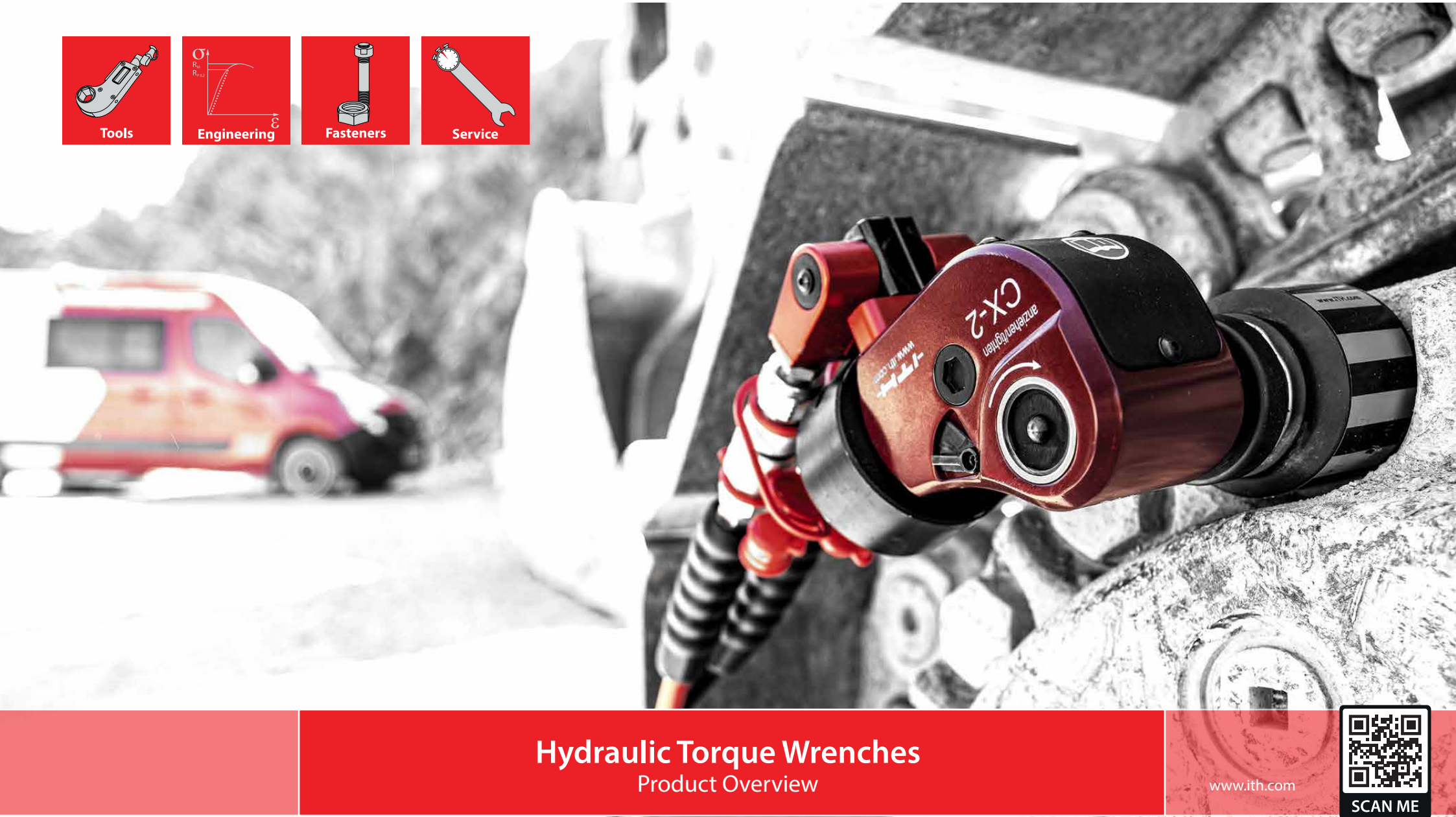
Bolting Technology

Tools

Engineering

Fasteners

Service



Hydraulic Torque Wrenches

Product Overview

www.ith.com

SCAN ME

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Hydraulic torque wrenches

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Technology

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ITH Hydraulic Torque Wrenches - Overview

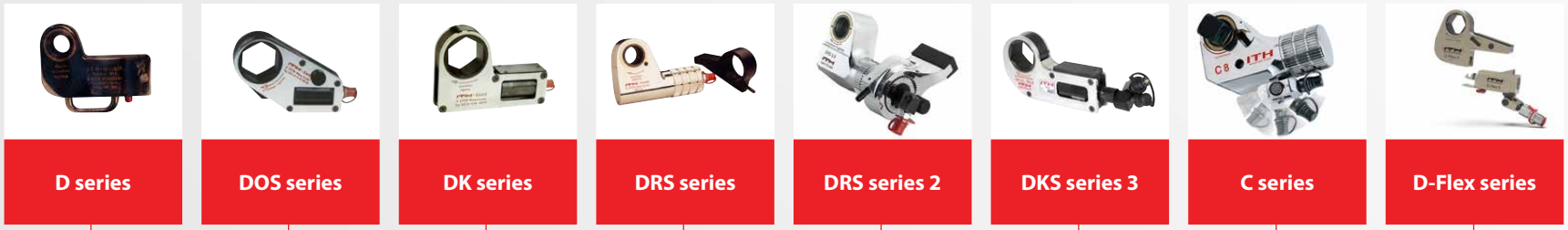






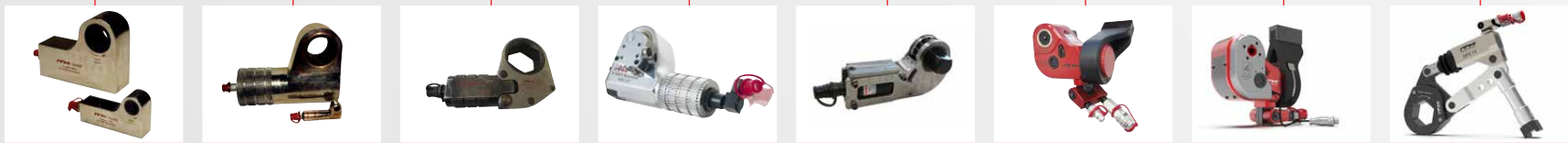


ITH Hydraulic Torque Wrenches - Continuous development competence



D series | DOS series | DK series | DRS series | DRS series 2 | DKS series 3 | C series | D-Flex series

1980 — Innovation and development



DG series | DR series | DV series | ALPHA-version* | DC series | CX series | Auto-Torque** + ALPHA* | DPX series

Development

*ALPHA-version: angle-controlled tightening, digital control.
**Auto-Torque: automatic function, digital control.

Bolting Technology

Hydraulic torque wrench

Type CX

Advantages

- ✓ Universal use for service-jobs and serial application
- ✓ Different support conditions
- ✓ For radial limited spaces and difficult to loosen bolts
- ✓ Fast-acting 2-hose system
- ✓ Weight-optimized and maintenance-friendly assembly design
- ✓ Compatible with all ITH high-pressure units with 2-hose systems
- ✓ Extendable application possibilities through various wrench inserts
- ✓ Adaptability to standard power wrench sockets (KSE) through square insert CX VE (no new power wrench sockets necessary)

Application













Types



CX 1 CX 2 CX 5 CX 8 CX 12 CX 18 CX 28 CX 40 CX 60 CX 80

Type CX Features

Click & Change
various inserts can be exchanged without tools and fixed in place with the insert lock



Asymmetric support
weight-optimized support including reinforced support shoe. Can be placed on both sides, positioned at a 360° angle and easily fixed in place with the recessed push button

High-performance housing
made of UL material (ultra-light): compact, weight-optimized, high-strength treatment

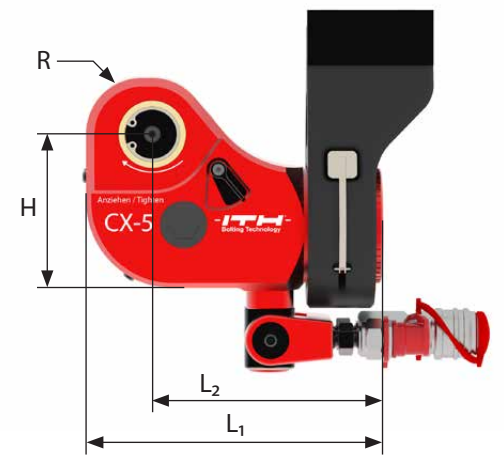
Handle
for easier handling. Tool-free setting allows adjustment to the desired position

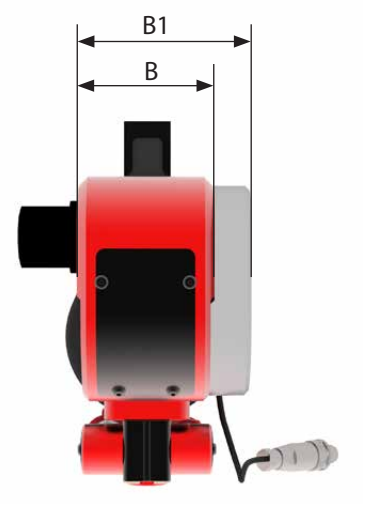
Dual swivel connection
rotatable in two dimensions for optimal positioning of the hydraulic hose

Dual-hose hydraulic connection
high-flow coupling and nipple for high delivery volumes

SCAN ME

Type CX Technical data







ALPHA-Sensor

Optional, adaptable

Read more on page 25.

Technical data

ITH type	Max. Torque		L1		L2		B		B1		R		H		Weight		ITH order no.
	[Nm]	[ft•lb]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[kg]	[lb]	
CX 1	1,200	855	128	5.04	100	3.94	58	2.28	-	-	24	0.94	58	2.28	2.0	4.4	56.10001-5000
CX 2	2,000	1,475	143	5.63	114	4.49	61	2.40	77	3.03	25	0.98	63	2.48	2.1	4.6	56.10002-5000
CX 5	5,000	3,688	175	6.89	136	5.35	73	2.87	93	3.66	33	1.30	91	3.58	4.0	8.8	56.10005-5000
CX 8	8,000	5,900	198	7.80	147	5.79	85	3.35	108	4.25	40	1.57	110	4.33	5.8	12.8	56.10008-5000
CX 12	12,800	9,441	222	8.74	165	6.50	104	4.10	126	4.96	47	1.85	122	4.80	9.1	20.1	56.10012-5000
CX 18	18,000	13,276	263	10.35	196	7.72	112	4.41	133	5.24	53	2.09	134	5.28	12.0	30.4	56.10018-5000
CX 28	28,000	20,652	310	12.20	235	9.25	129	5.08	150	5.90	60	2.56	155	6.10	19.0	49.4	56.10028-5000
CX 40	40,000	29,502	335	13.19	253	9.96	159	5.91	180	7.09	66	3.23	185	7.28	28.5	75.0	56.10040-5000
CX 60	60,000	44,254	413	16.26	305	12.00	170	6.69	-	-	80	3.19	210	8.27	42.0	92.6	56.10060-5000
CX 80	80,000	59,005	445	17.52	334	13.15	190	7.48	-	-	85	3.35	231	9.09	57.0	125.7	56.10080-5000

Contact us for additional or custom designs.

Type CX Accessories

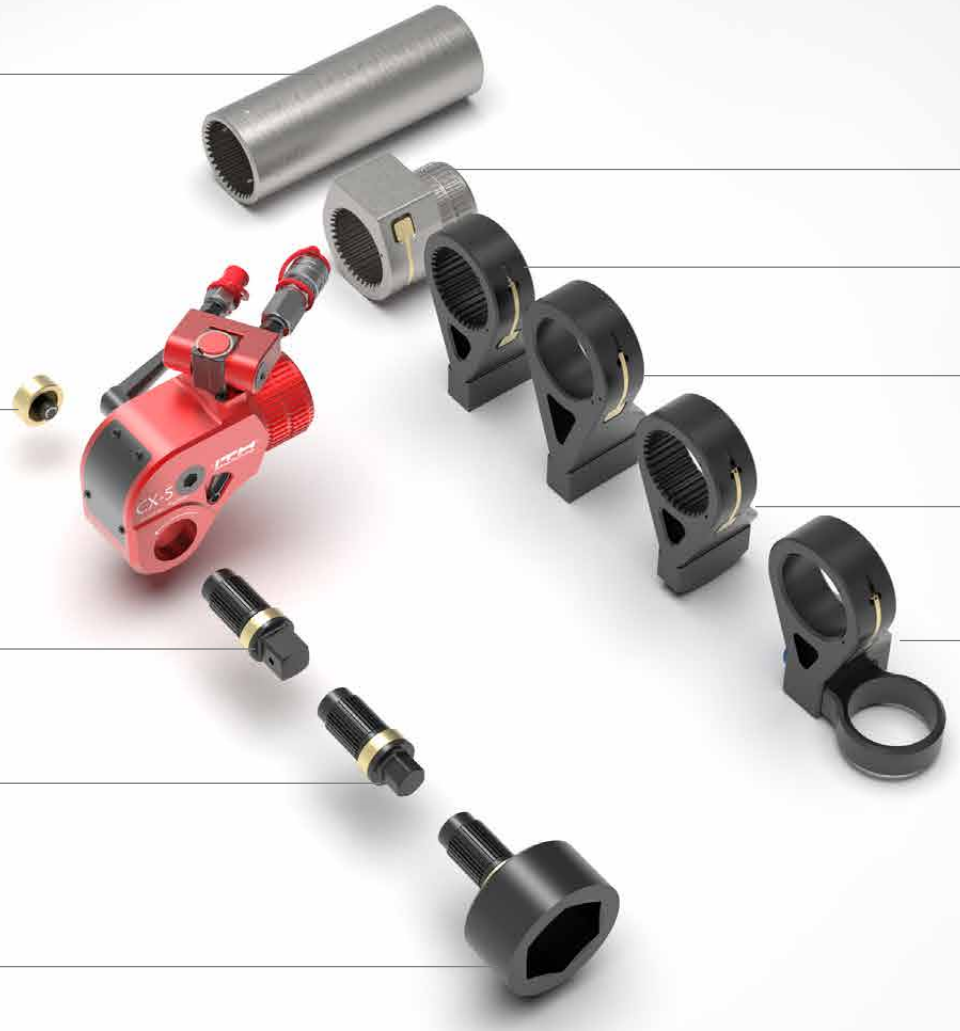
Support
horizontal

Click & Change
various inserts can be exchanged without tools and fixed in place with the insert lock

Type CX-VE
square insert for all standard power wrench sockets

Type CX-SE
hexagon insert for inner hexagon bolts

Type CX-KSE
power wrench socket for hexagon bolts



Elongation
horizontal

Support A
vertical standard

Support B
vertical long

Support C
vertical standard, rounded

Support D
vertical ring

Accessories: Inserts and Supports

The vertical ring support (Support D) allows the hydraulic torque wrench to be fixed on the next bolt.
All accessories can be exchanged flexibly and quickly.

Bolting Technology

Hydraulic torque wrench

Type D-Flex

Advantages

- ✓ **Flexible cassette-type hydraulic torque wrench:** one cylinder unit can operate various cassettes with different width across flats (A/F)
- ✓ **Quick change mechanism:** enables quick replacement of the cassettes - no extra tools required
- ✓ **Reduced head radii:** suitable for various applications and compatible with common flange standards

Application











Types



D-Flex 2 | D-Flex 5 | D-Flex 8 | D-Flex 12 | D-Flex 18 | D-Flex 28 | D-Flex 40

SCAN ME

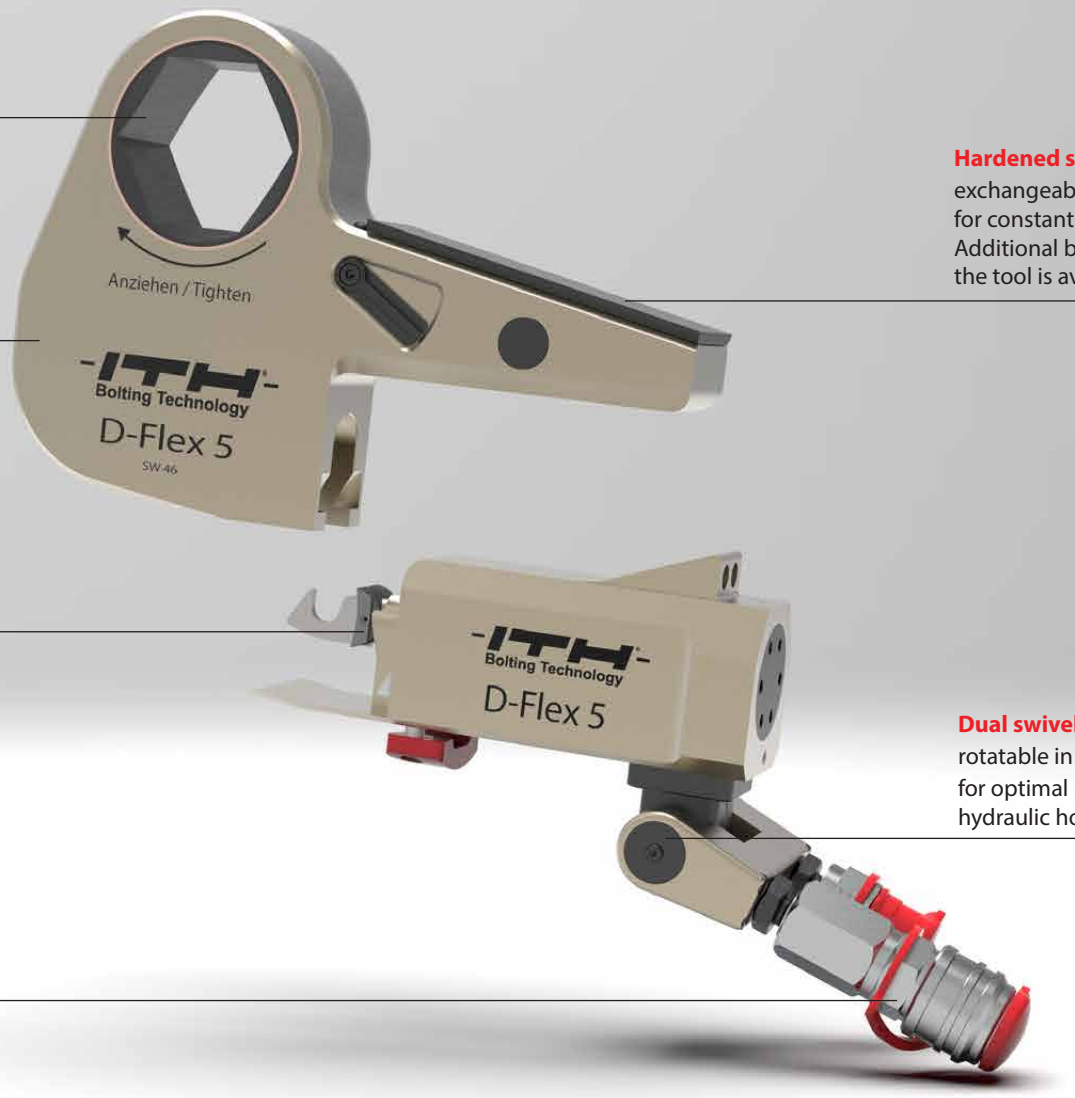
Type D-Flex Features

Smallest head radii
reduced outer diameter, suitable for smallest bolt pitches. Suitable for flange connections according to ASME B16.5 - 2003 and MSS SP-44 - 2006

Cassette unit
for different bolt diameters A/F

Cylinder unit
fast and robust: the CLICK-AND-GO mechanism for easy locking by hand. No extra tools required

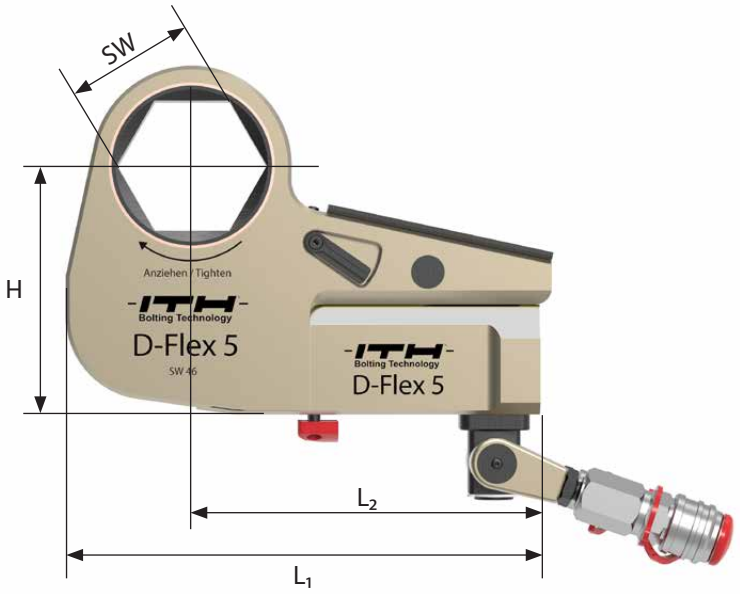
Dual-hose hydraulic connection
high-flow coupling and nipple for high delivery volumes



Hardened support plate
exchangeable, direct support for constant support conditions. Additional bending moment in the tool is avoided

Dual swivel connection
rotatable in two dimensions for optimal positioning of the hydraulic hose

Type D-Flex Technical data







ALPHA Sensor

Optional, adaptable

Read more on page 25.

Technical data

ITH type	Max. Torque		L1 min. to max.*		L2 min. to max.*		B		B1		H		ITH order no. cylinder unit
	[Nm]	[ft•lb]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	
D-Flex 2	2,000	1,475	183 - 193	7.20 - 7.60	135 - 144	5.31 - 5.67	34	1.34	50	1.97	88,7	3.49	58.00002-2000
D-Flex 5	5,000	3,688	238 - 260	9.37 - 10.24	174 - 195	6.85 - 7.68	42	1.65	59	2.32	124	4.88	58.00005-2000
D-Flex 8	8,000	5,900	253 - 273	9.96 - 10.75	176 - 203	6.93 - 7.99	48	1.89	64	2.52	141	5.55	58.00008-2000
D-Flex 12	12,000	8,851	285 - 301	11.22 - 11.85	200 - 224	7.87 - 8.82	56	2.20	77	3.03	158	6.22	58.00012-2000
D-Flex 18	18,000	13,276	357 - 376	14.06 - 14.80	250 - 270	9.84 - 10.63	68	2.68	84	3.31	196	7.72	58.00018-2000
D-Flex 28	28,000	18,439	400 - 428	15.75 - 16.85	280 - 310	11.02 - 12.20	77	3.03	93	3.66	215	8.46	58.00028-2000
D-Flex 40	40,000	29,502	458 - 509	18.03 - 20.04	328 - 368	12.91 - 14.49	94	3.70	110	4.33	240	9.45	58.00040-2000

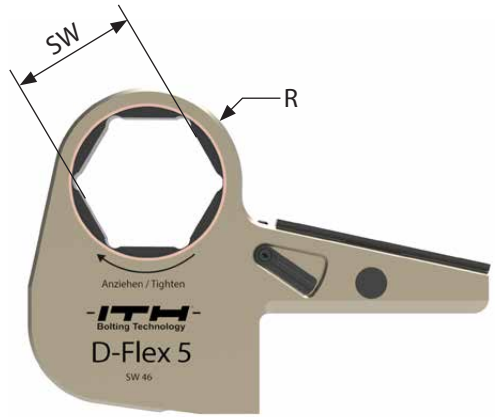
*depending on cassette unit.

Type D-Flex Head radii cassette unit

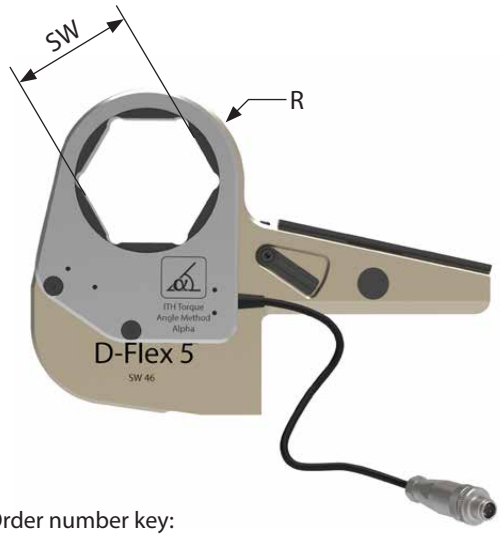
A/F		D-Flex 2	D-Flex 5	D-Flex 8	D-Flex 12	D-Flex 18	D-Flex 28	D-Flex 40	ITH order no.*	ALPHA ITH order no.
[mm]	["]	Head radius R [mm]								
19		28							58.000xx-3019	-A01
22		28							58.000xx-3022	-A01
24	15/16	28							58.000xx-3024	-A01
27		28	36						58.000xx-3027	-A01
30	1 1/4	28	36						58.000xx-3030	-A01
32		28	36						58.000xx-3032	-A01
36	1 4/9	28	39	44					58.000xx-3036	-A01
41	1 5/8	32	39	44					58.000xx-3041	-A01
46	1 4/5	35	39	44	48				58.000xx-3046	-A01
50	2	42	42	44	48	58			58.000xx-3050	-A01
55	2 1/5	42	44	44	48	58			58.000xx-3055	-A01
60	2 3/8	44	46	48	52	58			58.000xx-3060	-A01
65	2 4/7	48	50	48	52	58			58.000xx-3065	-A01
70	2 3/4		56	57	57	61			58.000xx-3070	-A01
75	3		56	57	57	61			58.000xx-3075	-A01
80	3 1/8		64	63	63	66	69		58.000xx-3080	-A01
85	3 3/2		64	63	63	66	69		58.000xx-3085	-A01
90	3 3/4			70	70	72	72	80	58.000xx-3090	-A01
95	3 7/8			70	70	72	72	80	58.000xx-3095	-A01
100	4 1/4				77	78	79	87	58.000xx-3100	-A01
105	4 5/8				77	78	79	87	58.000xx-3105	-A01
110						87	89	92	58.000xx-3110	-A01
115	5					87	89	92	58.000xx-3115	-A01
120**							94	97	58.000xx-3120	-A01
125							94	97	58.000xx-3125	-A01
130**	5 3/8						100	102	58.000xx-3130	-A01
135							100	102	58.000xx-3135	-A01
140**							105	107	58.000xx-3140	-A01
145	6 1/8						105	107	58.000xx-3145	-A01
150**								115	58.000xx-3150	-A01
155	6 1/2							115	58.000xx-3155	-A01
160**								122	58.000xx-3160	-A01
165								122	58.000xx-3165	-A01
170**								128	58.000xx-3170	-A01
175	7 1/8							128	58.000xx-3175	-A01
180	7 5/8							133	58.000xx-3180	-A01
185	8							133	58.000xx-3185	-A01
190								136	58.000xx-3190	-A01
195								136	58.000xx-3195	-A01
200	8 3/8							141	58.000xx-3200	-A01

Reduced head radii
matching flange standards:
ASME B16.5
Pipe flanges, class 300 to class 2,500
MSS SP-44
Steel pipe flanges, class 150 to 900.

Cassette unit standard



Cassette unit with ALPHA Sensor



* Order number key:
xx = Size cylinder unit. Example D-Flex 8: xx = 08.
** These wrench sizes can be adapted.

Type D-Flex Supports







Supports

ITH type	ITH order no. Support-A Horizontal standard	ITH order no. Support-B Vertical long	ITH order no. Support-C Horizontal low
D-Flex 2	58.00002-1xxx-01	58.00002-1xxx-02	58.00002-1xxx-03-Lyyy
D-Flex 5	58.00005-1xxx-01	58.00005-1xxx-02	58.00005-1xxx-03-Lyyy
D-Flex 8	58.00008-1xxx-01	58.00008-1xxx-02	58.00008-1xxx-03-Lyyy
D-Flex 12	58.00012-1xxx-01	58.00012-1xxx-02	58.00012-1xxx-03-Lyyy
D-Flex 18	58.00018-1xxx-01	58.00018-1xxx-02	58.00018-1xxx-03-Lyyy
D-Flex 28	58.00028-1xxx-01	58.00028-1xxx-02	58.00028-1xxx-03-Lyyy
D-Flex 40	58.00040-1xxx-01	58.00040-1xxx-02	58.00040-1xxx-03-Lyyy





Supports

ITH type	ITH order no. Support-D Horizontal ring	ITH order no. Support-E Horizontal long
D-Flex 2	58.00002-1xxx-04-Lyyy	58.00002-1xxx-05-Lyyy
D-Flex 5	58.00005-1xxx-04-Lyyy	58.00005-1xxx-05-Lyyy
D-Flex 8	58.00008-1xxx-04-Lyyy	58.00008-1xxx-05-Lyyy
D-Flex 12	58.00012-1xxx-04-Lyyy	58.00012-1xxx-05-Lyyy
D-Flex 18	58.00018-1xxx-04-Lyyy	58.00018-1xxx-05-Lyyy
D-Flex 28	58.00028-1xxx-04-Lyyy	58.00028-1xxx-05-Lyyy
D-Flex 40	58.00040-1xxx-04-Lyyy	58.00040-1xxx-05-Lyyy

Accessories:
Supports

Horizontal supports ("in-line") can avoid additional bending moments in the tool.

All supports can be easily replaced and secured by a push button.

Order number key
xxx = A/F Cassette
yyy = Support length

Type D-Flex Cylinder units and accessories

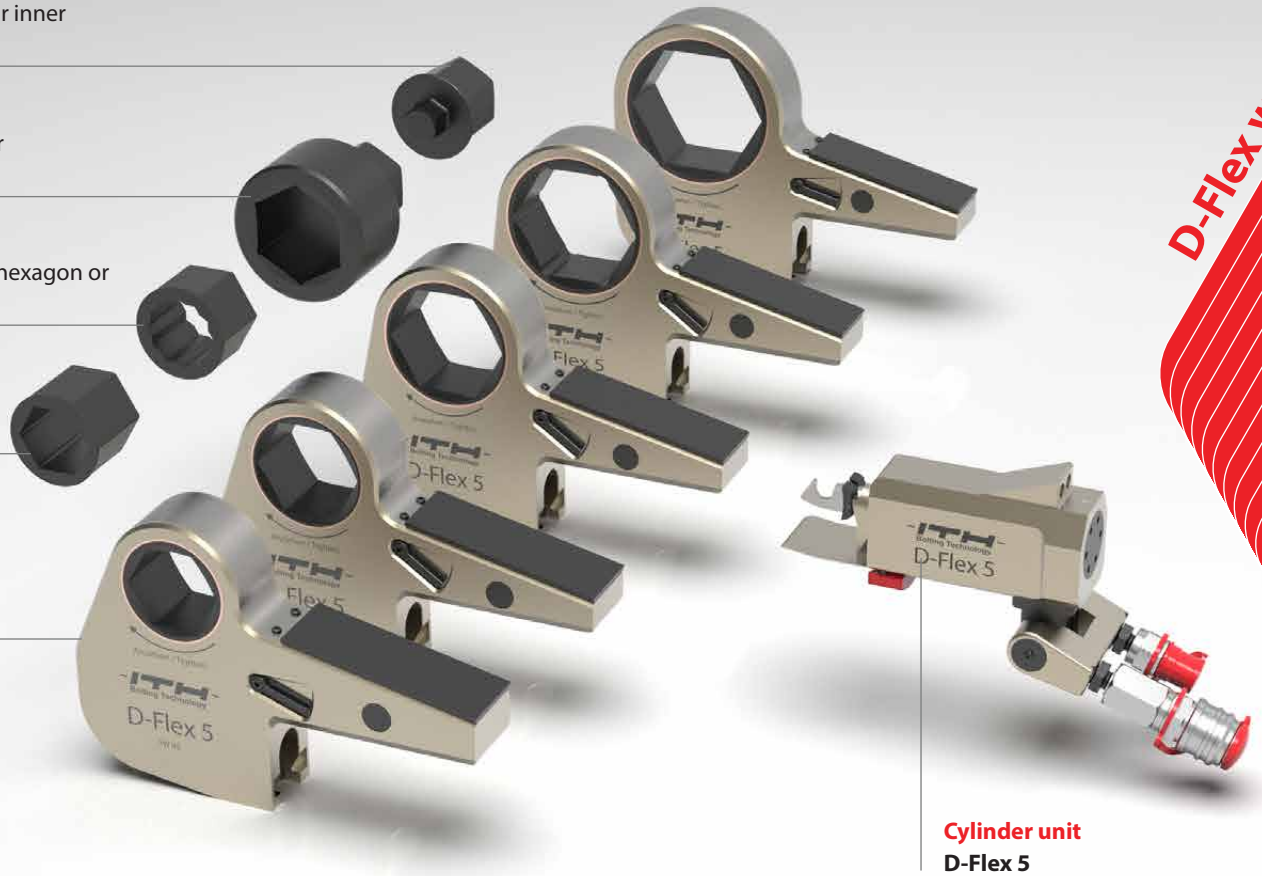
Type D-Flex-AS
Outer hexagon adapter for inner hexagon bolts

Type D-Flex-AN
Inner hexagon adapter for hexagon bolts

Type D-Flex-A (Z)
Twelve-sided adapter for hexagon or twelve-sided bolts

Type D-Flex-A
Hexagon adapter for hexagon bolts

Cassette unit
D-Flex 5



Cylinder unit
D-Flex 5

Accessories: Adapters

All adapters and supports can be replaced quickly - no extra tools required.

D-Flex wrench sizes

A/F 200
A/F 195
A/F 190
A/F 185
A/F 180
A/F 175
A/F 170
A/F 165
A/F 160
A/F 155
A/F 150
A/F 145
A/F 140
A/F 135
A/F 130
A/F125
A/F 120
A/F 115
A/F 110
A/F 105
A/F 100
A/F 95
A/F 90
A/F 85
A/F 80
A/F 75
A/F 70
A/F 65
A/F 60
A/F 55
A/F 50
A/F 46
A/F 41
A/F 36
A/F 32
A/F 30
A/F 27
A/F 24
A/F 22
A/F 19

ITH Bolting Technology

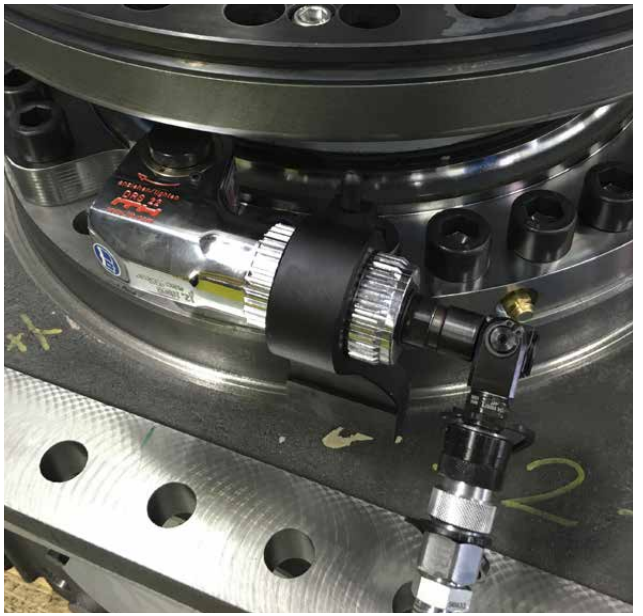
Hydraulic torque wrench

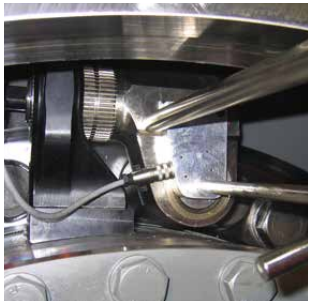
Type DRS

Advantages

- ✓ Single-hose system, compatible with all ITH Torque Wrench High-Pressure Units
- ✓ Closed housing for universal use
- ✓ Use of standard power wrench sockets through square adapters
- ✓ Space-saving single-hose system, single-acting hydraulic cylinder with automatic retraction

Application





Types



DRS 12 DRS 22 DRS 50 DRS 83 DRS 140

Type DRS Features

Fine-toothed spline
for power wrench sockets
type KSE, square inserts type VE
and hexagon inserts type SE

External toothing
to accommodate the support,
three horizontal levels can be
selected on the housing

Tip lock
for fixing the support,
360° rotatable



Closed and chromed steel housing

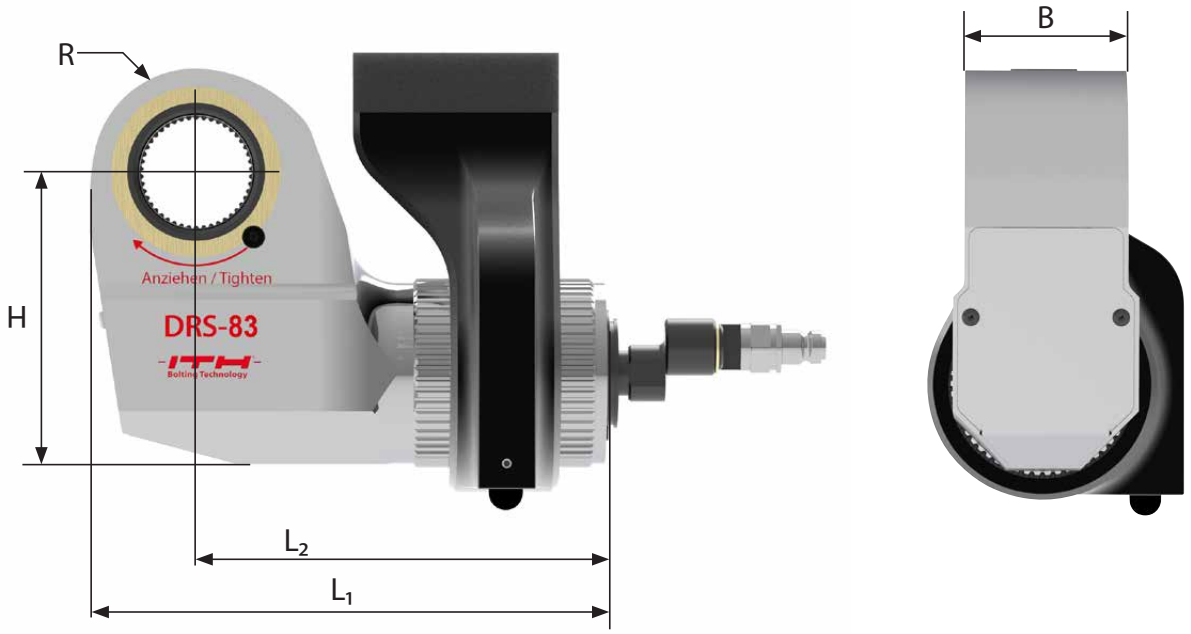
Asymmetric support
weight-optimized support,
including reinforced support shoe.
Can be placed on both sides,
positioned at a 360° angle and
easily fixed by the push button

Swivel connection
rotatable in two dimensions
for optimal positioning of the
hydraulic hose

Single hose hydraulic connection
space saving

SCAN ME

Type DRS Technical Data



Technical data

ITH type	Max. Torque		L1		L2		B		R		H		Weight		ITH order no.
	[Nm]	[ft·lb]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[kg]	[lb]	
DRS 12	1,250	922	124	4.88	103	4.06	38	1.50	21.5	0.85	58	2.28	1.7	3.75	51.10001-5000
DRS 22	2,200	1,623	161	6.34	136	5.35	45	1.77	25	0.98	68	2.68	2.3	5.07	51.10004-5000
DRS 50	5,000	3,688	180	7.09	150	5.91	54	2.13	30	1.18	90	3.54	4.1	9.04	51.10006-5000
DRS 83	8,300	6,122	219	8.62	179	7.05	60	2.36	40	1.57	118	4.65	6.8	14.99	51.10008-5000
DRS 140	14,000	10,326	224	8.82	179	7.07	70	2.76	45	1.77	127	5.00	9.6	21.16	51.10010-5000

Contact us for additional or custom designs.

ITH Bolting Technology

Hydraulic torque wrench

Type DKS

Advantages

- ✓ Single-hose system, compatible with all ITH Torque Wrench High-Pressure Units
- ✓ Perfect for radial limited spaces
- ✓ Constant support conditions
- ✓ Expandable application possibilities with various plug-in inserts type KSE, VE, SE
- ✓ Easy-to-maintain assembly design
- ✓ Single-acting hydraulic cylinder with automatic piston return

Application








Types



DKS 12 DKS 20 DKS 45 DKS 75

Type DKS Features

ITH Bolting Technology

Flexible holding fixture
for various socket inserts and direct tightening of hexagon bolts

Component design
system of hydraulic cylinder, ratchet system and lug enables simple and quick repair work



Chromed steel housing

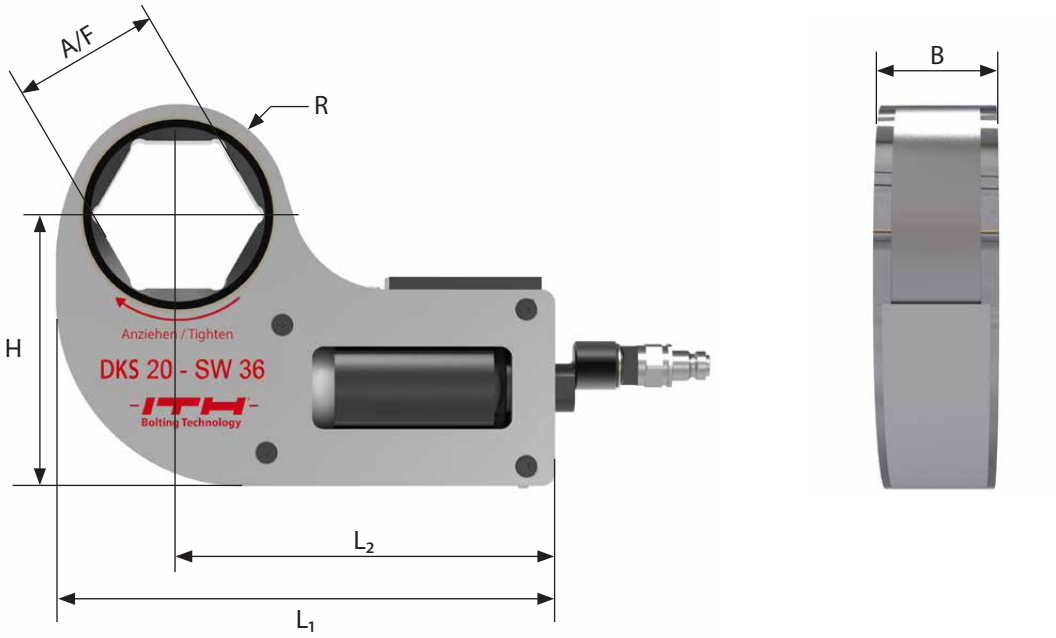
Hardened support plate
direct support for constant support conditions. Additional bending moment in the tool is avoided

Swivel connection
rotatable in two dimensions for optimal positioning of the hydraulic hose

Single hose hydraulic connection
space saving

SCAN ME

Type DKS Technical data



Technical data

ITH type	Max. Torque		L1		L2		B		R		H		A/F		Weight		ITH order no.
	[Nm]	[ft-lb]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[kg]	[lb]	
DKS 12	1,250	922	142	5.59	110	4.33	31,5	1.24	24	0.94	61.5	2.42	30	1.18	1.3	2.87	52.10001-5000
			142	5.79					28	1.10	61.5	2.42	36	1.42	1.4	3.09	52.10002-5000
DKS 20	2,000	1,475	183	7.20	145	5.71	34	1.34	28	1.10	73	2.87	36	1.42	1.5	3.31	52.10003-5000
			188	7.40					35	1.38	76	2.99	46	1.81	1.8	3.97	52.10004-5000
DKS 45	4,500	3,319	204	8.03	143	5.63	44	1.73	38	1.50	99	3.90	46	1.81	3.4	7.50	52.10008-5000
			206	8.11	160	6.30			42	1.65	99	3.90	55	2.17	3.6	7.94	52.10010-5000
			262	10.31	214	8.43			48	1.89	137	5.39	65	2.56	3.8	8.38	52.10011-5000
			270	10.63	214	8.43			56	2.20	137	5.39	75	2.95	4.1	9.04	52.10012-5000
			280	11.02	210	8.27			70	2.76	137	5.39	95	3.74	4.3	9.48	52.10014-5000
DKS 75	7,500	5,532	243	9.57	185	7.28	46	1.81	48	1.89	124	4.88	65	2.56	5.2	11.46	52.10020-5000
			260	10.24	195	7.68			56	2.20	124	4.88	75	2.95	5.5	12.13	52.10021-5000
			267	10.51	195	7.68			62	2.44	124	4.88	85	3.35	5.9	13.01	52.10022-5000

Hydro-DAX V-Series Features

ITH Bolting Technology

Carrying device and cable carrier
practical storage of the supply cable and the remote

High pressure gauge
analog, with rubberized protective cap, multicolor scale, and separate pressure scale from 0-1000 bar as standard. Digital pressure gauge (as shown) optional

Dual-hose hydraulic connection
with high-flow nipple and coupling for high delivery volumes. Compatible with single-hose and dual-hose systems



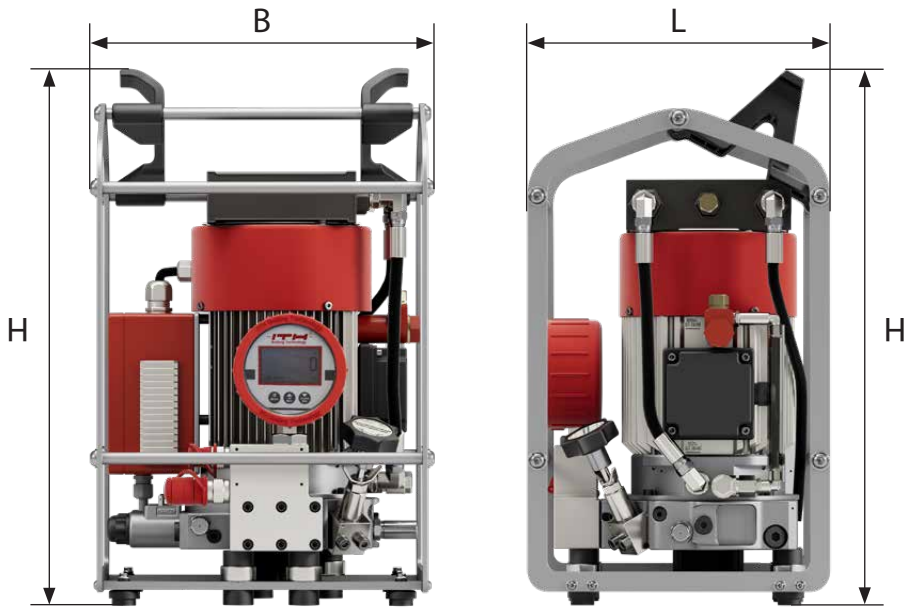
Oil cooler
for optimal cooling performance

Vertical multi-rib tank
with fan. Efficient temperature exchange through robust and weight-optimised aluminium multi-rib tank (passive) and constantly running fan (active)

Oil level sight glass

Pictured: Hydro-DAX V12-2 with optional accessories

Hydro-DAX V-Series Technical data



Pictured: Hydro-DAX V12-2 with optional accessories

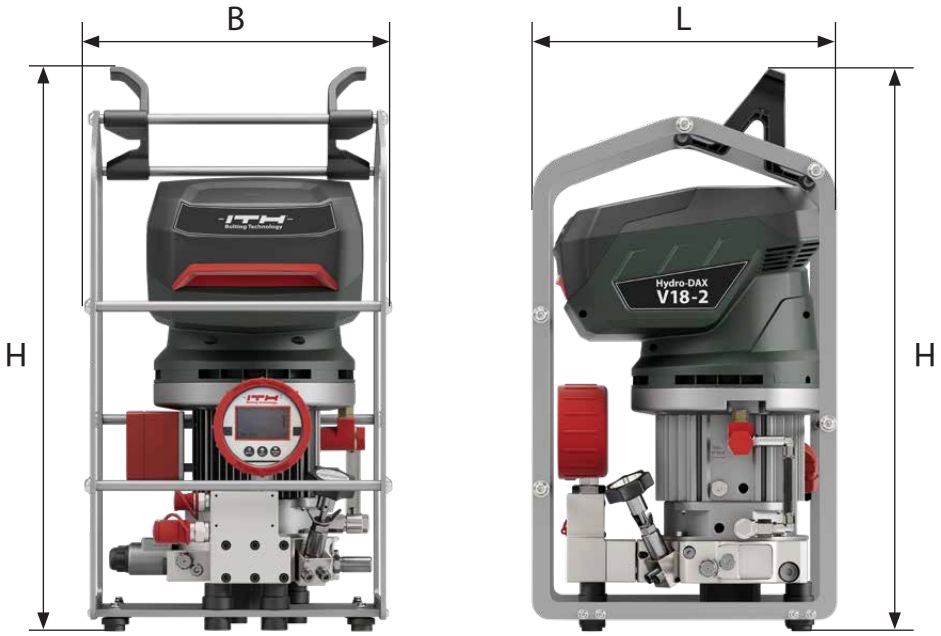
Technical data

ITH Hydro-DAX type	ITH order no.	Max. operating pressure	Drive power	Oil volume (usable)	Noise emission at 100 bar	Voltage 1-phase ± 10% 3-phase ± 5%	Phases	Frequency	Dimensions (L x B x H)		Weight*	
		[bar]	[kW]	[l]	[dB]	[V]	[n]	[Hz]	[mm]	["]	[kg]	[lbs]
V12-2	50.01212-x	850	0.55	1.4 (1.0)	< 80	120 230 400	1 1 3	50 + 60	300 x 320 x 520	11.8 x 12.6 x 20.5	22.5	49.6
V18-2	50.01218-x		0.7	1.8 (1.4)	< 80	120 230 400	1 1 3		300 x 320 x 580	11.8 x 12.6 x 22.8	26.5	58.4
V21-2	50.01221-x		1.35	2.2 (1.6)	< 85	120 230 400	1 1 3		310 x 337 x 625	12.2 x 13.3 x 24.6	35	77.2

120 V: x = 1117x (1-phase)
230 V: x = 2317x (1-phase)
400 V: x = 4037x (3-phase)

* Including oil, 400 V version: weight reduction of 0.5 kg (1.1 lbs).

Hydro-DAX V18 Battery Technical data



Scope of delivery

The scope of delivery can be customized.

Standard:
- ITH Hydro-DAX V18 Battery
- Operating instructions

More options:
- LiHD battery
- Calibration certificate
- High-performance quick charging station
- Additional accessories
- …

Pictured: Hydro-DAX V18 Battery with optional accessories.

Technical data

ITH Hydro-DAX type	ITH order no.	Max. operating pressure	Drive power	Oil volume (usable)	Noise emission at 100 bar	Voltage	Amperage	Dimensions (L x B x H)		Weight*	
		[bar]	[kW]	[l]	[dB]	[V]	[Ah]	[mm]	["]	[kg]	[lbs]
V18 Battery	50.A1218-x	850	1.5	1.1 (0.8)	< 80	2 x 18 V	5,5 8	350 x 330 x 640	13.8 x 13.0 x 25.2	25	55.1

*Including oil, without battery.

Aero-DAX 19 & DA 16



Pneumatic unit

- ✓ Operation by air pressure - no electrical power supply required
- ✓ Operating pressure: 850 bar
- ✓ One-man operation with pneumatic remote

Image shows optional accessories.

Type:	Aero-DAX 19
ITH order no.:	50.01019
Compatibility:	All ITH Hydraulic Torque Wrenches, optimal with dual-hose systems.
Max. operating pressure:	850 bar
Dimensions (L x B x H):	600 x 300 x 440 mm
Weight:	35 kg (31.9 kg without oil)
Oil volume:	1 l
Required air supply:	Min. 6 bar
Compressed air volume:	2,000 - 2,500 l/min.
Pneumatic connector (inside diameter Ø):	Min. 10 mm (adapters available)



Manual pump

- ✓ Manual operation for service applications or applications without power supply, compact and mobile
- ✓ High pressure gauge with multi-colour scale
- ✓ Pressure relief valve for setting the torque

Type:	DA 16
ITH order no.:	50.01016
Compatibility:	Hydraulic torque wrenches with single-hose systems.
Max. operating pressure:	950 bar
Dimensions (L x B x H):	880 x 180 x 280 mm
Weight:	11.8 kg including Oil



Dual-hose system

- ✓ Dual high-pressure hose, compatible with torque wrenches with dual-hose system and high-pressure units of the DAX series
- ✓ High-flow nipple and coupling , designed for high flow rates
- ✓ Optionally with protective cover

Length:	ITH order no.:
3 m	34.00230-0030
4 m	34.00230-0040
5 m	34.00230-0050
6 m	34.00230-0060



Single-hose system

- ✓ High-pressure hose, compatible to ITH Torque Wrenches type DRS and DKS
- ✓ Optionally with protective cover

Length:	ITH order no.:
3 m	34.10030-0030
4 m	34.10030-0040
5 m	34.10030-0050
6 m	34.10030-0060

Auto-Torque Automatic bolting

ITH Bolting Technology

Automatic bolting

ITH Auto-Torque

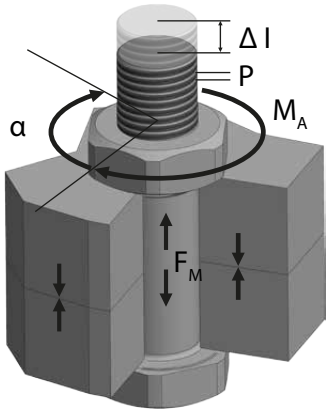
- ✓ **Pre-setting** of the target values torque and turning angle α (only with optional system ALPHA) via the multifunction display
- ✓ **The required pressure** is applied automatically and gradually by the hydraulic unit
- ✓ **Work safety by „Dead man's switch":** the system only works if the user activates the „Dead man's switch"
- ✓ **Easy control for the user:** when reaching the pre-set target values the system stops automatically and signals „Bolt ready" by a green light on the remote
- ✓ **Compatibility:**
  - ITH-Auto-Torque can be used and upgraded on any existing ITH Hydraulic Torque Wrench systems
  - Auto-Torque is a standard system component of CX ALPHA and D-Flex ALPHA units when they are first delivered

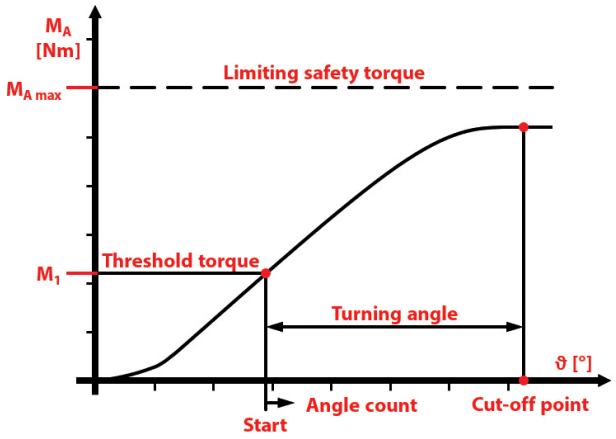


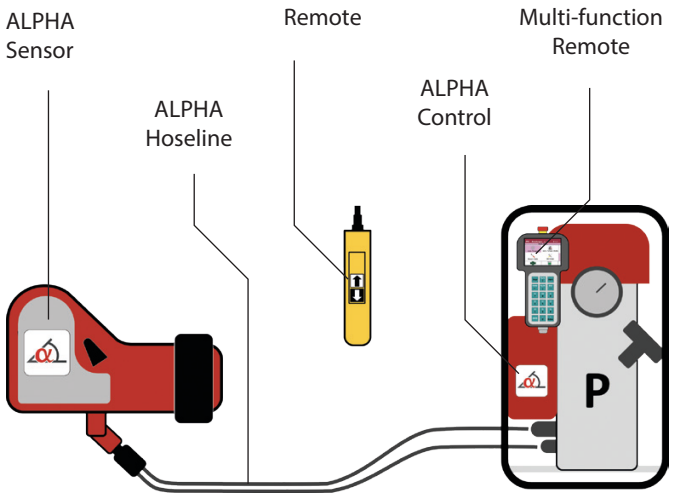




System ALPHA Angle-controlled tightening







Introduction

Angle-controlled tightening is a method, where the achieved bolt elongation Δl is measured indirectly.

Δl is calculated from the relation between bolt pitch P of the thread and rotation angle α (turning angle).

$$\textit{Simplistic: } \Delta l = \textit{bolt pitch } P \cdot \frac{\textit{rotation angle } \alpha}{360°}$$

From achieved bolt elongation Δl you can gain insights about the reached assembly preload F_M, which is your target value when tightening bolt connections (cf. VDI 2230).

Process

1. **Torque range:** one pre-defined torque M1 is applied on the bolt connection until all gaps between all components are closed. That is the point where the threshold torque is reached.
2. **Angle range:** after threshold torque the angle range begins. An angle of rotation α is applied on the bolt connection.
3. **ITH ALPHA sensor controls** torque M1 and α.
4. **Tightening process ends** after reaching α.
5. **ITH ALPHA software** offers process evaluation, for example automatically generated Excel- or PDF-protocols.

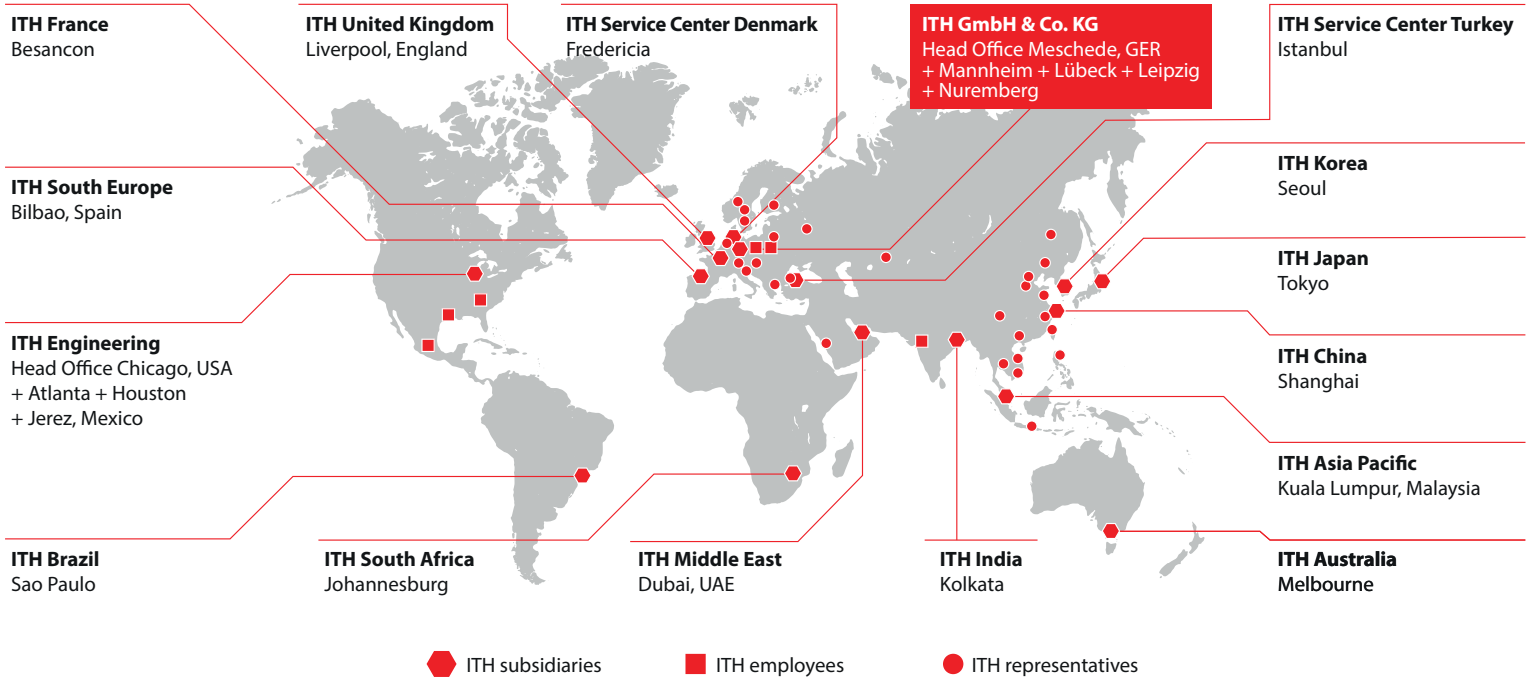
Advantage of less affection by friction: higher precision

- ✓ **Angle range is not affected by friction values:** since the angle of rotation serves as a control variable, changes in the friction coefficient from the angle count onwards do not affect the process. This results in higher assembly preload.
- ✓ **Digital ITH application software:** easy set-up and management of all relevant application parameters.
- ✓ **Low tightening factors α_A:** when designing bolted joints, it can be calculated with small tightening factors from 1.2 to 1.4 in most cases (cf. VDI 2230).

$$^*\alpha_A = \frac{F_{M\,max}}{F_{M\,min}}$$

Contact

Global leading system supplier in bolting technology



ITH drives innovation

With more than 40 years in the bolting industry, ITH continuously invests experience and know-how into new technical developments. More than 200 national and international patents prove the innovative capabilities of ITH. Many of these developments have become standards of bolting technology.

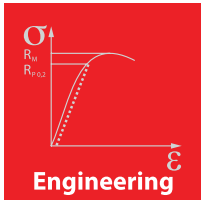
- ✓ Global technical sales & service network
- ✓ Synergy effects being a whole system supplier
- ✓ Qualified, flexible service and fast spare parts availability
- ✓ Individual industry- or branch specific customer solutions
- ✓ Competent advice in all bolting cases
- ✓ Lean Production & certified quality, environmental and occupational safety management according to DIN ISO 9001, 14001 and 45001

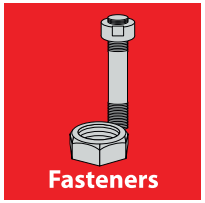
ITH offers synergy

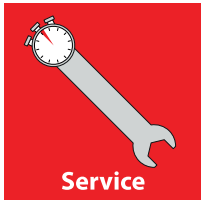
The technical and economic efficiency of a bolted connection is decisively determined by the design, the fasteners, the bolting tools and the assembly.

As a whole system supplier, ITH combines the expertise of these four sub-divisions (Tools, Engineering, Fasteners, Service) and configures the components with each other to achieve the best technical and economic result for our business partners.











Global technical sales & service network

Individual consultation is important for us. Visit the contact section on the ITH website to find the contact information of the local person in your country. We will be happy to advise you.

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