STAHLWILLE

Key to success

Torque tools, Torque testers

TRANSCAT®

Better by Your Every Measure

1-800-800-5001 Transcat.com

Electromechanical torque wrench No 730D

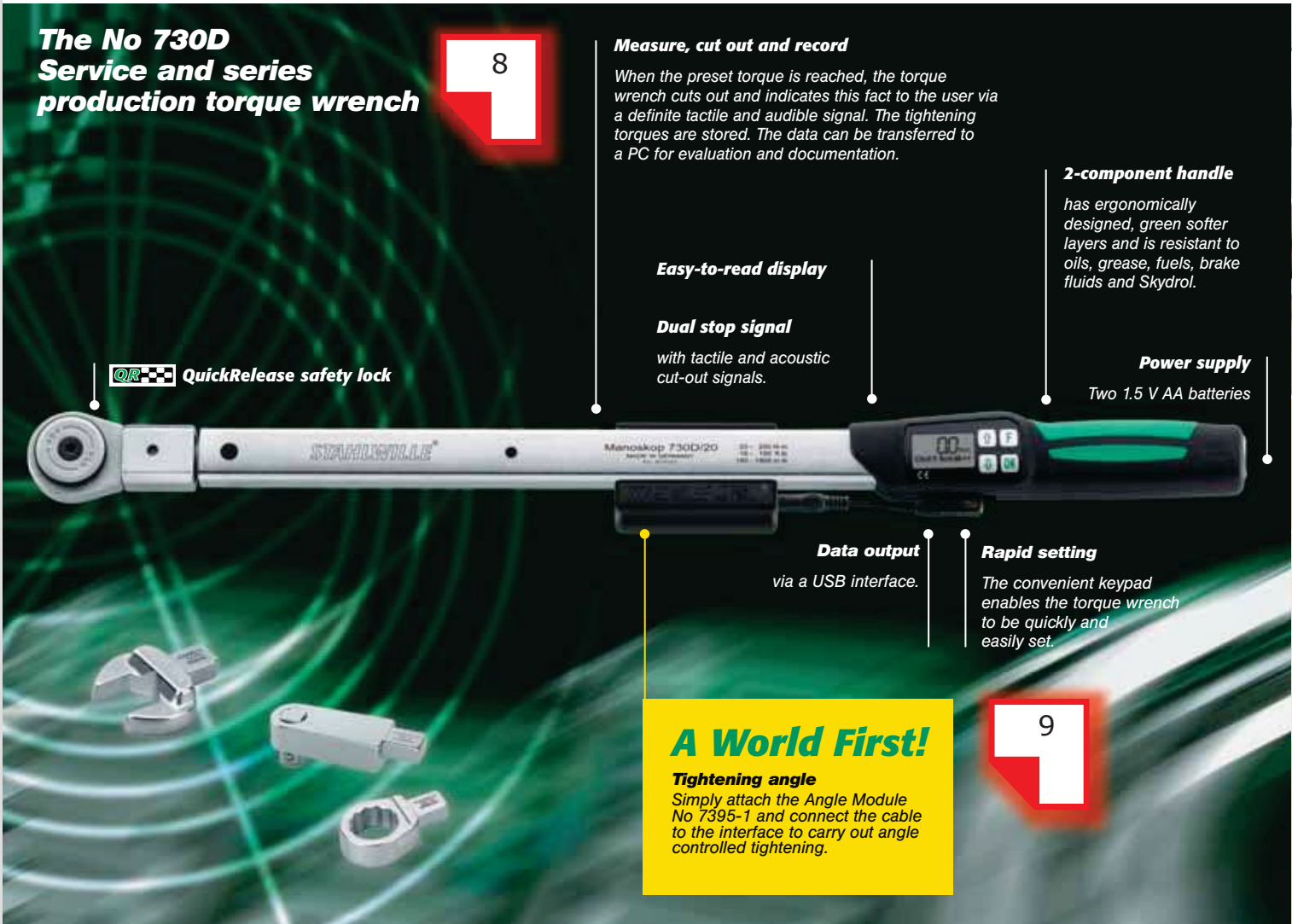
Service and series production MANOSKOP – measures, cuts out and documents the tightening torques read.

The 730D electromechanical torque wrench is currently the only one worldwide which combines the principle of a clicking torque wrench with the benefits of an electronic model. Once the preset torque level for a joint has been reached, it cuts out electronically and notifies the user through a definite jerk and a loud click.

The user thus has the same feeling as if it were a mechanical torque wrench. The torque applied is shown on the display and can be stored for documentation and evaluation purposes and transferred via a USB interface to a PC.
The additional "indicating" mode makes this a universally applicable tool.

At a glance:

- *Clicking and indicating electromechanical torque wrench*
- *Tactile and acoustic trigger signals*
- *Stores up to 7,500 bolt tightening actions*
- *Units of measurement: N m, ft.lb, in.lb*
- *Deviation of indication ± 2 %. With certificate*
- *Rapid setting using the convenient keypad and large display*
- *Different tolerance limits can be set for each joint*
- *Visual red and green signals in the display confirm the status of the joint*
- *The automatic keypad lock prevents inadvertent changes*
- *Additional security for presets (function mode, trigger or preset value, unit of measurement, tolerance, save, deviating extension) using PIN code*
- *Display also works for anticlockwise torque*
- *Angle-controlled measurement without a reference arm using a supplementary module*
- *Overload protection by means of acoustic and visual signals*
- *Automatic compensation to achieve correct tightening torque even if a changed extension is entered*
- *Automatic notification of the next calibration date*
- *Fully automated calibration using perfectControl calibrating unit No 7794-2.*
- *With a mount for interchangeable sockets and inserts and QuickRelease safety lock*
- *The torque wrench exceeds the requirements of DIN EN ISO 6789.*



With the No 730N mechanical torque wrench

Rapid, accurate, safe work methods thanks to innovative technology. This enhanced version of the highly acclaimed 730 torque wrench, available under the 730N tag, is the logical continuation of a successful product so that the user benefits even more from its advanced features.

The setting mechanism in the 730N is based on a completely new design concept. At the core of this technology is the new "QuickSelect" rapid-action adjuster. The required torque value is set quickly and accurately using the knob on the end of the handle. To set the required value, simply pull out the knob and turn it to the correct setting. During this action, the clear-view double scale with its colour-differentiated N m and ft.lb/in.lb scales remains clearly visible at all times. Located right beside the knob is the ring scale which is used for fine tuning the measuring range. Once the required value has been set, the knob is simply pressed back in to lock it, which prevents the setting being inadvertently changed.

At a glance:

- *Very quick, accurate one-handed setting*
- *Safe setting mechanism*
- *Easily readable 2-colour double scales in N m and ft.lb*
- *Double stop signals*
- *For clockwise and anticlockwise use*
- *Square drives with QuickRelease safety locks*
- *The measuring element is only under load while force is being applied*
- *Simple adjustment does not require disassembly*
- *Sturdy housing with wear-resistant, durable mechanism, protected from dirt inside the housing*
- *2-component handle, resistant to various aggressive fluids*
- *Deviation of indication ± 3%*
- *Complies fully with DIN EN ISO 6789*
- *Traceable to national standards*

No need for manual reset to zero

thanks to the tried-and-tested wear-free triggering cam system.

10

QuickRelease safety lock

Firm locking and rapid change of insert tools thanks to the QuickRelease safety lock.

Simple adjustment

The measuring mechanism can be quickly and easily adjusted from outside the tool using an Allen key inserted through the holes in the rating plate. It is not necessary to dismantle the torque wrench, which saves time.

Easily readable double scale

The colour differentiation between the N m and ft.lb scales simplifies fine setting.

Variable drive

The square drive enables a broad range of tightening tools to be used to match virtually any application. STAHLWILLE offers a full range of suitable insert tools for many applications.

Ring scale

Fine setting for the black measuring range on the double scale.

QuickSelect Rapid setting

Rapid, accurate, safe setting action: pull out the knob, turn it to the required reading with just a few revolutions and push it in again to lock it.

With STAHLWILLE as your preferred partner

Reliable safety thanks to intelligent technology with the STAHLWILLE Sensotork® range. Decades of research and development have given STAHLWILLE a head start as the experts in the design and manufacture of torque tools. The Sensotork® torque wrenches, angle-controlled wrenches and testers are further milestones along this fast-track path.

Our Sensotork® 712 torque wrench and the 713 torque/ angle-controlled wrench developments are based on a completely innovative concept.

Apart from the broad spectrum of applications, this intelligent technology enables the user to perform measurements fast and extremely accurately.

At a glance:

- *freely selectable names for each series of tests*
- *Quickselect (rapid recall of predefined sets of operating parameters)*
- *a number of repeated joints can be grouped as a defined sequence*
- *readings can either be directly stored, transmitted to the PC or simply displayed*
- *password protection (tamper proof use)*
- *wide display angle for visual signals*
- *extremely wide range of angle measurement (Sensotork® 713)*
- *various languages available*
- *units of measurement: N m, ft.lb, in.lb*
- *many modes of operation selectable*
- *for clockwise and anti-clockwise use*
- *works-specific identifier*
- *programmable via PC*
- *for use with all insert tools 9x12 and 14x18 mm*
- *resistant to oils, grease, fuels, brake fluids and skydrol*
- *broad measuring range (5 %-100 % of rated value)*
- *deviation of indication ± 1% of the current reading, ± 1% in the angle mode (Sensotork® 713 only)*
- *traceable to national standards*
- *meets requirements of DKD-R 3-7, Class 2 and DIN EN ISO 6789,*
- *wide range of application (-20°C to 60°C).*

14

S/e/n/s/o/t/o/r/k/®

712R Electronic torque wrench
713R Electronic torque wrench/angle-controlled wrench

Warning signals:

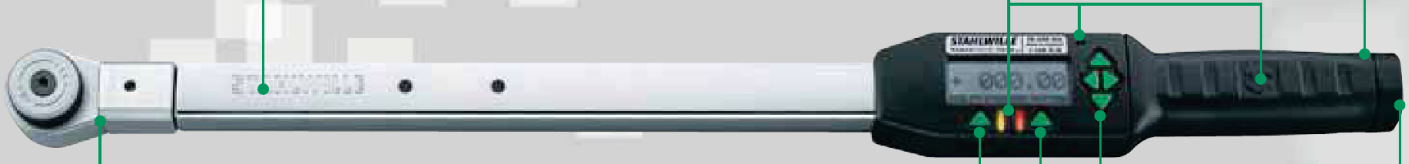
Warning signals can be selected as either acoustic (buzzer), tactile (vibration in the handle), visual (LEDs and display) or a combination of these. The point at which the warning signal is triggered can be freely set.

Free choice of grip:

The reading will always be accurate, irrespective of where you grip the torque wrench.

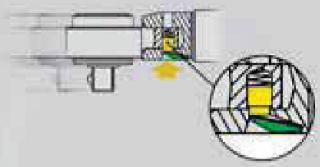
2 Angle-controlled measurements without a reference arm:

Angle-controlled measurements using the Sensotork® 713R do not require a reference arm.



QR QuickRelease

Firm locking and rapid change of any insert tools thanks to the QuickRelease safety lock.



Data output:

The port allows all data stored in the wrench to be output to a PC for detailed evaluation (USB).

Easy extension setting:

Where the insert tool requires an extension adjustment, simply enter the new value. Recalculation using complicated formulae is no longer necessary.

Amazingly simple handling:

All functions are selected using the arrow keys. The clear, well-organised menu-based operator guidance system, which uses clear text messages such as "Set up sequence", makes using the tool an easy matter. No need for a long drawn-out trial-and-error induction period.

The Sensotork® 7707 W electronic torque tester also offers a multitude of convenient technical advantages.

At a glance:

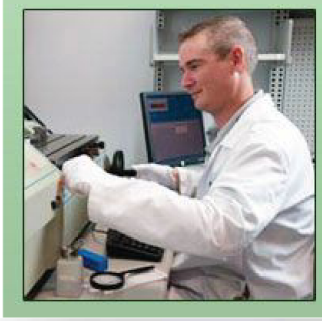
- *transducers can be individually recalibrated, your torque tester stays on site*
- *compact, can be used as a mobile laboratory (power supply is via the USB connection)*
- *the readings can be evaluated and digitalised inside the transducer (no external interference from a data cable)*
- *effect of lateral forces considerably reduced thanks to low-profile construction*
- *many operating modes*
- *automatic transducer detection*
- *wide range of application (-20°C to 60°C).*
- *acoustic overload warning*
- *clockwise and anticlockwise use*
- *units of measurement: N m, ft.lb, in.lb*
- *broad measuring range (approx. 2 %-100 % of rated value)*
- *deviation of indication up to ± 0.25 %*
- *meets DIN 51309, Class 2 and DKD-R 3-8: 2003, with works calibration certificate*
- *traceable to national standards*
- *solid aluminium mounting block incl. attachment for horizontal and vertical testing*

TRANSCAT
Calibration Services

Transcat's quality systems are ISO 9001:2000 compliant, and we have earned the widest scope of ISO/IEC 17025 accreditation in the industries we serve.

Our documented, externally audited and internally monitored quality management systems exceed ISO/IEC 17025 requirements.

Transcat delivers calibrations you can trust!



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Sensotork®

7707 W Electronic torque tester

1 *Displays and controls:*

This highly user-friendly unit can display both the preset torque value and the actual torque applied at the same time.
The unit can be positioned the way it suits you best – especially convenient where the measuring axis is horizontal or if you are using the tripod supplied, which includes the cable (1.5 m).

Intelligent transducers:

The readings are fully evaluated and digitalised inside the transducer using special, integrated circuitry. As an alternative to the display unit, you can use a PC and connect the unit via a USB cable, which also allows you to perform and organise measurements and generate a calibration certificate directly.

Interchangeable transducers:

The measuring range of the torque tester can be extended flexibly simply by changing the transducer for one with a different range.

QuickRelease

Rapid change and firm locking of the transducers thanks to the QuickRelease safety lock.

2

3

Interchangeable square drive adapters:

A set of interchangeable square drive adapters are conveniently stored in the mounting block for a range of different drive sizes.

Which insert tool for which torque wrench?

730D Service/Industrial MANOSKOP®, cut-out, indicating

730N Service MANOSKOP®, cut-out

730 Service MANOSKOP®, cut-out

755 Industrial MANOSKOP®, cut-out

		No	725QR/4	725QR/5	725QR/10	725QR/20	725B	725L/5	725/4	735/5	735/10	735/20	735/40	735/80	739/20H	734/4	734/5	734/10	734/20	734/40	734/80
size	size	mm																			
2	a/2	9x12	●	●	●		●	●	●	●	●					●	●	●			
4	a/4	9x12	●	●	●		●	●	●	●	●					●	●	●			
5	a/5	9x12	●	●	●		●	●	●	●	●					●	●	●			
10	a/10	9x12		●	●			●		●	●						●	●			
12	a/12	14x18				●						●	●		●				●	●	
20	a/20	14x18				●						●	●		●				●	●	
30	–	14x18				●						●	●		●				●	●	
40	a/40	14x18											●							●	
65	–	14x18											●							●	
80	–	24.5x28												●							●

		No	734F	734L/5	731/10	731/40	731/80	732/10	732/40	732/80	732aL/10	732G/10	732TX/10	732TX/40	733/10	736/10 736/10-1	736/40	737/10	737/40	7370/80
size	size	mm																		
2	a/2	9x12	●	●	●			●			●	●	●		●	●		●		
4	a/4	9x12	●	●	●			●			●	●	●		●	●		●		
5	a/5	9x12	●	●	●			●			●	●	●		●	●		●		
10	a/10	9x12	●	●	●			●			●	●	●		●	●		●		
12	a/12	14x18				●			●					●			●		●	
20	a/20	14x18				●			●					●			●		●	
30	–	14x18				●			●					●			●		●	
40	a/40	14x18				●			●					●			●		●	
65	–	14x18				●			●					●			●		●	
80	–	24.5x28					●			●										●

71 Torque Wrench MANOSKOP®, indicating

		No	735/5	735/10	735/20	735/40	735/80	734/4	734/5	734/10	734/20	734/40	734/80	731/10	731/40	731/80	732/10	732/40	732/80	7370/80
size		mm																		
80		24.5x28					●						●			●			●	●

712R Electronic Torque Wrenches Sensotork®

713R Electronic angle-controlled Torque Wrenches Sensotork®

size	mm	No	725QR/4	725QR/5	725QR/10	725QR/20	725B	725L/5	725/4	735/5	735/10	735/20	735/40	739/20H	734/4	734/5	734/10	734/20	734/40
6	9x12		●	●	●		●	●	●	●	●				●	●	●		
20	14x18					●						●	●	●				●	●
40	14x18												●						●

size	mm	No	734F	734L/5	731/10	731/40	732/10	732/40	732aL/10	732G/10	732TX/10	732TX/40	733/10	736/10 736/10-1	736/40	737/10	737/40
6	9x12		●	●	●		●		●	●	●		●	●		●	
20	14x18					●		●				●			●		●
40	14x18					●		●				●			●		●

Maximum continuous loads of square drive and ratchet insert tools are limited to: 734/4 – 40 N m, 734/5 – 80 N m, 734/10 – 100 N m, 734/20 – 300 N m, 734/40 – 650 N m.
The maximum torque for open-ended, ring, open-ring and TORX® insert tools varies according to their individual size. This can be below the maximum capacity of the torque wrench used.

Now there is no need to send your Stahlwille torque tools to Germany for calibration or repair

Call 1-800-800-5001 or visit Transcat.com

- ✔ *Transcat is the **only** laboratory in North america that can calibrate Stahlwille torque standards*
- ✔ *Factory-authorized calibration and repair for all Stahlwille torque products*
- ✔ *Stahlwille factory-authorized warranty repair center*
- ✔ *Short turn-around times*

Calibrations You Can Trust

NVLAP®
NVLAP LAB CODE 200730-0

ISO/IEC 17025 Accredited
ISO 9001 : 2000 Compliant

Service work & series production MANOSKOP® – indicating and cut-out

This electromechanical torque wrench combines the "indicating" and "cut-out" functions in a single tool; the function modes can be selected independently of each other. With a mount for interchangeable insert tools and QuickRelease safety lock; rapid setting using the convenient foil keypad and large display; tactile and acoustic trigger signal.
Differing tolerance limits can be set for each joint. Visual red and green signals in the display confirm the status of the joint.
Display also works for anticlockwise torque. Angle-controlled measurement using the Angle Module No 7395-1 (see page 165).

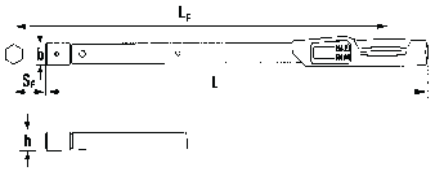
7500 data records can be stored, transferred via a USB interface and evaluated on the PC.
Automatic compensation to achieve correct tightening torque even if a changed extension is entered.
Overload protection by means of acoustic and visual signals. The automatic keypad lock prevents inadvertent changes. Additional security for presets (function mode, trigger or preset value, unit of measurement, tolerance, save, deviating extension) using PIN code. Save time thanks to settle-resistant mechanism.

All the sensitive components are protected by the sturdy housing. The 2-component handle with its ergonomically designed green softer layers is resistant to oils, grease, fuels, brake fluids and Skydrol.
Included in the set are two 1.5 V AA batteries. It is also possible to use rechargeable batteries (AA/LR6, NiMH, 1.2 V).
Automatic notification of the next calibration date. Fully automated calibration using perfectControl calibrating unit No 7794-2.
In sturdy plastic case (size 40 and 65 in steel case). Units of measurement: N m, ft.lb, in.lb
Deviation of indication ± 2%. With certificate.

Our own patents are pending.

(Inserts see pages 174–179)

730D Basic wrenches with tool carrier for insert tools



730D/20

QR

Code	size				Setting/display resolution Nm	ft.lb	in.lb	mm	b mm	h mm	L mm	L_F mm	S_F mm	g	g with box
9650 17 10	**10**	10–100 N m	7.4–75 ft.lb	90–900 in.lb	0.2/0.1	0.2/0.1	2/1.0	9 x 12	28	23	467	426.5	17.5	1085	1510
9650 17 20	**20**	20–200 N m	15–150 ft.lb	180–1800 in.lb	0.5/0.1	0.5/0.1	5/1.0	14 x 18	28	23	548	515	25	1361	1896
9650 17 40	**40**	40–400 N m	30–300 ft.lb	360–3600 in.lb	1.0/0.1	1.0/0.1	10/1.0	14 x 18	28	23	688	655	25	1765	5155
9650 17 65	**65**	65–650 N m	48–480 ft.lb	580–5800 in.lb	1.0/0.1	1.0/0.1	10/1.0	14 x 18	30.6	25.6	870	837	25	3300	6000

730DR Basic wrench with ratchet insert tool

Code	size	■ "	g	g with box
9650 18 10	**10**	1/2	1232	1657
9650 18 20	**20**	1/2	1663	2198
9650 18 40	**40**	3/4	2232	4722
9650 18 65	**65**	3/4	3767	6530

7759-3 USB adaptor, jack cable and software No 7732 for No 730D

Documentation and management of readings on a PC
- Read out stored wrench data and joint readings:
  - Joint identifier
  - Tool serial number
  - Date and time of tightening operation
  - Target torque or target angle
  - Torque level at which the tool cuts out
  - Tightening torque or angle reached
  - Tolerances
  - Joint evaluation
- Storage of joint data in a database
- Delete or print highlighted joints from the database
- Export displayed joint data to a CSV file (compatible with Excel)
- 13 languages
- User management
- Define new PIN
- Delete joint data stored in wrench

System requirements:
- PC
- Microsoft Windows 98 SE or compatible operating system with USB support
- USB connection
- Screen resolution of at least 1024 x 768 pixels
- STAHLWILLE USB hub or STAHLWILLE USB adapter cable
- Installed ODBC driver for Access data

Code	L m	⚖ g
96583627	1.5	137

7395-1 Angle Module for No 730D

Registered design, angle-controlled measurement without a reference arm. For torque wrench No 730D from software release 1.5.8.
Torque wrenches No 730D fitted with older releases of the software can be upgraded. Simply attach the module and connect to the torque wrench interface and the No 730D can be used for angle controlled tightening.
The measurements are read off and settings made via the torque wrench.
When the preset snug point is reached, the torque wrench automatically switches over to angle-controlled measurement in degrees.
Depending on the options selected, the torque wrench will either cut out when the preset angle is reached or an alarm is heard.
One 1.5 V battery is included in the package. Deviation of indication ± 1%.

7395-1

7395-1+730D

Code	⚖ g
96583628	387

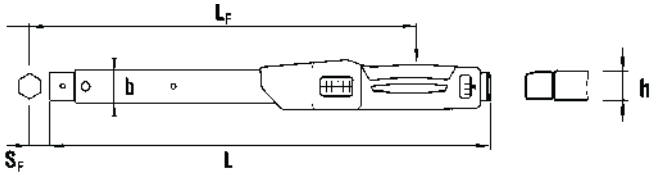
Service MANOSKOP® 730N

registered design, clicking torque wrench with mount for interchangeable insert tools, rapid, accurate setting using QuickSelect quick-action adjuster, with QuickRelease safety lock, double stop signals, very clear twin scales with colour coded N m/ft.lb and ft.lb/inch.lb markings and long-term repeated accuracy.

The measuring element is only under load while force is being applied, no need for manual reset to zero.
All the sensitive components are protected by the sturdy housing.
The 2-component handle with its ergonomically designed green softer layers is resistant to oils, grease, fuels, brake fluids and Skydrol.
Any force applied to the tool after the "click" or applied in the opposite direction to the current function – e.g. forcible loosening of a jammed screw – does not act on the trigger mechanism and cannot cause damage to it. The swap-over inserts can also be used to apply torque in an anti-clockwise direction.
Easily adjustable without disassembly, e.g. using tester No 7707 W or calibration system No 7706.
Deviation of indication ± 3%. With certificate.

(Inserts see pages 174–179)

730N Basic wrenches with tool carrier for insert tools

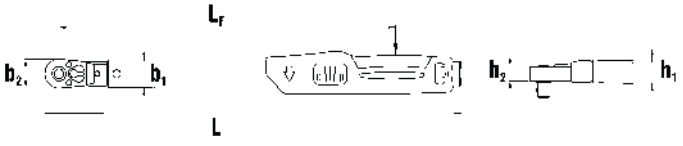


730N/10

Code	size					Fine scale	mm	b mm	h mm	L mm	L_F mm	S_F mm	g
50 18 10 02	**2**	2–20 N m	20–180 in.lb	1 N m	10 in.lb	0.2 N m	9 x 12	28	23	275	226	17.5	737
50 18 10 05	**5**	10–50 N m	7–37 ft.lb	5 N m	1 ft.lb	0.25 N m	9 x 12	28	23	330	280.5	17.5	831
50 18 10 10	**10**	20–100 N m	15–75 ft.lb	10 N m	2.5 ft.lb	0.5 N m	9 x 12	28	23	386	336	17.5	988
50 18 10 12	**12**	25–130 N m	20–95 ft.lb	10 N m	2.5 ft.lb	0.5 N m	14 x 18	28	23	421	379	25	1128
50 18 10 20	**20**	40–200 N m	30–150 ft.lb	10 N m	5 ft.lb	1 N m	14 x 18	28	23	467	424.5	25	1264
50 18 10 40	**40**	80–400 N m	60–300 ft.lb	20 N m	10 ft.lb	2 N m	14 x 18	28	23	607	564.5	25	1655
50 18 10 65	**65**	130–650 N m	100–480 ft.lb	50 N m	20 ft.lb	2.5 N m	14 x 18	30.6	25.6	890	848	25	3231
50 58 10 02	**a/2**	20–180 in.lb	1.5–15 ft.lb	10 in.lb	0.5 ft.lb	2 in.lb	9 x 12	28	23	275	226	17.5	737
50 58 10 05	**a/5**	90–450 in.lb	7–37 ft.lb	50 in.lb	1 ft.lb	2.5 in.lb	9 x 12	28	23	330	280.5	17.5	831
50 58 10 10	**a/10**	180–900 in.lb	15–75 ft.lb	100 in.lb	2.5 ft.lb	5 in.lb	9 x 12	28	23	386	336	17.5	988
50 58 10 20	**a/20**	350–1800 in.lb	30–150 ft.lb	100 in.lb	5 ft.lb	10 in.lb	14 x 18	28	23	467	424.5	25	1264
50 58 10 40	**a/40**	60–300 ft.lb	800–3600 in.lb	20 ft.lb	100 in.lb	2 ft.lb	14 x 18	28	23	607	564.5	25	1655

730NR Torque wrenches with permanently installed ratchet

in sturdy plastic case (size 65 in steel case).



730NR/20QR FK

Code	size					Fine scale	■ "	b_1 mm	b_2 mm	h_1 mm	h_2 mm	L mm	L_F mm	g	g with box
96 50 21 05	**5QR FK***	10–50 N m	7–37 ft.lb	5 N m	1 ft.lb	0.25 N m	3/8	28	29	23	14.5	372.5	291	961	1386
96 50 21 10	**10QR FK***	20–100 N m	15–75 ft.lb	10 N m	2.5 ft.lb	0.5 N m	1/2	28	29	23	14.5	428.5	346.5	1129	1554
96 50 21 20	**20QR FK***	40–200 N m	30–150 ft.lb	10 N m	5 ft.lb	1 N m	1/2	28	41	23	18	526	438	1589	2014
96 50 21 40	**40 FK**	80–400 N m	60–300 ft.lb	20 N m	10 ft.lb	2 N m	3/4	28	50	23	30.7	657	564.5	2122	2657
96 50 21 65	**65 FK**	130–650 N m	100–480 ft.lb	50 N m	20 ft.lb	2.5 N m	3/4	30.6	50	25.6	30.7	940	915	3698	6188

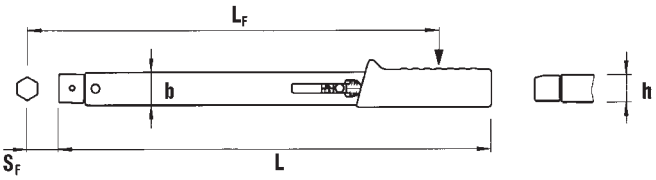
* Ratchet has quick-release safety lock QR

Service MANOSKOP® 730

Torque wrenches with tool carrier for interchangeable insert tools, with cut-out, with QuickRelease safety lock (size 5–65) dual signal, rapid adjustment (size 2–65), dual scale N m/ft.lb and N m/inch.lb. (size 5–80), long term accuracy and facility to accept insert/shell tools.
The robust steel tube completely encloses all working parts. The measuring element is only under load while force is being applied, no need for manual reset to zero. Any force applied to the tool after the "click" or applied in the opposite direction to the current function – e.g. forcible loosening of a jammed screw – does not act on the trigger mechanism and cannot cause damage to it. Reversible insert/shell tools allow anti-clockwise operation.
Easily adjustable without disassembly, e.g. using torque tester No 7707 W or calibration system No 7706. Deviation of indication ± 4%. With certificate.

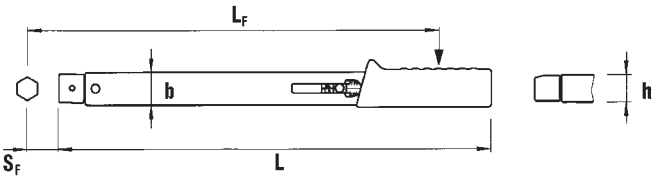
(Insert/shell tools see pages 174–179)

730 Basic wrenches with tool carrier for insert tools



730/2

Code	size			mm	b mm	h mm	L mm	L_F mm	S_F mm	g
50 18 00 02	**2**	4–20 N m	0.5 N m	9 x 12	27.5	23	178.5	174	17.5	315
50 18 00 04	**4**	8–40 N m	1 N m	9 x 12	27.5	23	222	218	17.5	395
50 58 00 01	**a/2-1** ✹	17.5–87.5 in.lb	2.5 in.lb	9 x 12	27.5	23	178.5	174	17.5	315
50 58 00 02	**a/2**	30–175 in.lb	5 in.lb	9 x 12	27.5	23	178.5	174	17.5	315
50 58 00 04	**a/4**	70–350 in.lb	10 in.lb	9 x 12	27.5	23	222	218	17.5	395

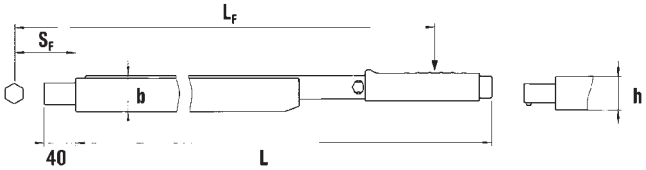


730/5

QR

Code	size					mm	b mm	h mm	L mm	L_F mm	S_F mm	g
50 18 00 05	**5**	6–50 N m	5–36 ft.lb	2 N m	1 ft.lb	9 x 12	28	23	315	288	17.5	805
50 18 00 10	**10**	20–100 N m	15–72.5 ft.lb	2.5 N m	2.5 ft.lb	9 x 12	28	23	370	343	17.5	1210
50 18 00 12	**12**	25–130 N m	20–95 ft.lb	2.5 N m	2.5 ft.lb	14 x 18	28	23	410	390	25	1100
50 18 00 20	**20**	40–200 N m	30–145 ft.lb	5 N m	5 ft.lb	14 x 18	28	23	455	435	25	1250
50 18 00 40	**40**	80–400 N m	60–300 ft.lb	10 N m	10 ft.lb	14 x 18	28	23	590	570	25	1880
50 18 00 65	**65**	130–650 N m	100–480 ft.lb	20 N m	20 ft.lb	14 x 18	30.6	25.6	875	855	25	3480
50 58 00 05	**a/5**	6–50 N m	50–440 in.lb	2 N m	10 in.lb	9 x 12	28	23	315	288	17.5	805
50 58 00 10	**a/10**	20–100 N m	180–880 in.lb	2.5 N m	20 in.lb	9 x 12	28	23	370	343	17.5	965
50 58 00 12	**a/12**	25–130 N m	225–1150 in.lb	2.5 N m	25 in.lb	14 x 18	28	23	410	390	25	1100
50 58 00 20	**a/20**	40–200 N m	350–1750 in.lb	5 N m	50 in.lb	14 x 18	28	23	455	435	25	1250

730 Basic wrench with tool carrier for shell tools, registered design



Code	size					mm	b mm	h mm	L mm	L_F mm	S_F mm	g
50 18 00 80	**80**	160–800 N m	120–600 ft.lb	20 N m	20 ft.lb	24.5 x 28	46	43	970	990	95	4925

Use shell adaptor No 7370/80 to make 14 x 18 mm insert tools fit.

730R/40/32 Torque wrench set

32 pieces, in steel case, for general service work.
Content:
1 SERVICE-MANOSKOP No 730/40, 80–400 N m
1 ratchet insert tool No 735/20, reversible, 1/2" ■-drive
1 square drive insert tool No 734/20, 1/2" ■-drive
7 o/e insert tools No 731/40, sizes 13, 15, 17, 19, 22, 27, 30 mm
1 No 3731/40 size 24 mm;
7 ring insert tools No 732/40, sizes 13, 15, 17, 19, 22, 24, 27 mm
10 sockets, bi-hexagon No 50, sizes 13, 14, 15, 17, 19, 22, 24, 25, 30, 32 mm
4 accessories, 1/2" ○-drive:
1 T-handle No 506
1 extension 255 mm No 509/10
1 extension 130 mm No 509/5
1 extension 55 mm No 509/2

Code	g	
96502053	9739	1

1299 ◉ BITS

for inside hexagon screws, for operating the adjusting screws on torque wrenches No 720, 721, 730 and 730N.

Code	◉ mm	outside ⬣	"	L mm	g	
08090002	2	C 6.3	1/4	34	4	10

outside ⬣ DIN 3126/ISO 1173

Plastic case, empty

for safe storage and transport of torque wrenches (please order inlays separately). Supplied without torque wrench.

Code	No	for torque wrenches No	L mm	g
81370002	**7301**	720/15; 721/5; 721/15; 730/5; 730/10; 730/12; 730/20; 730a/5; 730a/10; 730a/12; 730a/20; 730N/5; 730N/10; 730N/12; 730N/20; 730Na/5; 730Na/10; 730Na/20; 730D/10	550	425
81370003	**7302**	720/30; 721/30; 730/40; 730N/40; 730Na/40; 730D/20	680	535

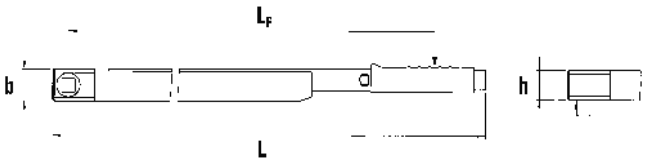
Inlays for plastic case

Code	for torque wrenches No	g
83071004	720/15; 721/5; 721/15; 730/5; 730/10; 730/12; 730/20; 730a/5; 730a/10; 730a/12; 730a/20; 730N/5; 730N/10; 730N/12; 730N/20; 730Na/5; 730Na/10; 730Na/20; 730D/10	88
83071002	720/30; 721/30; 730/40; 730N/40; 730Na/40; 730D/20	113

Standard MANOSKOP® 720Nf

Torque wrenches with dual "Stop" signal and cut-out, micrometer type adjustment, dual scale N m/ft.lb and long service life.
Robust steel tube and light alloy "U"-profile protect all working parts.
Push through square drive for right and left hand tightening.
Recalibration without dismantling using torque Tester No 7707 W or calibration system No 7706.
Deviation of indication ± 4%. With certificate.

720Nf Torque wrench with square drive

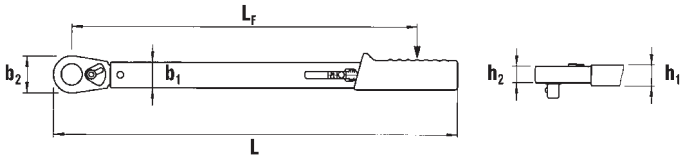


Code	size					■ "	b mm	h mm	L mm	L_F mm	S_F mm	g
50190081	**80**	160–800 N m	120–600 ft.lb	20 N m	20 ft.lb	3/4	45	42	1034	938	0	5650

Standard MANOSKOP® 721

Torque wrenches with dual "Stop" signal and cut-out, rapid adjustment, dual scale N m/ft.lb and long service life. Robust steel tube protects all working parts.
Any force applied to the tool after the "click" or applied in the opposite direction to the current function – e.g. forcible loosening of a jammed screw – does not act on the trigger mechanism and cannot cause damage to it.
Recalibration without dismantling using Torque Tester No 7707 W or calibration system No 7706.
Deviation of indication ± 4%. With certificate.

721 Torque wrenches with reversible ratchet



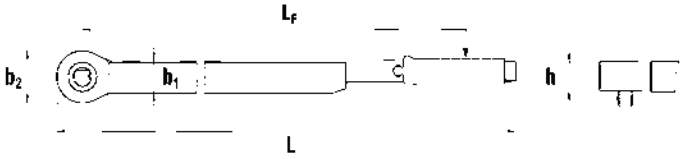
Code	size					■ "	b_1 mm	b_2 mm	h_1 mm	h_2 mm	L mm	L_F mm	g
50200005	**5**	6–50 N m	5–36 ft.lb	2 N m	1 ft.lb	3/8	28	27.5	23	14.5	352	293	900
50200015	**15**	30–150 N m	25–110 ft.lb	5 N m	5 ft.lb	1/2	28	41	23	18	452	387	1305
50200030	**30**	60–300 N m	50–220 ft.lb	10 N m	10 ft.lb	1/2	28	44	23	27.5	553	486	1720

size 30 with push through square drive (spare square drive, refer to page 189)

Standard MANOSKOP® 721Nf

Torque wrenches with dual "STOP" signal and cut-out, micrometer type adjustment, dual scale N m/ft.lb and long service life.
Robust steel tube and light alloy "U"-profile protect all working parts.
Push through square drive for right and left hand tightening.
Easily adjustable without disassembly using tester No 7707 W or calibration system No 7706.
Deviation of indication ± 4%. With certificate.

721Nf Torque wrenches with ratchet



Code	size					■ "	b_1 mm	b_2 mm	h mm	L mm	L_F mm	g
50200081	**80**	160–800 N m	120–600 ft.lb	20 N m	20 ft.lb	3/4	46.5	76	42	1051	938	6770
96502001	**100**	200–1000 N m	150–725 ft.lb	25 N m	25 ft.lb	3/4	46.5	76	42	1504	1365	7005

STAHLWILLE

Official partner of
BMW Motorrad Motorsport

forged and finished in Germany

Electronic angle-controlled torque wrench Sensotork® 713

Simple, flexible operation thanks to operator guidance on large-format display.
Very broad measuring range (5% to 100% of rated value) with deviation of indication ± 1% of the current reading. Deviation of indication of angle is ± 1%.
Repeated joints can be collated to form a single menu-guided sequence. (Insert tools see pages 174–179)

713R Electronic angle-controlled torque wrenches Sensotork®

Electronic angle-controlled torque wrench with insert tool pawl-action ratchet, with QuickRelease safety lock, for clockwise and anticlockwise use, readings independent of point of application of force (sizes 6 and 20), units of measurement: N m, ft.lb, in.lb, advance warning points for visual, tactile and acoustic signals, torque and angle are simultaneously visible, convenient angle measurement across a very wide angle range without a reference arm, choice of individual insert lengths, maintenance friendly due to easy adjustment and automatic reminder of next calibration date, individual identification possible, tamper-proof due to password protection, meets requirements of DKD-R 3-7, Class 2 and DIN EN ISO 6789, with works certificate in accordance with DIN EN 10204, supplied in sturdy plastic case (size 40 in sturdy steel case). Included in the set are three 1.5 V AA batteries. It is also possible to use rechargeable batteries (AA/LR6, NiMH, 1.2 V). Fully automated calibration (torque) using perfectControl calibrating unit No 7794-2.

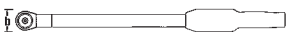


Code	size			■ "	mm	b mm	h mm	L mm	g	g with box
9650 1606	**6**	3–60 N m	2.5–44 ft.lb	3/8	9 x 12	50	33.5	378	856	1500
9650 1620	**20**	10–200 N m	7–148 ft.lb	1/2	14 x 18	50	33.5	608	1552	2430
9650 1640	**40**	20–400 N m	15–296 ft.lb	3/4	14 x 18	50	33.5	838	2332	5555

Electronic torque wrench Sensotork 712®

712R/6* Electronic torque wrench Sensotork®

Electronic torque wrench with option of attaching interchangeable insert tools, same design as No 713 but without angle function.


Code			■ "	mm	b mm	h mm	L mm	g	g with box
9650 1506	3–60 N m	2.5–44 ft.lb	3/8	9 x 12	50	33.5	378	856	1500

* to be discontinued

Accessories for electronic angle-controlled torque wrench Sensotork® No 713 and electronic torque wrench Sensotork® No 712

7759-1 USB adaptor, jack cable and software Sensomaster for No 712R, 713R

for documenting and managing readings on a PC and carrying out statistical analyses.
- Read out stored wrench data and joint readings: Joint identifier, Tool serial number, Target torque or target angle, Torque level at which the tool cuts out, Tightening torque or angle reached, Tolerances, Joint evaluation
- Storage of joint data in a database
- Delete or print highlighted joints from the database
- Export displayed joint data to a CSV file (compatible with Excel)
- 13 languages
- User management
- Define new PIN
- Delete joint data stored in wrench

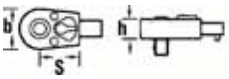
System requirements:
- PC
- Microsoft Windows 98 SE or compatible operating system with USB support
- USB connection
- Screen resolution of at least 1024 x 768 pixels
- STAHLWILLE USB hub or STAHLWILLE USB adapter cable
- Installed ODBC driver for Access data


Code	L m	g
9658 3625	1.5	137

Insert/shell tools for torque wrenches

725QR QuickRelease ratchet insert tool

reversible, with QuickRelease safety lock,
size 4: 22 teeth, sizes 5 and 10: 30 teeth, size 20: 36 teeth.

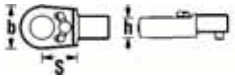



Code	size	■ "	mm	b mm	h mm	S mm	g
58253004	**4**	1/4	9 x 12	22	14.5	17.5	60
58253005	**5**	3/8	9 x 12	29	14.5	28*	130
58253010	**10**	1/2	9 x 12	29	14.5	28*	141
58253020	**20**	1/2	14 x 18	41	18	38.5*	325

* Caution! Modified settings on torque wrench
(refer to note on page 190)

725B Ratchet insert tool

reversible, with inside hexagon, 1/4" or 5/16", DIN 3126/ISO 1173 D 6.3 or D8, for direct acceptance of bits 1/4" or 5/16" outside hexagon C 6.3 (size 4: 22 teeth, size 5: 30 teeth). Internal hex drive with a collar-thrust spring (registered design). Bits are easy to insert, lock securely in position and can be removed just as easily; even hex bits with a wide groove (Type E, DIN 3126/ISO 1173).




Code	size	inside O "	mm	b mm	h mm	S mm	g
58255004	**4**	1/4	9 x 12	22	14	17.5	54
58255005	**5**	5/16	9 x 12	29	14.5	28*	117

* Caution! Modified settings on torque wrench
(refer to note on page 190)

725L/5 Ratchet insert tool

reversible, 30 teeth.
Caution! Modified settings on torque wrench (refer to note on p. 190).
This ratchet insert tool has the same extension length as ring insert tool No 732G/10 (see p. 177) and square drive insert tool No 734L/5 (see p. 175).


Code	■ "	mm	b mm	h mm	S mm	g
58151005	3/8	9 x 12	27.5	14.5	45	164

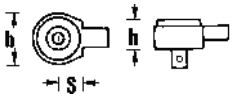
725/4 Ratchet insert tool

reversible, 22 teeth.


Code	■ "	mm	b mm	h mm	S mm	g
58254004	1/4	9 x 12	22	14.5	17.5	62

735 Ratchet insert tools

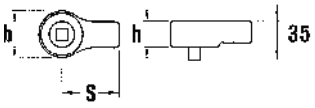
reversible, 60 teeth.




Code	size	■ "	mm	b mm	h mm	S mm	g
58250005	**5**	3/8	9 x 12	33	23.8	17.5	155
58250010	**10**	1/2	9 x 12	33	23.8	17.5	147
58250020	**20**	1/2	14 x 18	43	26	25	302
58250040	**40**	3/4	14 x 18	50	31.5	25	510

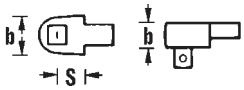
735/80 Ratchet shell tool

with push through square drive, registered design, 30 teeth.




Code	■ "	mm	b mm	h mm	S mm	g
58250080	3/4	24.5 x 28	76	43	95	2000

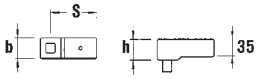
734 Square drive insert tools



Code	size	■ "	mm	b mm	h mm	S mm	g
58240004	**4**	1/4	9 x 12	20	14	17.5	71
58240005	**5**	3/8	9 x 12	20	14	17.5	76
58240010	**10**	1/2	9 x 12	20	14	17.5	82
58240020	**20**	1/2	14 x 18	27	18	25	203
58240040	**40**	3/4	14 x 18	40	25	25	396

734/80 Square drive shell tool

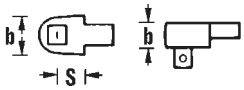
registered design.



Code	■ "	mm	b mm	h mm	S mm	g
58240080	3/4	24.5 x 28	42	42	95	1200

734F Square drive insert tools

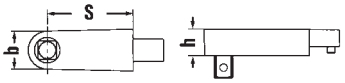
with permanently attached, captive square drive.



Code	size	■ "	mm	b mm	h mm	S mm	g
58241004	**4**	1/4	9 x 12	22	14	17.5	72
58241005	**5**	3/8	9 x 12	22	14	17.5	75

734L/5 Square drive insert tool

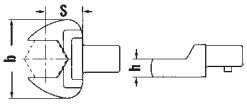
Caution! Modified settings on torque wrench (refer to note on p. 190).
This square-drive insert tool has the same extension length as ring insert tool No 732G/10 (see p. 177) and ratchet insert tool No 725L/5 (see p. 174).



Code	■ "	mm	b mm	h mm	S mm	g
58242005	3/8	9 x 12	20	14	45	141

731/10 Open ended insert tools

9 x 12 mm



Code	mm	b mm	h mm	S mm	g
58211007	**7**	22	5	17.5	40
58211008	**8**	22	5	17.5	39
58211009	**9**	26	5.5	17.5	38
58211010	**10**	26	5.5	17.5	42
58211011	**11**	26	5.5	17.5	41
58211012	**12** [1])	30	7	17.5	43
58211013	**13**	30	7	17.5	48
58211014	**14**	35	8	17.5	52
58211015	**15**	35	8	17.5	51
58211016	**16**	38	8.5	17.5	58
58211017	**17**	38	8.5	17.5	60
58211018	**18**	42	9	20*	71
58211019	**19**	42	9	20*	74

[1]) For flare nuts of hydraulic pipes on French vehicles

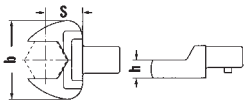
731a/10 Open ended insert tools

9 x 12 mm

Code	"	b mm	h mm	S mm	g
58611016	1/4	22	5	17.5	36
58611020	5/16	22	5	17.5	53
58611024	3/8	26	5.5	17.5	38
58611028	7/16	26	5.5	17.5	37
58611032	1/2	30	7	17.5	44
58611034	9/16	35	8	17.5	49
58611036	5/8	38	8.5	17.5	64
58611038	11/16	42	9	20*	76
58611040	3/4	42	9	20*	73

731/40 Open ended insert tools

14 x 18 mm



Code	mm	b mm	h mm	S mm	g
58214013	**13**	30	7	25	128
58214014	**14**	35	8	25	129
58214015	**15**	35	8	25	132
58214016	**16**	38	9	25	140
58214017	**17**	38	9	25	136
58214018	**18**	42	10	25	147
58214019	**19**	42	10	25	145
58214021	**21**	50	11	25	171
58214022	**22**	50	11	25	165
58214024	**24**	53	12	25	167
58214025	**25**	53	12	25	170
58214027	**27**	60	13	30*	219
58214030	**30**	66	14	30*	245
58214032	**32**	66	14	32.5*	246
58214034	**34**	66	14	32.5*	239
58214036	**36**	74	15	32.5*	275
58214038	**38**	74	15	32.5*	265
58214041	**41**	82	15	36.5*	307

* Caution! Modified settings on torque wrench (refer to note on page 190).

731a/40 Open ended insert tools

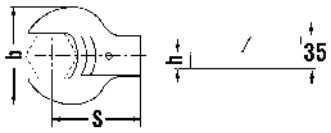
14 x 18 mm.

Code	⌀ "	b mm	h mm	S mm	g
5861 4028	7/16	30	7	25	127
5861 4032	1/2	30	7	25	125
5861 4034	9/16	35	8	25	129
5861 4036	5/8	38	9	25	136
5861 4038	11/16	42	10	25	148
5861 4040	3/4	42	10	25	144
5861 4042	13/16	50	11	25	171
5861 4044	7/8	50	11	25	165
5861 4046	15/16	53	12	25	177
5861 4048	1	60	13	30*	224
5861 4052	1 1/8	66	14	30*	258

* Caution! Modified settings on torque wrench (refer to note on page 190).

731/80 Open ended shell tools

registered design. 24.5 x 28 mm

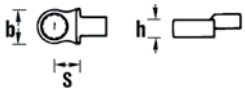


Code	⌀ mm	b mm	h mm	S mm	g
5821 8024	**24**	50	13	95	601
5821 8027	**27**	56	14	95	620
5821 8030	**30**	63	15	95	655
5821 8032	**32**	67	15	95	670
5821 8034	**34**	72	15	95	699
5821 8036	**36**	74	15	95	740
5821 8041	**41**	84	16	95	810
5821 8046	**46**	94	17	95	867
5821 8050	**50**	104	18	95	1010
5821 8055	**55**	114	19	95	1150
5821 8060	**60**	124	20	95	1330

732/10 Ring insert tools

AS-drive

9 x 12 mm



Code	⌀ mm	b mm	h mm	S mm	g
5822 1007	**7**	13	8	17.5	37
5822 1008	**8**	14.2	8	17.5	40
5822 1010	**10**	17.2	9	17.5	44
5822 1011	**11**	18.5	9	17.5	41
5822 1012	**12**	20.5	11	17.5	49
5822 1013	**13**	21.5	11	17.5	55
5822 1014	**14**	22.5	11	17.5	52
5822 1015	**15**	24.5	12	17.5	52
5822 1016	**16**	26	12	17.5	54
5822 1017	**17**	27	13	17.5	59
5822 1018	**18**	28	13	17.5	56
5822 1019	**19**	30.5	13	17.5	65
5822 1021	**21**	33	15	17.5	71
5822 1022	**22**	34.5	15	17.5	74

732a/10 Ring insert tools

AS-drive

9 x 12 mm

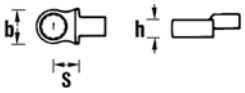
Code	⌀ "	b mm	h mm	S mm	g
5862 1016	1/4	13	8	17.5	36
5862 1020	5/16	14.2	8	17.5	37
5862 1024	3/8 [1])	17.2	9	17.5	37
5862 1028	7/16	18.5	9	17.5	40
5862 1032	1/2	21.5	11	17.5	53
5862 1034	9/16	22.5	11	17.5	52
5862 1036	5/8	26	12	17.5	54
5862 1038	11/16	28	13	17.5	58
5862 1040	3/4	30.5	13	17.5	58
5862 1042	13/16	33	15	17.5	68
5862 1044	7/8	34.5	15	17.5	69

[1]) For Volvo aero-engines, types "JAS"

732/40 Ring insert tools

AS-drive

14 x 18 mm



Code	⌀ mm	b mm	h mm	S mm	g
5822 4013	**13**	22.5	11	25	130
5822 4014	**14**	23	11	25	123
5822 4015	**15**	24	11	25	128
5822 4016	**16**	25.5	12	25	133
5822 4017	**17**	27	12	25	135
5822 4018	**18**	29	13	25	134
5822 4019	**19**	30.5	13	25	138
5822 4021	**21**	33	15	25	144
5822 4022	**22**	34.5	15	25	145
5822 4024	**24**	37.5	15	25	153
5822 4027	**27**	42.5	17	25	162
5822 4028	**28**	45.5	19	25	175
5822 4030	**30**	46	19	25	182
5822 4032	**32**	47.5	19	25	181
5822 4034	**34**	52	19	28*	210
5822 4036	**36**	54	19	28*	203
5822 4041	**41**	60	20	30*	240

* Caution! Modified settings on torque wrench (refer to note on page 190).

732a/40 Ring insert tools

AS-drive

14 x 18 mm

Code	⌀ "	b mm	h mm	S mm	g
5862 4032	1/2	22.5	11	25	122
5862 4034	9/16	23	11	25	122
5862 4036	5/8	25.5	12	25	134
5862 4038	11/16	29	13	25	132
5862 4040	3/4	30.5	13	25	138
5862 4042	13/16	33	15	25	142
5862 4044	7/8	34.5	15	25	147
5862 4046	15/16	37.5	15	25	151
5862 4048	**1**	41	17	25	160

732G/10 Ring insert tools

AS-drive HPQ

9 x 12 mm

Caution! Modified settings on torque wrench (refer to note on p. 190). This insert tool has the same extension length as insert tool No 725L/5 (see p. 174) and square-drive insert tool No 734L/5 (see p. 175). HPQ high performance steel, gunmetal finish.

Code	mm	b mm	h mm	S mm	g
58 62 00 07	**7**	11.5	6	45	31
58 62 00 08	**8**	12.4	6	45	33
58 62 00 09	**9**	14	8	45	40
58 62 00 10	**10**	15.6	8	45	44
58 62 00 13	**13**	19.3	9.2	45	60

732aG/10 Ring insert tools

AS-drive HPQ

9 x 12 mm

Caution! Modified settings on torque wrench (refer to note on p. 190). This insert tool has the same extension length as insert tool No 725L/5 (see p. 174) and square-drive insert tool No 734L/5 (see p. 175). HPQ high performance steel, gunmetal finish.

Code	"	b mm	h mm	S mm	g
58 62 12 16	1/4	10.4	6	45	28
58 62 12 20	5/16	12.4	6	45	31
58 62 12 24	3/8	14.9	8	45	42
58 62 12 28	7/16	17	8	45	43
58 62 12 32	1/2	19	9.2	45	58
58 62 12 34	9/16	21	9.2	45	58
58 62 12 36	5/8	23	12	45	74

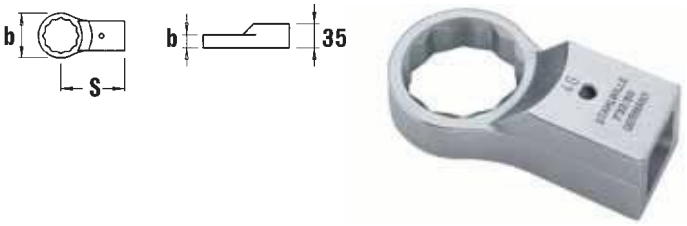
for assembling and dismantling aero-engines.

732/80 Ring shell tools

AS-drive

registered design.

24.5 x 28 mm



Code	mm	b mm	h mm	S mm	g
58 22 80 24	**24**	36	15	95	605
58 22 80 27	**27**	40.5	15	95	610
58 22 80 30	**30**	46	16	95	630
58 22 80 32	**32**	49	16	95	635
58 22 80 34	**34**	52	17	95	650
58 22 80 36	**36**	54	17	95	650
58 22 80 41	**41**	61	18	95	675
58 22 80 46	**46**	66	19	95	720
58 22 80 50	**50**	75	20	95	803
58 22 80 55	**55**	84	21	95	889
58 22 80 60	**60**	93	22	95	995

732a/80 Ring shell tools

AS-drive

registered design.

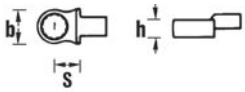
24.5 x 28 mm

Code	"	b mm	h mm	S mm	g
58 62 80 46	15/16 [1])	36	14	95	604
58 62 80 50	1 1/16 [1])	40.5	14	95	608

[1]) for jet engine pins (Airbus A320/A321)

732TX/10 TORX® insert tools

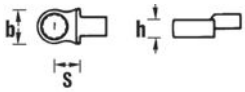
9 x 12 mm



Code	size	b mm	h mm	S mm	g
58 29 10 06	**E6**	13	8	17.5	40
58 29 10 08	**E8**	14.2	8	17.5	45
58 29 10 10	**E10**	17.2	9	17.5	45
58 29 10 12	**E12**	18.5	9	17.5	50
58 29 10 14	**E14**	21.5	11	17.5	60

732TX/40 TORX® insert tools

14 x 18 mm

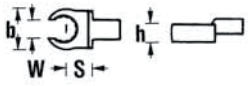


Code	size	b mm	h mm	S mm	g
58 29 40 14	**E14**	22.5	11	25	130
58 29 40 18	**E18**	24	11	25	135
58 29 40 20	**E20**	29	13	25	150
58 29 40 24	**E24**	30.5	13	25	150

733/10 Open ring insert tools

AS-drive

9 x 12 mm



Code	mm	b mm	h mm	W mm	S mm	g
58 23 10 10	**10**	21.5	11	7.1	17.5	57
58 23 10 11	**11**	22.5	11	8.6	17.5	55
58 23 10 12	**12**	24.5	12	9	17.5	59
58 23 10 13	**13**	26	12	10	17.5	55
58 23 10 14	**14**	27	13	11	17.5	60
58 23 10 16	**16**	30.5	13	13	17.5	65
58 23 10 17	**17**	31.5	13	14	17.5	64
58 23 10 18	**18**	33	15	14.8	17.5	74
58 23 10 19	**19**	34	15	15.8	17.5	80
58 23 10 21	**21**	38.5	15	16.2	20*	88
58 23 10 22	**22**	39.5	15	17	20*	92
58 23 10 24	**24**	40	15	18	20*	75

* Caution! Modified settings on torque wrench
(refer to note on page 190).

733a/10 Open ring insert tools

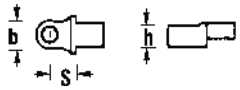
AS-drive

9 x 12 mm

Code	"	b mm	h mm	W mm	S mm	g
58 63 10 24	3/8	21.5	11	7.1	17.5	55
58 63 10 28	7/16	22.5	11	8.6	17.5	56
58 63 10 32	1/2	26	12	9.5	17.5	58
58 63 10 34	9/16	27.5	13	11	17.5	59
58 63 10 36	5/8	30.5	13	12.7	17.5	61
58 63 10 38	11/16	33	15	14	17.5	48
58 63 10 40	3/4	34	15	15.8	17.5	76

736 BIT holder insert tools

Internal hex drive with a collar-thrust spring (registered design).
Bits are easy to insert, lock securely in position and can be removed just as easily; even hex bits with a wide groove (Type E, DIN 3126/ISO 1173).

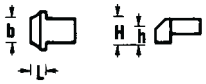


Code	size	inside O	"	mm	b mm	h mm	S mm	g
58 26 10 10	**10**	D 8	5/16	9 x 12	16	12.5	17.5	47
58 26 26 10	**10-1**	D 6.3	1/4	9 x 12	14	10	17.5	45
58 26 10 40	**40**	D 8	5/16	14 x 18	16	12.5	25	112

inside O DIN 3126/ISO 1173

737 Blank end insert tools

gunmetal finish. To prevent damage from excessive temperatures, the locking pin, spring and washer are not fitted until the welding work has been completed. Instructions are supplied.

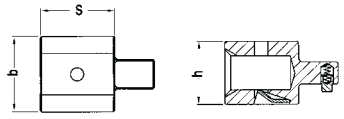


Code	size	Welding surface h x b mm	mm	H mm	L mm	g
58 27 00 10	**10**	8 x 14	9 x 12	14.5	8	35
58 27 00 40	**40**	11 x 25	14 x 18	21.5	12	98

7370/10 Adaptor

QR

for using insert tools with an outer square drive of 14 x 18 mm on torque wrenches with an internal square drive of 9 x 12 mm.
Caution! Modified settings on torque wrench (refer to note on p. 190).

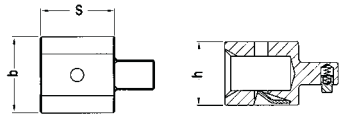


Code	■ mm	O mm	b mm	h mm	S mm	g
58 29 00 10	9 x 12	14 x 18	31	26	30.5	114

7370/40 Adaptor

QR

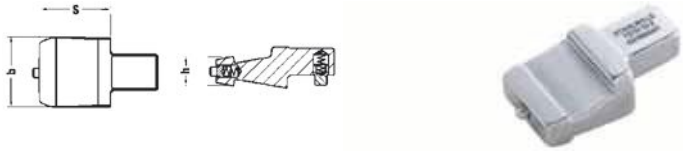
for using insert tools with an outer square drive of 9 x 12 mm on torque wrenches with an internal square drive of 14 x 18 mm.
Caution! Modified settings on torque wrench (refer to note on p. 190).



Code	■ mm	O mm	b mm	h mm	S mm	g
58 29 00 40	14 x 18	9 x 12	28	21	21.5	115

7370/10-2 Adaptor

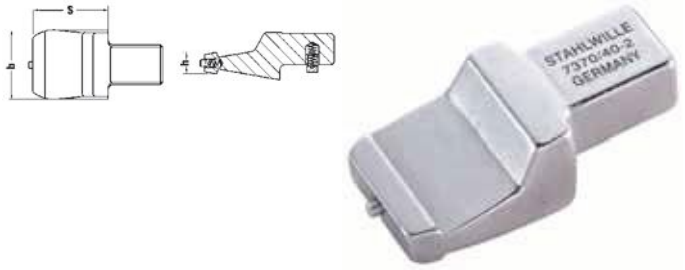
for use with insert tools with a lateral dovetail profile in torque wrenches with 9 x 12 mm internal square drives.
Caution! Modified settings on torque wrench (refer to note on p. 190).



Code	■ mm	b mm	h mm	S mm	g
58290012	9 x 12	23.5	9.5	24	51

7370/40-2 Adaptor

for use with insert tools with a lateral dovetail profile in torque wrenches with 14 x 18 mm internal square drives.
Caution! Modified settings on torque wrench (refer to note on p. 190).



Code	■ mm	b mm	h mm	S mm	g
58290042	14 x 18	31.5	9.5	34.6	138

7370/40-1 Adaptor

for using shell tools with an internal square drive of 24.5 x 28 mm on torque wrenches with an internal square drive of 14 x 18 mm.
Caution! Modified settings on torque wrench (refer to note on p. 190).

Code	■ mm	■ mm	b mm	h mm	g
58290041	14 x 18	24.5 x 28	28	24	251

7370/80 Shell adaptor

registered design, for attaching 14 x 18 mm insert tools.
Caution! Modified settings on torque wrench (refer to note on p. 190).

Code	○ mm	○ mm	b mm	h mm	S mm	g
58290080	24.5 x 28	14 x 18	36	26	70	281

Tool holder

with tool carrier to receive insert tools
(without torque function).

Code	No	■ mm	L mm	g
18200001	**1820**	9 x 12	382.5	490
18210001	**1821**	14 x 18	575	720

7380N/7385N Torque angle gauges

registered design, for angle controlled bolt/screw tightening, with static read-off point. Read-off possible from any angle thanks to a pair of angled scales. Removable magnet for attaching sockets with 1/2" internal square drive. For use in conjunction with tightening tools such as Service MANOSKOP® No 730N. Since this tightening method requires a pre-determined snug torque to be applied, it is essential to choose a torque wrench covering both snug torque as well as maximum torque required to reach the recommended tightening angle. Whether 1/2" or 3/4" sq.dr. Torque Angle Gauge is used depends upon the square drive of the appropriate torque wrench employed.

Code	No	○ "	■ "			b mm	h mm	L mm	g
54010001	**7380N**	1/2	1/2	± 360°	2°	78	43	416	494
54010002	**7385N**	3/4	3/4	± 360°	2°	78	76	416	720

Electronic torque tester for torque wrenches Sensotork® 7707 W
(For complete calibration systems, see p. 161)

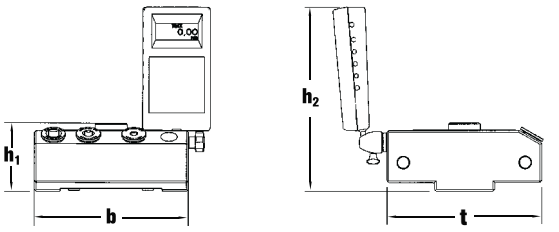
Compact workshop-based torque tester for easy adaptation by replacement of the transducers.
High degree of accuracy thanks to flat transducer and conversion and digitalisation of readings within the transducer (see p. 181).
High degree of safety through display showing actual torque read-off where clicking torque wrenches are used.

7707 W Workshop torque tester Sensotork®

QR

Electronic workshop torque tester for torque wrenches, consisting of:
- transducer (registered design)
- holder
- display unit (registered design)
- tripod for display unit (with 1.5 m cable)
- spiral cable
- mains adaptor (110 V–230 V with interchangeable socket adaptors) or direct connection to 12 V in-car supply is possible
- square drive adaptor (No 7707-2W, No 7707-2-1W, No 7707-2-2W, No 7707-3W)
- kit for attaching the unit to a workbench or wall in a horizontal or vertical testing position

for clockwise and anticlockwise use. Units of measurement: N m, ft.lb, in.lb. The easily interchangeable transducers are attached to the holder by means of a QuickRelease safety lock. Low lateral forces thanks to low-profile transducers, automatic detection of the transducer, flexible and user friendly because the unit can be used horizontally or vertically and the display unit can be placed in many positions, additional tripod with 1.5 m cable for mounting the display unit to facilitate visual monitoring when using longer torque wrenches, especially broad measuring range from approx. 2% to 100% of rated value. The software No 7759-2, including USB hub and jack cable (see p. 182), enables readings to be transferred to the PC for documenting and for generating calibration certificates in accordance with DIN EN 6789:2003 (no separate power supply needed, power comes from PC). While individual transducers are being recalibrated, the torque tester itself remains on-site for further use. Wide range of application (-20°C to +60°C).
Complies with DIN 51309: 2005, Class 2 and DKD-R 3-8: 2003. With certificate. Supplied in sturdy plastic case.



Code	No	Capacity N m	Capacity ft.lb	Capacity in.lb	▢ "	b mm	h_1 mm	h_2 mm	t mm	g	g with box
96 52 10 80	**7707-1W**	0.4–20	0.3–15	3.5–177	1/4	180	79	215	180	6255	9500
96 52 10 72	**7707-2W [1])**	2–100	1.5–74	18–885	3/8	180	79	215	180	7025	10300
96 52 10 83	**7707-2-1W [2])**	4–200	3–148	35–1770	1/2	180	79	215	180	7511	10975
96 52 10 84	**7707-2-2W [3])**	8–400	6–295	71–3540	3/4	180	79	215	180	7654	11100
96 52 10 82	**7707-3W [4])**	25–1100	18–812	221–9736	3/4	180	79	215	180	7495	11000

[1]) with square drive adaptor No 409M (1/4" ▢ x 3/8" ■)
[2]) with square drive adaptors No 7789-4 (1/4" ▢ x 1/2" ■), No 7789-5 (3/8" ▢ x 1/2" ■)
[3]) with square drive adaptors No 7787 (1/4" ▢ x 3/4" ■), No 7788 (3/8" ▢ x 3/4" ■), No 7789 (1/2" ▢ x 3/4" ■)
[4]) with square drive adaptors No 7787 (1/4" ▢ x 3/4" ■), No 7788 (3/8" ▢ x 3/4" ■), No 7789 (1/2" ▢ x 3/4" ■)

Which transducer is for which torque wrench?

(Calibration in accordance with DIN EN ISO 6789: 2003)

STAHLWILLE's recommendation:

+++ very well suited ++ well suited + suitable

No	7721-1	7722	7723-1	7723-2	7723-3
730D/10		+++			
730D/20			+++		
730D/40				+++	
730D/65					+++
730N/2	+++				
730N/5		+++			
730N/10		+++	++		
730N/12			+++		
730N/20			+++	++	
730N/40				+++	
730N/65					+++
730Na/2	+++				
730Na/5		+++			
730Na/10		+++	++		
730Na/20			+++	++	
730Na/40				+++	
730/2	+++	++	+		
730/4		+++	++	+	
730a/2	+++	++	+		
730a/4		+++	++	+	
730/5		+++	++		
730/10		+++	++	+	
730/12			+++	++	+
730/20			+++	++	+
730/40				+++	++
730/65					+++

No	7721-1	7722	7723-1	7723-2	7723-3	7724-1
730a/5		+++	++			
730a/10		+++	++	+		
730a/12			+++	++	+	
730a/20			+++	++	+	
730/80					+++	+
720Nf/80					+++	+
721/5		+++	++			
721/15			+++	++	+	
721/30				+++	++	
721Nf/80					+++	+
721Nf/100					+++	+
755R/1	+++					
755/4		+++	++			
755/10		+++	++	+		
755/20			+++	++	+	
755/30				+++	++	
71/40				+++	++	
71/80					+++	+
71aR/80					+++	+
73Nm/15	+++	++				
712R/6		+++				
712R/20			+++			
712R/40				+++		
713R/6		+++				
713R/20			+++			
713R/40				+++		

7721–7724 Transducers

QR

registered design, high degree of accuracy thanks to conversion and digitization of readings within the transducer itself.
Not susceptible to lateral forces due to low-profile construction.
Can also be used as part of a calibration system (see p. 161). With certificate.

Code	No	Measuring ranges by deviation of indication: Display deviation value ± 1% of the reading N m	ft.lb	in.lb	Display deviation value ± 0.5% of the reading N m	ft.lb	in.lb	Display deviation value ± 0.25% of the reading N m	ft.lb	in.lb	⬡ "	⚖ g
52 10 00 21	**7721** [1])	0.2–10	0.15–7.4	1.8–88.5	1–10	0.74–7.4	8.9–88.5	2–10	1.5–7.4	17.7–88.5	1/4	1735
52 10 00 26	**7721-1**	0.4–20	0.3–15	3.5–177	2–20	1.5–15	18–177	4–20	3–15	35–177	1/4	1735
52 10 00 22	**7722**	2–100	1.5–74	18–885	10–100	7–74	89–885	12–100	9–74	106–885	3/8	2486
52 10 10 23	**7723-1**	4–200	3–148	35–1770	20–200	15–148	177–1770	40–200	30–148	354–1770	1/2	2983
52 10 20 23	**7723-2**	8–400	6–295	71–3540	40–400	30–295	354–3540	80–400	59–295	708–3540	3/4	3134
52 10 00 28	**7723-3**	25–1100	18–812	221–9736	110–1100	81–812	974–9736	220–1100	162–812	1947–9736	3/4	2998
52 10 00 29	**7724-1** [2])	150–3000	111–2214	1328–26553	300–3000	221–2214	2655–26553	600–3000	443–2214	5311–26553	1 1/2	10500

[1]) for calibrating torque screwdrivers
[2]) for use with mechanical loader No 7792 and 7792-1 (see p. 185)

Note!

Torque testers are measuring instruments! They have to be regularly calibrated and, where necessary, adjusted, using suitable calibration equipment. We recommend recalibrating every 12 months.

Accessories for workshop torque tester and calibration systems

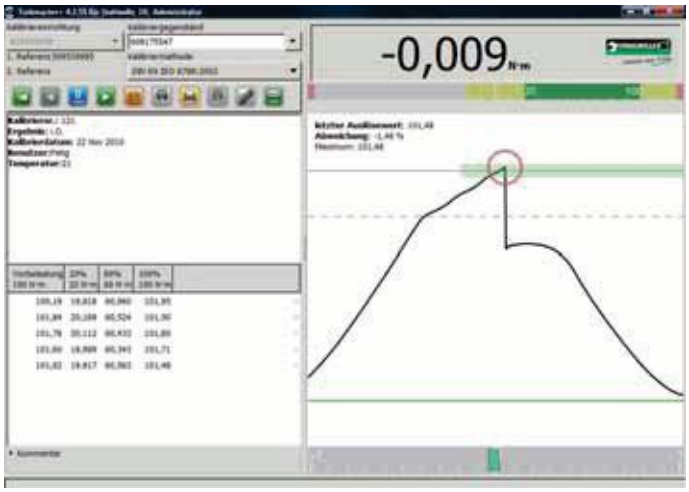
7750 Display unit

registered design, for displaying the actual torque as measured.
Units of measurement:
N m, ft.lb, in.lb.
Modes of operation:
track, peak hold, first peak (only with manual operation), additional display of actual torque applied with clicking torque wrenches.
Swivels to any desired position thanks to universal ball-joint.

Code	g
52 10 00 50	182

7759-2 USB adaptor, jack cable and software Torkmaster

Link between transducers and the PC. For adjusting and calibrating torque wrenches and generating calibration certificates in accordance with DIN EN ISO 6789: 2003.



Code	L m	g
96 58 36 26	1.5	137

7751 Jack cable

Connection between transducer and USB adaptor or display unit.

Code	L m	g
52 11 00 51	1.5	50

7753 USB adaptor with USB cable

for connecting up to 5 transducers to the PC for evaluating your data.

Code	L mm	b mm	h mm	g
52 11 00 53	125	65	41	230

7752 Spiral cable

Connection between transducer and display unit or USB adaptor, with jacks at both ends, 90° angled.

Code	L max. mm	g
52 11 00 52	500	35

7760 Mains adaptor

Input:
110 V–230 V AC ,
Output: 12 V DC,
with interchangeable socket adaptors.

Code	Volt	g
52 11 00 56	110-230	385

409M Square drive adaptor

1/4" socket x 3/8" plug (6.3 x 10 mm).

Code	L mm	Ø mm	g
11 03 00 10	13	25	14

7787 Square drive adaptor

1/4" socket x 3/4" plug
(6.3 x 20 mm).

Code	L mm	ø mm	g
5852 1087	15.5	29	41

7788 Square drive adaptor

3/8" socket x 3/4" plug
(10 x 20 mm).

Code	L mm	ø mm	g
5852 1088	23.5	29	52

7789 Square drive adaptor

1/2" socket x 3/4" plug
(12.5 x 20 mm).

Code	L mm	ø mm	g
5852 1089	23.5	29	42

7789-2 Square drive adaptor

3/4" socket x 1 1/2" plug
(20 x 40 mm).

Code	L mm	ø mm	g
5852 3089	44	60	383

7789-3 Square drive adaptor

1" socket x 1 1/2" plug
(25 x 40 mm).

Code	L mm	ø mm	g
5852 4089	44	60	291

7789-4 Square drive adaptor

1/4" socket x 1/2" plug
(6.3 x 12.5 mm).

Code	L mm	ø mm	g
5852 4090	15.5	29	25

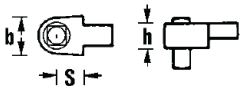
7789-5 Square drive adaptor

3/8" socket x 1/2" plug
(10 x 12.5 mm).

Code	L mm	ø mm	g
5852 4091	15.5	29	28

734K Calibrating square drive insert tools

Without a ball or pin. Optimum measuring results during calibration thanks to reduced lateral forces.



Code	size	■ "	ø mm	b mm	h mm	S mm	g
5824 3004	**4**	1/4	9 x 12	20	14	17.5	76
5824 3005	**5**	3/8	9 x 12	20	14	17.5	80
5824 3020	**20**	1/2	14 x 18	27	18	25	218
5824 3040	**40**	3/4	14 x 18	40	25	25	410

STAHLWILLE

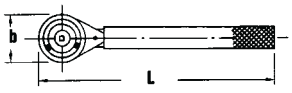
Official partner of
BMW Motorrad Motorsport

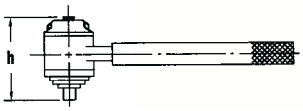
MULTIPOWER

Makes child's play of the largest torques.
Multipower – or really "tough work".
STAHLWILLE Multipower torque multipliers with planetary gears take the fatigue out of tightening or loosening stiff or large bolt connections. A long lever is not necessary.
STAHLWILLE Multipower multiplies human strength; steady torque transfer is easy on nuts and bolts.
Even the largest torques are transferred with ease and precision over long periods (guaranteed limit ± 5%).
Accordingly, construction materials and workmanship are extremely robust.
When combined with STAHLWILLE torque wrenches, Multipower really shows its strength.
The Multipower range extends to 5000 N m/3687 ft.lb.
Multipower tools are also available on request up to 12000 N m/8850 ft.lb.
The largest Multipower units are fitted with an anti-backlash device.

MULTIPOWER

with overload protection and planetary gears, in carrying case, with spare hex. for overload device, deviation of indication ± 5%.






MP300-800


MP300-1350


MP300-2000


MP300-3000


MP300-5000

Code	No	N m[1])	ft.lb[1])	N m[2])	ft.lb[2])	Gear ratio	Torque ratio	○ "	■ "	b mm	h mm	L mm	g	g with box
53 03 08 00	**MP300-800**	800	590	229	169	4 : 1	1 : 3.5	1/2	3/4	66	85	215	2000	5838
53 03 13 50	**MP300-1350**	1350	996	375	277	4 : 1	1 : 3.6	3/4	3/4	90	106	265	3400	7500
53 03 20 00	**MP300-2000*)**	2000	1475	160	118	16 : 1	1 : 12.5	1/2	1	95	161	330	7000	11000
53 03 30 00	**MP300-3000*)**	3000	2212	240	177	16 : 1	1 : 12.5	3/4	1	95	161	330	7000	11000
53 03 50 00	**MP300-5000*)**	5000	3687	294	217	20 : 1	1 : 17.0	3/4	1 1/2	120	180	400	10400	14000

Multipower tools are also available on request up to 12000 N m/8850 ft.lb.
*) with anti-backlash device
[1]) max. output
[2]) max. input

Spares for Multipower

Sun wheel with overload cutout

Code	No	for No	g
59 03 08 00	**SR300-800**	MP300-800	45
59 03 13 50	**SR300-1350**	MP300-1350	106
59 03 20 00	**SR300-2000**	MP300-2000	120
59 03 30 00	**SR300-3000**	MP300-3000	130
59 03 50 00	**SR300-5000**	MP300-5000	127
59 30 00 39	**SR290N**	STW 290N	41
59 30 00 67	**SR295N**	STW 295N	95
59 30 00 68	**SR391N**	STW 391N	95
59 30 00 69	**SR392N**	STW 392N	105
59 30 00 70	**SR393N**	STW 393N	105

Replacement square drives

drilled, for STAHLWILLE Multipower STW 390–STW 393 (until 1996).

Code	No	g
59 30 39 11	**STW 391-700***	89
59 30 39 21	**STW 392-70**	232
59 30 39 31	**STW 393-70**	252

* also for STW 390

Ratchet spare parts sets for torque wrenches 721/15–80

Code	No	Content	g
59 19 10 05	**7210/5**	For ratchet/torque wrench No 721/5: 1 pinion, 1 pawl, 1 switch-over button and pin, 1 ball, 2 compression springs, 2 screws	53
19 04 00 00	**5120 + 7210/15**	For ratchet/torque wrench No 721/15: 1 pinion, 1 pawl, 1 lever, 1 lever pin, 1 ball, 2 compression springs, 2 screws	127
59 19 10 30	**7210/30**	For ratchet/torque wrench No 721/30: 1 pinion, 1 pawl, 1 lever, 1 lever pin, 1 ball, 2 compression springs, 2 screws	134
59 19 10 80	**7210/80**	For ratchet/torque wrench No 721Nf/80, 721Nf/100, 735/80: 1 pinion, 2 pawls, 2 spring contact points, 2 compression springs	448

Sets of spare parts for ratchet insert tools No 725QR, No 735

4150 QR Spare parts set

QR

Content: 1 pinion; 1 pawl; 1 lever with pin; 1 ball; 2 compression springs; 2 screws M 1.7 x 8; 1 cover plate

Code	for No	g	
19 01 10 20	725QR/4	24	1

4350 QR Spare parts set

QR

Content: 1 pinion, 1 pawl, 1 lever with pin, 1 ball, 2 compression springs, 2 screws

Code	for No	g	
19 02 00 20	725QR/5	51	1

7250 QR/10 Spare parts set

QR

Content: 1 pinion, 1 pawl, 1 lever with pin, 1 ball, 2 compression springs, 2 screws

Code	for No	g	
19 04 10 20	725QR/10	64	1

5120 QR Spare parts set

QR

Content: 1 pinion, 1 pawl, 1 lever with pin, 1 ball, 2 compression springs, 2 screws

Code	for No	g	
19 04 00 20	725QR/20	127	1

7350/5 Set of spare parts

Content: 1 pinion, 1 pawl, 1 switching disk, 1 spring, 3 screws

Code	for No	g	
59 25 10 05	735/5	85	1

for ratchets from 12/97

7350/10 Set of spare parts

Content: 1 pinion, 1 pawl, 1 switching disk, 1 spring, 3 screws

Code	for No	g	
59 25 10 10	735/10	96	1

for ratchets from 12/97

7350/20 Set of spare parts

Content: 1 pinion, 1 pawl, 1 switching disk, 1 spring, 3 screws

Code	for No	g	
59 25 10 20	735/20	146	1

for ratchets from 4/96

7350/40 Set of spare parts

Content: 1 pinion, 1 pawl, 1 switching disk, 1 spring, 3 screws

Code	for No	g	
59 25 10 40	735/40	219	1

for ratchets from 5/97

70V Square drive units

for torque wrenches and insert tools.

Code	size	for No	a "	b "	L mm	g	
59 01 00 01	**1**	71...V/1	1/4	1/4	17.5	5	5
59 01 00 14	**11**	734/4	3/8	1/4	22	12	5
59 01 00 03	**3**	734/5	3/8	3/8	25.8	17	5
59 01 00 05	**5**	734/10	3/8	1/2	30	28	5
59 01 00 11	**502 1/2**	720/30; 734/20	1/2	1/2	33.5	39	5
59 01 00 07	**7**	721/30	1/2	1/2	44.3	52	5
59 01 00 08	**8**	734/40	3/4	3/4	52.2	138	5
59 01 00 15	**12**	720Nf/80; 721Nf/80+100	3/4	3/4	65	179	1

70VK Calibrating square drive units

Without a ball or pin. Optimum measuring results during calibration thanks to reduced lateral forces.

Code	size	for No	a "	b "	L mm	g	
59 01 10 14	**11**	734/4	3/8	1/4	24.7	15	5
59 01 10 03	**3**	734/5	3/8	3/8	27.6	20	5
59 01 10 11	**502 1/2**	734/20	1/2	1/2	36.9	60	5
59 01 10 08	**8**	734/40	3/4	3/4	52.2	147	5

Note! This is how to achieve the correct tightening torque –
even if you are using inserts with an extension

When you tighten fasteners using inserts whose extension length S deviates from the standard length S_F, it is necessary to recalculate the setting/display value for the torque wrench in use. Caution! If adapters are combined with inserts or special tools, use the sum of the extensions = ΣS. Where the special tool is angled to the side, W_K will have to be determined empirically.

$$W_K = \frac{M_A \times L_F}{L_k} \left[\frac{N\,m \times mm}{mm}\right]$$

$$W_K = \frac{M_A \times L_F}{L_F - S_F + S\ (or\ \Sigma S)}$$

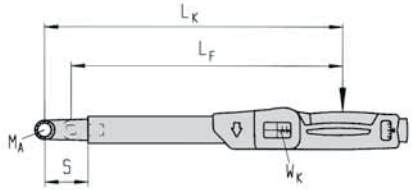
- M_A = desired tightening torque
- W = reading/setting $W = M_A$
- W_K = adjusted reading or setting value $W_K \neq M_A$
- L_F = functional length (see dimension table for torque wrenches)
- L_K = adjusted functional length $L_K = L_F - S_F + S\ (or\ \Sigma S)$
- S = extension of STAHLWILLE inserts or special tools (see dimension table for inserts)
- S_F = standard extension (see dimension table for torque wrenches)
- ΣS = total of all extensions of the attached inserts $S_{adapter} + S_{insert} + \ldots$

Example 1: adjusted setting value (1 insert tool)

Torque wrench No 730N/20 combined with ring insert tool No 732/40 size 36 mm
Required tightening torque for the screw M_A = 190 N m

Dimension table for torque wrenches: L_F = 424.5 mm, S_F = 25 mm
Dimension table for ring insert tools: S = 28 mm

→ $S \neq S_F$
→ $W \neq M_A$



$$W_K = \frac{M_A \times L_F}{L_F - S_F + S} = \frac{190\ N\,m \times 424.5\ mm}{424.5\ mm - 25\ mm + 28\ mm} = \frac{190\ N\,m \times 424.5\ mm}{427.5\ mm}$$

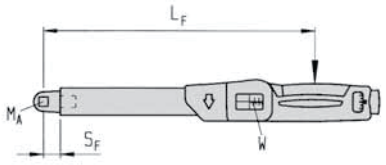
Adjusted setting value W_K = 188.7 N m → value to set = 189 N m

Normal situation

Torque wrench No 730N/10 combined with square drive insert tool No 734/5 and socket size 13 mm.
Required tightening torque for the screw M_A = 40 N m

Dimension table for torque wrenches: L_F = 336 mm, S_F = 17.5 mm
Dimension table for square drive insert tools: S = 17.5 mm

→ $S = S_F$
→ $W = M_A$



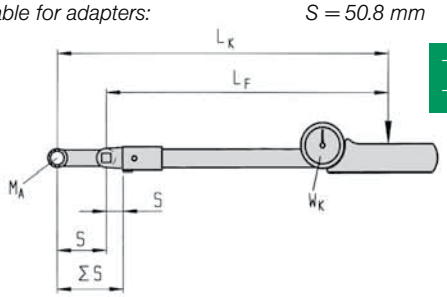
No adjustment to setting value required on torque wrench.

Example 2: adjusted reading (insert tool and adapter)

Torque wrench No 71/2 combined with square drive insert tool No 734/5 and adapter No 447 size 10 mm
Required tightening torque for the screw M_A = 25 N m

Dimension table for torque wrenches: L_F = 250 mm, S_F = 17.5 mm
Dimension table for square drive insert tools: S = 17.5 mm
Dimension table for adapters: S = 50.8 mm

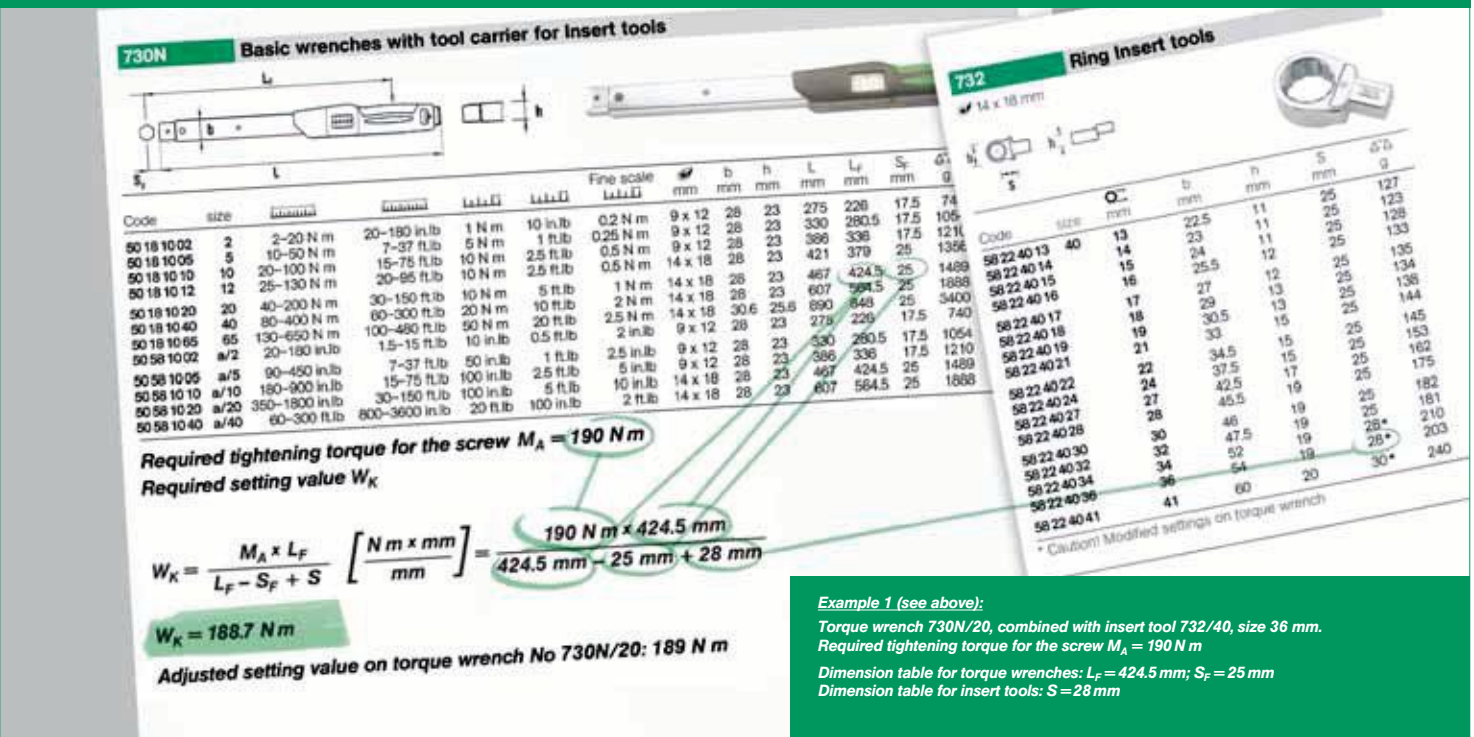
→ $\Sigma S \neq S_F$
→ $W \neq M_A$



$$W_K = \frac{M_A \times L_F}{L_F - S_F + \Sigma S} = \frac{25\ N\,m \times 250\ mm}{250\,mm - 17.5\,mm + 17.5\,mm + 50.8\,mm} = \frac{25\ N\,m \times 250\ mm}{300.8\ mm}$$

Adjusted reading W_K = 20.8 N m

… and this is what it looks like in the catalogue.



Example 1 (see above):
Torque wrench 730N/20, combined with insert tool 732/40, size 36 mm.
Required tightening torque for the screw M_A = 190 N m
Dimension table for torque wrenches: L_F = 424.5 mm; S_F = 25 mm
Dimension table for insert tools: S = 28 mm

Allocation of coefficients of friction and recommended values to various materials, surfaces and joint lubrication states

Class of friction coefficient	Range for μ_G and μ_K	Selection of typical examples for	
		Material/surfaces	Lubricants
A	0.04 to 0.10	bright metal, hardened and temperated black, phosphated electrocoatings like Zn, Zn/Fe, Zn/Ni, zinc flake coatings	solid lubricants such as MoS_2, graphite, PTFE, PA, PE, PI in bonded coatings, as topcoats or in pastes; melted wax, wax dispersion
B	0.08 to 0.16	bright metal, hardened and temperated black, phosphated electrocoatings like Zn, Zn/Fe, Zn/Ni, zinc flake coatings, Al and Mg alloyscoatings	solid lubricants, such as MoS_2, graphite, PTFE, PA, PE, PI in bonded coatings, as topcoats or in pastes; melted wax; wax dispersions; greases; oils; delivery state
		hot-dip zinc-plated	MoS_2; graphite; wax dispersions
		organic coatings	with integrated solid lubricant or wax dispersion
		austenitic steel	solid lubricants or waxes; pastes
C	0.14 to 0.24	austenitic steel	wax dispersion pastes
		bright metal, phosphatised	delivery status (slightly oiled)
		electroplated coatings like Zn, Zn/Fe, Zn/Ni, zinc flake coatings, adhesive	without
D	0.20 to 0.35	austenitic steel	oil
		electroplated coatings like Zn, Zn/Fe	without
E	≥ 0.30	electroplated coatings like Zn, Zn/Fe, Zn/Ni, austenitic steel, Al, and Mg alloys	without

Approximate values for static friction μ_T in the joint

Material pairings	Coefficient of static friction in this state	
	dry	lubricated
steel – steel/cast steel	0.1 to 0.23	0.07 to 0.12
steel – soft cast iron	0.12 to 0.24	0.06 to 0.1
soft cast iron – soft cast iron	0.15 to 0.3	0.2
bronze – steel	0.12 to 0.28	0.18
soft cast iron – bronze	0.28	0.15 to 0.2
steel – copper alloy	0.07	
steel – aluminum alloy	0.1 to 0.28	0.05 to 0.18
aluminum – aluminum	0.21	

Assembly pretension forces $F_{M\,Tab}$ and tightening torque M_A at $\nu = 0.9$ for **setscrews** with standard metric threads to DIN ISO 262; head sizes of hex screws to DIN EN ISO 4014 to 4018, screws with outer hex to DIN 34 800 and cheese head to DIN EN ISO 4762 and central bore "medium" to DIN EN 20 273.

Dim.	Strength class	Assembly pretension forces $F_{M\,Tab}$ in kN for $\mu_G =$							Tightening torque M_A in Nm for $\mu_K = \mu_G =$						
		0.08	0.10	0.12	0.14	0.16	0.20	0.24	0.08	0.10	0.12	0.14	0.16	0.20	0.24
M 4	8.8 10.9 12.9	4.6 6.8 8.0	4.5 6.7 7.8	4.4 6.5 7.6	4.3 6.3 7.4	4.2 6.1 7.1	3.9 5.7 6.7	3.7 5.4 6.3	2.3 3.3 3.9	2.6 3.9 4.5	3.0 4.6 5.1	3.3 4.8 5.6	3.6 5.3 6.2	4.1 6.0 7.0	4.5 6.6 7.8
M 5	8.8 10.9 12.9	7.6 11.1 13.0	7.4 10.8 12.7	7.2 10.6 12.4	7.0 10.3 12.0	6.8 10.0 11.7	6.4 9.4 11.0	6.0 8.8 10.3	4.4 6.5 7.6	5.2 7.6 8.9	5.9 8.6 10.0	6.5 9.5 11.2	7.1 10.4 12.2	8.1 11.9 14.0	9.0 13.2 15.5
M 6	8.8 10.9 12.9	10.7 15.7 18.4	10.4 15.3 17.9	10.2 14.9 17.5	9.9 14.5 17.0	9.6 14.1 16.5	9.0 13.2 15.5	8.4 12.4 14.5	7.7 11.3 13.2	9.0 13.2 15.4	10.1 14.9 17.4	11.3 16.5 19.3	12.3 18.0 21.1	14.1 20.7 24.2	15.6 22.9 26.8
M 7	8.8 10.9 12.9	15.5 22.7 26.6	15.1 22.5 26.0	14.8 21.7 25.4	14.4 21.1 24.7	14.0 20.5 24.0	13.1 19.3 22.6	12.3 18.1 21.2	12.6 18.5 21.6	14.8 21.7 25.4	16.8 24.7 28.9	18.7 27.5 32.2	20.5 30.1 35.2	23.6 34.7 40.6	26.2 38.5 45.1
M 8	8.8 10.9 12.9	19.5 28.7 33.6	19.1 28.0 32.8	18.6 27.3 32.0	18.1 26.6 31.1	17.6 25.8 30.2	16.5 24.3 28.4	15.5 22.7 26.6	18.5 27.2 31.8	21.6 31.8 37.2	24.6 36.1 42.2	27.3 40.1 46.9	29.8 43.8 51.2	34.3 50.3 58.9	38.0 55.8 65.3
M 10	8.8 10.9 12.9	31.0 45.6 53.3	30.3 44.5 52.1	29.6 43.4 50.8	28.8 42.2 49.4	27.9 41.0 48.0	26.3 38.6 45.2	24.7 36.2 42.4	36 53 62	43 63 73	48 71 83	54 79 93	59 87 101	68 100 116	75 110 129
M 12	8.8 10.9 12.9	45.2 66.3 77.6	44.1 64.8 75.9	43.0 63.2 74.0	41.9 61.5 72.0	40.7 59.8 70.0	38.3 56.3 65.8	35.9 52.8 61.8	63 92 108	73 108 126	84 123 144	93 137 160	102 149 175	117 172 201	130 191 223
M 14	8.8 10.9 12.9	62.0 91.0 106.5	60.6 88.9 104.1	59.1 86.7 101.5	57.5 84.4 98.8	55.9 82.1 96.0	52.6 77.2 90.4	49.3 72.5 84.8	100 146 171	117 172 201	133 195 229	148 218 255	162 238 279	187 274 321	207 304 356
M 16	8.8 10.9 12.9	84.7 124.4 145.5	82.9 121.7 142.4	80.9 118.8 139.0	78.8 115.7 135.4	76.6 112.6 131.7	72.2 106.1 124.1	67.8 99.6 116.6	153 224 262	180 264 309	206 302 354	230 338 395	252 370 433	291 428 501	325 477 558
M 18	8.8 10.9 12.9	107 152 178	104 149 174	102 145 170	99 141 165	96 137 160	91 129 151	85 121 142	220 314 367	259 369 432	295 421 492	329 469 549	360 513 601	415 592 692	462 657 769
M 20	8.8 10.9 12.9	136 194 227	134 190 223	130 186 217	127 181 212	123 176 206	116 166 194	109 156 182	308 438 513	363 517 605	415 592 692	464 661 773	509 725 848	588 838 980	655 933 1092
M 22	8.8 10.9 12.9	170 242 283	166 237 277	162 231 271	158 225 264	154 219 257	145 207 242	137 194 228	417 595 696	495 704 824	567 807 945	634 904 1057	697 993 1162	808 1151 1347	901 1284 1502
M 24	8.8 10.9 12.9	196 280 327	192 274 320	188 267 313	183 260 305	178 253 296	168 239 279	157 224 262	529 754 882	625 890 1041	714 1017 1190	798 1136 1329	875 1246 1458	1011 1440 1685	1126 1604 1877
M 27	8.8 10.9 12.9	257 367 429	252 359 420	246 351 410	240 342 400	234 333 389	220 314 367	207 295 345	772 1100 1287	915 1304 1526	1050 1496 1750	1176 1674 1959	1292 1840 2153	1498 2134 2497	1672 2381 2787
M 30	8.8 10.9 12.9	313 446 522	307 437 511	300 427 499	292 416 487	284 405 474	268 382 447	252 359 420	1053 1500 1755	1246 1775 2077	1428 2033 2380	1597 2274 2662	1754 2498 2923	2931 2893 3386	2265 3226 3775
M 33	8.8 10.9 12.9	389 554 649	381 543 635	373 531 621	363 517 605	354 504 589	334 475 556	314 447 523	1415 2015 2358	1679 2392 2799	1928 2747 3214	2161 3078 3601	2377 3385 3961	2759 3930 4598	3081 4388 5135
M 36	8.8 10.9 12.9	458 652 763	448 638 747	438 623 729	427 608 711	415 591 692	392 558 653	368 524 614	1825 2600 3042	2164 3082 3607	2482 3535 4136	2778 3957 4631	3054 4349 5089	3541 5043 5902	3951 5627 6585
M 39	8.8 10.9 12.9	548 781 914	537 765 895	525 748 875	512 729 853	498 710 831	470 670 784	443 630 738	2348 3345 3914	2791 3975 4652	3208 4569 5346	3597 5123 5994	3958 5637 6596	4598 6549 7664	5137 7317 8562

Assembly pretension forces and tightening torques

Assembly pretension forces F_M and tightening torques M_A for screws with standard metric threads to DIN 13, Page 43 (M 1.6–M 2.5–M 3 to M 39) and head contact sizes such as DIN 912 (DIN EN ISO 4762), DIN 931 (DIN EN 24014), DIN 934 (DIN EN 24032), DIN 6912, DIN 7984, DIN 7990.

The table readings F_M and M_A are based on the SI unit N (Newton). 1 N = 0.102 kp, 1 Ncm = 0.102 kpcm, 1 Nm = 0.102 kpm, 1 kp = 9.81 N, 1 kpcm = 9.81 Ncm, 1 kpm = 9.81 Nm.

The assembly pretension forces F_M listed in the table above result in 90% exploitation of a screw's yield strength $\delta_{0.2}$ (DIN ISO 898 Part 1) through the comparative tension $\delta_{red.}$, which depends on the coefficient of thread friction μ_G. The table of assembly pretension forces shows what quality of which screw is required for a particular thread friction to generate a certain required assembly pretension force F_M. The tightening torque M_A required to achieve 90% yield strength exploitation for a screw whose dimensions and quality are given can be determined from the right-hand table having regard to a specific underhead friction (μ_K).

To determine the rated torque to be applied, deduct half the spread of the corresponding torque wrench from the applicable tightening torque M_A in the table. Calculation of the table entries and notes on their application to VDI 2230, Page 1.