F.P.T.
FLUID POWER TECHNOLOGY

HIGH PRESSURE HYDRAULIC EQUIPMENT 700-4.000 BAR

LIFTING BOLTING AND TENSIONING EQUIPMENT

CONTENTS

F.P.T.
THE HIGH-PRESSURE EXPERTS

Relying on F.P.T. means choosing technical solutions based on more than 50 years of experience in the hydraulic sector.

It means utilising functional and modern technology that simplifies and improves the level of your work.

It means receiving personalised service that meets your specific requirements and satisfies any and all needs.

F.P.T.
FLUID POWER TECHNOLOGY

F.P.T.
DISTINCTIVE CHARACTER

For years F.P.T. supplies the international marketplace with a complete line of high-pressure hydraulic tools and equipment.

F.P.T. manufactures, assembles and tests, in company-owned facilities in Italy, a wide range of standard products, with ample warehouse availability, that make an operator's work easier and increase efficiency in various industrial sectors.

EXCELLENCE IN CUSTOMISED PRODUCTS

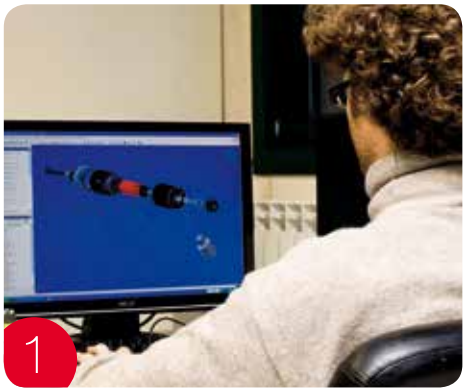
Thanks to years of sector-specific experience, highly specialised engineering and design expertise focused on developing new technical solutions, absolute quality products as well as efficient technical and after-sales service and assistance, F.P.T. has become the recognised reference in high-pressure hydraulic systems personalised to meet customer requirements.

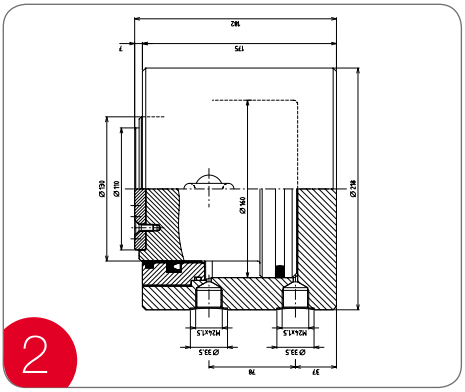
ADVANTAGES AND INNOVATIVE SOLUTIONS

serving the customer.

There's only one thing that allows F.P.T. to satisfy customer needs with products that make their work easier and better: to be first and foremost demanding with itself while always seeking the best for its customers.

F.P.T. pursues a strategy that focuses on absolute quality: all products are engineered, manufactured, assembled and tested in company-owned facilities. F.P.T. also guarantees performance excellence, from the smallest cylinder to the most complex lifting systems.





TECHNICAL CONSULTING

Inspections, when required and feasibility studies at customer sites: to find the best solution for all needs.

ENGINEERING

The best quality starts from an expert engineering department where original design solutions are developed on a daily basis to meet the technical requirements of the reference markets.

COMPONENT PRODUCTION AND ASSEMBLY

The ISO 9001 certified production system implements a rigorous quality process that starts from the selection and control of raw materials and all components, followed by precision mechanical machining and ends with heat and surface treatments to guarantee the longest possible service life.

TECHNICAL AND AFTER-SALES SERVICE

TESTING

To guarantee safety and the highest quality standards, F.P.T. always carries out precise dimensional and functional tests on all products before placing them on the market.

You can rely on F.P.T. for all the technical assistance you may need. A technical service centre is at your complete disposal for overhauling or carrying out maintenance on our products while a fully-stocked warehouse guarantees the delivery of spare parts around the world.

SERVING CUSTOMERS… AROUND THE WORLD

When excellence is the end result of traditions and innovation, the sky's the limit.
That's why F.P.T. products are used everywhere and in an incredibly wide range of industrial sectors. Products that make the job of lifting or moving large structures easier and more precise, including maintenance on motorway viaducts and large machinery, lifting and moving oil rigs and stressing stud bolts.


Heavy lifting


Transportation-infrastructure


Industrial maintenance


Engineering and construction


Steel mills


Transportation maintenance: trains – subways – buses – aircraft


Off-shore


Oil & Gas


Quarries


Wind


Energy


Shipyards and maintenance

MANUFACTURER OF:

SPECIAL EQUIPMENT AND TOOLS

F.P.T.'s strength is the ability to design and build special tools that meet customers' specific requirements. A team of experts works alongside the customer from technical consultation, engineering and production to installation of all equipment, evaluating the best technical solutions from the customer's point of view.

STANDARD PRODUCTS

WHEN THE STANDARD BECOMES A REFERENCE.

F.P.T. manufactures a wide range of standard high-pressure products, from 700 to 4000 bar, providing technical assistance and delivering spare parts around the globe.

QUALITY IS CERTIFIED.

Through its testing and prototype department, F.P.T. is constantly improving company production and productivity through specific analyses and studies.

All our products are supplied with a CE certificate and the quality management system is ISO 9001:2008 certified. This guarantees safety as well as compliance with all norms and, in particular, with the one regarding the constant satisfaction of customers.

CE of conformity
F.P.T. supplies a declaration of conformity for each product and the CE mark for the products that comply with the directives of the European Community.

F.P.T. SPECIAL PRODUCTS

What makes F.P.T. stand out from all the rest is the engineering and construction of special tools to meet customers' specific requirements: from the smallest workshop to the largest production unit, all industrial sectors can take full advantage of F.P.T. products that make work easier.

Hydraulic systems for the structural engineering sector

- Hydraulic equipment, such as high-tonnage cylinders and high flow rate hydraulic pumps, for lifting bridges and viaducts for the structural engineering sector

- Hydraulic equipment for structural maintenance, typically used for lifting decks and replacing supports or for adjusting the gradient of bridges and viaducts.

- Cylinders and hydraulic pumps for lifting, rotating and moving structures and components.

- Hydraulic systems designed to move large metal constructions for road or rail bridges.

- Tensioning of cables, stays and other load-bearing elements by means of single- or double-acting hollow cylinders.

- Synchronized lifting controlled by a PLC for synchronous management during the up and down phases for components such as: bridge and viaduct bays, heavy structural steelwork, steel brackets, concrete structures and large structures.

- Formwork lifting and holding hydraulic systems for cantilevered cranes and formwork in tunnels.

- Hydraulic equipment for launching structures and formwork.

The gradient of the bridge was achieved with cantilevered cranes, launched using a hydraulic F.P.T. system complete with double-acting cylinders with locking ring, hollow cylinders and hydraulic pump to launch 4 complete carts, 2 for each pier.

Hydraulic equipment for structural tests in civil engineering and geotechnical industries

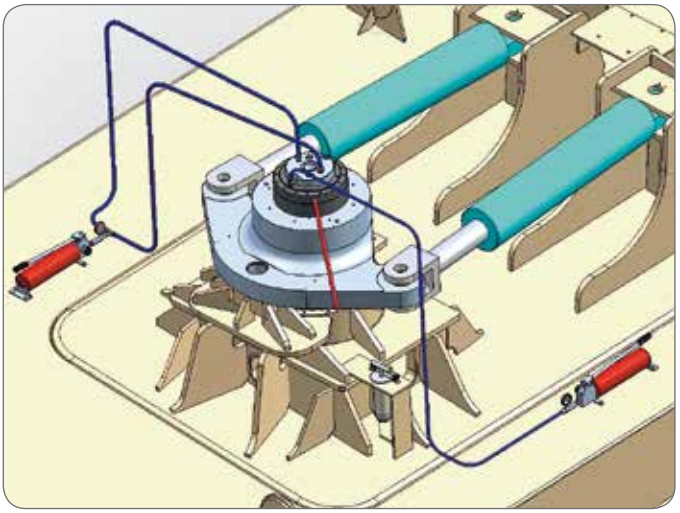
- Equipment for load tests on piles, to ascertain structural integrity of foundations and monitor behaviour.
- Hydraulic kit for static load tests with concentrated load, typically used for floor tests.
- Hydraulic equipment, made up of a hollow cylinder and hand or hydraulic pump, for pull-out tests for extracting bolts from concrete structures.
- Various hydraulic systems for structural tests and non-destructive tests in civil and construction engineering.

Equipment for lateral stress tests for safety components during the stages, by means of an F.P.T. kit made of aluminium cylinders, extensions, cross supports and hydraulic pump.

Hydraulic kit for floor Load Tests, used to carry out static load tests with concentrated load.
Kit comprising support cross members, hydraulic cylinder, light alloy extensions and hydraulic pump

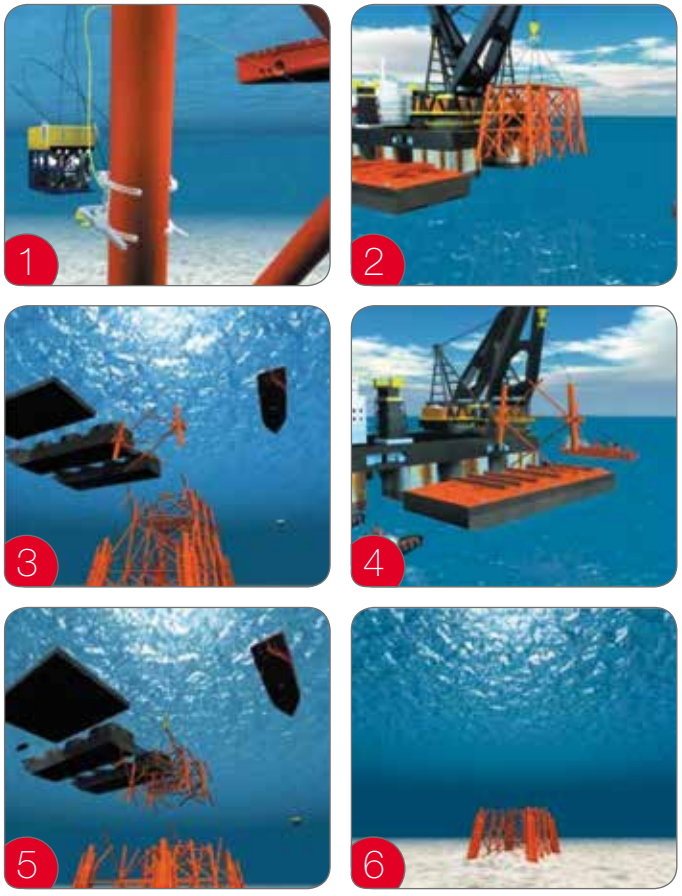
Load tests on foundation piles and failure recording with 250 ton-capacity, 250 mm stroke F.P.T. cylinders - model CRI250/250

Hydraulic nuts and keying systems



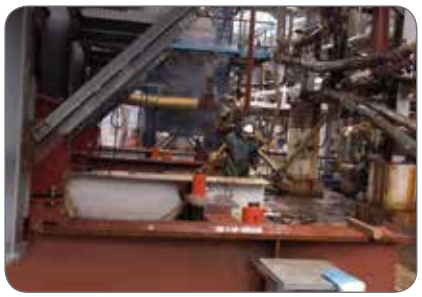
- Used mainly in the shipbuilding sector to key on and hold the position of rudder stocks or propellers.
- In these systems the hydraulic nut supplies the force to facilitate keying that also occurs as a result of the deformation.
- F.P.T. hand pumps that generate a pressure of 1600 bar are also supplied.

Dismantling a platform in the North Sea



- The platform support pipes are cut deep in the water and then a crane lifts the platform and places it on the transport barge.
- 16 F.P.T. cylinders, each with a capacity 250 tons, with safety ring are positioned to level the platform and to put each support point under the same load.

Hydraulic system for lifting and movement of large structures

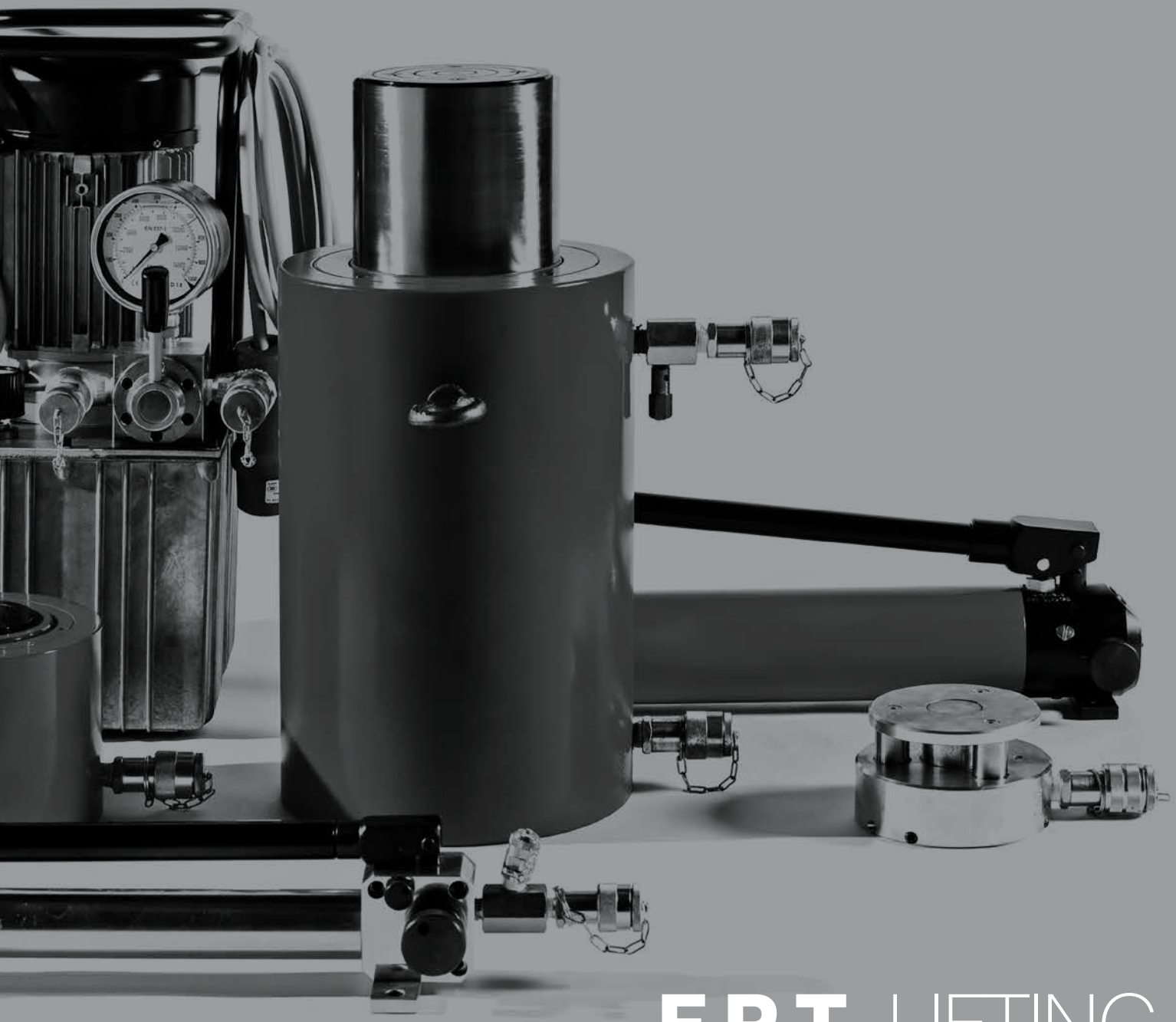


- The pictures show the lifting and movement of a petroleum distillation furnace. This 660-ton furnace was lifted and placed on roller trolleys and moved with 1.5 metre strokes.
  Once in position, it was lifted again, the roller trolleys removed, and then lowered to its final position.

- Thanks to this operation, the new furnace could be built next to the existing structure, which was subsequently demolished. As a result, production downtime was limited to just 6 days. The movement operation was completed in 7 hours.

The following F.P.T. equipment was used:

8 120-ton cylinders to lift the furnace
8 trolleys with continuous rollers
4 cylinders for the movement operation
1 ISO FLOW hydraulic pump with independent outlets, with a manual distributor.



F.P.T. LIFTING EQUIPMENT

The complete and extremely wide range of standard products manufactured by F.P.T. is truly innovative and functional and includes cylinders, hydraulic pumps, hand pumps, valves and various accessories and tools.

F.P.T.
HYDRAULIC CYLINDERS

F.P.T. manufactures a wide range of CE-certified cylinders designed for all industrial or maintenance applications in which load lifting, pushing, pulling or approach operations are required.

These single and double-acting, short or long stroke cylinders, in steel, aluminium or stainless steel, in a wide range of compact, hollow, extra flat or high-tonnage models, can be utilised in all customer applications.

CYLINDER	Capacity (ton)	Stroke (mm)	Series		Page
Single-acting cylinders with spring return	5-100	25-360	CRM		20
Compact, single-acting cylinders with spring return	10-100	50	CRM C		22
Extra flat, single-acting cylinders with spring return	4,5-150	10-15	CRM XP		24
Aluminium, single-acting cylinders with spring return	30-100	50-150	CRMA		26
Pulling, single-acting cylinders with spring return	2-100	75-160	CRM TRA CRM TR		28
Hollow, single-acting cylinders with spring return	10-100	50 - 160	CRM FO		30
Hollow cylinders with oil return	30-150	50 - 260	CRI FO		32
Single-acting cylinders with load return	5-600	15 - 300	CSE		34
Single-acting cylinders with load return safety ring	10-600	25-300	CSE GS and CRI GS		36
Cylinders with oil return	10-500	160 - 330	CRI		40
Compact cylinders with oil return	50-500	50 - 250	CRI C		42
Push-Pull, double-acting cylinders	5-30	30 - 260	CDE		44

HYDRAULIC CYLINDERS

All models are supplied with a 3/8 NPT female coupler and dust cap.
Most F.P.T. cylinders are heat-treated:

CHROME-BRONZE TREATMENT

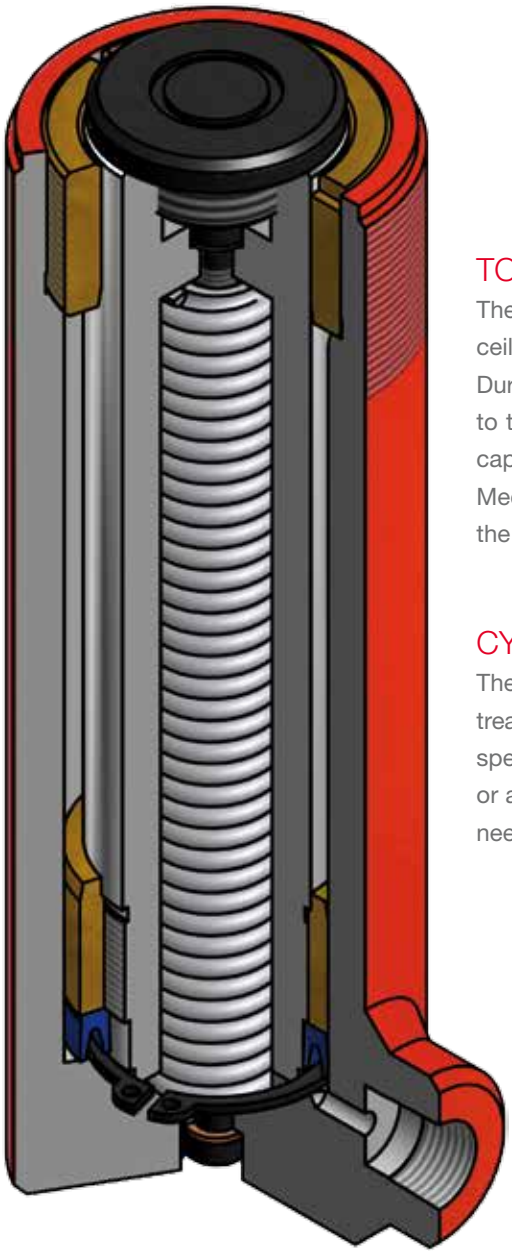
The bronze welded layer applied to plungers and guide rings or bronze components guarantee minimum friction and high absorption of any side loads, reducing any seizure. The chrome plating on the rod increases surface hardness in addition to corrosion and wear resistance.

FOR AGGRESSIVE ENVIRONMENTS ANTI-CORROSION NITROX TREATMENT

For cylinders used in outdoor applications or in marine or aggressive environments, all components are nitrox oxidized to harden the steel, increasing corrosion and wear resistance.

On request:

- Self-levelling heads
- Eyelets, flanges, rings or special connectors
- Stainless steel construction
- Custom-made strokes and tonnage capacity
- Cylinders resistant to high temperatures made with Viton gaskets for temperatures up to 200° C
- NITOX anti-corrosion treatment
- Lightweight aluminium cylinders
- RINA certifications



TO ENSURE SAFETY DURING OPERATIONS:

The capacity and stroke values supplied by the manufacturer are the recommended ceiling values to ensure safety. It is recommended not to exceed 80% of these values.
During lifting, the load must be uniformly distributed on the pushing head and perpendicular to the cylinder axis. A side load, if present, must not exceed 5% of the cylinder's rated capacity.
Mechanically secure the lifted load and never stand underneath the load during or after the lifting operation.

CYLINDER CODE DESCRIPTION

The cylinder code table shows various ranges: the construction materials, surface treatments, plunger stroke, pushing capacity and accessories. The table can be used for special cylinders and to identify your specific F.P.T cylinder and to request spare parts or a new product. If the standard products indicated in the catalogue do not satisfy your needs, special cylinders that meet specific requirements can also be built.

	A ALUMINIUM **S** STAINLESS STEEL **C** COMPACT		STROKE IN mm		TA TSELF-LEVELLING HEAD FS BALL JOINT FLA FRONT FLANGE SC SHOE	
CSE	**A**	**10**	**100**	**XP**	**TA**	
Series: CSE SINGLE-ACTING CRM SPRING RETURN CRI OIL RETURN CDE DOUBLE-ACTING		CAPACITY in tons at 700 bar		Type: GS SAFETY RING XP EXTRA FLAT FO HOLLOW TRA PULLING WITH EYELETS N NITROX		CUSTOMER ID FOR SPECIAL CYLINDERS

CRM

Up to 100 ton
Stroke up to 360 mm
700 bar

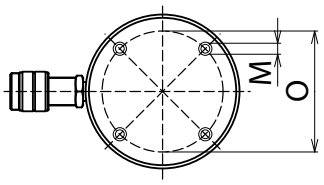
CRM Series — Single-acting cylinders with spring return

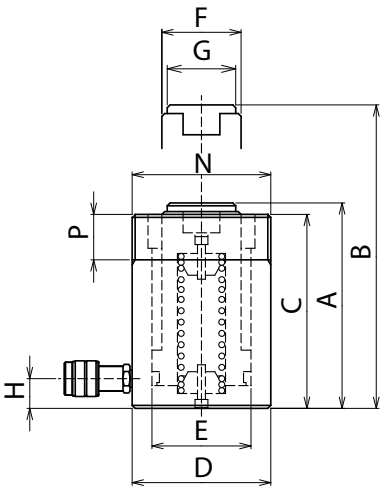
The most versatile cylinder for various utilizations

- Hydraulic cylinders for various utilizations, extremely versatile and suitable for diverse fields of applications.
- Spring-actuated return.
- The guide and stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The wiper reduces contamination between ring and rod.
- High-strength removable head.
- Drilled and threaded base for additional attachments.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Tensioning Operations





CRM

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm											
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	G	H	O	M	N	P
5 /49.5	25	CRM-5/25	7.1	17.7	1	110	135	108	40	30	25	24	20	20	2xM6	M40x1.5	20
	50	CRM-5/50	7.1	35.4	1.2	135	185	133	40	30	25	24	20	20	2xM6	M40x1.5	20
	75	CRM-5/75	7.1	53.3	1.4	160	235	158	40	30	25	24	20	20	2xM6	M40x1.5	20
	100	CRM-5/100	7.1	70.7	1.6	185	285	183	40	30	25	24	20	20	2xM6	M40x1.5	20
	125	CRM-5/125	7.1	88.4	1.8	210	335	208	40	30	25	24	20	20	2xM6	M40x1.5	20
	150	CRM-5/150	7.1	106.5	2	235	385	233	40	30	25	24	20	20	2xM6	M40x1.5	20
	175	CRM-5/175	7.1	123.7	2.2	260	435	258	40	30	25	24	20	20	2xM6	M40x1.5	20
	200	CRM-5/200	7.1	141.4	2.3	285	485	283	40	30	25	24	20	20	2xM6	M40x1.5	20
	230	CRM-5/230	7.1	162.6	2.6	315	545	313	40	30	25	24	20	20	2xM6	M40x1.5	20
10 /111.3	25	CRM-10/25	15.9	39.8	1.9	91	116	90	60	45	38	37	22	25	2xM8	M60x1.5	32
	50	CRM-10/50	15.9	79.6	2.4	121	171	115	60	45	38	37	22	25	2xM8	M60x1.5	32
	100	CRM-10/100	15.9	159.2	3.6	188	288	182	60	45	38	37	22	25	2xM8	M60x1.5	32
	160	CRM-10/160	15.9	254.5	4.7	248	408	242	60	45	38	37	22	25	2xM8	M60x1.5	32
	200	CRM-10/200	15.9	318.1	5.3	288	488	282	60	45	38	37	22	25	2xM8	M60x1.5	32
	260	CRM-10/260	15.9	413.5	6.4	348	608	342	60	45	38	37	22	25	2xM8	M60x1.5	32
	300	CRM-10/300	15.9	477.1	7.3	400	700	394	60	45	38	37	22	25	2xM8	M60x1.5	32
	355	CRM-10/355	15.9	564.6	9.2	498	853	492	60	45	38	37	22	25	2xM8	M60x1.5	32
15 /137.4	50	CRM-15/50	19.6	98.2	4.2	149	199	141	70	50	42	41	22	30	2xM8	M70x2	32
	100	CRM-15/100	19.6	196.4	5.3	199	299	191	70	50	42	41	22	30	2xM8	M70x2	32
	160	CRM-15/160	19.6	314.2	7.2	272	432	264	70	50	42	41	22	30	2xM8	M70x2	32
	260	CRM-15/260	19.6	510.5	9.5	372	632	364	70	50	42	41	22	30	2xM8	M70x2	32
	360	CRM-15/360	19.6	706.9	12.4	490	850	482	70	50	42	41	22	30	2xM8	M70x2	32
25 /232.3	25	CRM-25/25	33.2	83	6.9	139	164	130	92	65	55	53	22	37	2xM10	M92x2	37
	50	CRM-25/50	33.2	165.9	7.9	164	214	155	92	65	55	53	22	37	2xM10	M92x2	37
	100	CRM-25/100	33.2	331.8	9.8	214	314	205	92	65	55	53	22	37	2xM10	M92x2	37
	160	CRM-25/160	33.2	530.9	12.1	274	434	265	92	65	55	53	22	37	2xM10	M92x2	37
	200	CRM-25/200	33.2	663.7	13.7	314	514	305	92	65	55	53	22	37	2xM10	M92x2	37
	260	CRM-25/260	33.2	862.8	16	374	634	365	92	65	55	53	22	37	2xM10	M92x2	37
	300	CRM-25/300	33.2	995.5	18.4	430	730	421	92	65	55	53	22	37	2xM10	M92x2	37
	360	CRM-25/360	33.2	1194.6	21	495	855	486	92	65	55	53	22	37	2xM10	M92x2	37
30 /309.3	100	CRM-30/100	44.2	441.8	15.2	223	323	212	112	75	60	58	27	50	4xM10	M112x2	42
	200	CRM-30/200	44.2	883.6	22.2	340	540	329	112	75	60	58	27	50	4xM10	M112x2	42
50 /549.8	50	CRM-50/50	78.5	392.7	19	172	222	160	140	100	80	79	32	70	2xM12	M140x3	45
	100	CRM-50/100	78.5	785.4	23.3	222	322	210	140	100	80	79	32	70	2xM12	M140x3	45
	160	CRM-50/160	78.5	1256.6	28.5	282	442	270	140	100	80	79	32	70	2xM12	M140x3	45
	330	CRM-50/330	78.5	2591.8	45.2	470	800	458	140	100	80	79	32	70	2xM12	M140x3	45
100 /1077.6	100	CRM-100/100	153.9	1539.4	51	260	360	245	190	140	110	107	35	100	4xM12	M190x4	52
	170	CRM-100/170	153.9	2616.9	62	330	500	315	190	140	110	107	35	100	4xM12	M190x4	52
	260	CRM-100/260	153.9	4002.4	81	440	700	425	190	140	110	107	35	100	4xM12	M190x4	52

Cylinders with different strokes are also available.

CRM-C

10-100 ton
Stroke 50 mm
700 bar

CRM-C Series

Compact, single-acting cylinders with spring return

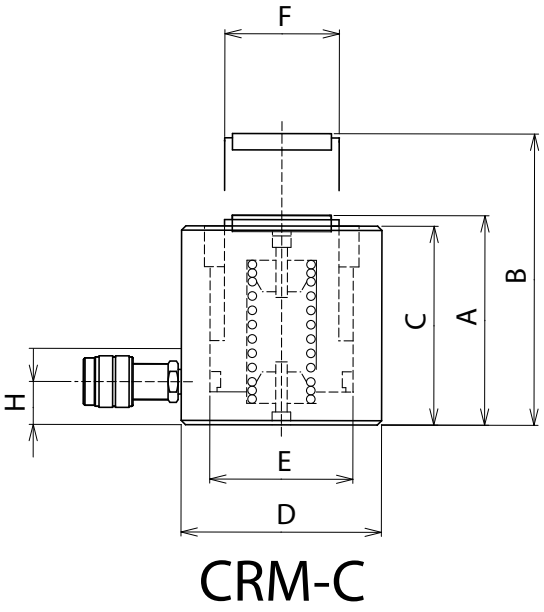
When being compact is a must

- Lightweight, easy-to-handle cylinders with limited closed height.
- Ideal for pushing and levelling operations in confined areas. Widely used in industrial assemblies and in the building sector.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- High strength steel plunger, Nitox treatment to increase resistance to wear and to corrosion.
- The wiper reduces contamination between ring and rod.
- High-strength, splined and removable head.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

100 ton-capacity compact cylinder - Model F.P.T. CRM100/50C 100 ton capacity, 50 mm stroke

100 ton compact cylinder – spring return with unidirectional flow control valve



CRM-C

Compact cylinder with spring return (100-ton capacity and 50 mm stroke) and self-levelling head.

NEWS SERIES

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm						
ton (kN)	mm		cm^2	cm^3	kg	A	B	C	D	E	F	H
10 /111,3	50	CRM-10/50-C	15,9	79,5	3,2	95	145	94	77	45	35	18
20 /218,2	50	CRM-20/50-C	31,2	155,9	4,7	103	153	102	93	63	50	19
30 /309,3	50	CRM-30/50-C	44,2	220,9	6,9	110	160	108	108	75	60	21
50 /549,8	50	CRM-50/50-C	78,5	392,7	9,7	120	170	118	126	100	80	19
100 /929,1	50	CRM-100/50-C	132,7	663,5	18,8	134	184	132	167	130	110	23

Cylinders with different strokes are also available.

CRM XP

4.5-150 ton
Stroke 10-15 mm
700 bar

CRM XP
Series

Extra flat, single-acting cylinders with spring return

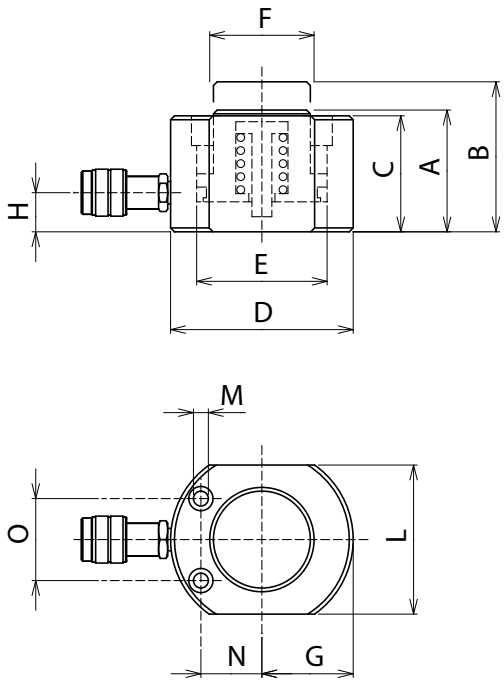
Ideal for narrow and confined areas

- Flat cylinders with extremely reduced closed height, ideal for working in narrow spaces where it would be impossible to use other cylinders.
- Thanks to its small dimensions the cylinder is ideal for lifting machinery, alignment operations, releasing moulds and bridge crane maintenance.
- Spring-actuated return. Designed to operate in any position.
- Nitrox surface treatment to increase hardness and corrosion resistance.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.

SPECIAL CYLINDERS ON REQUEST

Extra flat cylinder, 50-ton capacity, 16 mm stroke, with built-in self-levelling head.

CRM 30/10 XP used to align machinery.



CRM-XP

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm											
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	O	H	M	N	G	L
4.5 /43.1	6	CRM-5/6-XP	6.2	3.6	1	37	43	36	59	28	24	30	18	5.5	23	23.5	45
4.5 /43.1	15	CRM-5/15-XP	6.2	9.2	1.2	46	61	45	59	28	24	30	18	5.5	23	23.5	45
10 /111.3	10	CRM-10/10-XP	15.9	15.9	1.6	50	60	49	75	45	38	40	19	6.5	28	31.5	60
20 /218.2	10	CRM-20/10-XP	31.2	31.2	3	53	63	52	101	63	50	50	19	11	40	43	86
30 /309.3	10	CRM-30/10-XP	44.2	44.2	4.2	58	68	56	117	75	60	60	20	11	45	51	102
50 /549.8	10	CRM-50/10-XP	78.5	78.5	7.4	64	74	62	147	100	80	70	22	13	58	66	130
75 /791.7	10	CRM-75/10-XP	113.1	113.1	12	70	80	68	177	120	100	90	24	13	68	81	164
100 /1077.6	10	CRM-100/10-XP	153.9	153.9	15.4	77	87	75	192	140	120	90	21	13	76	88.5	178
150 /1496.8	14	CRM-150/14-XP	213.8	299.4	29	104	118	102	227	165	130	130	25	13	80	106	215

Cylinders with different strokes are also available.

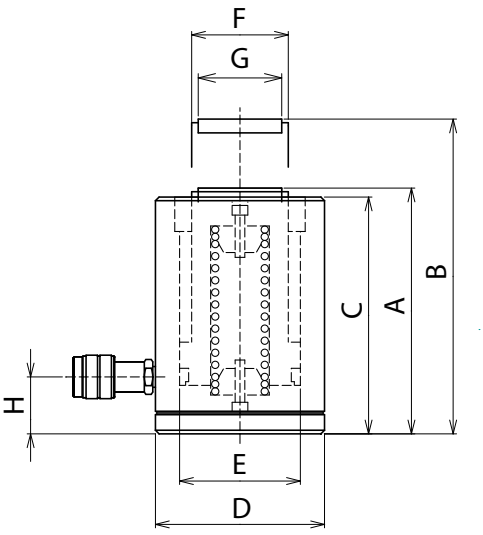
CRMA
30-100 ton
Stroke 50-150 mm
700 bar

CRMA Series — Aluminium, single-acting cylinders with spring return

- Built with special high-strength aluminium alloy.
- Lightweight cylinders that are easy to carry and very easy to handle. Used in applications in which reduced weight is an important factor.
- Spring-actuated return. Designed to operate in any position.
- Steel baseplate to prevent the cylinder from deforming if used on surfaces that are not perfectly flat.
- The stop ring guarantees maximum operator safety, preventing plunger over-stroke.
- The wiper reduces contamination between ring and rod.
- High-strength removable head, concentrically splined to distribute the load uniformly over the entire surface.

SPECIAL CYLINDERS ON REQUEST

CRMA 50/150 to lift a press section.



CRMA

Various aluminium cylinder models are also available

- CSEA single-acting cylinders with load return.

  Models in stock:
  CSEA-15/125
  CSEA-25/125
  CSEA-35/130

- CRIA double-acting cylinders with oil return.

- CRMAFO hollow, single-acting cylinders with spring return.

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm							
ton (kN)	mm		cm^2	cm^3	kg	A	B	C	D	E	F	G	H
30 /309.3	50	CRMA-30/50	44.2	220.9	5.3	170	220	166	120	75	60	52	40
	100	CRMA-30/100	44.2	441.8	6.6	220	320	216	120	75	60	52	40
50 /496.2	50	CRMA-50/50	70.9	354.4	9.7	178	228	174	149	95	80	72	45
	100	CRMA-50/100	70.9	708.8	11.9	226	326	222	149	95	80	72	45
	150	CRMA-50/150	70.9	1063.2	14.2	276	426	272	149	95	80	72	45
100 /1002	50	CRMA-100/50	143.1	715.7	19	192	242	188	198	135	110	92	50
	100	CRMA-100/100	143.1	1431.4	23	247	347	243	198	135	110	92	50
	150	CRMA-100/150	143.1	2147.1	28	307	457	303	198	135	110	92	50

Cylinders with higher tonnage and different strokes are also available.

CRM TRA-TR
2-100 ton
Stroke 75-160 mm
700 bar

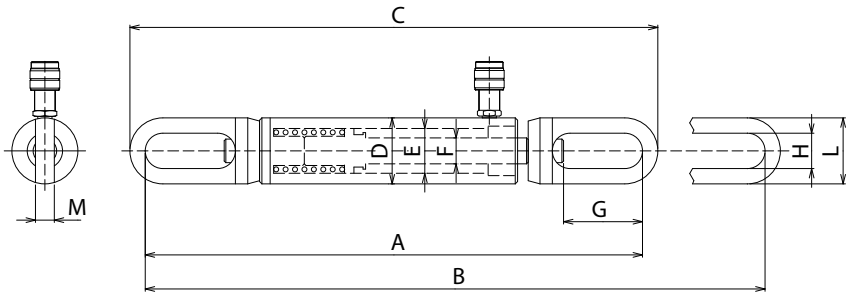
CRM TRA-TR Series — Pulling, single-acting cylinders with spring return

Pulling force: for structure approach operations

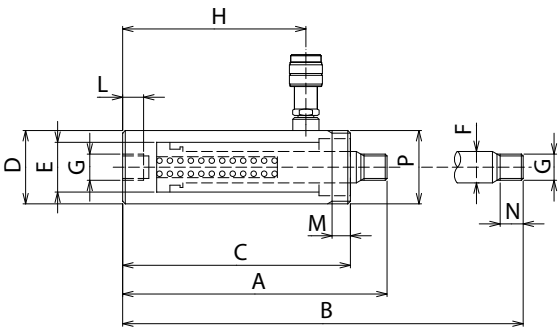
- Cylinders that operate under a pulling force. Ideal for load approach and welding operations in the shipbuilding and heavy structural steelwork sectors. Used in the laboratory to test construction materials for civil engineering applications.
- Spring-actuated return. Designed to operate in any position.
- The wiper reduces contamination entering the cylinder, limiting wear over time.
- High-strength, removable steel eyelets.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Double-acting pulling cylinder CRI 250/300 SN for bridge starling movement.



CRM-TRA



CRM-TR

- The eyelet can be used to adjust the extended and closed heights of the CRM30/75 TRA and CRM 30/155 TRA models.
- Construction on request of forks and pins, protective bellows and connectors or threads based on customer specifications.

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm								
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	G	H	L
10 /109	75	CRM-10/75-TRA	15.7	118	13.5	531	606	567	78	55	32	95	42	78
10 /109	150	CRM-10/150-TRA	15.7	235	14.5	606	756	642	78	55	32	95	42	78
30 /304.3	75	CRM-30/75-TRA	40.84	314	28.5	700 - 804	775 - 879	750 - 854	114	85	45	100	54	104
30 /304.3	155	CRM–30/155-TRA	40.84	648.5	38	810 - 914	965 - 1069	860 - 964	114	85	45	100	54	104
60 /613.1	80	CRM–60/80-TRA	84.23	674	70.5	690	770	768	175	125	70	137	62	140
60 /613.1	155	CRM–60/155–TRA	84.23	1306	92.5	840	995	918	175	125	70	137	62	140
100 /1042.3	160	CRM–100/160–TRA	143.2	2292	170	950	1110	1048	225	165	95	149	72	170

CAP/Forza	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSION IN mm											
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	G	H	L	M	N	P
2 /22.9	127	CRM 2/127 TR	3.27	41.5	1.8	234	361	202.5	40	30	22	3/4 NPT	163.5	22	20	18	M40 X 1.5
5 /53	140	CRM 5/140 TR	7.57	106	4.9	300	440	255	60	45	32	1 - 1/4 NPT	201.5	30	35	22	M60 X 1.5
10 /102.9	150	CRM 10/150 TR	14.13	226.9	8.4	304	454	264	80	55	35	M30X2	220	25	24	25	M80 X 2

Cylinders with higher tonnage and different strokes are also available.

CRM-FO
10-100 ton
Stroke 50-160 mm
700 bar

CRM-FO Series

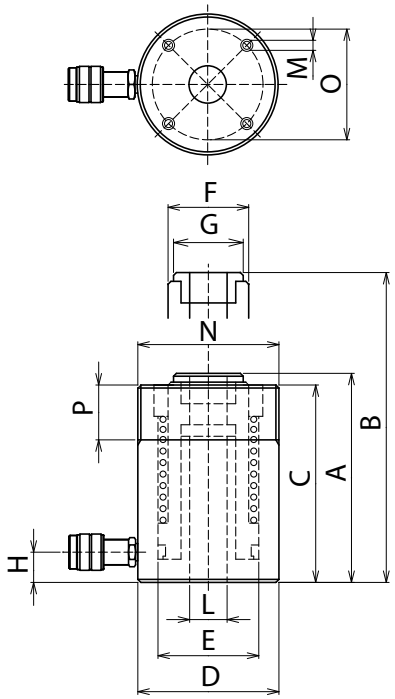
Hollow, single-acting cylinders with spring return

Cylinders for tensioning operations, maintenance and testing

- Cylinders with a hollow center.
- Designed for cable tensioning operations, positioning bars in tensile structures, pulley assembly and disassembly, and cable and tie rod pulling tests.
- Spring-actuated return.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The wiper reduces contamination between ring and rod.
- Hollow, high-strength, splined removable head.
- Base with threaded holes to fasten the cylinder in any position.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Hollow, single-acting cylinder with safety ring CRM 60/260 GS for bridge launching operations.



CRM-FO

HEADS AND ACCESSORIES
A wide range of threaded or flat push heads, connectors and anchor plates based on customer specifications is also available. See the CYLINDER ACCESSORIES page.

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm												
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	G	H	L	M	N	O	P
10 /115.4	50	CRM-10/50-FO	16.5	83	3.7	143	193	131	74	54	40	38	24	19.5	2xM8	M74x2	40	20
	80	CRM-10/80-FO	16.5	132	4.7	191	271	179	74	54	40	38	24	19.5	2xM8	M74x2	40	20
20 /238.2	50	CRM-20/50-FO	34	171	7.7	160	210	148	100	76	56	54	24	27.3	2xM8	M100x2	55	20
	100	CRM-20/100-FO	34	341	11.8	248	348	236	100	76	56	54	24	27.3	2xM8	M100x2	55	20
	160	CRM-20/160-FO	34	545	16.3	347	507	335	100	76	56	54	24	27.3	2xM8	M100x2	55	20
30 /295.3	50	CRM-30/50-FO	42.2	211	11.3	177	227	165	115	86	63	61	27	33.5	2xM10	M115x2	65	20
	100	CRM-30/100-FO	42.2	422	16.8	267	367	255	115	86	63	61	27	33.5	2xM10	M115x2	65	20
	150	CRM-30/150-FO	42.2	633	22.8	363	513	351	115	86	63	61	27	33.5	2xM10	M115x2	65	20
60 /589.6	75	CRM-60/75-FO	84.2	632	30	262	337	250	160	125	90	90	30	54.5	2xM12	M160x4	130	35
	150	CRM-60/150-FO	84.2	1264	37	337	487	325	160	125	90	90	30	54.5	2xM12	M160x4	130	35
100 /947	75	CRM-100/75-FO	135,3	1015	55	267	342	255	215	165	125	125	38	80,5	4xM12	M215x4	175	45

Cylinders with higher tonnage and different strokes are also available.

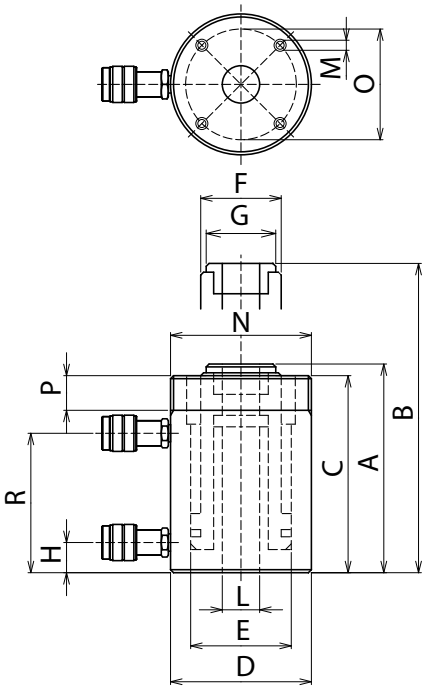
CRI-FO
30-150 ton
Stroke 50-260 mm
700 bar

CRI-FO Series — Hollow cylinders with oil return

- Cylinders with a hollow center.
- Designed for cable tensioning operations, positioning bars in tensile structures, pulley assembly and disassembly, hoisting, and cable and tie rod pulling tests.
- With the oil return system strokes can be longer than in cylinders with a spring return. Thanks to the oil return system, return times are shorter and under all operating conditions.
- With the threaded body cylinder positioning is easier, more accurate and safer.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The wiper reduces contamination between ring and rod.
- Hollow, high-strength, splined removable head.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Lifting sections of concrete structure bridges using 60 ton-capacity hollow cylinders and traction bars.



CRI-FO

CRI 100/150 FO and CRI 60/250 FO GS cylinders used for lifting structures in the infrastructure sector.

Hollow double-acting 800 ton-capacity cylinder.

CAP	STROKE	MODEL	FORCE max kN		SECTION cm²		VOLUME cm³		WEIGHT	DIMENSIONS in mm													
ton	mm		Thrust	Traction	Thrust	Traction	Thrust	Traction	kg	A	B	C	D	E	F	G	H	L	M	N	O	P	R
30	50	CRI-30/50-FO	295,3	29,4	42,2	19,6	211	99	11,7	177	227	165	115	86	70	64	27	33,5	2xM10	M115x2	65	20	120
	100	CRI-30/100-FO	295,3	29,4	42,2	19,6	422	197	15,3	236	336	224	115	86	70	64	27	33,5	2xM10	M115x2	65	20	175
	150	CRI-30/150-FO	295,3	29,4	42,2	19,6	633	295	18,3	286	436	274	115	86	70	64	27	33,5	2xM10	M115x2	65	20	225
	260	CRI-30/260-FO	295,3	29,4	42,2	19,6	1097	510	26,4	418	678	406	115	86	70	64	27	33,5	2xM10	M115x2	65	20	335
60	75	CRI-60/75-FO	589,6	77,8	84,2	51,8	632	389	25,1	207	282	200	160	125	95	90	30	54,5	2xM12	M160x4	130	35	143
	160	CRI-60/160-FO	589,6	77,8	84,2	51,8	1348	830	33,4	292	452	285	160	125	95	90	30	54,5	2xM12	M160x4	130	35	228
	260	CRI-60/260-FO	589,6	77,8	84,2	51,8	2191	1348	43,3	392	652	385	160	125	95	90	30	54,5	2xM12	M160x4	130	35	328
100	75	CRI-100/75-FO	947	121,6	135,28	81,09	1015	608	52	242	317	235	215	165	130	125	38	80,5	4xM12	M215x4	175	45	164
	150	CRI-100/150-FO	947	121,6	135,28	81,09	2029	1216	65,5	317	467	310	215	165	130	125	38	80,5	4xM12	M215x4	175	45	239
	260	CRI-100/260-FO	947	121,6	135,28	81,09	3517	2108	85,4	427	687	420	215	165	130	125	38	80,5	4xM12	M215x4	175	45	349
150	200	CRI-150/200-FO	1435	160,2	205	106,8	4100	2136	101	354	554	350	247	190	150	139	38	80,5	-	-	-	-	287

Cylinders with higher tonnage and different strokes are also available.

CSE
5-600 ton
Stroke 15-300 mm
700 bar

CSE Series

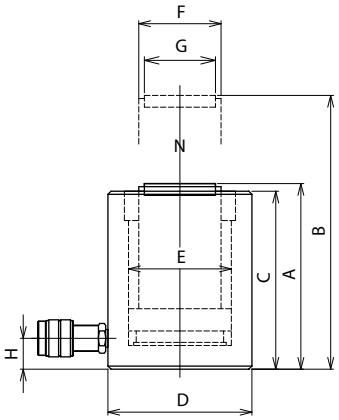
Single-acting cylinders with load return

- These compact, single-acting cylinders with load return are designed for industrial maintenance, civil shipbuilding and building industries in addition to the structural steelwork sectors.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The cylinders can withstand eccentric loads up to 5% of the rated capacity.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

CSE 1000/200 GS cylinders with load return and tilting plate for bridge section levelling.

CSE 50/100 for lifting machinery.



CSE

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm							
ton (kN)	mm		cm²	cm³	kg	A	B	C	D	E	F	G	H
5 /44.7	15	CSE-5/15-F	6.4	9.6	1	45	60	44	60	28.5	24	-	19
	80	CSE-5/80-F	6.4	51	2.4	125	205	124	60	28.5	24	-	19
10 /111.3	25	CSE-10/25	15.9	39.8	1.6	77	102	71	60	45	38	30	20
	50	CSE-10/50	15.9	79.5	2	102	152	96	60	45	38	30	20
20 /218.2	25	CSE-20/25	31.2	77.9	3.9	84	109	79	92	63	50	40	21
	50	CSE-20/50	31.2	155.9	5	109	159	104	92	63	50	40	21
30 /309.3	25	CSE-30/25	44.2	110.4	6	92	117	86	108	75	60	52	24
	50	CSE-30/50	44.2	220.9	7.4	117	167	111	108	75	60	52	24
	100	CSE-30/100	44.2	441.8	10.4	167	267	161	108	75	60	52	24
50 /549.8	25	CSE-50/25	78.5	196.3	11.5	104	129	98	140	100	80	72	30
	50	CSE-50/50	78.5	392.7	14	129	179	123	140	100	80	72	30
	100	CSE-50/100	78.5	785.4	18.9	179	279	173	140	100	80	72	30
	150	CSE-50/150	78.5	1178.1	24.8	237	387	231	140	100	80	72	30
100 /1077.6	25	CSE-100/25	153.9	384.8	24	117	142	111	190	140	118	92	34
	50	CSE-100/50	153.9	769.7	29	142	192	136	190	140	118	92	34
	100	CSE-100/100	153.9	1539.4	38	192	292	186	190	140	118	92	34
	150	CSE-100/150	153.9	2309.1	52	261	411	255	190	140	118	92	34
	200	CSE-100/200	153.9	3078.8	61	311	511	305	190	140	118	92	34
150 /1407.4	25	CSE-150/25	201.1	502.7	40	145	170	139	218	160	130	110	37
	50	CSE-150/50	201.1	1005.3	46	170	220	164	218	160	130	110	37
	100	CSE-150/100	201.1	2010.6	58	220	320	214	218	160	130	110	37
	150	CSE-150/150	201.1	3015.9	71	274	424	268	218	160	130	110	37
	200	CSE-150/200	201.1	4021.2	90	347	547	341	218	160	130	110	37
	250	CSE-150/250	201.1	5026.5	106	413	663	407	218	160	130	110	43
200 /1984.7	25	CSE-200/25	283.5	708.8	59	167	192	161	258	190	150	138	47
	50	CSE-200/50	283.5	1417.6	67	192	242	186	258	190	150	138	47
	100	CSE-200/100	283.5	2835.3	82	242	342	236	258	190	150	138	47
	150	CSE-200/150	283.5	4252.9	96	292	442	286	258	190	150	138	47
	200	CSE-200/200	283.5	5670.6	117	357	557	351	258	190	150	138	47
	250	CSE-200/250	283.5	7088.2	139	427	677	421	258	190	150	138	52
	300	CSE-200/300	283.5	8505.9	158	487	787	481	258	190	150	138	52
250 /2424.5	50	CSE-250/50	346.4	1731.8	111	228	278	222	290	210	170	148	52
	150	CSE-250/150	346.4	5195.4	154	328	478	322	290	210	170	148	52
	250	CSE-250/250	346.4	8659	206	447	697	441	290	210	170	148	52
300 /2908.3	50	CSE-300/50	415.5	2077.4	122	225	275	218	308	230	180	158	57
	150	CSE-300/150	415.5	6232.1	168	325	475	318	308	230	180	158	57
	250	CSE-300/250	415.5	10386.9	222	440	690	433	308	230	180	158	57
400 /4007.9	50	CSE-400/50	572.6	2862.8	193	250	300	243	365	270	220	196	67
	150	CSE-400/150	572.6	8588.3	270	362	512	355	365	270	220	196	67
	250	CSE-400/250	572.6	14313.9	337	462	712	455	365	270	220	196	67
500 /4948	50	CSE-500/50	706.9	3534.3	255	274	324	267	400	300	240	214	72
	150	CSE-500/150	706.9	10602.9	333	374	524	367	400	300	240	214	72
	250	CSE-500/250	706.9	17671.5	429	492	742	485	400	300	240	214	72
600 /5987.1	50	CSE-600/50	855.3	4276.5	325	287	337	280	440	330	270	244	82
	150	CSE-600/150	855.3	12829.5	422	387	537	380	440	330	270	244	82
	250	CSE-600/250	855.3	21382.5	540	505	755	498	440	330	270	244	82

Cylinders with higher tonnage and different strokes are also available.

CSE GS
10-600 ton
Stroke 25-300 mm
700 bar

CSE GS Series — Single-acting cylinders with load return and safety ring

- With the threaded safety ring the load can be mechanically locked and held for extended periods of time even when the hydraulic pump is disconnected. Therefore, the operator can work under a lifted load in complete safety.
- Cylinders designed to support and hold bridges, viaducts and heavy structural steelwork.
- **The end-stroke ring guarantees maximum operator safety, preventing plunger over-stroke.**
- High-strength removable head.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Very high tonnage (1200 ton) cylinders with self-levelling head for heavy lifting operations in the infrastructure sector.

CSE GS TU Series

Single acting plunging cylinders load return

- With Lock Nut to provide mechanical load holding for extended periods of time.
- Plunging version - Overflow port functions as a stroke limiter
- Anti-corrosion Nitox treatment

50 -1000 ton
50-300 mm stroke

CSE GS TU TA Series

Single acting cylinders load return with an extremely low height for use in confined areas

- With Lock Nut to provide mechanical load holding for extended periods of time.
- Plunging version - Overflow port functions as a stroke limiter
- Anti-corrosion Nitox treatment
- Saddle Max. Tilt Angle 3-5%

50 -1000 ton
45-50 mm stroke

CRI GS Series

Double acting cylinders with Lock Nut to maintain the load and to have an easy return of the piston

- Anti-corrosion Nitox treatment

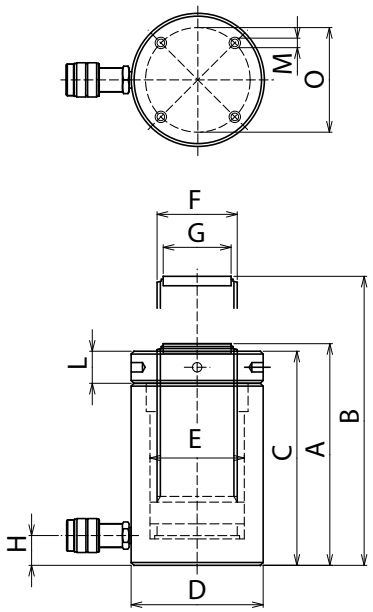
50 -1000 ton
50-300 mm stroke

CRI 200/100 GS TA double-acting cylinders with safety ring for lifting structures.

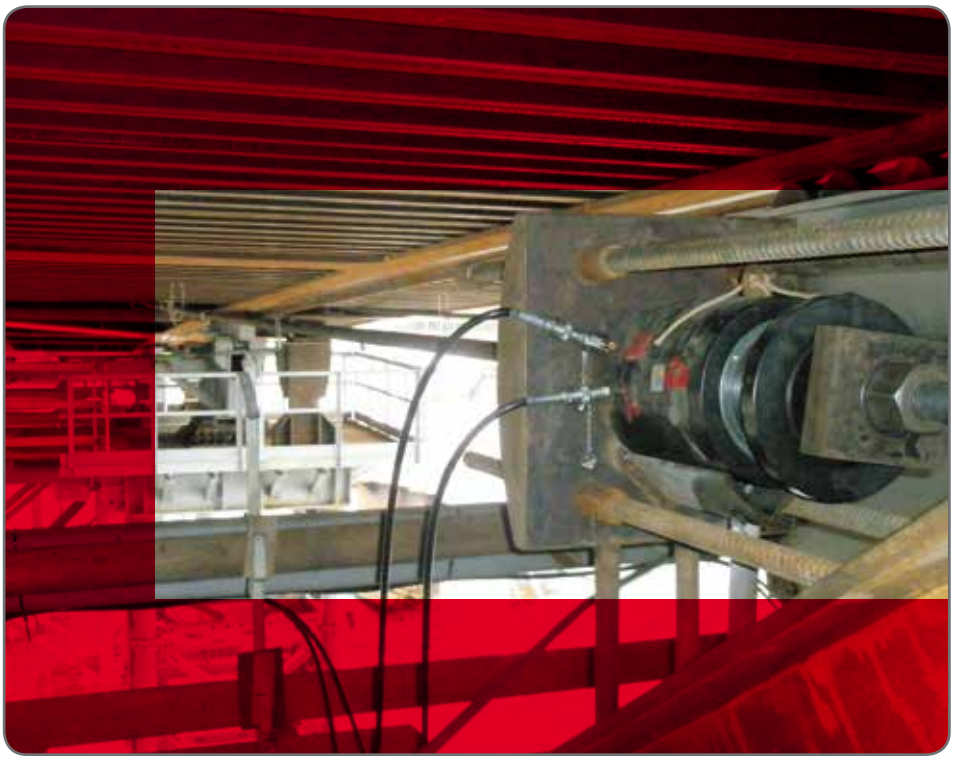
Plunging cylinders Series CSE GS TU TA

CAP/Force	STROKE	MODEL	SECTION	VOLUME	WEIGHT	DIMENSIONS in mm										
ton (kN)	mm		cm^2	cm^3	kg	A	B	C	D	E	F	G	H	L	M	O
10 /111.3	25	CSE-10/25-GS	15.9	39.7	3.1	97	122	88	75	45	Tr38 x3	30	19	18	M8	58
	50	CSE-10/50-GS	15.9	79.5	3.9	122	172	113	75	45	Tr38 x3	30	19	18	M8	58
20 /218.2	25	CSE-20/25-GS	31.2	77.9	5.5	120	145	108	92	63	Tr52 x6	40	20	25	M8	75
	50	CSE-20/50-GS	31.2	155.8	6.6	145	195	133	92	63	Tr52 x6	40	20	25	M8	75
	100	CSE-20/100-GS	31.2	311.7	8.9	195	295	183	92	63	Tr52 x6	40	20	25	M8	75
30 /309.2	25	CSE-30/25-GS	44.2	110.4	9.5	134	159	126	113	75	Tr65 x6	52	24	28	M10	92
	50	CSE-30/50-GS	44.2	220.8	11.2	159	209	151	113	75	Tr65 x6	52	24	28	M10	92
	100	CSE-30/100-GS	44.2	441.7	14.7	209	309	201	113	75	Tr65 x6	52	24	28	M10	92
50 /549.7	25	CSE-50/25-GS	78.5	196.3	16.6	148	173	140	140	100	Tr85 x6	72	30	34	M10	110
	50	CSE-50/50-GS	78.5	392.6	19.2	173	223	165	140	100	Tr85 x6	72	30	34	M10	110
	100	CSE-50/100-GS	78.5	785.3	25.8	235	335	227	140	100	Tr85 x6	72	30	34	M10	110
	150	CSE-50/150-GS	78.5	1178	30.9	285	435	277	140	100	Tr85 x6	72	30	34	M10	110
100 /1077.5	50	CSE- 100/50-GS	153.9	769.6	41	202	252	188	190	140	Tr120x10	92	34	48	M10	150
	100	CSE-100/100-GS	153.9	1539.3	51	252	352	238	190	140	Tr120x10	92	34	48	M10	150
	150	CSE-100/150-GS	153.9	2309	63	312	462	298	190	140	Tr120x10	92	34	48	M10	150
	200	CSE-100/200-GS	153.9	3078.7	72	362	562	348	190	140	Tr120x10	92	34	48	M10	150
150 /1407.4	50	CSE-150/50-GS	201.1	1005.3	69	252	302	238	218	160	Tr130x10	110	37	66	M10	180
	100	CSE-150/100-GS	201.1	2010.6	81	302	402	288	218	160	Tr130x10	110	37	66	M10	180
	150	CSE-150/150-GS	201.1	3015.9	93	352	502	338	218	160	Tr130x10	110	37	66	M10	180
	200	CSE-150/200-GS	201.1	4021.2	109	418	618	404	218	160	Tr130x10	110	37	66	M10	180
	250	CSE-150/250-GS	201.1	5026.5	123	475	725	461	218	160	Tr130x10	110	43	66	M10	120
200 /1984.7	25	CSE-200/25-GS	283.5	708.8	88	245	270	231	258	190	Tr160x10	138	47	70	M12	200
	50	CSE-200/50-GS	283.5	1417.6	96	270	320	256	258	190	Tr160x10	138	47	70	M12	200
	100	CSE-200/100-GS	283.5	2835.2	112	320	420	306	258	190	Tr160x10	138	47	70	M12	200
	150	CSE-200/150-GS	283.5	4252.9	127	370	520	356	258	190	Tr160x10	138	47	70	M12	200
	200	CSE-200/200-GS	283.5	5670.5	147	430	630	416	258	190	Tr160x10	138	47	70	M12	200
	250	CSE-200/250-GS	283.5	7088.2	164	485	735	471	258	190	Tr160x10	138	52	70	M12	140
	300	CSE-200/300-GS	283.5	8505.8	184	545	845	531	258	190	Tr160x10	138	52	70	M12	140
250 /2424.5	50	CSE-250/50-GS	346.4	1731.8	152	310	360	296	290	210	Tr170x10	148	52	74	M16	230
	150	CSE-250/150-GS	346.4	5195.4	194	410	560	396	290	210	Tr170x10	148	52	74	M16	230
	250	CSE-250/250-GS	346.4	8659	240	519	769	505	290	210	Tr170x10	148	52	74	M16	150
300 /2908.3	50	CSE-300/50-GS	415.5	2077.3	173	314	364	300	308	230	Tr180x10	158	57	80	M16	250
	150	CSE-300/150-GS	415.5	6232.1	219	414	564	400	308	230	Tr180x10	158	57	80	M16	250
	250	CSE-300/250-GS	415.5	10386.8	267	519	769	505	308	230	Tr180x10	158	57	80	M16	160
400 /4007.8	50	CSE-400/50-GS	572.6	2862.7	268	343	393	329	365	270	Tr220x10	196	67	86	M16	300
	150	CSE-400/150-GS	572.6	8588.3	344	455	605	441	365	270	Tr220x10	196	67	86	M16	300
	250	CSE-400/250-GS	572.6	14313.8	411	555	805	541	365	270	Tr220x10	196	67	86	M16	200
500 /4948	50	CSE-500/50-GS	706.9	3534.2	356	378	428	364	400	300	Tr240x10	214	72	97	M16	330
	150	CSE-500/150-GS	706.9	10602.8	435	478	628	464	400	300	Tr240x10	214	72	97	M16	330
	250	CSE-500/250-GS	706.9	17671.4	531	596	846	582	400	300	Tr240x10	214	72	97	M16	230
600 /5987	50	CSE-600/50-GS	855.3	4276.4	393	399	449	385	440	330	Tr270x10	244	82	105	M16	370
	150	CSE-600/150-GS	855.3	12829.4	554	499	649	485	440	330	Tr270x10	244	82	105	M16	370
	250	CSE-600/250-GS	855.3	21382.4	672	617	867	603	440	330	Tr270x10	244	82	105	M16	250

Cylinders with higher tonnage and different strokes are also available.



CSE-GS



Road bridge movement and levelling on pier using 8 hollow, 60-ton cylinders.

4 high-tonnage double-acting cylinders, with 600 ton-capacity 250 mm flow mechanical locking ring, controlled by 2 F.P.T. hydraulic pumps.

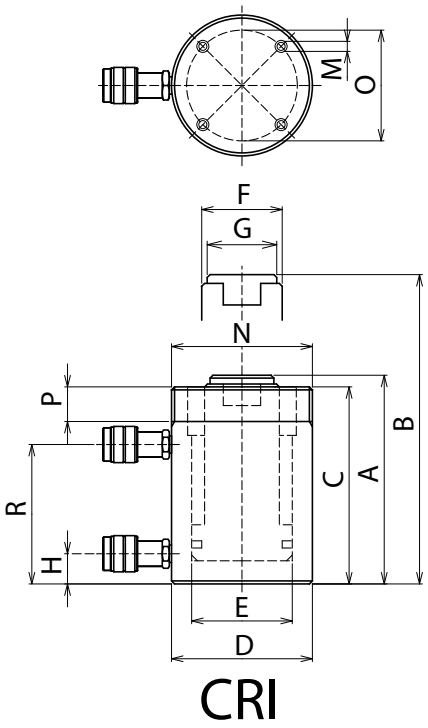
CRI
10-500 ton
Stroke 160-330 mm
700 bar

CRI Series — Cylinders with oil return

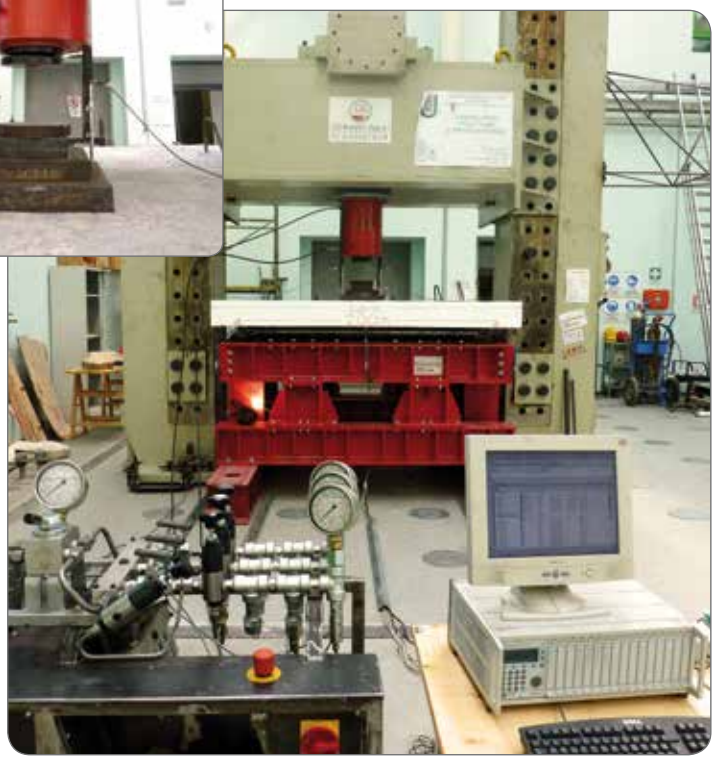
- With the oil return system strokes can be longer than in cylinders with a spring return. Thanks to the oil return system, return times are shorter under all operating conditions.
- Suitable for push installing underpasses or for tests on foundation piles.
- With the threaded body cylinder, positioning is easier, more accurate and safer.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstand eccentric load absorption.
- The wiper reduces contamination between ring and rod.
- High-strength, splined removable head.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

Push cylinders to move decks for building renovation operations.



CRI



400-ton CRI cylinder and hydraulic pump for load tests on reinforced concrete structures.

CAP	STROKE	MODEL	FORCE max kN		SECTION cm²		VOLUME cm³		WEIGHT	DIMENSIONS in mm												
ton	mm		Push	Pull	Push	Pull	Push	Pull	kg	A	B	C	D	E	F	G	H	M	N	O	P	R
10	160	CRI-10/160	111.3	16	15.9	4.6	254.5	73	5	250	410	242	60	45	38	37	20	2xM8	M60x1.5	22	32	190
	260	CRI-10/260	111.3	16	15.9	4.6	413.5	118.6	6.8	350	610	342	60	45	38	37	20	2xM8	M60x1.5	22	32	290
30	160	CRI-30/160	309.3	55.7	44.2	15.9	706.9	254.5	20.9	292	452	280	113	75	60	58	32	2xM10	M112x2	50	35	223
	260	CRI-30/260	309.3	55.7	44.2	15.9	1148.6	413.5	27.5	392	652	380	113	75	60	58	32	2xM10	M112x2	50	35	323
50	160	CRI-50/160	549.8	99	78.5	28.3	1256.6	452.4	33.8	310	470	298	140	100	80	79	32	4xM12	M140x3	70	45	233
	330	CRI-50/330	549.8	99	78.5	28.3	2591.8	933.1	53.3	503	833	495	140	100	80	79	32	4xM12	M140x3	70	45	438
75	160	CRI-75/160	791.7	121	113.1	34.6	1809.6	552.9	57.4	324	484	312	175	120	100	96	32	4xM12	M175x3	85	48	242
	260	CRI-75/260	791.7	121	113.1	34.6	2940.5	898.5	73.6	424	684	412	175	120	100	96	32	4xM12	M175x3	85	48	342
100	160	CRI-100/160	1077.6	156	153.9	44.6	2463	713.3	67.2	328	488	313	190	140	118	108	38	4xM12	M190x4	100	40	254
	330	CRI-100/330	1077.6	156	153.9	44.6	5080	1471.1	102.4	515	845	498	190	140	118	108	38	4xM12	M190x4	100	55	424
150	160	CRI-150/160	1496.8	283.8	213.8	81.1	3421.2	1297.5	99.7	353	513	338	225	165	130	126	43	4xM12	M225x4	120	48	270
	330	CRI-150/330	1496.8	283.8	213.8	81.1	7056.2	2676	149.7	548	878	533	225	165	130	126	43	4xM12	M225x4	120	55	440
200	160	CRI-200/160	1984.7	373.8	283.5	106.8	4536.5	1709	122.8	360	520	345	258	190	150	146	46	4xM12	M255x4	140	48	277
	330	CRI-200/330	1984.7	373.8	283.5	106.8	9356.4	3524.9	182.3	555	885	540	258	190	150	146	46	4xM12	M255x4	140	60	447
300	160	CRI-300/160	2908.3	563.5	415.5	161	6647.6	2576.1	185.2	352	512	335	308	230	180	176	52	4xM16	M305x4	200	55	245
	330	CRI-300/330	2908.3	563.5	415.5	161	13710.7	5313.2	277.5	547	877	530	308	230	180	176	52	4xM16	M305x4	200	65	430
400	160	CRI-400/160	4007.9	791.7	572.6	226.2	9160.9	3619.1	286.5	378	538	360	368	270	210	206	67	4xM16	M365x4	250	60	275
	330	CRI-400/330	4007.9	791.7	572.6	226.2	18894.3	7464.4	422.9	578	908	560	368	270	210	206	67	4xM16	M365x4	250	70	460
500	160	CRI-500/160	4948	1019.8	706.9	291.4	11309.7	4662.1	370.6	390	550	370	412	300	230	226	73	4xM16	M410x4	280	65	280
	330	CRI-500/330	4948	1019.8	706.9	291.4	23326.3	9615.6	540.6	590	920	570	412	300	230	226	73	4xM16	M410x4	280	80	465

Cylinders with higher tonnage and different strokes are also available.

CRI-C
50-500 ton
Stroke 50-250 mm
700 bar

CRI-C Series

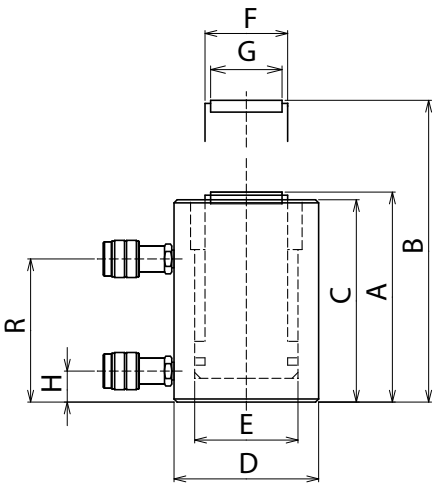
Compact cylinders with oil return

- High-tonnage cylinders with oil return.
- Suitable for heavy applications in civil and nautical engineering projects, heavy structural steelwork and for tests on foundation piles.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The wiper reduces contamination between ring and rod.
- High-strength, splined removable head.
- Models weighing more than 20 kg are equipped with a handle or lifting eyebolts to make them easier to carry.

SPECIAL CYLINDERS ON REQUEST

50-ton CRIC for lifting mechanical workshop machinery.

CRIC 250/250 cylinders for shifting a prefabricated concrete structure.



CRI-C

Compression tests in a civil engineering laboratory with 200-ton CRIC cylinders.

CAP	STROKE	MODEL	FORCE MAX Kn		SECTION cm²		VOLUME cm³		WEIGHT	DIMENSIONS in mm								
ton	mm		Spinta	Trazione	Spinta	Trazione	Spinta	Trazione	kg	A	B	C	D	E	F	G	H	R
50	50	CRI-C-50/50	496.2	113.4	70.9	32.4	354.4	162	14.8	153	203	146	132	95	70	52	28	97
	100	CRI-C-50/100	496.2	113.4	70.9	32.4	708.8	324	18.9	203	303	196	132	95	70	52	28	147
	150	CRI-C-50/150	496.2	113.4	70.9	32.4	1063.2	486	24.1	263	413	256	132	95	70	52	28	207
100	50	CRI-C-100/50	929.1	189.7	132.7	54.2	663.7	271	28.4	163	213	156	176	130	100	92	30	101
	100	CRI-C-100/100	929.1	189.7	132.7	54.2	1327.3	541.9	35.8	213	313	206	176	130	100	92	30	151
	150	CRI-C-100/150	929.1	189.7	132.7	54.2	1991	812.9	45.1	273	423	266	176	130	100	92	30	211
	200	CRI-C-100/200	929.1	189.7	132.7	54.2	2654.6	1083.8	55.3	338	538	331	176	130	100	92	30	266
	250	CRI-C-100/250	929.1	189.7	132.7	54.2	3318.3	1354.8	65.6	403	653	396	176	130	100	92	30	316
150	50	CRI-C-150/50	1407.4	239.2	201.1	68.3	1005.3	341.6	49.9	182	232	175	218	160	130	110	37	115
	100	CRI-C-150/100	1407.4	239.2	201.1	68.3	2010.6	683.3	61.9	232	332	225	218	160	130	110	37	165
	150	CRI-C-150/150	1407.4	239.2	201.1	68.3	3015.9	1024.9	76.7	282	432	275	218	160	130	110	37	215
	200	CRI-C-150/200	1407.4	239.2	201.1	68.3	4021.2	1366.6	90.1	347	547	340	218	160	130	110	37	280
	250	CRI-C-150/250	1407.4	239.2	201.1	68.3	5026.5	1708.2	103.5	402	652	395	218	160	130	110	37	335
200	50	CRI-C-200/50	1984.7	373.8	283.5	106.8	1417.6	534.1	71.5	187	237	180	258	190	150	138	42	120
	150	CRI-C-200/150	1984.7	373.8	283.5	106.8	4253	1602	108.3	287	437	280	258	190	150	138	42	220
	250	CRI-C-200/250	1984.7	373.8	283.5	106.8	7088	2670	151.2	402	652	395	258	190	150	138	42	335
250	50	CRI-C-250/50	2424.5	417.8	346.4	119.4	1731.8	596.9	107.3	205	255	198	298	210	170	148	46	128
	150	CRI-C-250/150	2424.5	417.8	346.4	119.4	5195.4	1790.7	152.5	305	455	298	298	210	170	148	46	228
	250	CRI-C-250/250	2424.5	417.8	346.4	119.4	8659	2984.5	211.5	430	680	423	298	210	170	148	46	353
300	50	CRI-C-300/50	2908.3	461.8	415.5	131.9	2077.4	659.7	124.3	222	272	214	308	230	190	158	50	137
	150	CRI-C-300/150	2908.3	461.8	415.5	131.9	6232.1	1979.2	172.4	322	472	314	308	230	190	158	50	237
	250	CRI-C-300/250	2908.3	461.8	415.5	131.9	10386.9	3298.7	237.9	452	702	444	308	230	190	158	50	367
400	50	CRI-C-400/50	4007.9	549.8	572.6	157.1	2862.8	785.4	188.8	238	288	228	365	270	230	196	57	150
	150	CRI-C-400/150	4007.9	549.8	572.6	157.1	8588.3	2356.2	258.5	338	488	328	365	270	230	196	57	250
	250	CRI-C-400/250	4007.9	549.8	572.6	157.1	14313.9	3927	352.7	468	718	458	365	270	230	196	57	380
500	50	CRI-C-500/50	4948	755.9	706.9	216	3534.3	1079.9	240.5	253	303	243	400	300	250	214	63	159
	150	CRI-C-500/150	4948	755.9	706.9	216	10602.9	3239.8	322	353	503	343	400	300	250	214	63	259
	250	CRI-C-500/250	4948	755.9	706.9	216	17671.5	5399.6	433	483	733	473	400	300	250	214	63	389

Cylinders with higher tonnage and different strokes are also available.

CDE
5-30 ton
Stroke 30-260 mm
700 bar

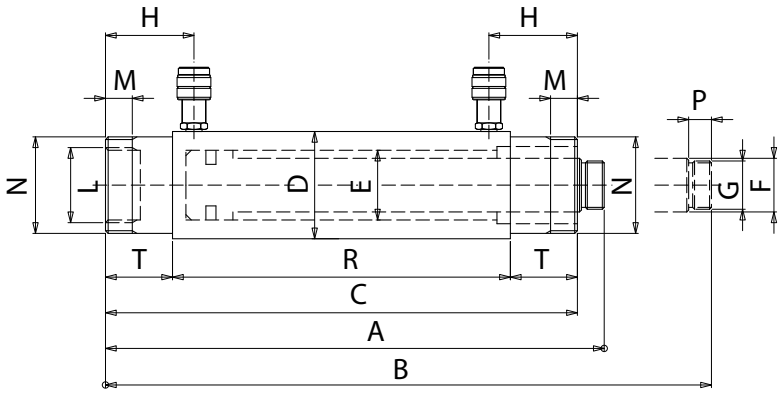
CDE Series — Push-pull double-acting cylinders

- Double-acting cylinders.
- Threaded into the body and the rod, these cylinders are interfaced with more complex mechanical machinery with high-frequency push and pull cycles in civil engineering laboratories and in locking systems.
- A wide range of accessories, such as eye connectors, flanges, rings and plates, is also available.
- The stop ring not only guarantees maximum operator safety, preventing plunger over-stroke, but also outstanding eccentric load absorption.
- The wiper reduces contamination between ring and rod.

SPECIAL CYLINDERS ON REQUEST

Systems for hot forming large support piles using 22-ton CDE cylinders with Viton gaskets to withstand high temperatures.

CDE 25/1650 (25 ton, stroke 1650 mm) double-acting cylinder, basculating with plate and pins.

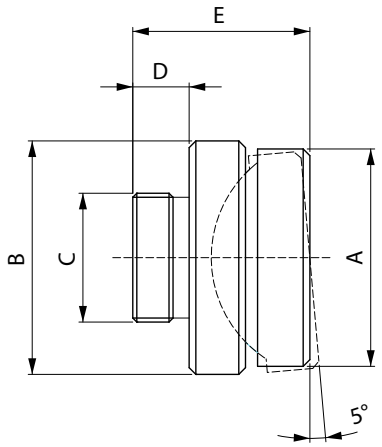


CDE

CAP	STROKE	MODEL	FORCE MAX kN		SECTION cm²		VOLUME cm³		WEIGHT	DIMENSIONS in mm													
ton	mm		Push	Pull	Push	Pull	Push	Pull	kg	A	B	C	D	E	F	G	H	L	M	N	P	R	T
5	30	CDE–5/30	49.5	22.9	7.1	3.3	21.2	9.8	2.1	177	207	154	49	30	22	M 20x1.5	46	M 35x1.5	14	M 42x1.5	18	102	26
	60	CDE–5/60	49.5	22.9	7.1	3.3	42.4	19.6	2.7	207	267	184	49	30	22	M 20x1.5	46	M 35x1.5	14	M 42x1.5	18	132	26
	100	CDE-5/100	49.5	22.9	7.1	3.3	70.7	32.7	3.5	247	347	222	49	30	22	M 20x1.5	46	M 35x1.5	14	M 42x1.5	18	170	26
	160	CDE–5/160	49.5	22.9	7.1	3.3	113.1	52.3	4.3	307	467	284	49	30	22	M 20x1.5	46	M 35x1.5	14	M 42x1.5	18	232	26
10	60	CDE–10/60	111.3	68.2	15.9	9.7	95.4	58.5	5.7	243	303	223	68	45	28	M 24x2	56	M 48x1.5	16	M 60x2	18	153	35
	100	CDE–10/100	111.3	68.2	15.9	9.7	159	97.5	6.5	283	383	263	68	45	28	M 24x2	56	M 48x1.5	16	M 60x2	18	193	35
	160	CDE–10/160	111.3	68.2	15.9	9.7	254.5	155.9	8	343	503	323	68	45	28	M 24x2	56	M 48x1.5	16	M 60x2	18	253	35
	260	CDE–10/260	111.3	68.2	15.9	9.7	413.5	253.4	10.5	443	703	423	68	45	28	M 24x2	56	M 48x1.5	16	M 60x2	18	353	35
14	80	CDE–14/80	137.4	88	19.6	12.6	157.1	100.5	11	308	388	283	78	50	30	M 27x2	72	M 56x1.5	25	M 70x2	23	179	52
	160	CDE–14/160	137.4	88	19.6	12.6	314.2	201.1	13.5	388	548	363	78	50	30	M 27x2	72	M 56x1.5	25	M 70x2	23	259	52
	260	CDE–14/260	137.4	88	19.6	12.6	510.5	326.7	16	488	748	463	78	50	30	M 27x2	72	M 56x1.5	25	M 70x2	23	359	52
22	80	CDE–22/80	232.3	121	33.2	17.3	265.5	138.2	14	342	422	316	92	65	45	M40x2	89	M 70x2	26	M 85x2	24	186	65
	160	CDE–22/160	232.3	121	33.2	17.3	530.9	276.5	17.5	422	582	396	92	65	45	M40x2	89	M 70x2	26	M 85x2	24	266	65
	260	CDE–22/260	232.3	121	33.2	17.3	862.8	449.2	21.5	522	782	496	92	65	45	M 40x2	89	M 70x2	26	M 85x2	24	366	65
30	260	CDE–30/260	309.3	142.9	44.2	20.4	1148.6	530.9	33.5	532	782	504	113	75	55	M 50x2	94	M 80x2	28	M 105x2	24	360	72

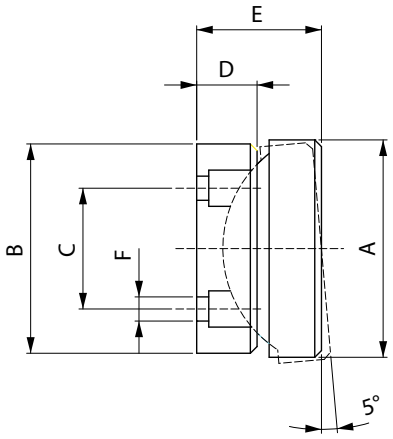
Cylinders with higher tonnage and different strokes are also available.

Heads – eye connectors anchor plates – flanges rings



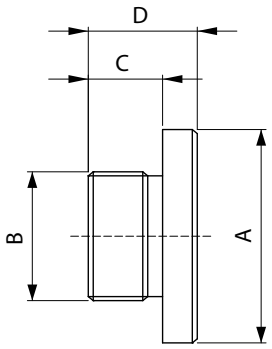
TAL-TFO

Model	Cylinder model	A	B	C	D	E	Weight kg
TAL 5	CRM 5	23	25	14	10	27	0.08
TFO 10	CRM 10	34	37	M24X2	11.5	33	0.18
TAL 10	CRI10	34	37	20	11	33.5	0.17
TFO 15	CRM 15	39	41	M27X2	14.5	36	0.3
TFO 25	CRM 25	52	53	M32X2	14.5	44	0.53
TFO 30	CRM 30	54	58	M32X2	14.5	46	0.55
TAL 30	CRI 30	54	57	28	18	49.5	0.7
TFO 50	CRM 50 CRI 50	66	75	M42X1.5	11	50	0.9
TAL 75	CRI 75	84	90	40	16	59.5	2.2
TFO 100	CRM100 CRI100	96	108	M50X2	20	67	2.3
TAL 150	CRI 150	116	119	50	20	65	3.15
TAL 200	CRI 200	136	146	50	20	71	6.2
TAL 300	CRI 300	156	176	65	22	74	7.5
TAL 400	CRI 400	194	206	80	25	80	13.2
TAL 500	CRI 500	210	226	80	25	80	15.6

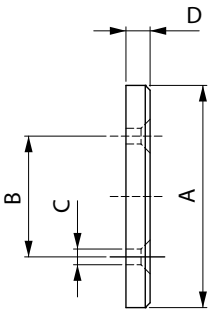


TPO

Model	Cylinder model	A	B	C	D	E	F	Weight kg
TPO 10	CSE 10 - CSE 10 GS CRM 10 C	34	30	16	12	21.5	5.5 (N°2)	0.11
TPO 20	CSE 20 - CSE 20 GS CRM 20 C	45	40	24	13	26	5.5 (N°2)	0.24
TPO 30	CSE 30 - CSE 30 GS CRM 30 C -CRMA 30 - CRI C 50	54	52	30	15	31	5.5 (N°2)	0.45
TPO 50	CSE 50 - CSE 50 GS CRM 50 C - CRMA 50	66	72	50	17	35	6.5 (N°2)	0.85
TPO 100	CSE 100 - CSE 100 GS CRM 100 C - CRMA 100 - CRI C 100	96	92	50	22	43	6.5 (N°2)	1.9
TPO 150	CSE 150 - CSE 150 GS CRI C 150	116	110	70	21	45	6.5 (N°2)	2.8
TPO 200	CSE 200 - CSE 200 GS CRI C 200	136	138	90	25	51	6.5 (N°4)	5.2
TPO 250	CSE 250 - CSE 250 GS CRI C 250	146	148	90	25	51	6.5 (N°4)	6
TPO 300	CSE 300 - CSE 300 GS CRI C 300	156	158	120	25	52	6.5 (N°4)	6.9
TPO 400	CSE 400 - CSE 400 GS CRI C 400	194	196	160	25	55	8.5 (N°4)	12.2
TPO 500	CSE 500 - CSE 500 GS CRI C 500	210	214	170	25	55	8.5 (N°4)	14.5
TPO 600	CSE 600 - CSE 600 GS	240	244	210	27	60	8.5 (N°4)	21.2



TPS-TSF

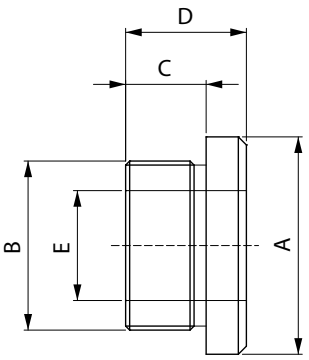


TSP

Model	Cylinder model	A	B	C	D	Weight kg
TPS 5	CRM 5	24	14	10	15	0.03
TSF 10	CRM 10	37	M24X2	12	17	0.08
TPS 10	CRI 10	37	20	11	18	0.07
TSF 15	CRM 15	41	M27X2	15	21	0.12
TSF 25	CRM 25	53	M32X2	15	22	0.2
TSF 30	CRM 30	58	M32X2	14	23	0.26
TPS30	CRI 30	58	28	18	28	0.3
TSF 50	CRM 50 CRI 50	79	M42X1.5	11	21	0.49
TPS 75	CRI 75	96	40	16	30	0.9
TSF 100	CRM 100 CRI 100	107	M50X2	20	32	1.11
TPS 150	CRI 150	126	50	20	30	1.28
TPS 200	CRI 200	146	50	20	33	2
TPS 300	CRI 300	176	65	22	35	3.04
TPS 400	CRI 400	206	80	25	40	4.88
TPS 500	CRI 500	226	80	25	40	5.67

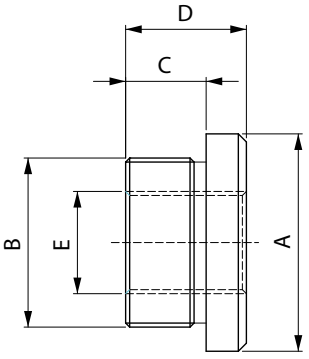
Model	Cylinder model	A	B	C	D	Weight kg
TSP 10	CSE 10 CSE 10 GS CRM 10 C	30	16	5.5 (N°2)	8	0.05
TSP 20	CSE 20 CSE 20 GS CRM 20 C	40	24	5.5 (N°2)	8	0.08
TSP 30	CSE 30 CSE 30 GS CRM 30 C CRMA 30 CRI C 50	52	30	5.5 (N°2)	10	0.16
TSP 50	CSE 50 CSE 50 GS CRM 50 C CRMA 50	72	50	6.5 (N°2)	10	0.32
TSP 100	CSE 100 CSE 100 GS CRM 100 C CRMA 100 CRI C 100	92	50	6.5 (N°2)	10	0.52
TSP 150	CSE 150 CSE 150 GS CRI C 150	110	70	6.5 (N°2)	10	0.74
TSP 200	CSE 200 CSE 200 GS CRI C 200	138	90	6.5 (N°4)	12	1.4
TSP 250	CSE 250 CSE 250 GS CRI C 250	148	90	6.5 (N°4)	12	1.61
TSP 300	CSE 300 CSE 300 GS CRI C 300	158	120	6.5 (N°4)	12	1.84
TSP 400	CSE 400 CSE 400 GS CRI C 400	196	160	8.5 (N°4)	12	2.83
TSP 500	CSE 500 CSE 500 GS CRI C 500	214	170	8.5 (N°4)	12	3.37
TSP 600	CSE 600 CSE 600 GS	244	210	8.5 (N°4)	12	4.38

Heads – eye connectors anchor plates – flanges rings



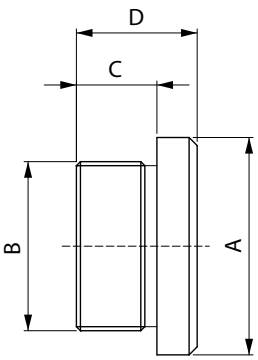
TFL-TFLA

Smooth hollow model	Cylinder model	A	B	C	D	E	Weight kg
TFL-10	CRM 10 FO	38	M28X1.5	18	28	19.5	0.1
TFL-20	CRM 20 FO	54	M42X1.5	25	35	27.3	0.25
TFL-30	CRM 30 FO	61	M50X1.5	20	30	33.5	0.3
TFLA-30	CRI 30 FO	64	M50X1.5	20	30	33.5	0.35
TFL-60	CRM 60 FO	82	M70X2	30	40	54.5	0.55
TFLA-60	CRI 60 FO	92	M70X2	30	40	54.5	0.65
TFL-100	CRM 100 FO CRI 100 FO	122	M100X2	35	45	78.5	1.3
TFL-150	CRI 150 FO	165	M112X2	27	40	80.5	2.6



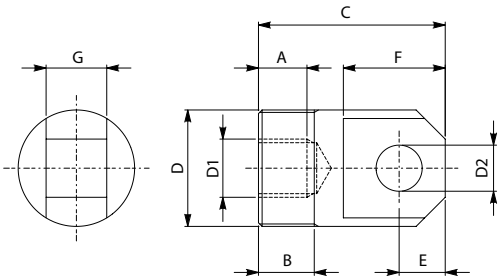
TFF-TFFA

Threaded hollow model	Cylinder model	A	B	C	D	E	Weight kg
TFF-10	CRM 10 FO	38	M28X1.5	18	28	M18X2.5	0.1
TFF-20	CRM 20 FO	54	M42X1.5	25	35	1”- 8 UNC	0.29
TFF-30	CRM 30 FO	61	M50X1.5	20	30	1” 1/4-7 UNC	0.33
TFFA-30	CRI 30 FO	64	M50X1.5	20	30	1” 1/4-7 UNC	0.35
TFF-60	CRM 60 FO	82	M70X2	30	40	1” 5/8-51/2 UNS	0.85
TFFA-60	CRI 60 FO	92	M70X2	30	40	1” 5/8-51/2 UNS	1
TFF-100	CRM 100 FO CRI 100 FO	122	M100X2	35	45	M76X6	1.5
TFF-150	CRI 150 FO	165	M112X2	27	40	M80X6	2.8



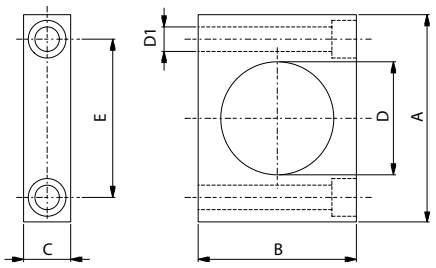
TFP-TFPA

Push model	Cylinder model	A	B	C	D	Weight kg
TFP-10	CRM 10 FO	38	M28X1.5	18	28	0.16
TFP-20	CRM 20 FO	54	M42X1.5	25	35	0.4
TFP-30	CRM 30 FO	61	M50X1.5	20	30	0.5
TFPA-30	CRI 30 FO	64	M50X1.5	20	30	0.54
TFP-60	CRM 60 FO	82	M70X2	30	40	1.2
TFPA-60	CRI 60 FO	92	M70X2	30	40	1.35
TFP-100	CRM 100 FO CRI 100 FO	122	M100X2	35	45	3
TFP-150	CRI 150 FO	165	M112X2	27	40	4.17



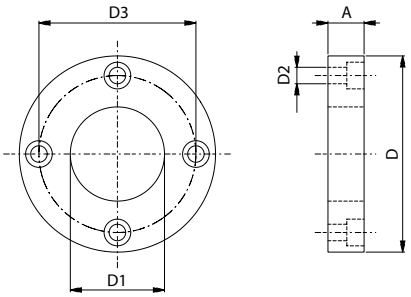
DEO

Model	Cylinder model	DIMENSIONS in mm									
		D	D1	D2	A	B	C	E	F	G	Weight kg
DEO 5	CDE 5	M35X1,5	M20X1,5	16	20	23	67	14	34	16	0,3
DEO 10	CDE 10	M48X1,5	M24X2	19	20	23	77	19	42	25	1,03
DEO 14	CDE 14	M56X1,5	M27X2	25	27	28	98	25	54	32	2,2
DEO 22	CDE 22	M70X2	M40X2	32	29	30	112	32	66	38	4,7
DEO 30	CDE 30	M80X2	M50X2	38	30	31	130	38	80	42	6,9



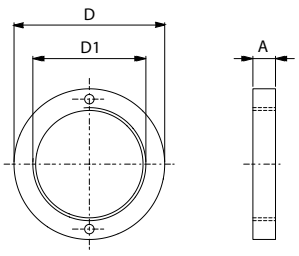
DEP

Model	Cylinder model	DIMENSIONS in mm						
		D	D1	A	B	C	E	Weight kg
DEP 5	CDE 5	42	10.5	84	60	15	64	0.3
DEP 10	CDE 10	60	13	110	84	25	84	1.03
DEP 14	CDE 14	70	17	136	100	35	100	2.2
DEP 22	CDE 22	85	23	170	130	45	124	4.7
DEP 30	CDE 30	105	25	200	150	50	148	6.9



DEF

Model	Cylinder model	DIMENSIONS in mm					
		D	D1	D2	D3	A	Weight kg
DEF 5	CDE 5	98	42	8.5	75	18	0.75
DEF 10	CDE 10	125	60	10.5	100	23	1.55
DEF 14	CDE 14	145	70	13	116	36	3.35
DEF 22	CDE 22	175	85	17	138	45	6
DEF 30	CDE 30	199	105	19	165	50	7.9



DEA

Model	Cylinder model	DIMENSIONS in mm			
		D	D1	A	Weight kg
DEA 5	CDE 5	60	M42X1.5	9	0.1
DEA 10	CDE 10	80	M60X2	12	0.2
DEA 14	CDE 14	94	M70X2	16	0.35
DEA 22	CDE 22	110	M85X2	20	0.65
DEA 30	CDE 30	135	M105X2	22	1.05

F.P.T. HAND PUMPS

F.P.T. manufactures a wide range of hand pumps in multiple configurations with different reservoir capacities, valves, construction materials and fluids to be pumped. These high-performance pumps are easy to use and durable.

SPECIAL PUMPS

F.P.T. products can meet specific requirements not only in terms of construction materials, but also the type of fluid to pump. On request, we can also build non-magnetic steel hand pumps for nuclear applications or for installation on military vehicles. These pumps can asily pump water, phosphoric esters, fuel oil and other hydrocarbons. Our pumps have a maximum operating pressure of 4000 bar.

On request:

- Special Viton - ethylene propylene gaskets.
- Higher capacity reservoirs
- FOOT CONTROL pedal models.
- Additional relief valves.
- For hydrostatic tests with fluids other than oil, all-steel pumps are also available.

Two-handle stainless steel pump and 40-litre reservoir for testing operations.

Pump for hydraulic stud bolt tensioning equipment for marine engines.

PMSA 3.5 L0.5 pump calibrated to 210 bar for tests.

PUMP	Reservoir capacity (litres)	Flow (litres)	Series		Page
Single-speed	0.3 - 3	0.9 - 3.1	PMSA		52
Two-speed	1.6 - 8	17.5 - 2.7	PDSA		54
Two-speed for double-acting cylinders	2.2 - 8	17.5 - 2.7	PDSA 20 DE		56
Very high pressure 1600-2800-4000 bar single and/or two speed	1.6 - 2.2	0.5 - 1.6 single 12.5 - 1.1 two	PMS - PDS		58
For diversified utilizations in steel-stainless steel	0.5 - 2	0.7 - 36.2	PS - PSL PSS - PSSL		60

PUMP CODE DESCRIPTION

Standard products do not always meet customer requirements and often pumps must be modified to adapt better to various applications. The hand pump code table shows various ranges, materials, flow, drive and reservoir capacity. This table can be used to request special pumps, to identify your specific F.P.T hand pump and to request spare parts or a new product.

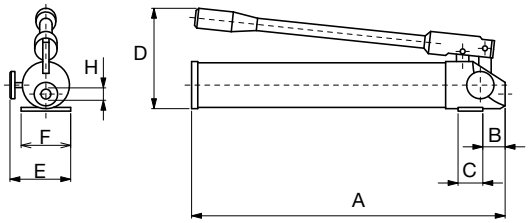
	Construction material: **A** ALUMINIUM **S** STAINLESS STEEL		**DE** DOUBLE-ACTING **FC** FOOT CONTROL		Special gaskets: **V** VITON **EP** ETHYLENE PROPYLENE	
PMS	**A**	**3,5**	**DE**	**4**	**V**	
Series: PMS SINGLE-SPEED PUMP PDS TWO-SPEED PUMP PDL TWO-HANDLE PUMP PS SINGLE HANDLE		OIL FLOW cm³/STROKE		RESERVOIR CAPACITY IN LITRES		CUSTOMER ID FOR SPECIAL PUMPS

PMSA
700 bar
0.7 - 3.1 cm³ oil flow
0.3 - 3 l reservoir

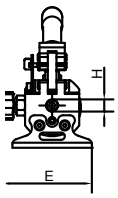
PMSA Series — Single-speed hand pumps

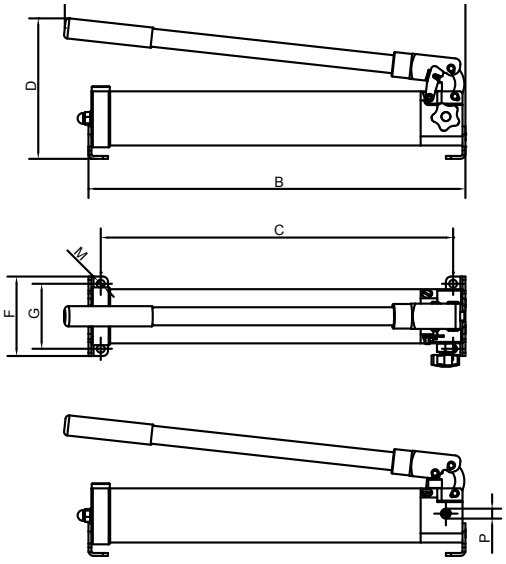
- These handy and easy-to-use pumps are ideal for controlling medium hydraulic cylinders.
- **Lightweight and compact, they are built aluminium.**
- Strong and functional pumps that require minimum maintenance.
- Equipped with an internal safety valve calibrated to maximum operating pressure.
- A pressure gauge can be mounted directly on the pump.
- Non-conducting handle for maximum operator safety.

Equipment to support decks in tunnels consisting of a PMSA 3.5 pump and 10-ton cylinders.

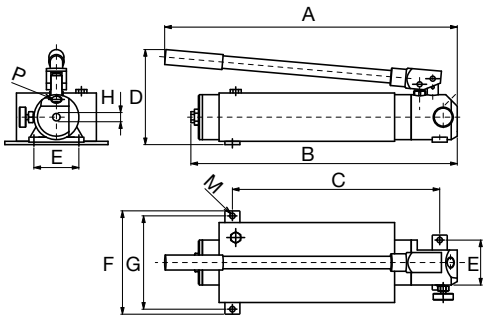


PMS-0,9





PMSA-3



PMSA-3,5-L3

MODEL	PRESSURE max	OIL DISPLACEMENT STROKE	RESERVOIR CAPACITY	USABLE OIL	DIMENSIONS in mm												WEIGHT
	bar	cm³	litres	litres	A	B	C	D	E	F	G	H	L	M	N	P	kg
PMS - 0.9	700	0.9	0.3	0.19	330	15	25	110	74	56	-	3/8" NPT	-	-	-	-	2.6
PMSA - 3	700	3	1.3	1	555	522	488	195	135	110	90	3/8" NPT	-	11	-	1/4"NPT	4,6
PMS - 3.5/L3	700	3.1	3	2.5	585	530	417	185	90	210	190	3/8" NPT	-	11	-	G 1/2"	10

PMSA 3.5 and PMSA 3.5/l3 aluminium pumps

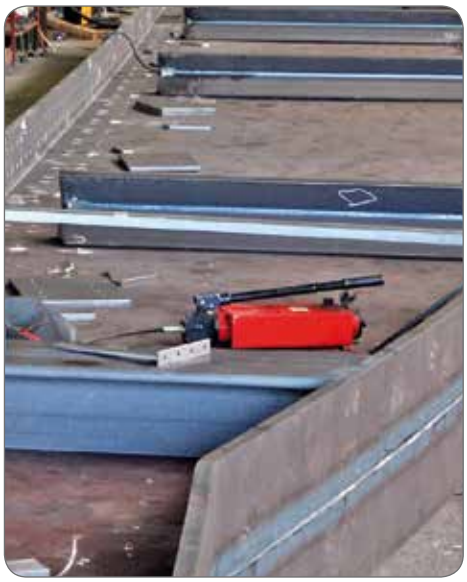
FOOT CONTROL pedal models also available.

- *for single-speed pump models: PMSA 3.5 FC*
- *for two-speed models: PDSA20 FC - PDSA21 FC*

PMSA-3

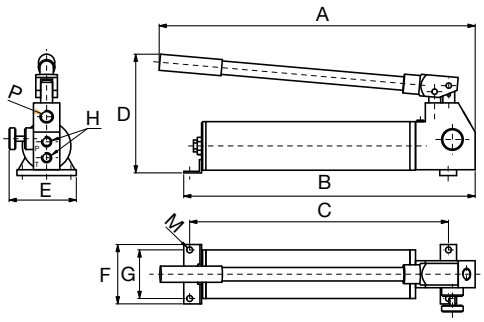
PDSA
700 bar
17.5 / 2.7 cm³ oil flow
1.6 - 8 l reservoir

PDSA Series — Two-speed hand pumps

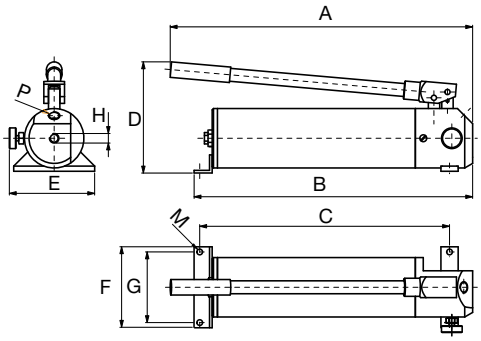


Hand pump for placing structural steelwork on a jig.

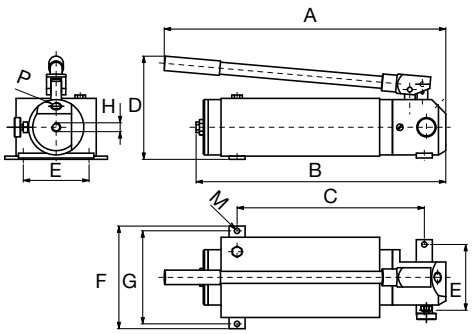
- Handy and easy-to-use pumps with high oil flow rates to operate a wide range of hydraulic cylinders or tools.
- Two-speed pumps to guarantee a high flow rate at low pressure during load approach operations which as a consequence makes the operator's work easier.
- Lightweight and compact with aluminium head and reservoirs (PDSA 20 – PDSA 21), versions are available with larger steel-plated reservoirs.
- Strong and functional pumps that require minimum maintenance.
- Equipped with an internal safety valve calibrated to maximum operating pressure.
- A pressure gauge can be mounted directly on the pump.
- Non-conducting handle for maximum operator safety.



PDSA-21

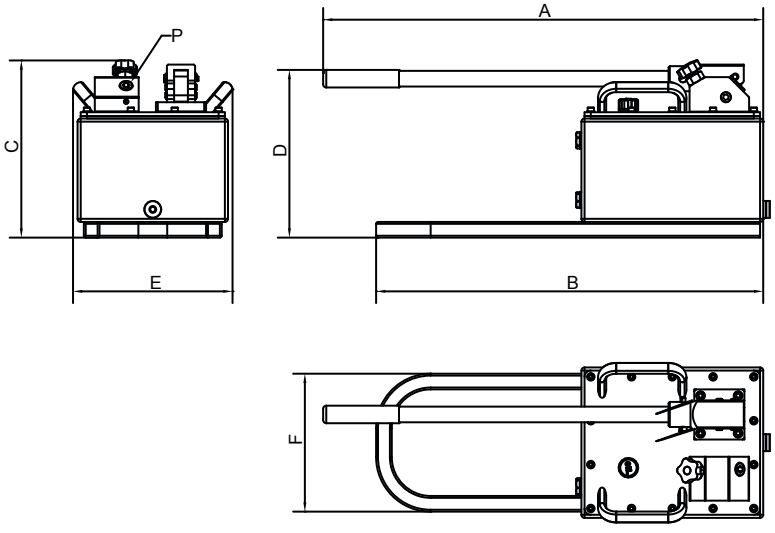


PDSA-20



PDS-20-L4/L8

Compact cylinders F.P.T. model - CRM50/50C controlled by two-speed PDSA21 hand pump to level a structure



PDS-120-SE

MODEL	PRESSURE 1ST/2ND STAGE	OIL FLOW 1ST/2ND STAGE	RESERVOIR CAPACITY	USABLE OIL	DIMENSIONS in mm										WEIGHT
	bar	cm³	litres	litres	A	B	C	D	E	F	G	H	M	P	kg
PDSA - 21	35/700	17.5/2.7	1.6	1.2	590	540	485	190	125	110	90	3/8" NPT *	11	G1/2"	6.5
PDSA - 20	35/700	17.5/2.7	2.2	1.65	590	465	435	230	160	140	120	3/8" NPT	11	G1/2"	10.5
PDS - 20 L4	35/700	17.5/2.7	4	3.4	590	517	380	235	120	200	180	3/8" NPT	11	G1/2"	14.5
PDS - 20 L8	35/700	17.5/2.7	8	6.1	590	517	380	230	120	350	330	3/8" NPT	11	G1/2"	20.5
PDS - 120 - SE	20/700	122/4,8	9	7,5	702	617	326	269	253	220	-	3/8" NPT	-	G1/2"	22,5

** Poutlet port and T drain port, 3/8" NPT.*

PDS 20 DE
700 bar
17.5 / 2.7 cm³ oil flow
2.2 - 8 l reservoir

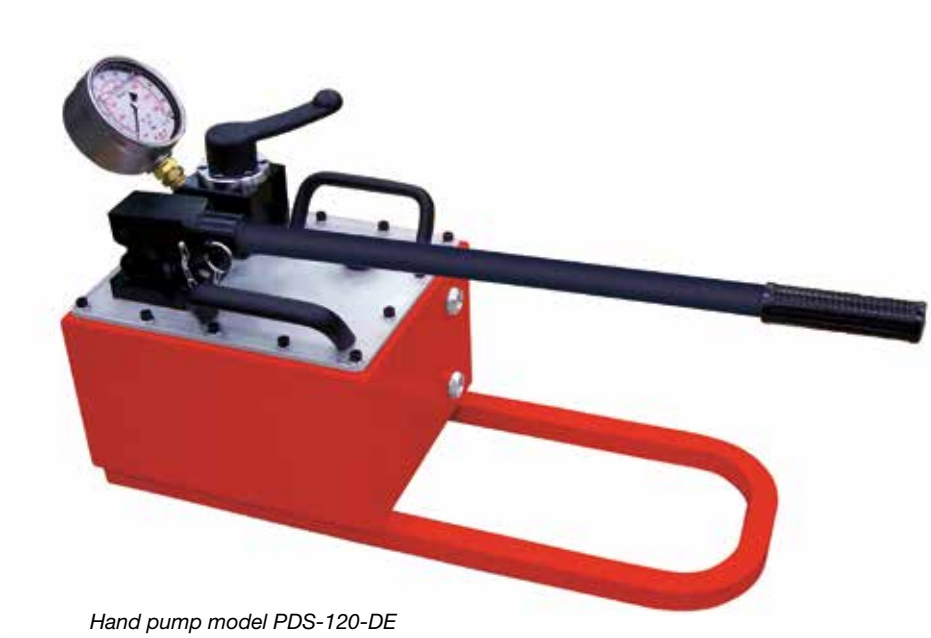
PDS 20 DE
Series

Two-speed hand pumps for double-acting cylinders

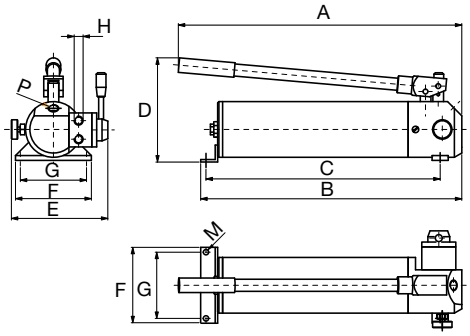
- Handy and easy-to-use pumps with high oil flow rates to operate a wide range of double-acting cylinders.
- Two-speed operation reduces the number of strokes at low pressure, which makes the operator's work easier during load approach operations and high-pressure load lifting.
- Strong and functional pumps that require minimum maintenance.
- Equipped with an internal safety valve calibrated to maximum operating pressure.
- A pressure gauge can be mounted on the pump directly or with an adaptor.
- Non-conducting handle for maximum operator safety.

Pump with 8-litre reservoir for lifting a press section.

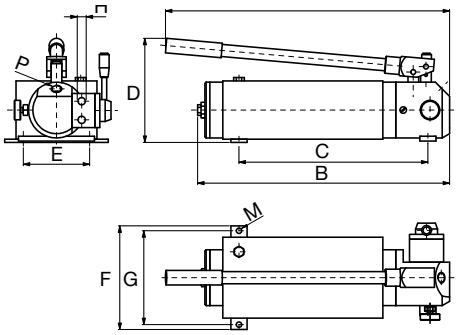
PDSA20 DE pump to operate a double-acting cylinder to level large machinery.



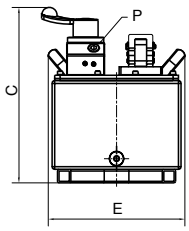
Hand pump model PDS-120-DE



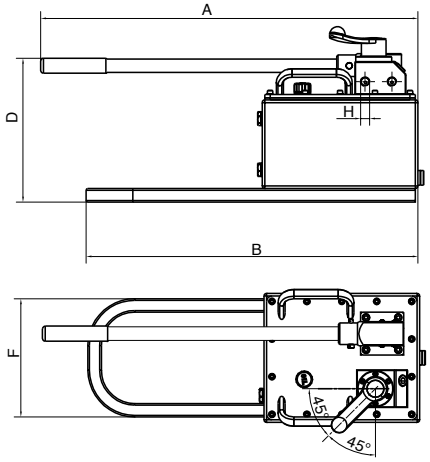
PDS-20-DE



PDS-20-L4/L8-DE



PDS-120-DE



MODEL	PRESSURE 1ST/2ND STAGE	OIL FLOW 1ST/2ND STAGE	RESERVOIR CAPACITY	USABLE OIL	DIMENSIONS in mm										WEIGHT
	bar	cm³	litres	litres	A	B	C	D	E	F	G	H	M	P	kg
PDS - 20 - DE	35/700	17.5/2.7	2.2	1.65	590	465	389	230	210	140	120	3/8" NPT	11	G1/2"	12
PDS - 20 - DEL4	35/700	17.5/2.7	4	3.4	590	517	380	230	120	200	180	3/8" NPT	11	G1/2"	16
PDS - 20 - DEL8	35/700	17.5/2.7	8	6.1	590	517	380	230	120	350	330	3/8" NPT	11	G1/2"	22
PDS - 120 - DE	20/700	122/4,8	9	7,5	702	617	326	269	253	220	-	3/8" NPT	-	G1/2"	22,5

PMS - PDS
1600 - 2800 - 4000 bar

0.5 - 1.2 cm^3
oil flow single-speed

12.5/0.7 - 12.5/1.1
oil flow two-speed

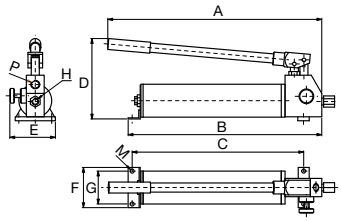
1.6 - 2.2 l reservoir

PMS - PDS
Series

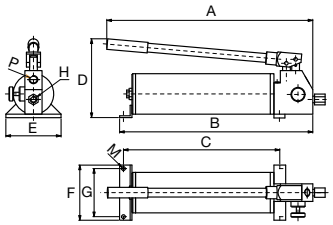
Single-speed and two-speed hand pumps for very high pressure up to 4000 bar

- Handy and easy-to-use hand pumps.
- Series with one and two speeds from 1600 to 2800 bar, also available in the 4000 bar version.
- Strong and functional pumps designed for very high pressures.
- Equipped with an internal safety valve calibrated to maximum operating pressure.
- Steel connectors with conic seal for very high pressure also available.
- Non-conducting handle for maximum operator safety.

Complete set for very high pressure pump to operate tensioning devices.

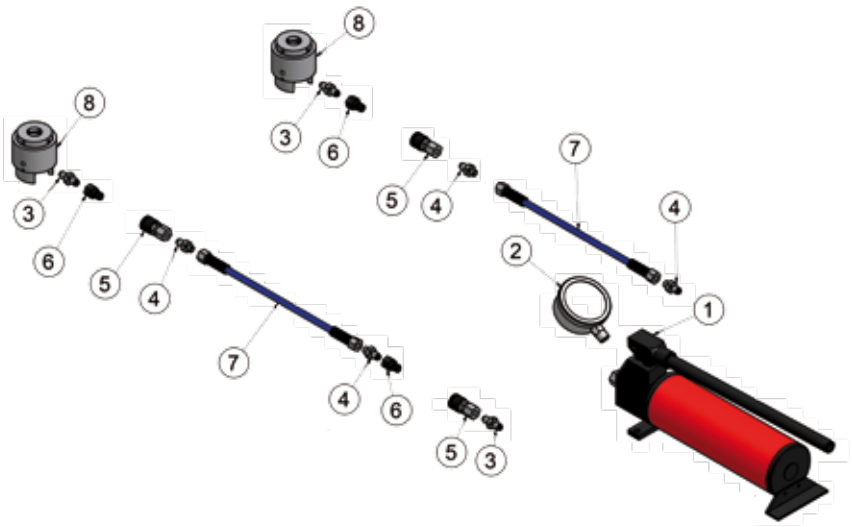


PMS-0,5 / PMS-0,7/ PMS-1,2



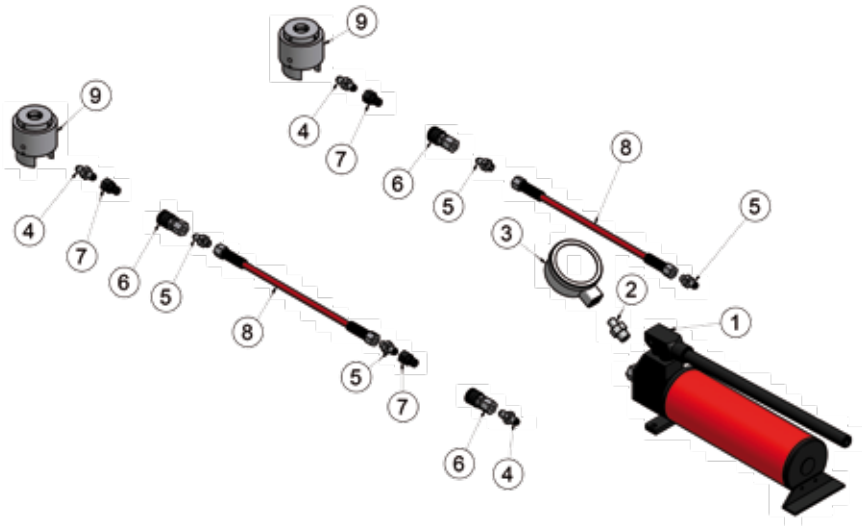
PDS-16 PDS-18

PUMP	MODEL	PRESSURE 1ST/2ND STAGE	OIL FLOW 1ST/2ND STAGE	RESERVOIR CAPACITY	USABLE OIL	DIMENSIONS in mm										WEIGHT
		bar	cm³	litres	litres	A	B	C	D	E	F	G	H	M	P	kg
SINGLE-SPEED	PMS - 1.2	1600	1.2	1.6	1.2	615	553	463	200	140	140	120	G 1/4"	11	G 1/2"	5.5
SINGLE-SPEED	PMS - 0.7	2800	0.7	1.6	1.2	615	553	463	200	140	140	120	G 1/4"	11	G 1/2"	5.5
SINGLE-SPEED	PMS - 0.5	4000	0.5	1.6	1.2	580	520	465	185	140	140	120	9/16" - 18	11	G 1/2"	5.5
TWO-SPEED	PDS - 18	35 / 1600	12.5 / 1.1	2.2	1.65	625	537	400	200	140	140	120	G 1/4"	11	G 1/2"	10.5
TWO-SPEED	PDS - 16	35 / 2800	12.5 / 0.7	2.2	1.65	625	537	400	200	140	140	120	G 1/4"	11	G 1/2"	10.5



1600 BAR TABLE

POS.	NR.	NAME
1	04PMS1 2	SINGLE-SPEED HAND PUMP 1600 BAR MOD. PMS-1.2
	04PDS18	TWO-SPEED HAND PUMP 1600 BAR MOD. PDS-18
2	MD100G/1600	PRESSURE GAUGE DN100 0-1600 BAR MOD. MD-100G/1600
	MD100G/2000	PRESSURE GAUGE DN100 0-2000 BAR MOD. MD-100G/2000
	MD100G/2500	PRESSURE GAUGE DN100 0-2500 BAR MOD. MD-100G/2500
3	N13265	NIPPLE 1/4"G CONE M 120° - 1/4"G CONE M 120°
4	N12976	NIPPLE 1/4"G CONE M 120° - 1/4"G CONE F 60°
5	07GR15F	FEMALE COUPLER 1500 BAR MOD. GR-15F
	07GR20F	FEMALE COUPLER 2000 BAR MOD. GR-20F
6	07GR15M	MALE COUPLER 1500 BAR MOD. GR-15M
	07GR20M	MALE COUPLER 2000 BAR MOD. GR-20M
7	TFR1/1500	FLEX HOSE WP 1800 BAR LENGTH 1 METRE MOD. TFR-1/1500
	TFR2/1500	FLEX HOSE WP 1800 BAR LENGTH 2 METRES MOD. TFR-2/1500
	TFR3/1500	FLEX HOSE WP 1800 BAR LENGTH 3 METRES MOD. TFR-3/1500
8	-	UTILIZATION 1500 BAR

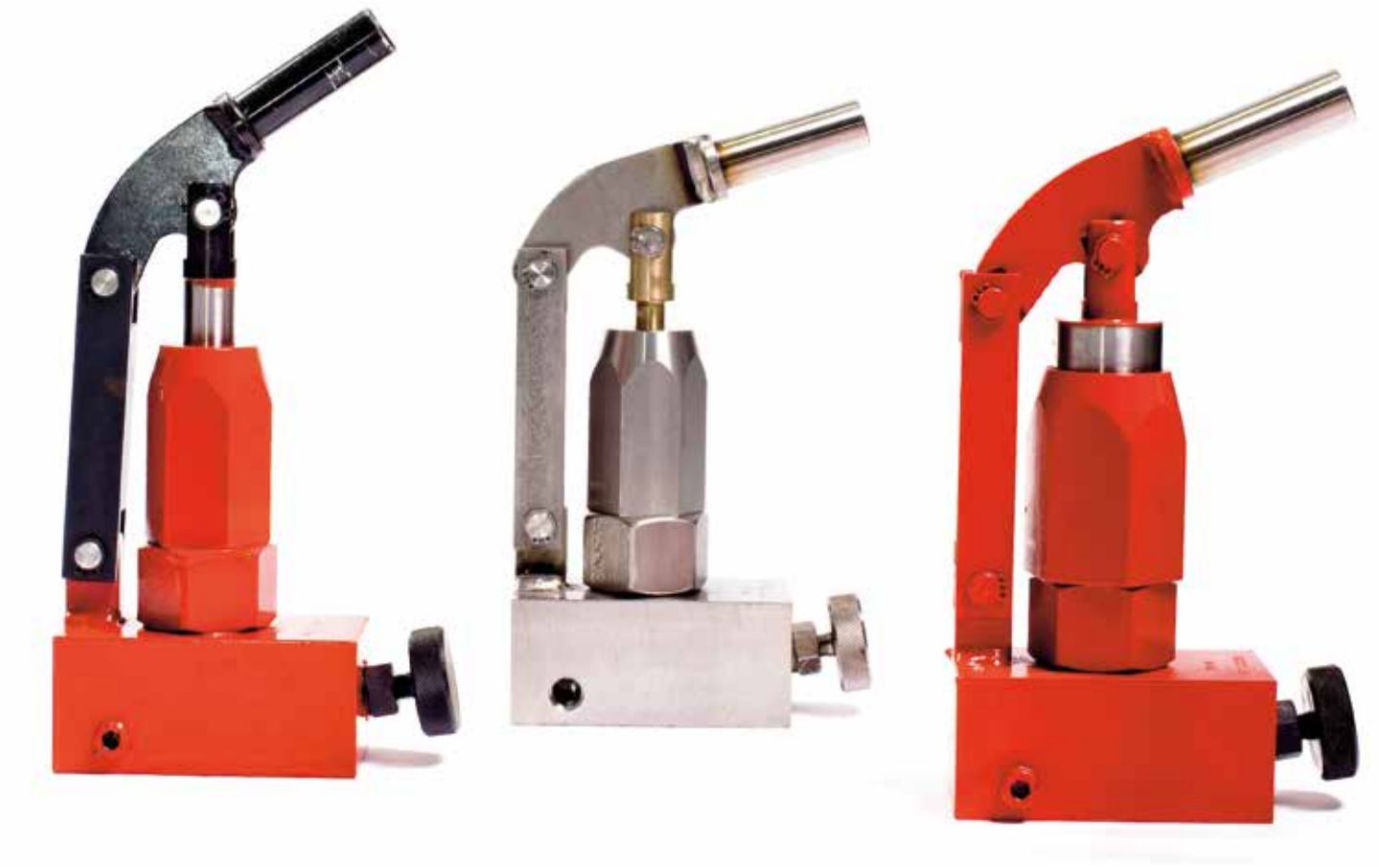


2500 BAR TABLE

POS.	NR.	NAME
1	04PMS0 7	SINGLE-SPEED HAND PUMP 2800 BAR MOD. PMS-0.7
	04PDS16	TWO-SPEED HAND PUMP 2800 BAR MOD. PDS-16
2	N14654	NIPPLE G 1/2" - M16X1.5
3	MD100G/3000	PRESSURE GAUGE DN100 0-3000 BAR MOD. MD-100G/3000
	MD100G/4000	PRESSURE GAUGE DN100 0-4000 BAR MOD. MD-100G/4000
4	N13265	NIPPLE 1/4"G CONE M 120° - 1/4"G CONE M 120°
5	N12976	NIPPLE 1/4"G CONE M 120° - 1/4"G CONE F 60°
6	07GR25F	FEMALE COUPLER 2500 BAR MOD. GR-25F
7	07GR25M	MALE COUPLER 2500 BAR MOD. GR-25M
8	TFR1/2500	HOSE WP2620 BAR LENGTH 1 METRE MOD. TFR-1/2500
	TFR2/2500	HOSE WP2620 BAR LENGTH 2 METRES MOD. TFR-2/2500
	TFR3/2500	HOSE WP2620 BAR LENGTH 3 METRES MOD. TFR-3/2500
9	-	UTILIZATION 2500 BAR

PS-PSS
35 - 2000 bar
0.7 - 36.2 cm³ oil flow

PS-PSS Series
Pumps for diverse utilizations from 35 to 2000 bar



- Modular hydraulic hand pumps for special utilizations mounted on machinery or for applications that require continuous operation.
- A steel series, with and without reservoir (PS – PSL), plus another series with stainless steel body and parts and a bronze piston (PSS – PSSL), are also available.
- They generate pressure from 35 to 2000 bar and are equipped with 2-way valve to operate single-acting cylinders.

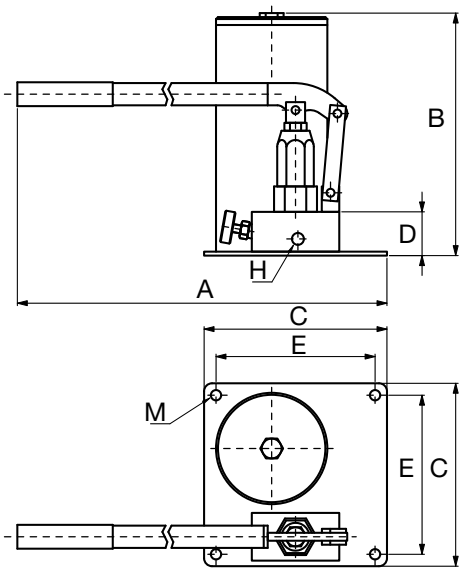
SPECIAL PUMPS ON REQUEST

Different reservoirs can be coupled to meet customer requirements.

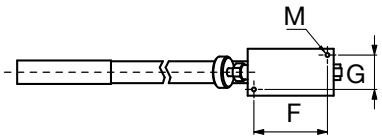
On request, a 4-way, 3-position valve can be adapted to operate double-acting cylinders.

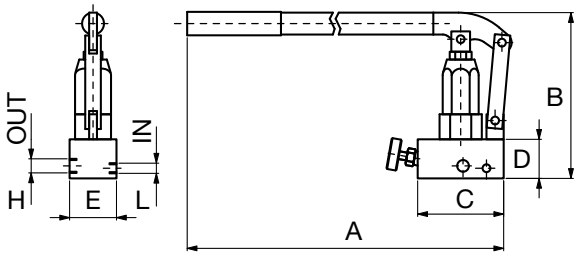
For hydrostatic tests with fluids other than oil, all-steel pumps are also available.

Pump with 2 pumping pistons for bidirectional operation to pump in both handle stroke directions. Built for railway applications.



PS-L0,5/L2





PS

MATERIAL	MODEL	Ø PISTON	PRESSURE	OIL FLOW	RESERVOIR CAPACITY	DIMENSIONS in mm										WEIGHT
		mm	bar	cm³	litres	A	B	C	D	E	F	G	H	L	M	kg
STEEL	PS - 34	38	35	36.2	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	7
STEEL	PS - 17	26	105	17.87	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.7
STEEL	PS - 9	19	210	9.92	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STEEL	PS - 3.6	12	700	3.92	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STEEL	PS - 2.5	9.5	1400	2.6	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STEEL	PS - 0.7	7	2000	0.7	-	640	230	110	50	60	94	44	1/4" GAS	1/4" GAS	M8	5.3
STEEL	PS - 34 / L2	38	35	36.2	2	700	310	230	70	200			3/8" NPT		13	12
STEEL	PS - 17 / L2	26	105	17.87	2	700	310	230	70	200			3/8" NPT		13	10.7
STEEL	PS - 9 / L2	19	210	9.92	2	700	310	230	70	200			3/8" NPT		13	10.3
STEEL	PS - 3.6 / L2	12	700	3.92	2	700	310	230	70	200			3/8" NPT		13	10.3
STEEL	PS - 2.5 / L2	9.5	1400	2.6	2	700	310	230	70	200			3/8" NPT		13	10.3
STEEL	PS - 0.7 / L0.5	7	2000	0.7	0.5	690	225	206	70	168			1/4" GAS		13	8.8
STAINLESS STEEL	PSS - 34	38	35	36.2	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	7
STAINLESS STEEL	PSS - 17	26	105	17.87	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.7
STAINLESS STEEL	PSS - 9	19	210	9.92	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STAINLESS STEEL	PSS - 3.6	12	700	3.92	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STAINLESS STEEL	PSS - 2.5	9.5	1400	2.6	-	640	230	110	50	60	94	44	3/8" NPT	1/4" GAS	M8	5.3
STAINLESS STEEL	PSS - 0.7	7	2000	0.7	-	640	230	110	50	60	94	44	1/4" GAS	1/4" GAS	M8	5.3
STAINLESS STEEL	PSS - 34 / L2	38	35	36.2	2	700	310	230	70	200			3/8" NPT		13	12
STAINLESS STEEL	PSS - 17 / L2	26	105	17.87	2	700	310	230	70	200			3/8" NPT		13	10.7
STAINLESS STEEL	PSS - 9 / L2	19	210	9.92	2	700	310	230	70	200			3/8" NPT		13	10.3
STAINLESS STEEL	PSS - 3.6 / L2	12	700	3.92	2	700	310	230	70	200			3/8" NPT		13	10.3
STAINLESS STEEL	PSS - 2.5 / L2	9.5	1400	2.6	2	700	310	230	70	200			3/8" NPT		13	10.3
STAINLESS STEEL	PSS - 0.7 / L0.5	7	2000	0.7	0.5	690	225	206	70	168			1/4" GAS		13	8.8

F.P.T.
HYDRAULIC PUMPS AND SYNCHRONOUS LIFTING SYSTEM

Strong, reliable and versatile

F.P.T. hydraulic pumps are designed and built to adapt to the various needs arising from the use of hydraulic equipment.

Built with 4 different motor versions: gasoline, three-phase or single-phase electric and pneumatic. Equipped with pumps operating at different flow rates and operated using manual, electric or pneumatic valves.

These units have a highly versatile construction to meet the most diverse lifting requirements from small cylinders to high tonnage.

HYDRAULIC PUMP	Motor	Standard reservoir capacity	Series	Page	
Transportable hydraulic pumps	SINGLE-PHASE ELECTRIC THREE-PHASE ELECTRIC PNEUMATIC	10	FPH		68
Hydraulic pumps for fixed installations	SINGLE-PHASE ELECTRIC THREE-PHASE ELECTRIC PNEUMATIC	10	FPT		70
Gasoline-driven hydraulic pumps	GASOLINE	10	FPH-MS		72
Pneumohydraulic pumps	PNEUMATIC	10	PP		73
	PNEUMATIC	from 2.5 to 10	PP		74
Hydraulic pumps with independent outlets for synchronized lifting	ELECTRIC	from 2.5 to 10	FPT ISO FLOW		75
Synchronous lifting systems	ELECTRIC	from 20 to 150	FPT SYNCHRO		76

Specifications for hydraulic pumps and models

COMPOSITION OF PRODUCT CODE FOR F.P.T. HYDRAULIC PUMPS:

The F.P.T. hydraulic pumps can be divided into two categories: the FPT series, specifically designed for heavy operations and suitable for fixed installations, and the FPH series for situations where the key factors are frequent transportation and ease of use. Both series mount 4 different types of our pumps:

FPH	5	ME2	M	VM5M	10	VM
hydraulic pump model	pump model	engine type	pressure gauge	valve model	reservoir capacity	accessories

Hydraulic pump model	
FPH	portable hydraulic pump
FPT	fixed hydraulic pump

Pump Model	Number of pistons low pressure/high pressure
1	2/2
2	-/4
5	2/4
9	4/2

Flow rates for type of pump					
	ME2	**ME4**	**ME21**	**ME41**	**MA**
1	1,8 / 0,9	0,9 / 0,45	1,8 / 0,9	0,9 / 0,45	1,8 / 0,9
2	1,8	0,9	1,6	0,9	1,8
5	4,5 / 1,8	2,5 / 0,9	4,2 /1,6	2,5 /0,9	4,5 / 1,8
9	7,5 / 0,9	3,7 / 0,45	7,3 / 0,9	3,5 /0,45	7,9 / 0,9

Engine type	
ME2	three-phase 2 poles
ME4	three-phase 4 poles
ME21	single-phase 2 poles
ME41	single-phase 4 poles
MA	pneumatic
MS	gasoline

Pressure gauge	
M	standard MD100G

Valve model	
VM5M	3 way - 3 pos. Manual
VER22C	4 way - 4 pos. Electric
VM17M	4 way - 4 pos. Manual

For a full list of valve models see pages 82 to 87

Reservoir capacity	
5	5L
10	10 L
20	20 L
25	25 L
30	30 L
40	40 L
60	60 L

others on request

Accessories	
VM	regulation valve Pressure
CD	remote control
CDF	remote control with pedal
CDP	pneumatic remote control
P	pressure switch
G	cage

CONFIGURATION EXAMPLE:

FPH2 ME2 M VM5M 10 VM

Hydraulic pump with three-phase motor, 2.2 kW, pressure 700 bar with 10L of oil, 3-way 3-position manual valve, pressure gauge and pressure regulator included.

The most used F.P.T. hydraulic pumps:

TO OPERATE SINGLE-ACTING CYLINDERS WITH MANUAL VALVE: FPH5-ME2-M-VM5M-10-VM

Three-phase hydraulic pump - manual valve for single-acting cylinders - pressure regulation valve - pressure gauge - 10 l reservoir.
Hydraulic pump supplied without couplers.

TO OPERATE DOUBLE-ACTING CYLINDERS WITH MANUAL VALVE: FPH5-ME2-M-VM17M-10-VM

Three-phase hydraulic pump - manual valve for double-acting cylinders - pressure regulation valves - pressure gauge - 10 l reservoir.
Hydraulic pump supplied without couplers.

version for operating double-acting cylinders

TO OPERATE SINGLE-ACTING CYLINDERS WITH REMOTE CONTROL: FPH5-ME2-M- VER2-10-VM-CD

Three-phase hydraulic pump - electric valve for single-acting cylinders - remote control - pressure gauge - 10 l reservoir - pressure regulation valve.
Hydraulic pump supplied without couplers.

TO OPERATE DOUBLE-ACTING CYLINDERS WITH REMOTE CONTROL: FPH5-ME2-M- VER22C-10-CD

Three-phase hydraulic pump - electric valve for double-acting cylinders - remote control - pressure gauge - 10 l reservoir - pressure regulation valve.
Hydraulic pump supplied without couplers.

version for operating double-acting cylinders

TO OPERATE 4 SINGLE-ACTING CYLINDERS
WITH MANUAL VALVE:
FPT5-ME2-M- VM2M-20-4U

Three-phase hydraulic pump - manual valve for operating 4 single-acting cylinders - 4 way manifold mounted directly on the unit - pressure gauge - 20 l reservoir - uni-directional flow control valve and 4 needle valves to control the load. Hydraulic pump supplied without couplers.

TO OPERATE 4 DOUBLE-ACTING CYLINDERS
WITH MANUAL VALVE:
FPT5-ME2-M- VM13M-20-4U

Three-phase hydraulic pump - manual valve for operating 4 double-acting cylinders - 4 + 4 ways manifold mounted directly on the unit - pressure gauge - 20 l reservoir - uni-directional flow control valve and 4 needle valves to control the load.
Hydraulic pump supplied without couplers.

Version for operating 4 double-acting cylinders

Accessories for hydraulic pumps

F.P.T. hydraulic pumps can be customised to meet the customer's specific requirements.

PROTECTION CAGE
- Standard equipment on FPH hydraulic pumps, available for reservoirs of all sizes and for the other series.
- Incredibly portable and very easy to handle.
- Protects the hydraulic pump and its parts.

MANIFOLDS MOUNTED ON THE HYDRAULIC PUMP
- Various manifolds can be mounted directly on the hydraulic pump.
- Valve control becomes even easier.

PRESSURE SWITCH
- For automated operations.
- Easy and precise to set, these pressure switches are supplied for use with various pressure ranges for optimum adjustment to all operating pressure values.

RADIO CONTROL
- Hydraulic pump controlled remotely with radio control

PERSONALISED PRESSURE GAUGES
DIGITAL PRESSURE GAUGES
- Pressure gauges with double scale bar / ton
- Digital pressure gauges

PRESSURE TRANSDUCER
- For precise pressure readings.

REMOTE CONTROL
- Available on FPH and FPT hydraulic pumps for VER valves.

HEAT EXCHANGER
- Reduces and dissipates the heat in the oil to decrease operating temperature for extended work cycles.

FOOT REMOTE CONTROL
- Double pedal for remote control.
- Available with various cable lengths.

FRAME BASED ON CUSTOMER SPECIFICATIONS
- Protection and transport casing according to applications

ATEX CERTIFICATION
- Hydraulic pumps can also be supplied ATEX certified.

For examples of how to customise the hydraulic pumps see page 79.

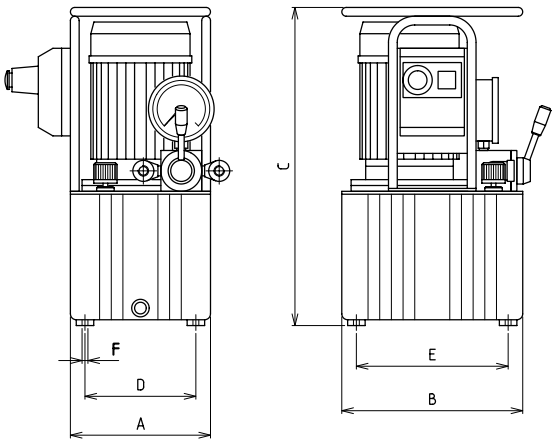
FPH SERIES PORTABLE HYDRAULIC PUMPS – WITH ALUMINIUM RESERVOIR

700 bar
Single-two speed
0.9/0.45 - 7.9/0.9 cm³ oil flow
5 to 25 l reservoir

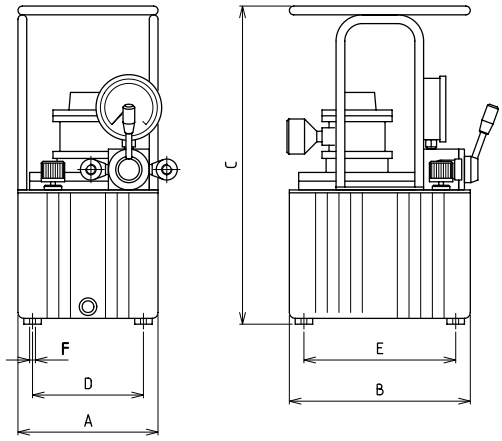
FPH Series — Portable hydraulic pumps

Lightweight and easy to handle.

- The best solution when the hydraulic pump must be moved frequently or used in construction sites and in hard-to-reach positions.
- The protection cage makes it easier to move and lift the hydraulic pump while the special construction features and aluminium parts help reduce overall weight. Aluminium reservoir from 5 to 25 litres.
- Maximum versatility thanks to the three-phase and single-phase electric motors and pneumatic motors. With such a wide range of FPT single or two-speed pumps with different flow rates, it's easy to make the right choice for each application.
- 3 or 4-way manual, electric or pneumatic valves can also be mounted.
- Reduced maintenance. Designed to last.
- Hydraulic pumps are always supplied without couplers.



FPH–ME



FPH–MA

Electric control unit for lifting a roupelle.

MODEL	PRESSURE 1st-2nd STAGE	FLOW RATE 1st-2nd STAGE	MOTOR	KW RPM	RESERVOIR CAPACITY	DIMENSIONS in mm						WEIGHT
	bar	l/min			litres	A	B	C	D	E	F	kg
FPH 1 - ME4		0.9 / 0.45	THREE-PHASE 4 POLES	1.1 / 1410		240	310	547	170	250	M8	35
FPH 1 - ME41		0.9 / 0.45	SINGLE-PHASE 4 POLES	1.1 / 1330		240	310	547	170	250	M8	40
FPH 1 - ME2	100 / 700	1.8 / 0.9	THREE-PHASE 2 POLES	1.1 / 2850	10	240	310	547	170	250	M8	35
FPH 1 - ME21		1.8 / 0.9	SINGLE-PHASE 2 POLES	1.5 / 2750		240	310	547	170	250	M8	40
FPH 1 - MA		1.8 / 0.9	PNEUMATIC	2.6 / 3000		240	310	547	170	250	M8	36
FPH 2 - ME4		0.9	THREE-PHASE 4 POLES	1.1 / 1390		240	310	547	170	250	M8	38
FPH 2 - ME41		0.9	SINGLE-PHASE 4 POLES	1.5 / 1330		240	310	547	170	250	M8	43
FPH 2 - ME2	700	1.8	THREE-PHASE 2 POLES	2.2 / 2850	10	240	310	547	170	250	M8	40
FPH 2 - ME21		1.6	SINGLE-PHASE 2 POLES	2.2 / 2850		240	310	547	170	250	M8	45
FPH 2 - MA		1.8	PNEUMATIC	2.6 / 3000		240	310	547	170	250	M8	36
FPH 5 - ME4		2.5 / 0.9	THREE-PHASE 4 POLES	1.1 / 1390		240	310	547	170	250	M8	38
FPH 5 - ME41		2.5 / 0.9	SINGLE-PHASE 4 POLES	1.5 / 1330		240	310	547	170	250	M8	43
FPH 5 - ME2	70 / 700	4.5 / 1.8	THREE-PHASE 2 POLES	2.2 / 2850	10	240	310	547	170	250	M8	40
FPH 5 - ME21		4.2 / 1.6	SINGLE-PHASE 2 POLES	2.2 / 2850		240	310	547	170	250	M8	45
FPH 5 - MA		4.5 / 1.8	PNEUMATIC	2.6 / 3000		240	310	547	170	250	M8	36
FPH 9 - ME4		3.7 / 0.45	THREE-PHASE 4 POLES	0.75 / 1410		240	310	547	170	250	M8	37
FPH 9 - ME41		3.5 / 0.45	SINGLE-PHASE 4 POLES	1.1 / 1330		240	310	547	170	250	M8	41
FPH 9 - ME2	70 / 700	7.5 / 0.9	THREE-PHASE 2 POLES	1.1 / 2850	10	240	310	547	170	250	M8	37
FPH 9 - ME21		7.3 / 0.9	SINGLE-PHASE 2 POLES	1.5 / 2750		240	310	547	170	250	M8	41
FPH 9 - MA		7.9 / 0.9	PNEUMATIC	2.6 / 3000		240	310	547	170	250	M8	36

FPT SERIES HYDRAULIC PUMPS WITH STEEL RESERVOIR FOR FIXED INSTALLATIONS

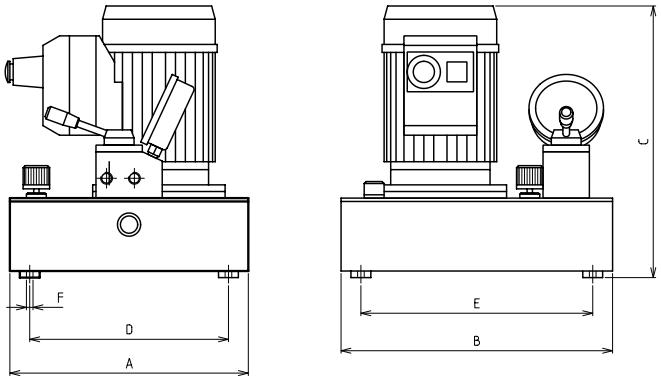
700 bar
Single-two speed
0.9/0.45 - 7.9/0.9 cm³ oil flow
5 to 25 l reservoir

FPT Series

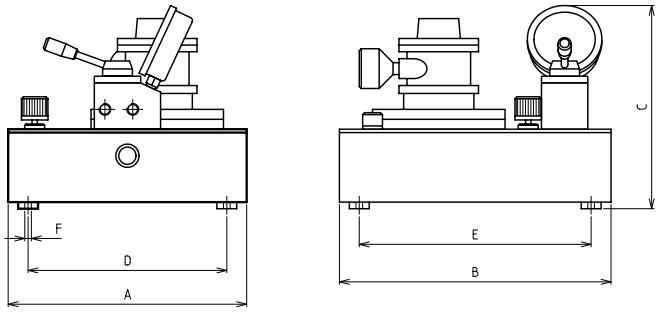
Hydraulic pumps for fixed installations

Strong and reliable.

- The FPT high-pressure hydraulic pumps, for heavy applications, make it easier to find the right solution for specific needs to operate hydraulic cylinders and equipment.
- Maximum versatility thanks to the three-phase and single-phase electric motors and pneumatic motors.
- Wide range of FPT single or two-speed pumps with different flow rates, for the best choice for each application.
- Designed for reduced maintenance and maximum service life and reliability.
- Equipped with a tough and strong steel reservoir (5 to 60 litres).
- 3 or 4-way manual, electric or pneumatic valves can also be mounted.
- Pressure control valve as standard equipment in the FPT model.
- Hydraulic pumps are always supplied without couplers.



FPT-ME



FPT-MA

Hydraulic pump with solenoid valve and 20 l tank.

MODEL	PRESSURE 1st-2nd STAGE	FLOW RATE 1st-2nd STAGE	MOTOR	KW RPM	RESERVOIR CAPACITY	DIMENSIONS in mm						WEIGHT
	bar	l/min			litres	A	B	C	D	E	F	kg
FPT 1 - ME4		0.9 / 0.45	THREE-PHASE 4 POLES	1.1 / 1410		360	410	410	300	350	M8	46
FPT 1 - ME41		0.9 / 0.45	SINGLE-PHASE 4 POLES	1.1 / 1330		360	410	410	300	350	M8	53
FPT 1 - ME2	100 / 700	1.8 / 0.9	THREE-PHASE 2 POLES	1.1 / 2850	10	360	410	410	300	350	M8	46
FPT 1 - ME21		1.8 / 0.9	SINGLE-PHASE 2 POLES	1.5 / 2750		360	410	410	300	350	M8	53
FPT 1 - MA		1.8 / 0.9	PNEUMATIC	2.6 / 3000		360	410	310	300	350	M8	47
FPT 2 - ME4		0.9	THREE-PHASE 4 POLES	1.1 / 1390		360	410	410	300	350	M8	50
FPT 2 - ME41		0.9	SINGLE-PHASE 4 POLES	1.5 / 1330		360	410	410	300	350	M8	57
FPT 2 - ME2	700	1.8	THREE-PHASE 2 POLES	2.2 / 2850	10	360	410	410	300	350	M8	52
FPT 2 - ME21		1.6	SINGLE-PHASE 2 POLES	2.2 / 2850		360	410	410	300	350	M8	59
FPT 2 - MA		1.8	PNEUMATIC	2.6 / 3000		360	410	310	300	350	M8	47
FPT 5 - ME4		2.5 / 0.9	THREE-PHASE 4 POLES	1.1 / 1390		360	410	410	300	350	M8	50
FPT 5 - ME41		2.5 / 0.9	SINGLE-PHASE 4 POLES	1.5 / 1330		360	410	410	300	350	M8	57
FPT 5 - ME2	70 / 700	4.5 / 1.8	THREE-PHASE 2 POLES	2.2 / 2850	10	360	410	410	300	350	M8	52
FPT 5 - ME21		4.2 / 1.6	SINGLE-PHASE 2 POLES	2.2 / 2850		360	410	410	300	350	M8	59
FPT 5 - MA		4.5 / 1.8	PNEUMATIC	2.6 / 3000		360	410	310	300	350	M8	47
FPT 9 - ME4		3.7 / 0.45	THREE-PHASE 4 POLES	0.75 / 1410		360	410	410	300	350	M8	47
FPT 9 - ME41		3.5 / 0.45	SINGLE-PHASE 4 POLES	1.1 / 1330		360	410	410	300	350	M8	54
FPT 9 - ME2	70 / 700	7.5 / 0.9	THREE-PHASE 2 POLES	1.1 / 2850	10	360	410	410	300	350	M8	47
FPT 9 - ME21		7.3 / 0.9	SINGLE-PHASE 2 POLES	1.5 / 2750		360	410	410	300	350	M8	54
FPT 9 - MA		7.9 / 0.9	PNEUMATIC	2.6 / 3000		360	410	310	300	350	M8	48

FPH–MS SERIES GASOLINE-DRIVEN HYDRAULIC PUMPS

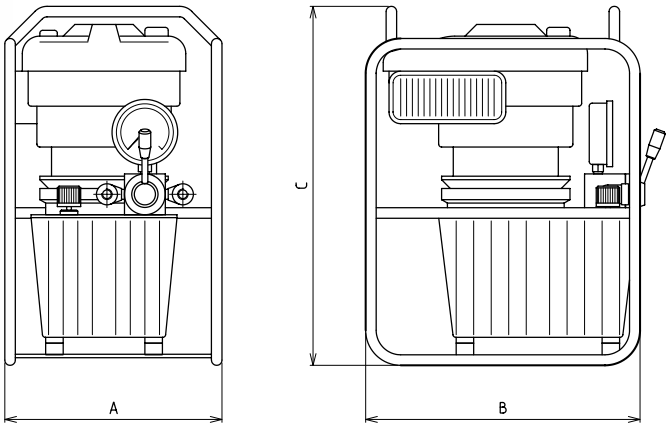
700 bar
Single-two speed
1.8/0.9 - 7.9/0.9 cm³ oil flow
5 to 25 l reservoir

FPH - MS
Series

Gasoline-driven hydraulic pumps

When flexibility is a must.

- The entire series is equipped with a protection cage that makes it easier to move and lift, protecting it in construction sites.
- Equipped with 4-stroke motor.
- Various sizes of reservoirs, from 5 to 40 litres, for use with a wide range of equipment and cylinders.
- 3 or 4-way manual, electric or pneumatic valves can also be mounted.
- Reduced maintenance. Designed to last.
- Hydraulic pumps are always supplied without couplers.



FPH–MS

MODEL	PRESSURE 1st-2nd STAGE	FLOW RATE 1st-2nd STAGE	MOTOR	DISPLACEMENT	KW RPM	RESERVOIR CAPACITY	DIMENSIONS in mm						WEIGHT
	bar	l/min		Cc		litres	A	B	C	D	E	F	kg
FPH 1 - MS	100 /700	1.8 / 0.9	4-STROKE GASOLINE	161	3 / 3000	10	372	470	615	-	-	-	42
FPH 2 - MS		1.8	4-STROKE GASOLINE	190	2.6 / 3000		372	470	615	-	-	-	44
FPH 5 - MS		4.5 / 1.8	4-STROKE GASOLINE	190	2.6 / 3000		372	470	615	-	-	-	44
FPH 9 - MS		7.9 / 0.9	4-STROKE GASOLINE	161	2.6 / 3000		372	470	615	-	-	-	42

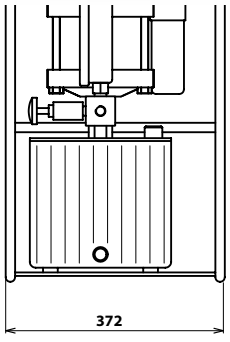
PP SERIES
PNEUMOHYDRAULIC PUMPS

Single-speed
5 to 10 l reservoir

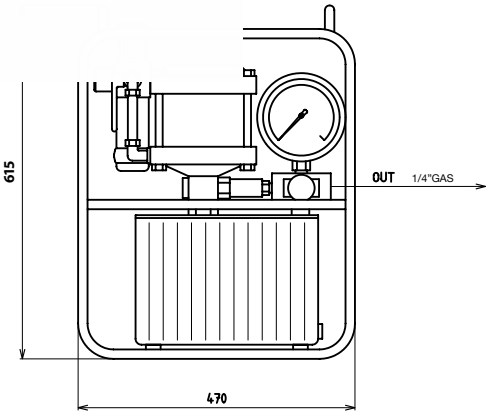
PP Series

Pneumohydraulic pumps

- 3 models are supplied as standard equipment at 1500 – 2100 – 2500 bar.
- Fed by a normal compressed air line it is the ideal solution for tensioning studs, explosion tests, unkeying bearings, hydraulic tensioning devices and anywhere very high pressure is used.
- Air consumption is approximately 2100 l/min. The feed pressure may vary from 1.8 to 7 bar. A distinctive feature of the pump is that following a drop in pressure, the hydraulic pump automatically restores the previous values.
- Pneumohydraulic units for pressure values up to 4000 bar can also be supplied on request.
- Hydraulic pumps are always supplied without couplers.



PP-1500-10-G



PP-2100-10-G

PP-2500-10-G

Unkeying unit with double pneumohydraulic unit (700 bar and 3000 bar).

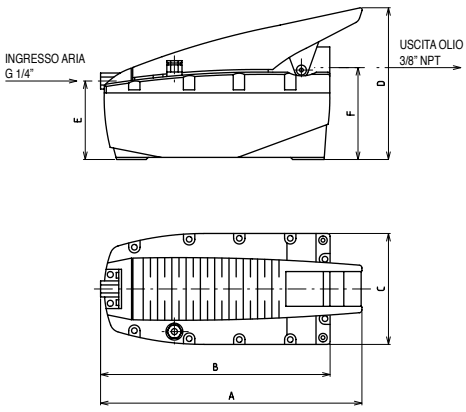
MODEL	PRESSURE MAX.	MULTIPLICATION RATIO	NO-LOAD FLOW	FLOW AT MAX. PRESSURE	RESERVOIR CAPACITY	USABLE OIL	AIR PRESSURE	WEIGHT
	bar		l/min	l/min	litres	litres	bar	kg
PP - 1500 - 10 - G	1500	1 : 220	0.28	0.01	10	8	1.8 - 7	23
PP - 2100 - 10 - G	2100	1 : 300	0.56	0.25	10	8	1.8 - 7	29
PP - 2500 - 10 - G	2500	1 : 440	0.21	0.04	10	8	1.8 - 7	25

PP SERIES
PNEUMOHYDRAULIC PUMPS

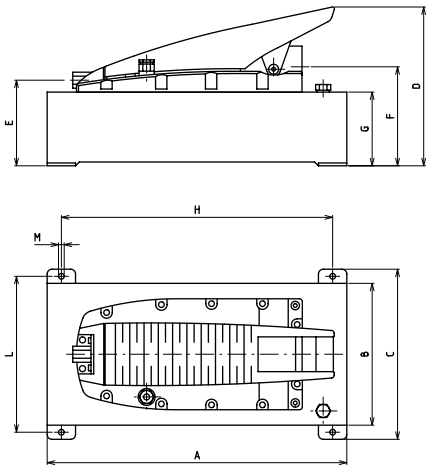
700 bar
Single-speed
2.5 to 10 l reservoir

PP- 700 Series — Pneumohydraulic pumps

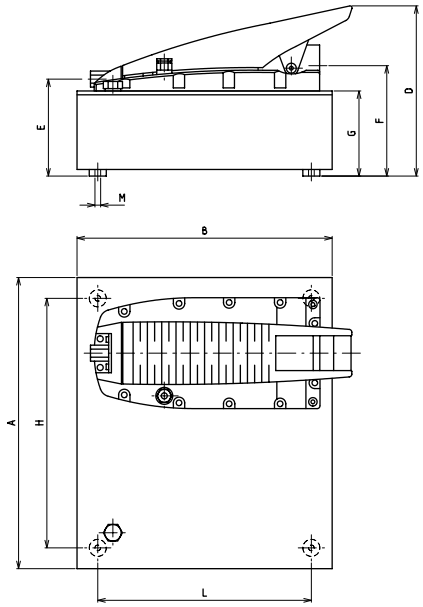
- Pneumohydraulic pumps that are compact and easy to use.
- Equipped with a standard reservoir of 2.5 litre in plastic and 5 or 10 litre in steel.
- Connected to the compressed air line with a threaded G ¼" fitting.
- The 3 or 4 way valves can be used to operate single or double-acting cylinders.
- Available version RC with remote control.
- Air operating pressure 2.8 to 8 bar.



PP-700-T



PP-700-T-L5



PP-700-T-L10

MODEL	PRESSURE	FLOW	RESERVOIR CAPACITY	USABLE OIL	AIR PRESSURE	DIMENSIONS in mm										WEIGHT
	bar	l/min	litres	litres	bar	A	B	C	D	E	F	G	H	L	M	kg
PP 700 T	700	0.8	2.5	2.1	2.8 - 8	365	320	155	209	109	127	-	-	-	-	6.3
PP 700 T L5		0.8	5	4	2.8 - 8	420	198	240	221	120	139	104	380	221.5	6	14
PP 700 T L10		0.8	10	8	2.8 - 8	410	360	-	237	136	155	120	350	300	M8	26
PP 700 T DE		0.8	2.5	2.1	2.8 - 8	320	320	155	233	109	129	-	-	-	-	6.3
PP 700 T DE L5		0.8	5	4	2.8 - 8	420	198	240	245	120	141	104	380	221.5	6	14
PP 700 T DE L10		0.8	10	8	2.8 - 8	410	360	-	261	136	157	120	350	300	M8	29
PP 700 T RC		0.8	2.5	2.1	2.8 - 8	322	320	155	218	109	127	-	-	-	-	6.3
PP 700 T RC L5		0.8	5	4	2.8 - 8	420	198	240	230	120	139	104	380	221.5	6	14
PP 700 T RC L10		0.8	10	8	2.8 - 8	410	360	-	246	136	155	120	350	300	M8	26

HYDRAULIC PUMPS WITH INDEPENDENT OUTLETS FROM F.P.T. ISO FLOW SERIES

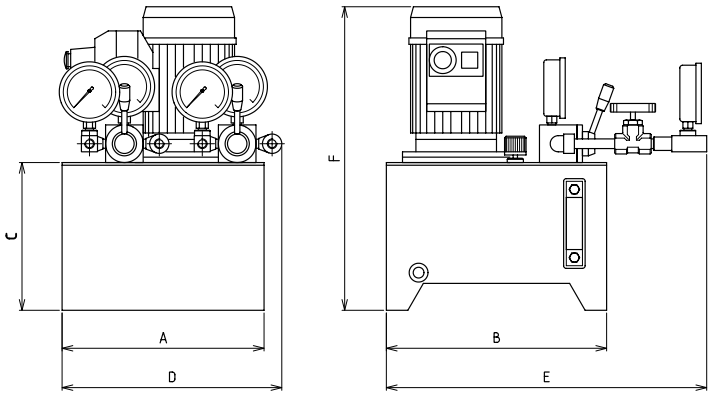
700 bar
Single-speed
00.4 - 0.9 l/min. oil flow
20 to 100 l reservoirs

FPT ISO FLOW Series

Hydraulic pump with independent outlets

For synchronous lifting during the lifting and lowering phases using counter balance valves

- Axial piston pumps, single-speed, with 2, 4 or 6 independent outlets and equal flow rate that remains constant even when the load varies.
- Synchronous load control during the lifting phase.
- Each outlet can be equipped with a flow control valve to control the load during the lowering phase. If a control is required on the up and down phase, an FPT synchronous system controlled by a PLC can be used (see page 74).
- 20 to 100-litre reservoirs can be used to operate a wide range of medium and high tonnage cylinders.
- Example of hydraulic pump configuration to operate 4 double-acting cylinders: F.P.T. 4X0.4-ME2-M-EV4/3-60-SP



ISO FLOW

Hydraulic pump with 4 independent delivery ports with single overcentre valves (700 bar) to synchronise the load in both lifting and lowering.

MODEL	MAXIMUM PRESSURE	FLOW PER UTILIZATION	MOTOR	KW RPM	RESERVOIR CAPACITY	DIMENSIONS in mm						WEIGHT
	bar	l/min			litres	A	B	C	D	E	F	kg
FPT 2x0.9 - ME2	700	0.9	THREE-PHASE 2-POLES	2.2 / 2850	20	376	410	275	430	560	565	83
FPT 4x0.4 - ME2		0.4	THREE-PHASE 2-POLES	2.2 / 2850	60	516	700	275	516	850	565	140
FPT 6x0.7 - ME4		0.7	THREE-PHASE 4-POLES	5.5 / 1450	100	586	900	275	775	900	625	240 *

** Excluding oil.*

FPT SYNCHRO Series

Synchronous lifting systems

For millimetre precision lifting

F.P.T. makes integrated PLC controlled lifting systems
The F.P.T. Synchro system allows the operator to carry out each stage of the lifting and lowering process in synchronicity via integrated management of the hydraulic and control elements. Unbalanced loads are kept level during the up and down phases, with a maximum levelling error of +/- 1 mm.
The system has been designed to adapt to all the customer's lifting requirements and can be fully personalised with a series of options. It's the ideal tool for lifting or weighing operations that need dedicated control functions.
The F.P.T. system is easy, safe and modulable for the operator to use.

Typical synchronous lifting application from 4 to 48 points:

The system through the signals from the stroke and pressure transducers allow synchronous lifting and lowering with precision of +/- 1 mm, reducing the risk of excessive strain due to unequal distribution of the loads across the lifting points.
The operator can use the PC screen to set parameters for the operation to be carried out, decide the number of cylinders to use, the stroke, the precision and speed at which to operate. All the data throughout the operation is constantly monitored by the system and allows greater productivity and safety during the operations.
All the data is recorded and can then be downloaded.

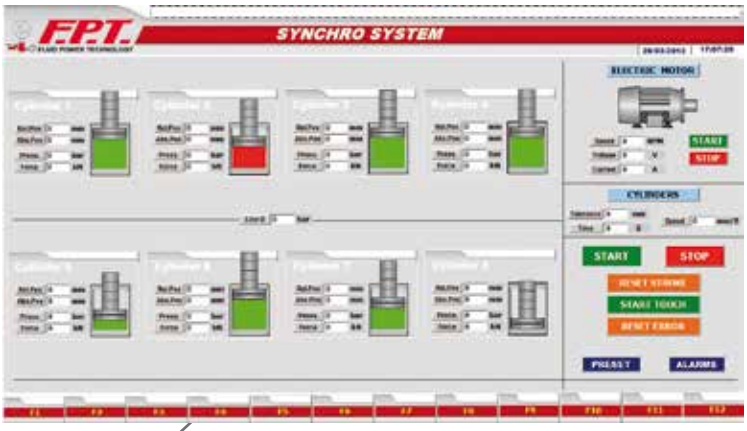
Basic composition of the system:

- 700 bar hydraulic pump with radial piston pump, three-phase engine controlled by a frequency changer
- portable PC or touch screen panel
- wire transducers to control the stroke
- plated cables complete with industrial connectors

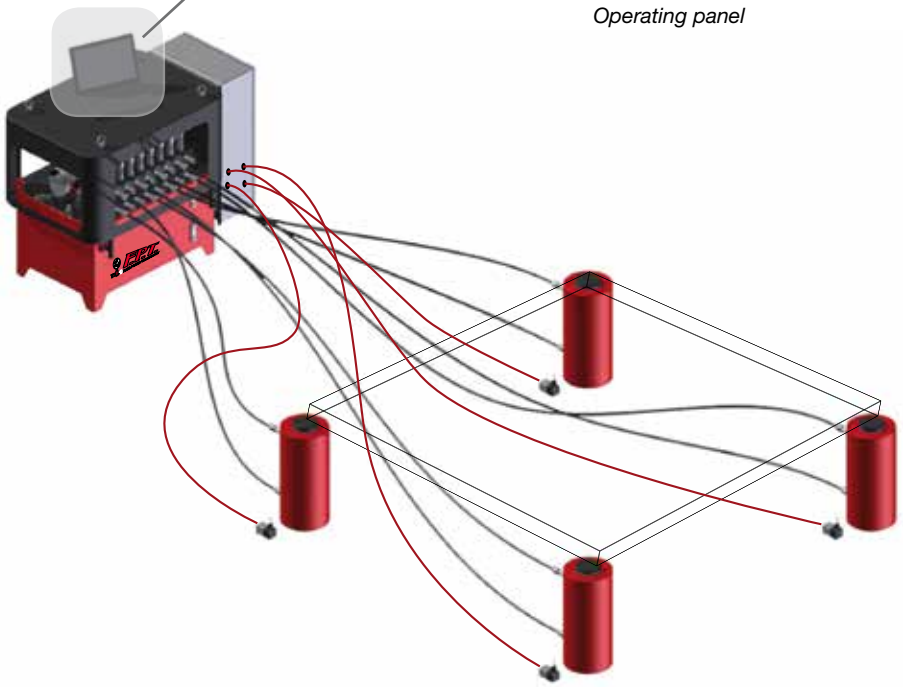
To use single- or double-acting hydraulic pumps

CONTROLS - OPERATOR PANEL:

- control from 4 to 48 lifting points
- controlled movement for lifting/lowering manoeuvres
- possible to select which cylinders to move
- 2 possible settings: automatic or manual
- possible to set maximum error
- synchronicity precision +/- 1 mm
- visual alarms for the load and stroke for maximum safety during operations
- visible indicator of relative maximum error for the various cylinders
- download and storage of lifting data



Operating panel



Typical layout for synchronous system from 4 to 8 points:

Wire transducers to control the stroke

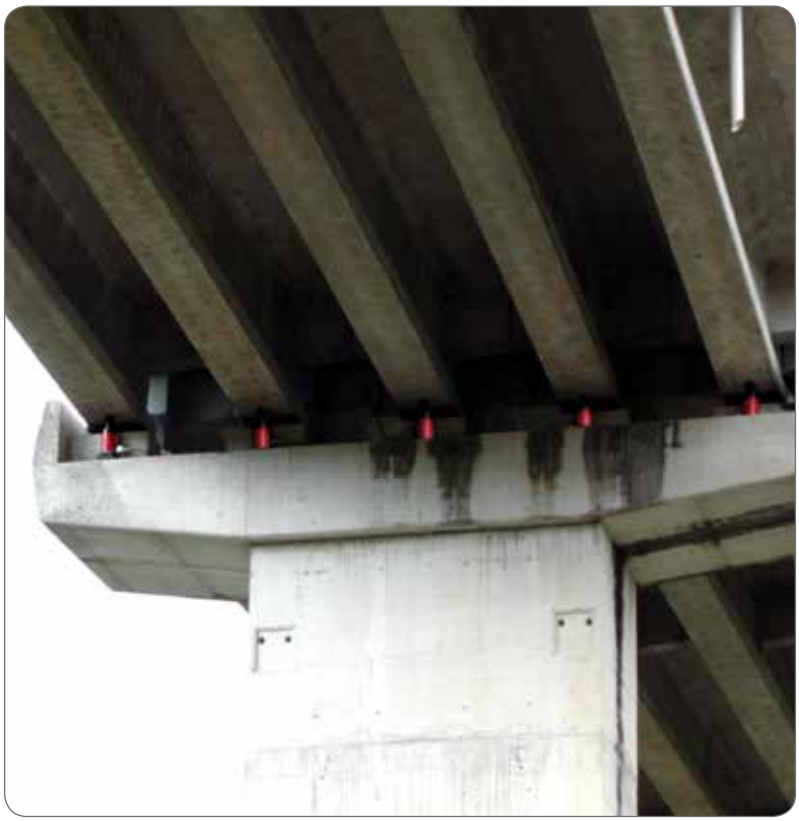
OPTIMISING SPEED

The system is capable of optimising the lifting/lowering speed of the load regardless of the number or size of the cylinders, maintaining the error margin within the limits set.
The operating panel allows the “contact operation” of the cylinders on the structure/decks being lifted to be carried out, saving a substantial amount of time.

The following information is visible for each cylinder:
- relative and absolute position
- pressure
- force
- direction (up/down)
- information on errors

TYPICAL APPLICATIONS OF SYNCHRONOUS LIFTING:

- Moving heavy structures
- Maintenance, launch or construction of bridges
- Load transfer operations
- Installation or maintenance of heavy plant
- Positioning off-shore platforms
- Weighing operations



OPTIONAL - SYSTEM PERSONALISATION:

- High flow rate pump to feed 700 bar high-tonnage cylinders
- Operating panel
- Synchronous systems can be created for environments with temperatures from -20C° to +50C° and 100% humidity
- Synchronous systems can be created in explosion proof version - ATEX
- Pressure transducers
- Heat exchangers
- Lifting on inclined cylinder axis
- Operations to weigh the load and calculate the centre of gravity
- Creating cylinders with integrated transducers

LIFTING CYLINDERS:

The synchronous system can be used with:

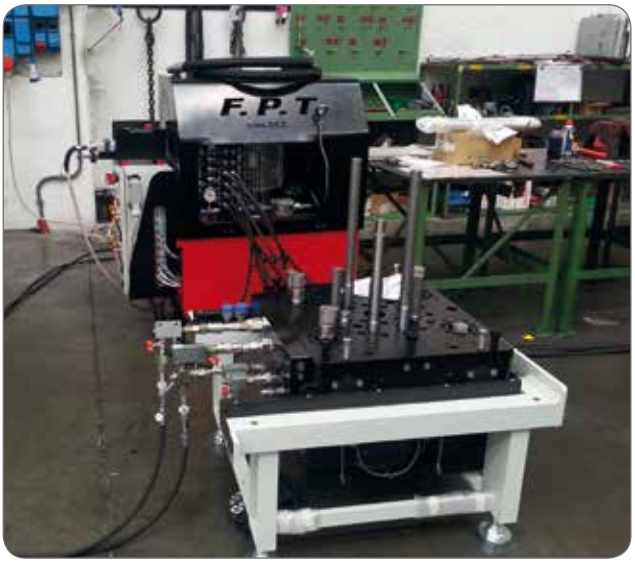
- single-acting cylinders
- single-acting cylinders with safety ring
- Double-acting cylinders
- Double-acting cylinders with safety ring

Special pumps

When standard production cannot meet customer requirements, F.P.T. can design and build hydraulic pumps based on customer specifications, varying the flow rates, reservoirs and functions of the hydraulic pump.

Special hydraulic pumps with:

- Electric motors with different voltages and frequencies.
- Operating pressure up to 1000 bar.
- Pressure control valve.
- Hydraulic pumps with a radial piston pump, combined and with different flow rates, can also be supplied.



Testing and flushing hydraulic power unit

Hydraulic pump to operate strand jacks in the field of post-tensioning

Hydraulic pump with double motor pump unit, low and high pressure, set according to customer requirements.

Hydraulic pump with 4 independent outlets for synchronous lifting of the load, independently from the different load weighing on each cylinder.

F.P.T.
VALVES AND ACCESSORIES

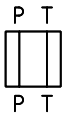
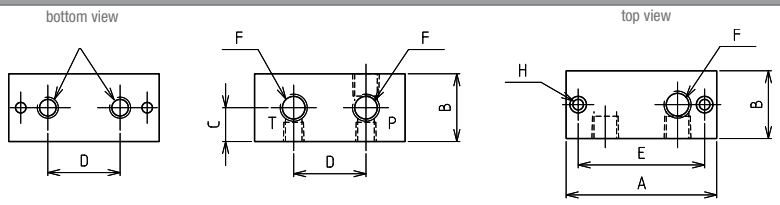
For control that's always reliable

F.P.T. valves are designed and built to guarantee maximum reliability and performance based on customer needs. They can be mounted directly on the hydraulic pump or inline, equipped with a manual or an electric drive, and with multiple configurations to provide the operator with maximum flexibility.

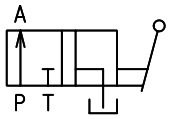
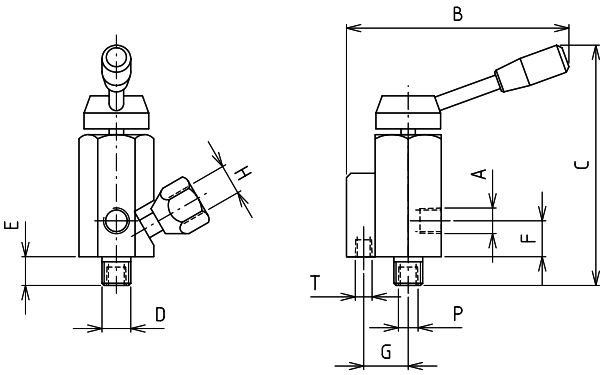
A wide range of components and accessories is available to complete your hydraulic power system. A complete line of pressure gauges, hoses, quick couplers, manifolds, fittings and oil to extend the service life and increase the operating efficiency of your equipment.

VALVE	Series		Page
3 way valves 4 way valves	VM-VE		82
Additional valves to control the flow rate and pressure			88
Pressure gauges	MD		90
Pressure gauge accessories	VM PM		91
Flexible tubes	TFG TFR		92
Rapid couplers	GR		93
Manifolds Fittings and oil	MR MA ML		94

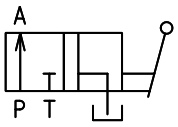
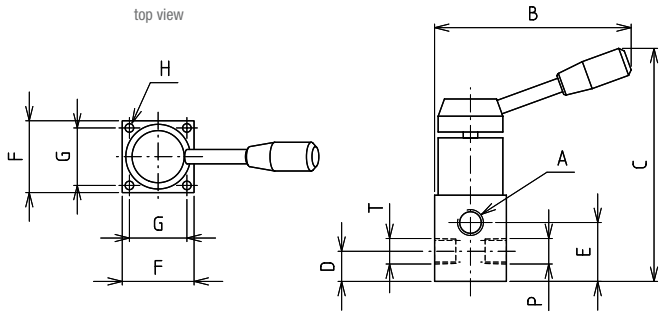
3-way valves 700BAR

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
		FPT	

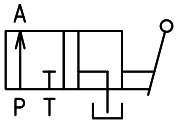
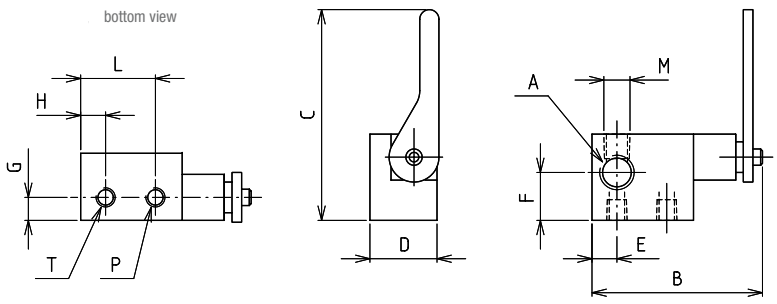
MODEL	A	B	C	D	E	F	G	H	P	T
PT	100	45	22,5	48	84	3/8" NPT	1/4" NPT	6,5	3/8" NPT	3/8" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-2 POSITION MANUAL		FPT POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	P	T
VM - 1M	3/8" NPT	155	170	M20x1,5	20	25	31	G 1/2"	1/4" NPT	1/8" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-2 POSITION MANUAL		FPT IN LINE	

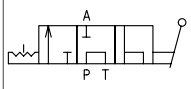
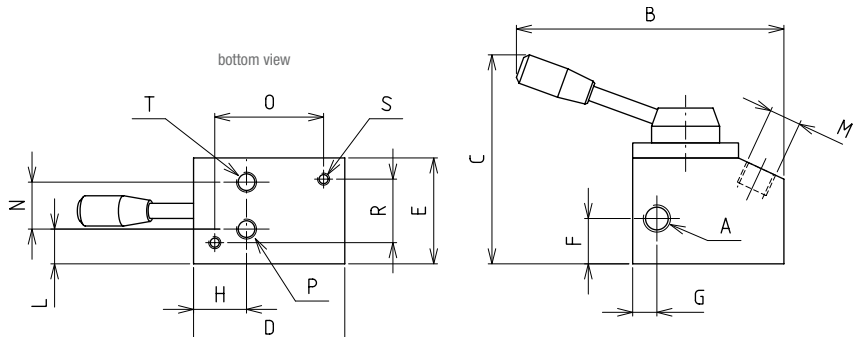
MODEL	A	B	C	D	E	F	G	H	P	T
VM - 1L	3/8" NPT	137	165	21	41	50	40	5,5	3/8" NPT	3/8" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-2 POSITION MANUAL		FPT POSITION ON HYDRAULIC PUMP	

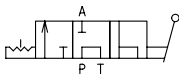
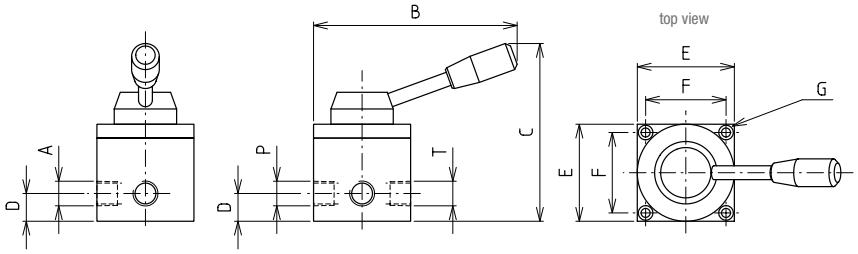
MODEL	A	B	C	D	E	F	G	H	L	M	P	T
VM - 4M	3/8" NPT	90	111	35	13	25	12	13	39	1/4" NPT	1/8" NPT	1/8" NPT

Other models of 3-way valves also available.

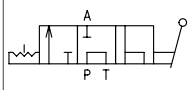
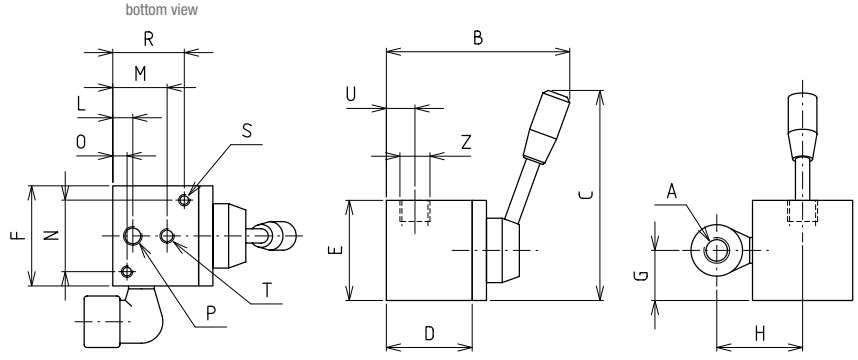
dimensions in mm

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL		FPT ON HYDRAULIC PUMP	

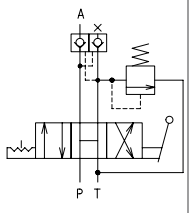
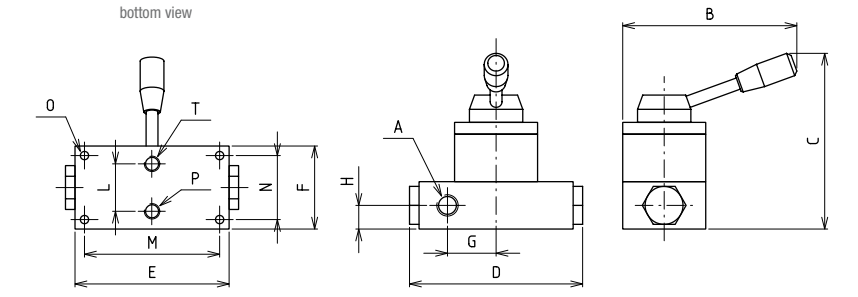
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T
VM - 2M	3/8" NPT	177	138	100	70	30	16	35	23	G 1/2"	31	72	1/4" NPT	42	M8	1/4" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL		FPT IN LINE	

MODEL	A	B	C	D	E	F	G	P	T
VM - 2L	3/8" NPT	147	128	20	70	58	5.5	3/8" NPT	3/8" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL		FPH POSITION ON HYDRAULIC PUMP	

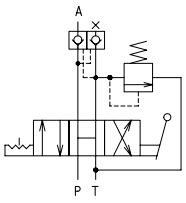
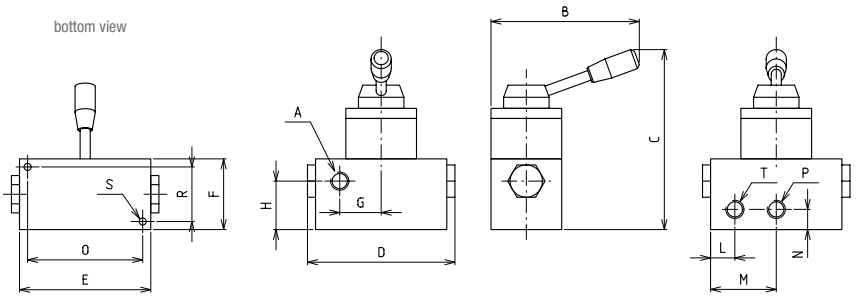
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U	Z
VM - 5M	3/8" NPT	128	147	60	70	70	20	75	14	38	50	10	1/4" NPT	50	M8	1/8" NPT	20	G 1/2"

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPT POSITION ON HYDRAULIC PUMP	

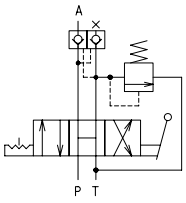
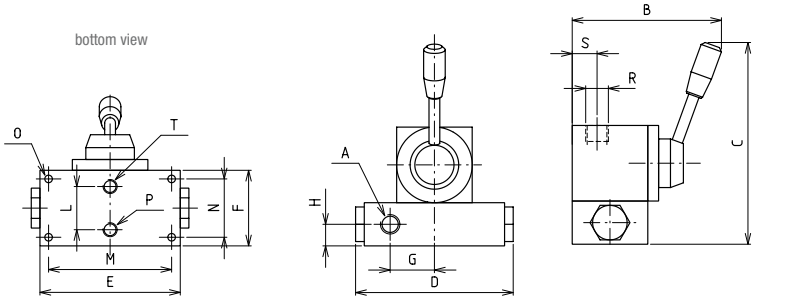
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	T
VM - 3M	3/8" NPT	147	148	146	130	70	41	20	40	114	54	6.5	1/4" NPT	1/4" NPT

Other models of 3-way valves also available.

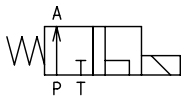
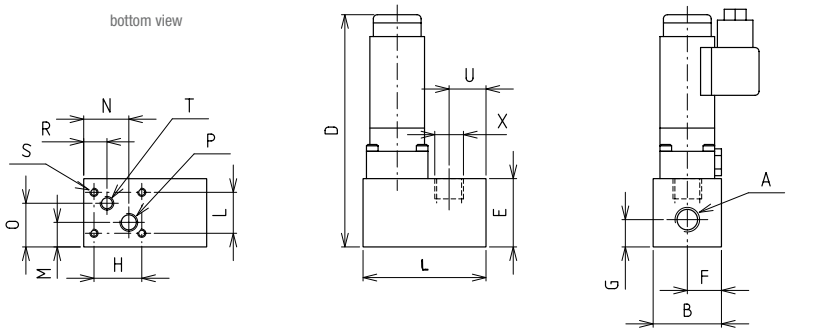
dimensions in mm

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPT IN LINE	

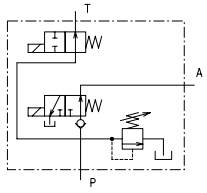
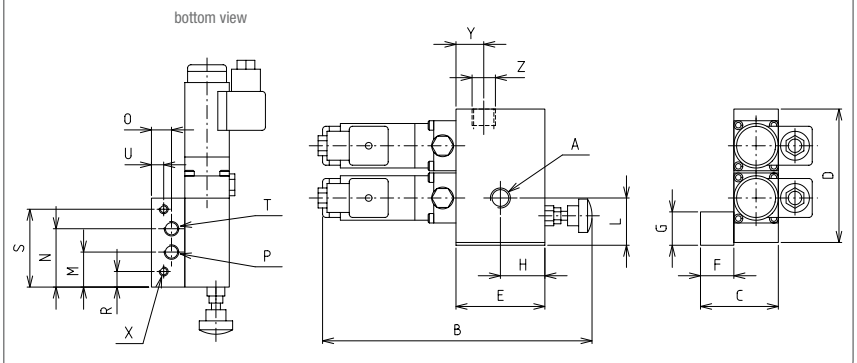
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T
VM - 3L	3/8" NPT	147	178	146	130	70	41	48	24	65	20	114	3/8" NPT	54	6.5	3/8" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPH POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T
VM - 6M	3/8" NPT	138	187	146	130	70	41	20	40	114	54	6.5	1/4" NPT	G 1/2"	23	1/4" NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-2 POSITION SOLENOID VALVE		FPT-FPH POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U	X
VE-R2	3/8" NPT	50	90	167	50	25	20	35	30	18	33	32	1/4" NPT	17	M6	1/8" NPT	27	G 1/2"

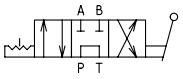
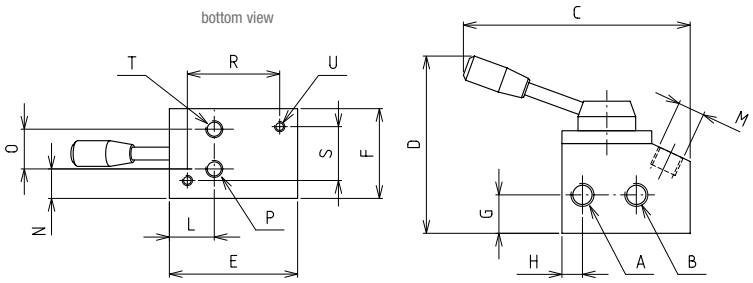
VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION SOLENOID VALVE		FPT-FPH POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U	X	Y	Z
VE-R21	3/8" NPT	240	70	120	80	30	30	40	40	31.5	52.5	18	1/4" NPT	14	70	1/4" NPT	11	M6	25	G 1/2"

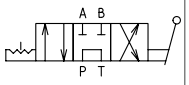
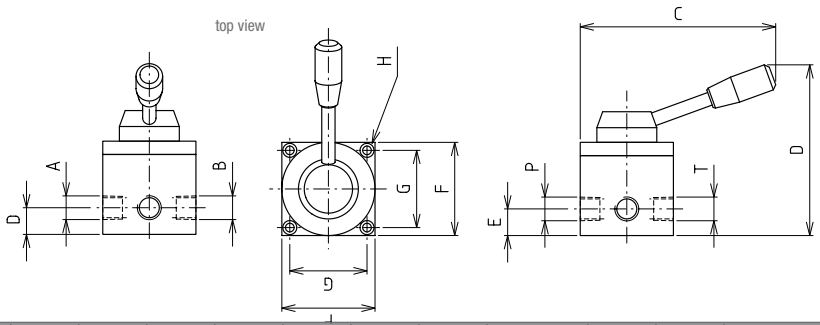
Other models of 3-way valves also available.

dimensions in mm

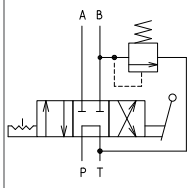
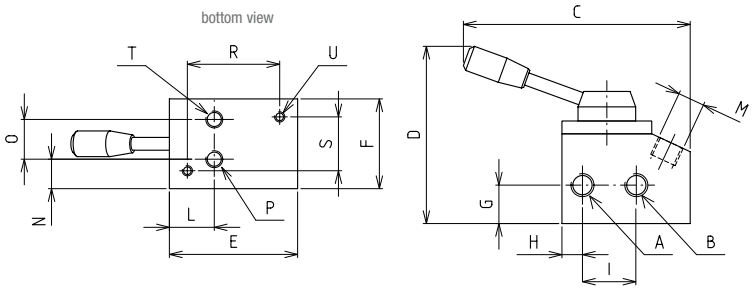
4-way valves 700 BAR

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL		FPT ON HYDRAULIC PUMP	

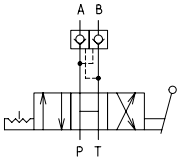
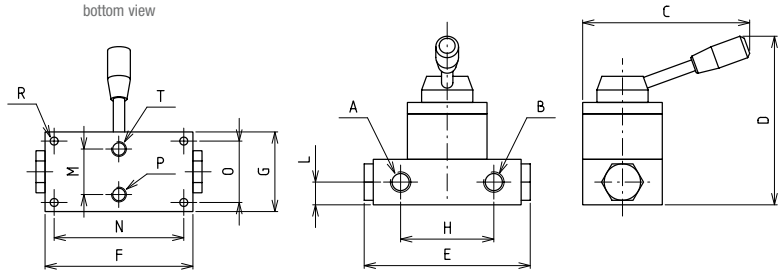
MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	R	S	T	U
VM - 11M	3/8" NPT	3/8" NPT	177	138	100	70	30	16	58	35	G 1/2"	23	31	1/4"NPT	72	42	1/4"NPT	M8

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL		FPT ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	R	S	T
VM - 11L	3/8" NPT	3/8" NPT	147	128	20	70	58	5,5						3/8"NPT			3/8"NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH RELIEF VALVE AT 150 BAR ON B		FPT ON HYDRAULIC PUMP	

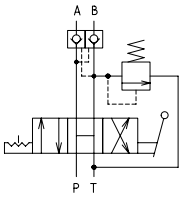
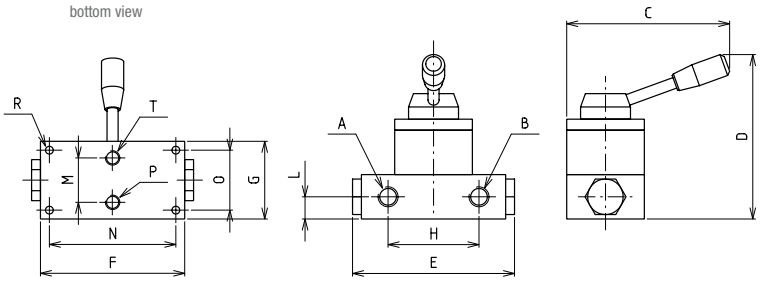
MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	R	S	T	U
VM - 13M	3/8" NPT	3/8" NPT	177	138	100	70	30	16	58	35	G 1/2"	23	31	1/4"NPT	72	42	1/4"NPT	M8

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
3 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPT ON HYDRAULIC PUM	

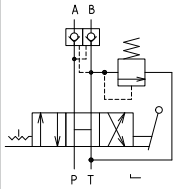
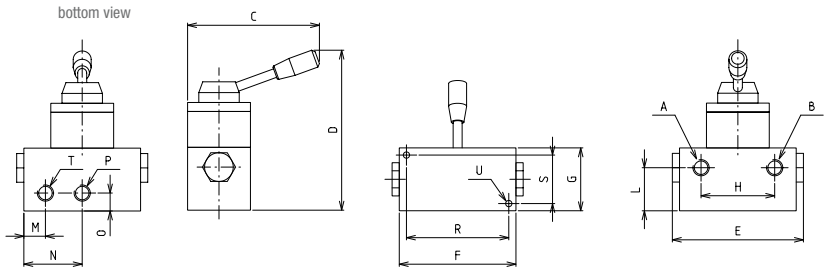
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	T
VM - 12M	3/8" NPT	3/8" NPT	147	148	146	130	70	82	20	40	114	54	1/4"NPT	6,5	1/4"NPT

Other models of 4-way valves also available.

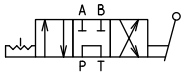
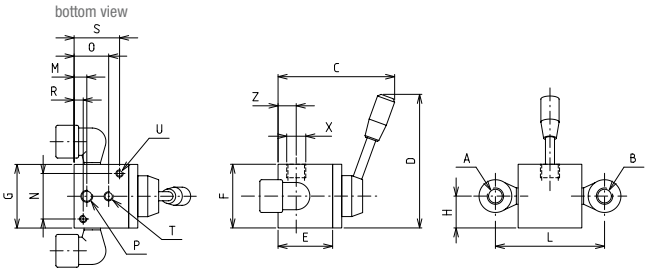
dimensions in mm

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE AND RELIEF VALVE AT 150 BAR ON B		FPT POSITION ON HYDRAULIC PUMP	

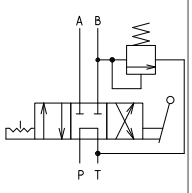
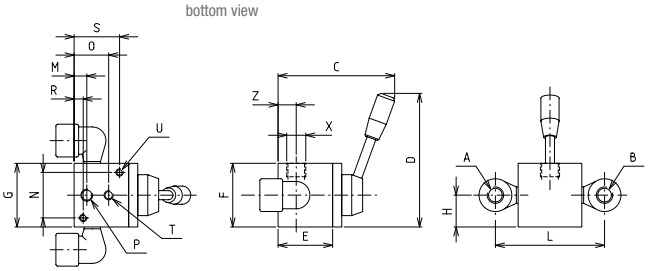
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T
VM - 14M	3/8" NPT	3/8" NPT	147	148	146	130	70	82	20	40	114	54	1/4"NPT	6,5		1/4"NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE AND RELIEF VALVE AT 150 BAR ON B		FPT POSITION ON HYDRAULIC PUMP	

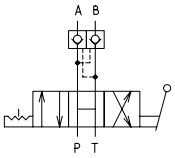
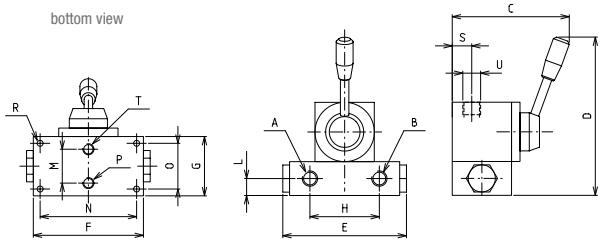
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T
VM - 14L	3/8" NPT	3/8" NPT	147	178	146	130	70	82	48	24	65	20	3/8"NPT	114	54	3/8"NPT

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL		FPT POSITION ON HYDRAULIC PUMP	

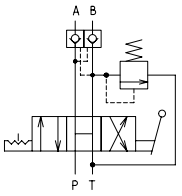
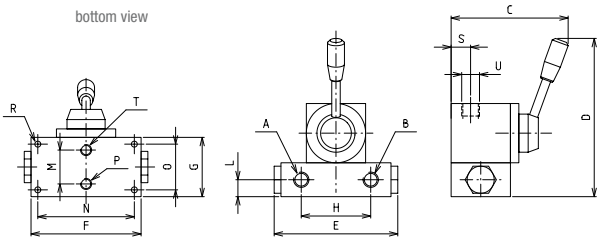
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U	Z	X
VM - 15M	3/8" NPT	3/8" NPT	128	147	60	70	70	20	150	14	50	38	1/4"NPT	10	50	1/8" NPT	M8	20	G 1/2"

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH RELIEF VALVE AT 150 BAR ON B		FPT POSITION ON HYDRAULIC PUMP	

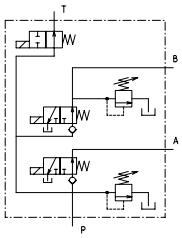
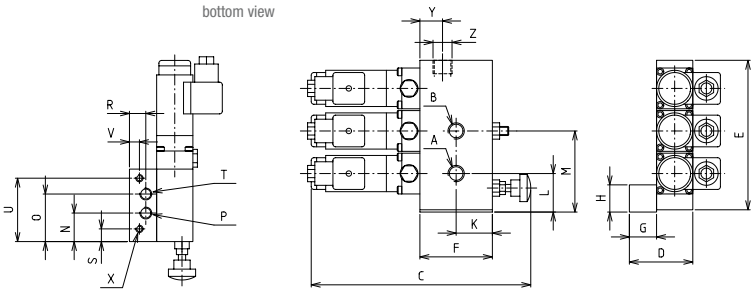
MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U	Z	X
VM - 17M	3/8" NPT	3/8" NPT	128	147	60	70	70	20	150	14	50	38	1/4"NPT	10	50	1/8" NPT	M8	20	G 1/2"

VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPT POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U
VM - 16M	3/8" NPT	3/8" NPT	138	187	146	130	70	82	20	40	114	54	1/4"NPT	6,5	23	1/4"NPT	G 1/2"

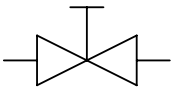
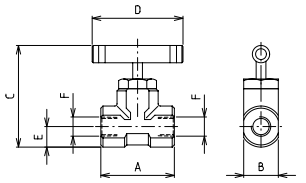
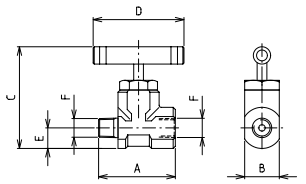
VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH PILOT-OPERATED CHECK VALVE		FPT POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	L	M	N	O	P	R	S	T	U
VM - 18M	3/8" NPT	3/8" NPT	138	187	146	130	70	82	20	40	114	54	1/4"NPT	6,5	23	1/4"NPT	G 1/2"

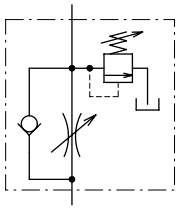
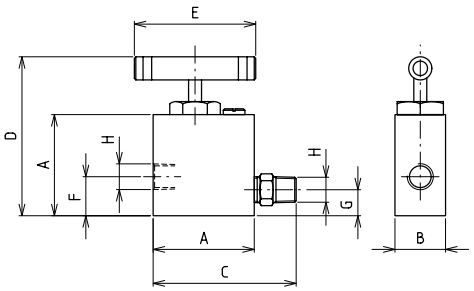
VALVE	HYDRAULIC DIAGRAM	MOUNTED ON	TECHNICAL DRAWING
4 WAY-3 POSITION MANUAL WITH RELIEF VALVE AT 150 BAR ON B		FPT POSITION ON HYDRAULIC PUMP	

MODEL	A	B	C	D	E	F	G	H	K	L	M	N	O	P	R	S	T	U	V	X	Y	Z
VE-R22C	3/8" NPT	3/8" NPT	240	70	165	80	30	30	40	40	87	31,5	52,5	1/4"NPT	18	14	1/4"NPT	70	11	M6	25	G 1/2"

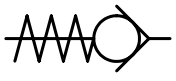
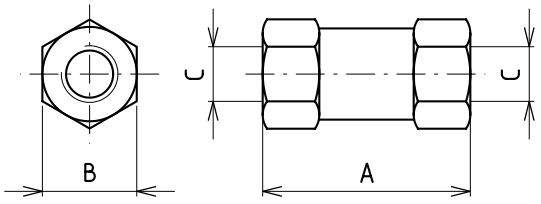
Additional flow rate and pressure control valves.

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	NEEDLE VALVE 1000 BAR		Inline needle valve used to exclude or hold parts of the hydraulic circuit under pressure (female-female).	 VM-5A
			Inline needle valve used to exclude or hold parts of the hydraulic circuit under pressure (male-female).	 VM-5B

MODEL	A	B	C	D	E	F
VM - 5A VM - 5B	68	32	94	84	19	3/8" NPT

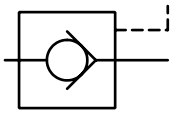
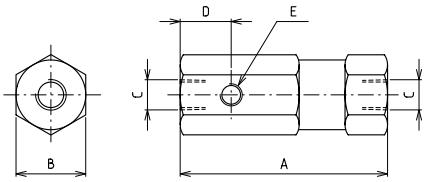
	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	UNIDIRECTIONAL FLOW CONTROL VALVE 700 BAR		Unidirectional flow control valve used to lower the load in a controlled manner. The built-in relief valve protects the circuit against overpressure.	

MODEL	A	B	C	D	E	F	G	H
RFUA	70	35	100	110	84	27	18	3/8" NPT

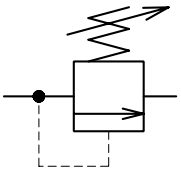
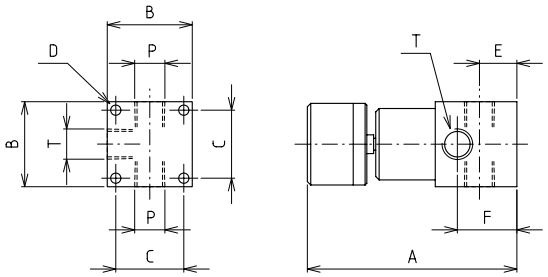
	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	CHECK VALVE 700 BAR		Inline unidirectional check valve. It blocks the flow in one direction while allowing it to move in the opposite direction.	

MODEL	A	B	C
VRL - A38	66	30	3/8" NPT
VRL - B14	56	25	1/4" NPT

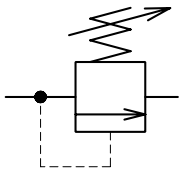
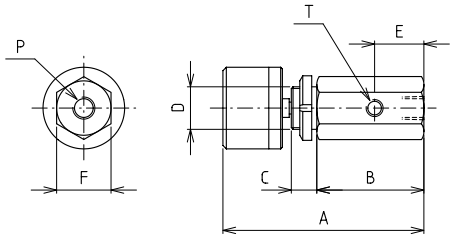
dimensions in mm

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	PILOT-OPERATED CHECK VALVE 700 BAR		Inline pilot-operate check valve blocks the flow in one direction allowing it to move in the opposite direction. The circuit is unblocked thanks to a pilot pressure 4 times lower than the circuit pressure.	

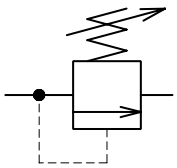
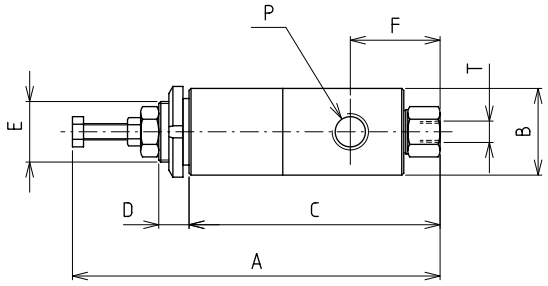
MODEL	A	B	C	D	E
VRPL - A	122	41	3/8" NPT	30	1/4" NPT

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	PRESSURE RELIEF VALVE 700 BAR		Pressure relief valve; the knob is used to regulate the pressure in the circuit. For inline mounting.	

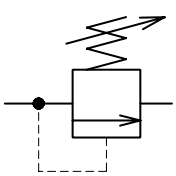
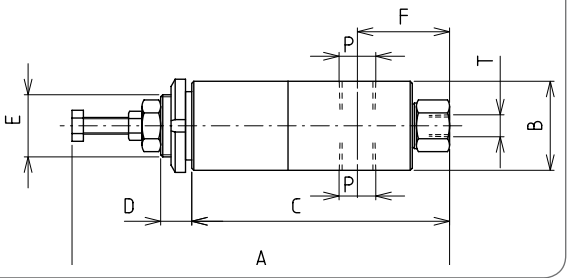
MODEL	A	B	C	D	E	F	P	T
VMPL - A	125	50	40	5.5	22	35	3/8" NPT	3/8" NPT

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	PRESSURE RELIEF VALVE 700 BAR		Pressure relief valve; the knob is used to regulate the pressure in the circuit. Panel mounted.	

MODEL	A	B	C	D	E	F	P	T
VMPP - A	120	63	15	M25x1.5	29	32	1/4" NPT	1/8" NPT

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	PRESSURE RELIEF VALVE 700 BAR		Pressure relief valve; the knob is used to regulate the pressure in the circuit. Panel mounted. Very accurate metering.	

MODEL	A	B	C	D	E	F	P	T
VMX/TS	183	43	128	15	M30x1.5	45	3/8" NPT	1/8" NPT

	VALVE	HYDRAULIC DIAGRAM	DESCRIPTION	TECHNICAL DRAWING
	PRESSURE RELIEF VALVE		Pressure relief valve; the knob is used to regulate the pressure in the circuit. Panel mounted.	

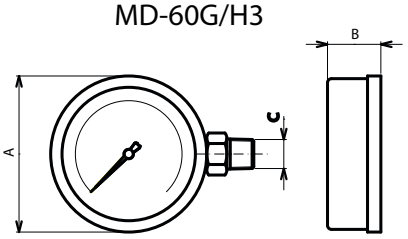
MODEL	A	B	C	D	E	F	P	T
VMX/TSL	183	43	128	15	M30x1.5	45	3/8" NPT	1/8" NPT

Other additional valve models are also available. For information contact F.P.T.

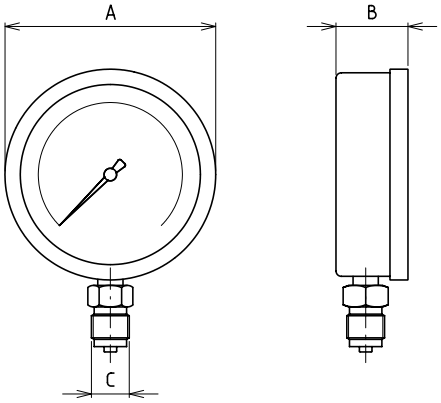
dimensions in mm

Pressure gauges

MD-60G/H3



MD PRESSURE GAUGES



- Glycerine-filled pressure gauges.
- Excellent precision and readability, easy to install.
- Two pressure gauge versions: digital or dual pressure reading scale (bar - ton).

MODEL	PRESSURE range		Ø FACE	TYPE	DIMENSIONS in mm		
	Bar	Psi	mm		A	B	C
MD 60 G/H3**	0 - 1000	0 - 14,000	60	GLYCERINE-FILLED	68	28	1/4" NPT
MD 60 G	0 - 1000	0 - 14,000	60	GLYCERINE-FILLED	68	28	1/4" NPT
MD 100 G	0 - 1000	0 - 14,000	100	GLYCERINE-FILLED	110	36	G 1/2" *
MD 100 G/1600	0 - 1600	0 - 23000	100	GLYCERINE-FILLED	110	47	G 1/2"
MD 100 G/2000	0 - 2000	0 - 30000	100	GLYCERINE-FILLED	110	47	G 1/2"
MD 100 G/2500	0 - 2500	0 - 36000	100	GLYCERINE-FILLED	110	47	G 1/2"
MD 150 G/2500	0 - 2500	0 - 36000	150	GLYCERINE-FILLED	160	50	G 1/2"
MD 100 G/4000	0 - 4000	0 - 60000	100	GLYCERINE-FILLED	110	50	M16x1.5
MD 150 G/4000	0 - 4000	0 - 60000	150	GLYCERINE-FILLED	160	50	M16x1.5

** Swivelling. To properly orient the face.*
*** Manometer for PMSA3 PUMP*

Pressure gauge accessories

PRESSURE GUAGE ADAPTORS

The FPT system can be used to mount the pressure gauge directly on the pump head. The pressure gauge adaptors are required on pumps and valves when the pressure gauge is not directly installed.

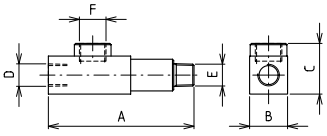

PM-356


PM-355

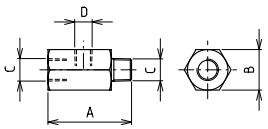

PM-351


PM-346

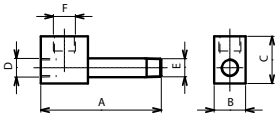
PM-39 PM-351



PM-355 PM-356



PM-346

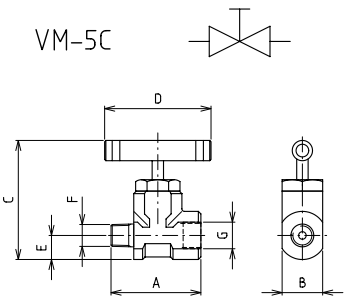


	MODEL	DIMENSIONS in mm					
		A	B	C	D	E	F
	PM - 346	115	30	45	3/8" NPT	3/8" NPT	G 1/2"
	PM - 351	115	30	40	3/8" NPT	1/4" NPT	G 1/2"
	PM - 355	68	27	1/4" NPT	1/4" NPT		
	PM - 356	68	32	3/8" NPT	1/4" NPT		

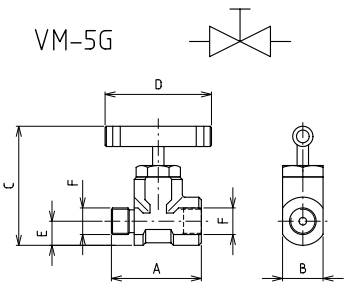
PRESSURE GAUGE SHUT-OFF VALVES

The pressure gauge shut-off valves cut off the pressure to the gauge so that it can be excluded when readings are not required.

VM-5C



VM-5G



	MODEL	MALE END	FEMALE END	DIMENSIONS in mm				
		F	G	A	B	C	D	E
	VM - 5C	3/8" NPT	G 1/2"	68	32	94	84	19
	VM - 5G	G 1/2"	G 1/2"	68	32	94	84	19

HOSES

Internal diameter: 6.3 and 9.7 mm
Length: 0.6 - 20 m
Maximum operating pressure: 700 bar

Hoses

- Flexible tubes of 1/4 - internal Ø of 6.3 mm, operating pressure 700 bar.
- For demanding applications with a 4:1 safety factor.
- Also available in custom sizes and types.

Hoses with internal Ø of 10 mm for applications with high flows or with very long hoses also available.

MODEL	HOSE AND QUICK COUPLERS ASSEMBLY		LENGTH
	END 1	END 2	m
TFR - 0.6	3/8" NPT	3/8" NPT	0.6
TFR - 1	3/8" NPT	3/8" NPT	1
TFR - 2	3/8" NPT	3/8" NPT	2
TFR - 3	3/8" NPT	3/8" NPT	3
TFR - 4	3/8" NPT	3/8" NPT	4
TFR - 5	3/8" NPT	3/8" NPT	5
TFR - 6	3/8" NPT	3/8" NPT	6
TFR - 10	3/8" NPT	3/8" NPT	10
TFRR - 0.6	1/4" NPT	1/4" NPT	0.6
TFRR - 1	1/4" NPT	1/4" NPT	1
TFRR - 2	1/4" NPT	1/4" NPT	2
TFRR - 3	1/4" NPT	1/4" NPT	3
TFRR - 4	1/4" NPT	1/4" NPT	4
TFRR - 5	1/4" NPT	1/4" NPT	5
TFRR - 6	1/4" NPT	1/4" NPT	6
TFRR - 10	1/4" NPT	1/4" NPT	10
TFG - 0.6	3/8" NPT	GR - 6M	0.6
TFG - 1	3/8" NPT	GR - 6M	1
TFG - 2	3/8" NPT	GR - 6M	2
TFG - 3	3/8" NPT	GR - 6M	3
TFG - 4	3/8" NPT	GR - 6M	4
TFG - 5	3/8" NPT	GR - 6M	5
TFG - 6	3/8" NPT	GR - 6M	6
TFG - 10	3/8" NPT	GR - 6M	10
TFGG - 0.6	GR - 6M	GR - 6M	0.6
TFGG - 1	GR - 6M	GR - 6M	1
TFGG - 2	GR - 6M	GR - 6M	2
TFGG - 3	GR - 6M	GR - 6M	3
TFGG - 4	GR - 6M	GR - 6M	4
TFGG - 5	GR - 6M	GR - 6M	5
TFGG - 6	GR - 6M	GR - 6M	6
TFGG - 10	GR - 6M	GR - 6M	10

TFR

TFRR

TFG

TFGG

Quick couplers

To connect circuits easily and quickly.

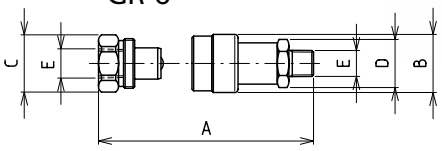
- High flow quick couplers are recommended for use on all equipment and F.P.T. products.
- Each coupler is equipped with a dust cap.
- The dust cap for the male coupler must be ordered separately.

GR6

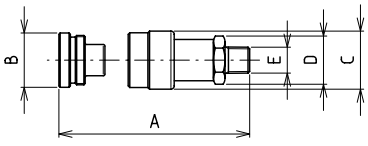
GR -6FF

GR1

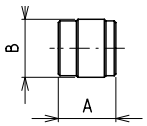
GR-1
GR-6



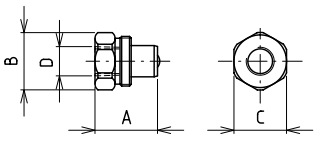
GR-1F
GR-6F



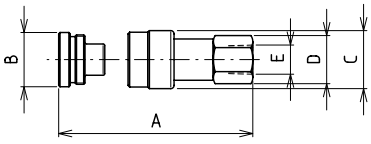
GRT-1M
GRT-6M



GR-1M
GR-6M



GR-6FF

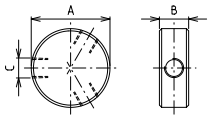
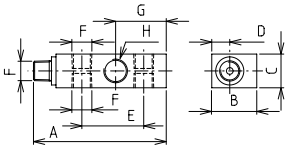
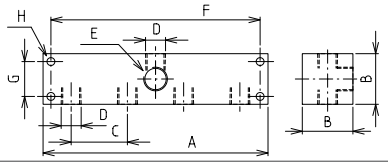


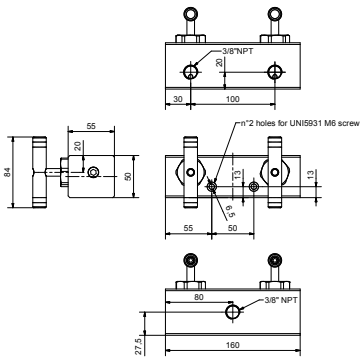
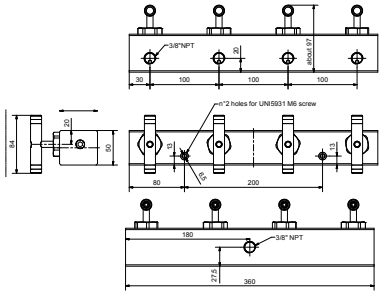
MODEL	DIMENSION in mm				
COUPLER	A	B	C	D	E
GR - 6	87	35	CH32	CH25	3/8"NPT
GR-6F	80	32	35	CH25	3/8"NPT
GR-6M	38	35	32	3/8"NPT	-
GRT-6M	35	35	-	-	-
GR - 6FF	82	32	35	CH25	3/8"NPT
GR - 1	78	30	CH27	CH22	1/4" NPT
GR - 1F	66	30	30	CH22	1/4" NPT
GR - 1M	37	30	27	1/4" NPT	-
GRT - 1M	28	30	-	-	-

MANIFOLDS

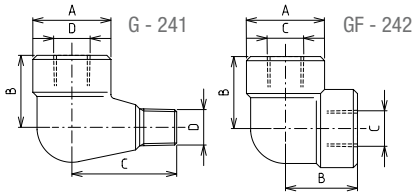
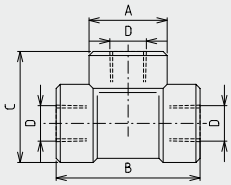
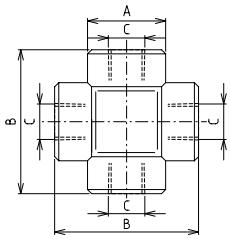
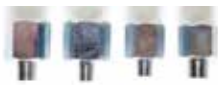
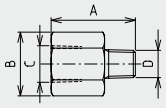
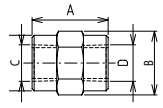
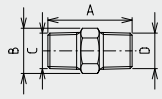
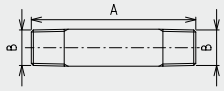
- Used to connect multiple lines to one inlet.
- Built with radial or linear outlet. The linear models are supplied with a pressure gauge installation hole.
- Available in 11 standard models and in special versions for high pressure jobs.
- 1000 BAR

Manifolds - fittings and hydraulic oil

	MODEL	NUMBER OF USES	DIMENSIONS in mm								
			A	B	C	D	E	F	G	H	
	MR - 3V	3	70	26	3/8" NPT						
	MR - 5V	5	70	26	3/8" NPT						
	MR - 11V	11	148	35	3/8" NPT						
	MR - 17V	17	230	35	3/8" NPT						
	MA - 5	5	118	40	30	16	55	3/8" NPT	45	G 1/2"	
	MA - 7	7	173	40	30	16	55	3/8" NPT	100	G 1/2"	
	MA - 9	9	228	40	30	16	55	3/8" NPT	100	G 1/2"	
	ML - 5	5	200	45	50	3/8" NPT	G 1/2"	186	31	6,5	
	ML - 7	7	300	45	50	3/8" NPT	G 1/2"	286	31	6,5	
	ML - 9	9	400	45	50	3/8" NPT	G 1/2"	386	31	6,5	
	ML - 11	11	500	45	50	3/8" NPT	G 1/2"	486	31	6,5	

	MODEL	NUMBER OF USES	DIMENSIONS in mm								
			A	B	C	D	E	F	G	H	
	VM5A/2	3	160	50	97	84	20	3/8"NPT	100	30	
	VM5A/4	5	360	50	97	84	13	3/8"NPT	100	30	

FITTINGS

	TYPE	MODEL	DIMENSIONS in mm				
			A	B	C	D	
	ELBOW	G - 241	38	35	50	3/8" NPT	
		GF - 242	38	35	3/8" NPT	-	
	T FITTING	T - 342	38	66	53	3/8" NPT	
	CROSS FITTING	C - 442	38	66	3/8" NPT	-	
	REDUCTION	R - 313	40	CH 27	1/4" NPT	3/8" NPT	
		R - 314	40	CH 27	3/8" NPT	1/4" NPT	
		R - 316	45	CH 32	G 1/2"	1/4" NPT	
		R - 352	45	CH 32	G 1/2"	3/8" NPT	
	HEX COUPLING	ME - 349	37	CH 27	3/8" NPT	3/8" NPT	
		ME - 357	37	CH 27	1/4" NPT	3/8" NPT	
	NIPPLE	N - 341	39	CH 17	1/4" NPT	1/4" NPT	
		N - 343	41	CH 19	1/4" NPT	3/8" NPT	
		N - 344	41	CH 19	3/8" NPT	3/8" NPT	
	LONG NIPPLE	NL - 345	55	3/8" NPT		-	
		NL - 346	80	3/8" NPT		-	
		NL - 347	150	3/8" NPT		-	

MODEL	Litres
OIL - 1	1
OIL - 5	5
OIL - 10	10

HYDRAULIC OIL

BOLT TIGHTENING EQUIPMENT

Versatile solutions

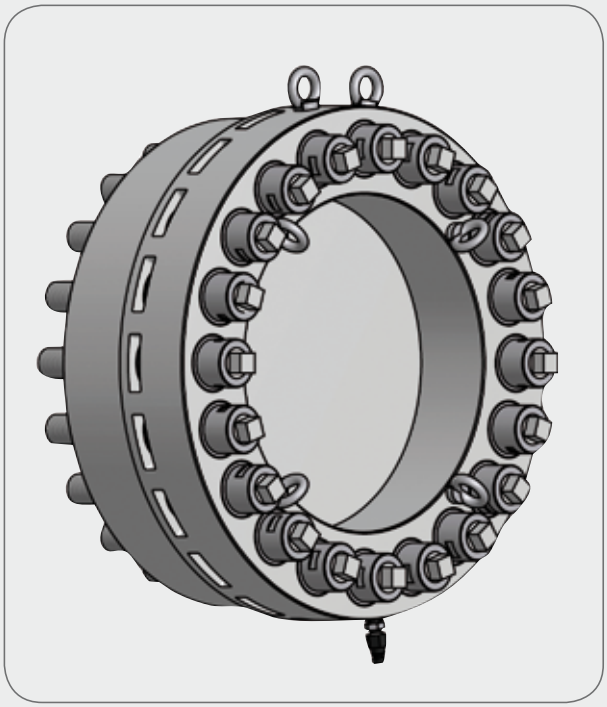
F.P.T. produces a wide range of equipment for bolt tightening applications: torque and bolt tensioning equipment.
Power pack for torque wrenches, bolt tensioners, hydraulic nuts and rings are part of the product line.

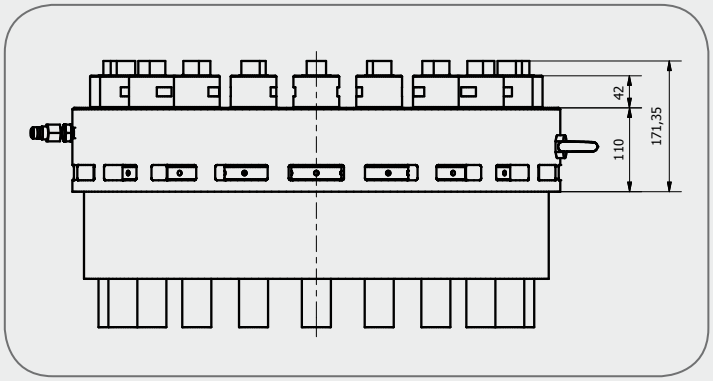
BOLT TIGHTENING EQUIPMENT	Series	Page	
Hydraulic tensioners	TTS - CTP		100
Hydraulic pumps for torque wrench	FPT - HTW		108
Hydraulic rings and nuts	GH		112

HYDRAULIC TENSIONERS

DESIGN AND PRODUCTION OF SPECIAL TENSIONERS

F.P.T. can provide specially designed bolt tightening solutions from 700 to 2.500 bar.
The relevant markets increasingly require hydraulic tensioners built to the customer's specifications so they can operate within the required geometry.
F.P.T. supports customers from studying the layout to the 3D model and the production of the requested tensioners.
F.P.T. doesn't just produce the tensioners, but also supports the customer in developing the hydraulic circuit, providing the hydraulic pumps and all the components needed to get the system running.





Using F.P.T. tensioners means:

- **precision in tension.** As the tensioner is applied directly to the tension rod, this allows very accurate control of the load in direct proportion with the pressure applied to the tensioner itself.

- **easy calculation of the force to apply to the tension rod.** The force calculation is simple and F.P.T. provides all the force/pressure conversion data.

- **fast and repeatable bolting operations.** The tensioner is easy to position and carries out the tensioning operation quickly, at the same time guaranteeing a very high repeat capacity.

- **less stress.** Using this bolting method, the tension rods are under less strain because there is no torsional strain, just axial.

SERIES TTS

3/4" to 4" (M20-M100)
236 kN - 2.820 kN
Stroke 10 - 15 mm
1.500 bar

Serie
TTS Top side bolt tensioners

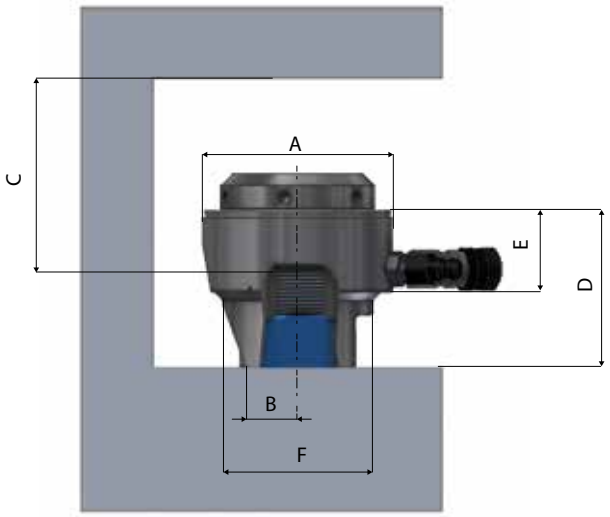
Powerful, extra compact and general-purpose bolt tensioning tools. With anti over-stroke device.

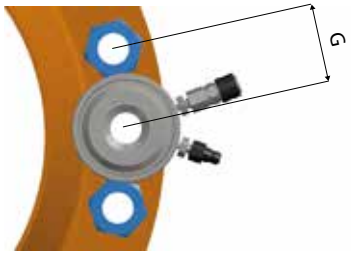
- The Tensioners Series TTS are designed **to suit most flanges type:** ANSI B16.5 - ANSI B16.47 - B.S.3293 - AWWA - MSS-SP44 - API-6A - API-17D - UNI EN 1092-1
- **Powerful and extra compact.** Great ratio between developed force and tools dimensions.
- **Dimensions and weight make the difference.** Series TTS is extremely compact and light weight to be suitable for the most tensioning operations.
- **Maximum flexibility.** With only 6 hydraulic cells the operator can cover an extended range of Imperial or Metric thread sizes from 3/4" to 4" (M20 – M100)
- 15 mm stroke cover most of the tensioning application. If longer stoke are required the tensioning operation can be carry on by steps.
- All components are manufactured with hardened high tensile strength steel.
- Special treatment to garantee: **high resistance to corrosion - high resistance to wear** – extremely low friction to help during screw operations
- Safety is a must. All size have over stroke indicators
- All model are equipped with 2 quick couplers male and female for serial hydraulic connection between tensioners.
- **Special high quality seals** for leak free operations and easy maintenance.

SPECIAL TENSION REQUEST

Set of tensioners for multiple tensioning (multi- stud) of M64 bolts - 2.300 bar

TENSIONING TOOL TTS SERIES COMPONENTS



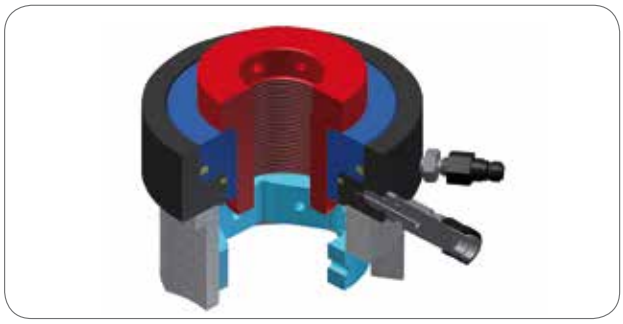


HYDRAULIC CELL Code	IMPERIAL ADAPTER KITS		METRIC ADAPTER KITS		FORCE		HYDRAULIC AREA		STROKE	WEIGHT	DIMENSIONS (mm)						
	Thread size	Kit code	Thread size	Kit code	kN	Ton	in²	mm²	mm	kg	A	B	C	D	E	F	G (min)
TTS1	3/4"-10 UNC	1.KI030410UNC	M20x2,5	1.KM.020025	236,5	24,1	2,44	1576,46	10	2	73	16	64	75	45	52	44,50
	7/8"-9 UNC	1.KI070809UNC	M22x2,5	1.KM.022025						1,9		22		79		58	50,50
	1"-8 UN	1.KI100008UN	M24x3	1.KM.024030						1,8		23		81		62	55
	1.1/8"-8 UN	1.KI110808UN	M27x3	1.KM.027030						1,8		24		81		68	61
TTS2	1.1/8"-8 UN	2.KI110808UN	M27x3	2.KM.027030	459,5	46,8	4,75	3063,05	15	4,6	101	25	89	104	54	75	64,50
	-	-	M30x3,5	2.KM.030035						4,6		25		104,		75	64,50
	1.1/4"-8 UN	2.KI110408UN	M33x3,5	2.KM.033035						4,5		28		108		80	69,50
	1.3/8"-8 UN	2.KI130808UN	M36x4	2.KM.036040						4,4		30		111		84	74,50
	1.1/2"-8 UN	2.KI110208UN	M39x4	2.KM.039040						4,2		33		114		88	79
TTS3	1.1/2"-8UN	3.KI110208UN	M39x4	3.KM.039040	831,3	84,7	8,59	5541,77	15	7,7	133	34	89	106,	57	95	82,50
	1.5/8"-8 UN	3.KI150808UN	M42x4,5	3.KM.042045						7,7		36		109		104	90
	1.3/4"-8 UN	3.KI130408UN	M45x4,5	3.KM.045045						7,5		40		112		108	94,50
	1.7/8"-8 UN	3.KI170808UN	M48x5	3.KM.048050						7,6		42		117		112	99,50
	2"-8 UN	3.KI200008UN	M52x5	3.KM.052050						7,5		48		118		116	104,50
TTS4	1.7/8"-8 UN	4.KI170808UN	M48x5	4.KM.048050	1345,5	137,2	13,90	8970,03	15	13,7	163	43	102	125	63	122	104,50
	2"-8 UN	4.KI200008UN	M52x5	4.KM.052050						13,2		45		128,		123	108
	2.1/4"-8 UN	4.KI210408UN	M56x5,5	4.KM.056055						12,7		54		133		132	117,50
	-	-	M60x5,5	4.KM.060055						13,3		53		137		140	120,50
	2.1/2"-8 UN	4.KI210208UN	M64x6	4.KM.064060						13		57		141		146	128
TTS5	2.1/2"-8 UN	5.KI210208UN	M64x6	5.KM.064060	1927,3	196,5	19,91	12848,33	15	18,9	193	59	98	134	63	148	131
	-	-	M68x6	5.KM.068060						19		62		137		154	135
	2.3/4"-8 UN	5.KI230408UN	M72x6	5.KM.072060						18,2		68		140		158	141,50
	3"-8 UN	5.KI300008UN	M76x6	5.KM.076060						17,5		70		146		165	150,50
TTS6	3"-8 UN	6.KI300008UN	M76x6	6.KM.076060	2819,9	287,5	29,14	18799,29	15	34,3	232	75	125	160	73	170	153
	-	-	M80x6	6.KM.080060						36,3		77		165		177	155
	3.1/4"-8 UN	6.KI310408UN	M85x6	6.KM.085060						34,3		77		170		182	164,50
	3.1/2"-8 UN	6.KI310208UN	M90x6	6.KM.090060						33		82		175		191	174,50
	3.3/4"-8 UN	6.KI330408UN	M95x6	6.KM.095060						32,9		86		180		206	187,50
	4"-8 UN	6.KI400008UN	M100x6	6.KM.100060						32,9		95		185		216	198

SPECIAL TREATMENT FOR TTS SERIES

- *High resistance to corrosion*
- *Offshore application*

Series
CTP
Hydraulic tensioners with threaded insert



CTP tensioner section

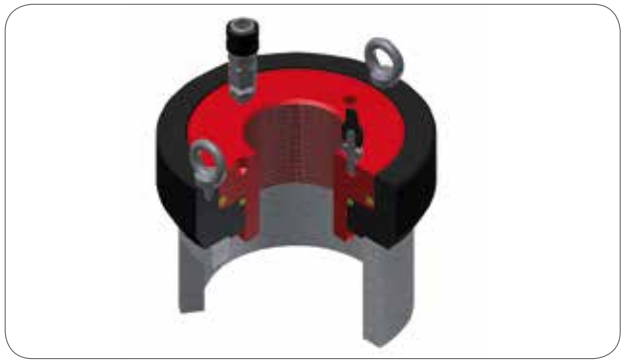
The CTP series is characterised by the threaded interchangeable insert which makes it possible to work on studs with various threads, using just one hydraulic cell.
This configuration is extremely versatile whenever stud with different threads and similar clearance must be tensioned, all you need is a set of inserts different sockets and in some cases bridges.

F.P.T. constructs this type of hydraulic tensioners to the customer's specifications, carrying out a preliminary study on the existing clearance in order to offer the most suitable solution.

Special hydraulic tensioners built to close marine engine cylinder heads

Series
CTP - C
Compact hydraulic tensioners

The CTP-C series, defined as compact is characterised by its threaded piston. This construction makes it possible to reduce the clearance, allowing an economically priced tensioner, the perfect size for using in tight environments. F.P.T. makes this type of tensioners for all instances when it manages to meet the clearance requirements without needing to move to the technical solution of a multi-stage tensioner.



CTP-C compact tensioner section

Series
CTP - M

Multi-stage hydraulic tensioners

CTP-M Multi-stage tensioner

CTP-M Multi-stage tensioner

The CTP-M series is characterised by a central puller which two loading cells operate on, this construction makes it possible to double the load capacity whilst keeping the external cell dimension the same. The results obtained are very tight clearances with the load supplied remaining equal.

- Suitable for all uses where radial width is restricted.
- Tensioner also available in the version with gear nut rotation mechanism to speed up the tensioning operations.
- Bridge can be moulded in order to best adapt it to the space available between each nut.

Hydraulic tensioners with spring return

F.P.T. also builds special spring return tensioners to speed up piston return operations.

M64x4 120-ton capacity hydraulic tensioner with spring to return the piston.

Set of 80-ton capacity M56 hydraulic tensioners with spring to return the piston.

Series
CTP-W

Hydraulic tensioners for the wind turbine sector

CTP-W Wind turbine tensioner

F.P.T. offers a range of tensioners specifically designed for the wind turbine sector. The F.P.T. tensioners in the W series are extremely compact and able to work to very high power, conceived and designed for a complete wind turbine bolting installation or maintenance programme. They are compact, with spring return piston and device for screwing/unscrewing nuts that optimize job cycles turbine.

Adjustable coupler

With the adjustable coupler you can operate in complete safety whilst having the option to adjust the flexible tube to the best position.

Automatic piston return system for maximum operation speed

Once the tensioning phase is complete, a series of powerful springs ensure the piston returns fully for maximum productivity during the operation.

Mechanism for screwing/ unscrewing the nut

The nut can be screwed/unscrewed on the stud through a ratchet key with a 1/2” square insert.

Assisted key positioning

To optimize job cycles all tensioners are equipped with a spring loaded device that automatically engages the tensioner drive socket with the hexagon nut.

Long Life Time puller

The specific measurements of the puller engineering using the FEM calculation and the use of special steels produce highly reliable pullers.

Applications - F.P.T. hydraulic tensioners

HYDRAULIC TENSIONERS FOR BOLTING HEAT EXCHANGERS

F.P.T. hydraulic tensioners:
12,440 kN (1,268 ton) at 1,500 bar – 7”-8 UN - 15 mm
Hydraulic pump: F.P.T. code PP210010G for simultaneously using 4 tensioners connected to each other with flexible hoses.
Production of a lifting equipment for tensioners to position them above ground and mount them in horizontal positions.

FPT 1500

1500 bar
4,5/0,35 l/min
10 l reservoir

Series
FPT 1500

Electric pump 1500 bar for tensioners

- Single phase electric pump to activate hydraulic tensioners up to 1500 bar
- The design is based on a low pressure gear pump and oil-oil pressure intensifier.
- The elctric pump is realized in two version: one whith solenoid valve and one with manual discharge valve, that permits to easily reach the max WP of 1500 bar
- A panel mounted regulator permits to easily set the pressure value.

MODEL	PRESSURE	OIL FLOW	MOTOR	KW RPM	VALVE	RESERVATOIR CAPACITY	DIMENSION			WEIGHT	ACCESSORIES
	bar	l/min			kW/rpm	litri	A	B	C	kg	
FPT1500-VM2/2-10	120/1500	4,5/0,35	SINGLE-PHASE 4 POLES	1,1/1400	MANUAL VALVE	10	360	700	500	35	DISCHARGE MANUAL VALVE
FPT1500-EV4/3-10	120/1500	4,5/0,35	SINGLE-PHASE 4 POLES	1,1/1400	SOLENOID VALVE	10	360	700	500	38	REMOTE CONTROL
FPT1500-EV4/3-10-D	120/1500	4,5/0,35	SINGLE-PHASE 4 POLES	1,1/1400	SOLENOID VALVE	10	360	700	500	39	REMOTE CONTROL WHIT INTEGRATED DIGITAL DISPLAY

Series
PMS - PDS

Single and two-speed hand pumps for tensioners

The PMS and PDS pumps have been specifically designed to operate hydraulic tensioners. Available in single- and two-speed for pressure from 1.600 to 2.800 bar.

TYPE OF PUMP	MODEL	PRESSURE 1st/2nd speed	OIL FLOW-RATE 1st/2nd speed	RESERVOIR CAPACITY	USABLE OIL
		bar	cm^3	litres	litres
SINGLE-SPEED	PMS - 1,2	1600	1,2	1,6	1,2
SINGLE-SPEED	PMS - 0,7	2800	0,7	1,6	1,2
TWO-SPEED	PDS - 18	35 / 1600	12,5 / 1,1	2,2	1,65
TWO-SPEED	PDS - 16	35 / 2800	12,5 / 0,7	2,2	1,65

For more details and technical specifications see pages 58-59.

Series
PP

Pneumo-hydraulic pumps for tensioners

1500 bar pneumo-hydraulic pump for tensioners

F.P.T. has a range of high pressure pneumo-hydraulic pumps configured to operate hydraulic tensioners.
Available in 3 standard models with: 1500 – 2100 – 2500 bar.
The hydraulic pumps are fed by a normal compressed air line and are the ideal solution for stud tensioning operations, hydraulic tensioners and unkeying bearings.

MODEL	MAX. PRESSURE	MULTIPLICATION RATIO	NO-LOAD FLOW	FLOW AT MAX. PRESSURE
	bar		l/min	l/min
PP - 1500 - 10 - G	1500	1 : 220	0,28	0,01
PP - 2100 - 10 - G	2100	1 : 300	0,56	0,25
PP - 2500 - 10 - G	2500	1 : 440	0,21	0,04

For more details and technical specifications see page 73.

FPT-HTW-C

700 bar
Two speed
3,5/0,45 - 7,9/0,9 l/m
5 to 10 l reservoir

FPT-HTW-C
Series

Compact pumps for torque wrenches electric and pneumatic

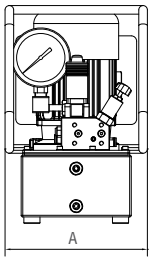
• The FPT-HTW-C is a **compact pump** that provide the power for your torque wrenches.

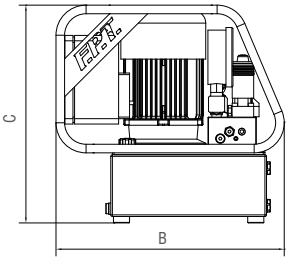
• The FPT-HTW-C10 Series is available in both single port models for single tool operation and quad port models for running up to four tools contemporaneously.

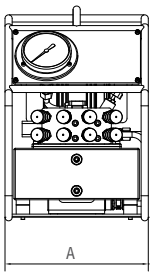
• The sight glasses enable operator to monitor reservoir oil levels and the transport cage for all around protection and easy handling.

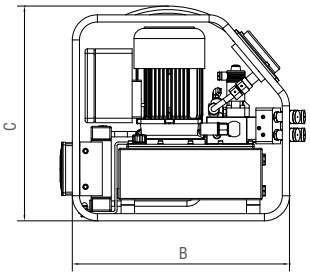
• The hydraulic pump is available in electric or pneumatic version, with different 2-Stage delivery.

• For this model are available different accessories. For both version the **heat exchanger**, the quick connect couplers and the twin houses, for FPT9-HTW-C10 the **quad block** and the **auto cycle - for automatic operation**. It is also possible the totally customize the pump up to the customers' needs.









CODE	MODEL	PRESSURE 1°/ 2° STAGE	OIL FLOW	MOTOR	TENSION/ FREQUENCY	POWER/ RPM	TANK CAPACITY	DIMENSION			WEIGHT
		bar	l/min			kW/rpm	litri	A	B	C	kg
51001	FPT9-ME41-HTW-C05	80/700	3,5/0,45	SINGLE-PHASE	230V-50Hz	0,75/1370	5	265	425	405	29
51002	FPT9-ME41-HTW-C05-SC	80/700	3,5/0,45	SINGLE-PHASE	230V-50Hz	0,75/1370	5	265	425	405	34
51003	FPT9-MA-HTW-C05	80/700	5,6/0,65	PNEUMATIC	-	1,3/3000	5	265	425	405	27
51004	FPT9-ME21-HTW-C10	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	36
51005	FPT9-ME21-HTW-C10-SC	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	40
51006	FPT9-ME21-HTW-C10-Q	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	38
51007	FPT9-ME21-HTW-C10-AC	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	37
51008	FPT9-ME21-HTW-C10-SC-Q	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	43
51009	FPT9-ME21-HTW-C10-SC-Q-AC	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	44
51010	FPT9-ME21-HTW-C10-Q-AC	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	39
51011	FPT9-ME21-HTW-C10-AC-SC	80/700	7,5/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	320	485	480	42
51012	FPT9-MA-HTW-C10	80/700	7,9/0,9	PNEUMATIC	-	3/3000	10	320	485	480	34
51013	FPT9-MA-HTW-C10-Q	80/700	7,9/0,9	PNEUMATIC	-	3/3000	10	320	485	480	36

FPH-HTW

700 bar
4/1,6 - 7,9/0,9 l/m Two speed
10 to 25 l reservoir

FPH-HTW
Series

Pumps for torque wrenches electric and pneumatic

• The FPH-HTW pump is the most used pump for torque operations and provide the power for your torque wrenches.

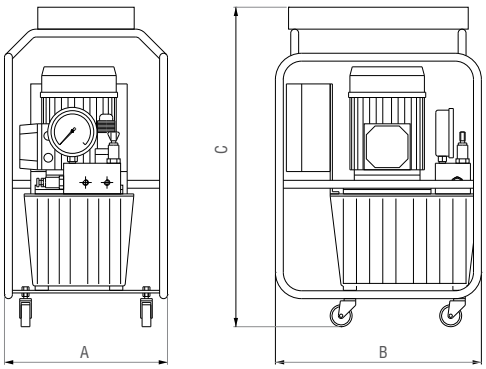
• The hydraulic pump is available in electric or pneumatic version, with different 2-Stage delivery.

• The transport cage guarantee all around protection and easy handling.

• For this model are available different accessories: the heater exchanger, the quad block, the automatic cycle, quick couplers and twin hoses.

• This pump model can moreover be totally personalized:

- ATEX
- hour counter
- different cages
- timer
- multiple switches
- different tanks
- different tension and frequency



FPH - HTW

OPTIONS	
SC	EXCHANGER
Q	QUAD BLOCK
AC	AUTO CYCLING
T	TIMER
HC	COUNTER HOUR

CODE	MODEL	PRESSURE 1°/ 2° STAGE	OIL FLOW	MOTOR	TENSION/ FREQUENCY	POWER/ RPM	TANK CAPACITY	DIMENSION			WEIGHT
		bar	l/min			kW/rpm	litri	A	B	C	kg
51014	FPH5-ME21-HTW	80/700	4/1,6	SINGLE-PHASE	230V-50Hz	2,2/2850	10	372	470	725	42
51015	FPH5-ME2-HTW	80/700	4,5/1,8	THREE-PHASE	400V-50Hz	2,2/2850	10	372	470	725	40
51016	FPH5-MA-HTW	80/700	5,4/1,8	PNEUMATIC	-	3/3000	10	372	470	725	34
51017	FPH9-ME21-HTW	80/700	7,2/0,9	SINGLE-PHASE	230V-50Hz	1,5/2850	10	350	460	610	38
51018	FPH9-ME2-HTW	80/700	7,2/0,9	THREE-PHASE	400V-50Hz	1,1/2850	10	350	460	610	37
51019	FPH9-MA-HTW	80/700	7,9/0,9	PNEUMATIC	-	1,3/3000	10	350	460	610	33

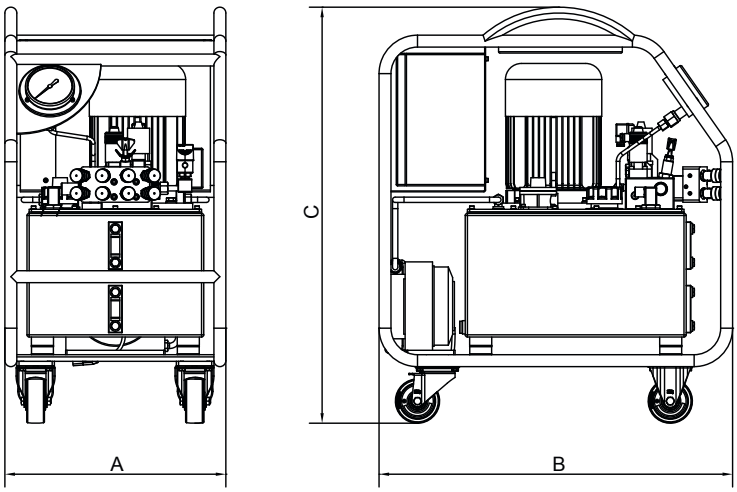
FPH-HTW-HF

700 bar
15/3 l/min Two speed
40 l reservoir

FPH-HTW-HF
Series

High flow pumps for torque wrenches

- The pump **FPT-HTW-HF** is a high flow version tipically used for intensive job with multiple tools.
- The pump is available on threephase version with 15 l/min at 100 bar and 3 l/min at 700 bar.
- The pump is equipped with protection cage and wheels for easy movements.
- Standard for this model are: heater exchanger, quad block manifold and oil return filter.
- There are also available different accessories: automatic cycle, quick couplers and twin hoses.
- The FPT-HTW-HF can also be equipped with different pumps and flow related to the torque specifications.



CODE	MODEL	PRESSURE 1°/ 2° STAGE	OIL FLOW	MOTOR	TENSION/ FREQUENCY	POWER/ RPM	TANK CAPACITY	DIMENSION			WEIGHT
		bar	l/min			kW/rpm	litri	A	B	C	kg
51086	FPT15-ME4-HTW-HF40	100/700	15/3	THREE-PHASE	400V-50Hz	4/1450	40	500	800	940	100
51087	FPT15-ME4-HTW-HF40-AC	100/700	12/3	THREE-PHASE	400V-50Hz	4/1450	40	500	800	940	100

ACCESSORIES AND SPECIALS

Accessories and special pumps for torque wrenches

MODEL	HOSE AND COUPLERS ASSEMBLY		LENGTH	PRESSURE
	CENTRAL END	WRENCH END	m	BAR
TTFG-5-HTW	N°2 NIPPLI 1/4"	GR1M + GR1F	5	700
TTFG-6-HTW	N°2 NIPPLI 1/4"	GR1M + GR1F	6	700
TTFG-10-HTW	N°2 NIPPLI 1/4"	GR1M + GR1F	10	700
TTFG-5-HTW-C	N°2 NIPPLI 1/4"	GR5M + GR5F	5	700
TTFG-6-HTW-C	N°2 NIPPLI 1/4"	GR5M + GR5F	6	700
TTFG-10-HTW-C	N°2 NIPPLI 1/4"	GR5M + GR5F	10	700
TTFGG-5-HTW	GR1M + GR1F	GR1M + GR1F	5	700
TTFGG-6-HTW	GR1M + GR1F	GR1M + GR1F	6	700
TTFGG-10-HTW	GR1M + GR1F	GR1M + GR1F	10	700
TTFGG-5-HTW-C	GR5M + GR5F	GR5M + GR5F	5	700
TTFGG-6-HTW-C	GR5M + GR5F	GR5M + GR5F	6	700
TTFGG-10-HTW-C	GR5M + GR5F	GR5M + GR5F	10	700

Available different types of hoses lenght and quick couplers.

OPTIONS	
SC	EXCHANGER
Q	QUAD BLOCK
AC	AUTO CYCLING
T	TIMER
HC	COUNTER HOUR

Special pumps

• Electric and pneumatic pumps ATEX version.

• High flow pump with heat exchanger and auto cycling.

• Compact pump 110V-60Hz version for extra European market.

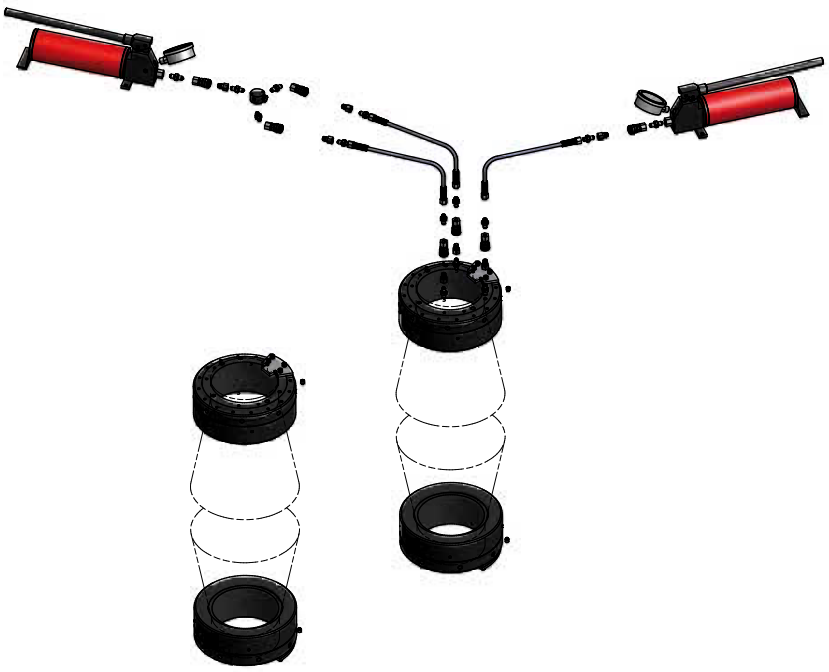
• Pneumatic pumps in high flow version for 1 or multiple tools use.

HYDRAULIC RINGS AND NUTS

GH - DI SERIES

- Used when strong torque is required mainly in confined operating spaces or for frequent disassemblies and assemblies.
- Replacing the traditional mechanical rings and nuts because they guarantee higher and controlled bolting values, they are built based on the dimensions and force values requested by the user.
- They are used in the nautical, steel-making and mechanical sectors.

Hydraulic nuts series operating pressure 2,250 bar for tension rods M36 - M56 - M72 with treated surface and special coatings for environments with high working temperatures. Hydraulic nuts can be made to the customer's specifications to get the most out of the clearances available.



HYDRAULIC NUT FOR PROPELLER SHAFT-RUDDER COUPLING

220 ton - 1500 bar hydraulic ring for keying on conical shafts. Equipped with safety ring to maintain the desired pre-load. The system comprises a series of 1500 hand pumps to supply the ring and the curved area of the shaft.

60-ton hydraulic ring with Tp460x6 threading.

60-TON HYDRAULIC RING WITH TP460X6 THREADING

Hydraulic ring suitable for use with oil or grease used for coupling and decoupling operations.
Guarantees high power where this is reduced clearance.

Hydraulic nut for propeller shaft-rudder coupling.

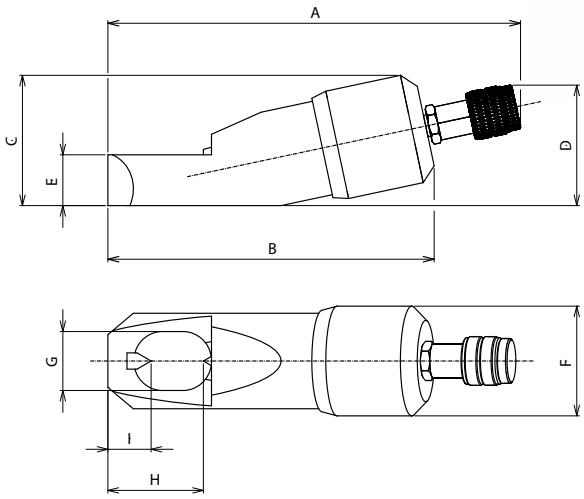
TOOLS AND SYSTEMS

Versatile solutions

F.P.T. produces a wide range of standard tools and custom versions to meet customer requirements. This includes hydraulic presses, hydraulic pullers, flange spreaders, wedgies, lifting systems for bus maintenance, testing equipment and numerous systems and tools for maintenance and lifting.

TB Series — Nut splitters

- Used when nuts are difficult to remove due to rust or wear.
- Equipped with fixed and mobile blades to cut the nut in a single operation: the blades can be sharpened or replaced.
- Used in the petrochemical, railway and nautical sectors.



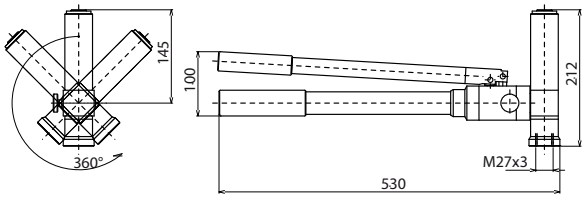
SAFETY INSTRUCTIONS

- Can be used on hexagonal nuts with hardness under 44 HRC
- During the cutting phase, position the blade at the centre of the surface to cut
- Avoid touching the washer if present

SCREW DIAMETER	HEX NUT DIAMETER	MODEL	FORCE in ton (at 700 bar)	DIMENSIONS in mm									WEIGHT	SPARE BLADE MODEL	
				A	B	C	D	E	F	G	H	I	kg	FIXED BLADE	MOBILE BLADE
M8 - M12	13 - 19	TB 13/19	5.5	203	133	48	58	19	43	26	41	21	1.2	CF-13/19	CM-13/19
M12 - M16	19 - 24	TB 19/24	11	233	163	65	68	25	58	34	47	22	2.3	CF-19/24	CM-19/24
M16 - M22	24 - 32	TB 24/32	16.5	260	190	75	74	30	69	41	57	24	3.2	CF-24/32	CM-24/32
M22 - M27	32 - 41	TB 32/41	21.8	297	230	90	80	35	84	55	77	35	5.1	CF-32/41	CM-32/41
M27 - M33	41 - 50	TB 41/50	35	347	280	112	93	42	103	68	89	38	10.4	CF-41/50	CM-41/50
M33 - M39	50 - 60	TB 50/60	49.5	395	330	136	105	52	124	82	103	42	17.5	CF-50/60	CM-50/60
M39 - M48	60-75	TB 60/75	90	454	400	182	132	75	168	110	113	28	38.5	CF-60/75	CM-60/75

Series
CPIA

Multipurpose cylinder, with pump, that can be used in any position



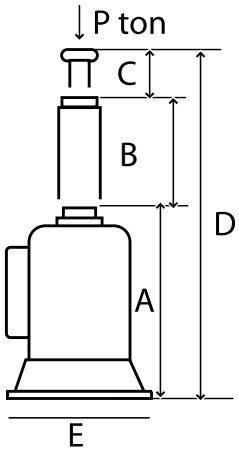
- The CPIA4 consists of a hydraulic cylinder with built-in pump that can be used in any position for pushing, lifting and deformation operations.
- 5-ton capacity, 75 mm stroke and extensions can be installed on the end.
- Mainly used in the shipbuilding industry to move hull plates closer to bulb irons.

Series
CB

Hydraulic bottle jacks

SERIES WITH LOAD-BEARING PISTON WITH RISER SCREW

- Complete range of hydraulic bottle jacks
- CB Series with load-bearing piston with riser screw
- Equipped with adjustable extension screws with safety lock and automatic stop valve
- The models are supplied with the suitable lever



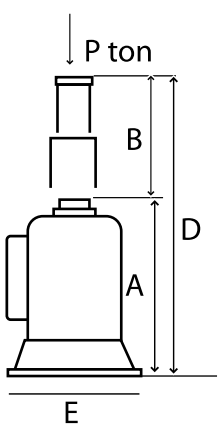
TYPE	TON	A	B	C	D	E	WEIGHT
CB3	3	215	150	-	365	140 x 110	5
CB3/P	3	245	175	-	420	140 x 110	5,5
CB5/P	5	255	180	-	435	145 x 115	7,5
CB3/V with riser screws	3	215	150	80	445	140 x 110	5
CB5 with riser screws	5	220	145	85	450	145 x 115	6,5
CB8 with riser screws	8	250	180	85	515	145 x 115	7,5
CB10 with riser screws	10	250	170	100	520	170 x 140	11,5
CB15 with riser screws	15	270	190	100	560	170 x 140	13
CB20 with riser screws	20	275	190	100	565	180 x 150	15,5
CB25 with riser screws	25	280	190	100	570	195 x 165	18
CB30 with riser screws	30	280	190	100	570	195 x 165	20
CB40 with riser screws	40	280	190	100	570	235 x 210	25
CB50 with riser screws	50	280	190	100	570	235 x 210	30

Series
CBT

Hydraulic bottle jacks

SERIES WITH TWO TELESCOPIC LOAD-BEARING PISTONS

- Complete range of hydraulic bottle jacks
- CB Series with two load-bearing pistons with riser screws
- Equipped with adjustable extension screws with safety lock and automatic stop valve
- The models are supplied with the suitable lever



TYPE	TON	LOAD ON 1st PISTON	A	B	C	D	E	WEIGHT
CBT1,5	1,5	4	160	200	-	360	145 x 115	5
CBT1,5 WITH PLATE	1,5	4	190	200	-	390	145 x 115	5,5
CBT3	3	5	170	210	-	380	145 x 115	6
CBT5	5	10	225	275	-	500	170 x 140	11
CBT10	10	20	230	310	-	540	195 x 165	14
CBT10/BUS	10	20	180	205	-	385	195 x 165	12
CBT15	15	25	230	310	-	540	195 x 165	18
CBT20	20	30	230	310	-	540	195 x 165	20
CBT25	25	40	240	310	-	550	235 x 210	22

PR Series Presses

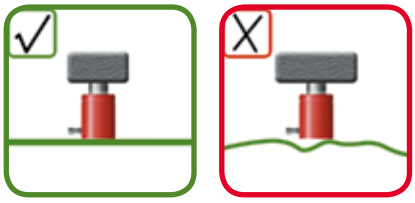
- Built according to customer needs and specific operating requirements.
- Equipped with safety guards and systems, fixed or mobile bench, push piston and positioning function on request.
- They can also be equipped with a hand pump or hydraulic pump with electric or air motor.
- Correctly sized structure to guarantee maximum strength and stability during operations.

SAFETY INSTRUCTIONS

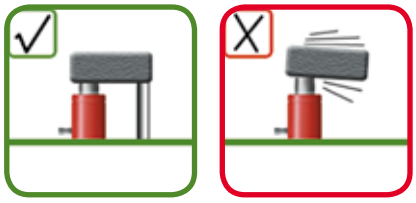
All F.P.T. products are designed and built in full compliance with the international regulations regarding occupational safety.
The following are some general guidelines regarding the correct and improper use of F.P.T. products.
Before using any F.P.T. equipment carefully read the user and maintenance manuals available to downloadable at www.fpt.it
Before operating equipment, always wear the required protective clothing.

F.P.T. cannot be held liable for damage or injuries caused by the improper use of products or lack of maintenance.

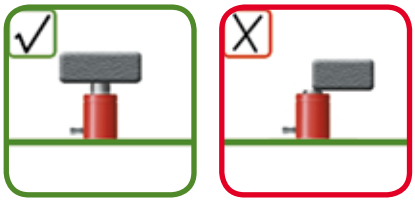
The capacity and stroke values supplied by the manufacturer are the recommended ceiling values to ensure safety. It is recommended not to exceed 80% of these values.



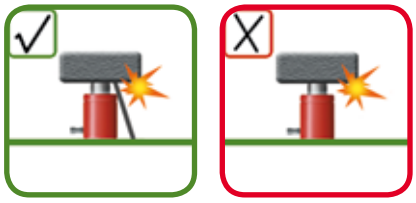
Cylinders must be stably positioned on smooth and even surfaces.



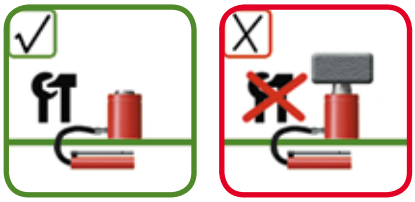
Loads must be mechanically secured, and never work underneath those loads.



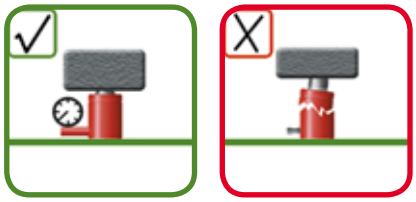
The anchor/support point of the load must be stable and centered along the cylinder's axis.



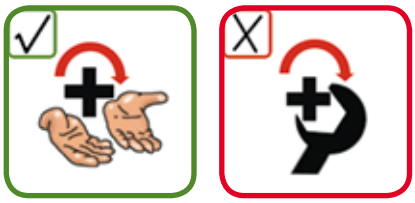
Do not expose equipment to heat sources or welding irradiation heating higher than 65°.



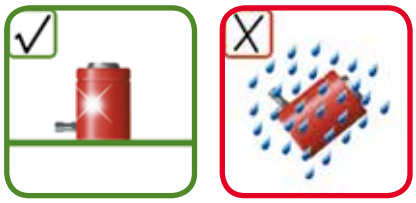
Maintenance operations must be carried out only when equipment is not under pressure.



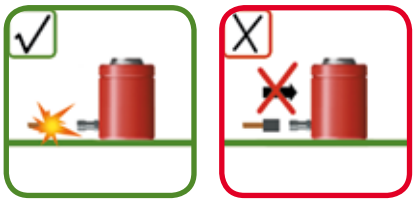
By means of a pressure gauge, check that the operating pressure does not exceed the rated pressure value indicated for that component.



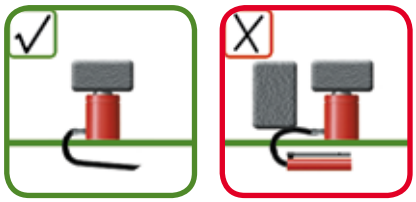
Do not use extensions on the pump handle or other tools on the manual controls of the valves.



Keeping equipment clean and tidy will help save money on maintenance expenses.



Clean fittings before installing them in cylinders: foreign matter may enter the hydraulic system and damage its most delicate components.



Do not overbend hoses and protect them against flattening.

The measurements and technical data provided are correct and verified at the time of printing. In any case, F.P.T. reserves the right to make any changes whatsoever to the products in this catalogue without notification. Because the products are constantly being developed, any of the information in this catalogue may be changed without notification.
Please contact the F.P.T. technical office for further information if the final measurements are important.

F.P.T. WARRANTY

F.P.T. products are warranted to be free of defects in workmanship under normal use for as long as they are owned by the original purchaser.

This warranty does not cover incorrect installation or use of the products, inadequate maintenance, alterations or repairs not authorised by F.P.T. or damage caused by transportation.

All electric parts, motors, solenoid valves and in general all parts not supplied by F.P.T. are excluded from this warranty. Such items are warranted to the extent of the warranty provided by the manufacturers of such items.

The warranty is limited only to new, original equipment products.

If the customer believes a product is defective, the product must be delivered to F.P.T. which, in its unquestionable judgement, if it deems the product to be defective, will be repaired or replaced under this warranty.
The customer must pay for any and all expenses for transporting the product to/from F.P.T.

F.P.T. will not be held liable for:
- any damage caused by defective or non-conforming products, negligence or any other damage
- any other obligations or liabilities arising out of breach of contract or of warranty. The warranty will not be applicable for non-payment (or even partial payment) of the goods supplied.

F.P.T's total liability, as regards reimbursement, is limited to and shall never exceed the purchase price paid.

CE

CE of conformity
F.P.T. supplies a declaration of conformity for each product and the CE mark for the products that comply with the directives of the European Community.

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HIGH PRESSURE HYDRAULIC EQUIPMENT 700-4.000 BAR

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