

EPower700

The Power of Hydraulic Force

*Professional
High Pressure
Hydraulic Cylinders,
Pumps, Pullers,
Tools and Systems*



*For the Professionals
For the Specialists
For the Experts*

INDUSTRIAL HYDRAULIC TOOLS

EP700-C1705

E-POWER 700

EURO POWER HYDRAULICS offers a full range of quality **E-POWER 700** high pressure hydraulic cylinders, pumps, pullers, tools & systems to meet the most demanding hydraulic application requirements, serving virtually all industrial & construction industries; and marketing through its authorised network of stocking distributors in many locations – products, parts & service availability.

E-POWER 700 products are widely used by customers in industries such as manufacturers, construction, bridge equipment manufacturers, energy, oil & gas, mining, rigging, quarrying, steel & rolling mills, shipbuilding & repairing, offshore marine, power plants, maintenance & repair (MRO), aerospace, railroads, transportation and many other industries requiring hydraulic power.

EURO POWER HYDRAULICS are committed to continued quality improvement and expanding its offering of standard, custom & special products, ensuring continuous customer satisfaction.

The POWER of Hydraulic Force

- **Innovative Products**
- **Reliable Performance**
- **High Quality Standards**
- **Safety**
- **Product Availability**
- **Service Support**
- **Application Solutions**
- **Project & System Design**

Industrial Applications

- Lifting, Supporting & Lowering
- Pushing, Pulling & Positioning
- Assembly & Manufacturing
- Metal Fabrication
- Maintenance & Repairs
- Clamping & Holding
- Pressing & Bending
- Straightening & Spreading
- Load & Tension Measurement
- Research & Development
- Quality Control

Professional High Pressure Hydraulic Cylinders, Pumps, Pullers, Tools and Systems to fulfil virtually all Industrial & Construction Application needs.



HYDRAULIC CYLINDERS

Page 4 - 23



HYDRAULIC CYLINDERS

HYDRAULIC PUMPS

Page 24 - 46



HYDRAULIC PUMPS

VALVES AND ACCESSORIES

Page 47 - 56



VALVES AND ACCESSORIES

HYDRAULIC TOOLS

Page 57 - 66



HYDRAULIC TOOLS

REFERENCES

Page 67 - 73



REFERENCES

- Hydraulic Formulas 67
- Special Products 68 - 69
- Safety Instructions 70 - 72
- Guarantee & Quality 73

HYDRAULIC CYLINDERS

•	How to choose the right cylinder	4
•	Hydraulic Cylinder – Specific Features	6
•	NITREG ONC – Process Treatment	6
CMI:	General Purpose Cylinders, Single-Acting, Spring Return	7
CMC:	Flat Profile Cylinders, Single-Acting, Spring Return	8
CMP:	Low Height Cylinders, Single-Acting, Spring Return	9
CMF:	Hollow Piston Cylinders, Single-Acting, Spring Return	10
COF:	Hollow Piston Cylinders, Double-Acting, Oil Return	11
COI:	Multi Purpose Cylinders, Double-Acting, Oil Return	12
COD:	Precision Production Cylinders, Double-Acting, Oil Return	13
CGS:	High Tonnage Cylinders, Single-Acting, Load Return	14 - 15
COS:	High Tonnage Cylinders, Double-Acting, Oil Return	16 - 17
CGG:	High Tonnage Cylinders, Lock Nut, Single-Acting, Load Return	18 - 19
CGR:	Low Profile Cylinders, Lock Nut, Single-Acting, Load Return	20
CMT:	Pull Cylinders, Single-Acting, Spring Return	21
CML:	Aluminium Cylinders, Single-Acting, Spring Return	22

HYDRAULIC PUMPS

•	How to choose the right pump	24 - 25
•	Components of a hydraulic system	26
PN:	Lightweight Hand Pumps (with Aluminum Alloy & Plastic Reservoirs)	28 - 29
PS:	Steel Hand Pumps	30
PV:	Steel Hand Pumps with large oil delivery	30
MLP:	Air-Hydraulic Power Pumps	31
MC:	Micro Electric-Hydraulic Power Pumps	32
MD:	Midi Electric-Hydraulic Power Pumps	33
•	Modular Hydraulic Power Pumps – Features & Model Composition Chart ...	34 - 35
MM:	Modular Hydraulic Power Pumps with Single-Phase Electric Motor	36 - 37
ME:	Modular Hydraulic Power Pumps with 3-Phase Electric Motor	38 - 39
MP:	Modular Hydraulic Power Pumps with Air Motor	40
MS:	Modular Hydraulic Power Pumps with Petrol Engine	41
VMM:	Manual-Controlled Valves for Modular Power Pumps	42
VMS:	Manual-Controlled Valves – Spring Return in Central Position	42
VME:	Electric-Controlled Valves for Modular Power Pumps	43
VMP:	Pneumatic-Controlled Valves for Modular Power Pumps	43
•	Accessories for Modular Hydraulic Power Pumps	44
ME / MM-PP:	Modular Hydraulic Power Pumps for Geotechnical Structural Tests	45
SPLIT FLOW:	Hydraulic Power Pumps for Synchronous Lifting Systems	46

VALVES and ACCESSORIES

G:	Pressure Gauges and Gauge Blocks.....	48
K:	Quick Couplers	49
R:	Manifolds and Fitting	50 - 51
S:	High Pressure Hoses	52
ZOH:	Hydraulic Oil.....	53
•	How to select a valve	53
VLM:	In-line Remote-Mounted Manual Valves	54
VLS:	In-line Remote-Mounted Manual Valves with Spring Return in Central Position	55
VLE:	In-line Remote-Mounted Electric Valves	55
VR:	In-line Regulating Valves.....	56

HYDRAULIC TOOLS

•	Pullers & Extractors – Features	58
UEC:	Complete Hydraulic Puller Sets	59
UEG:	2 & 3 Standard Jaw Pullers.....	60
UEZ:	2 & 3 Self-Aligning Jaw Pullers	60
UET:	Hydraulic Press Puller Sets.....	61
UD:	Hydraulic Spreaders.....	62
UJ:	Eurojack Head and Toe Lifting Jacks.....	63
UB:	Hydraulic Pipe Benders	64
UL:	Load Cells	65
UGC:	Mobile Floor Cranes	66

REFERENCES

•	Useful Hydraulic Formulas	67
•	Special Products	68 - 69
•	Safety Instructions	70 - 72
•	Manufacturer Guarantee	73
•	Manufacturer Quality	73

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All illustrations, performance specifications and dimensions may have slight variations due to manufacturing tolerances. Please contact EURO POWER HYDRAULICS if final dimensions are critical.

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HYDRAULIC CYLINDERS

HOW TO CHOOSE THE RIGHT CYLINDER

Some essential information is necessary to choose the correct cylinder. This information includes:

- **FORCE**
- **STROKE**
- **CLOSED HEIGHT**

And some supplementary data such as:

- **REQUIRED OIL VOLUME**
- **OPERATIONAL SPEED**

In the Reference pages you may find some useful hydraulic calculation formulas.

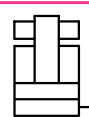
Pg. 67

There are three main types of cylinders: **Load Return, Spring Return and Oil Return.**

Load Return (Single-Acting)

Load return, in which the piston is retracted by the weight of the load (or any other external force). The minimum force required to retract the piston is approximately 0,2% of the rated cylinder nominal push value. These cylinders are the most economic solution for an application that does not

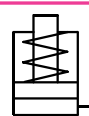
require quick removal of the cylinder after the load has been lowered. The cylinders of the **CGG, CGR, CGS** ranges belong to this group.



Spring Return (Single-Acting)

Spring assisted return, in which the piston is retracted by means of an internal compression or tension spring inside the cylinder. These cylinders are proposed whenever it is necessary to remove the cylinder quickly once the load has been lowered.

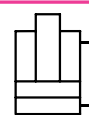
The cylinders of the **CMC, CMF, CMI, CML, CMP, CMT** ranges belong to this group.



Oil Return (Double-Acting)

Oil Return, (double acting): the piston is retracted hydraulically by pumping oil into the annular chamber of the cylinder. These cylinders are ideal for use in production applications where a fast cycle time is required. When being used in a lifting application, lowering of the load can be controlled by fitting a pilot check valve and one-way flow distributor into the circuit. The return pressure can be set at a lower value when it is only

needed to retract the piston. The cylinders of the **COF, COI, COS** ranges belong to this group. When it is necessary also to exert a pulling force, we recommend cylinders belonging to the **COD** ranges. These cylinders are supplied complete with the required threads and connections and may also be operated at the maximum working pressure on both sides of the piston.



Ordering Example: Cylinder

C	#	#	###	#	###	#
Cylinder	Return type G = Load Return M = Spring Return O = Oil Return	Series	Pushing Force in Tonnes	N = Standard P = Plunging (with no end of stroke nut)	Stroke in mm	F = with base mounting holes T = with integral saddle

CMF20N100

Cylinder, spring return with 20 T. force, N version, 100 mm stroke.

CGG200N250FT

Load return cylinder with safety nut, 200 T. force, N version, 250 mm stroke with fixing holes in the base and integral saddle.

HYDRAULIC CYLINDERS (Section Overview)



HYDRAULIC CYLINDERS

Page

CMI: General Purpose Cylinders, Single-Acting, Spring Return.....	7
CMC: Flat Profile Cylinders, Single-Acting, Spring Return.....	8
CMP: Low Height Cylinders, Single-Acting, Spring Return.....	9
CMF: Hollow Piston Cylinders, Single-Acting, Spring Return	10
COF: Hollow Piston Cylinders, Double-Acting, Oil Return	11
COI: Multi Purpose Cylinders, Double-Acting, Oil Return	12
COD: Precision Production Cylinders, Double-Acting, Oil Return.....	13
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COS: High Tonnage Cylinders, Double-Acting, Oil Return	16 - 17
CGG: High Tonnage Cylinders, Lock Nut, Single-Acting, Load Return	18 - 19
CGR: Low Profile Cylinders, Lock Nut, Single-Acting, Load Return	20
CMT: Pull Cylinders, Single-Acting, Spring Return	21
CML: Aluminium Cylinders, Single-Acting, Spring Return	22

SPECIFIC FEATURES

The manufacturing program of 700 bar components is based on innovative technology and on our longstanding experience in high pressure hydraulics.

The ideal choice of materials combined with surfaces treated and protected against corrosion makes **E-POWER 700** products suitable for use in harsh environments.

Furthermore, **E-POWER 700** hydraulic cylinders can withstand off-centred and side load forces up to 8% of their nominal capacity.

Most of our models are in compliance with ANSI (American National Standard Institute) B30.1 Standard.

1-2-3 Cylinder body

The cylinder body, piston and end of stroke nut are in high quality tempered steel and have been treated with a special nitriding process so that these parts have a high wear resistance and are corrosion protected; they have a long outdoor service life even in sea-water and aggressive atmospheres.

4 Wiper

The wiper prevents contamination and thus increases the service life of the cylinder.

5 Return spring

This spring ensures fast piston retraction irrespective of the cylinder position.

6 Seal

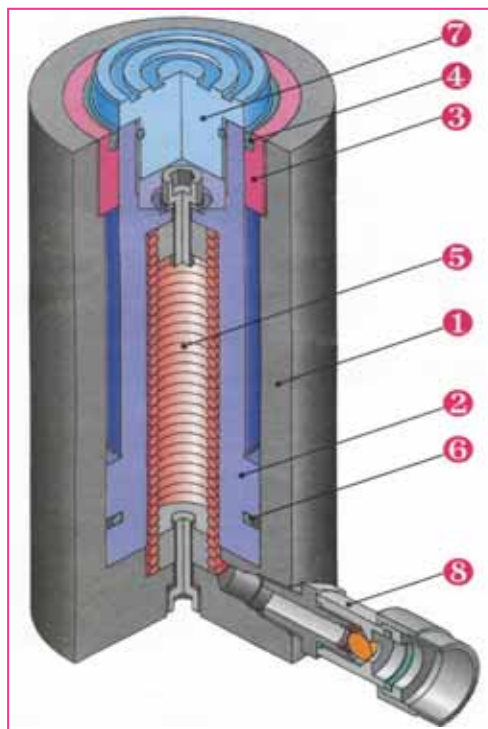
The compact seal provides good resistance to wear and extrusion.

7 Saddle

The saddle is in high tensile and nitrided steel and thus prevents deformation of the piston rod.

8 Quick coupler

The quick coupler mounted on all cylinders (except COD cylinders), is fitted with a dust cap.



NITREG ONC



E-POWER 700 products are the only ones in the sector treated with the **Nitreg® ONC®** process which, for many years now, has been carried out exclusively within our plants.

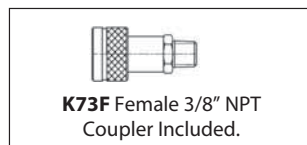
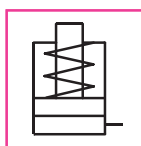
This process is a thermo-chemical treatment applied to steel, that starts with the liquid nitriding phase followed by an oxidation phase, causing a change in the steel's superficial chemical structure. This alteration makes steel exceptionally hard and resistant to corrosion. The already enhanced resistance is further strengthened with the application of a special oil that coats the treated surfaces and makes them immune to corrosion (tests conducted in saline smoked rooms show up to 300 hours of resistance to corrosion according to ASTM B117).

Our products, treated with this process, are therefore especially suitable for applications with high risks of corrosion and mechanical wear.

The black colour of all **E-POWER 700** products is a direct result of the last phase of this unique treatment and has come to symbolize our long lasting effort towards the pursuit of quality.

Single-Acting, Spring Return, General Purpose Cylinders

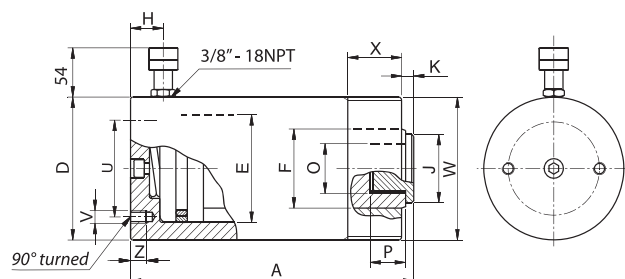
CMI Series



Capacity:
5 - 100 tonnes

Stroke:
25 - 350 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. Refer Page 23.



- Superior Bearing Design reduces wear & prolongs life.
- Collar threads, piston rod internal threads & base mounting holes provides easy fixturing & adaptability.
- Operate in any directional position.
- Heavy-duty spring improves retracting speed.
- Removable hardened grooved saddle for good load grip.
- Wiper seal prevents dirt penetration & extends cylinder working life.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Carrying handle for 50 tonnes & above models.
- Extremely versatile & suitable for wide range of industrial applications.

SELECTION CHART

SELECTION CHART				MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height	Saddle Dia.	Rod Protrusion	Rod Internal Thread	Rod Thread Depth	PCD Mounting Holes	Base Mounting Holes/ Holes Depth	Collar thread/ Thread Length	Weight		
Force (PUSH)	Stroke	Effective Area	Oil Volume																
Tonnes (kN)	mm	cm²	cm³															A mm	D mm
5 (49,5)	25	7,07	18	CMI5N25	92	40	30	25	19	24,5	2	M16x1,5	14	25	M6 10	M40x1,5 28	1,1		
	50	7,07	35	CMI5N50	117												1,3		
	75	7,07	53	CMI5N75	142												1,5		
	125	7,07	88	CMI5N125	202												1,9		
	175	7,07	124	CMI5N175	252												2,3		
	225	7,07	159	CMI5N225	302												2,7		
10 (111)	25	15,86	40	CMI10N25	83	60	45	35	19	33⊗	1⊗	-	-	39	M8 12	M60x1,5 28	2,0		
	50	15,86	80	CMI10N50	120												2,6		
	100	15,86	159	CMI10N100	170												3,5		
	150	15,86	238	CMI10N150	245												4,7		
	200	15,86	318	CMI10N200	295					5	M24x2	15	39				M8 12	M60x1,5 28	5,6
	250	15,86	398	CMI10N250	345														6,5
	300	15,86	477	CMI10N300	408				33							M65x2 28			9,03
	350	15,86	557	CMI10N350	458														10
25 (232)	25	33,14	83	CMI25N25	119	85	65	55	19	53	9	M32x2	16	58	M10 14	M85x2 40	4,6		
	50	33,14	166	CMI25N50	144												5,3		
	100	33,14	332	CMI25N100	214												7,5		
	150	33,14	498	CMI25N150	264												8,8		
	200	33,14	664	CMI25N200	314												10,2		
	250	33,14	830	CMI25N250	364												11,6		
	300	33,14	996	CMI25N300	414												13,0		
	350	33,14	1161	CMI25N350	464												15,0		
30 (309)	210	44,14	928	CMI30N210	386	102	75	55	47	53	9	M32x2	16	-	-	3 5/16"-12 49	18,4		
50 (496)	50	70,86	354	CMI50N50	164	127	95	80	25	65	4	M16	12	95	M12 18	M125x2 40	14,2		
	100	70,86	709	CMI50N100	214												17,4		
	150	70,86	1063	CMI50N150	264												20,8		
	325	70,86	2304	CMI50N325	439												32,6		
100 (929)	100	132,71	1327	CMI100N100	246	175	130	100	26	85	4	M16	17	140	M12 18	M168x2 51	39,6		
	150	132,71	1991	CMI100N150	296												46,0		

Nominal value shown in 'Tonnes', see kN for the exact force @700bar. ⊗ Mounting holes for ZTT10 tilt saddle

Single-Acting, Spring Return, Flat Profile Cylinders

CMC Series

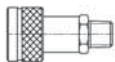
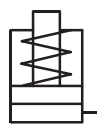
Capacity:

5 - 150 tonnes

Stroke:

6 - 15 mm

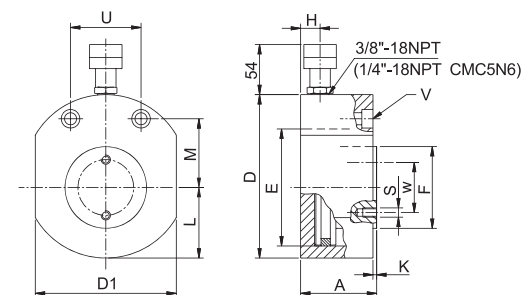
Maximum Operating Pressure:

700 bar (10,000 psi)

K73F Female 3/8" Coupler Included.
CMC5N6 with **K71F** Female 1/4" Coupler.



- Compact, lightweight design ideal for use in confined working areas where other cylinders will not fit.
- Operate in any directional position.
- Grooved piston rod end for improved load grip.
- Wiper seal prevents dirt penetration & extends cylinder working life for model 10 tonne & above.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- 30 tonnes & above models have two threaded holes in the rod end for mounting an optional tilt saddle.
- All models have two through holes for easy fixturing.
- Removable carrying handle for 75 tonne & above.
- Ideal for precision levelling of machinery, transformers, bridge sections, engines positioning etc.



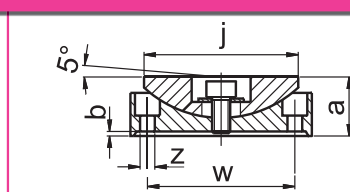
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*

SELECTION CHART

Force (PUSH) Tonnes (kN)	Stroke mm	Effective Area cm ²	Oil Volume cm ³	MODEL	Closed Height	Outside Dia.	External Dimension	Bore Dia.	Piston Rod Dia.	Coupler Height	Rod Protrusion	Distance from Rod Axis to the Outside Dia.	Distance from the Mounting Holes to the Rod Axis	Distance between the Mounting Holes - Centres	Through Holes for ISO-4762 Screws	PCD mounting Holes for Tilt Saddle	Mounting Holes for Tilt Saddle	Weight
					A mm	D mm	D1 mm	E mm	F mm	H mm	K mm	L mm	M mm	U mm	V mm	W mm	S mm	kg
5 (49,5)	6	7,07	4	CMC5N6 **	33	59	41	30	24	16	1	20,5	22,5	28,5	M5	-	-	0,6
	15	7,07	11	CMC5N15	42					19								0,8
10 (111)	10	15,86	16	CMC10N10	43	78	58	45	35	19	1	29	34	37	M6	-	-	1,6
20 (198)	10	28,29	28	CMC20N10	52	100	76	60	45	19	1	39	40	50	M10	-	-	2,8
30 (309)	10	44,14	44	CMC30N10	59	115	95	75	55	19	1	48	44	52	M10	44	2xM5	4,2
50 (496)	15	70,86	106	CMC50N15	68	143	120	95	80	19	1	60	54	67	M12	65	2xM6	6,9
75 (727)	15	103,86	156	CMC75N15	80	166	142	115	100	19	2	71	67	76	M12	65	2xM6	12,0
100 (929)	15	132,71	199	CMC100N15	86	178	160	130	100	20	2	80	75	76	M12	65	2xM6	14,5
150 (1407)	15	201	302	CMC150N15	100	217	194	160	120	23	2	97	83	117	M12	80	2xM6	24,5

Nominal value shown in 'Tonnes', see kN for the exact force @700bar. ** CMC5N6 with K71F (1/4" NPT) quick coupler

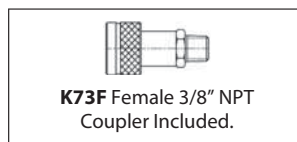
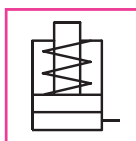
ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	j	z	w	kg
ZTT30	CMC30N10	19	1	53	5,5	44	0,3
ZTT50	CMC50N15	25	1	68	6,5	65	0,9
ZTT100	CMC75N15, CMC100N15	34	2	88		80	1,7
ZTT150	CMC150N15	45	3	118			3,4

Single-Acting, Spring Return, Low Height Cylinders

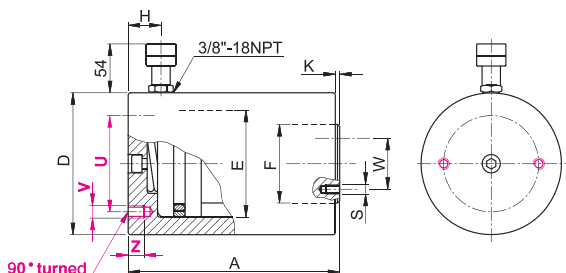
CMP Series



Capacity:
10 - 100 tonnes

Stroke:
25 - 50 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*



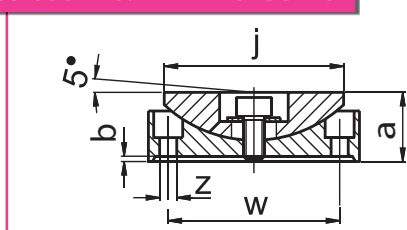
- Lightweight, low height design for use in confined spaces.
- Grooved piston rod end for improved load grip.
- Wiper seal prevents dirt penetration & extends cylinder working life.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Two threaded holes for mounting an optional tilt saddle.
- Base mounting holes are optional (Version 'F').
- Ideal for general maintenance works, lifting, levelling, support, pressing, assembly and construction operations in restricted working areas &/or tough environments.

SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height	Rod Protrusion	PCD Mounting Holes (Optional)	Mounting Holes / Holes Depth (Optional)	PCD Mounting Holes for Tilt Saddle	Mounting Holes for Tilt Saddle	Weight
Tonnes (kN)	mm	cm ²	cm ³		A mm	D mm	E mm	F mm	H mm	K mm	U mm	V/Z mm	W mm	S mm	kg
10 (111)	25	15,86	40	CMP10N25	72	75	45	35	19	1	25	2xM8 6	24	2xM5	2,5
	50	15,86	80	CMP10N50	97										3,2
20 (198)	25	28,29	71	CMP20N25	75	88	60	45	19	1	60	2xM10 10	34	2xM5	3,4
	50	28,29	141	CMP20N50	100										4,2
30 (309)	25	44,14	110	CMP30N25	86	102	75	55	19	1	65	2xM10 13	44	2xM5	5,0
	50	44,14	221	CMP30N50	111										6,1
50 (496)	25	70,86	177	CMP50N25	97	127	95	80	22	1	95	2xM12 15	65	2xM6	7,6
	50	70,86	354	CMP50N50	122										9,1
100 (929)	25	132,71	332	CMP100N25	116	175	130	100	22	2	140	2xM12 17	65	2xM6	17,6
	50	132,71	664	CMP100N50	141										20,5

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	j	z	w	kg
ZTT10	CMP10N # #	16	1	34	5,5	24	0,1
ZTT20	CMP20N # #	18		43		34	0,2
ZTT30	CMP30N # #	19		53		44	0,3
ZTT50	CMP50N # #	25	2	68	6,5	65	0,9
ZTT100	CMP100N # #	34		88			1,7

MODEL CODING

CMP	10	N	# #	#
Series	Pushing Force in tonne	N = Standard	Stroke in mm	F = with Base Mounting Holes

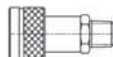
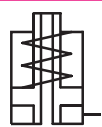
Single-Acting, Spring Return, Hollow Piston Cylinders

CMF Series

Capacity:
10 - 100 tonnes

Stroke:
50 - 160 mm

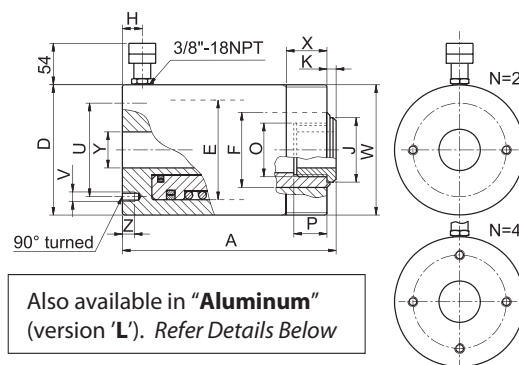
Maximum Operating Pressure:
700 bar (10,000 psi)



K73F Female 3/8"
Coupler Included.



- Hollow Piston design permits both pull & push forces.
- Operate in any directional position.
- Collar threads & base mounting holes for easy fixturing.
- Smooth hollow bore saddle screwed to rod bore to prevent any risk of rod deformation. Optional threaded saddle (ZTE) available to adapt threaded pulling rod.
- Wiper seal prevents dirt penetration & extends cylinder life.
- Nitride-treated to resist wear, provides excellent corrosion resistance & protect the bore centre.
- A bar or cable can be inserted through the hollow saddle for both pull & push operations.
- Suitable for pulling, tensioning, pulley, bearing/bush extracting etc.

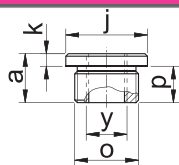


SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height	Hollow Saddle Dia.	Rod Protrusion	Rod Internal Thread	Rod Thread Depth	PCD Mounting Holes	Base Mounting Holes/ Holes Depth	Collar Thread	Collar Thread Length	Centre Hole Dia.	Weight (Steel)	Weight 'L' Version (Aluminum)
					A	D	E	F	H	J	K	O	P	U	V/Z	W	X	Y	kg	kg
10 (123)	50	17,57	88	CMF10N50	132	74	55	40	19	34,5	1	M30x1,5	16	50,8	2xM8 8	M74x2	20	21	3,8	2,5
	80	17,57	141	CMF10N80	176	(75)													4,8	3,1
20 (230)	50	32,86	164	CMF20N50	150	100 (105)	75	56	19	47,5	2	M40x1,5	24	82,6	2xM8 10	M100x2	20	28	7,8	5,3
	100	32,86	328	CMF20N100	221														10,7	7,4
	160	32,86	525	CMF20N160	305														14,1	9,5
30 (334)	50	47,71	239	CMF30N50	160	115 (125)	90	65	21	57,5	2	M48x1,5	32	92,2	2xM10 12	M115x2	20	34	10,5	8,1
	100	47,71	477	CMF30N100	233														14,5	11
	150	47,71	716	CMF30N150	303														18,1	13,6
60 (590)	75	84,29	632	CMF60N75	219	165 (180)	125	90	26	81,5	2	M72x1,5	40	130,2	2xM12 16	M165x4	25	54,5	28,9	21,4
	150	84,29	1264	CMF60N150	331														39,9	28,6
100 (947)	75	135,29	1015	CMF100N75	270	215 (235)	165	125	36	117,5	4	M102x1,5	55	130	4xM12 15	M215x4	35	80,5	59,3	44,6

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

ACCESSORIES: ZTE THREADED SADDLES



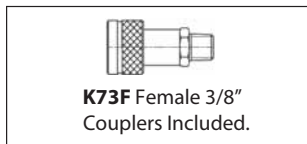
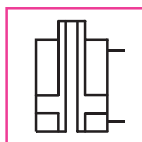
MODEL	For use with	a	k	j	p	y	o	kg
ZTE10	CMF10 # # # #	20	4	34,5	16	3/4" - 16 UNC	M30x1,5	0,1
ZTE20	CMF20 # # # #	30	6	47,5	24	1" - 8 UNC	M40x1,5	0,25
ZTE30	CMF30 # # # #	39	7	57,5	32	1 1/4" - 7 UNC	M48x1,5	0,32
ZTE60	CMF60 # # # #	47	7	81,5	40	1 5/8" - 5 1/2 UNS	M72x1,5	0,85

MODEL CODING

CMF	10	N	###
Series	Pushing Force in Tonne	N = In Steel L = in Aluminum	Stroke in mm

Double-Acting, Oil Return, Hollow Piston Cylinders

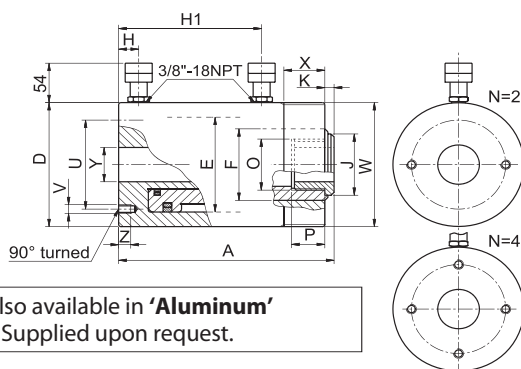
COF Series



Capacity:
30 - 200 tonnes

Stroke:
75 - 250 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



Also available in 'Aluminum'
– Supplied upon request.

Safety relief valve prevents damage in case of
over-pressurisation in the retract chamber.

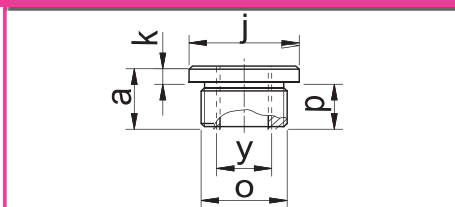
- Hollow Piston design permits both pull & push forces.
- Operate in any directional position.
- Collar threads & base mounting holes for model 30 to 100 tonnes provides easy fixturing.
- Smooth hollow bore saddle screwed to rod bore to prevent any risk of rod deformation. Optional threaded saddle (ZTE) available for 30 & 60 tonnes models.
- Wiper seal prevents dirt penetration & extends cylinder life.
- Nitride-treated to resist wear, provides excellent corrosion resistance & protect the bore centre.
- Double-acting operation for fast retraction.
- A bar or cable can be inserted through the hollow saddle for both pull & push operations.
- Suitable for pulling, tensioning, mounting & extracting pulleys, bearing, bushings and heat exchanger pipes etc.

SELECTION CHART

SELECTION CHART							MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Couplers Height		Hollow Saddle Dia.	Rod Protrusion	Rod Internal Thread	Rod Thread Depth	PCD Mounting Holes	Base Mounting Holes/ Holes Depth	Collar Thread	Collar Thread Length	Centre Hole Dia.	Weight
Force (PUSH)	Force (PULL)	Stroke	Effective Area (PUSH)	Effective Area (PULL)	Oil Volume (PUSH)	Oil Volume (PULL)		A	D	E	F	H	H1	J	K	O	P	U	V / Z	W	X	Y	kg
Tonnes (kN)		mm	cm²	cm²	cm³	cm³		mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
30 (334)	18 (176)	100	47,71	25,14	477	251	COF30N100	196	115	90	70	21	152	57,5	2	M48x1,5	32	65	2xM10 12	M115x2	20	34	13
		150	47,71	25,14	716	377	COF30N150	246					202										16
		250	47,71	25,14	1193	628	COF30N250	346					302										21
60 (590)	31 (309)	75	84,29	44,14	632	331	COF60N75	186	165	125	100	26	134	81,5	2	M72x1,5	40	90	4xM10 16	M165x4	25	54,5	26
		100	84,29	44,14	842	442	COF60N100	211					159										28
		150	84,29	44,14	1264	663	COF60N150	261					209										34
		250	84,29	44,14	2106	1104	COF60N250	361					309										46
100 (947)	58 (568)	75	135,29	81,14	1015	608	COF100N75	214	215	165	130	36	155	117,5	4	M102x1,5	55	130	4xM12 15	M215x4	35	80,5	47
		150	135,29	81,14	2029	1216	COF100N150	289					230										61
		250	135,29	81,14	3382	2027	COF100N250	389					330										79
150 (1435)	76 (748)	200	205	106,86	4100	2136	COF150N200	349	247	190	150	36	284	127,5	4	M112x2	60	-	-	-	-	80,5	100
200 (1979)	94 (924)	200	282,71	132	5655	2639	COF200N200	380	305	230	190	37	305	167,5	5	M135x2	70	-	-	-	-	103	160

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

ACCESSORIES: ZTE THREADED SADDLES



MODEL	For use with	a	k	j	p	y	o	kg
ZTE30	COF30N # # #	39	7	57,5	32	1 1/4" – 7 UNC	M48x1,5	0,32
ZTE60	COF60N # # #	47	7	81,5	40	1 5/8" – 5 1/2 UNS	M72x1,5	0,85

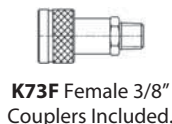
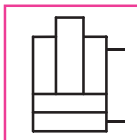
Double-Acting, Oil Return, Multi Purpose Cylinders

COI Series

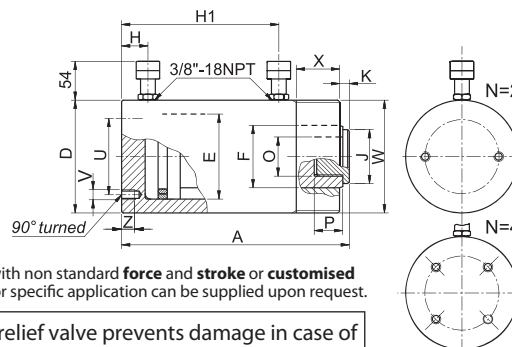
Capacity:
10 - 500 tonnes

Stroke:
150 - 325 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



- Superior Bearing Design reduces wear & prolongs life.
- Collar threads, piston rod internal threads & base mounting holes provides easy fixturing & adaptability.
- Operate in any directional position.
- Interchangeable hardened grooved saddle for load grip.
- Wiper seal prevents dirt penetration & extends cylinder working life.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Double-acting operation for fast retraction.
- Lifting eyelets equipped on 30 tonnes & above models.
- Highly versatile, heavy duty cylinders designed for wide range of industrial applications with high-cycle usage.
- Ruggedly used for toughest construction jobs in underpass pushing, preloading & pile testing, heavy lifting/lowering, pipe jacking operations etc.



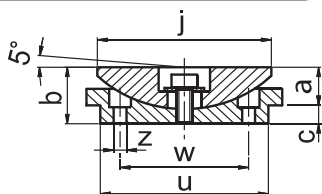
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*

SELECTION CHART

Force (PUSH) Tonnes (kN)	Force (PULL) Tonnes (kN)	Stroke mm	Effective Area (PUSH) cm ²	Effective Area (PULL) cm ²	Oil Volume (PUSH) cm ³	Oil Volume (PULL) cm ³	MODEL	Closed Height		Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height		Saddle Dia.	Rod Protrusion	Rod Internal Thread	Rod Thread Depth	PCD Mounting Holes	Base Mounting Holes/ Holes Depth	Collar Thread/ Thread Length	Weight
								A	D				H	H1								
10 (111)	5 (55)	150	15,86	7,86	239	118	COI10N150	258		60	45	32	19	213	34	6	M24x2	15	39	2xM8 12	M60x1,5 20	5,2
		250	15,86	7,86	398	197	COI10N250	358						313								6,8
30 (309)	10 (111)	150	44,14	15,86	663	239	COI30N150	279		100	75	60	23	221	53	9	M32x2	16	50	2xM10 15	M100x2 30	15,5
		250	44,14	15,86	1104	398	COI30N250	379						331								20,5
50 (496)	15 (144)	150	70,86	20,57	1063	309	COI50N150	288		127	95	80	25	234	65	4	M16	17	75	2xM12 18	M125x2 31	26,5
		325	70,86	20,57	2304	670	COI50N325	463						409								41,0
100 (929)	38 (379)	150	132,71	54,14	1991	813	COI100N150	323		175	130	100	33	250	85	4	M16	17	100	4xM12 23	M168x2 50	55
		300	132,71	54,14	3982	1626	COI100N300	473						400								77
150 (1407)	62 (616)	150	201	88	3016	1319	COI150N150	336		215	160	120	40	255	105	6	M16	17	130	4xM16 23	M215x4 56	85
		300	201	88	6032	2639	COI150N300	486						405								118
200 (1984)	76 (748)	150	283,43	106,86	4253	1602	COI200N150	355		255	190	150	48	268	135	7	M16	17	140	4xM16 23	M255x4 60	129
		300	283,43	106,86	8506	3204	COI200N300	505						418								177
300 (2908)	94 (923)	150	415,43	131,86	6232	1979	COI300N150	391		305	230	190	60	290	175	7	M16	17	200	4xM16 30	M305x4 74	208
		300	415,43	131,86	12464	3958	COI300N300	541						440								278
400 (4008)	112 (1099)	150	572,57	157	8588	2356	COI400N150	421		355	270	230	70	310	215	7	M16	17	250	4xM20 33	M355x4 84	307
		250	572,57	157	14314	3927	COI400N250	521						410								373
500 (4948)	154 (1512)	150	706,86	216	10603	3240	COI500N150	462		395	300	250	80	330	235	12	M16	17	280	4xM20 40	M395x4 100	416
		250	706,86	216	17671	5400	COI500N250	562						430								495

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

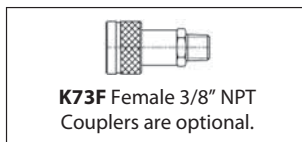
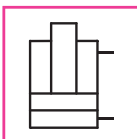
ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	c	j	u	z	w	kg
ZTT11	COI10N # # #	9	21	12	34	M24x2	-	-	0,1
ZTT31	COI30N # # #	16	30	14	53	M32x2	-	-	0,3
ZTT51	COI50N # # #	18	26	8	68	65	5,5	45	0,8
ZTT101	COI100N # # #	22	32		88	85		65	1,6
ZTT151	COI150N # # #	32	42	10	118	105	6,5	80	3,2
ZTT201	COI200N # # #	39	51		148	135		110	6,5
ZTT301	COI300N # # #	43	55		158	175		150	11,0
ZTT401	COI400N # # #	56	68		196	215	8,5	190	20,2
ZTT501	COI500N # # #	56	68			235		210	23,2

Double-Acting, Oil Return, Precision Production Cylinders

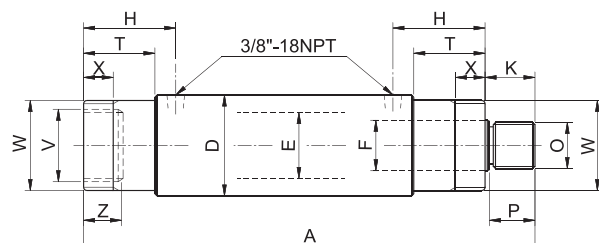
COD Series



Capacity:
5 - 25 tonnes

Stroke:
30 - 260 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



Accessories (Optional) available.
Refer Details Below



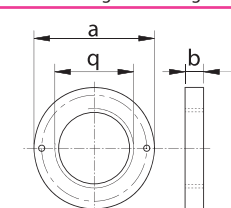
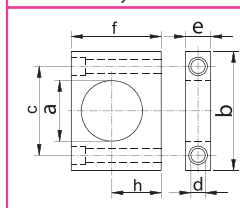
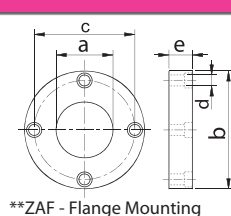
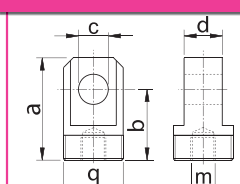
- Designed for long life, high precision & high production cycles applications.
- Operate in any directional position.
- Collar threads, external piston rod threads & internal base threads provides unique, versatile mounting configurations.
- Complete range of accessories are available for fixturing.
- Wiper seal prevents dirt penetration & extends cylinder life.
- Nitride-treated to resist wear, provides excellent corrosion resistance.
- Double-acting operation generates force in both directions and provides fast retraction.
- Suitable for laboratory testing requiring push & pull forces.

SELECTION CHART

Force (PUSH)	Force (PULL)	Stroke	Effective Area (PUSH)	Effective Area (PULL)	Oil Volume (PUSH)	Oil Volume (PULL)	MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Couplers Height	Rod Protrusion	Rod Thread	Rod Thread Length	Collar Length	Internal Base Thread	Internal Base Thread Depth	Collar Thread	Collar Thread Length	Weight
Tonnes (kN)		mm	cm ²	cm ²	cm ³	cm ³		A mm	D mm	E mm	F mm	H mm	K mm	O mm	P mm	T mm	V mm	Z mm	W mm	X mm	kg
5 (49,5)	3 (27,5)	30	7,07	3,93	21	12	COD5N30	185													2,1
		80	7,07	3,93	57	31	COD5N80	235	50	30	20	45	22	M18x1,5	19	26	M35x1,5	13	M42x1,5	9	2,8
		160	7,07	3,93	113	63	COD5N160	315													3,8
10 (97)	6 (62)	30	13,86	8,86	42	27	COD10N30	204													3,6
		80	13,86	8,86	111	72	COD10N80	254	63	42	25	54	23	M22x1,5	20	35	M42x1,5	15	M56x2	15	4,5
		160	13,86	8,86	222	143	COD10N160	334													5,8
		260	13,86	8,86	360	233	COD10N260	434													7,3
15 (137)	8 (81)	160	19,57	11,57	314	185	COD15N160	376	80	50	32	71	31	M30x2	28	52	M56x2	27	M70x2	16	10,8
		260	19,57	11,57	511	301	COD15N260	476													13,9
25 (232)	12 (121)	160	33,14	17,29	531	276	COD25N160	412	92	65	45	84	41	M42x1,5	38	65	M70x2	30	M85x2	20	15,5
		260	33,14	17,29	863	449	COD25N260	512													19,4

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

ACCESSORIES FOR COD CYLINDERS: ZAE - ZAF - ZAP - ZAA



MODEL	a	b	c	d	e	f	h	m	q	kg
ZAE5	62	46	16	16	-	-	-	M18x1,5	M35x1,5	0,3
ZAE10	77	58	20	25	-	-	-	M22x1,5	M42x1,5	0,6
ZAE15	98	73	25	32	-	-	-	M30x2	M56x2	1,2
ZAE25	112	80	32	38	-	-	-	M42x1,5	M70x2	2,0
ZAF5	42	98	78,6	11	17	-	-	-	-	0,8
ZAF10	56	118	99	11	23	-	-	-	-	1,5
ZAF15	70	145	116	17	35	-	-	-	-	3,4
ZAF25	85	168	136	17	45	-	-	-	-	6,0
ZAP5	42	80	58	10,5	17	60	32	-	-	0,4
ZAP10	56	110	82,6	13	23	82	45	-	-	1,1
ZAP15	70	135	100	21	35	100	52	-	-	2,6
ZAP25	85	160	118	26	45	125	63,5	-	-	5,1
ZAA5	58	9	-	-	-	-	-	-	M42x1,5	0,1
ZAA10	78	12	-	-	-	-	-	-	M56x2	0,3
ZAA15	95	16	-	-	-	-	-	-	M70x2	0,6
ZAA25	108	20	-	-	-	-	-	-	M85x2	0,8

**Mounting screws not included.

Single-Acting, Load Return, High Tonnage Cylinders

CGS Series

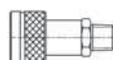
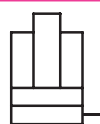
Capacity:

50 - 500 tonnes

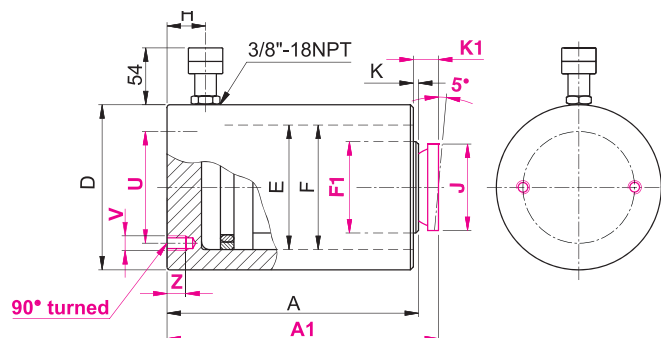
Stroke:

25 - 300 mm

Maximum Operating Pressure:

700 bar (10,000 psi)

K73F Female 3/8"
Coupler Included.



- Extremely solid robust cylinders.
- Concentric machined grooves on piston rod end improve load grip.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Cylinders are plunging type & have device to prevent any over-stroke.
- Piston rod has a coloured zone which becomes visible 10mm before the end of the piston stroke ('P' version).
- Lifting eyelets equipped on all models.
- Suitable for use in civil & marine engineering industries for lifting & lowering of heavy loads, piling testing etc.
- 'N' version** – Cylinder with end of stroke ring nut. (In compliance with ANSI B30.1)
- 'P' version** – Cylinder with no end of stroke nut (Plunging).
- 'F' version** – Cylinder with base mounting holes.
- 'T' version** – Cylinder with integrated tilt saddle.

All models can operate with off-centred load up to **8%** of their nominal capacity.



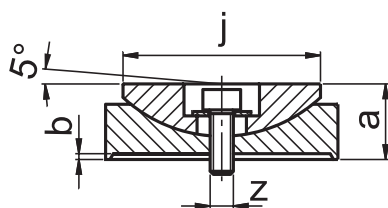
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*

MODEL CODING

CGS	5	N	###	#
Series	Pushing Force in tonne	N = With end of stroke nut P = With no end of stroke nut (Plunging)	Stroke in mm	F = with base mounting holes T = with integrated tilt saddle**

** Cylinders with non standard force and stroke can be supplied upon request

ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	j	z	kg
ZTT50	CGS50 # # # #	25	1	68	M8	0,9
ZTT100	CGS100 # # # #	34	2	88		1,7
ZTT150	CGS150 # # # #	45	3	118		3,4
ZTT200	CGS200 # # # #	54		148	M10	7,0
ZTT250	CGS250 # # # #			158		9,5
ZTT300	CGS300 # # # #					11,3
ZTT350	CGS350 # # # #					18,0
ZTT400	CGS400 # # # #	71		196	M12	20,7
ZTT500	CGS500 # # # #					23,8

SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	MODEL	Closed Height	Closed Height with Integrated Tilt Saddle	Outside Dia.	Bore Dia.	Ø Rod Version Dia.	Ø Rod Version Dia.	Coupler height	Integrated Tilt Saddle Dia. (T Version)	Rod Protrusion	Rod Protrusion with Integrated Tilt Saddle (T Version)	PCD Mounting Holes (F Version)	Bore Mounting Holes/ Holes Depth (F Version)	Weight
Tonnes kN	mm	cm ²	cm ³		A mm	A1 mm	D mm	E mm	F mm	F1 mm	H mm	J mm	K mm	K1 mm	U mm	V/Z mm	kg
50 (496)	50	70,86	354	CGS50P50	122	127	127	95	95	80	22	68	1	6	95	2xM12 15	11,6
	100	70,86	709	CGS50P100	172	177											15,8
	150	70,86	1063	CGS50P150	222	227											20,0
100 (929)	50	132,71	664	CGS100P50	141	148	175	130	130	100	22	88	2	9	130	2xM12 17	24,8
	100	132,71	1327	CGS100P100	191	198											32,0
	150	132,71	1991	CGS100P150	241	248											39,3
150 (1407)	25	201	503	CGS150P25	137	146	213	160	160	120	30	118	3	12	130	4xM12 17	36,5
	50	201	1005	CGS150P50	162	171											41,8
	100	201	2011	CGS150P100	212	221											52,4
	150	201	3016	CGS150P150	262	271											62,9
	200	201	4021	CGS150P200	312	321											73,4
	250	201	5026	CGS150P250	362	371											83,9
200 (1984)	25	283,43	709	CGS200P25	151	160	252	190	190	150	32	148	3	12	140	4xM16 20	57
	50	283,43	1418	CGS200P50	176	185											65
	100	283,43	2835	CGS200P100	226	235											81
	150	283,43	4253	CGS200P150	276	285											95
	200	283,43	5670	CGS200P200	326	335											111
	250	283,43	7088	CGS200P250	376	385											126
	300	283,43	8506	CGS200P300	426	435											141
250 (2424)	25	346,29	866	CGS250P25	167	176	280	210	210	170	34	158	3	12	150	4xM16 20	79
	50	346,29	1732	CGS250P50	192	201											88
	100	346,29	3464	CGS250P100	242	251											108
	150	346,29	5195	CGS250P150	292	301											127
	200	346,29	6927	CGS250P200	342	351											146
	250	346,29	8659	CGS250P250	392	401											166
	300	346,29	10391	CGS250P300	442	451											186
300 (2908)	25	415,43	1039	CGS300P25	173	182	305	230	230	190	38	158	3	12	170	4xM16 20	96
	50	415,43	2077	CGS300P50	198	207											108
	100	415,43	4155	CGS300P100	248	257											132
	150	415,43	6232	CGS300P150	298	307											155
	200	415,43	8310	CGS300P200	348	357											178
	250	415,43	10387	CGS300P250	398	407											202
	300	415,43	12464	CGS300P300	448	457											225
350 (3436)	25	490,86	1227	CGS350P25	180	192	332	250	250	210	39	196	3	15	200	4xM16 20	119
	50	490,86	2454	CGS350P50	205	217											132
	100	490,86	4909	CGS350P100	255	267											162
	150	490,86	7363	CGS350P150	305	317											190
	200	490,86	9817	CGS350P200	355	367											218
	250	490,86	12272	CGS350P250	405	417											247
	300	490,86	14726	CGS350P300	455	467											274
400 (4008)	25	572,57	1431	CGS400P25	187	199	356	270	270	230	42	196	3	15	230	4xM16 20	142
	50	572,57	2863	CGS400P50	212	224											159
	100	572,57	5726	CGS400P100	262	274											192
	150	572,57	8588	CGS400P150	312	324											225
	200	572,57	11451	CGS400P200	362	374											257
	250	572,57	14314	CGS400P250	412	424											290
	300	572,57	17177	CGS400P300	462	474											323
500 (4948)	25	706,86	1767	CGS500P25	195	207	396	300	300	250	50	196	3	15	250	4xM16 20	184
	50	706,86	3534	CGS500P50	220	232											204
	100	706,86	7069	CGS500P100	270	282											243
	150	706,86	10603	CGS500P150	320	332											284
	200	706,86	14137	CGS500P200	370	382											323
	250	706,86	17651	CGS500P250	420	432											363
	300	706,86	21206	CGS500P300	470	482											402

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

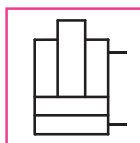
Double-Acting, Oil Return, High Tonnage Cylinders

COS Series

Capacity:
50 - 500 tonnes

Stroke:
25 - 300 mm

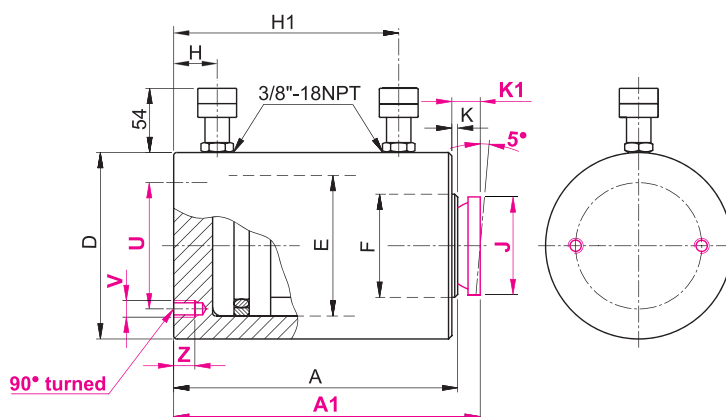
Maximum Operating Pressure:
700 bar (10,000 psi)



K73F Female 3/8"
Couplers Included.



- Extremely solid robust cylinders.
- Concentric machined grooves on piston rod end improve load grip.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Wiper seal prevents dirt penetration & extends cylinder life.
- Double-acting operation for fast retraction.
- Lifting eyelets equipped on all models.
- Suitable for use in civil & marine engineering industries for lifting, holding & lowering of heavy loads, pile or foundation testing etc.
- **'N' version** – Cylinder with end of stroke ring nut.
- **'F' version** – Cylinder with base mounting holes.
- **'T' version** – Cylinder with integrated tilt saddle.



All models can operate with off-centred load up to **8%** of their nominal capacity

Safety relief valve prevents damage in case of over-pressurisation in the retract chamber.



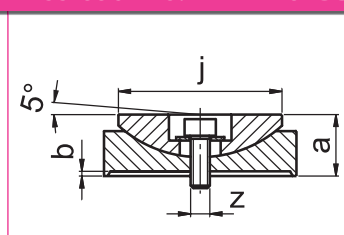
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*

MODEL CODING

COS	50	N	###	#
Series	Pushing Force in tonne	N = Standard	Stroke in mm	F = with base mounting holes T = with integrated tilt saddle **

** Cylinders with non-standard force & stroke can be supplied upon request.

ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	j	z	kg
ZTT50	COS50N ###	25	1	68	M8	0,9
ZTT100	COS100N ###	34	2	88	M10	1,7
ZTT150	COS150N ###	45	3	118		3,4
ZTT200	COS200N ###	54	3	148		7,0
ZTT250	COS250N ###	58		158		9,5
ZTT300	COS300N ###				11,3	
ZTT350	COS350N ###	71		196	M12	18,0
ZTT400	COS400N ###					20,7
ZTT500	COS500N ###					23,8

SELECTION CHART							MODEL	Closed Height	Closed Height with Integrated Tilt Saddle	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height		Integrated Tilt Saddle Dia. ('T' Version)	Rod Protrusion	Rod Protrusion with Integrated Tilt Saddle ('T' Version)	PCD Mounting Holes ('F' Version)	Mounting Holes/ Holes Depth ('F' Version)	Weight												
Force (PUSH)		Force (PULL)	Stroke	Effective Area (PUSH)	Effective Area (PULL)	Oil Volume (PUSH)							Oil Volume (PULL)	A							A1	D	E	F	H	H1	J	K	K1	U	V/Z	kg
Tonnes (kN)			mm	cm²	cm²	cm³							cm³	mm							mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm
50 (496)	15 (144)	50	70,86	20,57	354	103	COS50N50	149	154	127	95	80	20	104	68	1	6	95	2xM12 15	14												
		100	70,86	20,57	709	206	COS50N100	199	204					18																		
		150	70,86	20,57	1063	309	COS50N150	249	254					22																		
100 (929)	38 (379)	50	132,71	54,14	664	271	COS100N50	171	178	175	130	100	28	124	88	2	9	130	2xM12 17	30												
		100	132,71	54,14	1327	542	COS100N100	221	228					38																		
		150	132,71	54,14	1991	813	COS100N150	271	278					45																		
		200	132,71	54,14	2655	1084	COS100N200	321	328					52																		
150 (1407)	62 (616)	25	201	88	503	220	COS150N25	167	176	213	160	120	30	106	118	3	12	130	4xM12 17	45												
		50	201	88	1005	440	COS150N50	192	201					50																		
		100	201	88	2011	880	COS150N100	242	251					61																		
		150	201	88	3016	1319	COS150N150	292	301					71																		
		200	201	88	4021	1759	COS150N200	342	351					82																		
		250	201	88	5027	2199	COS150N250	392	401					93																		
200 (1984)	76 (748)	25	283,43	106,86	709	267	COS200N25	181	190	252	190	150	32	117	148	3	12	140	4xM16 20	69												
		50	283,43	106,86	1418	534	COS200N50	206	215					76																		
		100	283,43	106,86	2835	1068	COS200N100	256	265					92																		
		150	283,43	106,86	4253	1602	COS200N150	306	315					107																		
		200	283,43	106,86	5671	2136	COS200N200	356	365					123																		
		250	283,43	106,86	7088	2670	COS200N250	406	415					138																		
		300	283,43	106,86	8506	3204	COS200N300	456	465					153																		
250 (2424)	85 (835)	25	346,29	119,29	866	298	COS250N25	197	206	280	210	170	34	128	158	3	12	150	4xM16 20	92												
		50	346,29	119,29	1732	597	COS250N50	222	231					102																		
		100	346,29	119,29	3464	1194	COS250N100	272	281					122																		
		150	346,29	119,29	5195	1791	COS250N150	322	331					141																		
		200	346,29	119,29	6927	2388	COS250N200	372	381					161																		
		250	346,29	119,29	8659	2985	COS250N250	422	431					180																		
		300	346,29	119,29	10391	3581	COS250N300	472	481					200																		
300 (2908)	94 (923)	25	415,43	131,86	1039	330	COS300N25	203	212	305	230	190	38	130	158	3	12	170	4xM16 20	113												
		50	415,43	131,86	2077	660	COS300N50	228	237					125																		
		100	415,43	131,86	4155	1319	COS300N100	278	287					148																		
		150	415,43	131,86	6232	1979	COS300N150	328	337					172																		
		200	415,43	131,86	8310	2639	COS300N200	378	387					195																		
		250	415,43	131,86	10387	3299	COS300N250	428	437					219																		
		300	415,43	131,86	12464	3958	COS300N300	478	487					242																		
350 (3436)	103 (1011)	25	490,86	144,43	1227	361	COS350N25	210	222	332	250	210	39	132	196	3	15	200	4xM16 20	138												
		50	490,86	144,43	2454	723	COS350N50	235	247					153																		
		100	490,86	144,43	4909	1445	COS350N100	285	297					183																		
		150	490,86	144,43	7363	2168	COS350N150	335	347					213																		
		200	490,86	144,43	9817	2890	COS350N200	385	397					242																		
		250	490,86	144,43	12272	3613	COS350N250	435	447					272																		
		300	490,86	144,43	14726	4335	COS350N300	485	497					302																		
400 (4008)	112 (1099)	25	572,57	157	1431	393	COS400N25	217	229	356	270	230	42	135	196	3	15	230	4xM16 20	165												
		50	572,57	157	2863	785	COS400N50	242	254					182																		
		100	572,57	157	5726	1571	COS400N100	292	304					215																		
		150	572,57	157	8588	2356	COS400N150	342	354					248																		
		200	572,57	157	11451	3142	COS400N200	392	404					281																		
		250	572,57	157	14314	3927	COS400N250	442	454					313																		
		300	572,57	157	17177	4712	COS400N300	492	504					346																		
500 (4948)	154 (1512)	25	706,86	216	1767	540	COS500N25	225	237	396	300	250	50	140	196	3	15	250	4xM16 20	212												
		50	706,86	216	3534	1080	COS500N50	250	262					232																		
		100	706,86	216	7069	2160	COS500N100	300	312					271																		
		150	706,86	216	10603	3240	COS500N150	350	362					312																		
		200	706,86	216	14137	4320	COS500N200	400	412					352																		
		250	706,86	216	17671	5400	COS500N250	450	462					391																		
		300	706,86	216	21206	6480	COS500N300	500	512					431																		

Single-Acting, Load Return, Lock Nut , High Tonnage Cylinder

CGG Series

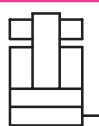
Capacity:

30 - 500 tonnes

Stroke:

25 - 300 mm

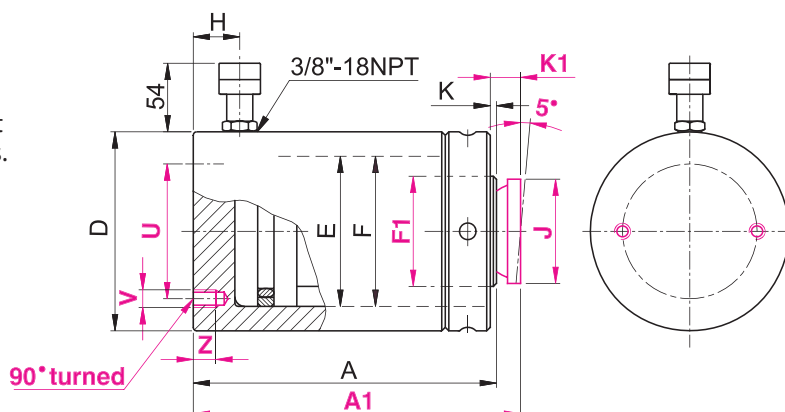
Maximum Operating Pressure:

700 bar (10,000 psi)

K73F Female 3/8"
Coupler Included.



- Extremely solid robust cylinders.
- Concentric machined grooves on piston rod end improve load grip.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Cylinders 50 tonnes & above are plunging type & have device to prevent any over-stroke.
- Piston rod has a coloured zone which becomes visible 10mm before the end of the piston stroke ('P' version).
- Lifting eyelets equipped on 50 tonnes & above models.
- Ideal for use in construction industries, such as bridge repairs, underpinning, load support etc.
- 'N' version** – Cylinder with end of stroke ring nut. (In compliance with ANSI B30.1)
- 'P' version** – Cylinder with no end of stroke nut (Plunging).
- 'F' version** – Cylinder with base mounting holes.
- 'T' version** – Cylinder with integrated tilt saddle.
- 'M' version** – Cylinder with spring return. (Available for 'N' version up to 150 tonnes models)



All models can operate with off-centred load up to **8%** of their nominal capacity.

Safety Lock Nut provides positive mechanical load holding supporting lifted load for extended long period with hydraulic pressure released.



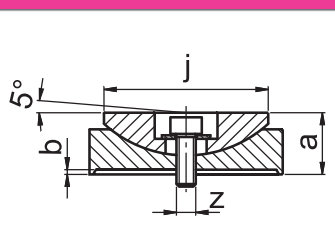
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. *Refer Details Below*

MODEL CODING

C#G	30	N	###	#
Series G (gravity) Series M (spring)	Pushing Force in tonne	N = With end of stroke nut P = With no end of stroke nut (Plunging)	Stroke in mm	F = with base mounting holes T = with integrated tilt saddle**

** Cylinders with a force below 100 tonne can be supplied subject to a minimum production batch, to be advised

ACCESSORIES: ZTT TILT SADDLES



MODEL	For use with	a	b	j	z	kg
ZTT30	CGG30N100	19	1	53	M5	0,3
ZTT50	CGG50 # # # #	25		68	M8	0,9
ZTT100	CGG100 # # # #	34	2	88	M10	1,7
ZTT150	CGG150 # # # #	45	3	118		3,4
ZTT200	CGG200 # # # #	54	3	148		7,0
ZTT250	CGG250 # # # #	58		158	9,5	
ZTT300	CGG300 # # # #				11,3	
ZTT350	CGG350 # # # #	71		196	M12	18,0
ZTT400	CGG400 # # # #				20,7	
ZTT500	CGG500 # # # #				23,8	

SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	MODEL	Closed Height	Closed Height with Integrated Tilt Saddle	Outside Dia.	Bore Dia.	P Rod Version Dia.	N Rod Version Dia.	Coupler Height	Integrated Tilt Saddle Dia. (T Version)	Rod Protrusion	Rod Protrusion with Integrated Tilt Saddle (T Version)	PCD Mounting Holes (F Version)	Mounting Holes/ Holes Depth (F Version)	Weight
Tonnes (kN)	mm	cm ²	cm ³		A mm	A1 mm	D mm	E mm	F mm	F1 mm	H mm	J mm	K mm	K1 mm	U mm	V/Z mm	kg
30 (309)	100	44,14	442	CGG30N100	189	193	102	75	-	Tr 65x6	19	53	1	5	65	2xM10 13	11
50 (496)	100	70,86	709	CGG50P100	208	213	127	95	Tr 95x6	Tr 85x6	22	68	1	6	95	2xM12 15	19
	150	70,86	1063	CGG50P150	258	263											23
100 (929)	100	132,71	1327	CGG100P100	236	243	175	130	Tr 130x10	Tr 110x10	22	88	2	9	130	2xM12 17	38
	150	132,71	1991	CGG100P150	286	293											45
150 (1407)	25	201	503	CGG150P25	184	193	213	160	Tr 160x10	Tr 130x10	30	118	3	12	130	4xM12 17	47
	50	201	1005	CGG150P50	209	218											52
	100	201	2011	CGG150P100	259	268											66
	150	201	3016	CGG150P150	309	318											74
	200	201	4021	CGG150P200	359	368											85
	250	201	5026	CGG150P250	409	418											95
200 (1984)	25	283,43	709	CGG200P25	205	214	252	190	Tr 190x10	Tr 165x10	32	148	3	12	140	4xM16 20	75
	50	283,43	1418	CGG200P50	230	239											84
	100	283,43	2835	CGG200P100	280	289											100
	150	283,43	4253	CGG200P150	330	339											116
	200	283,43	5670	CGG200P200	380	389											133
	250	283,43	7088	CGG200P250	430	439											149
	300	283,43	8506	CGG200P300	480	489											165
250 (2424)	25	346,29	866	CGG250P25	224	233	280	210	Tr 210x10	Tr 175x10	34	158	3	12	150	4xM16 20	95
	50	346,29	1732	CGG250P50	249	258											104
	100	346,29	3464	CGG250P100	299	308											127
	150	346,29	5195	CGG250P150	349	358											140
	200	346,29	6927	CGG250P200	399	408											158
	250	346,29	8659	CGG250P250	449	458											176
	300	346,29	10391	CGG250P300	499	508											194
300 (2908)	25	415,43	1039	CGG300P25	240	249	305	230	Tr 230x10	Tr 195x10	38	158	3	12	170	4xM16 20	126
	50	415,43	2077	CGG300P50	265	274											137
	100	415,43	4155	CGG300P100	315	324											160
	150	415,43	6232	CGG300P150	365	374											183
	200	415,43	8310	CGG300P200	415	424											205
	250	415,43	10387	CGG300P250	465	474											228
	300	415,43	12464	CGG300P300	515	524											251
350 (3436)	25	490,86	1227	CGG350P25	250	262	332	250	Tr 250x10	Tr 215x10	42	196	3	15	200	4xM16 20	149
	50	490,86	2454	CGG350P50	275	287											162
	100	490,86	4909	CGG350P100	325	337											188
	150	490,86	7363	CGG350P150	375	387											215
	200	490,86	9817	CGG350P200	425	437											241
	250	490,86	12272	CGG350P250	475	487											267
	300	490,86	14726	CGG350P300	525	537											293
400 (4008)	25	572,57	1431	CGG400P25	260	272	356	270	Tr 270x10	Tr 235x10	42	196	3	15	230	4xM16 20	187
	50	572,57	2863	CGG400P50	285	297											203
	100	572,57	5726	CGG400P100	335	347											234
	150	572,57	8588	CGG400P150	385	397											266
	200	572,57	11451	CGG400P200	435	447											298
	250	572,57	14314	CGG400P250	485	497											330
	300	572,57	17177	CGG400P300	535	547											362
500 (4948)	25	706,86	1767	CGG500P25	275	287	396	300	Tr 300x10	Tr 260x10	50	196	3	15	250	4xM16 20	257
	50	706,86	3534	CGG500P50	300	312											278
	100	706,86	7069	CGG500P100	350	362											319
	150	706,86	10603	CGG500P150	400	412											360
	200	706,86	14137	CGG500P200	450	462											402
	250	706,86	17651	CGG500P250	500	512											443
	300	706,86	21206	CGG500P300	550	562											484

Nominal value shown in 'Tonnes', see kN for the exact force @ 700 bar,

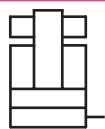
Single-Acting, Load Return, Lock Nut, Low Profile Hydraulic Cylinder

CGR Series

Capacity:
110 - 900 tonnes

Stroke:
50 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



K73F Female 3/8"
Coupler Included.

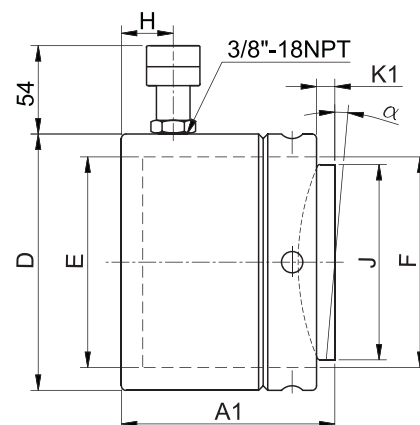


- Compact **Pancake Style Lock Nut Cylinders** for use where working space is limited.
- Concentric machined grooves on piston rod end improve load grip.
- Nitride anti-corrosive treatment provides excellent corrosion & wear resistance in harsh environments.
- Equipped with overflow port to prevent any over-stroke.
- Piston rod has a coloured zone which becomes visible 10mm before the end of the piston stroke.
- Lifting eyelets equipped on all models.
- Ideal for use in construction industries, such as maintenance of bridges, viaducts, building sites and industrial maintenance where working space is limited.

Recommendation:

If support resistance is not compatible with the pressure shown in the chart, place pressure plates on top of the saddle and under the base to distribute the load.

Non-compliance with this notice could result in cylinder damage &/or the load will be lifted.



Safety Lock Nut provides positive mechanical load holding supporting lifted load for extended long period with hydraulic pressure released.



Integrated Tilt Saddle (Standard supplied) – to reduce the effects of any off-centred loads.

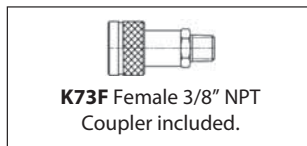
SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	Cylinder Bottom Pressure	Saddle Pressure	MODEL	Closed Height with Integrated Tilt Saddle	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height	Tilt Saddle Dia.	Rod Protrusion with Integrated Tilt Saddle	Tilt Saddle Angle	Weight
Tonnes (kN)	mm	cm ²	cm ³	MPa	MPa		A1 mm	D mm	E mm	F mm	H mm	J mm	K1 mm	α	kg
110 (1078)	50	154	770	46	113	CGR110N50	137	178	140	Tr 140x10	19	118	8	5°	26
160 (1589)		227	1135	45	102	CGR160N50	148	218	170	Tr 170x10	19	148	9	5°	42
200 (1985)		283,57	1418	45	87	CGR200N50	154	242	190	Tr 190x10	20	176	10	5°	54
250 (2424)		346,29	1732	45	84	CGR250N50	159	268	210	Tr 210x10	22	196	11	5°	68
400 (4008)		572,57	2863	44	89	CGR400N50	178	347	270	Tr 270x10	27	248	11	4°	128
500 (4948)		706,86	3534	44	81	CGR500N50	192	385	300	Tr 300x10	30	285	10	3°	171
700 (6735)		962,14	4811	44	85	CGR700N50	200	445	350	Tr 350x10	30	325	10	3°	238
900 (8796)		1256,57	6283	47	83	CGR900N50	216	495	400	Tr 400x10	30	375	12	3°	315

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

Single-Acting, Spring Return, Pull Cylinders

CMT Series

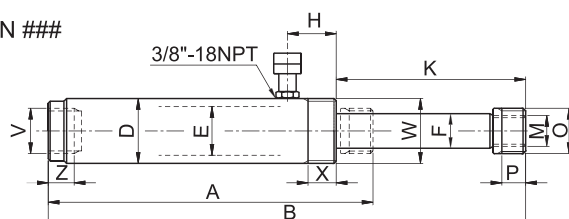


Capacity:
2 - 60 tonnes

Stroke:
127 - 150 mm

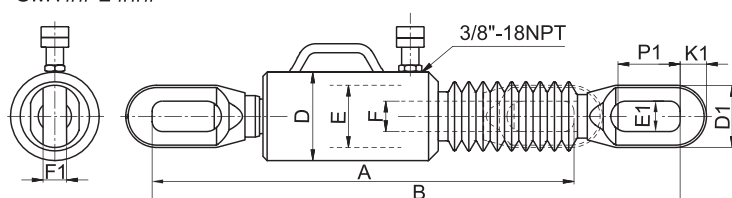
Maximum Operating Pressure:
700 bar (10,000 psi)

CMT## N ###



ZAS set of clevis eyes available for 'N' version. Refer Page: 23

CMT## L ###



Designed for pulling and tensioning

Steel 'N' version:-

- Available in 2, 5 & 10 tonnes models designed with threads on the cylinder body, piston rod & in the cylinder internal base to mount proper accessories.
- The internal & external nitriding treatment provides good corrosion & wear resistance.
- Used in assembling, building & in laboratories to test the resistance of materials.

Aluminium 'L' version:-

- Available in 10, 30 & 60 tonnes models.
- Designed completely in aluminium (except the piston rod).
- Anodizing treatment protects cylinders against corrosion.
- Equipped with a bellows to protect the piston rod.
- Carrying handle for 30 tonnes & above models.
- Used in shipbuilding & in steel structural works to pull plates or prefabricated parts together for welding.

STEEL CYLINDERS SELECTION CHART

Force (PULL)	Stroke	Effective Area (PULL)	Oil Volume	MODEL	Closed Height	Extended Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Distance	Rod Protrusion	Rod Thread	Saddle Thread	Saddle Thread Length	Internal Base Thread	Internal Base Thread Length	Body Thread/ Thread Length	Weight
Tonnes (kN)	mm	cm ²	cm ³		A mm	B mm	D mm	E mm	F mm	H mm	K mm	M mm	O mm	P mm	V mm	Z mm	W/X mm	kg
2 (22,9)	127	3,27	41	CMT2N127	244	371	48	30	22	39	155	M18x1,5	3/4" NPT	18	3/4" NP	20	M40x1,5 20	2,9
5 (55)	140	7,86	110	CMT5N140	301	441	60	45	32	45	175	M30x2	1 1/4" NPT	22	1 1/4" NPT	24	M60x1,5 26	4,9
10 (110)	150	15,71	236	CMT10N150	302	452	80	55	32	39	189	M30x2	-	30	M30x2	25	M80x2 20	8,0

Nominal value shown in 'Tonnes', see kN for the exact force @ 700 bar,

ALUMINIUM CYLINDERS SELECTION CHART

Force (PULL)	Stroke	Effective Area (PULL)	Oil Volume	MODEL	Closed Height	Extended Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Eyelet Width	Slit Width	Eyelet Thickness	Eyelet Top Thickness	Slit Length	Weight
Tonnes (kN)	mm	cm ²	cm ³		A mm	B mm	D mm	E mm	F mm	D1 mm	E1 mm	F1 mm	K1 mm	P1 mm	kg
10 (110)	150	15,71	236	CMT10L150	526	676	75	55	32	55	32	20	20	100	4,4
30 (334)		47,71	716	CMT30L150	612	762	128	90	45	90	44	34	38	100	13,2
60 (559)		79,86	1199	CMT60L150	734	884	168	120	65	107	61	40	50	140	33,5

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

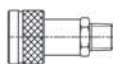
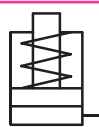
Single-Acting, Spring Return, Aluminium Cylinders

CML Series

Capacity:
50 - 100 tonnes

Stroke:
50 - 150 mm

Maximum Operating Pressure:
700 bar (10,000 psi)

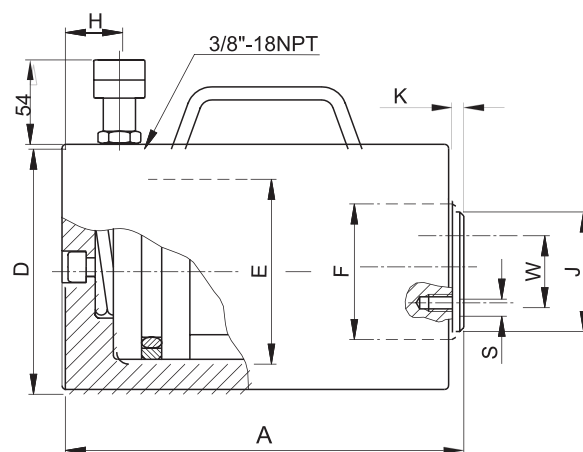


K73F Female 3/8" Coupler Included.



- Aluminium alloy cylinders offer lightweight solution for many lifting & lowering applications.
- Complete with protective treatment to increase corrosion resistance.
- Wiper seal prevents dirt penetration & extends cylinder working life.
- Interchangeable grooved saddle protects the piston rod from risk of deformation.
- Piston rod has two lateral threaded holes to mount tilt saddle.
- Removable carrying handle for all models.
- Ideal for use in applications where lightness & ease of handling are preferred.

Optional 6mm thick steel base plate can be added upon request. Add suffix 'S' at end of model no. (Example: CML100N150S)
Note: Closed Height will be increased by 6mm.



COL Series: Double-acting and Telescopic Aluminum Cylinders available upon request.



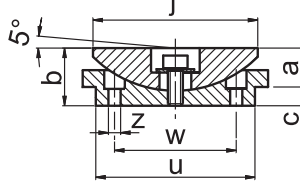
ZTT Tilt Saddle (Optional) – to reduce the effects of any off-centred loads. Refer Details Below

SELECTION CHART

Force (PUSH)	Stroke	Effective Area	Oil Volume	MODEL	Closed Height	Outside Dia.	Bore Dia.	Piston Rod Dia.	Coupler Height	Saddle Dia.	Rod Protrusion	PCD Mounting Holes for Tilt Saddle	Mounting Holes for Tilt Saddle	Weight
Tonnes (kN)	mm	cm ²	cm ³		A mm	D mm	E mm	F mm	H mm	J mm	K mm	W mm	S mm	kg
50 (496)	50	70,86	354	CML50N50	158	130	95	80	25	65	4	45	2xM5	7,0
	100	70,86	709	CML50N100	208									8,6
	150	70,86	1063	CML50N150	258									10,3
100 (929)	100	132,71	1327	CML100N100	246	178	130	100	25	85	4	65	2xM6	18,8
	150	132,71	1991	CML100N150	296									21,4

Nominal value shown in 'Tonnes', see kN for the exact force @700bar.

ACCESSORIES: ZTT TILT SADDLES

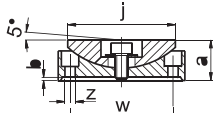
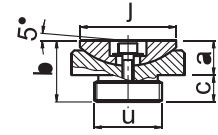
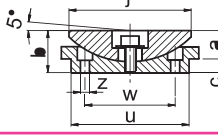


MODEL	For use with	a	b	c	j	u	z	w	kg
ZTT51	CML50N ###	18	26	8	68	65	5,5	45	0,8
ZTT101	CML100N ###	22	32	10	88	85	6,5	65	1,6

Accessories – ZTT Tilt Saddles & ZAS Eyelets Set

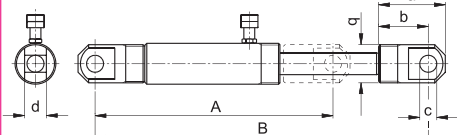

Accessories for **CMI** Series Single-Acting, Spring Return General Purpose Cylinders

ACCESSORIES: ZTT TILT SADDLES

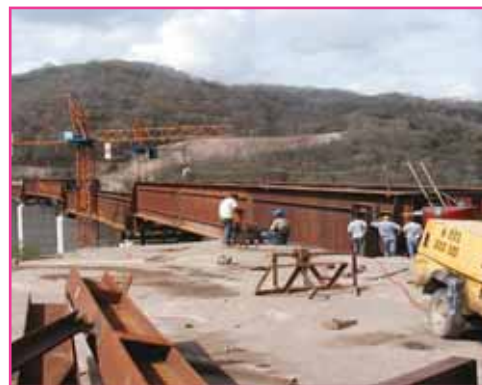
	MODEL	For use with	a	b	c	j	u	z	w	kg
	ZTT10	CMI10N25	16	1	-	34	-	5,5	24	0,1
	ZTT11	CMI10N ###	9	21	12	34	M24x2	-	-	0,1
	ZTT31	CMI25N ### CMI30N210	16	30	14	53	M32x2	-	-	0,3
	ZTT51	CMI50N ###	18	26	8	68	65	5,5	45	0,8
	ZTT101	CMI100N ###	22	32	10	88	85	6,5	65	1,6

Accessories for **CMT** Series Single-Acting, Spring Return Pull Cylinders

ACCESSORIES: ZAS EYELETS SET

	For use with	MODEL	Closed Height	Extended Height					
			A	B	a mm	b mm	c mm	d mm	q mm
	CMT2N127	ZAS2	290	417	62	46	16	16	M35x1,5
	CMT5N140	ZAS5	403	543	98	73	25	32	M56x2
	CMT10N150	ZAS10	394	544					

Construction Applications



E-POWER 700 Hydraulic System Solutions specialised in heavy lift & construction projects include:-

- Bridge Construction & Bearing Repair Maintenance.
- High Tonnages, Heavy Lifting & Supporting of Bridges, Buildings, Structures, Heavy Equipment & Machineries etc.
- Foundation Testing, Pipe Jacking, Tunnelling, Underpinning, Load Testing, Tensioning, Oil Rig, Power Plant & Port Construction etc.
- Integrated Hydraulic Systems for Bridge Construction Equipment.

For Special Products, Refer Pages: 68 - 69.

PUMPS

HOW TO CHOOSE THE RIGHT PUMP

Some essential information is necessary to choose the correct pump. This information is:

- **Reservoir capacity**
- **Cylinder plunger speed**

PUMP SELECTION BASED ON ITS TANK CAPACITY

After having selected the most suitable cylinder and determined the oil volume required for the stroke, it is now necessary to choose the most suitable pump based upon the required oil volume.

This volume can be defined by 1.1 multiplication of the oil

volume required for the selected cylinder(s). In the case of double acting cylinders the retraction oil volume shall be subtracted from the volume of oil required to extend the cylinder. Finally, the quantity of oil needed to fill the flexible hoses, i.e. 32 cm³ per meter length, needs to be taken into account.

The following tables will permit an easy choice.

The **Coloured Zones** represent the maximum utilisation limits for each hand/foot pump type (700 bar).

Useful Hydraulic Formulas, *Refer Page: 67*

SINGLE ACTING CYLINDERS

Stroke mm	Force in Tonnes										
	5	10	20	25	30	50	60	100	150	200	250
15											
25											
50											
75	PF120										
100											
125											
150											
175											
200											
225		PNP130									
250		PNP140	PN131	PN141							
275	PS100										
300									PV1810		
325											
350											
	PF150	PS101	PN132	PN142	PN162	PN164	PN168	PV1820			

DOUBLE ACTING CYLINDERS

Stroke mm	Force in Tonnes										
	5	10 - 15	25	30	50	60	100	150	200	250	300
25											
50											
75											
100											
125											
150											
175											
200											
225											
250											
275											
300											
325											
350											
			PN262			PN264	PN268	PV2810	PV2820		

HOW TO CHOOSE THE RIGHT PUMP

PUMP SELECTION BASED ON CYLINDER SPEED

HAND PUMPS

The data in the following graphs refer to the approximate piston stroke in mm for each hand/foot pump handle stroke.

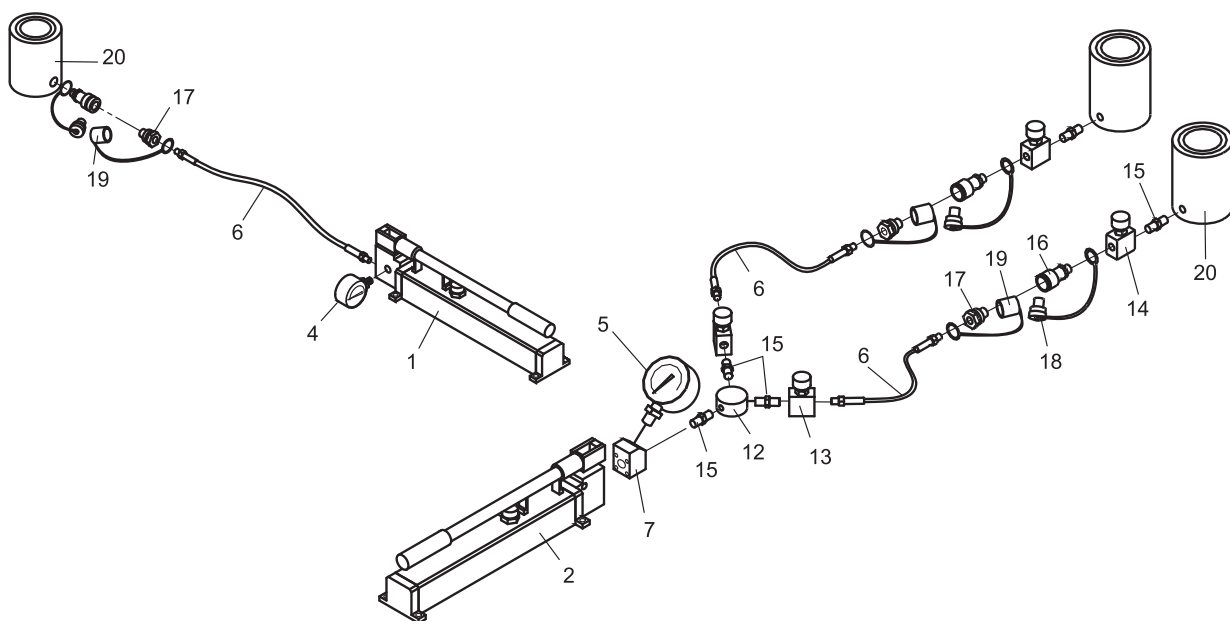
PUMP TYPE	Pressure stage	Force in Tonnes										
		5	10	20	25	30	50	60	100	150	200	250
PS100	Single stage	1,4	0,6	0,4	0,3	0,2	0,1	-	-	-	-	-
PNP130	Single stage	2,0	0,9	0,5	0,4	0,3	0,2	-	-	-	-	-
PF120	Single stage	3,1	1,4	0,8	0,7	0,5	0,3	0,3	0,2	-	-	-
PS101	Single stage	3,3	1,4	0,8	0,7	0,5	0,3	0,3	0,2	-	-	-
PN13#	Single stage	4,8	2,1	1,2	1,0	0,8	0,5	0,4	0,3	0,2	-	-
PNP140	1 st	20,8	9,2	5,2	4,4	3,3	2,1	-	-	-	-	-
	2 nd	1,6	0,7	0,4	0,3	0,2	0,2	-	-	-	-	-
PF150	1 st	14,6	6,5	3,6	3,1	2,3	1,5	1,2	0,8	-	-	-
	2 nd	3,1	1,4	0,8	0,7	0,5	0,3	0,3	0,2	-	-	-
PN14#	1 st	19,4	8,6	4,8	4,1	3,1	1,9	1,6	1,0	-	-	-
	2 nd	3,0	1,3	0,7	0,6	0,5	0,3	0,2	0,2	-	-	-
PN16#	1 st	45,3	20,1	11,3	9,6	7,2	4,5	3,8	2,4	1,6	-	-
	2 nd	4,2	1,9	1,1	0,9	0,7	0,4	0,4	0,2	0,1	-	-
PV18#	1 st	176,8	78,6	44,2	37,7	28,3	17,6	14,8	9,4	6,2	4,4	3,6
	2 nd	6,8	3,0	1,7	1,4	1,1	0,7	0,6	0,4	0,2	0,2	0,1

MOTOR DRIVEN PUMPS

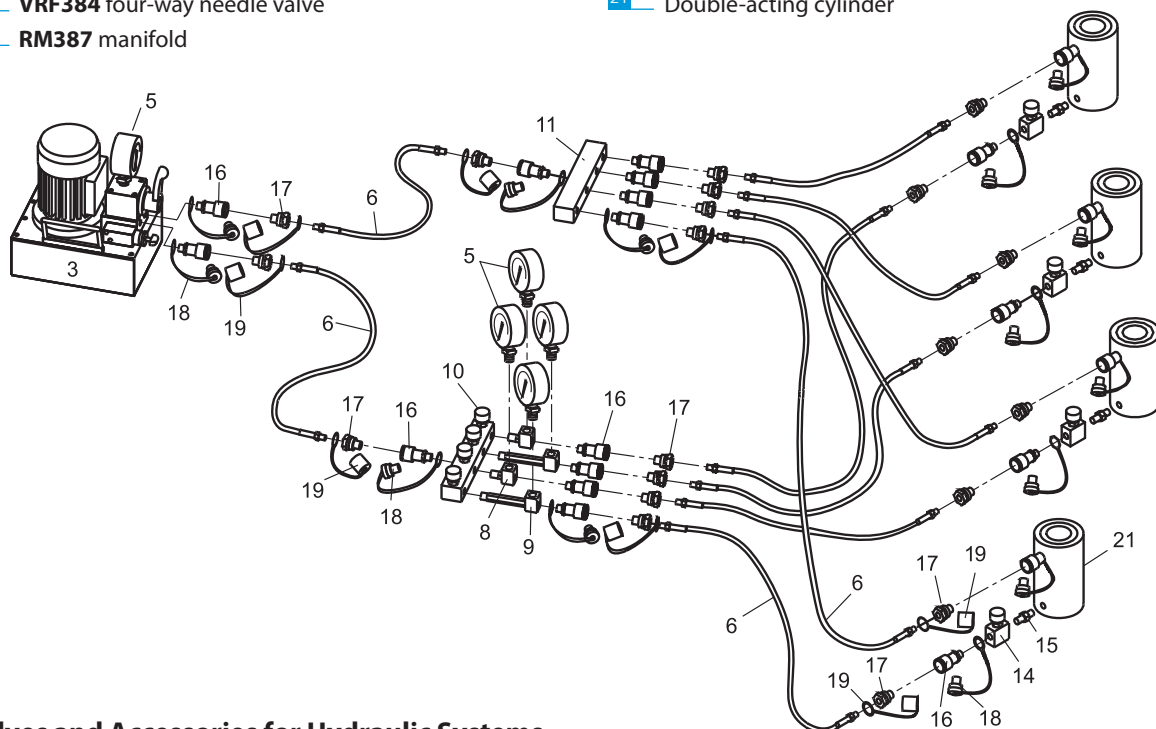
The data in the following chart refer to the approximate piston speed in mm per second.

PUMP TYPE	Pressure stage	Force in Tonnes														
		5	10	20	25	30	50	60	100	150	200	250	300	350	400	500
MC	Single stage	5,0	2,2	1,2	1,1	0,8	0,5	0,4	0,3	0,2	-	-	-	-	-	-
MD	1 st	56,6	25,2	14,1	12,1	9,1	5,6	4,7	3,0	2,0	1,4	1,2	1,0	0,8	0,7	0,6
	2 nd	9,4	4,2	2,4	2,0	1,5	0,9	0,8	0,5	0,3	0,2	0,2	0,2	0,1	0,1	0,1
MD # H	1 st	141,5	62,9	35,4	30,1	22,6	14,1	11,9	7,5	5,0	3,5	2,9	2,4	2,0	1,7	1,4
	2 nd	14,1	6,3	3,5	3,0	2,3	1,4	1,2	0,8	0,5	0,4	0,3	0,2	0,2	0,2	0,1
A	1 st	21,2	9,4	5,3	4,5	3,4	2,1	1,8	1,1	0,7	0,5	0,4	0,4	0,3	0,3	0,2
	2 nd	10,6	4,7	2,7	2,3	1,7	1,1	0,9	0,6	0,4	0,3	0,2	0,2	0,2	0,1	0,1
B	1 st	110,8	49,3	27,7	23,6	17,7	11,1	9,3	5,9	3,9	2,8	2,3	1,9	1,6	1,4	1,1
	2 nd	10,6	4,7	2,7	2,3	1,7	1,1	0,9	0,6	0,4	0,3	0,2	0,2	0,2	0,1	0,1
C	Single stage	21,2	9,4	5,3	4,5	3,4	2,1	1,8	1,1	0,7	0,5	0,4	0,4	0,3	0,3	0,2
D	1 st	42,4	18,9	10,6	9,0	6,8	4,2	3,6	2,3	1,5	1,1	0,9	0,7	0,6	0,5	0,4
	2 nd	21,2	9,4	5,3	4,5	3,4	2,1	1,8	1,1	0,7	0,5	0,4	0,4	0,3	0,3	0,2
H	1 st	56,6	25,2	14,1	12,1	9,1	5,6	4,7	3,0	2,0	1,4	1,2	1,0	0,8	0,7	0,6
	2 nd	21,2	9,4	5,3	4,5	3,4	2,1	1,8	1,1	0,7	0,5	0,4	0,4	0,3	0,3	0,2
E	1 st	221,6	98,5	55,4	47,2	35,5	22,1	18,6	11,8	7,8	5,5	4,5	3,8	3,2	2,7	2,2
	2 nd	21,2	9,4	5,3	4,5	3,4	2,1	1,8	1,1	0,7	0,5	0,4	0,4	0,3	0,3	0,2
F	Single stage	42,4	18,9	10,6	9,0	6,8	4,2	3,6	2,3	1,5	1,1	0,9	0,7	0,6	0,5	0,4
G	1 st	110,8	49,3	27,7	23,6	17,7	11,1	9,3	5,9	3,9	2,8	2,3	1,9	1,6	1,4	1,1
	2 nd	42,4	18,9	10,6	9,0	6,8	4,2	3,6	2,3	1,5	1,1	0,9	0,7	0,6	0,5	0,4
L	Single stage	37,7	16,8	9,4	8,0	6,0	3,8	3,2	2,0	1,3	0,9	0,8	0,6	0,5	0,5	0,4
K	1 st	273,5	121,6	68,4	58,3	43,8	27,3	22,9	14,6	9,6	6,8	5,6	4,7	3,9	3,4	2,7
	2 nd	37,7	16,8	9,4	8	6	3,8	3,2	2	1,3	0,9	0,8	0,6	0,5	0,5	0,4
T	1 st	235,7	104,8	59,0	50,2	37,7	23,5	19,8	12,6	8,3	5,9	4,8	4,0	3,4	2,9	2,4
	2 nd	42,4	18,9	10,6	9,0	6,8	4,2	3,6	2,3	1,5	1,1	0,9	0,7	0,6	0,5	0,4
V	1 st	235,7	104,8	59,0	50,2	37,7	23,5	19,8	12,6	8,3	5,9	4,8	4,0	3,4	2,9	2,4
	2 nd	58,9	26,2	14,7	12,6	9,4	5,9	4,9	3,1	2,1	1,5	1,2	1,0	0,8	0,7	0,6

COMPONENTS OF A HYDRAULIC SYSTEM



- | | | | |
|----|---|----|---------------------------------|
| 1 | Hand pump with side mounted gauge | 12 | RK383 radial manifold |
| 2 | Hand pump with front mounted gauge | 13 | VRF38 needle valve |
| 3 | Power pump with G10 gauge mounted on valve | 14 | VRU38 flow control valve |
| 4 | G106L gauge | 15 | RN38 nipple |
| 5 | G10 gauge | 16 | K73F female coupler |
| 6 | SN# hose, 3/8" NPT | 17 | K73M male coupler |
| 7 | ZPF12 gauge adapter (flange connection) | 18 | K73C female dust cap |
| 8 | RP50 gauge block | 19 | K73D male dust cap |
| 9 | RP502 gauge block | 20 | Single-acting cylinder |
| 10 | VRF384 four-way needle valve | 21 | Double-acting cylinder |
| 11 | RM387 manifold | | |



Valves and Accessories for Hydraulic Systems,
Refer Pages: 47 - 56



HYDRAULIC PUMPS



Manual Hand Pumps

PNPg. 28-29 PVPg. 30
PSPg. 30



Air-Hydraulic Pumps

MLPPg. 31



Compact Electric Pumps

MCPg. 32
MDPg. 33



Modular Hydraulic Power PumpsPg. 34 - 45

MMPg. 36-37	VMMPg. 42	AccessoriesPg. 44
MEPg. 38-39	VMSPg. 42	ME/MM-PPPg. 45
MPPg. 40	VMEPg. 43	
MSPg. 41	VMPPg. 43	



Synchronous Lifting Systems

Split FlowPg. 46

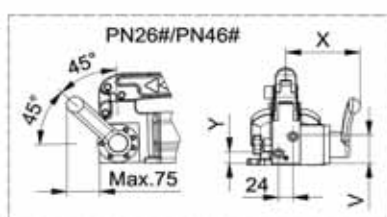
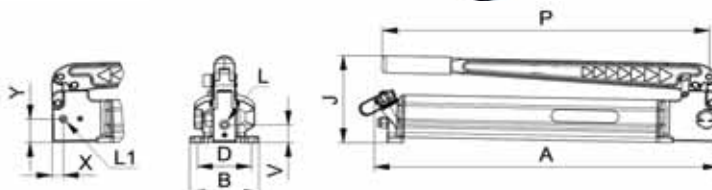
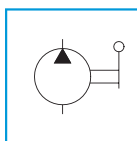
Lightweight Hand Pumps (Single & Two-Speed)

PN Series

Reservoir Capacity:
0,7 to 7,8 litres

Oil Delivery at Rated Pressure:
1,1 - 2,7 cu.cm./stroke

Maximum Operating Pressure:
700 bar (10,000 psi)



- Compact and lightweight design.
- Made of durable high strength light aluminum alloy metal that is being used in aviation field.
- Two-speed operation reduces handle strokes & for fast operation comparing with single speed.
- Handy & very low handle effort to minimise operator fatigue.
- Handle lever lock for ease of carrying.
- Side or front port for direct gauge connection except 'PN26' version.
- Equipped with externally adjustable pressure relief valve.
- Rear venting plug allow pump to use without venting & for easy oil filling in either horizontal or vertical position.
- Can be used vertically with pump body facing downward.
- Feature easy pump mounting.
- **'PN26' version** – Equipped with integral 4-way manual valve for operating double-acting cylinder/s.
- **'PN46' version** – Equipped with pilot-check valve to enable precise controlled retraction of double-acting cylinder under load when pump is in discharge position.
- **'PNP' version** – Comes with plastic reservoir for pump primarily used in fixed operations.

Pumps can be altered for use with other fluids other than standard hydraulic oil upon request.



Handle Lever Lock



Rear Venting Plug



* Direct Gauge Port
(1/4" NPT)

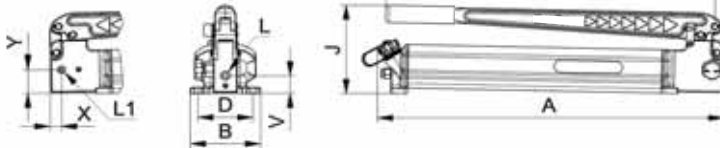
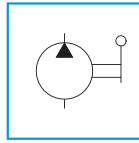
SELECTION CHART

SELECTION CHART																								
Pump Type (Speed)	Pressure 1st Stage	Pressure 2nd Stage	Oil Delivery per Stroke 1st Stage	Oil Delivery per Stroke 2nd Stage	Handle Effort	For use in Cylinder Tool	Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)														Weight
	bar	bar	cm³	cm³	N		litre	litre		A	B	D	G	H	F	J	L	* L1	P	V	X	Y	kg	
Single	-	20	-	1,4	426	Single-acting	0,7	0,5	PNP130	362	110	90	52	275	11	135	3/8"NPT	1/4"NPT	330	32	14	44	3,0	
				2,7	363		1,2	1,0	PNP131	551	110	90	52	460	11	135			554	32	14	44	4,0	
				14,7	1,1		0,7	0,5	PNP140	362	110	90	52	275	11	135			330	32	14	44	3,0	
				13,7	2,2		1,3	1,0	PNP141	551	110	90	52	460	11	135			544	32	14	44	4,0	
	-	30	-	2,7	363		1,2	1,0	PN131	572	115	90	83	460	11	154	3/8"NPT	1/4"NPT	544	32	18	42	4,8	
				2,2	2,0		PN132	572	128	105	83	460	11	169	544	47			18	57	6,2			
				1,2	1,0		PN141	572	115	90	83	460	11	154	544	32			18	42	4,8			
				2,2	2,0		PN142	572	128	105	83	460	11	169	544	47			18	57	6,2			
	30	13,7	2,2	380	2,2		2,0	PN162	572	128	105	83	460	11	173	3/8"NPT	1/4"NPT	544	32	18	55	6,6		
					4,3		3,8	PN164	572	190	176	90	471	9	173			544	32	18	55	9,8		
					7,8		7,2	PN168	652	270	256	90	551	9	173			544	32	18	55	14,5		
					2,2		2,0	PN262	572	128	105	83	460	11	173			544	52	124	22	7,4		
70	28,5	2,7	363	4,3	3,8	PN264	572	190	176	90	471	9	173	3/8"NPT	-	544	52	124	22	10,6				
				7,8	7,2	PN268	652	270	256	90	551	9	173			544	52	124	22	15,3				
				2,2	2,0	PN462	572	128	105	83	460	11	173			544	52	148	22	7,7				
				4,3	3,8	PN464	572	190	176	90	471	9	173			544	52	148	22	10,9				
Two	30	70	13,7	2,2	380	Double-acting	7,8	7,2	PN468	652	270	256	90	551	9	173	3/8"NPT	-	544	52	148	22	15,6	

• 1 litre = 1000 cm³

Lightweight Hand Pumps (Ultra-High Pressure)

PN Series



Pumps can be altered for use with other fluids other than standard hydraulic oil upon request.

Special pre-storage device of the internal pressure enables hand pumps to use fluids with a viscosity up to 1200 cSt.

Reservoir Capacity:

1,2 to 7,8 litres

Oil Delivery at Rated Pressure:

0.8 - 1,4 cu.cm./stroke

Maximum Operating Pressure:

1000 – 1600 - 2800 bar

- Similar in features as 'PN' Series 700 bar hand pumps but rated for Ultra-High Operating Pressure up to 2800 bar.
- Available in Single or Two-Speed operation.
- **PL16#10** and **PL16#16** versions ideal for bearing extractions & operating hydraulic bolt tensioners.
- **PL16#28** ideal for pressing on & pulling off drive elements, crimping operations, pretensioning of studs, in burst & calibration tests etc. Outlet port is 3/4" -16 UNF cone that uses with stainless steel fittings to provide 2800 bar sealing.

HYDRAULIC PUMPS

SELECTION CHART

SELECTION CHART																								
Pump Type (Speed)	Pressure 1st Stage	Pressure 2nd Stage	Oil Delivery per Stroke 1st Stage	Oil Delivery per Stroke 2nd Stage	Handle Effort	For use in Cylinder Tool	Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)														Weight
	bar	bar	cm³	cm³	N		litre	litre		A	B	D	G	H	F	J	L	L1	P	V	X	Y	kg	
Two	20	1000	28,5	1,4	385	Single-acting	2,2	2,0	PN16210	572	128	105	83	460	11	173	1/4"BSP 120°	-	544	30	-	-	6,6	
							4,3	3,8	PN16410	572	190	176	90	471	9	173			544	30	-	-	9,8	
							7,8	7,2	PN16810	652	270	256	90	551	9	173			544	30	-	-	14,5	
Single	-	-	-	-	437		1,2	1,0	PN13116	572	115	90	83	460	11	154	1/4"BSP 120°	1/2"BSP	544	31	*	-	3,0	
Two	15	1600	28,5	1,4	522		2,2	2,0	PN16216	572	128	105	83	460	11	173			544	30	-	-	6,6	
							4,3	3,8	PN16416	572	190	176	90	471	9	173			544	30	-	-	9,8	
							7,8	7,2	PN16816	652	270	256	90	551	9	173	544	30	-	-	14,5			
Single	-	-	-	-	432		1,2	1,0	PN13128	572	115	90	83	460	11	154	3/4"-16 UNF	3/8"BSP	544	35	*	-	3,0	
Two	10	2800	28,5	0,8	515		2,2	2,0	PN16228	572	128	105	83	460	11	173			544	42	28	42	6,8	
							4,3	3,8	PN16428	572	190	176	90	471	9	173			544	42	28	42	10,0	
						7,8	7,2	PN16828	652	270	256	90	551	9	173	544	42	28	42	14,7				

ACCESSORIES: ZPS - ZPF GAUGE ADAPTORS - 700 BAR

MODEL	For pumps	a	b	c	d	e	kg
ZPS12 (screw connection)	SERIES PN13# PN14# PN16#	50	30	48	3/8" NPT	1/2" BSP	0,25
ZPF12 (flange connection)	SERIES PN16#	45	45	60	3/8" NPT	1/2" BSP	0,90
ZPF121 (plate connection)	SERIES PN26#	83	30	70	-	1/2" BSP	0,37

* Gauge port on the pump head



ACCESSORIES: ZPS - ZPF GAUGE ADAPTERS - ZPD VALVES -1000/1600/2800 BAR

MODEL	For pumps	For gauge	Max. press.	a	b	c	d	e	kg
ZPS53 (screw connection gauge adapter)	SERIES PN16#10 PN16#16	G10	1000	50	30	48	3/8" NPT	1/2" BSP	0,9
ZPF14 (Flanged gauge adapter)	SERIES PN16#10 PN16#16	G10 G16	1600	45	45	60	1/4"BSP 120°	1/2" BSP	0,9
ZPF73 (Flanged gauge adapter)	SERIES PN16#28	G30 / G40+RN28	2800	40	45	85	3/4" -16UNF	1/2" BSP swivelling	1,0
ZPD16 (Double needle flanged valve)	SERIES PN16#10 PN16#16	G10 G16	1600	40	155	112	1/4"BSP 120°	1/2" BSP swivelling	1,0
ZPD28 (Double needle flanged valve)	SERIES PN16#28	G30 / G40+RN28	2800						



Ultra-High Pressure Hoses, Couplers & Fittings available on request.

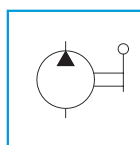
Steel Hand Pumps (Single-Speed)

PS Series

Reservoir Capacity:
0,42 to 0,8 litres

Oil Delivery at Rated Pressure:
1,0 – 2,3 cu.cm./stroke

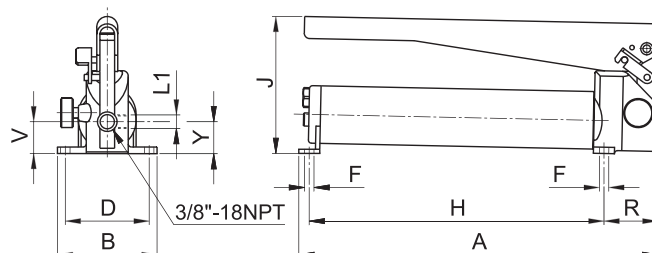
Maximum Operating Pressure:
400 – 700 – 1000 bar



G106L Gauge
(Optional)



- All steel construction for long lasting operation.
- 1/4" NPT side port to mount G106L gauge.
- Externally adjustable pressure relief valve.
- Handle locking mechanism for ease of carrying.
- Can be used vertically with pump head facing down.
- Feature wide feet for ease of pump mounting.
- Ideal for use with small hydraulic tools &/or single-acting cylinders that requires lesser oil.



SELECTION CHART

SELECTION CHART																		
Pump Type (Speed)	Max Pressure	Oil Delivery per Stroke	Handle Effort	For use with Cylinder Tool	Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)										Weight
	bar	cm³	N		cm³	cm³		A	B	D	F	H	J	L1	R	V	Y	kg
Single	700	1,0	280	Single- acting	420	300	PS100	340	95	80	9	280	130	1/4" NPT	50	32,5	32,5	3,2
	1000		380				PS10010					280						
	400	2,3	350		420	300	PS10004	340				280						4,5
	700		390				PS101					505						

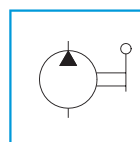
Steel Hand Pumps with Large Oil Delivery (Two-Speed)

PV Series

Reservoir Capacity:
9,3 to 19,4 litres

Oil Delivery at Rated Pressure:
4,8 cu.cm./stroke

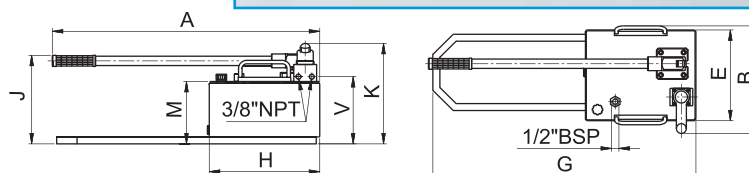
Maximum Operating Pressure:
700 bar (10,000 psi)



G10 Gauge
(Optional)



- All steel construction for long lasting operation.
- 1/2" BSP connection for direct gauge connection.
- Externally adjustable pressure relief valve.
- Carrying Handle.

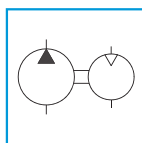


SELECTION CHART

SELECTION CHART																					
Pump Type (Speed)	Pressure 1 st stage	Pressure 2 nd stage	Oil Delivery per Stroke 1 st stage	Oil Delivery per Stroke 2 nd stage	Handle Effort	For use with Cylinder Tool	Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)								Weight without Oil	Weight with Oil		
	bar	bar	cm ³	cm ³	N		litres	litres		A	B	E	G	H	J	K	M	V	kg	kg	
Two	20	700	125	4,8	450	Single-acting	9,3	7,7	PV1810	763	261	245	750	315	257	290	180	194	20,9	29	
							19,4	16	PV1820				-	650	245	278	168	182	23,1	40	
						Double-acting	9,3	7,7	PV2810		313		750	315	257	290	180	194	20,9	29	
							19,4	16	PV2820					-	650	245	278	168	182	23,1	40
						Double-acting with controlled check valve	9,3	7,7	PV4810					750	315	257	290	180	194	20,9	29
							19,4	16	PV4820					-	650	245	278	168	182	23,1	40

Air-Hydraulic Power Pumps

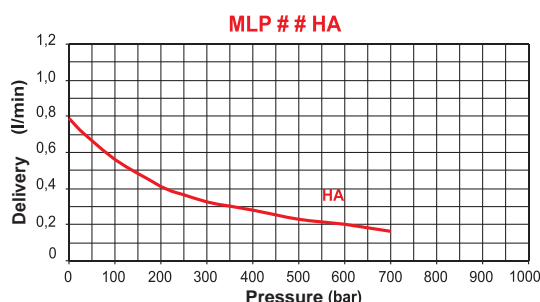
MLP Series



Reservoir Capacity:
2,4 to 10 litres

Oil Delivery at Rated Pressure:
0,16 litre/min.

Maximum Operating Pressure:
700 bar (10,000 psi)



ZML14

- Compact, lightweight & versatile.
- Unique design & exceptionally reliable for applications in tough environments.
- High efficient reciprocating air motor.
- Plastic material on the exterior and metal alloy in the interior.
- Non-adjustable maximum pressure valve provides overload protection.
- Outward oil pressure adjusted by regulating inward air pressure.
- Operating Inlet Air Pressure: 2,8 to 8,5 bar
- 2.4 litres reservoir is made of plastic. 5 & 10 litres reservoirs are made of steel.
- Use in industrial applications for lifting, maintenance & in automotive sector etc.

Accessories

ZML14 – Pressure Reducer for air supply.

ZMB7 – Pressure Booster, adaptable to MLP21HA to multiply outward oil pressure (Ratio 4:1). Inlet 3/8" NPT & Outlet 3/4"-16 UNF.

RP52 – Gauge Adaptor to mount G106L gauge type.

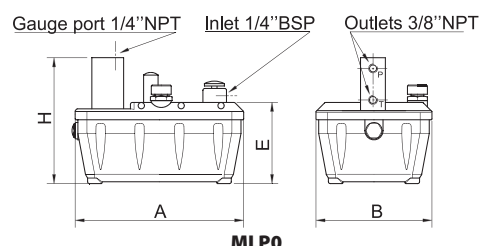
***Air Remote Control** for MLP2 & MLP4 versions optional – Add suffix 'B'.

***Air Remote Control Valve (ZMRP2)** equipped to MLP2 & MLP4 versions optional – Add suffix 'R'.

SELECTION CHART

CHARACTERISTICS AND DIMENSIONS

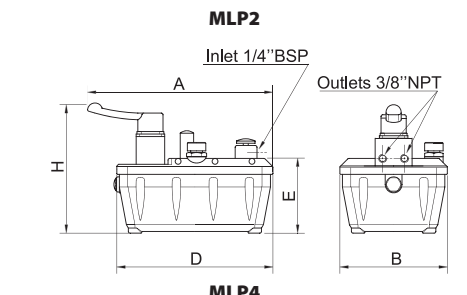
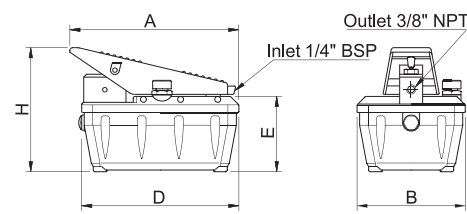
Version	Suitable for Cylinder Tool	Oil Tank litres	Usable Oil Volume litres	MODEL	Dimensions (mm)				Weight kg
					A	B	D	H	
With P and T Outlets block	According to the chosen on-line valve	2,4	1,9	MLP01HA	280	190	136	201	4,7
		5	4	MLP02HA	315	270	156	221	13,1
		10	8	MLP03HA	420	385	156	221	20,5



Other Working Pressures of 100, 350, 1000, 1500 & 2100 bar available upon request.

CHARACTERISTICS AND DIMENSIONS

Version	Suitable for Cylinder Tool	Oil Tank litres	Usable Oil Volume litres	MODEL	Dimensions (mm)					Weight kg
					A	B	D	E	H	
3/3 Control Pedal Valve	Single-acting	2,4	1,9	MLP21HA	300	190	280	136	220	5,5
		5	4	MLP22HA	325	270	315	156	237	13,9
		10	8	MLP23HA	420	385	410	156	237	21,3
4/3 Manual Control Valve	Double-acting	2,4	1,9	MLP41HA	335	190	280	136	240	5,1
		5	4	MLP42HA	350	270	315	156	257	13,5
		10	8	MLP43HA	420	385	410	156	257	20,9



Micro Electric-Hydraulic Power Pumps (Single-Speed)

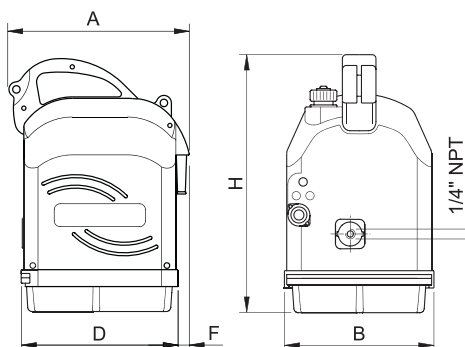
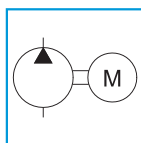
MC Series

Reservoir Capacity:
1,0 litres

Oil Delivery at Rated Pressure:
0,21 litre/min.

Motor Size:
0,25 kW (0,34 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)



ZMT – Shoulder Carrying Belt (Optional)

- Compact and lightweight design for maximum portability.
- Single-stage power pump specifically designed for operating small cylinders or tools at ease.
- 3-way 2-position solenoid control.
- 3m remote control switch (24 VAC).
- Plastic casing with easy-carry handle.
- Durable plastic tank.
- Oil level indicator.
- Equipped with pressure relief valve.
- Starts at full load.

Other Working Pressure of 500 bar available upon request.

SELECTION CHART

Maximum Pressure	Delivery at Minimum Pressure	Delivery at Maximum Pressure	Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)					Weight
						A	B	D	F	H	
bar	l/min	l/min	litres	litres							kg
700	0,32	0,21	1,0	0,8	MC71	245	197	212	15	345	9
					MC72						
					MC73						

0,25 kW Induction Motor: 230V/50Hz/Single-phase.

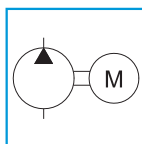
- Motors with 110V/60Hz/Single-phase available upon request.

FUNCTION CHART

MODEL	For use with Cylinder Tool	Remote Control Function	Symbol
MC71	Single-acting	Advance - Return (1 push button)	
MC72		Advance - Hold - Return (2 push buttons)	
MC73		Advance - Return (1 push button) Integrated control located at the end of the hose assembly	

Midi Electric-Hydraulic Power Pumps (Two Speed)

MD Series



Reservoir Capacity:

2.6 litres

Oil Delivery at Rated Pressure:

0.4 – 0.6 litre/min

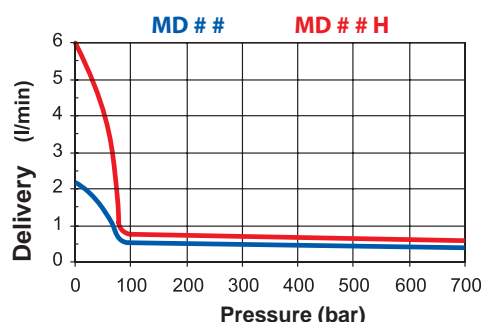
Motor Size:

0,75 – 1,1 kW (1 – 1.5 hp)

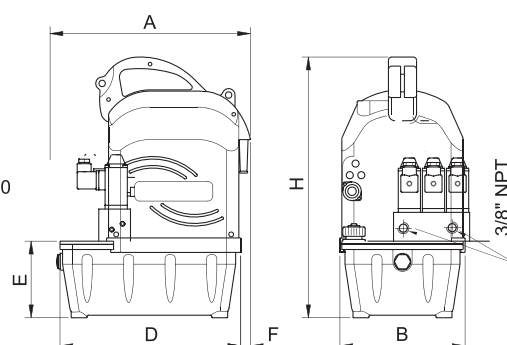
Maximum Operating Pressure:

700 bar (10,000 psi)

- Compact and lightweight design.
- Two-stage piston pump with excellent features.
- Manual & electric solenoid controlled valves with or without pilot check.
- 3m remote control switch (24VAC) for electric valve version.
- Plastic frame with carrying handle except 'H' version.
- Oil level gauge.
- Equipped with pressure relief valve.
- Starts at full load.



Other Working Pressures of 1000 & 1500 bar available upon request.



HYDRAULIC PUMPS

SELECTION CHART

Oil Delivery		Pressure Rating		Reservoir Capacity	Usable Oil Volume	MODEL	Dimensions (mm)						Weight	
1 st stage	2 nd stage	1 st stage	2 nd stage				A	B	D	E	F	H	kg	
l/min	l/min	bar	bar	litres	litres									
2,4	0,4	65	700	2,6	2,4		MDM21	329	197	287	119	15	406	16
							MDM31							16,3
							MDM41	366						16,3
						MDM42		16,5						
						MDE21R	316	16,3						
MDE22R	16,3													
MDE41R	18,5													

0,75 kW TEFC Induction Motor: 230V/50Hz/Single-phase (2800 rpm)

• Motors with 110V/60Hz/Single-phase available upon request.

MODEL CODING OF 700 BAR SERIES

MD	M21	R	#	J
Series	Valve Type	Remote Control (for motor only)	- Standard Pump H High Flow Pump	Pressure Regulation Valve

High Flow Pump – Add suffix 'H'.

- 1,1 kW Motor : 230V/50Hz/Single-phase
- Oil Delivery : 6,0 l/min. @1st stage
0,6 l/min. @2nd stage

Pressure Regulator – Add suffix 'J'.

Protective Cage for 'H' version only.

FUNCTION CHART

	MODEL	For use with Cylinder Tool	Valve Function	Symbol
Manual Valve	MDM21	Single acting	Advance - Return	
	MDM31		Advance - Hold - Return	
	MDM41	Double acting	Advance - Hold - Return	
	MDM42		Advance - Hold with pilot check - Return	
Electric Solenoid Valve	MDE21R	Single acting	Advance - Return	
	MDE22R		Advance - Hold - Return	
	MDE41R	Double acting	Advance - Hold - Return	

Modular Hydraulic Power Pumps - 700 Bar (10,000 Psi)

MM - ME - MP - MS Series



FEATURES

- Hydraulic Power Pumps are designed in modular concept for complete interchangeability of components and ensure customising options.
- Top cover plate serves as a base to mount all modular components, valves and accessories.
- Valves are also mounted on the plate to allow pressure adjustment on the return line.
- These power pumps are manufactured under strict quality controls to ensure:

- Safety

Valves are set at factory and each component is in compliance with "2006/42/CE Machine Directive" and its latest amendments.

- Life

Careful choice of components ensure excellent pump performance, weight/power ratio, limited dimensional requirements and provide easy maintenance.

- Environment

Easy to use, quiet, reliable and guarantee maximum performance.

700 bar Hydraulic Power Pump models consisting of:

- Motor Types** – Available in 4 versions:
 - MM** Series - Single-phase Electric (230V/50Hz).
 - ME** Series - 3-phase Electric (400V/50Hz).
 - MP** Series - Air Motor
 - MS** Series - Petrol Engine

Electric Motors are equipped with magneto-thermal cut-out with 0 voltage disconnection, complete with 5m power cord, plug and provides Class IP54 protection. Motors are totally enclosed fan-cooled (TEFC) Induction Type.

- Pump Types** – Available in 12 versions:
 - Ranging from 0,45 to 10,0 l/min.
 - Single-stage and Two-stage pumps configurations.
- Pressure Relief Valves** are externally adjustable on all pumps.
- Valve Types** – Available choice of Manual, Electric Solenoid, Air-operated and Spring-centred for single-acting & double-acting cylinder or tool operations.
(Refer Page: 42 - 43)
- Electric Remote Motor & Solenoid Valve Control Switches** are wired 24VAC & 'deadman' design for added safety.
- Reservoir Tank Size** ranging from 5 to 50 litres capacity.
- Accessories** to customise power units and extending its application needs.



Accessories
(Refer Page: 44)



'C' Protection Cage
(Refer Page: 44)



Applications

- Offered indispensable needs for wide applications like lifting and jacking systems with single-acting and double-acting cylinders and for all heavy duty or complex operations that cannot be performed with manual pumps.

Modular Hydraulic Power Pumps - 700 bar (10,000 psi)

ME - MM - MP - MS Series

MODEL CODING

ME	A	05	M21	G
1. Motor Type	2. Pump Type	3. Reservoir Capacity	4. Valve Type	5. Accessories and Customisation

MODEL COMPOSITION CHART

				1. Motor Type				
	Type	Description	Model	ME	MM	MP	MS	
			Power	400V/50Hz 3-phase	230V/50Hz Single-phase	Air Motor	Petrol Engine	
2. Pump	2-Speed	Delivery l/min BP/AP 0,9 / 0,45	Axial piston pump	A	•	•	-	-
	2-Speed	" 4,7 / 0,45	Axial piston pump	B	•	•	-	-
	Single-Speed	" - / 0,9	Axial piston pump	C	•	•	-	-
	2-Speed	" 1,8 / 0,9	Axial piston pump	D	•	•	•	•
	2-Speed	" 2,4 / 0,9	Axial piston pump	H	•	•	-	-
	2-Speed	" 9,4 / 0,9	Axial piston pump	E	•	•	•	•
	Single-Speed	" - / 1,8	Axial piston pump	F	•	-	-	•
	2-Speed	" 4,7 / 1,8	Axial piston pump	G	•	-	-	•
	Single-Speed	" - / 1,6	Axial piston pump	L	•	-	-	-
	2-Speed	" 11,6 / 1,6	Combined piston/gear pump	K*	•	-	-	-
2-Speed	" 10 / 1,8	Combined piston/gear pump	T**	•	-	-	-	
2-Speed	" 10 / 2,5	Radial piston pump	V*	•	-	-	-	
3. Reservoir		5 litres	05	•	•	•	-	
		10 litres high	10	•	•	•	-	
		10 litres low	11	•	•	•	•	
		20 litres	20	•	•	•	•	
		30 litres * Tank available for K and V pumps only	30	•	•	•	•	
		40 litres	40	•	-	-	-	
		50 litres * Tank available for V pumps only	50	•	-	-	-	
4. Valve	Version 'S' (Spring Centred Valve)	P and T outlet with by pass	M20	•	•	•	•	
		Manual controlled valve 3 way 2 pos.	M21	•	•	•	•	
		Manual controlled valve 3 way 3 pos.	M31	•	•	•	•	
		Manual controlled valve 3 way 3 pos. with check	M32	•	•	•	•	
		Manual controlled valve 4 way 3 pos.	M41	•	•	•	•	
		Manual controlled valve 4 way 3 pos. with check	M42	•	•	•	•	
		Manual controlled valve 4 way 3 pos. return 150 bar	M51	•	•	•	•	
		Manual controlled valve 4 way 3 pos. with check, return 150 bar	M52	•	•	•	•	
	Version 'p' (Air Valve)	Solenoid valve 3 way 2 pos. normally open	E21	•	•	P•	-	
		Solenoid valve 3 way 2 pos. normally closed	E22	•	•	P•	-	
		Solenoid valve 3 way 3 pos.	E31	•	•	P•	-	
		Solenoid valve 4 way 3 pos.	E41	•	•	P•	-	
		Solenoid valve 4 way 3 pos. with check	E42	•	•	P•	-	
		Solenoid valve 4 way 3 pos. return 150 bar	E51	•	•	P•	-	
		Solenoid valve 4 way 3 pos. with check, return 150 bar	E52	•	•	P•	-	
		5. Accessories		Pressure gauge ***	G	•	•	•
	Protective housing (standard for air motor type MS)		C	•	•	•	•	
	Protective housing with 4 pivoting wheels Ø 80x25 mm		W	•	•	•	•	
	Hand activated remote control		R	•	•	•	-	
	Pedal activated remote control		F	•	•	•	-	
	Pressure sensor and pressure gauge		P	•	•	-	-	
	Compressed air lubricator reduction filter		L	-	-	•	-	
	Unidirectional flow regulator		U	•	•	•	•	
	Unidirectional flow regulator with fine regulation		H	•	•	•	•	
	Counterbalance valve		B	•	•	•	•	
	Heat exchanger		E	•	•	-	-	
	Filter on return line ****		S	•	•	•	•	
Customisation			Without hand wheel adjustable max. pressure valve	Z	•	•	•	•
			Without magneto-thermal cut-out	Y	•	•	-	-
			Refer Pa.	38 & 39	36 & 37	40	41	

BP: Before Pressurisation (1st Stage/Speed)

AP: After Pressurisation (2nd Stage/Speed)

Electric Motors with different voltage available upon request.

* Tank available for V pumps only (50 litres tank) and for K and V pumps only (30 litres tank)

** Pump T available with 20 and 40 litres tanks only

*** Gauge Ø 100 with hand operated valves - Ø 63 with solenoid valves and hand operated valves with pilot check.

Digital gauges upon request.

**** Filter not available for 5 litres and 10 litres tank high.

Examples: **MEG20M42E** Power pump electric motor (400V/50Hz/3ph), pump 4,7/1,8 l/min, tank 20 litres, manual control valve 4-way/3-position with check, heat exchanger.

MPE10P41R Power pump air motor, pump 9,4/0,9 l/min, tank 10 litres high, air control valve 4-way/3-position, remote control.

NOTE: For the accessories, fill the letters in alphabetic order. Refer Page 44 for details.

Modular Hydraulic Power Pumps with Single-Phase Electric Motor

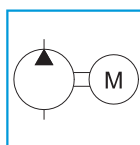
MM Series

Reservoir Capacity:
5 to 40 litres

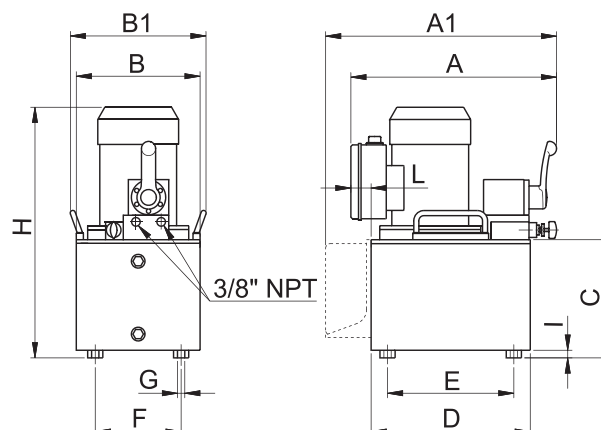
Oil Delivery at Rated Pressure:
0,45 – 0,9 litre/min.

Motor Size:
0,75 – 1,5 kW (1 – 2 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)

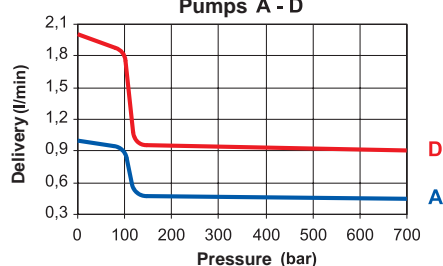


Picture illustrated with optional accessories.



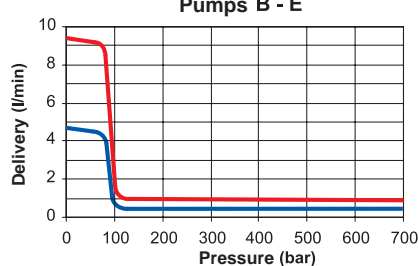
DELIVERY DIAGRAM

Pumps A - D



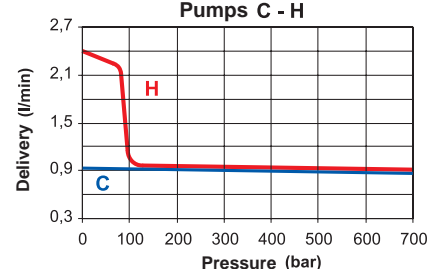
DELIVERY DIAGRAM

Pumps B - E



DELIVERY DIAGRAM

Pumps C - H



DIMENSIONS

Dimensions														
Reservoir Capacity	Usable Oil Volume	Dimensions (mm)												
litres	litres	A	A1 ②	B	B1	C	D	E	F	G	H ①	I		
5	3,8	370	470	245	270	129	315	250	170	M8	410	10		
10 high	8,8					227					508			
10 low	7,7	447	-	360	378	129	410	320	270		410			
20	17,7									538	40			
40	35,8	462		600	-	257	440	350	510	Ø 9				

① Add 48 mm for model **MMC**, **MMH**.

② For power packs with **5 l** and **10 l** high tanks with remote control model **R** or **F** only.

OPERATING CHARACTERISTICS

MODEL	Oil Delivery		Pressure		TEFC Induction Motor		
	1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	Voltage	Power	Speed
	l/min	l/min	bar	bar		kW	rpm
MMA	0,9	0,45	100	700	230V-50Hz (Single-phase) (Motors with different voltage upon request)	0,75	1400
MMB	4,7		85				
MMC	-	0,9	-			1,5	2800
MMD	1,8		100				1400
MMH	2,4		85				2800
MME	9,4						

Modular Hydraulic Power Pumps with Single-Phase Electric Motor

MM Series

SELECTION CHART

For Use with Cylinder Tool	MODEL	Valve Control	*Oil Delivery		Pressure		† Motor 230V ~ 50Hz (Single-phase)			Usable Oil Volume
			1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	Power	Speed	Poles	
			l/min	l/min	bar	bar	kW	rpm		
Single-acting	MMA10M32	3-Way Manual Valve with Check	0,9	0,45	100	700	0,75	1400	4	8,8
	MMA10E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MMA10M42	4-Way Manual Valve with Check								
	MMA10E42R	4-Way Solenoid Valve with Check & Remote Control								
Single-acting	MMB10M32	3-Way Manual Valve with Check	4,7	0,45	85	700	0,75	1400	4	8,8
	MMB10E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MMB10M42	4-Way Manual Valve with Check								
	MMB10E42R	4-Way Solenoid Valve with Check & Remote Control								
Single-acting	MMD20M32	3-Way Manual Valve with Check	1,8	0,9	100	700	1,5	2800	2	17,7
	MMD20E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MMD20M42	4-Way Manual Valve with Check								
	MMD20E42R	4-Way Solenoid Valve with Check & Remote Control								
Single-acting	MMH20M31R	3-Way Manual Valve with Remote Motor Control	2,4	0,9	85	700	1,5	1400	4	17,7
	MMH20E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MMH20M41R	4-Way Manual Valve with Remote Motor Control								
	MMH20E41R	4-Way Solenoid Valve with Remote Control								
Single-acting	MME20M32	3-Way Manual Valve with Check	9,4	0,9	85	700	1,5	2800	2	17,7
	MME20E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MME20M42	4-Way Manual Valve with Check								
	MME20E42R	4-Way Solenoid Valve with Check & Remote Control								

* Two Speed Pump Version

† 110V/60Hz/Single phase motors available upon request.

Modular Hydraulic Power Pumps with 3-Phase Electric Motor

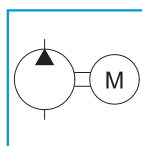
ME Series

Reservoir Capacity:
5 to 50 litres

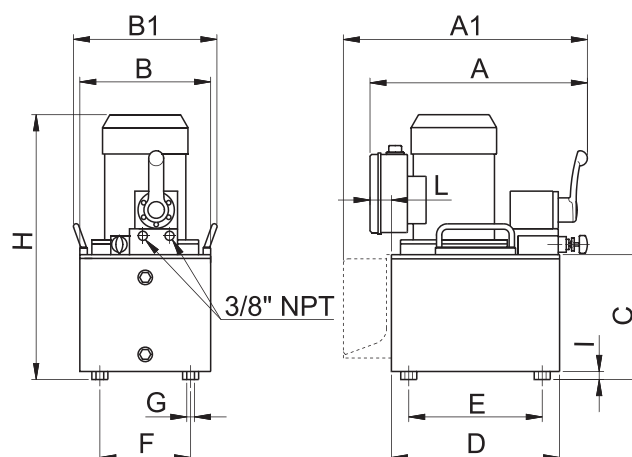
Oil Delivery at Rated Pressure:
0,45 – 2,5 litre/min.

Motor Size:
0,75 – 3 kW (1 – 4 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)



Picture illustrated with optional accessories.



DIMENSIONS

Reservoir Capacity		Usable Oil Volume		Dimensions (mm)												
litres	litres	A	A1 ^②	B	B1	C	D	E	F	G	H	I	L			
5	3,8	370	470	245	270	129	315	250	170	M8	390 ^①	10	40			
10 high	8,8					227					488 ^①					
10 low	7,7					378					390 ^①					
20	17,7	447	-	360	-	129	410	320	270	Ø 9	518 ^①	40	-			
40	35,8	462		600		257	440	350	510		640					
MEK 30	22	447		360		343	410	320	270		634					
MEV 30	20					307					634					
MEV 50	32			462		600	440	350	510							

① Add 16 mm for models **MEC, MEH**; add 40 mm for models **MEL, MEF, MEG, and MET**.

② For power packs with **5 l** and **10 l** high tanks with remote control model **R** or **F** only.



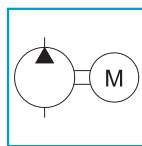
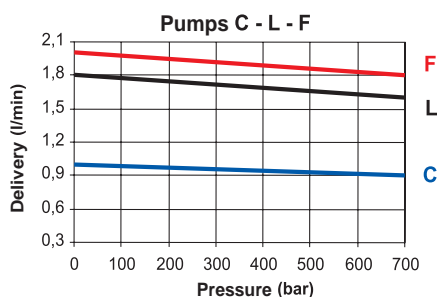
MEK power packs are particularly indicated for intensive use or when a very noiseless product is required.

Operating Characteristics

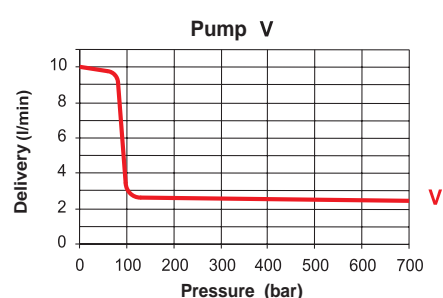
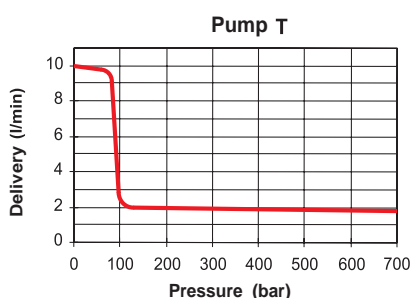
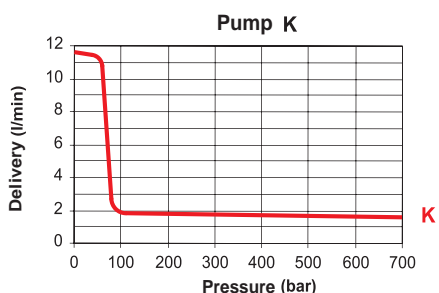
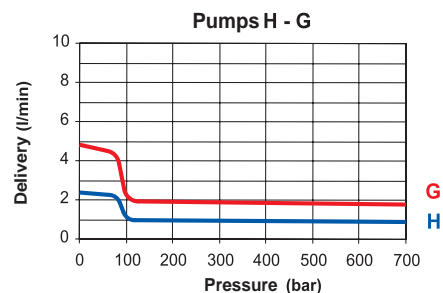
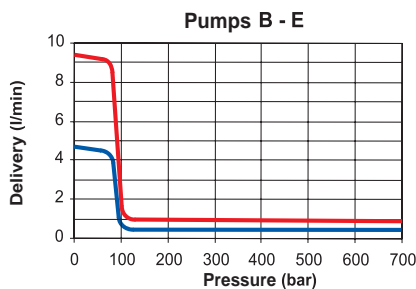
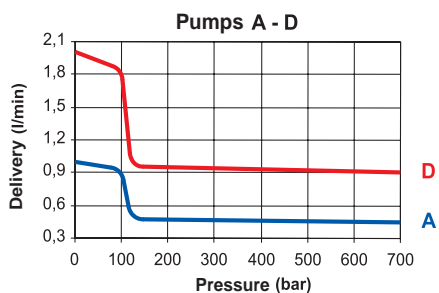
Operating Characteristics										
MODEL	Oil Delivery		Pressure		TEFC Induction Motor					
	1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	Voltage	Power	Speed			
	l/min	l/min	bar	bar		kW	rpm			
MEA	0,9	0,45	100	700	400V-50Hz (3-phase) (Motors with different voltage upon request)	0,75	1400			
MEB	4,7		85							
MEC	-		-							
MED	1,8	0,9	100			1,1	2800			
MEH	2,4		85				1400			
MEE	9,4		-				2800			
MEL	-	1,6	-			2,2	1400			
MEK	11,6		70				2800			
MEF	-		-							
MEG	4,7	1,8	85				1400			
MET	10									
MEV	2,5	3	1400							

Modular Hydraulic Power Pumps with 3-Phase Electric Motor

ME Series



Picture illustrated with optional accessories.



SELECTION CHART

For Use with Cylinder Tool	MODEL	Valve Control	*Oil Delivery		Pressure		†Motor 400V – 50Hz (3-phase)			Usable Oil Volume litres
			1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	Power	Speed	Poles	
			l/min	l/min	bar	bar	kW	rpm		
Single-acting	MEG20M32	3-Way Manual Valve with Check	4,7	1,8	85	700	2,2	2800	2	17,7
	MEG20E31R	3-Way Solenoid Valve with Remote Control								
Double-acting	MEG20M42	4-Way Manual Valve with Check	11,6	1,6	70	700	2,2	1400	4	17,7
	MEG20E42R	4-Way Solenoid Valve with Check & Remote Control								
Single-acting	MEK20M32	3-Way Manual Valve with Check	10	2,5	85	700	3	1400	4	32
Double-acting	MEK20M42	4-Way Manual Valve with Check								
Single-acting	MEV50M32	3-Way Manual Valve with Check	10	2,5	85	700	3	1400	4	32
Double-acting	MEV50M42	4-Way Manual Valve with Check								

* Two Speed Pump Version

† Motors with higher power and different voltage available upon request.

Modular Hydraulic Power Pumps with Air Motor

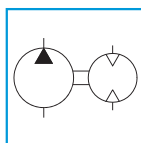
MP Series

Reservoir Capacity:
5 to 40 litres

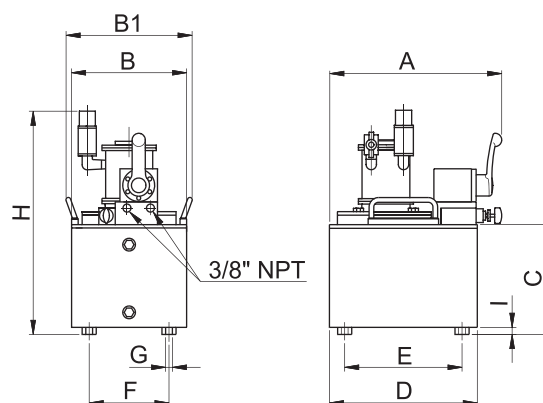
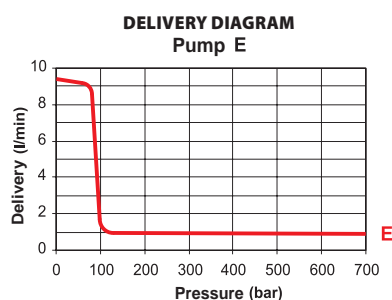
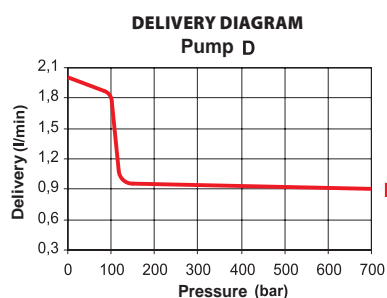
Oil Delivery at Rated Pressure:
0,9 litre/min.

Air Motor Size:
2,6 kW (3,5 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)



Picture illustrated with
optional accessories.



DIMENSIONS

Reservoir Capacity	Usable Oil Volume	Dimensions (mm)									
litres	litres	A	B	B1	C	D	E	F	G	H	I
5	3,8	370	245	270	129	315	250	170	M8	390	10
10 high	8,8				227					488	
10 low	7,7				129					390	
20	17,7	447	360	-	257	410	320	270	Ø 9	518	40
40	35,8	462				440	350	510			

Air Motor: 2,6 kW, 3000 rpm
Air Consumption: 3400 litre/min.

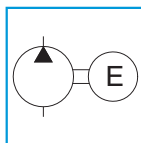
SELECTION CHART

For Use with Cylinder Tool	MODEL	Valve Control	*Oil Delivery		Pressure		Usable Oil Volume
			1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	
			l/min	l/min	bar	bar	
Single-acting	MPD05M31	3-Way Manual Valve	1,8	0,9	100	700	3,8
	MPD05P31	3-Way Air Valve					
Double-acting	MPD05M41	4-Way Manual Valve					
	MPD05P41	4-Way Air Valve					
Single-acting	MPE10M31	3-Way Manual Valve	9,4	0,9	85	700	8,8
	MPE10P31	3-Way Air Valve					
Double-acting	MPE10M41	4-Way Manual Valve					
	MPE10P41	4-Way Air Valve					

* Two Speed Pump Version

Modular Hydraulic Power Pumps with Petrol Engine

MS Series



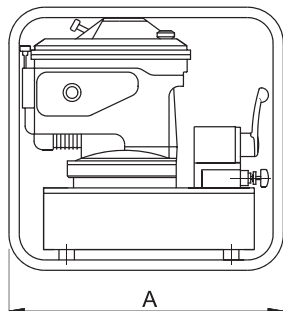
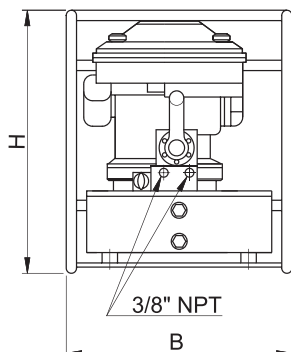
Picture illustrated with optional accessories.

Reservoir Capacity:
10 to 40 litres

Oil Delivery at Rated Pressure:
0,9 – 1,8 litre/min.

Engine Power Size:
3,6 kW (4,8 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)

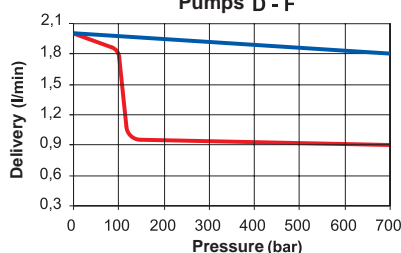


DIMENSIONS

Reservoir Capacity	Usable Oil Volume	Dimensions (mm)		
litres	litres	A	B	H
10 low	7,7	555	440	500
20	17,7			628
40	35,8	510	660	580

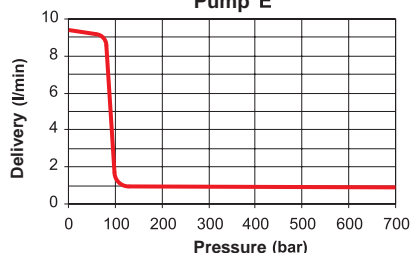
DELIVERY DIAGRAM

Pumps D - F



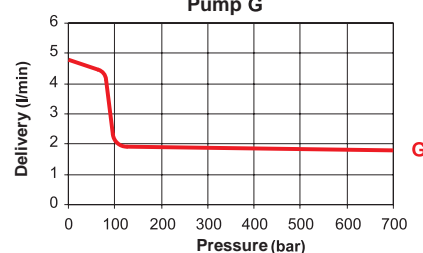
DELIVERY DIAGRAM

Pump E



DELIVERY DIAGRAM

Pump G



Petrol Engine: 4,4 kW, 3000 rpm

Petrol Consumption: 1,28 litre/hr. with full load
0,9 litre/hr. at 75% load

SELECTION CHART

For Use with Cylinder Tool	MODEL	Valve Control	*Oil Delivery		Pressure		Usable Oil Volume
			1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	
			l/min	l/min	bar	bar	litres
Single-acting	MSD20M32	3-Way Manual Valve with Check	1,8	0,9	100	700	17,7
Double-acting	MSD20M42	4-Way Manual Valve with Check					
Single-acting	MSE20M32	3-Way Manual Valve with Check	9,4		85		
Double-acting	MSE20M42	4-Way Manual Valve with Check					
Single-acting	MSG20M32	3-Way Manual Valve with Check	4,7	1,8	85	700	17,7
Double-acting	MSG20M42	4-Way Manual Valve with Check					
Single-acting	MSG40M32	3-Way Manual Valve with Check					
Double-acting	MSG40M42	4-Way Manual Valve with Check					

* Two Speed Pump Version

Valves for Modular Hydraulic Power Pumps - 700 bar (10,000 psi)

VMM - VMS Series

TABLE OF MANUAL-CONTROLLED VALVE FUNCTIONS

MODEL	For Use With Cylinder Tool	Manual-Controlled Valve Function	Symbol
VMM20	To shift control to in-line valve	Outlet P and T with by pass	
VMM21	SINGLE-acting	3-way, 2-position • Advance - return	
VMM31		3-way, 3-position • Advance - hold - return	
VMM32		3-way, 3-position • Advance - hold with pilot check - return	
VMM41	DOUBLE-acting	4-way, 3-position • Advance - hold - return	
VMM42		4-way, 3-position • Advance - hold with pilot check - return	
VMM51		4-way, 3-position • Advance - hold - return at 150 bar	
VMM52		4-way, 3-position • Advance - hold with pilot check - return at 150 bar	



VLM31

VLM Series -
In-line Remote
Manual-Controlled
Valves available.
Refer to Page 54

TABLE OF MANUAL-CONTROLLED VALVE FUNCTIONS - SPRING RETURN IN CENTRAL POSITION

MODEL	For Use With Cylinder Tool	Manual-Controlled Valve Function	Symbol
VMS31	SINGLE-acting	3-way, 3-position • Advance - hold - return	
VMS32		3-way, 3-position • Advance - hold with pilot check - return	
VMS41	DOUBLE-acting	4-way, 3-position • Advance - hold - return	
VMS42		4-way, 3-position • Advance - hold with pilot check - return	
VMS51		4-way, 3-position • Advance - hold - return at 150 bar	
VMS52		4-way, 3-position • Advance - hold with pilot check - return at 150 bar	



VLS31

VLS Series -
In-line Remote
Manual-Controlled Valves -
Spring Return in Central
Position available.
Refer to Page 55

Valves for Modular Hydraulic Power Pumps - 700 bar (10,000 psi)

VME - VMP Series

TABLE OF ELECTRIC-CONTROLLED SOLENOID VALVE FUNCTIONS (230 VAC VOLTAGE)

MODEL	For Use With Cylinder Tool	*Electric-Controlled Valve Function	Symbol
VME21	SINGLE -acting	3-way, 2-position • Advance - return	
VME22		3-way, 2-position • Advance - hold - return	
VME31		3-way, 3-position • Advance - hold - return	
VME41	DOUBLE -acting	4-way, 3-position • Advance - hold - return	
VME42		4-way, 3-position • Advance - hold with pilot check - return	
VME51		4-way, 3-position • Advance - hold - return at 150 bar	
VME52		4-way, 3-position • Advance - hold with pilot check - return at 150 bar	

* Optional Remote Solenoid Valve Control Switches are wired 24VAC.



VLE31

VLE Series -
In-line Remote
Electric-Controlled
Valves available.

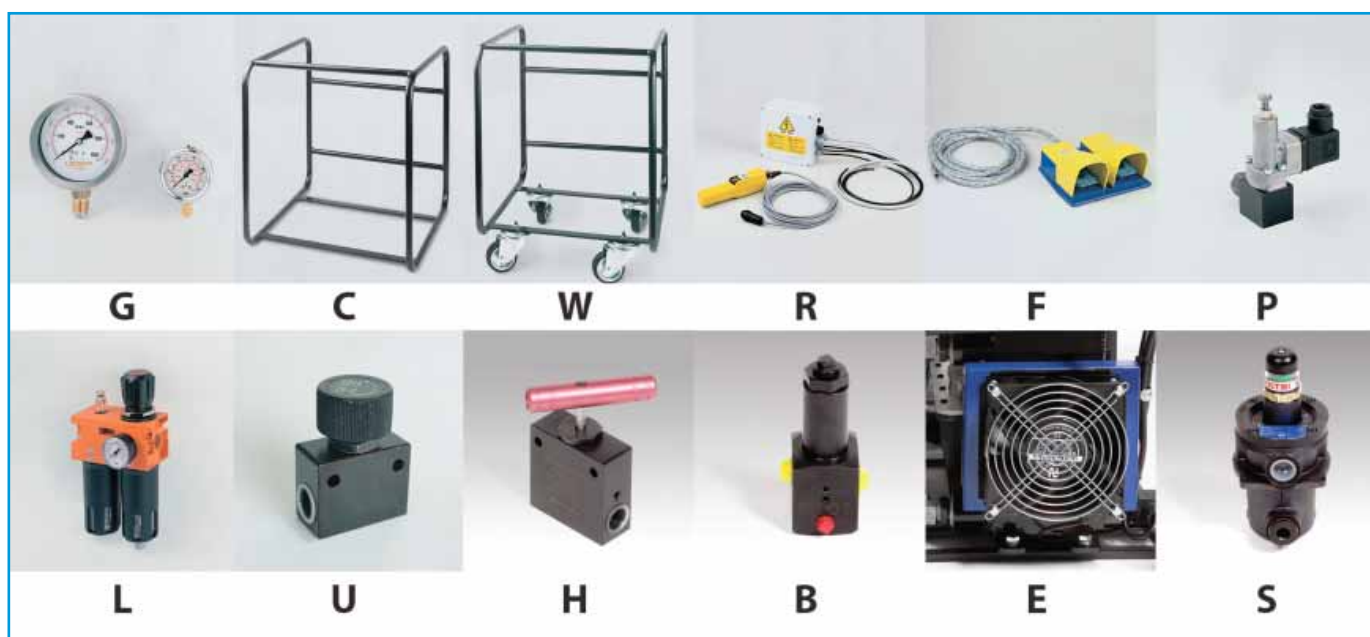
Refer to Page 55

HYDRAULIC PUMPS

TABLE OF PNEUMATIC-CONTROLLED VALVE FUNCTIONS

MODEL	For Use With Cylinder Tool	Pneumatic-Controlled Valve Function	Symbol
VMP21	SINGLE -acting	3-way, 2-position • Advance - return	
VMP22		3-way, 2-position • Advance - hold - return	
VMP31		3-way, 3-position • Advance - hold - return	
VMP41	DOUBLE -acting	4-way, 3-position • Advance - hold - return	
VMP42		4-way, 3-position • Advance - hold with pilot check - return	
VMP51		4-way, 3-position • Advance - hold - return at 150 bar	
VMP52		4-way, 3-position • Advance - hold with pilot check - return at 150 bar	

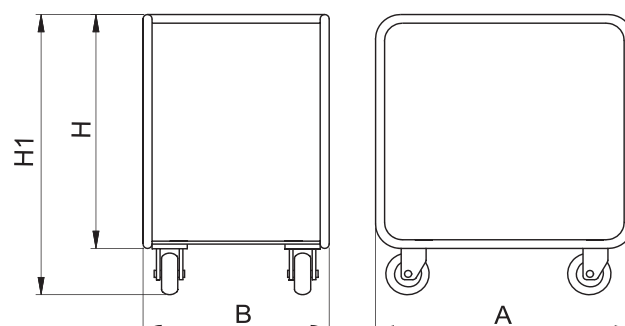
Accessories for Modular Hydraulic Power Pumps



- **G** - Glycerine filled Pressure gauge Ø 100 mm with manual valves and Ø 63mm with solenoids and with controlled check manual valves. (Digital gauge upon request).
- **C** - Protective housing (Standard for 'MS' power pumps).
- **W** - Protective housing with 4 pivoting wheels 80x25 mm
- **R** - Manual-activated remote control length 5 metres.
- **F** - Pedal-activated remote control length 5 metres.
- **P** - Pressure sensor and pressure gauge.
- **L** - Filter and pressure reducer for models with air motor.
- **U** - Unidirectional flow regulator.
- **H** - Unidirectional flow regulator with fine regulation.
- **B** - Counterbalance valve.
- **E** - Heat exchanger.
- **S** - Filter on return line (Not available for power pumps with 5 l and 10 l tank high)

CUSTOMIZED VERSIONS

- **Z** - Without hand wheel adjustable max. pressure valve.
- **Y** - Without magneto-thermal cut out for models fitted with electric motor.

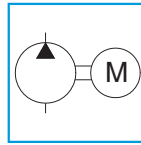


DIMENSIONS OF PROTECTIVE HOUSING

With Reservoir Capacity	Dimensions (mm)			
litres	A	B	H	H1
5	495	325	500	595
10 high			600	695
10 low	580	440	500	595
20			640	733
40				
MEK 30 - MEV 30	580	440	690	783
MEV 50	540	700		

Modular Hydraulic Power Pumps for Geotechnical Structural Tests

ME / MM - PP Series



Product shown as illustrated

Reservoir Capacity:

10 to 40 litres

Oil Delivery at Rated Pressure:

0,9 litre/min.

Motor Size:

1,1 – 1,5 kW (1,5 – 2 hp)

Maximum Operating Pressure:

700 bar (10,000 psi)

FEATURES

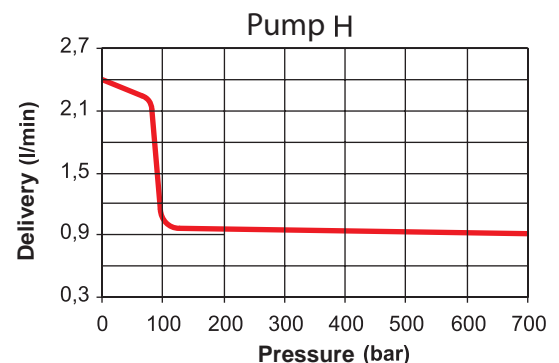
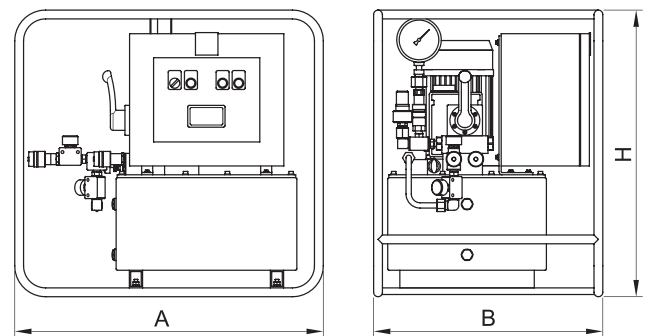
Through many years of experience in the geotechnical field, in particular test piles, a complete pump with special features has been developed to meet this sector requirements.

- Digital Display – Programmed for the desired pressure values.
- Automatic Pressure Restore – In case of structural yielding.
- Hysteresis System Cycle Setting.
- Automatic or Manual Control.
- Possibility to conduct test cycles by decreasing pressure.
- For use with either single-acting or double-acting cylinders.
- Externally adjustable pressure setting (50 to 700 bar range).
- Available in Single- or 3-phase electric motor.
- Two stage pump delivers high oil volume for rapid cylinder piston advance without load and shifts to high pressure, low volume stage when under load.
- Manual 4-way, 3-position valve with pilot check to guard against pressure loss when shifting manual valve position.
- Equipped with Analog 100mm diameter pressure gauge.
- Starts at full load.
- Available in 10, 20 and 40 litre reservoir tank.
- Oil level indicator.
- Protective and transport cage.

Application

Non-destructive tests on concrete structures, construction material trials and geotechnical experiments both on site and in laboratory.

Foundation load cap and pile testing.



OPERATING CHARACTERISTICS

MODEL	*Oil Delivery		Pressure		TEFC Induction Motor			Reservoir Capacity	Usable Oil Volume	Dimensions (mm)		
	1 st Stage	2 nd Stage	1 st Stage	2 nd Stage	Voltage	Power	Speed			A	B	H
	l/min	l/min	bar	bar		kW	rpm			litres	litres	A
MEH11M52PP	2,4	0,9	85	700	400V-50Hz (3-phase)	1,1	1400	10	7,7	700	520	522
MEH20M52PP								20	17,7	700	520	650
MEH40M52PP								40	35,8	710	700	650
MMH11M52PP					230V-50Hz (Single-phase)	1,5		10	7,7	700	520	522
MMH20M52PP								20	17,7	700	520	650
MMH40M52PP								40	35,8	710	700	650

* Two Speed Pump Version

Hydraulic Power Pumps for Synchronous Lifting System

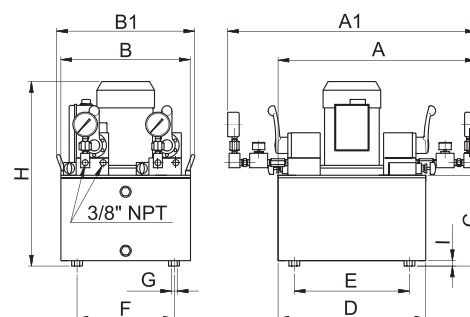
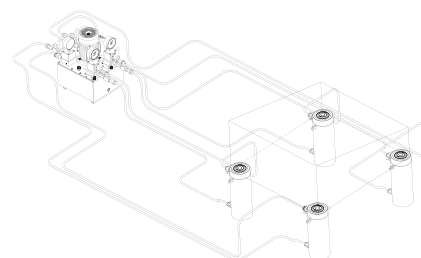
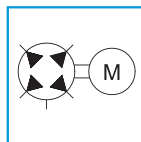
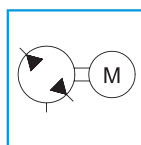
ME - SPLIT FLOW Series

Reservoir Capacity:
10 to 40 litres

Oil Delivery at Rated Pressure:
0,45 – 0,9 litre/min.

Motor Size:
2,2 kW (3 hp)

Maximum Operating Pressure:
700 bar (10,000 psi)



FEATURES

The **SPLIT FLOW** Hydraulic Power Pump has 2 or 4 independent valve outlets delivering a constant amount of oil, even if the pressure in each line is not the same. Flows and pressures of each pump are independent regardless of the load.

They are equipped with:-

- One 3-phase electric motor.
- 2 or 4 independent hydraulic pumps with choice of Single- or 2-speed version.
- 2 or 4 (one for each port) 4-way, 3-position manual control valves with piloted check and 150 bar pressure setting on 'B' return port.
- 2 or 4 flow control valves (one for each port) for controlled load lowering.
- 2 or 4 pressure gauges (one for each port).
- Reservoir tank capacity of 10, 20 & 40 litres.

Application

This pumps offered efficient and economical solution to lift up to a maximum of 4 cylinders with different loads or uneven load distribution. Pump configuration is based on equal geometrical pressure lines, without any external control on the actual stroke, this Split Flow power pump provides accurate $\pm 3\%$ synchronous lifting with visual control of the operation. It also allow synchronous load lowering operations under load when using with double-acting cylinders. For automatic control of the down stroke speed without pressure oscillations & load chattering, use **VRB38** Counterbalance Valve.

OPERATIONAL CHARACTERISTICS ACCORDING TO THE CHOSEN PUMP

MODEL	No. Outlets	Oil Delivery		Pressure		TEFC Induction Motor		
		1 st stage	2 nd stage	1 st stage	2 nd stage	Voltage	Power	Speed
		l/min	l/min	bar	bar		kW	rpm
MEM	2	-	0,9	-	700	400V-50Hz (3-phase)	2,2	2800
MEN	2	2,2		85				
MEQ	4	-	0,45	-				

Reservoir Capacity	Usable Oil Volume	Dimensions (mm)										
litres	litres	A	A1	B	B1	C	D	E	F	G	H	I
10 low	7,7	555	700	360	378	129	410	320	270	M8	410	10
20	17,7			600	-	257	440	350	510	Ø9	518	40
40	35,8	570										

MODEL CODING

ME	#	#	M52	G	U
Motor Type	Pump Type	Reservoir Capacity	Valve Type	Pressure Gauge	Unidirectional Flow Regulator

MODEL	No. Outlets	Oil Delivery	Pressure	Motor Voltage	Reservoir Capacity
MEM20M52GU	2	0,9 l/min	700 bar	400V-50Hz (3-phase)	20 litres
MEQ40M52GU	4	0,45 l/min			40 litres



VALVES AND ACCESSORIES FOR HYDRAULIC SYSTEMS



Pressure Gauges and Gauge Blocks

G.....Pg. 48



Couplers

K.....Pg. 49



Manifolds and Fittings

R.....Pg. 50 - 51



Hoses

S.....Pg. 52



Hydraulic Oil

ZOH.....Pg. 53



In-line Remote-Mounted Valves and Regulators

VL - VR.....Pg. 54 - 56

Pressure Gauges and Gauge Blocks

G Series

Maximum Working Pressure:
700 & 1000 bar

Dial Diameter:
63 & 100mm (2-½" & 4")

Accuracy:
±1% & 1.6% of full scale

Scale:
bar & bar/kN



FEATURES

Pressure Gauges

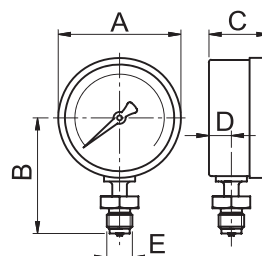
- Pressure Gauges available in Ø63 or Ø100mm dial with read-out in bar and psi scales.
- The 1000 bar pressure gauges are glycerine-filled while the 700 bar pressure gauges are dry.
- The G106L pressure gauge has a ¼" NPT screwed connection at 3 o'clock for direct installation on the left side of certain pump head.
- The G10 pressure gauges are also available in dual scale version (bar and kN) to suit different types & in respective of the tonnage capacities of cylinders. *Refer selection chart.*

Gauge Blocks

- Manufactured in steel and available in 4 versions to suit gauge diameter and distance from the tool.

SELECTION CHART FOR FORCE & PRESSURE GAUGES (DRY)

MODEL (G10 Series)	Scale bar	Scale kN	For Cylinders	Dimensions
G10F1020		0-121 / 0-225	CMF 10/20 ton	See G10 chart
G10F3060		0-327 / 0-578	CMF/COF 30/60 ton	
G10S1020	700	0-109 / 0-194	CGS/CMC/CMI/CMP/COI 10 ton CGS/CMC/CMP 20 ton	
G10S2530		0-228 / 0-303	CMI 25 ton - CGG/CGS/CMC/CMI/CMP/COI 30 ton	
G10S50100		0-486 / 0-911	CGG/CGS/CMC/CMI/CML/CMP/COI/COS 50/100 ton	



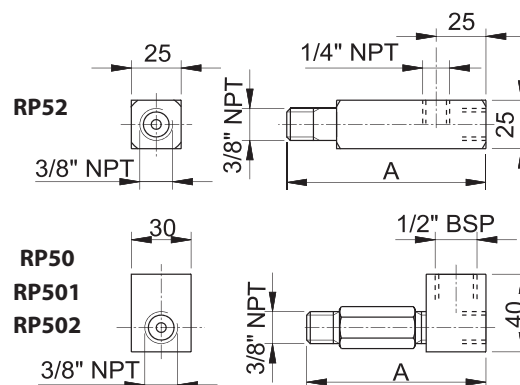
PRESSURE GAUGE SELECTION CHART: 700 – 1000 BAR (GLYCERINE-FILLED)

Max Working Pressure	* Full Scale	Dial Diameter	Precision Class DIN16005	Scale Indexing	Thread	Mounting	MODEL	Dimensions (mm)				Weight
bar	bar	mm	%	bar	E			A	B	C	D	kg
700	1000	63	1,6	50	1/4" NPT	Radial Fit	G106L	68	54	32	13	0,2
1000	1000	100	1,0	20	1/2" BSP Swivel	Lower Fit	G10	101	98	49	15,5	0,8

* Dual Scale: bar & psi

SELECTION CHART FOR 1000 BAR GAUGE BLOCKS TO BE MOUNTED IN-LINE

SELECTION CHART FOR 1000 BAR GAUGE BLOCKS TO BE MOUNTED IN LINE					
MODEL	Max Working Pressure	Gauge Connection	In/Out Connection	A Dimension	Weight
	bar			mm	kg
RP52	1000	1/4"NPT	3/8" NPT	100	0,40
RP50		1/2"BSP		60	0,28
RP501				90	0,33
RP502				140	0,42



Pressure range of gauges 1600, 3000 & 4000 bar available upon request.
Adapters range for gauges 1000 , 1600 & 3000 bar available upon request.

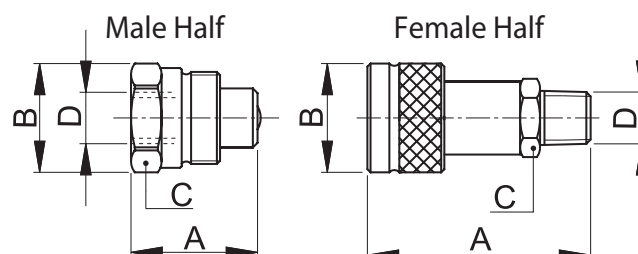
Quick Release Couplers

K Series



Maximum Working Pressure:
700 bar (10,000 psi)

Thread:
1/4" & 3/8" NPT



FEATURES

Quick Release Couplers are available in **Screwed** and **Flat Face** versions and are compatible with the **E-POWER 700** product range and also interchangeable with most couplings used on high pressure hydraulic equipment.

Flat Face Snap Couplers are advantageous because they are:-

- Anti-drip with negligible air or fluid inclusion during coupling, and uncoupling operations
- Easy to clean
- Rotary motion which prevents hose twisting
- Safe coupling system (two voluntary movements are necessary for uncoupling)



Couplers with Viton Seals are available upon request.



When using Screw Couplings, the nut of the female part must always be fully tightened on the male part. If the two parts are not fully connected the oil cannot pass through the coupler, and damage or injury can occur.

ELECTION CHART FOR QUICK COUPLERS: 700 BAR

Working Pressure	Coupling Type	Thread Type	Coupler Type	MODEL	Dimensions (mm)			Weight
					A	B	C	
bar		D						g
700	Screw	1/4" NPT	Complete (K71M+K71F+K71C+K71D)	K71	-	-	-	-
			Male Half with female thread	K71M	39	30	19	75
			Female Half with male thread	K71F	60,5	30	22	140
			Female Half with female	K71X	58	30	22	150
			Cap for female (aluminum)	K71C	-	-	-	-
			Cap for male (aluminum)	K71D	-	-	-	-
		3/8" NPT (High-Flow)	Complete (K73M+K73F+K73C+K73D)	K73	-	-	-	-
			Male Half with female thread	K73M	40,5	36	32	120
			Female Half with male thread	K73F	72	35,5	24	200
			Female Half with female thread	K73X	76	35,5	24	210
			Cap for female (plastic)	K73C	-	-	-	-
			Cap for male (plastic)	K73D	-	-	-	-
	Flat Face	1/4" NPT	Complete (KP71M+KP71X)	KP71	-	-	-	-
			Male Half with female thread	KP71M	48	24	22	90
			Female Half with female thread	KP71X	58	29	22	210
		3/8" NPT	Complete (KP73M+KP73X)	KP73	-	-	-	-
			Male Half with female thread	KP73M	55	26	24	100
			Female Half with female thread	KP73X	60	29	24	220

• Quick Release Couplers for 1000, 1500 & 2000 bar available upon request.

Manifolds & Fittings

R Series

Maximum Working Pressure:
1000 bar

No. of Manifold Female Outlets:
3 to 9 Ports



FEATURES

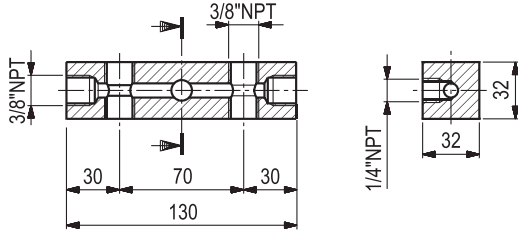
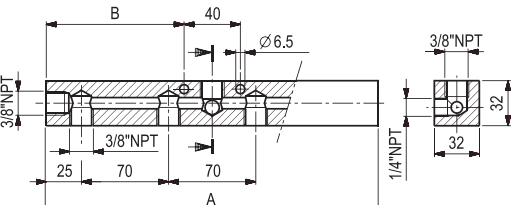
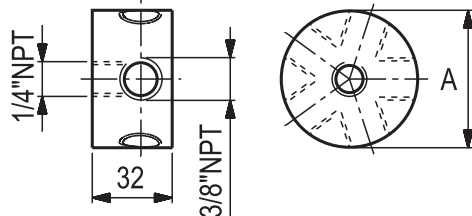
Manifolds

- Available in various sizes with axial or radial outlets.
- Manifolds are threaded 1/4" NPT which also fit **G106** pressure gauge.

Fittings

- Fittings designed for 1000 bar working pressure, providing a safety factor of 4 if operate at 700 bar working pressure and a safety factor of 2,8 if operate at 1000 bar working pressure.

MANIFOLDS

Type	MODEL		No. of Female Ports	A mm	B mm
Multi Level Manifold	RB386		6	-	-
Single Level Manifold	RM387		7	260	110
	RM389		9	400	180
Radial Manifold	RK383		3	45	-
	RK385		5	55	-
	RK387		7	65	-

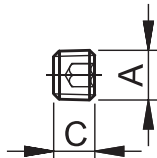

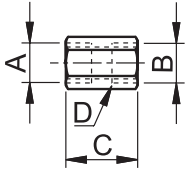

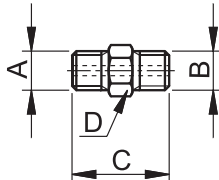

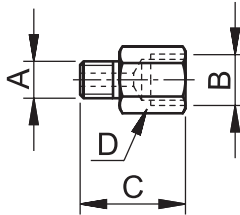

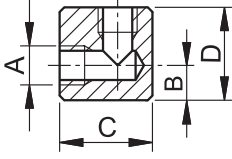

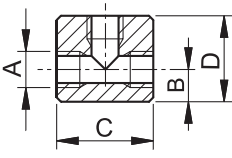

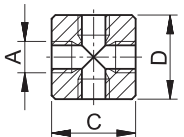

Fittings for 2000 & 3000 bar available upon request.

Fittings

R Series

Maximum Working Pressure:
1000 bar

FITTINGS

Type		MODEL		Dimensions				
				A	B	C	D	
Plug	RC14			1/4" NPT	-	10.5	-	
	RC38			3/8" NPT				
Coupling	RS14			1/4" NPT	1/4"NPT	32	19	
	RS38			3/8"NPT	34	24		
	RS52						1/4" NPT	
Nipple	RN14			1/4" NPT	1/4"NPT	39	17	
	RN38			3/8"NPT	41			
	RN381				70			
	RN382				120			
	RN52				1/4"NPT	41		
Reducing connector	RR23			1/4" BSP 120°	3/8"NPT	41	24	
	RR24			1/4" NPT		40		
	RR52			3/8" NPT	1/4"NPT	40	19	
	RR02			1/2" BSP			22	
	RR26			1/4" NPT	1/2"BSP		30	
	RR501			3/8" NPT				
	Elbow			RE14			1/4" NPT	15
RE38		3/8" NPT	15	40			40	
Tee	RT14			1/4" NPT	12,5	40	35	
	RT38			3/8" NPT	15	45	40	
Cross	RX14			1/4" NPT	-	45	45	
	RX38			3/8" NPT	-			

Fittings for 2000 & 3000 bar available upon request.

High Pressure Hoses

S Series

Maximum Working Pressure:
700 bar (10,000 psi)

Hose Internal Diameter:
6,4 mm (1/4")

Minimum Burst Pressure:
2800 bar



FEATURES

- Hoses are suitable for all hydraulic applications and consist of 2, 4 or 6 steel wire spirals depending on the operating pressure.
- Extremely high tensile strength.
- Outer layer covered with polyurethane material to provide excellent abrasion protection, whereas its minimal expansion during operation ensures maximum efficiency.
- Hoses are designed with a safety factor of 4 if operate at 700 bar working pressure

High Pressure Hoses for 1800 & 2500 bar available upon request.



The maximum operating pressure of the pump-hose-coupling system is the working pressure of the lowest rated part.



The oil volume required to fill the hoses needs to be taken into account when selecting the pump model.

SELECTION CHART FOR 700 - 1000 BAR HOSES

SELECTION CHART FOR 700 – 1000 BAR HOSES													
MODEL	Length	Max. Working Pressure	Fitting Thread	Screw Coupling	Nipple	Min. Burst Pressure	Safety Factor @700 bar	Safety Factor @1000 bar	Internal Diameter	Minimum Bending Radius	Oil Volume	Weight	
	metre	bar				bar			mm	mm	cm³/m	kg/m	
SN10	1	1000	3/8" NPT - 3/8" NPT male	-	-	2800	4	2,8	6,4	70	32,2	0,32	
SN20	1,8												
SN30	3												
SN60	6												
SN120	12												
SN150	15												
SN10M	1	700		K73M	-	2800	4	2,8	6,4	70	32,2	0,32	
SN20M	1,8												
SN30M	3												
SN10HT	10 = 1 m. 20 = 1,8 m. 30 = 3 m. etc.	700@120°C	3/8"NPT - 3/8"NPT male	-	-	2800	4	2,8	6,4	40	32,2	0,25	
SQ10		1000	1/4"NPT - 1/4"NPT male	-						70		0,32	
SQ10M		700		K71M									
SR10		1000	1/4"BSP - 1/4"BSP Swivel female	-									

Examples of ordering other hose lengths:-

- For 3m hose length – Model: **SN30**
- For same hose length but with **K73M** male half coupling – Model: **SN30M**

Hydraulic Oil

ZOH Series

Container Size:

1 & 5 litres



Always use E-POWER 700 hydraulic oil or oil having the same technical characteristics.

Different oil types might damage the seals or gaskets and equipment rendering its warranty null and void.

FEATURES

- **E-POWER 700 High Pressure Hydraulic Oil** is a mineral based oil of ISO Viscosity Grade (32/46) with excellent viscosity and lubrication properties.
- Using E-POWER 700 hydraulic oil will ensure maximum efficiency and tool & equipment long service life.
- E-POWER 700 hydraulic oil is non-foaming, will not leave any gummy deposits, nor corroding valve seats, seals or gaskets, or cylinder walls.

MODEL

ZOH1 1 litre Container

ZOH5 5 litres Container

VG32 or VG46 will be supplied discretionary.

HOW TO SELECT A VALVE

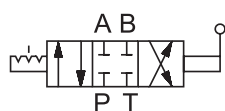
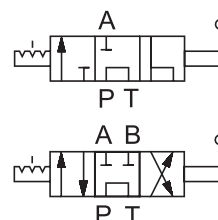
Step 1 : Select the hydraulic cylinder that best suits the application.

Step 2 : Select the hydraulic pump with adequate oil delivery and reservoir capacity to power the cylinder.

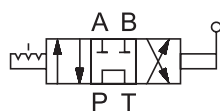
Step 3 : Select suitable valve that best matches the pump, cylinder, hydraulic system & application.

When choosing a valve, consider the following:-

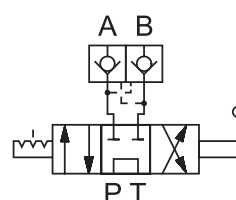
- **Single-acting Cylinder:** Use a 3-way directional control valve:-
 - o 3 outlets: Pressure 'P', Tank 'T', Cylinder 'A'.
- **Double-acting Cylinder:** Use a 4-way directional control valve:-
 - o 4 outlets: Pressure 'P', Tank 'T', Extension 'A', Return 'B'.
- **Positions:** These are valve lever position points:-
 - o 2-position: Extension & Retraction of cylinder.
 - o 3-position: Extension, Holding & Return of cylinder.
- **Centre:** Intermediate position of valve:-
 - o Open Centre: Valve connects the pump 'P' and port 'A' & 'B' to discharge outlet.
 - o Closed Centre: All outlets are closed to isolate the cylinder but allow the pump to feed other cylinders or lines when running multiple valves.
 - o Tandem Centre: Valve connects the pump 'P' back to discharge outlet or tank and holds pressure at port 'A' & 'B'.
- **Pilot Check:** Valve featuring that guards against pressure loss when shifting between valve positions.



4W/3P Manual Valve
(Closed Centre)



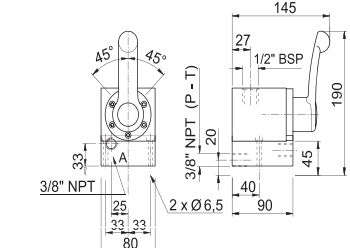

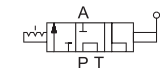
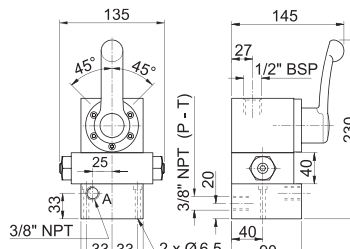

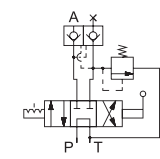
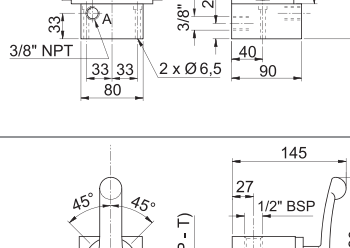

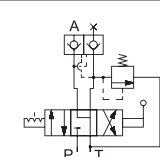
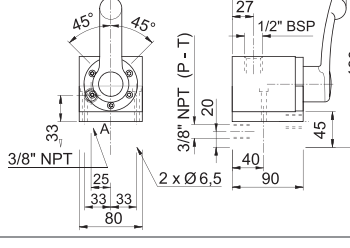

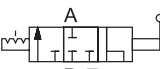
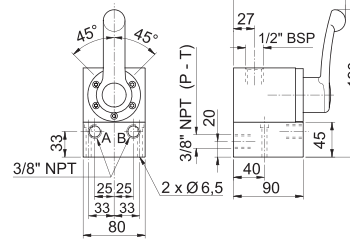


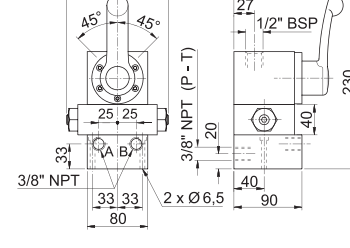

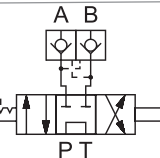
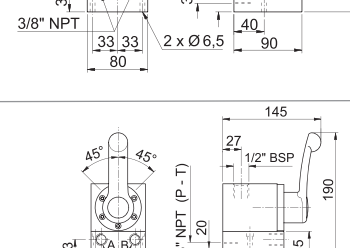

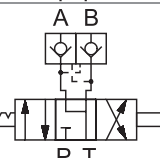
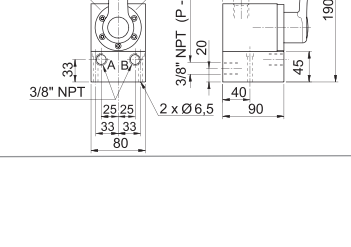


4W/3P Manual Valve
(Tandem Centre)



4W/3P Manual Valve
with Pilot Check
(Tandem Centre)

VLM Series – Manual Valves

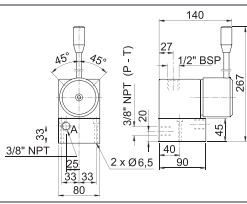
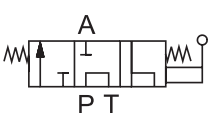
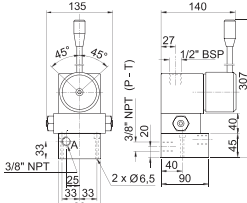
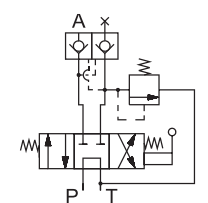
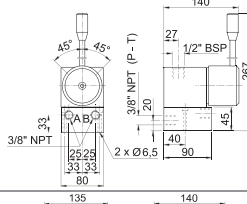
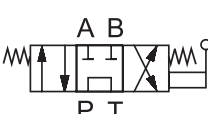
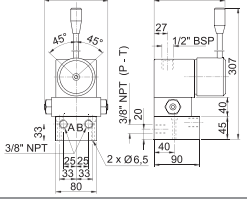
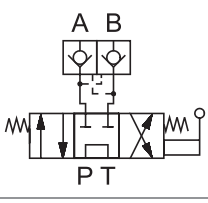
VLM PRESSURE 700 BAR

	MODEL	Description	Symbol
Single-Acting Operation	VLM31	3-way, 3-position Manual Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Return  	
	VLM32	3-way, 3-position Manual Control Valve with Pilot operated Check Valve. <ul style="list-style-type: none"> • Advance • Hold with Pilot Check • Return  	
	VLM35	3-way, 3-position Manual Control Valve with Pilot operated Check Valve P closed. <ul style="list-style-type: none"> • Advance • Hold with Pilot Check • Return  	
	VLM36	3-way, 3-position Manual Control Valve Closed Centre. <ul style="list-style-type: none"> • Advance • Hold • Return  	
Double-Acting Operation	VLM41	4-way, 3-position Manual Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Return  	
	VLM42	4-way, 3-position Manual Control Valve with Pilot operated Check. <ul style="list-style-type: none"> • Advance • Hold with Pilot Check • Return  	
	VLM45	4-way, 3-position Manual Control Valve with Pilot operated Check Valve P closed. <ul style="list-style-type: none"> • Advance • Hold with Pilot Check • Return  	
	VLM46	4-way, 3-position Manual Control Valve Closed Centre. <ul style="list-style-type: none"> • Advance • Hold • Return  	

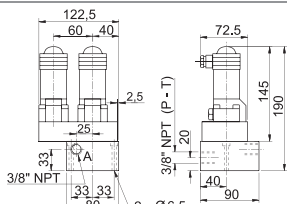
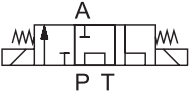
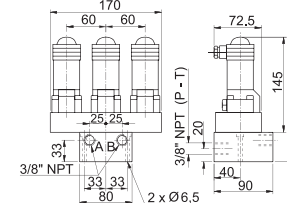
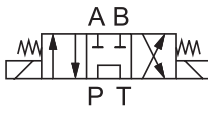
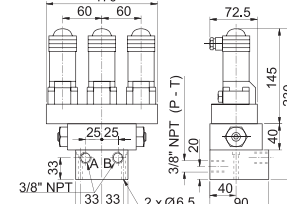
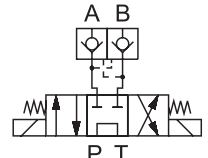
In-line Remote-Mounted Manual & Electric Valves (700 bar)

VLS Series – Manual Valves (Spring Return in Central Position) VLE Series – Electric Valves

VLS PRESSURE 700 BAR

	MODEL	Description	Symbol
Single-Acting Operation	VLS31	3-way, 3-position Manual Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Spring return in central position 	
	VLS32	3-way, 3-position Manual Control Valve with Pilot operated Check Valve. <ul style="list-style-type: none"> • Advance • Hold with pilot check • Spring return in central position 	
Double-Acting Operation	VLS41	4-way, 3-position Manual Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Spring return in central position 	
	VLS42	4-way, 3-position Manual Control Valve with Pilot operated Check Valve. <ul style="list-style-type: none"> • Advance • Hold with pilot check • Spring return in central position 	

VLE PRESSURE 700 BAR (230 VAC VOLTAGE)

	MODEL	Description	Symbol
Single-Acting Operation	VLE31	3-way, 3-position Electric Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Return 	
Double-Acting Operation	VLE41	4-way, 3-position Electric Control Valve. <ul style="list-style-type: none"> • Advance • Hold • Return 	
	VLE42	4-way, 3-position Electric Control Valve with Pilot operated Check. <ul style="list-style-type: none"> • Advance • Hold with pilot check • Return 	

In-line Regulating Valves (700 bar & 1000 bar)

VR Series

VR PRESSURE 700 BAR

MODEL	Description	Symbol
VRB38	Counterbalance valve. It allows the positive hold of the load; calibrated during assembling, it controls automatically the down stroke speed without pressure oscillations and load jumping. Only for double acting cylinders 	
VRM14	Pressure relief valve limiting the circuit pressure to the maximum required value (ranging between 50 and 700 bar). Adjusted by the valve control wheel. Suitable to be mounted on a panel. 	
VRM381	Pressure relief valve limiting the circuit pressure to the maximum required value (ranging between 50 and 700 bar). Adjusted by the valve control wheel. Suitable to be mounted in line. 	
VRP38	Pilot operated check valve. To permit free flow in one way and shut off the flow in the opposite direction. Pilot ratio 1.4 	
VRR38	One-way check valve. To shut off the oil flow in one direction $\Delta P = 1 \text{ bar}$ 	

VR PRESSURE 1000 BAR

MODEL	Description	Symbol
VRF38	Needle valve. To shut off the flow. 	
VRU38	One-way flow control valve. It permits controlled load lowering. 	
VRH38	One-way flow control valve with fine regulation. It permits controlled load lowering. 	
VRF382	Double outlet needle valve. To split the flow in two separate ways. $A = 90$ 	
VRF384	Needle valve with four outlets. To split the flow in four separate ways. $A = 210$ 	



HYDRAULIC TOOLS



Pullers

UECPg. 59

UETPg. 61

UEG - UEZPg. 60



Spreaders

UDPg. 62



Toe Lifting Jacks

UJPg. 63



Pipe Benders

UBPg. 64



Load Cells

ULPg. 65



Mobile Floor Crane

UGCPg. 66

PULLERS and EXTRACTORS

UE Series



FEATURES

Pullers & Extractors consist of 2 parts:-

- **Mechanical:** - Manufactured in high quality steel to ensure reliability and long life.
- **Hydraulics:** - Consisting of a 'PN' Series hand pump, a hollow piston cylinder from the 'CMF' Series range with 'ZTE' threaded hollow saddle, a SN20M 1,8m long hose assembly and a G106L pressure gauge.

'UE' Series range available in 4 tonnage capacities (10 – 20 – 30 – 50) and in 3 configurations:-

- **'UEC' Series** – Complete Hydraulic Puller Set consisting all mechanical and hydraulic components.
Eg. UEC20 – 20 tonnes capacity complete hydraulic puller set (Comes with standard jaw puller ('UEG')).
- **'UEG' Series** – Hydraulic Grip Jaw Puller Set consisting of a 2 & 3 grip jaw puller and hydraulic components.
Eg. UEG20 – 20 tonnes capacity hydraulic grip jaw puller set.
- **'UET' Series** – Hydraulic Press Puller Set consisting of a press puller, an internal puller ('UEI'), an external puller ('UEE') and hydraulic components.
Eg. UET20 – 20 tonnes capacity hydraulic press puller set.

Available Option

- **Self-aligning 3-jaw puller ('UEZ' Series)** is available for more precise and easy positioning on the workpiece.
Eg. UEZ20 – 20 tonnes capacity hydraulic self-aligning 3-jaw puller set.

Complete Hydraulic Puller Set can be ordered with self-aligning 3-jaw puller.
Eg. UEC20Z – 20 tonnes capacity complete hydraulic puller set with self-aligning 3-jaw puller ('UEZ').



Application

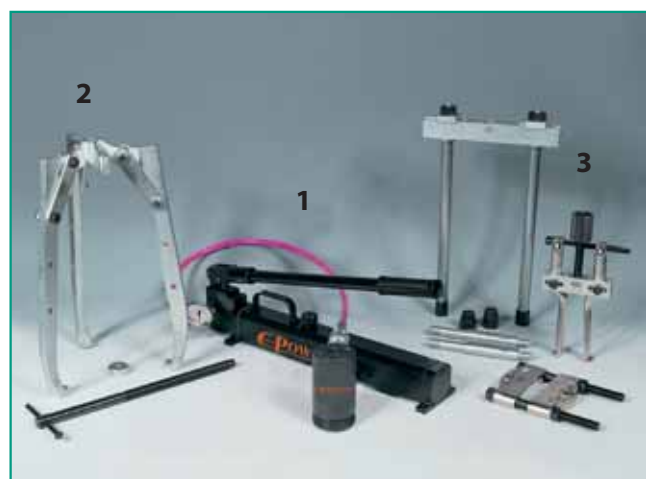
- Extracting gears, bearings, couplers, bushings etc.
- A correct assessment of the item to be extracted as well as the force required is essential for correct selection of the puller component



Each puller component has a different **operating pressure** which must never be exceeded. Please refer to data charts.
The safety regulations laid down in the operating and maintenance manual must be observed at all times.

Complete Hydraulic Puller Sets

UEC Series



Capacity:

10 – 20 – 30 – 50 tonnes

Maximum Operating Pressure:
(Refer Data Charts)



SELECTION CHART FOR COMPLETE PULLERS

		MODEL			
Capacity – Tonnes:		10	20	30	50
Description		UEC10	UEC20	UEC30	UEC50
HYDRAULICS UEU#	* Pos.				
Hand Pump	1	PN131	PN141	PN141	PN162
Cylinder		CMF10N50E	CMF20N50E	CMF30N50E	CMF60N75E
Hose		SN20M	SN20M	SN20M	SN20M
Pressure Gauge		G106L	G106L	G106L	G106L
Max. Operating Pressure	-	Refer to the data charts showing capacity of each mechanical component			
MECHANICAL PARTS UEC#M	* Pos.				
Jaw Pullers	2	UEG10M	UEG20M	UEG30M	UEG50M
Press, Internal & External Puller	3	UET10M	UET20M	UET30M	UET50M

* Pos. : Position as shown on illustrated picture.

Complete hydraulic puller set can be ordered with self-aligning 3-jaw puller.

Model: **UEC#Z** (where # refers to tonnage capacity).



Each puller component has a different **operating pressure** which must never be exceeded. Please refer to data charts.

ACCESSORIES: CARRY CASE UEB



MODEL	Carry Case For	Note
UEB10	UEC10	-
UEB20	UEC20	
UEB30	UEC30	Consisting of UEB10 + UEB20

2 & 3 Grip Jaw Hydraulic Puller Sets

UEG Series – Standard Jaw Puller

UEZ Series – Self-Aligning Jaw Puller

Capacity:

10 – 20 – 30 – 50 tonnes

Maximum Reach:

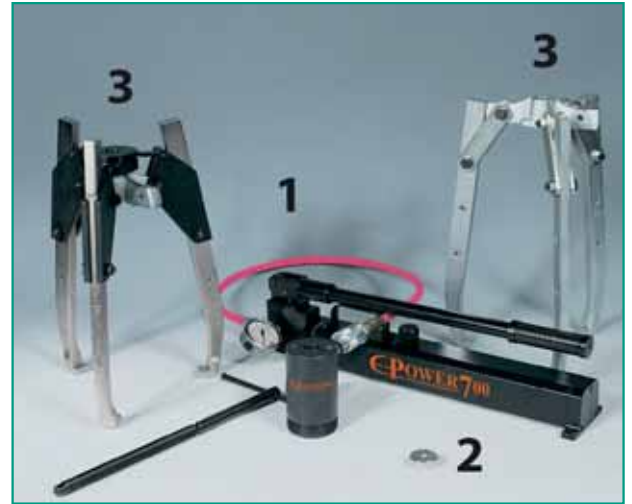
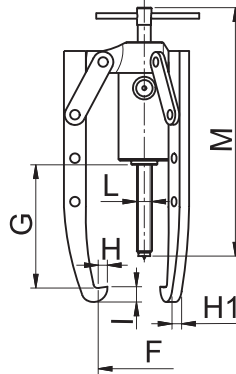
268 – 731 mm

Maximum Spread:

250 – 920 mm

Maximum Operating Pressure:

(Refer Data Charts)



SELECTION CHART FOR STANDARD (UEG) AND SELF ALIGNING TYPE (UEZ) JAW PULLERS

		MODEL				
Description	Cap - Tonnes:	10	20	30	50	
	Standard:	UEG10	UEG20	UEG30	UEG50	
	Self-Aligning:	UEZ10	UEZ20	UEZ30	UEZ50	
HYDRAULICS UEU#	* Pos.					
Hand Pump	1	PN131	PN141	PN141	PN162	
Cylinder		CMF10N50E	CMF20N50E	CMF30N50E	CMF60N75E	
Hose		SN20M	SN20M	SN20M	SN20M	
Pressure Gauge		G106L	G106L	G106L	G106L	
Max. Operating Pressure		-	560 bar - 3 Jaw (375 bar - 2 Jaw)	600 bar - 3 Jaw (400 bar - 2 Jaw)	615 bar - 3 Jaw (405 bar - 2 Jaw)	580 bar - 3 Jaw (390 bar - 2 Jaw)
MECHANICAL PARTS	UEG#M					
	UEZ#M	* Pos.				
Protection Saddle		2	UETS10	UETS20	UETS30	UETS50
Number of Jaws		3	* 2/3	2 & 3	2 & 3	2 & 3
Minimum Spread (mm)		F	50	70	90	120
Maximum Spread (mm)			250	480	580	920
Maximum Reach (mm)		G	268	335	425	731
Jaw Width (mm)		H	14	18	25	30
Jaw Depth (mm)		H1	15	20	22	25
Jaw Thickness (mm)		I	25	32	42	50
Adjusting Screw Thread		L	3/4" - 16 UNF	1" - 8 UNC	1 1/4" - 7 UNC	1 5/8" - 5,5 UNC
Adjusting Screw Length		M	400	670	790	975
Weight 2/3 Jaw		kg	12	22/27	36/45	85/103

* Pos.: Position as shown on illustrated picture & jaw puller drawings.

* Universal crosshead for UEG Puller



The jaw puller **UEZ** is fitted with a self aligning mechanical device to synchronise closing of the jaws on the workpiece so that precise positioning can be obtained.



Each puller component has a different **operating pressure** which must never be exceeded. Please refer to data charts.



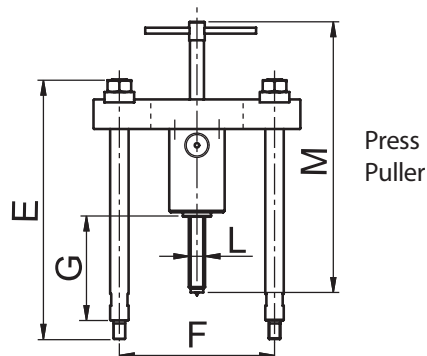
Hydraulic Press Puller Sets

UET Series

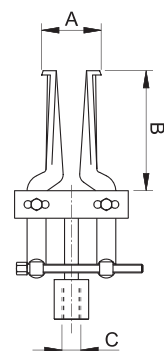


Capacity:
10 – 20 – 30 – 50 tonnes

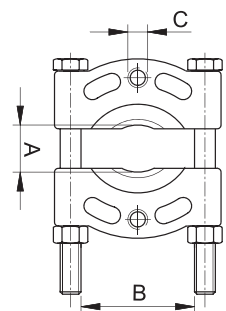
Maximum Operating Pressure:
(Refer Data Charts)



Press Puller



Internal Puller UEI



External Puller UEE

SELECTION CHART FOR PRESS PULLERS

		MODEL											
Capacity - Tonnes (t):		10			20			30			50		
Description		UET10			UET20			UET30			UET50		
HYDRAULICS UEU#	* Pos.												
Hand Pump	1	PN131			PN141			PN141			PN162		
Cylinder		CMF10N50E			CMF20N50E			CMF30N50E			CMF60N75E		
Hose		SN20M			SN20M			SN20M			SN20M		
Pressure Gauge		G106L			G106L			G106L			G106L		
Max. Operating Pressure	-	560bar			600bar			615bar			580bar		
MECHANICAL PARTS UET#M	* Pos.												
Internal Puller	2	UEI10			UEI20			UEI30			UEI50		
External Puller	3	UEE10			UEE20			UEE30			UEE50		
Protection Saddle	4	UETS10			UETS20			UETS30			UETS50		
Number of Legs	5	2	2	2	2	2	2	2	2	2	2	2	
Leg Length (mm)	E	209	460	209	336	515	665	328	582	836	820	1075	
Maximum Reach (mm)	G	-21	230	-56	71	250	400	4	258	512	399	655	
Minimum Spread (mm)	Fmin.	115			135			180			230		
Maximum Spread (mm)	Fmax.	260			345			440			580		
Adjusting Screw Thread	L	3/4" - 16 UNF			1" - 8 UNC			1 1/4" - 7 UNC			1 5/8" - 5,5 UNC		
Adjusting Screw Length	M	400			670			790			975		
Weight	kg	13			32			55			115		

* Pos.: Position as shown on illustrated picture & jaw puller drawings.

INTERNAL PULLER UEI

MODEL	Force	Pressure	Dimensions (mm)					Weight
	t	bar	A min.	A max.	B	C	kg	
UEI10	5	280	32	90	110	3/4" - 16 UNF	2	
UEI20	10	300	33	120	140	1" - 8 UNC	2,5	
UEI30	15	310	58	190	145	1 1/4" - 7 UNC	6	
UEI50	25	290	58	190	145	1 5/8" - 5,5 UNC	6	

EXTERNAL PULLER UEE

MODEL	Force	Pressure	Dimensions (mm)					Weight
	t	bar	A min.	A max.	B	C	kg	
UEE10	7	370	10	110	110	5/8" - 18 UNF	2,5	
UEE20	13	400	17	245	260	5/8" - 18 UNF	5,5	
UEE30	20	410	17	245	260	1" - 14 UNF	25	
UEE50	33	385	17	245	260	1 1/4" - 12 UNF	25	

Hydraulic Spreaders

UD Series

Capacity:

1 & 20 tonnes

Tip Clearance:

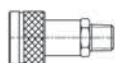
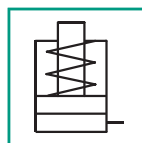
8 - 14 mm

Maximum Spread Range:

18 - 80 mm

Maximum Operating Pressure:

700 bar (10,000 psi)



K73F Female 3/8" NPT
Coupler Included.



FEATURES

'UD' Series **Hydraulic Spreader** is ideal for lifting and levelling of machinery, splitting flanges and for reforming bodywork.

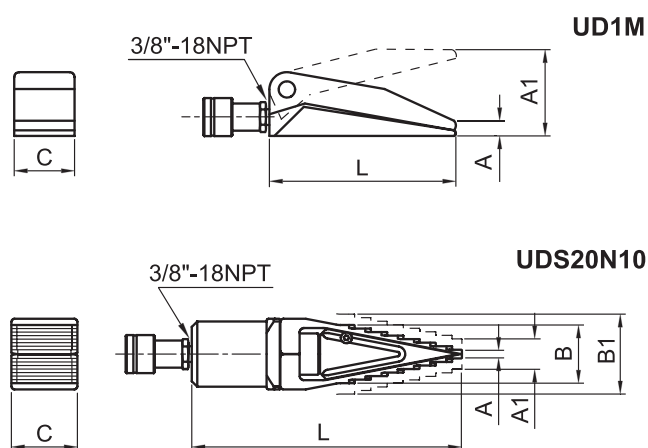
Spreaders are single-acting spring return and retract automatically when pressure is released.

The tool can be ordered in various versions:-

- **UD1M:** 1 tonne capacity Spreader only.
- **UDS20N10:** 20 tonne capacity Spreader only.
- **UD1MC:** 1 tonne capacity Spreader Set comprises of UD1M + PS100 hand pump + SN10M 1m hose.
- **UDS20C:** 20 tonne capacity Spreader Set comprises of UDS20N10 + PN131 hand pump + SN10M 1m hose.

Application:-

- Suitable for use in confined work areas, spread concrete forms or rebar or perform straightening jobs.



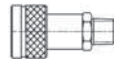
Follow Safety Instruction

SELECTION CHART

Force	MODEL	Oil Volume	Dimensions (mm)						Weight
			A	A1	B	B1	L	C	
Tonnes		cm ³							kg
1	UD1M	4	14	80	-	-	170	52	3,5
20 (Actual: 17)	UDS20N10	41	8	18	54	64	246	60	3,7

Eurojack Head and Toe Lifting Jacks

UJ Series



K73F Female 3/8" NPT Coupler Included.

Capacity:
10 & 25 tonnes

Stroke:
150 mm

Minimum Toe Clearance:
25 - 30 mm

Maximum Operating Pressure:
700 bar (10,000 psi)



FEATURES

'UJ' Series **Power Jack** with adjustable lifting toe is designed to lift large loads from very low positions.

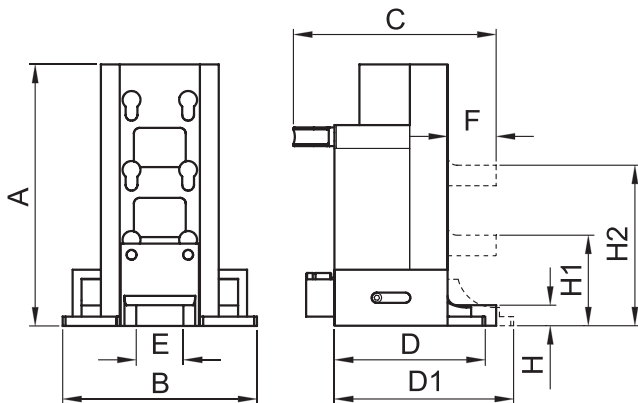
Extendable bases are provided for maximum stability. Lifting toe can be positioned at 3 different levels with only 25mm minimum clearance needed.

Jack operates both vertically and horizontally. The head of the jack may also be used to lift load vertically or be turned onto its side for pushing application.

Equipped with **CMI** Series Single-acting Spring Return Cylinder.

Application:-

- Suitable for lifting, moving and levelling of machinery and heavy equipment from a very low starting height.



Hand Pump **PN131** model is the recommended pump to operate the Power Jack **UJ** model.

SELECTION CHART

Force (PUSH) Tonnes (kN)	Stroke mm	Oil Volume cm ³	MODEL	Dimensions (mm)										Weight kg
				A	B	C	D	D1	E	F	H	H1	H2	
10 (111)	150	238	UJ10	280	206	215	160	190	50	50	25	100	175	22
25 (232)	150	498	UJ20	314	271	290	230	265	70	70	30	110	190	45

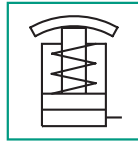
Hydraulic Pipe Benders

UB Series

Capacity:
Up to 17 tonnes

Pipe Bending Capacity:
3/8" to 4" Nominal Bore Tubes

Maximum Operating Pressure:
380 bar



FEATURES

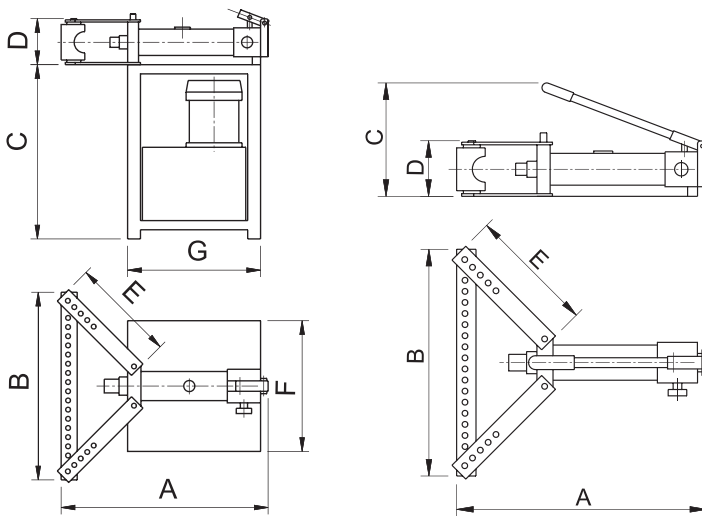
'UB' Series **Pipe Benders** are available in 2 versions:-

- **UB#** – With hand pump and former set for use on Nominal Bore Tubes from 3/8" to 4".
- **UB#M** – With motor-driven pump complete with former set for use on Nominal Bore Tubes from 3/8" to 4".

If necessary, this particular silent and fast version can also be manually-operated.

Applications:-

- 'UB' Series Pipe Benders are suitable for cold-bending without filling from 3/8" to 4" size nominal bore tubes to obtain one shot right and left bends up to 90°.



Pipe Benders for pipe sizes up to 6" nominal bore tubes or for special applications may be supplied upon request.

SELECTION CHART

MODEL	Type of Operation	Former Dimensions												Dimensions (mm)								Weight
		3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"	2"1/2	3"	3"1/2	4"	A	B	C	D	E	F	G	kg		
UB2	Hand Pump (Manual)	•	•	•	•	•	•	•					710	645	460	160	375	-	-	75		
UB3		•	•	•	•	•	•	•	•	•			810	980	550	215	540	-	-	135		
UB4		•	•	•	•	•	•	•	•	•	•	•	870	1016	730	250	590	-	-	180		
UB4M	* Electric	•	•	•	•	•	•	•	•	•	•	•	870	1016	765	250	590	575	585	300		

* 3 kW Motor: 400V/50Hz/3-phase (Can be wired for 230V/50Hz/3-phase upon request).

Load Cells

UL Series



Capacity:
5500 to 23000 kg.

Accuracy:
± 2.5% of full scale

FEATURES

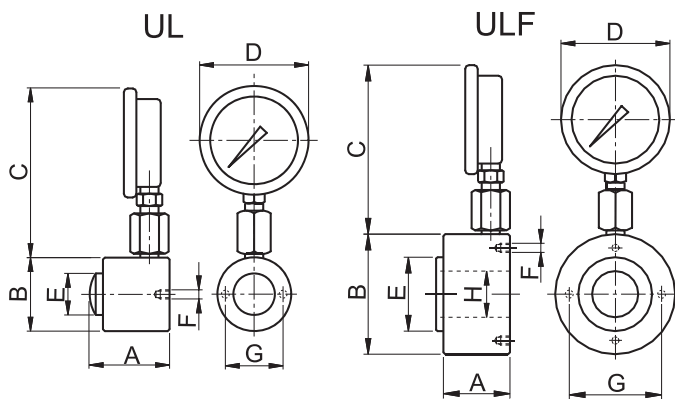
'UJ' Series **Self-contained Hydraulic Load Cells** are fully nitrided to provide high resistance to corrosion. Available in 2 versions:-

- **UL – With Solid Rod**
(Fitted with a spherical push saddle for off-centre load alignment)
- **ULF – With Hollow Rod**
(To insert threaded rods or tie bars)

Pressure Gauge scale marked in kilogram (kg) and equipped with a maximum indicating pointer to measure maximum peak load.
Degree of Accuracy: ±2.5% of full scale.

Application:-

Measurement of force and load.



SELECTION CHART

* Capacity	MODEL	Dimensions (mm)								Weight
kg		A	B	C	D	E	F	G	H	kg
5500	UL05	85	80	217	118	45	2 x M6	65	-	3,7
11000	UL10									
23000	UL23	93	105			65	2 x M8	90	-	6,5
15000	ULF15	80	130			80	4 x M8	100	50	7,0



* Higher capacity load cells available upon request.

For Load Cell complete with 1m flexible hose
– Add suffix 'F'.

MODEL CODE

UL	-	05	#
Load Cell	- with Solid Rod F with Hollow Rod	Capacity in Tonnes	F with 1m flexible tube

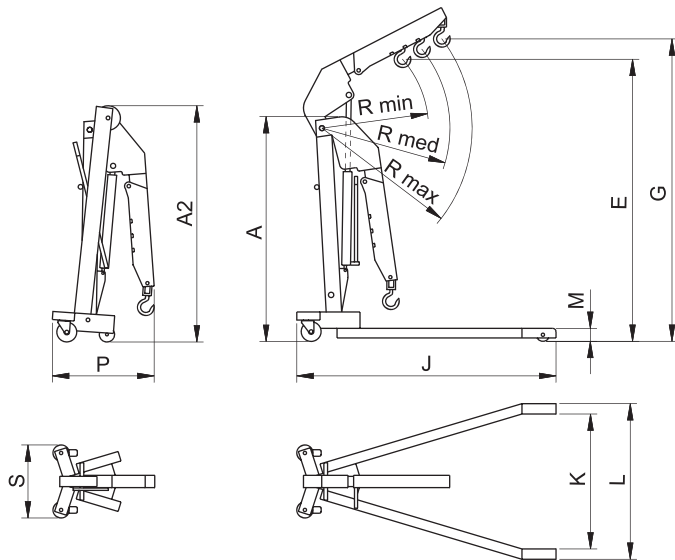
Mobile Floor Cranes

UGC Series

Capacity:

500 – 1000 – 2000 kg

Foldable for Easy Storage.



Always check that the pin is fully secured in the correct locating hole, depending on the jib position, and the load to be lifted.

FEATURES

UGC Series Mobile Floor Cranes are robust, versatile, and fully folding for easy storage.

There are 3 models available with maximum lifting capacities from 500kg to 2000 kg. Each model is fitted with hard wearing polyamide wheels and castors for smooth and quiet operation.

The 3 position fully extendable jib is fitted with a handle to facilitate easy positioning and is complete with lifting hook.

The combined cylinder and pump unit swivels to allow the operator maximum access and control.

The cylinder is equipped with a safety valve and a stroke limitation device.

Application:-

These cranes are used in a wide variety of applications including, machinery and engine removal, and in machine shops.

UGC mobile floor cranes are essential for lifting, moving and positioning of motors & engines and where space is limited.

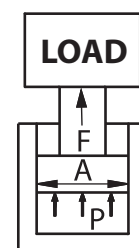
SELECTION CHART

Capacity			MODEL	Dimensions (mm)													Weight kg
Position 1	Position 2	Position 3															
kg	kg	kg		A	A2	E	G	J	K	L	M	R min.	R med.	R max	P	S	
500	400	325	UGC5	1400	1400	1970	2080	1500	820	970	80	1050	1150	1250	465	450	92
1000	800	700	UGC10	1675	1675	2275	2415	1695	935	1085	80	1260	1405	1550	545	450	121
2000	1750	1650	UGC20	1720	1815	2340	2500	1900	1035	1205	200	1275	1420	1570	635	570	173

USEFUL HYDRAULIC FORMULAS

FORCE CAPACITY

- **Pressure** (kg/cm²) = $\frac{\text{Force (kg)}}{\text{Cylinder Effective Area (cm}^2\text{)}}$
- **Force** (kg) = Pressure (kg/cm²) x Cylinder Effective Area (cm²)
- **Area** (cm²) = $\frac{\pi \times D^2}{400}$, where D = Diameter of Cylinder Bore in mm and $\pi = 3,1416$



F = Force
A = Cylinder Bore Eff. Area
P = Pressure

For A Double-Acting Cylinder:

- **Effective Area in Retract/Pull side** (cm²) = Area of Cylinder Bore (cm²) - Area of Piston Rod (cm²)

OIL CAPACITY (Displacement)

- **Cylinder Oil Capacity** (cm³) = $\frac{\text{Effective Area (cm}^2\text{) x Cylinder Stroke (mm)}}{10}$

For A Double-Acting Cylinder:

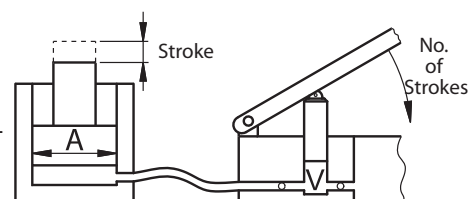
- **Cylinder Oil Capacity** (cm³)
= Cylinder Oil Capacity in Advance/Push side (cm³) - Cylinder Oil Capacity in Retract/Pull side (cm³)

SYSTEM SIZE (Based on Identical Cylinders)

- **Usable Oil Capacity of Pump** (cm³) = Oil Capacity of a Cylinder (cm³) x No. of Cylinder in System

NO. OF STROKES (Hand Pump)

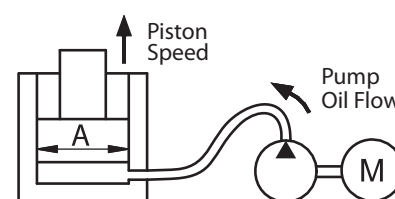
- **No. of Strokes** = $\frac{\text{Cylinder Effective Area (cm}^2\text{) x Cylinder Stroke (mm)}}{\text{Pump Oil Flow per Stroke (cm}^3\text{) x 10}}$



V = Pump Oil Flow / Stroke

PISTON SPEED (Power-driven Pump)

- **Piston Travel Rate** (cm/min.) = $\frac{\text{Pump Oil Flow (cm}^3\text{/min.)}}{\text{Cylinder Effective Area (cm}^2\text{)}}$
- **Time** (min.) taken to move cylinder piston to full stroke = $\frac{\text{Cylinder Oil Capacity (cm}^3\text{)}}{\text{Pump Oil Flow (cm}^3\text{/min.)}}$



A = Cylinder Bore Effective Area

Metric to Imperial Conversion

Length	: 1 mm (0,1 cm)	= 0,0394 in
Area	: 1 cm ²	= 0,1550 in ²
Volume	: 1 cm ³	= 0,06102 in ³
	: 1 litre (1000 cm ³)	= 0,2642 U.S. gallon
Mass	: 1 kg (9.81N)	= 2,2046 lbs
	: 1 tonne (1000 kgs)	= 2204,6 lbs = 1,102 short ton
	(1 kN = 101,972 kgs = 0,10197 tonne = 0,1124 short ton)	
Power	: 1 kW	= 1,341 hp
Torque	: 1 Nm	= 0,7376 ft.lb
Flow Rate	: 1 litre/min	= 0,035 cu.ft./min.
Pressure	: 1 kg/cm ²	= 14,219 psi
	: 1 bar (0,1 MPa)	= 14,5038 psi
	(700 bar = 713,7 kg/cm ² = 10152,6 psi)	

[Imperial to Metric Conversion]

[1 in = 25,4 mm]
[1 in ² = 6,4516 cm ²]
[1 in ³ = 16,3871 cm ³]
[1 U.S. gallon (231 in ³) = 3,7854 litres]
[1 lb = 0,4536 kg]
[1 short ton (2000 lbs) = 0,907 tonnes]
[1 hp = 0,7457 kW]
[1 ft.lb = 1,3558 Nm]
[1 cu.ft./min. = 28,32 litre/min]
[1 psi (lbf/in ²) = 0,0703 kg/cm ²]
[1 psi (lbf/in ²) = 0,0689 bar]

SPECIAL PRODUCTS

LIFTINGS

Lifting and precision levelling of the suspended floors during rebuilding works.



SYNCHRONIZED LIFTINGS

Synchronous lifting of mine digger's cabin P&H 4100 and P&H 2800 for periodic maintenance on cabin's thrust block and turntable.



Levelling of the central bay of a road bridge with high tonnage cylinders with safety nut, CGG series.



Double-acting aluminium telescopic cylinders and Split Flow power pump for the synchronized lifting of military vehicles for the upkeep of tracks.



Lifting of a cylindrical shell used to build a reactor for the oil sector. Cylinders were operated by a Split Flow power pump.



Synchronous lifting on a viaduct of the motorway to replace antivibrating bearings, while traffic remain undisturbed.



SPECIAL PRODUCTS

LOAD TESTS

Resistance and inflexion tests carried out on slabs or beams by using single- or double-acting cylinders.



Strengthening of a motorway viaduct with a test on a 1000 mm diameter cement pile with an induced load of about 700 ton.



Load tests made on a cut off wall in the bearing structure of a buildings foundations.



RERAILING OF RAILWAY CARRIAGES

Rerailing of railway carriages. This system allows the displacement of derailed carriages back onto the rails by using telescopic double-acting cylinders.



ALIGNMENT SYSTEMS

Alignment system made up of special CGG series cylinders for the particles detector at the end of the new LHC accelerator ring.



Foundations of one of the 30 aeolian 30 MW generators installed in the North Sea and levelled with 6 CGS50N100 working at a depth of 10-15 metres under water.



CRIMPING

Some of the special crimping tools projected and manufactured.



SAFETY INSTRUCTIONS

CYLINDERS



- Always provide a solid support for the entire cylinder base area.



- Make sure that the two areas on which the cylinder develop its force are sufficiently strong and non-deformable.



- Never use cylinders without the saddle, as they distribute the load evenly and prevent damage to the piston.



- The cylinder saddle must be in contact with the load and the cylinder movement must be in axis with the load movement.



- Avoid any lifting of off centred loads which could damage the cylinder. The use of a tilt saddle allows a misalignment of the load $\pm 5^\circ$.



- To hold the load lifted use a needle or a pilot check valve in addition to the pump or power pack valve. In case the load has to be held over a long period use a cylinder with a safety lock nut.



- Never work near the load supported only by the hydraulics. The safety lock nut of the cylinders has to be continuously screwed down onto the body of the cylinder during the lifting operation.



- Never place any part of your body under the load and for additional safety support the load mechanically.



- Keep your hydraulic equipment away from temperatures above 65°C (150°F).



- E-POWER 700 components have been treated against corrosion. Nevertheless in case of operations in very humid areas or marine environments, please contact our Technical Department for more information.

SAFETY INSTRUCTIONS



- Avoid retracting the piston too quickly if it is still under load. A sudden retraction creates pressure shocks in the hydraulic circuit. Slowly turn the hand pump and power pack release valve. When 4/3 valves are used in a maintained position it is advised to insert a needle valve between the directional valve and the cylinder in order to have a controlled lowering speed of the load.

- Never exceed the maximum working pressure indicated for any cylinder range.

E-POWER 700 CYLINDERS HAVE BEEN DESIGNED WITH GREAT SAFETY MARGIN. NEVERTHELESS TO AVOID UNDERVALUE THE LOAD TO BE LIFTED, ALWAYS CHOOSE A CYLINDER WITH AT LEAST 20% MORE CAPACITY THAN THE REQUESTED LOAD.



- Do not use any component with a load exceeding their nominal capacity. Always use a gauge to check the circuit pressure or tonnage.



- Before connecting, clean the couplers properly and to avoid contamination use the dust caps when not connected.

HYDRAULIC HOSES



- Always keep the hoses away from the area under the load.



- Only disconnect the cylinder from the pump when the rod has fully retracted.



- Do not lift any hydraulic component by the hose



- Do not kink hoses. The bending radius must not be under 70 mm. Do not walk over or drop heavy objects on them.

SAFETY INSTRUCTIONS

PUMPS



- Never refill the pump above indicated level and whilst the pump is connected to a partially extended cylinder.



- We recommend to use E-POWER 700 hydraulic oil only. Its viscosity and lubrication features guarantee the highest operational efficiency and a longer life of the equipment. The hydraulic oil temperature must not exceed 60°C (140° F). To operate at higher temperatures or with different fluids please contact our Technical Department.



- Do not use any extension on the pump handle. Operate hand pump is easy, when properly handled.



- We recommend to read carefully E-POWER 700 safety instructions before use.



- Use your fingers to close the release valve, a tool could cause damage.



- Use E-POWER 700 hydraulic oil only, to keep the seals intact.

MANUFACTURER GUARANTEE

E-POWER 700 products are covered by a one year guarantee against any defects in materials or workmanship. This guarantee does not cover normal wear and tear, improper use or any applications not in compliance with our recommended instructions, or where the equipment is used with unsuitable fluids, modifications and/or alterations (including those resulting from repair or attempted repair by persons not authorized by E-POWER 700), or damage caused by transportation.

To report any flaw, defect, non conformity, and/or to claim action under this guarantee, the Customer shall inform E-POWER 700 in writing within 5 days after receipt of the goods, or in case of hidden defect, within 5 days after such defect has been discovered. Before returning the goods to E-POWER 700 for possible remedy under guarantee, the purchaser shall have received E-POWER 700 authorization. If E-POWER 700 is firmly convinced that its own product is defective, E-POWER 700 will provide free of charge for repair or replacement. The transport costs to and from E-POWER 700 are at the customer's charge.

If the intervention of E-POWER 700 personnel or of our authorized distributors is requested on the site for installation of the replaced items (provided it is ascertained that they are covered by this guarantee) the costs of transfer of such personnel, their travelling hours and travel expenses are at the Customer's charge, whereas only the actual working hours will be at the charge of E-POWER 700 or of its authorized distributor.

THE ABOVE GUARANTEE IS THE ONLY GUARANTEE ACKNOWLEDGED AND RECOGNIZED BY E-POWER 700 AND IT REPLACES ANY AND ALL OTHER EXPLICIT OR IMPLICIT GUARANTEES REGARDING THE PRODUCTS MANUFACTURED AND MARKED BY E-POWER 700, AS TO THEIR MARKETABILITY OR SUITABILITY FOR SPECIFIC APPLICATIONS.

IT IS HEREBY EXPRESSLY STATED THAT ANY CHARGES AND/OR LIABILITY OF E-POWER 700 ARE EXCLUDED REGARDING:

- ANY ACCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY DEFECTIVE OR NON CONFORMING PRODUCTS, BY NEGLIGENCE OR OTHERWISE.
- DAMAGE DUE TO OTHER CAUSES INCLUDING, BUT NOT LIMITED TO NEGLIGENCE OF E-POWER 700.
- ANY OTHER OBLIGATION OR LIABILITY DERIVING FROM BREACH OF CONTRACT OR OF GUARANTEE.

THIS GUARANTEE WILL NOT BE EFFECTIVE IN CASE OF EVEN PARTIAL DEFAULT IN PAYMENT FOR THE SUPPLIED GOODS, INCLUDING INVOICES FOR TECHNICAL ASSISTANCE SERVICES.

The maximum amount payable by E-POWER 700 for damages will at all events be limited to the actually paid purchase price and shall therefore never exceed this price.

Validity May 2017

E-POWER 700 is the tradename & trademark of **EURO POWER HYDRAULICS PTE LTD**

MANUFACTURER QUALITY

QUALITY CERTIFICATION

E-POWER 700 factory has always been a Company very attentive to quality norms.

This means that both the design of our products and their manufacturing are planned considering the Good Manufacturing Practice. All necessary controls are made to grant our customers the highest possible quality standard. In this way the final product is produced and checked according to the defined procedures and this assures that the quality system is efficient, controlled and proved.

QUALITY SYSTEM CERTIFICATE ISO 9001:2008

Certification for design, manufacturing, marketing and repair of high pressure components



ENVIRONMENTAL SYSTEM CERTIFICATE ISO 14001:2004

System certification for design and manufacture, through the various step of cutting, mechanical machining, surface treatments, painting, assembly, testing, packing and dispatch, sales and service of high pressure hydraulic fluid components.



ANSI B30.1

All cylinders comply to the standard laid down by the American National Standards Institute (apart from CGS#P#, CGG#P#, and CGR Series cylinders).

EN 60204-1

The electric parts of the machines are made according to the standard of EN 60204-1

SAE 100R10

The 700 bar hoses exceed this norm.

CE DIRECTIVES 2006/42/CE – 2006/95/CE –2004/108/CE

All our power pumps conform the CE norm on the machine directive, low tension and electromagnetic compatibility.

CE mark.

All E-POWER 700 products meet the European safety directives.



HYDRAULIC CYLINDERS

Page 4 - 23



HYDRAULIC PUMPS

Page 24 - 46



VALVES AND ACCESSORIES

Page 47 - 56



HYDRAULIC TOOLS

Page 57 - 66



REFERENCES

Page 67 - 73

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E-POWER700