



TORQUE MEASUREMENT

Norbar started manufacturing electronic torque measuring instruments in the early 1970s and now offers a comprehensive range, from the easy to use, cost effective TruCheck™ through to the sophisticated T-Box XL™ and TDMS software, which provides the complete solution for torque tool calibration, data logging and data management. Norbar's torque measuring instruments are renowned for high accuracy and superb reliability. Indeed, many of those early instruments are still in regular use today. For our interchangeable transducer instruments, we remain one of the few manufacturers in the world that issue a UKAS accredited calibration certificate both for the instrument and for the torque transducer. In doing so, customers can swap combinations of instrument and transducer while retaining complete traceability.

Norbar's torque transducers have established an excellent reputation based on exceptional quality and accuracy. A very wide torque range is covered, 0.04 to 300,000 N·m and three basic transducer configurations are offered; Static, Impulse Rotary and Annular.

All transducers up to 100,000 N·m are supplied as standard with a UKAS accredited calibration certificate from Norbar's in-house laboratory.

For customers who wish to take advantage of Norbar's transducers but have an existing, non-Norbar display instrument, transducers can be provided with a mV/V calibration.

Norbar's instruments and transducers are complemented by a wide range of ancillary products. Within this group are the products that would be required to set up a torque calibration laboratory, for example, torque wrench calibrators meeting ISO requirements and precision beam and weight systems for calibration of torque transducers.

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TORQUE MEASUREMENT

Measurement and Calibration - Glossary of Terms

The following information may help in selecting the appropriate measuring device for your needs.

Accuracy

The precision of the instrument which can be reported in three ways.

1. By quoting the guaranteed tolerance as a percentage of the reading or indicated value (eg. '0.5% of reading').
2. By quoting the guaranteed tolerance as a percentage of the full scale value of the instrument (eg. 0.1% FS or 0.1% FSD).
3. By quoting a 'class' of device in accordance with BS7882:2017 'Method for calibration and classification of torque measuring devices'.

Modes of Operation

First Peak of Torque - when a 'click type' torque wrench signals that the set torque has been achieved, the applied torque will momentarily drop before climbing again. Generally the fastener stops rotating at point 1 and from a standstill, the breakaway torque to achieve further rotation of the fastener will be higher than point 3b. Only if the operator is very insensitive to the break point will the final tightening effort be incorrect.

'First Peak of Torque' mode will detect the break point of the torque wrench, not the highest torque applied.

Peak Torque - this mode of operation will record the highest torque applied. In the case of a 'click type' torque wrench this may be higher than the actual break point if the wrench continues to be loaded beyond the break.

Consequently, Peak Torque is more useful for calibrating devices without a break signal such as dial or electronic wrenches.

Track - this mode has no memory at all. When the load is removed the display will return to zero.

Track is used for calibrating the device itself or for monitoring a fluctuating torque.

Resolution

The smallest measurement interval that can be determined on the indicating device. This applies to analogue and digital devices.

Number of Digits

Digital displays are described as having a certain number of 'digits' or 'active digits'. Half digits can be used to increase the resolution of a device without the expense of going to an additional full active digit.

Example 1. 1,000 N·m displayed on a 4 digit system would read 1000 (resolution = 1 N·m).

Example 2. 1,000 N·m displayed on a 4½ digit system would read 1000.0 (resolution = 0.1 N·m).

Active digits change as the torque changes. Non-active digits only assist in showing the magnitude of the torque. For example, 10,000 N·m requires 5 digits to display its magnitude.

Example 3. With 4 active digits (and 1 passive digit), 10,000 N·m would change in steps of 10 N·m.

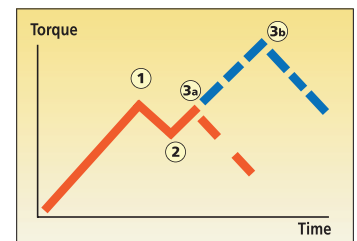
Example 4. With 4½ or 5 active digits, 10,000 N·m would change in steps of 1 N·m.

Signal Processing

Electronic circuitry falls broadly into two types, analogue and digital, with most electronic measurement systems comprising a mixture of the two. There are also whole analogue electronic systems, but these are rare in torque measurement. Most systems start with an analogue signal. The point at which the signal is converted defines the type.

Analogue systems – one in which the signal is processed before being converted to digital.

Digital systems – the original analogue signal is converted to digital before processing.



- 1 = Torque wrench activates
- 2 = 'Click' heard
- 3a = Wrench released quickly
- 3b = Wrench released slowly



TRUCHECK™ 0.1 - 25 N·m



TruCheck™ Plus 25



TruCheck™ Plus 3

For simple, cost-effective testing of torque screwdrivers and torque wrenches

- Allows torque tool performance to be monitored and tools kept in peak condition
- Two versions, TruCheck™ and TruCheck™ Plus
- Basic version has no settable options. Ideal for non-expert users
- TruCheck™ Plus allows selection of torque units and modes for 'click' and dial type wrenches
- Plus version allows operator to set a target value and tolerance
- Supplied with traceable calibration certificate

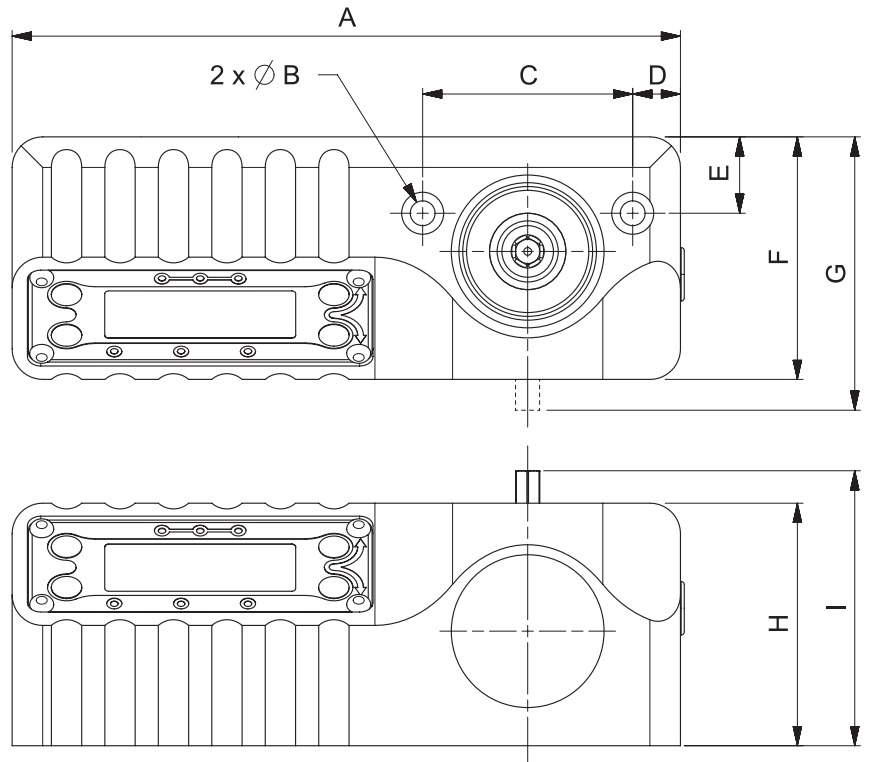
4	TRUCHECK
43253*	TruCheck 0.1 - 3.0 N·m
43250*	TruCheck Plus 0.1 - 3.0 N·m
43254*	TruCheck 1 - 10 N·m
43251*	TruCheck Plus 1 - 10 N·m
43255*	TruCheck 1 - 25 N·m
43252*	TruCheck Plus 1 - 25 N·m

* 43250, 43251, 43253 and 43254 supplied with ¼" female hex to female sq. adaptor

+ 43252 and 43255 supplied with ¼" female hex to ¼" female sq. adaptor and ¼" female hex to ⅜" female sq. adaptor

NOTE: UKAS accredited calibration is from 2% to 100% of full scale for 43253 & 43250 and from 10% to 100% of full scale for 43254 & 43251 and from 4% to 100% of full scale for 43255 & 43252.

Model	TruCheck/Plus 0.1- 10 N·m	TruCheck/Plus 1- 25 N·m
Part Number	43253 43250 43254 43251	43255 43252
Range	0.1- 3.0 N·m 1- 10 N·m	1- 25 N·m
Accuracy	±1%, ±1 digit over stated operating range	±1%, ±1 digit over stated operating range
Display	4 digit, 7 segment LED	4 digit, 7 segment LED
In-Built Transducer Male Hex Drive Size	¼"	¼"
Dimensions (mm)	A	175
	ØB	6.5
	C	55
	D	13
	E	20
	F	64
	G	N/A
	H	64
	I	72
Weight (kg)	2.6	2.6





TRUCHECK™ 10 - 2,000 N·m



One of the concerns in putting a torque tester into an environment where people are not calibration specialists is that incorrect selections will be made with the potential of incorrect tool setting and consequently joint failure.

The TruCheck™ torque wrench tester aims to cut the cost of purchasing a torque wrench calibration system, and remove the fears over the complexity of using such equipment.

There are two versions available, the TruCheck™ being the most basic version, and the TruCheck™ Plus having greater functionality, to offer more flexibility.

4	TRUCHECK
43221*	TruCheck 10 - 350 N·m
43226*	TruCheck 10 - 250 lbf·ft
43222*	TruCheck Plus 10 - 350 N·m
43230+	TruCheck 100 - 1,000 N·m
43237+	TruCheck 75 - 750 lbf·ft
43231+	TruCheck Plus 100 - 1,000 N·m
43244®	TruCheck 200 - 2,000 N·m
43245®	TruCheck Plus 200 - 2,000 N·m
TCACC.CW	UKAS accredited calibration - clockwise
TCACC.CW+CCW	UKAS accredited calibration - clockwise and counter-clockwise

* 43221, 43222 and 43226 supplied with ½" female square drive

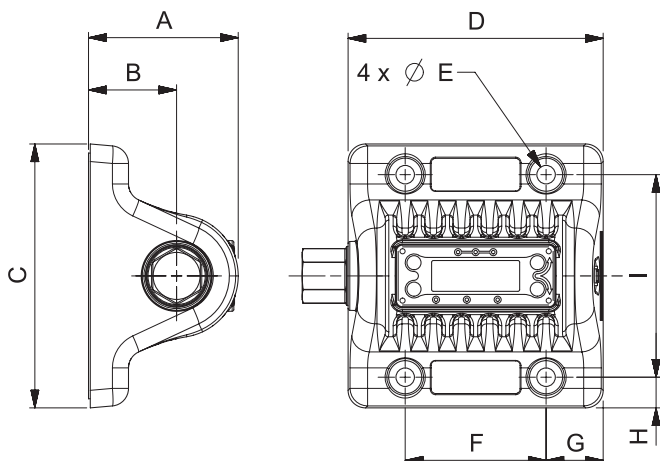
+ 43230, 43231 and 43237 supplied with 27 mm male hexagon plus ¾" sq. dr. socket

® 43244 and 43245 supplied with 27 mm male hexagon plus 1" sq.dr socket

NOTE: UKAS accredited calibration is from 5% to 100% of full scale for 43221, 43226, 43222 and 10% to 100% for 43230, 43231, 43237, 43244 & 43245.

NOTE: If you order a UKAS accredited calibration, this certificate will be provided in place of the traceable calibration certificate.

Model	TruCheck/Plus 10 - 350 N·m	TruCheck 100 - 1,000 N·m	TruCheck Plus 100 - 1,000 N·m	TruCheck/Plus 200 - 2,000 N·m
Part Number	43221 43226 43222	43230 43237	43231	43244 43245
Range	10- 350 N·m 10- 250 lbf·ft	100- 1,000 N·m 75- 750 lbf·ft	100- 1,000 N·m	200- 2,000 N·m
Accuracy	±1%, ±1 digit over stated operating range			
Display	4 digit, 7 segment LED			
Dimensions (mm)	A	85	85	85
	B	50	50	50
	C	150	150	150
	D	145	145	145
	∅E	11	11	11
	F	80	80	80
	G	33	33	33
	H	18	18	18
	I	115	115	115
Weight (kg)	3.1	4.7	4.7	5.7





PROFESSIONAL TORQUE TESTER (PRO-TEST)



The Professional Torque Tester (Pro-Test) - Series 2, is an accurate, highly specified and easy to operate instrument for testing and calibrating all types of torque wrench.

- Pro-Test is priced to make in-house testing a viable proposition even for the smaller industrial and automotive torque wrench user
- Guaranteed classification to BS7882:2017, Class 1 or better over the primary calibration range (20% to 100% of full scale), Class 2 or better over the secondary calibration range (lowest calibrated value to 20% of full scale). Class 1 equates to $\pm 0.5\%$ of reading
- Three essential operating modes allow the Pro-Test to be used with all torque wrench types 'Track' displays the live value, 'Peak Memory' records the highest value and 'First Peak Memory' records the first peak of torque (for click type torque wrenches). Both memory modes can be used with manual or automatic reset
- Large backlit display is easily visible from a distance and in poor light
- Display and transducer are hard-wired together with a 600 mm cable
- All common units of torque measurement are included
- Pictorial mode selection incorporated for ease of use
- User can select the language they wish to work in (most European languages are included)
- Transducer can be mounted for torque wrench operation in the horizontal or vertical plane
- RS-232-C is included for the output of reading to a printer, PC, data capture unit, SPC software etc
- Optional mounting plate gives greater flexibility of mounting options
- All user-settable parameters are menu selectable from the front panel
- Supplied in a robust carry case with a data transfer lead to connect to a PC or printer
- As standard, all transducers are calibrated in a clockwise direction. For additional counter-clockwise direction order:
Part No. PROTEST.CCW

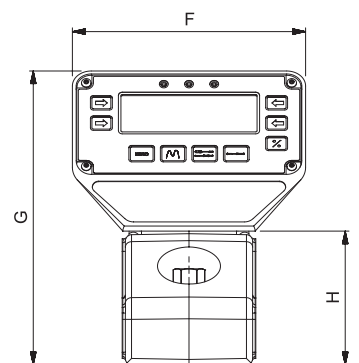
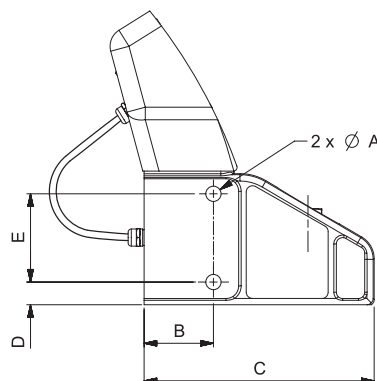


4	PRO-TEST SERIES 2
43218	Pro-Test 60, 1.2 - 60 N·m
43219	Pro-Test 400, 8 - 400 N·m
43220	Pro-Test 1500, 30 - 1,500 N·m

4	ANCILLARY PRODUCTS FOR PRO-TEST
62198.BLK9005	Mounting Bracket
60253	12v DC Power Supply for Series 2
29190	1" x 36 mm socket
29179	¾" x 36 mm socket
29143	½" x 36 mm socket
29083	⅜" x 36 mm socket
PROTEST.CCW	Counter-clockwise Calibration when ordered with new unit



Model	Pro-Test 60	Pro-Test 400	Pro-Test 1500	
Part Number	43218	43219	43220	
Socket(s) provided	¼" to 10 mm Hex ⅜" to 10 mm Hex ½" to 10 mm Hex	⅜" to 22 mm Hex ½" to 22 mm Hex ¾" to 22 mm Hex	¾" to 36 mm Hex	
Dimensions (mm)	ØA	12	12	12
	B	55	55	55
	C	183	183	183
	D	18	18	18
	E	70	70	70
	F	185	185	185
	G	233	233	233
	H	106	106	106
Weight (kg)	6.3	6.4	7.3	





TORQUE SCREWDRIVER TESTER (TST)



The Torque Screwdriver Tester (TST) combines simplicity and functionality to provide a high quality instrument for the testing and calibration of low capacity torque tools.

Featuring an internal transducer complete with Rundown Fixture, the TST is available in 3 torque ranges, 0.04 to 2 N·m, 0.5 to 10 N·m and 1.25 to 25 N·m. Class 1 system accuracy over its Primary range ($\pm 0.5\%$ of reading from 20% to 100% of full scale).

What makes the TST genuinely versatile is the interface for an external transducer. This interface, accessed by a 2 way switch on the TST, allows the connection of any transducer from Norbar's Smart range and most mV/V calibrated transducers from Norbar or other manufacturers.

- Pictorial display panel for easy mode selection
- Limit detection with low, pass and fail indication. Up to 8 target values can be set
- Digital limit state output for control of external tools
- Operation from fast charge internal battery pack (maximum time of 3 hours 20 minutes for full charge) or a.c. supply (90 to 264 Volts)
- RS-232-C serial data interface for connection to a printer or PC. Continuous RS 232 output when used in track mode (up to 11 readings per second)
- Pulse count feature in Impulse mode and Clutch Tool mode
- Smart intelligence for transducer recognition
- Memory for calibration details of 20 non-Smart mV/V calibrated transducers
- Analogue output allows the instrument to be used as part of a process control system for performance analysis
- User-selectable frequency response for each mode of operation
- All user-selectable features have password protection. The instrument can be issued to users with only the required modes of operation and units of measure enabled. This feature can virtually eliminate operator induced errors
- ¼" female hex to ¼" female square adaptor comes supplied as standard



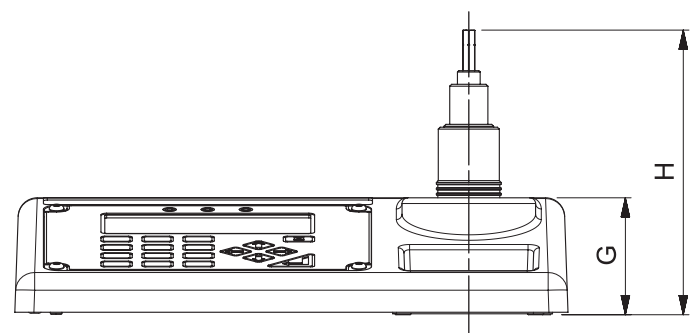
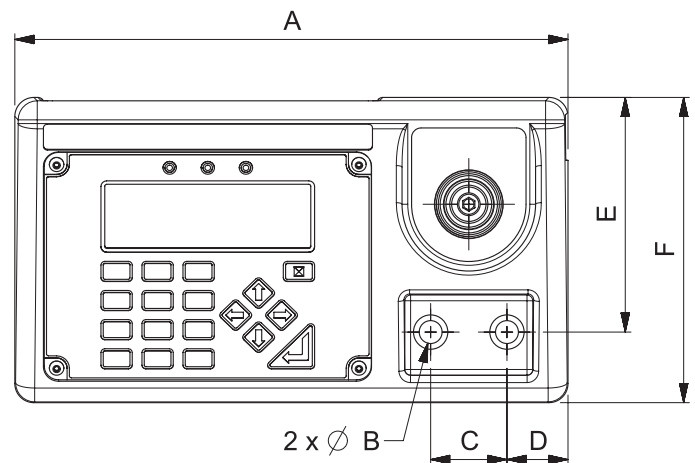
4	TST SERIES 2
43212	TST 2, 0.04 - 2 N·m
43213	TST 10, 0.5 - 10 N·m
43214	TST 25, 1.25 - 25 N·m
TST.CCW	Counter-clockwise calibration when ordered with new unit

Above part numbers exclude Transducer lead for external transducer (see page 98).

TST is supplied complete with a Rundown Fixture for joint simulation. Additional rundowns are available see pag 92.



Model	All Models
Part Number	43212 43213 43214
Dimensions (mm)	A 290
	ØB 10
	C 40
	D 32
	E 123
	F 160
	G 61
	H 149
Weight (kg)	4.7





TORQUE TOOL TESTER (TTT)



The Torque Tool Tester (TTT) shares all of the extensive features of the Torque Screwdriver Tester (TST) except that it has no internal transducer. Instead, the TTT offers not one but three external transducer interfaces allowing any three transducers to be simultaneously connected. Selection between the transducers is made by a rotary switch at the back of the instrument case.

Any transducer from Norbar's Smart range and most mV/V calibrated transducers from Norbar or other manufacturers can be connected to the TTT. The Smart feature means that once a transducer has been connected, the instrument will automatically recognise calibration details such as mV/V output, serial number and capacity.

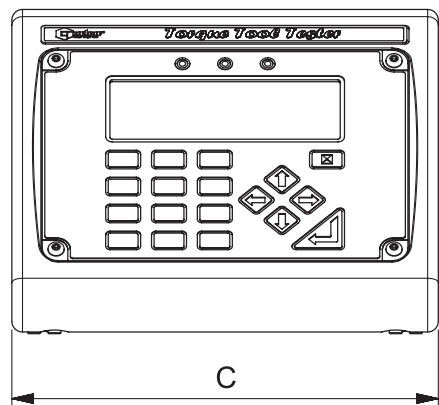
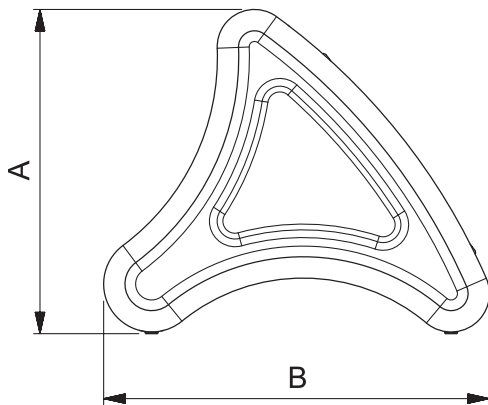
- Pictorial display panel for easy mode selection
- Limit detection with low, pass and fail indication. Up to 12 target values can be set
- Digital limit state output for control of external tools
- Operation from fast charge internal battery pack (maximum time of 3 hours 20 minutes for full charge) or a.c. supply (90 to 264 Volts)
- RS-232-C serial data interface for connection to a printer or PC. Continuous RS 232 output when used in track mode (up to 11 readings per second)
- Pulse count feature in Impulse mode and Clutch Tool mode
- Smart intelligence for transducer recognition, now displays transducer capacity, units and Serial Number
- Memory for calibration details of 20 non-Smart mV/V calibrated transducers
- Analogue output allows the instrument to be used as part of a process control system for performance analysis
- User-selectable frequency response for each mode of operation
- All user-selectable features have password protection. The instrument can be issued to users with only the required modes of operation and units of measure enabled. This feature can virtually eliminate operator induced errors
- Peak memory modes can now be configured to have auto reset (previously only manual reset was possible)
- Series 3 users can set up their own measurement units, making it possible to interface with non-torque transducers, for example load or pressure



4	TTT SERIES 3
43228	TTT Instrument
TTT.CCW	Counter-clockwise calibration when ordered with new unit
Above TTT part number excludes Transducer leads (see page 98)	



Model	All Models	
Part Number	43228	
Dimensions (mm)	A	152
	B	181
	C	200
Weight (kg)	4.8	





T-BOX XL™ & TDMS



The T-Box XL™ together with Norbar's Torque Data Management System (TDMS) software provides the complete solution for torque tool calibration, data logging and data management and archiving on your PC.

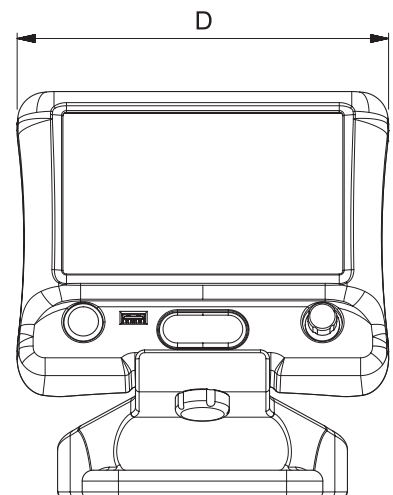
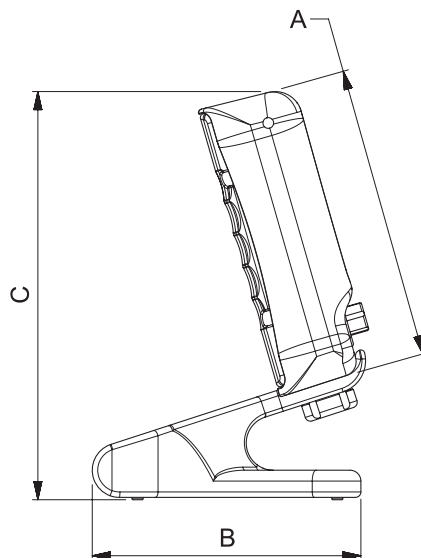
- Can be used as a hand held portable device using the provided neck strap or bench mounted
- Features a 7" (178 mm) colour touch screen LCD display with on screen graphic icons for simple and easy tool selection
- Can connect up to 4 Smart transducers including transducers with angle capabilities for instant connectivity. Alternatively, non-Norbar transducers with a mV/V output can be programmed into the T-Box XL™ memory
- 2 USB ports, one RS232 serial port and an ancillary connection (USB cable supplied as standard)
- T-Box XL™ contains a large capacity memory that will enable a user to collect data and store in excess of 100,000 individual test results directly to the instrument and then synchronise to the TDMS software
- Includes 8 modes for torque tool measurement: Track, Click, Dial & Electronic, Stall, Screwdriver, Hydraulic, Graph and Pulse
- Templates for all Norbar tools (Torque Wrenches, PneuTorques & EvoTorques) to enable the operator to easily perform calibrations on their tools to the relevant ISO standard using the in-built calibration program
- Pre-programmed routines for ISO 6789-1:2017 conformance tests and ISO 6789-2:2017 calibrations
- Automatically guides the user through the calibration routine required for the tool
- Inbuilt uncertainty test routines for tools requiring ISO 6789-2:2017 certificates of calibration



4	T-BOX XL
43258	T-Box XL Instrument with TDMS Software

4	TDMS SOFTWARE
61132	TDMS Software (supplied on USB Flash Drive) Supplied as standard with T-Box XL™.

Model	T-Box XL	
Part Number	43258	
Dimensions (mm)	A	162
	B	148
	C	225
	D	205
Weight (kg)	4.8	





SPARES FOR INSTRUMENTATION PRODUCTS

4 SPARES FOR INSTRUMENTATION PRODUCTS	
38876	Rechargeable Battery Pack for Pro-Log, TST & TTT
39406	Battery Pack for T-Box and T-Box XL
29610	¼" Female - ½" Male Sleeve Adaptor
29611	½" Female - ¾" Male Sleeve Adaptor
29612	½" Female - 1" Male Sleeve Adaptor
29613	¾" Female - 1" Male Sleeve Adaptor
29614	¾" Female - ½" Male Sleeve Adaptor

4 SERIAL DATA LEAD KIT	
60248	Serial Data Lead Kit
Note: Serial Data Lead Kit is not suitable for use with HE Instrument and TruCheck	
60259	USB to Serial Data Lead (Does not work with USM)
This kit enables Norbar 'CE Marked' instruments (Post January 1996 ETS, TWA and DTS plus all Pro-Test, TST and TTT) to connect to most PCs.	

PART NUMBER SUFFIX SYSTEM

Transducers can be ordered for use with Norbar's current range of instruments (TST, TTT, TTL-HE and T-Box XL™), and as Industry Standard (mV/V calibrated) for certain display instruments from other manufacturers. A part number suffix system is used to identify the type of calibration required. For example, a 1,000 N·m Static Transducer for use with a TTT instrument would become part number 50772.LOG.

SUFFIX	USAGE	CERTIFIED IN
.LOG	TST, TTT, TTL-HE & T-Box XL™	Torque Units
.IND	Instruments of non Norbar manufacture (check with Norbar for suitability) and TST, TTT, TTL-HE & T-Box XL™	mV/V

Where the transducer suffix .LOG is used, the transducer is calibrated with an instrument, as a system, a calibration certificate is provided in torque units. A full scale mV/V figure is also supplied.

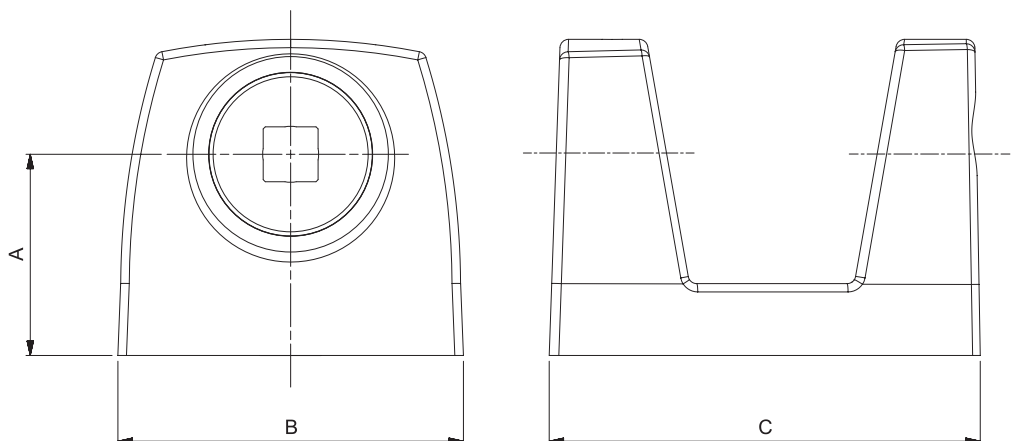
STATIC TRANSDUCER BENCH STANDS

4 BENCH STANDS FOR STATIC TORQUE TRANSDUCERS	
50211	Small frame size (10 N·m) ¼" sq.
50212	Small frame size (50 N·m) ⅜" sq.
50213	Small frame size (100/250 N·m) ½" sq.
50220	Large frame size (250/500 N·m) ¾" sq.
50221	Large frame size (1,000/1,500 N·m) 1" sq.
50127.BLK9005*	Extra large size (7,000 N·m) 1½" sq.
52014	¼" Insert for Small Bench Stands
52015	⅜" Insert for Small Bench Stands
52016	½" Insert for Small Bench Stands
52017	¾" Insert for Large Bench Stands
52018	1" Insert for Large Bench Stands

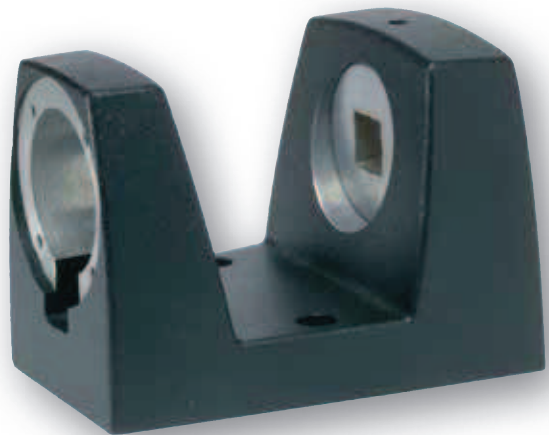
* Dimensions available on request



Model	Small Frame Size	Large Frame Size
Part Number	50211 50212 50213	50220 50221
Dimensions (mm)	A	70
	B	120
	C	150
Weight (kg)	0.8	2.5



Bench stands ensure the correct mounting of Norbar's Static Torque Transducers up to 7,000 N·m (5,000 lbf·ft).





STATIC TRANSDUCERS



The accuracy and quality of the Norbar Static Torque Transducers has made them the first choice of many calibration laboratories throughout the world. Up to 5,000 N·m (5,000 lbf·ft) classified to BS7882:2017, typically better than Class 1 for the primary classification range ($\pm 0.5\%$ of reading from 20% to 100% of full scale).

- Robust, heat treated, alloy steel torsion shaft design
- Designed to ignore non-torsional forces
- Operates in clockwise and counter-clockwise directions
- Calibration up to 100,000 N·m with a UKAS accredited Certificate
- Calibrated in clockwise direction as standard. Counter-clockwise provided on request

- Smart transducers have a built in memory circuit which contains essential information about the transducer. This information can be read by Norbar's TST, TTT, TTL-HE & T-Box XL™ instruments meaning that when the transducer is connected, it is immediately recognised and ready for use
- Smart transducers can also be used with many other instruments, however these will operate as normal ratio calibrated (mV/V) transducers - the Smart data will not be read

Static Transducers ¼" through to 1"

4	STATIC TRANSDUCERS - 0.1 - 1,500 N·m	
50587.xxx*	0.1 - 1 N·m	¼" M/F
50588.xxx	0.25 - 2.5 N·m	¼" M/F
50589.xxx	0.5 - 5 N·m	¼" M/F
50590.xxx	1 - 10 N·m	¼" M/F
50591.xxx	2.5 - 25 N·m	⅜" M/F
50592.xxx	5 - 50 N·m	⅜" M/F
50593.xxx	10 - 100 N·m	½" M/F
50594.xxx	25 - 250 N·m	½" M/F
50701.xxx	25 - 250 N·m	¾" M/F
50596.xxx	50 - 500 N·m	¾" M/F
50772.xxx	100 - 1,000 N·m	1" M/F
50766.xxx	150 - 1,500 N·m	1" M/F

4	STATIC TRANSDUCERS - 0.1 - 1,000 lbf·ft	
50611.xxx	0.1 - 1 lbf·ft	¼" M/F
50615.xxx	0.5 - 5 lbf·ft	¼" M/F
50618.xxx	1 - 10 lbf·ft	¼" M/F
50620.xxx	2.5 - 25 lbf·ft	⅜" M/F
50836.xxx	5 - 50 lbf·ft	½" M/F
50624.xxx	10 - 100 lbf·ft	½" M/F
50625.xxx	25 - 250 lbf·ft	½" M/F
50702.xxx	25 - 250 lbf·ft	¾" M/F
50627.xxx	50 - 500 lbf·ft	¾" M/F
50773.xxx	100 - 1,000 lbf·ft	1" M/F

4	STATIC TRANSDUCERS - 1 - 1,000 lbf·in	
50610.xxx*	1 - 10 lbf·in	¼" M/F
50612.xxx	2.5 - 25 lbf·in	¼" M/F
50614.xxx	5 - 50 lbf·in	¼" M/F
50617.xxx	10 - 100 lbf·in	¼" M/F
50619.xxx	25 - 250 lbf·in	⅜" M/F
50621.xxx	50 - 500 lbf·in	⅜" M/F
50623.xxx	100 - 1,000 lbf·in	½" M/F

4	STATIC TRANSDUCERS - 10 - 100 ozf·in	
50609.xxx*	10 - 100 ozf·in	¼" M/F

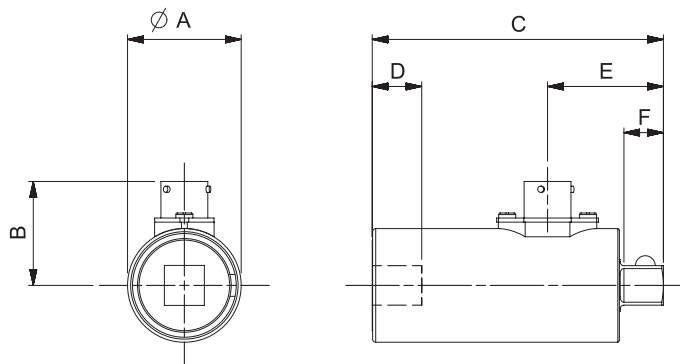
TD2.CCW Alternative calibration direction for transducers up to 1,500 N·m / 1,000 lbf·ft when ordered with new unit

xxx Indicates .LOG or .IND versions, please see page 88.

* .LOG versions not suitable for use with TST, TTT or TTL-HE, purchased pre Feb 2016.



Model	¼" M/F	⅜" M/F	½" M/F	¾" M/F	1" M/F	
Part Number	50587.xxx 50588.xxx 50589.xxx 50590.xxx 50611.xxx 50615.xxx 50618.xxx 50610.xxx 50612.xxx 50614.xxx 50617.xxx 50609.xxx	50591.xxx 50592.xxx 50620.xxx 50619.xxx 50621.xxx	50593.xxx 50594.xxx 50836.xxx 50624.xxx 50625.xxx 50623.xxx	50701.xxx 50596.xxx 50702.xxx 50627.xxx	50772.xxx 50766.xxx 50773.xxx	
Dimensions (mm)	ØA	36	36	36	54	54
	B	33	33	33	42	42
	C	86	90	93	142	147
	D	10	13	16	24	29
	E	30	34	37	46	51
	F	6.5	10	13	22	26
Weight (kg)	0.6	0.6	0.6	1.5	1.7	





STATIC TRANSDUCERS



Static Transducers 1½" through to 3½" Male to Female (M/F)

4	STATIC TRANSDUCERS - 250 - 7,000 N·m	
50703.xxx	250 - 2,500 N·m	1½" M/F
50791.xxx	300 - 3,000 N·m	1½" M/F
50599.xxx	500 - 5,000 N·m	1½" M/F
50669.xxx@	700 - 7,000 N·m	1½" M/F

4	STATIC TRANSDUCERS - 250 - 5,000 lbf·ft	
50704.xxx	250 - 2,500 lbf·ft	1½" M/F
50630.xxx	500 - 5,000 lbf·ft	1½" M/F

TD5.CCW@ Alternative calibration direction for transducers from 1,501 - 7,000 N·m / 1,001 - 5,000 lbf·ft when ordered with new unit

4	STATIC TRANSDUCERS - 1,000 - 100,000 N·m	
50776.xxx	1,000 - 10,000 N·m	2½" M/F
50797.xxx	2,500 - 25,000 N·m	2½" M/F
50781.xxx	5,000 - 50,000 N·m	2½" M/F
50783.xxx	8,000 - 80,000 N·m	3½" M/F
50816.xxx	10,000 - 100,000 N·m	3½" M/F

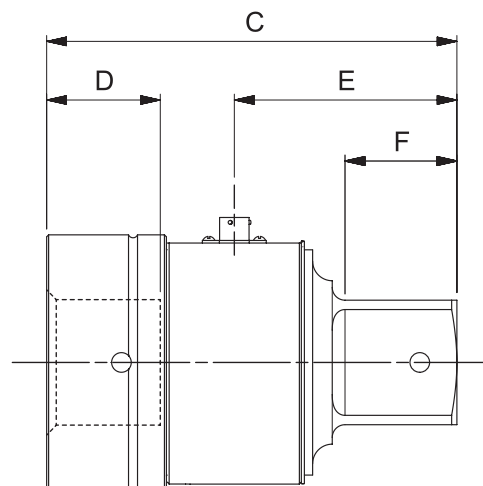
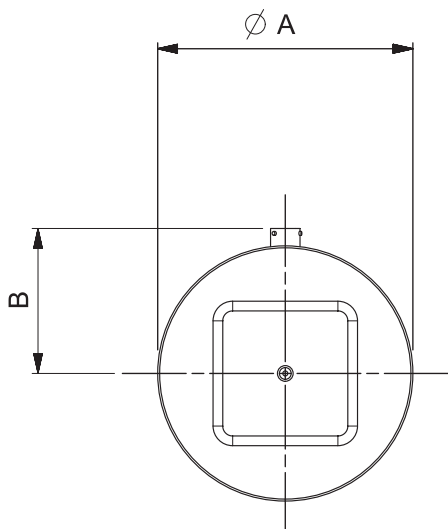
4	STATIC TRANSDUCERS - 1,000 - 60,000 lbf·ft	
50777.xxx	1,000 - 10,000 lbf·ft	2½" M/F
50798.xxx	2,500 - 25,000 lbf·ft	2½" M/F
50799.xxx	3,000 - 30,000 lbf·ft	2½" M/F
50782.xxx	6,000 - 60,000 lbf·ft	3½" M/F

TD3.CCW+ Alternative calibration direction for transducers from 7,001 - 100,000 N·m / 5,001 - 100,000 lbf·ft when ordered with new unit

- xxx Indicates .LOG or .IND versions, please see page 88.
- * .LOG versions not suitable for use with TST, TTT or TTL-HE, purchased pre Feb 2016.
- @ UKAS accredited calibration up to 6,000 N·m. A non-accredited value at 7,000 N·m is extrapolated and provided for reference only.
- + 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.



Model	1½" M/F	2½" M/F	3½" M/F	
Part Number	50703.xxx 50791.xxx 50599.xxx 50669.xxx 50704.xxx 50630.xxx	50776.xxx 50797.xxx 50781.xxx 50777.xxx 50798.xxx 50799.xxx	50783.xxx 50816.xxx 50782.xxx	
Dimensions (mm)	ØA	95	130	160
	B	59	80	107
	C	160	209	292
	D	41	59	91
	E	85	114	147
	F	38	57	76
Weight (kg)	4.5	11.5	16.5	





STATIC TRANSDUCERS



Static Transducers 1½" through to 3½" Male to Male (M/M)

4	STATIC TRANSDUCERS - 2,500 - 100,000 N·m	
50603.xxx	2,500 - 25,000 N·m	2½" M/M
50794.xxx	5,000 - 50,000 N·m	3½" M/M
50796.xxx	10,000 - 100,000 N·m	3½" M/M

4	STATIC TRANSDUCERS - 2,500 - 100,000 lbf-ft	
50635.xxx	2,500 - 25,000 lbf-ft	2½" M/M
50795.xxx	5,000 - 50,000 lbf-ft	3½" M/M
50637.xxx+	10,000 - 100,000 lbf-ft	3½" M/M

TD3.CCW+ Alternative calibration direction for transducers from 7,001 - 100,000 N·m / 5,001 - 100,000 lbf-ft when ordered with new unit

4	STATIC TRANSDUCERS - 15,000 - 200,000 N·m	
-	15,000 - 150,000 N·m	4½" M/M
-	20,000 - 200,000 N·m	4½" M/M

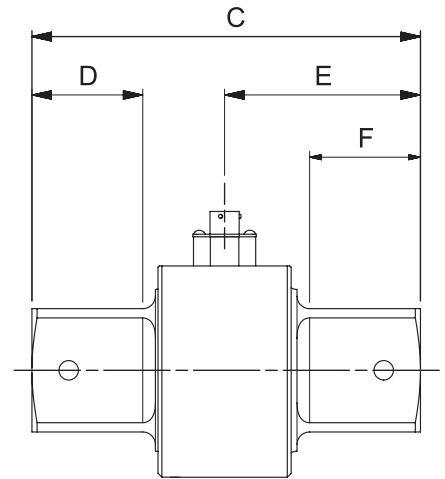
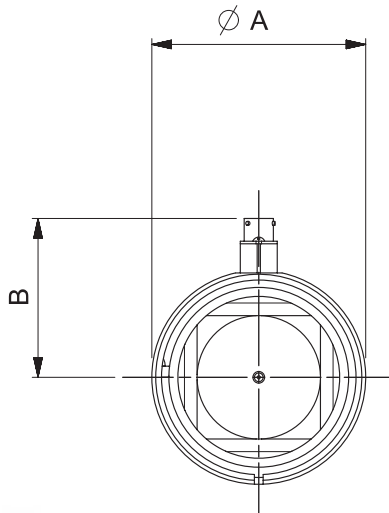
xxx Indicates .LOG or .IND versions, please see page 88.

* .LOG versions not suitable for use with TST, TTT or TTL-HE, purchased pre Feb 2016.

@ UKAS accredited calibration up to 6,000 N·m. A non-accredited value at 7,000 N·m is extrapolated and provided for reference only.

+ 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.

Model	2½" M/M	3½" M/M	
Part Number	50603.xxx 50635.xxx	50794.xxx 50796.xxx 50795.xxx 50637.xxx	
Dimensions (mm)	∅A	110	165
	B	82	95
	C	200	271
	D	57	76
	E	100	135
	F	57	76
Weight (kg)	11.5	16.5	



4	STATIC TRANSDUCERS
SECCAL.CW	Secondary Calibration in one direction on static transducers with 2½" square drives to extend the range below 10% of the rated capacity, when ordered with new unit
SECCAL.CW+CCW	Secondary Calibration in two directions on static transducers with 2½" square drives to extend the range below 10% of the rated capacity, when ordered with new unit
ADDCALPOINTS.NEW	Additional calibration steps below 10% of rated capacity to 2% for transducers up to 7,000 N·m (5,000 lbf-ft) when ordered with new unit



FLANGE MOUNTED TRANSDUCERS (FMT)



FMT 2 N-m

4	FMT
50671.xxx*	0.04 - 2 N-m ¼" sq. dr. with Joint Simulator
50672.xxx	0.5 - 10 N-m ¼" sq. dr. with Joint Simulator
50673.xxx	1.25 - 25 N-m ¼" + ⅜" sq. dr. with Joint Simulator
50677.xxx*	0.4 - 20 lbf-in ¼" sq. dr. with Joint Simulator
50678.xxx	5 - 100 lbf-in ¼" sq. dr. with Joint Simulator
50679.xxx	12.5 - 250 lbf-in ¼" + ⅜" sq. dr. with Joint Simulator

4	FMT
50844.xxx	3 - 60 N-m ½" + ⅜" sq. dr. with Joint Simulator
50674.xxx	7.5 - 150 N-m ½" + ⅜" sq. dr. with Joint Simulator
50680.xxx	5 - 100 lbf-ft ½" + ⅜" sq. dr. with Joint Simulator
50675.xxx	20 - 400 N-m ½" + ¾" sq. dr.
50681.xxx	12.5 - 250 lbf-ft ½" + ¾" sq. dr.

4	FMT
50676.xxx	30 - 1,500 N-m ½", ¾" + 1" sq. dr.
50682.xxx	20 - 1,000 lbf-ft ½", ¾" + 1" sq. dr.
TD1.CCW	Counter-clockwise calibration for FMT & STB when ordered with new unit

xxx Indicates .LOG or .IND versions, please see page 88.
 * If using this transducer with a Series 1 TST or TTT (Part No.s 43198- 43201) or a Pro-Log Display instrument, please contact Norbar.
 Includes integral transducer lead with connector to suit TST, TTT and T-Box XL™



FMT 400 N-m

FMT 1,500 N-m

Model	FMT (2 N-m - 25 N-m)	FMT (60 N-m - 400 N-m)	FMT (1,500 N-m)
Part Number	50671.xxx 50672.xxx 50673.xxx 50677.xxx 50678.xxx 50679.xxx	50844.xxx 50674.xxx 50680.xxx 50675.xxx 50681.xxx	50676.xxx 50682.xxx
Dimensions (mm)	∅A	5.5	12
	∅B	65	150
	C	63	84
Weight (kg)	0.8 (2 N-m & 20 lbf-in) 0.8 (10 N-m & 100 lbf-in) 0.9 (25 N-m & 250 lbf-in)	3.3 (150 N-m & 100 lbf-ft) 1.5 (400 N-m) 2.7 (250 lbf-ft)	7.0

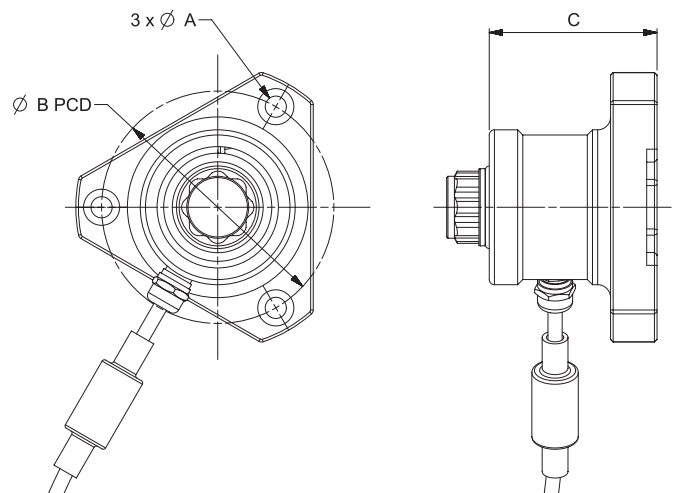
Flange Mounted Transducers (FMT) incorporate mounting points for securely fixing the transducer to the working surface. The transducer lead is also included and is fitted with a high quality connector, suitable for attachment to TST, TTT and T-Box XL™ instruments.

4	FMT (Ancillary Section)
50539	2 N-m Joint Simulator (also fits TST)
50540	10 N-m Joint Simulator (also fits TST)
50541	25 N-m Joint Simulator (also fits TST)
50845	60 N-m Joint Simulator
50692	150 N-m Joint Simulator
50819	400 N-m Joint Simulator
52236	¼" Hexagon - ¼" Square Drive Adaptor
52237	¼" Hexagon - ⅜" Square Drive Adaptor
52251	⅜" Female Square - 22 mm Bi-Square Adaptor
52246	½" Female Square - 22 mm Bi-Square Adaptor
52245	¾" Female Square - 22 mm Bi-Square Adaptor
52254	½" Female Square - 35 mm Bi-Square Adaptor
52241	¾" Female Square - 35 mm Bi-Square Adaptor
52242	1" Female Square - 35 mm Bi-Square Adaptor



FMT Mounting Brackets

4	FMT Mounting Brackets
62221.BLK9005	FMT Mounting Bracket 2 - 400 N-m
62220.BLK9005	FMT Mounting Bracket 150 - 1,500 N-m





ROTARY TRANSDUCERS



Rotary transducers are designed to measure the torque from continuously rotating shafts such as impulse power tools and certain non-impulse tools with a severe clutch action.

This range offers class-leading performance with impulse tools and will be supplied with a UKAS accredited calibration certificate from Norbar's laboratory.

These transducers are known as Smart transducers. They have built-in intelligence in the form of a memory circuit which contains essential information about the transducer which can be read by the appropriate type of instrument (TST, TTT, TTL-HE & T-Box XL™), thus reducing set-up time.

They will also work with instruments that cannot read the memory information, by inputting the relevant calibration details manually.

Note: Not for use with Impact Tools.

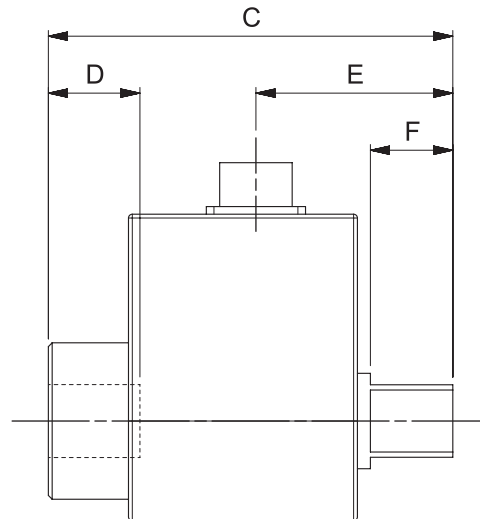
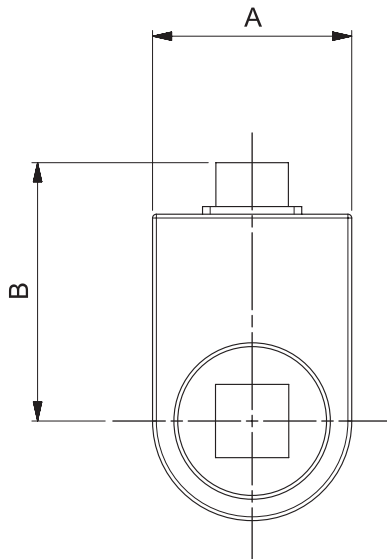
Angle measurement also available.



4	ROTARY TRANSDUCERS
50708.xxx	0.25 - 5 N·m ¼" M/F Hex
50709.xxx	1 - 20 N·m ¼" M/F Hex
50710.xxx	1 - 20 N·m ¼" M/F sq. dr.
50719.xxx	0.75 - 15 lbf-ft ¼" M/F sq. dr.
50711.xxx	3.75 - 75 N·m ⅜" M/F sq. dr.
50720.xxx	2.5 - 50 lbf-ft ⅜" M/F sq. dr.
50712.xxx	10 - 200 N·m ½" M/F sq. dr.
50721.xxx	7.5 - 150 lbf-ft ½" M/F sq. dr.

4	ROTARY TRANSDUCERS
50713.xxx	12.5 - 250 N·m ¾" M/F sq. dr.
50722.xxx	10 - 200 lbf-ft ¾" M/F sq. dr.
50714.xxx	25 - 500 N·m ¾" M/F sq. dr.
50723.xxx	15 - 300 lbf-ft ¾" M/F sq. dr.
50715.xxx	75 - 1,500 N·m 1" M/F sq. dr.
50724.xxx	50 - 1,000 lbf-ft 1" M/F sq. dr.
TD2.CCW	Counter-clockwise calibration.

Angle options available, contact Norbar.



Model	¼" M/F Hex	¼" M/F SQ DR	⅜" M/F SQ DR	½" M/F SQ DR	¾" M/F SQ DR	1" M/F SQ DR	
Part Number	50708.xxx 50709.xxx	50710.xxx 50719.xxx	50711.xxx 50720.xxx	50712.xxx 50721.xxx	50713.xxx 50714.xxx 50722.xxx 50723.xxx	50715.xxx 50724.xxx	
Dimensions (mm)	A	30	30	30	42	52	63
	B	58	58	62	67	73	79
	C	116	72	77	87	106	125
	D	N/A	10	13	16	24	29
	E	49	33	36	42	51	61
	F	26	7	11	15	21	26
Weight (kg)	0.2	0.2	0.2	0.4	0.8	1.5	