



GENERAL CATALOGUE

Industrial hydraulics, construction hydraulics, hydraulic tools
Heavy load transport

HYDRAULICS 2015

General Catalogue Hydraulics 2015



Dear customers,

Lifting and moving heavy loads have always been one of the core issues that have been at the centre of our activities. These lifting operations particularly depend on absolute safety for both human and material. For this reason, we have already expanded our standard range of slings years ago by a select range of innovative hydraulic systems.

Presented before you now is the result of our development in the field of heavy load lifting and heavy load transport: the new complete "Hydraulics" catalogue. With its 180 pages, it is your ideal partner when it comes to quality products in the fields of industrial hydraulics, hydraulic tools, hydraulics systems, heavy transport and hydraulics accessories. Compact and clearly arranged, it offers an impressive overall view of our product and services portfolio, which we have continuously expanded and improved in recent years. In the process we work exclusively with renowned partners such as the companies Hi-Force and Jung, which in turn are market leaders in the field of hydraulics.

In addition to quality products, we would like to particularly recommend our intelligent inspection service process "Carl Stahl Integrated Services". We undertake the annual inspection of your equipment prescribed by law, either at your site by our service technicians with their test vehicles, or in one of our service centres across Germany. Our service support centre in Süßen has also been awarded "Authorised service and repair location" by Hi-Force. We repair hydraulics equipment of all makes.

You may see that you can rely on our service and product quality. With 60 locations worldwide, we are there for you on site and shall be at your side as an efficient partner.

You are in safe hands with us.

Warm regards.

Wolfgang Schwenger

YOUR BENEFITS AT CARL STAHL

Delivery directly from stock

Many items listed in this catalogue are stocked in our Suessen warehouse and are available immediately.

Quality assurance

We are certified according to DIN EN ISO 9001:2000.

Special Requests

We develop, design and produce to your requirements.

Expertise of the world market leader

Benefit from 135 years of international experience.

Simple ordering

Send us your order by phone, fax or e-mail.

Wide range of seminars available

Recognised experts impart knowledge in the fields of rope-, lifting-, and safety-technology. Please see www.carlstahlevita.co.uk for further details.

Small orders? Welcome!

Our minimum order value is only 100 €. For smaller orders we will charge a processing fee of 15 €.

Returns

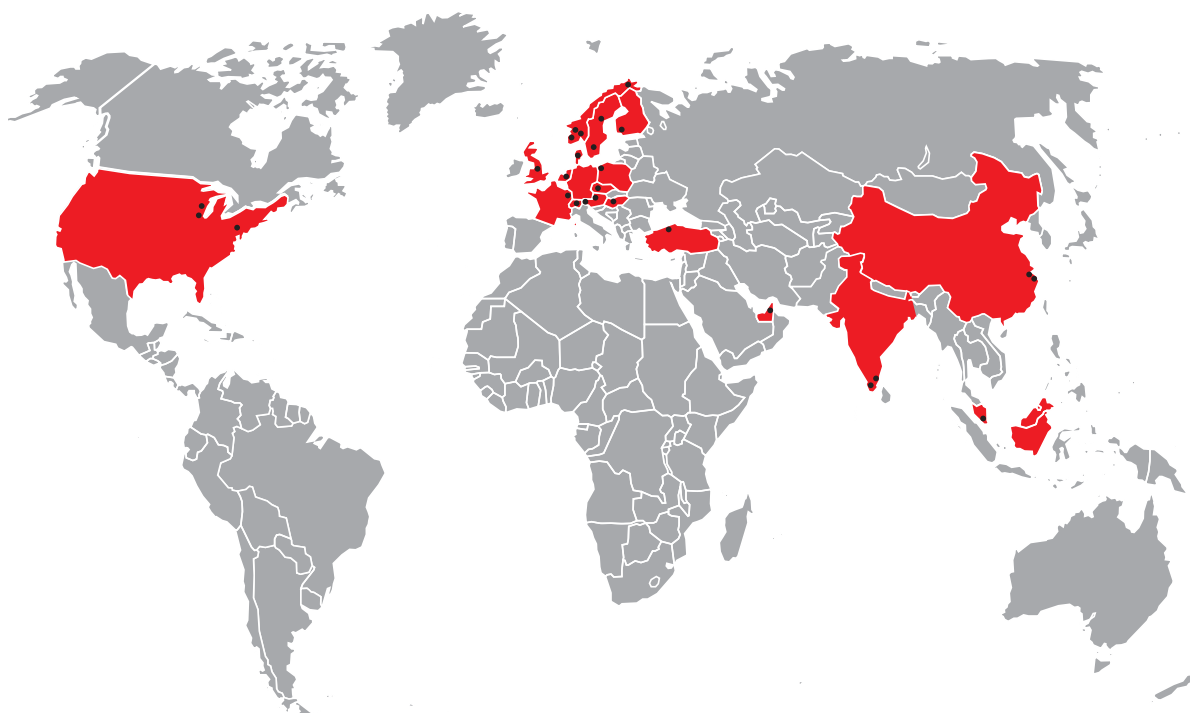
Only special constructions are non-returnable. All other products can be returned if freight is prepaid, if they are unused and in a reasonable condition. We will only charge a small processing fee.



Material surcharge

The currently very unstable price situation on the world steel markets might make it necessary to impose a material surcharge on certain products. Anyway as world market leader we will try to keep prices stable during the validity period of our price lists.

Carl Stahl companies worldwide



For the addresses of our subsidiaries please visit our Website
www.carlstahl.com

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Cylinders



Pumps



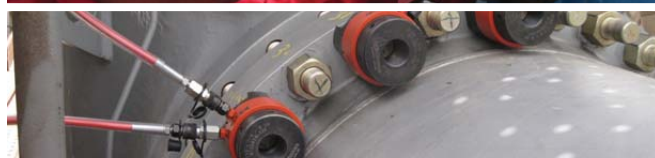
System Components



Jacks



Torque Tools



Bolt Tensioners



Hydrotest Pumps



Puller Kits



Crimpers & Cutters



Tools



Toughlift lifting systems for 50/100/150 and 200 tonnes



Heavy duty lifting and transportation

Low height, multi-purpose, hollow piston, double acting and high tonnage cylinders, sets & saddles	008	
Manual, electric, air, petrol engine driven, split flow electric pumps and accessories	026	
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Carl Stahl - Your partner for hydraulic tools

Hydraulic systems are used in a variety of industries - to lift heavy loads such as machinery or to push them into the correct position, to hold in position big components such as bridge elements or when flanges must be set. Not only in the setting up of structures, but also while dismantling, hydraulics products are used to loosen or force open, for example tight connections with the aid of tools.

Carl Stahl offers you a comprehensive quality range of hydraulic tools, as well as the appropriate inspection, maintenance and repair services close to you.

Hi-Force[®] HYDRAULIC TOOLS

Our hydraulic cylinders, hydraulic tools and associated pumps and accessories are manufactured by our partner Hi-Force at a very high level of vertical integration in Daventry (UK). These products are of the highest quality and offer an unbeatable price-performance ratio. See for yourself!

Your advantages at a glance:

- "Made in UK" quality
- Compatible with all 700 bar systems
- Inspection, maintenance and repair close to you



With our partner JUNG Hebeteknik and their products in the field of lifting and moving of loads, we complete our range of "Made in Germany" products on offer for you. With an operating pressure of 520 bars, our specially designed hydraulic hoist lifts machinery and other loads that can then be moved with the JUNG moving systems. These can be equipped with different rollers, depending on the indoor conditions at your place, such as normal steel rollers or specially coated rollers with JUWATHAN.



MADE IN GERMANY

Selection Table for Hi-Force Standard Range Cylinders

Choice of 124 standard cylinder models and unlimited specials made to order, Hi-Force will provide the best cylinder for the job !

stroke Cylinder in mm	Nominal lifting capacity of cylinder in tonnes												
	4.5	10 to 11	14.5 to 20	23 to 32	33 to 37	50 to 52	61 to 73	102 to 110	147 to 152	200 to 260	320 to 398	520 to 800	1000
4.5	HPS50	HVL10	HVL20	HVL30		HVL50		HVL100					
10		HPS100											
11			HPS200										
12				HPS300									
15						HPS500							
16	HPS51						HPS750	HPS1000	HPS1500				
25	HSS51	HSS101						HLS1001					
25		HHS101		HLS301		HLS501			HLS1501				
40		HLS101											
44			HLS201										
45									HFL1502	HFL2502	HFL4002	HFL5002	
50	HSS52	HHS102	HSS152	HHS202	HHS302			HFL1002	HLS1502	HFG2002			
51					HHR302	HSS502							
51			HHA182	HSS252	HHA372	HFL502							
56		HSS102											
60				HLS302		HLS502		HLS1002					
75	HSS53												
76							HHS603	HHS1003					
76							HHR603	HHR1003					
100	HSS54	HSS104	HSS154					HFG1004	HFG1504				
102				HSS254		HSS504							
102						HFG504		HSS1004					
105						HHA504							
125	HSS55												
150		HSS106	HSS156	HHS206	HHR306	HFG506		HFG1006					
150				HSS256			HHS606	HHS1006	HFG1506		HFG3006		
151											HFG4006		
152		HHS106		HDA256		HSS506	HSS756	HDA1006		HDA2006	HDA3006	HDA5006	
152				HAS306	HHS306	HDA506	HHR606	HHR1006	HDA1506	HFG2006	HDA4006	HFG5006	HDA10006
152						HAS506		HAS1006	HSG1506	HSG2006		HDA8006	HFG10006
152												HFG8006	
153								HSS1006			HSG3006		
155									HGG1506	HGG2006	HGG3006		
176	HSS57												
203						HSS508			HHR1508	HHR2508			
205				HSS308									
206		HSS108											
227	HSS59												
250		HSS1010	HSS1510	HSS2510									
254							HHR6010	HSS10010					
305		HSS1012			HHR3012				HDA15012	HDA20012			
330						HDA5013							
330						HSS5013		HDA10013					
356				HSS2514									
457				HSS2518									

Cylinder Range	Page	Main characteristics of Hi-Force cylinder range				
		Cylinder principle	Return action	Piston feature	Saddle	Stroke limiting device
HVL	11	single acting	load/gravity return	solid piston	integrated	stop ring
HPS	12	single acting	spring assisted return	solid piston	integrated	stop ring
HLS	13	single acting	spring assisted return	solid piston	integrated	stop ring
HSS	14-15	single acting	spring assisted return	solid piston	several options available	stop ring
HAS	16	single acting	spring assisted return	solid piston	flat saddle	stop ring
HHA	17	single acting	spring assisted return	hollow piston	several options available	stop ring
HHS	18	single acting	spring assisted return	hollow piston	several options available	stop ring
HHR	19	double acting	hydraulic return	hollow piston	several options available	stop ring
HDA	20	double acting	hydraulic return	solid piston	several options available	stop ring
HFL	21	single acting	load/gravity return	threaded piston & lock ring	tilting saddle	restriction port
HFG	22	single acting	load/gravity return	threaded piston & lock ring	tilting saddle	restriction port
HGG	23	single acting	load/gravity return	solid piston	tilting saddle	stop ring

CYLINDERS

Pancake Cylinders

Hi-Force
HYDRAULIC TOOLS

Carl Stahl

HVL - SINGLE ACTING VERY LOW HEIGHT PANCAKE CYLINDERS

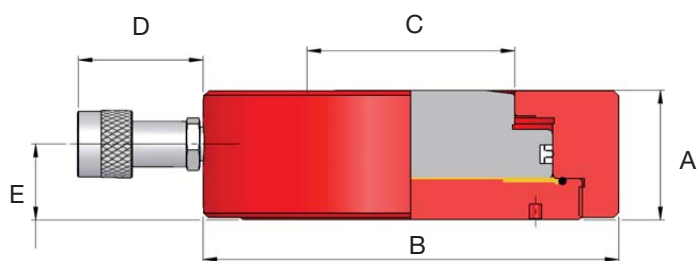
- Capacities from 10 to 104 tonnes
- Stroke length 6 mm
- Working pressure 700 Bar

The HVL pancake cylinder range combines a very low closed height with a 6mm stroke, providing a precise adjusting and lifting force in very confined work areas. Ideally suited for applications requiring alignment of machinery, turbines, heavy structures etc. All models are single acting, load return design. The base of all HVL cylinders must be fully supported during use.

- Single acting load return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals



HVL10 also available with 400 mm extension hose and coupling. Please add suffix 'H' to model no.



Note: All models, excluding HVL100, are fitted with extension nipple for required coupling clearance (drawing is without coupling extension nipple).



Did you know.....
Hi-Force HVL pancake cylinders are the lowest closed height hydraulic cylinders available on the market. If you don't have the space, we have the solution!

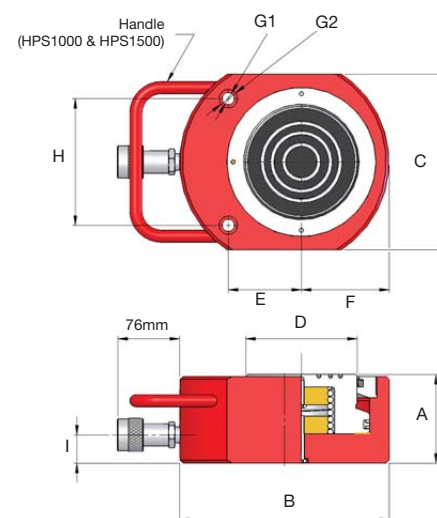
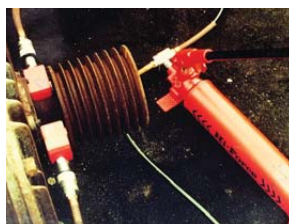
Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm					Weight kg	Item no.
					A	B	C	D	E		
HVL 10	10	6	9	14.4	28	87	38	111	16.0	1.6	78HV.L0.10
HVL 20	20	6	17	28.6	32	104	52	111	19.0	2.6	78HV.L0.20
HVL 30	32	6	27	45.6	34	120	60	111	19.5	3.0	78HV.L0.30
HVL 50	50	6	43	71.3	45	158	75	111	29.0	7.2	78HV.L0.50
HVL 100	104	6	88	146.5	65	200	100	76	37.0	15.6	78HV.L1.00

HPS - SINGLE ACTING LOW HEIGHT PAD CYLINDERS

- Capacities from 4.5 to 147 tonnes
- Stroke lengths from 6 to 16 mm
- Working pressure 700 Bar

The HPS pad cylinder range offers the best capacity, closed height and stroke length combination, spring assisted return cylinders in the industry. Ideally suited for applications where a low closed height and maximum possible stroke is of prime importance, these highly versatile cylinders are extensively used for maintenance, structural weld positioning, rigging, flange separating and many other applications.

- Single acting, spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals



Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm										Weight kg	Item no.
					A	B	C	D	E	F	G1	G2	H	I		
HPS50	4.5	6	4	6.4	32	60	38	24	20	19	5.6	9.75	26	19	0.8	78HP.S0.050
HPS51	4.5	16	10	6.4	42	60	38	24	20	19	5.6	9.75	26	19	0.9	78HP.S0.051
HPS100	10	10	14	14.4	46	81	56	38	34	28	6.8	11.25	37	19	1.6	78HP.S0.100
HPS200	20	11	31	28.6	52	100	76	51	40	39	8.8	14.25	50	19	2.6	78HP.S0.200
HPS300	32	12	55	45.6	59	115	95	60	46	48	8.8	14.25	52	19	4.2	78HP.S0.300
HPS500	50	15	107	71.3	67	140	114	70	54	60	10.8	17.25	67	20	6.6	78HP.S0.500
HPS750	73	16	164	102.7	81	165	140	82	67	70	13.0	19.00	76	21	10.4	78HP.S0.750
HPS1000	109	16	245	153.4	91	215	180	114	75	90	12.8	19.00	130	29	23.2	78HP.S1.000
HPS1500	147	16	330	206.2	100	215	191	114	83	95	13.0	19.00	117	29	28.5	78HP.S1.500

CYLINDERS

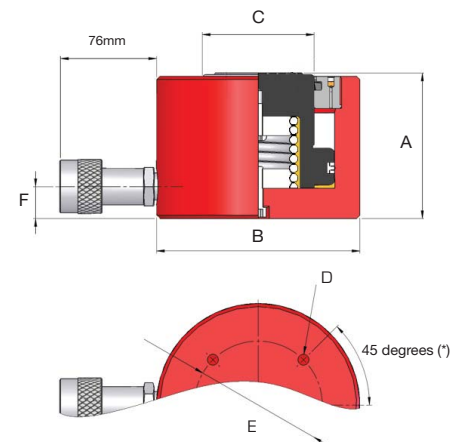
Low Height Cylinders

HLS - SINGLE ACTING LOW HEIGHT CYLINDERS

- Capacities from 10 to 147 tonnes
- Stroke lengths from 25 to 60 mm
- Working pressure 700 Bar

The HLS low height cylinder range is the most widely used Hi-Force cylinder design in the world today. All models have spring assisted return pistons and combine low closed height with optimum stroke lengths. Offering a compact, powerful force for a wide variety of applications in many industries including power generation, ship building & repair, construction, railways, mining, steel works, oil & gas and many others. The HLS range offers a compact, portable option in an inexpensive package.

- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals



(*) = HLS101 features 2 base mounting holes at 90° from coupler

Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm						Weight kg	Item no.
					A	B	C	D	E	F		
HLS101	10	40	58	14.4	95	70	38	M8	40	19	2.4	78HL.S0.101
HLS201	20	44	126	28.6	102	90	51	M8	60	19	4.8	78HL.S0.201
HLS301	32	25	114	45.6	83	102	60	M8	80	19	5.0	78HL.S0.301
HLS302	32	60	274	45.6	119	102	60	M8	80	19	7.0	78HL.S0.302
HLS501	50	25	178	71.3	91	127	70	M8	80	20	8.4	78HL.S0.501
HLS502	50	60	428	71.3	126	127	70	M8	80	20	10.4	78HL.S0.502
HLS1001	109	25	384	153.4	108	178	114	M12	140	30	19.8	78HL.S1.001
HLS1002	109	60	921	153.4	143	178	114	M12	140	30	24.0	78HL.S1.002
HLS1501	147	25	516	206.2	130	216	114	M12	165	41	37.0	78HL.S1.501
HLS1502	147	50	1031	206.2	155	216	114	M12	165	41	42.0	78HL.S1.502

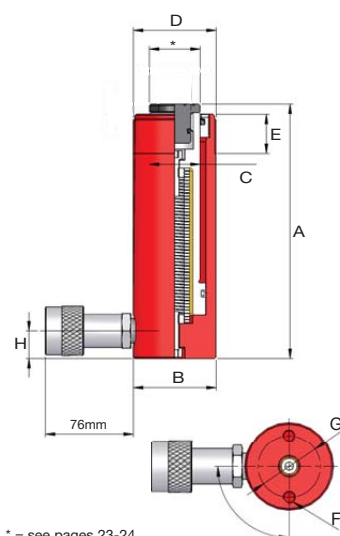
Multi-Purpose Cylinders

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS

- Capacities from 4.5 to 109 tonnes
- Stroke lengths from 25 to 457 mm
- Working pressure 700 Bar

The HSS single acting multi-purpose cylinder range offers the widest choice of stroke lengths and lifting capacities available, and provides an excellent choice for maintenance, production, fabrication and construction applications. All models are provided with a collar thread and thread protector, cylinder base and piston rod mountings for easy fixturing, making the HSS range the most versatile and adaptable multi-purpose cylinders available. Major user industries include power generation, railways, steelworks, mining, shipyards and oil & gas.

- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals
- Collar threads withstand full load
- Piston rod thread on all models up to 30t
- Base mounting holes on all models (except HSS308)
- Optional piston rod saddles (see pages 23-24)
- Collar thread protector supplied as standard



  **Lightweight aluminium alternatives available (see page 14)**

Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm (unless otherwise stated)								Weight kg	Item no.
					A	B	C	D	E	F	G	H		
HSS51	4,5	25	16	6,4	107	38	24	1 1/2"-16un	28	M6	25	19	1,0	78HS.S0.051
HSS52	4,5	50	32	6,4	132	38	24	1 1/2"-16un	28	M6	25	19	1,2	78HS.S0.052
HSS53	4,5	75	48	6,4	157	38	24	1 1/2"-16un	28	M6	25	19	1,4	78HS.S0.053
HSS54	4,5	100	64	6,4	182	38	24	1 1/2"-16un	28	M6	25	19	1,5	78HS.S0.054
HSS55	4,5	125	80	6,4	207	38	24	1 1/2"-16un	28	M6	25	19	1,8	78HS.S0.055
HSS57	4,5	176	113	6,4	258	38	24	1 1/2"-16un	28	M6	25	19	2,0	78HS.S0.057
HSS59	4,5	227	146	6,4	308	38	24	1 1/2"-16un	28	M6	25	19	2,4	78HS.S0.059
HSS101	10	25	36	14,4	100	57	35	2 1/4"-14un	27	M8	40	19	1,8	78HS.S0.101
HSS102	10	56	81	14,4	131	57	35	2 1/4"-14un	27	M8	40	19	2,4	78HS.S0.102
HSS104	10	100	144	14,4	175	57	35	2 1/4"-14un	27	M8	40	19	3,0	78HS.S0.104
HSS106	10	150	217	14,4	225	57	35	2 1/4"-14un	27	M8	40	19	4,2	78HS.S0.106
HSS108	10	206	297	14,4	281	57	35	2 1/4"-14un	27	M8	40	19	5,0	78HS.S0.108
HSS1010	10	250	361	14,4	325	57	35	2 1/4"-14un	27	M8	40	19	5,4	78HS.S1.010
HSS1012	10	305	440	14,4	379	57	35	2 1/4"-14un	27	M8	40	16	6,2	78HS.S1.012

CYLINDERS

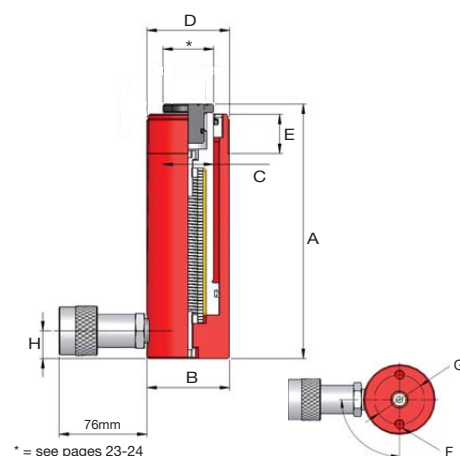
Multi-Purpose Cylinders

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS

- Spring assisted return
- Nitrocarburised piston rod
- Working pressure 700 Bar
- Capacities from 4.5 to 109 tonnes
- Stroke lengths from 25 to 457 mm
- Low friction bearing surfaces
- Anti-extrusion seals
- Collar threads withstand full load
- Piston rod thread on all models up to 30 t
- Base mounting holes on all models (except HSS308)
- Optional piston rod saddles (see pages 23-24)
- Collar thread protector supplied as standard



Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm (unless otherwise stated)								Weight kg	Item no.
					A	B	C	D	E	F	G	H		
HSS152	14,5	50	101	20.3	154	70	41	2 3/4"-16un	39	M10	48	19.0	3.4	78HS.S0.052
HSS154	14.5	100	203	20.3	204	70	41	2 3/4"-16un	39	M10	48	19.0	5.0	78HS.S0.054
HSS156	14.5	150	304	20.3	254	70	41	2 3/4"-16un	39	M10	48	19.0	6.6	78HS.S0.156
HSS1510	14.5	250	507	20.3	354	70	41	2 3/4"-16un	39	M10	48	19.0	8.8	78HS.S1.510
HSS252	25	51	178	34.9	174	86	54	3 5/16"-12un	49	M12	60	25.0	6.5	78HS.S0.252
HSS254	25	102	356	34.9	225	86	54	3 5/16"-12un	49	M12	60	25.0	8.0	78HS.S0.254
HSS256	25	150	524	34.9	273	86	54	3 5/16"-12un	49	M12	60	25.0	9.6	78HS.S0.256
HSS2510	25	250	874	34.9	374	86	54	3 5/16"-12un	49	M12	60	25.0	12.6	78HS.S2.510
HSS2514	25	356	1242	34.9	480	86	54	3 5/16"-12un	49	M12	60	25.0	16.8	78HS.S2.514
HSS2518	25	457	1597	34.9	611	86	54	3 5/16"-12un	49	M12	60	25.0	21.4	78HS.S2.518
HSS308	29	205	860	41.9	374	102	57	3 5/16"-12un	50	-	-	50.0	18.6	78HS.S0.308
HSS502	50	51	364	71.3	150	127	79	5"-12un	55	M12	85	20.0	13.0	78HS.S0.502
HSS504	50	102	728	71.3	201	127	79	5"-12un	55	M12	85	20.0	16.8	78HS.S0.504
HSS506	50	152	1084	71.3	251	127	79	5"-12un	55	M12	85	20.0	20.0	78HS.S0.506
HSS508	50	203	1448	71.3	302	127	79	5"-12un	55	M12	85	20.0	23.2	78HS.S0.508
HSS5013	50	330	2354	71.3	429	127	79	5"-12un	55	M12	85	20.0	33.6	78HS.S5.013
HSS756	73	152	1561	102.7	272	146	95	5 3/4"-12un	45	M12	115	31.5	31.0	78HS.S0.756
HSS1004	109	102	1565	153.4	223	185	114	6 7/8"-12un	50	M12	146	32.0	41.6	78HS.S1.004
HSS1006	109	153	2347	153.4	274	185	114	6 7/8"-12un	50	M12	146	32.0	49.8	78HS.S1.006
HSS10010	109	254	3896	153.4	375	185	114	6 7/8"-12un	50	M12	146	32.0	65.5	78HS.S1.0010

CYLINDERS

Aluminium Cylinders

HAS - SINGLE ACTING LIGHTWEIGHT ALUMINIUM CYLINDERS

- Capacities from 32 to 110 tonnes
- Stroke length 152 mm
- Working pressure 700 Bar

The HAS range of single acting, lightweight, aluminium cylinders is specifically designed for applications where weight and ease of positioning are features of prime importance. With an average weight of approximately 50% of comparable capacity steel construction cylinders, all models are supplied with a hard anodised, wear resistant, piston rod and cylinder body and a steel cylinder base protection plate. Available lifting capacities range from 32 to 110 tonnes capacity, at maximum working pressure of 700 Bar. All models are commonly used in a wide variety of industrial applications in shipyards, steel mills, construction and power plants. Other capacities and stroke length options available on request.

- Spring assisted return
- Hard anodised piston rod and cylinder
- Steel base plate to protect cylinder body
- Low friction bearing surfaces
- Optional piston rod saddles (see pages 23-24)

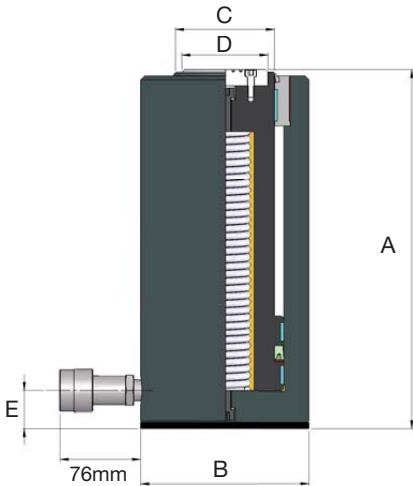


Please Note

Aluminum cylinders offer the benefit of greatly reduced weight compared to conventional steel cylinders. However, due to the inherent nature of the material, are not recommended for use in high cycle production applications. The recommended life cycle is estimated at approximately 5000 operations at maximum pressure, which in most lifting and maintenance applications represents a more than acceptable period of usage.



HAS1006



Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm (unless otherwise stated)					Weight kg	Item no.
					A	B	C	D	E		
HAS306	32	152	672	44.2	282	104	60	50	20	6.0	78HA.S0.306
HAS506	51	152	1077	70.9	287	135	80	70	25	9.0	78HA.S0.506
HAS1006	110	152	2340	153.9	317	195	110	100	35	23.0	78HA.S1.006



Note:
Other capacities and stroke lengths available on request

CYLINDERS

Multi-Purpose Cylinders

HHA - SINGLE ACTING HOLLOW PISTON ALUMINIUM CYLINDERS

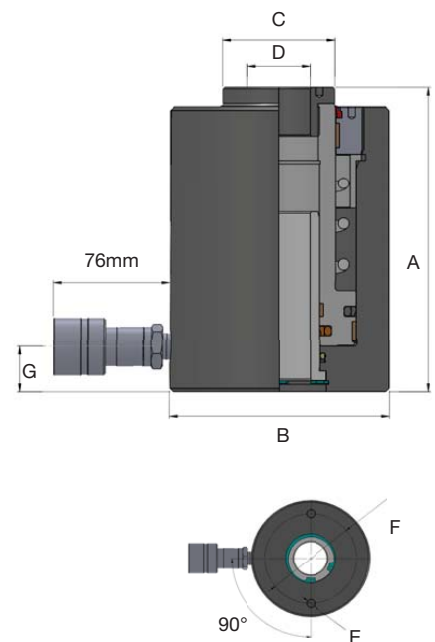
- Capacities from 18 to 52 tonnes
- Stroke lengths from 51 to 105 mm
- Working pressure 700 Bar

The HHA range of single acting hollow piston aluminium cylinders are specifically designed for applications where weight and ease of positioning are of prime importance. Similar in design to the HHS range, the HHA cylinder models have a hollow piston to enable a rod or cable to be passed through the entire cylinder length making it suitable for applications where a pulling force is required. All models are supplied with a hard anodised, wear resistant, piston rod and cylinder body and a steel cylinder base protection plate. Available lifting capacities range from 18 to 52 tonnes, at maximum working pressure of 700 Bar.

- Spring assisted return
- Hard anodised piston rod and cylinder
- Steel base plate to protect cylinder body
- Low friction bearing surfaces
- Optional piston rod saddles (see pages 23-24)



HHA504



Please Note

Aluminium cylinders offer the benefit of greatly reduced weight compared to conventional steel cylinders. However, due to the inherent nature of the material, are not recommended for use in high cycle production applications. The recommended life cycle is estimated at approximately 5000 operations at maximum pressure, which in most lifting and maintenance applications represents a more than acceptable period of usage.

Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm (unless otherwise stated)							Weight kg	Item no.
					A	B	C	D	E	F	G		
HHA182	18	51	129	25.2	175	98	45	26	M8x10	66.0	26	3.6	78HHA182
HHA372	37	51	266	52.1	193	136	69	39	M10x15	105.0	32	7.2	78HHA372
HHA504	52	105	765	72.8	280	160	79	51	M10x15	130.2	39	13.4	78HHA504

HHS - SINGLE ACTING HOLLOW PISTON CYLINDERS

- Capacities from 11 to 102 tonnes
- Stroke lengths from 25 to 152 mm
- Working pressure 700 Bar

The HHS single acting hollow piston cylinder range is extremely versatile for use in tooling, maintenance and tensioning applications. Specifically designed with a hollow piston to enable a rod or cable to be passed through the entire cylinder length for applications where a pulling force is required, the HHS range is used extensively in post-tensioning and pre-stressing applications as well as testing of various bonded or mechanical anchoring systems. HHS cylinders can also be used for general lifting applications, when fitted with readily available interchangeable hardened steel piston rod saddles.

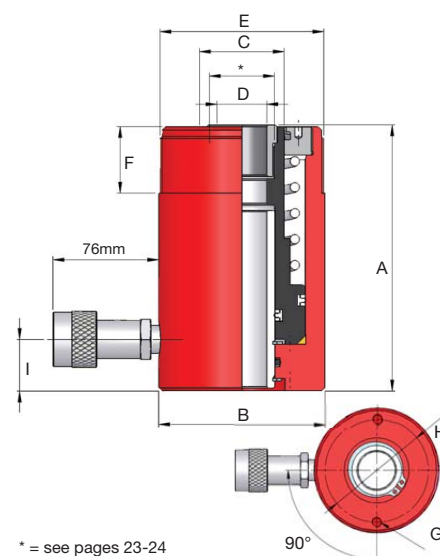
- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals
- Optional piston rod saddles (see pages 23-24)
- Collar thread protector supplied as standard



HHS302



HHS202



Type	Capacity tonnes	Stroke mm	Oil cap. cm³	Cyl. eff. area cm²	Dimensions in mm (unless otherwise stated)										Weight kg	Item no.
					A	B	C	D	E	F	G	H	I			
HHS101	11	25	39	15.8	110	70	38	20	2 3/4"-16un	30	M8	51	19	2.8	78HH.S0.101	
HHS102	11	50	79	15.8	140	70	38	20	2 3/4"-16un	30	M8	51	19	3.0	78HH.S0.102	
HHS106	11	152	240	15.8	297	70	38	20	2 3/4"-16un	30	M8	51	19	10.2	78HH.S0.106	
HHS202	23	50	167	33.3	160	100	51	30	3 7/8"-12un	40	M8	82.5	31	7.0	78HH.S0.202	
HHS206	23	150	500	33.3	306	100	51	30	3 7/8"-12un	40	M8	82.5	31	13.8	78HH.S0.206	
HHS302	33	50	233	46.7	165	115	60	35	4 1/2"-12un	40	M8	92	31	10.6	78HH.S0.302	
HHS306	33	152	710	46.7	320	115	60	35	4 1/2"-12un	40	M8	92	31	19.2	78HH.S0.306	
HHS603	61	76	651	85.7	226	160	92	55	6 1/4"-12un	59	M12	130	31	28.0	78HH.S0.603	
HHS606	61	150	1285	85.7	315	160	92	55	6 1/4"-12un	59	M12	130	31	40.6	78HH.S0.606	
HHS1003	102	76	1088	143.1	276	213	127	81	8 3/8"-12un	60	M16	178	45	64.0	78HH.S1.003	
HHS1006	102	150	2147	143.1	350	213	127	81	8 3/8"-12un	60	M16	178	45	75.0	78HH.S1.006	

CYLINDERS

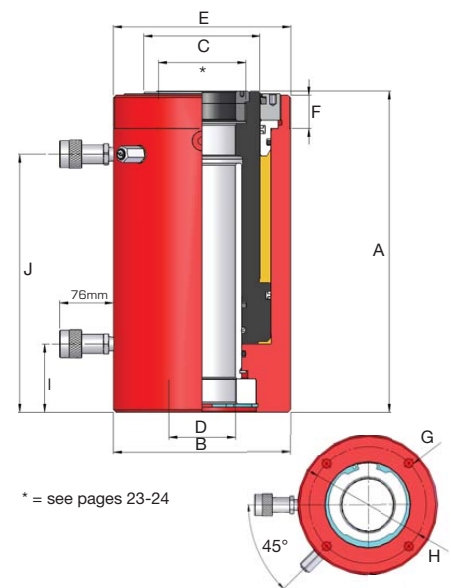
Piston Cylinders

HHR - DOUBLE ACTING HOLLOW PISTON CYLINDERS

- Capacities from 33 to 247 tonnes
- Stroke lengths from 51 to 305 mm
- Working pressure 700 Bar

The HHR double acting hollow piston cylinder range incorporates all of the design features of the HHS range with the added benefit of double acting design, which greatly enhances speed of operation and performance particularly in the longer length stroke options. Additionally a substantial hydraulic pulling force is available in the piston retraction mode of operation. Standard range models are featured in this catalogue, however other stroke and tonnage options are available on request.

- Double acting design
- Nitrocarburised piston rod
- Annular area overload protection valve
- Low friction bearing surfaces
- Anti-extrusion seals
- Optional piston rod saddles (see pages 23-24)
- Collar thread protector supplied as standard



Type	Capacity tonnes		Stroke mm	Oil cap. cm³	Cyl. eff. area cm²	Dimensions in mm (unless otherwise stated)										Weight kg	Item no.
	Push	Pull				A	B	C	D	E	F	G	H	I	J		
HHR302	33	24	51	238	46.7	180	115	60.3	35	4 1/2"-12un	40	M8	92	28	119	12.2	78HH.R0.302
HHR306	33	24	150	701	46.7	279	115	60.3	35	4 1/2"-12un	40	M8	92	28	218	17.6	78HH.R0.306
HHR3012	33	24	305	1424	46.7	434	115	60.3	35	4 1/2"-12un	40	M8	92	28	373	25.7	78HH.R3.012
HHR603	61	38	76	652	85.7	239	160	92	55	6 1/4"-12un	45	M12	130	31	166	30.6	78HH.R0.603
HHR606	61	38	152	1304	85.7	315	160	92	55	6 1/4"-12un	45	M12	130	31	242	41.6	78HH.R0.606
HHR6010	61	38	254	2179	85.7	417	160	92	55	6 1/4"-12un	45	M12	130	31	344	52.5	78HH.R6.010
HHR1003	102	43	76	1087	143.1	310	213	140	80	8 3/8"-12un	40	M16	178	82	234	68.5	78HH.R1.003
HHR1006	102	43	152	2174	143.1	386	213	140	80	8 3/8"-12un	40	M16	178	82	310	90.0	78HH.R1.006
HHR1508	152	71	203	4320	212.8	503	270	184	102	n/a	n/a	n/a	n/a	98	389	170.0	78HH.R1.508
HHR2508	247	76	203	7039	346.5	505	350	254	150	n/a	n/a	n/a	n/a	98	389	269.0	78HH.R2.508



Note :
33 & 61 tonne models feature 2 base mounting holes at 90° from coupler

CYLINDERS

High Tonnage Cylinders

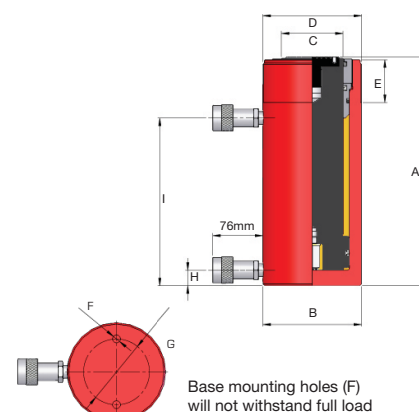
HDA - DOUBLE ACTING HIGH TONNAGE CYLINDERS

- Capacities from 25 to 1012 tonnes
- Stroke lengths from 152 to 330 mm
- Working pressure 700 Bar

The HDA double acting cylinder range offers the utmost in versatility and durability. Specifically designed for heavy duty lifting, construction and maintenance applications as well as presswork and industrial production, the double acting design provides substantial pulling force in the piston retraction mode as well as providing fast, controlled retraction for continuous duty cycle operation. All models up to 203 tonnes are supplied with flat saddle, piston rod threads and collar threads as standard. Models from 326 tonnes and upwards are supplied without collar thread and piston rod thread, however include replaceable tilting saddle as standard.

- Internal annular area overload protection valve Low friction bearing surfaces
- Nitrocarburised piston rod
- Anti-extrusion seals
- Lifting ring as standard on models from 50 to 109 tonnes Eyebolts as standard on models from 152 to 1012 tonnes
- Base mounting holes*

*Base mounting holes are for location of cylinder only. They are not designed to resist the full capacity of the cylinder



**Optional piston rod saddles
on pages 23-24**

Type	Capacity tonnes		Stroke mm	Oil cap. cm³	Cyl. eff. area cm²	Dimensions in mm (unless otherwise stated)										Weight kg	Item no.
	Push	Pull				A	B	C	D	E	F*	G	H	I			
HDA256	25	10	152	0.53	34.9	287	92	50	3 5/16"-12un	53	M10	60	30	212	15.0	78HD.A0.256	
HDA506	50	15	152	1.08	71.3	295	127	79	5"-12un	55	M12	85	20	216	28.4	78HD.A0.506	
HDA5013	50	15	330	2.35	71.3	473	127	79	5"-12un	55	M12	85	20	394	42.6	78HD.A5.013	
HDA1006	109	36	152	2.33	153.3	304	185	114	6 7/8"-12un	51	M12	146	30	226	64.5	78HD.A1.006	
HDA10013	109	36	330	5.06	153.3	482	185	114	6 7/8"-12un	51	M12	146	30	404	89.0	78HD.A1.0013	
HDA1506	152	79	152	3.26	214.2	310	210	114	8"-12un	55	M16	160	35	231	90.0	78HD.A1.506	
HDA15012	152	79	305	6.53	214.2	463	210	114	8"-12un	55	M16	160	35	384	120.5	78HD.A1.5012	
HDA2006	203	94	152	4.33	285.2	327	254	140	9 3/4"-12un	65	M20	185	43	238	129.8	78HD.A2.006	
HDA20012	203	94	305	8.69	285.2	480	254	140	9 3/4"-12un	65	M20	185	43	391	167.4	78HD.A2.0012	
HDA3006	326	-	152	6.95	457.4	409	312	165	optional	optional	M20	158	50	262	193.0	78HD.A3.006	
HDA4006	398	-	152	8.49	558.9	431	360	216	optional	optional	M24	203	55	277	286.0	78HD.A4.006	
HDA5006	520	-	152	11.09	729.9	470	397	203	optional	optional	M24	203	65	300	372.0	78HD.A5.006	
HDA8006	809	-	152	17.28	1134.1	535	500	300	optional	optional	Optional	Optional	70	318	650.0	78HDA8006	
HDA10006	1012	-	152	21.62	1419.3	590	540	320	optional	optional	Optional	Optional	99	357	900.0	78HDA10006	



Note:
Other capacities and stroke lengths
available on request

CYLINDERS

Lock Ring Cylinders

HFL - SINGLE ACTING LOW HEIGHT FAILSAFE LOCK RING CYLINDERS

- Capacities from 50 to 520 tonnes
- Stroke lengths from 45 to 51 mm
- Working pressure 700 Bar

The HFL low height single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support, offering a sustainable lifting force in very confined work areas. Ideally suited for applications requiring load holding for extended periods, such as bridge support work. The HFL range features a single acting load return piston, threaded throughout its stroke length to suit the threaded mechanical load holding lock ring. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard.

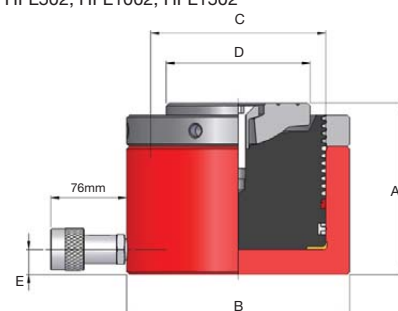
- Single acting load return design
- Nitrocarburised cylinder and piston rod
- Low friction bearing surfaces
- Anti-extrusion seals
- Tilting saddle fitted as standard
- Overstroke restrictor port
- See pages 26-45 for pumps suitable for use with all Hi-Force cylinders
- Saddle and piston rod details, see pages 23-24

For easy rotation of the load holding locking ring, Hi-Force recommends the purchase of tommy bar(s). Model numbers of suitable tommy bars are listed in below table.

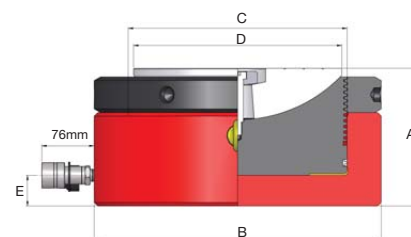


HFL1002

HFL502, HFL1002, HFL1502



HFL2502, HFL4002 & HFL5002



Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Tommy bar	Dimensions in mm					Weight kg	Item no.
HFL502	50	51	0.36	71.3	TTB10	A	B	C	D	E		
HFL1002	109	50	0.77	153.4	TTB10	125	127	95	70	19	14.2	78HFL0.502
HFL1502	152	45	1.07	214.3	TTB10	137	185	140	115	20	27.9	78HFL1.002
HFL2502	260	45	1.65	366.1	TTB14	150	216	165	135	28	44.0	78HFL1.502
HFL4002	398	45	2.51	559.0	TTB16	159	273	216	200	31	69.4	78HFL2.502
HFL5002	520	45	3.29	729.9	TTB16	178	360	267	260	36	121.0	78HFL4.002
						192	400	305	290	43	186.0	78HFL5.002

CYLINDERS

Lock Ring Cylinders

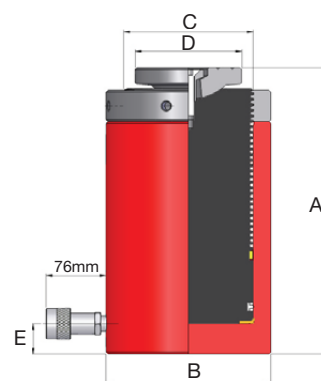
HFG - SINGLE ACTING FAILSAFE LOCK RING CYLINDERS

- Capacities from 50 to 1012 tonnes
- Stroke lengths from 50 to 152 mm
- Working pressure 700 Bar

The HFG single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support. Ideally suited for applications requiring sustained load holding for extended periods, such as bridge support work, the HFG range features a single acting, load return piston, threaded throughout its stroke length to suit the threaded mechanical load holding lock ring. Simply jack up the load, wind down the mechanical lock ring until it comes into contact with the cylinder body, release the hydraulic pressure and sustain the load mechanically. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard to reduce the risk of side loading the cylinder.

- Single acting load return design
- Nitrocarburised cylinder and piston rod for corrosion protection
- Low friction bearing surfaces
- Anti-extrusion seals
- Tilting saddle fitted as standard
- Overstroke restrictor port
- Saddle and piston rod details, see pages 23-24

For easy rotation of the load holding locking ring, Hi-Force recommends the purchase of tommy bar(s). Model numbers of suitable tommy bars are listed in below table.



Type	Capacity tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm ²	Tommy bar	Dimensions in mm					Weight kg	Item no.
						A	B	C	D	E		
HFG504	50	102	0.73	71.3	TTB10	224	127	95	70	25.0	20.6	78HF.G0.504
HFG506	50	150	1.07	71.3	TTB10	272	128	95	70	25.0	25.0	78HF.G0.506
HFG1004	109	100	1.53	153.4	TTB10	240	185	140	115	27.5	50.3	78HF.G1.004
HFG1006	109	150	2.30	153.4	TTB10	311	185	140	115	27.5	65.4	78HF.G1.006
HFG1504	152	100	2.14	214.3	TTB10	288	216	165	135	42.0	84.0	78HF.G1.504
HFG1506	152	150	3.21	214.3	TTB10	338	216	165	135	42.0	89.5	78HF.G1.506
HFG2002	203	50	1.42	285.1	TTB14	261	254	190	135	50.0	95.4	78HF.G2.002
HFG2006	203	152	4.33	285.1	TTB14	362	254	190	135	50.0	137.0	78HF.G2.006
HFG3006	326	150	6.87	457.7	TTB14	417	310	241	150	50.0	228.5	78HF.G3.006
HFG4006	398	151	8.44	559.0	TTB14	459	360	267	180	70.0	308.5	78HF.G4.006
HFG5006	520	152	11.10	729.9	TTB16	498	400	305	180	80.0	457.0	78HF.G5.006
HFG8006	809	152	17.47	1134.1	TTB16	565	480	380	340	80.0	735.0	78HFG8006
HFG10006	1012	152	21.61	1419.3	TTB20	620	540	425	340	90.0	1016.0	78HFG10006

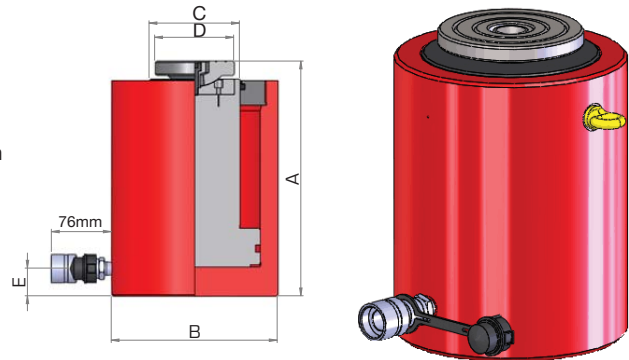


Note:
Other capacities and stroke lengths
available on request

HGG - SINGLE ACTING LOAD RETURN INDUSTRIAL CYLINDERS

- Capacities from 152 to 326 tonnes
- Stroke length 155 mm
- Working pressure 700 Bar

The HGG range of load return industrial cylinders is specifically designed for lifting and maintenance applications. All models are supplied with a tilting saddle to reduce the risk of damage caused by side loading and an integral stop ring for stroke limitation is fitted as standard. Standard range models are featured in this catalogue, however additional capacities and stroke options are available on request.

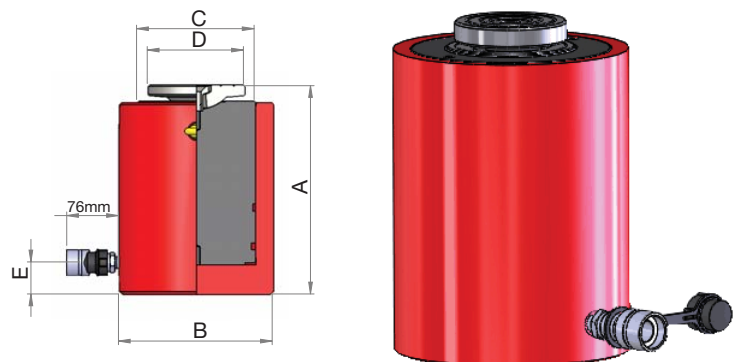


Type	Capacity tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm ²	Dimensions in mm					Weight kg	Item no.
					A	B	C	D	E		
HGG1506	152	155	3.32	214.3	297	210	114	100	37	58.3	78HGG1506
HGG2006	203	155	4.63	285.1	310	254	140	135	50	95.3	78HGG2006
HGG3006	326	155	7.10	457.7	343	312	165	150	50	153.5	78HGG3006

HSG - SINGLE ACTING LOAD RETURN CONSTRUCTION CYLINDERS

- Capacities from 152 to 326 tonnes
- Stroke length 152 to 153 mm
- Working pressure 700 Bar

The HSG range of single acting load return construction cylinders is ideally suited for construction, civil engineering, heavy fabrication and maintenance applications. All models are supplied with a tilting saddle fitted as standard and have an overstroke restrictor port to prevent over extension of the piston. Standard range models are featured in this catalogue, however additional capacities and stroke options are available on request.



Type	Capacity tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm ²	Dimensions in mm					Weight kg	Item no.
					A	B	C	D	E		
HSG1506	152	152	3.21	214.3	293	216	165.1	135	45	77.5	78HSG1506
HSG2006	203	152	4.34	285.1	296	254	190.5	135	45	107.7	78HSG2006
HSG3006	326	153	6.99	457.7	326	312	241.3	150	50	175.2	78HSG3006

HPC - SINGLE ACTING PULL CYLINDERS

- Capacities from 10 to 50 tonnes
- Stroke length 152 mm
- Working pressure 700 Bar

The HPC pull cylinder range comprises of four models, with capacities ranging from 10 tonnes to 50 tonnes of pulling force. All models are 700 Bar maximum working pressure and feature a single acting, spring assisted return piston, with a 152mm stroke length. Fitted with easily replaceable machined pulling eyes on the piston rod and cylinder base, the 10 tonnes capacity version can also be supplied with clevis eye attachments. Typical applications for HPC pull cylinders are plate alignment prior to welding in shipyards, cable tensioning and heavy load moving using chains or wire ropes.

- Spring assisted return
- Surface treated piston rod
- Replaceable pulling and clevis eyes
- Piston wiper prevents contamination

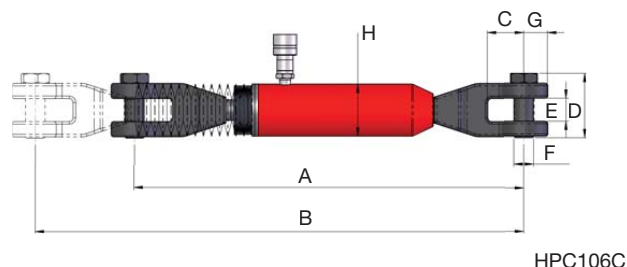


Hand and powered pumps suitable for use with HPC range pull cylinders are detailed on pages 26 to 45

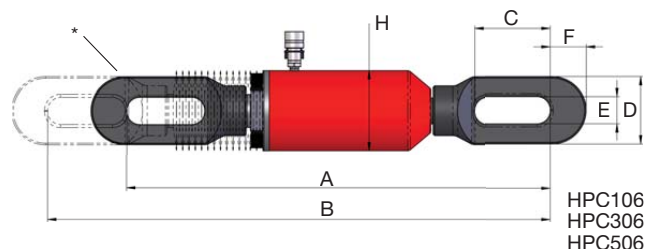
Protective bellows are fitted as standard



HPC106 c/w bellows



HPC106C



HPC106
HPC306
HPC506

* Eye bolt thickness: HPC106 = 22 mm, HPC306 = 35 mm, HPC506 = 40 mm

Type	Capacity tonnes	Stroke mm	Oil cap. cm ³	Cyl. eff. area cm ²	Dimensions in mm (unless otherwise stated)								Weight kg	Item no.
					A	B	C	D	E	F	G	H		
HPC106	10	152	228	15.0	600	752	114	67	32	33	-	80	12.0	78HP.C0.106
HPC106C	10	152	228	15.0	602	754	58	99	35	30	36	80	15.5	78HP.C0.106C
HPC306	30	152	636	41.8	695	847	145	105	42	50	-	122	31.0	78HP.C0.306
HPC506	50	152	1078	71.0	819	971	149	130	52	69	-	153	54.0	78HP.C0.506

CYLINDERS

Cylinder Saddles

CYLINDER SADDLES & PISTON ROD THREAD SPECIFICATIONS

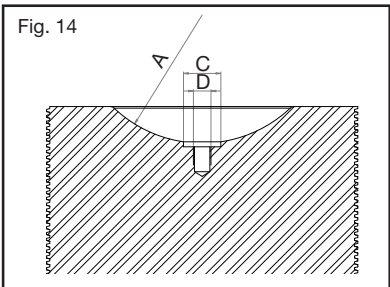
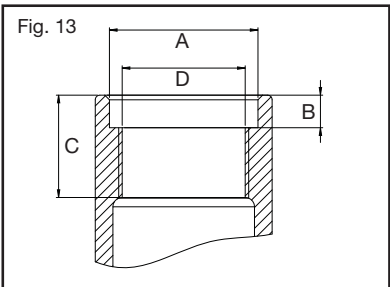
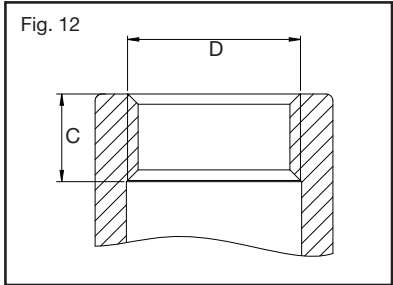
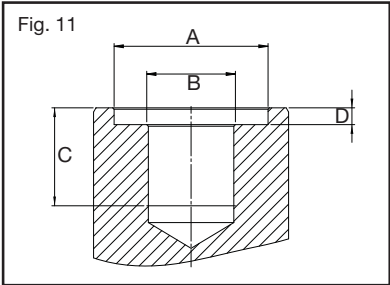
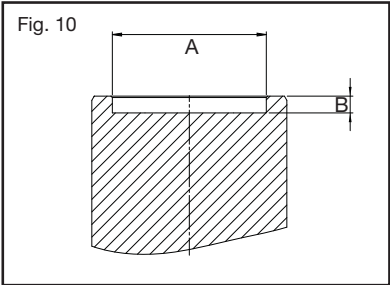
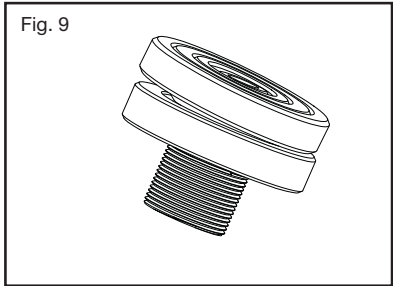
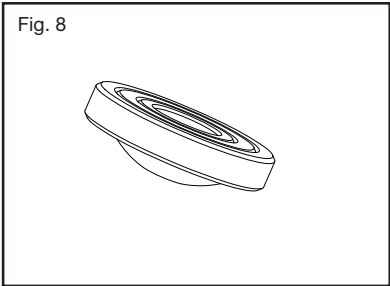
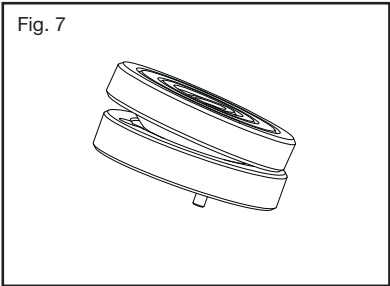
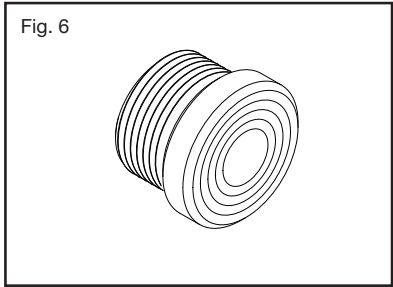
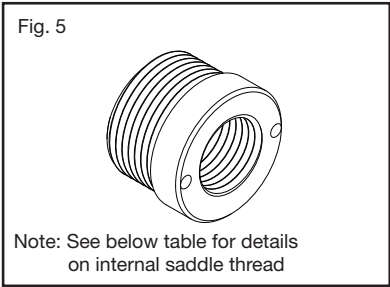
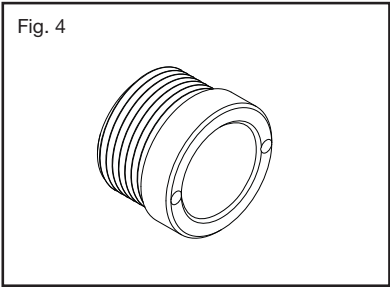
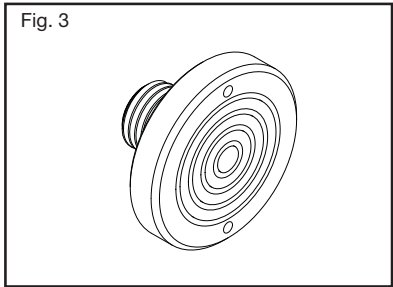
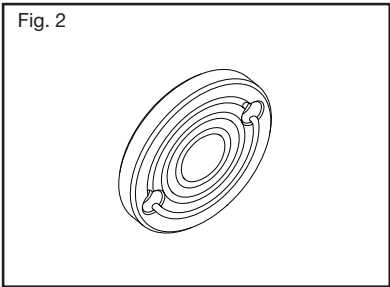
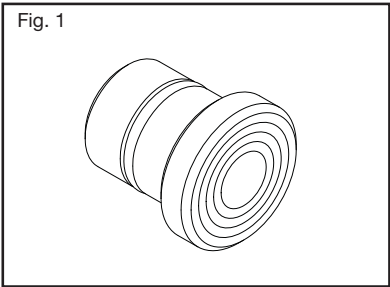
Cylinder Range	Saddles			
	Standard Saddle		Optional Saddle	
	Model No.	Figure	Model No.	Figure
HSS Cylinder Range				
HSS5	HA5	1	-	-
HSS10	HA10	1	HAT10	9
HSS15	HA15	1	HAT10	9
HSS25	HA25	1	HAT25	9
HSS30	HA30	1	HAT25	9
HSS50	HA50	2	HAT50	7
HSS75	HA75	2	HAT75	7
HSS100	HA100	2	HAT100	7
HAS Cylinder Range				
HAS30	HA30	2	HAT30	7
HAS50	HA50	2	HAT50	7
HAS100	HA100	2	HAT100	7
HHS Cylinder Range				
HHS11	HA102	4	HA102T, HA102G	5,6
HHS23	HA202	4	HA202T, HA202G	5,6
HHS33	HA302	4	HA302T, HA302G	5,6
HHS61	HA603	4	HA603T, HA603G	5,6
HHS102	HA1003	4	HA1003T, HA1003G	5,6
HHA Cylinder Range				
HHA18	HA18	4	HA18T	5
HHA37	HA37	4	HA37T	5
HHA50	HA50	4	HA50T	5
HHR Cylinder Range				
HHR33	HA302	4	HA302T, HA302G	5,6
HHR61	HA603	4	HA603T, HA603G	5,6
HHR102	HA1003	4	HA1003T, HA1003G	5,6
HHR150	HA1508	4	HA1508G	6
HHR250	HA2508	4	HA2508G	6
HDA Cylinder Range				
HDA25	HD25	3	HD25T	9
HDA50	HD50	3	HD50T	9
HDA100	HD100	3	HD100T	9
HDA150	HD150	3	HD150T	9
HDA200	HD200	3	HD200T	9
HDA300	HD300T	7	HD300	2
HDA400	HD400T	7	HD400	2
HDA500	HD500T	7	HD500	2
HDA800	TS800	8	-	-
HDA1000	TS1000	8	-	-
HFG Cylinder Range				
HFG50	TS50	8	-	-
HFG100	TS100	8	-	-
HFG150	TS150	8	-	-
HFG200	TS200	8	-	-
HFG300	TS300	8	-	-
HFG400	TS400	8	-	-
HFG500	TS500	8	-	-
HFG800	TS800	8	-	-
HFG1000	TS1000	8	-	-
HFL Cylinder Range				
HFL50	TS50	8	-	-
HFL100	TS100	8	-	-
HFL150	TS150	8	-	-
HFL250	TS250	8	-	-
HFL400	TS400	8	-	-
HFL500	TS500	8	-	-
HGG Cylinder Range				
HGG150	TS150	8	-	-
HGG200	TS201	8	-	-
HGG300	TS301	8	-	-
HSG Cylinder Range				
HSG150	TS150	8	-	-
HSG200	TS201	8	-	-
HSG300	TS302	8	-	-

Piston rod thread				
Dimensions in mm			Thread Size	Figure
A	B	C	D	
-	-	20	3/4"-16UNF	12
-	-	14	1"-8UNC	12
-	-	14	1"-8UNC	12
-	-	30	1 1/2"-16UNC	12
-	-	30	1 1/2"-16UNC	12
70	11	-	-	10
80	12	-	-	10
100	12	-	-	10
50	10	-	-	10
70	11	-	-	10
100	12	-	-	10
32	7	21	M28x1.5	13
43	10	31	M39x1.5	13
52	10	31	M48x1.5	13
80	10	31	M70x1.5	13
114	12	38	M105x2	13
-	-	28	M35x1.5	12
-	-	35	M50x1.5	12
-	-	37	M60x1.5	12
52	10.0	32	M48x1.5	13
80	10.0	32	M70x1.5	13
114	12.0	38	M105x2	13
170	13.5	50	M150x3	13
242	13.5	74	M220x3	13
45	9	35	1"-12UNF	11
70	11	45	1"-12UNF	11
100	12	55	1 1/4"-12UNF	11
100	12	52	3"-16UN	11
110	12	70	2 1/2"-12UN	11
150	25	-	-	-
180	25	-	-	-
180	25	-	-	-
180	-	51	M24x3	14
180	-	51	M24x3	14
15	-	30	M8x1.25	14
18	-	60	M12x1.75	14
18	-	60	M12x1.75	14
18	-	60	M12x1.75	14
16	-	70	M10x1.5	14
17	-	125	M12x1.75	14
17	-	125	M12x1.75	14
50	-	175	M24x3	14
51	-	175	M24x3	14
15	-	31	M8x1.25	14
18	-	60	M12x1.75	14
18	-	120	M12x1.75	14
40	-	140	M10x1.5	14
40	-	180	M12x1.75	14
40	-	200	M12x1.75	14
18	-	60.0	M12x1.75	14
18	-	124.5	M12x1.75	14
21	-	95.0	M12x1.75	14
18	-	60.0	M12x1.75	14
18	-	124.5	M12x1.75	14
28	-	160.0	M22x2.5	14

CYLINDERS

Cylinder Saddles

CYLINDER SADDLES & PISTON ROD THREAD SPECIFICATIONS



Cylinder Range	Internal saddle thread specification
HA18T	M24
HA37T	M36
HA50T	M48
HA102T	3/4"-16 UNF
HA202T	1" x 8 UNC
HA302T	1 1/4"x 7 UNC
HA603T	1 5/8"x 5 1/2" UNS
HA1003T	2 1/2"x8 UN

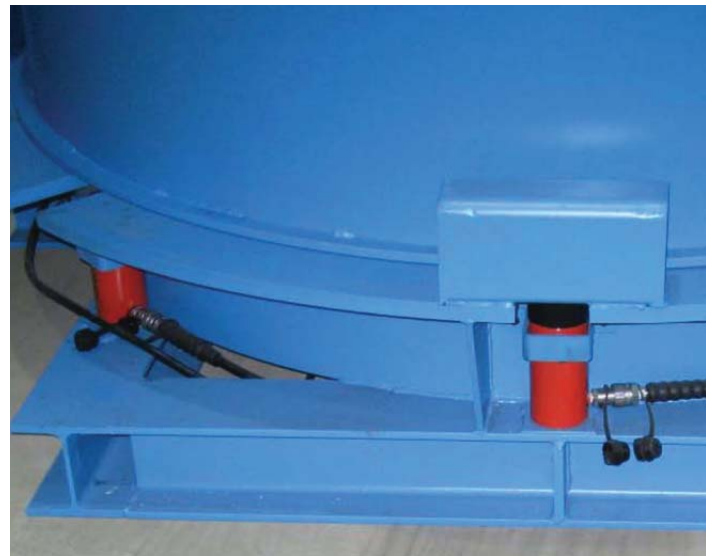
CYLINDERS

Hydraulic Cylinder Applications

Hi-Force
HYDRAULIC TOOLS

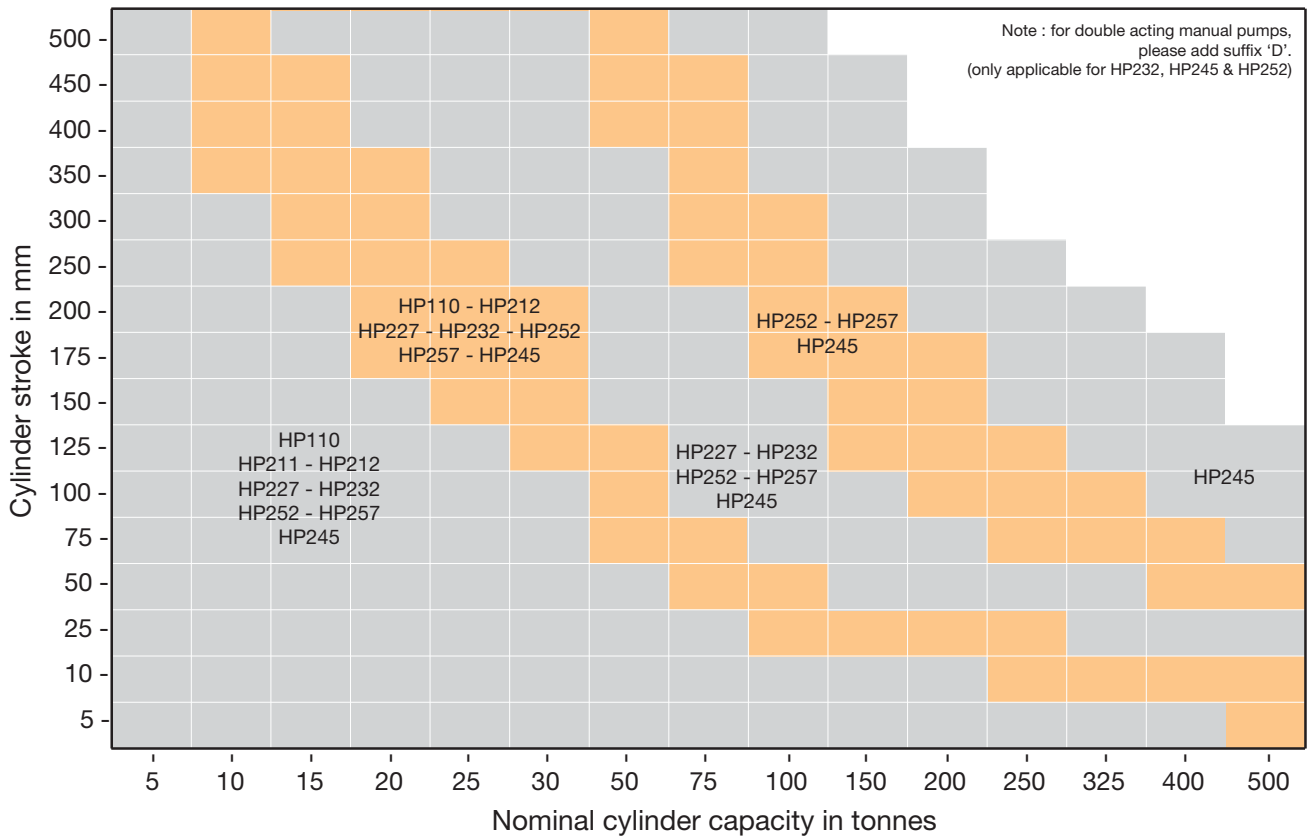
Carl Stahl

HYDRAULIC CYLINDER APPLICATIONS

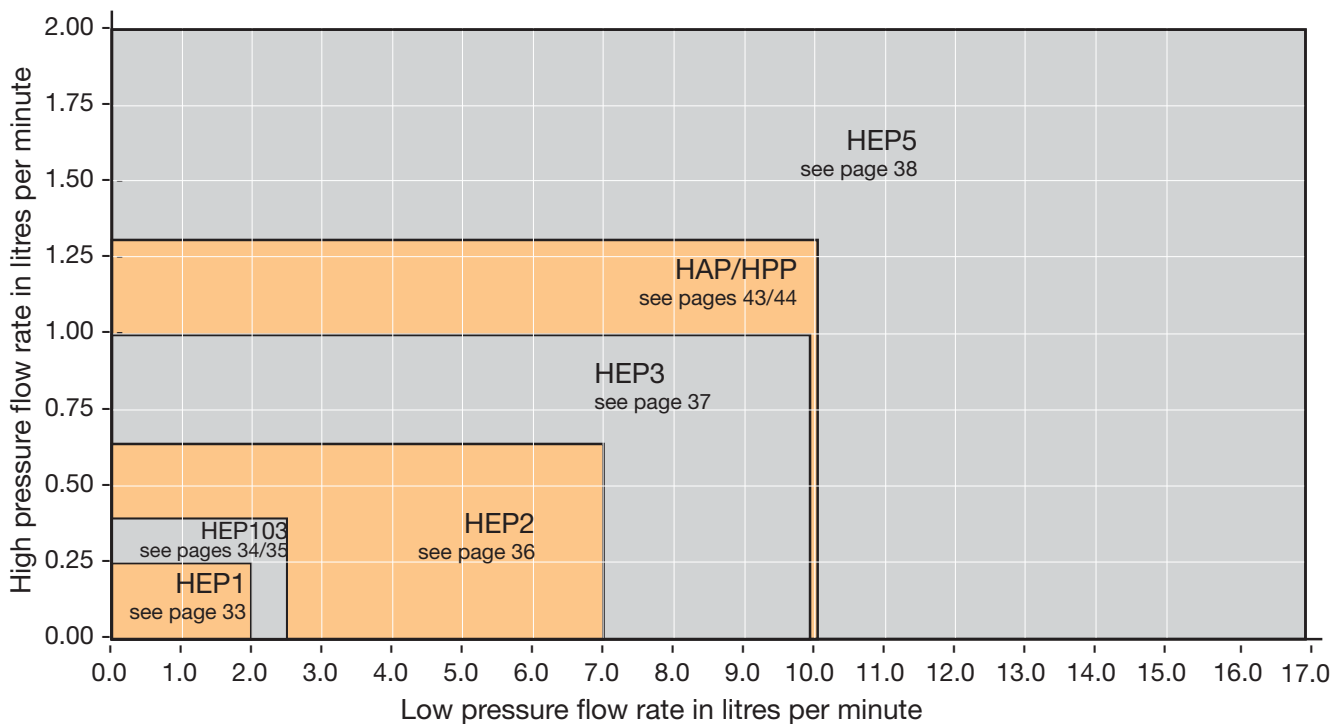


Selection Table for Hi-Force Hydraulic Pumps

MANUAL PUMPS



POWERED PUMPS

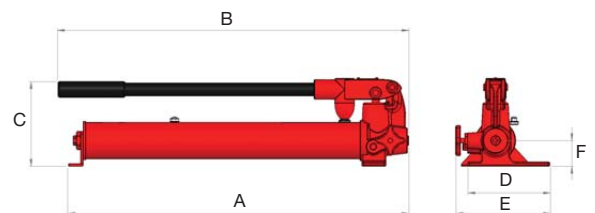
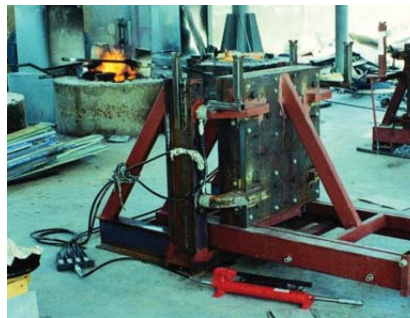


HP - MANUALLY OPERATED PUMPS - STEEL

- Single or two speed operation
- Choice of control valves
- Working pressure 700 Bar

The HP manually operated pump range offers a choice of single or two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single acting cylinders or tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power. A full range of system components suitable for use with HP manually operated pumps is detailed on pages 46-54.

- Oil reservoir capacity up to 5 litres
- Durable steel construction
- External pressure release valve
- Factory set safety relief valve
- Changeover pressure for two speed models is 14 Bar



Single speed hand operated pumps for single acting cylinders and tools

Type	Valve type	Displacement per stroke cm ³		Usable oil cap. litres	Handle effort kg	Dimensions in mm						Weight kg	Item no.
		1st stage	2nd stage			A	B	C	D	E	F		
HP110	2-way	2.9	-	1.0	45	558	566	128	134	145	40	5.6	78HP.01.10

Two speed hand operated pumps for single acting cylinders and tools

Type	Valve type	Displacement per stroke cm ³		Usable oil cap. litres	Handle effort kg	Dimensions in mm						Weight kg	Item no.
		1st stage	2nd stage			A	B	C	D	E	F		
HP227	2-way	12.9	2.3	2.3	38	544	597	168	135	145	53	10.5	78HP.02.27
HP257	2-way	12.9	2.3	5.0	38	545	597	168	135	150	53	15.2	78HP.02.57

Manually Operated Pumps

HP - MANUALLY OPERATED PUMPS - ALUMINIUM

- Two speed operation
- Working pressure 700 Bar
- Six models with choice of control valve

The HP manually operated aluminium pump range offers two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single or double acting cylinders and tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation and lightweight design, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power.

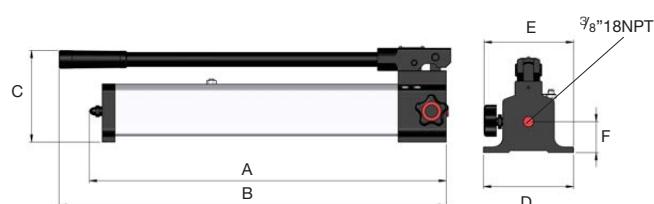
- Oil reservoir capacity up to 5 litres
- Lightweight aluminium construction
- External pressure release valve
- Factory set safety relief valve
- Changeover pressure 14 Bar



HP232



HP211



Two speed hand operated pumps for single acting cylinders and tools

Type	Valve type	Displacement per stroke cm ³		Usable oil cap. litres	Handle effort kg	Dimensions in mm						Weight kg	Item no.
		1st stage	2nd stage			A	B	C	D	E	F		
HP211	2-way	12.9	1.0	0.5	27	335	388	135	100	125	40	2.0	78HP.02.11
HP212	2-way	12.9	2.3	1.0	40	560	610	140	100	125	40	4.0	78HP.02.12
HP232	2-way	12.9	2.3	2.0	40	560	610	160	140	155	50	6.9	78HP.02.32
HP252	2-way	12.9	2.3	5.0	40	585	610	160	168	145	50	9.6	78HP.02.52

Two speed hand operated pumps for double acting cylinders and tools

Type	Valve type	Displacement per stroke cm ³		Usable oil cap. litres	Handle effort kg	Dimensions in mm						Weight kg	Item no.
		1st stage	2nd stage			A	B	C	D	E	F		
HP232D	4-way	12.9	2.3	2.0	40	580	625	160	140	175	30	8.7	78HP.02.32D
HP252D	4-way	12.9	2.3	5.0	40	605	625	160	168	175	30	13.6	78HP.02.52D

HP - MANUALLY OPERATED PUMPS - HIGH FLOW

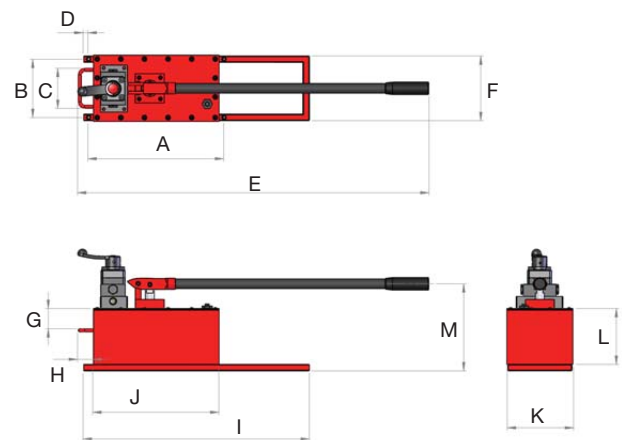
- High flow manual pump
- Working pressure 700 Bar
- 2 stage with semi automatic change-over

The HP245 range of high flow, two speed, manually operated pumps is ideally suited for applications where high tonnage cylinders are to be used on sites, without any available electric or compressed air power supply. Both models are suitable for working pressures up to 700 Bar and the very high, low pressure displacement (113 cm³ per stroke), enables fast piston extension (and retraction) under no load. These high performance pumps are also ideally suited to multiple cylinder lifting applications where a larger volume of oil is required to complete the job. Available with a 2-way valve for single acting cylinders or a 4-way valve for double acting cylinders, both models are supplied with a pre-filled 10 litre oil reservoir and are ready for immediate use.

- Durable steel construction
- Factory set safety relief valve
- Changeover pressure 28 Bar
- Low handle effort characteristics
- 10 litres of usable oil capacity



HP245D



Two speed hand operated pump for single acting cylinders and tools

Type	Valve type	Displacement per stroke cm³		Usable oil cap. litres	Handle effort kg	Material	Dimensions in mm												Weight kg	Item no.	
		1st stage	2nd stage				A	B	C	D	E	F	G	H	I	J	K	L			M
HP245	2-Way	113	4	10	40	Steel	420	180	124	15	1050	200	63	47	700	390	205	173	270	29.5	78HP.02.45

Two speed hand operated pump for double acting cylinders and tools

Type	Valve type	Displacement per stroke cm³		Usable oil cap. litres	Handle effort kg	Material	Dimensions in mm												Weight kg	Item no.	
		1st stage	2nd stage				A	B	C	D	E	F	G	H	I	J	K	L			M
HP245D	4-Way	113	4	10	40	Steel	420	180	124	15	1050	200	63	47	700	390	205	173	270	31.0	78HP.02.45D

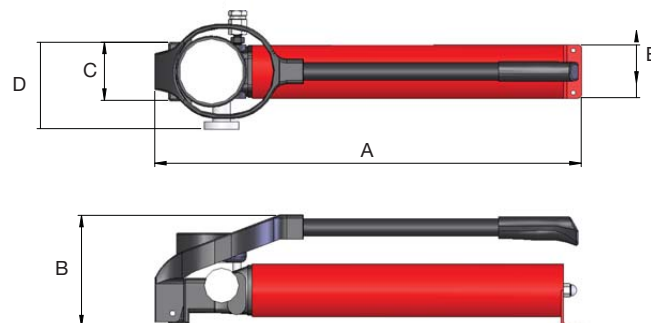
Manually Operated Pumps

HPX - MANUALLY OPERATED ULTRA HIGH PRESSURE PUMP

- Compact design
- Two speed operation
- Working pressure up to 2800 Bar

The HPX range of manually operated ultra high pressure hydraulic pumps is specifically designed for high pressure applications such as oil injection for bushing removal, valve testing, calibration of high pressure equipment and instruments, laboratory burst and proof testing, etc. The two speed operation, on both the HPX1500 and HPX2800 incorporates automatic changeover from low to high pressure at 20 Bar, enabling smooth and low operator handle effort. Both models are fitted with a dual scale gauge reading Bar and PSI contained within a bespoke loop handle and feature a mesh casing to protect the gauge from accidental damage.

- Lightweight aluminium construction
- Factory set safety relief valve
- External pressure release valve
- Low handle effort
- Oil reservoir capacity of 1.2 litres



Type	Working pressure Bar	Usable oil capacity litres	Displacement per stroke cm ³		Outlet port	Dimensions in mm					Weight kg	Item no.
			1st stage	2nd stage		A	B	C	D	E		
HPX1500	1500	1.2	20.0	1.0	1/4" BSP	617	161	84	125	76	6.5	78HPX1500
HPX2800	2800	1.2	20.0	0.8	9/16"-18 UNF	617	161	84	125	76	6.5	78HPX2800

Optional hoses

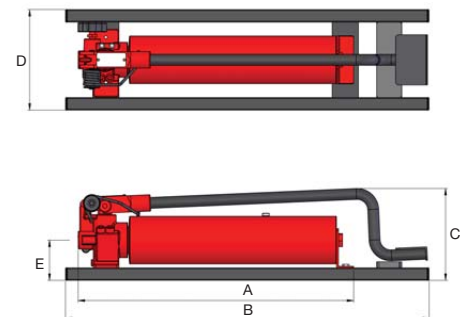
Type	Working pressure Bar	Description	Weight kg	Item no.
XHH3-15	1500	3 metres hose with 1/4" BSP male thread each end	1.7	78HXHH3-15
XHH5-15	1500	5 metres hose with 1/4" BSP male thread each end	2.6	78HXHH5-15
XHH3-30	3000	3 metres hose with 9/16" UNF male coned thread each end	1.7	78HXHH3-30
XHH5-30	3000	5 metres hose with 9/16" UNF male coned thread each end	2.6	78HXHH5-30

HP227FPC & HP227FP - MANUALLY OPERATED FOOT PUMPS

- Working pressure 700 Bar
- Two stage operation
- Complete with accessories

The HP227FPC manually operated foot pump is supplied complete with 100mm diameter pressure gauge, gauge mounting block and 3 metre length hydraulic hose with CM1 quick connect male coupler. Ideally suited for use with Hi-Force CH series crimper heads (see pages 141 & 142) and all other Hi-Force 700 Bar maximum working pressure, hydraulic tools that require a remote pump operation, the HP227FPC has a superb two speed low pressure displacement (12.9 cm³ per stroke) with automatic changeover to high pressure displacement (2.3 cm³ per stroke) up to 700 Bar. Supplied with a pre-filled oil reservoir offering a usable oil capacity of 2.3 litres, the HP227FPC is supplied ready for immediate use.

The HP227FP pump incorporates the same specification and features of the HP227FPC pump however is supplied without the pressure gauge, gauge mounting block and 3 metre hose assembly.



Type	Valve type	Displacement per stroke cm ³		Usable oil cap. litres	Handle effort kg	Material	Dimensions in mm					Weight kg	Item no.
		1st stage	2nd stage				A	B	C	D	E		
HP227FPC	2-way	12.9	2.3	2.3	39	Steel	544	763	227	200	78	14.5	78HP227FPC
HP227FP	2-way	12.9	2.3	2.3	39	Steel	544	715	185	200	78	12.5	78HP227FP

Battery Powered Pumps

BPP - BATTERY POWERED HYDRAULIC PUMP

- Working pressure 700 Bar
- Lightweight design
- 14.4V long life battery

The Hi-Force BPP107 battery powered hydraulic pump is designed for operator convenience in terms of handling and power supply. Driven by a powerful 14.4V long life battery the unit takes away the physical effort required by a manually operated hand or foot pump, whilst at the same time eliminating the need for an external power source. The pump is supplied with a shoulder strap and its ergonomic lightweight design (8.0 kg) makes the unit very portable and user friendly. The pump incorporates an automatic pressure relief and release valve meaning that the pressure automatically relieves once the pump reaches its maximum pressure of 700 Bar, making the pump ideal for use with Hi-Force CH series crimping tools, NS series nut splitters, HCH cutters and HKP series knockout punchers.



BPP107

Type	Max working pressure	Oil Cap litres	Oil Flow litres/min		Dimensions in mm			Weight kg	Item no.
			1st stage	2nd stage	Length	Width	Height		
BPP107	700 Bar	0.7	0.5	0.15	355	160	260	8.0	78HBPP107



Note: CU220 is supplied with the tool as standard. If you require CU110 charger, this needs to be ordered separately. Tools CANNOT be supplied without the standard CU220 charger.

ACCESSORIES



BP144



CCU144

Type	Description	Weight kg	Item no.
BP144	Battery Pack 14.4V	0,9	78HBP144

Type	Description	Weight kg	Item no.
CCU144	Car cigarette lighter charger unit	0,6	78HCCU114



CU110



MP220

Type	Description	Weight kg	Item no.
CU110	Charger 110V	1,1	78HCU110
CU220	Charger 220/230V	0,8	78HCU220

Type	Description	Weight kg	Item no.
MP110	Power supply to operate unit directly from mains 110 V	4,8	78HMP110
MP220	Power supply to operate unit directly from mains 220 / 230 V	4,8	78HMP220

HEP1 - ELECTRIC DRIVEN LIGHTWEIGHT MINI PUMPS WITH CARRYING STRAP

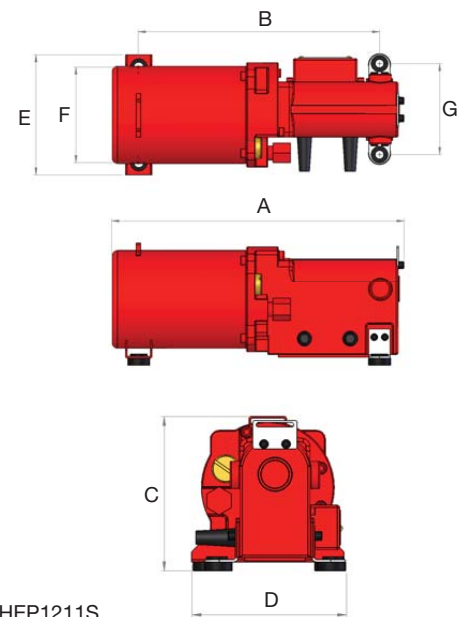
- Working pressure 700 Bar
- Two-stage design, changeover pressure 10 Bar
- Extremely compact, lightweight & powerful

The HEP1 range of two stage electric driven hydraulic mini pumps, offers the smallest and lightest weight, electric powered pump in the Hi-Force product range. Available with a choice of 110 volt or 240 volt single phase electric motor, both models feature an electric solenoid operated valve, complete with remote hand pendant controller and 3 metre control cable as standard. The two stage design of these pumps incorporates an automatic changeover from low to high pressure ensuring that an optimum pressure and flow rate combination is achievable from an extremely compact pump.

- 110 or 240V single phase motor options
- Internal safety overload valve
- Supplied with carrying strap



HEP1212S



HEP1211S
HEP1212S

Type	Motor voltage	Maximum pressure bar	Maximum flow rate l/min		Valve type	Usable oil cap. litres	Dimensions in mm							Weight kg	Item no.
			1st stage	2nd stage			A	B	C	D	E	F	G		
HEP1211S	110 V - 1 Ph	700	2,0	0,2	2-way	0,8	333	269	140	139	138	110	105	7,5	78HHEP1211S
HEP1212S	240 V - 1Ph	700	2,0	0,2	2-way	0,8	333	269	140	139	138	110	105	7,5	78HHEP1212S

HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS

- Working pressure 700 Bar
- Choice of valve options
- Compact, lightweight & powerful

The HEP103 range of two stage electric driven hydraulic pumps is suitable for a wide variety of applications and pumps are available in either 110 volt or 240 volt single phase electric motor options. Both voltage options also offer a choice of manual or electrically operated control valves, available as 2-way, 3-way or 4-way options with additional features like open centre, closed centre and locking valve designs available. Maximum working pressure is 700 Bar with automatic low to high pressure changeover fitted as standard. All models are supplied complete with a glycerine filled hydraulic pressure gauge, pre-filled 4 litre usable oil capacity reservoir with oil sight level gauge and an integral carrying handle for easy transportation of these lightweight, compact and versatile pumps to the job site.



HEP103442

Models featuring 2-way solenoid valve, normally closed (hold function), suitable for use with single acting cylinders and tools, requiring hold.

Type	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min		Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg	Item no.
			1st stage	2nd stage					
HEP103241LS	110 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	19.2	78HEP103241LS
HEP103242LS	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	19.2	78HEP103242LS

Models featuring 2-way solenoid valve, normally open (auto retract function), suitable for use with single acting cylinders and tools, requiring auto retract.

Type	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min		Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg	Item no.
			1st stage	2nd stage					
HEP103241S	110 V - 1Ph	700	2.50	0.35	150	advance/retract	4	20.5	78HEP103241S
HEP103242S	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	20.5	78HEP103242S

Models featuring 3-way manually operated valve, suitable for use with single acting cylinders and tools.

Type	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min		Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg	Item no.
			1st stage	2nd stage					
HEP103341	110 V - 1Ph	700	2.50	0.35	150	motor on/off	4	18.1	78HEP103341
HEP103342	240 V - 1 Ph	700	2.50	0.35	150	motor on/off	4	18.1	78HEP103342

Models featuring 4-way manually operated valve, suitable for use with double acting cylinders and tools.

Type	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min		Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg	Item no.
			1st stage	2nd stage					
HEP103441	110 V - 1Ph	700	2.50	0.35	150	motor on/off	4	18.1	78HEP103441
HEP103442	240 V - 1 Ph	700	2.50	0.35	150	motor on/off	4	18.1	78HEP103442

Models featuring 4-way solenoid valve, locking feature on A and B port, suitable for use with double acting cylinders and tools, requiring hold.

Type	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min		Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg	Item no.
			1st stage	2nd stage					
HEP103441LS	110 V - 1Ph	700	2.50	0.35	150	advance/retract	4	20.5	78HEP103441LS
HEP103442LS	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	20.5	78HEP103442LS

Note:
All motors are dual frequency (50/60 Hz)

HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS

- Working pressure 700 Bar
- Choice of valve options
- Compact, lightweight & powerful
- Integral carrying handle
- Pressure gauge and remote control fitted as standard
- Suitable for single and double acting cylinders and hydraulic tools
- All models are fitted with dual frequency (50/60 Hz) motor

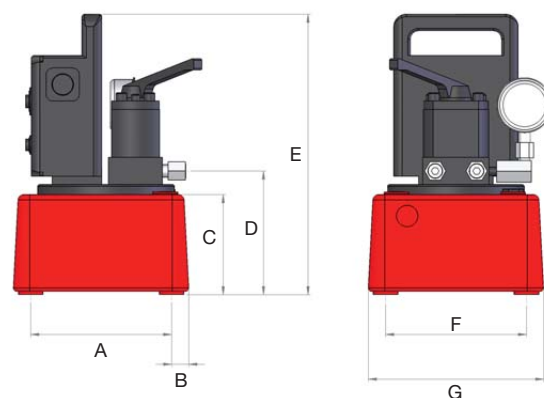


Did you know

Hi-Force manufactures powered pumps with flow rates up to 17 litres per minute in low pressure and 2 litres per minute up to 700 Bar.



See pages 36 to 38 for more details



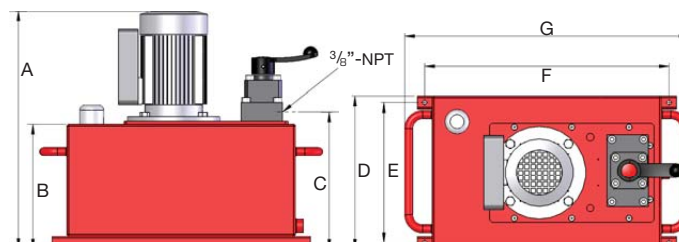
All types	Dimensions in mm
A	195.0
B	25.0
C	117.5
D	141.5
E	342.0
F	210.0
G	260.0

HEP2 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY MEDIUM FLOW

- Low pressure flow rate 7 ltr/min. up to 70 Bar
- High pressure flow rate 0.65 ltr/min. up to 700 Bar
- Two stage hydraulic pump unit
- Externally adjustable pressure relief valve
- Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- Solenoid valve options available



HEP207422



Type	Valve type	Oil cap. litres	Motor kW	Motor voltage	Dimensions in mm							Weight kg	Item no.
					A	B	C	D	E	F	G		
HEP207111	P-T Plate	10	1.5	110 / 115 V - 1Ph	498	198	230	246	221	368	438	47.0	78HEP207111
HEP207112	P-T Plate	10	1.5	220 / 240 V - 1Ph	498	198	230	246	221	368	438	47.0	78HEP207112
HEP207114	P-T Plate	10	1.5	380 / 440 V - 3Ph	498	198	230	246	221	368	438	47.0	78HEP207114
HEP207121	P-T Plate	25	1.5	110 / 115 V - 1Ph	527	227	259	306	281	490	570	63.0	78HEP207121
HEP207122	P-T Plate	25	1.5	220 / 240 V - 1Ph	527	227	259	306	281	490	570	63.0	78HEP207122
HEP207124	P-T Plate	25	1.5	380 / 440 V - 3Ph	527	227	259	306	281	490	570	63.0	78HEP207124
HEP207211	2-way	10	1.5	110 / 115 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207211
HEP207212	2-way	10	1.5	220 / 240 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207212
HEP207214	2-way	10	1.5	380 / 440 V - 3Ph	498	198	230	246	221	368	438	47.5	78HEP207214
HEP207221	2-way	25	1.5	110 / 115 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207221
HEP207222	2-way	25	1.5	220 / 240 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207222
HEP207224	2-way	25	1.5	380 / 440 V - 3Ph	527	227	259	306	281	490	570	63.5	78HEP207224
HEP207311	3-way	10	1.5	110 / 115 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207311
HEP207312	3-way	10	1.5	220 / 240 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207312
HEP207314	3-way	10	1.5	380 / 440 V - 3Ph	498	198	230	246	221	368	438	47.5	78HEP207314
HEP207321	3-way	25	1.5	110 / 115 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207321
HEP207322	3-way	25	1.5	220 / 240 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207322
HEP207324	3-way	25	1.5	380 / 440 V - 3Ph	527	227	259	306	281	490	570	63.5	78HEP207324
HEP207411	4-way	10	1.5	110 / 115 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207411
HEP207412	4-way	10	1.5	220 / 240 V - 1Ph	498	198	230	246	221	368	438	47.5	78HEP207412
HEP207414	4-way	10	1.5	380 / 440 V - 3Ph	498	198	230	246	221	368	438	47.5	78HEP207414
HEP207421	4-way	25	1.5	110 / 115 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207421
HEP207422	4-way	25	1.5	220 / 240 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP207422
HEP207424	4-way	25	1.5	380 / 440 V - 3Ph	527	227	259	306	281	490	570	63.5	78HEP207424



Note:
For optional extras please see page 45

HEP3 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY HIGH FLOW

- Low pressure flow rate 10 ltr/min. up to 70 Bar
- High pressure flow rate 1 ltr/min. up to 700 Bar
- Two stage hydraulic pump unit
- Externally adjustable pressure relief valve
- Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- Solenoid valve options available



HEP310322S

Type	Valve type	Oil cap. litres	Motor kW	Motor voltage	Dimensions in mm							Weight kg	Item no.
					A	B	C	D	E	F	G		
HEP310121	P-T Plate	25	2.2	110 / 115 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP310121
HEP310122	P-T Plate	25	2.2	220 / 240 V - 1Ph	527	227	259	306	281	490	570	63.5	78HEP310122
HEP310124	P-T Plate	25	2.2	380 / 440 V - 3Ph	527	227	259	306	281	490	570	63.5	78HEP310124
HEP310141	P-T Plate	40	2.2	110 / 115 V - 1Ph	636	336	368	306	281	490	560	88.5	78HEP310141
HEP310142	P-T Plate	40	2.2	220 / 240 V - 1Ph	636	336	368	306	281	490	560	88.5	78HEP310142
HEP310144	P-T Plate	40	2.2	380 / 440 V - 3Ph	636	336	368	306	281	490	560	88.5	78HEP310144
HEP310221	2-way	25	2.2	110 / 115 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310221
HEP310222	2-way	25	2.2	220 / 240 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310222
HEP310224	2-way	25	2.2	380 / 440 V - 3Ph	527	227	259	306	281	490	570	64.0	78HEP310224
HEP310241	2-way	40	2.2	110 / 115 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310241
HEP310242	2-way	40	2.2	220 / 240 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310242
HEP310244	2-way	40	2.2	380 / 440 V - 3Ph	636	336	368	306	281	490	560	89.0	78HEP310244
HEP310321	3-way	25	2.2	110 / 115 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310321
HEP310322	3-way	25	2.2	220 / 240 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310322
HEP310324	3-way	25	2.2	380 / 440 V - 3Ph	527	227	259	306	281	490	570	64.0	78HEP310324
HEP310341	3-way	40	2.2	110 / 115 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310341
HEP310342	3-way	40	2.2	220 / 240 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310342
HEP310344	3-way	40	2.2	380 / 440 V - 3Ph	636	336	368	306	281	490	560	89.0	78HEP310344
HEP310421	4-way	25	2.2	110 / 115 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310421
HEP310422	4-way	25	2.2	220 / 240 V - 1Ph	527	227	259	306	281	490	570	64.0	78HEP310422
HEP310424	4-way	25	2.2	380 / 440 V - 3Ph	527	227	259	306	281	490	570	64.0	78HEP310424
HEP310441	4-way	40	2.2	110 / 115 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310441
HEP310442	4-way	40	2.2	220 / 240 V - 1Ph	636	336	368	306	281	490	560	89.0	78HEP310442
HEP310444	4-way	40	2.2	380 / 440 V - 3Ph	636	336	368	306	281	490	560	89.0	78HEP310444



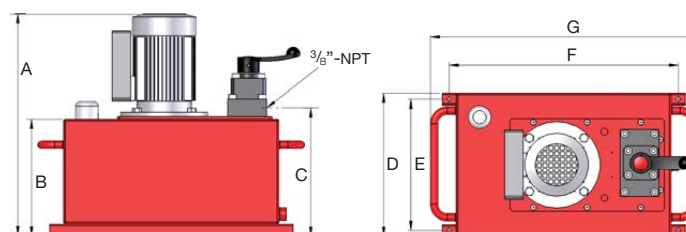
Note:
For optional extras please see page 45

HEP5 - ELECTRIC DRIVEN PUMPS - HEAVY DUTY HIGH FLOW

- Low pressure flow rate 17 ltr/min up to 70 Bar
- High pressure flow rate 2 ltr/min up to 700 Bar
- Two stage hydraulic pump unit
- Externally adjustable pressure relief valve
- Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- Solenoid valve options available



HEP517464



Type	Valve type	Oil cap. litres	Motor kW	Motor voltage	Dimensions in mm							Weight kg	Item no.
					A	B	C	D	E	F	G		
HEP517142	P-T Plate	40	2.2	220 / 240	636	336	368	306	281	490	560	88.5	78HEP517142
HEP517144	P-T Plate	40	2.2	380 / 440	636	336	368	306	281	490	560	88.5	78HEP517144
HEP517162	P-T Plate	60	2.2	220 / 240	657	357	389	406	381	513	583	120.0	78HEP517162
HEP517164	P-T Plate	60	2.2	380 / 440	657	357	389	406	381	513	583	120.0	78HEP517164
HEP517242	2-way	40	2.2	220 / 240	636	336	368	306	281	490	560	89.0	78HEP517242
HEP517244	2-way	40	2.2	380 / 440	636	336	368	306	281	490	560	89.0	78HEP517244
HEP517262	2-way	60	2.2	220 / 240	657	357	389	406	381	513	583	120.0	78HEP517262
HEP517264	2-way	60	2.2	380 / 440	657	357	389	406	381	513	583	120.0	78HEP517264
HEP517342	3-way	40	2.2	220 / 240	636	336	368	306	281	490	560	89.0	78HEP517342
HEP517344	3-way	40	2.2	380 / 440	636	336	368	306	281	490	560	89.0	78HEP517344
HEP517362	3-way	60	2.2	220 / 240	657	357	389	406	381	513	583	120.0	78HEP517362
HEP517364	3-way	60	2.2	380 / 440	657	357	389	406	381	513	583	120.0	78HEP517364
HEP517442	4-way	40	2.2	220 / 240	636	336	368	306	281	490	560	89.0	78HEP517442
HEP517444	4-way	40	2.2	380 / 440	636	336	368	306	281	490	560	89.0	78HEP517444
HEP517462	4-way	60	2.2	220 / 240	657	357	389	406	381	513	583	120.0	78HEP517462
HEP517464	4-way	60	2.2	380 / 440	657	357	389	406	381	513	583	120.0	78HEP517464



Note:
For optional extras please see page 45

HSP - ELECTRIC DRIVEN SPLIT FLOW MULTI-OUTLET PUMPS

- Working pressure 700 Bar
- Multiple outlet valve options
- Precise control to achieve synchronised lift

The HSP range of electric driven, split flow, hydraulic pumps is designed to deliver equal volumes of oil from each individual control valve regardless of any variations in the hydraulic pressure. The range offers a selection of outlet valve configurations ranging from a 2-outlet model with manually operated directional control valves, through to a 8-outlet model with electric solenoid operated valves. Each valve outlet is connected directly to an independent internal piston pump which is driven by a common electric motive force. This technology allows each internal piston pump to deliver an equal amount of oil flow per minute regardless of any variations in the required operating pressure at each control valve outlet. With HSP split flow pumps lifting and positioning large, unevenly weighted loads using multiple jacking points in a synchronised, level lift and controlled manner is easily achievable. Individual control of each valve on all electric valve versions, is via a specially made electric control box with easily identifiable on/off switches for each applicable valve plus a synchronised lift control button for all of the selected control valves. Maximum working pressure of all HSP pumps is 700 Bar with an externally adjustable pressure relief valve on each outlet for easy pressure adjustment between 70 and 700 Bar. A full range of system components is available and detailed on pages 46 to 54.

Optional extra's include a fully automatic PLC controlled synchronised lifting system, with a variety of user settings, such as target lifting height, maximum tolerance between the jacking points and other key settings, all controlled from a centralised touch screen computer.



HSP44E104

Type	Valve configuration	Valve type	Oil Capacity Litres	Oil flow per outlet l/min	Motor voltage	Weight kg	Item no.
HSP23M54	2 x 3-way	manual	50	0.9	380 / 440	178	78HSP23M54
HSP24M54	2 x 4-way	manual	50	0.9	380 / 440	178	78HSP24M54
HSP33M104	3 x 3-way	manual	100	1.8	380 / 440	333	78HSP33M104
HSP34M104	3 x 4-way	manual	100	1.8	380 / 440	333	78HSP34M104
HSP43M104	4 x 3-way	manual	100	1.1	380 / 440	272	78HSP43M104
HSP44M104	4 x 4-way	manual	100	1.1	380 / 440	272	78HSP44M104
HSP23E54	2 x 3-way	electric	50	0.9	380 / 440	180	78HSP23E54
HSP24E54	2 x 4-way	electric	50	0.9	380 / 440	180	78HSP24E54
HSP33E104	3 x 3-way	electric	100	1.8	380 / 440	335	78HSP33E104
HSP34E104	3 x 4-way	electric	100	1.8	380 / 440	335	78HSP34E104
HSP43E104	4 x 3-way	electric	100	1.1	380 / 440	274	78HSP43E104
HSP44E104	4 x 4-way	electric	100	1.1	380 / 440	274	78HSP44E104
HSP63E104	6 x 3-way	electric	100	0.9	380 / 440	335	78HSP63E104
HSP64E104	6 x 4-way	electric	100	0.9	380 / 440	335	78HSP64E104
HSP83E104	8 x 3-way	electric	150	0.7	380 / 440	370	78HSP83E104
HSP84E104	8 x 4-way	electric	150	0.7	380 / 440	370	78HSP84E104



Note:

For optional extras please see page 45

PUMPS

Electric Driven Pumps

HSP - ELECTRIC DRIVEN SPLIT FLOW PUMPS

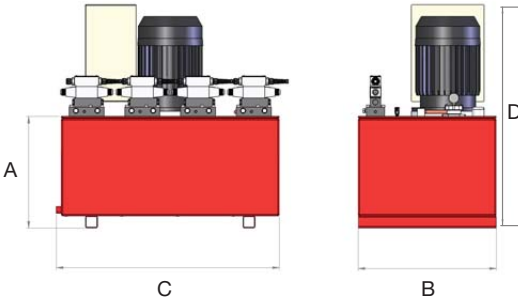
- Choice of manual or electric valve options
- Reservoir capacity 50 to 150 litres
- Consistent single speed flow rate

Hi-Force HSP series split flow pumps fitted with low voltage solenoid valves are complete with a low voltage control system, which allows the user to individually or simultaneously control each valve and the movement of the lifting cylinder pistons. Once the load is correctly supported, by the selected cylinder pistons, the synchronised lift operation can commence. The operation of the HSP Pump Unit can be entirely controlled from the remote control panel, which features individual valve on/off switches and a set of cylinder piston lift and lower buttons that can be individually selected for inclusion in the lift operation.

- Working pressure 700 Bar
- Equal output flow regardless of pressure
- Control panel with selector switches for each individual outlet, allowing for single or multiple (synchronised) operation
- Externally adjustable pressure relief valve for control of maximum system pressure



HSP44E104



Type	Oil capacity Litres	Dimensions in mm			
		A	B	C	D
HSP2 (all models)	50	460	570	500	817
HSP3 (all models)	100	460	570	920	920
HSP4 (all models)	100	460	570	920	920
HSP6 (all models)	100	470	800	750	920
HSP8 (all models)	150	470	800	1010	1085

AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS

- Working pressure 700 Bar
- Operates from standard 7 Bar air supply
- Compact, lightweight & powerful

The AHP11 single stage air powered hydraulic pump range provides an economical, portable alternative to manually operated hydraulic pumps. Designed to operate from a standard 7 Bar compressed air supply, these versatile compact pumps are ideally suited for use with Hi-Force hydraulic cylinders and tools in maintenance and construction applications. The ergonomically designed pump treadle can be operated by hand or foot for better versatility. With a choice of reservoir capacities, all models are supplied pre-filled with hydraulic oil ready for immediate use. A full range of system components suitable for use with AHP11 series pumps is detailed on pages 46-54.

- Choice of 2-way or 4-way control valves
- Internal safety overload valve
- Reservoir oil sight level gauge
- Standard oil reservoir capacities up to 10 litres



AHP1141



AHP1120



OPTIONAL REMOTE PENDANT:
Please suffix model number with 'R' for remote pendant options to suit AHP1120, AHP1121 and AHP1122.



Filter, regulator & lubricator units for use in combination with air driven pump units are also available.

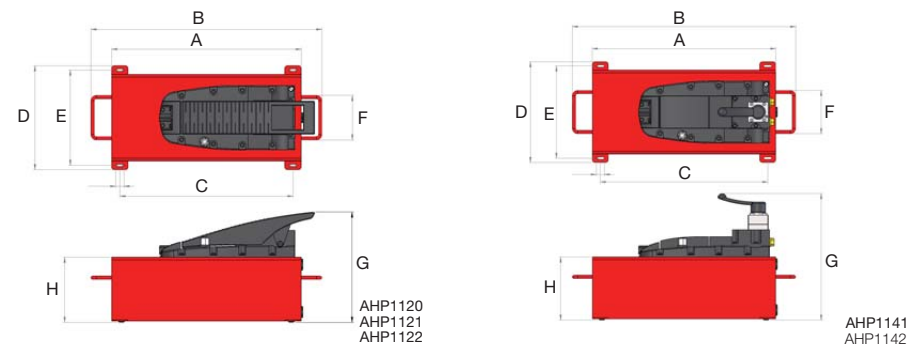
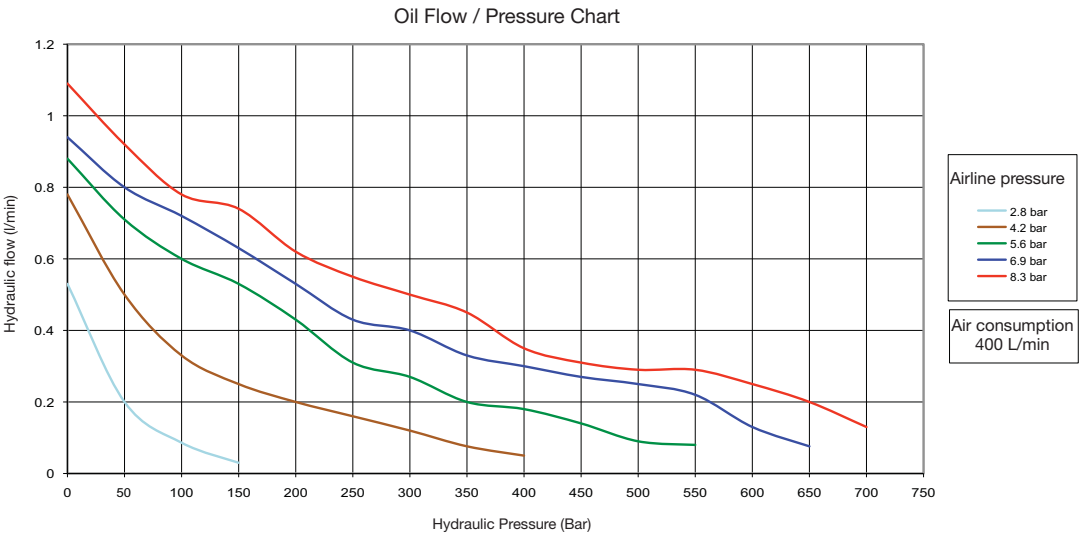
Type	Maximum pressure bar	Maximum flow rate l/min	Valve type	Usable oil capacity litres	Air inlet connection G	Oil outlet connection NPTF	Weight kg	Item no.
AHP1120	700	0.8	2-way	2.4	1/4"	3/8"	4.7	78HAHP1120
AHP1121	700	0.8	2-way	5.0	1/4"	3/8"	9.0	78HAHP1121
AHP1122	700	0.8	2-way	10.0	1/4"	3/8"	17.8	78HAHP1122
AHP1141	700	0.8	4-way	5.0	1/4"	3/8"	9.5	78HAHP1141
AHP1142	700	0.8	4-way	10.0	1/4"	3/8"	18.3	78HAHP1142

PUMPS

Air Driven Pumps

AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS

- Working pressure 700 Bar
- Operates from standard 7 Bar air supply
- Compact, lightweight & powerful



Type	Dimensions in mm								Weight kg	Item no.
	A	B	C	D	E	F	G	H		
AHP1120	365	*	237	157	66-90	*	210	125	4,7	78HAHP1120
AHP1121	420	*	380	240	220	*	223	114	9,0	78HAHP1121
AHP1122	464	560	*	210	*	108	274	158	17,8	78HAHP1122
AHP1141	420	*	380	240	220	*	265	114	9,5	78HAHP1141
AHP1142	464	560	*	210	*	*	315	158	18,3	78HAHP1142

*Not applicable

HAP - AIR DRIVEN PUMPS - GENERAL DUTY HIGH FLOW

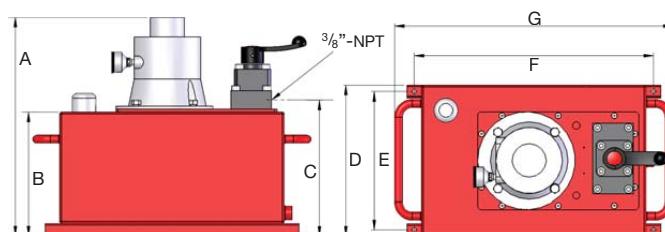
- Low pressure flow rate 10 litres/min up to 70 Bar
- High pressure flow rate 1.3 litres/min
- Working pressure 700 Bar

The HAP two stage air powered hydraulic pump range offers a low pressure flow of 10 litres/min with automatic changeover to 700 Bar high pressure flow rate of 1.3 litres/min. Driven by a powerful 3 kW rotary air motor with a maximum air consumption of 2.4 m³ per minute at 7 Bar inlet air pressure, the HAP range offers a choice of pump mounted or remote control valves (page 53) and oil reservoirs all fitted with filler and drain plugs. A full range of system components suitable for use with HAP pump units is detailed on pages 46-54.

- Two stage hydraulic pump unit
- Powerful air motor
- Externally adjustable pressure relief valve Choice of control valves
- Manual valve with load holding feature fitted as standard



HAP21026



Type	Valve type	Oil cap. litres	Motor kW	Dimensions in mm							Weight kg	Item no.
				A	B	C	D	E	F	G		
HAP21011	P-T Plate	10	3.0	393	198	230	246	221	368	438	41.5	78HAP21011
HAP21012	P-T Plate	25	3.0	422	227	259	306	281	490	570	57.5	78HAP21012
HAP21014	P-T Plate	40	3.0	531	336	368	306	281	490	560	71.5	78HAP21014
HAP21016	P-T Plate	60	3.0	552	357	389	406	381	513	583	96.5	78HAP21016
HAP21021	2-way	10	3.0	393	198	230	246	221	368	438	42.0	78HAP21021
HAP21022	2-way	25	3.0	422	227	259	306	281	490	570	58.0	78HAP21022
HAP21024	2-way	40	3.0	531	336	368	306	281	490	560	72.0	78HAP21024
HAP21026	2-way	60	3.0	552	357	389	406	381	513	583	97.0	78HAP21026
HAP21031	3-way	10	3.0	393	198	230	246	221	368	438	42.0	78HAP21031
HAP21032	3-way	25	3.0	422	227	259	306	281	490	570	58.0	78HAP21032
HAP21034	3-way	40	3.0	531	336	368	306	281	490	560	72.0	78HAP21034
HAP21036	3-way	60	3.0	552	357	389	406	381	513	583	97.0	78HAP21036
HAP21041	4-way	10	3.0	393	198	230	246	221	368	438	42.0	78HAP21041
HAP21042	4-way	25	3.0	422	227	259	306	281	490	570	58.0	78HAP21042
HAP21044	4-way	40	3.0	531	336	368	306	281	490	560	72.0	78HAP21044
HAP21046	4-way	60	3.0	552	357	389	406	381	513	583	97.0	78HAP21046



Note:
For optional extras please see page 45

Petrol Engine Driven Pumps

HPP - PETROL ENGINE DRIVEN PUMPS - GENERAL DUTY HIGH FLOW

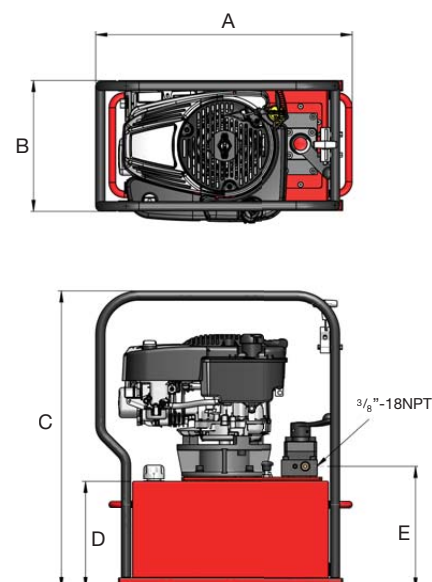
- Low pressure flow rate 10 litres/min up to 70 Bar
- High pressure flow rate 1.3 litres/min
- Working pressure 700 Bar

The HPP range of two stage petrol engine driven hydraulic pumps is ideally suited for applications in locations where there is no electricity or compressed air supply available. The range has similar reservoir and valve options (excluding solenoid valves) as electric and air powered pumps. All models are 700 Bar maximum working pressure and offer a low pressure flow rate of 10 litres/min with automatic changeover to a high pressure flow rate of 1.3 litres/min. Powered by a 3.35 kW rated four stroke engine, the HPP range provides reliable, independent hydraulic power. All models are fitted with a protective roll bar carrying frame for easy transportation and handling. A full range of system components suitable for use with HPP pumps is detailed on pages 46-54.

- Two stage hydraulic pump unit
- Powerful 3.35 kW four stroke petrol engine
- Externally adjustable pressure relief valve
- Roll bar protection frame included
- Manual valve with load holding feature fitted as standard



HPP21044



Type	Valve type	Oil cap. litres	Motor kW	Dimensions in mm					Weight kg	Item no.
				A	B	C	D	E		
HPP21012	P-T Plate	25	3.35	70.5	306	686	227	259	70.5	78HPP21012
HPP21014	P-T Plate	40	3.35	85.5	306	795	336	368	85.5	78HPP21014
HPP21016	P-T Plate	60	3.35	113.5	406	816	357	389	113.5	78HPP21016
HPP21022	2-way	25	3.35	71.0	306	686	227	259	71.0	78HPP21022
HPP21024	2-way	40	3.35	86.0	306	795	336	368	86.0	78HPP21024
HPP21026	2-way	60	3.35	114.0	406	816	357	389	114.0	78HPP21026
HPP21032	3-way	25	3.35	71.0	306	686	227	259	71.0	78HPP21032
HPP21034	3-way	40	3.35	86.0	306	795	336	368	86.0	78HPP21034
HPP21036	3-way	60	3.35	114.0	406	816	357	389	114.0	78HPP21036
HPP21042	4-way	25	3.35	71.0	306	686	227	259	71.0	78HPP21042
HPP21044	4-way	40	3.35	86.0	306	795	336	368	86.0	78HPP21044
HPP21046	4-way	60	3.35	114.0	406	816	357	389	114.0	78HPP21046

Protective roll frame



Roll frame

Type	For all HEP and HAP models	Weight kg	Item no.
PPA10RF	All pumps with 10L tank	2,0	78HPPA10RF
PPA25RF	All pumps with 25L tank	2,4	78HPPA25RF
PPA40RF	All pumps with 40L tank	2,8	78HPPA40RF
PPA60RF	All pumps with 60L tank	6,2	78HPPA60RF

All pumps can be supplied with roll frame factory fitted.
Just suffix pump model number with 'P'.

Wheel trolley



Wheel trolley

Type	For all HEP, HAP and HPP models	Weight kg	Item no.
PPA40WT	Wheel trolley for all 25 and 40 litre model pumps.	12,6	78HPPA40WT
PPA60WT	Wheel trolley for all 60 litre model pumps.	14,3	78HPPA60WT

All pumps can be supplied with wheel trolley factory fitted.
Just suffix pump model number with 'WT'.

Low voltage solenoid valve with hand pendant controller



suffix 'S'

Suffix	Description
S	All HEP2, 3 and 5 series electric pumps can be supplied with low voltage (24V) solenoid valve, either in 3-way or 4-way versions, both featuring a locking feature and remote pendant control as standard

To order pump with solenoid valve, just suffix pump model number with 'S'.

60Hz Electric Motor



suffix 'H'

Suffix	Description
H	All HEP2, 3 and 5 series electric pumps can be supplied with an electric motor suitable for 60 Hz.

To order pump with 60Hz motor, just suffix pump model number with 'H'.

SYSTEM COMPONENTS

Hydraulic Hoses

HIGH PRESSURE HYDRAULIC HOSES - BLACK & RED

- Working pressure 700 Bar
- 4:1 Factor of safety
- Hand grip protective strain relievers

Hi-Force high pressure hydraulic hoses provide the vital, high quality, safe connection for your hydraulic equipment. Available in black and red and supplied complete with an ergonomically designed protective strain reliever at both ends, Hi-Force high pressure hoses are suitable for working pressures up to 700 Bar with a 4 : 1 factor of safety.









Tip for double acting systems ...

By using black hoses for the advance lines and red hoses for the retract lines, identification is made easy and the possibility of incorrectly connected hoses is reduced.



Hose bore is 6.6mm and outside diameter is 12.7 mm

												
	Black		Red		Black		Red		Black		Red	
Length Metres	No couplers 3/8" - 18 NPT male fittings both ends Model number		3/8" - 18 NPT male fitting one end with CM1 coupler fitted one end Model number		3/8" - 18 NPT male fitting one end with CM1 coupler fitted one end Model number		3/8" - 18 NPT male fitting one end with CM1 coupler fitted one end Model number		CM1 male couplers fitted both ends Model number		CM1 male couplers fitted both ends Model number	
0.5	HH0.5	HH0.5R	HC0.5	HC0.5R	HC0.5C	HC0.5CR	HC0.5C	HC0.5CR	HC0.5C	HC0.5CR	HC0.5C	HC0.5CR
1.0	HH1	HH1R	HC1	HC1R	HC1C	HC1CR	HC1C	HC1CR	HC1C	HC1CR	HC1C	HC1CR
2.0	HH2	HH2R	HC2	HC2R	HC2C	HC2CR	HC2C	HC2CR	HC2C	HC2CR	HC2C	HC2CR
3.0	HH3	HH3R	HC3	HC3R	HC3C	HC3CR	HC3C	HC3CR	HC3C	HC3CR	HC3C	HC3CR
4.0	HH4	HH4R	HC4	HC4R	HC4C	HC4CR	HC4C	HC4CR	HC4C	HC4CR	HC4C	HC4CR
5.0	HH5	HH5R	HC5	HC5R	HC5C	HC5CR	HC5C	HC5CR	HC5C	HC5CR	HC5C	HC5CR
6.0	HH6	HH6R	HC6	HC6R	HC6C	HC6CR	HC6C	HC6CR	HC6C	HC6CR	HC6C	HC6CR
10.0	HH10	HH10R	HC10	HC10R	HC10C	HC10CR	HC10C	HC10CR	HC10C	HC10CR	HC10C	HC10CR
12.0	HH12	HH12R	HC12	HC12R	HC12C	HC12CR	HC12C	HC12CR	HC12C	HC12CR	HC12C	HC12CR
15.0	HH15	HH15R	HC15	HC15R	HC15C	HC15CR	HC15C	HC15CR	HC15C	HC15CR	HC15C	HC15CR
20.0	HH20	HH20R	HC20	HC20R	HC20C	HC20CR	HC20C	HC20CR	HC20C	HC20CR	HC20C	HC20CR
25.0	HH25	HH25R	HC25	HC25R	HC25C	HC25CR	HC25C	HC25CR	HC25C	HC25CR	HC25C	HC25CR
30.0	HH30	HH30R	HC30	HC30R	HC30C	HC30CR	HC30C	HC30CR	HC30C	HC30CR	HC30C	HC30CR

PRESSURE GAUGES & GAUGE MOUNTING BLOCKS

- Clear precise dual scale readings
- Manufactured to EN837-1
- Calibration certificates on request

Hi-Force hydraulic pressure gauges are your “window” to the system and are recommended for use within all hydraulic systems to allow the user to constantly monitor the system pressure. Hi-Force hydraulic pressure gauges are manufactured to EN837-1 and are accurate to +/- 1% of full scale. Standard range models up to 109 tonnes are featured in this catalogue, however gauges to suit Hi-Force high tonnage cylinders are available on request. For digital pressure gauges, please see page 48. Always specify Hi-Force pressure gauges for use with your Hi-Force hydraulic tools.



Gauges

Type	Gauge diameter mm	Gauge type	Reading Inner scale	Reading Outer scale	Inlet thread	Compatible Hi-Force cylinders	Weight kg	Item no.
HG63G	63	glycerine	0-700 Bar	0-10000 Psi	1/4"-18NPT	All models	0.2	78HG63G
HG1	100	dry	0-700 Bar	0-10000 Psi	1/2"-14NPT	All models	0.9	78HG1
HG1G	100	glycerine	0-700 Bar	0-10000 Psi	1/2"-14NPT	All models	1.0	78HG1G
HG5	100	dry	0-700 Bar	0-4.5 tonnes	1/2"-14NPT	All 4.5 tonnes models	0.9	78HG5
HG10	100	dry	0-700 Bar	0-10 tonnes	1/2"-14NPT	All 10 tonnes models	0.9	78HG10
HG11	100	dry	0-700 Bar	0-11 tonnes	1/2"-14NPT	All 11 tonnes models	0.9	78HG11
HG20	100	dry	0-700 Bar	0-20 tonnes	1/2"-14NPT	All 20 tonnes models	0.9	78HG20
HG23	100	dry	0-700 Bar	0-23 tonnes	1/2"-14NPT	All 23 tonnes models	0.9	78HG23
HG25	100	dry	0-700 Bar	0-25 tonnes	1/2"-14NPT	All 25 tonnes models	0.9	78HG25
HG32	100	dry	0-700 Bar	0-32 tonnes	1/2"-14NPT	All 32 tonnes models	0.9	78HG32
HG33	100	dry	0-700 Bar	0-33 tonnes	1/2"-14NPT	All 33 tonnes models	0.9	78HG33
HG50	100	dry	0-700 Bar	0-50 tonnes	1/2"-14NPT	All 50 tonnes models	0.9	78HG50
HG61	100	dry	0-700 Bar	0-61 tonnes	1/2"-14NPT	All 61 tonnes models	0.9	78HG61
HG102	100	dry	0-700 Bar	0-102 tonnes	1/2"-14NPT	All 102 tonnes models	0.9	78HG102
HG109	100	dry	0-700 Bar	0-109 tonnes	1/2"-14NPT	All 109 tonnes models	0.9	78HG109
HG2	150	dry	0-700 Bar	0-10000 Psi	1/2"-14NPT	All models	1.6	78HG2
HG2G	150	glycerine	0-700 Bar	0-10000 Psi	1/2"-14NPT	All models	1.7	78HG2G

Gauge Mounting Blocks

Type	Length mm	Dimensions Width mm	Height mm	Gauge thread	Inlet thread	Outlet thread	Weight kg	Item no.
HGA1	75	32	32	1/2"-14NPT	3/8"-18NPT male	3/8"-18NPT female	0.25	78HG.A0.01
HGA2	170	32	32	1/2"-14NPT	3/8"-18NPT male	3/8"-18NPT female	0.85	78HG.A0.02
HGA1-25	75	32	32	1/4"-18NPT	3/8"-18NPT male	3/8"-18NPT female	0.30	78HG.A1.25
HGA2-25	170	32	32	1/4"-18NPT	3/8"-18NPT male	3/8"-18NPT female	0.90	78HG.A2.25
AGA1-25	75	32	50	1/4"-18NPT	3/8"-18NPT male	3/8"-18NPT female	0.55	78HAGA1-25

Pressure Gauges

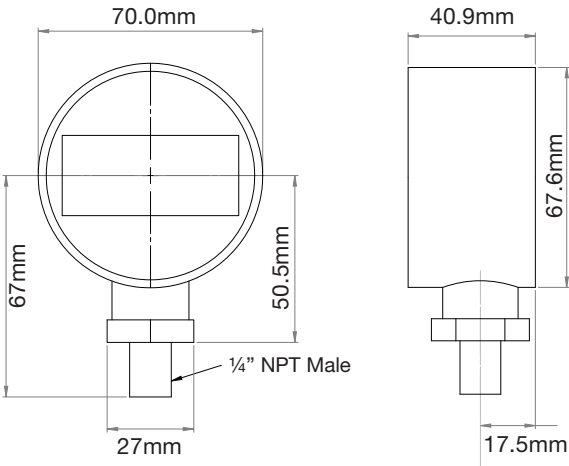
DIGITAL GAUGE

- 5 digit LCD display
- Choice of pressure readings
- 0.5% full scale accuracy

The Hi-Force HDG1 digital general purpose gauge is capable of measuring hydraulic pressure up to 1000 Bar (14,503 PSI) and can display in a variety of units of measure that include Bar, PSI, mPa, kg/cm2, as well as one additional user defined, programmable unit.

This high quality gauge offers an accuracy of 0.5% across its full scale range and incorporates a laser welded, stainless steel sensor & socket making it suitable for use with a wide variety of fluids. Standard features also include tare, min and max memory, blue backlight display, rubber protective enclosure and IP67 weatherproof enclosure rating.

- LCD display with 12mm, 5 digit upper line pressure reading and 6mm, 5 digit lower line unit reading.
- Blue backlight allows reading in low visibility situations
- 20 segment graphical display of pressure
- 0.5% terminal point accuracy
- Minimum 2000 hours battery life (3 VDC)
- Supplied with protective rubber enclosure
- Suitable gauge mounting blocks can be found on Page 47



Type	Gauge diameter mm	Pressure reading Bar	Pressure reading PSI	Pressure reading mPa	Pressure reading kg/cm²	Inlet thread	Weight kg	Item no.
HDG1	70	0-1000	0-14503	0-100	0-1019.7	1/4"-18NPT	0.2	78HDG1

PRESSURE TRANSDUCER & DIGITAL DISPLAY

- Max. working pressure 700 Bar
- Pressure readings in Bar and PSI
- 0.5% full scale accuracy

The Hi-Force HPT1 pressure transducer is capable of measuring hydraulic pressure up to 700 Bar (10.000 PSI) and is supplied complete with a 2 metre connecting cable. Offering an accuracy of 0.5%, this universal pressure transducer offers an economical solution for precise pressure measurement in many different applications.

The Hi-Force HDD1 digital display complements the HPT1 pressure transducer for applications where remote pressure reading is preferred. A choice of pressure unit in Bar or PSI is easily selected via panel buttons, conveniently located below the LCD display that provides clear easy to read measurements. Additional features include minimum and maximum value, average value, tare offset and reset

- IP65 enclosure rating
- Compact size with large LCD display
- 0.5% full scale accuracy
- Pressure reading in Bar or PSI
- Display voltage 18-32 VDC, supplied including power supply unit
- Suitable gauge mounting blocks can be found on Page 47



Pressure Transducer

Type	Pressure range Bar	Pressure range PSI	Connection thread	Accuracy percentage full scale	Cable length m	Weight kg	Item no.
HPT1	0-700	0-10000	1/4"-18NPT	0.5	2	0.1	78HPT1

Digital display unit

Type	Pressure reading Bar	Pressure reading PSI	Display size L x H mm	Overall size L x W x H mm	Voltage VDC	Weight kg	Item no.
HDD1	0-700	0-10000	76 x 25	120 x 110 x 40	18 - 32	0.3	78HDD1

Manifolds

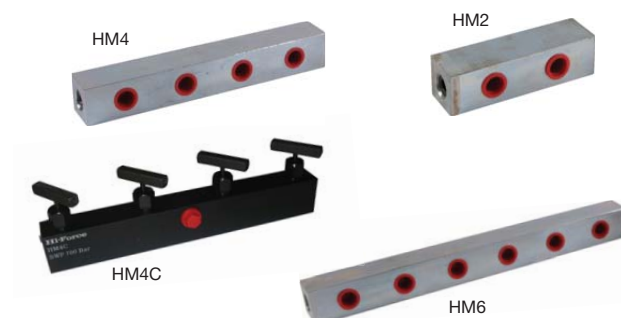
MANIFOLDS

- Working pressure 700 Bar
- Choice of open or controlled manifolds
- 2, 4, 5, 6 or 8 outlet port models available

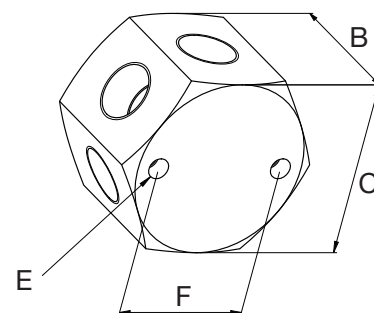
Hi-Force manifolds are designed specifically to allow easy control of the direction of flow of the hydraulic fluid within the system. Supplied either as open manifold blocks or with individual needle type shut off/throttle valves on each 3/8" NPT outlet, Hi-Force manifolds provide even greater versatility in your hydraulic system. The range offers 9 models with a choice of up to 8 outlets per manifold and all models are suitable for 700 Bar maximum working pressure.



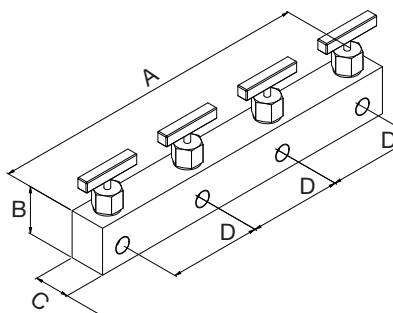
Manifolds are used in conjunction with Hi-Force manual and powered pumps. Refer to catalogue pages 26-45 for a full range of pumps.



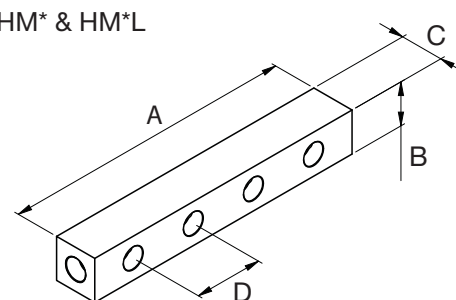
HM5



HM*C



HM* & HM*L



Model number	Type	Design	Number of outlets	Female Threads		Dimensions in mm						Weight kg	Item no.
				Inlet	Outlet	A	B	C	D	E	F		
HM2	manifold	parallel	2	3/8"-18NPT	2 x 3/8"-18NPT	114	32	32	50	-	-	1.0	78HM2
HM4	manifold	parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	214	32	32	50	-	-	1.5	78HM4
HM5	manifold	hexagon	5	3/8"-18NPT	5 x 3/8"-18NPT	-	41	51	-	M6	38	0.7	78HM5
HM6	manifold	parallel	6	3/8"-18NPT	6 x 3/8"-18NPT	314	32	32	50	-	-	2.0	78HM6
HM8	manifold	parallel	8	3/8"-18NPT	8 x 3/8"-18NPT	414	32	32	50	-	-	2.5	78HM8
HM4L	manifold	extended parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	394	32	32	110	-	-	2.4	78HM4L
HM6L	manifold	extended parallel	6	3/8"-18NPT	6 x 3/8"-18NPT	614	32	32	110	-	-	3.7	78HM6L
HM2C	controlled manifold	parallel	2	3/8"-18NPT	2 x 3/8"-18NPT	150	51	38	100	-	-	2.0	78HM2C
HM4C	controlled manifold	parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	350	51	38	100	-	-	3.5	78HM4C

MANIFOLDS

- Working pressure 700 Bar
- Designed for single or double acting systems
- 2 or 4 outlet port models available

Hi-Force controlled manifold units are designed specifically to allow easy control of the direction of flow of the hydraulic fluid, within a single acting or double acting system. These controlled manifold units are mounted in a sturdy framework and are available as 2-outlet or 4-outlet options and are supplied with pressure gauges, reading 0-700 Bar, fitted to each outlet port. All models are fitted with quick connect couplings on all inlet and outlet ports, including the 2-Way and 4-Way open manifold return flow lines on double acting versions.

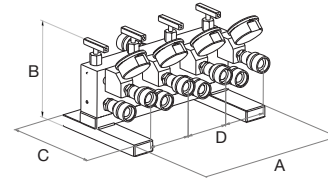
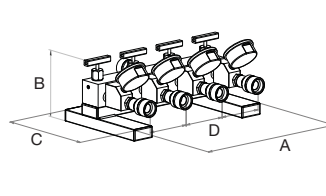
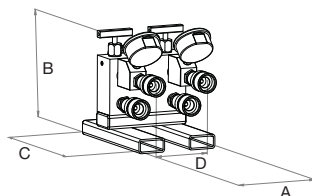
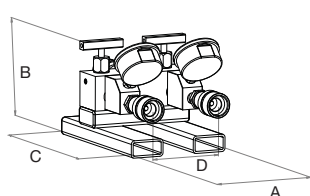


HM2C-SU

HM2C-DU

HM4C-SU

HM4C-DU



Model number	Type	Dimensions in mm				Weight kg	Item no.
		A	B	C	D		
HM2C-SU	2-Way controlled manifold unit, suitable for single acting systems	150	51	51	100	2.0	78HM2C-SU
HM2C-DU	2-Way controlled manifold unit, suitable for double acting systems	150	102	51	100	3.0	78HM2C-DU
HM4C-SU	4-Way controlled manifold unit, suitable for single acting systems	350	51	51	100	3.5	78HM4C-SU
HM4C-DU	4-Way controlled manifold unit, suitable for double acting systems	350	102	51	100	6.0	78HM4C-DU

HYDRAULIC OIL

Hi-Force premium grade hydraulic oil is specially formulated for use with Hi-Force hydraulic tools, providing optimum performance throughout all working conditions.



Type	Capacity litres	For use with	Weight kg	Item no.
HFO32-1	1	Manually operated pumps	1.3	78HFO32-1
HFO32-5	5	Manually operated pumps	24.0	78HFO32-5
HFO32-25	25	Manually operated pumps	4.9	78HFO32-25
HFO46-1	1	Powered pumps	1.3	78HFO46-1
HFO46-5	5	Powered pumps	24.0	78HFO46-5
HFO46-25	25	Powered pumps	4.9	78HFO46-25

SYSTEM COMPONENTS

Couplers And Fittings

HIGH PRESSURE COUPLERS AND FITTINGS

- Large selection of standard adaptors
- Working pressure 700 Bar

Hi-Force high pressure couplers and fittings are designed for easy system connection and assembly of your Hi-Force hydraulic equipment. All Hi-Force couplers and fittings are suitable for 700 Bar maximum working pressure. Hi-Force recommends the use of threaded dust caps with quick connect couplers to protect the thread of the coupler and at the same time prevent any contaminants entering your hydraulic system. Always specify Hi-Force couplers and fittings for use with your Hi-Force hydraulic tools.



Safety first !

Be sure to use genuine Hi-Force couplers and fittings which are designed to withstand the full 700 Bar working pressure.

Type	See picture	Description	Thread specification	Weight kg	Item no.
HF7	1	Nipple	1/4" NPT male to 1/4" NPT male	0.1	78HF7
HF8	5	Adaptor	1/4" NPT female to 1/4" NPT female	0.1	78HF8
HF10	2	Elbow	3/8" NPT female to 3/8" NPT female	0.3	78HF10
HF12	3	Equal tee	3/8" NPT female	0.4	78HF12
HF13	4	Cross	3/8" NPT female	0.4	78HF13
HF14	5	Adaptor	3/8" NPT female to 3/8" NPT female	0.1	78HF14
HF15	5	Reducer	3/8" NPT female to 1/4" NPT female	0.2	78HF15
HF16	6	Elbow	3/8" NPT female to 3/8" NPT male	0.2	78HF16
HF17	1	Nipple	3/8" NPT male to 3/8" NPT male	0.1	78HF17
HF19	1	Long nipple	3/8" NPT male to 3/8" NPT male	0.1	78HF19
HF24	7	Adaptor	3/8" NPT male to 3/8" BSP female	0.1	78HF24
HF27	1	Nipple	1/4" NPT male to 3/8" NPT male	0.1	78HF27
HF30	7	Reducer	3/8" NPT male to 1/4" NPT female	0.2	78HF30
HF31	8	Tee	3/8" NPT female to 3/8" NPT male	0.2	78HF31
HF33	7	Reducer	3/8" NPT male to 1/4" BSPT female	0.1	78HF33
HF55	7	Reducer	3/8" NPT female to 1/4" NPT male	0.1	78HF55
HF69	7	Adaptor	1/2" BSP male to 3/8" NPT female	0.1	78HF69
CF1	9	Female coupler	3/8" NPT male	0.3	78HCF1
CM1	10	Male coupler	3/8" NPT female	0.2	78HCM1
CMF1	9 + 10	Complete coupler	3/8" NPT	0.5	78HCMF1
CF2	9	Female coupler	1/4" NPT male	0.2	78HCF2
CM2	10	Male coupler	1/4" NPT female	0.1	78HCM2
CMF2	9 + 10	Complete coupler	1/4" NPT	0.4	78HCMF2
CFD1	11	Metal dust cap for CF1	-	0.1	78HCFD1
CMD1	12	Metal dust cap for CM1	-	0.1	78HCM1
CFD2	11	Metal dust cap for CF2	-	0.1	78HCFD2
CMD2	12	Metal dust cap for CM2	-	0.1	78HCM2
PPC1	13	Moulded universal dust cap to suit CF1 & CM1	-	0.1	78HPPC1



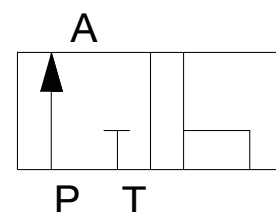
DIRECTIONAL CONTROL VALVES

- Working pressure 700 Bar
- Pump or remote mounted design
- Manual or solenoid options available

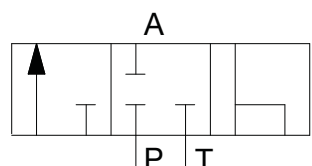
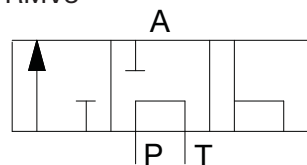
Hi-Force control valves are designed to provide precise control of the hydraulic system either by accurate pressure or directional flow control. The PMV range of pump mounted valves is identical to the valves fitted to the Hi-Force powered pumps featured on pages 36-38, 39-40, 43-44 and can be easily interchanged, making your powered pump even more versatile. The RMV range allows for remote mounting away from the pump. Always specify Hi-Force control valves for use with your Hi-Force hydraulic tools. Flow control valves are featured on the next page.



PMV2

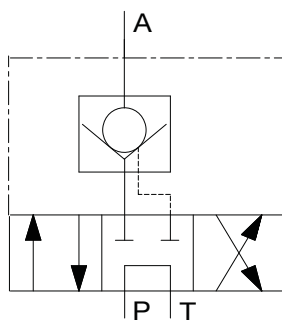


PMV3
RMV3

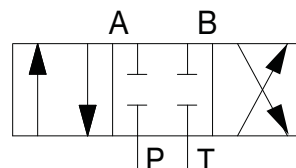
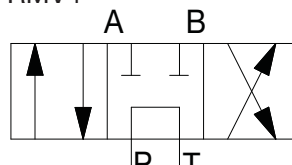


PMV3C
RMV3C

PMV3L
RMV3L

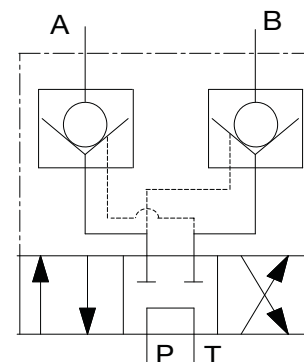


PMV4
RMV4



PMV4C
RMV4C

PMV4L
RMV4L



Description	Model number			
	Manual valve no load holding	Manual valve with load holding	Solenoid valve 24V incl. control	Manual valve closed centre
Pump mounted, 2-way, 2 position valve	PMV2	-	-	-
Pump mounted, 3-way, 3 position valve	PMV3	PMV3L	PMV3S	PMV3C
Pump mounted, 4-way, 3 position valve	PMV4	PMV4L	PMV4S	PMV4C
Remote mounted, 3-way, 3 position valve	RMV3	RMV3L	RMV3S	RMV3C
Remote mounted, 4-way, 3 position valve	RMV4	RMV4L	RMV4S	RMV4C

Control Valves

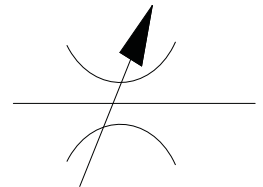
FLOW CONTROL VALVES

- Working pressure 700 Bar
- 3/8" -18 NPT connections
- Ensures system safety and control



Manual shut off valve with needle type flow control.
Used for load holding and throttling functions. Can also be used as a gauge isolator.

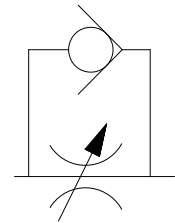
Type	Height	Dimensions in mm Length	Width	Weight kg	Item no.
HM1C	82	64	38	0.4	78HM1C



HM1C

Manual check valve used for automatic load locking,
with precise manual load lowering feature.

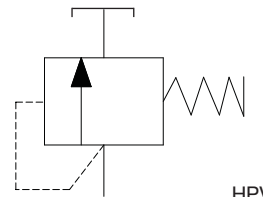
Type	Height	Dimensions in mm Length	Width	Weight kg	Item no.
HFV66	86	75	47	0.9	78HFV66



HFV66

Adjustable pressure relief valve, for pressure setting from 55 to 700 Bar.
Supplied complete with return line hose.

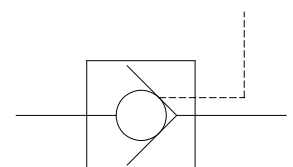
Type	Height	Dimensions in mm Length	Width	Weight kg	Item no.
HPV152	102	64	32	2.0	78HPV152



HPV152

Pilot operated check valve used as a safety valve for double acting cylinders.
Pilot port connects to cylinder retract line.

Type	Height	Dimensions in mm Length	Width	Weight kg	Item no.
HFV42	84	64	32	1,1	78HFV42



HFV42

JACKS

Aluminium Jacks

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

JAH & JAS - ALUMINIUM JACKS

- Capacities from 10 to 60 tonnes
- Stroke lengths from 75 to 305 mm
- Internal safety overload device

The JAH and JAS ranges of lightweight aluminium jacks offers a wide variety of capacities and lift height options. Available as either plain ram lifting jacks, with or without "failsafe" mechanical lock ring, or optional low height claw lifting design, all models are constructed predominantly of lightweight aluminium alloy with all critical functioning parts manufactured from high quality steel. Used extensively in maintenance, construction, heavy plant and machinery applications, these high quality jacks are the proven industry standard.

- Lightweight construction
- Stroke limiting device
- Available as plain ram jack, claw jack or "failsafe" locking ring design



Note:
JAS103 and JAS105 feature spring assisted piston retraction



Multi purpose superjack

Type	Jack capacity tonnes	Claw capacity tonnes	Stroke mm	Closed height	Dimensions in mm			Weight kg	Item no.
					Toe height	Base length	Base width		
JAS103	10	-	75	131	-	162	75	4.3	78JA.S1.03
JAS105	10	-	125	181	-	162	75	5.7	78JA.S1.05

Jack with plain piston

Type	Jack capacity tonnes	Claw capacity tonnes	Stroke mm	Closed height	Dimensions in mm			Weight kg	Item no.
					Toe height	Base length	Base width		
JAH620	20	-	152	263	-	178	121	11	78JA.H0.620
JAH1220	20	-	305	438	-	246	121	17	78JA.H1.220
JAH630	30	-	152	263	-	203	140	16	78JA.H0.630
JAH1230	30	-	305	451	-	273	140	24	78JA.H1.230
JAH660	60	-	152	293	-	251	190	28	78JA.H0.660
JAH1260	60	-	305	500	-	342	190	44	78JA.H1.260

Jack with plain piston & lifting claw & with extended base

Type	Jack capacity tonnes	Claw capacity tonnes	Stroke mm	Closed height	Dimensions in mm			Weight kg	Item no.
					Toe height	Base length	Base width		
JAH620C	20	8	152	280	67	246	121	15	78JA.H0.620C
JAH1220C	20	8	305	456	67	246	121	23	78JA.H1.220C
JAH630C	30	12	152	281	73	273	140	21	78JA.H0.630C
JAH1230C	30	12	305	472	73	273	140	32	78JA.H1.230C
JAH660C	60	24	152	327	73	342	190	44	78JA.H0.660C
JAH1260C	60	24	305	540	73	342	190	65	78JA.H1.260C

Jack with "failsafe" locking ring

Type	Jack capacity tonnes	Claw capacity tonnes	Stroke mm	Closed height	Dimensions in mm			Weight kg	Item no.
					Toe height	Base length	Base width		
JAH620SR	20	-	152	289	-	178	121	13	78JA.H0.620SR
JAH1220SR	20	-	305	464	-	246	121	19	78JA.H1.220SR
JAH630SR	30	-	152	292	-	203	140	17	78JA.H0.630SR
JAH1230SR	30	-	305	479	-	273	140	25	78JA.H1.230SR
JAH660SR	60	-	152	330	-	251	190	30	78JA.H0.660SR
JAH1260SR	60	-	305	536	-	342	190	46	78JA.H1.260SR

JACKS

Compact Jacks

JCS - COMPACT JACKS - SOLID PISTON

- Capacities from 10 to 30 tonnes
- Operates in any position
- Lightweight and compact

The Hi-Force JCS range of compact jacks is ideally suited for applications requiring a lifting or positioning force in confined spaces. Lightweight, easy to operate and manufactured from high grade steel (JCS10) and aluminium (JCS20 & JCS30), all models incorporate a spring assisted return, wear coated piston. The pumping mechanism rotates through 360° providing maximum versatility in any application. With the removable operating handle measuring only 240mm in length, these compact lifting jacks will fit in any toolbox.

- Spring assisted return piston
- Multi-position pump mechanism
- Internal safety overload valve
- Nitrocarburised piston rod
- Sealed hydraulic system



Multi purpose superjack

Type	Capacity tonnes	Material	Stroke mm	Length	Dimensions in mm				Weight kg	Item no.
					Closed Height	Piston Dia.	Max. handle height	Width		
JCS10	10	Steel	35	240	76	38	266	70	4.5	78JC.S0.10
JCS20	20	Aluminium	41	257	102	51	281	102	5.5	78JC.S0.20
JCS30	30	Aluminium	45	281	112	60	285	125	8.0	78JC.S0.30

JCH - COMPACT JACKS - HOLLOW PISTON

- Capacity of 13 and 21 tonnes
- Operates in any position
- Lightweight and compact

The JCH range of compact jacks is of similar design to the JCS range detailed above, however JCH models feature a hollow piston design for even greater versatility. Suitable for use in tooling, maintenance and tensioning applications, where a pulling force is required. With many common parts to the JCS range these multi-purpose JCH jacks can also be used for general lifting applications.



Multi purpose superjack

Type	Capacity tonnes	Material	Stroke mm	Length	Closed Height	Dimensions in mm			Hole Centre	Width	Weight kg	Item no.
						Piston Dia.	Max handle height					
JCH13	13	Aluminium	41	257	95	51	281		25	102	5.5	78JC.H0.13
JCH21	21	Aluminium	45	281	114	60	285		35	125	8.0	78JC.H0.21

JSS - STEEL BOTTLE JACKS

- Capacities from 3 to 100 tonnes
- Strong rigid steel construction
- Suitable for industrial and automotive use

The Hi-Force JSS range of steel bottle jacks offers capacities from 3 to 100 tonnes, with stroke lengths from 135 to 195 mm. Models up to 16 tonnes capacity feature a screw extension to span the gap between the piston ram cap and the load. All models are supplied with a tubular operating lever.

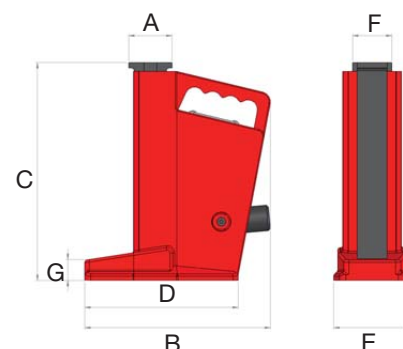


Type	Capacity tonnes	Stroke mm	Screw extension mm	Closed height	Dimensions in mm			Weight kg	Item no.
					Piston diameter	Base length	Base width		
JSS35	3	135	70	195	28	100	100	3.0	78JS.S0.035
JSS55	5	135	90	200	32	110	115	4.0	78JS.S0.055
JSS106	10	174	90	243	43	135	130	7.0	78JS.S0.106
JSS166	16	178	95	255	53	160	150	10.0	78JS.S0.166
JSS207	20	190	-	280	56	127	165	15.0	78JS.S0.207
JSS327	32	190	-	285	71	152	190	22.0	78JS.S0.327
JSS507	50	195	-	300	85	177	217	32.0	78JS.S0.507
JSS1007	100	195	-	340	117	265	240	69.0	78JS.S1.007

HCJ - STEEL TOE JACK

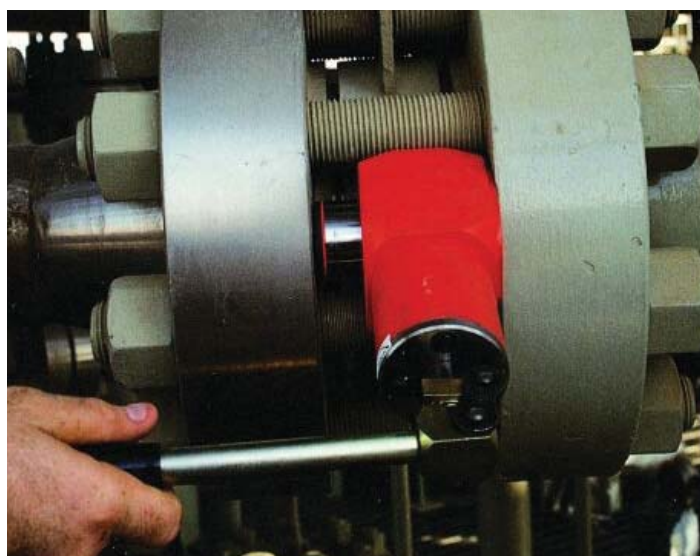
- Capacity 5 tonnes
- Strong rigid steel construction
- Toe guided over full stroke length

The Hi-Force HCJ5 toe jack offers a full 5 tonnes capacity either on the piston head or the fully integrated toe. The low height toe is guided over the full stroke length of the jack, reducing the effects of side loading. The piston is enclosed within the toe and is not exposed during operation. These features make the HCJ5 a truly multi-purpose jack which can easily and safely be used in the most difficult conditions, including underground mining applications.



Type	Jack capacity tonnes	Toe capacity tonnes	Stroke mm	Dimensions in mm							Weight kg	Item no.
				A	B	C	D	E	F	G		
HCJ5	5	5	175	64	255	327	219	114	57	41	18	78HCJ5

HYDRAULIC JACK APPLICATIONS



TWM - MANUAL TORQUE WRENCHES - CLICK TYPE

- Torque capacities from 5 to 850 Nm
- Repeatable accuracy +/- 3%
- Dual scale Nm & lbf.ft.

The TWM range of industrial manual torque wrenches offers 7 models with torque capacities from 5 to 850 Nm (3.5 to 630 lbf.ft) with square drive sizes from 3/8" to 3/4". All models are designed and 84 manufactured to meet or exceed the highest demands of industry and are marked with a unique serial number and supplied with a calibration certificate.

All TWM manual torque wrenches have a dual scale reading of Nm and lbf.ft and are ideally suited for applications requiring repeatable, accurate torqueing of bolts and nuts. The reversible square drive and integrated ratchet head allows the wrench to be used for torque control in both clockwise and anti-clockwise directions. All models incorporate an ergonomic handgrip and integrated locking mechanism to prevent accidental alteration of the torque setting during operation. The ratchet head gives a audible click immediately the required preset torque is achieved.

- Heavy duty ratchet head
- Accuracy +/- 3%
- Reversible square drive
- Supplied with calibration certificate
- Micrometer scale for setting accurate interim values



See pages 69 & 70 for manual torque wrenches with higher torque capacities

Type	Square drive	Torque range		Main scale grad. Nm	Micro scale grad. Nm	Overall length mm	Ratchet head dia mm	Weight kg	Item no.
		Nm	lbf.ft						
TWM50	3/8"	5 - 50	3.5 - 37	2.50	0.25	334	35	0.5	78HTWM50
TWM100	1/2"	20 - 100	15 - 75	5.00	0.50	394	44	0.9	78HTWM100
TWM200	1/2"	40 - 200	30 - 150	10.00	1.00	485	44	1.1	78HTWM200
TWM300	1/2"	60 - 300	45 - 220	10.00	1.00	577	46	1.4	78HTWM300
TWM400	3/4"	80 - 400	60 - 300	10.00	1.00	686	67	2.0	78HTWM400
TWM550	3/4"	110 - 550	80 - 405	10.00	1.00	956	69	3.8	78HTWM550
TWM850	3/4"	250 - 850	185 - 630	10.00	1.00	1379	69	4.7	78HTWM850

Torque Wrenches

HTW - MANUAL TORQUE WRENCHES - BREAK BACK TYPE

- Torque capacities from 300 to 2000 Nm
- Repeatable accuracy +/- 4%
- Dual scale Nm & lbf.ft.

Hi-Force HTW industrial manual torque wrenches offer output torque capacities ranging from 300 to 2000 Nm (220 to 1500 lbf.ft) with repeatable accuracy of +/- 4% and a choice of 3/4" and 1" square drive. All HTW break-back type models provide a large break angle, to prevent the possibility of over torquing. The cam control of the internal mechanism will ensure a controlled "break" once the required preset torque is achieved, which reduces the risk of the operator losing balance. The wrench automatically resets when hand pressure is released.

All models are designed and manufactured to meet or exceed the highest demands of industry and are marked with a unique serial number and supplied with a calibration certificate. All HTW manual torque wrenches incorporate a push-through square drive which allows for torque control in both clockwise and anti-clockwise directions.

- Heavy duty ratchet head
- Accuracy +/- 4%
- Push-through square drive
- Supplied with calibration certificate
- Complete with carrying & storage case



**Need a higher torque capacity
Please check our mechanical and
pneumatic torque multipliers on
pages 62 to 64.**

**Alternatively see pages 65 to 74 for
hydraulic torque wrench options.**

Type	Square drive	Torque range		Overall length mm	Ratchet head dia mm	Weight kg	Item no.
		Nm	lbf.ft				
HTW1000B	3/4"	300 - 1000	220 - 750	1475	70	7.3	78HTW1000B
HTW1500B	3/4"	700 - 1500	500 - 1000	1475	70	10.4	78HTW1500B
HTW1800B	1"	700 - 1500	500 - 1000	1475	70	10.4	78HTW1800B
HTW2000B	1"	900 - 2000	600 - 1500	1920	70	13.0	78HTW2000B

TWM - HIGH CAPACITY ALUMINIUM MANUAL TORQUE WRENCHES

- Torque capacities from 520 to 2000 Nm
- Repeatable accuracy +/- 3%
- Lightweight design

Hi-Force TWM high capacity, aluminium manual torque wrenches offer comparable output torque capacities to the HTW range of manual torque wrenches, featured on page 60, but have the added benefit of a lightweight aluminium body. The range offers a choice of 3 models with torque capacities from 520 to 2000 Nm and square drive sizes of 3/4" and 1".

All models are supplied with extension handles to minimise operator effort when high torque values need to be achieved. Optional ratchet heads available for use with the TWM aluminium manual torque wrenches are detailed below under accessories.



TWM1000 and TWM2000 with extension handle

Type	Square drive	Torque range		Scale grad. Nm	Nr. of ext. rods	Overall length mm	Recom. ratchet head	Weight kg	Item no.
		Nm	lbf.ft						
TWM1000	3/4"	520 - 1000	380 - 730	10	1	1413	TWM075R	5,6	78HTWM1000
TWM1500	1"	600 - 1500	-	25	1	1608	TWM100R	10,8	78HTWM1500
TWM3000	1"	750 - 2000	-	50	2	2353	TWM100R	11,6	78HTWM2000

ACCESSORIES

- Ratchet heads for use with high capacity aluminium manual torque wrench models
- Clockwise controlled torqueing
- Square drives of 3/4" and 1"



TWM100R

Type	Square drive input	Square drive output	capacity Nm Max. torque	Height mm	Diameter mm	Weight kg	Item no.
TWM075R	3/4"	3/4"	1000	53	65	1,0	78HTWM075R
TWM100R	1"	1"	2000	63	73	1,8	78HTWM100R

Torque Multipliers

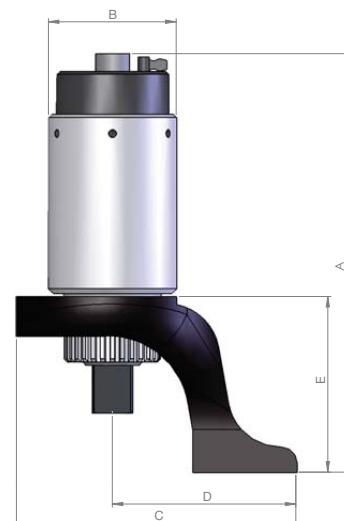
TWG - MECHANICAL TORQUE MULTIPLIERS

- Torque capacities up to 10000 Nm
- Lightweight aluminium housing
- Supplied complete with reaction arm

The Hi-Force TWG range of mechanical torque multipliers offers output torque capacities from 50 to 10000 Nm with gearbox multiplication ratios from 1:4 to 1:28.5. Available in a choice of 6 models, each fitted with a high performance aluminium housing, all models are ideal for use in bolting applications in many industries including oil & gas, construction, railways, ship building, machinery & plant engineering and heavy vehicle workshops.

Models TWG40, TWG60 and TWG100 are fitted with an anti-wind up ratchet and non-destructive overload safety mechanism for enhanced gear protection. All models are supplied with an offset reaction arm and suitable Hi-Force manual torque wrenches for use with TWG torque multipliers are detailed on page 59 of this catalogue.

- Single stage planetary gear in models up to 2800 Nm
- Compact two stage planetary gear in models up to 10000 Nm
- Output square drives of 3/4", 1" and 1 1/2"



Type	Torque capacity		Gearbox ratio	Input square drive	Output square drive	Recom. torque wrench	Dimensions in mm					Weight kg	Item no.
	Nm	lbf.ft					A	B	C	D	E		
TWG13	1300	950	1:5	1/2"	3/4"	TWM300	133	80	124	96	98	1.3	78HTWG13
TWG20	2000	1500	1:4	3/4"	1"	TWM550	131	88	190	150	80	1.8	78HTWG20
TWG28	2800	2050	1:5.5	3/4"	1"	TWM550	146	106	156	159	83	2.4	78HTWG28
TWG40	4000	2930	1:16	1/2"	1"	TWM300	227	88	175	135	110	4.2	78HTWG40
TWG60	6000	4400	1:18	3/4"	1 1/2"	TWM400	256	102	240	190	145	6.6	78HTWG60
TWG100	10000	7330	1:28.5	3/4"	1 1/2"	TWM400	292	142	267	215	163	10.9	78HTWG100

TWP - PISTOL GRIP PNEUMATIC TORQUE MULTIPLIERS

- Torque capacities up to 6000 Nm
- Repeatable accuracy of +/- 5%
- Lightweight and durable construction

The TWP pistol grip, pneumatic torque multiplier range is designed to provide smooth, controllable bolt tightening operations, without impacting or pulsing. Offering a repeatable torque accuracy of +/-5%, this low noise, ultra lightweight range of tools, reduces operator fatigue, increases safety and ensures fast, consistently accurate, tightening of bolted components. The powerful, but lightweight, reversible, pistol grip design air motor, allows the tool to be used for tightening and loosening of bolts. The non-impacting design of the planetary gears, ensures that there is minimum wear to sockets and bolted components. The high grade, steel gearbox has a electro coated galvanized surface, offering even greater corrosion protection and reduces the importance of lubrication, in the gear box. All models are supplied with an airline pressure and lubrication control unit, in a handy carrying frame with a 3 metre length connecting hose with quick connect couplings. Accurate pre-set and consistent torque repeatability is easily achieved by adjusting the input air pressure, to the tool, in conjunction with the calibration graph, supplied with each tool. Average air consumption is 23 litres per second, from a standard airline pressure of 8 Bar (49.5 cubic feet per minute at 116 PSI).

- Slimline gearbox allows excellent access
- Sensitive trigger control allows for easy reaction arm positioning
- Smooth, quiet, non-impacting design with reversible air motor
- Two speed models available on request
- Supplied complete with FRL filter, regulator and lubricator unit including class 1.0 air inlet pressure gauge and connecting hose



Type	Torque capacity *		Square drive size	R.P.M. at max pressure	Overall length mm	Gearbox diameter mm	Weight kg	Item no.
	Nm	lbf.ft						
TWP09S	200-900	150-670	3/4"	24	328	80	3.2	78HTWP09S
TWP15S	300-1500	220-1110	1"	12	343	88	4.7	78HTWP15S
TWP22S	500-2200	370-1620	1"	7	360	88	5.1	78HTWP22S
TWP32S	800-3200	590-2360	1"	4	383	88	5.8	78HTWP32S
TWP40S	850-4200	620-3100	1"	4	383	88	5.8	78HTWP40S
TWP60S	1200-6000	880-4400	1 1/2"	4	400	102	7.7	78HTWP60S

(*) Minimum torque value at 1.5 Bar, maximum torque value at 8 Bar airline pressure. Weight is without reaction arm.

Torque Multipliers

TWP-OG - PISTOL GRIP PNEUMATIC TORQUE MULTIPLIERS

- Torque capacities up to 4800 Nm
- Repeatable accuracy of +/- 5%
- Lightweight and durable construction

The TWP-OG pistol grip, pneumatic torque multiplier, with integrated offset gearbox is designed to provide smooth, controllable bolt tightening operations, without impacting or pulsing. Offering a repeatable torque accuracy of +/-5%, this low noise, ultra lightweight tool, reduces operator fatigue, increases safety and ensures fast, consistently accurate tightening of bolted components. The powerful, but lightweight, reversible, pistol grip design air motor allows the tool to be used for tightening and loosening of bolts. The non-impacting design of the planetary gears ensures that there is minimum wear to sockets and bolted components. The high grade steel gearbox has a electro coated galvanized surface offering even greater corrosion protection and reduces the importance of lubrication in the gear box. All models are supplied complete with an air-line pressure and lubrication control unit, in a handy carrying frame, with a 3 metre length connecting hose with quick connect couplings. Accurate preset and consistent torque repeatability is easily achieved by adjusting the input air pressure to the tool, in conjunction with the pressure table supplied with the tool. Average air consumption is 23 litres per second from a standard airline pressure of 8 Bar (49.5 cubic feet per minute at 116 PSI).

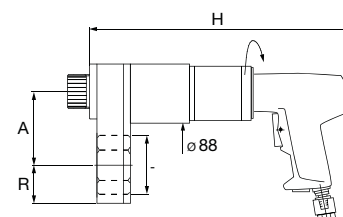
- Offset gearbox specially designed for heat exchangers
- Sensitive trigger control allows for easy reaction arm positioning
- Smooth, quiet, non-impacting design with reversible air motor
- Two speed models available on request
- Supplied complete with FRL filter, regulator and lubricator unit including class 1.0 air inlet pressure gauge and connecting hose



TWP30S-OG1



FRL-Einheit



Type	Torque capacity *		R.P.M. at max pressure	Female Hexagon	Dimensions in mm+			Weight kg	Item no.
	Nm	lbf.ft			A	H	R		
TWP30S-OG1	3000	2200	7	60 mm AF	112	396	61	10	78HTWP30S-OG1
TWP30S-OG2	3600	2650	5	80 mm AF	118	396	75	12	78HTWP30S-OG2
TWP30S-OG3	4800	3500	4	95 mm AF	135	396	95	13	78HTWP30S-OG3

(*) Maximum torque value at 8 Bar airline pressure

TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE

- Working pressure 700 Bar
- Compact, lightweight, aluminium construction
- Fitted with 360° Uni-Swivel quick release couplings

Hi-Force TWS-N series lightweight aluminium hydraulic torque wrenches are designed to handle the toughest bolting jobs accurately and quickly. All models provide a torque accuracy of $\pm 3\%$. The internal reaction arm spline allows the operator to easily position the tool and, if necessary, react directly off the tool body in very confined access applications. All models incorporate an easily reversible high grade alloy steel square drive enabling the operator to quickly switch from tightening to loosening applications. Uni-Swivel quick release couplers are fitted as standard to all models enabling easy positioning of the hydraulic hoses away from any possible "pinch points". Optional allen hex drives are available (see page 67) along with a comprehensive range of high quality torque wrench sockets. (See pages 68 & 69).

- Accurate to $\pm 3\%$ with calibration chart supplied
- Multi-position reaction foot with safety lock feature
- Reversible square drive for tightening and loosening applications Suitable for continuous operation at maximum pressure



Allen hex drive adaptors
(see page 67)



Did you know.....

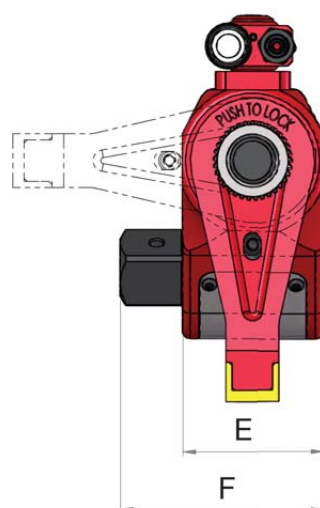
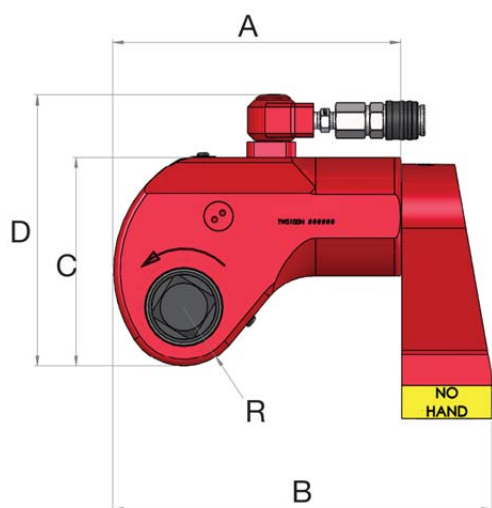
Hi-Force hydraulic torque tools are manufactured on the latest "State of the art" CNC machining centres, guaranteed to manufacture components to the highest quality standards available.

TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE

- Designed for tightening and loosening
- Internal reaction arm spline
- Accurate to +/- 3%



TWS100N



Type	Torque capacity *		Square drive size	Dimensions in mm							Weight incl. reaction foot kg	Item no.
	Nm at 700 Bar	lbf .ft at 10,000 PSI		A	B	C	D	E	F	R		
TWS17N	1727	1254	3/4"	129	167	90	131	51	73	25	1.9	78TW.S0.017
TWS45N	4529	3289	1"	167	218	121	170	68	98	34	4.8	78TW.S0.045
TWS100N	10064	7308	1 1/2"	223	293	163	211	92	135	46	9.0	78TW.S0.100
TWS150N	14974	10873	1 1/2"	247	323	192	236	100	141	54	15.0	78TW.S0.150
TWS370N	36992	26860	2 1/2"	329	432	240	288	137	204	66	32.5	78TW.S0.370

TWS-N-ACCESSORIES

- Sizes available for all TWS-N wrenches
- Limitations on applied torque (check before use)
- Suitable for tightening & loosening applications



TWS17N with hexagon drive fitted

Imperial Allen Hexagon Drive Adaptors

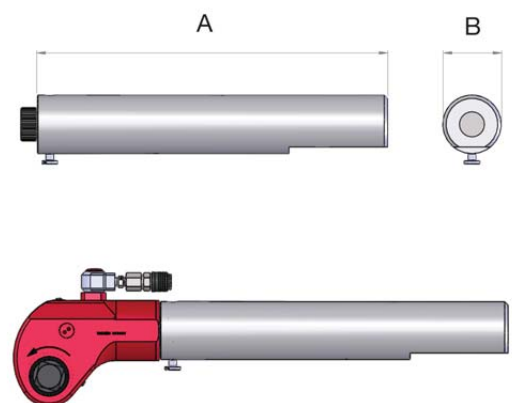
For tool Type	Type	Hexagon Size	Maximum Torque load Nm	Item no.
TWS17N	IH17N-008	1/2"	470	78HIH17N-008
TWS17N	IH17N-010	5/8"	930	78HIH17N-010
TWS17N	IH17N-012	3/4"	1600	78HIH17N-012
TWS17N	IH17N-014	7/8"	1700	78HIH17N-014
TWS17N	IH17N-100	1"	1700	78HIH17N-100
TWS45N	IH45N-010	5/8"	930	78HIH45N-010
TWS45N	IH45N-012	3/4"	1600	78HIH45N-012
TWS45N	IH45N-014	7/8"	2550	78HIH45N-014
TWS45N	IH45N-100	1"	3800	78HIH45N-100
TWS45N	IH45N-102	1 1/8"	4500	78HIH45N-102
TWS45N	IH45N-104	1 1/4"	4500	78HIH45N-104
TWS100N	IH100N-014	7/8"	1890	78HIH100N-014
TWS100N	IH100N-100	1"	3800	78HIH100N-100
TWS100N	IH100N-102	1 1/8"	5440	78HIH100N-102
TWS100N	IH100N-104	1 1/4"	7480	78HIH100N-104
TWS100N	IH100N-106	1 3/8"	9920	78HIH100N-106
TWS100N	IH100N-108	1 1/2"	10000	78HIH100N-108
TWS150N	IH150N-104	1 1/4"	7400	78HIH150N-104
TWS150N	IH150N-106	1 3/8"	9900	78HIH150N-106
TWS150N	IH150N-108	1 1/2"	15000	78HIH150N-108
TWS150N	IH150N-110	1 5/8"	15000	78HIH150N-110
TWS150N	IH150N-112	1 3/4"	15000	78HIH150N-112
TWS370N	IH370N-108	1 1/2"	12900	78HIH370N-108
TWS370N	IH370N-110	1 5/8"	16300	78HIH370N-110
TWS370N	IH370N-112	1 3/4"	20400	78HIH370N-112
TWS370N	IH370N-114	1 7/8"	25100	78HIH370N-114
TWS370N	IH370N-200	2"	30600	78HIH370N-200
TWS370N	IH370N-204	2 1/4"	37000	78HIH370N-204

Metric Allen Hexagon Drive Adaptors

Type	Hexagon Size	Maximum Torque load Nm	Item no.
MH17N-14	14mm	740	78HMH17N-14
MH17N-17	17mm	1350	78HMH17N-17
MH17N-19	19mm	1612	78HMH17N-19
MH17N-22	22mm	1700	78HMH17N-22
MH17N-24	24mm	1700	78HMH17N-24
MH45N-17	17mm	1100	78HMH45N-17
MH45N-19	19mm	1600	78HMH45N-19
MH45N-22	22mm	2550	78HMH45N-22
MH45N-24	24mm	3700	78HMH45N-24
MH45N-27	27mm	4500	78HMH45N-27
MH100N-22	22mm	2480	78HMH100N-22
MH100N-24	24mm	3700	78HMH100N-24
MH100N-27	27mm	4650	78HMH100N-27
MH100N-30	30mm	6380	78HMH100N-30
MH100N-32	32mm	7625	78HMH100N-32
MH100N-36	36mm	10000	78HMH100N-36
MH150N-30	30mm	7000	78HMH150N-30
MH150N-32	32mm	7500	78HMH150N-32
MH150N-36	36mm	10900	78HMH150N-36
MH150N-41	41mm	15000	78HMH150N-41
MH150N-46	46mm	15000	78HMH150N-46
MH370N-36	36mm	10000	78HMH370N-36
MH370N-41	41mm	16300	78HMH370N-41
MH370N-46	46mm	22500	78HMH370N-46
MH370N-50	50mm	30600	78HMH370N-50
MH370N-55	55mm	37000	78HMH370N-55
MH370N-60	60mm	37000	78HMH370N-60

Extended Reaction Arms

For tool Type	Type	Length A		Diameter B		Item no.
		Inch	mm	Inch	mm	
TWS17N	ERA17-21	21"	533	1 3/4"	44.5	78HERA17-21
TWS17N	ERA17-24	24"	610	1 3/4"	44.5	78HERA17-24
TWS17N	ERA17-36	36"	914	1 3/4"	44.5	78HERA17-36
TWS45N	ERA45-21	21"	533	2 1/2"	63.5	78HERA45-21
TWS45N	ERA45-24	24"	610	2 1/2"	63.5	78HERA45-24
TWS45N	ERA45-36	36"	914	2 1/2"	63.5	78HERA45-36
TWS100N	ERA100-21	21"	533	3 1/2"	88.9	78HERA100-21
TWS100N	ERA100-24	24"	610	3 1/2"	88.9	78HERA100-24
TWS100N	ERA100-36	36"	914	3 1/2"	88.9	78HERA100-36
TWS150N	ERA150-21	21"	533	3 1/2"	88.9	78HERA150-21
TWS150N	ERA150-24	24"	610	3 1/2"	88.9	78HERA150-24
TWS150N	ERA150-36	36"	914	3 1/2"	88.9	78HERA150-36
TWS370N	ERA370-21	21"	533	4 3/4"	120.6	78HERA370-21
TWS370N	ERA370-24	24"	610	4 3/4"	120.6	78HERA370-24
TWS370N	ERA370-36	36"	914	4 3/4"	120.6	78HERA370-36

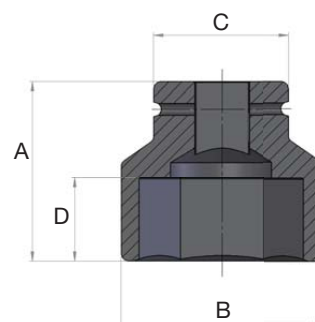


TWS-N fitted with extended reaction arm

IS - IMPERIAL HEXAGON AF SIZE HEAVY DUTY SOCKETS

- Square drives from 3/4" to 2 1/2"
- Across flat sizes up to 6 7/8"
- Supplied complete with retaining ring and pin

Hi-Force high quality imperial size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The IS range of imperial impact sockets offers 47 models, with square drives from 3/4" to 2 1/2" and across flat sizes up to 6 7/8". Long length, bi-hexagonal and special sockets are available on request.



Type	Square drive	Nut AF inches	Dimensions in mm				Item no.
			A	B	C	D	
IS2-101	3/4"	1 1/16"	52	40	38	16	78HIS2-101
IS2-104	3/4"	1 1/4"	52	44	44	20	78HIS2-104
IS2-107	3/4"	1 7/16"	56	51	44	23	78HIS2-107
IS2-110	3/4"	1 5/8"	62	58	44	27	78HIS2-110
IS2-113	3/4"	1 13/16"	68	67	44	32	78HIS2-113
IS2-200	3/4"	2"	72	71	54	35	78HIS2-200
IS2-203	3/4"	2 3/16"	74	77	54	35	78HIS2-203
IS2-206	3/4"	2 3/8"	75	84	54	35	78HIS2-206
IS9-101	1"	1 1/16"	58	44	51	17	78HIS9-101
IS9-104	1"	1 1/4"	60	51	51	21	78HIS9-104
IS9-107	1"	1 7/16"	62	56	52	26	78HIS9-107
IS9-110	1"	1 5/8"	62	62	52	26	78HIS9-110
IS9-113	1"	1 13/16"	64	68	58	27	78HIS9-113
IS9-200	1"	2"	70	74	58	31	78HIS9-200
IS9-203	1"	2 3/16"	72	80	62	32	78HIS9-203
IS9-206	1"	2 3/8"	78	87	62	35	78HIS9-206
IS9-209	1"	2 9/16"	80	93	62	36	78HIS9-209
IS9-212	1"	2 3/4"	85	98	62	40	78HIS9-212
IS9-215	1"	2 15/16"	95	104	86	48	78HIS9-215
IS9-302	1"	3 1/8"	100	109	86	52	78HIS9-302
IS9-308	1"	3 1/2"	105	125	86	52	78HIS9-308
IS9-314	1"	3 7/8"	105	136	95	52	78HIS9-314
IS5-113	1 1/2"	1 13/16"	84	76	86	27	78HIS5-113
IS5-200	1 1/2"	2"	87	82	86	29	78HIS5-200

Type	Square drive	Nut AF inches	Dimensions in mm				Item no.
			A	B	C	D	
IS5-203	1 1/2"	2 3/16"	90	86	86	36	78HIS5-203
IS5-206	1 1/2"	2 3/8"	92	93	86	38	78HIS5-206
IS5-209	1 1/2"	2 9/16"	95	97	86	40	78HIS5-209
IS5-212	1 1/2"	2 3/4"	100	105	86	43	78HIS5-212
IS5-215	1 1/2"	2 15/16"	103	110	86	45	78HIS5-215
IS5-302	1 1/2"	3 1/8"	110	116	86	50	78HIS5-302
IS5-308	1 1/2"	3 1/2"	118	130	86	55	78HIS5-308
IS5-314	1 1/2"	3 7/8"	125	140	95	58	78HIS5-314
IS5-404	1 1/2"	4 1/4"	125	150	95	58	78HIS5-404
IS5-410	1 1/2"	4 5/8"	135	165	95	65	78HIS5-410
IS5-500	1 1/2"	5"	140	179	127	70	78HIS5-500
IS5-506	1 1/2"	5 3/8"	150	195	127	75	78HIS5-506
IS6-302	2 1/2"	3 1/8"	140	124	127	51	78HIS6-302
IS6-308	2 1/2"	3 1/2"	140	135	127	51	78HIS6-308
IS6-314	2 1/2"	3 7/8"	150	147	127	57	78HIS6-314
IS6-404	2 1/2"	4 1/4"	160	159	127	64	78HIS6-404
IS6-410	2 1/2"	4 5/8"	170	172	127	71	78HIS6-410
IS6-500	2 1/2"	5"	175	185	127	75	78HIS6-500
IS6-506	2 1/2"	5 3/8"	180	197	127	79	78HIS6-506
IS6-512	2 1/2"	5 3/4"	185	210	127	83	78HIS6-512
IS6-602	2 1/2"	6 1/8"	190	223	127	91	78HIS6-602
IS6-608	2 1/2"	6 1/2"	195	235	127	95	78HIS6-608
IS6-614	2 1/2"	6 7/8"	200	248	127	105	78HIS6-614

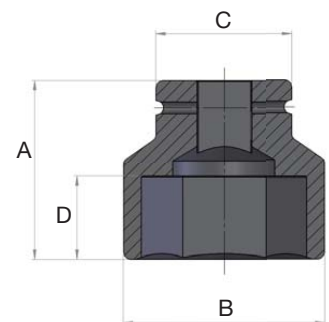
TORQUE TOOLS

Sockets

MS - METRIC HEXAGON AF SIZE HEAVY DUTY SOCKETS

- Square drives from 3/4" to 2 1/2"
- Across flat sizes up to 145mm
- Supplied complete with retaining ring and pin

Hi-Force high quality metric size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The MS range of metric impact sockets offers 56 models, with square drives from 3/4" to 2 1/2" and across flat sizes up to 145mm. Long length, bi-hexagonal and special sockets are available on request.



Type	Square drive	Nut AF mm	Dimensions in mm				Item no.
			A	B	C	D	
MS2-24	3/4"	24	50	39	44	16	78HMS2-24
MS2-27	3/4"	27	54	43	44	16	78HMS2-27
MS2-30	3/4"	30	54	47	44	23	78HMS2-30
MS2-32	3/4"	32	56	49	44	23	78HMS2-32
MS2-36	3/4"	36	56	54	44	23	78HMS2-36
MS2-41	3/4"	41	58	60	44	24	78HMS2-41
MS2-46	3/4"	46	63	67	44	30	78HMS2-46
MS2-50	3/4"	50	72	71	54	32	78HMS2-50
MS2-55	1"	55	74	78	54	35	78HMS2-55
MS2-60	1"	60	75	84	54	37	78HMS2-60
MS9-24	1"	24	58	42	54	17	78HMS9-24
MS9-27	1"	27	58	46	54	17	78HMS9-27
MS9-30	1"	30	60	50	54	21	78HMS9-30
MS9-32	1"	32	60	51	54	21	78HMS9-32
MS9-36	1"	36	65	56	54	30	78HMS9-36
MS9-41	1"	41	67	63	54	31	78HMS9-41
MS9-46	1"	46	74	69	54	36	78HMS9-46
MS9-50	1"	50	80	74	54	42	78HMS9-50
MS9-55	1"	55	84	80	54	44	78HMS9-55
MS9-60	1"	60	87	86	54	44	78HMS9-60
MS9-65	1"	65	90	92	54	46	78HMS9-65
MS9-70	1"	70	96	99	54	51	78HMS9-70
MS9-75	1"	75	98	106	86	45	78HMS9-75
MS9-80	1"	80	100	112	86	48	78HMS9-80
MS9-85	1"	85	105	118	86	52	78HMS9-85
MS9-90	1"	90	105	125	86	52	78HMS9-90
MS9-95	1"	95	115	131	86	52	78HMS9-95
MS9-100	1"	100	115	137	95	58	78HMS9-100

Type	Square drive	Nut AF mm	Dimensions in mm				Item no.
			A	B	C	D	
MS5-36	1 1/2"	36	78	64	86	23	78HMS5-36
MS5-41	1 1/2"	41	80	70	86	26	78HMS5-41
MS5-46	1 1/2"	46	84	76	86	27	78HMS5-46
MS5-50	1 1/2"	50	87	81	86	29	78HMS5-50
MS5-55	1 1/2"	55	90	86	86	36	78HMS5-55
MS5-60	1 1/2"	60	92	93	86	38	78HMS5-60
MS5-65	1 1/2"	65	95	97	86	40	78HMS5-65
MS5-70	1 1/2"	70	100	105	86	43	78HMS5-70
MS5-75	1 1/2"	75	103	110	86	45	78HMS5-75
MS5-80	1 1/2"	80	110	116	86	50	78HMS5-80
MS5-85	1 1/2"	85	118	125	86	55	78HMS5-85
MS5-90	1 1/2"	90	118	130	86	55	78HMS5-90
MS5-95	1 1/2"	95	118	137	95	55	78HMS5-95
MS5-100	1 1/2"	100	125	140	95	58	78HMS5-100
MS5-105	1 1/2"	105	125	150	95	58	78HMS5-105
MS5-110	1 1/2"	110	125	156	95	58	78HMS5-110
MS5-115	1 1/2"	115	135	160	95	65	78HMS5-115
MS5-130	1 1/2"	130	140	185	127	70	78HMS5-130
MS6-80	2 1/2"	80	140	124	127	51	78HMS6-80
MS6-85	2 1/2"	85	140	130	127	51	78HMS6-85
MS6-90	2 1/2"	90	145	136	127	54	78HMS6-90
MS6-95	2 1/2"	95	145	143	127	54	78HMS6-95
MS6-100	2 1/2"	100	150	149	127	57	78HMS6-100
MS6-105	2 1/2"	105	155	155	127	61	78HMS6-105
MS6-110	2 1/2"	110	160	161	127	64	78HMS6-110
MS6-115	2 1/2"	115	165	167	127	67	78HMS6-115
MS6-130	2 1/2"	130	175	188	127	75	78HMS6-130
MS6-145	2 1/2"	145	185	208	127	83	78HMS6-145

TORQUE TOOLS

Hi-Force
HYDRAULIC TOOLS

Torque Wrench - Drive Cylinders

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS

- Working pressure 700 Bar
- Powerful with low clearance design
- Fitted with 360° x 360° Uni-Swivel couplings

Hi-Force TWH-N series female hexagon cassette head hydraulic torque wrenches offer a choice of 5 models with output torque capacities from 2625 Nm to 48181 Nm (1906 to 34985 lbf.ft). Manufactured from high grade aluminium (except TWH430N), all models provide direct in-line reaction and a minimal radius clearance for easy fitment in confined spaces. The user friendly design of the tool simply requires the operator to withdraw/insert a single pin to change the ratchet head. Ratchet heads are available in all standard metric and imperial AF sizes from 24 to 175 mm (1 1/16" to 6 7/8") with low cost hexagon reducer bushes also available (see pages 75-76). Uni-Swivel quick release couplers are fitted as standard to all models, enabling easy positioning of the hydraulic hoses.

- Compact, lightweight, aluminium drive unit (except TWH430N)
- Accurate to +/- 3% with standard torque chart supplied
- Low profile design for limited access applications
- Minimum radius cassette head for fitment in confined spaces
- Suitable for continuous operation at maximum pressure



Note:
Model TWH430N manufactured from high grade alloy steel

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS

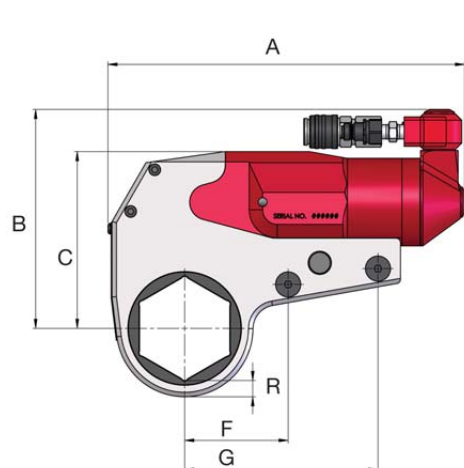
- Designed for tightening and loosening applications
- Easily assembled to selected ratchet head
- Minimal nose radius for fitment in confined spaces



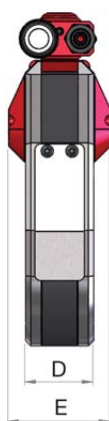
Note: Drawing shows drive cylinder, including ratchet head as detailed on pages 72-73. Drive cylinder and ratchet head are separate items and must be ordered separately.



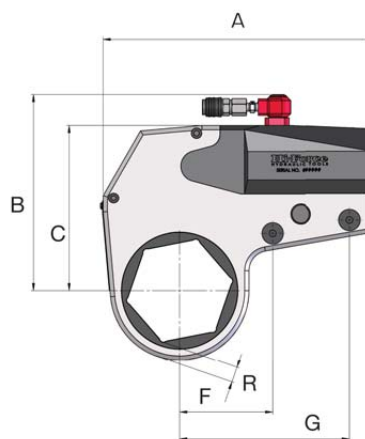
TWH27N, TWH54N,
TWH120N, TWH210N



All Models



TWH430N



Type (Drive cyl.)	Torque capacity		Hexagon AF size		Weight kg	Dimensions in mm								Item no.
	Nm at 700 Bar	lbf. ft at 10,000PSI	Metric min max	Imperial min max		A max	B max	C max	D	E	F	G	R min - max	
TWH27N	2625	1906	24 - 46	1 1/16" - 1 3/16"	1.4	193	125	97	32	51	54	109	9.5 - 12.2	78TW.H0.27N
TWH27N	3068	2228	50 - 60	2" - 2 3/8"	1.4	193	136	108	32	51	54	109	10.1 - 10.5	78TW.H0.27N
TWH54N	5372	3901	38 - 65	1 7/16" - 2 9/16"	2.3	250	158	125	41	64	73	137	10.7 - 13.8	78TW.H0.54N
TWH54N	6037	4384	70 - 80	2 3/4" - 3 1/8"	2.3	250	169	136	41	64	73	137	11.7 - 14.6	78TW.H0.54N
TWH120N	11737	8522	50 - 80	2 3/16" - 3 1/8"	3.8	310	189	157	52	78	92	112	14.7 - 15.2	78TW.H1.20N
TWH120N	14349	10419	85 - 100	3 1/2" - 3 7/8"	3.8	310	214	182	52	78	92	112	15.9 - 18.7	78TW.H1.20N
TWH210N	21216	15405	70 - 100	2 3/4" - 3 7/8"	6.4	378	223	191	64	97	114	213	18.1 - 18.6	78TW.H2.10N
TWH210N	23124	16791	105 - 11	4 1/4" - 4 5/8"	6.4	378	236	204	64	97	114	213	18.3 - 20.7	78TW.H2.10N
TWH430N	43792	31798	80 - 115	3 1/8" - 4 5/8"	16.1	405	291	242	83	93	146	267	25.6 - 31.3	78TW.H4.30N
TWH430N	48181	34985	130 - 175	5" - 6 7/8"	16.1	425	309	260	83	93	146	267	24.8 - 27.3	78TW.H4.30N



Note: Above selection table is for drive unit only. Ratchet head(s) to be ordered separately - see pages 72-73. Weight as stated is drive cylinder only, exact radius size (R) varies according to ratchet AF size selected.

TWH-NRH - IMPERIAL SIZE RATCHET HEADS

- Choice of standard imperial sizes
- Easily fitted to TWH-N drive units
- Strong steel construction
- Non standard and special design ratchet heads can be made to order

The TWH-NRH range of imperial hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 70–71), provide exceptional flexibility with across flats (AF) sizes from 1 1/16" to 6 7/8" available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of imperial hexagon reducer bushes (see page 75) and square drive conversion kits (see page 74) to suit TWH-NRH imperial ratchet heads are also available.



Imperial Ratchet Head Selection Table

Bolt size	Nut AF size	For TWH27N			For TWH54N			For TWH120N			For TWH210N			For TWH430N		
		Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg
5/8"	1 1/16"	TWH27NRH1.1/16	10.4	1.5												
3/4"	1 1/4"	TWH27NRH1.1/4	9.7	1.6												
7/8"	1 7/16"	TWH27NRH1.7/16	9.8	1.6	TWH54NRH1.7/16	13.5	2.9									
1"	1 5/8"	TWH27NRH1.5/8	10.0	1.6	TWH54NRH1.5/8	10.8	2.8									
1 1/8"	1 13/16"	TWH27NRH1.13/16	10.5	1.7	TWH54NRH1.13/16	10.7	2.9									
1 1/4"	2"	TWH27NRH2	10.5	1.7	TWH54NRH2	11.7	3.0									
1 3/8"	2 3/16"	TWH27NRH2.3/16	10.3	1.8	TWH54NRH2.3/16	11.8	3.1	TWH120NRH2.3/16	14.7	6.1						
1 1/2"	2 3/8"	TWH27NRH2.3/8	10.5	1.8	TWH54NRH2.3/8	11.8	3.2	TWH120NRH2.3/8	14.8	6.4						
1 5/8"	2 9/16"				TWH54NRH2.9/16	11.6	3.3	TWH120NRH2.9/16	14.8	6.4						
1 3/4"	2 3/4"				TWH54NRH2.3/4	11.8	3.4	TWH120NRH2.3/4	14.9	6.5	TWH210NRH2.3/4	18.3	12.1			
1 7/8"	2 15/16"				TWH54NRH2.15/16	14.8	3.5	TWH120NRH2.15/16	14.9	6.5	TWH210NRH2.15/16	18.3	12.2			
2"	3 1/8"				TWH54NRH3.1/8	12.1	3.5	TWH120NRH3.1/8	15.1	6.5	TWH210NRH3.1/8	18.5	12.3	TWH430NRH3.1/8	26.0	23.2
2 1/4"	3 1/2"							TWH120NRH3.1/2	16.9	7.9	TWH210NRH3.1/2	19.3	12.4	TWH430NRH3.1/2	26.8	23.9
2 1/2"	3 7/8"							TWH120NRH3.7/8	19.6	8.5	TWH210NRH3.7/8	19.5	12.5	TWH430NRH3.7/8	26.5	25.7
											TWH210NRH4.1/4	19.5	13.3	TWH430NRH4.1/4	26.9	26.1
											TWH210NRH4.5/8	19.3	13.8	TWH430NRH4.5/8	25.9	26.3
														TWH430NRH5	27.4	27.9
														TWH430NRH5.3/8	25.8	28.3
														TWH430NRH5.3/4	24.8	29.3
														TWH430NRH6.1/8	25.0	30.1
														TWH430NRH6.1/2	25.0	31.0
														TWH430NRH6.7/8	27.3	31.8

TWH-NRH - METRIC SIZE RATCHET HEADS

- Choice of standard metric sizes
- Easily fitted to TWH-N drive units
- Strong steel construction
- Non standard and special design ratchet heads can be made to order

The TWH-NRH range of metric hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 70-71), provide exceptional flexibility with across flats (AF) sizes from 24mm to 175mm available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of metric hexagon reducer bushes (see page 76) and square drive conversion kits (see page 74) to suit TWH-NRH metric ratchet heads are also available.



Imperial Ratchet Head Selection Table

Bolt size	Nut AF size	For TWH27N			For TWH54N			For TWH120N			For TWH210N			For TWH430N		
		Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg	Type	R mm	Wt kg
16	24	TWH27NRH-24	12.1	1.5												
18	27	TWH27NRH-27	10.4	1.6												
20	30	TWH27NRH-30	10.7	1.6												
22	32	TWH27NRH-32	9.5	1.6												
24	36	TWH27NRH-36	10.1	1.6	TWH54NRH-36	13.8	2.9									
-	38				TWH54NRH-38	12.6	2.8									
27	41	TWH27NRH-41	10.1	1.6	TWH54NRH-41	10.9	2.8									
30	46	TWH27NRH-46	10.5	1.7	TWH54NRH-46	10.7	2.9									
33	50	TWH27NRH-50	10.4	1.7	TWH54NRH-50	12.1	3.0	TWH120NRH-50	15.2	5.8						
36	55	TWH27NRH-55	10.1	1.8	TWH54NRH-55	12.1	3.1	TWH120NRH-55	15.0	6.1						
39	60	TWH27NRH-60	10.5	1.8	TWH54NRH-60	12.0	3.2	TWH120NRH-60	15.0	6.4						
42	65				TWH54NRH-65	11.7	3.3	TWH120NRH-65	14.9	6.4						
45	70				TWH54NRH-70	11.7	3.4	TWH120NRH-70	14.8	6.5	TWH210NRH-70	18.2	12.1			
48	75				TWH54NRH-75	14.6	3.5	TWH120NRH-75	14.7	6.5	TWH210NRH-75	18.1	12.2			
52	80				TWH54NRH-80	11.7	3.5	TWH120NRH-80	14.7	6.5	TWH210NRH-80	18.1	12.3	TWH430NRH-80	25.6	23.2
56	85							TWH120NRH-85	16.4	7.8	TWH210NRH-85	18.2	12.4	TWH430NRH-85	29.0	24.0
60	90							TWH120NRH-90	16.2	7.9	TWH210NRH-90	18.6	12.4	TWH430NRH-90	31.3	26.0
64	95							TWH120NRH-95	15.9	7.9	TWH210NRH-95	18.6	12.5	TWH430NRH-95	28.5	25.8
68	100							TWH120NRH-100	18.7	8.5	TWH210NRH-100	18.6	12.5	TWH430NRH-100	25.6	25.6
72	105										TWH210NRH-105	18.4	12.9	TWH430NRH-105	28.6	26.5
76	110										TWH210NRH-110	18.3	13.3	TWH430NRH-110	25.7	26.2
80	115										TWH210NRH-115	20.7	13.8	TWH430NRH-115	27.3	26.4
90	130													TWH430NRH-130	25.6	27.3
-	135													TWH430NRH-135	26.6	28.3
100	145													TWH430NRH-145	25.4	29.4
110	155													TWH430NRH-155	25.0	30.1
115	165													TWH430NRH-165	25.0	31.0
-	175													TWH430NRH-175	27.3	31.8

TWH-N ACCESSORIES

- Suitable for TWH-N range up to 23124 Nm
- Square drive sizes from 1" to 2 1/2"
- Easily fitted, no special tools required

Hi-Force SDC square drive conversion kits, suitable for Hi-Force TWH-N hexagon drive hydraulic torque wrenches (see pages 70-73) are available for all models, excluding TWH430N. All models are supplied complete with an easily attachable reaction foot and a standard hexagon AF size adaptor, suitable for fitment to a commonly used size of imperial or metric ratchet head, per tool type (see table for more details). These SDC square drive conversion kits provide the most flexible and cost effective method of converting a female hexagon drive hydraulic torque wrench into a square drive wrench.

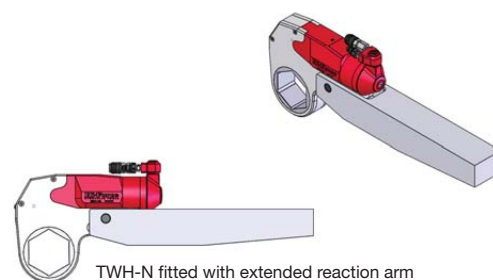
- Supplied complete with reaction foot
- Makes your hexagon drive torque wrench even more versatile
- Full range of heavy duty sockets available (see pages 68 & 69)



Type (Drive cyl.)	Square drive	Hexagon AF Size	Maximum torque Nm	Maximum torque lbf.ft	Weight	Suitable for drive cylinder incl. ratchet head		Item no.
SDC27-I	1"	1 13/16"	3068	2263	1.1	TWH27N	TWH27NRH-1 13/16	78HSDC27-I
SDC27-M	1"	46 mm	3068	2263	1.1	TWH27N	TWH27NRH-46	78HSDC27-M
SDC54-I	1 1/2"	2 9/16"	6037	4453	3.0	TWH54N	TWH54NRH-2 9/16	78HSDC54-I
SDC54-M	1 1/2"	65 mm	6037	4453	3.0	TWH54N	TWH54NRH-65	78HSDC54-M
SDC120-I	1 1/2"	3 1/8"	14349	10583	4.4	TWH120N	TWH120NRH-3 1/8	78HSDC120-I
SDC120-M	1 1/2"	80 mm	14349	10583	4.4	TWH120N	TWH120NRH-80	78HSDC120-M
SDC210-I	2 1/2"	3 7/8"	23124	17055	9.1	TWH210N	TWH210NRH-3 7/8	78HSDC210-I
SDC210-M	2 1/2"	100 mm	23124	17055	9.1	TWH210N	TWH210NRH-100	78HSDC210-M

Extended Reaction Arms

Extended reaction arm



Type	Length A		Length B		Height (C)		Width (D)		Weight kg	Item no.
	Inch	mm	Inch	mm	Inch	mm	Inch	mm		
ERA27-20	19.6"	499	20.7"	525	1.8"	45	2.0"	50	2.5	78HERA27-20
ERA54-20	20.2"	513	21.1"	535	2.2"	55	2.5"	65	3.7	78HERA54-20
ERA120-21	20.8"	527	21.7"	550	3.0"	75	3.4"	85	8.4	78HERA120-21
ERA210-21	21.5"	545	23.2"	588	3.7"	95	3.7"	95	12.2	78HERA210-21
ERA430-22	22.2"	565	24.7"	628	4.7"	120	4.7"	120	20.5	78HERA430-22

IB - IMPERIAL HEXAGON REDUCER BUSHES

To reduce the female hexagon AF size of the TWH-NRH imperial ratchet heads (see page 72), these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.



Selection Table

Outside AF size	Inside AF size	For TWH27NRH		For TWH54NRH		For TWH120NRH		For TWH210NRH		For TWH430NRH	
		Type	W mm	Type	W mm	Type	W mm	Type	W mm	Type	W mm
1 1/4"	1 1/16"	IB27-104-101	2.4								
1 7/16"	1 1/16"	IB27-107-101	4.8								
1 7/16"	1 1/4"	IB27-107-104	2.4								
1 5/8"	1 1/4"	IB27-110-104	4.8	IB54-110-104	4.8						
1 5/8"	1 7/16"	IB27-110-107	2.4	IB54-110-107	2.4						
1 13/16"	1 7/16"	IB27-113-107	4.8	IB54-113-107	4.8						
1 13/16"	1 5/8"	IB27-113-110	2.4	IB54-113-110	2.4						
2"	1 5/8"	IB27-200-110	4.8	IB54-200-110	4.8						
2"	1 13/16"	IB27-200-113	2.4	IB54-200-113	2.4						
2 3/16"	1 5/8"	IB27-203-110	7.2	IB54-203-110	7.2						
2 3/16"	1 13/16"	IB27-203-113	4.8	IB54-203-113	4.8						
2 3/16"	2"	IB27-203-200	2.4	IB54-203-200	2.4						
2 3/8"	1 13/16"	IB27-206-113	7.2	IB54-206-113	7.2						
2 3/8"	2"	IB27-206-200	4.8	IB54-206-200	4.8						
2 3/8"	2 3/16"	IB27-206-203	2.4	IB54-206-203	2.4	IB120-206-203	2.4				
2 9/16"	2"			IB54-209-200	7.2	not available	-				
2 9/16"	2 3/16"			IB54-209-203	4.8	IB120-209-203	4.8				
2 9/16"	2 3/8"			IB54-209-206	2.4	IB120-209-206	2.4				
2 3/4"	2 3/16"			IB54-212-203	7.2	IB120-212-203	7.2				
2 3/4"	2 3/8"			IB54-212-206	4.8	IB120-212-206	4.8				
2 3/4"	2 9/16"			IB54-212-209	2.4	IB120-212-209	2.4				
2 15/16"	2 3/8"			IB54-215-206	7.2	IB120-215-206	7.2				
2 15/16"	2 9/16"			IB54-215-209	4.8	IB120-215-209	4.8				
2 15/16"	2 3/4"			IB54-215-212	2.4	IB120-215-212	2.4	IB210-215-212	2.4		
3 1/8"	2 9/16"			IB54-302-209	7.2	IB120-302-209	7.2	not available	-		
3 1/8"	2 3/4"			IB54-302-212	4.8	IB120-302-212	4.8	IB210-302-212	4.8		
3 1/8"	2 15/16"			IB54-302-215	2.4	IB120-302-215	2.4	IB210-302-215	2.4		
3 1/2"	2 15/16"					IB120-308-215	7.2	IB210-308-215	7.2		
3 1/2"	3 1/8"					IB120-308-302	4.8	IB210-308-302	4.8	IB430-308-302	4.8
3 7/8"	3 1/8"					IB120-314-302	9.5	IB210-314-302	9.5	IB430-314-302	9.5
3 7/8"	3 1/2"					IB120-314-308	4.8	IB210-314-308	4.8	IB430-314-308	4.8
4 1/4"	3 1/2"							IB210-404-308	9.5	IB430-404-308	9.5
4 1/4"	3 7/8"							IB210-404-314	4.8	IB430-404-314	4.8
4 5/8"	3 7/8"							IB210-410-314	9.5	IB430-410-314	9.5
4 5/8"	4 1/4"							IB210-410-404	4.8	IB430-410-404	4.8
5"	4 1/4"									IB430-500-404	9.5
5"	4 5/8"									IB430-500-410	4.8
5 3/8"	4 5/8"									IB430-506-410	9.5
5 3/8"	5"									IB430-506-500	4.8
5 3/4"	5"									IB430-512-500	9.5
5 3/4"	5 3/8"									IB430-512-506	4.8
6 1/8"	5 3/8"									IB430-602-506	9.5
6 1/8"	5 3/4"									IB430-602-512	4.8
6 1/2"	5 3/4"									IB430-608-512	9.5
6 1/2"	6 1/8"									IB430-608-602	4.8
6 7/8"	6 1/8"									IB430-614-602	9.5
6 7/8"	6 1/2"									IB430-614-608	4.8

MB - METRIC HEXAGON REDUCER BUSHES

To reduce the female hexagon AF size of the TWH-NRH metric ratchet heads (see page 73), these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.



Selection Table

Outside AF size	Inside AF size	For TWH27NRH		For TWH54NRH		For TWH120NRH		For TWH210NRH		For TWH430NRH	
		Type	W mm	Type	W mm	Type	W mm	Type	W mm	Type	W mm
30	24	MB27-30-24	3.0								
32	24	MB27-32-24	3.0								
32	27	MB27-32-27	3.0								
36	30	MB27-36-30	3.0	MB54-36-30	3.0						
41	36	MB27-41-36	2.5	MB54-41-36	2.5						
46	36	MB27-46-36	5.0	MB54-46-36	5.0						
46	41	MB27-46-41	2.5	MB54-46-41	2.5						
50	41	MB27-50-41	4.5	MB54-50-41	4.5						
50	46	MB27-50-46	2.0	MB54-50-46	2.0						
55	41	MB27-55-41	7.0	MB54-55-41	7.0						
55	46	MB27-55-46	4.5	MB54-55-46	4.5						
55	50	MB27-55-50	2.5	MB54-55-50	2.5	MB120-55-50	2.5				
60	46	MB27-60-46	7.0	MB54-60-46	7.0	not available	-				
60	50	MB27-60-50	5.0	MB54-60-50	5.0	MB120-60-50	5.0				
60	55	MB27-60-55	2.5	MB54-60-55	2.5	MB120-60-55	2.5				
65	50			MB54-65-50	7.5	MB120-65-50	7.5				
65	55			MB54-65-55	5.0	MB120-65-55	5.0				
65	60			MB54-65-60	2.5	MB120-65-60	2.5				
70	55			MB54-70-55	7.5	MB120-70-55	7.5				
70	60			MB54-70-60	5.0	MB120-70-60	5.0				
70	65			MB54-70-65	2.5	MB120-70-65	2.5				
75	60			MB54-75-60	7.5	MB120-75-60	7.5				
75	65			MB54-75-65	5.0	MB120-75-65	5.0				
75	70			MB54-75-70	2.5	MB120-75-70	2.5	MB210-75-70	2.5		
80	65			MB54-80-65	7.5	MB120-80-65	7.5	not available	-		
80	70			MB54-80-70	5.0	MB120-80-70	5.0	MB210-80-70	5.0		
80	75			MB54-80-75	2.5	MB120-80-75	2.5	MB210-80-75	2.5		
85	70					MB120-85-70	7.5	MB210-85-70	7.5		
85	75					MB120-85-75	5.0	MB210-85-75	5.0		
85	80					MB120-85-80	2.5	MB210-85-80	2.5	MB430-85-80	2.5
90	75					MB120-90-75	7.5	MB210-90-75	7.5	not available	-
90	80					MB120-90-80	5.0	MB210-90-80	5.0	MB430-90-80	5.0
90	85					MB120-90-85	2.5	MB210-90-85	2.5	MB430-90-85	2.5
95	80					MB120-95-80	7.5	MB210-95-80	7.5	MB430-95-80	7.5
95	85					MB120-95-85	5.0	MB210-95-85	5.0	MB430-95-85	5.0
95	90					MB120-95-90	2.5	MB210-95-90	2.5	MB430-95-90	2.5
100	85					MB120-100-85	7.5	MB210-100-85	7.5	MB430-100-85	7.5
100	90					MB120-100-90	5.0	MB210-100-90	5.0	MB430-100-90	5.0
100	95					MB120-100-95	2.5	MB210-100-95	2.5	MB430-100-95	2.5
105	90							MB210-105-90	7.5	MB430-105-90	7.5
105	95							MB210-105-95	5.0	MB430-105-95	5.0
105	100							MB210-105-100	2.5	MB430-105-100	2.5
110	95							MB210-110-95	7.5	MB430-110-95	7.5
110	100							MB210-110-100	5.0	MB430-110-100	5.0
110	105							MB210-110-105	2.5	MB430-110-105	2.5
115	100							MB210-115-100	7.5	MB430-115-100	7.5
115	105							MB210-115-105	5.0	MB430-115-105	5.0
115	110							MB210-115-110	2.5	MB430-115-110	2.5
130	105									MB430-130-105	12.5
130	110									MB430-130-110	10.0
130	115									MB430-130-115	7.5
145	110									MB430-145-110	17.5
145	115									MB430-145-115	15.0
145	130									MB430-145-130	7.5

TORQUE TOOLS

Backup Wrenches

BW - BACKUP WRENCHES

- Suitable for use with TWS-N & TWH-N Wrenches
- Interchangeable hexagon links
- Positive release mechanism

The Hi-Force BW series of backup wrenches provide an easily fitted and easily removable back nut reaction arm to prevent both nuts rotating during tightening applications. The 'T-Bar' design adjustable reaction point prevents lock up once tightening is completed.



BWH with BMW-50

Complete set

Type (Drive cyl.)	Description	Backup wrench holder incl. set of links:				Weight kg	Item no.
		Imperial	Metric	Imperial	Metric		
BWI-SET	Holder complete with imperial link set (12 pcs)	1 7/16"	-	3 7/8"	-	12.2	78BW.00.02
BWM-SET	Holder complete with metric link set (14 pcs)	-	36mm	-	100mm	15.0	78BW.00.03

Holder

Type (Drive cyl.)	Description	Hexagon AF size		Weight kg	Item no.
		Imperial	Metric		
BWH	Backup wrench holder	-	-	1.9	78BW.00.01

Hexagon links

Type (Drive cyl.)	Description	Hexagon AF size		Weight kg	Item no.
		Imperial	Metric		
BWI-107	Female hexagon link for backup wrench (imperial)	1 7/16"	-	0.5	78HBWI-107
BWI-110	Female hexagon link for backup wrench (imperial)	1 5/8 "	-	0.5	78HBWI-110
BWI-113	Female hexagon link for backup wrench (imperial)	1 13/16"	-	0.5	78HBWI-113
BWI-200	Female hexagon link for backup wrench (imperial)	2 "	-	0.6	78HBWI-200
BWI-203	Female hexagon link for backup wrench (imperial)	2 3/16"	-	0.8	78HBWI-203
BWI-206	Female hexagon link for backup wrench (imperial)	2 3/8 "	-	0.9	78HBWI-206
BWI-209	Female hexagon link for backup wrench (imperial)	2 9/16"	-	0.9	78HBWI-209
BWI-212	Female hexagon link for backup wrench (imperial)	2 3/4"	-	0.9	78HBWI-212
BWI-215	Female hexagon link for backup wrench (imperial)	2 15/16"	-	1.1	78HBWI-215
BWI-302	Female hexagon link for backup wrench (imperial)	3 1/8"	-	1.0	78HBWI-302
BWI-308	Female hexagon link for backup wrench (imperial)	3 1/2"	-	1.3	78HBWI-308
BWI-314	Female hexagon link for backup wrench (imperial)	3 7/8 "	-	1.6	78HBWI-314
BWM-36	Female hexagon link for backup wrench (metric)	-	36 mm	0.4	78HBWM-36
BWM-41	Female hexagon link for backup wrench (metric)	-	41 mm	0.5	78HBWM-41
BWM-46	Female hexagon link for backup wrench (metric)	-	46 mm	0.6	78HBWM-46
BWM-50	Female hexagon link for backup wrench (metric)	-	50 mm	0.6	78HBWM-50
BWM-55	Female hexagon link for backup wrench (metric)	-	55 mm	0.8	78HBWM-55
BWM-60	Female hexagon link for backup wrench (metric)	-	60 mm	0.8	78HBWM-60
BWM-65	Female hexagon link for backup wrench (metric)	-	65 mm	0.9	78HBWM-65
BWM-70	Female hexagon link for backup wrench (metric)	-	70 mm	0.9	78HBWM-70
BWM-75	Female hexagon link for backup wrench (metric)	-	75 mm	1.0	78HBWM-75
BWM-80	Female hexagon link for backup wrench (metric)	-	80 mm	1.0	78HBWM-80
BWM-85	Female hexagon link for backup wrench (metric)	-	85 mm	1.5	78HBWM-85
BWM-90	Female hexagon link for backup wrench (metric)	-	90 mm	1.5	78HBWM-90
BWM-95	Female hexagon link for backup wrench (metric)	-	95 mm	1.7	78HBWM-95
BWM-100	Female hexagon link for backup wrench (metric)	-	100 mm	1.7	78HBWM-100

Torque Wrench Pumps

HTWP - TORQUE WRENCH PUMPS

- Working pressure 700 Bar
- Choice of air or electric power options
- Supplied complete with hand pendant controller

Hi-Force hydraulic torque wrench pumps are compatible for use with all Hi-Force hydraulic torque wrenches. All models are 700 Bar maximum working pressure, fitted with an easily accessible and adjustable torque setting pressure relief valve, and are available as air driven or electric driven pump units. All pumps are supplied with a remote operation, push button hand pendant controller with three metres of control line cable. Glycerine filled, easy to read, dual scale (0-700 Bar/0-10,000 PSI) hydraulic pressure gauges are fitted as standard to all models. Air driven versions also include an integral inline filter, regulator, lubricator system with airline pressure gauge and an exhaust air cooling system.

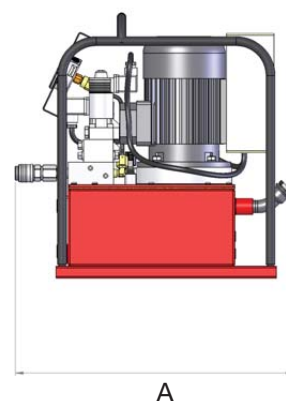
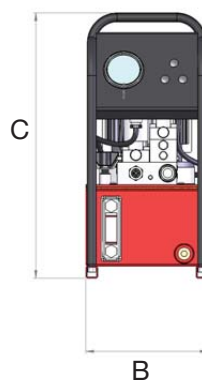
- Dual scale glycerine filled pressure gauge
- Two speed operation
- Externally adjustable torque setting valve
- Protective rollbar carrying frame
- Air pressure gauge and filter-regulator-lubricator unit (air powered pumps only)
- Integral oil cooling system (air powered pumps only) Reservoir oil sight level gauge
- Auto retract function (electric powered pumps only)
- Choice of standard hose length available, see page 81



HTWP2142AR



HTWP2140P



Type	Max pressure bar	Power supply	Motor rating kW	Displacement l/min		Changeover pressure bar	Dimensions in mm			Weight kg	Item no.
				low pressure	high pressure		A	B	C		
HTWP2140P	700	7 Bar	1.50	6.1	0.51	60	468	205	445	28.0	78HT.WP.2140
HTWP2141AR	700	110 volt	0.75	3.9	0.36	60	468	205	445	34.0	78HTWP2141AR
HTWP2141ARH	700	110 volt	0.75	3.9	0.36	60	468	205	445	34.0	78HTWP2141ARH
HTWP2142AR	700	240 volt	0.75	3.9	0.36	60	468	205	445	34.0	78HT.WP.2142
HTWP2142ARH	700	240 volt	0.75	3.9	0.36	60	468	205	445	34.0	78HTWP2142ARH



Note:
Pumps with suffix 'H' in the model number are supplied with 60Hz electric motor.

TPA / TPE - TORQUE WRENCH PUMPS - PREMIUM LINE

- High flow 3-stage pump unit
- Choice of air or electric power options
- Rigid, compact & lightweight

The Hi-Force TPA & TPE range of Premium line torque wrench pumps offers the following features :

- High speed 3-stage, 8 piston pump unit
- Multi outlet 4-way split block for simultaneous operation of up to 4 hydraulic wrenches
- Compact design, fitted within a rigid rollbar protection & carrying frame
- Automatically activated oil cooling heat exchanger fitted as standard on all electric driven models
- Exhaust air radiator cooling system on air driven models
- Adjustable torque setting pressure relief valve with locking nut
- Models with suffix 'A' fitted with analogue pressure gauge
- Models with suffix 'D' fitted with pressure transducer and digital pressure gauge
- Pendant controlled choice of manual with auto retract or full automatic cycle operation (automatic cycle functions only available on electric driven models)
- Solenoid valve with pendant control including motor on/off and 5 metre cable



TPE25A

TPE25A

Air driven pump units

Type	Max pressure bar	Power supply	Pressure gauge	Gauge reading (*)	Displacements l / m			Weight kg	Item no.
					1st stage 0-65 bar	2nd stage 65-325 bar	3rd stage 325-700 bar		
TPA07A	700	7.0 Bar air	analogue	Bar/PSI	7.0	1.6	0.80	30.0	78HTPA07A
TPA07D	700	7.0 Bar air	digital	Bar/PSI/Nm/Lbf.Ft	7.0	1.6	0.80	30.0	78HTPA07D

Electric driven pump units

Type	Max pressure bar	Power supply	Pressure gauge	Gauge reading (*)	Displacements l / m			Weight kg	Item no.
					1st stage 0-65 bar	2nd stage 65-325 bar	3rd stage 325-700 bar		
TPE15A	700	110V-1Ph-50Hz	analogue	Bar/PSI	6.5	1.5	0.75	39.0	78HTPE15A
TPE15D	700	110V-1Ph-50Hz	digital	Bar/PSI/Nm/Lbf.Ft	6.5	1.5	0.75	39.0	78HTPE15D
TPE16A	700	120V-1Ph-60Hz	analogue	Bar/PSI	7.8	1.8	0.90	39.0	78HTPE16A
TPE16D	700	120V-1Ph-60Hz	digital	Bar/PSI/Nm/Lbf.Ft	7.8	1.8	0.90	39.0	78HTPE16D
TPE25A	700	230V-1Ph-50Hz	analogue	Bar/PSI	6.5	1.5	0.75	39.0	78HTPE25A
TPE25D	700	230V-1Ph-50Hz	digital	Bar/PSI/Nm/Lbf.Ft	6.5	1.5	0.75	39.0	78HTPE25D
TPE26A	700	230V-1Ph-60Hz	analogue	Bar/PSI	7.8	1.8	0.90	39.0	78HTPE26A
TPE26D	700	230V-1Ph-60Hz	digital	Bar/PSI/Nm/Lbf.Ft	7.8	1.8	0.90	39.0	78HTPE26D
TPE45A	700	400V-3Ph-50Hz	analogue	Bar/PSI	6.5	1.5	0.75	39.0	78HTPE45A
TPE45D	700	400V-3Ph-50Hz	digital	Bar/PSI/Nm/Lbf.Ft	6.5	1.5	0.75	39.0	78HTPE45D
TPE46A	700	480V-3Ph-60Hz	analogue	Bar/PSI	7.8	1.8	0.90	39.0	78HTPE46A
TPE46D	700	480V-3Ph-60Hz	digital	Bar/PSI/Nm/Lbf.Ft	7.8	1.8	0.90	39.0	78HTPE46D



Note:

(*) Torque value reading only available on software controlled, programmable pump unit

TORQUE TOOLS

Torque Wrench Pumps

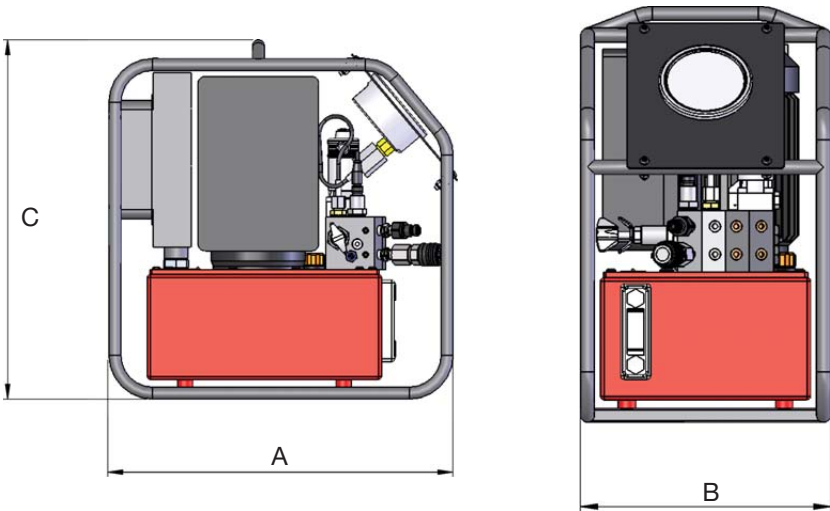
TPA / TPE - TORQUE WRENCH PUMPS - PREMIUM LINE

- Maximum working pressure 700 Bar
- Inbuilt oil cooling system
- Multi-outlet block for operation of 4 wrenches

Optional extras include a full software controlled pump unit, enabling the user to select the hydraulic torque wrench in use via the digital display and have torque readings (in Nm or Lbf.ft) on the digital gauge. All Hi-Force TWS-N and TWH-N hydraulic torque wrenches are programmed and selectable as standard.



TPA07A



Type	Oil capacity	Max. noise level	Max. oil temp	Length (A)	Dimensions in mm Width (B)	Height (C)	Weight incl. oil
All TPA air driven models	7 litres	90 db (A)	80° C	456	286	476	30 kg
All TPE electric driven models	7 litres	88 db (A)	80° C	456	286	476	39 kg

Coupler Sets

Optional coupler sets for simultaneous operation of multiple torque wrenches (one set supplied fitted as standard):

Type	Description	Weight kg	Item no.
TP-CS1	Single set of male / female flat face couplers, for simultaneous operation of two hydraulic wrenches	0.7	78HTP-CS1
TP-CS2	Double set of male / female flat face couplers, for simultaneous operation of three hydraulic wrenches	1.3	78HTP-CS2
TP-CS3	Triple set of male / female flat face couplers, for simultaneous operation of four hydraulic wrenches	2.0	78HTP-CS3

4-WAY MULTI SPLIT BLOCK



Type	Description	Weight kg	Item no.
HTWM4	Multi-split block complete with quick connect couplers. Suitable for use with up to 4 hydraulic wrenches from one pump unit	11.1	78HT.WM.04

QUICK CONNECT COUPLINGS



Type	Thread type	Description	Weight kg	Item no.
CF4F	1/4" NPT Female	Female half coupler	0.3	78CF.4F
CM4F	1/4" NPT Female	Male half coupler	0.3	78CM.4F



Note: Always check for the required thread size when ordering spare or replacement couplings. If different thread size is required, please check available reducers and adaptors on page 52 of this catalogue.

HYDRAULIC HOSES

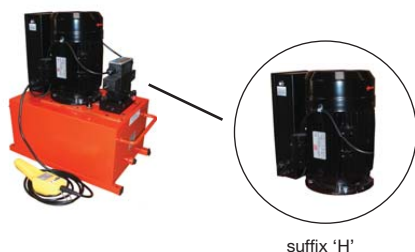


Type	Length metres	Description	Weight kg	Item no.
HTWH4	4	Twin hose set with hose clips and quick connect couplers on both ends.	3.5	78HT.WH.04
HTWH5	5		3.8	78HT.WH.05
HTWH6	6		4.6	78HT.WH.06
HTWH8	8		5.3	78HT.WH.08
HTWH10	10		6.8	78HT.WH.10



Note: Alternative length hoses available on request.

50 Hz & 60 Hz ELECTRIC MOTOR



Description
HTWP Pump models with suffix 'H' are supplied with 60Hz electric motor.
HTWP Pump models without suffix 'H' are supplied with 50Hz electric motor.

BOLT TENSIONERS

Spring Return Bolt Tensioners

SBT - SPRING RETURN BOLT TENSIONERS - IMPERIAL

- Imperial bolt size range from 1 1/4 " to 4 "
- Maximum working pressure 1500 Bar
- Spring assisted piston retraction

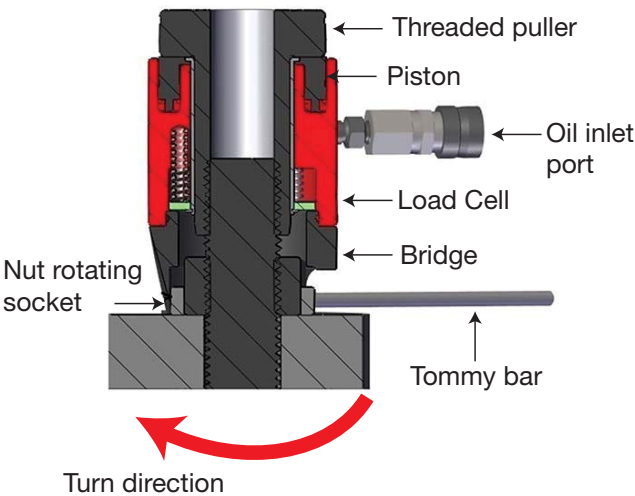
The SBT imperial range of hydraulic bolt tensioners, offers all of the features and benefits of our standard STS range (see pages 90 and 91), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature will reduce bolt tensioning cycle times considerably, as the tensioner pistons will automatically start to retract, immediately the hydraulic pressure is released. The range currently comprises of 22 models, suitable for standard size bolts from 1 1/4" to 4" diameter. The versatility of the SBT bolt tensioner range, is identical to our standard STS range, with a variety of interchangeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. Further details on SBT imperial conversion kits are detailed on pages 84 & 85. All SBT bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum. Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with SBT tensioners are detailed on pages 103 & 104 of this catalogue.

- Nitrocarburised piston
- Maximum piston stroke indicator
- Spring assisted return
- User friendly operating and maintenance procedure

! Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioners. We recommend the purchase of one tommy bar for every four hydraulic tensioners.



SBT3-187B1



Tensioner range	Tommy bar
SBT2	TTB08
SBT3	TTB10
SBT4	TTB10
SBT5	TTB14
SBT6	TTB14

BOLT TENSIONERS

Spring Return Bolt Tensioners

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

SBT - SPRING RETURN BOLT TENSIONERS - IMPERIAL

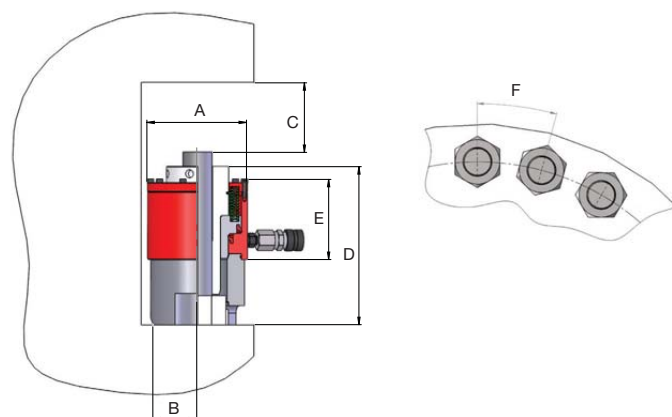
- Bolt sizes from 1 1/4" to 4"
- Modular design for optimum versatility
- Dual quick connect couplings for easy connection



Conversion kits for SBT imperial range of bolt tensioners can be found on pages 84 and 85 of this catalogue



SBT3-187B1



Note: F = minimum pitch distance

Type	Bolt thread size	Threads per inch	Capacity kN	tonnes	Effective area cm ²	Stroke mm	Dimensions in mm						Weight kg	Item no.
							A	B	C min	D	E	F		
SBT2-125B1	1 1/4"	8	457	46.6	30.5	15	102	39	140	164	91	74	102	78HSBT2-125B1
SBT2-137B1	1 3/8"	8	457	46.6	30.5	15	102	39	140	164	91	77	102	78HSBT2-137B1
SBT2-150B1	1 1/2"	8	457	46.6	30.5	15	102	39	140	164	91	80	102	78HSBT2-150B1
SBT3-162B1	1 5/8"	8	822	83.8	54.8	15	137	47	158	188	94	92	137	78HSBT3-162B1
SBT3-175B1	1 3/4"	8	822	83.8	54.8	15	137	47	158	188	94	93	137	78HSBT3-175B1
SBT3-175B2	1 3/4"	8	822	83.8	54.8	15	137	50	156	193	94	104	137	78HSBT3-175B2
SBT3-187B1	1 7/8"	8	822	83.8	54.8	15	137	47	158	188	94	97	137	78HSBT3-187B1
SBT3-187B2	1 7/8"	8	822	83.8	54.8	15	137	50	156	193	94	104	137	78HSBT3-187B2
SBT3-200B2	2"	8	822	83.8	54.8	15	137	50	156	193	94	104	137	78HSBT3-200B2
SBT4-187B1	1 7/8"	8	1264	128.9	84.3	15	167	50	167	197	97	104	167	78HSBT4-187B1
SBT4-200B1	2"	8	1264	128.9	84.3	15	167	50	167	197	97	104	167	78HSBT4-200B1
SBT4-200B2	2"	8	1264	128.9	84.3	15	167	62	177	213	97	106	167	78HSBT4-200B2
SBT4-225B2	2 1/4"	8	1264	128.9	84.3	15	167	62	177	213	97	121	167	78HSBT4-225B2
SBT4-250B2	2 1/2"	8	1264	128.9	84.3	15	167	62	177	213	97	127	167	78HSBT4-250B2
SBT5-250B1	2 1/2"	8	1833	186.9	122.2	15	209	73	187	229	102	134	209	78HSBT5-250B1
SBT5-275B1	2 3/4"	8	1833	186.9	122.2	15	209	73	187	229	102	140	209	78HSBT5-275B1
SBT5-300B1	3"	8	1833	186.9	122.2	15	209	73	187	229	102	147	209	78HSBT5-300B1
SBT6-300B1	3"	8	2649	270.0	176.6	15	257	84	219	254	102	161	257	78HSBT6-300B1
SBT6-325B1	3 1/4"	8	2649	270.0	176.6	15	257	84	219	254	102	167	257	78HSBT6-325B1
SBT6-350B1	3 1/2"	8	2649	270.0	176.6	15	257	84	219	254	102	172	257	78HSBT6-350B1
SBT6-375B3	3 3/4"	8	2649	270.0	176.6	15	257	105	258	295	102	191	257	78HSBT6-375B3
SBT6-400B3	4"	8	2649	270.0	176.6	15	257	105	258	295	102	196	257	78HSBT6-400B3



Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 82 for ordering code.

BOLT TENSIONERS

Bolt Tensioner Components

SBT - BOLT TENSIONER COMPONENTS - IMPERIAL

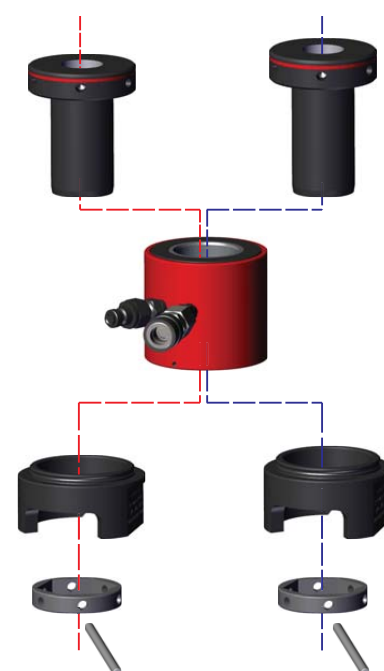
- Use with SBT Imperial Spring Return Tensioners
- Modular design
- Offers greater versatility

The modular design of Hi-Force SBT series spring return hydraulic bolt tensioners enables the user to adapt an existing SBT tensioner assembly to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required thread components (see drawing and table on the next page), Hi-Force SBT bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models SBT3, SBT4 and SBT6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. **DO NOT** mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

Changes within the same colour code **DO NOT** require a bridge change however, changes from the red to blue line (or vice versa) **MUST** include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.



! Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

! Note: SBT2 & SBT5 models both have only one tensioner bridge available.

BOLT TENSIONERS

Bolt Tensioner Components

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

SBT - BOLT TENSIONER COMPONENTS - IMPERIAL

This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

To change from SBT3-162B1 to SBT3-187B1 would require conversion kit CKS3-187B1 only.

To change from SBT3-187B1 to SBT3-200B2 would require conversion kit CKS3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

Principle of SBT spring return bolt tensioner

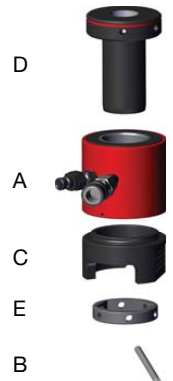
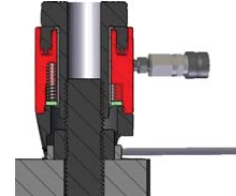
A = Load cell

B = Tommy bar

C = Bridge

D = Threaded puller

E = Nut rotating socket



Complete tensioner	
Model number	Bolt Thread
For tensioner range SBT2:	
SBT2-125B1	1 1/4"
SBT2-137B1	1 3/8"
SBT2-150B1	1 1/2"
For tensioner range SBT3:	
SBT3-162B1	1 5/8"
SBT3-175B1	1 3/4"
SBT3-187B1	1 3/4"
SBT3-175B2	1 7/8"
SBT3-187B2	1 7/8"
SBT3-200B2	2"
For tensioner range SBT4:	
SBT4-187B1	1 7/8"
SBT4-200B1	2"
SBT4-200B2	2"
SBT4-225B2	2 1/4"
SBT4-250B2	2 1/2"
For tensioner range SBT5:	
SBT5-250B1	2 1/2"
SBT5-275B1	2 3/4"
SBT5-300B1	3"
For tensioner range SBT6:	
SBT6-300B1	3"
SBT6-325B1	3 1/4"
SBT6-350B1	3 1/2"
SBT6-375B3	3 3/4"
SBT6-400B3	4"

Individual components					
A Load cell	B Tommy Bar	C Bridge	Available as conversion kit		D & E Complete conversion kit
			D - Threaded puller	E - Rotating socket	
SBT2-LC	TTB08	STS1-B1	TPS2-125B1	RS2-51B1	CKS2-125B1
			TPS2-137B1	RS2-56B1	CKS2-137B1
			TPS2-150B1	RS2-60B1	CKS2-150B1
SBT4-LC	TTB10	STS3-B1	TPS3-162B1	RS3-65B1	CKS3-162B1
			TPS3-175B1	RS3-70B1	CKS3-175B1
			TPS3-187B1	RS3-75B1	CKS3-187B1
		STS3-B2	TPS3-175B2	RS3-70B2	CKS3-175B2
			TPS3-187B2	RS3-75B2	CKS3-187B2
			TPS3-200B2	RS3-80B2	CKS3-200B2
SBT4-LC	TTB10	STS4-B1	TPS4-187B1	RS4-75B1	CKS4-187B1
			TPS4-200B1	RS4-80B1	CKS4-200B1
		STS4-B2	TPS4-200B2	RS4-80B2	CKS4-200B2
			TPS4-225B2	RS4-90B2	CKS4-225B2
SBT5-LC	TTB14	STS5-B1	TPS4-250B2	RS4-98B2	CKS4-250B2
			TPS5-250B1	RS5-100B1	CKS5-250B1
			TPS5-275B1	RS5-108B1	CKS5-275B1
SBT6-LC	TTB14	STS6-B1	TPS5-300B1	RS5-118B1	CKS5-300B1
			TPS6-300B1	RS6-118B1	CKS6-300B1
			TPS6-325B1	RS6-127B1	CKS6-325B1
		STS6-B3	TPS6-350B1	RS6-137B1	CKS6-350B1
			TPS6-375B3	RS6-146B3	CKS6-375B3
			TPS6-400B3	RS6-156B3	CKS6-400B3



Note:

Remember to check bridge compatibility for SBT3, SBT4 and SBT6 models when ordering components.

BOLT TENSIONERS

Spring Return Bolt Tensioners


SBT - SPRING RETURN BOLT TENSIONERS - METRIC

- Metric bolt size range from M30 to M100
- Maximum working pressure 1500 Bar
- Spring assisted piston retraction

The SBT metric range of hydraulic bolt tensioners, offers all of the features and benefits of our standard STS range (see pages 94 and 95), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature will reduce bolt tensioning cycle times considerably, as the tensioner piston will automatically start to retract, after the hydraulic pressure is released. The range currently comprises of 26 models, suitable for standard size bolts from M30 to M100 diameter.

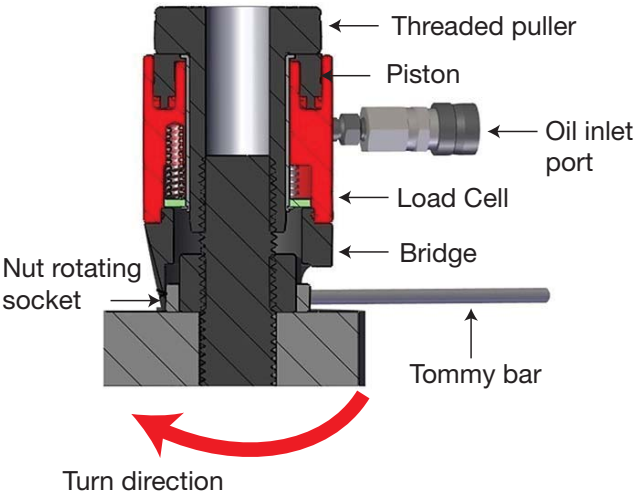
The versatility of the SBT bolt tensioner range, is identical to our standard STS range, with a variety of inter- changeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. Further details on SBT metric conversion kits are detailed on pages 88 & 89. All SBT bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum. Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with SBT tensioners are detailed on pages 103 & 104 of this catalogue.

- Nitrocarburised piston
- Maximum piston stroke indicator
- Spring assisted return
- User friendly operating and maintenance procedure



Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioners. We recommend the purchase of one tommy bar for every four hydraulic tensioners.

Tensioner range	Tommy bar
SBT2	TTB08
SBT3	TTB10
SBT4	TTB10
SBT5	TTB14
SBT6	TTB14



BOLT TENSIONERS

Spring Return Bolt Tensioners

Hi-Force®
HYDRAULIC TOOLS

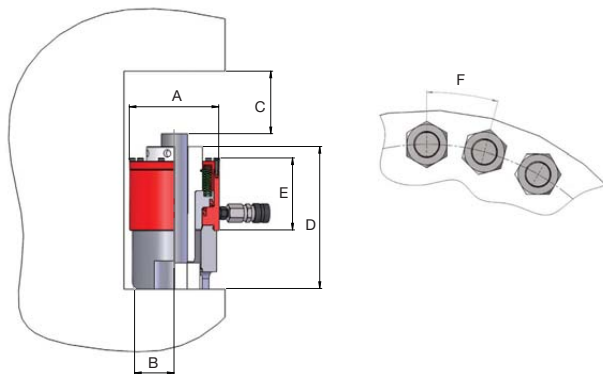
Carl Stahl®

SBT - SPRING RETURN BOLT TENSIONERS - METRIC

- Bolt sizes from M30 to M100
- Modular design for optimum versatility
- Dual quick connect couplings for easy connection



Conversion kits for SBT metric range of bolt tensioners can be found on pages 88 and 89 of this catalogue



Note: F = minimum pitch distance



SBT3-M42B1

Type	Bolt thread size	Threads per inch	Capacity kN	tonnes	Effective area cm²	Stroke mm	A	B	C min	D	E	F	Weight kg	Item no.
SBT2-M30B1	M30	3.5	457	46.6	30.5	15	102	39	140	164	91	71	4.0	78HSBT2-M30B1
SBT2-M33B1	M33	3.5	457	46.6	30.5	15	102	39	140	164	91	74	4.0	78HSBT2-M33B1
SBT2-M36B1	M36	4	457	46.6	30.5	15	102	39	140	164	91	77	4.0	78HSBT2-M36B1
SBT2-M39B1	M39	4	457	46.6	30.5	15	102	39	140	164	91	80	4.0	78HSBT2-M39B1
SBT3-M42B1	M42	4.5	822	83.8	54.8	15	137	47	158	188	94	91	6.7	78HSBT3-M42B1
SBT3-M45B1	M45	4.5	822	83.8	54.8	15	137	47	158	188	94	94	6.7	78HSBT3-M45B1
SBT3-M45B2	M45	4.5	822	83.8	54.8	15	137	50	156	193	94	105	6.7	78HSBT3-M45B2
SBT3-M48B1	M48	5	822	83.8	54.8	15	137	47	158	188	94	97	6.7	78HSBT3-M48B1
SBT3-M48B2	M48	5	822	83.8	54.8	15	137	50	156	193	94	105	6.7	78HSBT3-M48B2
SBT3-M52B2	M52	5	822	83.8	54.8	15	137	50	156	193	94	105	6.7	78HSBT3-M52B2
SBT4-M48B1	M48	5	1264	128.9	84.3	15	167	50	167	197	97	105	11.0	78HSBT4-M48B1
SBT4-M52B1	M52	5	1264	128.9	84.3	15	167	50	167	197	97	108	11.0	78HSBT4-M52B1
SBT4-M52B2	M52	5	1264	128.9	84.3	15	167	62	177	213	97	120	11.0	78HSBT4-M52B2
SBT4-M56B2	M56	5.5	1264	128.9	84.3	15	167	62	177	213	97	120	11.0	78HSBT4-M56B2
SBT4-M60B2	M60	5.5	1264	128.9	84.3	15	167	62	177	213	97	124	11.0	78HSBT4-M60B2
SBT4-M64B2	M64	6	1264	128.9	84.3	15	167	62	177	213	97	126	11.0	78HSBT4-M64B2
SBT5-M64B1	M64	6	1833	186.9	122.2	15	209	73	187	229	102	134	16.5	78HSBT5-M64B1
SBT5-M68B1	M68	6	1833	186.9	122.2	15	209	73	187	229	102	136	16.5	78HSBT5-M68B1
SBT5-M72B1	M72	6	1833	186.9	122.2	15	209	73	187	229	102	139	16.5	78HSBT5-M72B1
SBT5-M76B1	M76	6	1833	186.9	122.2	15	209	73	187	229	102	142	16.5	78HSBT5-M76B1
SBT6-M76B1	M76	6	2649	270.0	176.6	15	257	84	219	254	102	158	24.0	78HSBT6-M76B1
SBT6-M80B1	M80	6	2649	270.0	176.6	15	257	84	219	254	102	160	24.0	78HSBT6-M80B1
SBT6-M85B1	M85	6	2649	270.0	176.6	15	257	84	219	254	102	162	24.0	78HSBT6-M85B1
SBT6-M90B1	M90	6	2649	270.0	176.6	15	257	84	219	254	102	170	24.0	78HSBT6-M90B1
SBT6-M95B3	M95	6	2649	270.0	176.6	15	257	105	258	295	102	184	24.0	78HSBT6-M95B3
SBT6-M100B3	M100	6	2649	270.0	176.6	15	257	105	258	295	102	190	24.0	78HSBT6-M100B3



Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 89 for ordering code

BOLT TENSIONERS

Bolt Tensioner Components

SBT - BOLT TENSIONER COMPONENTS - METRIC

- Cost saving option
- Easily fitted to existing tensioner assembly
- Offers greater versatility

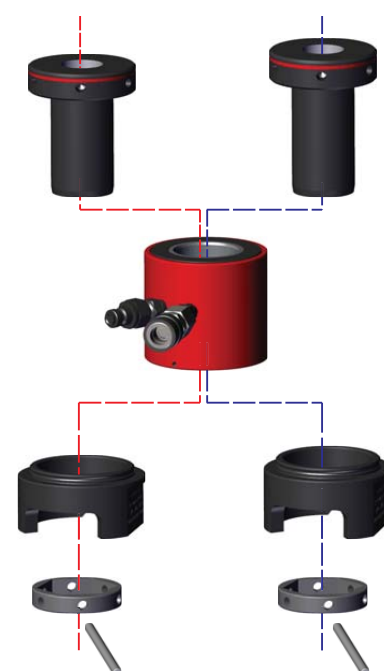
Similar to the imperial tensioner components (pages 84 & 85), the Hi-Force metric spring return hydraulic bolt tensioners are also modular in design and can be adapted to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force SBT spring return bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models SBT3, SBT4 & SBT6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. DO NOT mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

Changes within the same colour code DO NOT require a bridge change however, changes from the red to blue line (or vice versa) MUST also include a relative bridge.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.

! Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.



! Note: SBT2 & SBT5 models both have only one tensioner bridge available.

BOLT TENSIONERS

Bolt Tensioner Components

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

SBT - BOLT TENSIONER COMPONENTS - IMPERIAL

This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

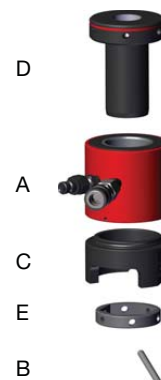
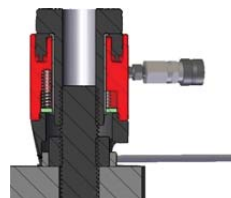
To change from SBT3-162B1 to SBT3-187B1 would require conversion kit CKS3-187B1 only.

To change from SBT3-187B1 to SBT3-200B2 would require conversion kit CKS3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

Principle of SBT spring return bolt tensioner

- A = Load cell
- B = Tommy bar
- C = Bridge
- D = Threaded puller
- E = Nut rotating socket



Complete tensioner	
Model number	Bolt Thread
For tensioner range SBT2:	
SBT2-M30B1	M30
SBT2-M33B1	M33
SBT2-M36B1	M36
SBT2-M39B1	M39
For tensioner range SBT3:	
SBT3-M42B1	M42
SBT3-M45B1	M45
SBT3-M48B1	M45
SBT3-M45B2	M48
SBT3-M48B2	M48
SBT3-M52B2	M52
For tensioner range SBT4:	
SBT4-M48B1	M48
SBT4-M52B1	M52
SBT4-M52B2	M52
SBT4-M56B2	M56
SBT4-M60B2	M60
SBT4-M64B2	M64
For tensioner range SBT5:	
SBT5-M64B1	M64
SBT5-M68B1	M68
SBT5-M72B1	M72
SBT5-M76B1	M76
For tensioner range SBT6:	
SBT6-M76B1	M76
SBT6-M80B1	M80
SBT6-M85B1	M85
SBT6-M90B1	M90
SBT6-M95B3	M95
SBT6-M100B3	M100

Individual components					
A Load cell	B Tommy Bar	C Bridge	Available as conversion kit		D & E Complete conversion kit
			D - Threaded puller	E - Rotating socket	
SBT2-LC	TTB08	STS1-B1	TPS2-M30B1	RS2-46B1	CKS2-M30B1
			TPS2-M33B1	RS2-51B1	CKS2-M33B1
			TPS2-M36B1	RS2-56B1	CKS2-M36B1
			TPS2-M39B1	RS2-60B1	CKS2-M39B1
SBT3-LC	TTB10	STS3-B1	TPS3-M42B1	RS3-65B1	CKS3-M42B1
			TPS3-M45B1	RS3-70B1	CKS3-M45B1
			TPS3-M48B1	RS3-75B1	CKS3-M48B1
		STS3-B2	TPS3-M45B2	RS3-70B2	CKS3-M45B2
			TPS3-M48B2	RS3-75B2	CKS3-M48B2
			TPS3-M52B2	RS3-80B2	CKS3-M52B2
SBT4-LC	TTB10	STS4-B1	TPS4-M48B1	RS4-75B1	CKS4-M48B1
			TPS4-M52B1	RS4-80B1	CKS4-M52B1
		STS4-B2	TPS4-M52B2	RS4-80B2	CKS4-M52B2
			TPS4-M56B2	RS4-85B2	CKS4-M56B2
			TPS4-M60B2	RS4-90B2	CKS4-M60B2
SBT5-LC	TTB14	STS5-B1	TPS5-M64B1	RS5-95B1	CKS5-M64B1
			TPS5-M68B1	RS5-100B1	CKS5-M68B1
			TPS5-M72B1	RS5-105B1	CKS5-M72B1
			TPS5-M76B1	RS5-110B1	CKS5-M76B1
SBT6-LC	TTB14	STS6-B1	TPS6-M76B1	RS6-110B1	CKS6-M76B1
			TPS6-M80B1	RS6-115B1	CKS6-M80B1
			TPS6-M85B1	RS6-120B1	CKS6-M85B1
			TPS6-M90B1	RS6-130B1	CKS6-M90B1
		STS6-B3	TPS6-M95B3	RS6-135B3	CKS6-M95B3
			TPS6-M100B3	RS6-146B3	CKS6-M100B3



Note:
Remember to check bridge compatibility for SBT3, SBT4 and SBT6 models when ordering components.

BOLT TENSIONERS

Topside Bolt Tensioners

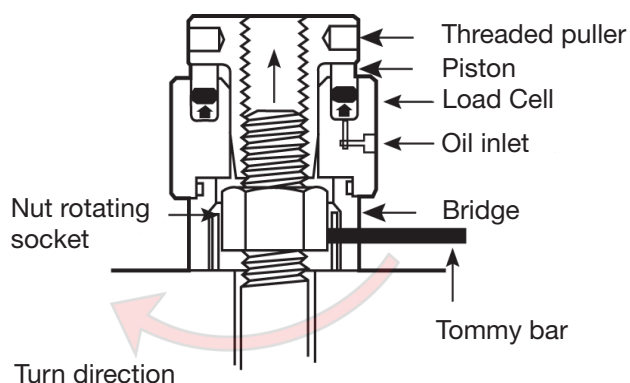
STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE

- Capacities from 234 to 2649 kN
- Working pressure 1500 Bar
- Single acting design

The STS imperial bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 26 imperial size options ranging from 3/4" to 4" thread size and all models are suitable for working pressures up to 1500 Bar. Each of the 6 models of hydraulic tensioning cylinder can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers, bridges and nut rotating sockets are available as individual components (see pages 92 & 93 for detailed information).

All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 103 & 104.

- Nitrocarburised piston
- Maximum piston stroke indicator
- Suitable for single or multi-tensioning applications
- Specially designed tensioners available on request (see page 98)
- User friendly operating and maintenance procedure
- Choice of manually operated or air powered pumps available (see page 103)



The STS range of tensioners are push back type tensioners. For spring return tensioners see pages 82-85 of this catalogue.

BOLT TENSIONERS

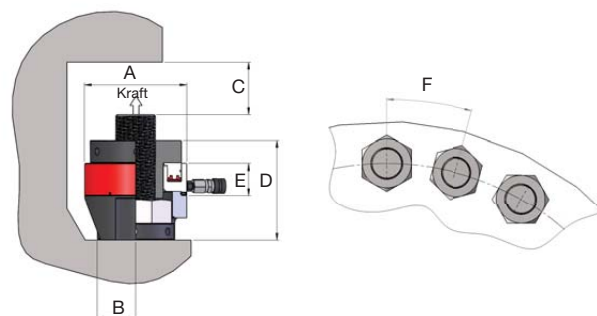
Topside Bolt Tensioners

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE

- Bolt sizes from 3/4" to 4"
- Modular design for optimum versatility
- Dual quick connect couplings for easy connection



Note: F = minimum pitch distance

Type	Bolt thread size	Threads per inch	Capacity kN	tonnes	Effective area cm²	Stroke mm	A	B	Dimensions in mm				Weight kg	Item no.
									C min	D	E	F		
STS1-075B1	3/4"	10	234	23.9	15.6	10	74	28	74	90	45	51	1.7	78HSTS1-075B1
STS1-087B1	7/8"	9	234	23.9	15.6	10	74	28	74	90	45	54	1.7	78HSTS1-087B1
STS1-100B2	1"	8	234	23.9	15.6	10	74	30	80	98	45	61	1.7	78HSTS1-100B2
STS1-112B2	1 1/8"	8	234	23.9	15.6	10	74	30	80	98	45	64	1.7	78HSTS1-112B2
STS2-125B1	1 1/4"	8	457	46.6	30.5	15	102	39	103	128	54	74	3.5	78HSTS2-125B1
STS2-137B1	1 3/8"	8	457	46.6	30.5	15	102	39	103	128	54	77	3.5	78HSTS2-137B1
STS2-150B1	1 1/2"	8	457	46.6	30.5	15	102	39	103	128	54	80	3.5	78HSTS2-150B1
STS3-162B1	1 5/8"	8	822	83.8	54.8	15	133	47	115	150	56	92	6.1	78HSTS3-162B1
STS3-175B1	1 3/4"	8	822	83.8	54.8	15	133	47	115	150	56	93	6.1	78HSTS3-175B1
STS3-175B2	1 3/4"	8	822	83.8	54.8	15	133	50	117	155	56	104	6.1	78HSTS3-175B2
STS3-187B1	1 7/8"	8	822	83.8	54.8	15	133	47	115	150	56	97	6.1	78HSTS3-187B1
STS3-187B2	1 7/8"	8	822	83.8	54.8	15	133	50	117	155	56	104	6.1	78HSTS3-187B2
STS3-200B2	2"	8	822	83.8	54.8	15	133	50	117	155	56	104	6.1	78HSTS3-200B2
STS4-187B1	1 7/8"	8	1264	128.9	84.3	15	163	50	119	149	57	104	10.6	78HSTS4-187B1
STS4-200B1	2"	8	1264	128.9	84.3	15	163	50	119	149	57	104	10.6	78HSTS4-200B1
STS4-200B2	2"	8	1264	128.9	84.3	15	163	62	119	149	57	106	10.6	78HSTS4-200B2
STS4-225B2	2 1/4"	8	1264	128.9	84.3	15	163	62	135	165	57	121	10.6	78HSTS4-225B2
STS4-250B2	2 1/2"	8	1264	128.9	84.3	15	163	62	135	165	57	127	10.6	78HSTS4-250B2
STS5-250B1	2 1/2"	8	1833	186.9	122.2	15	193	73	145	187	60	134	16.0	78HSTS5-250B1
STS5-275B1	2 3/4"	8	1833	186.9	122.2	15	193	73	145	187	60	140	16.0	78HSTS5-275B1
STS5-300B1	3"	8	1833	186.9	122.2	15	193	73	145	187	60	147	16.0	78HSTS5-300B1
STS6-300B1	3"	8	2649	270.0	176.6	15	233	84	178	216	64	161	23.5	78HSTS6-300B1
STS6-325B1	3 1/4"	8	2649	270.0	176.6	15	233	84	178	216	64	167	23.5	78HSTS6-325B1
STS6-350B1	3 1/2"	8	2649	270.0	176.6	15	233	84	178	216	64	172	23.5	78HSTS6-350B1
STS6-375B3	3 3/4"	8	2649	270.0	176.6	15	233	105	205	257	64	191	23.5	78HSTS6-375B3
STS6-400B3	4"	8	2649	270.0	176.6	15	233	105	205	257	64	196	23.5	78HSTS6-400B3



Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 93 column B for ordering code.

BOLT TENSIONERS

Bolt Tensioner Components

STS - BOLT TENSIONER COMPONENTS - IMPERIAL

- For use with STS Imperial Tensioners
- Modular design
- Offers greater versatility

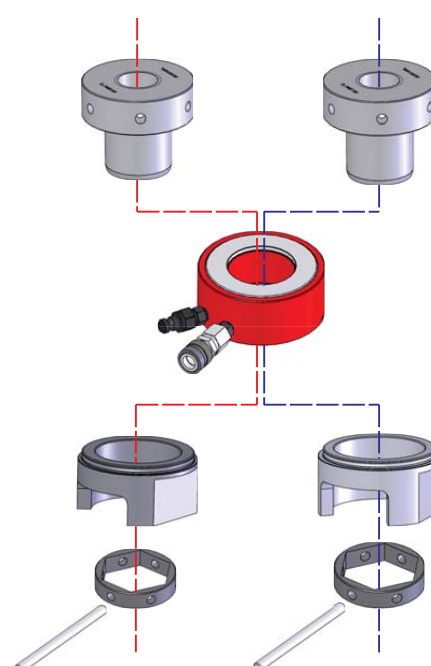
The modular design of Hi-Force STS series topside hydraulic bolt tensioners enables the user to adapt an existing STS tensioner assembly to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. DO NOT mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

Changes within the same colour code DO NOT require a bridge change however, changes from the red to blue line (or vice versa) MUST include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.

! Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.



! Note: STS2 & STS5 models both have only one tensioner bridge available.

BOLT TENSIONERS

Bolt Tensioner Components

STS - BOLT TENSIONER COMPONENTS - IMPERIAL

This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

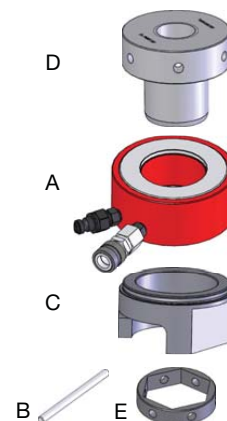
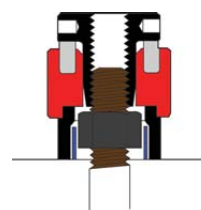
To change from STS3-162B1 to STS3-187B1 would require conversion kit CK3-187B1 only.

To change from STS3-187B1 to STS3-200B2 would require conversion kit CK3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

Principle of STS bolt tensioner

- A = Load cell
- B = Tommy bar
- C = Bridge
- D = Threaded puller
- E = Nut rotating socket



Complete tensioner	
Model number	Bolt Thread
For tensioner range STS1:	
STS1-075B1	3/4"
STS1-087B1	7/8"
STS1-100B2	1"
STS1-112B2	1 1/8"
For tensioner range STS2:	
STS2-125B1	1 1/4"
STS2-137B1	1 3/8"
STS2-150B1	1 1/2"
For tensioner range STS3:	
STS3-162B1	1 5/8"
STS3-175B1	1 3/4"
STS3-187B1	1 7/8"
STS3-175B2	1 3/4"
STS3-187B2	1 7/8"
STS3-200B2	2"
For tensioner range STS4:	
STS4-187B1	1 7/8"
STS4-200B1	2"
STS4-200B2	2"
STS4-225B2	2 1/4"
STS4-250B2	2 1/2"
For tensioner range STS5:	
STS5-250B1	2 1/2"
STS5-275B1	2 3/4"
STS5-300B1	3"
For tensioner range STS6:	
STS6-300B1	3"
STS6-325B1	3 1/4"
STS6-350B1	3 1/2"
STS6-375B3	3 3/4"
STS6-400B3	4"

Individual components					
A Load cell	B Tommy Bar	C Bridge	Available as conversion kit		D & E Complete conversion kit
			D - Threaded puller	E - Rotating socket	
STS1-LC	TTB06	STS1-B1	TP1-075B1	RS1-32B1	CK1-075B1
			TP1-087B1	RS1-37B1	CK1-087B1
		STS1-B2	TP1-100B2	RS1-41B2	CK1-100B2
			TP1-112B2	RS1-46B2	CK1-112B2
STS2-LC	TTB08	STS2-B1	TP2-125B1	RS2-51B1	CK2-125B1
			TP2-137B1	RS2-56B1	CK2-137B1
			TP2-150B1	RS2-60B1	CK2-150B1
		STS2-B2			
STS3-LC	TTB10	STS3-B1	TP3-162B1	RS3-65B1	CK3-162B1
			TP3-175B1	RS3-70B1	CK3-175B1
			TP3-187B1	RS3-75B1	CK3-187B1
		STS3-B2	TP3-175B2	RS3-70B2	CK3-175B2
			TP3-187B2	RS3-75B2	CK3-187B2
			TP3-200B2	RS3-80B2	CK3-200B2
STS4-LC	TTB10	STS4-B1	TP4-187B1	RS4-75B1	CK4-187B1
			TP4-200B1	RS4-80B1	CK4-200B1
		STS4-B2	TP4-200B2	RS4-80B2	CK4-200B2
			TP4-225B2	RS4-90B2	CK4-225B2
			TP4-250B2	RS4-98B2	CK4-250B2
STS5-LC	TTB14	STS5-B1	TP5-250B1	RS5-100B1	CK5-250B1
			TP5-275B1	RS5-108B1	CK5-275B1
			TP5-300B1	RS5-118B1	CK5-300B1
STS6-LC	TTB14	STS6-B1	TP6-300B1	RS6-118B1	CK6-300B1
			TP6-325B1	RS6-127B1	CK6-325B1
			TP6-350B1	RS6-137B1	CK6-350B1
		STS6-B3	TP6-375B3	RS6-146B3	CK6-375B3
			TP6-400B3	RS6-156B3	CK6-400B3



Note:

Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

BOLT TENSIONERS

Hi-Force
HYDRAULIC TOOLS

Topside Bolt Tensioners

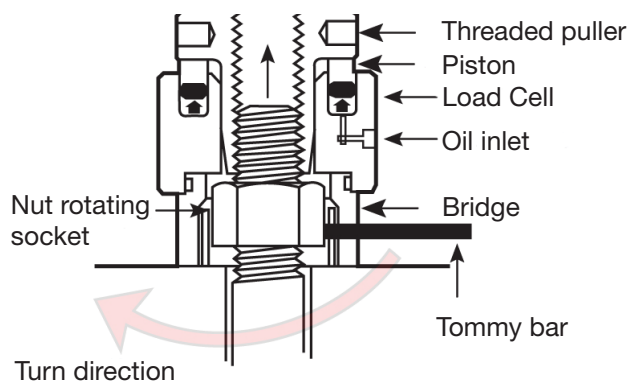
STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE

- Capacities from 234 to 2649 kN
- Working pressure 1500 Bar
- Single acting design

The STS metric bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 26 metric size options ranging from M16 to M100 thread size and all models are suitable for working pressures up to 1500 Bar. Each of the 6 models of hydraulic tensioning cylinder can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers and nut rotating sockets are available as individual components (see pages 96 & 97 for detailed information).

All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 103 & 104.

- Nitrocarburised piston
- Maximum piston stroke indicator
- Suitable for single or multi-tensioning applications
- Specially designed tensioners available on request (see page 98)
- User friendly operating and maintenance procedure
- Choice of manually operated or air powered pumps available (see page 103)



The STS range of tensioners are push back type tensioners. For spring return tensioners see pages 86-89 of this catalogue.

BOLT TENSIONERS

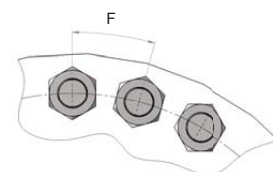
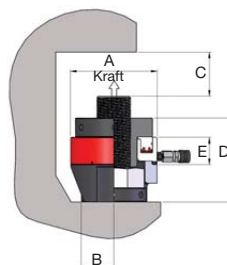
Topside Bolt Tensioners

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE

- Bolt sizes from M16 to M100
- Modular design for optimum versatility
- Dual quick couplings for easy connection



Note: F = minimum pitch distance

Type	Bolt thread size	Threads per inch	Capacity kN	tonnes	Effective area cm²	Stroke mm	Dimensions in mm						Weight kg	Item no.
							A	B	C	D	E	F		
STS1-M16B1	M16	2	234	23.9	15.6	10	74	28	74	90	45	47	1.7	78HSTS1-M16B1
STS1-M18B1	M18	2.5	234	23.9	15.6	10	74	28	74	90	45	49	1.7	78HSTS1-M18B1
STS1-M20B1	M20	2.5	234	23.9	15.6	10	74	28	74	90	45	51	1.7	78HSTS1-M20B1
STS1-M22B2	M22	2.5	234	23.9	15.6	10	74	30	80	98	45	56	1.7	78HSTS1-M22B2
STS1-M24B2	M24	3	234	23.9	15.6	10	74	30	80	98	45	59	1.7	78HSTS1-M24B2
STS1-M27B2	M27	3	234	23.9	15.6	10	74	30	80	98	45	61	1.7	78HSTS1-M27B2
STS2-M30B1	M30	3.5	457	46.6	30.5	15	102	39	103	128	54	71	3.5	78HSTS2-M30B1
STS2-M33B1	M33	3.5	457	46.6	30.5	15	102	39	103	128	54	74	3.5	78HSTS2-M33B1
STS2-M36B1	M36	4	457	46.6	30.5	15	102	39	103	128	54	77	3.5	78HSTS2-M36B1
STS2-M39B1	M39	4	457	46.6	30.5	15	102	39	103	128	54	80	3.5	78HSTS2-M39B1
STS3-M42B1	M42	4.5	822	83.8	54.8	15	133	47	115	150	56	91	6.1	78HSTS3-M42B1
STS3-M45B1	M45	4.5	822	83.8	54.8	15	133	47	115	150	56	94	6.1	78HSTS3-M45B1
STS3-M45B2	M45	4.5	822	83.8	54.8	15	133	50	117	155	56	105	6.1	78HSTS3-M45B2
STS3-M48B1	M48	5	822	83.8	54.8	15	133	47	115	150	56	97	6.1	78HSTS3-M48B1
STS3-M48B2	M48	5	822	83.8	54.8	15	133	50	117	155	56	105	6.1	78HSTS3-M48B2
STS3-M52B2	M52	5	822	83.8	54.8	15	133	50	117	155	56	105	6.1	78HSTS3-M52B2
STS4-M48B1	M48	5	1264	128.9	84.3	15	163	50	119	149	57	105	10.6	78HSTS4-M48B1
STS4-M52B1	M52	5	1264	128.9	84.3	15	163	50	119	149	57	108	10.6	78HSTS4-M52B1
STS4-M52B2	M52	5	1264	128.9	84.3	15	163	62	135	165	57	120	10.6	78HSTS4-M52B2
STS4-M56B2	M56	5.5	1264	128.9	84.3	15	163	62	135	165	57	120	10.6	78HSTS4-M56B2
STS4-M60B2	M60	5.5	1264	128.9	84.3	15	163	62	135	165	57	124	10.6	78HSTS4-M60B2
STS4-M64B2	M64	6	1264	128.9	84.3	15	163	62	135	165	57	126	10.6	78HSTS4-M64B2
STS5-M64B1	M64	6	1833	186.9	122.2	15	193	73	145	187	60	134	16.0	78HSTS5-M64B1
STS5-M68B1	M68	6	1833	186.9	122.2	15	193	73	145	187	60	136	16.0	78HSTS5-M68B1
STS5-M72B1	M72	6	1833	186.9	122.2	15	193	73	145	187	60	139	16.0	78HSTS5-M72B1
STS5-M76B1	M76	6	1833	186.9	122.2	15	193	73	145	187	60	142	16.0	78HSTS5-M76B1
STS6-M76B1	M76	6	2649	270.0	176.6	15	233	84	178	216	64	158	23.5	78HSTS6-M76B1
STS6-M80B1	M80	6	2649	270.0	176.6	15	233	84	178	216	64	160	23.5	78HSTS6-M80B1
STS6-M85B1	M85	6	2649	270.0	176.6	15	233	84	178	216	64	162	23.5	78HSTS6-M85B1
STS6-M90B1	M90	6	2649	270.0	176.6	15	233	84	178	216	64	170	23.5	78HSTS6-M90B1
STS6-M95B3	M95	6	2649	270.0	176.6	15	233	105	205	257	64	184	23.5	78HSTS6-M95B3
STS6-M100B3	M100	6	2649	270.0	176.6	15	233	105	205	257	64	190	23.5	78HSTS6-M100B3



Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 97, column B for ordering code.

BOLT TENSIONERS

Bolt Tensioner Components

STS - BOLT TENSIONER COMPONENTS - IMPERIAL

- Cost saving option
- Easily fitted to existing tensioner assembly
- Offers greater versatility

Similar to the imperial tensioner components (pages 92 & 93), the Hi-Force metric topside hydraulic bolt tensioners are also modular in design and can be adapted to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

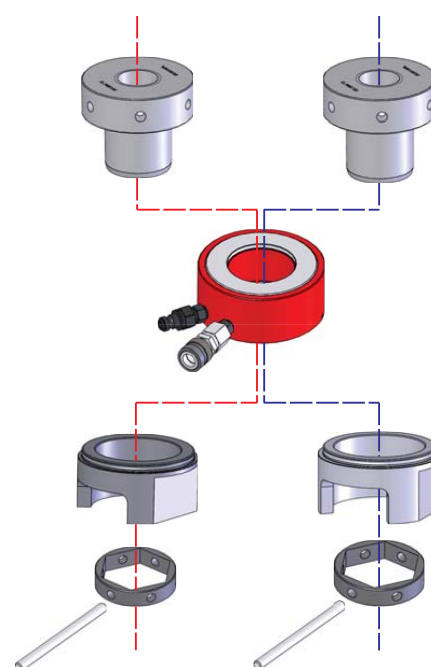
Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. DO NOT mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

Changes within the same colour code DO NOT require a bridge change however, changes from the red to blue line (or vice versa) MUST include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.



Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.



Note: STS2 & STS5 models both have only one tensioner bridge available.

BOLT TENSIONERS

Bolt Tensioner Components

STS - BOLT TENSIONER COMPONENTS - METRIC

This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e.B1, B2 or B3).

Examples:

To change from STS3-M42B1 to STS3-M48B1

would require conversion kit CK3-M48B1 only.

To change from STS3-M48B1 to STS3-M52B2

would require conversion kit CK3-M52B2 and bridge STS3-B2.

Denotes smaller bridge size within tensioner range

Denotes larger bridge size within tensioner range

Denotes one bridge size within tensioner range

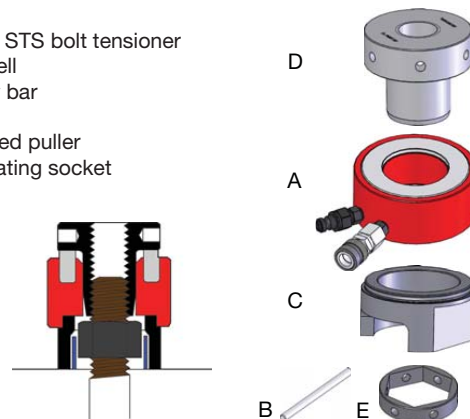
Principle of STS bolt tensioner

A = Load cell
B = Tommy bar

C = Bridge

D = Threaded puller

E = Nut rotating socket



Complete tensioner	
Model number	Bolt Thread
For tensioner range STS1:	
STS1-M16B1	M16
STS1-M18B1	M18
STS1-M20B1	M20
STS1-M22B2	M22
STS1-M24B2	M24
STS1-M27B2	M27
For tensioner range STS2:	
STS2-M30B1	M30
STS2-M33B1	M33
STS2-M36B1	M36
STS2-M39B1	M39
For tensioner range STS3:	
STS3-M42B1	M42
STS3-M45B1	M45
STS3-M48B1	M48
STS3-M45B2	M45
STS3-M48B2	M48
STS3-M52B2	M52
For tensioner range STS4:	
STS4-M48B1	M48
STS4-M52B1	M52
STS4-M52B2	M52
STS4-M56B2	M56
STS4-M60B2	M60
STS4-M64B2	M64
For tensioner range STS5:	
STS5-M64B1	M64
STS5-M68B1	M68
STS5-M72B1	M72
STS5-M76B1	M76
For tensioner range STS6:	
STS6-M76B1	M76
STS6-M80B1	M80
STS6-M85B1	M85
STS6-M90B1	M90
STS6-M95B3	M95
STS6-M100B3	M100

Individual components					
A Load cell	B Tommy Bar	C Bridge	Available as conversion kit		D & E Complete conversion kit
			D - Threaded puller	E - Rotating socket	
STS1-LC	TTB06	STS1-B1	TP1-M16B1	RS1-24B1	CK1-M16B1
			TP1-M18B1	RS1-27B1	CK1-M18B1
			TP1-M20B1	RS1-30B1	CK1-M20B1
		STS1-B2	TP1-M22B2	RS1-32B2	CK1-M22B2
			TP1-M24B2	RS1-37B2	CK1-M24B2
			TP1-M27B2	RS1-41B2	CK1-M27B2
STS2-LC	TTB08	STS2-B1	TP2-M30B1	RS2-46B1	CK2-M30B1
			TP2-M33B1	RS2-51B1	CK2-M33B1
			TP2-M36B1	RS2-56B1	CK2-M36B1
			TP2-M39B1	RS2-60B1	CK2-M39B1
STS3-LC	TTB10	STS3-B1	TP3-M42B1	RS3-65B1	CK3-M42B1
			TP3-M45B1	RS3-70B1	CK3-M45B1
			TP3-M48B1	RS3-75B1	CK3-M48B1
		STS3-B2	TP3-M45B2	RS3-70B2	CK3-M45B2
			TP3-M48B2	RS3-75B2	CK3-M48B2
			TP3-M52B2	RS3-80B2	CK3-M52B2
STS4-LC	TTB10	STS4-B1	TP4-M48B1	RS4-75B1	CK4-M48B1
			TP4-M52B1	RS4-80B1	CK4-M52B1
		STS4-B2	TP4-M52B2	RS4-80B2	CK4-M52B2
			TP4-M56B2	RS4-85B2	CK4-M56B2
			TP4-M60B2	RS4-90B2	CK4-M60B2
			TP4-M64B2	RS4-95B2	CK4-M64B2
STS5-LC	TTB14	STS5-B1	TP5-M64B1	RS5-95B1	CK5-M64B1
			TP5-M68B1	RS5-100B1	CK5-M68B1
			TP5-M72B1	RS5-105B1	CK5-M72B1
			TP5-M76B1	RS5-110B1	CK5-M76B1
STS6-LC	TTB14	STS6-B1	TP6-M76B1	RS6-110B1	CK6-M76B1
			TP6-M80B1	RS6-115B1	CK6-M80B1
			TP6-M85B1	RS6-120B1	CK6-M85B1
			TP6-M90B1	RS6-130B1	CK6-M90B1
		STS6-B3	TP6-M95B3	RS6-135B3	CK6-M95B3
			TP6-M100B3	RS6-146B3	CK6-M100B3



Note:

Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

BOLT TENSIONERS

Customised Bolt Tensioners

STS - CUSTOMISED & SPECIAL DESIGN BOLT TENSIONERS

- Custom design & built to your requirements
- Working pressure up to 2275 Bar
- Short delivery lead time

In addition to the large range of standard topside and sub-sea bolt tensioners available, Hi-Force has the capability to manufacture tensioners to suit special requirements. Our product designs incorporate the latest Solid Works computer technology and together with our 'state of the art' CNC production machinery, we have the capability to offer a solution to meet your needs.

Example of situations where Hi-Force have been able to offer bespoke solutions include:

- Non standard sizes and shapes of nut requiring special bridges
- Nuts recessed into holes requiring special sockets
- Studs with two different thread sizes
- Larger size bolts
- Applications with restricted space requirements
- Systems with different operating pressures
- Bridges with increased load bearing area



BOLT TENSIONERS

Sub Sea Bolt Tensioners

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

STU - SUB SEA BOLT TENSIONERS - IMPERIAL

- Working pressure 1500 Bar
- Interchangeable quickfit/release pullers
- Load cell with integral bridge

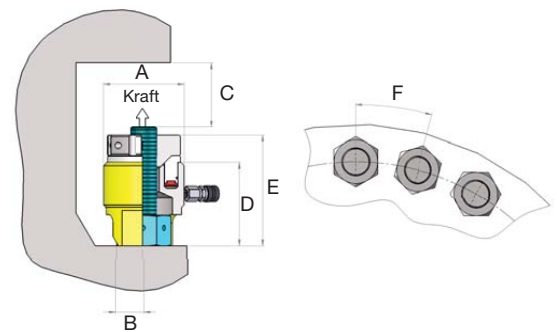
Hi-Force STU series sub-sea bolt tensioners are designed and manufactured to suit the demanding requirements of divers operating in harsh sub-sea environments. With an easy to operate two piece design comprising of a quick fit/release threaded puller and a hydraulic load cell with integral bridge and an extra long 30mm piston stroke to reduce re-setting operations. Hi-Force STU series sub-sea bolt tensioners offer a consistent, reliable and cost effective method of tensioning sub-sea bolted joints. All hydraulic load cells are suitable for different thread sizes (see table below and on page 100) and interchangeable quick fit/release pullers can be ordered separately, as required, resulting in even greater flexibility and cost savings.



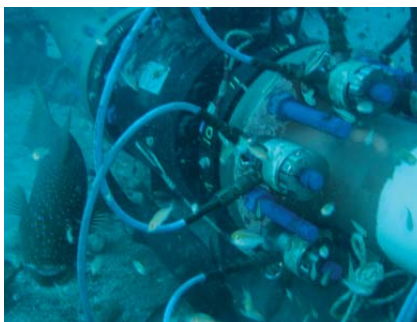
STU3-162



Top view Hi-Force quick fit threaded puller



Note: F = minimum pitch distance



Type	Bolt thread size	Capacity		Effective area cm ²	Stroke mm	Tommy bar	Dimensions in mm						Weight kg	Item no.
		kN	tonnes				A	B	C	D	E	F		
STU1-100	1" - 8UN	256.04	26.10	17.07	20	TTB06	82	22	119	119	140	61	3.4	78HSTU1-100
STU1-112	1 1/8" - 8UN	256.04	26.10	17.07	20	TTB06	82	22	119	119	140	64	3.4	78HSTU1-112
STU2-125	1 1/4" - 8UN	430.36	43.87	28.69	30	TTB08	102	30	140	140	164	73	6.0	78HSTU2-125
STU2-137	1 3/8" - 8UN	430.36	43.87	28.69	30	TTB08	102	30	140	140	164	75	6.0	78HSTU2-137
STU3-150	1 1/2" - 8UN	553.35	56.41	36.89	30	TTB10	114	35	142	142	169	82	7.5	78HSTU3-150
STU3-162	1 5/8" - 8UN	553.35	56.41	36.89	30	TTB10	114	35	142	142	169	85	7.5	78HSTU3-162
STU4-175	1 3/4" - 8UN	756.30	77.09	50.42	30	TTB10	128	41	151	151	181	94	9.8	78HSTU4-175
STU4-187	1 7/8" - 8UN	756.30	77.09	50.42	30	TTB10	128	41	151	151	181	98	9.8	78HSTU4-187
STU5-200	2" - 8UN	1168.19	119.08	77.88	30	TTB12	150	48	164	164	202	112	14.5	78HSTU5-200
STU5-225	2 1/4" - 8UN	1168.19	119.08	77.88	30	TTB12	150	48	164	164	202	116	14.5	78HSTU5-225
STU6-250	2 1/2" - 8UN	1649.12	168.11	109.94	30	TTB14	176	60	183	183	231	136	22.8	78HSTU6-250
STU6-275	2 3/4" - 8UN	1649.12	168.11	109.94	30	TTB14	176	60	183	183	231	141	22.8	78HSTU6-275
STU7-300	3" - 8UN	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	162	35.6	78HSTU7-300
STU7-325	3 1/4" - 8UN	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	173	35.6	78HSTU7-325
STU7-350	3 1/2" - 8UN	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	175	35.6	78HSTU7-350



Note:

Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners.

Please note that the tommy bar listed will fit related quickfit puller; a different size may be required for the hexagon nut.

BOLT TENSIONERS

Sub Sea Bolt Tensioners

STU - SUB-SEA BOLT TENSIONERS - METRIC

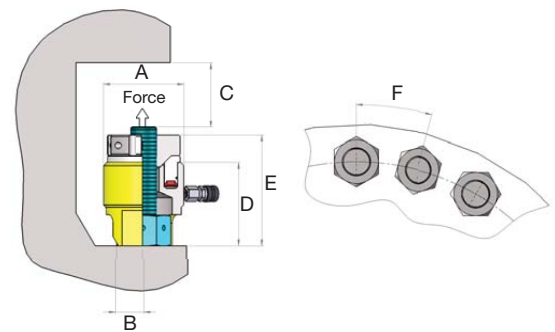
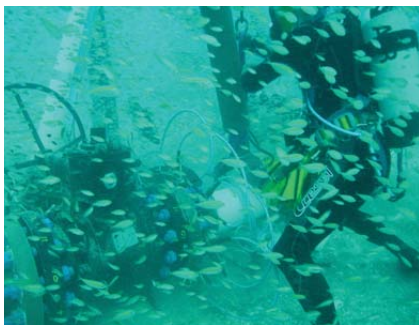
- Working pressure 1500 Bar
- Interchangeable quickfit/release pullers
- Load cell with integral bridge
- Extra long 30mm piston stroke to reduce re-setting time
- Maximum piston stroke indicator
- Dual hose connection for easy hook up
- Corrosion protected for operation in harsh sub-sea environments



STU3-42



Topview Hi-Force quick fit threaded puller



Note: F = minimum pitch distance

Type	Bolt thread size	Capacity		Effective area cm ²	Stroke mm	Tommy bar	Dimensions in mm						Weight kg	Item no.
		kN	tonnes				A	B	C	D	E	F		
STU1-24	M24 x 3	256.04	26.10	17.07	20	TTB06	82	22	119	119	140	61	3.4	78HSTU1-24
STU1-27	M27 x 3	256.04	26.10	17.07	20	TTB06	82	22	119	119	140	64	3.4	78HSTU1-27
STU2-30	M30 x 3.5	430.36	43.87	28.69	30	TTB08	102	30	140	140	164	73	6.0	78HSTU2-30
STU2-33	M33 x 3.5	430.36	43.87	28.69	30	TTB08	102	30	140	140	164	75	6.0	78HSTU2-33
STU2-36	M36 x 4	430.36	43.87	28.69	30	TTB10	102	30	140	140	164	78	6.0	78HSTU2-36
STU3-39	M39 x 4	553.35	56.41	36.89	30	TTB10	114	35	142	142	169	82	7.5	78HSTU3-39
STU3-42	M42 x 4.5	553.35	56.41	36.89	30	TTB10	114	35	142	142	169	85	7.5	78HSTU3-42
STU4-45	M45 x 4.5	756.30	77.09	50.42	30	TTB10	128	41	151	151	181	94	9.8	78HSTU4-45
STU4-48	M48 x 5	756.30	77.09	50.42	30	TTB12	128	41	151	151	181	98	9.8	78HSTU4-48
STU5-52	M52 x 5	1168.19	119.08	77.88	30	TTB12	150	48	164	164	202	112	14.5	78HSTU5-52
STU5-56	M56 x 5.5	1168.19	119.08	77.88	30	TTB14	150	48	164	164	202	116	14.5	78HSTU5-56
STU6-60	M60 x 5.5	1649.12	168.11	109.94	30	TTB14	176	60	183	183	231	136	22.8	78HSTU6-60
STU6-64	M64 x 6	1649.12	168.11	109.94	30	TTB16	176	60	183	183	231	136	22.8	78HSTU6-64
STU6-68	M68 x 6	1649.12	168.11	109.94	30	TTB16	176	60	183	183	231	136	22.8	78HSTU6-68
STU6-72	M72 x 6	1649.12	168.11	109.94	30	TTB16	176	60	183	183	231	141	22.8	78HSTU6-72
STU7-76	M76 x 6	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	164	35.6	78HSTU7-76
STU7-80	M80 x 6	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	164	35.6	78HSTU7-80
STU7-85	M85 x 6	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	175	35.6	78HSTU7-85
STU7-90	M90 x 6	2483.44	253.15	165.56	30	TTB16	215	89	215	215	260	175	35.6	78HSTU7-90



Note:

Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners. Please note that the tommy bar listed will fit related quickfit puller; a different size may be required for the hexagon nut.

BOLT TENSIONERS

Tensioner Nuts

Hi-Force
HYDRAULIC TOOLS

Carl Stahl

HTN - HYDRAULIC TENSIONER NUTS - IMPERIAL

- Integral mechanical load retaining collar
- Working pressure 1500 Bar
- Imperial thread sizes from 1" to 4"

The Hi-Force HTN range of imperial top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint, for inspection and maintenance purposes is required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts, on one side of the bolted joint. Initially the bolt tension or elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar.

Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, if the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for imperial bolt sizes from 1" to 4", with other sizes available to special order. All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses (see pages 103 & 104).



HTN9-200

HTN7-175

HTN10-225

! Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioner nuts. We recommend the purchase of one tommy bar for every four tensioners nuts.

Type	Bolt size	Capacity		Effective area cm ²	Stroke mm	Tommy bar	Diameter mm	Height mm	Weight kg	Item no.
		kN	tonnes							
HTN1-100	1" - 8UN	198.27	20.21	13.22	5	TTB06	72	55	1.9	78HTN1-100
HTN2-112	1 1/8" - 8UN	216.30	22.05	14.42	5	TTB06	75	55	2.0	78HTN2-112
HTN3-125	1 1/4" - 8UN	252.94	25.78	16.86	5	TTB06	82	57	2.4	78HTN3-125
HTN4-137	1 3/8" - 8UN	305.83	31.18	20.39	5	TTB06	88	57	2.7	78HTN4-137
HTN5-150	1 1/2" - 8UN	344.12	35.08	22.94	6	TTB06	93	58	2.9	78HTN5-150
HTN6-162	1 5/8" - 8UN	397.61	40.53	26.51	6	TTB06	100	62	3.5	78HTN6-162
HTN7-175	1 3/4" - 8UN	475.01	48.42	31.67	6	TTB06	106	64	4.0	78HTN7-175
HTN8-187	1 7/8" - 8UN	501.40	51.11	33.43	6	TTB06	110	64	4.2	78HTN8-187
HTN9-200	2" - 8UN	563.72	57.46	37.58	6	TTB06	117	67	4.9	78HTN9-200
HTN10-225	2 1/4" - 8UN	746.44	76.09	49.76	8	TTB06	128	74	6.4	78HTN10-225
HTN11-250	2 1/2" - 8UN	905.13	92.27	60.34	8	TTB06	141	77	8.0	78HTN11-250
HTN12-275	2 3/4" - 8UN	999.85	101.92	66.66	8	TTB08	150	78	8.8	78HTN12-275
HTN13-300	3" - 8UN	1203.43	122.67	80.23	8	TTB08	162	81	10.6	78HTN13-300
HTN14-325	3 1/4" - 8UN	1413.72	144.11	94.25	10	TTB08	174	87	12.9	78HTN14-325
HTN15-350	3 1/2" - 8UN	1605.04	163.61	107.00	10	TTB10	187	95	16.2	78HTN15-350
HTN16-375	3 3/4" - 8UN	1704.59	173.76	113.64	10	TTB10	194	102	18.3	78HTN16-375
HTN17-400	4" - 8UN	1911.46	194.85	127.43	10	TTB10	205	110	21.9	78HTN17-400

Tensioner Nuts

HTN - HYDRAULIC TENSIONER NUTS - METRIC

- Integral mechanical load retaining collar
- Working pressure 1500 Bar
- Metric thread sizes from M24 to M100

The Hi-Force HTN range of metric top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint for inspection and maintenance purposes is required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts on one side of the bolted joint. Initially the bolt tension or elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar.

Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, when the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for bolt sizes from M24 to M100, with other sizes available to special order. All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses (see page 103 & 104).



HTN8-M48



Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioner nuts. We recommend the purchase of one tommy bar for every four tensioners nuts.

Type	Bolt thread size	Capacity kN	Capacity tonnes	Effective area cm ²	Stroke mm	Tommy bar	Diameter mm	Height mm	Weight kg	Item no.
HTN1-M24	M24 x 3	198.27	20.21	13.22	5	TTB06	72	55	1.9	78HTN1-M24
HTN2-M27	M27 x 3	216.30	22.05	14.42	5	TTB06	75	55	2.0	78HTN2-M27
HTN3-M30	M30 x 3.5	252.94	25.78	16.86	5	TTB06	82	57	2.4	78HTN3-M30
HTN3-M33	M33 x 3.5	252.94	25.78	16.86	5	TTB06	82	57	2.4	78HTN3-M33
HTN4-M36	M36 x 4	305.83	31.18	20.39	5	TTB06	88	57	2.7	78HTN4-M36
HTN5-M39	M39 x 4	344.12	35.08	22.94	6	TTB06	93	58	2.9	78HTN5-M39
HTN6-M42	M42 x 4.5	397.61	40.53	26.51	6	TTB06	100	62	3.5	78HTN6-M42
HTN7-M45	M45 x 4.5	475.01	48.42	31.67	6	TTB06	106	64	4.0	78HTN7-M45
HTN8-M48	M48 x 5	501.40	51.11	33.43	6	TTB06	110	64	4.2	78HTN8-M48
HTN9-M52	M52 x 5	563.72	57.46	37.58	6	TTB06	117	67	4.9	78HTN9-M52
HTN10-M56	M56 x 5.5	746.44	76.09	49.76	8	TTB06	128	74	6.4	78HTN10-M56
HTN11-M60	M60 x 5.5	905.13	92.27	60.34	8	TTB06	141	77	8.0	78HTN11-M60
HTN11-M64	M64 x 6	905.13	92.27	60.34	8	TTB06	141	77	8.0	78HTN11-M64
HTN12-M68	M68 x 6	999.85	101.92	66.66	8	TTB08	150	78	8.8	78HTN12-M68
HTN13-M72	M72 x 6	1203.43	122.67	80.23	8	TTB08	162	81	10.6	78HTN13-M72
HTN13-M76	M76 x 6	1203.43	122.67	80.23	8	TTB08	162	81	10.6	78HTN13-M76
HTN14-M80	M80 x 6	1413.72	144.11	94.25	10	TTB08	174	87	12.9	78HTN14-M80
HTN15-M85	M85 x 6	1605.04	163.61	107.00	10	TTB10	187	95	16.2	78HTN15-M85
HTN15-M90	M90 x 6	1605.04	163.61	107.00	10	TTB10	187	95	16.2	78HTN15-M90
HTN16-M95	M95 x 6	1704.59	173.76	113.64	10	TTB10	194	102	18.3	78HTN16-M95
HTN17-M100	M100 x 6	1911.46	194.85	127.43	10	TTB10	205	110	21.9	78HTN17-M100

BOLT TENSIONERS

Pumps for Bolt Tensioners

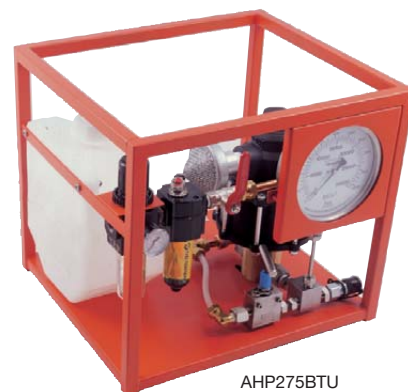
Hi-Force
HYDRAULIC TOOLS



AHP-BTU - AIR DRIVEN PUMP FOR BOLT TENSIONERS

- Operates from standard 7 Bar air supply
- Air consumption 28 scfm (0.79 m³/minute)
- Working pressure 1500 Bar

The Hi-Force AHP-BTU range of air driven hydraulic pumps is compatible for use with Hi-Force STS, SBT and STU bolt tensioners as well as HTN hydraulic nuts. The pump unit is easy to operate and is supplied complete with a glycerine filled vibra-gauge and quick release outlet coupling. The complete system, including an air inlet filter, regulator and lubricator unit is fitted in a robust stainless steel frame. See page 104 for compatible high pressure hydraulic hoses and couplings.



AHP275BTU

Type	Working pressure Bar	Usable oil capacity litres	Oil flow per stroke cm ³	Outlet coupler	Length	Dimensions in mm		Height	Weight kg	Item no.
						Width				
AHP275BTU	1500	7	1.6	STFC4	450	395		395	20	78HAHP275BTU
AHP2-237BTU	1500	7	6.1	STFC4	450	390		465	24	78HAHP2-237BTU

HPX-BTU - MANUALLY OPERATED PUMP FOR BOLT TENSIONERS

- Compact & lightweight design
- Complete with pressure gauge
- Working pressure 1500 Bar

Hi-Force HPX1500BTU manually operated high pressure hydraulic pump is compatible for use with Hi-Force STS, SBT and STU bolt tensioners as well as HTN hydraulic nuts. Lightweight, compact and independent from any required power source, it is suitable for all tensioning applications on-site requiring reliable hydraulic power. The pump is easy to operate and supplied complete with a pressure gauge and quick release outlet coupling. See page 104 for compatible high pressure hydraulic hoses.



HPX1500BTU

Type	Working pressure Bar	Usable oil capacity litres	Displacement per stroke (cm ³)		Outlet coupler	Length	Dimensions in mm		Height	Weight kg	Item no.
			1st stage	2nd stage			Width				
HPX1500BTU	1500	1.2	20.0	1.0	STFC4	617	125		161	6.5	78HPX1500BTU

BOLT TENSIONERS

Bolt Tensioner Accessories

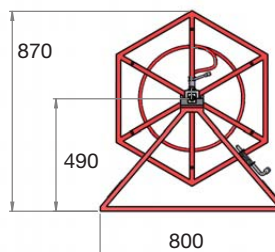
BOLT TENSIONER HOSES, COUPLERS & HOSE REELS

- Safety factor 3 : 1
- Working pressure up to 1500 Bar
- Supplied with quick connect couplings

Hi-Force ultra-high pressure hoses are compatible for use with all Hi-Force bolt tensioning products up to a maximum of 1500 Bar working pressure. Each hose is supplied complete with quick connect couplings on each end (male/female) and has a safety factor of 3:1 on maximum working pressure. Eleven standard lengths are available with special lengths available on request.



Designed for sub-sea main line hose connection between the pump and the first tensioner, the reel above is suitable for off-shore use and can accommodate up to 300 meters of Hi-Force XHC hydraulic hose. The reel comes complete with quick connect couplings, integrated brake and a spring loaded locking bolt.



Type	Maximum pressure Bar	Description	Weight kg	Item no.
XHC1.5B	1500	Link hose complete with quick connect couplings, length 1.5 metres	1.0	78HXHC1.5B
XHC3B	1500	Link hose complete with quick connect couplings, length 3.0 metres	1.7	78HXHC3B
XHC5B	1500	Mainline hose complete with quick connect couplings, length 5.0 metres	2.6	78HXHC5B
XHC10B	1500	Mainline hose complete with quick connect couplings, length 10.0 metres	4.5	78HXHC10B
XHC25B	1500	Mainline hose complete with quick connect couplings, length 25.0 metres	9.2	78HXHC25B
XHC50B	1500	Mainline hose complete with quick connect couplings, length 50.0 metres	16.9	78HXHC50B
XHC100B	1500	Mainline hose complete with quick connect couplings, length 100.0 metres	31.0	78HXHC100B
XHC150B	1500	Mainline hose complete with quick connect couplings, length 150.0 metres	46.0	78HXHC150B
XHC200B	1500	Mainline hose complete with quick connect couplings, length 200.0 metres	61.0	78HXHC200B
XHC250B	1500	Mainline hose complete with quick connect couplings, length 250.0 metres	76.0	78HXHC250B
XHC300B	1500	Mainline hose complete with quick connect couplings, length 300.0 metres	91.0	78HXHC300B
XHR1	1500	Hose reel, suitable for up to 300 meters of XHC high pressure hose	28.0	78HXHR1
STFC4	1500	Female coupling	0.4	78HSTFC4
STMC4	1500	Male coupling	0.2	78HSTMC4
STN1P2	1500	1/8" x 1/4" BSP nipple for current model STS1 only	0.4	78HSTN1P2
STN1P4	1500	1/4" BSP nipple c/w bonded sealing washer (old design - not for STS1)	0.5	78HSTN1P4
STN1P4-C	1500	1/4" BSP nipple with cone seat seal (current design - not for STS1)	0.7	78HSTN1P4-C

BOLT TENSIONERS

Bolt & Nut Protection Caps

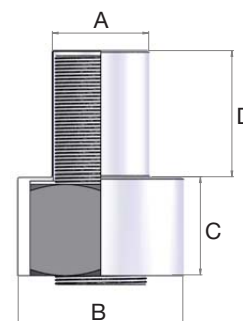
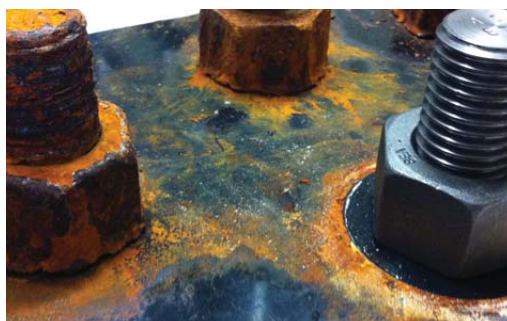
Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

ITP & MTP - BOLT & NUT PROTECTION CAPS

- Protects exposed bolt threads and nuts
- Sizes from 3/4" to 4" (M16 to M100)
- Strong and secure fixing

The ITP & MTP bolt and nut protection caps are designed to protect bolts and nuts from thread damage and to considerably help prevent corrosion. These screw-on metal caps have a special internal female thread matching the bolt thread, that ensures a strong and secure fixing to the bolt. These protection caps are commonly installed on heat exchangers and reactors operating at temperatures up to 550°C and over, where common plastic caps would melt. Ideal for use in refineries, petrochemical, LNG plants, offshore platforms and steel structures. The ITP caps are available to suit imperial bolt thread sizes from 3/4" to 4" and MTP caps are suitable for metric bolt thread sizes from M16 to M100.



Type	Maximum pressure Bar	Dimensions in mm				Weight kg	Item no.
		A	B	C	D		
ITP012	3/4"	19.0	39	22	23	0.2	78HITP012
ITP014	7/8"	22.3	44	26	33	0.2	78HITP014
ITP100	1"	25.5	48	29	37	0.2	78HITP100
ITP102	1 1/8"	28.6	55	33	40	0.2	78HITP102
ITP104	1 1/4"	31.8	60	36	44	0.2	78HITP104
ITP106	1 3/8"	35.0	65	39	48	0.2	78HITP106
ITP108	1 1/2"	38.2	70	42	53	0.2	78HITP108
ITP110	1 5/8"	41.3	77	46	59	0.2	78HITP110
ITP112	1 3/4"	44.5	83	49	64	0.2	78HITP112
ITP114	1 7/8"	47.7	88	53	67	0.2	78HITP114
ITP200	2"	51.0	94	56	72	0.2	78HITP200
ITP204	2 1/4"	57.2	105	62	80	0.2	78HITP204
ITP208	2 1/2"	63.5	114	69	91	0.2	78HITP208
ITP212	2 3/4"	70.0	125	75	99	0.2	78HITP212
ITP300	3"	76.3	136	81	107	0.2	78HITP300
ITP304	3 1/4"	82.7	152	87	116	0.2	78HITP304
ITP308	3 1/2"	89.0	160	94	126	0.2	78HITP308
ITP312	3 3/4"	95.4	172	100	135	0.2	78HITP312
ITP400	4"	102.0	183	107	152	0.2	78HITP400

Type	Maximum pressure Bar	Dimensions in mm				Weight kg	Item no.
		A	B	C	D		
MTP16	M16	16	31	18	22	0.2	78HMTP16
MTP18	M18	18	34	21	23	0.2	78HMTP18
MTP20	M20	20	39	23	25	0.2	78HMTP20
MTP22	M22	22	40	25	32	0.2	78HMTP22
MTP24	M24	24	45	29	34	0.2	78HMTP24
MTP27	M27	27	51	30	37	0.2	78HMTP27
MTP30	M30	30	55	33	40	0.2	78HMTP30
MTP33	M33	33	61	36	46	0.2	78HMTP33
MTP36	M36	36	65	39	48	0.2	78HMTP36
MTP39	M39	39	70	42	52	0.2	78HMTP39
MTP42	M42	42	77	46	59	0.2	78HMTP42
MTP45	M45	45	83	49	64	0.2	78HMTP45
MTP48	M48	48	88	53	67	0.2	78HMTP48
MTP52	M52	52	94	56	72	0.2	78HMTP52
MTP56	M56	56	102	60	84	0.2	78HMTP56
MTP64	M64	64	113	69	91	0.2	78HMTP64
MTP68	M68	68	119	73	98	0.2	78HMTP68
MTP72	M72	72	125	77	100	0.2	78HMTP72
MTP76	M76	76	131	81	105	0.2	78HMTP76
MTP80	M80	80	136	85	107	0.2	78HMTP80
MTP90	M90	90	159	95	126	0.2	78HMTP90
MTP100	M100	100	183	105	144	0.2	78HMTP100



Standard material : plated steel
Optional material : aluminium & stainless steel

BOLT TENSIONERS

Boltright Software

Hi-Force
HYDRAULIC TOOLS

BOLTRIGHT SOFTWARE - THE EASY ANSWER !

- Available as download only
- Multi-Language Interface
- Easy to use, minimal computer knowledge required

The Hi-Force BoltRight software programme is designed to assist engineers in a wide variety of industries where accurate and consistent "bolt up" of components is required. The programme allows the user to input key joint data related to flange size and class, for all ANSI/ASME, API and ISO type flanges along with the applicable bolt material, gasket material and type, operating temperature, preferred or specified method of bolt tightening (torque or direct tension), friction reducing lubricant to be applied, or the applicable value of friction coefficient necessary for torque tightening applications. Based on the information entered, the BoltRight programme will analyse all of the data and produce a comprehensive calculation sheet along with the required torque or tension figures to ensure an accurate and correctly bolted joint is achieved.

BoltRight will also create an individual tightening procedure for each bolted joint, which can include specific information such as plant owner name, bolting contractor company name, joint tag reference number and any special remarks all of which can be easily entered into the procedure by the user. These individually produced tightening procedures can also be added to a master joint register, which can be either printed or stored electronically to ensure full traceability.

Whilst calculating the applicable torque or direct tension figures, the BoltRight programme will also calculate the required pump pressure settings for the selected Hi-Force hydraulic wrench or bolt tensioner to be used. In most cases the programme will offer a multiple choice of suitable Hi-Force tools based on the applicable torque or tension figures and the design output capacity of the tools recommended.

For bolt tensioning applications BoltRight also offers the user a choice of 25%, 33%, 50% and 100% simultaneous bolt tensioning options along with the applicable A and B pump pressure settings for all options, excluding 100% simultaneous tensioning, where only one pump pressure setting is required. For torque wrench applications the BoltRight programme will calculate the required pump pressure settings for a 25%, 50% and 100% applied output torque figure, which is the recommended three stage procedure when using a single hydraulic torque wrench to tighten a multiple bolt flange in a diametrically opposed manner. The tightening procedure will also provide the necessary bolt numbering sequence to ensure that the bolts are tightened in the correct numerical order.

Currently the BoltRight programme is available in English, Dutch, Portuguese, French, Chinese, Russian and Italian with the addition of further languages an ongoing process. The BoltRight programme is Windows compatible and only available by download from www.hi-force.com and www.boltright.com using an authorised password issued by Hi-Force. Applications for the password can be made via the website.



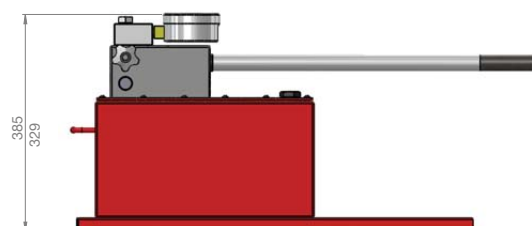
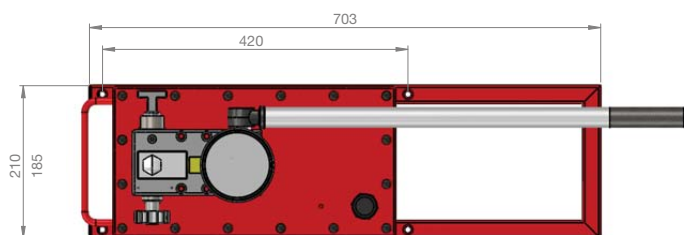
Designed for 

MHP - MANUALLY OPERATED HYDROTEST PUMPS

- Up to 1000 Bar working pressure
- Suitable for use with a wide variety of fluids
- Two stage with manual pressure changeover

The Hi-Force MHP series of manually operated two speed hydraulic pumps are suitable for use with a wide variety of fluids including water. Manufactured predominantly from high quality aluminium alloy, with stainless steel piston assemblies, the MHP pump series are lightweight, versatile and robust. The pumps two stage piston design gives a high flow low pressure stage of 50cm³ up to 50 Bar pressure. The pump incorporates a reliable smooth manual changeover from low to high pressure output. The MHP series pumps are available in 5 different pressure capacities ranging from 100 to 1000 Bar working pressure and all models are fitted with a factory pre-set relief valve for added safety. Each pump is supplied with a multi positional 610mm operating lever for increased operator comfort during use. Major applications for the MHP series of pumps include hydro-testing of pipes, pressure vessels, valves, and also back-up systems and other pressure retaining equipment, prior to commissioning.

- Lightweight aluminium design with stainless steel pistons
- Relief valve incorporated as standard
- Standard 15 litre capacity stainless steel powder coated fluid reservoir
- Optional pressure gauges available (see page 108)



Type (with tank)	Working pressure Bar	Valve type	Displacement per stroke cm ³		Changeover pressure Bar	Outlet port	Suction port	Weight with tank kg	Item no.
			1st stage	2nd stage					
MHP100	100	2-way	50	22	50	3/8" NPT	3/8" BSP	20	78HMHP100
MHP300	300	2-way	50	8	50	3/8" NPT	3/8" BSP	20	78HMHP300
MHP500	500	2-way	50	4	50	3/8" NPT	3/8" BSP	20	78HMHP500
MHP700	700	2-way	50	3	50	3/8" NPT	3/8" BSP	20	78HMHP700
MHP1000	1000	2-way	50	2	50	3/8" BSP	3/8" BSP	20	78HMHP1000

Type (pump only)	Working pressure Bar	Valve type	Displacement per stroke cm ³		Changeover pressure Bar	Outlet port	Suction port	Weight pump only kg	Item no.
			1st stage	2nd stage					
MHP100PU	100	2-way	50	22	50	3/8" NPT	3/8" BSP	5.6	78HMHP100PU
MHP300PU	300	2-way	50	8	50	3/8" NPT	3/8" BSP	6.0	78HMHP300PU
MHP500PU	500	2-way	50	4	50	3/8" NPT	3/8" BSP	6.0	78HMHP500PU
MHP700PU	700	2-way	50	3	50	3/8" NPT	3/8" BSP	6.1	78HMHP700PU
MHP1000PU	1000	2-way	50	2	50	3/8" BSP	3/8" BSP	6.1	78HMHP1000PU

HYDROTEST PUMPS

Hi-Force®
HYDRAULIC TOOLS

Manually Operated Hydrotest Pumps, Accessories

MHP-PU - MANUALLY OPERATED HYDROTEST PUMPS

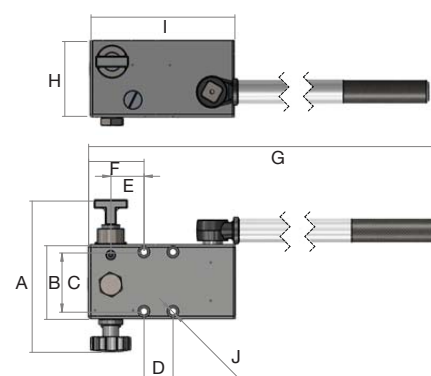
- Choice of 5 different models
- Supplied complete with fixing kit
- Compact, lightweight and easy to operate

The Hi-Force MHP-PU series offer the same features as the MHP range on page 107 however these are supplied as a pump unit only without a fluid reservoir. The pump unit is supplied complete with a mounting kit for easy attachment to any specially designed fluid reservoir and an operating lever.

Dimension in mm (all models)										Weight kg
A	B	C	D	E	F	G	H	I	J	
183,0	89,0	71,5	35,0	40,0	67,0	760,0	92,0	177,0	4 X M8	5,0



MHP300PU



RESERVOIRS

Type	Description	Weight kg	Item no.
MHR15	15 litre standard reservoir	9.0	78HMHR15



PRESSURE GAUGES

Type	Pressure range Bar	Weight kg	Item no.
MHP100GK	110	1.4	78HMHP100GK
MHP300GK	310	1.4	78HMHP300GK
MHP500GK	552	1.4	78HMHP500GK
MHP700GK	700	1.4	78HMHP700GK
MHP1000GK	1000	1.4	78HMHP1000GK



HOSES

Type	Max W.P. Bar	Length (metres)	End Fitting	For model number	Weight kg	Item no.
HH3-6NMS-1	up to 300	3	3/8" NPT Male Swivel	MHP100 & MHP300	0.8	78HH3-6NMS-1
HH3-6NMS-2	up to 700	3	3/8" NPT Male Swivel	MHP500 & MHP700	0.9	78HH3-6NMS-2
HH3-6NMS-3	1000	3	3/8" NPT Male Swivel	MHP1000	1.5	78HH3-6NMS-3



AHP - AIR DRIVEN HYDROTEST PUMPS - STANDARD FLOW

- Output pressures up to 2931 Bar
- Suitable for use with various fluids
- 150 mm dual scale vibra pressure gauge

The Hi-Force AHP series of air driven hydrostatic pressure testing pumps offer a choice of eight models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI). All models are suitable for use with various fluids, including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve. All units are of compact design with a maximum weight of 23 kg.

- Air consumption 28 scfm (0.79m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity



AHP58

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	10 PSI	50 PSI	100 PSI			Length	Width	Height		
	0.69 Bar	3.45 Bar	6.9 Bar							
AHP10	6	34	69	42.3	1/2" NPT	450	395	395	23	78HAHP10
AHP26	14	90	181	16.0	1/2" NPT	450	395	395	21	78HAHP26
AHP36	17	122	250	12.3	1/2" NPT	450	395	395	20	78HAHP36
AHP58	28	200	400	7.6	1/2" NPT	450	395	395	20	78HAHP58
AHP107	62	373	738	4.0	1/2" NPT	450	395	395	20	78HAHP107
AHP187	97	638	1293	2.2	9/16" 18UNF	450	395	395	20	78HAHP187
AHP275	155	931	1897	1.6	9/16" 18UNF	450	395	395	20	78HAHP275
AHP425	345	1448	2931	1.0	9/16" 18UNF	450	395	395	20	78HAHP425

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)							
PSI	Bar	AHP10	AHP26	AHP36	AHP58	AHP107	AHP187	AHP275	AHP425
0	0	23.10	8.80	6.00	3.56	1.97	1.15	0.72	0.43
500	35	12.00	5.85	4.39	3.05	1.50	1.05	0.68	0.40
1000	69	*	4.72	3.80	2.51	1.28	1.00	0.65	0.38
1500	104	*	3.90	3.34	2.38	1.25	0.90	0.60	0.36
2000	138	*	3.00	3.00	2.25	1.21	0.78	0.55	0.34
2500	173	*	1.21	2.56	2.05	1.18	0.75	0.50	0.33
3000	207	*	*	1.95	1.85	1.16	0.73	0.48	0.31
4000	276	*	*	*	1.56	1.02	0.70	0.45	0.29
5000	345	*	*	*	1.02	0.95	0.67	0.42	0.26
7500	517	*	*	*	*	0.76	0.60	0.40	0.25
10000	690	*	*	*	*	0.44	0.52	0.37	0.24
15000	1034	*	*	*	*	*	0.39	0.33	0.21
25000	1724	*	*	*	*	*	*	0.30	0.20
30000	2069	*	*	*	*	*	*	0.21	0.16
40000	2760	*	*	*	*	*	*	*	0.13
20000	1379								0.05

* Pressure exceeds pump capacity.

Air Driven Hydrotest Pumps

AHP-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER

- Output pressures up to 2931 Bar
- Suitable for use with various fluids
- 150 mm dual scale vibra pressure gauge

The Hi-Force AHP-CR series of air driven hydrostatic pressure testing pumps offer a choice of 8 models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, light-weight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds. All units are of compact design with a maximum weight of 31 kg.



AHP187-CR

- Air consumption 28 scfm (0.79m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity
- Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 115

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	10 PSI	50 PSI	100 PSI			Length	Width	Height		
	0.69 Bar	3.45 Bar	6.9 Bar							
AHP10-CR	6	34	69	42.3	1/2" NPT	530	390	390	31	78HAHP10-CR
AHP26-CR	14	90	181	16.0	1/2" NPT	530	390	390	29	78HAHP26-CR
AHP36-CR	17	122	250	12.3	1/2" NPT	530	390	390	28	78HAHP36-CR
AHP58-CR	28	200	400	7.6	1/2" NPT	530	390	390	28	78HAHP58-CR
AHP107-CR	62	373	738	4.0	1/2" NPT	530	390	390	28	78HAHP107-CR
AHP187-CR	97	638	1293	2.2	9/16" 18UNF	530	390	390	28	78HAHP187-CR
AHP275-CR	155	931	1897	1.6	9/16" 18UNF	530	390	390	28	78HAHP275-CR
AHP425-CR	345	1448	2931	1.0	9/16" 18UNF	530	390	390	28	78HAHP425-CR

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)							
PSI	Bar	AHP10-CR	AHP26-CR	AHP36-CR	AHP58-CR	AHP107-CR	AHP187-CR	AHP275-CR	AHP425-CR
0	0	23.10	8.80	6.00	3.56	1.97	1.15	0.72	0.43
500	35	12.00	5.85	4.39	3.05	1.50	1.05	0.68	0.40
1000	69	*	4.72	3.80	2.51	1.28	1.00	0.65	0.38
1500	104	*	3.90	3.34	2.38	1.25	0.90	0.60	0.36
2000	138	*	3.00	3.00	2.25	1.21	0.78	0.55	0.34
2500	173	*	1.21	2.56	2.05	1.18	0.75	0.50	0.33
3000	207	*	*	1.95	1.85	1.16	0.73	0.48	0.31
4000	276	*	*	*	1.56	1.02	0.70	0.45	0.29
5000	345	*	*	*	1.02	0.95	0.67	0.42	0.26
7500	517	*	*	*	*	0.76	0.60	0.40	0.25
10000	690	*	*	*	*	0.44	0.52	0.37	0.24
15000	1034	*	*	*	*	*	0.39	0.33	0.21
20000	1379	*	*	*	*	*	*	0.30	0.20
25000	1724	*	*	*	*	*	*	0.21	0.16
30000	2069	*	*	*	*	*	*	*	0.13
40000	2760								0.05

* Pressure exceeds pump capacity.

AHP2 - AIR DRIVEN HYDROTEST PUMPS - MEDIUM FLOW

- Output pressures up to 1634 Bar
- Suitable for use with various fluids.
- 150 mm dual scale vibra pressure gauge

The Hi-Force AHP2 series of air driven hydrostatic pressure testing pumps offer a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve.

- Air consumption 56 scfm (1.59m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity



AHP2-036

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm ³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	10 PSI	50 PSI	100 PSI			Length	Width	Height		
	0.69 Bar	3.45 Bar	6.9 Bar							
AHP2-036	17.2	124.1	248.2	40.8	1/2" NPT	450	390	465	24	78HAHP2-036
AHP2-060	31.0	199.9	413.7	24.6	1/2" NPT	450	390	465	24	78HAHP2-060
AHP2-097	51.7	327.5	668.8	15.2	1/2" NPT	450	390	465	24	78HAHP2-097
AHP2-144	75.8	489.5	992.8	10.2	1/2" NPT	450	390	465	24	78HAHP2-144
AHP2-237	131.0	799.8	1634.1	6.1	9/16" 18UNF	450	390	465	24	78HAHP2-237

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)				
PSI	Bar	AHP2-036	AHP2-060	AHP2-097	AHP2-144	AHP2-237
0	0	10.20	6.20	3.90	2.70	1.57
500	35	8.60	5.50	3.55	2.50	1.52
1000	69	7.25	4.80	3.19	2.35	1.47
1500	104	6.15	4.50	3.00	2.16	1.42
2000	138	5.40	4.20	2.87	2.15	1.38
3000	207	3.05	3.50	2.55	1.88	1.29
4000	276	*	2.75	2.28	1.75	1.22
5000	345	*	2.16	2.10	1.64	1.20
7500	517	*	*	1.45	1.35	1.10
10000	690	*	*	*	1.15	0.98
15000	1034	*	*	*	*	0.78
20000	1379	*	*	*	*	0.51
23700	1634	*	*	*	*	0.34

* Pressure exceeds pump capacity.

Air Driven Hydrotest Pumps

AHP2-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER

- Output pressures up to 1634 Bar
- Suitable for use with various fluids
- 150mm dual scale vibra pressure gauge

The Hi-Force AHP2-CR series of air driven hydrostatic pressure testing pumps offer a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds.



AHP2-237CR

- Air consumption 56 scfm (1.59m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity
- Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 115

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	10 PSI	50 PSI	100 PSI			Length	Width	Height		
	0.69 Bar	3.45 Bar	6.9 Bar							
AHP2-036CR	17.2	124.1	248.2	40.8	1/2" NPT	555	390	465	32	78HAHP2-036CR
AHP2-060CR	31.0	199.9	413.7	24.6	1/2" NPT	555	390	465	32	78HAHP2-060CR
AHP2-097CR	51.7	327.5	668.8	15.2	1/2" NPT	555	390	465	32	78HAHP2-097CR
AHP2-144CR	75.8	489.5	992.8	10.2	1/2" NPT	555	390	465	32	78HAHP2-144CR
AHP2-237CR	131.0	799.8	1634.1	6.1	9/16" 18UNF	555	390	465	32	78HAHP2-237CR

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)				
PSI	Bar	AHP2-036CR	AHP2-060CR	AHP2-097CR	AHP2-144CR	AHP2-237CR
0	0	10.20	6.20	3.90	2.70	1.57
500	35	8.60	5.50	3.55	2.50	1.52
1000	69	7.25	4.80	3.19	2.35	1.47
1500	104	6.15	4.50	3.00	2.16	1.42
2000	138	5.40	4.20	2.87	2.15	1.38
3000	207	3.05	3.50	2.55	1.88	1.29
4000	276	*	2.75	2.28	1.75	1.22
5000	345	*	2.16	2.10	1.64	1.20
7500	517	*	*	1.45	1.35	1.10
10000	690	*	*	*	1.15	0.98
15000	1034	*	*	*	*	0.78
20000	1379	*	*	*	*	0.51
23700	1634	*	*	*	*	0.34

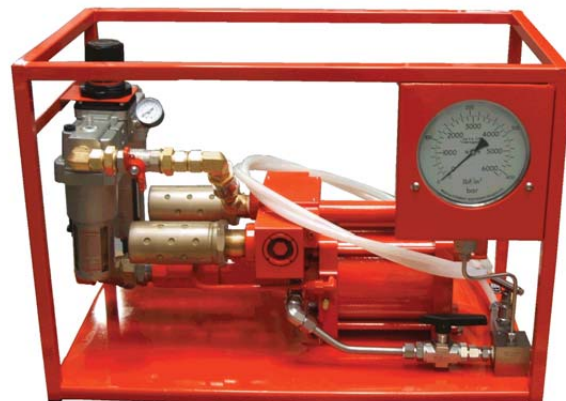
* Pressure exceeds pump capacity.

AHP3 - AIR DRIVEN HYDROTEST PUMPS - HIGH FLOW

- Output pressures up to 700 Bar
- Suitable for use with various fluids
- 150 mm dual scale vibra pressure gauge

The Hi-Force AHP3 series of air driven hydrostatic pressure testing pumps offer a choice of 3 models with output pressure capacities ranging from 42 Bar (609 PSI) to 700 Bar (10000 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, pressure isolation valve, pressure release valve, fluid inlet via Y-type fluid strainer, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system, distance piece for chemical duty and chart recorder.

- Air consumption 175 scfm (4.96 m³/minute)
- Infinitely variable output pressure and flow
- Fluid inlet 1.1/4" BSPF



AHP3-040

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm ³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	15 PSI 1.04 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar			Length	Width	Height		
AHP3-040	41.4	137.9	275.8	98.3	1/2" NPTF	715	390	490	40	78HAHP3-040
AHP3-060	62.1	206.9	413.7	57.4	1/2" NPTF	715	390	490	40	78HAHP3-060
AHP3-100	103.4	344.8	689.5	34.4	1/2" NPTF	715	390	490	40	78HAHP3-100

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)			
PSI	Bar	AHP3-040	AHP3-060	AHP3-100	
0	0	18.35	15.63	11.96	
500	34.5	14.42	12.85	10.49	
1000	68.9	10.81	10.51	8.69	
1500	103.4	7.21	8.57	7.05	
2000	137.9	5.90	6.97	5.65	
2500	172.4	4.26	5.66	4.83	
3000	206.8	2.62	4.60	4.18	
3500	241.3	1.31	3.74	3.85	
4000	275.8	0	3.02	3.52	
4500	310.3	*	2.40	3.03	
5000	344.8	*	1.84	2.79	
5500	379.2	*	1.27	2.62	
6000	413.7	*	0.65	2.46	
6500	448.2	*	*	1.88	
7000	482.6	*	*	1.39	
7500	517.1	*	*	1.15	
8000	551.6	*	*	0.90	
8500	586.1	*	*	0.66	
9000	620.5	*	*	0.49	
9500	655.0	*	*	0.33	
10000	689.5	*	*	0.16	

* Pressure exceeds pump capacity.

HYDROTEST PUMPS

Air Driven Hydrotest Pumps

ATDP - AIR DRIVEN TWIN DOUBLE ACTING HYDROTEST PUMPS

- Output pressures up to 1489 Bar
- Suitable for use with various fluids
- Twin double acting design offering high volume flow

The Hi-Force ATDP series of twin double acting air driven hydrostatic pressure testing pumps offer a choice of 3 models with output pressure capacities ranging from 87 Bar (1260 PSI) to 1489 Bar (21600 PSI). The twin double acting design offers a much higher displacement volume per stroke than the smaller AHP & AHP2 series, making it ideal for prefill as well as pressure testing. All models are supplied with a 150mm diameter glycerine filled vibra-gauge (calibrated on request), inlet airline filter, lubricator and regulator unit, pump start/stop valve and fluid strainer. Viton and ethylene propylene seals for handling special fluids or chemicals can be factory fitted prior to delivery if required. Other seal materials are available on request.



- Air consumption 212 scfm (6m³ /minute)
- Suitable for use with various fluids including water
- 150mm dual scale glycerine filled gauge
- Infinitely variable output pressure and flow
- Fitted with inlet air filter, regulator & lubricator
- Optional extras include stainless steel frame work, pneumatic or LCD stroke counter system, onboard chart recorder, pressure isolation valve and wheel mounting

Type	Max. output pressure (Bar) at airline input pressure			Fluid volume displacement per stroke (cm ³)	Outlet port thread	Dimensions in mm			Weight kg	Item no.
	20 PSI 1.38 Bar	60 PSI 4.14 Bar	100 PSI 6.9 Bar			Length	Width	Height		
ATDP63	87	260	434	275	1/2" NPT	765	570	700	96	78HATDP63
ATDP125	172	517	862	140	1/2" NPT	765	570	700	96	78HATDP125
ATDP216	298	894	1489	79	1 1/8 -12UNF	765	570	700	96	78HATDP216

Hydraulic pressure		Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar)			
PSI	Bar	ATDP63	ATDP125	ATDP216	
0	0	32.2	16.9	9.5	
1000	69	25.7	14.0	8.8	
2000	138	20.5	12.3	8.0	
3000	207	16.2	10.6	7.4	
4000	276	12.5	9.4	6.9	
5000	345	8.0	8.3	6.4	
6000	414	2.8	7.3	6.1	
8000	552	*	4.8	5.5	
10000	690	*	3.0	4.9	
12000	828	*	0.4	4.3	
16000	1103	*	*	3.2	
20000	1379	*	*	1.6	

* Pressure exceeds pump capacity.

Pack of 100 spare charts, diameter 163mm, 4 hour time scale

Type	Chart Reading PSI	Suitable for Hydrotest Pump unit	Weight kg	Item no.
AHP-C01	0 - 1.500	AHP10-CR	0.3	78HAHP-C01
AHP-C03	0 - 3.000	AHP26-CR	0.3	78HAHP-C03
AHP-C05	0 - 5.000	AHP36-CR - AHP2-036CR	0.3	78HAHP-C05
AHP-C10	0 - 10.000	AHP58-CR - AHP2-060CR	0.3	78HAHP-C10
AHP-C15	0 - 15.000	AHP107-CR - AHP2-097CR	0.3	78HAHP-C15
AHP-C20	0 - 20.000	AHP187-CR - AHP2-144CR	0.3	78HAHP-C20
AHP-C30	0 - 30.000	AHP275-CR - AHP2-237CR	0.3	78HAHP-C30
AHP-C45	0 - 45.000	AHP425-CR	0.3	78HAHP-C45

Replacement pen for chart recorder

Type	Colour	Description	Weight kg	Item no.
AHP-PB	Black	Suitable for pressure reading on all Hi-Force AHP pumps with chart recorder	0.1	78HAHP-PB



Did you know

Hi-Force can also supply chart recorders with multiple reading functions



PULLER KITS

Hydraulic Puller Kits

SCP - SELF-CONTAINED HYDRAULIC PULLERS

- Capacities from 10 to 30 tonnes
- Sealed hydraulic system
- Operates in any position

The SCP range of self-contained hydraulic pullers offers a choice of 3 models, each with integral manually operated hydraulic pump and multi-position operating handle. The completely sealed hydraulic system of the SCP pullers enables use of the tool in any position and all models are easy to operate and provide an efficient solution for many pulling applications.

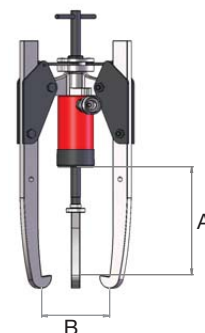


Type	Capacity tonnes	Type of puller	Hydraulic stroke mm	Piston Ext. mm	Reach	Dimensions in mm				Weight kg	Item no.
						Dia min.	Dia max.	Tip depth	Tip height		
SCP103	10	3-way jaw	82	50	195	30	310	22	22	11.6	78HSCP103
SCP203	20	3-way jaw	82	100	275	50	430	29	29	23.7	78HSCP203
SCP303	30	3-way jaw	110	150	405	100	610	38	38	50.0	78HSCP303

ACP - AUTO-CENTRE HYDRAULIC PULLER KITS

- Capacities from 10 to 50 tonnes
- Quick set-up time, easy to use
- High quality, drop forged steel components

The ACP heavy duty, auto-centering hydraulic puller kit range offers a choice of 4 models, with capacities from 10 to 50 tonnes. All models are supplied complete with a detachable hollow ram cylinder, manually operated pump, hydraulic hose and a 100mm diameter pressure gauge. All models are easy to set up and are the ideal tool for all pulling, pushing, installing and removing applications required for press fitted or heat fitted parts, including wheels, sprockets, flywheels, gears and bearings.



Type	Capacity tonnes	Type of puller	Cylinder model no.	Pump model no.	Dimensions in mm			Weight kg	Item no.
					A	B (Min)	B (Max)		
ACP10	10	2 & 3 jaw	HHS102	HP110	296	50	350	24.5	78HACP10
ACP20	20	3 jaw	HHS202	HP110	320	70	480	44.0	78HACP20
ACP30	30	3 jaw	HHS302	HP110	407	90	580	76.5	78HACP30
ACP50	50	3 jaw	HHS603	HP227	727	120	920	181.0	78HACP50

PULLER KITS

Hydraulic Puller Kits

Hi-Force®
HYDRAULIC TOOLS

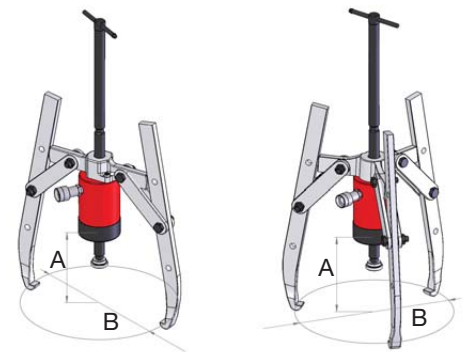
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PKS - HYDRAULIC 2 & 3 WAY PULLER KITS

- Capacities from 4.5 to 50 tonnes
- Quick set-up time, easy to use
- High quality, drop forged steel components

The PKS heavy duty hydraulic puller range is designed for removing stubborn parts such as wheels, gears, sprockets, sleeves, pulleys and other similar items. The range offers a selection of 8 models with pulling capacities up to 50 tonnes. All models are supplied complete with a full set of versatile detachable hydraulic components. All models are safe and easy to operate and avoid the need for heating and hammering.

- Working pressure 700 Bar
- Multi-purpose hollow piston cylinder (excl. PKS5-2-3)
- Complete with all hydraulic components (pump, cylinder, hose, gauge, etc.)
- Supplied complete with storage and transport box



Type	Capacity tonnes	Type of puller	Cylinder model no.	Pump model no.	Dimensions in mm		Weight kg	Item no.
					A	B (Min)		
PKS5-2-3	4.5	2 & 3 jaw	HSS53	HP110	225	240	24	78HPKS5-2-3
PKS10-2-3	10	2 & 3 jaw	HHS102	HP110	296	350	34	78HPKS10-2-3
PKS20-2	20	2 jaw	HHS202	HP110	320	480	29	78HPKS20-2
PKS20-3	20	3 jaw	HHS202	HP110	320	480	37	78HPKS20-3
PKS30-2	30	2 jaw	HHS302	HP110	407	580	49	78HPKS30-2
PKS30-3	30	3 jaw	HHS302	HP110	407	580	58	78HPKS30-3
PKS50-2	50	2 jaw	HHS603	HP227	727	920	105	78HPKS50-2
PKS50-3	50	3 jaw	HHS603	HP227	727	920	130	78HPKS50-3
PK202	20	2 jaw beam	*	*	*	*	3	78HPK202
PK302	30	2 jaw beam	*	*	*	*	4	78HPK302
PK502	50	2 jaw beam	*	*	*	*	7	78HPK502



Note:
PK202, PK302 & PK502 are 2-jaw beam only (not complete kit). Dimensions calculated with 15° outward angled puller legs.

PULLER KITS

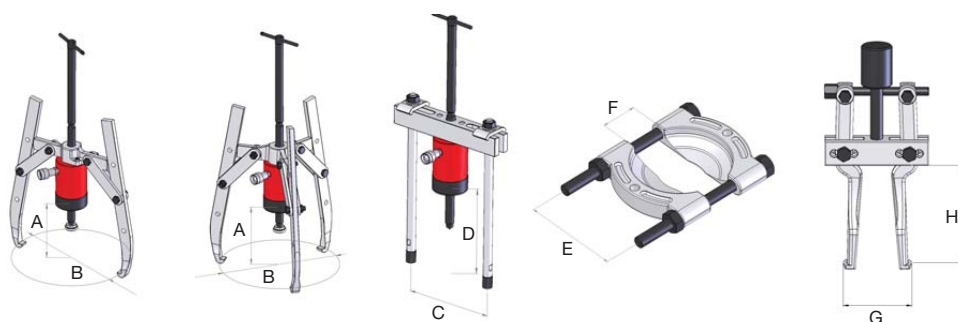
Hydraulic Puller Kits

PKC - COMPREHENSIVE HYDRAULIC PULLER KITS

- Capacities from 10 to 50 tonnes
- Combination of 4 different pullers in one set
- Quick set-up time, easy to use

The PKC heavy duty, multi-purpose hydraulic puller kit range is extremely versatile and includes 2-way and 3-way grip pullers (as detailed on page 117), bearing pullers, bearing cup pullers and cross head pullers. All models are designed for pulling, pushing, installing and removing all press fitted or heat fitted parts such as gears, bearings, sleeves, cogs, internal bearings, wheels, sprockets, flywheels, etc. The range offers a selection of 4 models with pulling capacities up to 50 tonnes, all supplied complete with a full set of versatile, detachable hydraulic components.

- Working pressure 700 Bar
- Complete hydraulic system supplied, including gauge
- High quality, drop-forged steel components
- Supplied complete with storage and transport box



Type	Capacity tonnes	Cylinder model no.	Pump model no.	Dimensions in mm												Weight kg	Item no.
				A	B	C min	C max	D	E	F min	F max	G min	G max	H			
PKC10	10	HHS102	HP110	296	350	115	260	300	110	10	110	40	145	115	25	78HPKC10	
PKC20	20	HHS202	HP110	320	480	135	345	265	152	11	134	40	145	115	60	78HPKC20	
PKC30	30	HHS302	HP110	407	580	180	440	284	260	15	250	60	240	150	116	78HPKC30	
PKC50	50	HHS603	HP227	727	920	230	580	447	260	15	250	60	240	150	268	78HPKC50	

! Dimensions A & B calculated with 15° outward angled puller legs

PULLER KITS

Hydraulic Pullers

Hi-Force
HYDRAULIC TOOLS

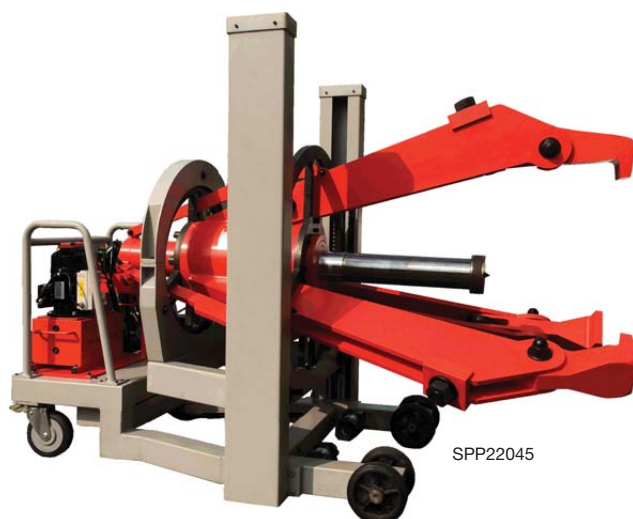
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SPP - HEAVY DUTY HYDRAULIC PULLERS

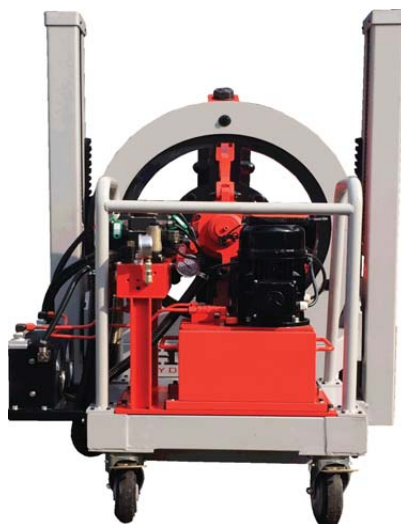
- Capacities from 75 to 220 tonnes
- Wireless remote controlled operation
- Powered driven trolley for easy positioning

The SPP range of heavy duty pullers offers a choice of 18 models with capacities ranging from 75 to 220 tonnes. The functional and ergonomic design of the heavy duty hydraulic pullers features a movable trolley and the two vertical supports provide stability and safety as well as allow the user to adjust the height to the desired position.

All models include self-centering pulling jaws that can rotate 180° and a wireless remote control that allows for an easier and safer operation. Ideal for use in steel plants, mines, shipyards, petrochemical industries for repair and maintenance applications.



Self-centering puller jaws with anti-slip mechanism



Hydraulic system powered by HEP2 series pump

SPP - HEAVY DUTY HYDRAULIC PULLERS

- Self-centering jaw design
- Spread up to 1220 mm
- Adjustable height
- Hydraulically actuated jaws with adjustable jaw tip angle
- Anti-slip mechanism in puller jaws
- Easy to manoeuvre with wheel locking feature



Did you know

The SPP pullers incorporate the HEP2 series electric driven pump. For more information on HEP2 series pumps, see page 36.



SPP22045

Puller with 50Hz motor

Type	Capacity tonnes	Type of puller	Motor Voltage	Stroke mm	Dimensions in mm		Weight kg	Item no.
					A	A		
SPP7515	75	2 & 3 jaw	110/115V	165	490 - 700	110 - 1220	660	78HSPP7515
SPP7525	75	2 & 3 jaw	220/240V	165	490 - 700	110 - 1220	660	78HSPP7525
SPP7545	75	2 & 3 jaw	380/440V	165	490 - 700	110 - 1220	660	78HSPP7545
SPP12015	120	2 & 3 jaw	110/115V	170	900 - 1100	150 - 1220	888	78HSPP12015
SPP12025	120	2 & 3 jaw	220/240V	170	900 - 1100	150 - 1220	888	78HSPP12025
SPP12045	120	2 & 3 jaw	380/440V	170	900 - 1100	150 - 1220	888	78HSPP12045
SPP22015	220	2 & 3 jaw	110/115V	170	900 - 1100	150 - 1220	1300	78HSPP22015
SPP22025	220	2 & 3 jaw	220/240V	170	900 - 1100	150 - 1220	1300	78HSPP22025
SPP22045	220	2 & 3 jaw	380/440V	170	900 - 1100	150 - 1220	1300	78HSPP22045

Puller with 60Hz motor

Type	Capacity tonnes	Type of puller	Motor Voltage	Stroke mm	Dimensions in mm		Weight kg	Item no.
					A	A		
SPP7516	75	2 & 3 jaw	110/115V	165	490 - 700	110 - 1220	660	78HSPP7516
SPP7526	75	2 & 3 jaw	220/240V	165	490 - 700	110 - 1220	660	78HSPP7526
SPP7546	75	2 & 3 jaw	380/440V	165	490 - 700	110 - 1220	660	78HSPP7546
SPP12016	120	2 & 3 jaw	110/115V	170	900 - 1100	150 - 1220	888	78HSPP12016
SPP12026	120	2 & 3 jaw	220/240V	170	900 - 1100	150 - 1220	888	78HSPP12026
SPP12046	120	2 & 3 jaw	380/440V	170	900 - 1100	150 - 1220	888	78HSPP12046
SPP22016	220	2 & 3 jaw	110/115V	170	900 - 1100	150 - 1220	1300	78HSPP22016
SPP22026	220	2 & 3 jaw	220/240V	170	900 - 1100	150 - 1220	1300	78HSPP22026
SPP22046	220	2 & 3 jaw	380/440V	170	900 - 1100	150 - 1220	1300	78HSPP22046

PULLER KITS

Bush Replacement Kits

Hi-Force
HYDRAULIC TOOLS

Carl Stahl

HBR-1 - SPRING EYE BUSH REPLACEMENT KIT

- Bushes replaced directly on the vehicle
- Safe, simple and easy to operate
- Portable and powerful hydraulic operation

The Hi-Force HBR-1 spring eye bush replacement kit is offered with a choice of manual or air powered hydraulic pump unit, or it can be supplied without a pump, should the user already have a suitable 700 Bar pump within his tool store. All models offer a superb 18 tonnes of hydraulic power, when operated at the maximum working pressure of 700 Bar. This innovative product from Hi-Force is primarily targeted at commercial vehicle manufacturers and service centres, as well as heavy plant vehicle workshops, where traditional hammer and heat methods of bush replacement activities have proved unsafe, time consuming and costly. All kits incorporate a standard Hi-Force HHA182 lightweight, aluminium hydraulic cylinder making the kit portable and easy to fit to a wide variety of bush replacement applications. Supplied in a smart metal storage case for easy transportation and storage, all kits include a range of standard tooling with non standard and special tooling available on request.

- Offers time & labour savings of up to 60%
- Lightweight & compact design for easy transportation
- Minimal manual effort during operation
- Improved safety over traditional methods



Pump options

The HBR-1 hydraulic spring eye bush replacement tool kit can be operated by either the AHP1120 air driven foot pump or the HP212 lightweight aluminium hand pump.



Type	Capacity tonnes	Stroke mm	Cylinder	Pump	Hose	Base plate	Threaded rods	Dolleys	Pull sleeves	Weight kg	Item no.
HBR-1	18	51	HHA182	n/a	n/a	1	3	5	2	15.2	78HBR-1
HBR-1H	18	51	HHA182	HP212	HC2	1	3	5	2	20.2	78HBR-1H
HBR-1A	18	51	HHA182	AHP1120	HC2	1	3	5	2	22.8	78HBR-1A

PULLER KITS

Bush Replacement Kits

HPR - PIN & BUSH REPLACEMENT TOOL KITS

- Safe, simple, hands free operation
- Offers time & labour savings of up to 60%
- Flexible and adaptable system

The Hi-Force HPR range, of pin and bush replacement kits, is offered with a choice of 37 or 50 tonnes capacity, both available with either a manual or air driven hydraulic pump unit. Both the HPR-1 & the HPR-2 can also be supplied without a hydraulic pump for those users that already have a suitable 700 Bar pump available within their tool store. All models operate at 700 Bar maximum working pressure and incorporate either a standard HHA372 37 tonne capacity or a HHA504 50 tonne capacity, lightweight, aluminium hydraulic cylinder. This innovative product from Hi-Force is targeted at manufacturers, service centres and users of heavy plant vehicles, used in the construction and mining industries. Supplied in a smart metal storage case for easy transportation and storage, all kits include a range of standard tooling with non-standard and special tooling available on request.

- Ideal for use on-site and in the workshop
- Improved safety over traditional methods
- Suitable for a wide range of pin & bush applications
- Multi-purpose aluminium hollow piston cylinder



Type	Capacity tonnes	Stroke mm	Cylinder	Pump	Hose	Base plate	Threaded rods	Pull sleeves	Adaptors	Reducer sleeves	Weight kg	Item no.
HPR-1	37	51	HHA372	n/a	n/a	1	1	2	2	1	21.5	78HPR-1
HPR-1H	37	51	HHA372	HP212	HC2	1	1	2	2	1	24.0	78HPR-1H
HPR-1A	37	51	HHA372	AHP1120	HC2	1	1	2	2	1	27.3	78HPR-1A
HPR-2	50	104	HHA504	n/a	n/a	2	1	4	1	1	50.0	78HPR-2
HPR-2H	50	104	HHA504	HP212	HC2	2	1	4	1	1	55.5	78HPR-2H
HPR-2A	50	104	HHA504	AHP1120	HC2	2	1	4	1	1	58.5	78HPR-2A

CRIMPERS & CUTTERS

Crimping Tools - General Information

Hi-Force hydraulic cable crimping tools are designed and manufactured for crimping un-insulated compression and mechanical connectors, in copper and aluminium, to a wide range of electrical power cables including distribution and transmission lines. Offering a choice of self-contained operation with inbuilt manually operated hydraulic pump mechanism, separate remote operation crimping head for use with a separate hydraulic pump and hose assembly, or battery operated which offers all the versatility of our self-contained and manually operated tools but, with the added speed and ease of use associated with a battery powered tool.

The Hi-Force hydraulic crimping tools range offers the most optimum choice to suit the widest range of electrical cable crimping applications. All models are designed and manufactured for use at 700 Bar maximum working pressure, supplied complete with all applicable die sets, compatible for use with the selected tool and include a convenient carrying and storage case. Self contained manually operated and battery powered crimper tools are fitted with an automatic pump pressure relief valve, which activates and releases the hydraulic pressure immediately once the compression (crimping) process has been successfully achieved. All remote operation crimper heads must be operated with a compatible Hi-Force 700 Bar hydraulic pump unit, fitted with an inbuilt pump safety overload, pressure relief valve, 700 Bar pressure gauge and 700 Bar rated hydraulic hose assembly.



CRIMPERS & CUTTERS

Cable Crimping Heads

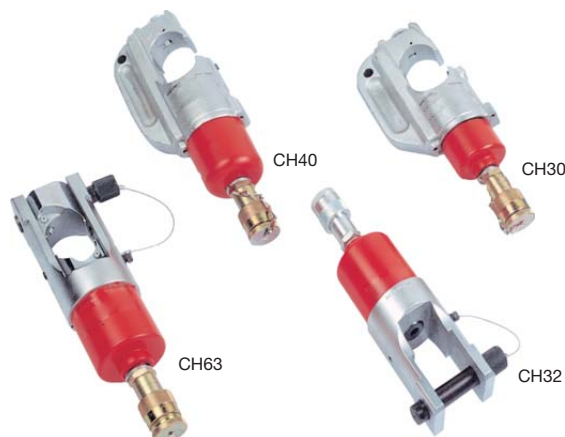
Hi-Force®
HYDRAULIC TOOLS

CH - CABLE CRIMPING HEADS

- Choice of 7 models available
- Supplied complete with die sets
- Working pressure 700 Bar

The CH hydraulic cable crimping tool range offers 7 models with a choice of open "C" jaw or parallel guide design. All models are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces. Suitable pump units include HP227FPC foot operated pump set which includes elbow fitting, gauge, gauge block, 3 metre hose and male coupler, as shown below. Standard hand operated pumps suitable for use with CH crimper heads can be found on pages 27-29. All models, excluding CH1000, are available as a complete kit, comprising of HP227FPC, CSB1 metal storage case and selected crimping tool with die sets.

- Model CH21 is suitable for crimping non-insulated terminals up to 240mm²
- Models CH30, CH32 & CH40 are suitable for crimping connectors up to 400mm²
- Models CH63 & CH80 are suitable for crimping connectors up to 630mm²
- Model CH1000 is suitable for crimping distribution and transmission lines up to 1000mm²



HP227FPC manually operated foot pump unit complete with accessories, see page 31

Crimping tools complete with die set

Type	Output tonnes	C-Jaw opening	Applicable range DIN mm ²	Standard dies mm ²	Length mm	Weight kg	Item no.
CH21	10	not applicable	16-240	With die (4pcs) 16-25, 35-70, 70-185, 240 Female die (1pc) 25-35, 50-70, 95-120, 150-185, 240	210	3.0	78HCH21
CH30	12	30 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	220	4.0	78HCH30
CH32	18	not applicable	16-400	With die (4pcs) 16, 25-35, 50-120, 150-400 Female die (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400	210	3.6	78HCH32
CH40	12	38 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	245	4.8	78HCH40
CH63	18	not applicable	35-630	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	240	4.8	78HCH63
CH80	15	50 mm	35-630	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	300	7.0	78HCH80
CH1000	55	not applicable	500-1000	With die 500, 630, 800, 1000	450	30.7	78HCH1000

Complete set

Type	Description	Weight kg	Item no.
CHP21	Comprehensive kit, comprising of crimper CH21, manual operated foot pump HP227FPC and steel box CSB1	20.2	78HCHP21
CHP30	Comprehensive kit, comprising of crimper CH30, manual operated foot pump HP227FPC and steel box CSB1	22.4	78HCHP30
CHP32	Comprehensive kit, comprising of crimper CH32, manual operated foot pump HP227FPC and steel box CSB1	23.1	78HCHP32
CHP40	Comprehensive kit, comprising of crimper CH40, manual operated foot pump HP227FPC and steel box CSB1	24.5	78HCHP40
CHP63	Comprehensive kit, comprising of crimper CH63, manual operated foot pump HP227FPC and steel box CSB1	25.7	78HCHP63
CHP80	Comprehensive kit, comprising of crimper CH80, manual operated foot pump HP227FPC and steel box CSB1	26.1	78HCHP80

CRIMPERS & CUTTERS

Cable Crimping Heads

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

CH - CABLE CRIMPING HEADS

- All fitted with standard quick connect coupler
- Choice of 'C' jaw or parallel guide design
- Designed for easy access in confined spaces

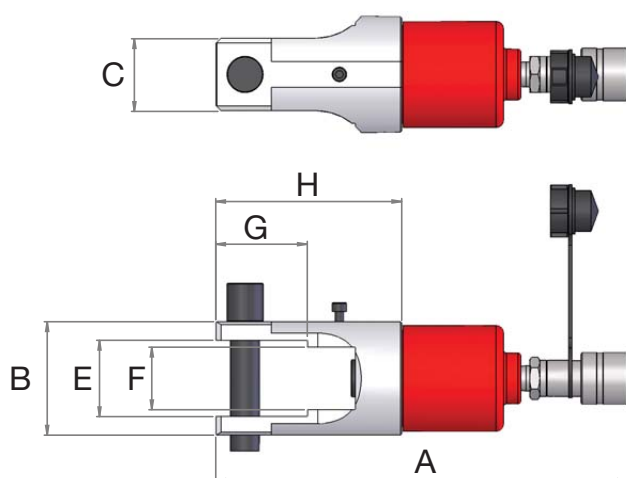


CH21

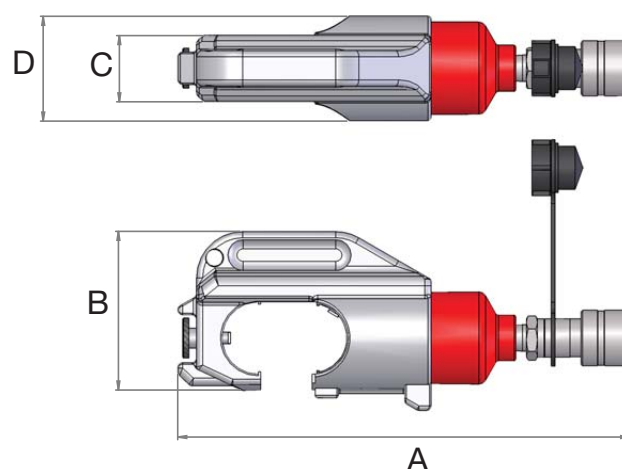


CH80

CH30/CH40/CH80



CH32/CH63



Type	Dimensions in mm							
	A	B	C	D	E	F	G	H
CH21	278	88	28	-	-	-	-	-
CH30	294	105	43	68	-	-	-	-
CH32	284	78	50	-	53	43	63	96
CH40	326	113	43	74	-	-	-	-
CH63	319	78	50	-	49	-	163	-
CH80	370	106	63	-	-	-	-	-
CH1000	455	210	60	-	100	-	285	-



Note:
CH21 and CH1000 dimensional drawings
are not shown.

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

Type	Description	Weight kg	Item no.
CD10	Die set 10mm ² , suitable for crimping tool CH30, CH40 & CH63	0.3	78HCD10
CD16	Die set 16mm ² , suitable for crimping tool CH30, CH40 & CH63	0.3	78HCD16
CD25	Die set 25mm ² , suitable for crimping tool CH30, CH40 & CH63	0.3	78HCD25

CRIMPERS & CUTTERS

Cable Crimping Tools

Hi-Force®
HYDRAULIC TOOLS

SC - SELF-CONTAINED CABLE CRIMPING TOOLS

- Choice of 6 models available
- Supplied complete with die sets
- Automatic pressure release valve

The SC self-contained hydraulic cable crimping tool range offers 6 models with a choice of open "C" jaw or parallel guide design. All models are fitted with an automatic pressure release valve and are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces.

- Model SC21 is suitable for crimping connectors up to 240mm²
- Models SC30, SC32 & SC40 are suitable for crimping connectors up to 400 mm²
- Model SC60 is suitable for crimping non-insulated terminals up to 630 mm²
- Model SC18X is suitable for crimping non-insulated terminals up to 185 mm²



Type	Output tonnes	C-Jaw opening	Applicable range DIN mm ²	Standard dies mm ²	Length mm	Weight kg	Item no.
SC21	10	not applicable	25-240	With die (4pcs) 16-25, 35-70, 70-185, 240 Female die (1pc) 25-35, 50-70, 95-120, 150-185, 240	528	5.2	78HSC21
SC30	12	30 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	610	6.3	78HSC30
SC32	18	not applicable	16-400	With die (4pcs) 16, 25-35, 50-120, 150-400 Female die (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400	650	6.2	78HSC32
SC40	12	38 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	636	7.7	78HSC40
SC60	18	not applicable	35-630	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	650	6.5	78HSC60
SC18X	6	not applicable	10-185	With die 10-16, 25-35, 50-70, 95-120, 150, 185	370	2.0	78HSC18X



Note:

Models SC21 & SC32 are supplied with single indent dies, all other models are supplied with hexagonal dies.

CRIMPERS & CUTTERS

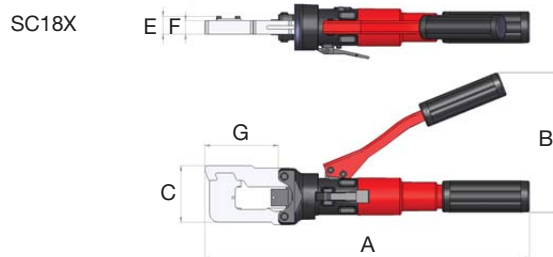
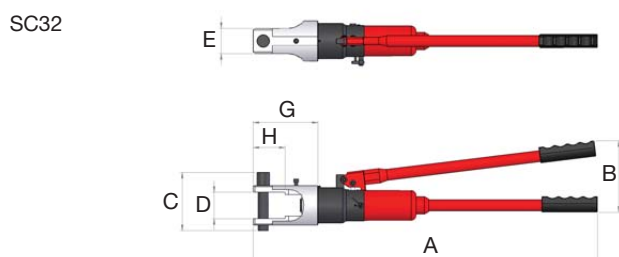
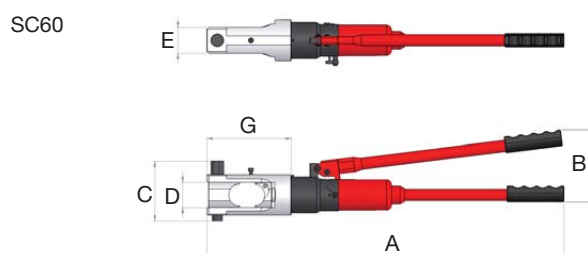
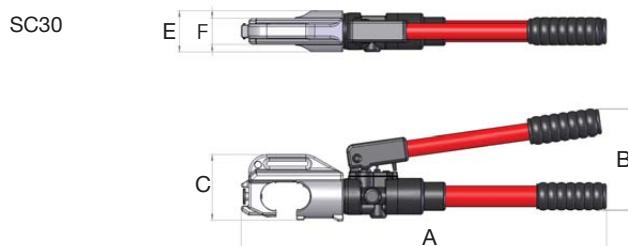
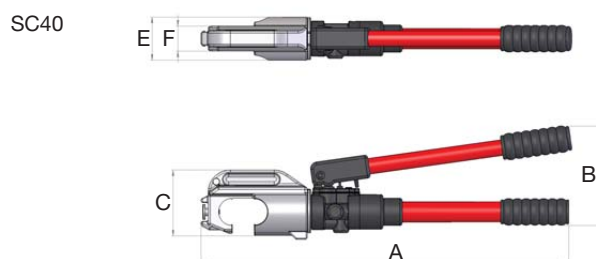
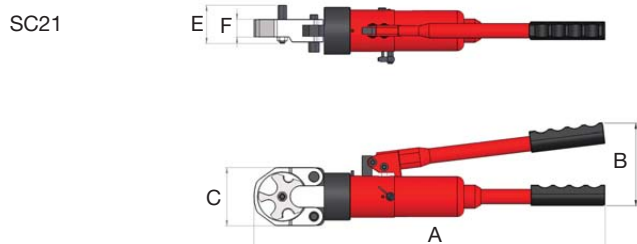
Cable Crimping Tools

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

SC - SELF-CONTAINED CABLE CRIMPING TOOLS

- Supplied in convenient carrying & storage case
- Easy to operate, self-contained design
- Choice of open 'C' jaw or parallel guide design



Type	Dimensions in mm							
	A	B	C	D	E	F	G	H
SC21	520	122	86	-	57	27	-	-
SC30	602	166	116	-	68	43	-	-
SC32	680	137	116	52	50	-	128	63
SC40	630	166	113	-	74	48	-	-
SC60	690	140	116	52	50	-	163	-
SC18X	380	142	70	-	21	16	86	-

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

Type	Description	Weight kg	Item no.
CD10	Die set 10mm², suitable for crimping tool SC30, SC40 & SC60	0.3	78HCD10
CD16	Die set 16mm², suitable for crimping tool SC30, SC40 & SC60	0.3	78HCD16
CD25	Die set 25mm², suitable for crimping tool SC30, SC40 & SC60	0.3	78HCD25

CRIMPERS & CUTTERS

Cable Crimping Tools

Hi-Force®
HYDRAULIC TOOLS

BC - BATTERY OPERATED CABLE CRIMPING TOOLS

- Supplied complete with standard set of dies
- Battery power warning light
- Efficient and quick battery recharger

The BC range of battery powered crimping tools consists of 4 models with a choice of 'C' jaw or parallel guide design that incorporates a 360° swivel head.

The range offers all the versatility of the manually operated CH and SC range but with the added speed and ease of use associated with a battery powered tool. All models are supplied with battery, battery charger, shoulder strap and tool box storage case.



BC30

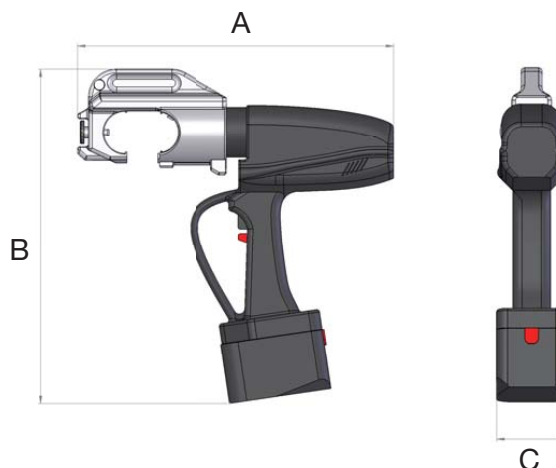
Type	Output tonnes	C - Jaw opening	Applicable range DIN mm²	Standard dies mm²	Dimensions in mm			Weight kg	Item no.
					A	B	C		
BC18X	7	not applicable	10-185	With die 10-16, 25-35, 50-70, 95-120, 150, 185	370	280	70	3.8	78HBC18X
BC30	12	30 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	400	280	70	5.9	78HBC30
BC40	12	38 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	430	270	70	7.2	78HBC40
BC63	18	not applicable	35-630	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	420	320	75	6.9	78HBC63



Note: CU220 is supplied with the tool as standard. If you require CU110 charger, this needs to be ordered separately. Tools CANNOT be supplied without the standard CU220 charger.

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.



Type	Description	Weight kg	Item no.
CD10	Die set 10mm², suitable for crimping tool BC30, BC40 & BC63	0.3	78HCD10
CD16	Die set 16mm², suitable for crimping tool BC30, BC40 & BC63	0.3	78HCD16
CD25	Die set 25mm², suitable for crimping tool BC30, BC40 & BC63	0.3	78HCD25

CRIMPERS & CUTTERS

Cable Crimping Tools Accessories

Battery Pack 14.4V

Type	Description	Weight kg	Item no.
BP144	Battery Pack 14.4V	0.9	78HBP144



Note: Charger supplied separately



BP144

Car cigarette lighter charger unit

Type	Description	Weight kg	Item no.
CCU144	14.4V Car cigarette lighter charger unit	0.6	78HCCU144



CCU144

Charger

Type	Description	Weight kg	Item no.
CU110	Charger 110V	1.1	78HCU110
CU220	Charger 220/230V	0.8	78HCU220



CU110

Power supply

Type	Description	Weight kg	Item no.
MP110	Power supply to operate unit directly from mains 110V	4.8	78HMP110
MP220	Power supply to operate unit directly from mains 220/230V	4.8	78HMP220



MP220

CRIMPERS & CUTTERS

Hydraulic Cutter Heads

Hi-Force®
HYDRAULIC TOOLS

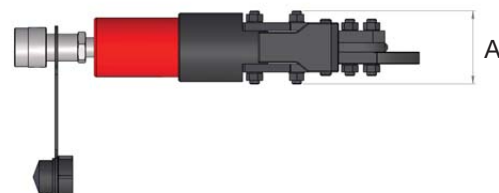
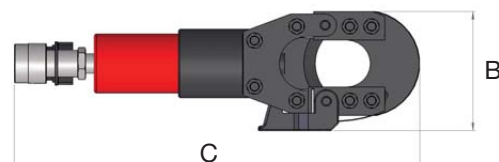
HCH - HYDRAULIC CUTTER HEADS

- Cutting capacity up to 120 mm diameter
- Working pressure 700 Bar
- Compact and lightweight

The HCH cutter head range cuts a wide range of materials and offers 2 models with similar features to the CT range of self-contained cutters. A comprehensive range of suitable manually operated and powered hydraulic pumps suitable for use with Hi-Force HCH cutters is detailed on pages 26 to 45.



HCH40



Type	Cutting force tonnes	Dimensions in mm			Weight kg	Item no.
		A	B	C		
HCH40	7	62	101	247	2.8	78HCH40
HCH120	13	76	250	600	15.0	78HCH120

Material	Description	Maximum diameter cutting capacity in mm	
		HCH40	HCH120
Steel Wire Rope	6x7 Hempcore	20	30
	6x12 Hempcore	25	36
	6x19 Hempcore	25	36
Round Bar	Soft copper bar	25	40
	Soft aluminium bar	22	40
	Soft steel bar	16	-
Wire Strands	Bare copper strands	32	50
	Bare aluminium strands	32	50
Cable	Telephone cable CCP	40	120
	Lead sheathed telephone cable	40	120
	Armoured underground cable	40	120

Replacement blades for HCH hydraulic cutter models

Blade Part number	Blade type	For Cutter	Item no.
CT40-11	Moving	HCH40	78HCT40-11
CT40-05	Static	HCH40	78HCT40-05
HCH120-01	Moving	HCH120	78HCH120-01
HCH120-02	Static	HCH120	78HCH120-02



Did you know
HCH cutters can be operated with battery powered pumps. For more details, see page 32 of this catalogue.

CRIMPERS & CUTTERS

Hydraulic Cutters

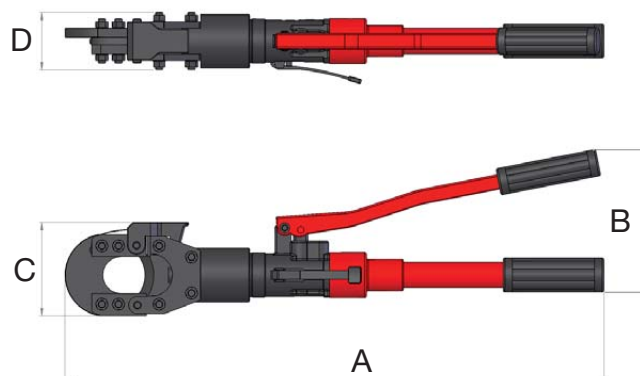
Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

CT - SELF-CONTAINED HYDRAULIC CUTTERS

- Cutting capacity up to 40 mm diameter
- Cuts a wide variety of materials
- Self-contained operation

The CT self-contained hydraulic cutter range offers a choice of 2 models with cutting capacities up to 25 mm steel wire rope and 40 mm cable. These versatile cutters are suitable for cutting wire rope, round bar, wire strands and electrical cable.



Type	Cutting force tonnes	Dimensions in mm				Weight kg	Item no.
		A	B	C	D		
CT20	6	390	145	76	40	2.8	78HCT20
CT40	7	560	155	103	65	6.0	78HCT40

Material	Description	Maximum diameter cutting capacity in mm	
		CT20	CT40
Steel Wire Rope	6x7 Hempcore	16	20
	6x12 Hempcore	20	25
	6x19 Hempcore	20	25
Round Bar	Soft copper bar	20	25
	Soft aluminium bar	20	22
	Soft steel bar	16	16
Wire Strands	Bare copper strands	20	32
	Bare aluminium strands	20	32
Cable	Telephone cable CCP	20	40
	Lead sheathed telephone cable	20	40
	Armoured underground cable	20	40

Replacement blades for CT self-contained cutter models

Blade Part number	Blade type	For Cutter	Item no.
CT20-04	Moving	CT20	78HCT20-04
CT20-05	Static	CT20	78HCT20-05
CT40-11	Moving	CT40	78HCT40-11
CT40-05	Static	CT40	78HCT40-05



Comprehensive service kits are also available for CT self-contained cutters.
For more information, visit our website www.hi-force.com or contact your regional Hi-Force office.

CRIMPERS & CUTTERS

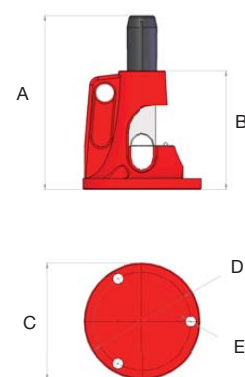
Wire Rope And Cable Cutters

Hi-Force®
HYDRAULIC TOOLS

HWC - HAMMER BLOW WIRE ROPE AND CABLE CUTTERS

- Highly cost efficient impact design
- Cutting capacity up to 38 mm diameter wire rope
- Portable and lightweight

The Hi-Force HWC range of highly cost effective hammer blow cutters is manufactured from high quality, shock resistant, ductile iron and is fitted with replaceable cutting blades made from tool steel. The cutting blades are retained in the housing at the moment of impact, ensuring absolute safety. These cutters offer a considerable time saving over conventional axe, chisel and hacksaw methods.



Type	Cutting capacity			Dimensions in mm					Weight kg	Item no.
	Wire rope Ø mm	Electric cable mcm*	mm²	A	B	C	D	E		
HWC90	19	250	127	225	140	88	N/A	N/A	3.2	78HWC90
HWC91	27	300	152	245	154	160	148	14	7.0	78HWC91
HWC92	38	750	380	285	195	195	164	18	13.0	78HWC92

*mcm = 1,000 circular mils

Replacement blades for HWC hammer blow wire and rope cutters

Blade Part number	For Cutter	Item no.
HWC90-105	HWC90	78HWC90-105
HWC91-125	HWC91	78HWC91-125
HWC92-135	HWC92	78HWC92-135



CRIMPERS & CUTTERS

Wire Rope Cutters

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

HSWC - SELF-CONTAINED HYDRAULIC WIRE ROPE CUTTERS

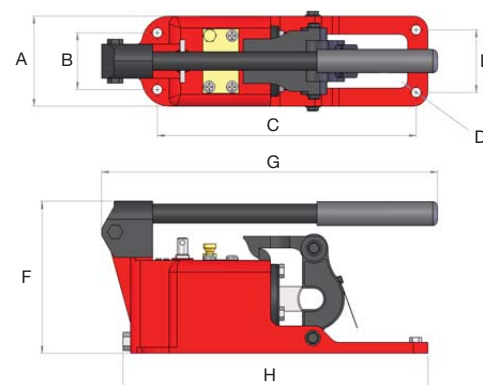
- Cutting capacities up to 44 mm diameter
- Strong rigid steel construction
- Easy to use with minimum operator effort

The Hi-Force range of self-contained portable hydraulic wire rope and cable cutters comprises of 3 models with cutting capacities up to 44 mm diameter. Approved and specified by many major industries throughout the world, these high quality cutters are precision engineered to give a good, clean cut with minimum effort, time after time. The self-contained design of the cutter enables easy transportation to the job site with minimum of fuss.

The shear blades are manufactured using high quality tool steel, which is heat treated and ground to very tight tolerances, ensuring superior performance and long-life. Users include wire rope manufacturers, earthmoving and construction contractors, rigging shops, elevator manufacturers and repairers and many others.



HSWC44



Type	Cutting capacity Wire rope Ø mm	A	B	C	Dimensions in mm		F	G	H	Weight kg	Item no.
HSWC19	19	93	58	265	D	E	154	345	315	9.5	78HSWC19
HSWC28	28	105	64	294	10.2	67	174	374	357	15.5	78HSWC28
HSWC44	44	125	70	393	10.2	84	203	490	460	30.0	78HSWC44

Replacement blades for HSWC self-contained wire cutters

Blade Part number	For Cutter	Item no.
HSWC19-4	HSWC19	78HSWC19-4
HSWC28-4	HSWC28	78HSWC28-4
HSWC44-4	HSWC44	78HSWC44-4



CRIMPERS & CUTTERS

Wire Rope Cutters

Hi-Force®
HYDRAULIC TOOLS

HWRC - DOUBLE ACTING WIRE ROPE CUTTERS

- Working pressure 700 Bar
- Double acting design
- Smooth guillotine cutting action

The HWRC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile locked coil wire rope and solid steel bar. Maximum cutting capacities up to 114mm diameter wire rope and up to 40mm diameter 28 tonnes tensile solid steel bar. All models incorporate a double acting hydraulic cylinder, suitable for working pressures up to 700 Bar and an open jaw design cutting head (see pictures below) for easy access to the material to be cut. Cutting blades and jaws are manufactured from specially toughened high tensile steel and the smooth guillotine action of the cutter greatly reduces the risk of blade jamming.



Step 1:
To open the cutter, swivel cutting head forward.



Step 2:
Position material to be cut in the cutting head slot.



Step 3:
Close the cutting head by swivelling it back to its original position and secure behind the latch.

Type	Output tonnes	Wire rope Ø mm	Cutting capacity in mm		Oil capacity litres	Dimensions in mm			Weight kg	Item no.
			Cable	Reinforcing Bar		Length	Width	Height		
HWRC1115	36	38	38	20	0.35	400	155	270	30	78HWRC1115
HWRC1125	80	63	63	32	0.90	450	200	390	60	78HWRC1125
HWRC1136	80	90	90	32	1.20	515	200	390	70	78HWRC1136
HWRC1145	120	114	114	40	2.40	570	280	445	95	78HWRC1145

Replacement blades for HWRC wire rope cutter models

Blade Part number	For Cutter	Item no.
HWRC1115-B	HWRC1115	78HWRC1115-B
HWRC1125-B	HWRC1125	78HWRC1125-B
HWRC1136-B	HWRC1136	78HWRC1136-B
HWRC1145-B	HWRC1145	78HWRC1145-B



Hand and powered pumps suitable for use with HWRC cutters are detailed on pages 26 to 45.

CRIMPERS & CUTTERS

Chain Cutters

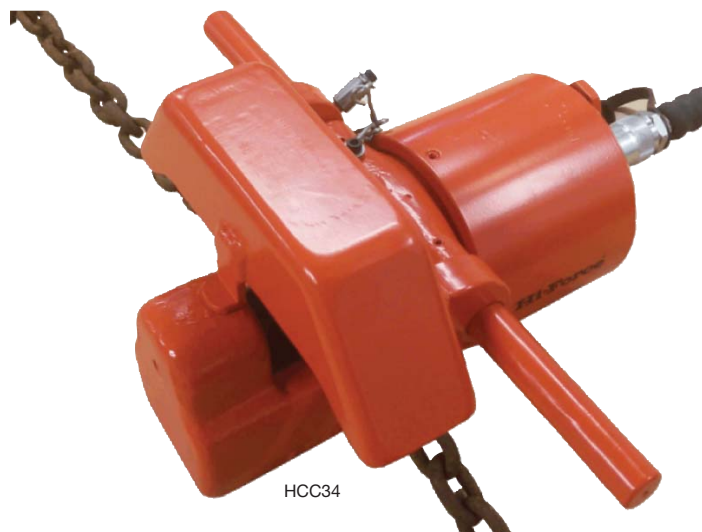
Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

HCC - CHAIN CUTTERS

- Working pressure 700 Bar
- Single acting design
- Fitted with locking guard

The HCC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile chain and reinforcing bar. The easily replaceable cutter blades are manufactured from specially toughened high tensile steel and the choice of models available offer maximum cutting capacities up to 50mm diameter. All models are suitable for working pressures up to 700 Bar and incorporate a single acting cylinder fitted with a powerful piston retraction spring. The swivel action design of the locking safety guard (see pictures below) allows easy access for the material to be cut.



Type	Cutting capacity mm Ø	Cutting force tonnes	Max. allowed		Oil capacity cm³	Dimensions in mm			Weight kg	Item no.
			chain grade	steel hardness		Length	Width	Height		
HCC26	26	70	80	44 HRC	276	440	180	180	23	78HCC26
HCC26-100	26	70	100	47 HRC	276	440	180	180	23	78HCC26-100
HCC34	34	100	80	44 HRC	492	410	460	250	40	78HCC34
HCC34-100	34	100	100	47 HRC	492	410	460	250	40	78HCC34-100
HCC46	46	140	80	44 HRC	980	565	635	345	72	78HCC46
HCC46-100	46	140	100	47 HRC	980	565	635	345	72	78HCC46-100
HCC50	50	145	80	44 HRC	1100	565	635	360	77	78HCC50
HCC50-100	50	145	100	47 HRC	1100	565	635	360	77	78HCC50-100

Replacement blades for HCC chain cutter models

Blade Part number	Blade type	For Cutter	Item no.
HCC26-4M	Moving	HCC26	78HCC26-4M
HCC26-4S	Static	HCC26	78HCC26-4S
HCC26-4M100	Moving	HCC26-100	78HCC26-4M100
HCC26-4S100	Static	HCC26-100	78HCC26-4S100
HCC34-5M	Moving	HCC34	78HCC34-5M
HCC34-5S	Static	HCC34	78HCC34-5S
HCC34-5M100	Moving	HCC34-100	78HCC34-5M100
HCC34-5S100	Static	HCC34-100	78HCC34-5S100
HCC46-11M	Moving	HCC46	78HCC46-11M
HCC46-11S	Static	HCC46	78HCC46-11S
HCC46-11M100	Moving	HCC46-100	78HCC46-11M100
HCC46-11S100	Static	HCC46-100	78HCC46-11S100
HCC50-17M	Moving	HCC50	78HCC50-17M
HCC50-17S	Static	HCC50	78HCC50-17S
HCC50-17M100	Moving	HCC50-100	78HCC50-17M100
HCC50-17S100	Static	HCC50-100	78HCC50-17S100



Picture 1:
Cutter shown with swivel action safety guard opened.



Picture 2:
Cutter shown with swivel action safety guard closed.

TOOLS

Hole Punchers

HHP - HOLE PUNCHERS

- Punching force up to 50 tonnes
- Throat depth 70 mm
- Working pressure 700 Bar

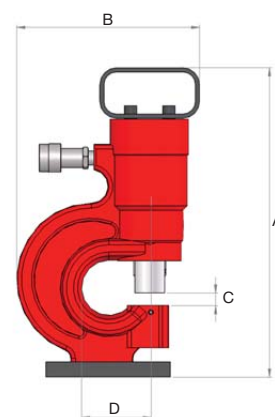
The Hi-Force HHP series hydraulic hole puncher range offers a choice of two models comprising of the HHP30, 30 tonnes capacity single acting version, and the HHP50, 50 tonnes capacity double acting version. Both models are suitable for punching holes in steel plate as per the respective capacity of each model and are supplied complete with standard punch and die sets and an integral positioning and carrying handle. See pages 26-45 for detailed information of suitable pumps for use with HHP series punchers.



HHP50



HHP30



Type	Maximum force tonnes	Throat depth mm	Punch capacity (mm)		Standard punch/die sets included mm	Recommended pump & hose		Dimensions in mm				Weight excl. pump kg	Item no.
			Steel plate	Hole punch diameter		Manually operated	Pneumatically operated	A	B	C	D		
HHP30	30	70	10.0	up to 20.5	10.5, 13.5 17.5, 20.5	HP232 complete with HC3 3m hose	AHP1120 complete with HC3 3m hose	370.0	220	13	78.0	13	78HHP30
HHP50	50	70	15.0	up to 25.5	10.5, 13.5 17.5, 20.5, 25.5	HP232D c/w 2 x HC3	AHP1141 c/w 2 x HC3	413.5	281	15	70.6	42	78HHP50

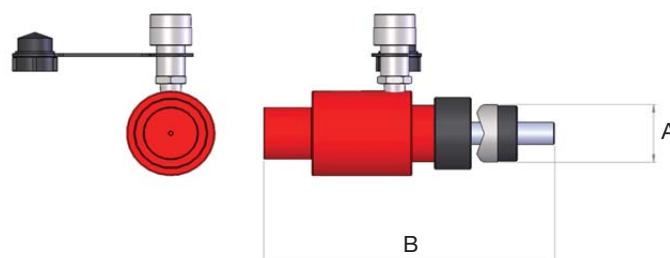


The HHP30 is single acting operation,
the HHP50 is double acting operation

HKP & SKP - KNOCK OUT PUNCHERS

- Capacity up to 10 tonnes
- Spring return hydraulic cylinder
- Working pressure 700 Bar

The Hi-Force HKP and SKP knock out puncher range is supplied as a complete set, including all standard sizes of punches/dies as specified below. Ideal for on-site hole punching in electric control panels and metal plates.



Type	Maximum force tonnes	Plate capacity (mm)		Pump Included	Hose Included	Complete set weight kg	Item no.
		Stainless steel	Mild steel				
HKP10-2	10	1.6	3.2	HP110	HC2	14.6	78HKP10-2
HKP10-4	10	1.6	3.2	HP110	HC2	26.1	78HKP10-4
HKP10-2H	10	1.6	3.2	Not included	Not included	7.0	78HKP10-2H
HKP10-4H	10	1.6	3.2	Not included	Not included	18.5	78HKP10-4H
SKP7	7	1.6	3.2	Self contained unit with integral pump		10.0	78HSPK7

Did you know.....
Hi-Force knock-out punchers are supplied complete with a carrying case

Type	Description	Punches/dies included									
HKP10-2	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5				
	Conduit Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"				
	Length B	306	240	240	240	240	240				
HKP10-4	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5	76.1	88.9	102.8	115.5
	Conduit Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
	Length B	306	240	240	240	240	240	253	253	253	253
SKP7	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5				
	Conduit Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"				
	Length B	306	240	240	240	240	240				

TOOLS

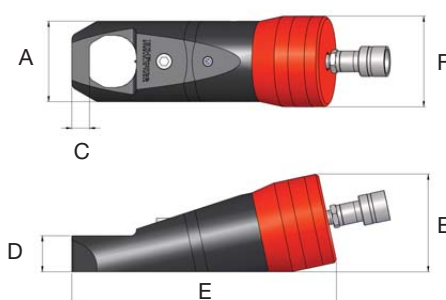
Nut Splitters

NS - NUT SPLITTERS

- Capacities from 17 to 75 mm AF
- Working pressure 700 Bar
- Compact & easy to use

The improved NS range of hydraulic nut splitters offers a choice of 5 models suitable for hexagon nut AF sizes from 17 to 75mm (M10 to M48 bolt sizes). The revolutionary design incorporates a hardened steel linkage that ensures the blade cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. Optional unique 360° positional swivel coupling for easy adjustment and fitment in confined spaces is available for use with models NS104 and NS110. Suitable pumps are detailed on pages 26 to 45.

- Angled body design on all models
- Provides necessary clearance on flanges and flat surfaces
- Manufactured from high quality steel



Type	Hexagon AF sizes		Bolt sizes		Dimensions in mm						Weight kg	Item no.
	mm	inch	metric	imperial	A	B	C min	D	E	F		
NS104	17 - 32	11/16" - 1 1/4"	M10 - M22	1/2" - 3/4"	64	77	12.5	30.0	210	67	4.0	78HNS104
NS110	32 - 41	1 1/4" - 1 5/8"	M22 - M27	3/4" - 1 5/8"	78	96	20.0	37.0	268	88	7.4	78HNS110
NS200	41 - 50	1 5/8" - 2"	M27 - M33	1" - 1 1/4"	96	116	21.0	43.0	315	108	10.6	78HNS200
NS206	50 - 60	2" - 2 3/8"	M33 - M39	1 1/4" - 1 1/2"	115	138	24.0	52.0	336	126	15.8	78HNS206
NS215	60 - 75	2 3/8" - 2 15/16"	M39 - M48	1 1/2" - 1 7/8"	156	175	27.0	75.0	426	162	39.3	78HNS215



Note : The NS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

Replacement blades for NS nut splitters

Blade Part number	For Nut splitter	Item no.
NS104-B	NS104	78HNS104-B
NS110-B	NS110	78HNS110-B
NS200-B	NS200	78HNS200-B
NS206-B	NS206	78HNS206-B
NS215-B	NS215	78HNS215-B



TOOLS

Nut Splitters

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

HMNS - SELF CONTAINED NUT SPLITTERS

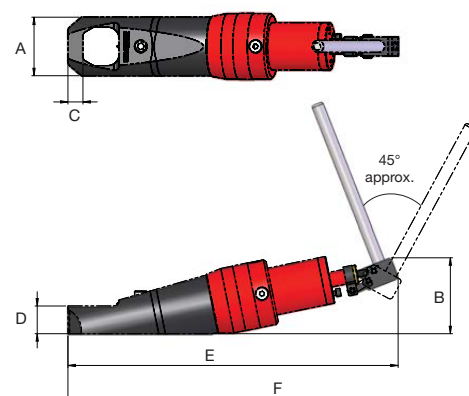
- Capacities from 17 to 50mm AF
- Choice of 3 models
- Compact & easy to use

The HMNS range of hydraulic nut splitters offers a choice of 3 models suitable for hexagon nut AF sizes from 17 to 50mm (M10 to M33 bolt sizes). All models have an angled body design to provide the necessary clearance on flanges and flat surfaces. The revolutionary design incorporates a hardened steel linkage that ensures the blades cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. All models incorporate an integral hydraulic pump with multi-positional lever for even greater versatility.

- Angled body design on all models
- Provides necessary clearance on flanges and flat surfaces
- Manufactured from high quality steel



HMNS110



Type	Hexagon AF sizes		Bolt sizes		Dimensions in mm						Weight kg	Item no.
	mm	inch	metric	imperial	A	B	C	D	E	F		
HMNS104	17 - 32	11/16" - 1 1/4"	M10 - M22	1/2" - 3/4"	64	88	12.5	30.0	380	455	5.8	78HMNS.01.04
HMNS110	32 - 41	1 1/4" - 1 5/8"	M22 - M27	3/4" - 1 5/8"	78	101	20.0	37.0	440	540	7.9	78HMNS.01.10
HMNS200	41 - 50	1 5/8" - 2"	M27 - M33	1" - 1 1/4"	94	112	21.0	43.0	471	566	13.6	78HMNS.02.00



Note : The HMNS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

Replacement blades for HMNS nut splitters

Blade Part number	For Nut splitter	Item no.
NS104-B	HMNS104	78HNS104-B
NS110-B	HMNS110	78HNS110-B
NS200-B	HMNS200	78HNS200-B



TOOLS

Nut Splitters

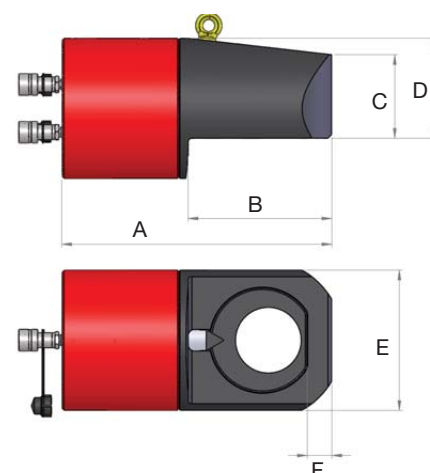
DNS - DOUBLE ACTING NUT SPLITTERS

- Choice of 2 models
- Working pressure 700 Bar
- Double acting design

The Hi-Force DNS range of double acting, hydraulic nut splitters offers a choice of 2 models suitable for splitting nuts of across flats (AF) sizes from 2.15/16" to 5.3/8" (74mm to 136mm). Both models are 700 Bar maximum working pressure and feature a double acting hydraulic piston for easy extension and retraction of the toughened steel splitting blade. Hi-Force DNS range hydraulic nut splitters are easy to set up and capable of safely splitting nuts quickly without any sparks, flames or flying debris usually associated with cutting torches. The DNS range nut splitter heads are designed to fit on all API and ANSI flanges and capable of splitting the hardest nuts with minimal damage to the stud bolt threads. Splitting blades are easy to remove and re-install after re-sharpening or when a replacement blade is required.



DNS506



Type	Hexagon AF sizes		Stud bolt thread sizes		Dimensions in mm						Weight kg	Item no.
	mm	inch	metric	imperial	A	B	C min	D	E	F		
DNS404	75 - 105	2 15/16" - 4 1/4"	M48 - M72	1 7/8" - 2 3/4"	379.5	192	99.5	130.5	183	34	50	78HDNS404
DNS506	105 - 136	4 1/4" - 5 3/8"	M72 - M95	2 3/4" - 3 1/2"	451.0	240	140.0	167.5	235	41	96	78HDNS506



Note : The DNS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

Replacement blades for HMNS nut splitters

Blade Part number	For Nut splitter	Item no.
DNS404-B	DNS404	78HDNS404-B
DNS506-B	DNS506	78HDNS506-B



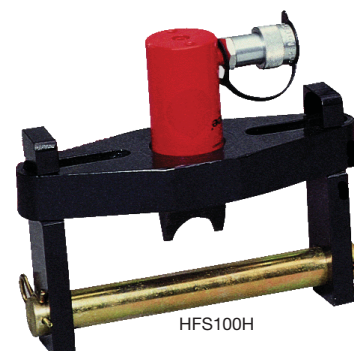
Hand and powered pumps suitable for use with DNS nut splitters are detailed on pages 26 to 45.

HFS-H - HYDRAULIC FLANGE SPREADERS

- Capacities from 4.5 to 10 tonnes
- Working pressure 700 Bar
- Quick and easy to assemble on flange

HFS-H hydraulic flange spreaders provide the ideal solution for safely opening pipe flanges in the marine and oil & gas industry. Available in capacities from 0 - 4.5 tonnes and 0 - 10 tonnes, these models offer the user the capability of opening flanges up to 2 x 57 mm or 2 x 92 mm thick respectively. Hi-Force flange spreaders can be operated individually, or as a pair when opening large flanges using a standard pump (see pages 27 to 29) and connecting hose (see page 46). With Hi-Force flange spreaders you are only minutes away from safely opening the toughest flanges without the risk of sparks caused by hammer blows, chisels and flying wedges.

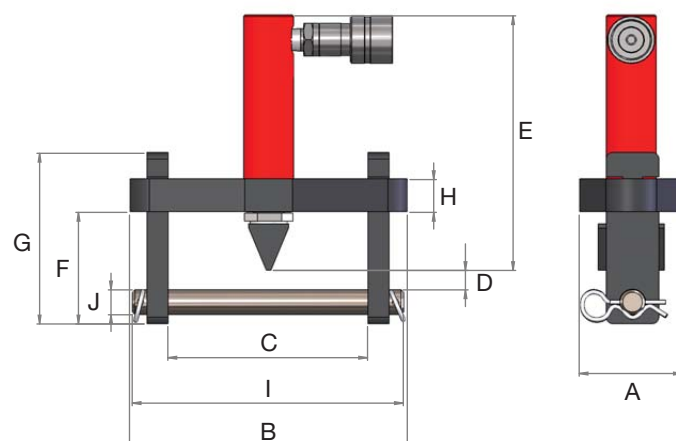
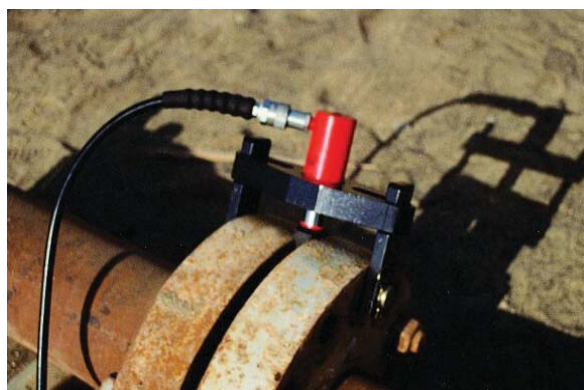
- Suitable for fitment onto flanges with a maximum stud bolt size of 1 5/8" (41 mm)



HFS100H



Pump and hose not included!
See page 142 for complete kits.



Type	Capacity tonnes	Stroke mm	Oil capacity cm ³	Max. flange thickness mm	Stud size mm	Standard wedge mm	Weight kg	Item no.
HFS50H	4.5	75	48	2 x 57	19 - 29	3 - 29	5.0	78HFS50H
HFS100H	10	56	81	2 x 92	32 - 41	3 - 29	11.6	78HFS100H

Type	Dimensions in mm										
	A	B	C min	C max	D	E	F	G	H	I	J
HFS50H	76	210	61	155	10	192	69	129	25	206	18
HFS100H	108	290	61	224	30	165	89	178	38	273	31

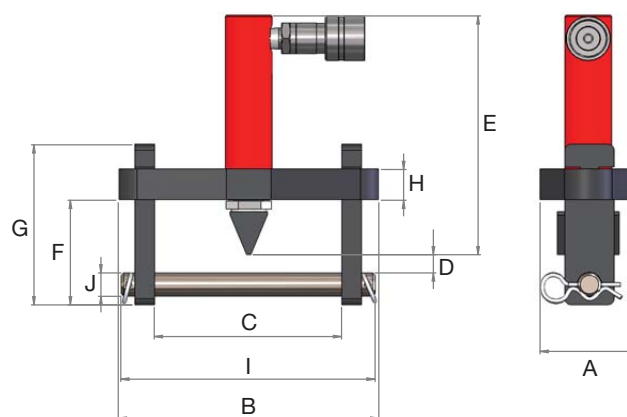
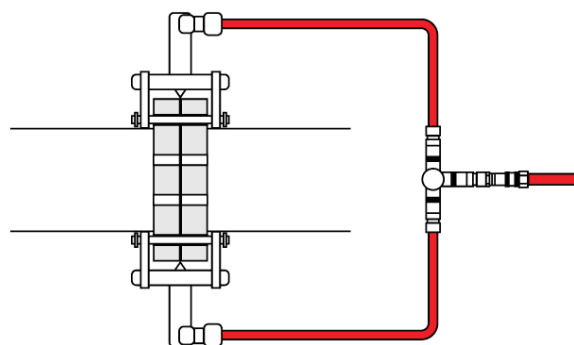
Hydraulic Flange Spreaders

HFS & HFS-TK - HYDRAULIC FLANGE SPREADER KITS

- Capacities from 4.5 to 10 tonnes per spreader
- Working pressure 700 Bar
- Complete with manual pump

HFS and HFS-TK hydraulic flange spreader kits offer a choice of either single spreader complete with pump and accessories (HFS) or a twin spreader arrangement incorporating two flange spreaders operated from a single pump with a T-piece and twin hose connection (HFS-TK). For flange separation in applications where long lengths of heavy pipe work are involved, the HFS-TK twin spreader kit enables the operator to achieve parallel flange separation all around the joint. Hi-Force HP110 hand pump is supplied as standard to HFS & HFS-TK flange spreader kits and details can be found on page 27 of this catalogue.

- Supplied complete with manually operated pump and hose assembly
- Suitable for fitment onto flanges with a maximum stud bolt size of 1 5/8" (41 mm)



Type	Capacity tonnes	Stroke mm	Oil capacity cm ³	Max. flange thickness mm	Stud size mm	Standard wedge mm	Weight kg	Item no.
HFS50	4.5	75	48	2 x 57	19 - 29	3 - 29	22.5	78HFS50
HFS100	10	56	81	2 x 92	32 - 41	3 - 29	29.1	78HFS100
HFS50-TK	2 x 4.5	75	2 x 48	2 x 57	19 - 29	3 - 29	27.5	78HFS50-TK
HFS100-TK	2 x 10	56	2 x 81	2 x 92	32 - 41	3 - 29	35.7	78HFS100-TK

Type	Dimensions in mm										
	A	B	C min	C max	D	E	F	G	H	I	J
HFS-50	76	210	61	155	10	192	69	129	25	206	18
HFS-100	108	290	61	224	30	165	89	178	38	273	31
HFS50-TK	76	210	61	155	10	192	69	129	25	206	18
HFS100-TK	108	290	61	224	30	165	89	178	38	273	31

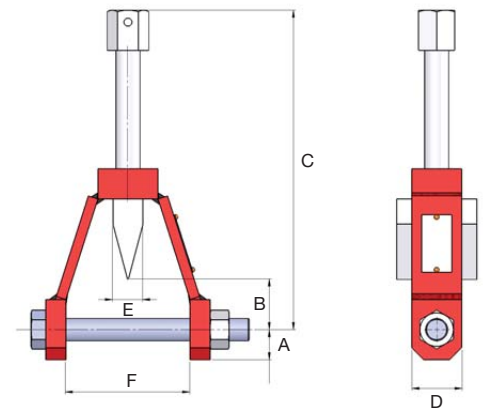
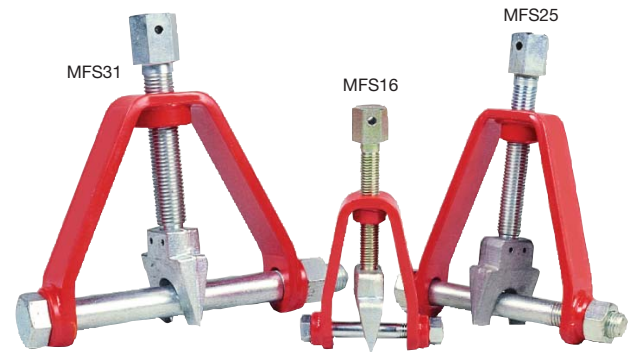
Mechanical Flange Spreaders / Jaw Spreaders

MFS - MECHANICAL FLANGE SPREADERS

- Suitable for bolt diameters up to 31mm
- Maximum spread 231 mm
- No external power source required

The MFS range of mechanical flange spreaders comprises of 6 models, each offering a safe and economical way to open flanges without the risk of sparks. The threaded spindle can be operated using a standard spanner, allowing the user to apply a controlled force without damaging the flange. Due to the mechanical design of these flange spreaders, no external power source is needed and therefore, they can be used anywhere on-site.

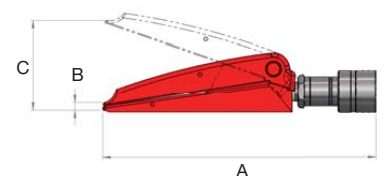
- Choice of six models available
- High grade steel construction with high tensile cross bolt
- Case hardened spreading wedge



Type	Pin diameter		Min flange bolt hole diameter	Maximum flange thickness		Dimensions in mm							Weight kg	Item no.
	mm	inch		mm	inch	A	B max.	C min.	C max.	D	E	F		
MFS16	16	5/8"	17	2 x 22	2 x 7/8"	25	28	185	232	40	25	70	2.2	78HMFS16
MFS19	19	3/4"	20	2 x 35	2 x 1 3/8"	30	50	185	254	50	25	95	2.7	78HMFS19
MFS22	22	7/8"	23	2 x 47	2 x 1 13/16"	30	50	247	318	50	30	124	4.1	78HMFS22
MFS25	25	1"	26	2 x 62	2 x 2 7/16"	30	85	247	353	50	30	155	6.4	78HMFS25
MFS28	28	1 1/8"	29	2 x 70	2 x 2 3/4"	30	80	275	382	60	40	181	8.2	78HMFS28
MFS31	31	1 1/4"	32	2 x 95	2 x 3 3/4"	32	84	275	385	60	40	231	9.6	78HMFS31

JS - JAW SPREADER

The JS4 hydraulic spreader is the ideal solution for K spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted return design enables the tool to fit into a gap of 12 mm and offers a maximum spread of 81 mm. Manufactured from high strength steel, with a maximum pressure of 700 Bar, the JS4 is supplied fitted with a quick connect female half coupler, and can be used with HP110 manual hand pump and HC hose.



Type	Capacity tonnes	Oil capacity cm³	Dimensions in mm			Weight kg	Item no.
			A	B	C		
JS4	0.9	10.0	230	12	81	2.2	78JS.00.04

TOOLS

Jaw Spreaders

SJS - STEPPED JAW SPREADERS

- Capacity 13 tonnes per spreader unit
- Supplied with safety block & stepped blocks
- Maximum spread 60 mm

The Hi-Force SJS10 hydraulic spreader offers the ideal solution for spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted, piston retract design of the SJS10 offers the user a powerful 13 tonnes of spreading capacity. Manufactured from high strength steel, the low height jaw tips can easily fit within an 8mm gap and can provide a total spreading distance of 60mm in 5 operations, using the step blocks provided with the tool. Suitable for operation up to 700 Bar maximum working pressure, and supplied complete with a female half quick connect coupler for easy attachment to a Hi-Force manually operated or powered hydraulic pump. Many applications require two tools, operated simultaneously, to achieve an even spread of a flange joint during gasket replacement. The SJS10-TK comprehensive kit offers the solution for this and comprises of two SJS10 spreaders, manually operated lightweight aluminium pump, controlled manifold, two pressure gauges, gauge blocks and hoses. All connections are fitted with quick release couplers and the set is supplied in a strong metal transport and storage box (pictured above). The SJS10-M has all the features of the SJS10, but with the added benefit of an in built manually operated hand pump.



SJS10-TK

- Single acting, spring assisted return
- Compact & lightweight design



SINGLE SPREADERS

Type	Capacity tonnes	Stroke mm	Min. height mm	Max. spread mm	Oil capacity cm ³	Weight kg	Item no.
SJS10	13	50	8	60	74	5.5	78HSJS10
SJS10-M	13	50	8	60	74	7.5	78HSJS10-M

TWIN KIT

Type	Spreaders 2 x	Pump 1 x	Hoses 2 x	Manifold 1 x	Gauges 2 x	Gauge blocks 2 x	Metal box 1 x	Weight kg	Item no.
SJS10-TK	SJS10	HP212	HC3C	HM2C	HG63G	AGA1-25	MSB1	34.5	78HSJS10-TK

TOOLS

Jaw Spreaders

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

SJS - STEPPED JAW SPREADERS

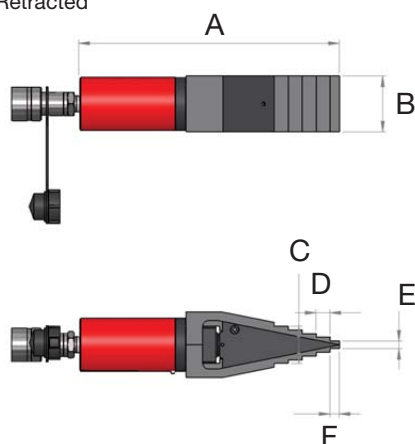
- Capacity 13 tonnes per spreader unit
- Supplied with safety block & stepped blocks
- Maximum spread 60mm

All SJS10 & SJS10-M hydraulic spreaders are supplied complete with two stepped blocks (for increased spreading capacity) and one stepped safety block. The SJS10-TK comes complete with a double set of stepped and safety blocks. Suitable manual pumps and accessories for use with SJS10 can be found on pages 27-28 and 46-47.

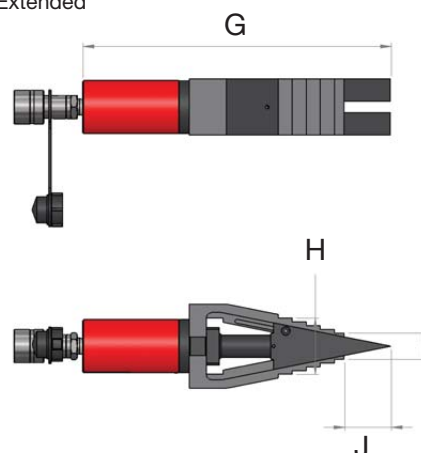
- Single acting, spring assisted return
- Compact & lightweight design



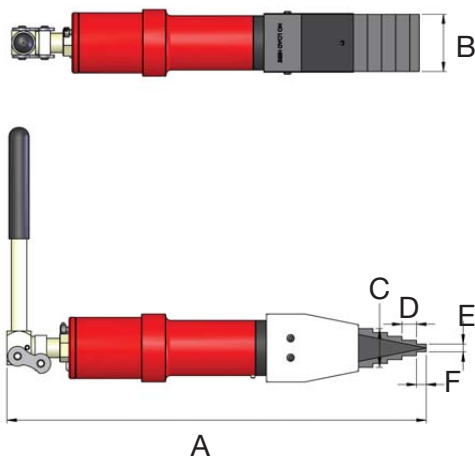
SJS10
Retracted



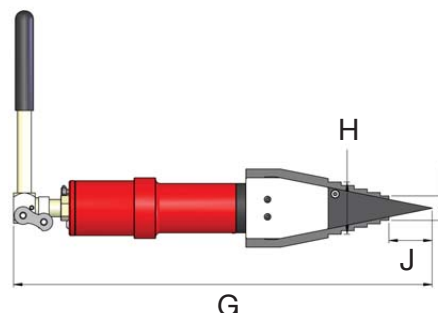
SJS10
Extended



SJS10M
Retracted



SJS10 M
Extended



Type	Capacity tonnes	Dimensions in mm										Weight kg	Item no.
		A	B	C	D	E	F	G	H	I	J		
SJS10	13	279	60	40	15	8	10	328	60	28	49	5.5	78SJ.S0.10
SJS10-M	13	433	60	40	15	8	10	483	60	28	49	7.5	78SJ.S0.10M

PB - HYDRAULIC PIPE BENDER

- Working pressure 700 Bar
- Bends up to 90 degrees
- For use with hydraulic pumps

The Hi-Force PB10 hydraulic pipe bender is designed to bend various sizes and thicknesses of JIS standardised conduit pipe and gas pipe ranging from 15mm-82mm (1/2" to 3"). Made of aluminium, the bending frame and pivot shoes are lightweight so that it can be easily carried on and off site, and can be operated by any manual or powered pump up to 700 Bar. Available as single pipe bender unit (PB10) or as convenient set including all available bending shoes, suitable for either thin steel conduit (PB10A), thick steel conduit (PB10B) or standard gas pipe (PB10C). For a range of suitable Hi-Force pumps see pages 26-45 of this catalogue.



Type	Max capacity tonnes	Stroke mm	Oil capacity litres	Applicable range / included bending shoes	Weight kg	Item no.
PB10	10	250	0.4	PB10 does not include bending shoes	18.6	78HPB10
PB10A	10	250	0.4	Thin steel conduit from 15 mm (5/8") to 75 mm (3")	62.5*	78HPB10A
PB10B	10	250	0.4	Thick steel conduit from 16 mm (1/2") to 82 mm (3")	62.5*	78HPB10B
PB10C	10	250	0.4	Standard gas pipe from 15 mm (1/2") to 65 mm (2 1/2")	60.0*	78HPB10C

*Weight for PB10A, PB10B, & PB10C includes metal storage box

Dimensions in mm							
A	B	C	D	E	F	G	H
720	147	755	695	595	495	395	295

BENDING SHOES

A range of bending shoes, compatible with the pipe bender PB10, are available as an optional extra to ensure a smooth, wrinkle free bend.

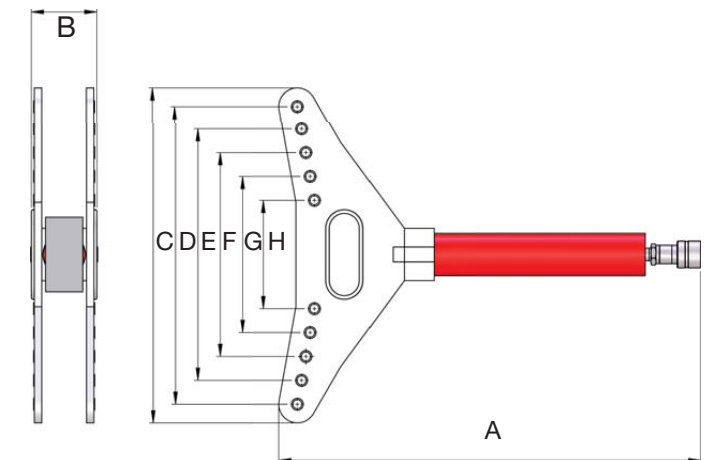
Note:
PB10A includes all BS-A bending shoes (8 pcs)
PB10B includes all BS-B bending shoes (8 pcs)
PB10C includes all BS-SGP bending shoes (7 pcs)

For thin conduit

Type	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)	Weight kg	Item no.
BS-A15	5/8"	15.9	13.5	80	0.6	78HBS-A15
BS-A19	3/4"	19.1	15.9	100	0.7	78HBS-A19
BS-A25	1"	25.4	22.2	137	0.9	78HBS-A25
BS-A31	1 1/4"	31.8	28.6	200	1.7	78HBS-A31
BS-A39	1 1/2"	38.1	34.9	220	2.1	78HBS-A39
BS-A51	2"	50.8	47.6	365	4.4	78HBS-A51
BS-A63	2 1/2"	63.5	59.5	420	2.4	78HBS-A63
BS-A75	3"	76.2	72.2	530	2.7	78HBS-A75

For thick conduit

Type	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)	Weight kg	Item no.
BS-B16	1/2"	21.0	16.4	75	0.5	78HBS-B16
BS-B22	3/4"	26.5	21.9	90	0.7	78HBS-B22
BS-B28	1"	33.3	28.3	130	1.1	78HBS-B28
BS-B36	1 1/4"	41.9	36.9	195	1.9	78HBS-B36
BS-B42	1 1/2"	47.8	42.8	230	2.7	78HBS-B42
BS-B54	2"	59.6	54.0	270	3.7	78HBS-B54
BS-B70	2 1/2"	75.2	69.6	450	3.4	78HBS-B70
BS-B82	3"	87.9	82.3	500	4.9	78HBS-B82



For standard gas pipe

Type	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)	Weight kg	Item no.
BS-SGP15	1/2"	21.7	16.1	60	0.5	78HBS-SGP15
BS-SGP20	3/4"	27.2	21.6	80	0.7	78HBS-SGP20
BS-SGP25	1"	34.0	27.6	100	1.1	78HBS-SGP25
BS-SGP32	1 1/4"	42.7	35.7	130	1.6	78HBS-SGP32
BS-SGP40	1 1/2"	48.6	41.6	160	2.2	78HBS-SGP40
BS-SGP50	2"	60.5	52.9	220	3.7	78HBS-SGP50
BS-SGP65	2 1/2"	76.3	67.9	320	4.3	78HBS-SGP65

HPF - WORKSHOP PRESSES

- Capacities from 10 to 200 tonnes
- Stroke lengths from 250 to 330 mm
- Working pressure 700 Bar

The HPF range of workshop presses offers a choice of 25 models with either single acting or double acting cylinders and manually operated, air powered or electric powered pumps. Floor presses incorporate an adjustable work table and dual scale pressure gauge.

- Choice of manual, air or electric powered pumps
- Supplied complete with pressure gauge
- Other configurations available on request



HPF10042

Type	Capacity tonnes	Stroke mm	Cylinder model no. 1	Cylinder principle	Pump model no. 2	Pump operation	Weight kg	Item no.
HPF1020	10	250	HSS1010	single acting	HP110	hand operated	95	78HPF1020
HPF1030	10	250	HSS1010	single acting	AHP1120	air powered	85	78HPF1030
HPF2520	25	250	HSS2510	single acting	HP227	hand operated	145	78HPF2520
HPF2530	25	250	HSS2510	single acting	AHP1120	air powered	138	78HPF2530
HPF2541	25	250	HSS2510	single acting	HEP103341	electric driven 110 V	160	78HPF2541
HPF2542	25	250	HSS2510	single acting	HEP103342	electric driven 240 V	160	78HPF2542
HPF2544	25	250	HSS2510	single acting	HEP207314	electric driven 415 V	160	78HPF2544
HPF5020S	50	330	HSS5013	single acting	HP257	hand operated	470	78HPF5020S
HPF5020D	50	330	HDA5013	double acting	HP252D	hand operated	500	78HPF5020D
HPF5030S	50	330	HSS5013	single acting	AHP1121	air powered	505	78HPF5030S
HPF5030D	50	330	HDA5013	double acting	AHP1141	air powered	505	78HPF5030D
HPF5041S	50	330	HSS5013	single acting	HEP207311	electric driven 110 V	505	78HPF5041S
HPF5041D	50	330	HDA5013	double acting	HEP207411	electric driven 110 V	481	78HPF5041D
HPF5042S	50	330	HSS5013	single acting	HEP207312	electric driven 240 V	512	78HPF5042S
HPF5042D	50	330	HDA5013	double acting	HEP207412	electric driven 240 V	518	78HPF5042D
HPF5044S	50	330	HSS5013	single acting	HEP207314	electric driven 415 V	518	78HPF5044S
HPF5044D	50	330	HDA5013	double acting	HEP207414	electric driven 415 V	518	78HPF5044D
HPF10020	100	330	HDA10013	double acting	HP245D	hand operated	1011	78HPF10020
HPF10030	100	330	HDA10013	double acting	HAP21042	air powered	1029	78HPF10030
HPF10041	100	330	HDA10013	double acting	HEP207421	electric driven 110 V	1043	78HPF10041
HPF10042	100	330	HDA10013	double acting	HEP207422	electric driven 240 V	1043	78HPF10042
HPF10044	100	330	HDA10013	double acting	HEP207424	electric driven 415 V	1043	78HPF10044
HPF20041	200	305	HDA20012	double acting	HEP310421	electric driven 110 V	3250	78HPF20041
HPF20042	200	305	HDA20012	double acting	HEP310422	electric driven 240 V	3250	78HPF20042
HPF20044	200	305	HDA20012	double acting	HEP310424	electric driven 415 V	3250	78HPF20044



Notes: 1) For detailed specification on applicable cylinders, see pages 12-13 for HSS range and page 18 for HDA range.

2) For detailed specification on applicable pumps, see pages 27-29 for HP range, pages 34-38 for HEP range, pages 41-42 for AHP11 range and page 43 for HAP range.

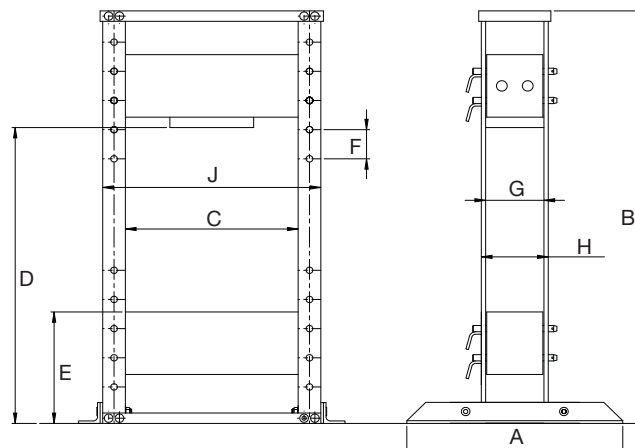
HPF - WORKSHOP PRESSES

Factory mounted optional accessories include a mechanical bed winch for easy adjustment of the work table, rolling head kit and multi-position V-blocks. All presses are supplied completely assembled, ready for use. Hi-Force workshop presses are manufactured to the highest quality standards, and are suitable for the most demanding jobs.



In order to fully comply with CE regulations, some presses must be equipped with specific safety components, such as spring centered valves, two-hand control devices or others.

Note: Press bed and press head are adjustable in steps of 'F', 50 tonne has 4 positions, 100 tonne has 3 positions, 200 tonne has 7 positions. 10 and 25 tonne press frame has fixed press head and adjustable press bed.



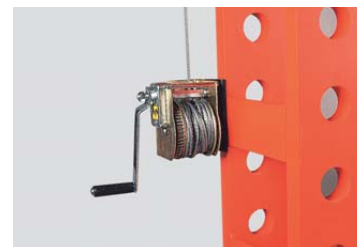
Press Range	Capacity tonnes	Frame dimensions in mm											Item no.
		A	B	C	D min.	D max.	E min.	E max.	F	G	H	J	
HPF1000	10	742	1448	508	1258	1258	260	1010	150	-	152	660	78HPF1000
HPF2500	25	742	1448	508	1258	1258	260	1010	150	-	152	660	78HPF2500
HPF5000	50	1000	2055	800	1140	1560	395	815	140	258	298	1000	78HPF5000
HPF10000	100	1000	1980	1000	1090	1370	550	830	140	338	388	1240	78HPF10000
HPF20000	200	1200	2500	1250	2115	1815	610	1510	150	330	410	1750	78HPF20000

Optional Extras:

BED WINCH

- Only available factory fitted option
- Lifts and lowers work table
- Available for 50 and 100 tonne presses

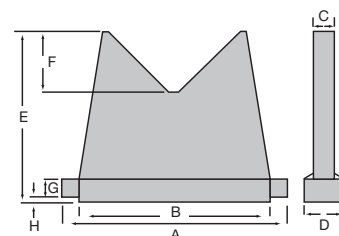
Suffix	Description
BW	Bed winch, suitable for 50 and 100 tonne models



Multi-position V-blocks with flat bed and V-shape press surfaces

- Available for 10, 25, 50 and 100 tonne presses

Type	Cap. per set tonnes	Dimensions in mm								Weight kg	Item no.
		A	B	C	D	E	F	G	H		
HVB2500	10 - 25	204	154	20	45	155	45	20	8	12.0	78HVB2500
HVB5000	50	365	265	25	50	190	60	25	10	16.0	78HVB5000
HVB10000	100	425	325	35	60	265	85	35	10	56.0	78HVB10000



TOOL BOXES

- Metal storage and transport box
- Width up to 500 mm
- Durable steel body

Hi-Force offers users a choice of four tool box models that can be used for storing and transporting Hi-Force products and accessories. These tool boxes are of strong durable steel construction and have an anti-corrosion powder coating making them resistant to rust and abrasion and hence suitable for long term use at on-site locations, workshops and service centres.

Available in lengths of 620 to 1100 mm, these lockable tool boxes help control authorised tool usage, maintain tool integrity and protect them in harsh environments.



MSB6

Type	Length mm	Width mm	Height mm	Weight kg	Item no.
MSB2	620	340	147	9.7	78HMSB2
MSB4	875	280	250	13.8	78HMSB4
MSB6	720	500	250	16.3	78HMSB6
MSB8	1100	500	250	30.5	78HMSB8



Need help deciding which tool box will best suit your requirement?
Contact your local Hi-Force office or authorised Hi-Force Distributor for assistance.



A tool box used for storing and transporting PCS cylinder & pump sets.

TOUGHLIFT

Toughlift Jacking Systems

Hi-Force
HYDRAULIC TOOLS

The Hi-Force ToughLift jacking system offers users the easiest and safest method of lifting material haulers in the mining and construction industry and locomotives in the railway industry, when critical maintenance and breakdown repair work requires completion.

Suitable for lifting even the largest earth haulers in the world, the Hi-Force ToughLift is available in 50, 100, 150 and 200 tonnes lifting capacities. All models are available with either a 110 volt or 240 volt single phase electric driven pump unit or a 6 Bar compressed air driven pump version. All models are operated via a remote, push button hand pendant controller with a 6 metre length control cable to ensure the operator has precise control over the lifting operation from a safe distance away from the load.

Hi-Force ToughLift jacking systems are supplied fitted as standard with a hardened steel lifting saddle, patented “snap latch” handle assembly for easy positioning and transportation and a patented jacking system design for increased safety, enabling them to be easily positioned, in the tightest of spaces, to ensure location into the correct and exact lifting and jacking position.

Fitted with large diameter wheels and heavy duty tyres as standard, all ToughLift models are narrow in width and have the smallest footprint area in the industry.

A wide variety of optional extras are also available which include load holding blocks, swivel load caps, locking, load block extensions, slip lock extensions and accessory tool boxes. Further details can be found on pages 152 to 154.

With the Hi-Force ToughLift, plant operators in mining, construction and railway industries are assured of minimal maintenance and repair downtime, of their capital intensive equipment, from the strongest and most versatile lifting jack in the world!



TOUGHLIFT

Toughlift Jacking Systems

Hi-Force®
HYDRAULIC TOOLS

Carl Stahl®

TL - TOUGHLIFT JACKING SYSTEMS

- Working pressure 700 Bar
- Choice of 12 models with a range of accessories
- Used in mining, construction & railway industries
- Choice of 50, 100, 150 or 200 tonne lifting capacities
- Patented multi-positional lifting handle for easy transportation and positioning
- Available with choice of electric or air driven hydraulic pump unit
- Push button remote hand pendant controller with 6 metre control cable
- Patented jacking system for safe and correct positioning prior to load lift
- Wide range of accessories available for even greater versatility (see pages 152 to 154) Narrow width, with small footprint for easy access into confined spaces
- Integral airline filter, lubricator and pressure regulator unit (air driven models only)
- User friendly design with easily accessible maintenance features
- Large diameter, heavy duty wheels for easy positioning underneath the load



TL150A520

TL200A380

! For more information take a look at the ToughLift website www.toughlift.com

Type	Capacity tonnes	Power Supply	Stroke mm	Max additional stack in mm	Weight kg	Item no.
TL050A255	50	6-Bar air driven	254	680	160	78HTL050A255
TL050E255	50	240V electric	254	680	168	78HTL050E255
TL100A405	100	6-Bar air driven	405	480	288	78HTL100A405
TL100A530	100	6-Bar air driven	530	180	318	78HTL100A530
TL100E405	100	240V electric	405	480	296	78HTL100E405
TL100E530	100	240V electric	530	180	326	78HTL100E530
TL150A390	150	6-Bar air driven	390	485	312	78HTL150A390
TL150A520	150	6-Bar air driven	520	180	348	78HTL150A520
TL150E390	150	240V electric	390	485	320	78HTL150E390
TL150E520	150	240V electric	520	180	356	78HTL150E520
TL200A380	200	6-Bar air driven	381	500	372	78HTL200A380
TL200E380	200	240V electric	381	500	380	78HTL200E380

! Note: All electric driven ToughLift jacking systems are available in 110V and 240V single phase, power supply options. For 110V version, please suffix model number with A, i.e TL050E255-A for 110V version.

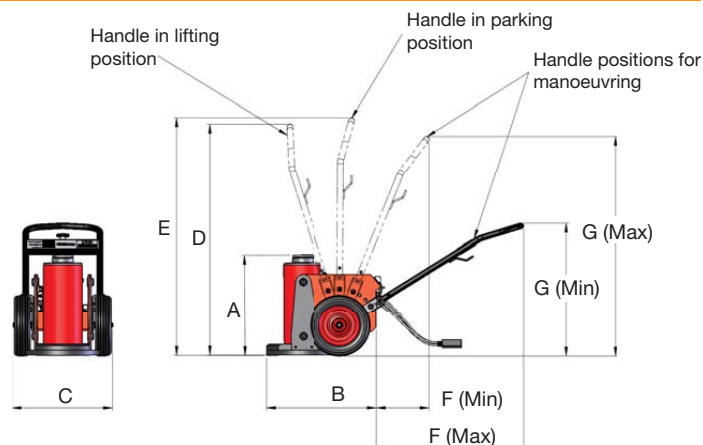
TOUGHLIFT

Toughlift Jacking Systems

TL - TOUGHLIFT JACKING SYSTEMS



Note: The 50 tonne models have a combined lifting and parking position.



Type	Dimensions in mm						
	A	B	C	D	E	F Min - Max	G Min - Max
TL050A255	455	660	560	1440	1440	380-1000	700-1300
TL050E255	455	660	560	1440	1440	380-1000	700-1300
TL100A405	665	730	660	1520	1560	360-960	860-1440
TL100A530	843	730	660	1520	1560	360-960	860-1440
TL100E405	665	730	660	1520	1560	360-960	860-1440
TL100E530	843	730	660	1520	1560	360-960	860-1440
TL150A390	665	730	660	1520	1560	360-960	860-1440
TL150A520	843	730	660	1520	1560	360-960	860-1440
TL150E390	665	730	660	1520	1560	360-960	860-1440
TL150E520	843	730	660	1520	1560	360-960	860-1440
TL200A380	660	730	660	1520	1560	360-960	860-1440
TL200E380	660	730	660	1520	1560	360-960	860-1440

SADDLES

Tilting saddles are fitted as standard to all ToughLift jacks, however flat saddles can also be supplied as an optional extra. Both types of saddle (flat or tilting swivel) can be easily fitted to all slip lock and load lock extensions.

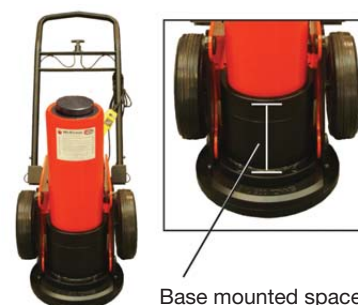
EXTENSIONS

Hi-Force also offers a range of extensions for use with ToughLift jacking systems. Slip lock extensions can be used in multiples up to the maximum height specified on page 153. Load lock extensions can only be used one at a time, however, they can be used in conjunction with slip lock extensions.

Both extension options must terminate with a flat or swivel tilting saddle on the top of the extension stack.

SPACERS

Base mounted spacers increase the closed height by 300 mm. This optional extra is available for 200 tonne models only and weighs 78.5 kg. Please suffix model number with "E" when ordering.



SLIP LOCK EXTENSIONS

Length 180 mm	Length 300 mm	Length 400 mm	Length 485 mm	Length 500 mm	To suit jack model	Recommended max. extension height in mm
SLE180-50	SLE300-50	SLE400-50	*	SLE500-50	TL050A255	680
SLE180-50	SLE300-50	SLE400-50	*	SLE500-50	TL050E255	680
SLE180-100	SLE300-100	*	SLE485-100	*	TL100A405	485
SLE180-100	*	*	*	*	TL100A530	180
SLE180-100	SLE300-100	*	SLE485-100	*	TL100E405	485
SLE180-100	*	*	*	*	TL100E530	180
SLE180-150	SLE300-150	*	SLE485-150	*	TL150A390	485
SLE180-150	*	*	*	*	TL150A520	180
SLE180-150	SLE300-150	*	SLE485-150	*	TL150E390	485
SLE180-150	*	*	*	*	TL150E520	180
SLE180-200	SLE300-200 S	SLE400-200	*	SLE500-200	TL200A380	500
SLE180-200	SLE300-200 S	SLE400-200	*	SLE500-200	TL200E380	500

* = Exceeds recommended maximum extension height



LOAD LOCK EXTENSIONS

Length 180 mm	Length 300 mm	Length 400 mm	Length 485 mm	Length 500 mm	To suit jack model	Recommended max. extension height in mm
LLE180-50	LLE300-50	LLE400-50	*	LLE500-50	TL050A255	680
LLE180-50	LLE300-50	LLE400-50	*	LLE500-50	TL050E255	680
LLE180-100	LLE300-100	*	LLE485-100	*	TL100A405	485
LLE180-100	*	*	*	*	TL100A530	180
LLE180-100	LLE300-100	*	LLE485-100	*	TL100E405	485
LLE180-100	*	*	*	*	TL100E530	180
LLE180-150	LLE300-150	*	LLE485-150	*	TL150A390	485
LLE180-150	*	*	*	*	TL150A520	180
LLE180-150	LLE300-150	*	LLE485-150	*	TL150E390	485
LLE180-150	*	*	*	*	TL150E520	180
LLE180-200	LLE300-200	LLE400-200	*	LLE500-200	TL200A380	500
LLE180-200	LLE300-200	LLE400-200	*	LLE500-200	TL200E380	500

* = Exceeds recommended maximum extension height



LOAD BLOCK SETS

Load block sets Type	Capacity tonnes	Lock out Height (mm)	Load Blocks	Adaptor	To suit jack model	Item no.
TLB50-250	50	250	3	1	TL050A255	78HTLB50-250
TLB50-250	50	250	3	1	TL050E255	78HTLB50-250
TLB100-405	100	400	5	1	TL100A405	78HTLB100-405
TLB100-530	100	525	7	1	TL100A530	78HTLB100-530
TLB100-405	100	400	5	1	TL100E405	78HTLB100-405
TLB100-530	100	525	7	1	TL100E530	78HTLB100-530
TLB150-390	150	385	5	1	TL150A390	78HTLB150-390
TLB150-520	150	515	7	1	TL150A520	78HTLB150-520
TLB150-390	150	385	5	1	TL150E390	78HTLB150-390
TLB150-520	150	515	7	1	TL150E520	78HTLB150-520
TLB200-380	200	375	5	1	TL200A380	78HTLB200-380
TLB200-380	200	375	5	1	TL200E380	78HTLB200-380



TOUGHLIFT

Toughlift Jacking Systems

Hi-Force
HYDRAULIC TOOLS

FLAT SADDLES

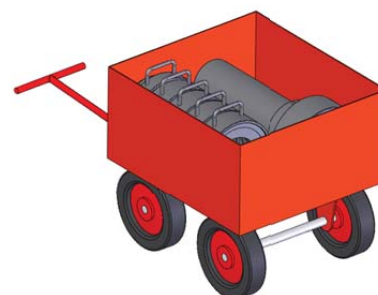
Flat saddle Type	Capacity tonnes	To Suit Jack Model	Item no.
TLF50	50	TL050A255	78HTLF50
TLF50	50	TL050E255	78HTLF50
TLF150	100	TL100A405	78HTLF150
TLF150	100	TL100A530	78HTLF150
TLF150	100	TL100E405	78HTLF150
TLF150	100	TL100E530	78HTLF150
TLF150	150	TL150A390	78HTLF150
TLF150	150	TL150A520	78HTLF150
TLF150	150	TL150E390	78HTLF150
TLF150	150	TL150E520	78HTLF150
TLF200	200	TL200A380	78HTLF200
TLF200	200	TL200E380	78HTLF200



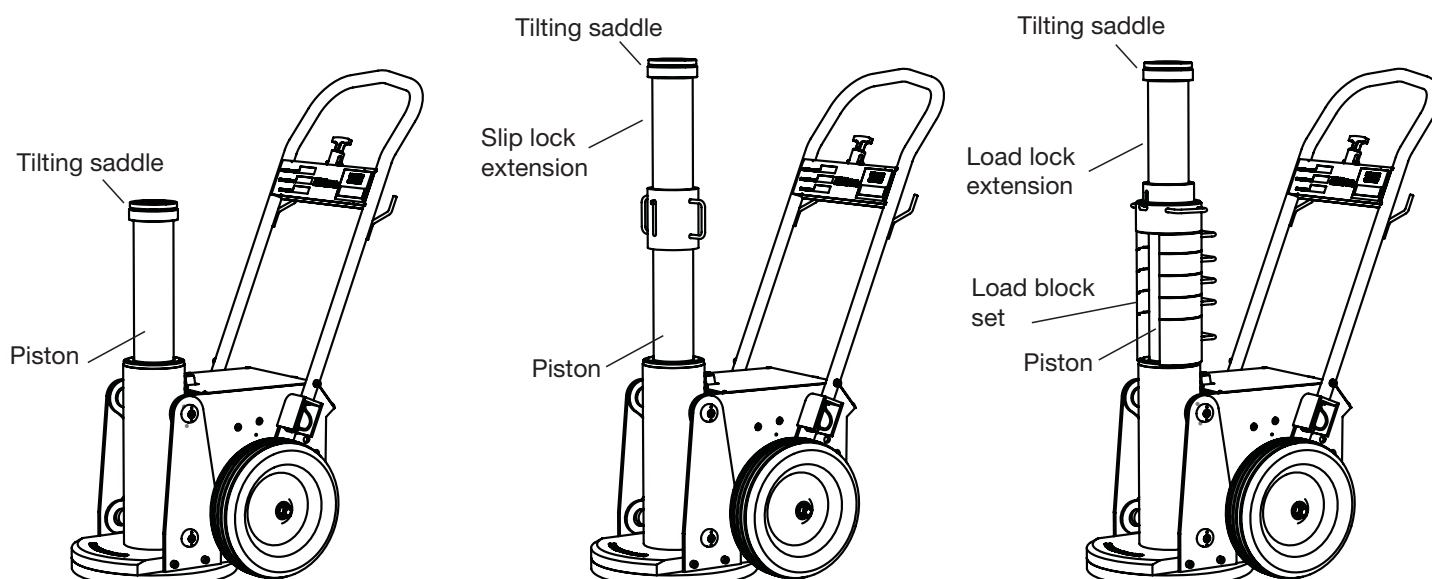
TLF150

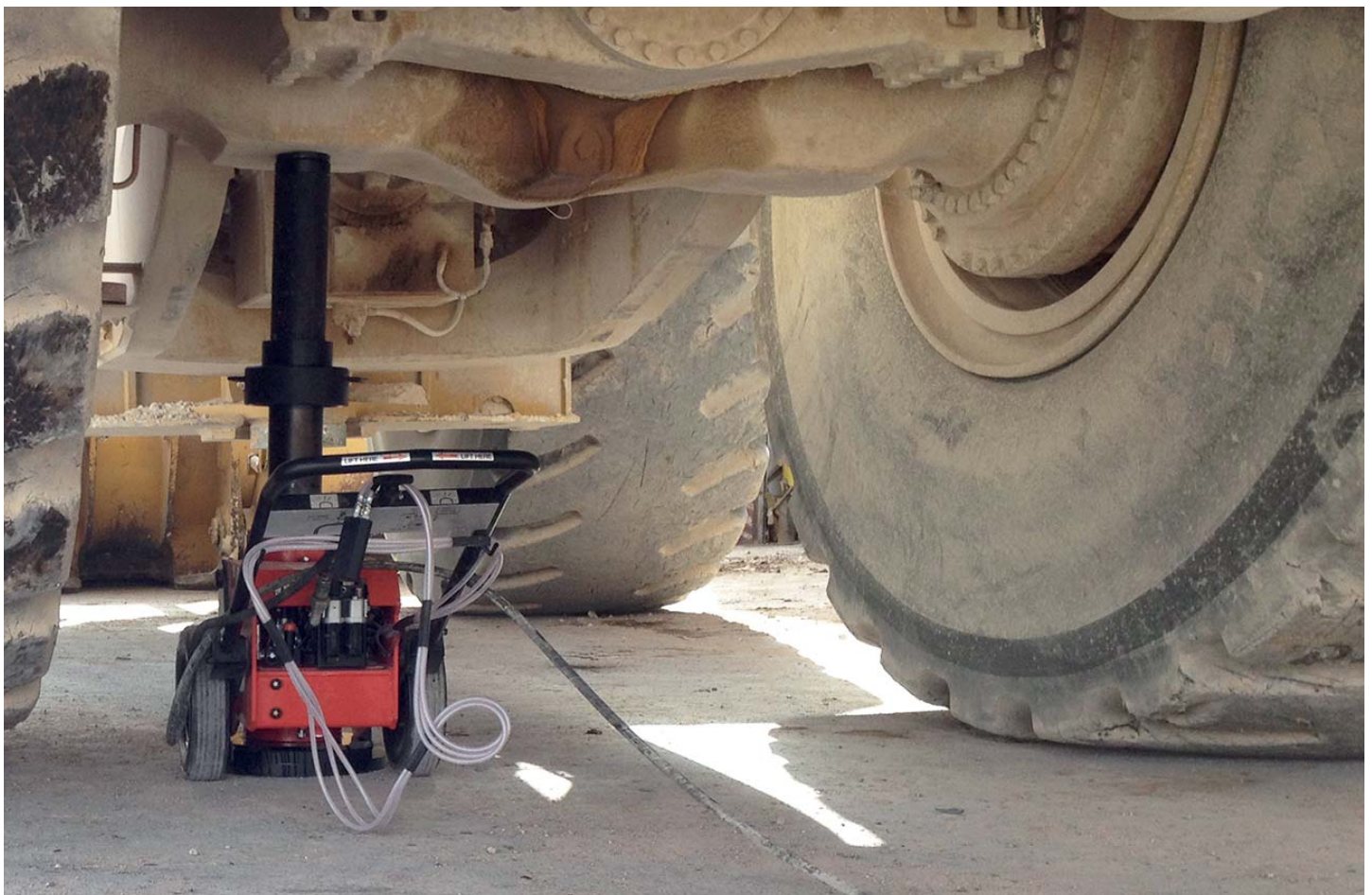
TOOL BOXES

To store your ToughLift accessories safely why not consider ordering a tool box made specifically to suit your accessory set. Hi-Force offers ToughLift accessory tool boxes made to special order with a fast delivery time to help maintain the working condition and integrity of your ToughLift system.



TOUGHLIFT CONFIGURATION EXAMPLES





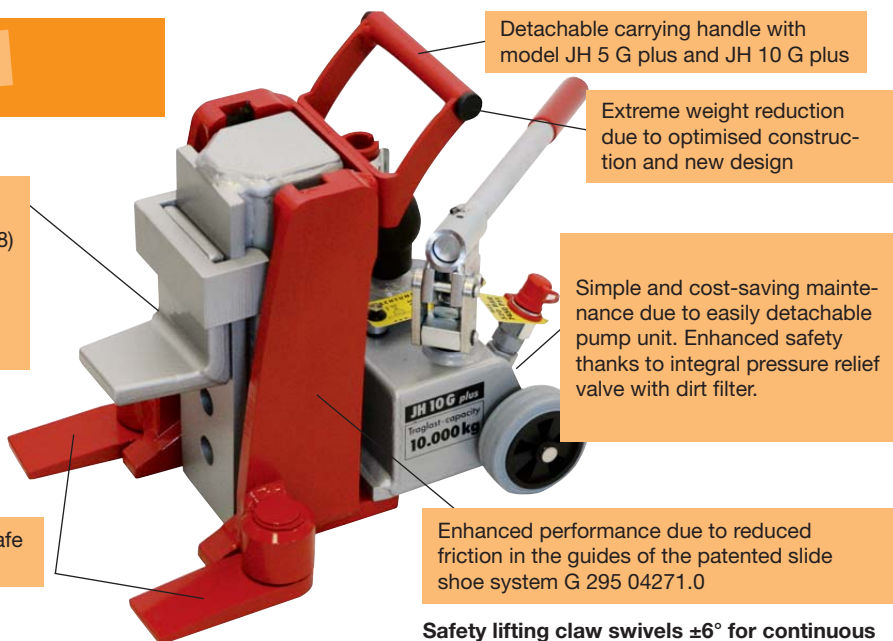
Machine Jacks JH-G plus Series

**New and
lightweight!**

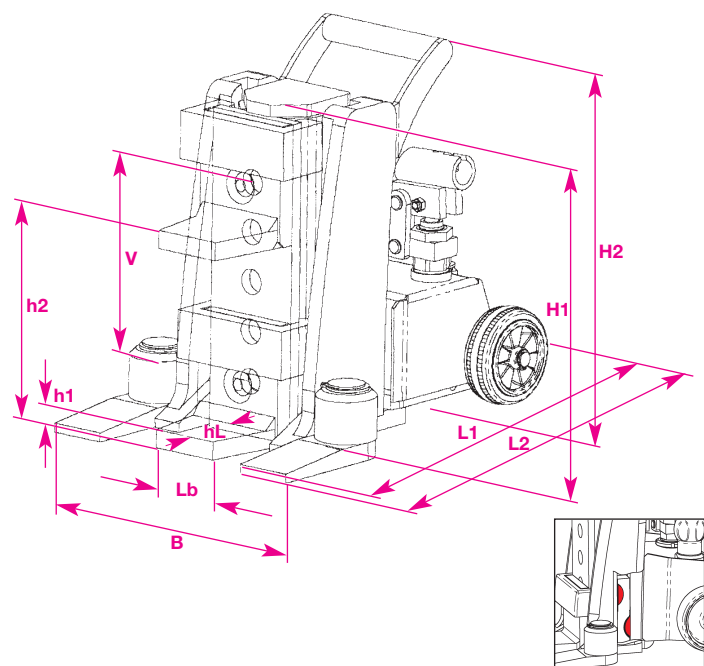
Safe working and moving of the lifting device with the patented safety lifting claw system (Patent no. 4413478)

- Drop forged lifting claw
- Extreme toughness excludes crack formation
- Spring steel grade ensu- res high impact strength

Support feet are slewable through 180° for easy and safe positioning under all space conditions



For suitable accessories
(pumps and hoses)
see page 162



Advantages in detail:

- **Reduced friction** due to slide shoes with movable seat. Compared to conventional jacks the load is distributed over a much bigger surface in all operating conditions (see figure right) which results in less wear on the guides and a higher efficiency.
- **Low maintenance cost** due to detachable pump unit and exchangeable slide shoes.
- **High performance but extremely lightweight** due to high grade materials and innovative construction.
- **Ideal adaption to the load thanks to movable safety lifting claw.** High stability especially in elevated position.
- **Quick lift** with JH 15 / 20 G plus

Item no.		7830.10.55	7830.11.00	7830.21.00	7830.11.50	7830.12.00
Type		JH 6 G plus	JH 10 G plus	JH 10 G plus short	JH 15 G plus	JH 20 G plus
Load capacity on top plate in kg		6000	10000	10000	15000	20000
Stroke in mm		140	150	108	175	190
Minimum lifting claw height	h1 in mm	12	15	15	20	20
Maximum lifting claw height	h2 in mm	157	180	138	205	225
Adjustment range of lifting claw	V in mm	6 x 29	5 x 41	4 x 41	5 x 46	5 x 51
Top plate height	H1 in mm	245	275	235	310	340
Claw width front	Lb in mm	50	60	60	80	80
Usable claw length	nL in mm	50	55	55	66	66
Foot length straight	L2 in mm	326	346	346	415	425
Foot length swung sideways	L1 in mm	311	330	330	401	405
Width	B in mm	233	247	247	300	322
Overall height	H2 in mm	280	310	235	310	340
Cylinder volume in l		0.18	0.3	0.21	0.5	0.73
Weight in kg		23	29	26	48	60

Machine Jacks JH-G plus Ex Series without integrated Pump

For technical details please refer to the machine jack JH-G plus

- JH 15G to JH 30G plus Ex are equipped with spring return, therefore no force effort to reset in lowest position
- External pumps are necessary to operate the JH-G plus Ex series (see below)

These jacks are usually combined with manually or electrically operated hydraulic pumps. This configuration offers an ideal solution for heavy duty lifting in confined spaces or other tricky situations.



Item no.		7830.31.00	7830.21.50	7830.22.00	7830.13.00
Type		JH10G plus Ex	JH15G plus Ex	JH20G plus Ex	JH30G plus Ex
Load capacity on top plate in kg		10000	15000	20000	30000
Stroke in mm		150	175	190	200
Minimum lifting claw height	h1 in mm	15	20	20	20
Maximum lifting claw height	h2 in mm	180	205	225	305
Adjustment range of lifting claw	V in mm	5 x 41	5 x 46	5 x 51	5 x 71
Top plate height	H1 in mm	275	310	340	420
Claw width front	Lb in mm	60	80	80	80
Usable claw length	nL in mm	55	66	66	66
Foot length straight	L2 in mm	270	340	360	380
Foot length swung sideways	L1 in mm	210	230	230	270
Width	B in mm	247	300	322	375
Overall height	H2 in mm	275	310	340	420
Cylinder volume in litres		0.3	0.5	0.73	1.27
Weight in kg		24	41	52	92

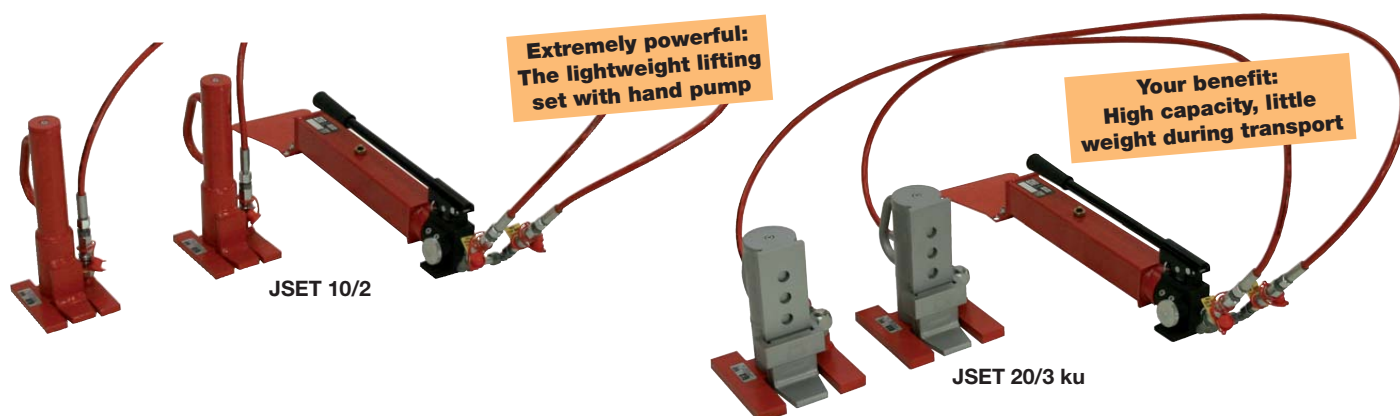


Hydraulic Lifting Set Type JSET Capacity up to 20 ton

Directions for use:

2 lifting jacks are connected to a pump by hydraulic hoses with non-drip quick couplers. The 2 lifting jacks are controlled by the external pump. Thus it is made sure that the jacks are not unintentionally overloaded during lowering.

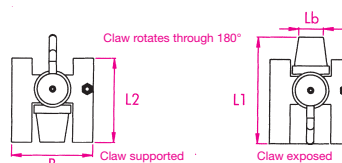
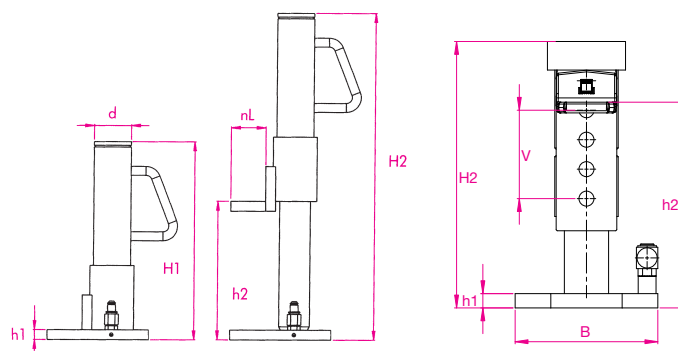
- Lifting claw rotates through 180° to lift with or without supporting feet
- High capacity at low weight
- Pump and jacks are separate units and can therefore be used flexibly in confined spaces. Horizontal operation is also possible.
- Swivelling lifting toe on JHS 10 ku assures optimal adjustment to the load, along with safe and stable support even in raised position.



Item no.	7850.00.50	7850.01.00	7850.01.01
Lifting set	JSET 10/2	JSET 20/3	JSET 20/3 ku
Max. capacity in kg	10000	20000	20000
Lifting set consisting of:			
2 x Hydraulic jack	JHS 5	JHS 10	JHS 10 ku
2 x Hydraulic hose	JS 2	JS 3	JS 3
1 x Hand pump	JP 26	JP 26	JP 26

Technical data for hydraulic jacks JHS 5 and JHS 10

Type	JHS 5	JHS 10	JHS 10 ku
Capacity in kg	5000	10000	10000
Smallest starting height with towing eye h1 in mm	15	20	20
Maximum lifting claw height h2 in mm	240	240	288
Top plate height H1 in mm	350	370	265
Max. lifting height with top plate H2 in mm	590	610	373
Claw width front Lb in mm	45	60	60
Usable claw length nL in mm	40	55	55
Adjustability of claw V in mm	-	-	5 x 41
ø d top plate in mm	60	80	95
Length L2 with claw supported in mm	170	205	205
Length L1 with claw exposed in mm	220	260	260
Width B in mm	145	200	200
Cylinder volume in litres	0.3	0.47	0.21
Weight in kg	10	19	19



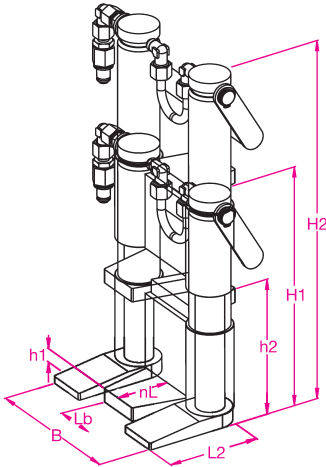
For suitable accessories
(pumps and hoses)
see page 162

Hydraulic Lifting Jack Type Primus

- Advantages of the hydraulic jack Primus:
- High performance at low weight
 - Slewable feet for optimised positioning
 - Equal load distribution and adaption of the jack to the load by integrated twin cylinder system
 - Jacks and pump as separate units for high flexibility
 - Effortless transport and retraction of the cylinder with the included retraction/transport truck (only JSET 30/2 and JSET 50/3)



For suitable accessories
(pumps and hoses)
see page 162



Item no.	7830.25.00
Type	JH 50 P
Load capacity on top plate in kg	50000
Stroke in mm	250
Minimum lifting claw height h1 in mm	35
Maximum lifting claw height h2 in mm	275
Minimum Top plate height H1 in mm	542
Maximum Top plate height H2 in mm	792
Claw width front Lb in mm	100
Usable claw length nL in mm	85
Length L2 with feet in front in mm	350
Width B in mm	380
Cylinder volume in litres	2.51
Weight in kg	105

Hydraulic Lifting Jack Set Type JSET

- The advantages of the lifting jack Type Primus:
- Complete lifting set including all necessary hoses, pump, jack and back pressure/drive unit of type JRS 1
 - Ergonomic transport by combined back pressure/drive unit JRS 1
 - Flexible and reliable operation due to separate lifting and pumping units

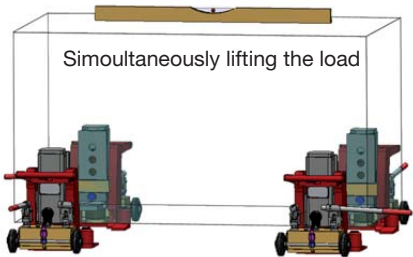


Item no.	7850.50./3
Lifting set	JSET 50/3
Lifting jack	1 x JH 50 P
Hose	2 x JS 3
Pump	1 x JPE 55 NVR
Back pressure/drive unit	1 x JRS 1

Pressure block Type JD

Hydraulic pressure block provides safety

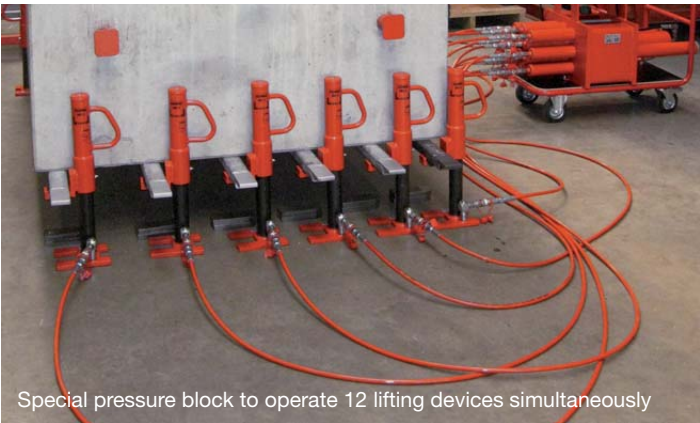
- Advantages when working with hydraulic pressure block:
- Work safely without danger of tipping
 - Save time
 - One-man operation



! Attention! Danger of tipping without hydraulic pressure block. Especially for high loads with small contact area, the tilting of the load may come about easily in the so-called "lifting on call" with four independently operating hydraulics jacks. An even greater danger may arise when discharging the load, as this is much faster compared to lifting, and a tilting of the load often cannot be detected in time.



Hydraulic pressure block JD 80+



Special pressure block to operate 12 lifting devices simultaneously



JD 40 E+ VS



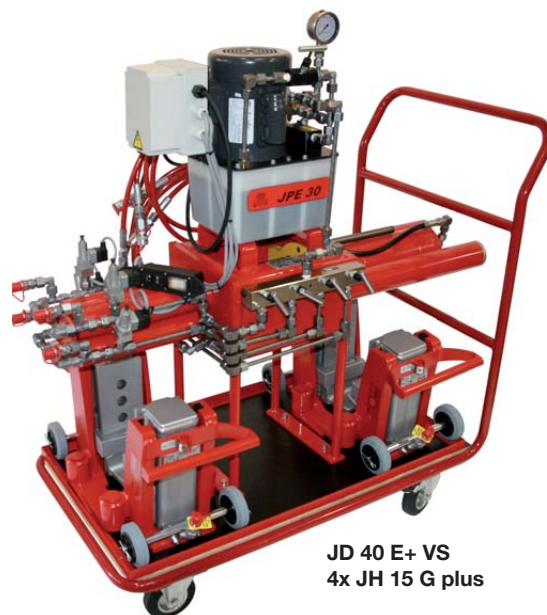
JD 40 E+ VS
4x JHS 10

Item no.	7852.04.00	7852.04.01	7852.04.02	7852.08.01	7852.08.02
Type	JD 40+	JD 40 E+	JD 40 E+ VS	JD 80 E+	JD 80 E+ VS
Mounted with electric pump	no	yes	yes	yes	yes
Return spring	no	yes	yes	yes	yes
Length in mm	1200 / 47.2"	1200 / 47.2"	1200 / 47.2"	1200 / 47.2"	1200 / 47.2"
Width in mm	650 / 25.6"	650 / 25.6"	650 / 25.6"	650 / 25.6"	650 / 25.6"
Height in mm	1300 / 51.2"	1300 / 51.2"	1300 / 51.2"	1300 / 51.2"	1300 / 51.2"
Operating pressure of electric pump (bar)	520	520	520	520	520

Pressure block JD 40 E+ VS with easy to operate spring return

Advantages when working with hydraulic pressure block:

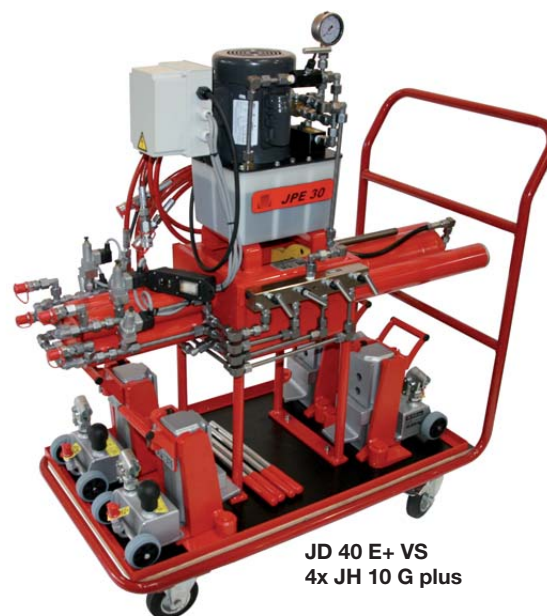
- Perform synchronous lifting and lowering of loads with decentralised centre of gravity easily and safely.
- Simple push button operation (remote control).
- All the slave-cylinders equipped with safety pressure switch pre-set at 520 bar. Pressure control by integrated pressure switch with LED indicator, thereby overloading is not possible.
- Reset of the machine lifting jack also without load (JH 15 - 20 G plus EX)
- Load independent, constant lifting speed.
- Adjustable lowering speed.
- The complete system is mobile and conveniently situated on a utility cart.
- Electrical pump JPE 30 and VS-control unit for driving individual lifting devices.
- Clear and simple control unit, switchable on the system or individual jack and suitable for establishing a three-point support
- Oil volume in the system is sufficient for up to 4 pcs. JH 10 G plus / JH 10 G plus EX / JHS 10. Larger jacks can be operated, but with a reduced stroke.
- The pressure block is equipped with springs, so the working cylinder automatically returns to its original position.



JD 40 E+ VS
4x JH 15 G plus



Hydraulic pressure block JD 40 E+ VS



JD 40 E+ VS
4x JH 10 G plus

Matching lifting equipment for JD 40 E+ VS	Traglast in kg
4x JH 6 G plus (full stroke, without spring return)	24 000
4x JHS 5 (full stroke, without spring return)	20 000
4x JH 10 G plus (full stroke, without spring return)	40 000
4x JHS 10 / JH 10 G plus ku (full stroke, without spring return)	40 000
4x JH 15 G plus (reduced stroke, without spring return)	60 000
4x JH 15 G plus EX (reduced stroke, with spring return)	60 000
4x JH 20 G plus (reduced stroke, without spring return)	80 000
4x JH 20 G plus EX (reduced stroke, with spring return)	80 000

Air and electric pumps Type JPL and JPE

- These electric pumps are extremely easy to operate
- They offer an optimum ratio of flow rate to weight



Item no.	7852.00.15	7852.03.00	7852.03.55
Type	JPL 15	JPE 30 NVR	JPE 55 NVR
Tank volume (useful) in l	1.5	7.6 / 4.8	9.5 / 8.4
Working pressure in bar	0-700	520	520
Connections in St	2 drip-free hydraulic connections	2	2
Capacity low pressure in l/min.	1.07	3.9 at 7 bar	7.1 at 50 bar
Capacity high pressure in l/min.	0.18	0.33 at 520 bar	0.95 at 520 bar
Weight in kg	9	40	40
Dimensions L x B x H in mm	380 x 136 x 185	530 x 300 x 560	530 x 300 x 560
Hose length in mm	-	Variable	Variable
Motor data	-	230 V, 50 Hz, 5 A	230 V, 50 Hz, 13 A
Applicable with cylinder	Single-acting	-	-
Compressed air connection in bar	7-14	-	-

Hydraulic Hand Pump Type JP 26

Your advantages in detail:

- Sturdy construction but still light weight and handy
- Pressure limit valve as overload protection
- Equipped with integrated quick-lift for faster work



Item no.	7851.02.50
Type	JP 26
total/useful oil capacity in l	2.1 / 2.0
Working pressure in bar	520
Number of connections	2
Dimensions L x W x H in mm	770 x 170 x 169
Weight in kg	13

*up to 15,000 mm

Possible fields of application

Lifting jacks	JP26
JH 6 G plus	for 2 hydraulic jacks
JH 10 G plus	for 2 hydraulic jacks
JH 15 G plus	for 2 hydraulic jacks
JH 20 G plus	for 2 hydraulic jacks
JH 10 G plus ku	for 2 hydraulic jacks
JH 13 P	for 2 hydraulic jacks
JHS 5	for 2 hydraulic jacks
JHS 10	for 2 hydraulic jacks
JHS 10 G ku	for 2 hydraulic jacks

Hydraulic Hoses Type JS

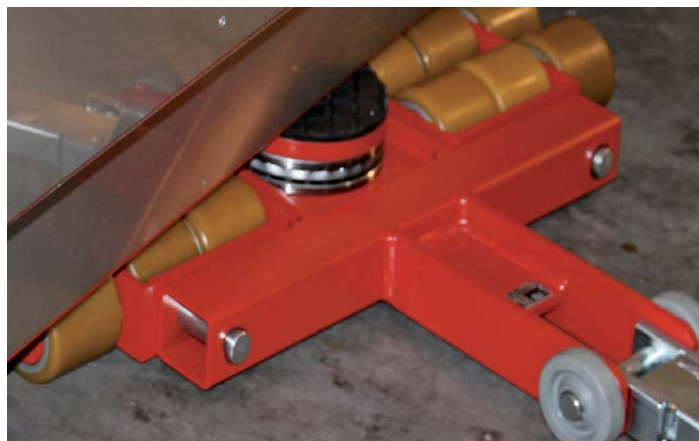
- Both ends fitted with non-drip couplers, evacuated oil-filled, ready to use
- Safety factor 4:1

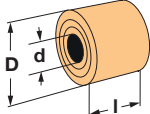











Item no.	7853.00.20	7853.00.30	7853.00.40	7853.00.60
Type	JS 2	JS 3	JS 4	JS 6
Number of non-drip couplers	2	2	2	2
Length in mm	2000	3000	4000	6000

Max. length available is 15,000 mm

Roller coverings for a variety of prevailing ground conditions



Roller type	Steel	JUWAmid	JUWathan®	JUWathan®plus	JUWathan®Professional
Details	<p>The roller body is made from seamless precision steel tubes.</p> <p>2 ball bearings are pressed into the roller body.</p>	<p>Two ball bearings are pressed into a high-quality polyamide roller.</p>	<p>The roller surface is cast onto a steel core. In the steel core 2 ball bearings are pressed in.</p>	<p>A covering of a special mixture on polyurethane basis is applied on an aluminium core.</p> <ul style="list-style-type: none"> • 30% improvement in rolling resistance due to optimised coating thickness • Weight savings of almost 35% 	<ul style="list-style-type: none"> • Higher load capacity than JUWathan® plus rollers by the division of the rollers and arrangement in pairs (2 x 2 ball bearings) • Significantly less friction between floor surface and roller, since the two rollers can rotate against each other • Less force when screwing in the rollers • Stable driving due to reduced friction even at the trailing axis
Application	<p>Large unevenness and poor ground conditions with heavy dirt accumulation</p> 	<p>Level, smooth industrial floors without contamination/chips</p>	<ul style="list-style-type: none"> • Level, smooth industrial floors without dirt/chips • Industrial floor with dirt/chips and smaller recesses and uneven surfaces 		
Type of carriage and roller dimensions	JKB D x d x l (mm) 85 x 25 x 43				
	M D x d x l (mm) 85 x 25 x 43				
	K D x d x l (mm) 85 x 25 x 85				
	K Prof. D x d x l (mm) 85 x 25 x 85				
	G Prof. D x d x l (mm) 140 x 35 x 59				
	H D x d x l (mm) 200 x 70 x 170 200 x 70 x 85				

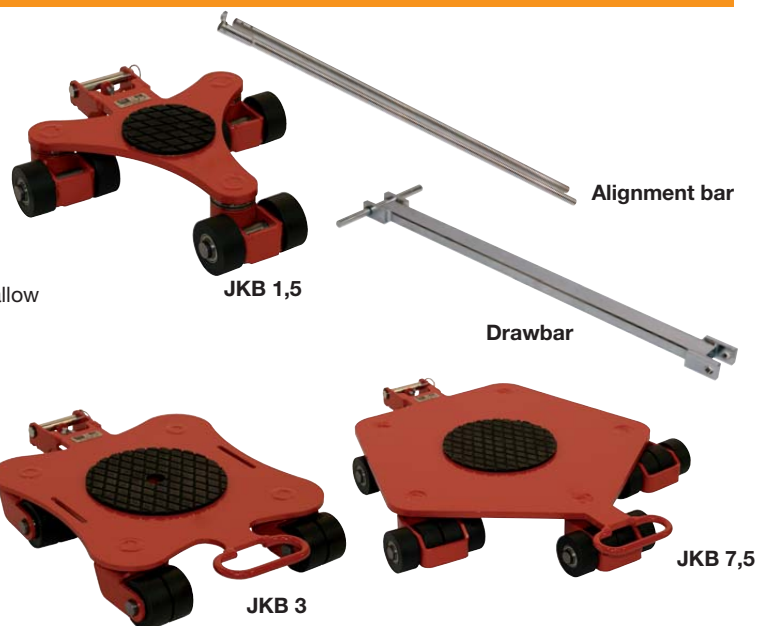
Rotor trolley Type JKB, mounting height 110 mm

Your advantages in detail:

- Low weight combined with high load capacity
- Rotatable by 360° through ball bearing swivel castors
- Mounting height suitable for transport trolleys and steering systems of the Type K
- Unrivalled: Due to the reduced roller width of the swivel castors, steering movements are much easier and reduces friction forces to a minimum when cornering
- The trolleys JKB 3-7,5 can be connected with the load at the provided openings with standard lashing straps
- In addition, central holes (Ø 30 mm) are mounted on all JKB trolleys to allow the fixing of the load.

Optional:

- The shown drawbar and the alignment bar are not included in the set.
- The alignment bar can be clamped easily without tools using the drawbar bracket on the carry handle.



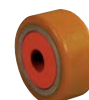
Optionally available with the following roller types:
(for details see page 163)



JUWAmid
covering



JUWAmid
covering white



JUWathan® plus

Type	JKB 1,5/3	JKB 3/6	JKB 4/8	JKB 6/12	JKB 7,5 / 15
Capacity Single device / Set in kg	1500 / 3000	3000 / 6000	4000 / 8000	6000 / 12000	7500 / 15000
Number of rollers per device	6	8	12	16	20
Dimensions rollers in mm	85 x 43	85 x 43	85 x 43	85 x 43	85 x 43
Load surface per cassette in mm	150	250	250	250	250
Dimensions cassette in mm	530 x 490	690 x 460	690 x 475	690 x 525	910 x 740
Weight with JUWAmid Single device / Set in kg	20/40	30/60	43/86	44/88	63,5/127
Item no. Set (consisting of 2 single devices)	9107.02.15	9107.02.30	9107.02.40	9107.02.60	9107.02.75
Item no. Single device	9107.01.15	9107.01.30	9107.01.40	9107.01.60	9107.01.75
Item no. Drawbar	910Z.00.09	910Z.00.09	910Z.00.09	910Z.00.09	910Z.00.09
Item no. Alignment bar	910Z.00.10	910Z.00.10	910Z.00.11	910Z.00.11	910Z.00.11

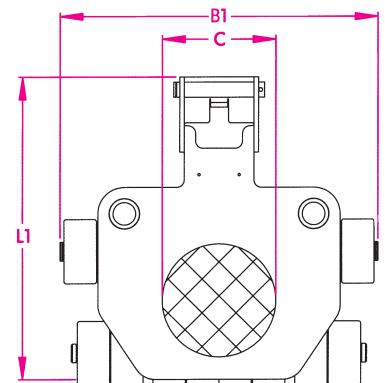
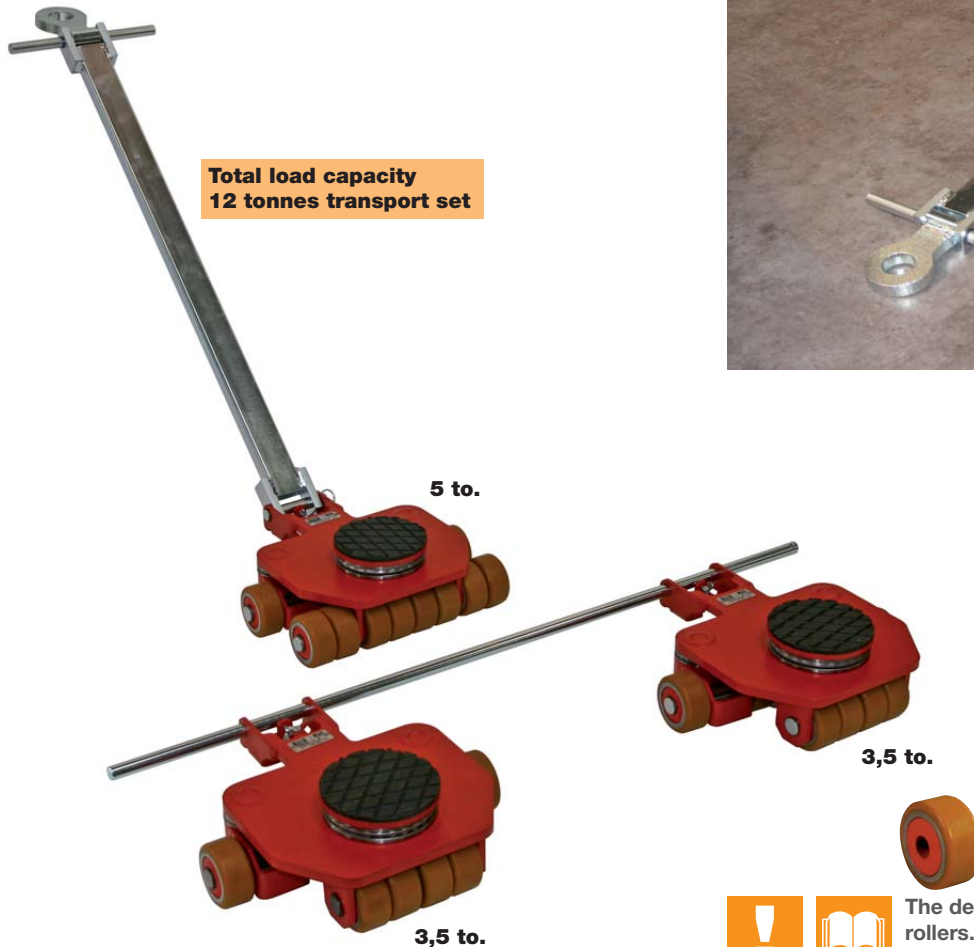
Servo trolley Type M

Your advantages in detail:

- 80% lighter steering due to two steering rollers
- Keeps on track though rigid axis
- Can be combined as steering and trolley
- The steering forces when stationary can be reduced by up to 80%. This protects the rollers and the floor covering, and represents a significant ergonomic relief for the user
- Allows a transverse displacement of the load in the driving direction



**Total load capacity
12 tonnes transport set**



The device is equipped with JUWathan® plus rollers. For details see Page 163.

Item no.	9107.20.35	9107.21.20	9107.20.50	9107.21.50
Type	JLF 3,5	JLF Set 12	JLF 5	JLF Set 15
Capacity in kg	3500	1 x 5000 + 2 x 3500	5000	3 x 5000
Number of rollers	8	1 x 12 + 2 x 8	12	3 x 12
Dimensions of rollers in mm	85 x 43	85 x 43	85 x 43	85 x 43
Overall height in mm	150	150	150	150
Load surface turntable ø C in mm	150	150	150	150
Total width B1 in mm	420	420	420	420
Skate length L1 in mm	410	410	410	410
Weight with JUWathan plus rollers in kg	23	71	25	75

Adjustable and steerable Transport Skates Type K, Load Capacity 6-24 t, Overall Height 110 mm

Your advantages in detail:

- Galvanised axles and safety clip ring for improved corrosion resistance
- Fitted with top quality rollers as standard
- Reduced weight due to optimised cassette design
- All transport skates are immediately ready for use.
- The steerable skate is equipped with a roller bearing turntable and the pictured steering handle.
- The fixed skates can be connected with the included alignment bar as pictured on the below.



**Total load capacity
24 tonnes transport set**



Optionally available with the following roller types:
(for details see page 163)



Steel



JUWAamid
covering



JUWAthan® plus

Steerable skate JL 12 K

12 to.

6 to.

Fixed skates JFB 12 K

6 to.

Item no.	9102.20.30	9101.20.30	9102.20.60	9101.20.60	9102.20.90	9101.20.90	9102.21.20	9101.21.20
Type	JLB 3 K	JFB 3 K	JLB 6 K	JFB 6 K	JL 9 K	JFB 9 K	JL 12 K	JFB 12 K
Capacity in kg	3000	3000	6000	6000	9000	9000	12000	12000
Number of rollers	4	4	8	8	12	12	16	16
Dimensions of rollers in mm	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85
Overall height in mm	110	110	110	110	110	110	110	110
Load surface fixed skates in mm		120 x 80		175 x 170		175 x 170		175 x 170
Dimensions of fixed skates		190 x 115		325 x 200		325 x 390		325 x 390
Length of alignment bar in mm		1000**		1230		1230		1230
Adjustment range of skates in mm		125-880		400-1030		400-1030		400-1030
Turntable ø in mm	150		150		170		170	
Dimensions of steerable skates in mm	225 x 280		445 x 590		580 x 820		580 x 1000	
Length of steering handle in mm	990*		1120		1120		1120	
Weight with JUWAthan plus rollers in kg	12	11	33	25	54	32	64	35

* Without towing eye, ** Non articulated alignment bar

Adjustable and steerable Transport Skates Type K Professional, Load Capacity 14-28 ton, Overall Height 110 mm

Your advantages in detail:

- Galvanised axles and safety clip ring for improved corrosion resistance
- Less turning effort due to divided rollers. Considerably reduced friction when negotiating curves. The drastically lower friction also provides enhanced directional stability for the trailing axles.
- Higher load capacity at identical dimensions compared to K series.
- All transport skates are immediately ready for use.
- The steerable skate is equipped with a roller bearing turntable and the pictured steering handle.
- The fixed skates can be connected with the included alignment bar as pictured on the below.



All devices are equipped with JUWathan® Professional rollers. For details see page 163.

**Total load capacity
14 tonnes transport set**

Steerable skate JLB 7 K

7 to.

3,5 to.

Fixed skates JFB 7 K

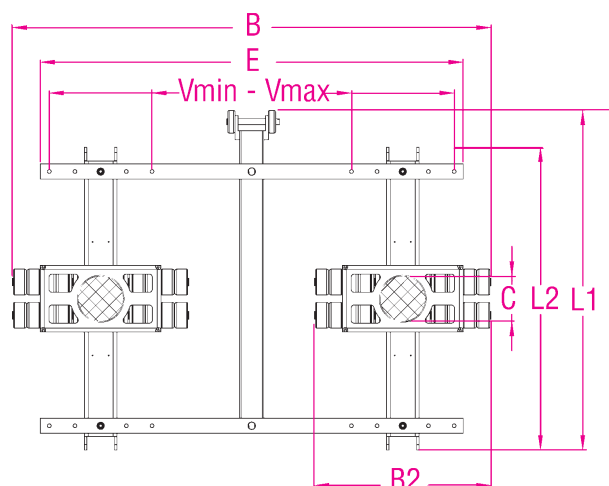
3,5 to.

Item no.	9102.30.70	9101.30.70	9102.31.00	9101.31.00	9102.31.40	9101.31.40
Type	JLB 7 K	JFB 7 K	JL 10 K	JFB 10 K	JL 14 K	JFB 14 K
Capacity in kg	7000	7000	10000	10000	14000	14000
Number of rollers	8	8	12	12	16	16
Dimensions of rollers in mm	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85	85 x 85
Overall height in mm	110	110	110	110	110	110
Load surface fixed skates in mm		175 x 170		175 x 170		175 x 170
Dimensions of fixed skates		325 x 200		325 x 390		325 x 390
Length of alignment bar in mm		1230		1230		1230
Adjustment range of skates in mm		400-1030		400-1030		400-1030
Turntable ø in mm	150		170		170	
Dimensions of steerable skates in mm	445 x 590		580 x 820		580 x 1000	
Length of steering handle in mm	1120		1120		1120	
Weight with JUWathan Professional rollers in kg	36	27	56	35	68	39

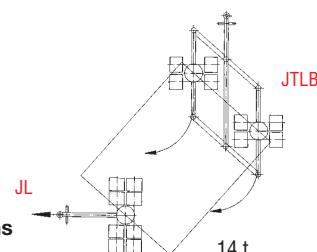
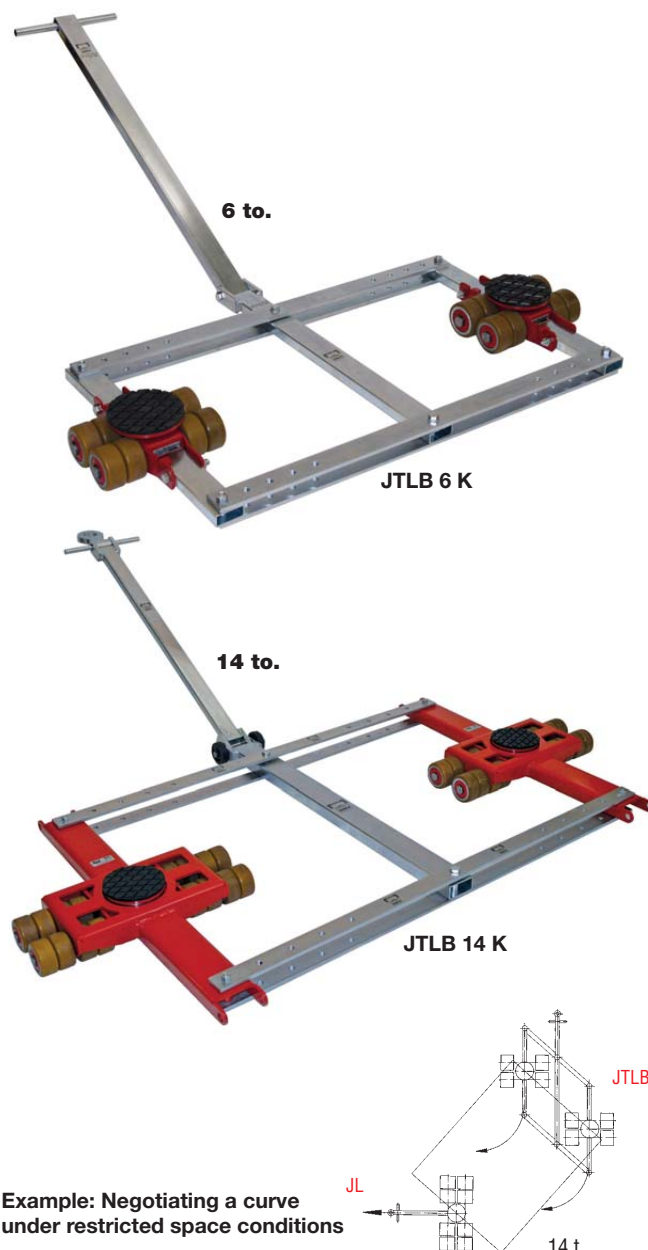
Tandem Skates Series K Professional, Capacity up to 14 ton, Overall Height 110 mm

Your advantages in detail:

- These tandem skates are specially suitable for loads with no leading or trailing edge centre support.
- Galvanised axles, bolts, and safety clip ring for improved corrosion resistance
- Less turning effort due to divided rollers. Considerably reduced friction when negotiating curves. The drastically lower friction also provides enhanced directional stability for the trailing axles.
- Immediately ready for use.
- 2 steering handles and 1 each alignment bar.
- Multi-purpose use: Can also be used as single skates. Without any further accessories the steerable skates can be used as single units with half the load capacity.
- Steering angle up to 45° possible
- Delivery includes 2 steerable skates



All devices are equipped with JUWathan® Professional rollers. For details see page 163.



Example: Negotiating a curve under restricted space conditions

Item no.	9102.10.60	9102.11.40
Type	JTLB 6 K Professional	JTLB 14 K Professional
Capacity in kg	6000	14000
Number of double rollers	8	16
Dimensions of rollers in mm	85 x 85	85 x 85
Overall height in mm	110	110
Dimensions of steerable skate L2 x B2 in mm	600 x 280	1000 x 590
Load surface per turntable Ø C in mm	150	150
Width of alignment bar E in mm	1000	1400
Adjustment range of steerable skates $V_{min} - V_{max}$ in mm	560 - 960*	660 - 1340*
Adjustment steps	5 x	5 x
Overall length L1 x overall width B1 in mm	760 x 1240	1070 x 1580
Length of steering handle in mm	990**	1120
Weight with JUWathan Professional rollers in kg	37	104

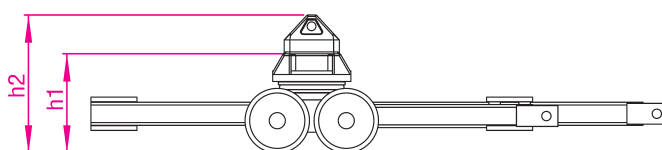
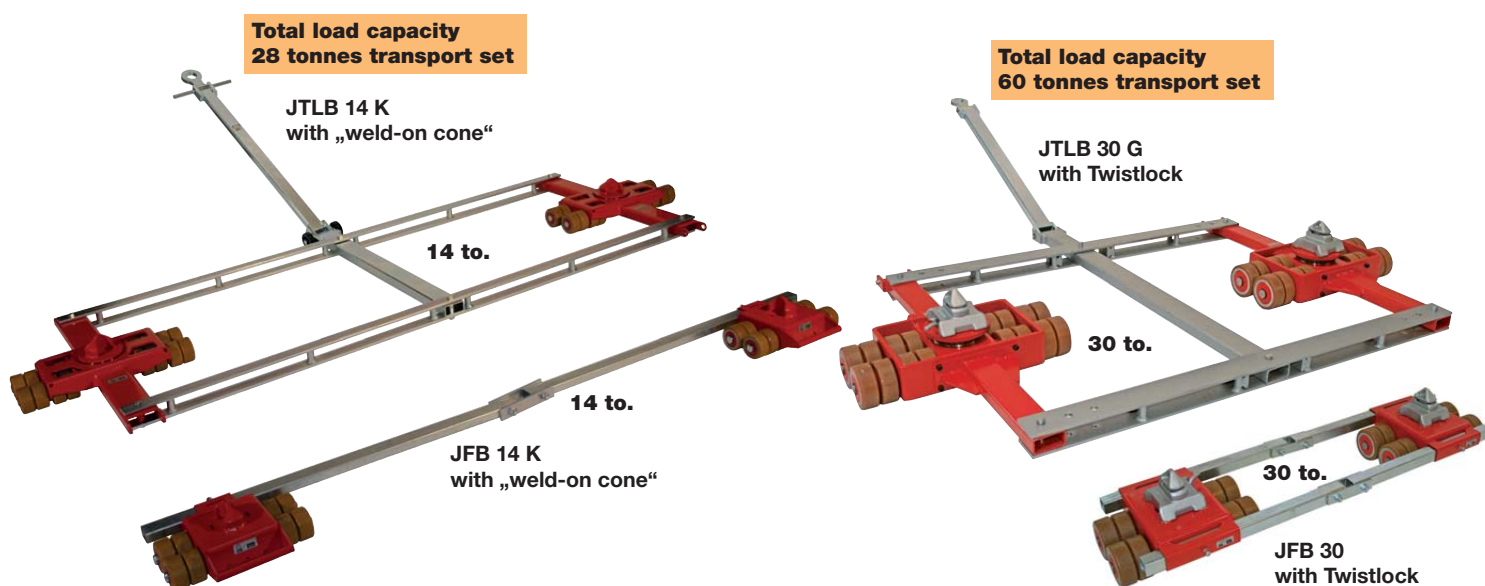
*other lengths available **without towing eye

Weld-on Cone for Container Transport up to 28 ton, Overall Height 180 mm Twistlock for Container Transport up to 60 ton, Overall Height 330 mm

Your advantages in detail:

- Safe transport of ISO containers.
- Containers can be moved under profile restrictions.
- Positive and force-locking connection between skates and container (twist lock system) and only positive connection respectively („weld-on cone“ system).
- **Weld-on cone version** with 2 modified turntables and cassettes with container receptacles, not lockable, and lengthened alignment bars (2.26 m) suitable for ISO containers instead of the standard alignment bars.
- Delivery includes tandem skates with 2 draw bars with towing eyes.
- **Option:** „weld-on cone“ easily retrofittable for K series and K series Professional skates.
- Lockable **twist lock** version with 2 modified turntables and cassettes and lengthened alignment bars suitable for ISO size (2.26m; not adjustable) instead of standard alignment bars.
- Delivery includes tandem skates with 2 draw bars with towing eyes.
- **Option:** A longer alignment bar is available on request.

Easy to operate due to two-part alignment bar



„Weld-on cone“ system for K series skates see pages 166-168

Item no.	9102.41.40	9101.41.40
Type	JTLB 14 K WC	JFB 14 K WC
Capacity in kg	14000	14000
Overall height h1 in mm	110	110
Overall height h2 in mm	180	180

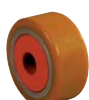
Twistlock system for G series skates see pages 170-171

Item no.	9103.41.50	9103.43.00	9104.41.50	9104.42.20	9104.43.00
Type	JTL 15 TW	JTL 30 G TW	JFB 15 TW	JFB 22 TW	JFB 30 TW
Capacity in kg	15000	30000	15000	22000	30000
Overall height h1 in mm	215	215	215	215	215
Overall height h2 in mm	300	300	300	300	300

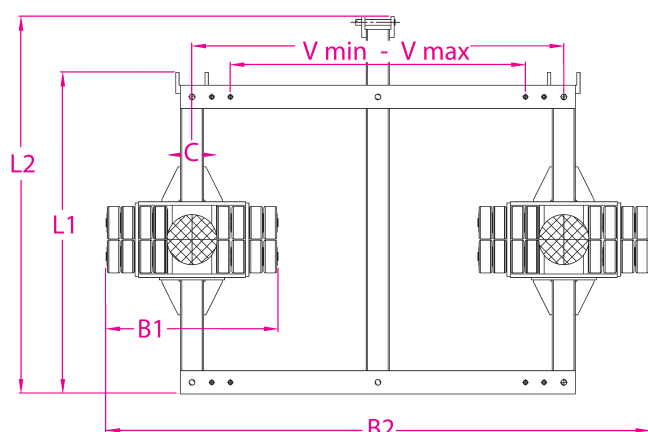
Tandem Skates Series G Professional, Capacity up to 30 ton, Overall Height 180 mm

Your advantages in detail:

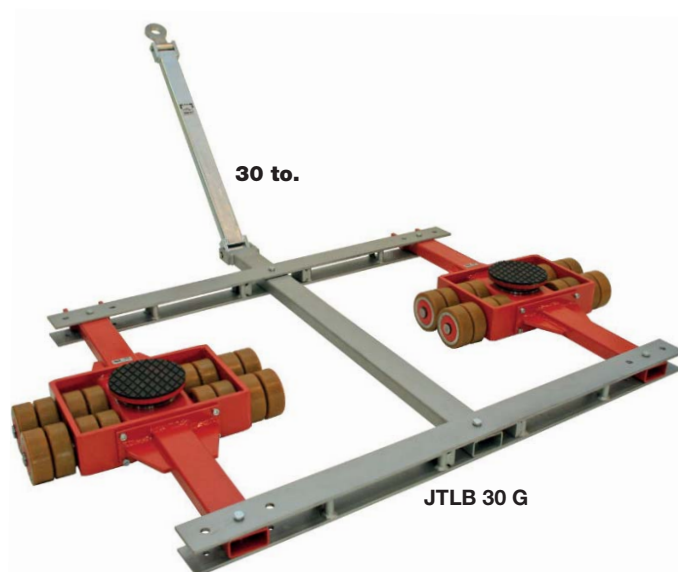
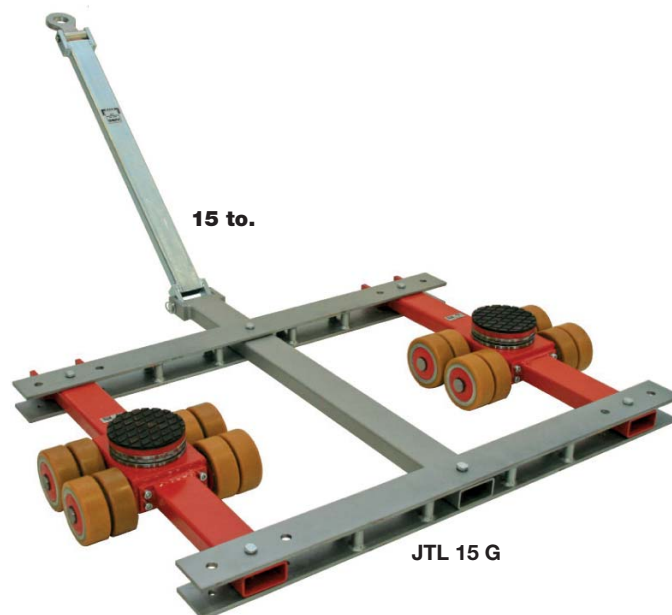
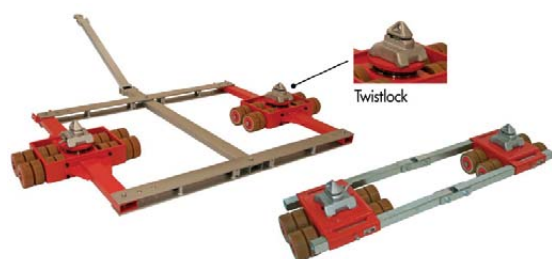
- Excellent running characteristics on uneven ground and yard surfaces due to big roller Ø of 140 mm and width of 59 mm.
- Safe crossing of small ledges and and floor-embedded rails.
- Multi-purpose use: Can also be used as single skates. Without any further accessories the steerable skates can be used as single units with half the load capacity.
- Customized versions are possible; other widths or adjustment ranges available. Please contact us for other alignment bar lengths.



All skates are equipped with JUWathan® plus rollers.
For details see page 163



Also available with twistlock system for form-locking container transport (see page 169)



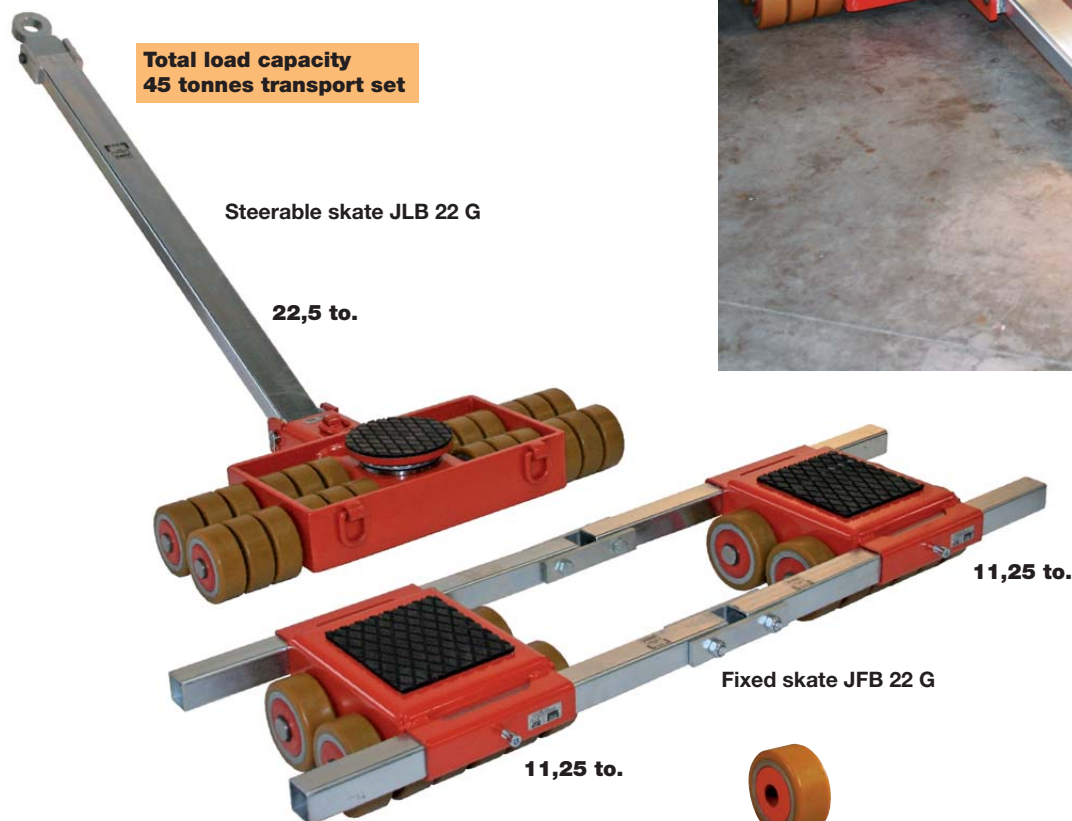
Item no.	9103.11.50	9103.13.00
Type	JTL 15 G Professional	JTLB 30 G Professional
Capacity in kg	15000	30000
Number of rollers	16	32
Dimensions of rollers in mm	140 x 59	140 x 59
Overall height in mm	180	180
Dimensions of steerable skates L1 x B1 in mm	1020 x 440	1380 x 740
Load surface per turntable Ø C in mm	170	215
Width of alignment bar E in mm	1330	1700
Adjustment range of steerable skates $V_{min} - V_{max}$ in mm	900 - 1230*	1270 - 1600*
Adjustment steps	3 x	3 x
Overall length L2 x overall width B2 in mm	1260 x 1670	1620 x 2340
Length of steering handle in mm	1230	1230
Weight with JUWathan plus rollers in kg	168	291

*other lengths available

Adjustable and steerable Transport Skates Type G, Load Capacity 30-60 ton, Overall Height 180 mm

Your advantages in detail:

- The rollers are mechanically pivoted. Therefore equal load distribution on all wheels and the floor. No elaborated and failure-prone hydraulic compensation needed.
- All transport skates are immediately ready for use. The steerable skate is equipped with a roller bearing turntable and the pictured steering handle.
- Less turning effort with half the roller width and twice the number of rollers. Considerably reduced friction when negotiating curves. The drastically lower friction also provides enhanced directional stability for the trailing axles.
- The fixed skates can be connected with the included alignment bar as pictured on the below.



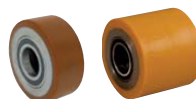
All skates are equipped with JUWathan® plus rollers. For details see page 163

Item no.	9103.01.50	9104.01.50	9103.02.20	9104.02.20	9103.33.00	9104.33.00
Type	JLB 15 G	JFB 15 G	JLB 22 G	JFB 22 G	JL 30 G	JFB 30 G
Capacity in kg	15000	15000	22500	22500	30000	30000
Number of rollers	16	16	24	24	32	32
Dimensions of rollers Ø in mm	140 x 59	140 x 59	140 x 59	140 x 59	140 x 59	140 x 59
Overall height in mm	180	180	180	180	180	180
Load surface fixed skates in mm		220 x 200		220 x 200		220 x 200
Dimensions of fixed skates		460 x 285		460 x 400		460 x 528
Length of alignment bar in mm		2 x 1540		2 x 1540		2 x 1540
Adjustment range of skates in mm		475 - 1300		530 x 1300		530 x 1300
Turntable ø in mm	215		215		250	
Dimensions of steerable skates in mm	565 x 741		565 x 981		750 x 1550	
Length of steering handle in mm	1230		1450		1590	
Weight with JUWathanplus rollers in kg	96	88	129	113	312	126

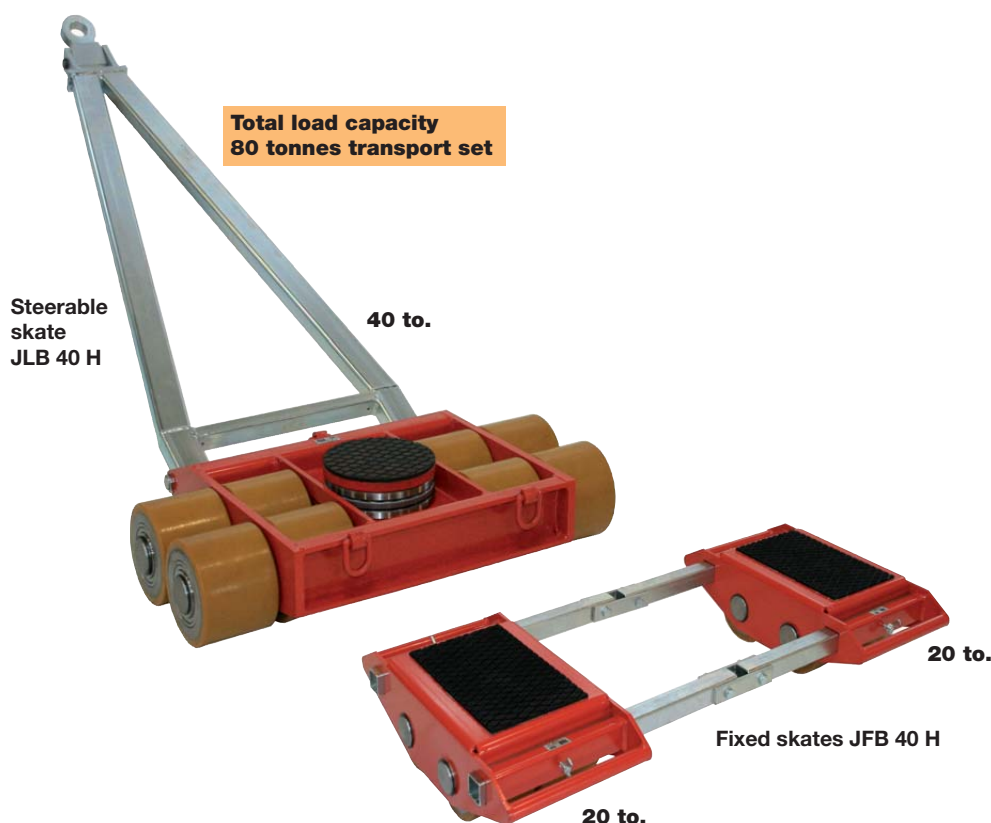
Adjustable and steerable Transport Skates Type H, Load Capacity 80-120 ton, Overall Height 230 mm

Your advantages in detail:

- In comparison to the capacity unequalled compact and lightweight construction.
- Mechanically pivoted rollers for equal load distribution on all wheels and the floor.
- All transport skates are immediately ready for use.
- The steerable skate is equipped with a roller bearing turntable and a drawbar.
- The fixed skates can be connected with the included alignment bars.



All skates are equipped with JUWathan® rollers.
For details see page 163



Item no.	9103.03.50	9104.03.50	9103.06.00	9104.06.00
Type	JLB 40 H	JFB 40 H	JLB 60 H	JFB 60 H
Capacity in kg	40000	40000	60000	60000
Number of rollers	8	8	8/8	8/8
Dimensions of rollers in mm	200 x 170	200 x 170	200 x 170 / 85	200 x 170 / 85
Overall height in mm	230	230	230	230
Load surface fixed skates in mm		395 x 260		395 x 260
Dimensions of fixed skates		740 x 400		740 x 580
Length of alignment bar in mm		2 x 1540		2 x 1540
Adjustment range of skates in mm		600-1140		600-1140
Turntable ø in mm	250		250	
Length of steering handle in mm	650 x 1060		650 x 1400	
Steering handle with towing eye in mm	1590		1590	
Weight mit JUWathan rollers in kg	320	289	450	410

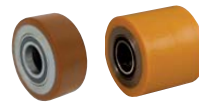
Transport Skates Type H Load capacity up to 160 ton, Overall Height 240 mm

Your advantages in detail:

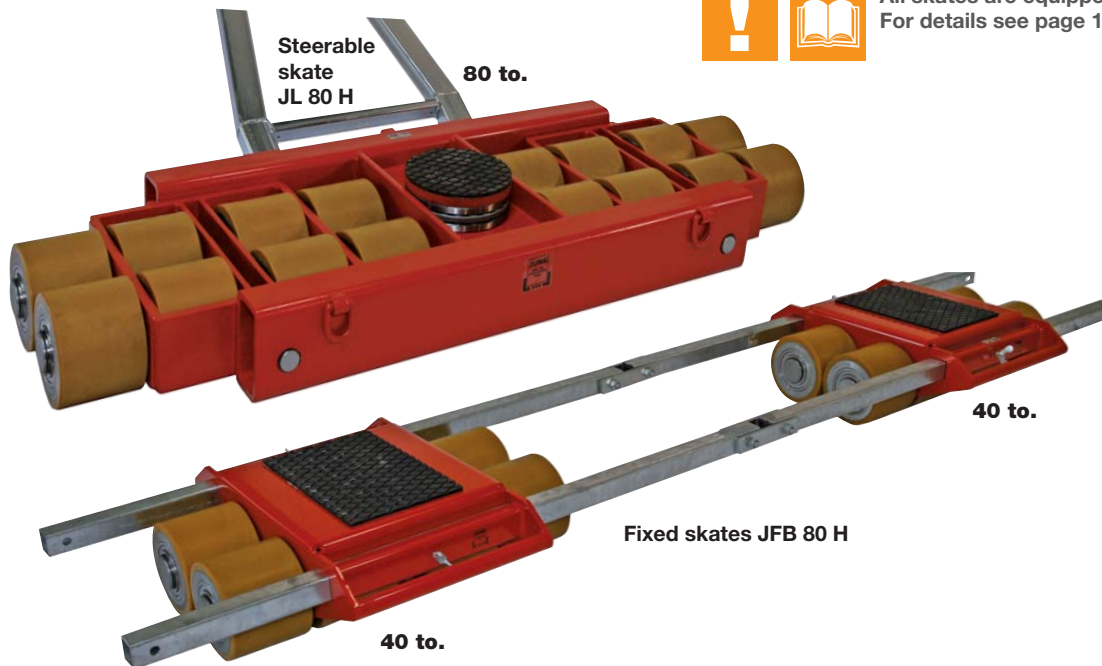
- In comparison to the capacity unequalled compact and lightweight construction.
- Mechanically pivoted rollers for equal load distribution on all wheels and the floor.
- All transport skates are immediately ready for use.
- The steerable skate is equipped with a roller bearing turntable and a drawbar.
- The fixed skates can be connected with the included alignment bars.



**Total load capacity
160 tonnes transport set**



All skates are equipped with JUWathan® rollers.
For details see page 163



Item no.	9103.08.00	9104.08.00	9104.12.00
Type	JL 80 H	JFB 80 H	JFB 120 H
Capacity in kg	80000	80000	120000
Number of rollers	16	16	24
Dimensions of rollers in mm	200 x 170	200 x 170	200 x 170
Overall height in mm	240	240	240
Load surface fixed skates in mm		400 x 260	440 x 300
Dimensions of fixed skates L x W in mm		750 x 830	960 x 830
Length of alignment bar in mm		2 x 3000	2 x 3000
Adjustment range of skates in mm		830 - 2530	830 - 2530
Turntable ø in mm	250		
Dimensions of steerable skates in mm	820 x 1900		
Length of steering handle in mm	1590		
Weight with JUWathan rollers in kg	723	565	815

Powered Skate JLA 15/30 G, Load Capacity 15 ton, Pulling Capacity 30 ton, Overall Height 180 mm

Your advantages in detail:

- Very short set-up time, connect air hose and go
- No additional tractor necessary
- Low-maintenance drive
- All lines are detachable for easy transport
- Rotates through 360°
- No electric power needed
- Standard compressed air connection with a continuous minimum pressure of 8 bar and a flow rate of 25 l/s
- Stepless adjustment due to working pressure adaption
- Can be combined with G-series skates



Powered steerable skate
JLA 15/30 G



Scope of delivery of JLA Set 3:

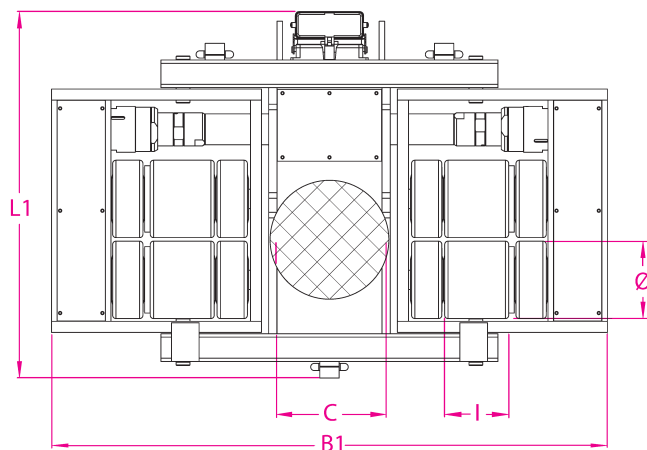
- 1 piece steerable skate JLA 15/30 G including pendant control
- 1 set (= 2 pcs.) skates JFB 15 G
- Air hose, length 30 m x 19 mm
- Transport trolley with oil and lubricants



JLA Set 3

Options:

- All components are also available separately
- Higher load capacities are available on request



Item no.	9103.00.10
Type	JLA Set 3
Load capacity in kg	15000
Pulling capacity in kg	30000
Number and dimension of rollers JFB 15 G	16 rollers 140 mm ø x 59 mm B
Number and dimension of rollers JLA 15/30 G	4 rollers 140 mm ø x 120 mm B and 8 rollers 140 mm ø x 59 mm B
Overall height in mm	180
Load surface per turntable Ø C in mm	215
Dimensions L1 x B1 in mm	650 x 1000
Weight in kg	175 w/o pendant control
Air consumption / necessary minimum air pressure	25 l/s / 8 bar continuously

TRADING TERMS AND CONDITIONS

1. Scope:

All service agreements made with us are subject to our general terms of business as listed below. We do not recognize buyer's terms that contradict or differ from our conditions of sale insofar as we have not expressly agreed to the same. Our terms of business are also valid for all future transactions with the buyer.

2. Conclusion of a Contract:

Any orders that are placed with us or any changes or additions to the contract or supplementary agreements must be made in writing. Orders placed by phone or in another form are only considered to have been accepted following our confirmation, shipping or delivery of the goods and issuance of the invoice.

3. Prices / Packaging Costs:

Prices are valid as at the time the order was placed. Insofar as no agreement to the contrary is made in the order confirmation our prices are valid per delivered unit, net, ex works excluding packaging and including statutory value-added tax, which is stated separately in the invoice.

We will carry out shipping and packaging at our discretion. Any goods accepted by the shipper, carrier or recipient without dispute are considered to have been packaged correctly.

4. Conditions of Payment / Compensation:

- 4.1 Our invoices are payable within 30 days of invoice date insofar as no other agreement has been reached in the order confirmation. In the event of a delay in payment we are entitled to charge interest on arrears at a rate 8% p.a. above the basic interest rate in accordance with §1 of the bank rate law, whereby we reserve the right to also assert the right to damages for arrears at a higher rate.
- 4.2 The buyer may only offset charges against our claims for payment if his counterclaim is found to be legally binding, undisputed or expressly recognized by us.

5. Delivery and Delivery Delays:

- 5.1 The start date for a delivery deadline or delivery period that has been confirmed by us presumes the clarification of all technical and business-related questions.
- 5.2 Our delivery obligations exist on condition of complete and correct availability of supplies to us, except if we are responsible for the non-delivery or delay.
- 5.3 In the event of a delay in delivery the buyer is entitled to set a reasonable extension, which must be at least 2 weeks, in connection with the threat of refusal and may withdraw from the contract following expiry of this extended deadline. In the event of unforeseeable events that are beyond our control, such as strike, lockout, stoppage, delays in the supply or advance materials, we do not accept responsibility if we are in arrears, irrespective of whether these hindrances occur with us or with our suppliers.
- 5.4 Claims for compensation due to the violation of service obligations or non service-related auxiliary obligations can only be made if we are guilty of intent or gross negligence and this is proven. We do not rule out our liability for damages resulting from injury to life, limb or health as a proven consequence of negligent breach of duty on our part.
- 5.5 For specially manufactured goods delivery quantities can vary by up to 10% plus or minus. This discrepancy will be taken into account in the invoice.
- 5.6 For all delivered goods we reserve the right to allow industry-standard discrepancies in dimensions are other technical specifications except where we have expressed assured adherence to dimensions.
- 5.7 We are entitled to make deliveries in reasonable partial quantities.
- 5.8 In the event that the buyer delays his acceptance of the goods or if he violates other co-operation obligations we are entitled to claim for damage we have incurred, including any additional costs.
- 5.9 In the event that the buyer delays his acceptance of the goods the risk of chance destruction or chance deterioration of the ordered goods is transferred to the buyer as of the time the buyer delays the acceptance.
- 5.10 Responsibility for transportation Once goods are transferred to the carrier transfer of risk is also determined by the statutory regulations

6. Claims for Defects / Liability:

- 6.1 In the event that the newly manufactured goods delivered by us are defective then the buyer is entitled to demand subsequent fulfilment. We reserve the right to choose between repair of the defect and subsequent delivery of non-defective goods.
- 6.2 Further claims for withdrawal, reduction in costs or compensation are not possible except if the subsequent fulfilment is not successful. In this event the buyer can reduce the purchase price or, as long as the defect is not a construction service, withdraw from the contract if he so chooses. Claims for compensation based on accountable and provable intentional or grossly negligent breach of duty or claims for compensation that result from injury to life, limb or health are not excluded.
- 6.3 The buyer is not permitted to claim for withdrawal or compensation in the case of insignificant defects.
- 6.4 We are not liable to the buyer for properties that he expects in accordance with public statements by the seller or the manufacturer or their agents, particularly in advertisements, except if these statements explaining properties are expressly confirmed by us in writing.
- 6.5 We do not guarantee any property or durability where this is not expressly agreed in writing.
- 6.6 We do not accept liability for defective installation instructions from suppliers and other companies except if grossly negligent breach of duty is proven against us in this regard. The statutory regulations are valid for required examination and notice. We expressly contradict the commercial requirement for examination and notice by the buyer in accordance with § 377 HGB. The buyer must subject the goods to a comprehensive check of incoming goods.
- 6.7

7. Period of Limitation:

- 7.1 Insofar as no individual period of limitation has been agreed between the contractual parties the guarantee period for claims regarding defects in newly manufactured goods will be two years. This is not valid for the period of limitation for compensations claims following injury to life, limb or health insofar as this damage is a result of accountable and provable grossly negligent or intentional breach of duty on our part. This period of limitation is also not valid for claims for reimbursement for other damage caused by accountable grossly negligent or intentional breach of duty on our part.
- 7.2 In the case of the sale of consumer goods the limitation period for claims regarding defects is two years for newly manufactured goods and one year for used good.

8. Sale of Consumer Goods:

The regulations in figure 6, above, are not valid when based on the sale of consumer goods. However claims for compensation are also not permissible in this case except if they are caused by intentional or grossly negligent breach of duty on our part or from injury to life, limb or health resulting from intentional or grossly negligent breach of duty.

9. Reservation of Proprietary Rights:

- 9.1 We reserve the proprietary rights to the delivered goods until all payments from the delivery contract are paid. In the event of behaviour by the buyer that contradicts the contract, particularly payment arrears, we are entitled to recover the delivered goods. This reservation does not represent withdrawal from the contract insofar as we do not state this expressly in writing.
- 9.2 If we have a continuous business relationship with the buyer then the reservation of proprietary rights to the delivery goods also extends to delivery goods in all previously unpaid claims.
- 9.3 The buyer is entitled to dispose of and process the delivered goods within orderly business processes. He does, however, immediately transfer all claims he incurs resulting from the disposal to his customers or third parties to us up to the total of all unpaid claims. The buyer retains his authorization to collect the claim himself; this does not affect our authority to collect claims. We are, however, obliged not to report transfer in relation to customers or third parties as long as the buyer fulfils his payment obligations to us and no application has been made for the initiation of process of bankruptcy or settlement or payments are otherwise stopped. The buyer is obliged to provide us with all necessary information on the transferred claims on demand and to submit the corresponding documentation to us.
- 9.4 In the event that the buyer processes or converts the goods delivered by us then we have partial proprietary rights to the new object in proportion to the value of our goods in comparison to the value of the other processed objects at the time of processing. The above regulations apply to the new object created by this process in the same way.
- 9.5 The buyer will also transfer to us those claims on third parties in accordance with the above regulations that are created by the combination of our delivered goods with a piece of land.
- 9.6 Insofar as the value of all securities exceeds our claims by more than 20% because of the agreed reservation of proprietary rights, we are obliged to release securities to the excess value as we wish when requested by the buyer to do so.

10. Place of Fulfilment / Court of Jurisdiction / Choice of Law:

- 10.1 The place of fulfilment for all obligations resulting from the contractual relationship is Suessen and/or the location of an affiliated company or branch insofar as no other regulation is contained in the order confirmation.
- 10.2 If the buyer is a merchant in the German commercial register then we will agree Suessen and/or the location of an affiliated company or branch as the court of jurisdiction. We do, however, retain the right to taken the buyer to court at his general court of jurisdiction.
- 10.3 The law of the Federal Republic of Germany is valid for our contractual relationships under exclusion of the UN Convention on the International Sale of Goods.

11. Partial Invalidity:

If any contractual regulation is invalid this will not affect the validity of the remaining regulations.

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Chipster

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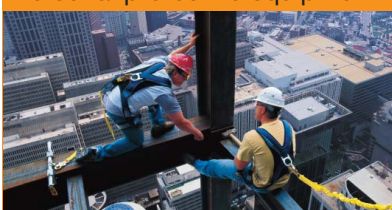
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