



LEGEND

TORQUE WRENCHES		
Accuracy (%)	Ratchet	Digital Display
Single Scale	Torque Handle	IP Rated
Dual Scale	Fixed	Case Included
Multi Scale	Declaration of Conformance	Calibration Certificate
Adjustment Lock	Torque & Angle	UKAS Accredited Certification

MANUAL TORQUE MULTIPLIERS		
Accuracy (%)	Calibration Certificate	Anti Wind-up Ratchet
Adjustable Reaction	UKAS Accredited Certification	Case Included

POWERED TORQUE MULTIPLIERS		
Accuracy (%)	2 Speed	Calibration Certificate
Multi Scale	Bi-Directional	IP Rated
Digital Display	Adjustable Reaction	Air Consumption - litres/sec
Lifting Attachment	Torque & Angle	Bluetooth Enabled

TORQUE MEASUREMENT INSTRUMENTS		
Accuracy (%)	Digital Display	Case Included
Multi Transducers	Calibration Certificate	Back-up Data
Multi Scale	UKAS Accredited Certification	

HYDRAULIC TOOL CALIBRATION FIXTURES		
Accuracy (%)		

HARSH ENVIRONMENT INSTRUMENTS		
Accuracy (%)	UKAS Accredited Certification	Case Included
Multi Transducers	IP Rated	
Multi Scale	Digital Display	

ULTRASONIC MEASUREMENT		
Multi Scale	Back-up Data	Case Included
Digital Display	Calibration Certificate	

CALIBRATION BEAMS & WEIGHTS		
UKAS Accredited Certification	Case Included	

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ABOUT NORBAR



GLOBAL SERVICE

We are the world's leading specialist in torque control and we are engaged solely in the design, development and production of torque tightening and measuring equipment.

Our customers include manufacturers and engineering services in such diverse sectors as aerospace, energy, oil and gas, mining and sub-sea.

There are sales and service branches in Australia, New Zealand, North America, Singapore, China and India.

In addition, we have distributors of our torque control products in more than 60 countries around the world.

A FAMILY RUN BUSINESS

The Brodey family has been a part of Norbar since Bill Brodey and his partner Ernest Thornitt incorporated the company in 1943. We are now the third generation of the family to manage the business and are passionate about its every aspect. From our humble beginnings in a small workshop in North Bar, Banbury town centre, Norbar has grown into an international group of companies that leads the field of torque control. However, what has not changed in over 75 years is that our product range is still substantially manufactured in Banbury with many suppliers in the surrounding area and we are still dedicated to being the best at what we do. As Bill Brodey's original slogan stated 'made in Banbury in accordance with time-honoured tradition'.

Early in 2019 we will be launching our highly anticipated EvoTorque® Battery Tool, giving our customers the ability to reach high torque values with freedom from cables and hoses. Norbar's tool will combine a powerful brushless motor, accurate transducer controlled torque, comprehensive data gathering and wireless communication capability.

We also take a new look at one of our original products – the Industrial Torque Wrench. Our customers told us that they wanted a wrench that was easier to set accurately, that would pack down smaller for transportation in service vehicles and for shipping and that was even easier to maintain. We believe that we have met all of these requirements and we are proud to introduce the resulting new product on page 26.

We continue to invest in the very latest design, manufacturing and quality control technology to achieve the highest level of innovation and precision in the field of torque control and equipment.



The Norbar Directors from left to right: Philip Brodey (Marketing Director), Catherine Rohll (Commercial Director), Neill Brodey (Managing Director)



INTRODUCTION TO TORQUE

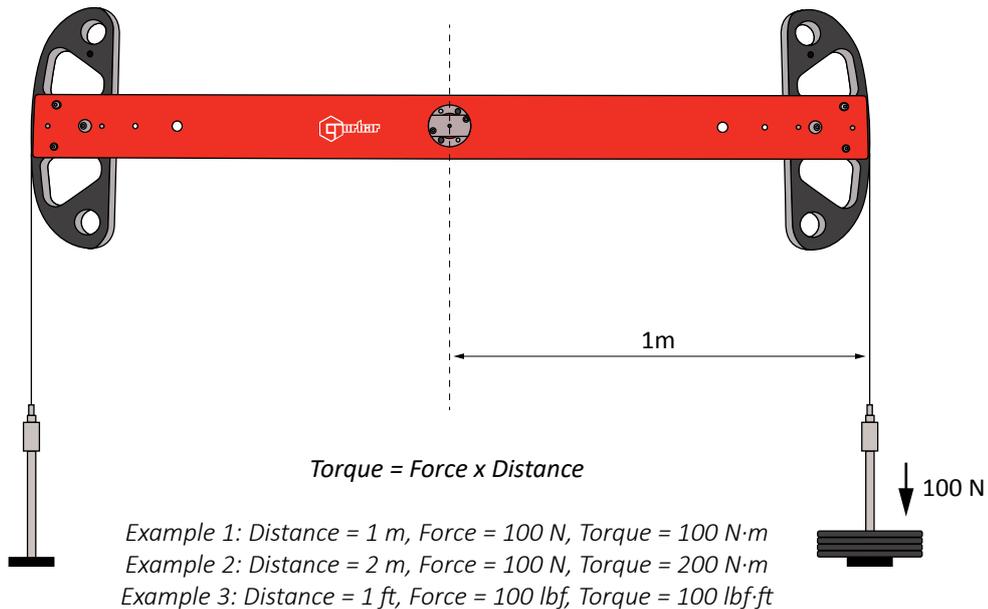
What is Torque?

Torque is any force or system of forces that tends to cause rotation about an axis.

Measurement of Torque

Imagine someone tightening a bolt using a socket attached to a meter (m) long bar. If they apply 10 kg of force (kgf) perpendicular to the bar they will produce a torque of 10 kgf·m at the axis (the centre of the bolt).

However, under the S.I. system of measurement, force is expressed in Newtons (N) rather than kgf. The conversion between kgf and N is x 9.807 so the person is applying 98.07 N·m of torque.



The Importance of Torque Control

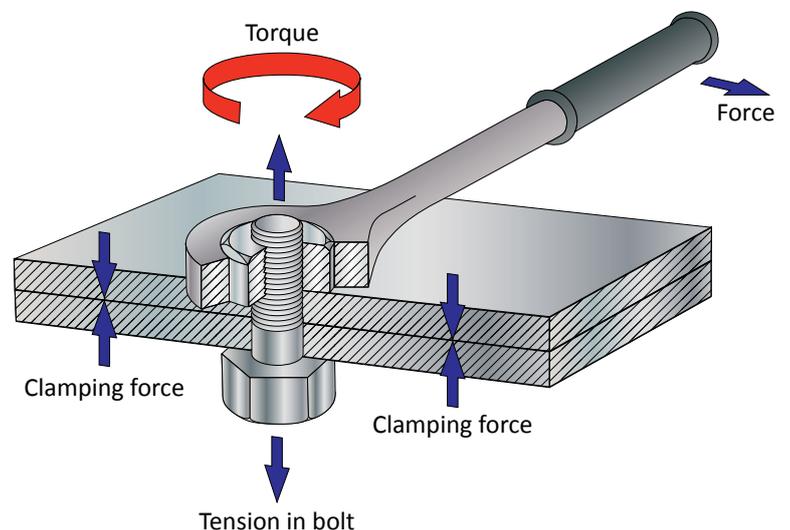
Although many methods exist to join two or more parts together, the ease of assembly and disassembly provided by threaded fasteners make them the ideal choice for many applications.

The object of a threaded fastener is to clamp parts together with a tension greater than the external forces tending to separate them. The bolt then remains under constant stress and is immune from fatigue. However, if the initial tension is too low, varying loads act on the bolt and it will quickly fail. If the initial tension is too high, the tightening process may cause bolt failure. Reliability therefore depends upon correct initial tension. The most practical way of ensuring this is by specifying and controlling the tightening torque.

Bolt Tension

When an assembly is clamped by tightening a nut and bolt, the induced tension causes the bolt to stretch. An equal force acts to compress the parts which are thus clamped.

The proof load of a bolt, normally established by test, is the load which just starts to induce permanent set – also known as the yield point. Typically bolts are tightened to between 75% and 90% of yield.

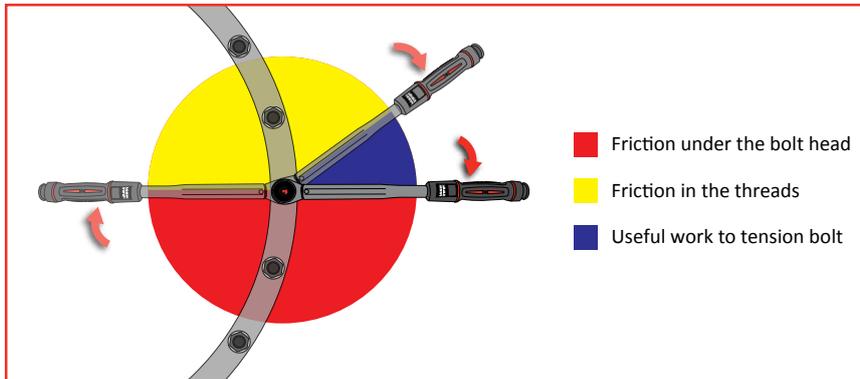




INTRODUCTION TO TORQUE

Friction in the Bolted Joint

When a threaded fastener is tightened, the induced tension results in friction under the head of the bolt and in the threads. It is generally accepted that as much as 50% of the applied torque is expended in overcoming friction between the bolt head and the abutting surface and another 30% to 40% is lost to friction in the threads. As little as 10% of the applied torque results in useful work to tension the bolt.



Given that up to 90% of the applied torque will be lost to friction, it follows that any changes in the coefficient of friction resulting from differences in surface finish, surface condition and lubrication can have a dramatic effect on the torque versus tension relationship. Some general points can be made:

- Most torque tightened joints do not use washers because their use can result in relative motion between the nut and washer or the washer and joint surface during tightening. This has the effect of changing the friction radius and hence affects the torque-tension relationship. Where a larger bearing face is required then flange nuts or bolts can be used. If washers are to be used, hard washers with a good fit to the shank of the bolt give lower and more consistent friction and are generally to be preferred.
- Degreasing fasteners of the film of oil usually present on them as supplied will decrease the tension for a given torque and may result in shear of the fastener before the desired tension is achieved.
- Super lubricants formulated from graphite, molybdenum disulphide and waxes result in minimal friction. Unless allowance is made in the specified tightening torque, the induced tension may be excessive causing the bolt to yield and fail. However, used in a controlled manner, these lubricants serve a useful purpose in reducing the torque to produce the desired tension meaning that a lower capacity tightening tool can be used.
- For reasons of appearance or corrosion resistance, fasteners may be plated. These treatments affect the coefficient of friction and therefore the torque versus tension relationship.
- Friction is often deliberately introduced into the fastener to reduce the possibility of loosening due to vibration. Devices such as lock-nuts must be taken into account when establishing the correct tightening torque.

As a rough guide, the calculated tightening torque should be multiplied by the factor from the table below according to surface treatment and lubrication.

		Surface Condition of Bolt			
		Untreated	Zinc	Cadmium	Phosphate
Surface Condition of Nut	Untreated	1.00	1.00	0.80	0.90
	Zinc	1.15	1.20	1.35	1.15
	Cadmium	0.85	0.90	1.20	1.00
	Phosphate and oil	0.70	0.65	0.70	0.75
	Zinc with wax	0.60	0.55	0.65	0.55



INTRODUCTION TO TORQUE

Tightening to Yield

Bolts tightened to yield provide consistently higher preloads from smaller diameter bolts. The reduced fastener stiffness reduces the fatigue loading to which the bolt is subjected under repeated external load reversals, e.g. cylinder heads and connecting rods.

In theory, a bolt tightened to its yield point will provide the strongest and most fatigue-resistant joint possible, within the physical limitations of the bolt material and manufacturing process.

The downside of this method is the cost of the sophisticated equipment necessary to determine when the bolt goes into yield.

Torque Tension Calculator

For further information and guidance on establishing the correct tightening torque for a fastener, see Norbar’s web based calculator, www.norbar.com/Home/Torque-Tension-Calculator



Calculated Maximum Torque
N.m.: 0.05
lbf. ft.: 0.04

Calculated Maximum Load
kN: 0.15
lbf: 34.7

Bolt Properties

Bolt Diameter	1.6	mm
Yield Stress	180	Nmm ²
Pitch	0.35	mm
Pitch Diameter	1.373	mm
Root Diameter	1.171	mm
Hex A/F Diameter	3.2	mm

Standard Parameters

Bolt Type: Metric Coarse
Bolt Dia.: 1.6
Grade: 3.6

Friction Coefficients

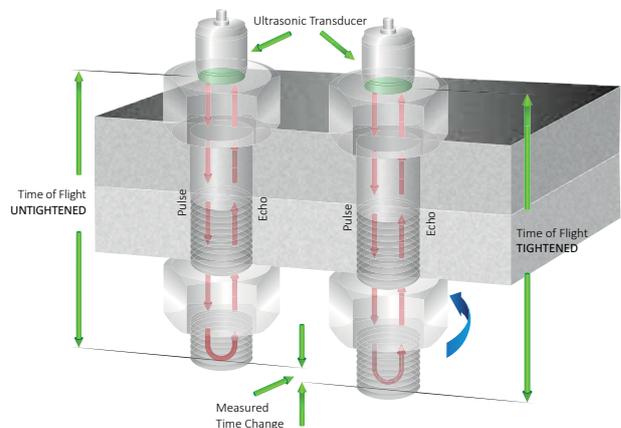
Thread: 0.14
Head: 0.14

These torque and load values are for guidance only! Always check with equipment/bolt manufacturer

When Torque Doesn’t Equal Tight

As we have established, it is the tension in a fastener rather than the torque that is the critical factor. Torque is an indirect means of establishing tension and in a correctly engineered joint and with a controlled tightening process, it is a satisfactory method under the majority of circumstances.

However, in joints that are highly critical due to safety or the cost and implications of machine down-time, a more direct means of establishing tension is needed. Various methods exist including several types of load indicating bolts or washers. However, one of the most versatile methods is to measure the extension of the bolt due to the tightening process using ultrasound and this is exactly what Norbar’s USM-3 does. For full details of this instrument see page 117 and Norbar’s web site: www.norbar.com.





INTRODUCTION TO TORQUE

Recommended Maximum Torque Values

The information supplied here is intended to be an acceptable guide for normal conditions. For critical applications, further information and research will be necessary. The following basic assumptions have been made:

- a. Bolts are new, standard finish, uncoated and not lubricated (other than the normal protective oil film)
- b. The load will be 90% of the bolt yield strength
- c. The coefficient of friction is 0.14
- d. The final tightening sequence is achieved smoothly and slowly

If lubrication is to be applied to the nut/bolt, multiply the recommended torque by the appropriate factor shown in the table on page 4. Alternatively, use the Torque/Tension Calculator on the Norbar website (shown on page 5) which enables fastener and friction conditions to be modified with ease.

 M	BOLT GRADE									 mm
	3.6	4.6	5.6	5.8	6.8	8.8	9.8	10.9	12.9	
	Torque in N·m									
M 1.6	0.05	0.07	0.09	0.11	0.14	0.18	0.21	0.26	0.31	3.2
M 2	0.11	0.14	0.18	0.24	0.28	0.38	0.42	0.53	0.63	4
M 2.5	0.22	0.29	0.36	0.48	0.58	0.78	0.87	1.09	1.31	5
M 3	0.38	0.51	0.63	0.84	1.01	1.35	1.52	1.9	2.27	5.5
M 4	0.71	0.95	1.19	1.59	1.91	2.54	2.86	3.57	4.29	7
M 5	1.71	2.28	2.85	3.8	4.56	6.09	6.85	8.56	10.3	8
M 6	2.94	3.92	4.91	6.54	7.85	10.5	11.8	14.7	17.7	10
M 8	7.11	9.48	11.9	15.8	19	25.3	28.4	35.5	42.7	13
M 10	14.3	19.1	23.8	31.8	38.1	50.8	57.2	71.5	85.8	17
M 12	24.4	32.6	40.7	54.3	65.1	86.9	97.9	122	147	19
M 14	39	52	65	86.6	104	139	156	195	234	22
M 16	59.9	79.9	99.8	133	160	213	240	299	359	24
M 18	82.5	110	138	183	220	293	330	413	495	27
M 20	117	156	195	260	312	416	468	585	702	30
M 22	158	211	264	352	422	563	634	792	950	32
M 24	202	270	337	449	539	719	809	1,011	1,213	36
M 27	298	398	497	663	795	1,060	1,193	1,491	1,789	41
M 30	405	540	675	900	1,080	1,440	1,620	2,025	2,430	46
M 33	550	734	917	1,223	1,467	1,956	2,201	2,751	3,301	50
M 36	708	944	1,180	1,573	1,888	2,517	2,832	3,540	4,248	55
M 39	919	1,226	1,532	2,043	2,452	3,269	3,678	4,597	5,517	60
M 42	1,139	1,518	1,898	2,530	3,036	4,049	4,555	5,693	6,832	65
M 45	1,425	1,900	2,375	3,167	3,800	5,067	5,701	7,126	8,551	70
M 48	1,716	2,288	2,860	3,813	4,576	6,101	6,864	8,580	10,296	75
M 52	2,210	2,947	3,684	4,912	5,895	7,859	8,842	11,052	13,263	80
M 56	2,737	3,650	4,562	6,083	7,300	9,733	10,950	13,687	16,425	85
M 60	3,404	4,538	5,673	7,564	9,076	12,102	13,614	17,018	20,422	90
M 64	4,100	5,466	6,833	9,110	10,932	14,576	16,398	20,498	24,597	95
M 68	4,963	6,617	8,271	11,029	13,234	17,646	19,851	24,814	29,777	100



INTRODUCTION TO TORQUE

Torque Conversion Factors

Units to be converted	S.I. Units		Imperial Units			Metric Units	
	cN·m	N·m	ozf·in	lbf·in	lbf·ft	kgf·cm	kgf·m
1 cN·m =	1	0.01	1.416	0.088	0.007	0.102	0.001
1 N·m =	100	1	141.6	8.851	0.738	10.20	0.102
1 ozf·in =	0.706	0.007	1	0.0625	0.005	0.072	0.0007
1 lbf·in =	11.3	0.113	16	1	0.083	1.152	0.0115
1 lbf·ft =	135.6	1.356	192	12	1	13.83	0.138
1 kgf·cm =	9.807	0.098	13.89	0.868	0.072	1	0.01
1 kgf·m =	980.7	9.807	1389	86.8	7.233	100	1

FORCE

$$\text{lbf} \times 4.45 = \text{N}$$

$$\text{N} \times 0.225 = \text{lbf}$$

FLOW

$$\text{l/s} \times 2.119 = \text{cu-ft/min}$$

$$\text{cu-ft/min} \times 0.472 = \text{l/s}$$

PRESSURE

$$\text{lbf/in}^2 \times 0.069 = \text{bar}$$

$$\text{bar} \times 14.504 = \text{lbf/in}^2$$

POWER

$$\text{hp} \times 0.746 = \text{kW}$$

$$\text{kW} = \frac{\text{N}\cdot\text{m} \times \text{rev/min}}{9,546}$$

Formulae

Accepted formulae relating torque and tension, based on many tests are:-

For Imperial Sizes

$$M = \frac{P \times D}{60}$$

M = torque lbf·ft
P = bolt tension lbf
D = bolt diameter (ins)

For Metric Sizes

$$M = \frac{P \times D}{5000}$$

M = torque N·m
P = bolt tension Newtons
D = bolt diameter (mm)

These formulae may be used for bolts outside the range of the tables.

Formula for Calculating the Effect of Torque Wrench Extensions

$$M1 = M2 \times L1/L2$$

Where L1 is the normal length and L2 is the extended length, M1 is the set torque and M2 the actual torque applied to the nut.

Example

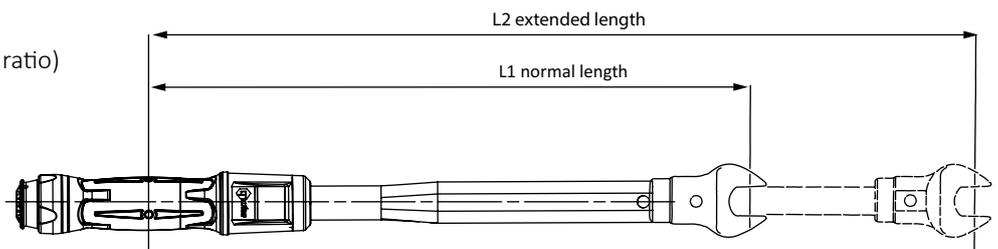
The required torque on the fastener is 130 N·m (M2) but what do you set on the torque wrench scale?

$$L1 = 500 \quad L2 = 650$$

(units of length not important, this is ratio)

$$M1 = 130 \times 500/650$$

$$M1 = 100$$



For further information and guidance on converting torque and calculating the effect of torque wrench extensions download our purpose built applications for iPhone and Android.



HANDTORQUE® TORQUE MULTIPLIERS

Torque wrench design offers just two solutions to the challenge of applying higher torques: either the load at the handle must be higher or the lever length must be greater. Clearly there are practical and safety limits to both of these solutions. For example, a Norbar model 1000 (1,000 N·m) torque wrench is 1.7 m long with the extension handle fitted. As this is already quite long, how would one apply 2,000 or 3,000 N·m? Often there will not be the space to operate a torque wrench of sufficient length to comfortably apply such high torques and the chance that the wrench might slip off the nut increases as length increases.

Norbar's solution is to use a compact, epicyclic gearbox called a HandTorque® multiplier to accurately multiply the input torque provided by a torque wrench by a fixed ratio. This fixed ratio might be in the order of 5:1, 25:1 or even up to 125:1 for very high torque application. This means that a much smaller torque wrench can be used for a given torque application and the combined weight of the torque multiplier and torque wrench will often be lower than for a single large torque wrench. For example, one could apply 1,000 N·m using a Norbar Model 1000 torque wrench weighing 5.8 kg or an HT-52/22.2 combined with a NorTorque® 60 with a total weight of just under 2 kg and a lever length of just 310 mm.

The Norbar HandTorque® multiplier range is the most comprehensive available. Standard products are available up to 47,500 N·m (35,000 lbf·ft) and 'specials' to 300,000 N·m (220,000 lbf·ft). A range of 'nose extensions' for reaching difficult to access bolts and a full range of torque transducers for highly accurate torque monitoring are available.

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TORQUE REACTION

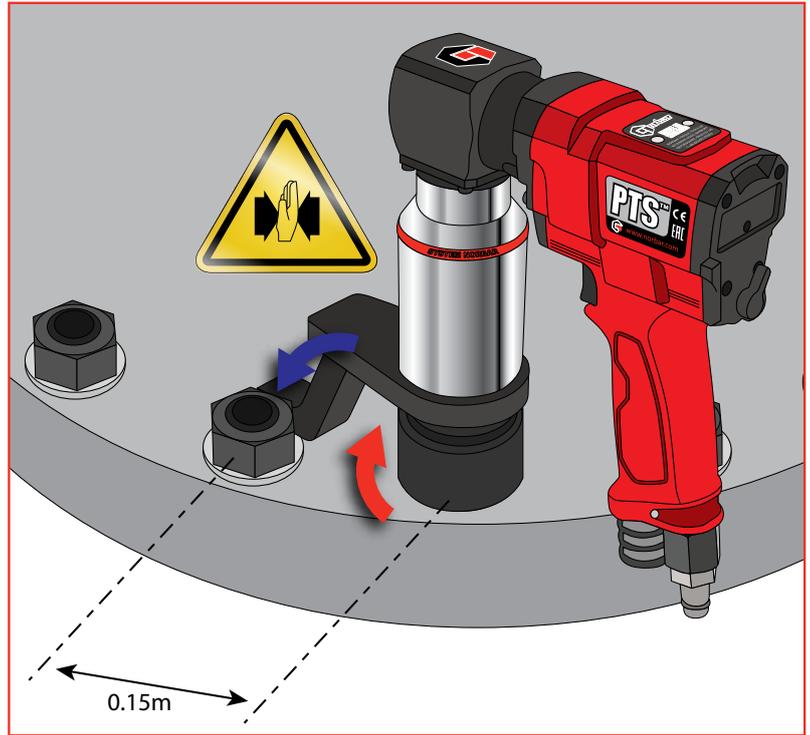
This page applies to both HandTorque® multipliers and powered torque tools

Principles of Torque Reaction

Newton's law dictates that for every applied force there is an equal and opposite reactive force. For applications requiring relatively low torques that can be applied with a torque wrench, this does not present a problem as the reactive force is absorbed by the operator. However, if the desired torque necessitates the use of a multiplier, the resultant reactive force can only be absorbed using an appropriate reaction device.

For this reason all Norbar multipliers are supplied with a reaction plate or reaction foot fitted as standard.

All of the standard reaction plates and feet supplied with standard Norbar tools have been designed to enable the multiplier's use in a variety of environments. However, due to an infinite number of bolting arrangements, it is impossible to have one reaction device that will satisfy every customer's requirement. See page 69 for when the supplied standard reaction is not suitable.



In the above example, 1,000 N·m torque output will result in a reactive force of 6,667 N at a point 0.15 m from the axis of rotation or 2,000 N at 0.5 m.

Avoiding Torque Reaction Problems

It has already been mentioned that the reaction force is equal to the force being applied. However, the magnitude of the reaction force is dependent upon the perpendicular distance between the point of reaction and the centre line of the multiplier, ie. the greater the distance the lower the force.

For this reason the point of reaction should be kept as far away from the centre line of the gearbox as is practical.

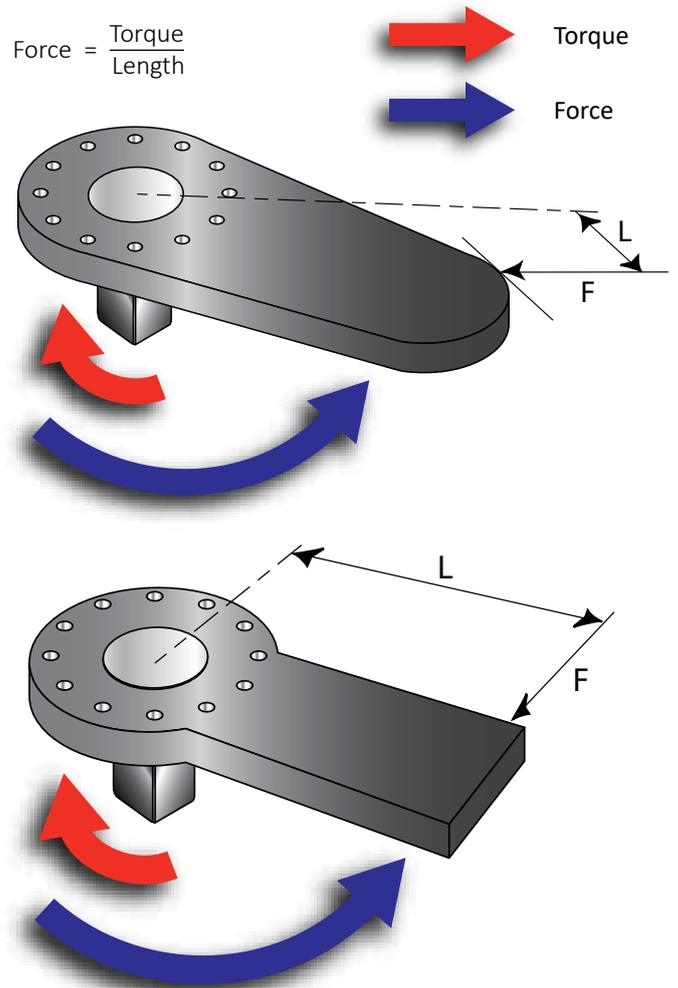
Customers using or modifying reaction plates for Standard Series multipliers up to a capacity of 3,400 N·m should note that if the reaction is taken on the radiused part, the reaction force is perpendicular to the tangent of the curve. Consequently, the further around the radius the reaction is taken, the smaller the perpendicular distance and therefore the greater the force.

Although a longer reaction plate may mean lower forces, the bending moment close to the multiplier will increase.

Customers extending the length of Norbar's standard reaction plates should be aware that an increase in overall length will result in a larger induced bending stress and should not assume that because the reaction plate is strong enough at one length it will remain so when extended.

Excessive side loading, resulting from poor reaction, increases frictional forces inside the multiplier. This can lead to lower multiplication ratios (outside ±4%).

The ideal reaction arrangement has the centre of the reaction bar and the centre of the nut on a perpendicular line to the centre line of the tool.





TORQUE REACTION

This page applies to both HandTorque® multipliers and powered torque tools



*Red shading indicates ideal area for torque reaction to achieve multiplication factor better than ±4%.
It is not advised to react outside of the shaded area.*



Signs of poor reaction are evident on this damaged foot. Reaction was taken at the wrong point on the foot and burring indicates that the foot was slipping off the reaction point.

Points to remember

- Take the reaction as far away from the multiplier as practical
- Ensure that the reaction point remains square to the multiplier wherever possible as this will minimise any additional stress in the output square, which could result in premature failure. If the multiplier tilts under load, the reaction may not be square
- For applications that do not allow the reaction to be taken securely it is advisable to use a double ended or balanced reaction plate

Reaction Force

When using multipliers and PneuTorques the reaction point must be capable of withstanding the reaction force. Therefore, great care must be exercised where the reaction is taken when applying high torques to studs and bolts.

By using the following formula you can calculate the force at the point of reaction. The greater the distance the lower the force.

D = Stud Diameter

$$\text{Formula to calculate Area of Stud} = \frac{\pi \times D^2}{4}$$

$$\text{Formula to calculate shear force: Shear Force} = \frac{\text{Reaction Force}}{\text{Area of Stud}}$$

What to do if the standard reaction device is not suitable

For those applications that do not permit the use of a standard reaction plate the customer has three options.

- Norbar or an authorised Norbar distributor will design and manufacture a special purpose reaction plate to the customer's requirements
- The customer can modify the standard reaction plate to suit their requirements
- The customer can fabricate their own reaction device after liaison with Norbar's technical department or a Norbar distributor

Customers wishing to either modify the original reaction plate or fabricate their own device should read the above information on how to avoid common torque reaction problems.



HANDTORQUE® TORQUE MULTIPLIERS

What is a Torque Multiplier?

A torque multiplier is a device that increases the torque that can be applied by an operator. This is because the power output cannot exceed the power input, the number of output revolutions will be lower than the number of input revolutions (Torque x rpm = Power).

How HandTorque® Torque Multipliers Work

HandTorque® multipliers incorporate an 'epicyclic' or 'planetary' gear train having one or more stages. Each stage of gearing increases the torque applied by a factor of 5, allowing Norbar to offer multipliers typically in ratios of 5:1, 25:1 and 125:1.

In the planetary gear system, torque is applied to the input gear or 'sun' gear. Three or four planet gears whose teeth are engaged with the 'sun' gear therefore rotate. The outside casing of the multiplier, or 'annulus' is also engaged with the planet gear teeth, and would normally rotate in the opposite direction to the 'sun' gear. A reaction arm prevents the annulus from rotating, and this causes the planet gears to orbit around the 'sun'. The planet gears are held in a 'planetary' carrier which also holds the output square drive, therefore as the planet gears orbit around the sun gear, the carrier and so the square drive turns. Without the reaction arm to keep the annulus stationary, the output square will not apply torque.

Why use a HandTorque® Multiplier?

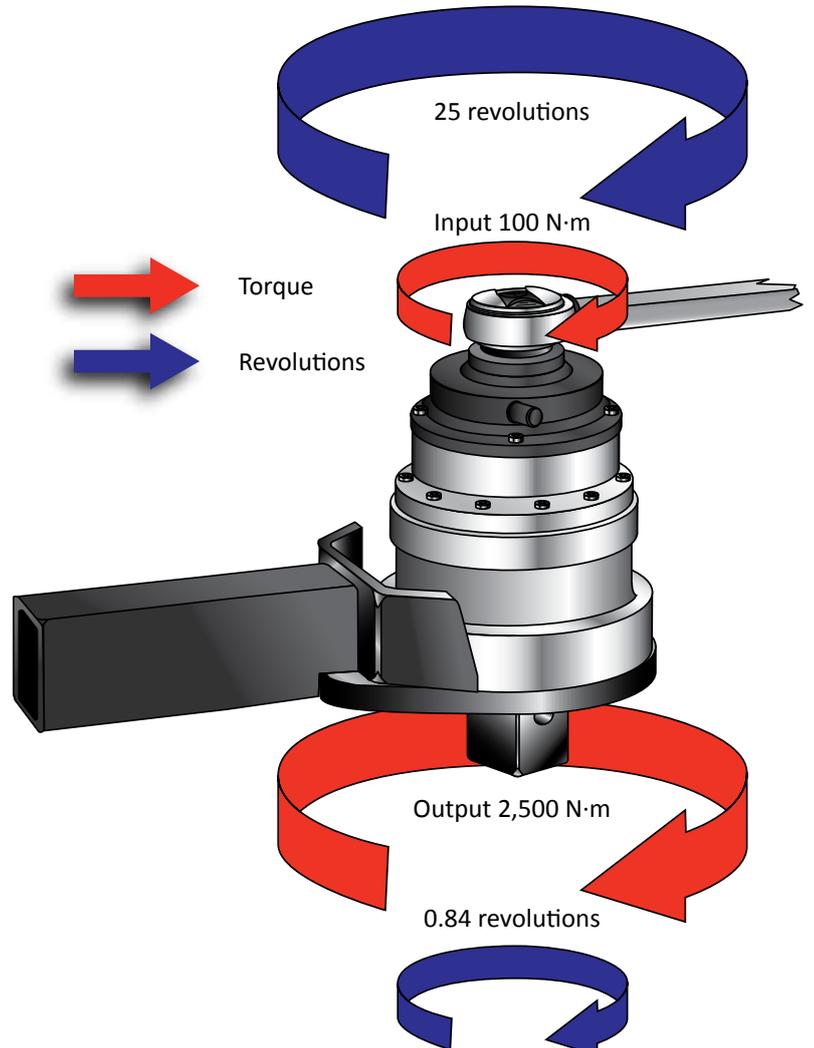
- **Safety** – use of long levers can be dangerous. Torque multipliers allow for a reduction in the lever length or operator effort by a factor of 5, 25 or 125
- **Space limitation** – the use of a long lever may be impossible due to the available space
- **Accuracy** – torque will be applied most accurately when it is applied smoothly and slowly. Torque multipliers enable this by removing much of the physical effort from the tightening task



Without a torque multiplier



With a torque multiplier





HANDTORQUE® TORQUE MULTIPLIERS

Advantages of the Norbar HandTorque® System

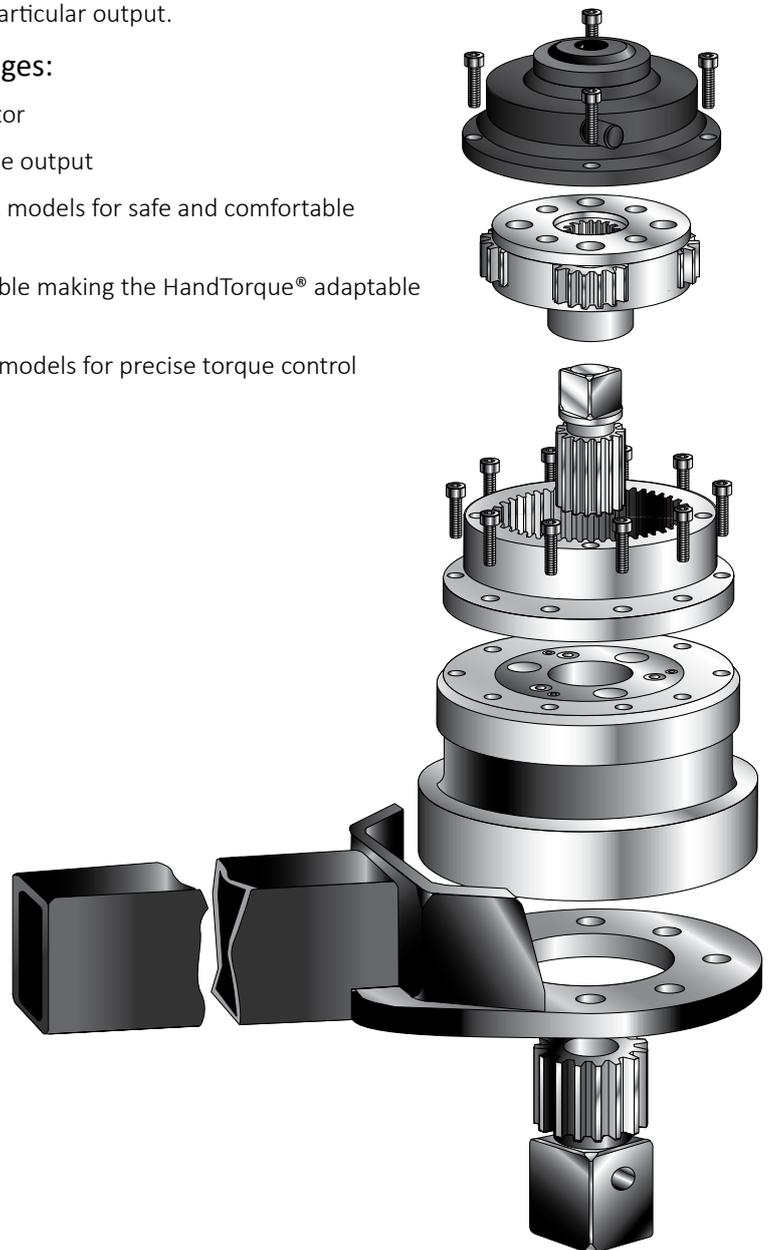
Norbar gearboxes are built to an extremely high standard of precision. All gears rotate on needle roller bearings about hardened and ground journal pins. As a result, Norbar HandTorques can be relied upon to have a torque multiplication accuracy of $\pm 4\%$ throughout the operating range, taking the uncertainty out of high torque tightening.

No gearbox is 100% efficient and so the velocity ratio (the number of turns that the input has to make to achieve one revolution of the output) is not the same as the torque multiplication ratio. Norbar multipliers are engineered such that each gear stage has a velocity ratio of typically 5.45:1 which results in a true torque multiplication factor of 5:1.

Torque output calculations are therefore a matter of simple arithmetic with little risk of incorrect bolt loading due to conversion errors. Other manufacturer's multipliers often require graphs or formulae to calculate the input torque to achieve a particular output.

Summary of Norbar torque multiplier advantages:

- The ratio stated is the true torque multiplication factor
- No correction charts are needed to determine torque output
- Strong, safe Anti Wind-Up Ratchet available on most models for safe and comfortable operation
- A wide range of alternative reaction styles are available making the HandTorque® adaptable to many applications
- Electronic torque transducers are available on most models for precise torque control





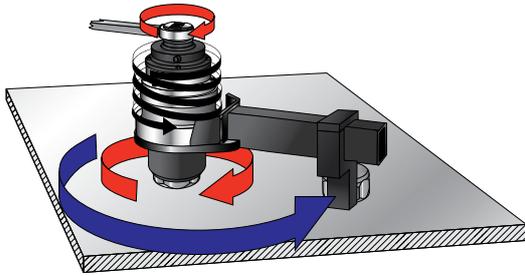
ANTI WIND-UP RATCHETS



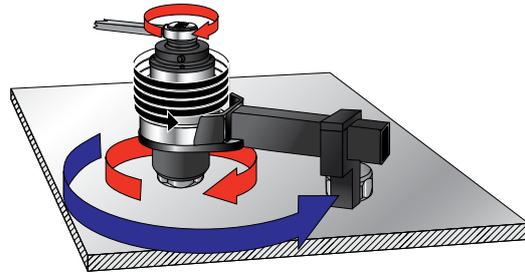
Norbar Anti Wind-Up Ratchets

Most multipliers with ratios of 25:1 and over are fitted with an anti wind-up ratchet. The multiplier can be thought of as a spring which must be fully wound before any tightening/untightening work can be applied to the bolt.

The AWUR ensures that the 'spring' stays wound and that any further torque input to the multiplier is applied directly to the bolt.



Multiplier behaves like a very stiff 'spring'

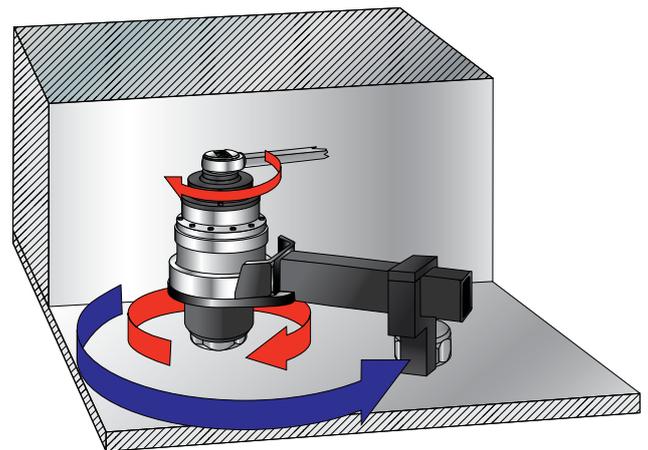


Multiplier will achieve maximum torque only after the 'spring' has been taken up



AWUR benefits include:

1. The torque input device cannot fly backwards against the direction of operation if it is suddenly released.
2. Without an Anti Wind-Up Ratchet, it will often be necessary to continue to make 360° sweeps with the torque input device otherwise the multiplier will 'unwind'. However, obstructions will often make this impossible (as demonstrated in this example).



AWUR set to counter-clockwise operation



AWUR set to neutral



AWUR set to clockwise operation



HANDTORQUE® HT3-1000



- 5:1 nominal torque multiplication reaction dependant. Ratio with cranked foot is 4.8:1; with straight reaction being 4.9:1
- ±4% torque multiplication accuracy
- Small and compact design
- Updated aesthetics with tough silver metallic powder coat
- Supplied with 2 reaction bar styles for maximum versatility
- Quick change cranked reaction with improved flexibility allowing reaction in 8 orientations
- Robust construction means minimal maintenance and long life
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)

2	HT3-1000
180260	HT3-1000, 1,000 N·m Kit, ½" input x ¾" output

HANDTORQUE® HT3 SERIES

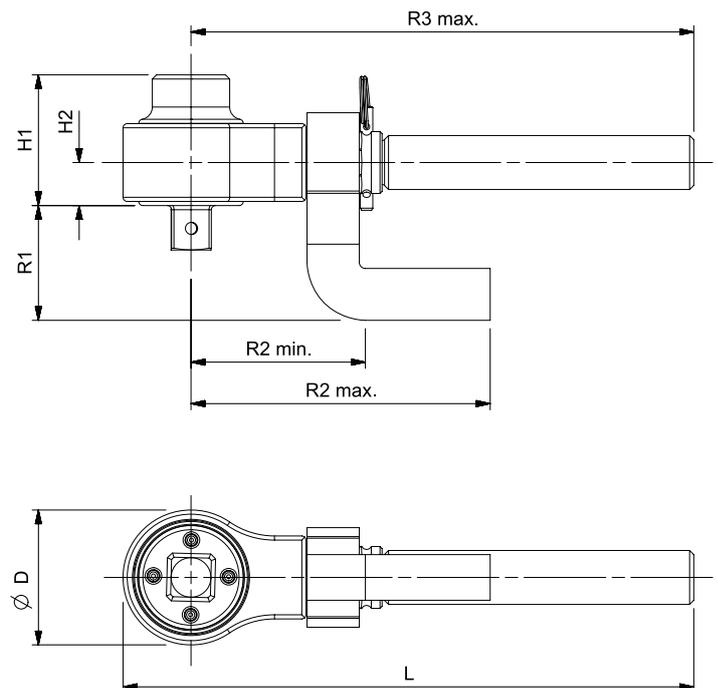


- 5:1 torque multiplication, accuracy ±4%
- Supplied with two reaction bar styles for maximum versatility
- Robust construction means minimal maintenance and long life
- Supplied in a carry case, the Highwayman is ideal for inclusion in the heavy vehicle tool kit
- 1,300 N·m version has a spare ¾" output square included in the kit
- Multiplier head only (no reaction bars or plastic box) also available
- 1,300 N·m version, part no. 17218
- 2,700 N·m version, part no. 17219
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)

2	HT3 SERIES
17220	HT3 1,300 N·m Kit, ½" input x ¾" output
17221	HT3 2,700 N·m Kit, ¾" input x 1" output

Kits are supplied in a carry case with a reaction bar and a reaction foot (17220 also contains a spare ¾" sq. dr.)

Model	HT3-1000	HT3-1300	HT3-2700
Part Number	180260	17220	17221
Multiplication Ratio	Nominal	5:1	5:1
	With Cranked Reaction	4.8:1	N/A
	With Straight Reaction	4.9:1	N/A
Dimensions (mm)	ØD	65	108
	H1	63	103
	H2	21	44
	L	273	398
	R1	55	77
	R2 min.	83	140
	R2 max.	143	212
	R3 max.	240	344
Tool Weight (kg)	2.7	3.8	3.8
Reaction Weight (kg)	Cranked	0.5	1.36
	Straight	0.7	1.1





HANDTORQUE® HT4 SERIES

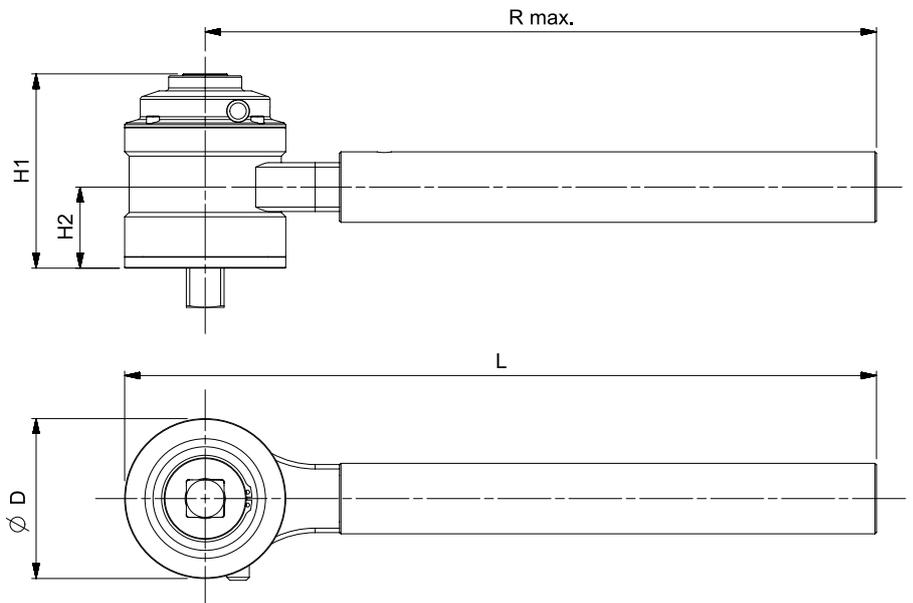


- Robust construction means minimal maintenance and long life
- True 15.5:1 (3,000 N·m) or 26:1 (4,500 N·m) torque multiplication, accuracy ±4%
- High ratios allow the use of a small torque wrench
- Supplied in carrying case with replacement square drive
- Anti Wind-Up Ratchet fitted to allow safer and more practical operation
- Angle protractor for easy torque and angle tightening
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)



4	HT4 SERIES
17022	HT4 3,000 N·m ½" in 1" out AWUR
17021	HT4 4,500 N·m ½" in 1" out AWUR

Model	HT4/15.5 AWUR	HT4/26 AWUR
Part Number	17022	17021
Multiplication Ratio	15.5:1	26:1
Dimensions (mm)	ØD	108
	H1	131
	H2	55
	L	504
	R max.	450
Tool Weight (kg)	6.1	7.0
Reaction Weight (kg)	1.9	1.9



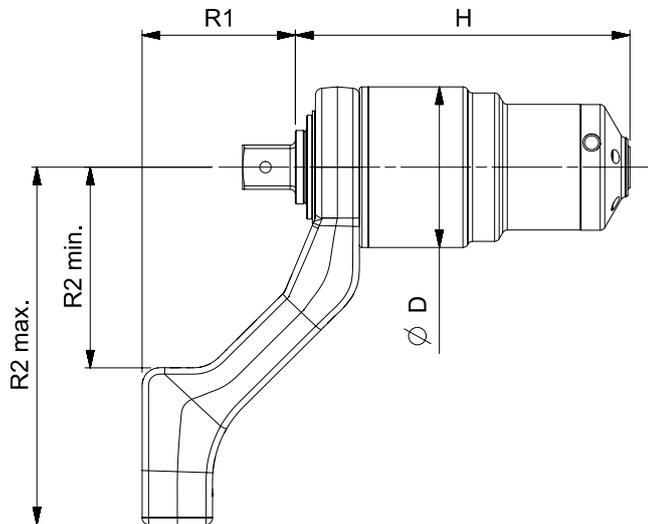


HANDTORQUE® COMPACT SERIES



Sockets not included

- Compact dimensions allow excellent access to applications and easy, safe handling
- Lightweight for torque capacity
- Supplied as standard with an aluminium reaction arm (steel reactions for HT-52). Other options are available on request, including customised reactions
- Torque multiplication accuracy $\pm 4\%$
- Robust, 48 tooth Anti Wind-Up Ratchet (AWUR) contains the forces generated during tightening for safe and easy operation
- Each multiplier is supplied with its own unique calibration certificate allowing the accurate calculation of input torque for critical applications



4 COMPACT SERIES

180200	HT-52/4.7 1,000 N·m ½" in ¾" out
180201	HT-52/22.2 1,000 N·m ¾" in ¾" out
180202	HT-52/22.2 1,000 N·m ½" in ¾" out
180203	HT-52/22.2 1,000 N·m ¾" in ¾" out AWUR
180204	HT-52/22.2 1,000 N·m ½" in ¾" out AWUR
180205	HT-52/22.2 1,000 N·m ¾" in 1" out AWUR
180206	HT-52/22.2 1,000 N·m ½" in 1" out AWUR
180208	HT-72/5.2 1,500 N·m ½" in 1" out
180209	HT-72/5.2 1,000 N·m ¾" in ¾" out
180210	HT-72/5.2 2,000 N·m ¾" in 1" out
180212	HT-72/27 2,000 N·m ½" in 1" out
180214	HT-72/27 2,000 N·m ½" in 1" out AWUR
180215	HT-92/25 4,000 N·m ½" in 1" out AWUR
180216	HT-119/25.5 7,000 N·m ½" in 1½" out AWUR



11 NOSE EXTENSIONS FOR 72 SERIES

18349.006	6" long, SPM/SPF
18349.009	9" long, SPM/SPF
18349.012	12" long, SPM/SPF
18349.015	15" long, SPM/SPF
18349.018	18" long, SPM/SPF
18330.50	Telescopic Nose Assembly

Note: Square drive fitted from existing tool. SPM = Spline Male. SPF = Spline Female.

Model	HT-52/4.7	HT-52/22.2	HT52/22.2 AWUR	HT-72/5.2	HT-72/5.2	HT-72/27	HT-72/27 AWUR	HT-92/25 AWUR	HT-119/25.5 AWUR	
Part Number	180200	180201 180202	180203 180204 180205 180206	180208 180209	180210	180212	180214	180215	180216	
Multiplication Ratio	4.7:1	22.2:1	22.2:1	5.2:1	5.2:1	27:1	27:1	25:1	25.5:1	
Dimensions (mm)	ØD	52	52	72	72	72	72	92	119	
	H	91	116	130	140	135	137	154	212	
	R1	58	58	58	67	72	72	87	117	
	R2 min.	71	71	71	91	91	91	91	115	151
	R2 max.	131	131	131	166	166	166	166	205	199
Tool Weight (kg)	1.0	1.3	1.4	2.7	2.7	2.7	3.2	5.4	9.3	
Reaction Weight (kg)	0.9	0.9	0.9	0.7	0.7	0.7	0.7	1.4	2.1	



HANDTORQUE® COMPACT SERIES KITS



SpinNor included
Part No. 19253

Multiplier & Torque Wrench Kits

For convenience, it is now possible to purchase a torque multiplier from the 'Compact Series' packaged with the appropriate torque wrench, up to 4,000 N·m. This allows the operator to arrive at the bolting application with everything needed in one robust carry case. Space has also been allowed in the carry case for accessories such as sockets.

The torque multiplier is supplied with its own unique calibration certificate and the torque wrench is supplied with a Declaration of Conformance, allowing accurate calculation of input torque to the multiplier for critical applications.

- All kits include a 'SpinNor' which aids fast reaction location
- All models include an Anti Wind-up Ratchet on the multiplier

4	HT COMPACT SERIES & TORQUE WRENCH KITS
18186	HT-52 1,000 N·m ¾" out + NorTorque 60 ½" Dual Scale
18192	HT-72 2,000 N·m 1" out + NorTorque 100 ½" Dual Scale
18195	HT-92 4,000 N·m 1" out + NorTorque 200 ½" Dual Scale
19253	½" SpinNor

HANDTORQUE® STANDARD SERIES



- Torque multiplication accuracy ±4%
- High ratios allow the use of a small torque wrench, multipliers can be used where access is limited
- Anti Wind-Up Ratchet available on models of 25:1 ratio and above
- Other reaction styles can be designed to suit specific applications
- Electronic torque transducers can be fitted for precise torque monitoring, see page 95
- Other models available up to 300,000 N·m
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost) up to 6,000 N·m

4	STANDARD SERIES
16010	HT 1/5 1,700 N·m ½" in ¾" out
16012.HD	HT 2/5 1,700 N·m ¾" in 1" out
16034.HD	HT 2/25 1,700 N·m ½" in 1" out
16089.HD	HT 2/25 1,700 N·m ½" in 1" out AWUR
16014	HT 5/5 3,400 N·m ¾" in 1" out
16028	HT 5/25 3,400 N·m ½" in 1" out
16090	HT 5/25 3,400 N·m ½" in 1" out AWUR
16016	HT 6/5 3,400 N·m ¾" in 1½" out
16024	HT 6/25 3,400 N·m ½" in 1½" out
16092	HT 6/25 3,400 N·m ½" in 1½" out AWUR
16093	HT 6/125 3,400 N·m ½" in 1½" out AWUR
16067	HT 7/5 6,000 N·m ¾" in 1½" out
16018	HT 7/25 6,000 N·m ½" in 1½" out
16065	HT 7/25 6,000 N·m ½" in 1½" out AWUR
16068	HT 7/125 6,000 N·m ½" in 1½" out AWUR
16059	HT 9/25 9,500 N·m ¾" in 1½" out
16070	HT 9/25 9,500 N·m ¾" in 1½" out AWUR
16071	HT 9/125 9,500 N·m ½" in 1½" out AWUR
16082	HT 11/25 20,000 N·m ¾" in 2½" out
16049	HT 11/125 20,000 N·m ½" in 2½" out AWUR
18085	HT 12/87.5 34,000 N·m ¾" in 2½" out AWUR
16053	HT 13/125 47,500 N·m ¾" in 2½" out AWUR

Other gear ratios may be available upon request.
If AWUR is not required please enquire for part number.
HT 13/125 fitted with weld prepared reaction ring as standard.
AWUR = Anti Wind-Up Ratchet. See page 45

For spares kits for Norbar multipliers, please see page 126.

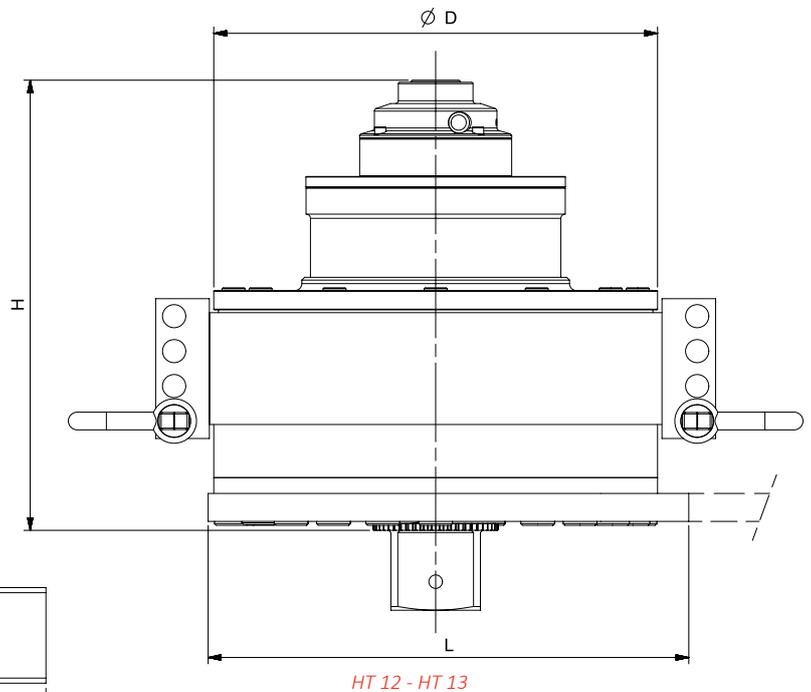
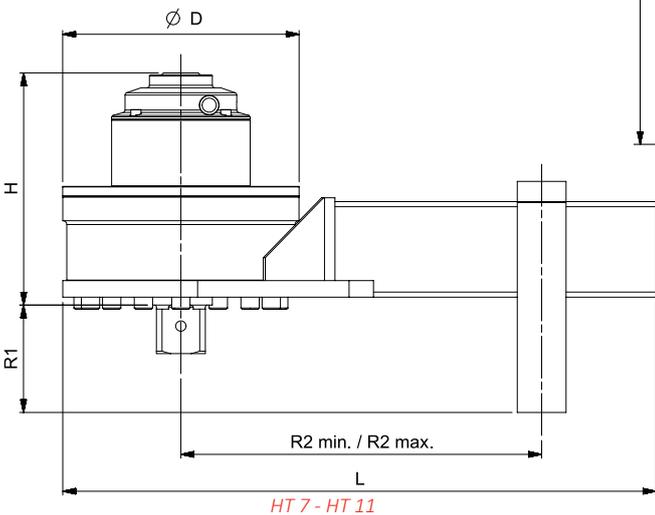
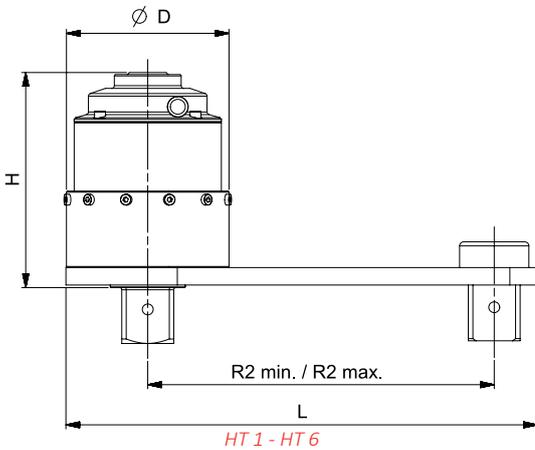


HANDTORQUE® STANDARD SERIES



Model	HT 1/5	HT 2/5	HT 2/25	HT 2/25 AWUR	HT 5/5	HT 5/25	HT 5/25 AWUR	HT 6/5	HT 6/25	HT 6/25 AWUR	HT 6/125 AWUR
Part Number	16010	16012.HD	16034.HD	16089.HD	16014	16028	16090	16016	16024	16092	16093
Multiplication Ratio	5:1	5:1	25:1	25:1	5:1	25:1	25:1	5:1	25:1	25:1	125:1
Dimensions (mm)	ØD	108	108	108	108	119	119	119	119	119	119
	H	83	98	98	114	106	127	106	128	134	159
	L	303	303	303	303	355	355	355	355	355	355
	R1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2 min.	83	83	83	83	86	86	86	86	86	86
	R2 max.	216	216	216	216	263	263	263	263	263	263
Tool Weight (kg)	3.0	3.2	4.6	6.7	4.7	6.4	7.5	4.7	6.4	7.5	9.0
Reaction Weight (kg)	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Model	HT 7/5	HT 7/25	HT 7/25 AWUR	HT 7/125 AWUR	HT 9/25	HT 9/25 AWUR	HT 9/125 AWUR	HT 11/25	HT 11/125 AWUR	HT 12/87.5 AWUR	HT 13/125 AWUR
Part Number	16067	16018	16065	16068	16059	16070	16071	16082	16049	18085	16053
Multiplication Ratio	5:1	25:1	25:1	125:1	25:1	25:1	125:1	25:1	125:1	87.5:1	125:1
Dimensions (mm)	ØD	144	144	144	184	184	184	212	212	248	315
	H	136	157	162	188	166	162	182	208	235	281
	L	423	423	423	423	448	448	448	609	609	325
	R1	84	84	84	84	84	84	84	N/A	N/A	N/A
	R2 min.	150	150	150	150	175	175	175	320	320	N/A
	R2 max.	331	331	331	331	351	351	351	500	500	N/A
Tool Weight (kg)	8.1	9.6	10.7	12.2	16.3	17.4	18.9	31.7	32.1	41.5	95.2
Reaction Weight (kg)	6.3	6.3	6.3	6.3	8.3	8.3	8.3	13.3	13.3	6.5	6.9

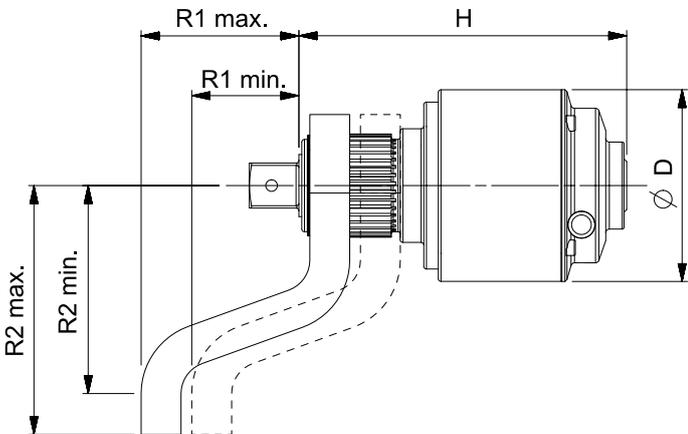




HANDTORQUE® SMALL DIAMETER SERIES



- HandTorque® models HT 30 and 60 have a higher torque output for a given gearbox diameter than the Standard Series
- Reduced diameter enables better access, particularly on pipe flanges
- Reaction taken from high strength spline
- Reaction foot can slide on the spline to allow sockets of various lengths
- Anti Wind-Up Ratchet available on all models (except 5:1 ratios), allowing safer and more practical operation
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)



4	SMALL DIAMETER SERIES
18003	HT 30/5 3,000 N·m ¾" in 1" out
18004	HT 30/15 3,000 N·m ½" in 1" out AWUR
18006	HT 30/25 3,000 N·m ½" in 1" out AWUR
18009	HT 60/25 6,000 N·m ½" in 1½" out
18008	HT 60/25 6,000 N·m ½" in 1½" out AWUR
18013	HT 60/125 6,000 N·m ½" in 1½" out

HT 30s and 60s are supplied with a cranked reaction foot. Most small diameter gearboxes are available without AWUR. Please enquire for part numbers.

Model	HT 30/5	HT 30/15 AWUR	HT 30/25 AWUR	HT 60/25	HT 60/25 AWUR	HT 60/125
Part Number	18003	18004	18006	18009	18008	18013
Multiplication Ratio	5:1	15:1	25:1	25:1	25:1	125:1
Dimensions (mm)	∅D	108	108	119	119	119
	H	164	183	183	212	240
	R1 min.	60	60	60	94	94
	R1 max.	88	88	88	119	119
	R2 min.	117	117	117	146	146
	R2 max.	140	140	140	174	174
Tool Weight (kg)	5.0	7.0	7.0	9.5	10.6	11.0
Reaction Weight (kg)	2.0	2.0	2.0	4.0	4.0	4.0

UKAS ACCREDITED CALIBRATION CERTIFICATION

The part numbers shown below are for 'As Found', for new manual torque multiplying gearboxes up to the maximum capacity shown.

12	ONE DIRECTION
HTCC2.CW	Up to 6,000 N·m / 5,000 lbf-ft
12	TWO DIRECTIONS
HTCC2.CW+CCW	Up to 6,000 N·m / 5,000 lbf-ft





POWERED TORQUE TOOLS

Electronic Tools

The EvoTorque® is an electronic torque tool designed for applying torque to threaded fasteners. The unique 'Intelligent Joint Sensing' technology will accurately tighten to the correct torque without the risk of excess overshoot or undershoot that is common in other electric tools.

EvoTorque® utilises patented motor technology to give unprecedented joint control from hard through to soft joints.

Pneumatic Tools

PneuTorque® operation is quiet - less than 85 dB(A) with absolutely no impacting. These two factors make PneuTorques comfortable for the operator to use, reducing fatigue and consequently increasing safety.

PneuTorques provide accurate torque control - on a given joint they will stall repeatably to within $\pm 5\%$. Using electronic shut off, this repeatability can be improved to $\pm 2\%$.

The PneuTorque® consists of a robust air motor driving a Norbar multiplier with three or more stages of epicyclic gearing.

Torque control is achieved by adjustment of the air pressure. An air pressure versus torque graph and a calibration certificate is supplied with each tool and allows specific torque values to be set. For more critical applications PneuTorques can be fitted with a torque transducer and the precise torque output displayed. The tool can then be shut off at the desired torque either manually or automatically using suitable control circuitry. Models are available up to 300,000 N·m (220,000 lbf·ft).

EvoTorque®2	53
EvoTorque® Battery Tool (EBT)	57
Pneumatic Torque Tools	59
PneuTorque® PTS™ Series	61
PneuTorque® PTS™ Remote	63
PneuTorque® PTM Series	64
PneuTorque® PTME-72 Series	67
ET, PTS™, PTM Nose Extensions	68
Optional Reaction Plates	69
PTS™ and PTM Dual Trigger Module	71
Secondary Handle	71
Right Angle Gearbox	72
PneuTorque® Standard Series	75
PneuTorque® Standard Series - Optional Accessories	78
Lubro Control Units	78
Tool Controllers	79





EVOTORQUE®2



The EvoTorque®2 is an electronic torque tool designed to accurately apply torque to threaded fasteners. Tools are factory calibrated to $\pm 3\%$ of reading. The unique 'intelligent joint sensing' technology continually measures the joint during tightening and when necessary, employs dynamic braking to avoid torque over-shoot due to motor inertia. Consequently, EvoTorque®2 can apply torque accurately over a wide range of joint rates from hard (high torque rate) through to soft (low torque rate). All EvoTorque®2 tools are highly tolerant of supply voltage and frequency variation. If the supply voltage is outside of tolerance then, as a safety feature, the tool will be prevented from starting.

The EvoTorque®2 has the ability to memorise multiple targets, work IDs, user IDs and readings. A work sequence (flow) can be performed on the EvoTorque®2, taking the user through a pre-defined tightening sequence. The tool has four modes of operation: Torque, Torque & Angle, Torque & Angle with Final Torque and Torque Audit. The unique Audit Mode is a sophisticated feature for testing pre-tightened bolts with minimal impact on the original fastening torque and can provide quality control data for monitoring joint performance over time. EvoTorque®2 builds on the original tool with these additional features:

- Multiple units of torque measurement, N-m, lbf-ft, ft-lb and kgf-m
- Calibrated from 20% to 100% of tool range
- Torque, Torque & Angle and Torque Audit modes available
- In Torque & Angle Mode and Audit Mode, torque can be set from 10% of tool maximum
- Display and on-board storage of final torque or torque and angle values
- Memory capacity for 3,000 readings, time and date stamped
- Clear indication of successful joint application
- USB and Bluetooth® 4.0 data transfer (also called Bluetooth® Smart)
- Complimentary PC software 'EvoLog' for data management and tool configuration
- 12 user IDs can be downloaded to the tool and results can be stored against individual users
- 20 unique stand-alone targets plus 20 unique work group targets for each work group
- Results can be output in CSV (comma-separated values) format for users not able to use EvoLog
- Ability to produce and store real time graphs via EvoLog
- Torque & Angle with Final Torque
- 'Usage' counter gives the ability to see the amount of times the tool has been used since the last reset
- 'Operation Direction' feature designed primarily for undoing bolts. When doing sequence tightening, it is now possible to undo an incorrectly tightened bolt without interrupting the sequence
- Two stage tightening gives faster application of a Snug Torque & Angle Target
- 'Turn Angle' option can be used to check if bolts have already been tightened in an assembly process
- Tool can be integrated into third party control systems
- Two different lock levels, lock level 1 as per previous lock, lock level 2 will not allow user to exit the run screen or change the target
- Maximum Audit Mode target angle of 720°



EVOTORQUE®2



Colour OLED display shows torque and angle values



Display can be powered up independently of tool for data transfer (via USB)



Built in Bluetooth® for wireless data transfer

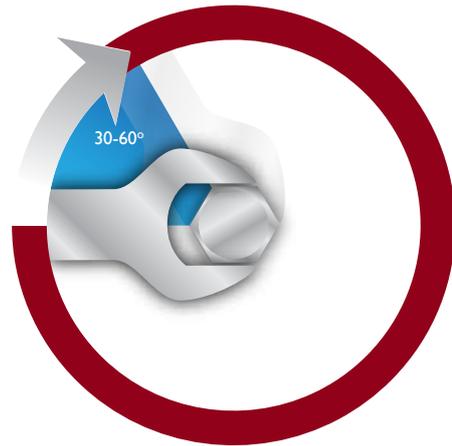


Communication between tool and PC either wirelessly using Bluetooth® 4.0 or wired using supplied USB cable

EvoTorque®2's intelligent joint sensing technology always detects which type of bolt you are working with.

Hard joints

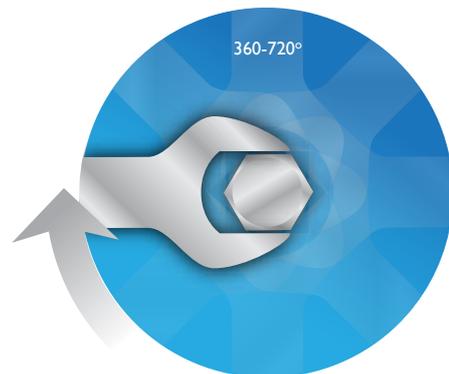
(High Torque Rate*)



Joints completed within the range 30° - 60°

Soft joints

(Low Torque Rate*)



Joints completed within the range 360° - 720°

*High torque rate and low torque rate as defined by ISO 5393 'Rotary tools for threaded fasteners- Performance test method'

The EvoTorque®2 has been designed to complete joints of 30° and above to within the tools ±3% accuracy. For joints below 30° use the tools audit mode feature.

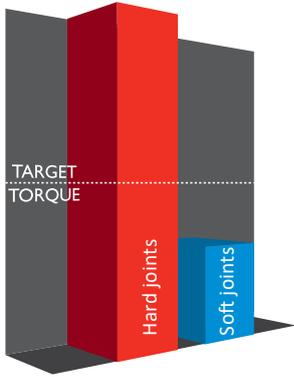


EVOTORQUE®2

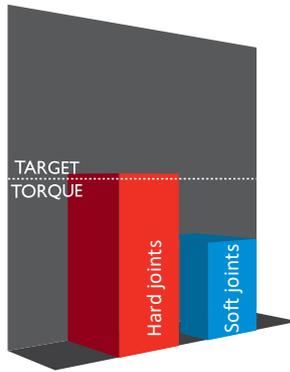


Traditional electronic torque tools give vastly different results depending on the joint type. Norbar's 'intelligent joint sensing' technology eliminates these issues so that you can be confident in your bolting work.

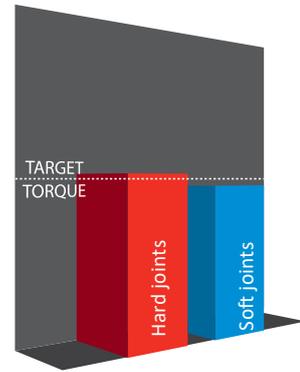
First generation



Best of present generation



New generation EvoTorque®2



ET2-72 (1000 & 1350)

ET2-72 (2000)

ET2-80 (2700)

ET2-92 (3500 & 4000)

ET2-119 (6000 & 7000)

11	EVOTORQUE 2 - 110 V
180230.B06	ET2-72-1000-110 ¾" sq. dr., 200 - 1,000 N·m
180231.B06	ET2-72-1350-110 ¾" sq. dr., 270 - 1,350 N·m
180232.B08	ET2-72-2000-110 1" sq. dr., 400 - 2,000 N·m
180239.B08	ET2-80-2700-110 1" sq. dr., 540 - 2,700 N·m
180237.B08	ET2-92-3500-110 1" sq.dr., 700 - 3,500 N·m
180238.B08	ET2-92-4000-110 1" sq. dr., 800 - 4,000 N·m
180235.B12	ET2-119-6000-110 1½" sq. dr., 1,200 - 6,000 N·m
180236.B12	ET2-119-7000-110 1½" sq. dr., 1,400 - 7,000 N·m

11	EVOTORQUE 2 - 230 V
180220.B06	ET2-72-1000-230 ¾" sq. dr., 200 - 1,000 N·m
180221.B06	ET2-72-1350-230 ¾" sq. dr., 270 - 1,350 N·m
180222.B08	ET2-72-2000-230 1" sq. dr., 400 - 2,000 N·m
180229.B08	ET2-80-2700-230 1" sq. dr., 540 - 2,700 N·m
180227.B08	ET2-92-3500-230 1" sq.dr., 700 - 3,500 N·m
180228.B08	ET2-92-4000-230 1" sq. dr., 800 - 4,000 N·m
180225.B12	ET2-119-6000-230 1½" sq. dr., 1,200 - 6,000 N·m
180226.B12	ET2-119-7000-230 1½" sq. dr., 1,400 - 7,000 N·m

The EvoTorque®2 is supplied in a cardboard box as standard, if a sturdier case is required Norbar can provide a Peli Case at an additional charge. Please add .PEL on to the end of the part number when ordering. Optional Peli Case at additional cost; part number 26969 - for tools up to and including 2,000 N·m and part number 26971 for tools 2,700 N·m and above.



Standard Box



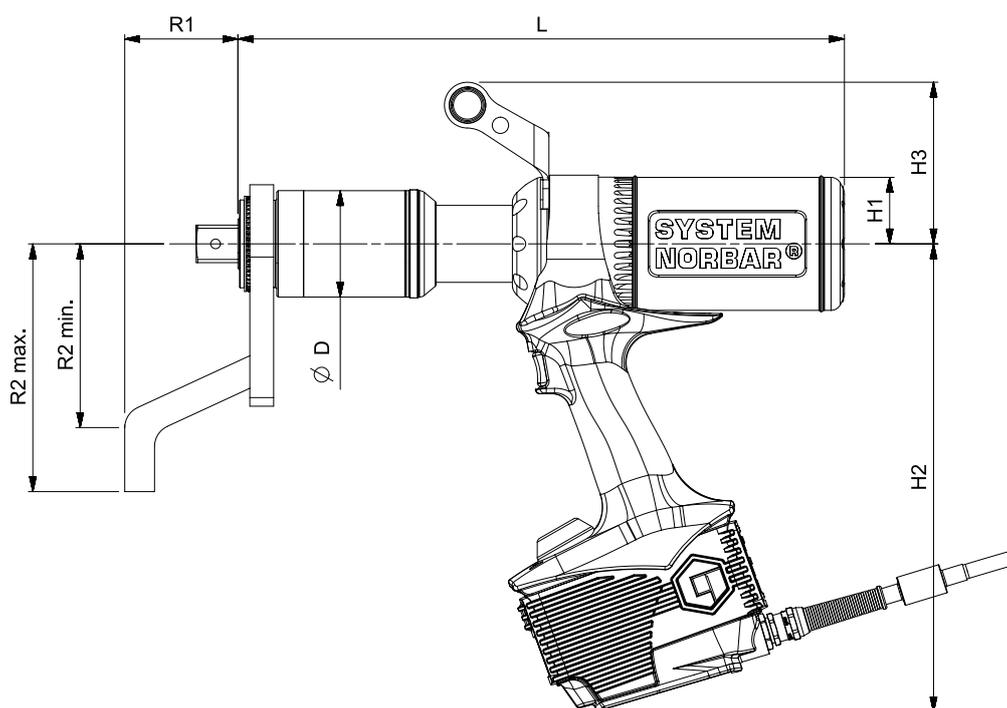
Optional Peli Case
Part No. 26969 or 26971



EVOTORQUE®2



Model	ET2-72-1000 ET2-72-1350	ET2-72-2000	ET2-80-2700	ET2-92-3500 ET2-92-4000	ET2-119-6000 ET2-119-7000	
Part Number	180230.B06 180220.B06 180231.B06 180221.B06	180232.B08 180222.B08	180239.B08 180229.B08	180237.B08 180227.B08 180238.B08 180228.B08	180235.B12 180225.B12 180236.B12 180226.B12	
Output Speed (rpm)	21 (ET-72-1000) 17 (ET-72-1350)	11	10	6	3.3	
Dimensions (mm)	ØD	72	72	80	92	119
	H1	45	45	45	45	45
	H2	317	317	317	317	317
	H3	109	109	109	109	109
	L	366	407	363	417	440
	R1	71	76	76	70	90
	R2 min.	124	124	124	125	162
	R2 max.	167	167	167	175	210
Tool Weight (kg)	10.4	10.8	10.8	12.9	16.8	
Reaction Weight (kg)	1.5	1.5	1.5	2.6	3.9	





EVOTORQUE® BATTERY TOOL (EBT)



Coming Soon



The EvoTorque® Battery Tool (EBT) features a new brushless motor, data memory and data transfer capabilities. Norbar have combined this with their respected gearboxes to deliver a range of fast, reliable, accurate battery torque tools.

Fast: EBT uses a powerful motor coupled with either a single speed or auto two speed gearbox for rapid joint completion times.

Durable: The industrial motor used by the EBT will keep going where most other battery tools will overheat.

Accurate: EBT is a transducer controlled battery powered torque tool designed for accurately applying torque to threaded fasteners. The unique 'intelligent joint sensing' technology continually measures the joint during tightening and when necessary, employs dynamic braking to avoid torque over-shoot due to motor inertia, consistently achieving highly accurate results of ±3% of setting.

- Tool is not constrained by power cable or hose improving safety, convenience and versatility
- 18V, 5.0Ah battery and efficient motor give outstanding fastening performance per charge.
- Up to 3 cold batteries can be simultaneously charged from flat in 45 minutes
- 'Safe to start' button ensures hands are safely positioned at start up
- OLED display ensures visibility in all conditions
- High powered LED to illuminate application
- Optional 'Ease of Use' functionality when in 'Torque Only' mode, minimising operator error
- Available in single speed and auto 2 speed configurations
- 'Bare' tools also available at a lower price that exclude batteries and charger. Enquire for part number and price
- Retains features from corded EvoTorque®2. Full list of features can be found on page 53



EBT display panel and dual trigger button

13	EBT-72 SERIES - SINGLE SPEED
180445	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf-ft

13	EBT-72 SERIES - AUTO TWO SPEED
180469	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf-ft

13	EBT-80 SERIES - SINGLE SPEED
180541	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf-ft

13	EBT-80 SERIES - AUTO TWO SPEED
180565	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf-ft

13	EBT-92 SERIES - SINGLE SPEED
180637	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft

13	EBT-92 SERIES - AUTO TWO SPEED
180661	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft

NOTE: N·m only and Right Angle Gearbox versions will be available soon, please contact Norbar for details.



EVOTORQUE® BATTERY TOOL (EBT)



EBT-72 Series



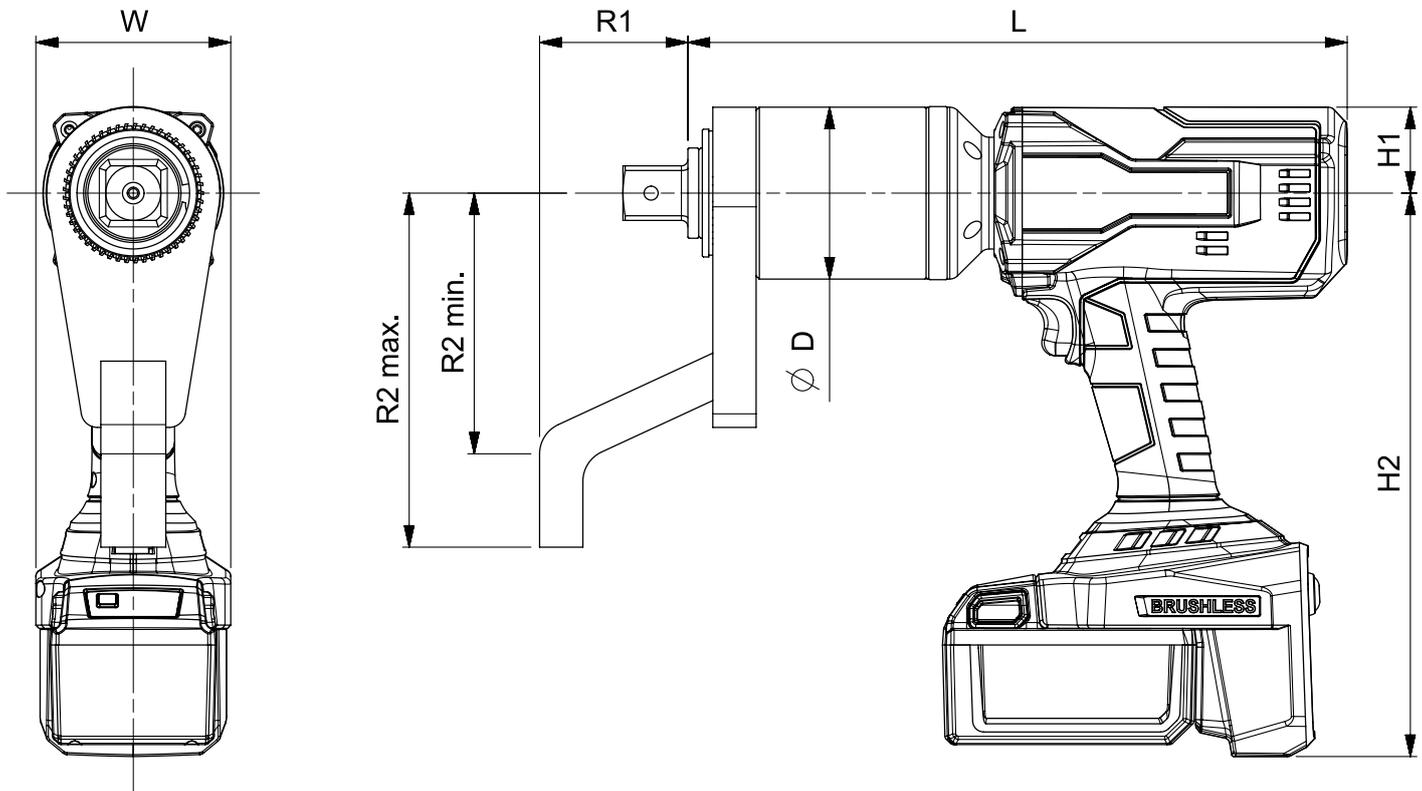
EBT-80 Series



EBT-92 Series

Model	EBT-72-1350	EBT-72-1350 Auto 2 Speed	EBT-80-2700	EBT-80-2700 Auto 2 Speed	EBT-92-4000	EBT-92-4000 Auto 2 Speed
Part Number	180445	180469	180541	180565	180637	180661
Output Speed (rpm)	6.5	32	3.3	13	2.3	9.5
Dimensions (mm)	ØD	72	80	80	92	92
	H1	40	40	40	40	40
	H2	262	262	262	262	262
	L	298	317	298	333	352
	R1	76	76	76	76	70
	R2 min.	124	124	124	124	125
	R2 max.	167	167	167	167	175
	W	90	90	90	90	90
Tool Weight (kg)*	5.7	6.2	5.9	6.5	7.9	8.5
Reaction Weight (kg)	1.4	1.4	1.4	1.4	2.5	2.5

* Tool weight excludes both reaction and battery. The battery weighs 0.8 kg.



NOTE: The EvoTorque® Battery Tool is currently in development and is subject to change, therefore the information provided may alter upon the launch of the product.

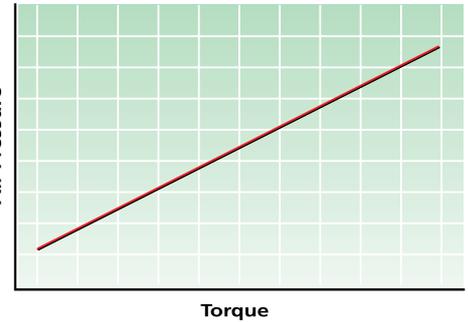


PNEUMATIC TORQUE TOOLS

What is a PneuTorque® Pneumatic Torque Tool?

The PneuTorque® consists of a robust air motor driving a Norbar multiplier with three or more stages of epicyclic gearing.

Torque control is achieved by adjustment of the air pressure. An air pressure versus torque graph and a calibration certificate is supplied with each tool and allows specific torque values to be set. For more critical applications, PneuTorques can be fitted with a torque transducer and the precise torque output displayed. The tool can then be shut off at the desired torque either manually or automatically using suitable control circuitry.



Why use PneuTorque® Pneumatic Torque Tool?

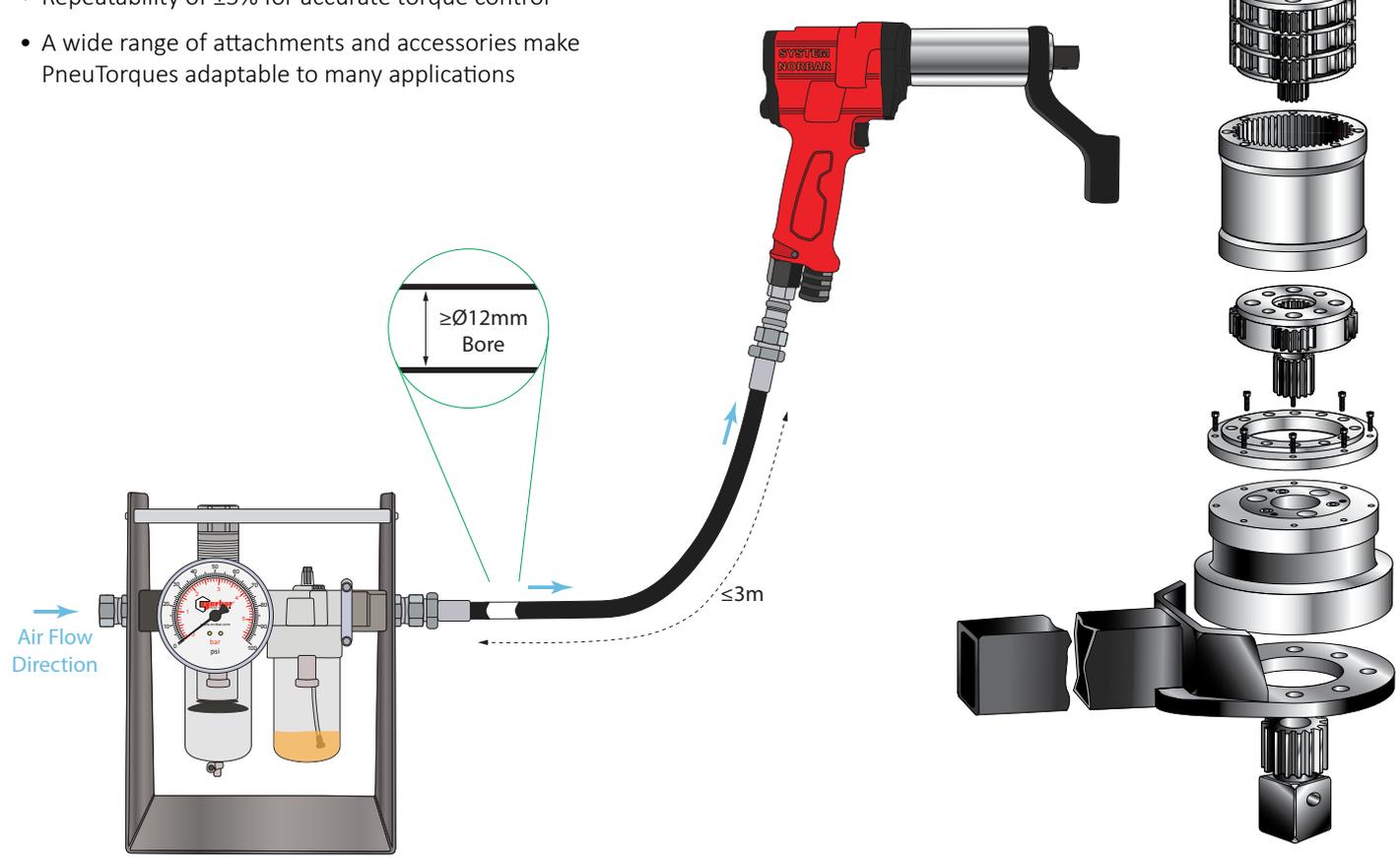
Hand operated torque multipliers are ideal for low volume or intermittent use or when there is no power source available. However, for production lines or whenever a large number of bolts is involved, a powered multiplier will save a considerable amount of time.

PneuTorque® operation is quiet – less than 85 dB(A) with absolutely no impacting. These two factors make PneuTorques comfortable for the operator to use, reducing fatigue and consequently increasing safety.

PneuTorques provide accurate torque control – on a given joint they will stall repeatedly to within ±5%. Using electronic shut off, this repeatability can be improved to ±2%.

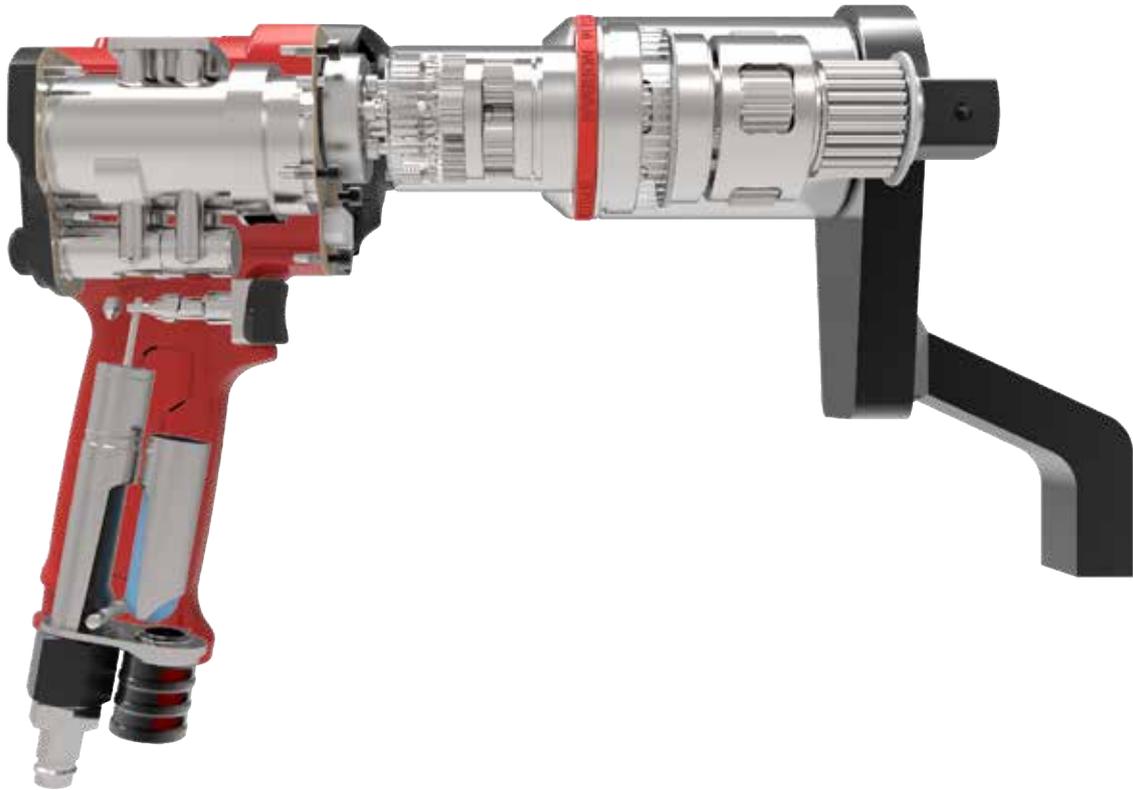
Summary of PneuTorque® Advantages:

- Sound pressure level does not exceed 85 dB(A)
- No impacting means less damage to the tool, socket and bolted assembly
- Less operator fatigue, results in increased safety
- Powerful – models available up to 300,000 N·m (220,000 lbf-ft)
- Repeatability of ±5% for accurate torque control
- A wide range of attachments and accessories make PneuTorques adaptable to many applications





PNEUMATIC TORQUE TOOLS



PneuTorque® Applications

The smooth and continuous torque output of the PneuTorque® makes these tools suitable for a wide range of bolting and non-bolting applications.

Bolting

PneuTorques are ideally suited to tightening and untightening bolts of up to 150 mm diameter. The following is just a small selection of applications:

- Wheel nuts on trucks, buses and large machinery
- Structural steelwork
- High pressure joints e.g. Pipelines, boiler feed pumps and pressure vessels
- Engine head bolts
- Injector heads on plastic injection moulding machines
- Heat exchangers
- Heavy vehicle production eg. chassis and suspension bolts

Non-bolting

Whenever a high continuous torque is needed, PneuTorques can be used as the power source. Typical applications include:

- Ball valve operation
- Powering wagons and gantries
- Barring of large diesel engines (turning the crankshaft) during build
- Weld testing by applying test torques
- Roller adjustment in steel mills and paper mills
- Valving of gas bottles





PNEUTORQUE® PTS™ SERIES



The PTS™ is the result of an extensive design project to produce an efficient air motor in an accurate torque tool. The new air motor is then married to Norbar's respected gearbox range, sharing common torque reaction accessories with PTM and EvoTorque® tools.

- Pistol grip handle for operator comfort
- Designed to offer excellent power-to-weight ratio
- Up to 2.5 kg weight saving compared with PT equivalents
- Easily accessible switch for forward and reverse operation
- ±3% repeatability of reading from 20% to 100% of range
- Air coupling designed for safety and rapid operation
- Quiet operation - The sound pressure level is 77 dB(A) [the PTS™ 4000 is 79 dB(A)]. Uncertainty K=3 dB. The sound emission values were determined according to BS EN ISO 11148-6
- Directional exhaust barrel directs exhaust away from operator
- Replaceable square drive
- Fast operation for rapid bolt rundown. Up to 60% faster than the previous PT model
- Non-impacting - exceptionally low vibration levels (0.343 m/s²), make these tools comfortable and safe for operator use.
- Steel reactions supplied as standard. Bespoke reactions available upon request

11	PTS-52 SERIES - STALL TOOLS - BI-DIRECTIONAL
180241.B06	¾" sq. dr., 100 - 500 N·m, 74 - 370 lbf·ft
180242.B06	¾" sq. dr., 160 - 800 N·m, 118 - 590 lbf·ft

11	PTS-72 SERIES - STALL TOOLS - BI-DIRECTIONAL
180243.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180244.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180245.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft

11	PTS-80 SERIES - STALL TOOLS - BI-DIRECTIONAL
180246.B08	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft

11	PTS-92 SERIES - STALL TOOLS - BI-DIRECTIONAL
180250.B08	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180250.B12	1½" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft

11	PTS-119 SERIES - STALL TOOLS - BI-DIRECTIONAL
180248.B12	1½" sq. dr., 1,200 - 6,000 N·m, 885 - 4,425 lbf·ft
180249.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft





PNEUTORQUE® PTS™ SERIES



PTS™-52



PTS™-72



PTS™-80

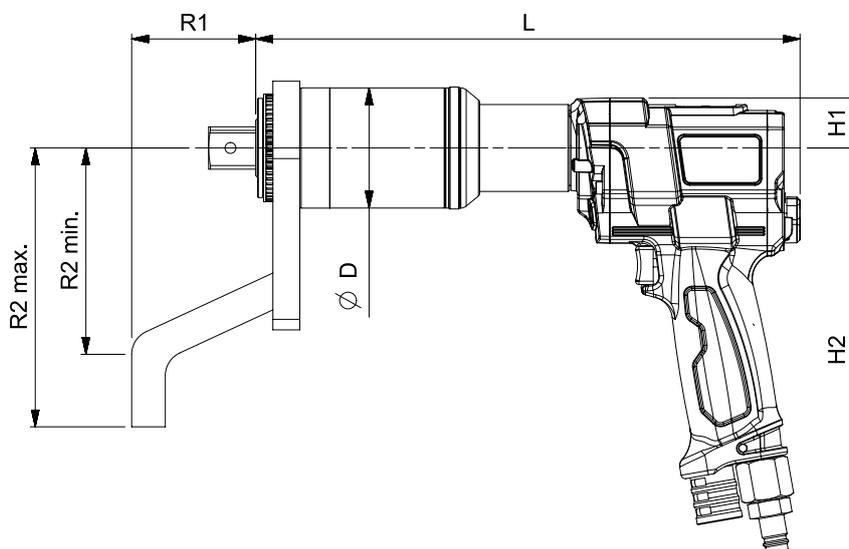


PTS™-92



PTS™-119

Model	PTS-52-500 PTS-52-800	PTS-72-1000 PTS-72-1350	PTS-72-2000	PTS-80-2700	PTS-92-4000	PTS-119-6000 PTS-119-7000	
Part Number	180241.B06 180242.B06	180243.B06 180244.B08	180245.B08	180246.B08	180250.B08 180250.B12	180248.B12 180249.B12	
Output Speed (rpm)	35.5 (PTS-52-500) 25.7 (PTS-52-800)	20.4 (PTS-72-1000) 14.7 (PTS-72-1350)	9.2	7.3	5.3	2.6	
Dimensions (mm)	∅D	52	72	72	80	92	119
	H1	30	30	30	30	30	30
	H2	243	243	243	243	243	243
	L	263	290	324	290	347	369
	R1	59	76	76	76	70	90
	R2 min.	71	124	124	124	125	162
	R2 max.	131	167	167	167	175	210
Tool Weight (kg)	4.2	6.2	6.6	6.2	9.0	12.5	
Reaction Weight (kg)	0.9	1.4	1.4	1.4	2.5	3.8	





PNEUTORQUE® PTS™ REMOTE SERIES



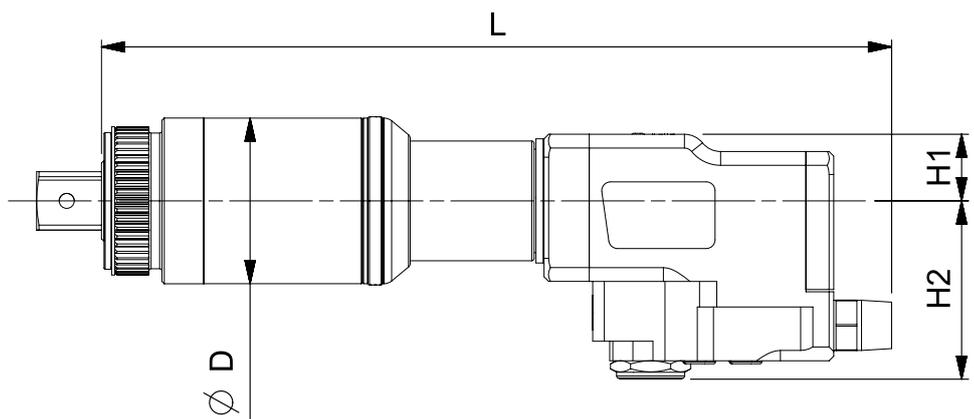
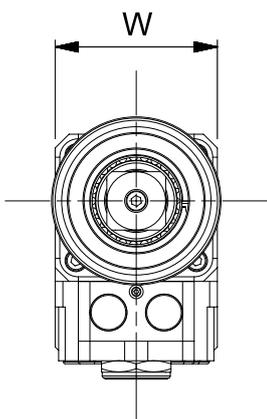
Remote control versions have no direction control on the tool but rely on external pneumatic circuitry to provide this function. This opens up numerous application possibilities for the PneuTorque® ranging from simple stall shut-off in a hazardous working environment to sophisticated, multi-spindle torque and angle shut-off systems.

- Designed to offer excellent power-to-weight ratio
- ±3% repeatability of reading from 20% to 100% of range
- Replaceable square drive

NOTE: For full versatility, PTS™ Remotes are supplied without reaction see pages 69 - 70 for options or discuss bespoke engineered options with Norbar.

11	PTS REMOTE SERIES
180271.B06	¾" sq. dr., 100 - 500 N·m, 74 - 370 lbf-ft
180272.B06	¾" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft
180273.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft
180274.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft
180275.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft
180276.B08	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf-ft
180295.B08	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft
180295.B12	1½" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft
180279.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf-ft

Model	PTS REMOTE 52-500	PTS REMOTE 52-800	PTS REMOTE 72-1000	PTS REMOTE 72-1350	PTS REMOTE 72-2000	PTS REMOTE 80-2700	PTS REMOTE 92-4000	PTS REMOTE 92-4000	PTS REMOTE 119-7000	
Part Number	180271.B06	180272.B06	180273.B06	180274.B08	180275.B08	180276.B08	180295.B08	180295.B12	180279.B12	
Output Speed (rpm)	27.8	20.1	16	11.5	7.2	5.7	4.1	4.1	2	
Dimensions (mm)	∅D	52	52	72	72	72	80	92	119	
	H1	29	29	29	29	29	29	29	29	
	H2	78	78	78	78	78	78	78	78	
	L	284	284	311	311	344	311	362	362	385
	W	70	70	70	70	70	70	70	70	70
Tool Weight (kg)	4.1	4.1	6.1	6.1	6.5	6.1	8.9	8.9	12.4	

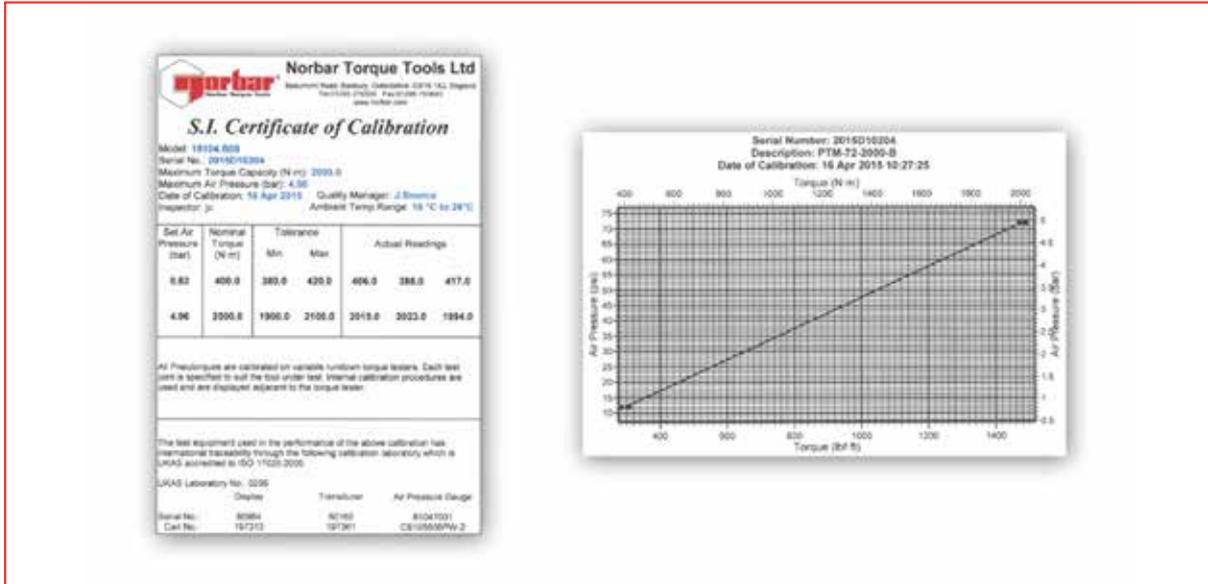




PNEUTORQUE® PTM SERIES



Using twin motor technology, the PTM series of PneuTorques is engineered to be amongst the lightest and fastest on the market. For example, the 800 N·m version has a gearbox diameter of just 52 mm, allowing excellent bolt access, and has a maximum free running speed of 224 rpm. Torque control is normally achieved by adjustment of air pressure. An air pressure versus torque graph and a calibration certificate is supplied with each tool.



PTM-52, PTM-72 and PTME-72 also offer the option of electronic torque control in two versions. Both versions incorporate a torque transducer on the output of the tool. Internal Control (IC) tools have a torque display, user interface and a solenoid valve to shut-off the air supply at a pre-determined torque. External Control (EC) tools incorporate a solenoid valve and three coloured LEDs for the indication of low, within tolerance or high results. However, all control functions and torque display are housed in an external controller unit (purchased separately). External controllers can give a much greater range of functionality than is possible on the IC version of the tools.

- Exceptionally compact 52 mm and 72 mm gearboxes result in light, well balanced tools
- Fitted with a light robust aluminium reaction plate as standard
- Other reaction plates are available for maximum versatility
- Quiet - less than 83 dB(A) when free running
- Fast operation for rapid bolt run-down
- ±5% repeatability of reading from 20% to 100% of range
- Internal Control (IC) versions incorporate torque transducer, torque setting and display panel and solenoid valve to shut off the air supply at the desired torque
- External Control (EC) versions incorporate torque transducer and output for an external controller. Ideal for production lines
- IC and EC tools have an accuracy of ±2%



Internal Control (IC) Panel



External Control (EC) Panel



PNEUTORQUE® PTM SERIES



11	PTM-52 SERIES - STALL TOOLS - BI-DIRECTIONAL*
18100.B06	3/4" sq. dr., 100 - 500 N·m, 74 - 370 lbf-ft
18101.B06	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft
*Comes supplied in a carry case.	
Stall tools are also available as forward only tools, replace B with F when ordering.	

11	PTM-72 SERIES - STALL TOOLS - BI-DIRECTIONAL*
18102.B06	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft
18103.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft
18104.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft
*Comes supplied in a carry case.	
Stall tools are also available as forward only tools, replace B with F when ordering.	

11	PTM-52 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - INTERNAL
18110.B06	3/4" sq. dr., 100 - 500 N·m, 74 - 370 lbf-ft (IC)
18111.B06	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft (IC)

11	PTM-72 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - INTERNAL
18112.B06	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft (IC)
18113.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft(IC)
18114.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft(IC)

11	PTM-52 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - EXTERNAL (Requires Tool Controller, see page 79)
18120.B06	3/4" sq. dr., 100 - 500 N·m, 74 - 370 lbf-ft (EC)
18121.B06	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft (EC)

11	PTM-72 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - EXTERNAL (Requires Tool Controller, see page 79)
18122.B06	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft (EC)
18123.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft(EC)
18124.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft(EC)

11	PTM-52 SERIES WITH ANGLE CONTROL
18125.B06	3/4" sq. dr., 100 - 500 N·m, 74 - 370 lbf-ft (IC)
18126.B06	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft (IC)
18136.B06	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf-ft (EC)
All the above are supplied with a 3/4" square drive (Part No. 18544).	

11	PTM-72 SERIES WITH ANGLE CONTROL
18127.B06	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft (IC)
18128.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft(IC)
18129.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft(IC)
18138.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf-ft(EC)

11	ACCESSORIES
18545	1" square drive for above tools



PTM-52 with Internal Control (IC) Panel





PNEUTORQUE® PTM SERIES



The PTM-80, PTM-92 and PTM-119 tools bring the speed advantage of the twin motor handle to higher capacity PneuTorque® models. These models deliver an ideal balance between robustness, speed and weight.

11 PTM-80 SERIES - STALL TOOLS - BI-DIRECTIONAL

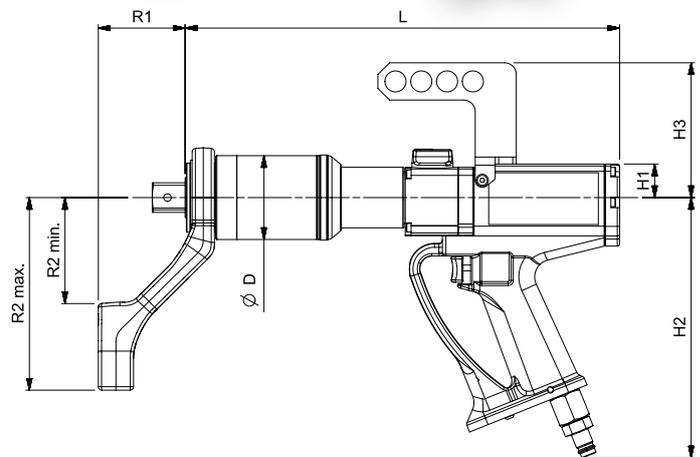
180296.B08 1" sq. dr., 540 - 2,700 N·m, 400 - 2,000 lbf·ft
Also available as forward only tools, replace B with F when ordering. Stall tools are supplied in a carry case.

11 PTM-92 SERIES - STALL TOOLS - BI-DIRECTIONAL

18159.B08 1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
18159.B12 1½" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
Also available as forward only tools, replace B with F when ordering. Stall tools are supplied in a carry case.

11 PTM-119 SERIES - STALL TOOLS - BI-DIRECTIONAL

18108.B12 1½" sq. dr., 900 - 4,500 N·m, 660 - 3,300 lbf·ft
18109.B12 1½" sq. dr., 1,200 - 6,000 N·m, 885 - 4,425 lbf·ft
Also available as forward only tools, replace B with F when ordering. Stall tools are supplied in a carry case.



Model	PTM-52-500-B PTM-52-800-B	PTM-72-1000-B PTM-72-1350-B	PTM-72-2000-B	PTM-80-2700-B	PTM-92-4000-B	PTM-119-4500-B PTM-119-6000-B	
Part Number	18100.B06 18101.B06	18102.B06 18103.B08	18104.B08	180296.B08	18159.B08 18159.B12	18108.B12 18109.B12	
Output Speed (rpm)	224 (PTM-52-500-B) 148 (PTM-52-800-B)	122 (PTM-72-1000-B) 86 (PTM-72-1350-B)	58	40	32	23 (PTM-119-4500-B) 15.5 (PTM-119-6000-B)	
Dimensions (mm)	ØD	52	72	72	80	92	119
	H1	29	29	29	29	29	29
	H2	224	224	224	224	224	224
	H3	116	116	116	116	116	116
	L	310	342	371	335	394	415
	R1	59	68	74	80	87	118
	R2 min.	71	91	91	91	115	150
R2 max.	131	165	165	165	205	199	
Tool Weight (kg)	4.1	6.1	6.5	7.5	8.5	13.3	
Reaction Weight (kg)	0.9	0.7	0.7	1.4	1.4	2.2	



PNEUTORQUE® PTME-72 SERIES



Designed to meet the needs of the commercial vehicle market, the integrated reaction foot of the PTME-72 series of tools reaches recessed wheel bolts whilst the 72 mm diameter gearbox handles the high frequency of use demanded by busy tyre shops.

- IC and EC tools have an accuracy of ±2%



11 PTME-72 SERIES - STALL TOOLS - BI-DIRECTIONAL*

18140.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft
18149.B08	1" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft
18141.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft

*Comes supplied in a carry case.

Stall tools are also available as forward only tools, replace B with F when ordering.

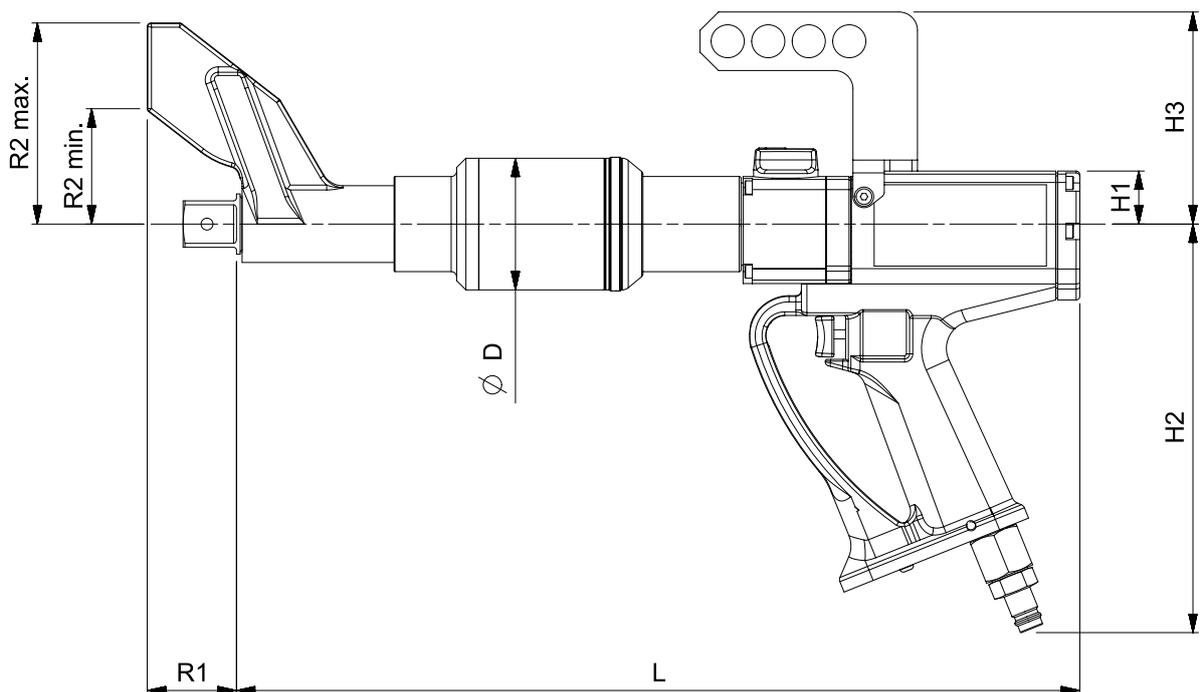
11 PTME-72 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - INTERNAL

18142.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft (IC)
18143.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft(IC)

11 PTME-72 SERIES - SHUT-OFF TOOLS - BI-DIRECTIONAL - EXTERNAL (Requires Tool Controller, see page 79)

18144.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf-ft (EC)
18145.B08	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft(EC)

Model	PTME-72-1000-B	PTME-72-2000-B
Part Number	18140.B06 18149.B08	18141.B08
Output Speed (rpm)	122	58
Dimensions (mm)	ØD	72
	H1	29
	H2	224
	H3	116
	L	403
	R1	81
	R2 min.	63
	R2 max.	110
Tool Weight (kg)	7.2	7.7





ET, ET2, EBT, PTS™ AND PTM NOSE EXTENSIONS

Special nose extension reaction devices are available for use in situations where the tool access is restricted. A typical application is the rear wheel nuts on heavy vehicles.



11	NOSE EXTENSIONS FOR 52 SERIES
18601.006	6" long, F/M 3/4" sq. dr.
18601.009	9" long, F/M 3/4" sq. dr.
18601.012	12" long, F/M 3/4" sq. dr.

11	NOSE EXTENSIONS FOR 72 SERIES
19007.006	6" long, SPM/M 1" sq. dr.
19007.009	9" long, SPM/M 1" sq. dr.
19007.012	12" long, SPM/M 1" sq. dr.
18755.006	6" long SPM/M 1" sq. dr. for pre May 2009 PTM-72
18755.009	9" long SPM/M 1" sq. dr. for pre May 2009 PTM-72
18755.012	12" long SPM/M 1" sq. dr. for pre May 2009 PTM-72

SPM/M = Spline Male/Male Square



11	SPLINED NOSE EXTENSIONS FOR 52 SERIES
19045.006	6" long
19045.009	9" long
19045.012	12" long

11	SPLINED NOSE EXTENSIONS FOR 72 SERIES 3/4" DRIVE
19046.006	6" long, 3/4" sq. dr.
19046.009	9" long, 3/4" sq. dr.
19046.012	12" long, 3/4" sq. dr.

11	SPLINED NOSE EXTENSIONS FOR 72/92 SERIES 1" DRIVE
19285.006	ET/ET2/EBT/PTS/PTM-72 6" long, 1" sq. dr.
19285.009	ET/ET2/EBT/PTS/PTM-72 9" long, 1" sq. dr.
19285.012	ET/ET2/EBT/PTS/PTM-72 12" long, 1" sq. dr.
19047.006	ET/ET2/EBT/PTS/PTM-92 6" long, 1" sq. dr.
19047.009	ET/ET2/EBT/PTS/PTM-92 9" long, 1" sq. dr.
19047.012	ET/ET2/EBT/PTS/PTM-92 12" long, 1" sq. dr.



The TrukTorque™ nose extension features a special curved reaction arm designed to handle bolt tightening on the front and rear wheels of trucks and buses. The design easily accommodates wheel trims and deeply recessed wheel bolts.

11	NOSE EXTENSIONS FOR TRUCK AND BUS WHEELS (Fits PTM-72)
19087.009	1,000 N·m, 9" long, 3/4" sq. dr
19087.012	1,000 N·m, 12" long, 3/4" sq. dr
19089.009	1,000 N·m, 9" long, 1" sq. dr
19089.012	1,000 N·m, 12" long, 1" sq. dr



OPTIONAL REACTION PLATES

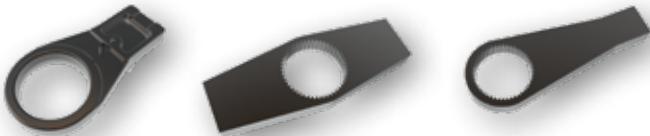
A variety of steel reaction plates and adaptors, together with ancillary feet, blades and heads to aid their use are available for HandTorque®, EvoTorque®, EvoTorque® Battery Tool and PneuTorque®.

11 FOR HT/PTS/PTM-52 SERIES	
18590	Double Sided Reaction Plate
18576	Straight Reaction Plate
18558	Reaction Adaptor
19186	Spline Adaptor from 52 mm to 72 mm
62236	Reaction Plate Spline Adaptor



Reaction Adaptors
(18290 & 18558)

11 FOR HT/ET/EBT/PTS/PTM-72 SERIES	
18293	Double Sided Reaction Plate
18292	Straight Reaction Plate
18290	Reaction Adaptor



Double Sided Reaction Plate (18293)
Straight Reaction Plate (18292)
Reaction Adaptor (18290)

11 FOR ET/EBT/PTS/PTM-92 SERIES	
18979	Straight Reaction Plate
18980	Double Sided Straight Reaction Plate

11 FOR ET/EBT/PTM-119 SERIES	
16687	Straight Reaction Plate
18981	Double Sided Straight Reaction Plate



Straight Reaction with Peg (18298)
Short Reaction Foot (18241)
Straight Reaction (18291)

11 ANCILLARY ITEMS FOR USE WITH 18290 OR 18558	
18298	Straight Reaction with Peg
18291	Straight Reaction
18241	Short Reaction Foot
18358	Sliding Reaction Blade (to be used with 18291)
18359	Sliding Reaction Spigot Head (to be used with 18291)



Reaction Weld Ring

11 REACTION WELD RINGS	
18694	For HT/PTS/PTM-52
18695	For HT/ET/EBT/PTS/PTM-72
18696	For HT/ET/EBT/PTS/PTM-92
18697	For HT/ET/EBT/PTS/PTM-119



Light Weight Reaction (19214)

11 LIGHT WEIGHT REACTIONS	
19214	ET/EBT/PT/PTS/PTM-72 API Class 4 Light Weight Reaction

11 SLIDING REACTIONS	
180300.052.B06	52 mm diameter Sliding Reaction 3/4" SQ.
180300.072.B06	72 mm diameter Sliding Reaction 3/4" SQ.
180300.072.B08	72 mm diameter Sliding Reaction 1" SQ.
180300.080.B08	80 mm diameter Sliding Reaction 1" SQ.
180300.092.B08	92 mm diameter Sliding Reaction 1" SQ.
180300.092.B12	92 mm diameter Sliding Reaction 1 1/2" SQ.
180300.119.B12	119 mm diameter Sliding Reaction 1 1/2" SQ.



Sliding Reaction (180300.092.B08)



Reaction Adaptor (18290) with
Straight Reaction with Peg (18298)



OPTIONAL REACTION PLATES

A variety of reaction plates, manufactured in Steel or Aluminium, for EvoTorque®, EvoTorque® Battery Tool, HandTorque® and PneuTorque®. Norbar also offer a range of specific reactions for the Wind Industry.

11	SPLINED REACTION FOR HT/PTS/PTM-52 SERIES
18646	Steel Cranked Reaction for 52 mm

11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-72 SERIES
19289	Steel Cranked Reaction for 72 mm
18494	Aluminium Cranked Reaction for 72 mm



11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES
19291	Steel Cranked Reaction for 92 mm
18936	Aluminium Cranked Reaction for 92 mm



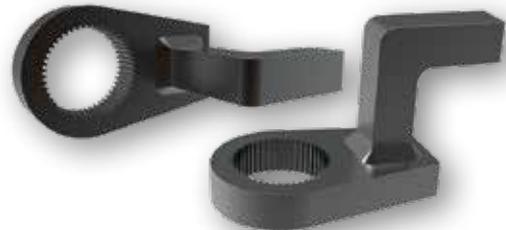
11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-119 SERIES
19293	Steel Cranked Reaction for 119 mm (7,000 N-m)
18961	Aluminium Cranked Reaction for 119 mm



	A	B	C
18646	70 mm	80 mm	131 mm
19289	114 mm	100 mm	167 mm
18494	91 mm	99 mm	166 mm
19291	115 mm	105 mm	175 mm
18936	115 mm	124 mm	205 mm
19293	150 mm	128 mm	210 mm
18961	132 mm	157 mm	199 mm

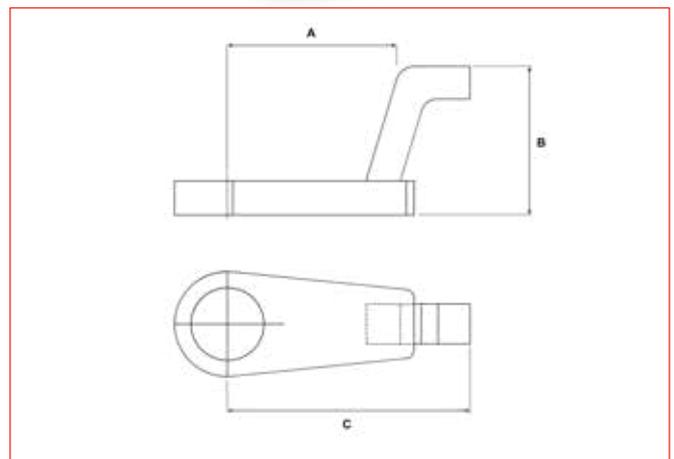
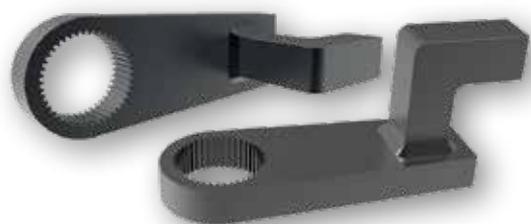
11	SPECIAL SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES
78028	Steel Cranked Reaction for 92 mm

*Typical Wind Tower mid-section reaction
Part No. 78028*



11	SPECIAL SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-119 SERIES
78027	Steel Cranked Reaction for 119 mm

*Typical Wind Tower mid-section reaction
Part No. 78027*



	A	B	C
78028	57 mm	115 mm	145 mm
78027	150 mm	130 mm	250 mm



PTS™ AND PTM DUAL TRIGGER MODULE (DTM)



Dual Trigger Module (19286)

A secondary trigger for use with all PTS and PTM tools that easily attaches between the tool's air inlet port and hose. This requires the operator to use both hands to run the tool and so reduces the risk of hands getting trapped between the reaction bar and reaction point.

- Inlet ½" BSPP Female
- Outlet ½" BSPP Male



11	DUAL TRIGGER MODULE
19286	Dual Trigger Module for use with any PneuTorque

To order a pre-assembled tool add the suffix .DTM onto the end of the part number.

NOTE: When fitting a DTM the torque tool must be recalibrated with the DTM in place



SECONDARY HANDLE



The secondary handle is an easy to fit and versatile accessory which offers additional support and ease of handling when applying torque with Norbar's powered tools. The secondary handle is designed to fit directly to all new powered tools which have a handle location groove in the annulus which is covered by a red rubber band (see inset image to the right).

11	SECONDARY HANDLE
19363	For use with ET/ET2/EBT/PTS/PTM 72, 92 & 119 Series
19448	For use with ET/ET2/EBT/PTS/PTM 80 Series
Not suitable for use with PTS™/PTM 52 Series	





RIGHT ANGLE GEARBOX

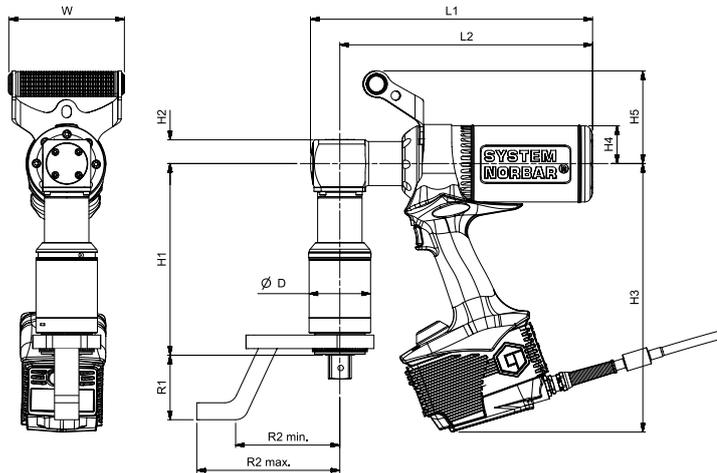


Right Angle Gearbox (180280)

11 RIGHT ANGLE GEARBOX
180280 Right Angle Gearbox Module

To order a pre-assembled tool add the suffix .RA onto the end of the part number.

The EvoTorque®2 can also be supplied in a Peli Case pre-assembled to a Right Angle Gearbox at an additional charge. Please add .RAPEL onto the end of the EvoTorque®2 part number.



Model	ET-72-1000 ET-72-1350	ET-72-2000	ET-80-2700	ET-92-3500 ET-92-4000	ET-119-6000 ET-119-7000	
Part Number	180230.B06.RA 180220.B06.RA 180231.B06.RA 180221.B06.RA	180232.B08.RA 180222.B08.RA	180239.B08.RA 180229.B08.RA	180237.B08.RA 180227.B08.RA 180238.B08.RA 180228.B08.RA	180235.B12.RA 180225.B12.RA 180236.B12.RA 180226.B12.RA	
Output Speed (rpm)	21 (ET-72-1000) 17 (ET-72-1350)	11	10	6	3.3	
Dimensions (mm)	ØD	72	72	80	92	119
	H1	198	226	250	250	272
	H2	28	28	28	28	28
	H3	317	317	317	317	317
	H4	45	45	45	45	45
	H5	109	109	109	109	109
	L1	331	331	331	331	331
	L2	296	296	296	296	296
	R1	71	76	76	70	90
	R2 min.	124	124	124	125	162
	R2 max.	167	167	167	175	210
W	136	136	136	136	136	
Tool Weight (kg)	12.6	13.0	12.9	15.0	19.0	
Reaction Weight (kg)	1.5	1.5	1.5	2.6	3.9	

The Right Angle Gearbox Adaptor will provide most ET, PTS™ and PTM tools with a 90° angle of operation, enabling the benefits of Norbar’s pneumatic and electric torque tools to be brought to a host of applications from which they are currently excluded due to space restrictions.

- Allows more comfortable operation of these tools on vertical bolting applications at chest height and above as the pistol grip is presented correctly to the operator
- The tool handle can rotate 360° in relation to the Right Angle Gearbox allowing the most comfortable and safest position to be found
- The handle and Right Angle Gearbox can index in relation to the tool gearbox meaning that reaction forces are not passed back to the operator
- Manufactured from steel, the Right Angle Gearbox is robustly constructed for durability and long life
- The Right Angle Gearbox can be purchased as a stand-alone product and retrofitted to existing Norbar tools by suitably qualified technicians. Norbar recommend tool recalibration after a Right Angle Gearbox has been fitted but where this is not possible, an efficiency of 97% can be assumed



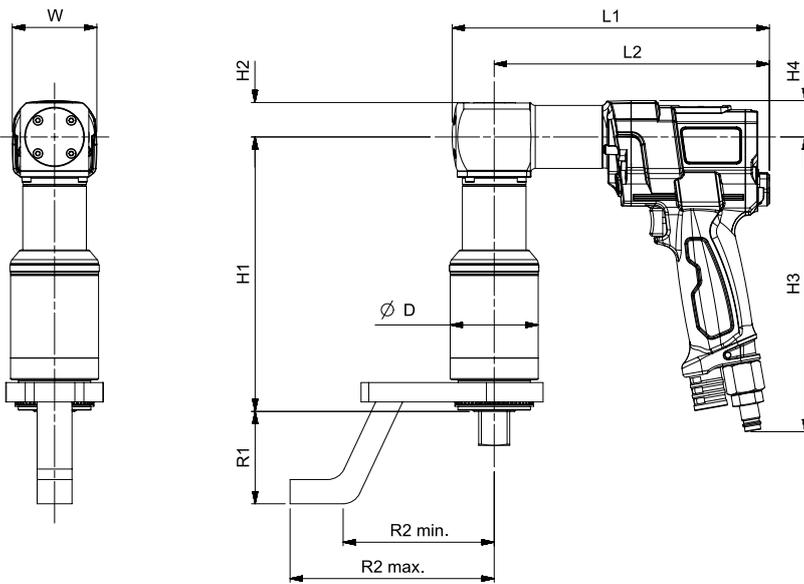
Right Angle Gearbox fitted to EvoTorque®2



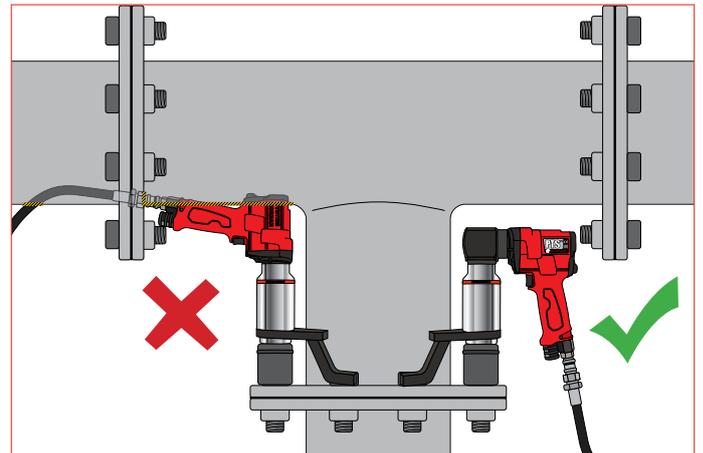


RIGHT ANGLE GEARBOX

Model	PTS-52-500 PTS-52-800	PTS-72-1000 PTS-72-1350	PTS-72-2000	PTS-80-2700	PTS-92-4000	PTS-119-7000	
Part Number	180241.B06.RA 180242.B06.RA	180243.B06.RA 180244.B08.RA	180245.B08.RA	180246.B08.RA	180250.B08.RA 180250.B12.RA	180249.B12.RA	
Output Speed (rpm)	35.5 (PTS-52-500) 25.7 (PTS-52-800)	20.4 (PTS-72-1000) 14.7 (PTS-72-1350)	9.2	7.3	5.3	2.6	
Dimensions (mm)	∅D	52	72	72	80	92	119
	H1	166	198	226	250	250	272
	H2	28	28	28	28	28	28
	H3	243	243	243	243	243	243
	H4	30	30	30	30	30	30
	L1	260	260	260	260	260	260
	L2	225	225	225	225	225	225
	R1	59	76	76	76	70	90
	R2 min.	71	124	124	124	125	162
	R2 max.	131	167	167	167	175	210
	W	69	69	69	69	69	69
Tool Weight (kg)	6.4	8.4	8.8	8.3	11.1	14.7	
Reaction Weight (kg)	0.9	1.4	1.4	1.4	2.5	3.8	



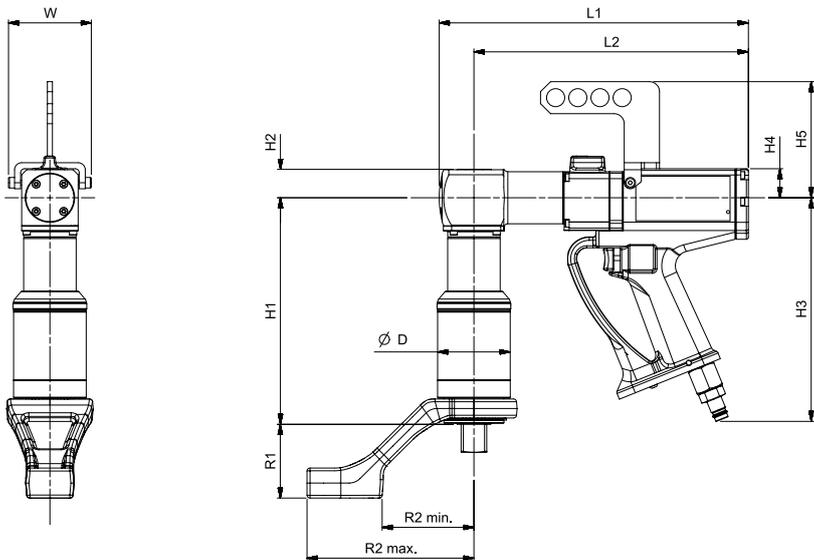
Right Angle Gearbox fitted to PTS™





RIGHT ANGLE GEARBOX

Model	PTM-52-500-B PTM-52-800-B	PTM-72-1000-B PTM-72-1350-B	PTM-72-2000-B	PTM-80-2700-B	PTM-92-4000-B	PTM-119-4500-B PTM-119-6000-B	
Part Number	18100.B06.RA 18101.B06.RA	18102.B06.RA 18103.B08.RA	18104.B08.RA	180296.B08.RA	18159.B08.RA 18159.B12.RA	18108.B12.RA 18109.B12.RA	
Output Speed (rpm)	224 (PTM-52-500-B) 148 (PTM-52-800-B)	122 (PTM-72-1000-B) 86 (PTM-72-1350-B)	58	40	32	23 (PTM-119-4500-B) 15.5 (PTM-119-6000-B)	
Dimensions (mm)	∅D	52	72	72	80	92	119
	H1	166	198	226	191	250	272
	H2	28	28	28	28	28	28
	H3	224	224	224	224	224	224
	H4	29	29	29	29	29	29
	H5	116	116	116	116	116	116
	L1	307	307	307	307	307	307
	L2	272	272	272	272	272	272
	R1	59	74	74	80	87	119
	R2 min.	71	91	91	91	124	149
	R2 max.	131	166	166	166	205	199
	W	82	82	82	82	82	82
Tool Weight (kg)	6.3	8.3	8.7	9.7	10.7	15.4	
Reaction Weight (kg)	0.9	0.7	0.7	1.4	1.4	2.2	



Right Angle Gearbox fitted to PTM





PNEUTORQUE® STANDARD SERIES



Based on the original PneuTorque®, the ‘Standard Series’ range is a direct result of over 50 years of refinement and development necessary to keep pace with the requirements of industry today.

In use in many thousands of applications worldwide PneuTorque® wrenches continue to represent the foundation of Norbar’s powered tool range. Two speed models offer all the advantages of single speed versions but with the additional benefit of a run-down speed five times greater than the high torque speed setting.

- Models available for almost every bolting and torque application, up to 300,000 N·m
- Forward and reverse operation
- Quiet, non-impacting or pulsing operation - low operator fatigue
- Stall control gives repeatability of ±5% on a given joint
- Other reaction styles can be designed to suit specific applications
- Electronic torque transducers can be fitted for precise torque monitoring

11	TO 100,000 N·m - SINGLE SPEED
16031	PT 1 ¾" sq. dr., 160 - 680 N·m, 120 - 500 lbf-ft
16011	PT 1 1" sq. dr., 160 - 680 N·m, 120 - 500 lbf-ft
16098	PT 1A ¾" sq. dr., 270 - 1,200 N·m, 200 - 900 lbf-ft
16097	PT 1A 1" sq. dr., 270 - 1,200 N·m, 200 - 900 lbf-ft
16013	PT 2 1" sq. dr., 515 - 1,700 N·m, 380 - 1,250 lbf-ft
16015	PT 5 1" sq. dr., 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16017	PT 6 1½" sq. dr., 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16066	PT 7 1½" sq. dr., 1,762 - 6,000 N·m, 1,300 - 4,500 lbf-ft
16072	PT 9 1½" sq. dr., 2,710 - 9,500 N·m, 2,000 - 7,000 lbf-ft
16046	PT 11 2½" sq. dr., 4,400 - 20,000 N·m, 3,250 - 14,700 lbf-ft
18086	PT 12 2½" sq. dr., 9,500 - 34,000 N·m, 7,000 - 25,000 lbf-ft
16052	PT 13 2½" sq. dr., 13,550 - 47,000 N·m, 10,000 - 35,000 lbf-ft
16045	PT 14 3½" sq. dr., 22,375 - 100,000 N·m, 16,500 - 73,500 lbf-ft

11	TO 9,500 N·m - AUTOMATIC TWO SPEED
16031.AUT	PT 1 ¾" sq. dr., Auto 2SP 160 - 680 N·m, 120 - 500 lbf-ft
16011.AUT	PT 1 1" sq. dr., Auto 2SP 160 - 680 N·m, 120 - 500 lbf-ft
16098.AUT	PT 1A ¾" sq. dr., Auto 2SP 400 - 1,200 N·m, 295 - 900 lbf-ft
16097.AUT	PT 1A 1" sq. dr., Auto 2SP 400 - 1,200 N·m, 295 - 900 lbf-ft
16013.AUT	PT 2 1" sq. dr., Auto 2SP 700 - 1,700 N·m, 516 - 1,250 lbf-ft
16015.AUT	PT 5 1" sq. dr., Auto 2SP 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16017.AUT	PT 6 1½" sq. dr., Auto 2SP 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16066.AUT	PT 7 1½" sq. dr., Auto 2SP 2,200 - 6,000 N·m, 1,622 - 4,500 lbf-ft
16072.AUT	PT 9 1½" sq. dr., Auto 2SP 2,100 - 9,500 N·m, 2,286 - 7,000 lbf-ft

MTS = Manual Two Speed. Auto 2SP = Automatic Two Speed.
 Angle Encoders are available for Standard Series PTs please contact Norbar for further details.

NB: PneuTorque® PT 11 - PT 18 are supplied with a Lubro Control Unit as standard equipment. PneuTorques PT 12, 13 and 14 are also supplied with a weld prepared reaction ring as standard. PTs 13 and 14 are also supplied with a transporting trolley. PT 15 - 18 do not include output drive or reaction. These components will be engineered uniquely for each application. Remote PT part numbers are designated with an .X
 e.g. PT 1 Remote is 16031.X
 e.g. PT 1 Remote Auto is 16031.XAUT

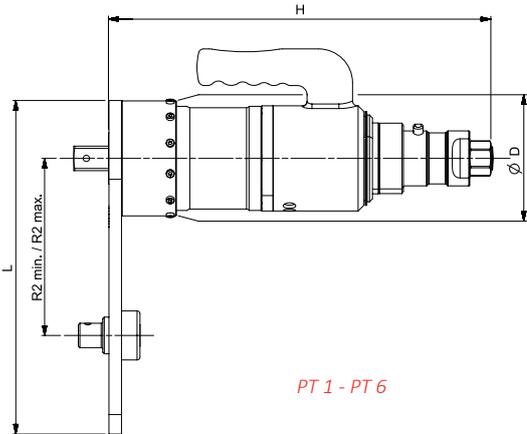
11	TO 300,000 N·m - MANUAL TWO SPEED
16031.MTS	PT 1 ¾" sq. dr., MTS 160 - 680 N·m, 120 - 500 lbf-ft
16011.MTS	PT 1 1" sq. dr., MTS 160 - 680 N·m, 120 - 500 lbf-ft
16098.MTS	PT 1A ¾" sq. dr., MTS 270 - 1,200 N·m, 200 - 900 lbf-ft
16097.MTS	PT 1A 1" sq. dr., MTS 270 - 1,200 N·m, 200 - 900 lbf-ft
16013.MTS	PT 2 1" sq. dr., MTS 515 - 1,700 N·m, 380 - 1,250 lbf-ft
16015.MTS	PT 5 1" sq. dr., MTS 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16017.MTS	PT 6 1½" sq. dr., MTS 880 - 3,400 N·m, 650 - 2,500 lbf-ft
16066.MTS	PT 7 1½" sq. dr., 1,762 - 6,000 N·m, 1,300 - 4,500 lbf-ft
16072.MTS	PT 9 1½" sq. dr., 2,710 - 9,500 N·m, 2,000 - 7,000 lbf-ft
16046.MTS	PT 11 2½" sq. dr., 4,400 - 20,000 N·m, 3,250 - 14,700 lbf-ft
18086.MTS	PT 12 2½" sq. dr., 9,500 - 34,000 N·m, 7,000 - 25,000 lbf-ft
16052.MTS	PT 13 2½" sq. dr., 13,550 - 47,000 N·m, 10,000 - 35,000 lbf-ft
16045.MTS	PT 14 3½" sq. dr., 22,375 - 100,000 N·m, 16,500 - 73,500 lbf-ft
18089.MTS	PT 15 MTS, 40,000 - 150,000 N·m, 29,500 - 110,500 lbf-ft
18090.MTS	PT 16 MTS, 55,000 - 200,000 N·m, 40,500 - 147,500 lbf-ft
18088.MTS	PT 17 MTS, 70,000 - 250,000 N·m, 51,500 - 184,500 lbf-ft
16054.MTS	PT 18 MTS, 85,000 - 300,000 N·m, 62,500 - 221,500 lbf-ft
16490	Lifting Bracket for Standard Series (up to PT7)



PT 16 Manual Two Speed



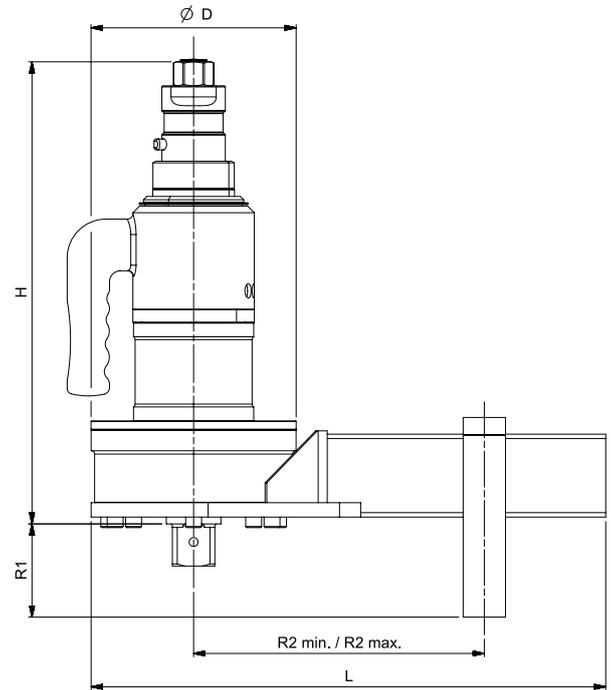
PNEUTORQUE® STANDARD SERIES



PT 1 - PT 6

PneuTorque® Standard Series Automatic Two Speed

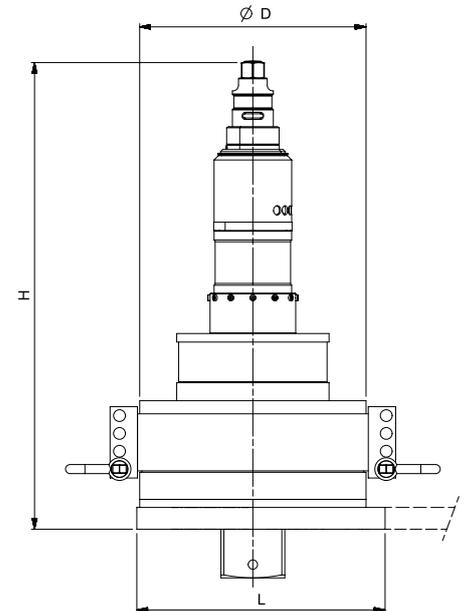
Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9
Part Number	16031.AUT 16011.AUT	16098.AUT 16097.AUT	16013.AUT	16015.AUT	16017.AUT	16066.AUT	16072.AUT
Output Speed (rpm)	150	75	45	25	25	12.5	9
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	419	419	419	462	464	492
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)	14.1	14.6	14.6	17.5	17.5	23.2	27.9
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3



PT 7 - PT 11

PneuTorque® Standard Series Single Speed

Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9	PT 11	PT 12	PT 13	PT 14
Part Number	16031 16011	16098 16097	16013	16015	16017	16066	16072	16046	18086	16052	16045
Output Speed (rpm)	30	15	9	5	5	2.5	1.8	1.2	0.5	0.3	0.2
Dimensions (mm)	ØD	108	108	108	119	119	144	184	212	248	315
	H	350	350	350	393	395	423	418	495	536	578
	L	303	303	303	355	355	423	448	609	325	341
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A	N/A
	R2 min.	83	83	83	86	86	150	175	320	N/A	N/A
	R2 max.	216	216	216	263	263	331	351	500	N/A	N/A
Tool Weight (kg)	10.6	11.1	11.1	14	14	19.7	24.4	38.6	49.8	102.2	119.4
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3	13.3	6.5	6.9	10.4



PT 12 - PT 14

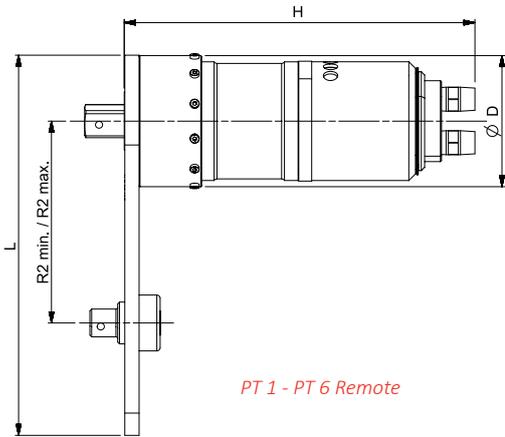
PneuTorque® Standard Series Manual Two Speed

Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9	PT 11	PT 12	PT 13	PT 14	PT 15	PT 16	PT 17	PT 18	
Part Number	16031.MTS 16011.MTS	16098.MTS 16097.MTS	16013.MTS	16015.MTS	16017.MTS	16066.MTS	16072.MTS	16046.MTS	18086.MTS	16052.MTS	16045.MTS	18089.MTS	18090.MTS	18088.MTS	16054.MTS	
Output Speed (rpm)	150	75	45	25	25	12.5	9	6	2.5	1.5	1	0.5	0.4	0.35	0.3	
Dimensions (mm)	ØD	108	108	108	119	119	144	184	212	248	315	315	*	410	410	520
	H	436	436	436	479	481	509	504	581	622	664	729	*	866	939	936
	L	303	303	303	355	355	423	448	609	325	341	341	*	N/A	N/A	N/A
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A						
	R2 min.	83	83	83	86	86	150	175	320	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2 max.	216	216	216	263	263	331	351	500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tool Weight (kg)	14.1	14.6	14.6	17.5	17.5	23.2	27.9	42.1	53.3	105.7	122.9	*	270.0	285.0	380.0	
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3	13.3	6.5	6.9	10.4	N/A	N/A	N/A	N/A	

* Available on request



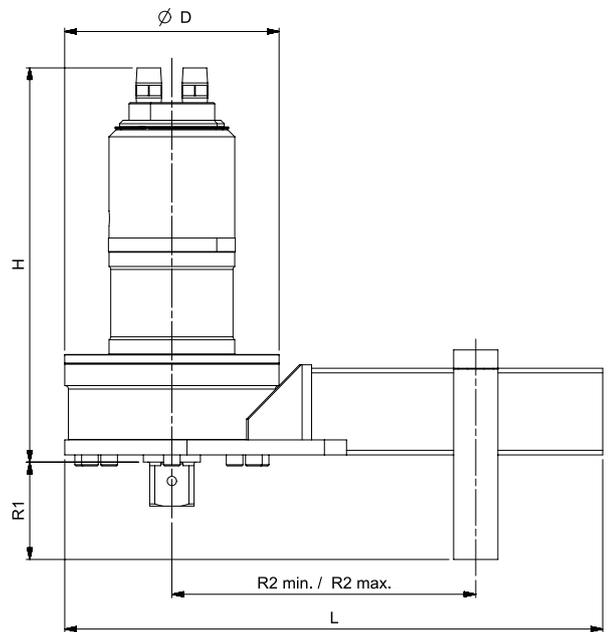
PNEUTORQUE® STANDARD SERIES



PT 1 - PT 6 Remote

PneuTorque® Standard Series Automatic Two Speed - Remote

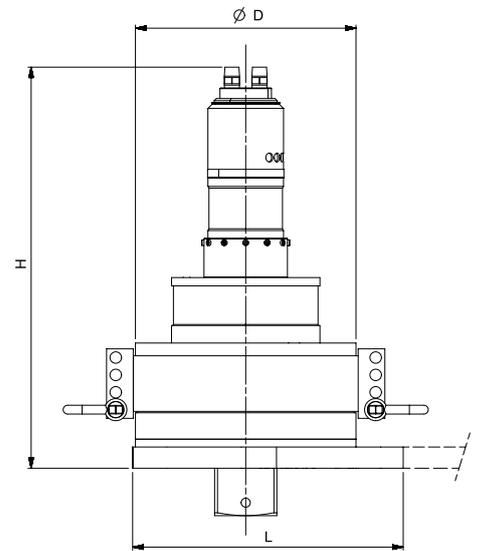
Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9
Part Number	16031.XAUT 16011.XAUT	16098.XAUT 16097.XAUT	16013.XAUT	16015.XAUT	16017.XAUT	16066.XAUT	16072.XAUT
Output Speed (rpm)	150	75	45	25	25	12.5	9
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	339	339	339	382	383	412
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)	14.1	14.6	14.6	17.5	17.5	23.2	27.9
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3



PT 7 - PT 11 Remote

PneuTorque® Standard Series Single Speed - Remote

Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9	PT 11	PT 12	PT 13	PT 14
Part Number	16031.X 16011.X	16098.X 16097.X	16013.X	16015.X	16017.X	16066.X	16072.X	16046.X	18086.X	16052.X	16045.X
Output Speed (rpm)	30	15	9	5	5	2.5	1.8	1.2	0.5	0.3	0.2
Dimensions (mm)	ØD	108	108	108	119	119	144	184	212	248	315
	H	270	270	270	313	314	343	340	415	456	490
	L	303	303	303	355	355	423	448	609	325	341
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A	N/A
	R2 min.	83	83	83	86	86	150	175	320	N/A	N/A
	R2 max.	216	216	216	263	263	331	351	500	N/A	N/A
Tool Weight (kg)	10.6	11.1	11.1	14.0	14.0	17.9	24.4	38.6	49.8	102.2	119.4
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3	13.3	6.5	6.9	10.4



PT 12 - PT 14 Remote

PneuTorque® Standard Series Manual Two Speed - Remote

Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9	PT 11	PT 12	PT 13	PT 14	PT 15	PT 16	PT 17	PT 18	
Part Number	16031.XMSTS 16011.XMSTS	16098.XMSTS 16097.XMSTS	16013.XMSTS	16015.XMSTS	16017.XMSTS	16066.XMSTS	16072.XMSTS	16046.XMSTS	18086.XMSTS	16052.XMSTS	16045.XMSTS	18089.XMSTS	18090.XMSTS	18088.XMSTS	16054.XMSTS	
Output Speed (rpm)	150	75	45	25	25	12.5	9	6	2.5	1.5	1	0.5	0.4	0.35	0.3	
Dimensions (mm)	ØD	108	108	108	119	119	144	184	212	248	315	315	*	410	410	520
	H	356	356	356	399	400	429	425	501	542	576	649	*	786	859	856
	L	303	303	303	355	355	423	448	609	325	341	341	*	N/A	N/A	N/A
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A						
	R2 min.	83	83	83	86	86	150	175	320	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2 max.	216	216	216	263	263	331	351	500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tool Weight (kg)	14.1	14.6	14.6	17.5	17.5	23.2	27.9	42.1	53.3	105.7	122.9	*	270.0	285.0	380.0	
Reaction Weight (kg)	2.2	2.2	2.2	2.5	2.5	6.3	8.3	13.3	6.5	6.9	10.4	N/A	N/A	N/A	N/A	

* Available on request



PNEUTORQUE® STANDARD SERIES - OPTIONAL ACCESSORIES



11	NOSE EXTENSIONS FOR STANDARD SERIES GEARBOX
16480.006	PT 1 & 2, 6" long, F/M ¾" sq. dr.
16480.009	PT 1 & 2, 9" long, F/M ¾" sq. dr.
16480.012	PT 1 & 2, 12" long, F/M ¾" sq. dr.
16542.006	PT 1 & 2, 6" long, F/M 1" sq. dr.
16542.009	PT 1 & 2, 9" long, F/M 1" sq. dr.
16542.012	PT 1 & 2, 12" long, F/M 1" sq. dr.
16694.006	PT 5, 6" long, M/M 1" sq. dr.
16694.009	PT 5, 9" long, M/M 1" sq. dr.
16694.012	PT 5, 12" long, M/M 1" sq. dr.

The nose extensions shown above can also be used with HT 2s and 5s. If required other sizes of nose extension are available.

F/M = Female input square/male output square
M/M = Male input square/male output square

11	FOR HT 30 / PT 2700
16686	Single Sided Straight Reaction Plate



Sliding Spigot Reaction Plate (18436)

11	FOR HT 60 / PT 4500 / PT 5500
16687	Single Sided Straight Reaction Plate
18436	Sliding Spigot Reaction Plate

LUBRO CONTROL UNITS



16074



16075



60290

Norbar's standard filter, regulator, lubricator unit 16074 features a 100 mm diameter gauge for easy and accurate setting of air pressure with ergonomic placement of air pressure adjustment control. It is supplied with 3 metres of robust, steel braided air hose with fittings to connect to PneuTorque® wrenches.

Twin Regulator Lubro Control Unit, part number 16075

The 'Twin Lubro' has the same features as Norbar's standard filter, regulator, lubricator unit but has the benefit of two regulators and a switch that allows quick selection between two air pressure settings. A typical application for this would be a PneuTorque® user wishing to quickly select between two applications requiring different torque settings. For example, this might be controlled torque in the forward direction and maximum torque allowed by the tool in the reverse direction.

Multi Channel Lubro, part number 60290

The Multi Channel Lubro is for users who wish to run their pneumatic tools at multiple air pressure settings, without having to make time consuming adjustments to an air regulator. The Multi Channel Lubro can be programmed for up to 15 air pressure settings and these settings can be locked by the removal of the programming key. A typical application would be a tyre shop servicing various vehicles, each vehicle having a different wheel nut torque. Settings can be recorded on a write-on label situated on the front of the Lubro Control. The Multi Channel Lubro is battery powered with a battery life of approximately 16 hours under normal use.

11	LUBRO CONTROL UNITS
16074	Lubro Control Unit F/W 3 m hose
16075	Twin Lubro Control Unit
60290	Multi Channel Lubro

See Page 126 for Lubro Control Unit spares.



TOOL CONTROLLERS



The Tool Controller shut-off system is supplied in a wall box for 'External Control' versions of the Norbar PTM series of tools. This can give a much greater range of functionality than is possible on the 'Internal Control' version of the tool.

11 TOOL CONTROLLER (TTT based)

60244	Shut-off system in wall box
60254	Shut-off system in wall box with printer

Tool Controllers are supplied without leads

61127.600	Lead for PTM Series Tool
61126.600	Transducer Lead for PT Series Tool
61128.600	Solenoid Lead for PT Series Tool (for single valve)

Other lead lengths can be ordered at an additional cost. Both 61126.600 and 61128.600 are required to control a PT Series tool with a tool controller.



Example of T-Box XL™ based Tool Controller
Part No. 60302

11 TOOL CONTROLLER (T-BOX XL™ based)

60302	Shut-off system in wall box for PTM tools
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Tool Controllers are supplied without leads

61135.600	Transducer Lead for PTM-EC and Angle Series Tools, 6 m
61135.1000	Transducer Lead for PTM-EC and Angle Series Tools, 10 m

The models above are a sample of the controllers that Norbar produce. Please contact Norbar for your special requirements.



Example of Remote 108 Operating Valve Assembly fitted to a 108 Remote Motor
Part No. 60309

This assembly includes two 3 way shut-off valves Part No. 28943

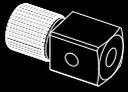
8 3 WAY SHUT-OFF VALVE

28943	3 Way Shut-off Valve 10 BAR Maximum Air Pressure
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8 TWIN SOLENOID VALVE ASSEMBLY

60309	Twin Solenoid Valve Assembly for 108 Remote Tools
60310	Twin Solenoid Valve Assembly for 72 Remote Tools
60298.600*	Solenoid Lead for twin valve assembly, 6 m
60298.1000*	Solenoid Lead for twin valve assembly, 10 m

* For use with special tool controllers.



SPARES KITS

In order to maintain the quality, performance and peace of mind associated with their products Norbar recommend that only genuine Norbar spares are fitted to their products.

SERVICE REPLACEMENT POLICY

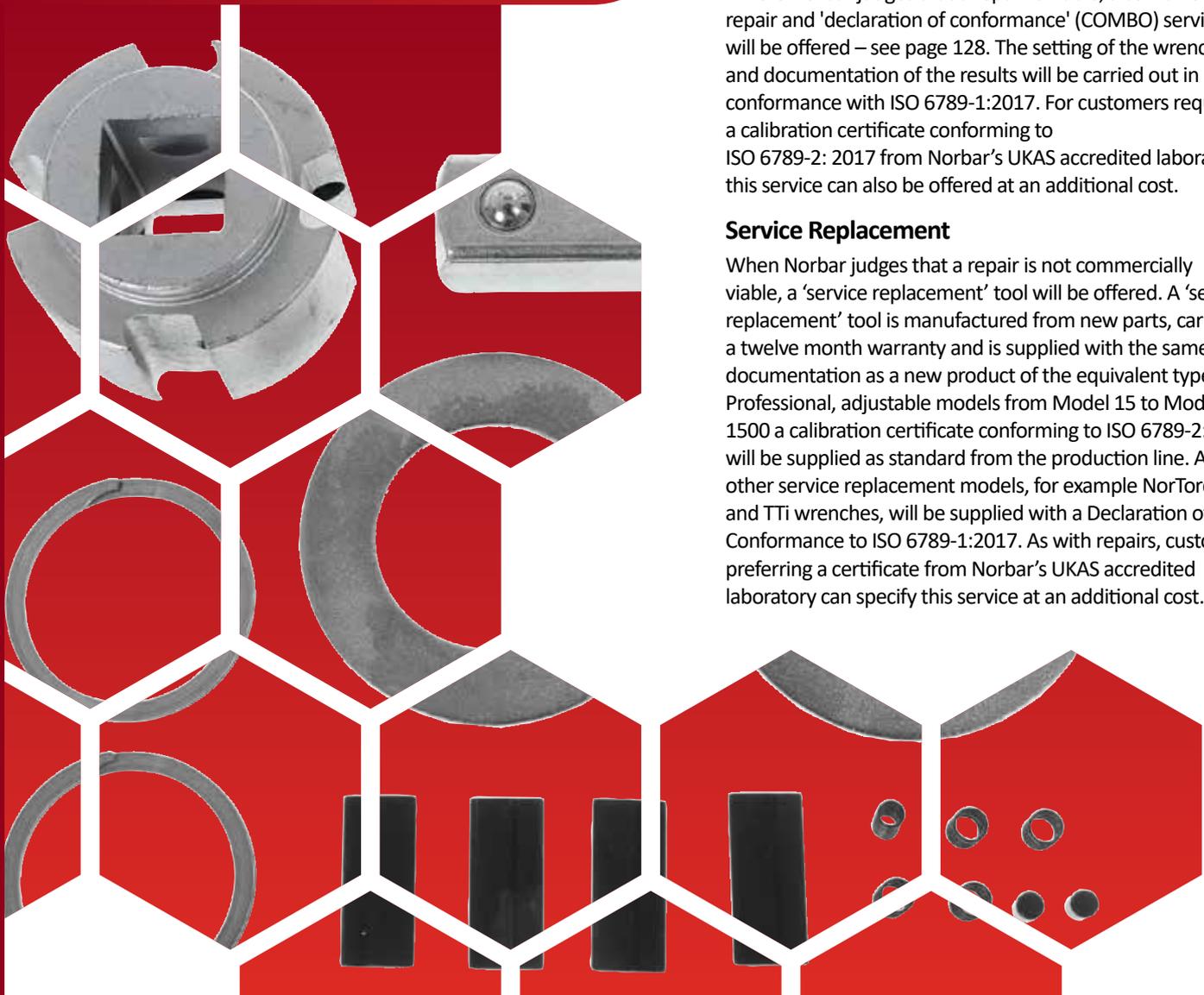
Our aim is to give you the fastest possible service when you send in a wrench for repair. Therefore, our policy is that all Norbar wrenches will, at Norbar's discretion, either be repaired or a 'service replacement' tool will be offered. This policy may be extended to wrenches from other manufacturers sent to Norbar for repair/replacement.

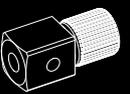
Repair

Where Norbar judges that a repair is viable, a combined repair and 'declaration of conformance' (COMBO) service will be offered – see page 128. The setting of the wrench and documentation of the results will be carried out in conformance with ISO 6789-1:2017. For customers requiring a calibration certificate conforming to ISO 6789-2: 2017 from Norbar's UKAS accredited laboratory, this service can also be offered at an additional cost.

Service Replacement

When Norbar judges that a repair is not commercially viable, a 'service replacement' tool will be offered. A 'service replacement' tool is manufactured from new parts, carries a twelve month warranty and is supplied with the same documentation as a new product of the equivalent type. For Professional, adjustable models from Model 15 to Model 1500 a calibration certificate conforming to ISO 6789-2:2017 will be supplied as standard from the production line. All other service replacement models, for example NorTorque® and TTi wrenches, will be supplied with a Declaration of Conformance to ISO 6789-1:2017. As with repairs, customers preferring a certificate from Norbar's UKAS accredited laboratory can specify this service at an additional cost.





SPARES KITS

8	TORQUE SCREWDRIVER
13593.001NM	TTs Handle Repair Kit for 1.5 N-m Tool
13593.003NM	TTs Handle Repair Kit for 3.0 N-m Tool
13593.006NM	TTs Handle Repair Kit for 6.0 N-m Tool
13593.013LBI	TTs Handle Repair Kit for 13 lbf-in Tool
13593.026LBI	TTs Handle Repair Kit for 26 lbf-in Tool
13593.053LBI	TTs Handle Repair Kit for 53 lbf-in Tool
13593.P	TTs Handle Repair Kit for P Type Tool
13594	TTs Adjusting Screw & Retention Clip Repair Kit
13595	TTs Body Tube & Cam Assembly Repair Kit
13596	TTs End Knob Assembly Repair Kit
13597	TTs ¼" Blade Repair Kit
13609	TTs P Type Locking Knob Repair Kit

8	TT WRENCHES UP TO 50 N-m/35 lbf-ft
13425	¼" Ratchet Repair Kit, Mdl 20 N-m, 180 lbf-in
13426	⅜" Ratchet Repair Kit, Mdl 20 N-m, 180 lbf-in, 50 N-m, 35 lbf-ft
13427	½" Ratchet Repair Kit, Mdl 50 N-m, 35 lbf-ft
13636.020NLF	Handle Repair Kit, 20 N-m/lbf-in Scale
13636.020NM	Handle Repair Kit, 20 N-m Scale
13636.180LBI	Handle Repair Kit, 180 lbf-in Scale
13636.050NLF	Handle Repair Kit, 50 N-m/lbf-ft Scale
13636.050NM	Handle Repair Kit, 50 N-m Scale
13636.035LBF	Handle Repair Kit, 35 lbf-ft Scale
13417	Adjusting Knob Repair Kit
13637	Thrust Washer Repair Kit
11762	Rivet Repair Kit

8	TT WRENCHES 100 N-m/75 lbf-ft TO 300 N-m/250 lbf-ft
13410.100NLF	Handle Repair Kit, 100 N-m/lbf-ft Scale
13410.100NM	Handle Repair Kit, 100 N-m Scale
13410.075LBF	Handle Repair Kit, 75 lbf-ft Scale
13410.150NLF	Handle Repair Kit, 150 N-m/lbf-ft Scale
13410.150NM	Handle Repair Kit, 150 N-m Scale
13410.110LBF	Handle Repair Kit, 110 lbf-ft Scale
13410.200NLF	Handle Repair Kit, 200 N-m/lbf-ft Scale
13410.200NM	Handle Repair Kit, 200 N-m Scale
13410.150LBF	Handle Repair Kit, 150 lbf-ft Scale
13410.250NLF	Handle Repair Kit, 250 N-m/lbf-ft Scale
13410.250NM	Handle Repair Kit, 250 N-m Scale
13410.185LBF	Handle Repair Kit, 185 lbf-ft Scale
13410.300NLF	Handle Repair Kit, 300 N-m/lbf-ft Scale
13410.300NM	Handle Repair Kit, 300 N-m Scale
13410.220LBF	Handle Repair Kit, 220 lbf-ft Scale
13410.250LBF	Handle Repair Kit, 250 lbf-ft Scale

8	TT WRENCHES 100 N-m/75 lbf-ft TO 300 N-m/250 lbf-ft
13411	Adjusting Knob Repair Kit
13415	Thrust Washer Repair Kit
13414	Rivet Repair Kit

8	TTi WRENCHES
13693	TTi20 ¼" Ratchet Lever Arm Assemblies
13694	TTi20 ⅜" Ratchet Lever Arm Assemblies
13690	TTi50 ⅜" Ratchet Lever Arm Assemblies
13691	TTi50 ½" Ratchet Lever Arm Assemblies
13212	Ratchet Repair Kit, ⅜" sq. dr., 60/100
13214	Ratchet Repair Kit, ½" sq. dr., 200
13215	Ratchet Repair Kit, ½" sq. dr., Mdl 250/300 N-m, 185/220 lbf-ft
13491	Ratchet Replacement Kit, ⅜" sq. dr., 60/100
13492	Ratchet Replacement Kit, ½" sq. dr., 50 - 200
13493	Ratchet Replacement Kit, ½" sq. dr. Mdl 250/300 N-m, 185/220 lbf-ft)

For Handle Repair Kits please see TT section to the left.

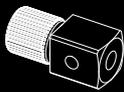
8	TTfth WRENCHES
13695	TTfth20 9 x 12 mm Female End Repair Kit
13692	TTfth50 9 x 12 mm Female End Repair Kit

8	NON-MAGNETIC RATCHET REPAIR KITS
13769	Ratchet Repair Kit for 13292 & 13294
13770	Ratchet Repair Kit for 13585 & 13295

8	MODEL 5
13123	Spares Kit Model 5 Adjustable
13125	Spares Kit Model 5 'P' Type
13124	Calibration Kit Model 5 'P' Type

8	PROFESSIONAL TORQUE WRENCHES MODELS 60 - 400 (pre March 2015)
11598	'Automotive Ratchet' Repair Kit ⅜" Beta (Pro 60 & 100)
11618	'Automotive Ratchet' Repair Kit ½" Beta (Pro 60 & 100)
11622	'Automotive Ratchet' Repair Kit ½" Rev Beta (Pro 200 & 300)
11623	Push-Through Beta 72 Tooth Repair Kit ½"
13212	'Industrial Ratchet' Repair Kit ⅜" (Pro 60/100)
13213	'Industrial Ratchet' Repair Kit ½" (Pro 60/100)
13214	'Industrial Ratchet' Repair Kit ½" (Pro 200)
13215	'Industrial Ratchet' Repair Kit Mdl 300/330 ½" for 13047, 13049 & 13057
13216	'Industrial Ratchet' Repair Kit Pro 400 ¾" for 13050 & 13056
13190	Pro 400 ¾" sq. dr to 17 mm Hex.
13235	Sq. Dr. Repair Kit ⅜" (Pro 60/100)
13236	Sq. Dr. Repair Kit ½" (Pro 60/100)
13237	Sq. Dr. Repair Kit ½" Pro 200/300/330
13157	Spares Kit Prof. Handle (post 1 st Jan 2001)

8	PROFESSIONAL TORQUE WRENCHES PRO 15 - 25 SPARES KITS
15395	'Automotive Ratchet' Repair Kit, ¼" sq. dr.
15396	'Automotive Ratchet' Repair Kit, ⅜" sq. dr.
15397.K	Handle Repair Kit
15398.K	Scale Mechanism Repair Kit
15399.K	Locking Knob Repair Kit
15400.K	Thrust Washer and Screw Kit
15401.K	Spring Repair Kit



SPARES KITS

8	PROFESSIONAL TORQUE WRENCHES SPARES KITS
150100.K	Handle Repair Kit
150101.K	Scale Mechanism Repair Kit
150102.K	Locking Knob Repair Kit
150103.K	Thrust Washer and Screw Kit
150104.K	Spring Repair Kit
150105.K	½" sq. dr. Mushroom Kit
150106.K	¾" sq. dr. Mushroom Kit
150112.K	'Industrial Ratchet' Repair Kit, ¾" sq. dr. (Pro 50)
254100.PK	SKT Grub M5 x 8 LG Oval Point - Pack of 50
150113.K	'Industrial Ratchet' Repair Kit, ½" sq. dr. (Pro 100 - 200)
150114.K	'Industrial Ratchet' Repair Kit, ½" sq. dr. (Pro 300 - 340)
150115.K	'Industrial Ratchet' Repair Kit, ¾" sq. dr. (Pro 400)
11598	'Automotive Ratchet' Repair Kit ¾" sq. dr. (Pro 50 & 100)
11618	'Automotive Ratchet' Repair Kit ½" sq. dr. (Pro 50 & 100)
150111.K	'Automotive Ratchet' Repair Kit, ½" sq. dr. (Pro 200)

8	PROFESSIONAL TORQUE WRENCHES SPARES PACKS
10628.PK	Label TimeStrip - Pack of 50
10640.PK	TimeStrip Adhesive Gasket - Pack of 50
11521.PK	Shaped Washer - Pack of 20
11522.PK	End Stop - Pack of 10
15312.PK	End Cap - Pack of 25
25496.PK	SCR:SKT Grub M5 x 6 LG Oval - Pack of 50
25497.PK	SCR:SKT Grub M5 x 5 LG Dog Point - Pack of 50
254100.PK	SCR:SKT Grub M5 x 8 LG Oval Point - Pack of 50
25746.PK	M3 Dog Point Grub SCR - Pack of 50
25938.PK	Washer M4 STD.Flat - Pack of 100
26033.PK	Pivot Pin - Pack of 20
27029.PK	Steel Ball 3.8 mm Dia - Pack of 50
25351.10.PK	SHCS M4 x 10 LG - Pack of 50

8	CLICKTRONIC® TORQUE WRENCHES SPARES KITS
150104.K	Spring Repair Kit
150105.K	½" sq. dr. Mushroom Kit
150106.K	¾" sq. dr. Mushroom Kit
150107.K	Adjusting Screw and Wiper Kit
150108.K	Locking Knob Kit
150109.K	Lower Handle Kit
150110.K	Complete Handle Kit

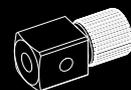
8	CLICKTRONIC® TORQUE WRENCHES SPARES PACKS
10628.PK	Label TimeStrip - Pack of 50
10640.PK	TimeStrip Adhesive Gasket - Pack of 50
15524.PK	USB Bung - Pack of 5
39721.PK	Wiper 1 - 3 N - Pack of 5
25742.PK	M2.5 x 12 LG Torx Pan Screw - Pack of 80
25743.PK	M4 x 8 LG Torx CSK Screw - Pack of 50

8	PROFESSIONAL TORQUE WRENCHES MODELS 550 - 1500
14195	Ratchet Repair Kit Mdl 550/650 ¾"
14196	Ratchet Repair Kit Mdl 800/1000/1500 ¾"
14197	Ratchet Repair Kit Mdl 800/1000/1500 1"
14162	Ratchet Assembly Mdl 550/650
14163	Ratchet Assembly Mdl 1000
12297	Replacement Square Drive Mdl 550/650 ¾"
12299	Replacement Square Drive Mdl 550 1"
14157	Replacement Square Drive Mdl 800 - 1500 ¾"
14165	Replacement Square Drive Mdl 800 - 1500 1"
14185	Cover Kit for all Models
14218	Secondary Lever and Support Block Assy Upgrade kit for all Models pre 2004/169391
14217	Secondary Lever and Support Block Assy for all Models post 2004/169391
14220	Secondary Lever Assembly
14187	Screw Adjustable Kit for all Models
14166	Calibration Kit 'P' Type for all Models
13217	Replacement Professional Handle Kit
11807	Handle Spares Kit Professional 'P' Type
11698	Calibration Kit Professional 'P' Type
13242	Rivet Repair Kit

8	SLIMLINE TORQUE WRENCHES
11831	Ratchet Repair Kit SLO ¾" (post Jan 2008)
11832	Ratchet Repair Kit SLO ¾" (post Jan 2008)
11806	Spares Kit - SLO Adj Knob
29683	Mushroom Head Sq. Dr. Assy ½" SL3
11914	¾" sq.dr for SLO Fixed Head
11762	Rivet Repair Kit

8	INDUSTRIAL TORQUE WRENCHES
12307	Ratchet Repair Kit Industrial (except 6R)
12373	Ratchet Repair Kit (6R only)
12297	¾" Square Drive Assy for 3AR - 5AR
12299	1" Square Drive Assy for 3AR - 5AR
18492	1" Square Drive Assy for 6R
12374	1" Square Drive Repair Kit (6R only)
12355	Industrial Thrust Washer Spares Kit
12360	End Caps - Plastic 10 pack (Industrial)
12381	3AR Adjusting Nut
12382	No.4 Adjusting Nut
12383	4R Adjusting Nut
12384	4AR Adjusting Nut
12385	5R Adjusting Nut
12386	5AR Adjusting Nut
12387	6R Adjusting Nut

In order for Norbar to supply the correct adjusting nut, we need to know the correct scale length for the tool being repaired. The scale length is denoted by a number on the nut being replaced and will be of the form e.g. 159/60.



SPARES KITS

8	NORTORQUE TORQUE WRENCHES HANDLE KITS
130501.060NLF	Handle Repair Kit, 60 N-m/lbf-ft Scale
130501.060NM	Handle Repair Kit, 60 N-m Scale
130501.100NLF	Handle Repair Kit, 100 N-m/lbf-ft Scale
130501.100NM	Handle Repair Kit, 100 N-m Scale
130501.200NLF	Handle Repair Kit, 200 N-m/lbf-ft Scale
130501.200NM	Handle Repair Kit, 200 N-m Scale
130501.300NLF	Handle Repair Kit, 300 N-m/lbf-ft Scale
130501.300NM	Handle Repair Kit, 300 N-m Scale
130501.340NLF	Handle Repair Kit, 340 N-m/lbf-ft Scale
130501.340NM	Handle Repair Kit, 340 N-m Scale



13235 Repair Kit

8	NORTORQUE TORQUE WRENCHES SQUARE DRIVE REPAIR KITS
13235	Sq. Dr. Repair Kit 3/8" (Mdl60)
13236	Sq. Dr. Repair Kit 1/2" (Mdl100)
13237	Sq. Dr. Repair Kit 1/2" (Mdl200/300/340)



13212 Repair Kit

8	NORTORQUE TORQUE WRENCHES RATCHET REPAIR KITS
13212	Ratchet Repair Kit 3/8" (Mdl60)
13213	Ratchet Repair Kit 1/2" (Mdl100)
13214	Ratchet Repair Kit 1/2" (Mdl200)
13215	Ratchet Repair Kit 1/2" (Mdl300/340)

8	NORTORQUE TORQUE WRENCHES OTHER REPAIR KITS
130500.K	Locking Knob Kit
150103.K	Thrust Washer and Screw Kit



13215 Repair Kit

8	MULTIPLIER SPARES KIT
16831	Spares Kit No. 2 Output Carrier
16836	Spares Kit No. 5 Output Carrier
16832	Spares Kit No. 7 Output Carrier
16835	Spares Kit No. 9 Output Carrier
19348	HT3-1000 N-m Retention Pin
19349	HT3-1000 N-m Cranked Reaction
19347	HT3-1000 N-m Straight Reaction
77018.1	Sq. Drive HT3 3/4" (old style)
17185	Spares Kit HT3 3/4" Sq Dr (Pre May 1993 style with shoulder screw)
17676	Sq. Drive HT3 3/4" (to fit 17218, 17220 & all other models with square drive retained by rollpin)



77018.1



17676



17185

17223	Spares Kit HT3 Carriers
17224	Spares Kit HT3 1/2" Input Gear
17225	Spares Kit HT3 3/4" Input Gear
18365	Spares Kit 72 mm Air Motor Handle
18374	Spares 72 mm Remote Block
18544	Replacement 3/4" sq. dr., ET/PTS/PTM-52 Series
18545	Replacement 1" sq. dr., ET/PTS/PTM-52 Series
18779	Replacement 3/4" sq. dr., ET/PTS/PTM-72 Series
18492	Replacement 1" sq. dr., ET/PTS/PTM-72 Series
18221	Replacement 3/4" sq. dr., PT 72 Series
18220	Replacement 1" sq. dr., PT 72 Series
19260	Spares Kit for Fwd/Rev Gearbox Knob post Feb 2011 Tools
19077	Upgrade Kit for Fwd/Rev Gearbox for PTM

8	ET/PTS/PTM-92 & ET/PTS/PTM-119 SQUARE DRIVES
18934	1" for ET/PTS/PTM-92
18935	1 1/2" for ET/PTS/PTM-92
18959	1 1/2" for ET/PTS/PTM-119

8	VANE SETS FOR PNEUTORQUE MULTIPLIERS
18631	For PTM Series (Pack of 5)
18278	For PT 72 mm Series (Pack of 6)
16218	For PT Standard Series (Pack of 6)

8	SPARES FOR LUBRO CONTROL UNIT
28911	3 m Hose*
28912	6 m Hose*
28913	Pressure Gauge
28914	Filter Element for Filter/Regulator
28915	Bowl Assembly for Filter/Regulator
28916	Bowl Assembly for Lubricator
28917	Locking Collar
28918	1/2" BSP Taper Thread Adaptor

*Other lengths of hose are available, please contact Norbar for details.



CALIBRATION SERVICES

Declaration of Conformance	128
UKAS Accredited Calibration Certification	128
Other Certification	132
General Notes	132

A calibration 'priority booking' service is available, please contact the Customer Relations Department a minimum of one month prior to the required recalibration due date.

- Tel: +44 (0)1295 753635
- Fax: +44 (0)1295 753636
- Email: repairs@norbar.com

CALIBRATION SERVICES

Devices sent in for UKAS accredited calibration certification will be calibrated and the 'As Found' readings recorded. The calibration will be performed to the appropriate standard as specified in our schedule of accreditation.

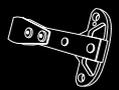
- Should the device be in specification 'As Found', a certificate will be raised and the device returned.
- Should the device be out of specification, but capable of adjustment, it will be adjusted, 'As Left' readings taken, and one certificate raised with 'As Found' and 'As Left' readings on it.
- Should the device require repair that is not covered by a combined calibration and service, we will do so where possible, after consultation with the customer.

Norbar are accredited by UKAS for torque measurements between 0.005 N·m and 108,500 N·m or the imperial equivalents. Our Schedule of Accreditation gives further details (please refer to www.norbar.com).

UKAS accredited calibration certificates are issued under the authority of the United Kingdom Accreditation Service.

Norbar can calibrate non-Norbar Torque products, please contact us with the details of your equipment.





DECLARATION OF CONFORMANCE

TORQUE WRENCH DECLARATION OF CONFORMANCE (DOC)



ONE DIRECTION

DOC1.CW	Up to 400 N·m / 300 lbf·ft
DOC2.CW	Up to 1,000 N·m / 750 lbf·ft
DOC3.CW	Up to 1,500 N·m / 1,100 lbf·ft

ONE DIRECTION & REPAIR COMBO

RCDOC1.CW	NorTorque and Professional wrenches up to 400 N·m
RCDOC2.CW	Industrial wrenches 2R - 5R
RCDOC3.CW	Industrial wrench 5AR
RCDOC4.CW	Large Professional 550 & 650 N·m
RCDOC5.CW	Large Professional 800 - 1,500 N·m

TWO DIRECTIONS

DOC1.CW+CCW	Up to 400 N·m / 300 lbf·ft
DOC2.CW+CCW	Up to 1,000 N·m / 750 lbf·ft
DOC3.CW+CCW	Up to 1,500 N·m / 1,100 lbf·ft

TWO DIRECTIONS & REPAIR COMBO

RCDOC1.CW+CCW	NorTorque and Professional wrenches up to 400 N·m
RCDOC2.CW+CCW	Industrial wrenches 2R - 5R
RCDOC3.CW+CCW	Industrial wrench 5AR
RCDOC4.CW+CCW	Large Professional 550 & 650 N·m
RCDOC5.CW+CCW	Large Professional 800 - 1,500 N·m

UKAS ACCREDITED CALIBRATION CERTIFICATION

TORQUE WRENCH, UKAS ACCREDITED CALIBRATION CERTIFICATION

On receipt an 'As Found' calibration certificate will be carried out where possible. If the results do not fall within specification the wrench will be adjusted and if the adjustment does not bring the wrench back within specification then it will either be repaired or a service replacement will be offered – see page 123 for further details.

Calibration certificates are in accordance with the current standard for hand torque tools BS ISO 6789-2:2017. The certificate shows the nominal torque applied and the measured torque readings.

For guidance on Norbar's procedure for wrenches sent in for repair, see page 123. If the same tool is required to be returned, i.e. if you do not want the tool to be service replaced, then this should be made clear on the purchase order which accompanies the tool.

ONE DIRECTION

TWCC1.CW	Up to 400 N·m / 300 lbf·ft
TWCC2.CW	Up to 1,000 N·m / 750 lbf·ft
TWCC3.CW	Up to 3,000 N·m / 2,200 lbf·ft

TWO DIRECTIONS

TWCC1.CW+CCW	Up to 400 N·m / 300 lbf·ft
TWCC2.CW+CCW	Up to 1,000 N·m / 750 lbf·ft
TWCC3.CW+CCW	Up to 3,000 N·m / 2,200 lbf·ft

NORTRONIC UKAS ACCREDITED CALIBRATION CERTIFICATION



ONE DIRECTION & ANGLE

NTCC1.CW	NorTronic all sizes
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TWO DIRECTIONS & ANGLE

NTCC1.CW+CCW	NorTronic all sizes
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MANUAL TORQUE MULTIPLYING GEARBOXES, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for Certification 'As Found',

ONE DIRECTION

HTCC1.CW	Up to 6,000 N·m / 5,000 lbf·ft
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TWO DIRECTIONS

HTCC1.CW+CCW	Up to 6,000 N·m / 5,000 lbf·ft
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UKAS ACCREDITED CALIBRATION CERTIFICATION

ELECTRONIC DEVICES

In accordance with the current standards for calibration of torque measurement devices, it is desirable to calibrate transducers with the display that is normally used. In this case the 'system' is calibrated. If it is not possible to supply the display unit, an equivalent calibrated display unit from the laboratory will be used. The calibration will then be valid for the transducer with the original display as long as the original display has been calibrated within the last 12 months.

Calibration certificates are in accordance with the current standard for torque measuring devices BS 7882:2017, and show the nominal torque applied, and the measured torque readings. Measured readings may be given in mV/V on request. Details of the standard are available on request.

It is not our intention to offer a full repair service for torque devices from other manufacturers. Where a device is in need of repair, the customer is advised to have this performed by an approved service agent or the manufacturer before submitting the device for UKAS accredited calibration. Some electronic transducer systems from other manufacturers may incur an additional calibration cost; the electronics department repair technicians will clarify this point if required. Occasionally it will be necessary to manufacture special adaptors to enable the calibration to be performed. This will of course affect the price and delivery, and will be discussed with the customer as the need arises.

CALIBRATION TO BS7882:2017 CLASS 0.1

Norbar's UKAS accredited laboratory performs standard calibrations on torque measuring devices to BS 7882:2017 class 0.2 increasing torques only. However the laboratory is able to calibrate devices to class 0.1 at the customer's request. Class 0.1 requires calibration in four different mounting positions each rotated 90° about the measurement axis. Classification to class 0.1 is dependent on the devices performance. Calibrations including a decreasing series of torques can also be provided if required. A price for these services is available on request.

This section contains combined calibration and service fixed details for Norbar products. Other manufacturers' equipment will be handled by individual quotation. Provided that the product is in serviceable condition*, we guarantee to carry out all calibration, function checks and repair work in order to bring the equipment back to its original functionality.

*Product would be regarded as unserviceable if either it or the components required for the repair are obsolete or unavailable. Serviceability also implies that the product is capable of repair without complete replacement.

Service replacements are available for some products.

ELECTRONIC TORQUE TRANSDUCERS, UKAS ACCREDITED CALIBRATION CERTIFICATION (WITH SQUARE DRIVE, FLANGE MOUNTED & PRE 2004 ROTARY)



The part numbers shown below are for Combined Calibration and Service, 'As Found' and 'As Left'

ONE DIRECTION

TDCCS1.CW	Up to 1,500 N·m / 1,000 lbf-ft
TDCCS5.CW®	From 1,501 to 7,000 N·m / 1,001 - 5,000 lbf-ft
TDCCS3.CW*	Square/Splined Drive From 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft
TDCCS4.CW*	Flange Drive From 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft
ADDCALPOINTS.CCS	Additional calibration steps below 10% of rated capacity to 2% for transducers up to 7,000 N·m (5,000 lbf-ft)

TWO DIRECTIONS

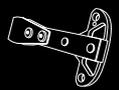
TDCCS1.CW+CCW	Up to 1,500 N·m / 1,000 lbf-ft
TDCCS5.CW+CCW®	From 1,501 to 7,000 N·m / 1,001 - 5,000 lbf-ft
TDCCS3.CW+CCW*	Square/Splined Drive From 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft
TDCCS4.CW+CCW*	Flange Drive From 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft

@ 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.

For part numbers TDCCS3.CW and TDCCS4.CW, static transducers with 2½" square drives and annular transducers to fit HT/PT9 & HT/PT11, a secondary calibration to extend the range below 10% of the rated capacity may be ordered using part number TDCCS5.CW

For part numbers TDCCS3.CW+CCW and TDCCS4.CW+CCW, static transducers with 2½" square drives and annular transducers to fit HT/PT9 & HT/PT11, a secondary calibration to extend the range below 10% of the rated capacity may be ordered using part number TDCCS5.CW+CCW



UKAS ACCREDITED CALIBRATION CERTIFICATION

ROTARY TRANSDUCERS (2004 ONWARDS), UKAS ACCREDITED CALIBRATION CERTIFICATION (PART CODE 50708.XXX-50724.XXX)



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ONE DIRECTION

TDCCS2.CW	Up to 1,500 N·m / 1,000 lbf-ft
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TWO DIRECTIONS

TDCCS2.CW+CCW	Up to 1,500 N·m / 1,000 lbf-ft
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TRUCHECK



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ONE DIRECTION

TCCCS1.CW	TruCheck All Sizes (UKAS Accredited Calibration Certification)
TCCCS2.CW	TruCheck All Sizes *

TWO DIRECTIONS

TCCCS1.CW+CCW	TruCheck All Sizes (UKAS Accredited Calibration Certification)
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*Issued with traceable certification.

PRO-TEST, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ONE DIRECTION

PROCCS.CW	Pro-Test All sizes
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TWO DIRECTIONS

PROCCS.CW+CCW	Pro-Test All Sizes
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PRO-LOG, TTT, T-BOX, T-BOX XL & TTL-HE, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ONE DIRECTION

INSTCCS3.CW	Pro-Log or TTT
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TWO DIRECTIONS

INSTCCS3.CW+CCW	Pro-Log or TTT
INSTCCS4.CW+CCW	TTL-HE, T-Box or T-Box XL

TST, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left' This includes both an instrument and system calibration

ONE DIRECTION

TSTCCS.CW	TST
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TWO DIRECTIONS

TSTCCS.CW+CCW	TST
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Section with combined calibration & service ends here

CALIBRATION BEAMS & WEIGHTS, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for Length Certification, 'As Found' and 'As Left'

CBLC1	Disc or Beam up to 150 N·m / 100 lbf-ft
CBLC2	Disc or Beam up to 1,500 N·m / 1,000 lbf-ft
CBLC3	Disc or Beam up to 6,800 N·m / 5,000 lbf-ft
WEIGHT.CC1	Calibration of Weights up to 25 kgf / 245 N / 55 lbf



UKAS ACCREDITED CALIBRATION CERTIFICATION

MECHANICAL TORQUE TESTING DEVICES, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ONE DIRECTION

MCCS1.CW | Up to 5,000 N·m / 5,000 lbf-ft

TWO DIRECTIONS

MCCS1.CW+CCW | Up to 5,000 N·m / 5,000 lbf-ft

TWA, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for Combined Calibration and Service, 'As Found' and 'As Left'

ONE DIRECTION

TWACCS.CW | TWA All Sizes

TWO DIRECTIONS

TWACCS.CW+CCW | TWA All Sizes

ETS, UKAS ACCREDITED CALIBRATION CERTIFICATION



The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

INSTCCS1.CW | ETS

DTS, UKAS ACCREDITED CALIBRATION CERTIFICATION



ONE DIRECTION

DTSCCS1.CW® | DTS up to 7,000 N·m or 5,000 lbf-ft

DTSCCS2.CW* | DTS from 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft Square and Spline drive

DTSCCS3.CW* | DTS from 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft Flange drive

TWO DIRECTIONS

DTSCCS1.CW+CCW® | DTS up to 7,000 N·m or 5,000 lbf-ft

DTSCCS2.CW+CCW* | DTS from 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft Square and Spline drive

DTSCCS3.CW+CCW* | DTS from 7,001 to 100,000 N·m / 5,001 to 100,000 lbf-ft Flange drive

@ 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.

ETTA, UKAS ACCREDITED CALIBRATION CERTIFICATION

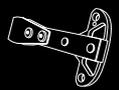


The part numbers shown below are for combined calibration and service, 'As Found' and 'As Left'

ETTACCS.CW | ETTA

GENERAL DEVICES, UKAS ACCREDITED CALIBRATION CERTIFICATION

EMCC | Mechanical Enclosure Meter Calibration (CW + CCW)



OTHER CERTIFICATION

EVOTORQUE AND PNEUTORQUE CERTIFICATES



These devices are outside the scheduled accreditation issued by UKAS.

HTCERT	Compact Series Calibration
PTCERT	PneuTorque Calibration
PTICEC	PTM IC/EC Certificate of air pressure vs torque
ETCERT	EvoTorque 1 & 2 Certificate of torque and angle

USM CERTIFICATES



These devices are outside the scheduled accreditation issued by UKAS.

USMCC	Ultrasonic Stress Meter certificate of calibration
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GENERAL DEVICES

These devices are outside the scheduled accreditation issued by UKAS.

Weight Set Certificates accredited by UKAS or other certified bodies

ETSDPFT	ETS Data Printer. Function Test
ETSBPUFT	ETS Battery Power Unit. Function Test
FWSUFT	ETS or ETTA 5 Way Switch Unit. Function Test
TWSUFT	ETS or ETTA 2 Way Switch Unit. Function Test

TRANSDUCER CONVERSIONS

SQ8888	ETS Transducer conversion to Smart Transducer (does not include calibration)
SQ2005	ETTA Transducer conversion to Smart Transducer (does not include calibration)

GLOBAL SERVICE

Norbar is the only torque equipment manufacturer capable of offering tool and instrument calibration services to the original factory standard on four continents.



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Accredited laboratories in Australia, USA, Singapore, China and India operate the same equipment and procedures as the UKAS accredited laboratory within our headquarters in the UK.



1. INTERPRETATION AND APPLICATION OF TERMS

1.1 In these Conditions the following words have the following meanings:

“Contract”	means the contract between Norbar and the Customer for the sale and purchase of the Goods and/or Services, incorporating these Conditions, the Order and the Order Acknowledgement;
“Customer”	means the person(s), firm or company who purchases Goods and/or Services from Norbar;
“Customer Equipment”	means equipment belonging to the Customer which is the subject of Services to be carried out under a Contract;
“Delivery Point”	means the address within the UK mainland which is notified to Norbar as the place for delivery of the Goods and/or Customer Equipment;
“Engineer to Order Goods”	means any non-standard Goods specifically designed, modified and/or made for the Customer or to the Customer’s specification;
“Goods”	means the goods set out in the Order to be supplied by Norbar to the Customer (including any part or parts of them);
“Norbar”	means Norbar Torque Tools Limited (380480), whose registered office address is at Wildmere Road, Banbury, Oxon, OX16 3JU;
“Order”	means the order for the Goods and/or Services placed on Norbar by the Customer;
“Order Acknowledgement”	means the acknowledgement of Order issued by Norbar to the Customer;
“Services”	means the services set out in the Order to be performed by Norbar for the Customer.

- 1.2 Subject to any variation under Condition 1.4 the Contract will be on these Conditions, the Order and the Order Acknowledgement to the exclusion of all other terms and conditions. They supersede any previously issued terms and conditions of supply. If there is any discrepancy between these Conditions, the Order and the Order Acknowledgement, the latter will prevail to the extent necessary to resolve the inconsistency.
- 1.3 No terms or conditions endorsed upon, delivered with or contained in the Customer’s Order, confirmation of order, specification or other document will form part of the Contract.
- 1.4 These Conditions apply to all of Norbar’s sales and any variation to these Conditions and any representations about the Goods and/or Services will have no effect unless expressly agreed in writing and signed by an authorised representative of Norbar. The Customer acknowledges that it has not relied on and will have no remedy in respect of any statement, promise or representation made or given by or on behalf of Norbar which is not set out in the Contract. Nothing in this Condition will exclude or limit Norbar’s liability for fraudulent misrepresentation.
- 1.5 Each Order or acceptance of a quotation for Goods or Services by the Customer from Norbar will be deemed to be an offer by the Customer to purchase Goods and/or Services subject to these Conditions and no Order will be deemed to be accepted by Norbar until a written Order Acknowledgement is issued by Norbar or Norbar delivers the Goods and/or Services to the Customer, whichever occurs first.
- 1.6 Any quotation is given on the basis that no Contract will come into existence until Norbar despatches an Order Acknowledgement or delivers the Goods and/or Services to the Customer. Any quotation is valid for a period of 30 days only from its date, provided that Norbar has not previously withdrawn or amended it.

2 DESCRIPTION

- 2.1 The description of the Goods will be as set out in Norbar’s catalogue or other published specification current at the time that the relevant order is accepted by Norbar or, in the case of Services and Engineer to Order Goods, as specified in the relevant quotation or Order Acknowledgement. If there is any inconsistency between the published specification, the quotation and the Order Acknowledgement, the Order Acknowledgement will take precedence over the quotation which will take precedence over the published specification to the extent necessary to resolve the inconsistency.
- 2.2 Norbar reserves the right to make any changes to the specification of the Goods (including Engineer to Order Goods) and/or Services which are required to conform with any applicable statutory or regulatory requirements or which do not materially affect their quality or performance. The Customer will not be permitted to reject Goods and/or Services and Norbar will have no liability to the Customer in respect of any failure of the Goods and/or Services to comply with any specification in these circumstances.
- 2.3 The Customer acknowledges that all intellectual property rights in the Goods (including Engineer to Order Goods) and in any novel combinations or applications of the Goods (whether as a kit, system or otherwise) or which arise in the course of conducting the Services belong solely to Norbar and, to the extent that any such rights do not automatically vest in Norbar by operation of law, hereby assigns to Norbar all such rights. The Customer will take any action and execute any document reasonably required by Norbar to give full effect to this Condition.

3 DELIVERY

- 3.1 In the case of sales of Goods within the UK mainland, delivery will take place:
- if the Goods are to be collected, on delivery to the Customer or to the Customer’s named carrier at Norbar’s premises at Wildmere Road, Banbury, Oxon OX16 3JU; and
 - in all other cases, on delivery to the Delivery Point.
- In the case of sales outside the UK mainland (including non-mainland UK) sales will be delivered FCA Norbar’s premises at Wildmere Road, Banbury, Oxon OX16 3JU (INCOTERMS 2010 edition), except where otherwise agreed in writing.
- 3.2 All Services will be performed at Norbar’s premises at Wildmere Road, Banbury, Oxon OX16 3JU unless otherwise agreed in writing and the Services will be deemed to be performed on completion of the performance of the Services as specified in the Order Acknowledgement.
- 3.3 Any dates specified by Norbar for delivery of the Goods or performance of the Services are intended to be an estimate and time for delivery will not be made of the essence by notice. If no dates are so specified, delivery will be within a reasonable time. The Goods and/or Services may be delivered by instalments.

- 3.4 If for any reason the Customer will not accept delivery of any of the Goods when they are ready for delivery, or Norbar is unable to deliver the Goods on time because the Customer has not provided appropriate instructions, documents, licences or authorisations then, without prejudice to any other right or remedy available to Norbar:
- risk in the Goods will pass to the Customer;
 - the Goods will be deemed to have been delivered; and
 - Norbar may store the Goods until delivery whereupon the Customer will be liable for all related costs and expenses (including, without limitation, storage and insurance).
- 3.5 Norbar may, at its discretion, accept returns of Goods ordered in error or no longer required, subject to the payment of a handling charge of 15% of the order value (excluding VAT), except that:
- Production ‘P’ type wrenches will not be accepted for return;
 - Goods supplied with a UKAS accredited calibration certificate will be subject to a recalibration charge in addition to the handling charge;
 - Engineer to Order Goods may be charged for up to 100% of full price.
- Goods returned for credit will only be accepted if they are returned in the original packaging, in a new, unused condition, carriage paid within 30 days after the despatch date.

4 NON DELIVERY

- 4.1 The quantity of any consignment of Goods as recorded by Norbar upon despatch from Norbar’s place of business will be conclusive evidence of the quantity received by the Customer on delivery unless the Customer can provide conclusive evidence proving the contrary.
- 4.2 Norbar will not be liable for any non delivery of Goods (even if caused by Norbar’s negligence) unless written notice is given to Norbar within 14 days of the date when the Goods would, in the ordinary course of events, have been received.
- 4.3 Any liability of Norbar for non delivery of the Goods will be limited to replacing the Goods within a reasonable time or issuing a credit note at the pro rata Contract rate against any invoice raised for such Goods.

5 RISK/TITLE

- 5.1 The Goods are at the risk of the Customer from the time of delivery.
- 5.2 Ownership of the Goods will not pass to the Customer until Norbar has received in full (in cash or cleared funds) all sums due to it in respect of the Goods and all other sums which are or which become due to Norbar from the Customer on any account.
- 5.3 Until ownership of the Goods has passed to the Customer, the Customer will hold all Goods on a fiduciary basis as Norbar’s bailee and Norbar will be entitled at any time:
- to require (at no cost to Norbar) that the Goods are stored separately and clearly marked in such a way that they will readily be seen to be the property of Norbar; and/or
 - to require the Customer to deliver up the Goods or any part of them to Norbar and if the Customer refuses to do so, to immediately repossess them; and/or
 - to enter any premises or vehicle (by its employees or agents and in the case of premises, with or without vehicles) where Goods still owned by Norbar are stored or reasonably thought to be stored in order to inspect and/or repossess them.
- 5.4 Norbar will be entitled to recover payment for the Goods ordered notwithstanding that ownership of the Goods has not passed from Norbar.
- 5.5 The Customer may resell the Goods before ownership has passed to it providing that any such sale is made in the ordinary course of its business at full market value and the Customer is not aware that an event specified in Condition 5.6(a) has occurred or is likely to occur.
- 5.6 Until ownership of the Goods has passed to the Customer, the Customer’s right to possession of the Goods will terminate immediately if:
- the Customer is made bankrupt or petitions for its own bankruptcy, or has a receiver, administrative receiver or administrator appointed over all or any of its assets or undertaking or, other than for the purposes of a solvent amalgamation or reconstruction, enters into liquidation, enters into any composition or arrangement with or for the benefit of its creditors or ceases to carry on business; or
 - the Customer fails to observe or perform any of its obligations under the Contract or any other contract between Norbar and the Customer; or
 - the Customer encumbers or in any way charges any of the Goods.
- 5.7 Ownership of all Customer Equipment will remain the property of the Customer throughout the provision of the Services. Subject to Condition 6.2, Norbar will take reasonable care to safeguard the Customer Equipment and no less care than it takes to safeguard its own similar property.
- 5.8 On termination of the Contract for any reason, Norbar’s rights under this Condition 5 will remain in effect.

6 PRICE AND PAYMENT

- 6.1 Unless otherwise agreed by Norbar in writing the price for the Goods and/or Services will be the price set out in Norbar’s price list current as at the date of delivery of the Goods or performance of the Services or will be as set out in any quotation provided by Norbar.
- 6.2 The price given in the current Norbar price list for calibration and repair services or in any quotation for such Services is subject to the returned Customer Equipment being of serviceable condition. If the Customer Equipment is not of serviceable condition or is out of specification and cannot be adjusted or is uneconomic to repair, either a new quotation will be provided or a service replacement tool will be offered to the Customer. If the Customer does not accept the revised quotation or service replacement within 30 days, Norbar will re-quote, revising the costs as necessary. If after a further 30 days instructions have still not been received, Norbar may (at its option) either return the Customer Equipment and invoice for costs incurred or dispose of the Customer Equipment.
- 6.3 The price for the Goods and/or Services will be exclusive of any value added tax which the Customer will pay in addition when it is due to pay for the Goods and/or Services. The price for Goods and Services includes the cost



- of delivery (or return of Customer Equipment in the case of Services) if the order (i) is for delivery on Monday to Friday (inclusive) within the UK mainland to the Customer's usual Delivery Point using Norbar's usual delivery method and (ii) has a value of over £100.00 (excluding VAT). If delivery is to Northern Ireland, the price for Goods and Services includes the cost of delivery (or return of Customer Equipment in the case of Services) if the order (i) is for delivery on Monday to Friday (inclusive) to the Customer's usual Delivery Point using Norbar's usual delivery method and (ii) has a value of over £300.00 (excluding VAT). In all other cases, the cost of delivery of Goods or return of Customer Equipment will be charged in addition and will be due for payment at the same time as payment for the Goods is due.
- 6.4 If the Customer holds an account with Norbar, payment of the price for the Goods and/or Services is due within the agreed payment terms for that account. If any amount payable is not made within 30 days after the due date in accordance with the terms of the account, Norbar may withdraw credit facilities. If the Customer does not have an account with Norbar, or if credit facilities have been withdrawn from the Customer, payment is due either at the time the Order is placed or in accordance with any payment schedule set out in the quotation and may be tendered by cheque, credit card or bank transfer. In all cases, payment must be in pounds sterling (except where otherwise agreed in writing).
- 6.5 Time for payment will be of the essence.
- 6.6 No payment will be deemed to have been received until Norbar has received cleared funds.
- 6.7 All payments payable to Norbar under the Contract will become due immediately upon termination of this Contract notwithstanding any other Condition of the Contract or any other arrangement or agreement between the parties.
- 6.8 The Customer will make all payments due under the Contract without any deduction whether by way of set-off, counterclaim, discount, abatement or otherwise unless the Customer has a valid court order requiring an amount equal to such deduction to be paid by Norbar to the Customer.
- 6.9 If the Customer fails to pay Norbar any sum due pursuant to the Contract the Customer will be liable to pay interest to Norbar on such sum from the due date for payment at the annual rate of 4% above the base lending rate from time to time of HSBC Bank plc, accruing on a daily basis until payment is made, whether before or after any judgment.
- 7. WARRANTY AND LIABILITY**
- 7.1 Norbar warrants that, subject to the other provisions of these Conditions upon delivery, and for a period of 12 months after the date of delivery, the Goods will:
- be of satisfactory quality within the meaning of the Sale of Goods Act 1979; and
 - comply in all material respects with the specification for them as set out in Norbar's catalogue or other published specification current at the time that the order for the Goods was accepted by Norbar.
- 7.2 Norbar warrants that, subject to the other provisions of these Conditions all Services will:
- be supplied with reasonable skill and care within the meaning of the Supply of Goods and Services Act 1982; and
 - conform in all material respects with the specification for them as set out in Norbar's catalogue or other published specification current at the time the order for the Services was accepted by Norbar (unless specifically varied in the quotation or Order Acknowledgement).
- 7.3 Norbar will not be liable for a breach of any of the warranties in Condition 7.1 unless:
- the Customer gives written notice of the defect to Norbar within 14 days of the time when the Customer discovers or ought to have discovered the defect; and
 - the Customer returns the defective Goods properly packed, carriage paid to Norbar's premises at the address given in Condition 1.1 or otherwise specified by Norbar.
- 7.4 Norbar will not be liable for a breach of the warranties in Condition 7.1 if:
- the Customer makes any further use of the Goods after giving notice of any defect; or
 - the Goods have been misused, mishandled, overloaded, amended, modified or repaired in any way by the Customer or its customers, or used for any purpose other than that for which they were designed; or
 - the defect is due to fair wear and tear or arises because the Goods have been subject to excessive use or used in an environment for which they were not designed; or
 - the Customer or its customer has failed to follow Norbar's oral or written instructions as to the storage, installation, commissioning, use, repair, calibration or maintenance of the Goods or the recommendations set out in any national or international standard applicable to the Goods or (if there are no applicable instructions or standards) good trade practice.
- 7.5 Norbar will not be liable for a breach of the warranties in Condition 7.2 unless:
- the Customer gives written notice to Norbar identifying which Services are defective in sufficient detail within 14 days of the time when the Customer discovers or ought to have discovered the defect; and
 - if the claim relates to Customer Equipment, Norbar is given a reasonable opportunity to examine the Customer Equipment and to assess the claim of defective Services,
- 7.6 Subject to Conditions 7.3 and 7.4, if any of the Goods do not conform with any of the warranties in Condition 7.1, Norbar will at its option repair or replace such Goods (or the defective part of them) or refund the price of such Goods at the pro rata Contract rate. The provisions of these Conditions will apply to any Goods that are remedied or replaced.
- 7.7 Subject to Condition 7.5 if any of the Services do not conform with any of warranties in Condition 7.2, Norbar will at its option remedy, re-perform or refund the Services that do not comply at the pro rata Contract rate. The provisions of these Conditions will apply to any Services that are remedied or re-performed for a period of 90 days with effect from the date of performance of the remedied or re-performed Services. If any repair of Customer Equipment fails within 90 days after the date on which it was returned to the Customer by Norbar, Norbar will at its option remedy, re-perform or refund the Services that do not comply at the pro rata Contract rate.
- 7.8 If Norbar complies with Condition 7.6 or 7.7 (as applicable), it will have no further liability for a breach of any of the warranties in Condition 7.1 or 7.2 in respect of such Goods and/or Services.

7.9 Except as provided in Conditions 7.1 and 7.2, Norbar makes no representation or warranty, whether express or implied, as to the quality or fitness for purpose of the Goods or Services and all warranties, Conditions and other terms which may be implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.10 Nothing in this Contract excludes or limits the liability of Norbar for:

- death or personal injury caused by Norbar's negligence; or
- defective products under the Consumer Protection Act 1987; or
- for fraud or fraudulent misrepresentation; or
- any matter for which it would be unlawful for Norbar to exclude or restrict liability.

THE CUSTOMER'S ATTENTION IS DRAWN TO THE PROVISIONS OF CONDITION 7.11

7.11 Subject to 7.10:

- Norbar's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise arising in connection with the performance or contemplated performance of this Contract will be limited to the price of the Goods and/or Services; and
- Norbar will not in any event be liable to the Customer for any loss of profit, loss of business or depletion of goodwill or loss of data, in each case whether direct, indirect or consequential, or any claims for consequential compensation whatsoever (howsoever caused) which arise out of or in connection with this Contract.

7.9 The Customer acknowledges that the price of the Goods and/or Services has been calculated on the basis that Norbar excludes and limits its liability in accordance with Condition 7.11.

7.10 Where the Goods and/or Services are sold under a consumer transaction the statutory rights of the Customer are not affected by these Conditions.

8. FORCE MAJEURE

Norbar reserves the right to defer the date of delivery or to cancel the Contract or reduce the volume of the Goods or Services ordered by the Customer (without liability to the Customer) if it is prevented from or delayed in the carrying on of its business due to circumstances beyond the reasonable control of Norbar including, without limitation, acts of God, governmental actions, war or national emergency, riot, civil commotion, fire, explosion, flood, epidemic, lock-outs, strikes or other labour disputes (whether or not relating to either party's workforce), or restraints or delays affecting carriers or inability or delay in obtaining supplies of adequate or suitable materials or components.

9. NOTICES

Any notice to be given under this Contract will be in writing and will be sent by first class mail within the UK, or by air mail, or by fax; in the case of Norbar to the address set out in Condition 1.1 and in the case of the Customer to the Delivery Point or such other address or fax number as the Customer may from time to time notify to Norbar for this purpose in accordance with this Condition. Notices sent as above will be deemed to have been received three working days after the date of posting (in the case of mail within the UK), or seven working days after the date of posting (in the case of air mail), or on the next working day after transmission (in the case of faxed messages) but only if a transmission report is generated by the sender's fax machine recording error free transmission of all pages to the correct fax number.

10. ANTI-BRIBERY

- Both Norbar and the Customer will comply with the United Kingdom Bribery Act 2010 and associated guidance and all other applicable United Kingdom legislation, statutory instruments and regulations in relation to bribery or corruption and similar or equivalent legislation in any other relevant jurisdiction.
- Without limitation to clause 10.1, neither party shall make or receive any bribe (as defined in the Bribery Act 2010) or other improper payment or allow any such to be made or received on its behalf either in the United Kingdom or elsewhere and shall implement and maintain adequate procedures to ensure that such bribes or payments are not made or received directly or indirectly on its behalf.

11. GENERAL

- The parties to the Contract do not intend that any term of the Contract will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to it, except that any Affiliate of Norbar may directly enforce any term of the Contract where "Affiliate" means any entity that directly or indirectly Controls, is Controlled by or is under common control with Norbar and "Control" means ownership of more than 50% of the issued share capital of a company.
- Each right or remedy of Norbar under the Contract is without prejudice to any other right or remedy of Norbar whether under the Contract or not.
- If any provision of the Contract is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void, voidable or unenforceable it will to the extent of such illegality, invalidity, voidness, voidability or unenforceability be deemed severable and the remaining provisions of the Contract and the remainder of such provision will continue in full force and effect.
- The Customer will not be entitled to assign the Contract or any part of it without the prior written consent of Norbar. Norbar may assign the Contract or any part of it or sub-contract any or all of its obligations under the Contract to any person, firm or company.
- Failure or delay by Norbar in enforcing or partially enforcing any provision of the Contract will not be construed as a waiver of any of its rights under the Contract.
- Any waiver by Norbar of any breach of, or any default under, any provision of the Contract by the Customer will not be deemed a waiver of any subsequent breach or default and will in no way affect the other terms of the Contract.
- The formation, existence, construction, performance, validity and all aspects of the Contract will be governed by English law and the parties submit to the non-exclusive jurisdiction of the English courts.

2019 NORBAR SHUTDOWN PERIODS

THE FACTORY WILL BE CLOSED ON THE FOLLOWING DATES (INCLUSIVE)

Tuesday 1 st January - New Year's Day
Friday 19 th April to Monday 22 nd April - Easter Bank Holiday
Monday 6 th May - May Day Bank Holiday
Monday 27 th May - Spring Bank Holiday
Monday 26 th August - Late Summer Bank Holiday
Wednesday 25 th December to Wednesday 1 st January 2020 - Christmas Shutdown

NORBAR PROMOTIONAL MATERIAL

CATALOGUES & LEAFLETS

07571	NorTorque® Sales Leaflet
07536	ClickTronic® Sales Leaflet
07563	Professional Torque Wrench Sales Leaflet
07570	EvoTorque®2 Sales Leaflet
07560	T-Box XL™ Sales Leaflet
07554	USM Sales Leaflet
07557	Oil & Gas ETO Leaflet
07579	HandTorque® HT3-1000 Sales Leaflet
07580	Industrial 2R & 2AR Sales Leaflet
07581	PneuTorque® PTS™ Sales Leaflet
07585	Right Angle Gearbox Sales Leaflet
07589	TWC Sales Leaflet
07436	NorTronic® Sales Leaflet
07591	EvoTorque® Battery Tool Sales Leaflet
07512	Aerospace Leaflet
07515	Energy Generation Leaflet

PROMOTIONAL ITEMS

07532	Norbar Torque Wrench Display Board Contact Norbar for slat wall adaptors
07539	Norbar Branded Pen
07551	Norbar Branded Pocket Notepad
07555	Norbar Branded Baseball Cap
07590	Norbar Branded Beanie Hat
07587.18	Norbar Branded USB Stick
07572	Set of 12 Posters
07573	Norbar Branded Construction Pen
07574	Norbar Branded 2 Ring White Ring Binder
07576	Norbar Branded Screen Saver Cloth / Mouse Mat

CUSTOMER RELATIONS

OFFICE OPENING HOURS

Monday - Thursday	07:30 - 17:30
Friday	07:30 - 16:15

CONTACT DETAILS

New Sales
Direct Tel +44 (0)1295 753600
Email sales@norbar.com

NORBAR PRODUCT PORTFOLIO



Torque Screwdrivers



Torque Wrenches



Electronic Torque Wrenches



Manual Torque Multipliers



Pneumatic Torque Tools



Electronic Torque Tools



Battery Torque Tools



Torque Measurement Instruments



Torque Transducers



Ultrasonic Bolt Measurement



Calibration Services

NORBAR SOCIAL MEDIA



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www.norbar.com/news-events/blog



Norbar Torque Tools Ltd



Norbar Torque Tools



Norbar Torque



Norbar Torque Tools Ltd



Let's Talk

The live chat feature can be found at the bottom right of any page on our website