
HSL2
ECO-PLUS

LKV, LKS
MANUAL SOLUTIONS

LKV

SCOPE OF DELIVERY

- DEVICE
- REACTION ARM CRANKED
- TOOL BOX
- OPERATING MANUAL
- FACTORY CALIBRATION CERTIFICATE
- TORQUE CALCULATOR

LKV-L OR Z

SCOPE OF DELIVERY

- DEVICE
- REACTION ARM
- TOOL BOX
- OPERATING MANUAL
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- TORQUE CALCULATOR

LKS

SCOPE OF DELIVERY

- DEVICE
- OPERATING MANUAL

THE TORQUE MULTIPLIER
LKV SERIES, 500 - 54000 Nm

Integrated overload safety mechanism for gear unit protection

Integrated return safety „RS“ for CW/CCW rotation and safe operation (as of model LKV-40RS)

Lean, high-performance aluminium housing is 30 % lighter than a steel one

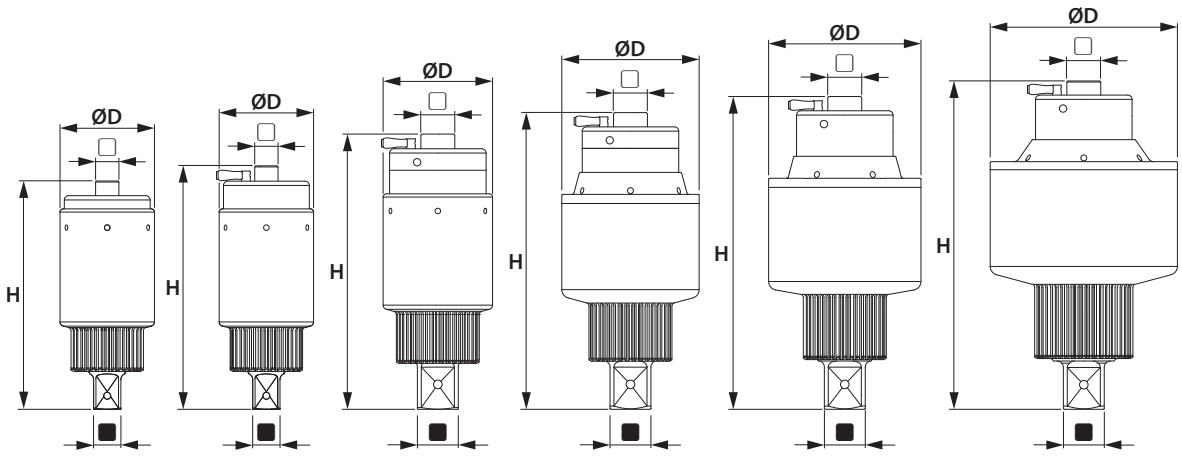
Planet gear unit with ceramic-Teflon®-coated tooth flanks (as of model LKV-40) enables minimum lubrication

Supplied with individual GEDORE factory calibration certificate

Drop-forged reaction arm with lock on function, made of chrome-vanadium steel for even greater stability

LKV-40 LKV-40RS LKV-60RS LKV-80RS LKV-100RS LKV-120RS

Technical data LKV-40 - LKV-120RS



Type	N·m max	lbf·ft max	N·m min / max*1	lbf·ft min / max*1	*2	▢	■	Ø D mm	H mm	*3
LKV-40	300	220	500 - 4000	400 - 2930	1:16	½"	1"	88	212.8	3.9
LKV-40RS	310	230	500 - 4000	400 - 2930	1:16	½"	1"	88	226.9	4.2
LKV-60RS	400	300	650 - 6000	500 - 4400	1:18	¾"	1 ½"	102	256.2	6.6
LKV-80RS	420	310	800 - 8000	600 - 5870	1:22	¾"	1 ½"	128	276.5	9.1
LKV-100RS	410	305	1000 - 10 000	700 - 7330	1:28.5	¾"	1 ½"	142	291.5	10.9
LKV-120RS	380	280	1320 - 13 000	1000 - 9530	1:39	¾"	1 ½"	174.5	306	17.0

*1 Maximum load limit! Take into account a reserve of ~25% when selecting a device and, where applicable, note increased loosening torques!
*2 Approximate data *3 Without reaction arm (except for LKV-550RS device with reaction plate)
Further torque ranges on request. Subject to modifications without prior notice.

Scope of delivery

- Device
- Reaction arm cranked with lock on function made of chrome vanadium steel (up to LKV-80 RS)
- Tool box
- Operating instructions
- Factory calibration certificate
- Torque calculator

Optional accessories

- Reaction arm cranked with lock on function, made of light alloy with protective cap made of steel (from LKV-100RS)
- Reaction arm made of light alloy, straight with adjustable locking knob with moveable square-end and retaining ring (up to LKV-80RS)

Mechanical, hand operated torque multiplier for controlled tightening and untightening of bolt-connections

Housing and gear unit

The housing and gear unit are the innovations in this series. A new production method was created, based on nature. The housing is therefore approx. 30 % lighter but still sturdy.
At the same time, the ceramic-Teflon® coating enables minimum device lubrication. While convential lubricated torque multipliers decrease in performance (efficiency) when the outside temperatures are colder, due to the increasing tenacity of the grease, this unit operates independently of the temperature.

Non-destructive overload protection

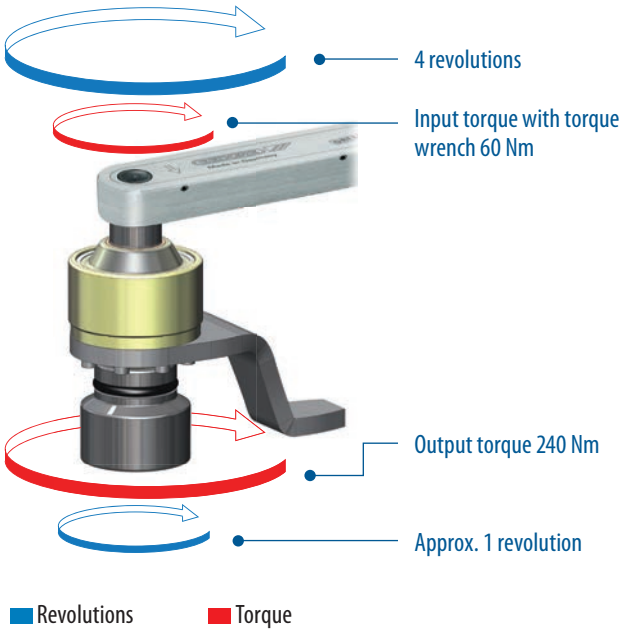
The 40-120RS models are equipped with a non-destructive overload safety mechanism. This patent-filed innovation represents real cost savings for the user. The basis of this extra feature is a highly-dynamic, pre-tensioned slip-coupling. As soon as the maximum permissible input torque is exceeded, the „Slipper“ triggers with a clearly audible acoustic noise.
The torque multiplier is not damaged so that normal operation can be started again. This means that no assembly downtimes occur and the safety of the operator is actively supported.

Certified safety

A completely new benefit for the torque multiplier is the individual factory calibration certificate for each device. This has never been the case before. This allows bolting operations to be implemented at a high level of torque precision. The torque tables on the devices display the standard torque for HV bolts. The tables can also be modified on request to the individual torques of the operator.

THE FUNCTION PRINCIPLE

Torque – Speed



The image demostrates the principle of torque multiplication.
Let us assume a 60 Nm input torque and a 240 Nm output torque.
At a 1:4 ratio, 4 revolutions are needed at the input for 1 revolution with a 240 Nm torque to be obtained at the output.

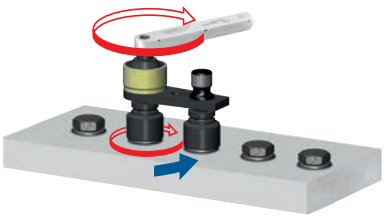
This is based on the physical formula:

Power = torque x revolution

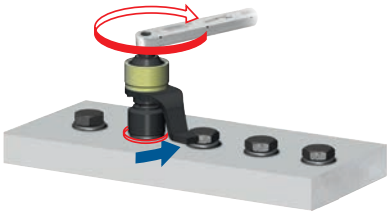
With gear efficiency deducted, the output power can be considered as a constant equal to the input power. Thus multiplication of the torque can only be obtained from an increased number of revolutions at the input.

Force and reaction

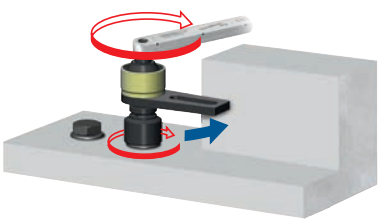
When working with a torque multiplier, torsion wind-up is built up in the gear while the bolt is tightened.
This stress must be reduced. A reaction absorbed by reaction arm and thrust bearing is produced.



Reaction arm made of light alloy, straight with adjustable locking knob with slave square: The reaction acts on the adjacent impact socket



Reaction arm cranked:
The reaction acts on the adjacent bolt connection



Reaction arm straight without adjustable reaction square drive:
The reaction acts on the wall. However, the resulting tilting moment means that the maximum permitted torque is reduced by 20%.

Torque

Reaction

THE TORQUE MULTIPLIER
SERIES LKV, 50 - 1300 Nm

Total weight of 1.9 kg for best torque-weight ratio

Lightweight, high-performance aluminium housing is 30 % lighter than a steel version

Easy to handle and compact as optimal on-board tool suitable for utility vehicles or construction machines

Drop-forged reaction arm with lock on function, made of chrome-vanadium steel for even greater stability

Supplied with individual GEDORE factory calibration certificate

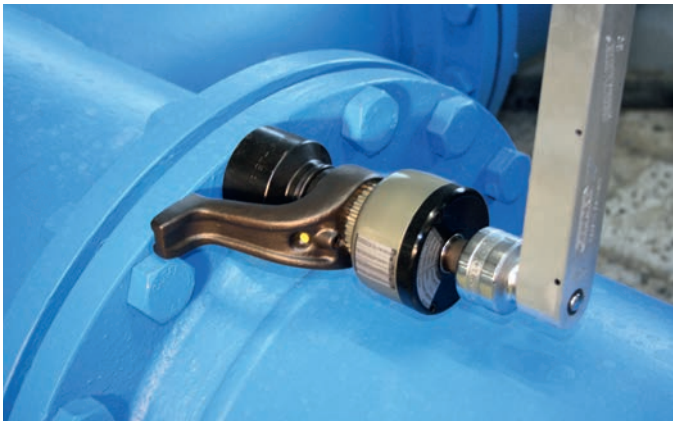
Scope of delivery

- Device
- Reaction arm cranked with lock on function made of chrome vanadium steel
- Tool box
- Operating Instructions
- Factory calibration certificate
- Torque calculator

Optional accessories

- Reaction arm made of light alloy, straight with adjustable locking knob with slave square and retaining ring
- Replacement sun wheel (replacement part)

TECHNICAL DATA LKV-12



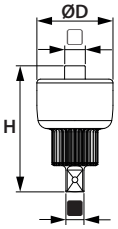
Small, easy to handle, light and sturdy

The smallest torque multiplier in this series is particularly suitable for maintenance purposes and in workshops. The little power packet has been reduced to the smallest possible dimensions without losing any robustness or torque power. It is equipped with an offset reaction arm and can be retrofitted with a straight reaction arm.

The sun gear acts as a predetermined breaking point if the device is overloaded. This protects both the operator and the device. The sun gear can be easily and rapidly replaced by the operator. Assembly and cost outlay remain low.

The optimal on-board tool

The LKV-12 has small dimensions and can fit in a pocket. This device is highly suitable for use as an on-board tool in utility or construction site vehicles. It can be stored in the vehicle in a stable transport case. Due to the minimum lubrication of the gear unit, the device is not effected by temperature changes and can be operated without problems even at freezing temperatures.



Type	N·m max	lbf·ft max	N·m min / max*1	lbf·ft min / max*1	*2	□	■	Ø D mm	H mm	*3 kg
LKV-12	270	200	50 - 1300	40 - 950	1:5	1/2"	3/4"	80	132.5	1.3

*1 Maximum load limit! Take into account a reserve of ~25% when selecting a device and, where applicable, note increased loosening torques!
*2 Approximate data *3 Without reaction arm

THE TORQUE MULTIPLIER
SERIES LKV, 100 - 2800 Nm

Lightweight, high-performance aluminium housing is 30 % lighter than a steel one

Fixed reaction arm in straight or cranked version

Output square as overload protection for gear unit protection

Supplied with individual GEDORE factory calibration certificate

Series LKV-20L/ 28L

Scope of delivery

- Device
- Reaction arm cranked or straight (screwed to the device)
- Tool box
- Operating Instructions
- Factory calibration certificate
- Torque calculator

Replacement parts

- Replacement square drive for LKV-20
- Replacement square drive for LKV-28

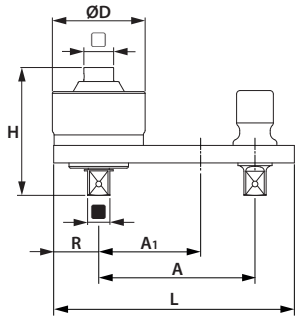
TECHNICAL DATA LKV-20/28

Popular for flange bolt connections: LKV-20/28L

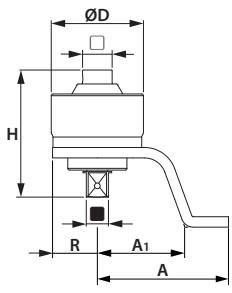
The positioning of the torque multiplier must be implemented easily and rapidly, particularly for flange bolt connections. The LKV-L is equipped with a fixed straight reaction arm and is therefore a complete solution for flange bolt connections. The required spacing between two bolts can be rapidly and easily set using the adjustable reaction square, accelerating work.

Practical and easy to handle: LKV-20/28Z

The LKV-Z series is particularly suitable for mechanical and plant engineering, maintenance and the transport industry. This series also has a fixed reaction arm, but cranked version. The gear unit is protected against overload with a shearing square which can be easily replaced.



LKV-L



LKV-Z

Type	N·m max	lbf·ft max	N·m min / max*1	lbf·ft min / max*1	•:⚙*2	□	■	A mm	A_1 mm	ø D mm	H mm	R mm	L mm	kg *3
LKV-20L	580	430	100 - 2000	70 - 1500	1:4	¾"	1"	152	73	88	131	43	220	1.8
LKV-20Z	580	430	100 - 2000	70 - 1500	1:4	¾"	1"	150	100	88	131	43	194	1.8
LKV-28L	550	410	500 - 2800	400 - 2050	1:5.5	¾"	1"	199	83	106	146	52	275	2.4
LKV-28Z	550	410	500 - 2800	400 - 2050	1:5.5	¾"	1"	151	101	106	146	52	204	2.4

*1 Maximum load limit! Take into account a reserve of ~25% when selecting a device and, where applicable, note increased loosening torques!
*2 Approximate data *3 Without reaction arm

THE COUNTER WRENCH
LKS SERIES, RSW 32 - 115 mm

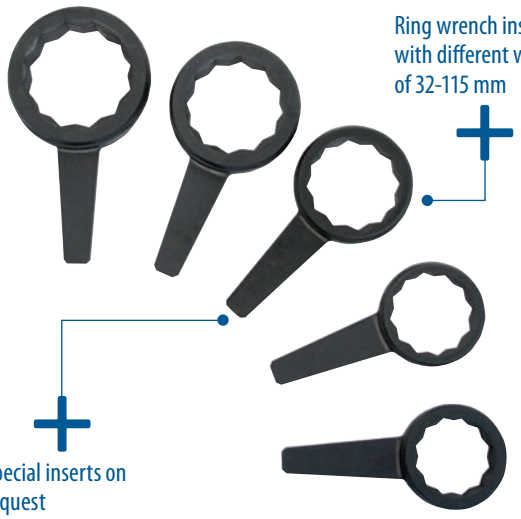
Rugged housing made of cast steel

The allen screw fixes the ring wrench inserts and enables simple and rapid replacement

Pivoted reaction arm adjusts to the most diverse environments. Can also be used without reaction arm

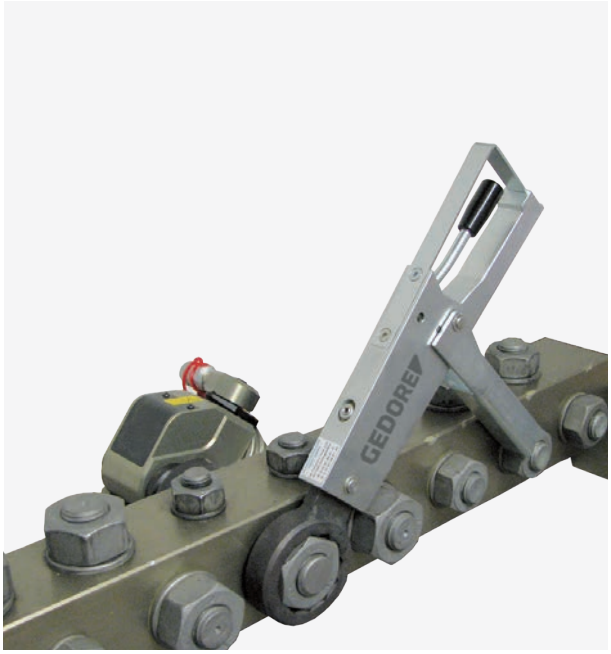
Various ring wrench inserts enable universal holding up

Optional ring wrench inserts RSW 32-115mm



Ring wrench inserts with different widths of 32-115 mm

Special inserts on request



Danger to assembly personnel must be avoided

Every user knows the problems and dangerous situations that can arise when counter-holding while a bolted connection is being tightened. The wrench used for counter-holding can often rotate with unpredictable torques, block or jump off. Once the bolting operation is complete, it often needs to be levered off or even knocked off.
The danger of injury for the assembly personnel is very high here and the risk of damaging neighbouring components or the tools is also significant. The results can be irritating, time loss and assembly downtimes.

The solution: The GEDORE Counter Wrench

Equipped with the appropriate insert, the device utilises a thrust bearing and absorbs the driving torque with the integrated mechanics. Following completion of the bolting operation, a simple press of the lever and the counter-wrench can be rapidly and easily released.

Frequently copied, but never matched

The patented mechanism of the GEDORE counter wrench is unique. Only the precise interplay of the individual components ensures correct and problem-free function. Cheaper copies can bend or stick under large loads. The ring inserts are made of forged chrome-vanadium steel as of size 70.

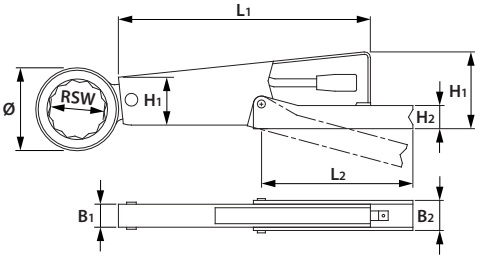
Technical data

Type	L_1 mm	B_1 mm	H_1 mm	L_2 mm	B_2 mm	H_2 mm	kg
LKS	310	27	65/95	190	38	30	2.6 / 0.4[*1]

[*1] Plus reaction element

Ring wrench inserts type RSW

RSW mm	Ø[*2] mm	RSW mm	Ø[*2] mm	RSW mm	Ø[*2] mm
32	54	60	94	90	152
36	54	65	104	95	152
41	60	70	110	100	155
46	75	75	115	105	172
50	80	80	126	110	172
55	88	85	130	115	172



[*2] Head diameter (Ø similar DIN 7444)

WORK LOGGED AND CONTROLLED
WITH THE BOLTING SOFTWARE

Increasing safety and quality requirements make it necessary to prove the quality of each individual fitting.

With the software modules, bolted connections can not only be predefined and saved, but also logged for quality-assured archiving.

Documentation module TRACK for quality assurance

With the module TRACK bolting processes can be traced.
During the bolting work, the data is logged and then exported to the PC.
A bolting protocol can be created and saved as Adobe PDF or Microsoft Excel file.

This ensures that all bolts have been bolted with the correct settings.
The encrypted log file ensures that manipulation of the data is excluded.

Bolted Screw Protocol GEDORE

Master data

Personal Number Date		Project Number	
Application Type ID No. bolt Tool	LHD-75	Subassembly Department Quantity Serial Number	

Tightening process
Torque tightening

Evaluation

Legend Status:
AB = cancel, ÜL = overloading, TEMP = excess temperature, i.O = OK, n. i. O = not OK

No.	Date	Time	R/L	Target torque [Nm]	Actual torque [Nm]	Typical bolt	Status
1	22.01.2018	8:57:35	R	2800	2887	M36	i.O.
2	22.01.2018	13:14:04	R	8000	7957	M56	i.O.
3	22.01.2018	13:14:18	R	8000	7900	M56	i.O.
4	22.01.2018	13:16:07	R	8000	7957	M56	i.O.
5	22.01.2018	13:19:00	R	8000	7992	M56	i.O.
6	22.01.2018	13:19:27	R	6500	6510	M48	i.O.
7	22.01.2018	13:19:40	R	6500	6503	M48	i.O.
8	22.01.2018	13:54:58	R	8000	8013	M56	i.O.
9	22.01.2018	13:55:14	R	8000	8002	M56	i.O.
10	22.01.2018	13:55:30	R	8000	6989	M56	ÜL
11	22.01.2018	13:55:55	R	8000	7156	M56	ÜL
12	25.01.2018	7:57:39	R	3010	3112	M39	i.O.
13	25.01.2018	8:02:43	R	8000	8015	M56	i.O.
14	25.01.2018	8:03:12	R	8000	0	M56	AB
15	25.01.2018	8:03:32	R	8000	8021	M56	i.O.
16	25.01.2018	8:03:46	R	8000	8004	M56	i.O.
17	25.01.2018	8:04:05	R	8000	8021	M56	i.O.
18	25.01.2018	8:04:21	R	8000	8004	M56	i.O.
19	25.01.2018	8:04:38	R	8000	7452	M56	ÜL
20	25.01.2018	8:04:57	R	8000	7276	M56	ÜL
21	25.01.2018	8:05:17	R	8000	7108	M56	ÜL
22	25.01.2018	8:06:41	R	2900	2912	M39	i.O.
23	25.01.2018	8:12:06	R	8000	8012	M56	i.O.
24	25.01.2018	8:12:24	R	8000	8026	M56	i.O.
25	25.01.2018	8:12:42	R	8000	8010	M56	i.O.
26	25.01.2018	8:14:30	R	6500	6521	M48	i.O.
27	25.01.2018	8:14:46	R	6500	6547	M48	i.O.
28	25.01.2018	8:15:00	R	6500	6523	M48	i.O.
29	25.01.2018	8:15:20	R	6500	6508	M48	i.O.
30	25.01.2018	8:15:35	R	6500	6557	M48	i.O.
31	25.01.2018	8:21:24	R	5000	5055	M45	i.O.
32	25.01.2018	8:21:38	R	5000	5034	M45	i.O.
33	25.01.2018	8:21:50	R	5000	5050	M45	i.O.
34	25.01.2018	8:22:03	R	5000	5063	M45	i.O.
35	25.01.2018	8:22:19	R	5000	5030	M45	i.O.
36	25.01.2018	8:22:32	R	5000	5050	M45	i.O.
37	25.01.2018	8:33:03	R	5000	5013	M45	i.O.
38	25.01.2018	8:33:17	R	5000	5030	M45	i.O.
39	25.01.2018	8:33:30	R	5000	5013	M45	i.O.
40	25.01.2018	8:33:50	R	6500	6513	M48	i.O.
41	25.01.2018	8:34:23	R	8000	8045	M56	i.O.
42	25.01.2018	8:34:44	R	4500	4503	M42	i.O.
43	25.01.2018	8:34:57	R	4500	4506	M42	i.O.

Original printed with GEDORE bolting software.

1 Detailed information

2 Log of bolting with device-specific documentation values:

- Date / time of each bolt
- Tightening process
  DA – Torque tightening
  DW – Torque angle tightening
- TARGET torque
- ACTUAL torque
- Typical bolt
- Bolted connection status
  i. O – OK
  n. i .O – not OK
  AB – cancel
  ÜL – overloading
  TEMP – excess temperature

Authentic check icon is displayed in the bolting software

CHECK

3 Forgery-proof – only original protocols are provided with this line. Manipulated documents are therefore excluded.

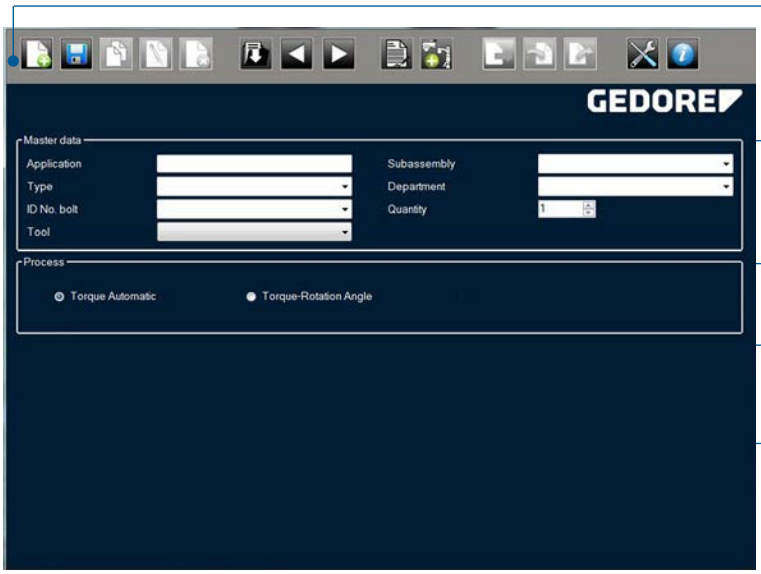
Quality management module QS for definition and documentation

The QS module is suitable for all companies who need to define and document bolting cases according to quality management specifications.

The bolted connections and values are pre-defined on the PC using our bolting software. Here any number of bolted connections can be defined and stored. These are then loaded via the interface to the device and stored in a database.

The operator can only select from the stored bolting cases on the device. After the bolting process, the results of each bolt are loaded back to the PC and documented via the software as a Bolted Screw Protocol.
For more detailed information, see the TRACK module (p. 54).

Define bolting case



Define new bolting case

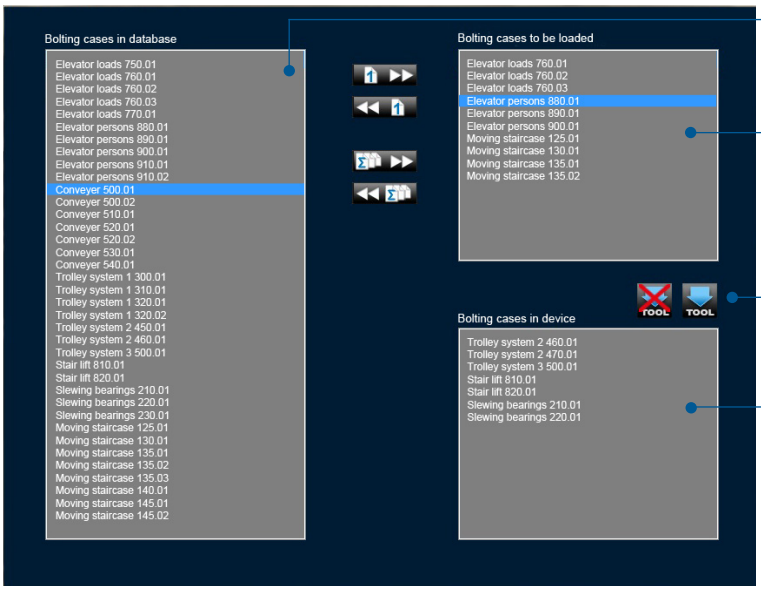
1 Detailed master data of your bolting case (including selection of tools) and four freely selectable fields

2 Selection of the desired tightening process

3 Entering the specifications of the bolting case

4 Definition of control parameters and error management

Data export to device



1 Bolting database

2 Selection of one or more bolting cases, which would like to be exported to the device

3 Export to device or delete from device

4 Current bolting cases on the device

Display status during data exports

Bolting software modules for the following devices available:

	LDE/LEW	LHU Solution	LDB	LHD
Modul TRACK	⊕	⊕	⊕	⊕
Modul QS	–	⊕	–	⊕

⊕ Optional available
– Not possible