Class 4	Class 5	Class 6	Class 7
Part Number	80019	80024	80025	80020
Dimensions (mm)	A	372	403	428
	B	215	246	326
Weight (kg)	17.5	22.0	51.0	48.0





INTERVENTION TOOL VERIFICATION KITS

Calibration details

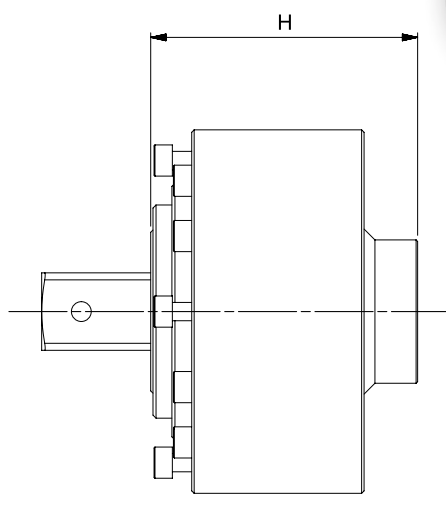
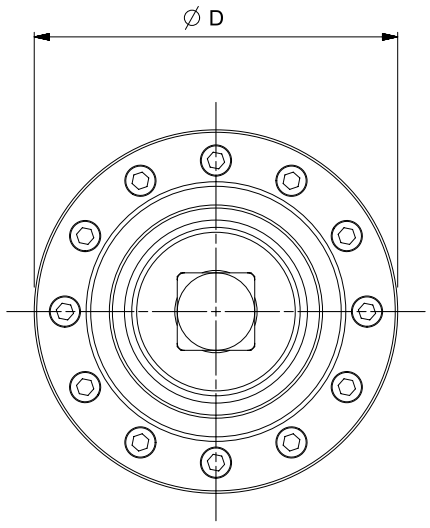


4	INTERVENTION TOOL TORQUE VERIFICATION KIT
60278.xxx	3,000 N·m ISO 13628 Class 4 Intervention Tool Torque Verification Kit
60281.xxx	10,000 N·m ISO 13628 Class 5 Intervention Tool Torque Verification Kit
60282.xxx	15,000 N·m ISO 13628 Class 6 Intervention Tool Torque Verification Kit
60279.xxx	25,000 N·m API 17D Class 7 (short) Intervention Tool Test Kit
60280.xxx	40,000 N·m API 17D Class 7 (short) Intervention Tool Test Kit

Other test pots and Torque Verification Kits are available for standard and non-standard API Intervention tool test and verification. Please contact Norbar.

MULTIPLIERS FOR SUBSEA

4	MULTIPLIERS FOR INTEGRATION INTO SUBSEA INTERVENTION TOOLS
77331	HT5 5:1 for Subsea Intervention Tools
77301	HT5 5:1 for Subsea Splined Output



Model	HT5 5:1 Subsea	
Part Number	77331 77301	
Dimensions (mm)	D	119
	H	106
Weight (kg)	TBC	