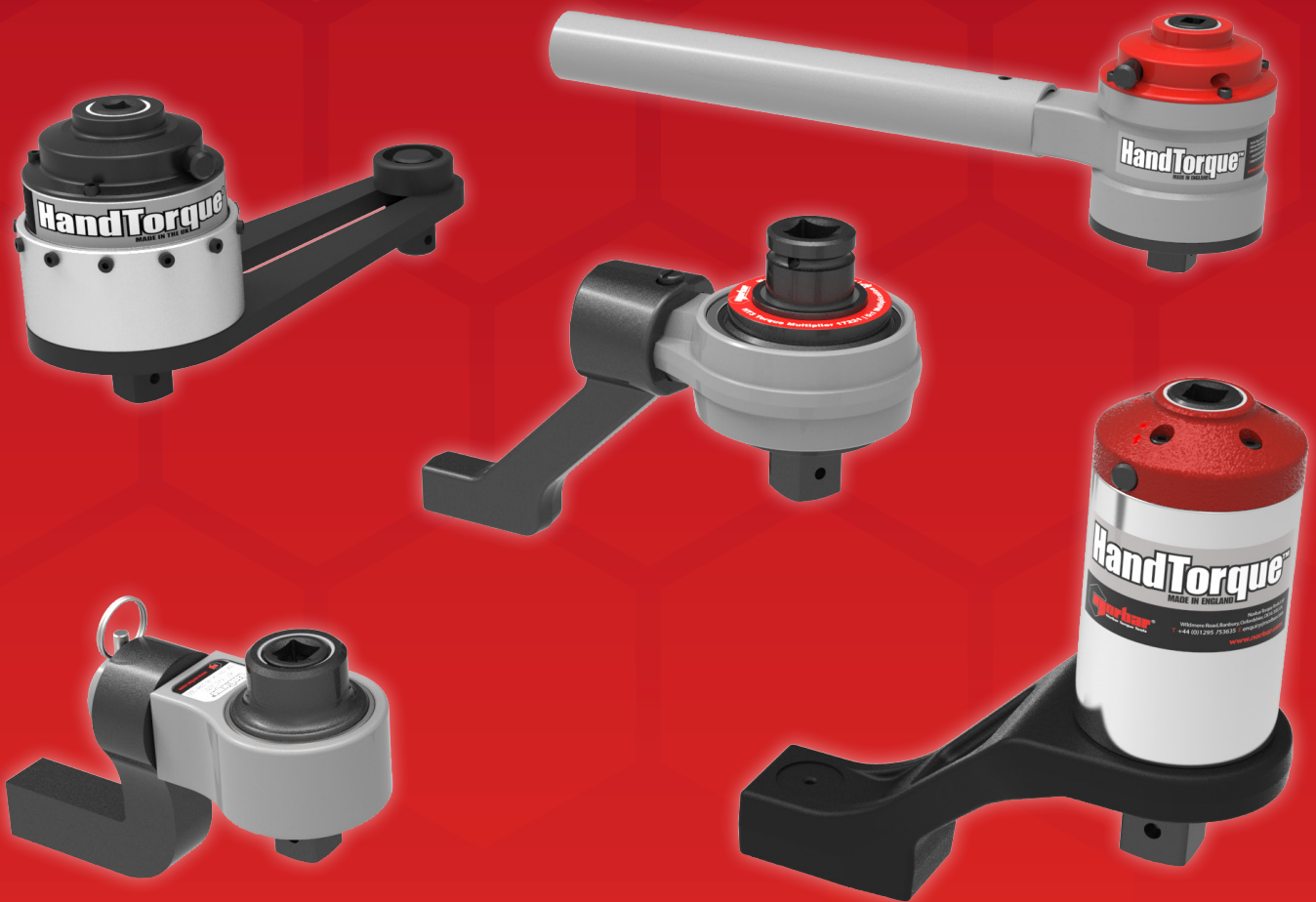


DRILCO



The Voice of Torque Control



HANDTORQUE MULTIPLIER CATALOGUE

2022



HANDTORQUE® TORQUE MULTIPLIERS

HandTorque® HT3-1000	2
HandTorque® HT3 Series	2
HandTorque® HT4 Series	3
HandTorque® Compact Series	4
HandTorque® Compact Series Kits	5
HandTorque® Standard Series	5
HandTorque® Small Diameter Series	7
UKAS Accredited Calibration Certification	7
HandTorque® Torque Multipliers	8
Anti Wind-Up Ratchets (AWUR)	10

LEGEND

 Accuracy (%)	 Case Included	 Calibration Certificate
 Adjustable Reaction	 Anti Wind-up Ratchet	

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. 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, 27:1 or even up to 135:1 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.





HANDTORQUE® HT3-1000



- 5:1 nominal torque multiplication, reaction dependant. Mean ratio with cranked foot is 4.8:1; with straight reaction is 4.9:1
- ±4% mean 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

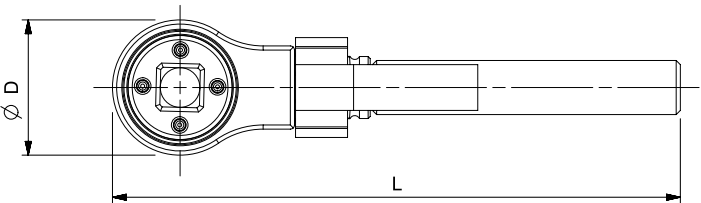
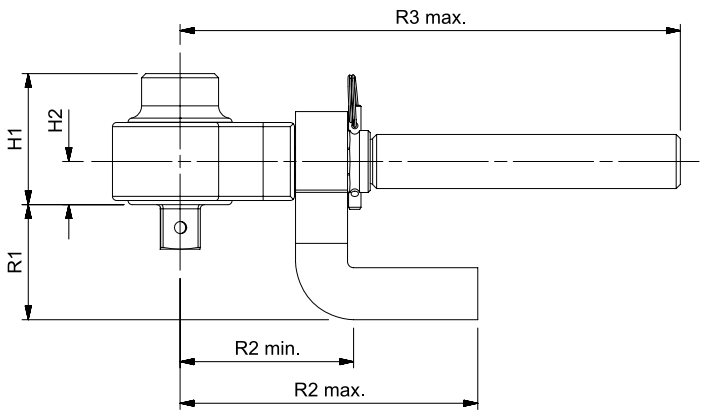
HANDTORQUE® HT3 SERIES



- 5:1 mean 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 1,300 N·m	HT3 2,700 N·m
Part Number		180260	17220	17221
Mean Multiplication Ratio	Nominal	5:1	5:1	5:1
	With Cranked Reaction	4.8:1	4.75:1	4.75:1
	With Straight Reaction	4.9:1	5:1	5:1
Dimensions (mm)	ØD	65	108	108
	H1	63	103	100
	H2	21	44	36
	L	273	398	398
	R1	55	77	85
	R2 min.	83	140	140
	R2 max.	143	212	212
	R3 max.	240	344	344
Tool Weight (kg)		2.7	3.8	3.8
Reaction Weight (kg)	Cranked	0.5	1.36	1.36
	Straight	0.7	1.1	1.1



HT3 1300/2700
on right shown in
comparison with
HT3 1000





HANDTORQUE® HT4 SERIES



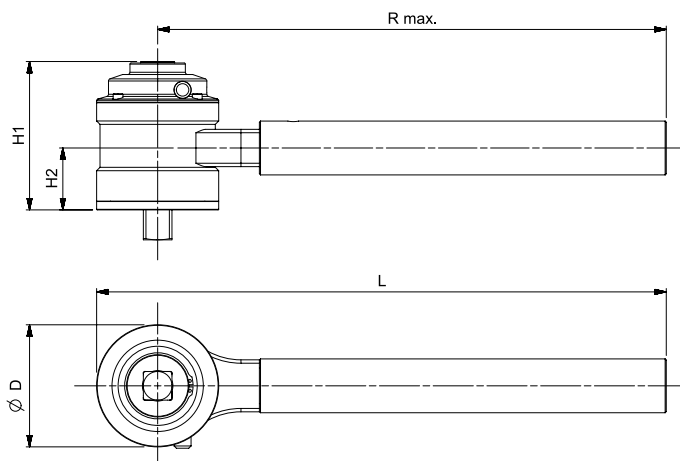
- Robust construction means minimal maintenance and long life
- Mean 15.5:1 (3,000 N·m) or 26:1 (4,500 N·m) torque multiplication, accuracy $\pm 4\%$
- High ratios allow the use of a small torque wrench
- Supplied in carrying case with replacement square drive
- Anti Wind-Up Ratchet fitted to allow safer 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 AWUR, 3,000 N·m, ½" in 1" out
17021	HT4 AWUR, 4,500 N·m, ½" in 1" out



Model	HT4/15.5 AWUR	HT4/26 AWUR
Part Number	17022	17021
Mean Multiplication Ratio	15.5:1	26:1
Dimensions (mm)	ØD	108
	H1	131
	H2	55
	L	498
	R max.	444
Tool Weight (kg)	6.1	7.0
Reaction Weight (kg)	1.9	1.9





HANDTORQUE® COMPACT SERIES



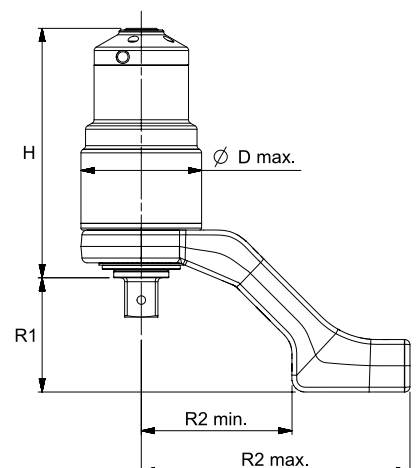
HT92/25

- 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
- Mean 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 traceable calibration certificate allowing the accurate calculation of input torque for critical applications
- If you order a UKAS accredited calibration certificate (available at extra cost), this certificate will be provided in place of the traceable calibration certificate.



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 AWUR, 1,000 N·m, ¾" in ¾" out
180204	HT-52/22.2 AWUR, 1,000 N·m, ½" in ¾" out
180205	HT-52/22.2 AWUR, 1,000 N·m, ¾" in 1" out
180206	HT-52/22.2 AWUR, 1,000 N·m, ½" in 1" out
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 AWUR, 2,000 N·m, ½" in 1" out
180215	HT-92/25 AWUR, 4,000 N·m, ½" in 1" out
180216	HT-119/25.5 AWUR, 7,000 N·m, ½" in 1½" out

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
Mean 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 max.	52	52	52	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	115	151
	R2 max.	131	131	131	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 (1/2") 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

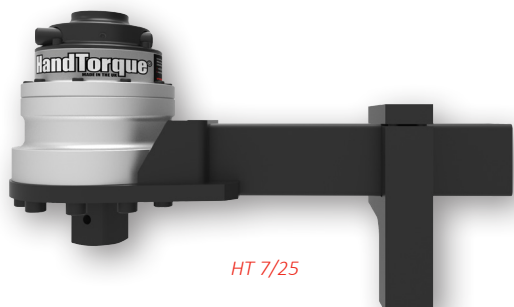
4	HT COMPACT SERIES & TORQUE WRENCH KITS
18186	HT-52, 1,000 N·m, 3/4" out + NorTorque 60 1/2" Dual Scale
18192	HT-72, 2,000 N·m, 1" out + NorTorque 100 1/2" Dual Scale
18195	HT-92, 4,000 N·m, 1" out + NorTorque 200 1/2" Dual Scale

HANDTORQUE® STANDARD SERIES



HT 5/25

- Mean torque multiplication accuracy $\pm 4\%$
- High ratios allow the use of a small torque wrench, multipliers can be used where access is limited
- Anti Wind-Up Ratchet available on high ratio models
- Other reaction styles can be designed to suit specific applications
- Electronic torque transducers can be fitted for precise torque monitoring
- 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



HT 7/25

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

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 10

NOTE: Model name does not reflect multiplication ratios, see mean multiplication ratios on page 6

For spares kits for Norbar multipliers, please see the Norbar catalogue.

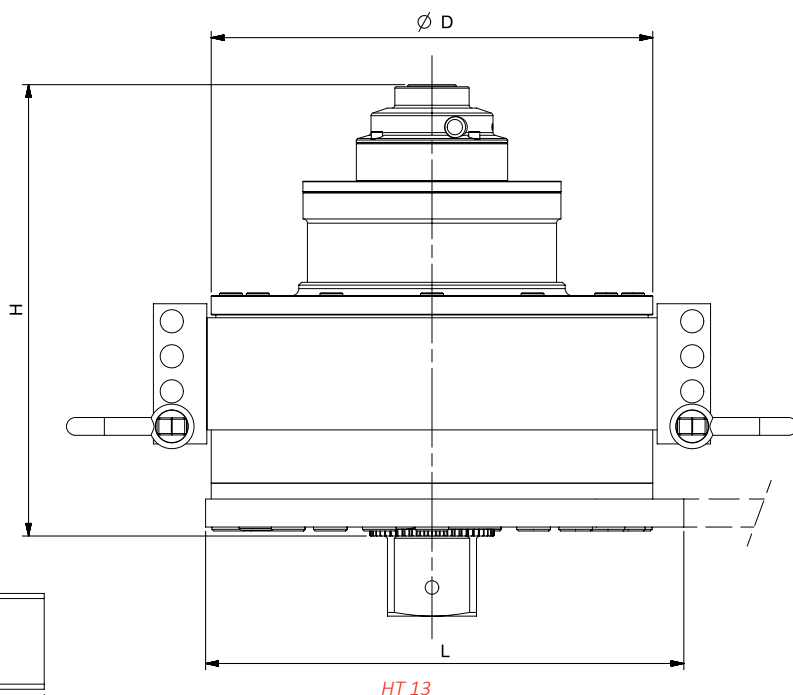
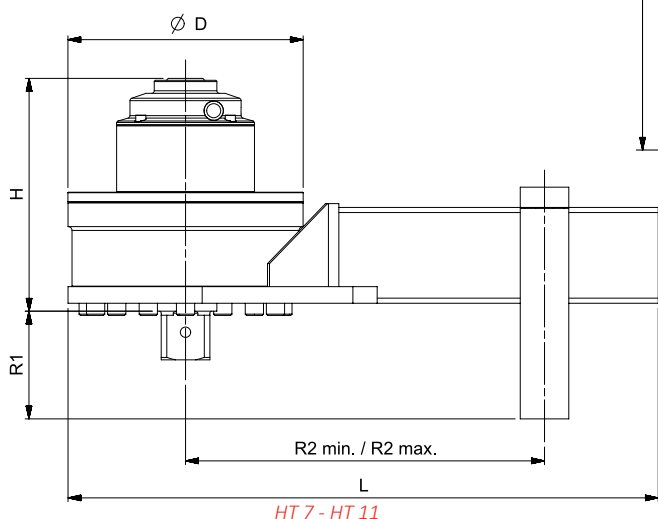
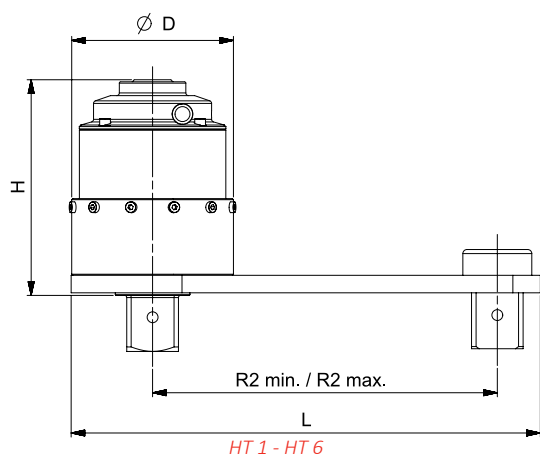


HANDTORQUE® STANDARD SERIES



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
Mean Multiplication Ratio	5.2:1	5.2:1	27:1	27:1	5.2:1	27:1	27:1	5.2:1	27:1	27:1	135:1
Dimensions (mm)	ØD	108	108	108	119	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 13/125 AWUR
Part Number	16067	16018	16065	16068	16059	16070	16071	16082	16049	16053
Mean Multiplication Ratio	5.2:1	27:1	27:1	135:1	27:1	27:1	135:1	27:1	135:1	135:1
Dimensions (mm)	ØD	144	144	144	184	184	184	212	212	315
	H	136	157	162	166	162	182	208	235	322
	L	423	423	423	448	448	448	609	609	341
	R1	84	84	84	84	84	84	N/A	N/A	N/A
	R2 min.	150	150	150	175	175	175	320	320	N/A
	R2 max.	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	95.2
Reaction Weight (kg)	6.3	6.3	6.3	6.3	8.3	8.3	8.3	13.3	13.3	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
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)

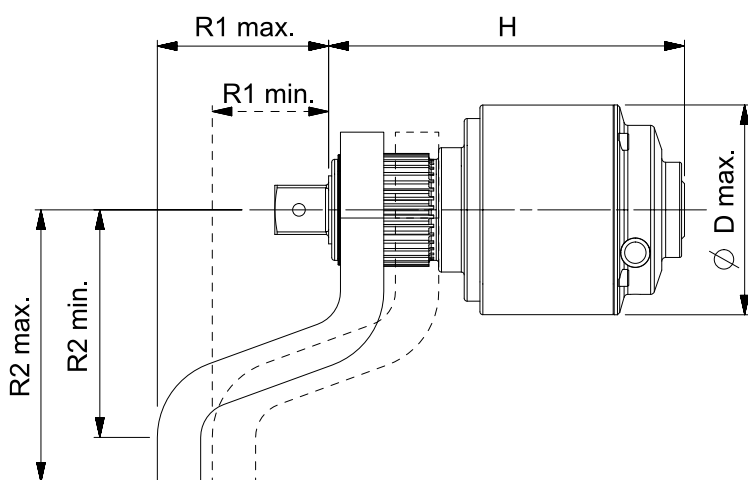


4 SMALL DIAMETER SERIES

18006	HT 30/25 AWUR, 3,000 N·m, ½" in 1" out
18008	HT 60/25 AWUR, 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.

NOTE: Model name does not reflect multiplication ratios, see mean multiplication ratios below



Model	HT 30/25 AWUR	HT 60/25 AWUR
Part Number	18006	18008
Mean Multiplication Ratio	27:1	27:1
Dimensions (mm)	ØD max.	108
	H	183
	R1 min.	60
	R1 max.	88
	R2 min.	117
	R2 max.	140
Tool Weight (kg)	7.0	10.6
Reaction Weight (kg)	2.0	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





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 ($\text{Torque} \times \text{rpm} = \text{Power}$).

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, allowing Norbar to offer multipliers typically in ratios of 5:1, 27:1 and 135:1.

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.

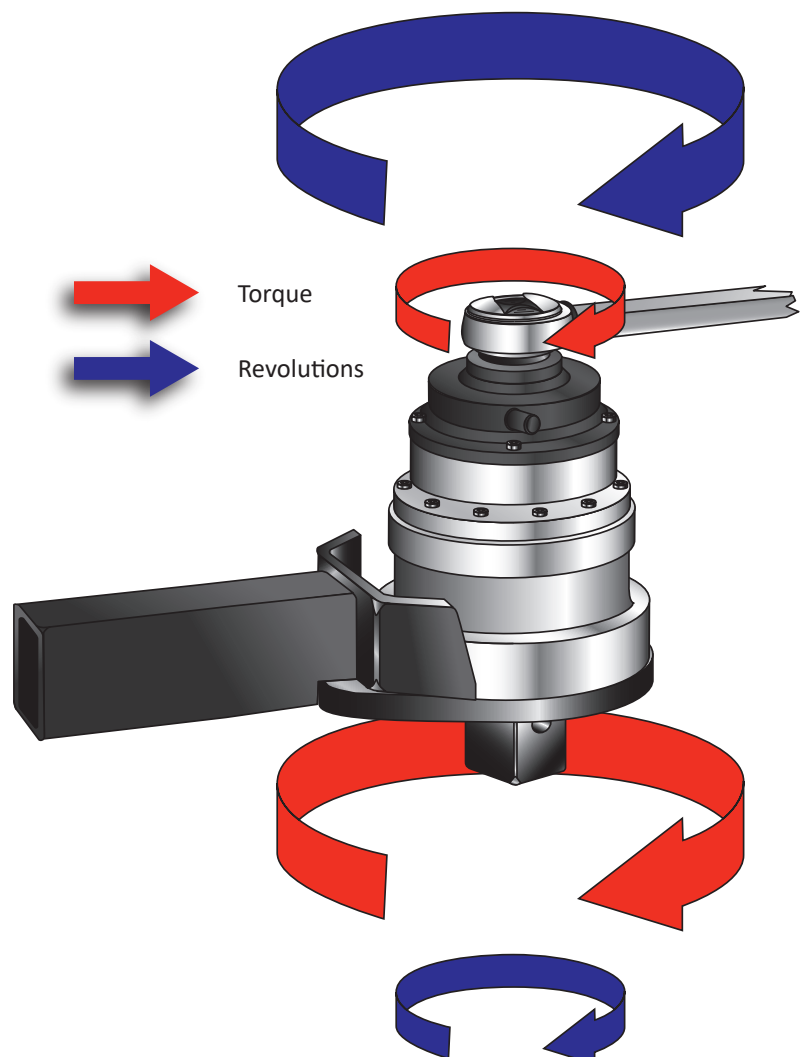
No gearbox is 100% efficient, and so the velocity ratio (the number of turns that the input has to make to achieve one revolution of the output) is not the same as the torque multiplication ratio. Norbar multipliers are engineered such that each gear stage typically has a nominal 5:1 ratio, this means a velocity ratio of typically 5.45:1 which results in a true torque multiplication factor of 5.2:1.



Without a torque multiplier



With a torque multiplier





HANDTORQUE® TORQUE MULTIPLIERS

Why use a HandTorque® Multiplier?

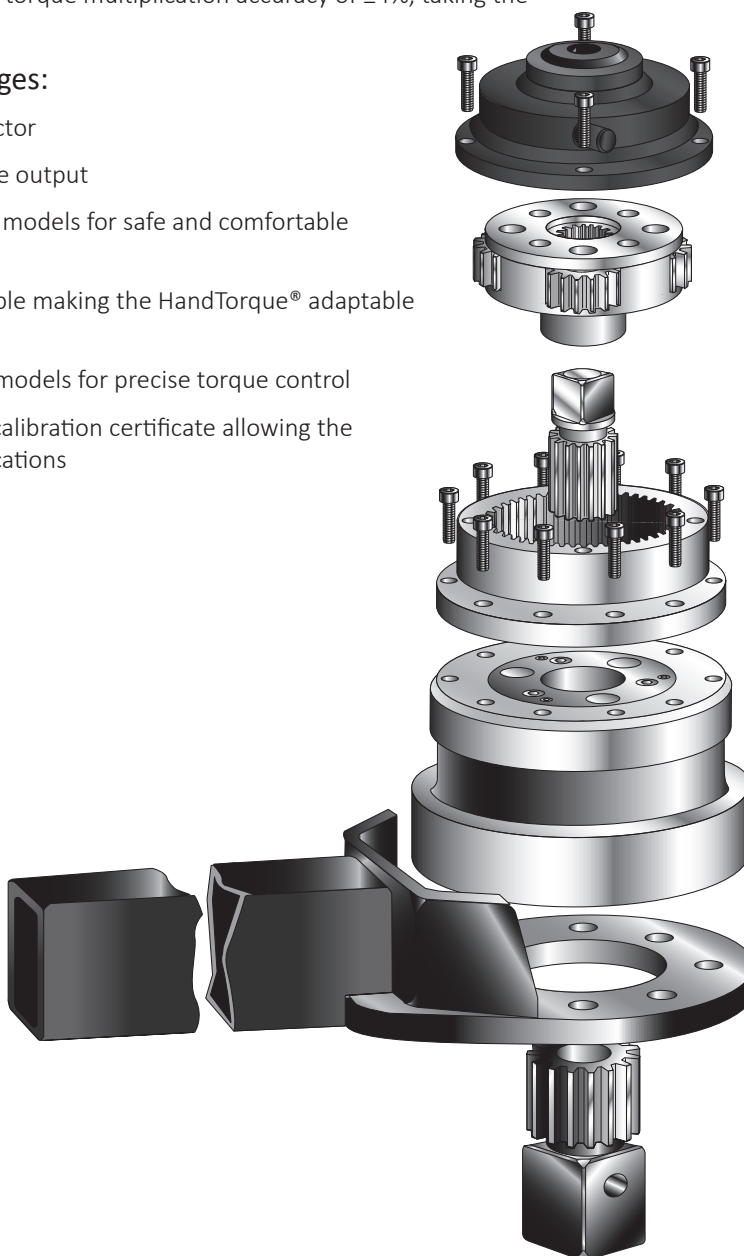
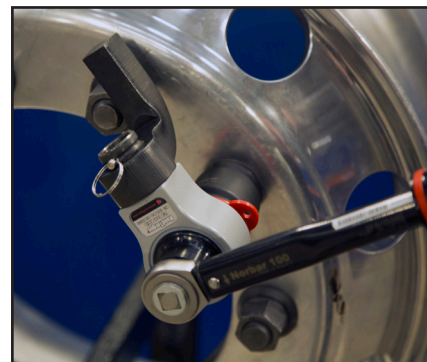
- **Safety** – use of long levers can be dangerous. Torque multipliers allow for a reduction in the lever length or operator effort
- **Space limitation** – the use of a long lever may be impossible due to the available space
- **Accuracy** – torque will be applied most accurately when it is applied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

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 mean torque multiplication accuracy of $\pm 4\%$, taking the uncertainty out of high torque tightening.

Summary of Norbar torque multiplier advantages:

- The ratio stated is the mean 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
- Compact Series are supplied with their own unique calibration certificate allowing the accurate calculation of input torque for critical applications





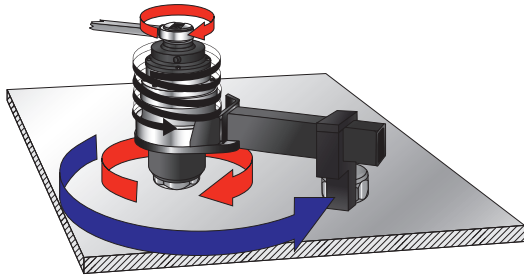
ANTI WIND-UP RATCHETS (AWUR)



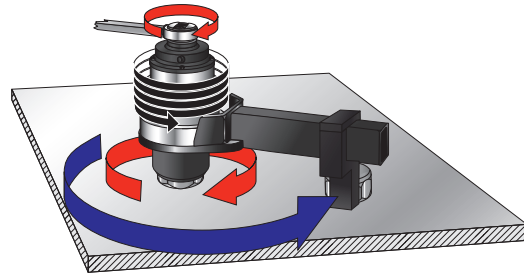
Norbar Anti Wind-Up Ratchets (AWUR)

Most multipliers with ratios of 15:1 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.

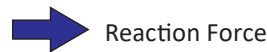
The AWUR ensures that the 'spring' stays wound and that any further torque input to the multiplier is applied directly to the bolt.



Multiplier behaves like a very stiff 'spring'

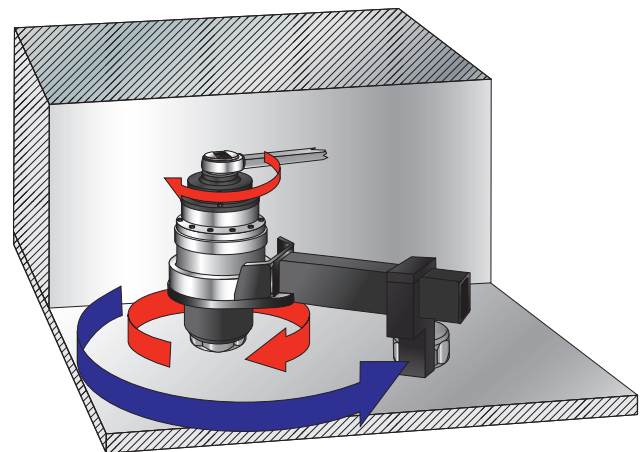


Multiplier will achieve maximum torque only after the 'spring' has been taken up



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

2022 NORBAR SHUTDOWN PERIODS

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

Monday 3 rd January - New Year's Day
Friday 15 th April to Monday 18 th April - Easter Bank Holiday
Monday 2 nd May - Early May Bank Holiday
Thursday 2 nd June - Spring Bank Holiday
Friday 3 rd June - Platinum Jubilee Bank Holiday
Monday 29 th August - Summer Bank Holiday
Monday 26 th December to Tuesday 3 rd January 2023 - Christmas Shutdown

NORBAR PROMOTIONAL MATERIAL

CATALOGUES & LEAFLETS

07571	NorTorque® Sales Leaflet
07563	Professional Torque Wrench Sales Leaflet
07594	Industrial Torque Wrench- New Generation Sales Leaflet
07606	ProTronic® Sales Leaflet
07607	ProTronic® Plus Sales Leaflet
07436	NorTronic® Sales Leaflet
07579	HandTorque® HT3-1000 Sales Leaflet
07570	EvoTorque® 2 Sales Leaflet
07591	EvoTorque® Battery Tool Sales Leaflet
07581	PneuTorque® PTS™ Sales Leaflet
07585	Right Angle Gearbox Sales Leaflet
07597	TruCheck™ 2 Sales Leaflet
07598	T-Box™ 2 Sales Leaflet
07589	TWC Sales Leaflet
07512	Aerospace Leaflet
07515	Energy Generation Leaflet
07510	Oil & Gas 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
07587	Norbar Branded USB Stick
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

After Sales Service
+44 (0)1295 753635
service@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



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

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