

80⁺
YEARS
OF TORQUE
INNOVATION

EXPERTS BY CHOICE



DRILCO



GENERIC

Accuracy (%)	Torque & Angle	Digital Display
Single Scale	Dual Scale	Multi Scale
Calibration Certificate	UKAS Accredited Certification	IP Rated
Bluetooth Enabled	Case Included	

SCREWDRIVERS & TORQUE WRENCHES

Ratchet	Torque Handle	Fixed
Adjustment Lock	Declaration of Conformance	Calibration Certificate
1/4" Hex Bit Holder		

MANUAL TORQUE MULTIPLIERS

Adjustable Reaction	Anti Wind-up Ratchet	
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POWERED TORQUE TOOLS

Adjustable Reaction	2 Speed	Air Consumption - litres/sec
Lifting Attachment	Bi-Directional	

TORQUE MEASUREMENT INSTRUMENTS

Multi Transducers	Back-up Data	
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HARSH ENVIRONMENT INSTRUMENTS

Multi Transducers		
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ULTRASONIC MEASUREMENT

Back-up Data		
--------------	--	--

CUSTOMER RELATIONS

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NORBAR SOCIAL MEDIA



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POWERED TORQUE TOOLS



EvoTorque® Battery Tool Compact (EBT-C) 50

EvoTorque® Battery Tool Compact Advanced (EBT-CA) 51

EvoTorque® Battery Tool (EBT) 54

EvoTorque®2 56

Pneumatic Torque Tools 58

PneuTorque® PTS™ Series 60

PneuTorque® PTS™ Remote Series 62

ET, ET2, PTS™ and PTM Nose Extensions 63

PneuTorque® Standard Series 64

Torque Reaction 68

PTS™ and PTM Dual Trigger Module (DTM) 72

Secondary Handle 72

Right Angle Gearbox Module 72

Lubro Control Units 74

Socket Retainers 74

Electronic Tools

EvoTorque® are electronic torque tools 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.

Pneumatic Tools

PneuTorques consist of a robust air motor driving a Norbar multiplier with three or more stages of epicyclic gearing. This gives the advantage of smooth, continuous rotation (versus an impulsive action or the hammer action in an impacting tool).



EVOTORQUE® BATTERY TOOL COMPACT (EBT-C)

**Discover the Evolution**

The EvoTorque® Battery Tool Compact (EBT-C) is setting new standards in the torque multiplier market.

Experience the blend of compact design, precise torque measurement and exceptional thermal management that makes the EBT-C the tool of choice for those who refuse to compromise on safety and reliability.



More than...

20%

smaller than
equivalent EBT models



- The compact, lightweight and ergonomic design allows for easier access to applications and improved operator grip and comfort
- Patented cooling system, specifically engineered to manage and dissipate heat efficiently during operation ensures that the tool remains at optimal operating temperatures, even under heavy use
- Patented transducer-controlled battery torque tool works with 'intelligent joint sensing' technology to provide high accuracy and repeatability across all joint types
- The 'Safe to Start' button enhances safety by preventing accidental activation, requiring intentional engagement to proceed. Users can disable this feature in the menu settings for flexibility and personal preference
- 18V, 5.0Ah battery and efficient motor give outstanding fastening performance per charge
- High powered LED to illuminate application



EVOTORQUE® BATTERY TOOL COMPACT ADVANCED (EBT-CA)



Data you can Trust

The EvoTorque® Battery Tool Compact Advanced (EBT-CA) shares all the features and benefits of the EBT-C but has the premium additions of communication and data functionality.

	EBT-C	EBT-CA
Accuracy	± 5 %	± 3 %
Comms	□	■
Presets	10	50
Torque Mode	■	■
Torque Then Angle Mode	■	■
Angle Mode	□	■
Torque and Angle Monitoring	□	■
Audit Mode	□	■
Result Storage	□	■
User ID	□	■
PC Software	□	■
Phone App	□	■
Job Presets	□	■
External Gearbox Ratio Setting	□	■
Tool Lock Modes	□	■

EBT-CA Torque Modes

Torque

Operator sets a torque value and the tool will tighten until the target torque is achieved.



Torque Then Angle

Operator sets an initial torque target and final angle value. The tool will tighten to the set torque target, and then apply the angle value. The final torque value after the angle has been applied will be displayed.



Angle Only (Optional Torque Limit)

Operator sets an angle target, and the tool will immediately rotate until that angle is achieved. Torque is monitored, and a torque limit can be set which the tool will not exceed.



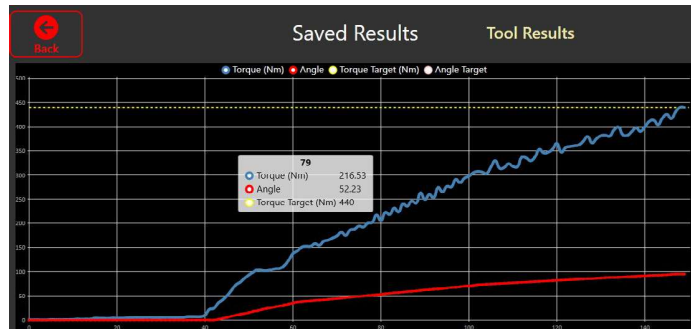
Torque with Angle Monitoring (TAM)

Operator sets an Initial and Final Torque, the angle is monitored between the Initial and Final Torque.



Audit Mode

The Operator sets a target torque and an angle limit. The tool will tighten until the target torque is achieved. The fastener rotation is measured, a pass/fail is then indicated.



Software Graph

The tool comes supplied with PC software and a mobile phone app is also available. These can be used to retrieve results, view tool diagnostics, configure Presets, User IDs and Job Presets.

Connectivity Options

- Connect to mobile app using Bluetooth® Low Energy (BLE)
- Connect to PC software via USB
- Connect to G400 or CTech Box systems with XBEE
- (Please see pages 76- 77 for more information on Connected Tools)

Create and send Presets

The user can create individual Presets, these can be grouped together in Jobs. Each Job can hold up to 50 Presets. Jobs and/or Presets can be transmitted to the tool, and results recorded.

Create and send Users

Set up and send User IDs, with full name and tool access password.

Save Results

The user can download results and graphs to a database in either the PC software or mobile app.

Viewing Downloaded Results

The results include the tool serial number, timestamp, checkmarks of whether the result achieved the correct torque and angle values. These can be viewed in either table or graph format, and exported as CSV files.

Symbol Key

□	■
Not Included Features	Included Features
Torque	Angle
Torque Monitoring	Angle Monitoring
Torque Limit	



13	EBT-C SERIES
181473	¾" sq. dr., 150 - 750 N·m, 110 - 550 lbf·ft
181477	1" sq. dr., 220 - 1,100 N·m, 160 - 800 lbf·ft
8	EBT-C & EBT-CA SERIES - ACCESSORIES
60334.EBT	Battery Pack
60352.KIT	Single Bay Battery Charger
19868	¾" sq. dr for EBT-C 1,100

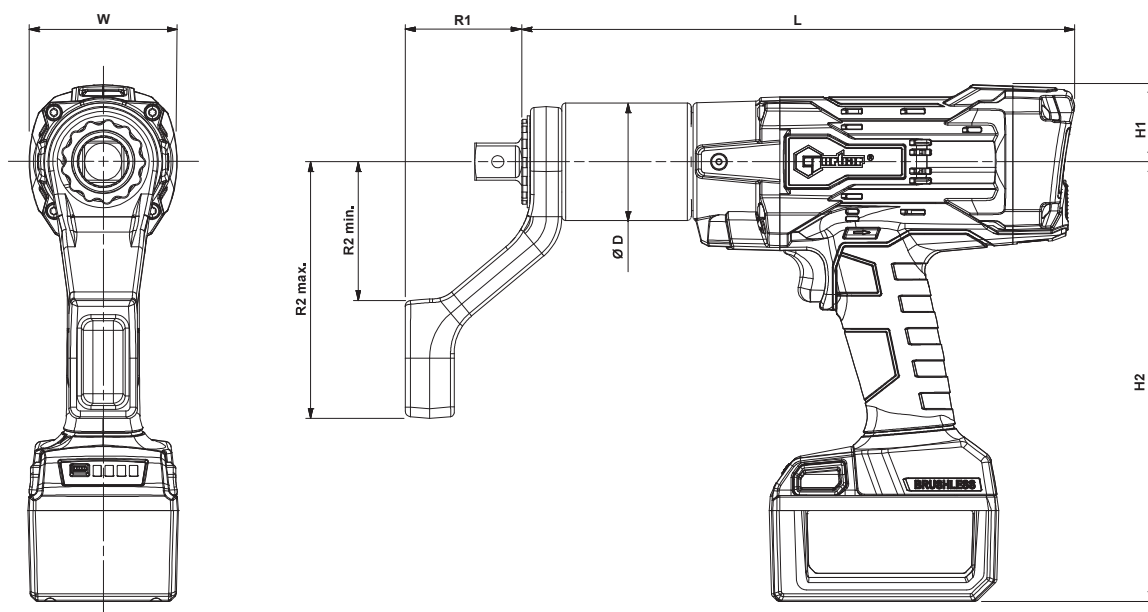
Model	EBT-C-750 EBT-CA-750	EBT-C-1100 EBT-CA-1100
Part Number	181473 181474 181475 181476	181477 181478 181479 181480
Operating Range (N·m)	75 - 750	110 - 1,100
Calibrated Range (N·m)	150 - 750	220 - 1,100
Output Speed (rpm)	12.5	9.1
Dimensions (mm)	ØD max.	60
	H1	39
	H2	224
	L	282
	R1	60
	R2 min.	71
	R2 max.	131
W	76	76
Tool Weight (kg)**	3.1	3.8
Reaction Weight (kg)	0.8	1.4

13	EBT-CA SERIES NON - WIRELESS
181474	¾" sq. dr., 150 - 750 N·m, 110 - 550 lbf·ft
181478	1" sq. dr., 220 - 1,100 N·m, 160 - 800 lbf·ft
13	EBT-CA SERIES BLUETOOTH
181475	¾" sq. dr., 150 - 750 N·m, 110 - 550 lbf·ft
181479	1" sq. dr., 220 - 1,100 N·m, 160 - 800 lbf·ft
13	EBT-CA SERIES G400
181476	¾" sq. dr., 150 - 750 N·m, 110 - 550 lbf·ft
181480	1" sq. dr., 220 - 1,100 N·m, 160 - 800 lbf·ft



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

*Tool supplied with a traceable Torque and
Angle Certificate of Calibration, 2 batteries,
1 single bay battery charger, cranked reaction,
operator's manual and quick reference guide*





19864

Wheel Reaction Assembly for use with EBT-C & EBT-CA 750



19859

Bladed Reaction for use with EBT-C & EBT-CA 750



EBT-C-750 Series

EBT-C 750 shown with Cranked Reaction (19860)



EBT-C-1100 Series

EBT-C 1100 shown with Cranked Reaction (19861)

11	EBT-C & EBT-CA REACTIONS FOR 750 N·m Tools
19859	Bladed Reaction
19860	Cranked Reaction
19864	Wheel Reaction Assembly
19876.006	6" Bladed Extension
19876.009	9" Bladed Extension
19869	6", ¾" sq. dr. Nose Extension



Below: 19864 -
Wheel Reaction Assembly



Right: 19859 -
Bladed Reaction

11	EBT-C & EBT-CA REACTIONS FOR 1,100 N·m Tools
19870	Bladed Reaction
19861	Cranked Reaction
19872	Wheel Reaction Assembly
19879.009	9" Bladed Extension

Left to Right:
19611 - Cranked Reaction
19782 - Single Sided
Reaction Plate
19783 - Double Sided
Reaction Plate
See pages 70 - 71 for more
information



NOTE: Existing reactions for 68 mm gearbox will work with EBT-C and EBT-CA 1100
Where a more bespoke reaction is required, our 'Engineer to Order' service is available



EVOTORQUE® BATTERY TOOL (EBT)



The EvoTorque® Battery Tool (EBT) features a new brushless motor, data memory and data transfer capabilities. Norbar has combined this with our respected gearboxes to deliver a range of fast, reliable, accurate torque tools that retain key features from our EvoTorque® 2 range (see page 56).

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 gives long life with minimal motor service requirement.

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. Both accuracy and repeatability of $\pm 3\%$ of the setting within the calibrated range.

- 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
- 'Safe to start' button ensures hands are safely positioned at start up

Note: In some circumstances it can be difficult to support and operate the tool while simultaneously pressing the trigger and 'safe to start' button. For this reason, single trigger models are also available.

- 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
- Optional 'Relax Mode' feature automatically reverses tool following joint completion until the tool becomes free or the trigger is released, minimising the chance of fastener and reaction 'locking' in place
- Supplied with a traceable calibration certificate for torque and angle as standard
Calibrated ranges shown in the table on page 55, clockwise only
- Available in single speed ideal for torque with angle control
- Auto two speed configurations available for rapid joint completion
- Torque, Torque & Angle and Torque Audit modes available
- In Torque & Angle Mode and Audit Mode, torque can be set from a lower percentage of tool maximum on single speed tools compared to their auto two speed equivalents. Single speed tools are therefore recommended for angle operation
- Software can be updated remotely, without the need to return the product to Norbar
- Quiet : Noise level : 79.1dB(A), with an uncertainty $K = 3\text{dB}$, when free-running
- Vibration : Does not exceed 2.5m/s^2 (highest measured under test : 0.9m/s^2)



EBT-800 Series

EBT-1350 Series



EBT-2000 Series

EBT-2700 Series



EBT-4000 Series

EBT-7000 Series



EVOTORQUE® BATTERY TOOL (EBT)



13	EBT SERIES - SINGLE SPEED - 'SAFE TO START' MODELS
180349	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf-ft, Kit
180445*	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf-ft, Kit
180493	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft, Kit
180541	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf-ft, Kit
180637	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft, Kit
181481	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf-ft, Kit

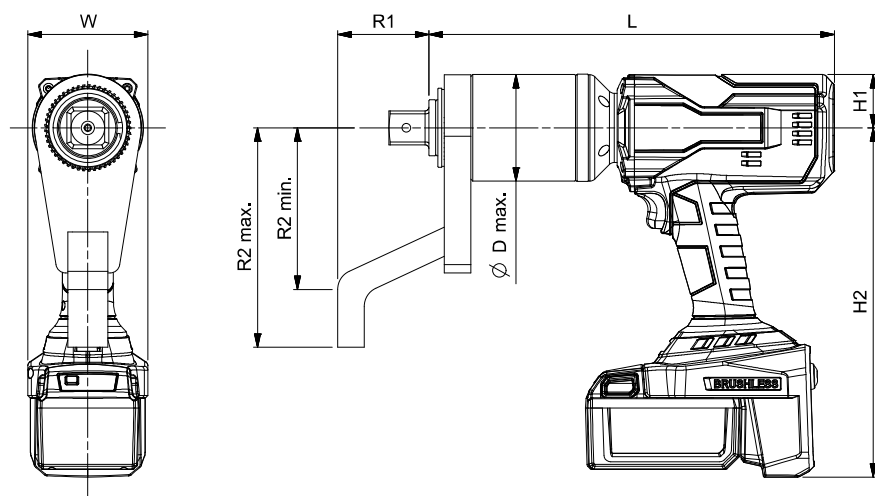
13	EBT SERIES - AUTO TWO SPEED - 'SAFE TO START' MODELS
180469*	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf-ft, Kit
180565	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf-ft, Kit
180661	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf-ft, Kit

*1,350 N·m models come supplied with both ¾" and 1" sq. dr.

13	EBT SERIES - SINGLE SPEED - SINGLE TRIGGER MODELS
180850	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf-ft, Kit
180898*	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf-ft, Kit
181305	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf-ft, Kit
180946	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf-ft, Kit
180994	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf-ft, Kit
181482	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf-ft, Kit

13	EBT SERIES - AUTO TWO SPEED - SINGLE TRIGGER MODELS
180922*	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf-ft, Kit
180970	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf-ft, Kit
181018	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf-ft, Kit

Model	EBT-800	EBT-1350	EBT-1350 Auto Two Speed	EBT-2000	EBT-2700	EBT-2700 Auto Two Speed	EBT-4000	EBT-4000 Auto Two Speed	EBT-7000
Part Number	180349 180850	180445 180898	180469 180922	180493 181305	180541 180946	180565 180970	180637 180994	180661 181018	181481 181482
Operating Range (N·m)	100 - 800	120 - 1,350	338 - 1,350	200 - 2,000	270 - 2,700	676 - 2,700	400 - 4,000	1,000 - 4,000	1,400 - 7,000
Calibrated Range (N·m)	160 - 800	200 - 1,350	338 - 1,350	400 - 2,000	400 - 2,700	676 - 2,700	800 - 4,000	1,000 - 4,000	1,400 - 7,000
Output Speed (rpm)	11.2	6.5	32	4.2	3.3	13	2.3	9.5	1.2
Dimensions (mm)	ØD max.	52	72	72	68	80	80	92	119
	H1	40	40	40	40	40	40	40	40
	H2	262	262	262	262	262	262	262	262
	L	271	298	317	294	298	333	352	378
	R1	59	76	76	75	76	70	70	90
	R2 min.	68	124	124	120	124	125	125	160
	R2 max.	131	167	167	165	167	175	175	210
	W	90	90	90	90	90	90	90	90
Tool Weight (kg)*	3.7	5.7	5.9	4.9	5.9	6.8	7.9	8.3	13.1
Reaction Weight (kg)	0.8	1.4	1.4	1.1	1.4	1.4	2.5	2.5	3.9



NOTE: Kit versions come with tool, 2 batteries, charger and a secondary handle in a carry case. 800 N·m tools do not come with a secondary handle.

Bare tools are also available, please visit www.norbar.com for more information.

Bare tools are supplied in a cardboard box without batteries, charger and secondary handle. Other tool variations are available, please contact Norbar for details.

NOTE: When the tool is to be used for untightening bolts; Norbar recommends the selection of single speed versions. In the case of prevailing torque lock-nuts or partially tightening bolts, the Auto Two Speed version of the tools will generally give no advantage and single speed tools should be selected.

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

Tool ranges shown above are calibrated ranges, see table above line drawing for operating ranges.

8	EBT SERIES - ACCESSORIES
60334.EBT	Battery Pack
60352.KIT	Single Bay Battery Charger



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. With accuracy and repeatability of $\pm 3\%$ of the setting, EvoTorque®2 offers many features including:

- 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
- Display and on-board storage of final torque or torque and angle values
- Memory capacity for 3,000 readings, time and date stamped
- USB and Bluetooth® 4.0 data transfer (also called Bluetooth® Smart)
- Complementary 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
- Results can be output in CSV (comma-separated values) format for users not able to use EvoLog
- 'Usage' counter gives the ability to see the amount of times the tool has been used since the last reset
- 'Turn Angle' option can be used to check if bolts have already been tightened in an assembly process
- Supplied with a traceable calibration certificate for torque and angle as standard. Calibrated from 20% to 100% of tools maximum torque capacity, clockwise only



ET2-1000 & 1350



ET2-2700



ET2-4000



ET2-7000



EVOTORQUE®2

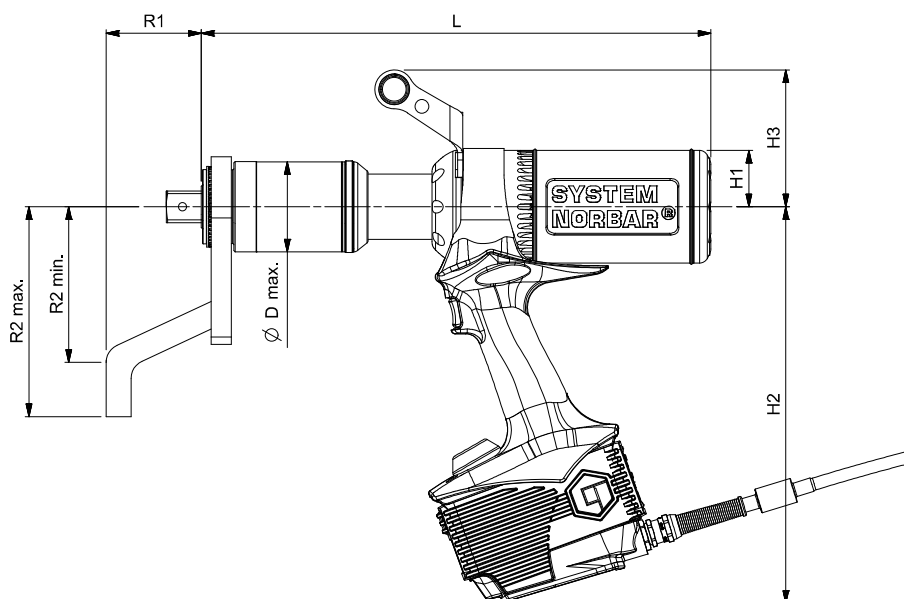


11	EVOTORQUE 2 - 110 V
180230.B06	ET2-72-1000-110, ¾" sq. dr., 200 - 1,000 N·m
180231.B06	ET2-72-1350-110, ¾" sq. dr., 270 - 1,350 N·m
180232.B08	ET2-72-2000-110, 1" sq. dr., 400 - 2,000 N·m
180239.B08	ET2-80-2700-110, 1" sq. dr., 540 - 2,700 N·m
180238.B08	ET2-92-4000-110, 1" sq. dr., 800 - 4,000 N·m
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
180228.B08	ET2-92-4000-230, 1" sq. dr., 800 - 4,000 N·m
180226.B12	ET2-119-7000-230, 1½" sq. dr., 1,400 - 7,000 N·m



Model		ET2-1000 ET2-1350	ET2-2000	ET2-2700	ET2-4000	ET2-7000
Part Number		180230.B06 180220.B06 180231.B06 180221.B06	180232.B08 180222.B08	180239.B08 180229.B08	180238.B08 180228.B08	180236.B12 180226.B12
Output Speed (rpm)		21 (ET-72-1000) 17 (ET-72-1350)	11	10	6	3.3
Dimensions (mm)	ØD max.	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	160
	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



Patented in the UK and Germany (EP2699389) and in the USA (US9676086).



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 through 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 Tools?

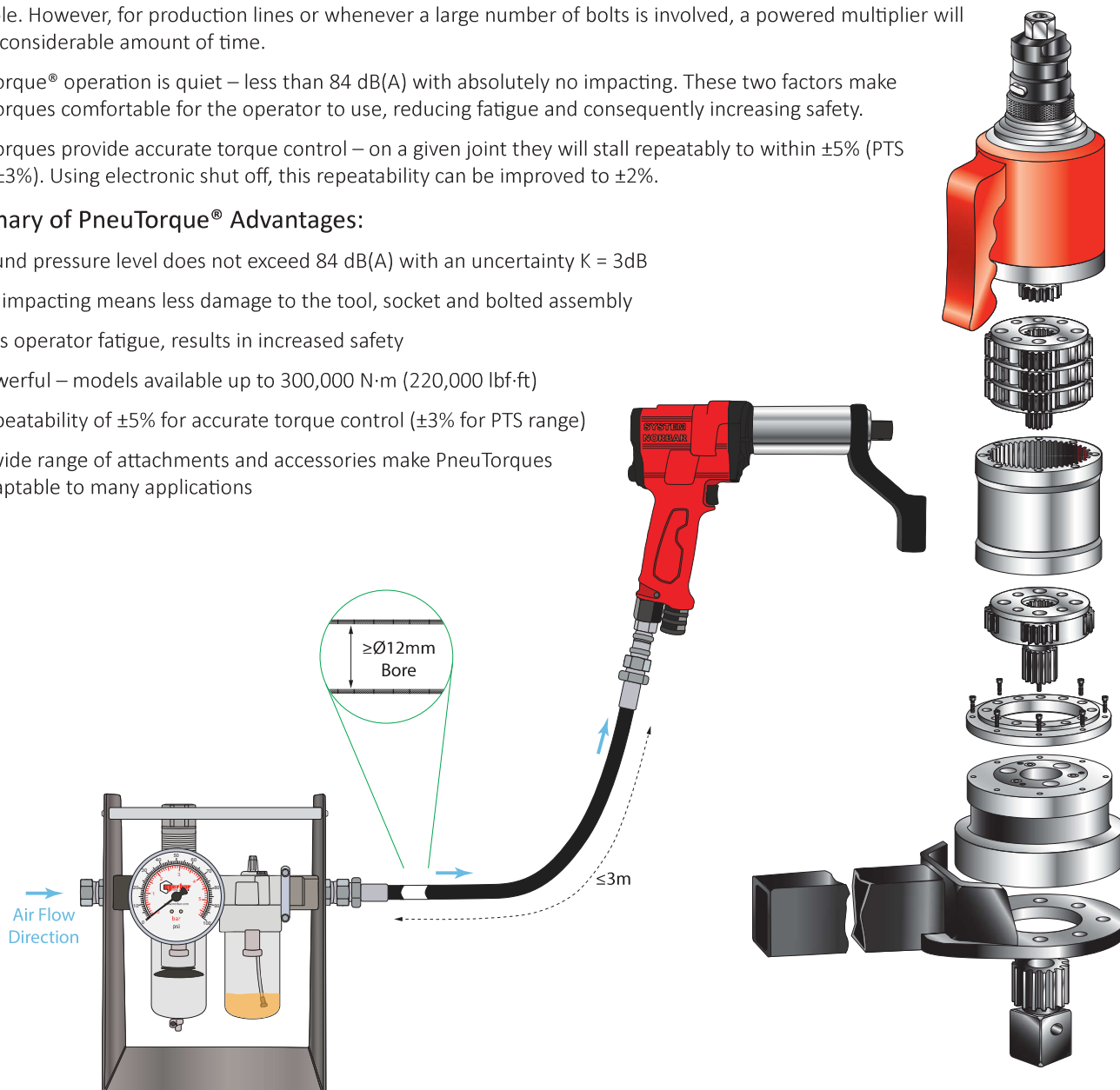
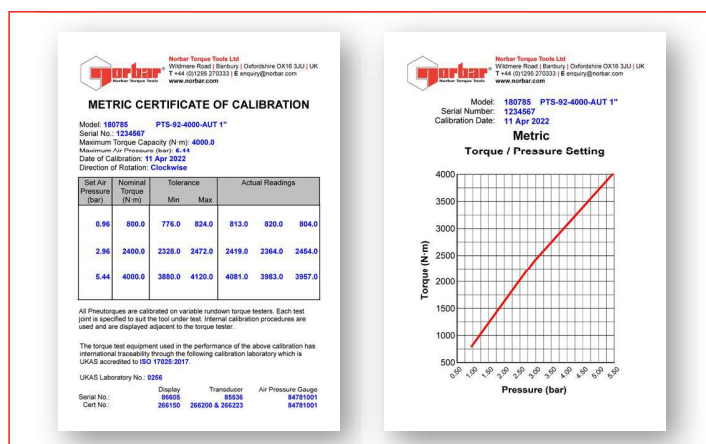
Hand operated torque multipliers are ideal for low volume or intermittent use or when there is no power source available. However, for production lines or whenever a large number of bolts is involved, a powered multiplier will save a considerable amount of time.

PneuTorque® operation is quiet – less than 84 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 $\pm 5\%$ (PTS tools, $\pm 3\%$). Using electronic shut off, this repeatability can be improved to $\pm 2\%$.

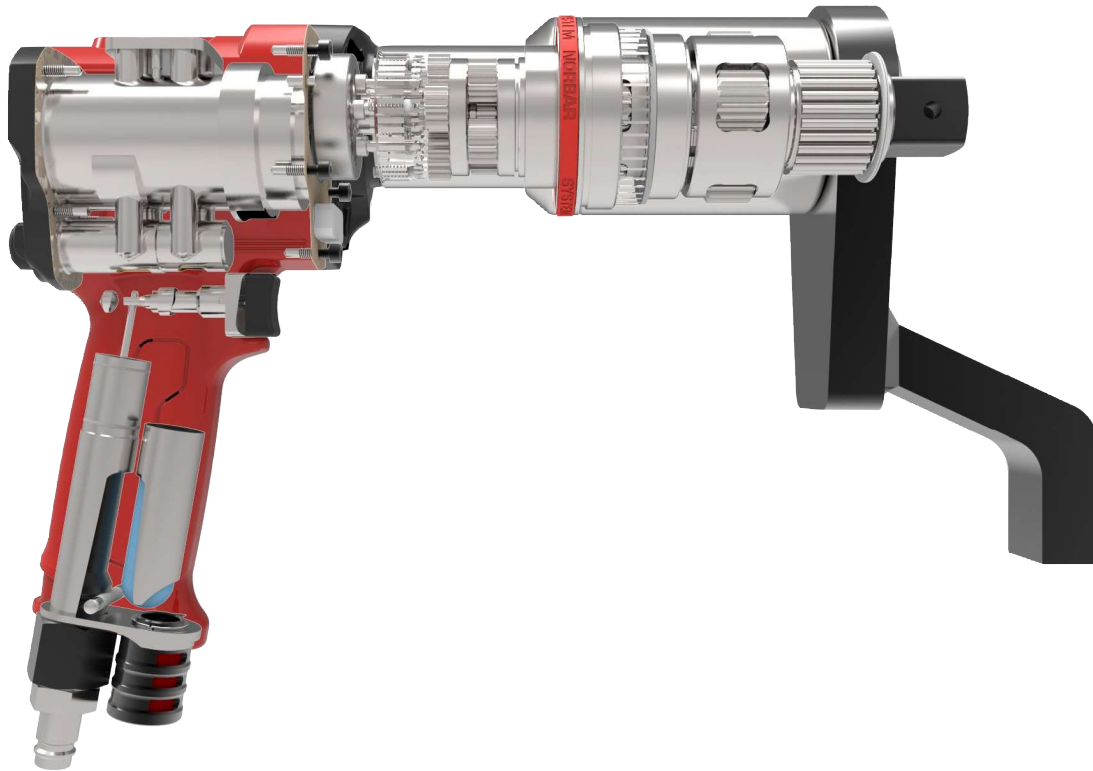
Summary of PneuTorque® Advantages:

- Sound pressure level does not exceed 84 dB(A) with an uncertainty $K = 3$ dB
- 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 $\pm 5\%$ for accurate torque control ($\pm 3\%$ for PTS range)
- 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:

- Valve Actuation and valve grinding
- 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 air motor is then married to Norbar's respected gearbox range, sharing common torque reaction accessories with PTM, EvoTorque® 2 and EBT.

- Pistol grip handle for operator comfort
- Designed to offer excellent power-to-weight ratio
- Easily accessible switch for forward and reverse operation
- $\pm 3\%$ 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
- Directional exhaust barrel directs exhaust away from operator
- Replaceable square drive
- Fast operation for rapid bolt rundown
- Non-impacting - exceptionally low vibration levels (0.343 m/s^2), make these tools comfortable and safe for operator use
- Steel reactions supplied as standard. Bespoke reactions available upon request

When the tool is to be used for untightening bolts, Norbar recommends the selection of single speed versions. In the case of prevailing torque lock-nuts or partially tightening bolts, the Auto Two Speed version of the tools will generally give no advantage and single speed tools should be selected.

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - SINGLE SPEED
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
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
181454	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft
180246.B08	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180250.B08	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180249.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - AUTO TWO SPEED
180781	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180782	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180784	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180785	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180788	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft





PNEUTORQUE® PTS™ SERIES



Model		PTS-500 PTS-800	PTS-1000 PTS-1350	PTS-1000 Auto Two Speed PTS-1350 Auto Two Speed	PTS-2000	PTS-2700	PTS-2700 Auto Two Speed	PTS-4000	PTS-4000 Auto Two Speed	PTS-7000	PTS-7000 Auto Two Speed
Part Number		180241.B06 180242.B06	180243.B06 180244.B08	180781 180782	181454	180246.B08	180784	180250.B08	180785	180249.B12	180788
Output Speed (rpm)		35.5 (PTS-52-500) 25.7 (PTS-52-800)	20.4 (PTS-72-1000) 14.7 (PTS-72-1350)	100 (PTS-72-1000) 75 (PTS-72-1350)	9.2	7.3	30	5.3	22	2.6	13
Dimensions (mm)	ØD max.	52	72	72	68	80	80	92	92	119	119
	H1	30	30	30	30	30	30	30	30	30	30
	H2	243	243	243	243	243	243	243	243	243	243
	L	264	292	310	285	291	327	343	374	369	406
	R1	59	74	74	74	74	74	74	75	90	90
	R2 min.	71	124	124	120	124	124	125	125	160	160
	R2 max.	131	165	167	165	165	167	175	175	210	210
Tool Weight (kg)		4.2	6.2	6.28	5.35	6.2	7.45	8.59	8.89	12.5	12.8
Reaction Weight (kg)		0.9	1.4	1.4	1.1	1.4	1.4	2.5	2.5	3.9	3.9



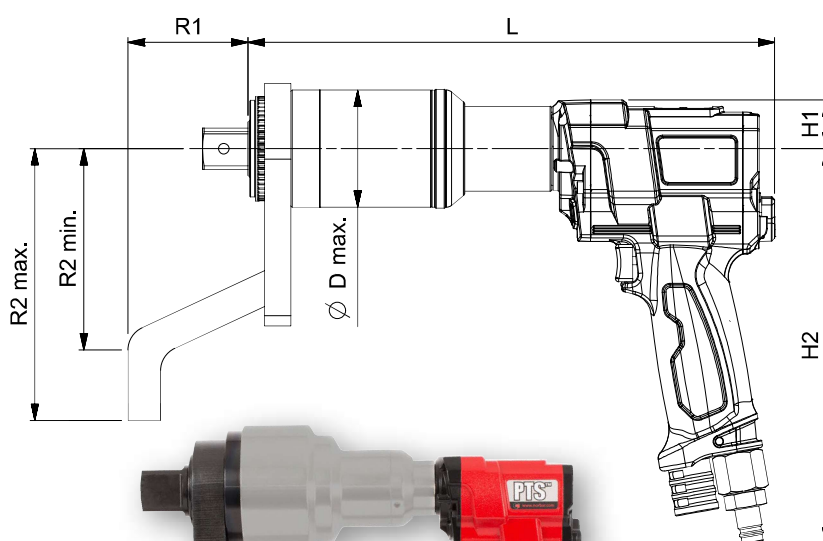
PTS™-2000



PTS™-2700



PTS™-7000





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

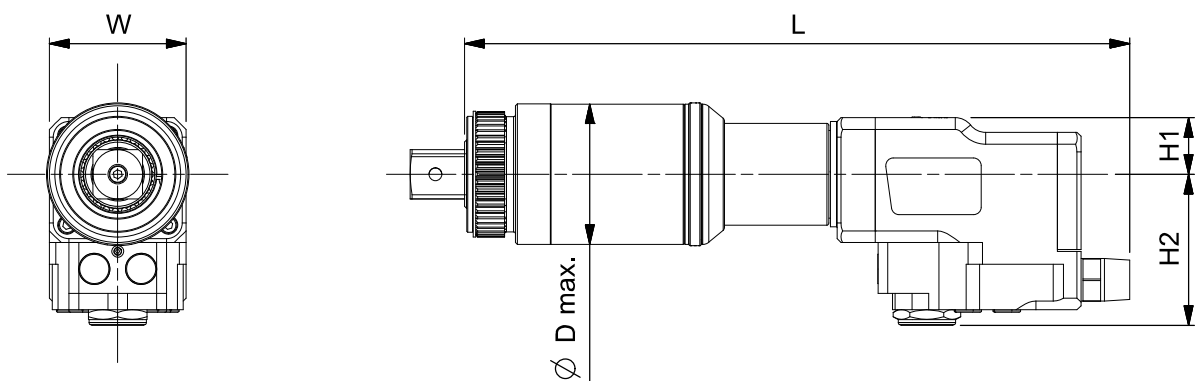
NOTE: For full versatility, PTS™ Remotes are supplied without reaction see pages 70-71 for options or discuss bespoke engineered options with Norbar.

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
181455	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
180279.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

11	PTS REMOTE SERIES - AUTO TWO SPEED
180789	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180790	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180792	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180793	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180796	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

Model	PTS REMOTE-500	PTS REMOTE-800	PTS REMOTE-1000	PTS REMOTE-1350	PTS REMOTE-2000	PTS REMOTE-2700	PTS REMOTE-4000	PTS REMOTE-7000
Part Number	180271.B06	180272.B06	180273.B06	180274.B08	181455	180276.B08	180295.B08	180279.B12
Output Speed (rpm)	27.8	20.1	16	11.5	7.2	5.7	4.1	2
Dimensions (mm)	ØD max.	52	52	72	72	68	80	92
	H1	29	29	29	29	29	29	29
	H2	78	78	78	78	78	78	78
	L	284	284	311	311	302	311	362
	W	70	70	70	70	70	70	70
Tool Weight (kg)	4.1	4.1	6.1	6.1	5.25	6.1	8.9	12.4

Model	PTS REMOTE-1000 Auto Two Speed	PTS REMOTE-1350 Auto Two Speed	PTS REMOTE-2700 Auto Two Speed	PTS REMOTE-4000 Auto Two Speed	PTS REMOTE-7000 Auto Two Speed
Part Number	180789	180790	180792	180793	180796
Output Speed (rpm)	78	56	22	20	10
Dimensions (mm)	ØD max.	72	72	80	92
	H1	29	29	29	29
	H2	78	78	78	78
	L	330	330	344	395
	W	70	70	70	70
Tool Weight (kg)	6.2	6.2	7.0	9.3	12.78





ET, ET2, 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.

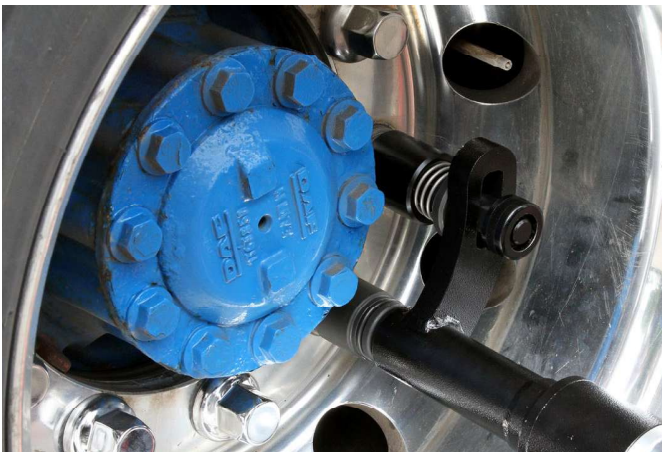


11	SPLINED NOSE EXTENSIONS FOR 72/92 SERIES 1" DRIVE
19285.006	ET2/EBT/PTS/PTM-72 6" long, 1" sq. dr.
19285.009	ET2/EBT/PTS/PTM-72 9" long, 1" sq. dr.
19285.012	ET2/EBT/PTS/PTM-72 12" long, 1" sq. dr.
19047.006	ET2/EBT/PTS/PTM-92 6" long, 1" sq. dr.
19047.009	ET2/EBT/PTS/PTM-92 9" long, 1" sq. dr.
19047.012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



11	SPLINED NOSE EXTENSIONS FOR 52 SERIES
19045.006	6" long, ¾" sq. dr.
19045.009	9" long, ¾" sq. dr.
19045.012	12" long, ¾" sq. dr.

11	SPLINED NOSE EXTENSIONS FOR 72 SERIES ¾" DRIVE
19046.006	6" long, ¾" sq. dr.
19046.009	9" long, ¾" sq. dr.
19046.012	12" long, ¾" sq. dr.



11	NOSE EXTENSIONS FOR 52 SERIES
18601.006	6" long, F/M ¾" sq. dr.
18601.009	9" long, F/M ¾" sq. dr.
18601.012	12" long, F/M ¾" sq. dr.

F/M = Female input square/Male output square

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.

11	NOSE EXTENSIONS FOR 80 SERIES
19480.009	9" long, SPM/M 1" sq. dr.
19480.012	12" long, SPM/M 1" sq. dr.

SPM/M = Spline Male input/Male output square



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, ¾" sq. dr
19087.012	1,000 N·m, 12" long, ¾" sq. dr
19089.009	1,000 N·m, 9" long, 1" sq. dr
19089.012	1,000 N·m, 12" long, 1" sq. dr



PNEUTORQUE® STANDARD SERIES

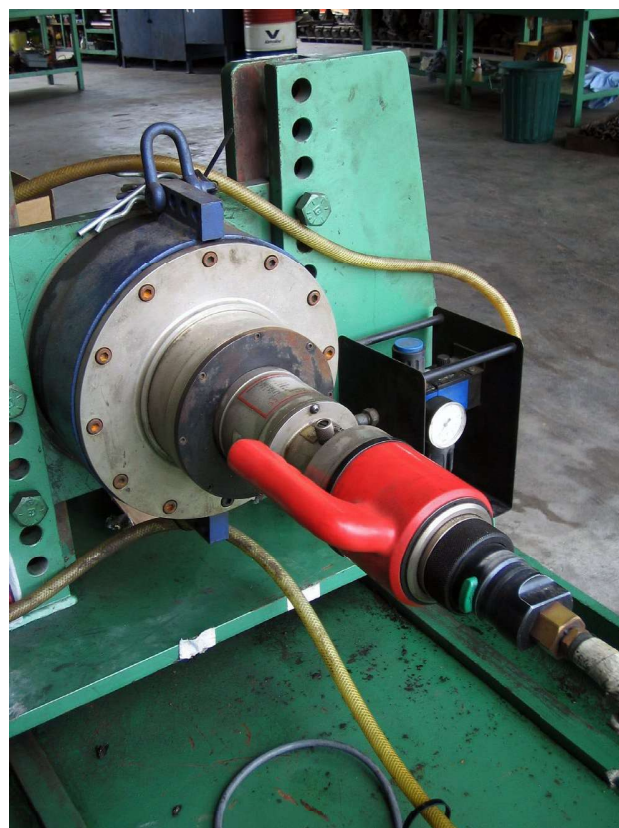


From left to right PT 5 Remote, PT 5 Single Speed, PT 5 Automatic Two Speed and PT 5 Manual Two Speed

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.
Models above 6,000 N·m are Manufactured to Order, for more information please contact Norbar
- Forward and reverse operation
- Quiet : Noise level : 81dB(A), with an uncertainty K = 3dB, when free running
- Vibration : Does not exceed 2.5m/s² (highest measured under test: 0.444m/s²)
- 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





PNEUTORQUE® STANDARD SERIES



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.

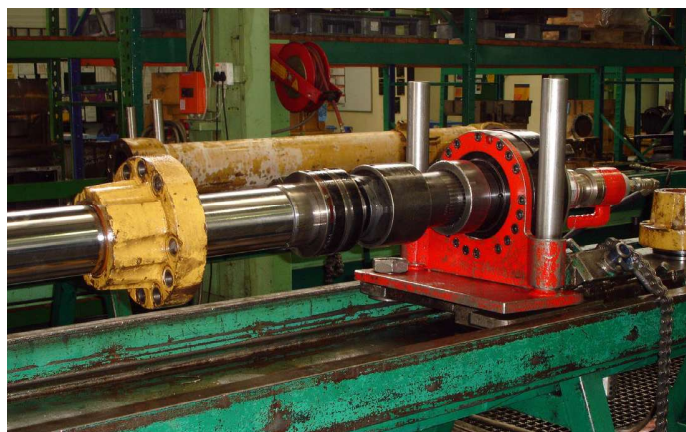
Angle Encoders are available for Standard Series PTs please contact Norbar for further details.

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. 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

For remote models, consult Norbar for prices.



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 9 and larger models are available as Manufacture to Order, please contact Norbar for more details





PNEUTORQUE® STANDARD SERIES



PneuTorque® Standard Series Manual Two Speed

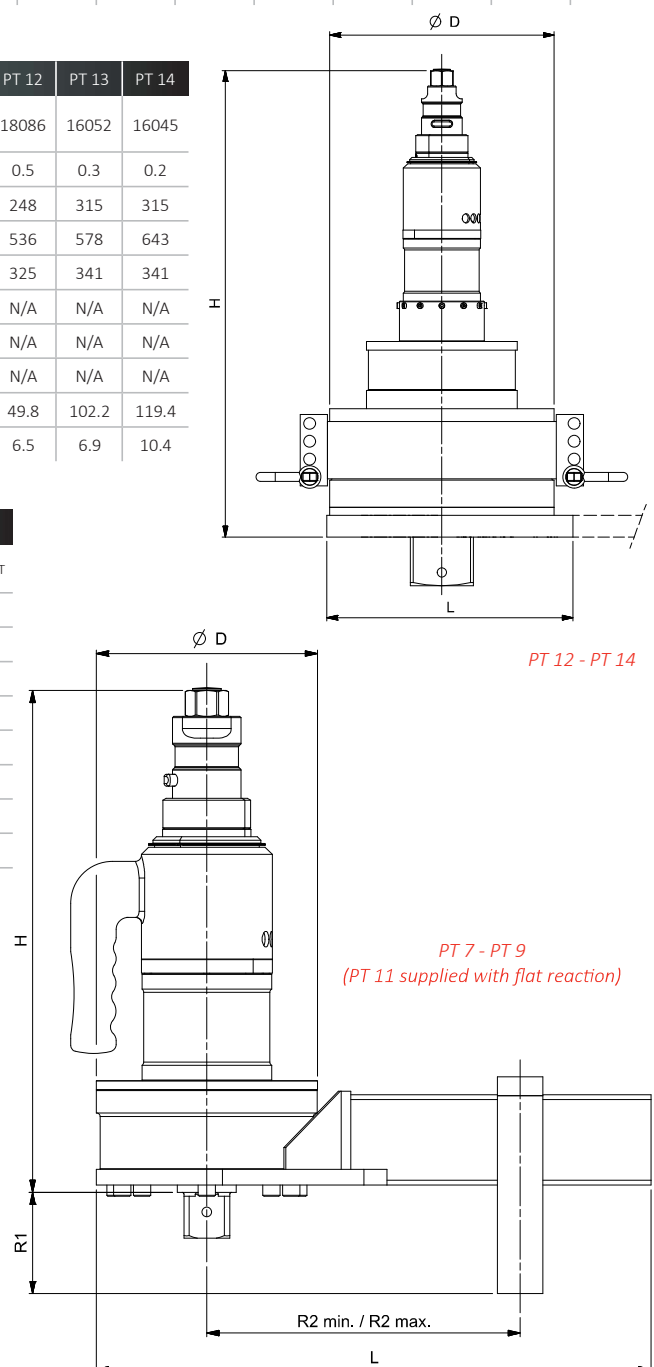
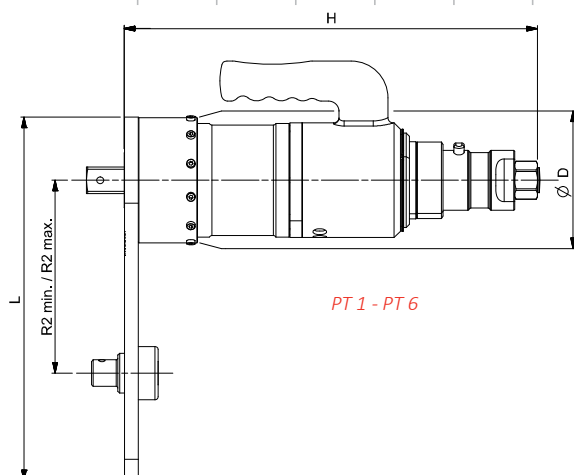
Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9	PT 11	PT 12	PT 13	PT 14	PT 15	PT 16	PT 17	PT 18	
Part Number	16031.MTS 16011.MTS	16098.MTS 16097.MTS	16013.MTS	16015.MTS	16017.MTS	16066.MTS	16072.MTS	16046.MTS	18086.MTS	16052.MTS	16045.MTS	18089.MTS	18090.MTS	18088.MTS	16054.MTS	
Output Speed (rpm)	150	75	45	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	N/A	N/A	N/A	N/A	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	

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	315
	H	350	350	350	393	395	423	418	495	536	578	643
	L	303	303	303	355	355	423	448	609	325	341	341
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A	N/A	N/A
	R2 min.	83	83	83	86	86	150	175	320	N/A	N/A	N/A
	R2 max.	216	216	216	263	263	331	351	500	N/A	N/A	N/A
Tool Weight (kg)		10.6	11.1	11.1	14.0	14.0	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

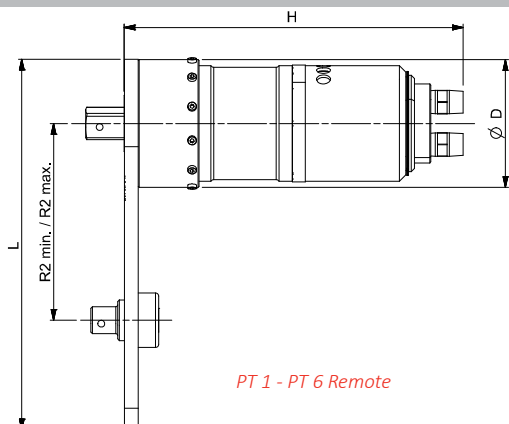
PneuTorque® Standard Series Automatic Two Speed

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	184
	H	419	419	419	462	464	492	487
	L	303	303	303	355	355	423	448
	R1	N/A	N/A	N/A	N/A	N/A	84	84
	R2 min.	83	83	83	86	86	150	175
	R2 max.	216	216	216	263	263	331	351
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	





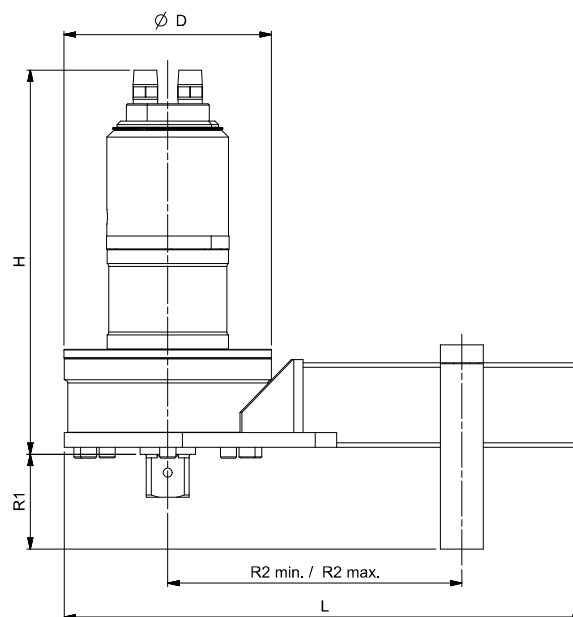
PNEUTORQUE® STANDARD SERIES



PT 1 - PT 6 Remote

PneuTorque® Standard Series Automatic Two Speed - Remote

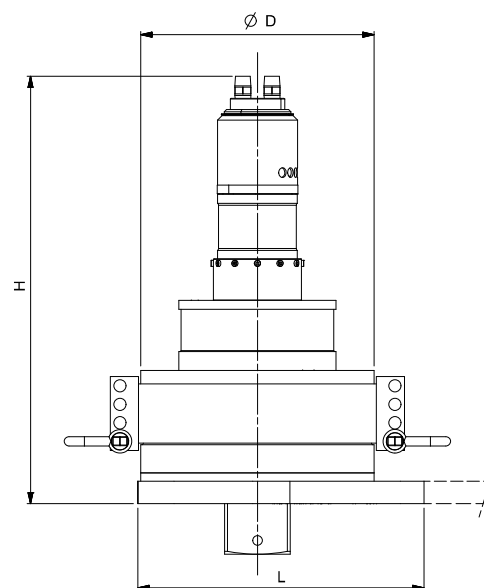
Model	PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7	PT 9
Part Number	16031.XAUT 16011.XAUT	16098.XAUT 16097.XAUT	16013.XAUT	16015.XAUT	16017.XAUT	16066.XAUT	16072.XAUT
Output Speed (rpm)	150	75	45	25	25	12.5	9
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	339	339	339	382	383	412
	L	303	303	303	355	355	423
	R1	N/A	N/A	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 9 Remote (PT 11 Remote supplied with flat reaction)

PneuTorque® Standard Series Single Speed - Remote

Model	PT 1	PT 1A	PT 2	PT 5	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	16066.X	16072.X	16046.X	18086.X	16052.X	16045.X
Output Speed (rpm)	30	15	9	5	2.5	1.8	1.2	0.5	0.3	0.2
Dimensions (mm)	ØD	108	108	108	119	144	184	212	248	315
	H	270	270	270	313	343	340	415	456	490
	L	303	303	303	355	423	448	609	325	341
	R1	N/A	N/A	N/A	N/A	84	84	N/A	N/A	N/A
	R2 min.	83	83	83	86	150	175	320	N/A	N/A
	R2 max.	216	216	216	263	331	351	500	N/A	N/A
Tool Weight (kg)	10.6	11.1	11.1	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	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	*	410	410	520
	H	356	356	356	399	400	429	425	501	542	576	649	*	786	859
	L	303	303	303	355	355	423	448	609	325	341	341	*	N/A	N/A
	R1	N/A	N/A	N/A	N/A	N/A	84	84	N/A	N/A	N/A	N/A	N/A	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
	R2 max.	216	216	216	263	263	331	351	500	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



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 70-71 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.

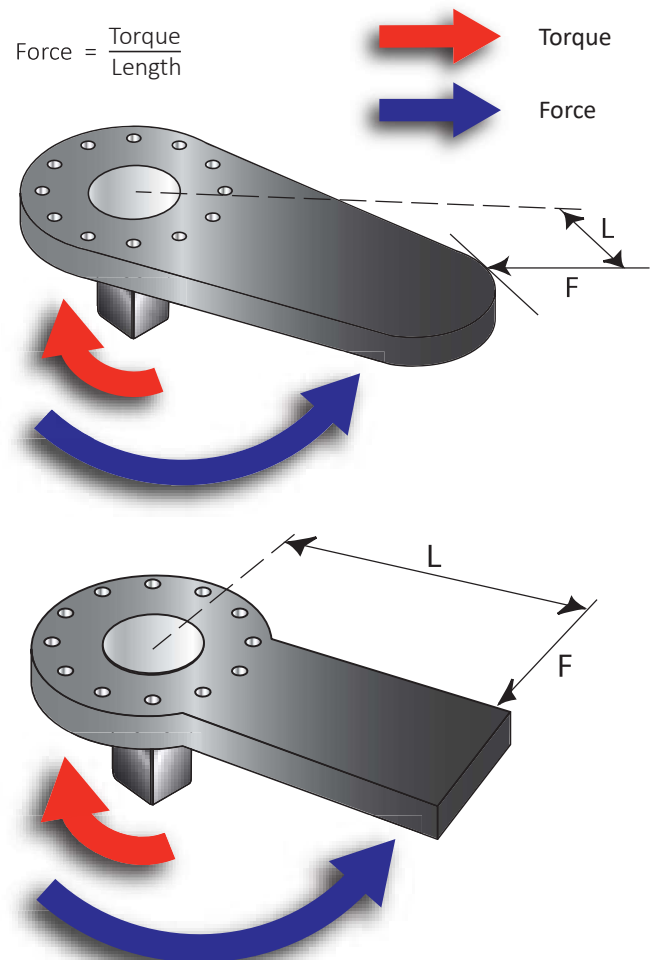
Customers using or modifying reaction plates for Standard Series multipliers up to a capacity of 3,400 N-m should note that if the reaction is taken on the radiused part, the reaction force is perpendicular to the tangent of the curve. Consequently, the further around the radius the reaction is taken, 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 $\pm 4\%$).

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



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-sided 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.



TORQUE REACTION

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

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

11	REACTION FOR ET/EBT/PTS/PTM-68 SERIES
19611	Steel Cranked Reaction for 68 mm



Steel Cranked Reaction
for 68 mm Gearbox

11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-72 & 80 SERIES
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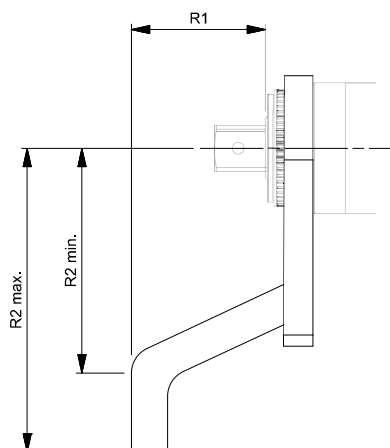
19289	Steel Cranked Reaction for 72 mm and 80 mm		18494	Aluminium Cranked Reaction for 72 mm and 80 mm	
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11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES
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19291	Steel Cranked Reaction for 92 mm		18936	Aluminium Cranked Reaction for 92 mm	
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11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-119 SERIES
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19293	Steel Cranked Reaction for 119 mm (Max. 7,000 N·m)		18961	Aluminium Cranked Reaction for 119 mm (Max. 6,000 N·m)	
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11	SPECIAL SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES
78028	Steel Cranked Reaction for 92 mm

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

11	SPECIAL SPLINED REACTION FOR API FLANGES
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78029	HT/ET/EBT/PTS/PTM-72 & 80 Series Steel Crowfoot Reaction for 1½" – 1½"(M30 – M39) nuts/bolts
78028	HT/ET/EBT/PTS/PTM-92 Series Steel Cranked Reaction (see image above) for 1½" – 1½"(M42 – M48) nuts/bolts
78030	HT/ET/EBT/PTS/PTM-119 Series Steel Crowfoot Reaction for 2" – 2½"(M52 – M64) nuts/bolts

Part Number	R1	R2 min	R2 max
18646	59 mm	71 mm	131 mm
19611	75 mm	120 mm	165 mm
19289	76 mm	124 mm	167 mm
18494	68 mm	91 mm	165 mm
19291	70 mm	125 mm	175 mm
18936	87 mm	115 mm	205 mm
19293	90 mm	160 mm	210 mm
18961	118 mm	150 mm	199 mm

Part Number	R1	R2 min	R2 max
78027	90 mm	148 mm	248 mm
78028	70 mm	57 mm	145 mm
78029	76 mm	45 mm	115 mm
78030	110 mm	70 mm	156 mm



TORQUE REACTION

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	SPECIAL SPLINED REACTION FOR RAIL
Q4714	HT/ET/EBT/PTS/PTM-52 Series Pegged Reaction Plate Max Torque 500 N·m
Q5000	HT/ET/EBT/PTS/PTM-72 Series Pegged Reaction Plate Max Torque 1,500 N·m



Q4714 Pegged Reaction Plate for rail

11	FOR HT/EBT/PTS/PTM-52 SERIES
18590	Double-Sided Reaction Plate
18576	Straight Reaction Plate
62236	Reaction Plate Spline Adaptor

11	FOR ET/EBT/PTS/PTM-68 SERIES
19783	Double-Sided Reaction Plate

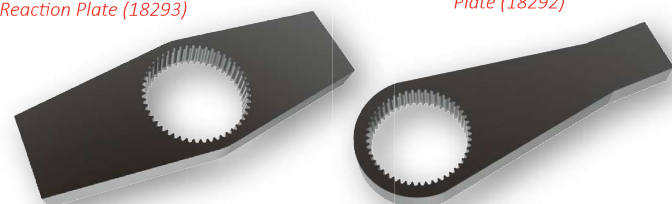
11	FOR HT/ET/EBT/PTS/PTM-72 & 80 SERIES
18293	Double-Sided Reaction Plate
18292	Straight Reaction Plate

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

*Double-Sided
Reaction Plate (18293)*

*Straight Reaction
Plate (18292)*



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

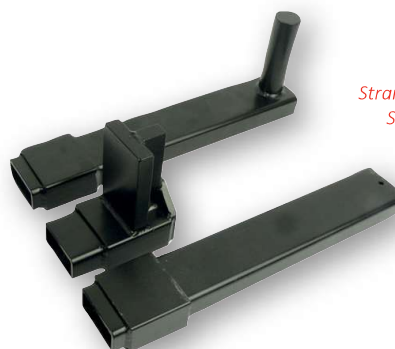


*Light-Weight Reaction
(19214)*



Reaction Weld Ring

11	REACTION WELD RINGS
18694	For HT/EBT/PTS/PTM-52
19784	For ET/EBT/PTS/PTM-68
18695	For HT/ET/EBT/PTS/PTM-72 & 80
18696	For HT/ET/EBT/PTS/PTM-92
18697	For HT/ET/EBT/PTS/PTM-119
19871	EBT-C 750 Reaction Weld Ring
19784	EBT-C 1,100 Reaction Weld Ring



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

11	ANCILLARY ITEMS FOR USE WITH 18290 OR 18558
18558	Reaction Adaptor for HT/ET/EBT/PTS/PTM-52 Series
18290	Reaction Adaptor for HT/ET/EBT/PTS/PTM-72 Series
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)

Sliding Reaction (180300.092.B08)



11	SLIDING REACTIONS
180300.052.B06	52 mm diameter Sliding Reaction ¾" sq.
19785.068.B06	68 mm diameter Sliding Reaction ¾" sq.
19785.068.B08	68 mm diameter Sliding Reaction 1" sq.
180300.072.B06	72 mm diameter Sliding Reaction ¾" 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 ½" sq.
180300.119.B12	119 mm diameter Sliding Reaction 1 ½" sq.



Sliding Spigot Reaction Plate (18436)

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

11	FOR ET/EBT/PTS/PTM-68 SERIES
19782	Single-Sided Straight Reaction Plate

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



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

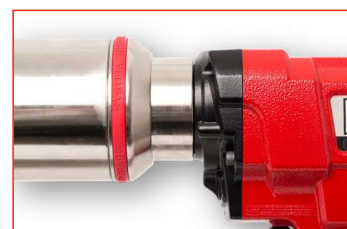
To order a pre-assembled tool add the suffix .DTM onto the end of the part number.

NOTE: When fitting a DTM the torque tool must be recalibrated with the DTM in place, contact Norbar for details.

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 ET2/EBT/PTS/PTM 72, 92 & 119 Series
19448	For use with ET2/EBT/PTS/PTM 80 Series
Not suitable for use with ET2/EBT/PTS/PTM 52 and 68 Series	

RIGHT ANGLE GEARBOX MODULE

*Right Angle Gearbox
(180280)*

The Right Angle Gearbox Adaptor will provide most ET, EBT, 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.

- The tool handle can rotate 360° in relation to the Right Angle Gearbox allowing the most comfortable and safest position to be found
- 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.

11	RIGHT ANGLE GEARBOX MODULE
180280	For use with ET2/EBT/PTS/PTM 72, 80, 92 & 119 Series
181486	For use with ET2/EBT/PTS/PTM 68 Series



RIGHT ANGLE GEARBOX MODULE

11	EVOTORQUE 2 - 110 V - RIGHT ANGLE GEARBOX
180230.B06.RA	ET2-72-1000-110, 3/4" sq. dr., 200 - 1,000 N·m
180231.B06.RA	ET2-72-1350-110, 3/4" sq. dr., 270 - 1,350 N·m
180232.B08.RA	ET2-72-2000-110, 1" sq. dr., 400 - 2,000 N·m
180239.B08.RA	ET2-80-2700-110, 1" sq. dr., 540 - 2,700 N·m
180238.B08.RA	ET2-92-4000-110, 1" sq. dr., 800 - 4,000 N·m
180236.B12.RA	ET2-119-7000-110, 1 1/2" sq. dr., 1,400 - 7,000 N·m

11	EVOTORQUE 2 - 230 V - RIGHT ANGLE GEARBOX
180220.B06.RA	ET2-72-1000-230, 3/4" sq. dr., 200 - 1,000 N·m
180221.B06.RA	ET2-72-1350-230, 3/4" sq. dr., 270 - 1,350 N·m
180222.B08.RA	ET2-72-2000-230, 1" sq. dr., 400 - 2,000 N·m
180229.B08.RA	ET2-80-2700-230, 1" sq. dr., 540 - 2,700 N·m
180228.B08.RA	ET2-92-4000-230, 1" sq. dr., 800 - 4,000 N·m
180226.B12.RA	ET2-119-7000-230, 1 1/2" sq. dr., 1,400 - 7,000 N·m



Right Angle Gearbox fitted to EvoTorque®2



Right Angle Gearbox fitted to PTS™

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - AUTO TWO SPEED - RIGHT ANGLE GEARBOX
180781.RA	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180782.RA	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180784.RA	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180785.RA	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180788.RA	1 1/2" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - SINGLE SPEED - RIGHT ANGLE GEARBOX
180241.B06.RA	3/4" sq. dr., 100 - 500 N·m, 74 - 370 lbf·ft
180242.B06.RA	3/4" sq. dr., 160 - 800 N·m, 118 - 590 lbf·ft
180243.B06.RA	3/4" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180244.B08.RA	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
181454.B08.RA	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft
180246.B08.RA	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180250.B08.RA	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180249.B12.RA	1 1/2" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

13	EBT SERIES - SINGLE SPEED - 'SAFE TO START' - RIGHT ANGLE GEARBOX
180353	3/4" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, Kit
180449*	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, Kit
180497	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, Kit
180545	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, Kit
180641	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, Kit

13	EBT SERIES - AUTO TWO SPEED - 'SAFE TO START' - RIGHT ANGLE GEARBOX
180473*	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, Kit
180569	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, Kit
180665	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, Kit

*1,350 N·m models come supplied with both 3/4" and 1" sq. dr.



Right Angle Gearbox fitted to EBT



LUBRO CONTROL UNITS

**Lubro Control Unit, part number 16074**

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. 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.



16074



16075

11	LUBRO CONTROL UNITS
16074	Lubro Control Unit with 3 m hose
60339	MPa only gauged Lubro Control Unit with 3 m hose
16075	Twin Lubro Control Unit with 3 m hose

See page 134 for Lubro Control Unit spares.

SOCKET RETAINERS



These socket retaining clips make attaching sockets to square drives easy and quick.

8	SOCKET RETAINING CLIPS
19556	Socket Retaining Clip for 3/4" sq. dr. (Yellow) - Pack of 10
19557	Socket Retaining Clip for 1" sq. dr. (Red) - Pack of 10
19558	Socket Retaining Clip for 1 1/2" sq. dr. (Green) - Pack of 10
19559	Socket Retaining Clip for 2 1/2" sq. dr. (Blue) - Pack of 10



This product is intended for general purpose use at ground level. It is not intended as a solution for socket retention when working at height or where FOD (foreign object damage) could cause a safety and/or commercial risk.

Not recommended for use with impact tools.



CONNECTED TOOLS



EBT for use with G400 and G400MP 76

Torque Controller System Global 400 Series 77

Multi-Port Torque Controller System Global 400MP Series 77

These systems are designed to error proof processes where highly customised products are assembled. When combined with the EBT customers can ensure correct torque has been achieved at key critical bolting steps of their processes monitored by the Global 400 or Global 400MP.



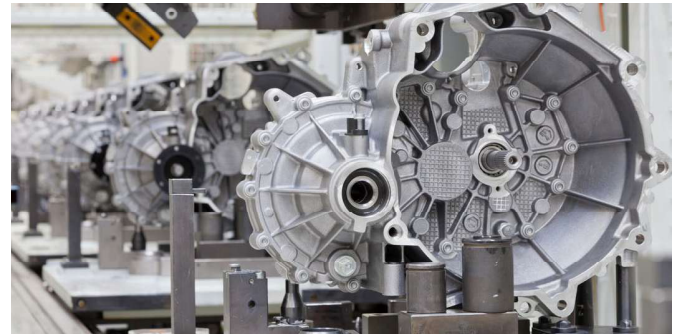


EBT FOR USE WITH G400 AND G400MP



Norbar's highly accurate transducer controlled EBT battery powered torque tool perfectly complements and connects with Sturtevant Richmond's Global 400 series Torque Controller systems via Xbee radio. These systems are designed to error-proof processes where highly customised products are assembled. When combined with the EBT customers can ensure correct torque has been achieved at key critical bolting steps of their processes monitored by the Global 400 or Global 400MP.

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. Both accuracy and repeatability of $\pm 3\%$ of the setting within the calibrated range.



- Powerful motor coupled with either a single speed or auto two speed gearbox for rapid joint completion times
- Tool is not constrained by power cable or hose, improving safety, convenience and versatility
- OLED display ensures visibility in all conditions
- Clear indication of successful joint application
- 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
- 'Safe to start' button ensures hands are safely positioned at start up
- Quiet with noise levels that do not exceed 79.1dB(A)
- Non-impacting with vibration that do not exceed 2.5m/s²

13	EBT SERIES G400 CONTROLLER COMPATIBLE TOOLS
180357	EBT 800 G400
180453	EBT 1350 G400
180477	EBT 1350-AUT G400
180549	EBT 2700 G400
180573	EBT 2700-AUT G400
180645	EBT 4000 G400
180669	EBT 4000-AUT G400
180858	EBT 800 G400 ST
180906	EBT 1350 G400 ST
180930	EBT 1350-AUT G400 ST
180954	EBT 2700 G400 ST
180978	EBT 2700-AUT G400
181002	EBT 4000 G400
181026	EBT 4000-AUT G400 ST

13	EBT-CA SERIES G400 CONTROLLER COMPATIBLE TOOLS
181476	EBT-CA 750 G400
181480	EBT-CA 1100 G400

For more information contact Norbar.



TORQUE CONTROLLER SYSTEM GLOBAL 400 SERIES



Utilise connected wireless tooling to error-proof your processes

The Global 400 is designed to organise workstations where highly customised products are assembled. It can work with 16 primary torque tools, 8 holding tools and an additional 8 I/O tools. It has the capacity for 100 sets of parameters that can be grouped allowing 4 operators to work as a team. These parameters or groups can be formed into jobs containing a fixed build sequence of up to 35 steps. Error-proofs your processes using connected wireless tooling.

- Supports up to 16 Sturtevant Richmond tools as well as the Norbar EvoTorque® Battery Tool
- Works with many protocols and MES systems (EitherNet IP, Open Protocol, Toolsnet, 24 Volt I/O)
- Supports the use of barcode scanners to further error proof your process
- Has the capability for 100 sets of parameters
- 10 pin I/O connector providing discreet I/O capabilities



System Capabilities:

- 6 inch diagonal, back-lit colour LCD display
- USB-A connector for use with barcode scanner, or updating firmware and saving files
- RS-232 D-Sub9 Connector for use with serial barcode scanner or serial printer
- Key switch for programming access, 21 function keys for programming
- Adjustable and programmable beeper for audio communication



MULTI-PORT TORQUE CONTROLLER SYSTEM GLOBAL 400MP SERIES



Designed to organise multiple workstations where highly customised products are assembled

The Global 400mp distributes all the power, flexibility, ease and capabilities of the Global 400 over 4 individual network interfaces. The result? Up to 4 operators can work independently and don't even have to be in the same work cell.

4 separate network interfaces and Global 400mp architecture eliminate the need for groups in order to support simultaneous work.

Parameters are formed directly into jobs. With 4 network interfaces each operator can work on their own job, independent of the other operators.

The Global 400mp can be applied to assembly, repair and maintenance operations.

- Has the ability to work with 4 different stations/operators simultaneously through multiple ports
- Supports up to 16 Sturtevant Richmond tools as well as the Norbar EvoTorque® Battery Tool
- Works with many protocols and MES systems (EitherNet IP, Open Protocol, Toolsnet, 24 Volt I/O)
- Supports the use of barcode scanners to further error proof your process
- Has the capability for 100 sets of parameters
- 10 pin I/O connector providing discreet I/O capabilities

