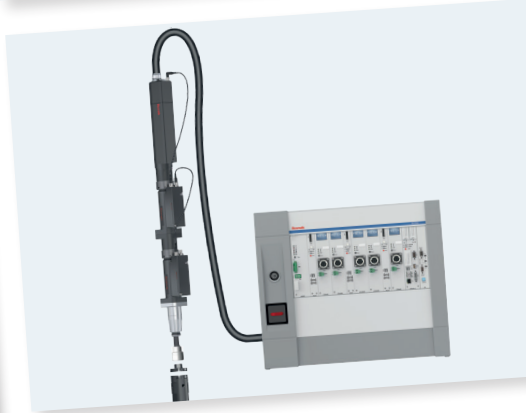
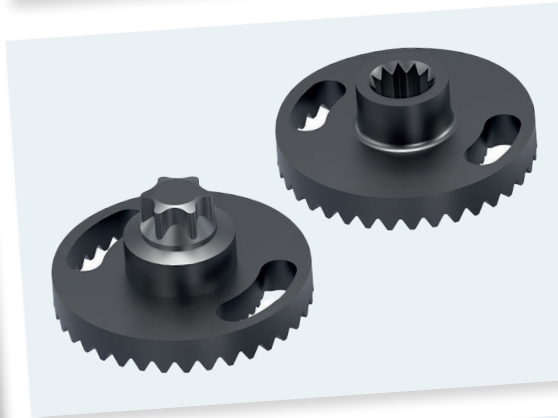
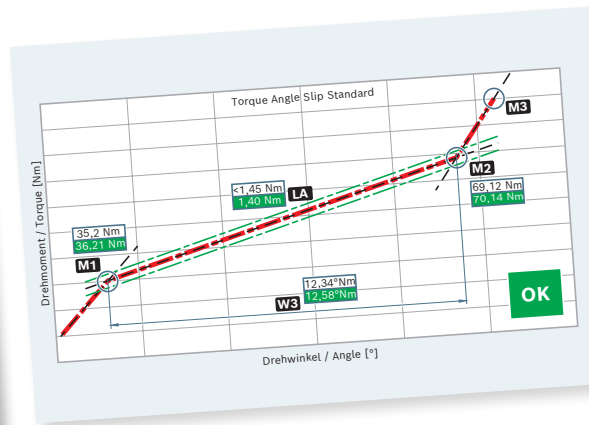


Rexroth

TASS Verification System





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TORQUE ANGLE SLIP STANDARD**

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14 DIMENSIONS

**WE MOVE.
YOU WIN.**

TASS

Torque angle slip standard



Safety-critical fittings require tools you can absolutely rely on. This is why many manufacturers like to use Rexroth's intelligent tightening systems in these cases: tightening spindles, ErgoSpin hand-held nutrunners or Nexo cordless Wi-Fi nutrunners!

But anyone who has to ensure 100% quality in the products does not rely exclusively on the good experience with certain products. Regular control of the tools used is required out of responsibility towards our customers.

CURRENT PROBLEMS IN THE TESTING OF INTELLIGENT TIGHTENING SYSTEMS

- ▶ Tight tolerances make regular testing of tools necessary for critical screwed connections.
- ▶ Machine capability tests (MCT) are very complex and are usually only possible if production is interrupted.
- ▶ Sample inspections carried out more frequently on the product do reduce the quality risk. They are, however, inaccurate and can only be carried out by specialists. They are therefore highly inefficient.

THE CONVENIENT ALTERNATIVE: TASS

How is it now possible to make the necessary testing of nutrunners more economical and even safer? The idea for the nutrunner test using TASS was developed from assembly practice in the Bosch Powertrain Solutions division in Homburg:

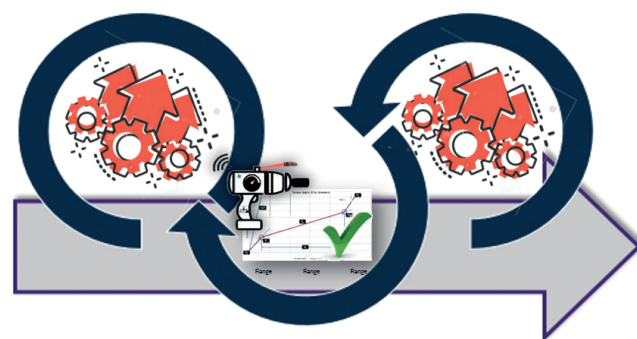
- ▶ A preloaded torsion element in a housing serves as a dimensional standard for the torque curve in a certain rotation angle range.
- ▶ This TASS element can be "screwed" like a product with a specific tightening program.
- ▶ This test process results in a characteristic curve for the tightening spindle or hand-held nutrunner used.
- ▶ The software compares this measured characteristic curve with the nominal characteristic curve of the mechanical element and detects possible deviations.

ADVANTAGES OF THE TEST WITH TASS

- ▶ The test can be carried out completely automatically. Even manual testing does not require specially trained personnel.
- ▶ The tightening system measures itself - additional measuring equipment is not required.
- ▶ The test can be carried out very quickly.
- ▶ The entire nutrunner system is tested, incl. the output drive.

FOR THE CUSTOMER, THIS MEANS

- ▶ Consistent assembly quality can be ensured because the test can be carried out more frequently and the human influence on the test result is minimized.
- ▶ The profitability of production increases, as production is not interrupted, the risk of rejects decreases and the provision of an expensive reference measuring system is not required. In addition, the periods between the MCTs can be extended.

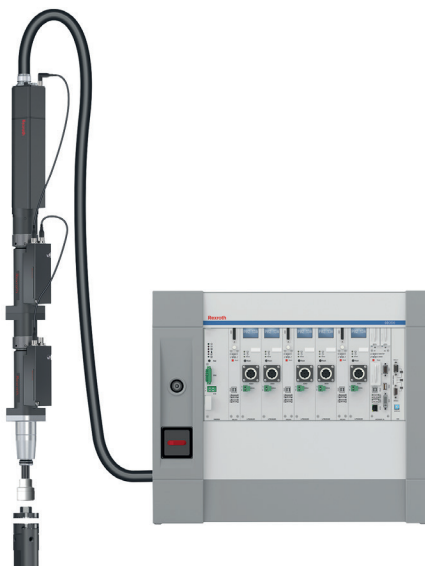


TASS

How it works

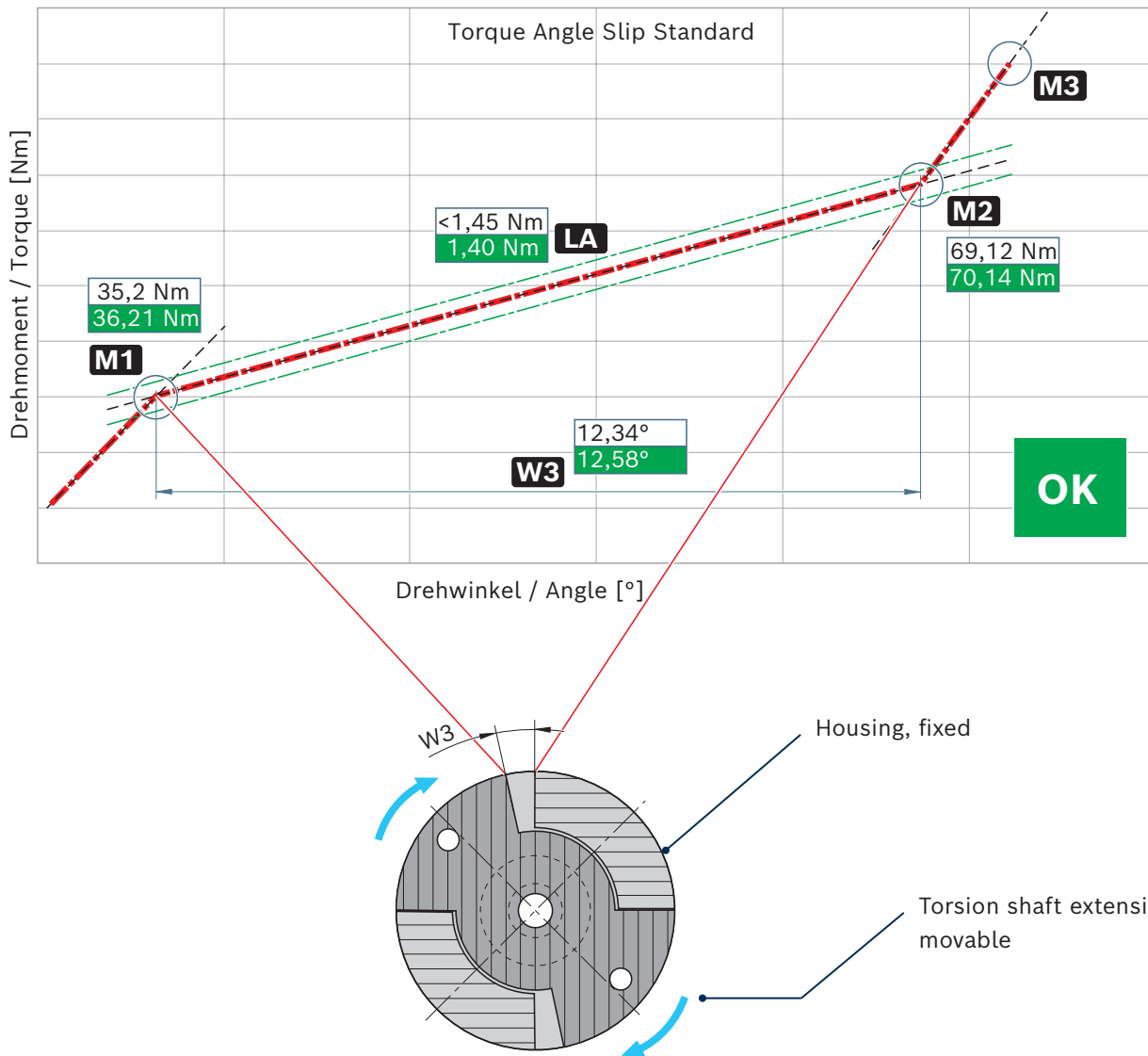
STRUCTURE OF THE TASS ELEMENT

- ▶ At the base body, the TASS element is clamped in the test device in a form- or force-fit manner.
- ▶ The torsion shaft inside the base body acts as a dimensional standard. It has a defined torque/rotation angle curve in the specified torsion range of 12°. Every TASS element is delivered with a calibration certificate that documents the measuring points M1 and M2, the rotation angle range W3 as well as the linearity deviation LA (see diagram on page 7). The torsion element has Hirth toothing at the top for connecting the exchange part. Four sizes cover torque ranges from 1 Nm to 260 Nm.
- ▶ The exchange part serves as a coupling to the tightening system. Blanks can be adapted to the specific nutrunner geometry by the customer.



TEST ARRANGEMENT

- ▶ The tightening system remains in its production environment during the test.
- ▶ A special test program is created in the control and executed for the test process.
- ▶ During the test, the nutrunner performs a fitting with a certain rotation angle and low tightening velocity.
- ▶ During this test fitting, the tool control records the process data as with a normal tightening case. No special test equipment is required for this.
- ▶ A comparison with the nominal curve of the standardized torsion element determines whether the measurement of the tightening system is OK or NOK.

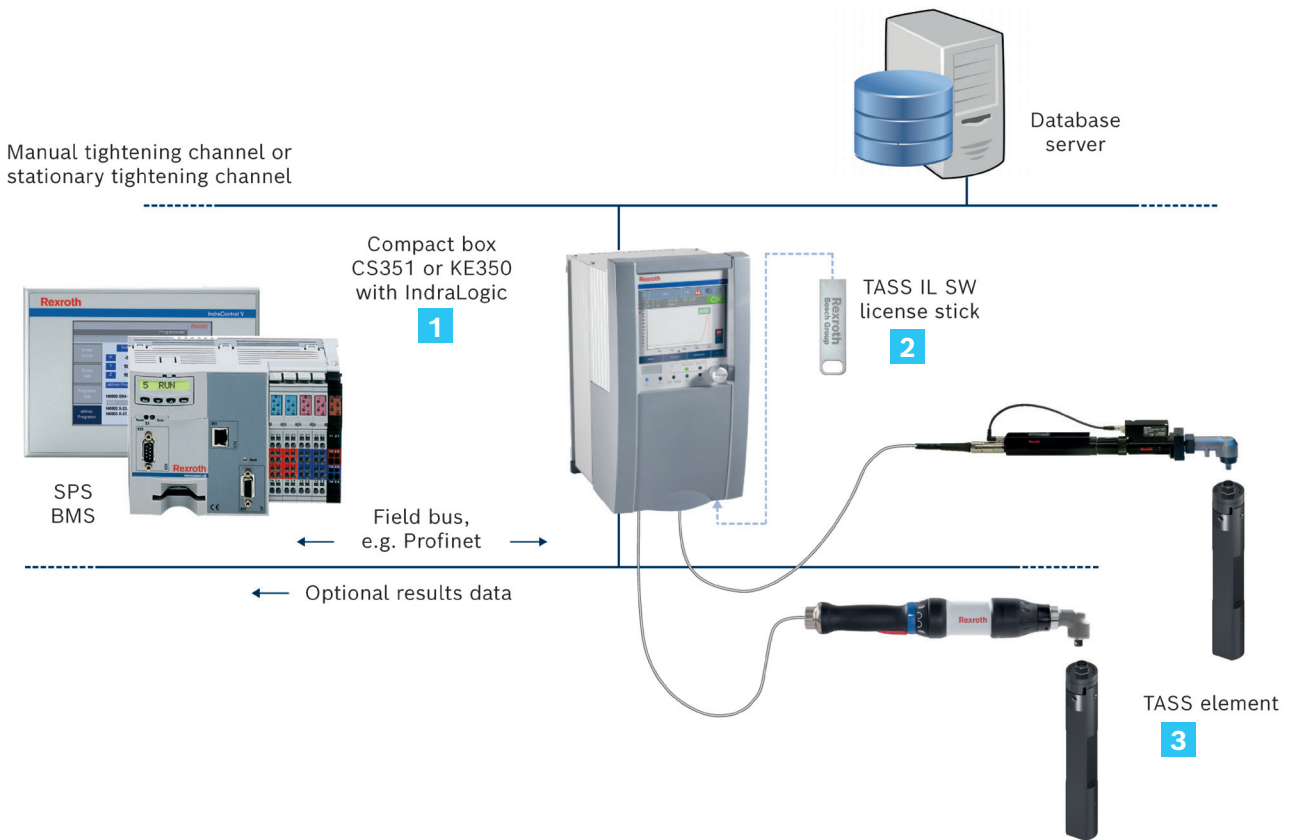


TEST PROCEDURE

- ▶ The torque increase up to point M1 results from overcoming the preload in the torsion shaft.
- ▶ After reaching point M1 (corresponding to the preload of the torsion shaft), the torsion shaft is rotated between the two stop surfaces on the TASS element. This W3 range corresponds to a rotation angle of 12° and is characterized by a linear increase in torque.
- ▶ At point M2, the torsion shaft is in contact with the second stop surface. In the further course, the housing of the TASS element is twisted. The torque curve is significantly steeper.
- ▶ The test is completed at a M3 torque significantly above M2.
- ▶ An evaluation of the measurement results at points M1 and M2 as well as a freely definable envelope curve around the nominal curve is used to check whether the test is OK.

Components

COMPONENTS REQUIRED FOR SETTING UP A TASS TEST SYSTEM



	Component	Order number	Manual tightening channel			Stationary tightening channel			
			Single-channel system		Multi-channel system	Single-channel system		Multi-channel system	
			Display/DVI	TFT display		Display/DVI	TFT display		
1	Control/ communication unit	KE350G IL	0 608 830 265	○	○	●	○	○	●
		CS351E-D IL	0 608 830 274	●	○	○	○	○	○
		CS351E-G IL	0 608 830 275	○	●	○	○	○	○
		CS351S-D IL	0 608 830 276	○	○	○	●	○	○
		CS351S-G IL	0 608 830 277	○	○	○	○	●	○
2	Software	CF350 1 Gbyte memory card	0 608 830 318	●	●	●	●	●	●
		TASS IL Application KE350	3 609 438 192	○	○	●	○	○	●
		TASS IL Application CS351	3 609 438 191	●	●	○	●	●	○
		TASS setup Software *)	3 609 438 197	●	●	●	●	●	●
3	TASS	TASS element	see table TASS element	●	●	●	●	●	●
		TASS exchange part blank	see table exchange part blanks	●	●	●	●	●	●

*) The TASS setup software is delivered as standard with the license stick. It can also be purchased as a single license for a fee.

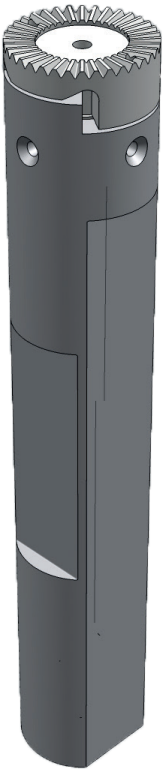
- ▶ The TASS setup software is used to determine the system-specific parameter values (e.g. rigidity, torsional stress, threshold value for curve value acquisition). As these parameters may vary due to the different set-ups of the tightening systems, the appropriate values have to be determined on site.
- ▶ The TASS setup software allows direct access to the tightening curves and parameter data.
- ▶ The TASS setup software can also be used for error analysis after a TASS test.



Ordering information

TASS ELEMENT

- ▶ Select the TASS element so that your torque under test is as close to M2 as possible, but does not exceed M2.
- ▶ Your tightening system must be able to reach the M3 value.



Torque range	M1 Nm	M2 Nm	M3 Nm	Order no.
TR 1	1.0	2.0	2.5	3 609 438 112
	2.0	4.0	5.0	3 609 438 113
	3.0	6.0	7.5	3 609 438 114
	4.0	8.0	10.0	3 609 438 115
	5.0	10.0	12.5	3 609 438 116
TR 2	6.0	12.0	15.0	3 609 438 122
	8.0	15.0	18.8	3 609 438 123
	10.0	20.0	25.0	3 609 438 124
	13.0	25.0	31.3	3 609 438 125
	15.0	30.0	37.5	3 609 438 126
	18.0	35.0	43.8	3 609 438 127
TR 3	20.0	40.0	50.0	3 609 438 132
	25.0	50.0	62.5	3 609 438 133
	30.0	60.0	75.0	3 609 438 134
	35.0	70.0	87.5	3 609 438 135
	40.0	80.0	100.0	3 609 438 136
	45.0	90.0	113.0	3 609 438 137
	50.0	100.0	125.0	3 609 438 138
TR 4	54.0	120.0	150.0	upon request
	63.0	140.0	175.0	upon request
	72.0	160.0	200.0	upon request
	81.0	180.0	225.0	upon request
	90.0	200.0	250.0	upon request
	99.0	220.0	275.0	upon request
	108.0	240.0	300.0	upon request
	117.0	260.0	325.0	upon request

EXCHANGE PART BLANKS

- ▶ The exchange part blanks can be used to produce suitable connection profiles for the customer-specific application.
- ▶ For exchange parts with standard threads and connection profiles, see table on page 12

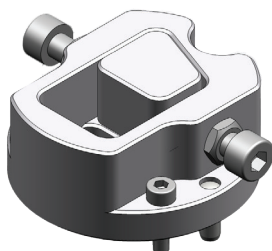
Torque Range	Code	Order no.
TR 1	TASS WT Blank TR1	3 842 890 625
TR 2	TASS WT Blank TR2	3 842 890 626
TR 3	TASS WT Blank TR3	3 842 890 627
TR 4	TASS WT Blank TR4	upon request



ACCESSORIES

- ▶ Original accessory holding fixture for TASS element
- ▶ The TASS element can be flexibly clamped into the tool holder at the top or bottom.
- ▶ repeatable holding
- ▶ secure fixation
- ▶ compact
- ▶ The holding fixtures for TR 4 and TR 5 on request

Torque Range	Code	Order no.
TR 1	TASS TR1 FIX	3 609 438 001
TR 2	TASS TR2 FIX	3 609 438 002
TR 3	TASS TR3 FIX	3 609 438 003



Ordering information

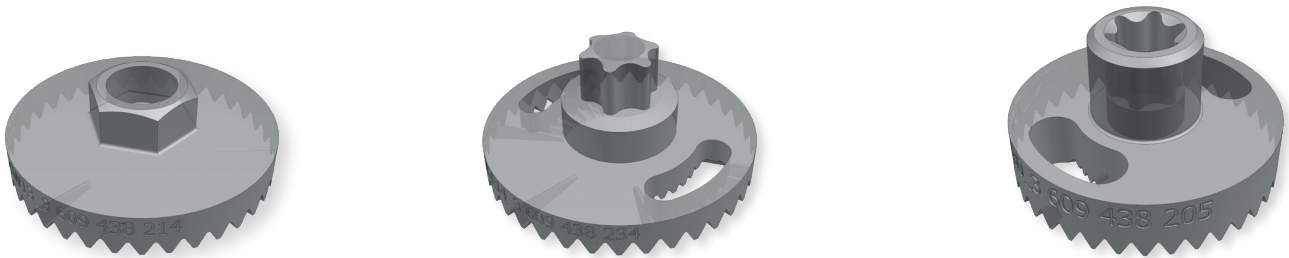
EXCHANGE PARTS (TR 1 - 3)

Torque range	Metric standard thread	Connection profile	Code	Designation	Order no.
TR 1	M2,5	Torx T	WT TR1 ISR T8	Exchange part TR1 ISR T8	3 609 438 711
		Internal hexagon	WT TR1 ISK SW2,5	Exchange part TR1 ISK SW2.5	3 609 438 701
	M3	External hexagon	WT TR1 ASK SW5,5	Exchange part TR1 ASK SW5.5	3 609 438 702
		Torx T	WT TR1 ISR T10	Exchange part TR1 Torx T10	3 609 438 703
		Torx E	WT TR1 ASR E5	Exchange part TR1 Torx E5	3 609 438 206
	M4	Internal hexagon	WT TR1 ISK SW3	Exchange part TR1 ISK SW3	3 609 438 704
		External hexagon	WT TR1 ASK SW7	Exchange part TR1 ASK SW7	3 609 438 705
		Torx T	WT TR1 ISR T20	Exchange part TR1 Torx T20	3 609 438 706
		Torx E	WT TR1 ASR E6	Exchange part TR1 Torx E6	3 609 438 708
	M5	Internal hexagon	WT TR1 ISK SW4	Exchange part TR1 ISK SW4	3 609 438 709
		External hexagon	WT TR1 ASK SW8	Exchange part TR1 ASK SW8	3 609 438 700
		Torx T	WT TR1 ISR T25	Exchange part TR1 Torx T25	3 609 438 707
		Torx E	WT TR1 ASR E6	Exchange part TR1 Torx E6	3 609 438 708
	M6	Internal hexagon	WT TR1 ISK SW4	Exchange part TR1 ISK SW4	3 609 438 709
		External hexagon	WT TR1 ASK SW10	Exchange part TR1 ASK SW10	3 609 438 699
		Torx T	WT TR1 ISR T30	Exchange part TR1 Torx T30	3 609 438 205
Torx E		WT TR1 ASR E8	Exchange part TR1 Torx E8	3 609 438 209	
TR 2	M6	Internal hexagon	WT TR1 ISK SW4	Exchange part TR1 ISK SW4	3 609 438 709
		External hexagon	WT TR1 ASK SW10	Exchange part TR1 ASK SW10	3 609 438 699
		Torx T	WT TR1 ISR T30	Exchange part TR1 Torx T30	3 609 438 205
	M8	Torx E	WT TR1 ASR E8	Exchange part TR1 Torx E8	3 609 438 209
		External hexagon	WT TR 2 / ASK SW10	Exchange part TR2 ASK SW10	3 609 438 710
		Torx T	WT TR2 ISR T45	Exchange part TR2 Torx T45	3 609 438 218
TR 3	M6	Torx E	WT TR3 ASR E8	Exchange part TR3 Torx E8	3 609 438 229
		Torx T	WT TR3 ISR T50	Exchange part TR3 Torx T50	3 609 438 723
	M8	External hexagon	WT TR3 ASK SW13	Exchange part TR3 ASK SW13	3 609 438 223
		Torx E	WT TR3 ASR E10	Exchange part TR3 Torx E10	3 609 438 227
		Torx T	WT TR 3 / ISR T45	Exchange part TR3 Torx T45	3 609 438 721
	M10	Torx E	WT TR3 ASR E12	Exchange part TR3 Torx E12	3 609 438 225
		External hexagon	WT TR 3 / ASK SW16	Exchange part TR3 ASK SW16	3 609 438 720
		Torx T	WT TR3 ISR T50	Exchange part TR3 Torx T50	3 609 438 723
	M12	External hexagon	WT TR3 ASK SW18	Exchange part TR3 ASK SW18	3 609 438 224
		Torx E	WT TR3 ASR E14	Exchange part TR3 Torx E14	3 609 438 228
Torx T		WT TR3 SR T55	Exchange part TR3 Torx T55	3 609 438 722	

EXCHANGE PARTS (TR 4)

Torque range	Metric standard thread	Connection profile	Code	Designation	Order no.
TR 4	M12	External hexagon	WT TR4 ASK SW18	Exchange part TR4 ASK SW18	upon request
		Torx E	WT TR4 / ASR E14	Exchange part TR4 Torx E14	upon request
		Torx T	WT TR4 Torx T55	Exchange part TR4 Torx T55	upon request
	M14	Torx E	WT TR4 Torx E18	Exchange part TR4 Torx E18	upon request
		Torx T	WT TR4 Torx T60	Exchange part TR4 Torx T60	upon request
	M16	Torx E	WT TR4 Torx E20	Exchange part TR4 Torx E20	upon request
		External hexagon	WT TR4 ASK SW24	Exchange part TR4 ASK SW24	upon request
		Torx T	WT TR4 Torx T70	Exchange part TR4 Torx T70	upon request
	M18	Torx T	WT TR4 Torx T80	Exchange part TR4 Torx T80	upon request
		Torx E	WT TR4 Torx E24	Exchange part TR4 Torx E24	upon request

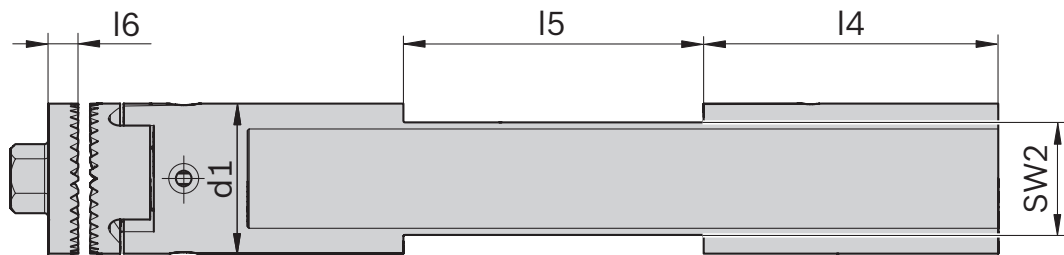
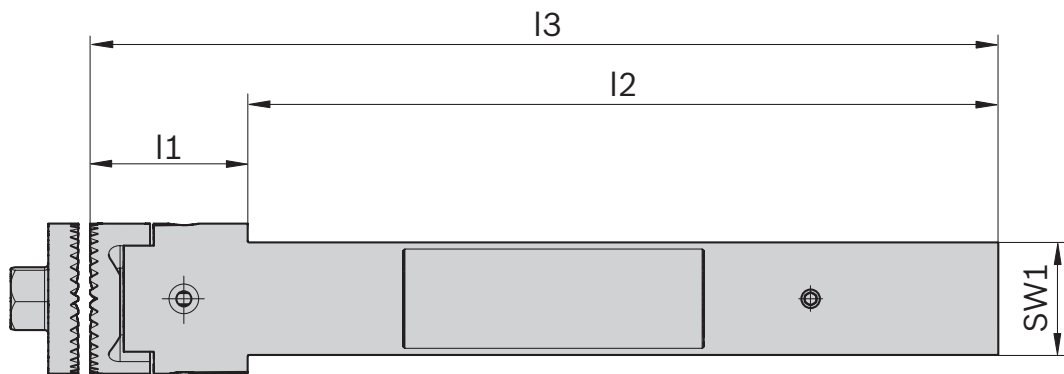
- Customer-specific exchange parts can be produced on request.



Examples of exchange parts with different connection profiles

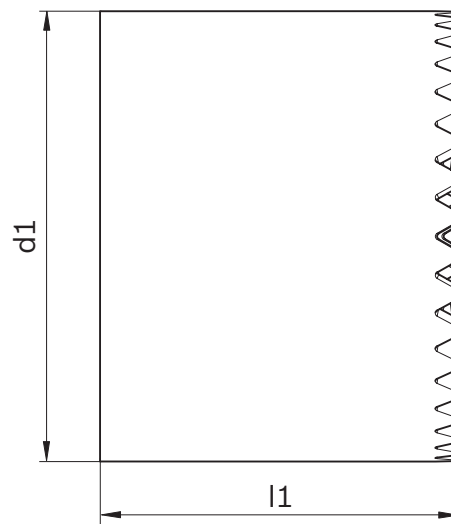
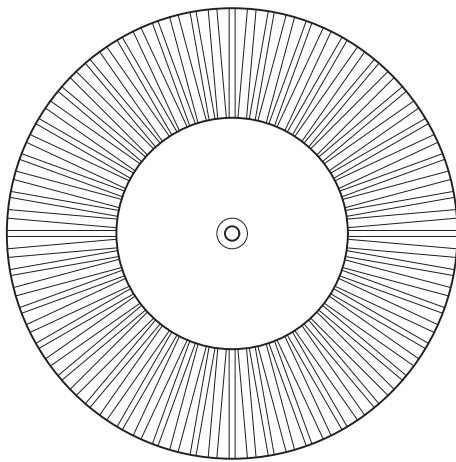
Dimensions

TASS ELEMENT



Torque range	l_1 mm	l_2	l_3	l_4	l_5	l_6	d_1	SW_1	SW_2
TR 1	21.0	100.0	121.0	39.25	39.6	4.0	20.0	15.0	15.0
TR 2	36.5	140	176.5	65.0	39.6	6.0	37.0	30.0	30.0
TR 3	41.5	185.0	226.5	90.0	39.6	6.0	39.0	32.0	32.0
TR 4	53.0	220.0	273.0	112.25	39.6	6.0	45.0	38.0	38.0

EXCHANGE PART BLANKS



Torque range	l1 mm	d1
TR 1	29.0	20.0
TR 2	31.0	37.0
TR 3	31.0	39.0
TR 4	31.0	45.0

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We're here for you – contact us.

Contact us by email:

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Further information online:



Online product catalog

In addition to the CAD data, you can also download the latest firmware service packs here:
www.boschrexroth.com/tightening



Rexroth media directory

Commercial media and technical documentation is available for download 24/7 at:
www.boschrexroth.com/en/us/download-center/

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