

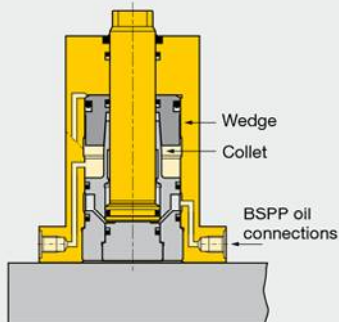
Push cylinders - Collet-Lok® design

Shown: MPTC-110, MPFC-210



MP series

Collet-Lok® positive locking push cylinders are designed to mechanically hold the workpiece after hydraulic pressure is removed. Push capacities range from 11,1 kN to 22,2 kN.



Hydraulic pressure pushes the collet up a wedge, locking the plunger in the clamping position.

Lower flange Collet-Lok® push cylinder used for positioning a motorcycle frame.

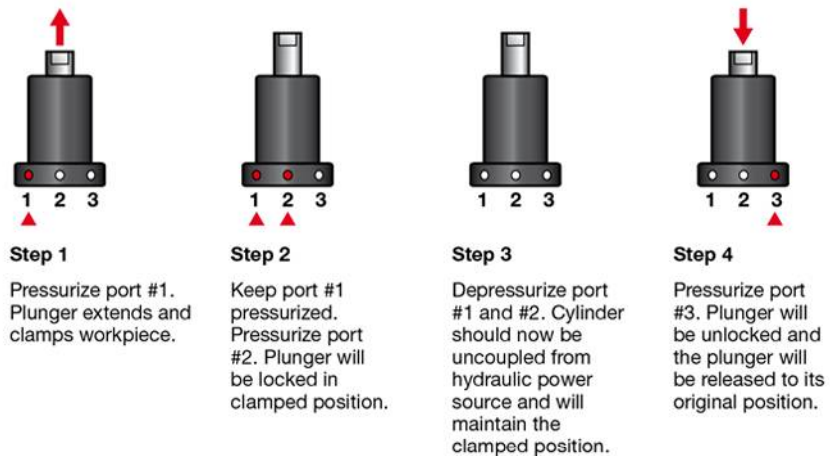


Ideal when live hydraulics are not available

...clamping is sustained mechanically so live hydraulics are not required during the machining cycle

- Double-acting Collet-Lok® action allows fully automated operation
- Additional level of safety since live hydraulics are not required
- Collet-Lok® push cylinders can either be mounted by the flange, or threaded into the fixture
- The Collet-Lok® design is an industry exclusive
- Capacities up to 39,9 kN available on request.

Collet-Lok® sequence



Product selection

Max. push force	Hydr. plunger stroke	Lower flange	Threaded body	Operating pressure		Hydraulic effective area	Oil capacity		Max. oil flow	
				min.	max.		cm ³ unlock	retr.		l/min
kN	mm			bar	cm ² adv.	cm ³ adv.	cm ³ unlock	retr.	l/min	
Model number										
11,1	15,3	MPFC-110V	MPTC-110V	50	350	3,23	4,92	6,06	3,93	2,0
22,2	15,2	MPFC-210V	MPTC-210V	50	350	6,39	10,00	10,00	6,06	4,0

Maximum cycle rate: 8 cycles/min.

Note: Call Enerpac to order models with UNF thread and SAE port connections. Capacities up to 39,9 kN available on request.

Dimensions in mm []

Model number	A	B	C	C1	D	D1	D2	E	E1	F
▼ Lower flange										
MPFC-110V	155,8	140,5	131	-	∅ 70,0	100	-	15,8	15	-
MPFC-210V	176,7	161,5	149	-	∅ 78,0	110	-	22,2	20	-
▼ Threaded body										
MPTC-110V	154,8	139,5	130	18,5	M60 x 2	60	M36 x 1,5	15,8	15	46
MPTC-210V	175,7	160,5	148	18	M70 x 2	70	M48 x 1,5	22,2	20	55

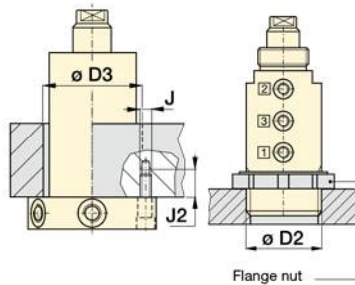
We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications



Dimensions & options **MP-series**

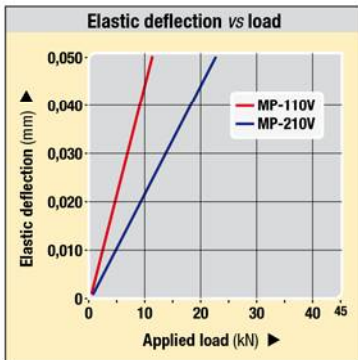
Installation dimensions in mm

Push force kN	Fixture hole ϕ D3	Mounting thread J	Minimum depth J2
▼ Lower flange			
11,1	71	M6 x 1,0	17
22,2	79	M8 x 1,0	18
▼ Threaded body			
11,1	M60 x 2	-	-
22,2	M70 x 2	-	-



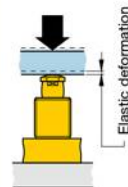
Force: 11,1 - 22,2 kN
Stroke: 15,0 mm
Pressure: 50 - 350 bar

- E** Cilindros de empuje
- F** Vérins pousseurs
- D** Gesicherter Druckzylinder

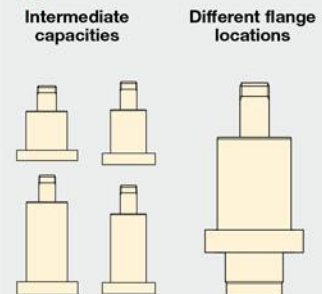


Deflection chart:

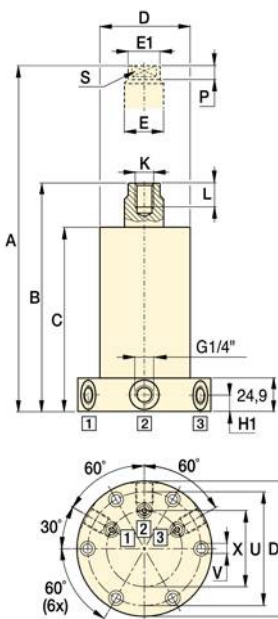
Elastic deformation of the plunger resulting from the application of load.



Custom Options Available



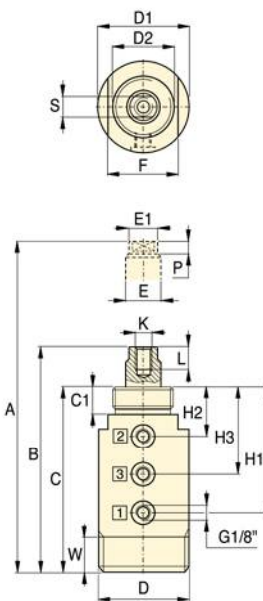
MPFC



Oil port functions

- 1** Clamp
- 2** Lock
- 3** Unlock/Retract

MPTC



H1	H2	H3	K	L	P	S*	U	V	W	X	kg	Model number
12,5	-	-	M8 x 1,25	15	7,0	12,0	84,1	7	-	56,1	4,0	MPFC-110V
12,5	-	-	M10 x 1,5	20	8,7	16,0	94,0	9	-	70,0	5,0	MPFC-210V
Threaded body ▼												
96,0	33,0	64,5	M8 x 1,25	15	7,0	12,0	-	-	19	-	3,0	MPTC-110V
111,0	32,5	72,0	M10 x 1,5	20	8,7	16,0	-	-	20	-	3,4	MPTC-210V

* Spanner holes (x 2)

Options

- Auto couplers**
174 ▶
- Sequence valves**
152 ▶
- Accessories**
86 ▶
- Collet-Lok® swing cylinders**
12 ▶

Important

For proper application, clamp force, pressures and timing, consult Enerpac for support.

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications



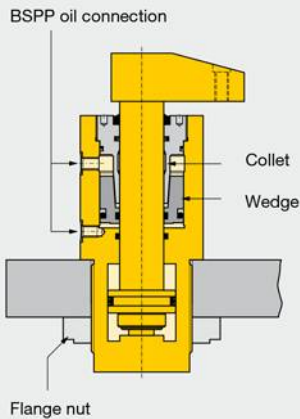
Swing cylinders - Collet-Lok® design

Shown: MPTR-100V, MPFR-100V



MP series

Enerpac Collet-Lok® cylinders are designed to mechanically hold the workpiece after hydraulic pressure is removed. Clamping capacities range from 4,4 to 37,8 kN.



Hydraulic pressure pushes the collet up a wedge, locking the plunger in the clamping position.

Lower flange Collet-Lok® swing cylinder mounted on a pallet.



Ideal when live hydraulics are not available

- Double acting Collet-Lok® action allows fully automated operation
- Additional level of safety since live hydraulics are not required to maintain clamping force
- Collet-Lok® swing cylinders can be mounted by the flange or threaded into the fixture. Flanged models have manifold ports and tubing ports.
- Viton seals are standard.

Selection chart

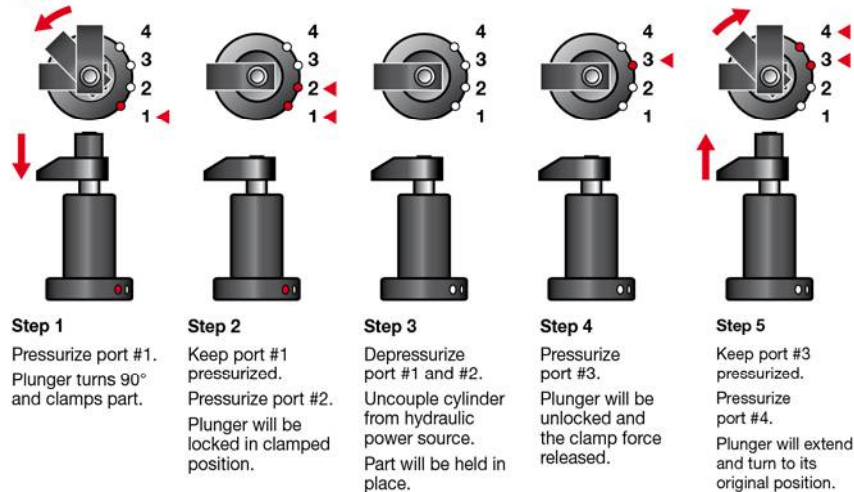
Clamping force ¹⁾	Stroke		Left turning	Right turning	Cylinder effective area		Oil capacity		Max. oil flow ¹⁾	Standard clamp arm
	kN	mm			cm ²	cm ³				
	Clamp	Total			Clamp	Un-clamp	Clamp	Un-clamp	l/min	Sold separately
▼ Lower flange										
			Model number							
4,4	8	24,2	MPFL-50V	MPFR-50V	1,6	4,5	3,9	10,9	0,5	MA-540
8,9	12	28,2	MPFL-100V	MPFR-100V	3,2	7,1	9,0	19,9	1,0	MA-1050
37,8	10	42	MPFL-300V*	MPFR-300V*	13,2	22,2	55,7	93,4	4,0	MA-3070
▼ Threaded body										
			Model number							
8,9	12	28,2	MPTL-100V	MPTR-100V	3,2	7,1	9,0	19,9	0,5	MA-1050
37,8	10	42	MPTL-300V*	MPTR-300V*	13,2	22,2	55,7	93,4	4,0	MA-3070

¹⁾ Using standard clamp arm. Clamp arms are sold separately (14).

Note: - Call Enerpac for models with UNF thread and SAE port connections.
- Minimum working pressure for Collet-Lok® system is 100 bar.

* This product is made to order. Please contact Enerpac for delivery information before specifying in your design.

Collet-Lok® sequence



Product dimensions in mm [\varnothing]

Left turning models *	A	B	C	C1	D	D1	F	H1	H2	H3
					\varnothing	\varnothing	\varnothing			
▼ Lower flange										
MPFL-50V	201,2	177	171,2	25	58	85	19	10	12,5	-
MPFL-100V	222,9	194,7	192,9	25	68	100	22,3	10	12,5	-
MPFL-300V	322	280	275	25	89,8	130	34,9	11	12,5	-
▼ Threaded body										
MPTL-100V	213,2	185	121,3	90,5	M48 x 1,5	64	22,3	31,5	67	75,5
MPTL-300V	310,5	268,5	163	115	M80 x 2,0	89	34,9	38	92	100,5

Note: Dimensions shown with standard clamp arm.

* For nonrotational model replace "L" with "N". Example: MPFN-100V.

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications

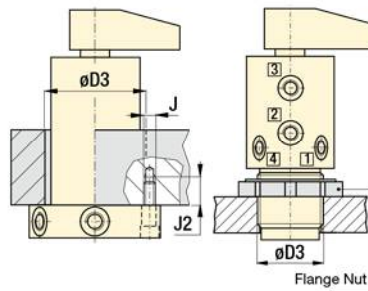


MP-series

Installation dimensions
in mm

Clamping force ¹⁾ kN	Fixture hole Ø D3	Mounting thread J mm	Minimum depth J2
▼ Lower flange			
4,4	58,4 ±0,3	M6 x 1	18
8,9	68,6 ±0,3	M8 x 1,25	19
37,8	90,5 ±0,3	M10 x 1,5	19
Clamping force ¹⁾ kN	Fixture hole Ø D3	Mounting flange Sold separately ┐ 87 ▶	Mounting nut Sold separately ┐ 86 ▶
▼ Threaded body			
8,9	M48 x 1,5	MF-482	FN-482
37,8	M80 x 2	MF-802	FN-802

¹⁾ With standard clamp arm.

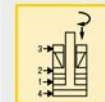


Oil port functions

- 1 90° Rotation and clamp
- 2 Locks system
- 3 Unlocks system
- 4 Unclamp and 90° rotation

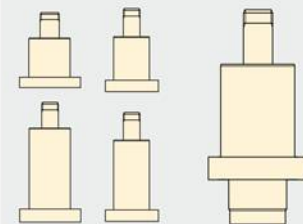
Force: 4,4 - 37,8 kN
Stroke: 24,0 - 42,0 mm
Pressure: 100 - 350 bar

- E** Cilindros giratorios
- F** Vérins de bridage pivotants
- D** Schwenkspannzylinder

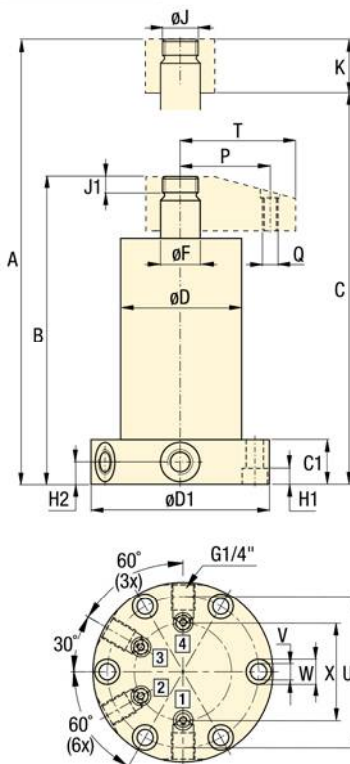


Custom Options Available

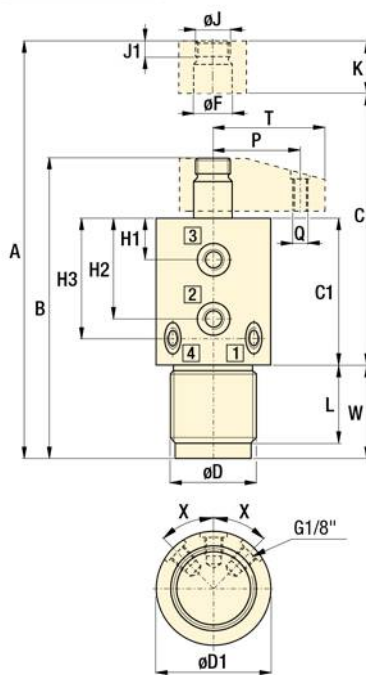
- Intermediate capacities
- Different flange locations



MPF models



MPT models



X = 45° MPT-100 models
X = 30° MPT-300 models

FMS Flexible Machining Systems
See Yellow Pages (┐ 224)

Options

- Clamp arms**
┐ 14 ▶
- Collet-Lok® work supports**
┐ 16 ▶
- Sequence valves**
┐ 152 ▶
- Accessories**
┐ 86 ▶

Important

Minimum unlock pressure must be at least 105 bar above lock pressure.

J	J1	K	L	P	Q	T	U	V	W	X	kg	Right turning models
Lower flange ▼												
M16 x 1,5	8	30	-	40	M8 x 1,25	54	70,1	9	ø 14	48,0	2,3	MPFR-50V*
M20 x 1,5	9	30	-	50	M10 x 1,5	64	84,1	9	ø 14	54,1	3,5	MPFR-100V*
M33 x 2,0	10	47	-	70	M16 x 2	93	112,1	11	ø 17	96,1	12,0	MPFR-300V*
Threaded body ▼												
M20 x 1,5	9	30	41,5	50	M10 x 1,5	64	-	-	61,9	-	3,0	MPTR-100V*
M33 x 2,0	10	47	85	70	M16 x 2	93	-	-	99,5	-	11,0	MPTR-300V*

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications



Swing cylinders, MA-series *Dimensions & options*

Force: 4,4 - 37,8 kN

Pressure: 100 - 350 bar

- E** Brazos de amarre
- F** Bras de bridage
- D** Spannarme

Important

Do not exceed maximum oil flow. If flow rates are exceeded, swing cylinder indexing mechanism may be permanently damaged.

When designing custom clamp arms, the flow rates must be further reduced. This rating should be in proportion to the mass and the center of gravity of the clamp arm.

Example:
If the mass of the arm is twice that of the long arm, flow rates must be reduced by 50%.

Index mechanism



Options

Gauges

□190 ▶



Flow control valves

□155 ▶



Sequence valves

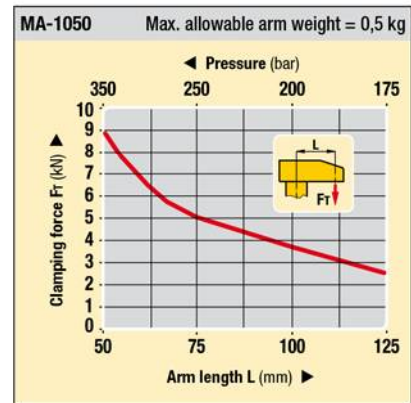
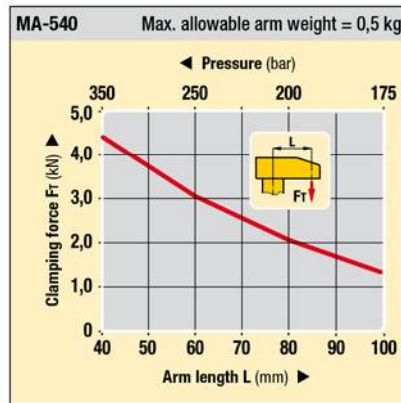
□152 ▶



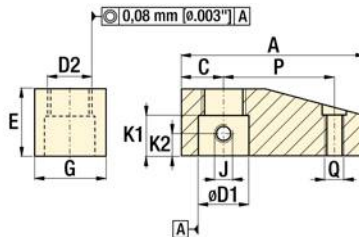
Determine the right size of your Collet-Lok® swing cylinder

The maximum operating pressure, clamping force and length of the clamp arm will determine your size of swing cylinder. The real operating pressure is a function of both the clamp arm length and clamping force.

In the diagrams below you select the required clamp arm length and clamping force. The use of different length clamp arms requires reduction in applied pressure and resulting clamp force. The diagrams below show this relation.



MA models Standard clamp arms for Collet-Lok® swing clamps



Product dimensions in mm [\pm]

Clamp. force kN	Model number	A	C	D1 ø	D2	E	G	J	K1	K2	P	Q	kg
4,4	MA-540	74,7	18,0	19,02-19,05	M16 x 2	30	32	M8 x 1,25	19	10	40	M8 x 1,25	0,5
8,9	MA-1050	83,0	19,0	22,30-22,33	M20 x 1,5	30	35	M8 x 1,25	18	10	50	M10 x 1,5	0,5
37,8	MA-3070	128,0	35,0	34,97-35,00	M33 x 2	47	59	M8 x 1,25	32	17	70	M16 x 2	2,3

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications



Special Collet-Lok® Examples

Special configurations are available

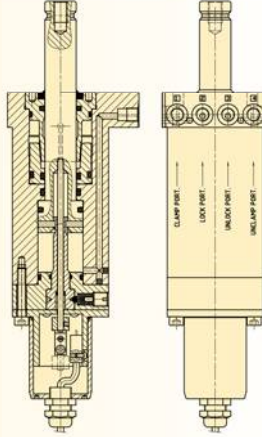
Model: MPFL100PE001-S

Body style: Upper flange

Clamp capacity: 9 kN (2000 lbs)

Clamping stroke: 18 mm (.71 in.)

Special feature: Position sensing



Special features for Swing Cylinders *

Enerpac can design Collet-Lok® cylinders with special features to meet the needs of your production fixtures:

- Special mounting
- Special manifold port location
- Longer stroke
- Special rotation
- Internal clutch to protect rotation mechanism
- Viton seals
- Special rod end
- Position sensing

* Special features also available for Collet-Lok® Push Cylinders and Work Supports.

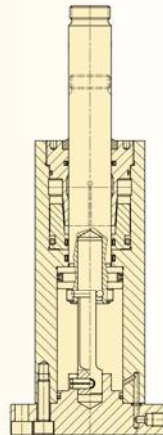
Model: MPFN300VE002

Body style: Lower flange

Clamp capacity: 39 kN (8800 lbs)

Clamping stroke (straight):
57,4 mm (2.25 in.)

Special feature: Viton seals
Long stroke



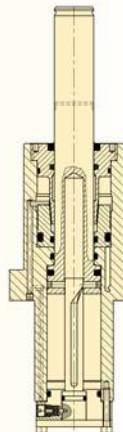
Model: MPFL200VE100

Body style: Mid-body flange

Clamp capacity: 20 kN (3900 lbs)

Clamping stroke (left hand):
63,5 mm (2.50 inch)

Special feature: Viton seals
Long stroke
Mid-flange body



We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications

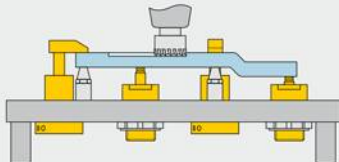
Work supports - Collet-Lok® design

Shown: MPFS-100, MPTS-100



MP series

Enerpac work supports provide either additional non-fixed location points to the clamps, or support to larger or thin section workpiece components, always in order to minimize workpiece deflection during machining. The Collet-Lok® design does not require hydraulic system pressure to maintain support position.



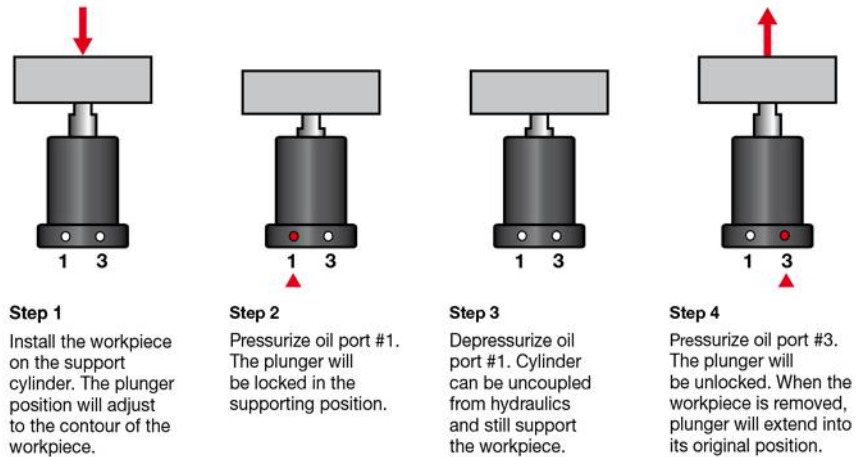
While pallet No. 1 is in the machine, a new work piece is loaded on to pallet No. 2.



Hydraulically locked, mechanically maintained work support

- Collet-Lok® design allows the work support to maintain support position after the hydraulic pressure is removed
- Collet-Lok® maintains a higher level of safety, as it is not dependent on hydraulic supply pressure
- Low deflection: lowest deflection of any work support available
- Threaded or flanged body increases mounting flexibility
- Capacities up to 44,5 kN available.

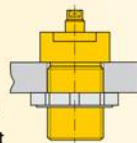
Collet-Lok® sequence



Mounting style

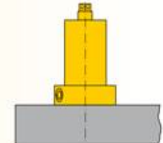
MPT series, Threaded mount

Threaded body can be used with a threaded hole in fixture plate or a jam nut with a bored hole. Ports are located in top collar block.



MPF series, Flange models

Mounts directly to fixture plate. Offers the flexibility of side ports or manifold ports on the underside of the flange.



Product selection

Max. support force	Support plunger stroke	Flange models	Threaded models	Operating pressure		Locking system displacement		Plunger contact spring force	Max. oil flow
				min.	max.	lock	unlock		
kN	mm			bar		cm ³		N	l/min
8,9	10	MPFS-100V	-	100	350	3,93	3,93	20,0	0,5
17,8	10	MPFS-200V	-	100	350	6,06	6,06	35,2	1,0
44,5	19,6	MPFS-450V	-	100	350	18,03	18,03	300,4	4,0
8,9	10	-	MPTS-100V	100	350	3,93	3,93	15,0	0,5
17,8	10	-	MPTS-200V	100	350	6,06	6,06	30,0	1,0

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications



Dimensions & options **MP-series**

Force: 8,9 - 44,5 kN

Stroke: 10 - 19,6 mm

Pressure: 100 - 350 bar

- (E) Cilindros de soporte
- (F) Vérin anti-vibreur
- (D) Abstützzylinder



Options

Collet-Lok® swing cylinders

12 ▶



Auto couplers

174 ▶



Positive clamping cylinders

80 ▶



Sequence valves

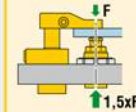
152 ▶



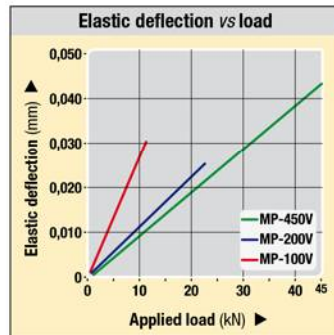
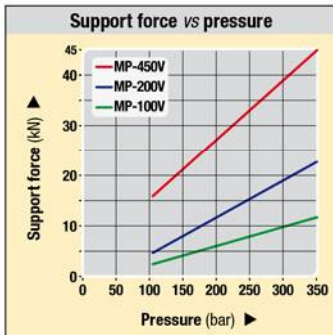
Important

WARNING!

Support force and clamping force must be matched. Support force should be at least 150% of clamping force.

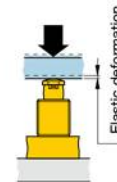


For proper application, clamp force, pressures and timing, consult Enerpac for support.



Deflection chart:

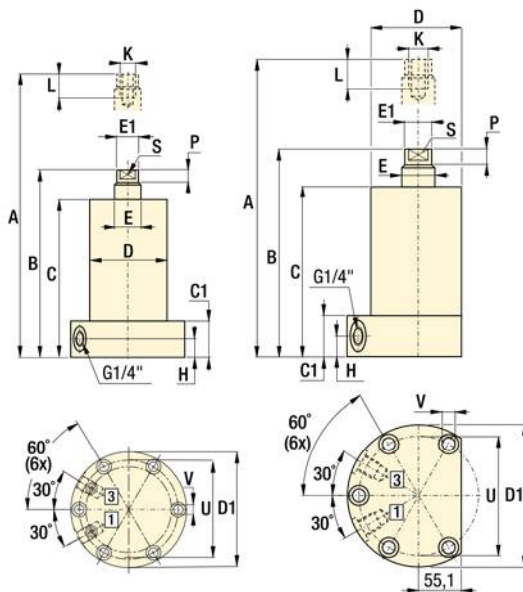
Elastic deformation of the work support resulting from the application of load.



MPFS-100V, -200V

MPFS-450V

MPTS-100V, -200V



Product dimensions in mm [∇ \odot]

Model number	A	B	C	C1	D	D1	E	E1	F	H	K	L	M	P	S*	U	V	W	X	kg
						∅	∅	∅								∅	∅		∅	
▼ Flange models																				
MPFS-100V	126	116	106	25	∅ 76	110	15,9	14	-	12,5	M8 x 1,25	15	-	7	2,8	94,1	9	-	81,5	4,0
MPFS-200V	130	120	106	25	∅ 92	130	25	24	-	12,5	M12 x 1,75	20	-	9	2,8	112,1	9	-	97,1	6,0
MPFS-450V	193,4	173,8	161	25	∅ 130	165	50	48	-	12,5	M20 x 2	30	-	10	30**	147	11	-	125	16,0
▼ Threaded models																				
MPTS-100V	125	115	105	38	M60 x 2	69	15,9	14	55	15,5	M8 x 1,25	15	20	7	2,8	-	-	67	-	3,0
MPTS-200V	129	119	105	38	M80 x 2	89	25	24	70	15,5	M12 x 1,75	20	20	9	2,8	-	-	67	-	4,0

* 2x spanner holes ∅ 2,8 mm for MPFS-100 and 200 models.

** Wrench Flats for MPFS-450.

We offer a Full Range of Hydraulic Products from a comprehensive range of manufacturers to bring you the products and systems most suited to your applications

