

Linear cylinders

Linear Cylinders

A wide variety of styles and features make Enerpac's linear cylinder line the most complete in the industry. Ranging from compact short stroke spring return cylinders to heavy-duty industrial grade double acting automation cylinders, Enerpac has the cylinder to meet every application need. Whether you have to push it, pull it, clamp it, punch it, stamp it, press it, or hold it in place for days at a time, Enerpac has the cylinder to meet your need.



Technical support

Refer to the "Yellow Pages" of this catalog for:

- Safety instructions
- Basic hydraulic information
- Advanced hydraulic technology
- FMS (Flexible Machining Systems) technology
- Conversion charts and hydraulic symbols

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Link Clamps *Application & selection*

Shown: LUCS-32 with LCAS-32



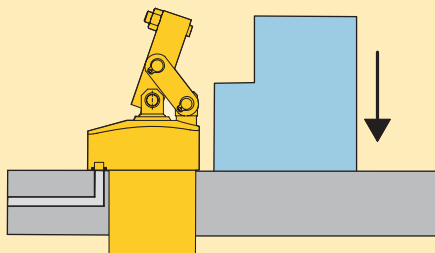
Swing cylinders
Work supports

Linear cylinders

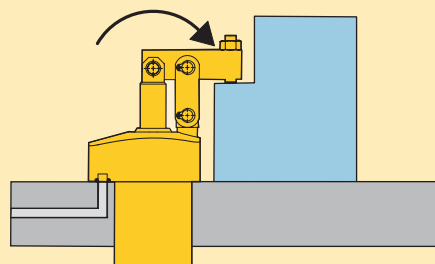
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▶ Link clamp allows unobstructed part loading and high clamping forces. The hydraulic cylinders extend to provide clamping force, and retract to allow part removal.

Arm completely retracts to allow part loading.



As cylinder extends, arm rotates to clamp part in place.

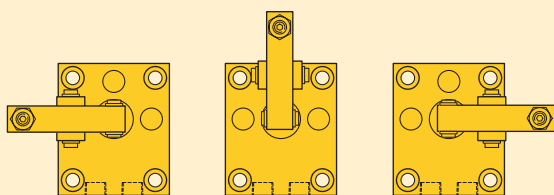


Clamp arm location is changed easily without the use of tools.

Left

Center

Right



Quick and accurate clamping action

- Hydraulic cylinder pushes linkage, rotating clamp arm into position
- Design ensures repeatable clamping location
- Linkage can be re-positioned to clamp at 90, 180, or 270 degrees from ports
- Link clamps can be mounted using the supplied bolts or held in place with a flange nut
- Standard or long clamp arm or long arm sold separately

Product selection

Cylinder clamp force	Stroke	Model number	Effective area	Oil capacity	Clamp arms		
					Model number	Model number	
at 350 bar kN	mm		cm ²	cm ³	Standard	Long arm (sold separately)	
							42 ▶
▼ Single-acting							
2,9	18,5	LUCS-32	1,23	2,27	LCAS-32	LCAL-32	
7,8	23,5	LUCS-82	3,10	7,28	LCAS-82	LCAL-82	
11,8	30,5	LUCS-122	4,13	12,59	LCAS-122	LCAL-122	
▼ Double-acting							
3,0	18,5	LUCD-32	1,23	2,27	LCAS-32	LCAL-32	
8,0	23,5	LUCD-82	3,10	7,28	LCAS-82	LCAL-82	
12,0	30,5	LUCD-122	4,13	12,59	LCAS-122	LCAL-122	

Call Enerpac for higher clamping capacities or to order models with imperial threads and SAE port connections.

Dimensions in mm [⌀]

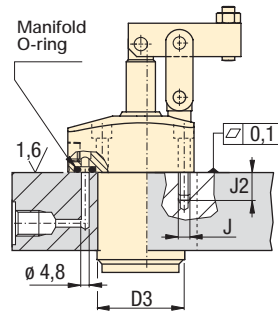
Model number	B1	B2	B3	C	D	D1	D2	E	E1	
					∅					
▼ Single-acting										
LUCS-32	28,0	36,5	55,0	49,0	M48x1,5	62	56	28,0°	1,1	
LUCS-82	30,0	39,5	63,0	55,0	M65x1,5	82	70	25,4°	0,1	
LUCS-122	37,0	49,5	80,0	70,0	M80x2,0	102	88	27,1°	0,7	
▼ Double-acting										
LUCD-32	28,0	36,5	55,0	49,0	M48x1,5	62	56	28,0°	1,1	
LUCD-82	30,0	39,5	63,0	55,0	M65x1,5	82	70	25,4°	0,1	
LUCD-122	37,0	49,5	80,0	70,0	M80x2,0	102	88	27,1°	0,7	



A Installation dimensions in mm [⊕]

Clamp force kN	Fixture hole Ø D3	Mounting thread J	Min. depth J2	Manifold O-ring ¹⁾ ARP nr.
3,0	48,3	M6	16,5	010
8,0	65,3	M8	19,0	010
12,0	80,3	M8	19,0	010

¹⁾ O-rings included. Polyurethane, 92 Durometer. For additional cavity machining information call Enerpac's Technical Service Department.

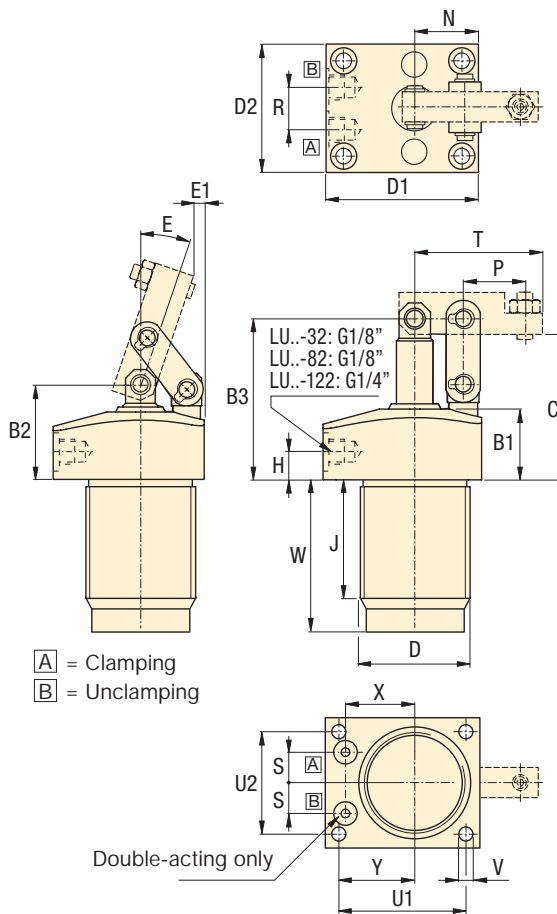


LU-Series

Dimensions shown with standard clamp arm.

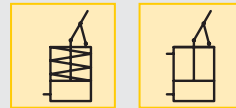
When using the standard and long clamp arms from the LCAS and LCAL series consult the diagrams shown on the next page for clamping forces.

42 ▶



Force:	3,0 - 12,0 kN
Stroke:	18,5 - 30,5 mm
Pressure:	35 - 350 bar

- E** Cilindros de amarre
- F** Vérins de bridage à levier
- D** Gelenkspanner



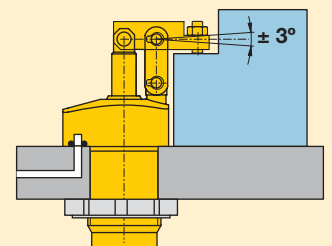
Options

- Clamp arms for link clamps 42 ▶
- Work supports 28 ▶
- Pull down clamps 62 ▶

! Important

Single-acting cylinders use a regenerative circuit; oil is sent to both sides of the piston at the same time. This eliminates the breather port, reducing damage from coolant and contamination.

Clamp arm should be parallel to cylinder mounting surface within 3° to avoid damage to cylinder and linkage. Use the included set screw to adjust clamp arm alignment.



	H	J	N	P	R	S	T	U1	U2	V	W	X	Y	kg	Model number
															Single-acting ▼
	10,5	44	28	23,5	-	10,46	48,0	52	46	7,0	47	28,7	29	1,3	LUCS-32
	11,0	65	35	32,0	-	14,02	67,0	68	56	8,2	65	38,5	40	2,7	LUCS-82
	12,0	71	44	37,5	-	16,07	78,0	88	74	8,2	71	44,2	51	4,8	LUCS-122
															Double-acting ▼
	10,5	44	28	23,5	20	21,76	48,0	52	46	7,0	47	20,3	29	1,4	LUCD-32
	11,0	65	35	32,0	24	25,39	67,0	68	56	8,2	65	30,3	40	2,8	LUCD-82
	12,0	71	44	37,5	30	26,38	78,0	88	74	8,2	71	37,7	51	5,0	LUCD-122

Clamp arms *for link clamps*

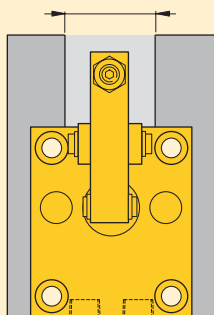
Shown: LCAS-32



▶ Clamp arms are used to transmit the force generated by the link clamp to the workpiece. Standard clamp arms are readily available from Enerpac to meet most applications. In applications that require a custom designed arm, the machining information is supplied on page 43.

Clamp point must be within the boundaries of the anchor links on the clamp. Clamping outside of this area will cause damage to the linkage, leading to premature failure.

Allowable clamping area

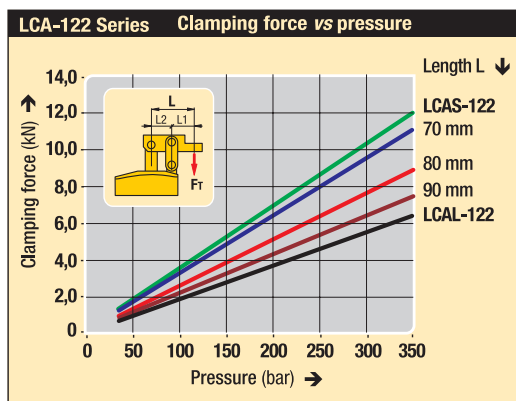
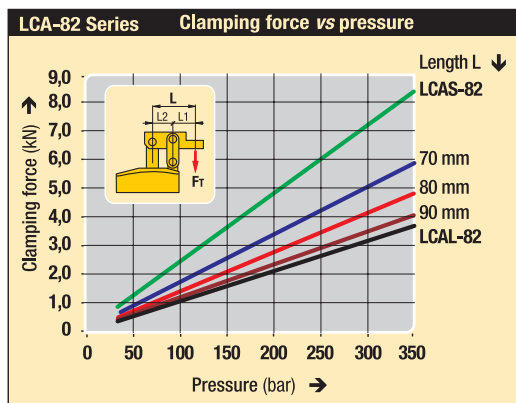
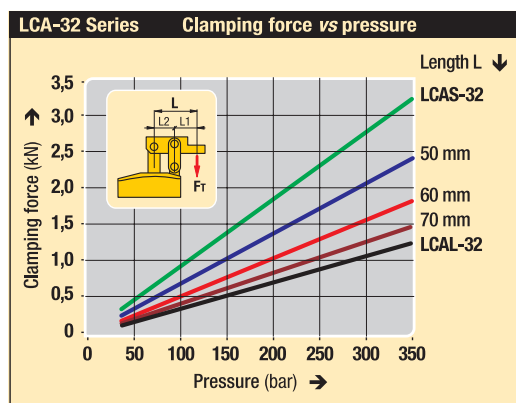


Standard or custom built

- Available from Enerpac in standard or extended length
- Standard arm includes set screw and lock nut
- Long arm can be machined on-site to match your needs
- Make your own custom arm to suit specific applications

Pressure vs clamping force

Different length clamp arms will determine the amount of clamping force transferred to the workpiece. As the length increases, the clamping force decreases.





Force: 1,3 - 12,0 kN

Pressure: 35 - 350 bar

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

Options

Work supports

▣28▶



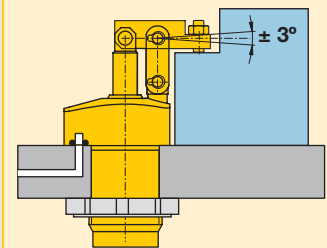
Cylinder accessories

▣72▶



Important

Clamp arm should be parallel to cylinder mounting surface within 3° to avoid damage to cylinder and linkage. Use the included set screw to adjust clamp arm alignment.



Linear cylinders

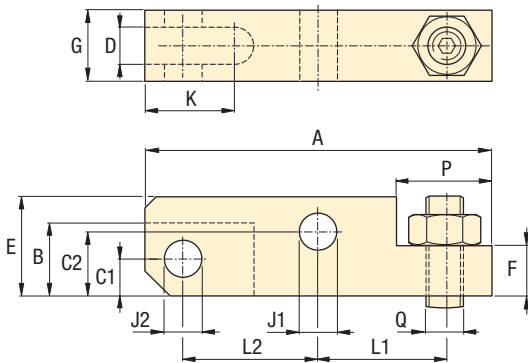
Power sources

Valves

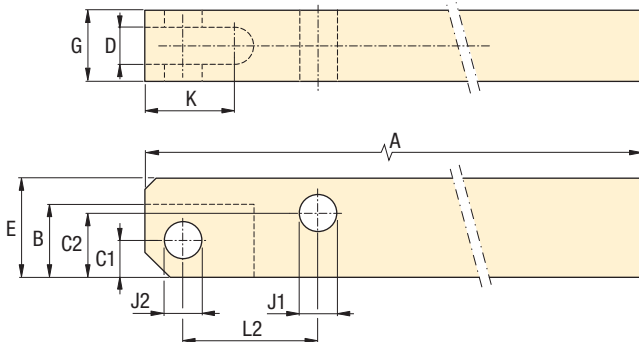
System components

Yellow pages

LCAS series Standard clamp arms



LCAL series Long clamp arms



Dimensions in mm

Clamp arm Model number	Clamping force kN	A	B	C1	C2	D	E	F	G	J1	J2	K	L1	L2	P	Q	kg
▼ Standard clamp arms																	
LCAS-32	3,0	54,0	13,0	6	9,5	6	16	8	11,9	6,02-6,07	6,02-6,07	13	23,5	18,5	13	M6x1,0	0,1
LCAS-82	8,0	74,5	17,5	8	15,5	10	25	13	18,9	10,05-10,10	8,05-8,10	16	32,0	24,5	22	M10x1,5	0,3
LCAS-122	12,0	87,5	22,0	10	19,5	11	32	16	21,9	12,05-12,10	10,05-10,10	20	37,5	30,0	25	M12x1,75	0,5
▼ Long clamp arms																	
LCAL-32	1,3	85,0	13,0	6	9,5	6	16	-	11,9	6,02-6,07	6,02-6,07	13	-	18,5	-	-	0,2
LCAL-82	3,6	105,0	17,5	8	15,5	10	25	-	18,9	10,05-10,10	8,05-8,10	16	-	24,5	-	-	0,4
LCAL-122	6,2	110,0	22,0	10	19,5	11	32	-	21,9	12,05-12,10	10,05-10,10	20	-	30,0	-	-	0,6

Pull cylinders *Application & selection*

Shown: PLSS-121, MPTC-110, PUSD-121



▶ Hydraulic pull cylinders utilize hydraulic pressure to hold down parts in a fixture. The guided plunger maintains orientation during the full clamping cycle, eliminating the need for an external guide. Internally threaded plunger ends accept various custom attachments to assist in the clamping process.

Enerpac offers both single and double-acting pull cylinders, with capacities ranging from 2,6 - 43,5 kN for pulling and 5,3 - 81,9 kN for pushing applications.

■ *Hydraulic fixture with pull and swing cylinders, manifold and threaded cylinders for positioning and holding the work piece during milling process of gun breeches.*



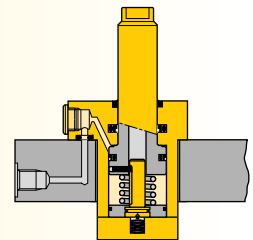
Compact and full featured design

- Guided linear plunger movement
- Compact design allows for efficient fixture layout
- Variety of mounting styles to meet design needs
- Internal plunger thread and flats across plunger top allow easy mounting of attachments
- Choice of porting styles to meet system and design requirements
- Single and double-acting cylinders to suit a variety of hydraulic requirements

i Select your pull cylinder type:

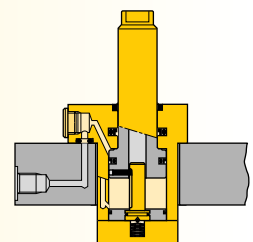
Single-acting

- The obvious choice when there are few system restrictions, and there are not many units retracting simultaneously
- Fewer valving requirements which results in a less complex circuit



Double-acting

- When greater control is required during the unclamp cycle
- When heavy attachments are being used
- When timing sequences are critical: less sensitive to system back pressures resulting from long tube lengths or numerous components being retracted at the same time



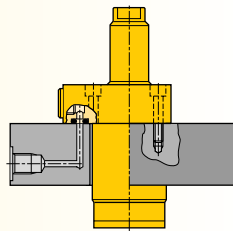
For Collet-Lok® Push cylinders, see 52 ▶



i Select your mounting method:

PU series, Upper flange mounting

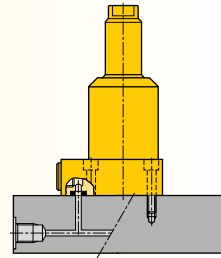
- Flexible design allows for manifold or threaded oil port connection
- The fixture hole does not require tight tolerances
- Easy installation with only 3 or 4 mounting bolts



▣46 ▶

PL series, Lower flange mounting

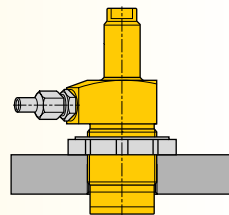
- Flexible design allows for manifold or threaded port connection
- No fixture hole required
- Easy installation with only 3 or 4 mounting bolts



▣48 ▶

PT series, Threaded body mounting

- Body thread for precise cylinder height positioning
- Threaded oil port connection
- Can be threaded directly into the fixture and secured in position by means of standard flange nuts



▣50 ▶

Pull force: 2,6 - 43,5 kN

Push force: 5,3 - 81,9 kN

Stroke: 16,5 - 30,0 mm

Pressure: 35 - 350 bar



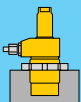
E Cilindros de tracción

F Vérins traction

D Zugzylinder



i Product selection

Cylinder capacity		Stroke mm	Upper flange	Lower flange	Threaded Body
Pull kN	Push kN				
▼ Single-acting			Model number		
2,6	-	16,5	PUSS-22	PLSS-22	PTSS-22
5,6	-	22,6	PUSS-52	PLSS-52	PTSS-52
13,3	-	28,4	PUSS-121	PLSS-121	PTSS-121
▼ Double-acting			Model number		
2,7	5,3	16,5	PUSD-22	PLSD-22	PTSD-22
6,3	13,3	22,6	PUSD-52	PLSD-52	PTSD-52
11,2	28,0	22,1	PUSD-92	PLSD-92	PTSD-92
14,3	27,4	28,4	PUSD-121	PLSD-121	PTSD-121
43,5	81,9	30,0	PUSD-352	PLSD-352	PTSD-352

Note: - Call Enerpac to order models with imperial thread and SAE port connections.
- Pull forces for single-acting cylinders reduced to overcome spring force.

i Options

Sequence valves

▣92 ▶



Accessories

▣72 ▶



Collet-Lok®
push cylinders

▣52 ▶



Work supports

▣28 ▶



Swing cylinders

▣10 ▶



Pull cylinders - Upper flange models

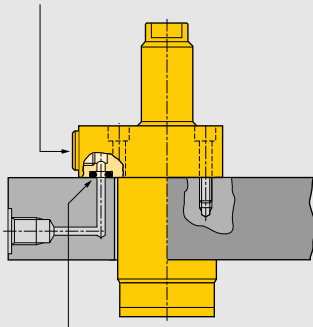
Shown: PUSS-52, PUSD-121



► PU series

Upper flange pull cylinders are designed for integrated manifold mounting solutions. Hydraulic connections are made through SAE or BSPP oil connection or the standard integrated O-ring ports.

BSPP oil connection



Integrated O-ring port

■ *Energac upper flange pull cylinders in a fixture for gun breech production.*



Minimal mounting height

...when space is at a premium

- Guided linear plunger movement
- Flexible design allows for manifold or threaded port connection
- Low profile mounting style allows body to be below mounting surface
- Internal plunger thread allows easy mounting of attachments
- Simple mounting preparation
- Easy to machine fixture hole: does not require tight tolerances
- Easy assembly: 3 or 4 mounting bolts
- Double oil connection: threaded port or manifold mount

Product selection

Cylinder capacity	Stroke		Model number	Cylinder effective area		Oil capacity		
	kN	mm		cm ²	cm ³			
Pull	Push		Pull	Push	Pull	Push		
▼ Single-acting								
2,6	-	16,5	PUSS-22	0,77	-	1,31	-	
5,6	-	22,6	PUSS-52	1,81	-	4,10	-	
13,3	-	28,4	PUSS-121	4,06	-	11,47	-	
▼ Double-acting								
2,7	5,3	16,5	PUSD-22	0,77	1,55	1,31	2,62	
6,3	13,3	22,6	PUSD-52	1,81	3,81	4,10	8,69	
11,2	28,0	22,0	PUSD-92	3,16	8,06	6,88	17,70	
14,3	27,4	28,4	PUSD-121	4,06	7,94	11,47	22,94	
43,5	81,9	30,0	PUSD-352	12,39	23,74	37,20	71,28	

Note: - Call Energac to order models with SAE oil connections.
- Pull forces for single-acting cylinders reduced to overcome spring force.

Dimensions in mm []

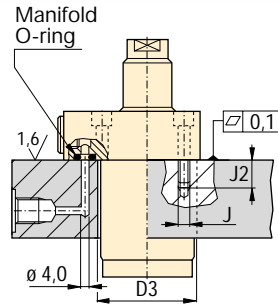
Model number	A	B	D	D1	D2	E	E1	F	G1	H	K
			∅			∅	∅		∅		
▼ Single-acting											
PUSS-22	107	91	28	47,2	45,0	10	8	7,1	9,4	11	M5x0,8
PUSS-52	129	106	35	54,1	57,2	16	15	13,2	11,2	10	M8x1,25
PUSS-121	160	132	48	66,8	73,2	22	21	17,3	11,2	10	.500-20 UNF
▼ Double-acting											
PUSD-22	107	91	28	47,2	45,0	10	8	7,1	9,4	11	M5x0,8
PUSD-52	129	106	35	54,1	57,2	16	15	13,2	11,2	10	M8x1,25
PUSD-92	130	108	48	70,1	53,8	25	24	18,0	11,2	13	M10x1,5
PUSD-121	160	132	48	66,8	73,2	22	21	17,3	11,2	10	.500-20 UNF
PUSD-352	196	166	77	100,1	88,9	38	36	28,4	11,2	13	M16x2



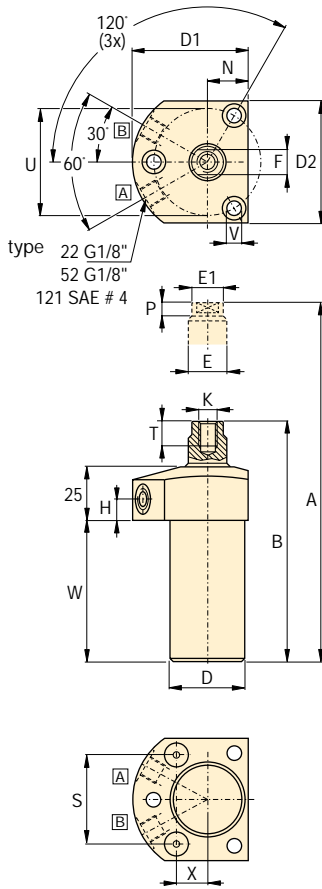
Installation dimensions in mm

Pull Force kN	Fixture hole Ø D3 ±0,3	Mounting thread J	Min. depth J2	Manifold O-ring ¹⁾ ARP nr. or Inside Ø x thickness
2,7	28,5	M5	16,5	568-010
6,3	35,5	M6	16,5	568-011
11,2	49,0	M6	15,0	4,32 x 3,53
14,3	49,0	.312-24 UNF	20,3	568-011
43,5	78,0	M10	18,8	4,32 x 3,53

¹⁾ O-ring material: polyurethane, 92 Durometer

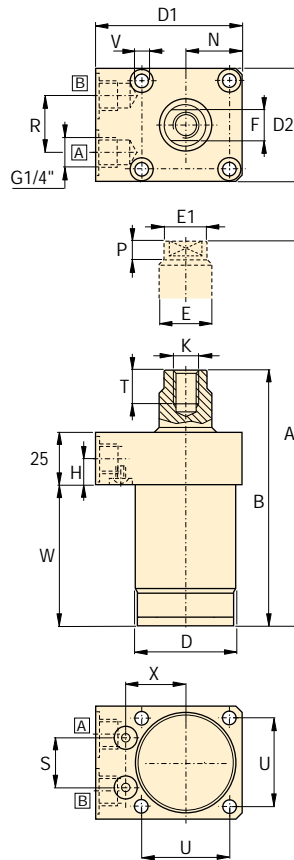


-22, 52, 121



type 22 G1/8"
52 G1/8"
121 SAE # 4

-92, -352



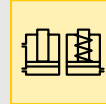
[A] = Pull
[B] = Push (venting)

	N	P	R	S	T	U Ø	V Ø	X	W	kg	Model number
Single-acting ▼											
	15,5	5	-	21,0	8	40,1	5,7	18,1	53,1	0,5	PUSS-22
	19,1	6	-	41,0	16	50,0	6,8	14,3	66,0	1,1	PUSS-52
	25,4	10	-	52,4	19	63,5	8,8	18,4	85,9	1,6	PUSS-121
Double-acting ▼											
	15,5	5	-	21,0	8	40,1	5,7	18,1	53,1	0,5	PUSD-22
	19,1	6	-	41,0	16	50,0	6,8	14,3	66,0	1,1	PUSD-52
	26,9	10	26	23,6	16	41,9	6,9	28,7	68,1	2,0	PUSD-92
	25,4	10	-	52,4	19	63,5	8,8	18,4	85,9	1,6	PUSD-121
	44,5	13	25	34,4	31	70,1	10,8	41,6	88,4	5,1	PUSD-352

Note: U= bolt circle, U1= manifold port circle

Pull force:	2,6 - 43,5 kN
Push force:	5,3 - 81,9 kN
Stroke:	16,5 - 30,0 mm
Pressure:	35 - 350 bar

- [E] Cilindros de tracción
- [F] Vérins traction
- [D] Zugzylinder



Options

Sequence valves [92](#)

Accessories [72](#)

Collet-Lok® push cylinders [52](#)

Swing cylinders [10](#)

Important

Single-acting cylinders can be vented through the manifold port.

The upper flange pull cylinder has a bolt pattern which is identical to its lower flange equivalent, enabling interchangeability.

In case there is a risk of machining coolants and debris being inhaled via the breather vent, it is recommended to pipe this port to an area outside the fixture that is protected from machining coolants and debris.

Pull cylinders - Lower flange models

Shown: PLSD-52, PLSD-121



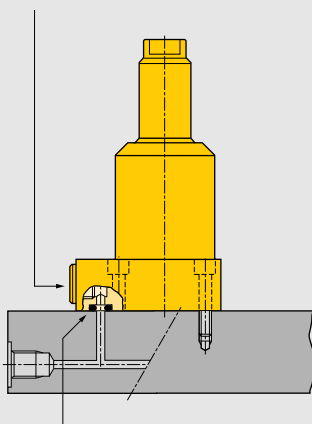
Swing cylinders
Work supports

Linear cylinders

▶ PL series

The lower flange cylinders are designed for integrated manifold mounting solutions. Hydraulic connections are made through SAE or BSPP oil connection or the standard integrated O-ring ports.

BSPP oil connection



Integrated O-ring port

Minimal mounting height

...when space is at a premium

- Guided linear plunger movement
- Flexible design allows for manifold or threaded port connection
- Low profile mounting style allows body to be below mounting surface
- Internal plunger thread allows easy mounting of attachments
- Easiest mounting preparation in the line
- Easy to machine fixture hole: does not require tight tolerances
- Easy assembly: 3 or 4 mounting bolts
- Double oil connection: threaded port or manifold mount

Product selection

Cylinder capacity	Stroke		Model number	Cylinder effective area		Oil capacity	
	kN	mm		cm ²	cm ³		
Pull	Push		Pull	Push	Pull	Push	
▼ Single-acting							
2,6	-	16,5	PLSS-22	0,77	-	1,31	-
5,6	-	22,6	PLSS-52	1,81	-	4,10	-
13,3	-	28,4	PLSS-121	4,06	-	11,47	-
▼ Double-acting							
2,7	5,3	16,5	PLSD-22	0,77	1,55	1,31	2,62
6,3	13,3	22,6	PLSD-52	1,81	3,81	4,10	8,69
11,2	28,0	22,0	PLSD-92	3,16	8,06	6,88	17,70
14,3	27,4	28,4	PLSD-121	4,06	7,94	11,47	22,94
43,5	81,9	30,0	PLSD-352	12,39	23,74	37,20	71,28

Nota: - Call Enerpac to order models with SAE port connections.
- Pull forces for single-acting cylinders reduced to overcome spring force.

Dimensions in mm [⊕]

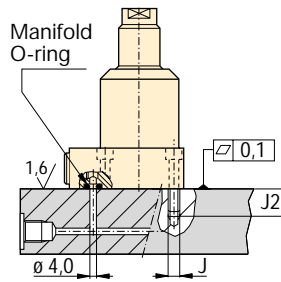
Model number	A	B	C	D	D1	D2	E	E1	F	H	K
				∅			∅				
▼ Single-acting											
PLSS-22	107	91	78	28	47	45	10	9	7	14	M5x0,8
PLSS-52	129	106	91	35	54	57	16	15	13	14	M8x1,25
PLSS-121	160	132	111	48	67	73	22	21	17	16	.500-20 UNF
▼ Double-acting											
PLSD-22	107	91	78	28	47	45	10	9	7	14	M5x0,8
PLSD-52	129	106	91	35	54	57	16	15	13	14	M8x1,25
PLSD-92	138	116	101	48	70	54	25	24	18	13	M10x1,5
PLSD-121	160	132	111	48	67	73	22	21	17	16	.500-20 UNF
PLSD-352	204	173	121	80	100	89	38	36	28	12	M16x2



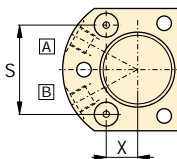
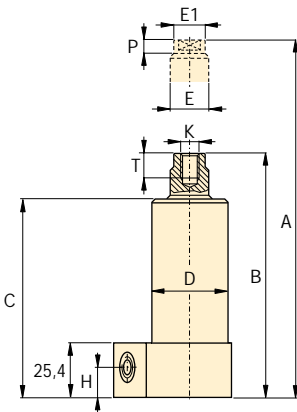
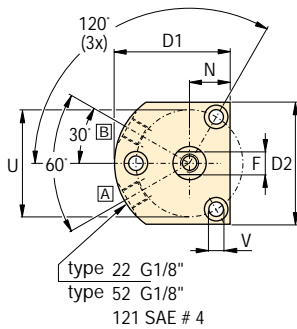
A Installation dimensions in mm

Pull Force kN	Mounting thread J	Minimum depth J2	Manifold O-ring ¹⁾ ARP nr. or Inside Ø x thickness
2,7	M5	16,5	568-010
6,3	M6	16,5	568-011
11,2	M6	15,0	4,32 x 3,53
14,3	M8	20,3	568-011
43,5	M10	18,8	4,32 x 3,53

¹⁾ O-ring material: polyurethane, 92 Durometer

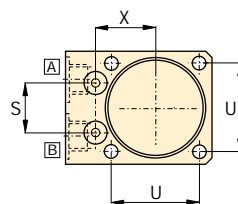
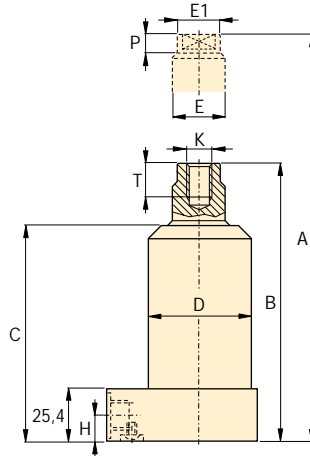
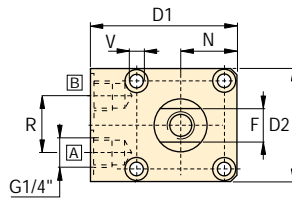


-22, 52, 121



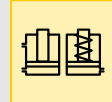
A = Pull
B = Push (venting)

-92, -352



Pull force:	2,6 - 43,5 kN
Push force:	5,3 - 81,9 kN
Stroke:	16,5 - 30,0 mm
Pressure:	35 - 350 bar

- E** Cilindros de tracción
- F** Vérins traction
- D** Zugzylinder



B Options

Sequence valves **92**

Accessories **72**

Collet-Lok® push cylinder **52**

Swing cylinders **10**

! Important

Single-acting cylinders can be vented through the manifold port.

The lower flange pull cylinder has a bolt pattern which is identical to its upper flange equivalent, enabling interchangeability.

In case there is a risk of machining coolants and debris being inhaled via the breather vent, it is recommended to pipe this port to an area outside the fixture that is protected from machining coolants and debris.

	N	P	R	S	T	U	V	X	kg	Model number
							Ø			
	15,5	5	-	21,0	8	40	5,7	18,1	0,5	PLSS-22
	19,1	6	-	41,0	16	50	6,8	14,3	1,1	PLSS-52
	25,4	10	-	52,4	19	64	8,8	18,4	1,6	PLSS-121
	15,5	5	-	21,0	8	40	5,7	18,1	0,5	PLSD-22
	19,1	6	-	41,0	16	50	6,8	14,3	1,1	PLSD-52
	10,4	10	26	23,6	16	42	6,9	28,7	2,0	PLSD-92
	25,4	10	-	52,4	19	64	8,8	18,4	1,6	PLSD-121
	44,5	13	25	34,4	31	70	10,8	41,6	5,6	PLSD-352

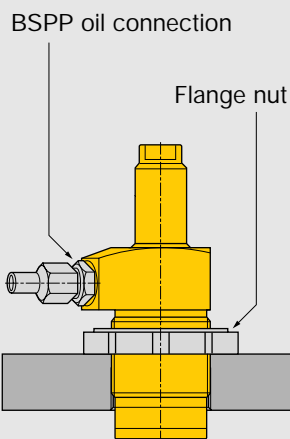
Pull cylinders - Threaded body models

Shown: PTSS-22, PTSD-52



▶ PT series

The threaded body pull cylinders can be bolted to the fixture. This allows easy installation or removal of the unit and does not require machined fixture holes. The cylinder is adjusted to the appropriate height, and then locked in place using a flange nut (□ 72).



■ Threaded body pull cylinder with modified clamp arm, mounted on a frame-straightening fixture.



Threaded directly into the fixture

...can be secured at any height

- Guided linear plunger movement
- Threaded port connection
- Internal plunger thread allows easy mounting of attachments
- Simple mounting preparation
- Easy installation and removal
- Greatest flexibility in fixture design

🌐 Product selection

Cylinder capacity	Stroke		Model number	Cylinder effective area		Oil capacity		
	kN Pull	mm Push		cm ² Pull	cm ³ Push			
▼ Single-acting								
2,6	-	16,5	PTSS-22	0,77	-	1,31	-	
5,6	-	22,6	PTSS-52	1,81	-	4,10	-	
13,3	-	28,4	PTSS-121	4,06	-	11,47	-	
▼ Double-acting								
2,7	5,3	16,5	PTSD-22	0,77	1,55	1,31	2,62	
6,3	13,3	22,6	PTSD-52	1,81	3,81	4,10	8,69	
11,2	28,0	22,0	PTSD-92	3,16	8,06	6,88	17,70	
14,3	27,4	28,4	PTSD-121	4,06	7,94	11,47	22,94	
43,5	81,9	30,0	PTSD-352	12,39	23,74	37,20	71,28	

Note: - Call Enerpac to order models with imperial thread and SAE port connections.
- Pull forces for single-acting cylinders reduced to overcome spring force.

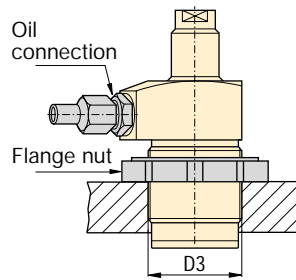
📐 Dimensions in mm [▷⊕]

Model number	A	B	C1	D	D1	D2	E	
				∅			∅	
▼ Single-acting								
PTSS-22	107	91	25,4	M28 x 1,5	39,4	33,0	10	
PTSS-52	129	106	25,4	M35 x 1,5	50,0	38,1	16	
PTSS-121	160	132	25,4	1.875-16 UN	60,5	50,8	22	
▼ Double-acting								
PTSD-22	107	91	25,4	M28 x 1,5	39,4	33,0	10	
PTSD-52	129	106	25,4	M35 x 1,5	50,0	38,1	16	
PTSD-92	130	108	30,0	M48 x 1,5	62,5	48,0	25	
PTSD-121	160	132	25,4	1.875-16 UN	60,5	50,8	22	
PTSD-352	196	166	32,0	M80 x 2	88,4	80,0	38	



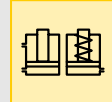
A Installation dimensions
in mm

Pull Force kN	Fixture hole thread size D3
2,7	M28 x 1,5
6,3	M35 x 1,5
11,2	M48 x 1,5
14,3	1.875-16 UNF
43,5	M80 x 2



Pull force:	2,6 - 43,5 kN
Push force:	5,3 - 81,9 kN
Stroke:	16,5 - 30,0 mm
Pressure:	35 - 350 bar

- E** Cilindros de tracción
- F** Vérins traction
- D** Zugzylinder



Linear cylinders

Power sources

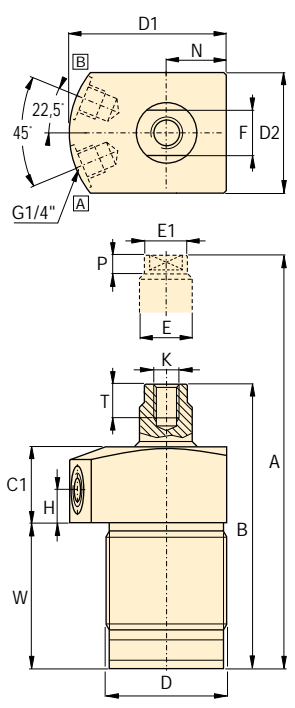
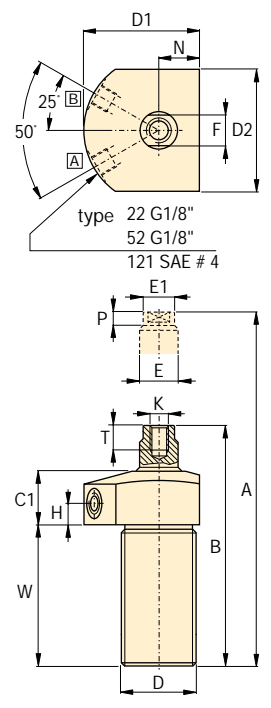
Valves

System components

Yellow pages

-22, 52, 121

-92, -352



A = Pull
B = Push (venting)

B Options

- Sequence valve [92](#)
- Accessories [72](#)
- Collet-Lok® push cylinders [52](#)
- Swing cylinders [10](#)

! Important

Single-acting cylinders can be vented through the manifold port.

In case there is a risk of machining coolants and debris being inhaled via the breather vent, it is recommended to pipe this port to an area outside the fixture that is protected from machining coolants and debris.

	E1	F	H	K	N	P	T	W	kg	Model number
	∅									
										Single-acting ▼
	9	7	10	M5 x 0,8	15,5	5	8	52,6	0,5	PTSS-22
	15	13	10	M8 x 1,25	19,1	6	16	65,6	1,1	PTSS-52
	21	17	10	.500-20 UNF	25,4	10	19	85,8	1,6	PTSS-121
										Double-acting ▼
	9	7	10	M5 x 0,8	15,5	5	8	52,6	0,5	PTSD-22
	15	13	10	M8 x 1,25	19,1	6	16	65,6	1,1	PTSD-52
	24	18	13	M10 x 1,5	23,9	10	16	63,0	2,0	PTSD-92
	21	17	10	.500-20 UNF	25,4	10	19	85,8	1,6	PTSD-121
	36	28	13	M16 x 2	39,9	13	31	82,0	4,7	PTSD-352

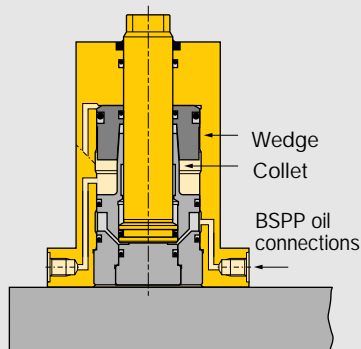
Push cylinders - Collet-Lok® Design

Shown: MPTC-110, MPFC-210



MP series

Collet-Lok® 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.

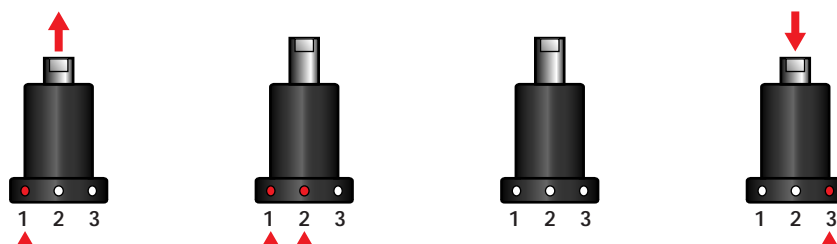


Ideal when live hydraulics are not available

...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

Collet-Lok® sequence



Step 1

Pressurize port #1. Plunger extends and clamps workpiece.

Step 2

Keep port #1 pressurized. Pressurize port #2. Plunger will be locked in clamped position.

Step 3

Depressurize port #1 and #2. Cylinder should now be uncoupled from hydraulic power source and will maintain the clamped position.

Step 4

Pressurize port #3. Plunger will be unlocked and the plunger will be released to its original position.

Product selection

Max. push force	Hydr. plunger stroke	Lower flange	Threaded body	Operating pressure		Hydraulic effective area		Oil capacity		Max. oil flow
				min.	max.	lock	adv.	unlock	retr.	
kN	mm			bar	bar	cm ²	cm ²	cm ³	cm ³	l/min
11,1	15,0	MPFC-110	MPTC-110	50	350	3,23	4,92	6,06	3,93	9,8
22,2	15,0	MPFC-210	MPTC-210	50	350	6,39	10,00	10,00	6,06	9,8

Maximum cycle rate: 8 cycles/min.

Note: Call Enerpac to order models with imperial thread and SAE port connections.

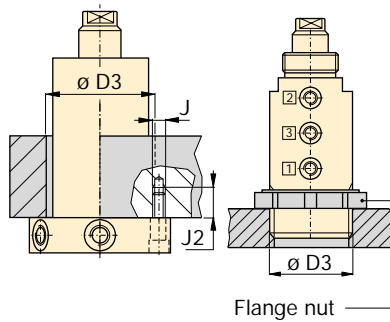
Dimensions in mm [⌀]

Model number	A	B	C	C1	D	D1	D2	E	E1	F
					Ø	Ø		Ø	Ø	Ø
▼ Lower flange										
MPFC-110	154	139	131	-	70,1	100	-	16	15	-
MPFC-210	172	157	149	-	78,0	110	-	22	20	-
▼ Threaded body										
MPTC-110	154	139	130	19	M60 x 2	64	M36 x 1,5	16	15	46
MPTC-210	171	156	148	18	M70 x 2	74	M48 x 1,5	22	20	55



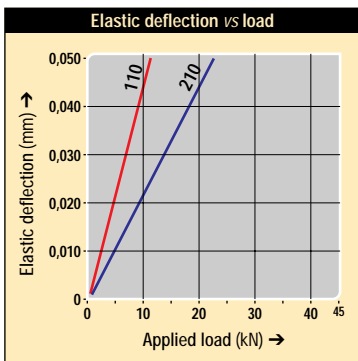
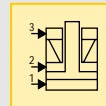
Installation dimensions in mm

Push force kN	Fixture hole øD3	Mounting Thread J	Minimum depth J2
▼ Lower flange			
11,1	71	M6	17
22,2	79	M8	18
▼ Threaded body			
11,1	M60 x 2	-	-
22,2	M70 x 2	-	-

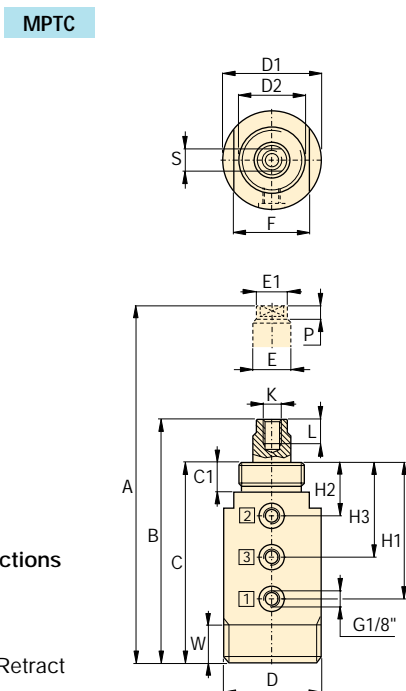
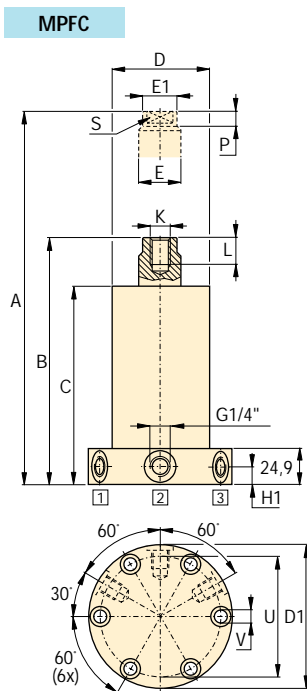
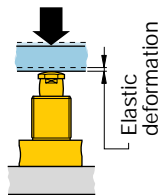


Push force:	11,1 - 22,2 kN
Stroke:	15,0 mm
Pressure:	50 - 350 bar

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



Deflection chart:
Elastic deformation of the work support resulting from the application of load.



Oil port functions

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

Options

- Auto couplers**  100 ▶
- Sequence valves**  92 ▶
- Accessories**  72 ▶
- Swing cylinders**  10 ▶
- Contact bolts**  72 ▶

H1	H2	H3	K	L	P	S	U	V	W		Model number	
											kg	
											Lower flange ▼	
12,4	-	-	M8 x 1,25	15	7	12	84	7	-	4,0	MPFC-110	
12,4	-	-	M10 x 1,5	20	9	16	94	9	-	5,0	MPFC-210	
											Threaded body ▼	
96,0	33	65	M8 x 1,25	15	7	12	-	-	19	3,0	MPTC-110	
111,0	32	72	M10 x 1,5	20	9	16	-	-	20	3,4	MPTC-210	

Important

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

Threaded cylinders *Application & selection*

Shown: CST-382, CST-572, CST-18252, CDT-18132, CDT-40252

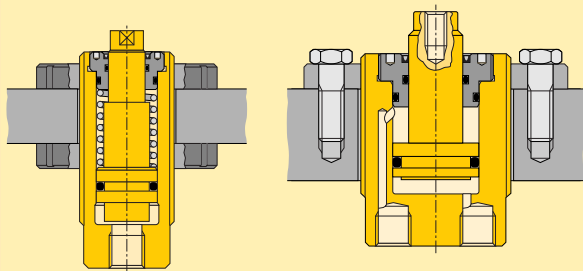


Swing cylinders
Work supports

Linear cylinders

9B_050_2

▶ Threaded cylinders are designed for workpiece positioning, holding and ejecting applications where space is at a premium. Double-acting models are also suited to manufacturing applications, such as production punching.



■ Threaded cylinder, mounted with horizontal bracket to position the workpiece against the stops. Enerpac swing cylinders are then activated to clamp the work piece before machining operations begin.



High clamping forces in a compact design

- Minimum cylinder diameter combined with maximized clamping forces
- Threaded body allows fine positioning and easy installation
- Nitro carburized bodies and internal plunger wipers allow maintenance-free, high cycle performance
- Center-tapped plungers will hold workpiece contact buttons
- Single-acting models with spring return simplify hydraulic tubing requirements
- Double-acting models are ideal for applications requiring powered pulling toward the cylinder body

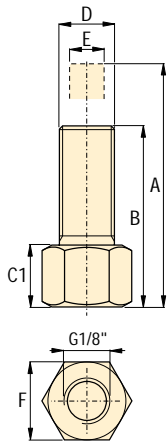
Product selection

Cylinder capacity at 350 bar	Stroke	Model number	Effective area		Oil capacity		
			push	pull	push	pull	
kN	mm		cm ²	cm ²	cm ³	cm ³	
push			pull	push	pull		
▼ Single-acting							
1,7	-	7	CST-272	0,50	-	0,36	-
1,7	-	10	CST-2102	0,50	-	0,52	-
1,7	-	13	CST-2132	0,50	-	0,67	-
5,6	-	7	CST-572	1,61	-	1,08	-
5,6	-	13	CST-5132	1,61	-	2,01	-
5,6	-	19	CST-5192	1,61	-	2,94	-
5,6	-	25	CST-5252	1,61	-	3,87	-
5,6	-	38	CST-5382	1,61	-	5,88	-
11,7	-	7	CST-1072	3,35	-	2,32	-
11,7	-	13	CST-10132	3,35	-	4,31	-
11,7	-	19	CST-10192	3,35	-	6,30	-
11,7	-	25	CST-10252	3,35	-	8,29	-
11,7	-	38	CST-10382	3,35	-	12,60	-
17,8	-	13	CST-18132	5,08	-	6,63	-
17,8	-	25	CST-18252	5,08	-	12,74	-
17,8	-	38	CST-18382	5,08	-	19,37	-
17,8	-	50	CST-18502	5,08	-	25,48	-
27,8	-	15	CST-27152	7,93	-	11,82	-
27,8	-	25	CST-27252	7,93	-	19,70	-
27,8	-	50	CST-27502	7,93	-	39,40	-
39,9	-	13	CST-40132	11,42	-	14,76	-
39,9	-	25	CST-40252	11,42	-	28,39	-
39,9	-	38	CST-40382	11,42	-	43,15	-
39,9	-	50	CST-40502	11,42	-	56,78	-
▼ Double-acting							
17,4	10,5	13	CDT-18132	4,99	3,01	6,63	3,94
17,4	10,5	25	CDT-18252	4,99	3,01	12,74	7,58
17,4	10,5	38	CDT-18382	4,99	3,01	19,37	11,52
17,4	10,5	50	CDT-18502	4,99	3,01	25,48	15,16
27,4	18,5	15	CDT-27152	7,82	5,29	11,81	7,94
27,4	18,5	25	CDT-27252	7,82	5,29	19,68	13,23
27,4	18,5	50	CDT-27502	7,82	5,29	39,35	26,45
39,8	26,5	13	CDT-40132	11,37	7,58	14,76	9,81
39,8	26,5	25	CDT-40252	11,37	7,58	28,39	18,87
39,8	26,5	38	CDT-40382	11,37	7,58	43,15	28,68
39,8	26,5	50	CDT-40502	11,37	7,58	56,77	37,74

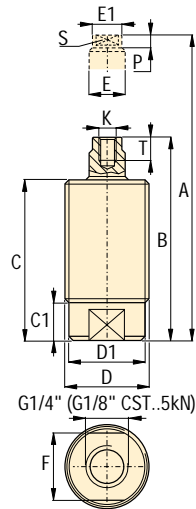
Note: - Seal material: Buna-N, Polyurethane.
- Minimum operating pressure for single-acting models (to overcome return spring force) is 40 bar.



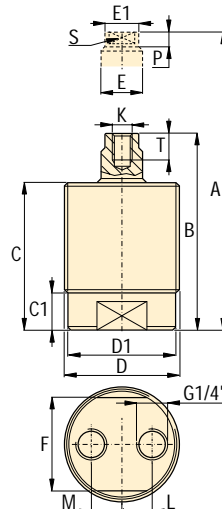
CST-272, -2102, -2132



Other CST models



CDT models

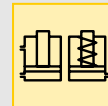


Force: 1,7 - 39,8 kN

Stroke: 7,0 - 50,0 mm

Pressure: 40 - 350 bar

- E** Cilindros roscados
- F** Vérins corps filetés
- D** Einschraubzylinder



Options

Flange nuts

72 ▶



Product dimensions mm

Model number	A Ext. height	B Retr. height	C	C1	D Ø	D1 Ø	E Ø	E1 Ø	F	K	L	M	P	S	T	kg
▼ Single-acting																
CST-272	49,0	42,0	-	13,5	M12x1,5	-	4,8	-	16,0	-	-	-	-	-	-	0,09
CST-2102	52,8	42,8	-	14,3	M12x1,5	-	4,8	-	16,0	-	-	-	-	-	-	0,14
CST-2132	63,2	50,2	-	14,2	M12x1,5	-	4,8	-	16,0	-	-	-	-	-	-	0,14
CST-572	58,1	51,1	47,0	7,5	M20x1,5	18,0	7,9	7,0	15,9	M4x0,7	-	-	4,0	5,9	7,0	0,14
CST-5132	72,6	59,6	55,5	7,5	M20x1,5	18,0	7,9	7,0	15,9	M4x0,7	-	-	4,0	5,9	7,0	0,18
CST-5192	83,3	64,3	60,0	7,5	M20x1,5	18,0	7,9	7,0	15,9	M4x0,7	-	-	4,0	5,9	7,0	0,23
CST-5252	98,3	73,3	70,2	7,5	M20x1,5	18,0	7,9	7,0	15,9	M4x0,7	-	-	4,0	5,9	7,0	0,32
CST-5382	131,2	93,2	89,0	7,5	M20x1,5	18,0	7,9	7,0	15,9	M4x0,7	-	-	4,0	5,9	7,0	0,41
CST-1072	64,4	57,4	52,0	10,5	M28x1,5	26,0	11,9	11,0	24,0	M6x1,0	-	-	5,5	9,0	8,0	0,27
CST-10132	76,4	63,4	58,0	10,5	M28x1,5	26,0	11,9	11,0	24,0	M6x1,0	-	-	5,5	9,0	8,0	0,32
CST-10192	97,9	78,9	73,5	10,5	M28x1,5	26,0	11,9	11,0	24,0	M6x1,0	-	-	5,5	9,0	8,0	0,36
CST-10252	113,0	88,0	84,3	10,5	M28x1,5	26,0	11,9	11,0	24,0	M6x1,0	-	-	5,5	9,0	8,0	0,41
CST-10382	141,4	103,4	98,0	10,5	M28x1,5	26,0	11,9	11,0	24,0	M6x1,0	-	-	5,5	9,0	8,0	0,45
CST-18132	82,9	69,9	63,5	12,5	M35x1,5	32,5	15,9	15,0	30,0	M8x1,25	-	-	6,5	12,0	12,0	0,55
CST-18252	114,9	89,9	83,5	12,5	M35x1,5	32,5	15,9	15,0	30,0	M8x1,25	-	-	6,5	12,0	12,0	0,59
CST-18382	146,4	108,4	102,0	12,5	M35x1,5	32,5	15,9	15,0	30,0	M8x1,25	-	-	6,5	12,0	12,0	0,68
CST-18502	174,4	124,4	118,0	12,5	M35x1,5	32,5	15,9	15,0	30,0	M8x1,25	-	-	6,5	12,0	12,0	0,77
CST-27152	87,9	72,9	66,5	13,5	M42x1,5	39,8	17,9	17,0	36,0	M8x1,25	-	-	6,5	15,0	12,0	0,64
CST-27252	118,4	93,4	87,0	13,5	M42x1,5	39,8	17,9	17,0	36,0	M8x1,25	-	-	6,5	15,0	12,0	0,91
CST-27502	195,9	145,9	139,5	13,5	M42x1,5	39,8	17,9	17,0	36,0	M8x1,25	-	-	6,5	15,0	12,0	1,32
CST-40132	89,4	76,4	68,5	11,0	M48x1,5	45,5	19,9	19,0	41,4	M10x1,5	-	-	8,0	16,9	12,0	1,00
CST-40252	120,8	95,8	88,0	11,0	M48x1,5	45,5	19,9	19,0	41,4	M10x1,5	-	-	8,0	16,9	12,0	1,18
CST-40382	164,9	126,9	119,0	11,0	M48x1,5	45,5	19,9	19,0	41,4	M10x1,5	-	-	8,0	16,9	12,0	1,50
CST-40502	188,9	138,9	131,0	11,0	M48x1,5	45,5	19,9	19,0	41,4	M10x1,5	-	-	8,0	16,9	12,0	1,77
▼ Double-acting																
CDT-18132	81,0	68,0	61,5	16,0	M48x1,5	45,6	15,9	15,0	41,0	M8x1,25	12,8	12,8	6,5	12,7	12,0	1,09
CDT-18252	107,0	82,0	75,5	16,0	M48x1,5	45,6	15,9	15,0	41,0	M8x1,25	12,8	12,8	6,5	12,7	12,0	1,32
CDT-18382	131,5	93,0	86,5	16,0	M48x1,5	45,6	15,9	15,0	41,0	M8x1,25	12,8	12,8	6,5	12,7	12,0	1,55
CDT-18502	155,5	105,0	98,5	16,0	M48x1,5	45,6	15,9	15,0	41,0	M8x1,25	12,8	12,8	6,5	12,7	12,0	1,77
CDT-27152	86,0	71,0	64,8	17,0	M55x1,5	52,6	17,9	17,0	46,0	M8x1,25	16,0	10,0	6,5	15,8	12,0	1,18
CDT-27252	107,0	82,0	75,8	17,0	M55x1,5	52,6	17,9	17,0	46,0	M8x1,25	16,0	10,0	6,5	15,8	12,0	1,41
CDT-27502	157,0	107,0	100,8	17,0	M55x1,5	52,6	17,9	17,0	46,0	M8x1,25	16,0	10,0	6,5	15,8	12,0	1,86
CDT-40132	91,5	78,5	70,5	17,5	M65x1,5	62,0	22,0	21,0	55,0	M10x1,5	20,2	9,8	8,0	16,9	15,0	1,82
CDT-40252	115,5	90,5	82,5	17,5	M65x1,5	62,0	22,0	21,0	55,0	M10x1,5	20,2	9,8	8,0	16,9	15,0	2,09
CDT-40382	141,5	103,5	95,5	17,5	M65x1,5	62,0	22,0	21,0	55,0	M10x1,5	20,2	9,8	8,0	16,9	15,0	2,55
CDT-40502	165,5	115,5	117,5	17,5	M65x1,5	62,0	22,0	21,0	55,0	M10x1,5	20,2	9,8	8,0	16,9	15,0	3,00

Manifold Cylinders *Application & selection*

Shown: CSM-10132, CSM-572, CSM-18252

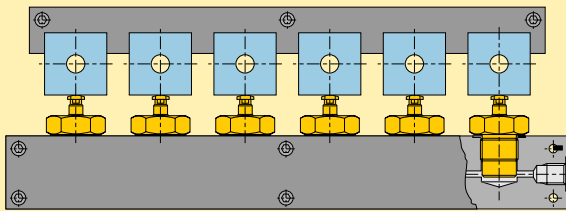


Swing cylinders
Work supports

Linear cylinders

99_0516_2

► These compact, fixture-integrated cylinders are designed for workpiece positioning, holding and ejecting applications where space is at a premium. No exposed tubing.



Six manifold cylinders are used to clamp piston blocks for machining. The hydraulic flow to the cylinders is side-ported in order to minimize the required manifold thickness.

■ *Manifold cylinders are installed in the fixture to position engine manifolds for drilling, tapping and mill finish.*



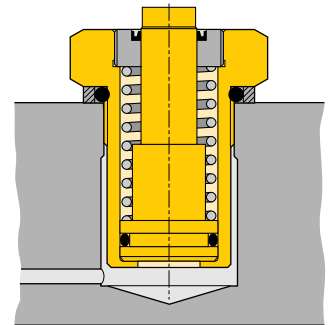
99_0516_3

Compact fixture-integrated positioning and holding

- Design eliminates the need for fittings and tubing, minimizing space requirements and facilitating easy removal of chips and dirt
- Minimal cylinder height relative to the plunger stroke enables extremely compact fixture designs
- Cylinder body is fully recessed within the fixture allowing the workpiece to be positioned near-flush with the fixture surface, saving space
- Nitro carburized bodies and internal plunger wipers allow maintenance-free, high cycle performance
- Center-tapped plungers will hold workpiece contact buttons
- Single-acting design with spring return simplifies hydraulic requirements

Manifold mount

Manifold cylinders are designed to be screwed directly into a manifold or fixture. Enerpac's manifold cylinders include a steel washer and O-ring providing an effective seal between the cylinder and manifold.



Product selection

Cylinder capacity at 350 bar	Stroke	Model number	Effective area	Oil capacity
kN	mm		cm ²	cm ³
1,7	7	CSM-272	0,5	0,4
1,7	13	CSM-2132	0,5	0,7
5,3	7	CSM-572	1,6	1,1
5,3	13	CSM-5132	1,6	2,0
11,3	7	CSM-1072	3,3	2,3
11,3	13	CSM-10132	3,3	4,3
11,3	19	CSM-10192	3,3	6,3
17,2	13	CSM-18132	5,1	6,6
17,2	25	CSM-18252	5,1	12,7
26,9	15	CSM-27152	7,9	11,8
26,9	25	CSM-27252	7,9	19,7

Note: Seal material: Buna-N, Polyurethane.

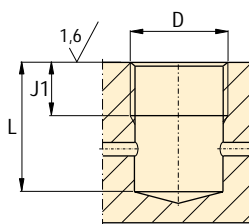


Installation dimensions in mm [⊥ ⊕]

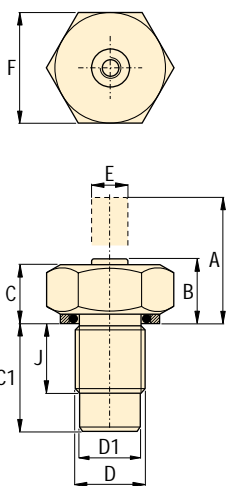
Model number	D	J1 min.	L min.
CSM-272	M12 x 1,5	11	22
CSM-2132	M12 x 1,5	11	33
CSM-572	M20 x 1,5	13	28
CSM-5132	M20 x 1,5	13	37
CSM-1072	M28 x 1,5	16	28
CSM-10132	M28 x 1,5	16	35
CSM-10192	M28 x 1,5	16	44
CSM-18132	M36 x 1,5	19	39
CSM-18252	M36 x 1,5	19	58
CSM-27152	M42 x 1,5	19	40
CSM-27252	M42 x 1,5	19	58

Note: O-rings included. For additional cavity machining information call Enerpac's Technical Service Department.

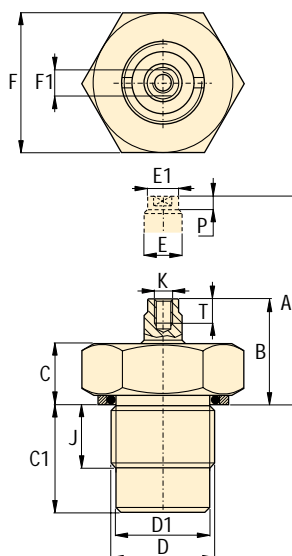
Installation dimensions



CSM-272, -2132



other CSM models



Product dimensions in mm [⊥ ⊕]

Model number	A Ext. height	B Retr. height	C	C1	D	D1	E	E1	F	F1	J	K	P	T	kg
CSM-272	20,5	13,5	13,3	21,7	M12x1,5	10,1	4,8	-	19	-	11,4	-	-	-	0,1
CSM-2132	24,4	11,4	11,2	32,2	M12x1,5	10,1	4,8	-	19	-	11,4	-	-	-	0,1
CSM-572	23,5	16,5	12,5	27,5	M20x1,5	17,5	7,9	7	27	5,9	12,5	M4x0,7	4,0	7	0,2
CSM-5132	29,5	16,5	12,5	36,0	M20x1,5	17,5	7,9	7	27	5,9	12,5	M4x0,7	4,0	7	0,3
CSM-1072	27,3	20,3	14,8	27,1	M28x1,5	25,6	11,9	11	36	9,0	14,1	M6x1	5,5	8	0,5
CSM-10132	33,3	20,3	14,8	33,1	M28x1,5	25,6	11,9	11	36	9,0	14,1	M6x1	5,5	8	0,6
CSM-10192	39,3	20,3	14,8	48,6	M28x1,5	25,6	11,9	11	36	9,0	14,1	M6x1	5,5	8	0,7
CSM-18132	36,2	23,2	16,8	36,6	M36x1,5	34,2	15,9	15	46	12,0	18,1	M8x1,25	6,5	12	0,5
CSM-18252	48,2	23,2	16,8	56,1	M36x1,5	34,2	15,9	15	46	12,0	18,1	M8x1,25	6,5	12	0,6
CSM-27152	42,2	27,2	20,8	37,5	M42x1,5	39,7	17,9	17	55	15,0	16,9	M8x1,25	6,5	12	0,7
CSM-27252	52,8	27,8	21,3	56,0	M42x1,5	39,7	17,9	17	55	15,0	16,9	M8x1,25	6,5	12	0,9

Force: 1,7 - 26,9 kN

Stroke: 7,0 - 25,0 mm

Pressure: 40 - 350 bar

- Ⓜ GB Manifold cylinder
- Ⓜ D Einschraubzylinder
- Ⓜ E Cilindros roscados



Options

Contact bolts

72 ▶



Gauges

106 ▶



Power sources

74 ▶



Important

Tighten manifold cylinders according to specifications in the instruction sheet.

Return springs in CSM-cylinders should not be used to pull back heavy attachments consistently.

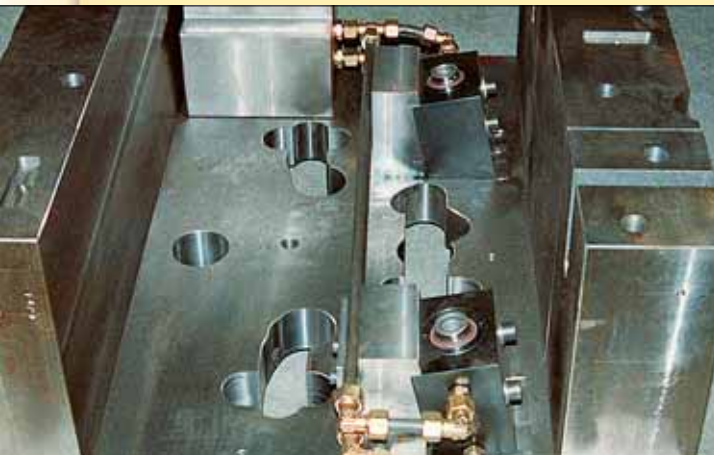
Block cylinders *Application & selection*

Shown: BD-18202, BMD-70502, BD-40252



▶ Block cylinders are used for punching, pressing, riveting and bending applications. In general, these cylinders are used for moving, positioning, lifting, opening and closing.

■ *The versatile Enerpac block cylinders, fixture mounted for clamping applications.*



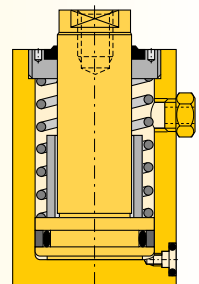
Versatile, all purpose cylinder

- Six clamping capabilities, enable you to choose the right size for your application
- Variety of strokes, to meet design needs
- Double acting and single-acting (spring return), allows selection of cylinder that best conforms to your hydraulic system
- Two oil connection possibilities:
 - with BSPP threaded oil ports
 - manifold O-ring ports
- Compact cylinder design does not require large amounts of space on your fixture
- Integral wiper ring, keeps contaminants out of cylinder to extend life
- Designed according ISO-standards

i Select your block cylinder type

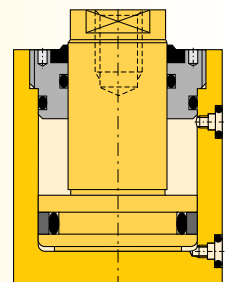
BMS, BS series, Single-acting

- BS series with BSPP oil port
- BMS series with manifold O-ring ports
- Internal threaded plunger
- Nickel-plated plunger
- Strong return spring
- Black oxide base
- Filtered vent plug



BMD, BD series, Double-acting

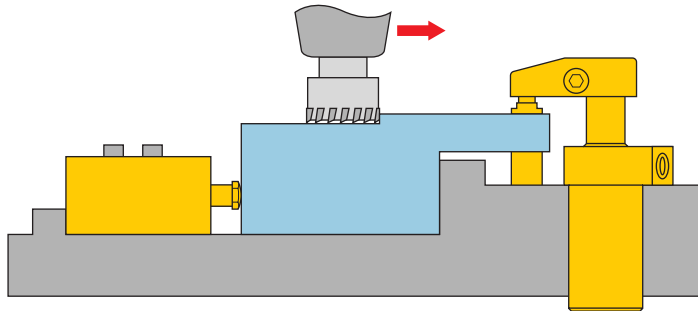
- BD series with BSPP oil port
- BMS series with manifold O-ring ports
- Internal threaded plunger
- Nickel-plated plunger
- Black oxide base





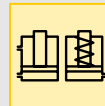
i Application example

Block cylinder positions workpiece against fixed point with further clamping coming from an Enerpac swing cylinder.



Force:	10,9 - 274,8 kN
Stroke:	8 - 56 mm
Pressure:	40 - 350 bar

- E** Cilindros tipo bloque
- F** Vérins cube
- D** Blockzylinder



i Options

Contact bolts	
72	
Fittings	
110	
Valves	
86	

globe Product selection

Piston Ø	Rod Ø	Clamping force at 350 bar		Stroke mm	Model number Manifold O-ring oil port	Model number BSP threaded oil port	Cylinder effective area		Cylinder oil capacity		Minimum spring return force N	kg
		push kN	pull kN				push cm ²	pull cm ²	push cm ³	pull cm ³		
▼ Single-acting												
20	12	10,9	-	8	BMS-1082	BS-1082	3,1	-	2,5	-	93	0,9
20	12	10,9	-	18	BMS-10182	BS-10182	3,1	-	5,7	-	108	1,2
25	16	17,0	-	10	BMS-18102	BS-18102	4,9	-	4,9	-	168	1,3
25	16	17,0	-	25	BMS-18252	BS-18252	4,9	-	12,3	-	157	1,8
40	25	43,6	-	12	BMS-40122	BS-40122	12,6	-	15,1	-	378	2,0
40	25	43,6	-	25	BMS-40252	BS-40252	12,6	-	31,4	-	381	2,7
50	32	68,2	-	12	BMS-70122	BS-70122	19,6	-	23,6	-	471	3,3
50	32	68,2	-	25	BMS-70252	BS-70252	19,6	-	49,1	-	425	4,4
80	50	174,9	-	20	BMS-180202	BS-180202	50,2	-	100,5	-	917	12,0
100	63	273,4	-	25	BMS-280252	BS-280252	78,5	-	196,3	-	1419	19,0
▼ Double-acting												
20	12	11,0	7,0	16	BMD-10162	BD-10162	3,1	2,0	5,0	3,2	-	0,9
20	12	11,0	7,0	36	BMD-10362	BD-10362	3,1	2,0	11,3	7,2	-	1,2
25	16	17,2	10,1	20	BMD-18202	BD-18202	4,9	2,9	9,8	5,8	-	1,3
25	16	17,2	10,1	50	BMD-18502	BD-18502	4,9	2,9	24,5	14,8	-	1,8
40	25	44,0	26,8	25	BMD-40252	BD-40252	12,6	6,3	31,4	15,8	-	1,9
40	25	44,0	26,8	50	BMD-40502	BD-40502	12,6	6,3	62,8	31,6	-	2,6
50	32	68,7	40,6	25	BMD-70252	BD-70252	19,6	11,6	49,1	29,0	-	3,2
50	32	68,7	40,6	50	BMD-70502	BD-70502	19,6	11,6	98,2	58,0	-	4,3
80	50	175,8	107,2	25	BMD-180252	BD-180252	50,2	30,6	125,6	76,6	-	9,3
80	50	175,8	107,2	50	BMD-180502	BD-180502	50,2	30,6	251,2	153,1	-	11,5
100	63	274,8	165,7	28	BMD-280282	BD-280282	78,5	47,3	219,8	132,6	-	14,7
100	63	274,8	165,7	56	BMD-280562	BD-280562	78,5	47,3	439,6	265,1	-	18,2

Block cylinders *Dimensions & options*

Shown: BD-18202, BMD-70502, BD-40252

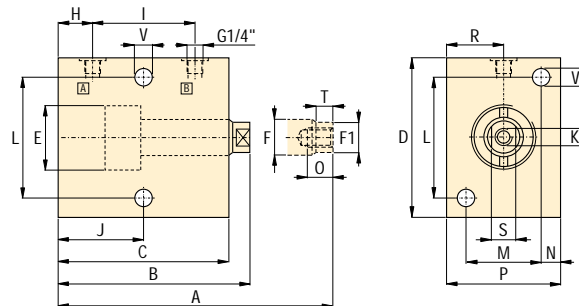


▶ These compact block cylinders are easily mounted in horizontal or vertical position for a range of special tooling applications. They can be used for positioning, clamping, pushing, pressing or punching operations. The plunger has an internal thread to accommodate accessories such as contact bolts.

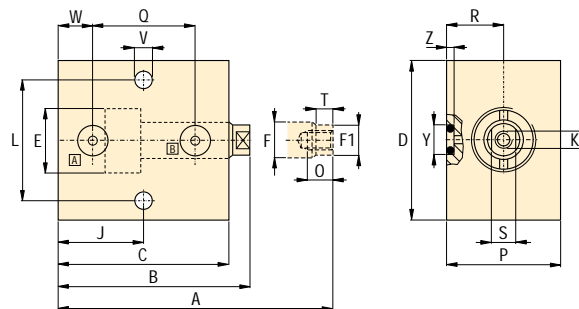
■ Block cylinder used for punching applications.



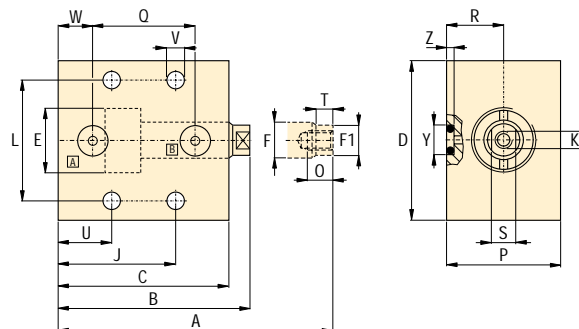
All BS and BD models



BMS-1082 BMD-10162
 BMS-18102 BMD-18202
 BMS-40122 BMD-40252
 BMS-70122 BMD-70252
 BMD-280282



BMS-10182 BMD-10362
 BMS-18252 BMD-18502
 BMS-40252 BMD-40502
 BMS-70252 BMD-70502
 BMS-180252 BMD-180502
 BMS-280252 BMD-280562



Product dimensions in mm [D]

Model nr. Manifold O-ring port	Model nr. BSPP port	A	B	C	D	E	F	F1	H	I	J
						∅	∅	∅			
▼ Single-acting											
BMS-1082	BS-1082	70	62	54,5	60	20	12	11	12,0	25	24,5
BMS-10182	BS-10182	100	82	74,5	60	20	12	11	12,0	45	44,5
BMS-18102	BS-18102	80	70	62,0	65	25	16	15	12,0	30	27,0
BMS-18252	BS-18252	125	100	92,0	65	25	16	15	12,0	60	57,0
BMS-40122	BS-40122	92	80	68,0	80	40	25	24	12,0	35	32,0
BMS-40252	BS-40252	130	105	93,0	80	40	25	24	12,0	60	57,0
BMS-70122	BS-70122	102	90	76,0	100	50	32	31	14,0	40	36,0
BMS-70252	BS-70252	140	115	101,0	100	50	32	31	14,0	65	61,0
BMS-180202	BS-180202	151	131	114,0	140	80	50	49	15,5	70	66,5
BMS-280252	BS-280252	177	152	132,5	170	100	63	62	18,0	80	77,5
▼ Double-acting											
BMD-10162	BD-10162	78	62	54,5	60	20	12	11	12,0	25	24,5
BMD-10362	BD-10362	118	82	74,5	60	20	12	11	12,0	45	44,5
BMD-18202	BD-18202	90	70	62,0	65	25	16	15	12,0	30	27,0
BMD-18502	BD-18502	150	100	92,0	65	25	16	15	12,0	60	57,0
BMD-40252	BD-40252	105	80	68,0	80	40	25	24	12,0	35	32,0
BMD-40502	BD-40502	155	105	93,0	80	40	25	24	12,0	60	57,0
BMD-70252	BD-70252	115	90	76,0	100	50	32	31	14,0	40	36,0
BMD-70502	BD-70502	165	115	101,0	100	50	32	31	14,0	65	61,0
BMD-180252	BD-180252	131	106	89,0	140	80	50	49	15,5	45	41,5
BMD-180502	BD-180502	181	131	114,0	140	80	50	49	15,5	70	66,5
BMD-280282	BD-280282	152	124	104,5	170	100	63	62	18,0	52	49,5
BMD-280562	BD-280562	208	152	132,5	170	100	63	62	18,0	80	77,5



i Installation Instructions

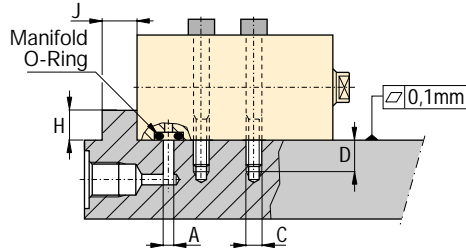
When operating above 140 bar in applications as shown in the figure below, provide cylinder back-up using a support to eliminate shear loads on the mounting bolts.

Manifold Mounting

When hydraulic connections are made through the standard integrated O-ring ports as shown in figure, the sealing surface must have a roughness of 1,6 micrometers.

Single-acting cylinders

If the risk of machining coolants or debris entering via the breather vent (port B) exists, it is recommended that this port be connected to a clean, remote termination point.



A Installation dimensions in mm [⌀]

Clamping force at 350 bar	Oil channel diameter	Mounting thread	Minimum thread length	Torque (bolt type 12.9 DIN 912)	Minimum support dimensions		Manifold O-ring	
kN	øA	C	D	Nm	H	J	Di x W	Partnumber
11	ø 4	M6	11	17	5	7	4,34x3,53	CZ392.041
17	ø 4	M8	13	40	5	8	4,34x3,53	CZ392.041
44	ø 4	M10	16	85	5	10	4,34x3,53	CZ392.041
68	ø 4	M12	19	145	5	13	4,34x3,53	CZ392.041
175	ø 6	M16	24	353	10	16	7,52x3,53	CZ935.041
275	ø 6	M20	30	675	10	21	7,52x3,53	CZ935.041

Note: Manifold O-rings included.

Force: 10,9 - 274,8 kN

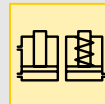
Stroke: 16 - 56 mm

Pressure: 40 - 350 bar

E Cilindros tipo bloque

F Vérins cube

D Blockzylinder



i Options

Contact bolts

72 ▶



Fittings

110 ▶



! Important

Linear cylinder support is required at operating pressures above 140 bar. Follow the instructions on this page.

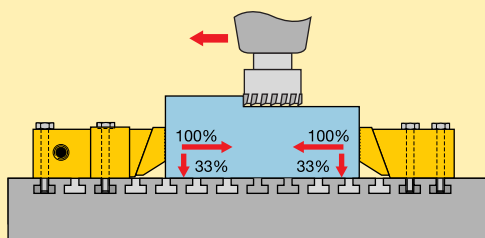
	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y	Z	Model nr. Manifold O-ring	Model nr. BSPP thread
																ø	ø
	Single-acting ▼																
M6	45	25	7,5	10	40	25,0	20,0	9	5,5	-	7,0	12,0	11,0 - 11,1	2,8 - 2,9	BMS-1082	BS-1082	
M6	45	25	7,5	10	40	45,0	20,0	9	5,5	24,5	7,0	12,0	11,0 - 11,1	2,8 - 2,9	BMS-10182	BS-10182	
M8	50	30	7,5	12	45	30,0	22,5	13	6,0	-	9,0	12,0	11,0 - 11,1	2,8 - 2,9	BMS-18102	BS-18102	
M8	50	30	7,5	12	45	60,0	22,5	13	6,0	27,0	9,0	12,0	11,0 - 11,1	2,8 - 2,9	BMS-18252	BS-18252	
M16	60	35	10,0	25	55	37,5	27,5	22	9,5	-	11,0	9,5	11,0 - 11,1	2,8 - 2,9	BMS-40122	BS-40122	
M16	60	35	10,0	25	55	62,5	27,5	22	9,5	27,0	11,0	9,5	11,0 - 11,1	2,8 - 2,9	BMS-40252	BS-40252	
M20	80	45	10,0	30	65	40,0	32,5	27	11,0	-	12,5	12,5	11,0 - 11,1	2,8 - 2,9	BMS-70122	BS-70122	
M20	80	45	10,0	30	65	65,0	32,5	27	11,0	26,0	12,5	12,5	11,0 - 11,1	2,8 - 2,9	BMS-70252	BS-70252	
M30	110	80	15,0	45	110	70,0	55,0	41	14,5	26,5	17,0	15,5	14,1 - 14,2	2,8 - 2,9	BMS-180202	BS-180202	
M36	135	90	17,5	50	125	80,0	62,5	50	17,0	37,5	21,0	18,0	14,1 - 14,2	2,8 - 2,9	BMS-280252	BS-280252	
	Double-acting ▼																
M6	45	25	7,5	10	40	25,0	20,0	9	5,5	-	7,0	12,0	11,0 - 11,1	2,8 - 2,9	BMD-10162	BD-10162	
M6	45	25	7,5	10	40	45,0	20,0	9	5,5	24,5	7,0	12,0	11,0 - 11,1	2,8 - 2,9	BMD-10362	BD-10362	
M8	50	30	7,5	12	45	30,0	22,5	13	6,0	-	9,0	12,0	11,0 - 11,1	2,8 - 2,9	BMD-18202	BD-18202	
M8	50	30	7,5	12	45	60,0	22,5	13	6,0	27,0	9,0	12,0	11,0 - 11,1	2,8 - 2,9	BMD-18502	BD-18502	
M16	60	35	10,0	25	55	37,5	27,5	22	9,5	-	11,0	9,5	11,0 - 11,1	2,8 - 2,9	BMD-40252	BD-40252	
M16	60	35	10,0	25	55	62,5	27,5	22	9,5	27,0	11,0	9,5	11,0 - 11,1	2,8 - 2,9	BMD-40502	BD-40502	
M20	80	45	10,0	30	65	40,0	32,5	27	11,0	-	12,5	12,5	11,0 - 11,1	2,8 - 2,9	BMD-70252	BD-70252	
M20	80	45	10,0	30	65	65,0	32,5	27	11,0	26,0	12,5	12,5	11,0 - 11,1	2,8 - 2,9	BMD-70502	BD-70502	
M30	110	80	15,0	45	110	45,0	55,0	41	14,5	-	17,0	15,5	14,1 - 14,2	2,8 - 2,9	BMD-180252	BD-180252	
M30	110	80	15,0	45	110	70,0	55,0	41	14,5	26,5	17,0	15,5	14,1 - 14,2	2,8 - 2,9	BMD-180502	BD-180502	
M36	135	90	17,5	50	125	52,0	62,5	50	17,0	-	21,0	18,0	14,1 - 14,2	2,8 - 2,9	BMD-280282	BD-280282	
M36	135	90	17,5	50	125	80,0	62,5	50	17,0	37,5	21,0	18,0	14,1 - 14,2	2,8 - 2,9	BMD-280562	BD-280562	

Pull down clamps *Application & selection*

Shown: ECM-20, ECH-202, ECM-5, ECH-52

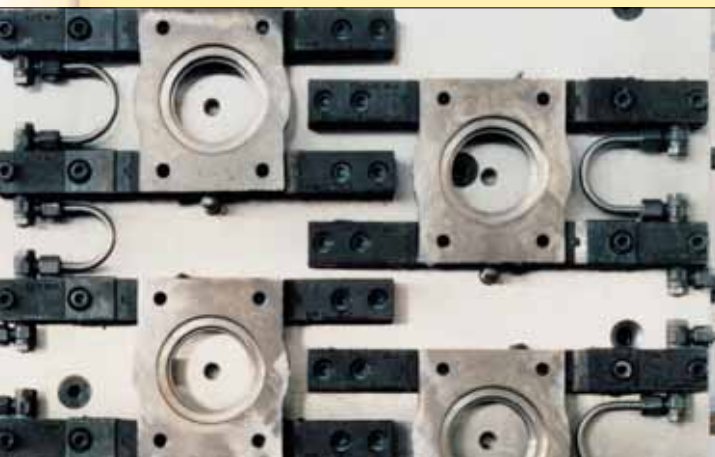


▶ Enerpac pull down clamps are designed to allow unobstructed top face machining. Independent horizontal and vertical movement achieves high lateral and pull down forces to hold the workpiece firmly down against the machine table or fixture. The pull down forces are approximately 33% of the clamping force.



The pull down clamps can be permanently mounted using the supplied mounting bolts. Optional T-Nuts can be used for adapting to varying workpiece sizes.

■ Enerpac hydraulic pull down clamps and their mechanical counter parts used to manufacture tie-rod cylinder end caps.

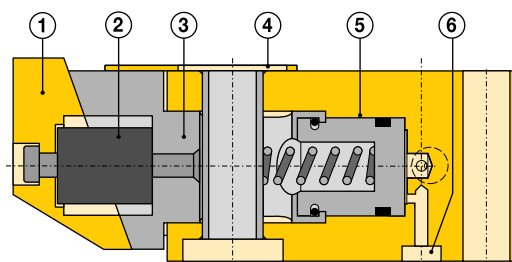


Low profile clamp

...for unobstructed top face machining

- Independent horizontal and vertical movement for a true pull down effect
- Compact size and low height allows more flexible and economic mounting than comparable dedicated vise
- Manifold and BSPP porting
- Investment high-alloy cast, heat-treated clamping jaw and plunger
- Contamination resistant design for low maintenance, removable guard for chip removal
- Oil ports on both sides for mounting flexibility
- Optional mechanical counter hold provides pull down on end stop for large parts
- Mounting bolts included for ease of installation

i Pull down clamp operation



The moveable jaw (1) and the flexible connection design (2) allows lateral movement and eliminate any bending moment. Rollerfinished cylinder bore (3) improves seal life. The removable guard (4) prevents the entry of chips and allows easy cleaning. Heat treated, centerless ground plunger (5) for extremely close tolerances and long life. The clamps feature both manifold mount (6) and plumbed oil connection.

Product selection

▼ Hydraulic pull down clamps

Lateral clamping force at 350 bar kN	Pull down force at 350 bar kN	Stroke mm	Model number	Effective area cm ²	Oil capacity cm ³	Mounting bolts ¹⁾ (included) mm
3,9	1,3	5,1	ECH-52	1,16	0,13	M8x 45
17,4	5,8	7,9	ECH-202	5,03	1,07	M12x 80

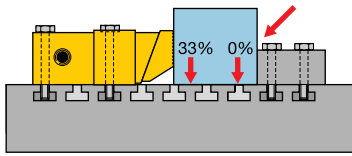
▼ Mechanical counter holds

Holding force kN	For pull down clamp Model number	Model number	Mounting bolts included ¹⁾ mm	Replaceable ribbed jaws Model number
3,9	ECH-52	ECM-5	M8x 35	ECJR-5
17,4	ECH-202	ECM-20	M12x 65	ECJR-20

¹⁾ Torque M8 with 25 Nm, M12 with 85 Nm
The use of T-nuts requires longer bolts.

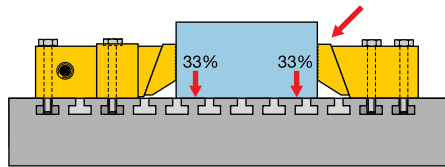


i Pull down force



Fixed stop set-up

A very workable set-up for workpieces that are not larger or wider than twice the width of the edge clamp. The pull down force of the hydraulic actuated edge clamp is sufficient to pull down and hold the product during actual machining.

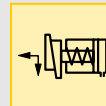


Counter hold set-up



For workpieces larger than twice the width of the edge clamp used, it is recommended to install a mechanical counterhold. The counter hold also produces a pull down force equal to 1/3 of the lateral force of the hydraulic edge clamp applied. In this way the grip on the workpiece is very tight. Another advantage of this set-up is the repeated accuracy of machining results.

- Force: 3,9 - 17,4 kN
- Stroke: 5,1 - 7,9 mm
- Pressure: 15 - 350 bar

- E** Garras de empuje oblicuo
- F** Crampons plaqueurs
- D** Niederzugspanner



i Options

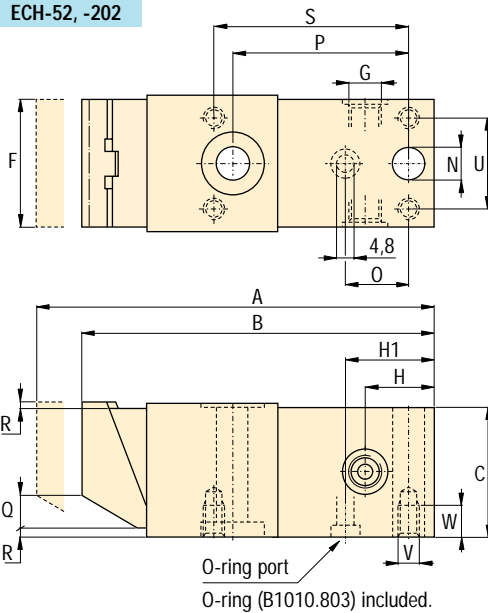
- Link clamps**  [40](#)
- Threaded cylinders**  [54](#)
- Positive clamping cylinders**  [66](#)
- Power sources**  [74](#)

! Important

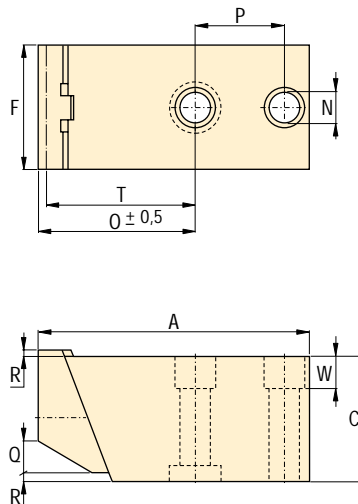
Threaded push cylinders (CST, CDT, CSM series) or spring loaded cylinders (MRS-series) can be used to hold the workpiece against the side locators during part clamping.

Do not allow the clamping jaw to extend below the lower surface of the clamp body.

ECH-52, -202



ECM-5, -20



A Product dimensions in mm [⊕]

Model number	A	B	C	F	G	H	H1	N	O	P	Q	R	S	T	U	V	W	kg
	mm																	
▼ Hydraulic pull down clamps																		
ECH-52	105,2	100,1	30,0	30,0	G1/8"	19,1	18,8	8,5	11,6	53,1	3,0	2,0	58,9	-	22,1	M5x0,8	6,1	0,7
ECH-202	142,7	134,9	50,0	50,0	G1/4"	24,9	23,6	12,5	13,6	67,1	14,0	3,0	73,9	-	36,1	M8x1,25	11,9	2,5
▼ Mechanical counter holds																		
ECM-5	79,0	-	30,0	30,0	-	-	-	8,5	37,0	11,2	3,0	2,0	-	40,9	-	-	7,9	0,6
ECM-20	102,1	-	50,0	50,0	-	-	-	12,5	42,2	12,2	14,0	3,0	-	58,9	-	-	13,0	1,9

Hollow plunger cylinders *Application & selection*

Shown: MRH-120, HCS-20, HCS-80

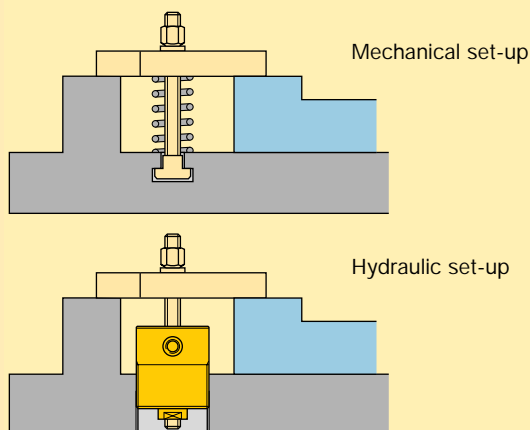


Swing cylinders
Work supports

Linear cylinders

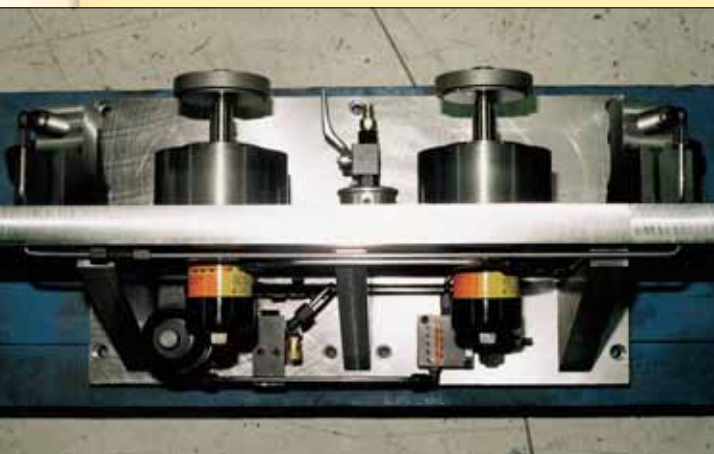
02_006

▶ These cylinders are regularly used for upgrading mechanical clamping to faster and easier hydraulic clamping. Other typical applications include production pressing, punching and crimping operations.



Traditional mechanical elements in a clamping fixture are replaced by a hollow plunger hydraulic cylinder.

■ Two Enerpac MRH-120 hollow cylinders mounted at the back side of a fixture.



For high force push & pull applications on and around the fixture

- Load can be attached to either end of the cylinder, providing a choice of push or pull actions - both realizing full cylinder capacity
- Very high cylinder capacities contained within small dimensions allow compact fixture designs
- Spring return operation allows for easy unloading of the workpiece
- Threaded collars and base mounting holes allow mounting flexibility, including table-top surfaces and T-slots
- Nickel-plated plungers, plunger wipers and internal venting prevent corrosion and support longer operation life on all HCS models

Product selection

Cylinder capacity ¹⁾	Stroke	Center hole diameter	Model number	Effective area	Oil capacity	Maximum operating pressure
kN	mm	mm		cm ²	cm ³	bar
17,8	7,9	13,5	MRH-20	8,58	6,72	210
21,5	9,9	10,9	HCS-20	6,19	6,23	350
56,3	11,9	13,0	HCS-50	16,26	19,50	350
61,4	7,9	19,6	MRH-120	17,81	14,09	350
83,7	14,0	17,0	HCS-80	23,42	32,61	350
113,4	16,0	21,1	HCS-110	32,65	52,27	350

¹⁾ At maximum operating pressure.

Note: Seal material Buna-N, Polyurethane, Teflon.

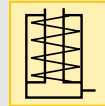


Force: 17,8 - 113,4 kN

Stroke: 7,9 - 16,0 mm

Pressure: 55 - 350 bar

- E** Garras de empuje oblicuo
- F** Vérins a piston creux
- D** Hohlkolbenzylinder



Options

Flange nuts

72 ▶



Power sources

74 ▶



Gauges

106 ▶



Fittings

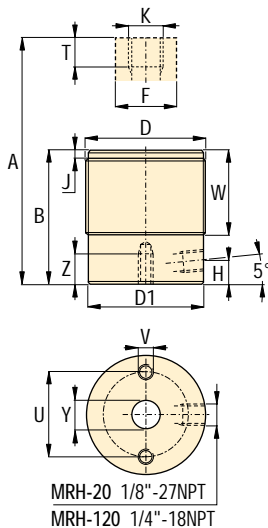
110 ▶



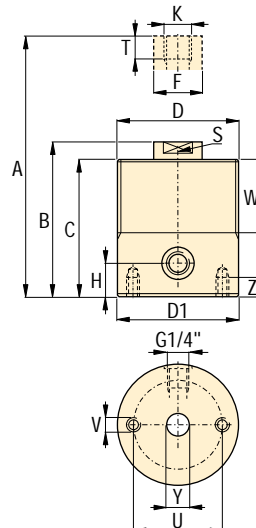
Important

Use DIN12.9 (Grade 8) bolt quality or better for pulling.
Use DIN10.9 (Grade B7) threaded rod quality or better for pulling applications.

MWH-20, 120



HCS models



Product dimensions in mm

Model number	A	B	C	D Ø	D1 Ø	F Ø	H	J	K Ø	S	T	U Ø	V Ø	W	Y Ø	Z	kg
MRH-20	60,5	52,3	-	M48 x 1,5	45,5	25,4	7,1	3,0	13,0	-	22,4	35,1	M6 x 1,0	38,1	12,7	6,4	0,6
HCS-20	84,1	74,2	66,0	M58 x 1,5	57,9	16,0	10,9	-	M10 x 1,5	14,0	25,9	39,9	M6 x 1,0	39,9	10,9	9,9	1,1
HCS-50	96,0	84,1	74,9	M65 x 1,5	65,0	27,9	14,0	-	M12 x 1,75	22,1	24,4	45,0	M8 x 1,25	45,0	13,0	11,9	1,5
MRH-120	63,5	55,6	-	M70 x 1,5	69,9	35,1	9,9	4,8	M18 x 1,5	-	16,0	50,8	M6 x 1,0	30,2	19,6	6,4	1,4
HCS-80	109,0	95,0	85,1	M75 x 1,5	74,9	32,0	17,0	-	M16 x 2,0	23,9	32,5	54,9	M8 x 1,25	50,0	17,0	11,9	2,3
HCS-110	119,9	103,9	93,0	M90 x 2,0	89,9	39,9	19,1	-	M20 x 2,5	32,0	36,3	65,0	M10 x 1,5	59,9	21,1	15,0	3,6

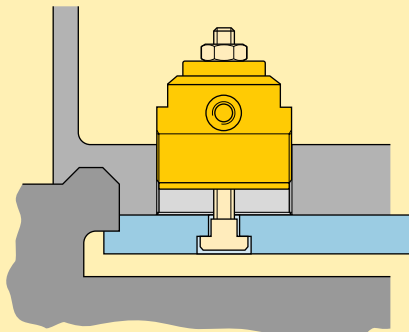
Positive clamping cylinders *Application & selection*

Shown: MRS-1, MRS-1001, MRS-5001



▶ These cylinders are designed for prolonged clamping applications in moveable machine parts, tools, fixtures, pallets and workpieces.

The mechanical clamping force of this cylinder is ideal for FMS applications. Hydraulic pressure is used to release the workpiece and is not required to maintain the clamping force on the workpiece. Internal high strength springs produce the required clamping force.



■ When pressure is released, the Enerpac MRS cylinders clamp the workpiece by pushing it against the frame that is attached to the fixture.

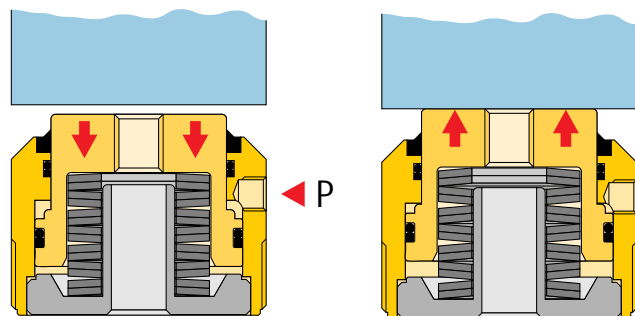
Ideal for palletized applications

- Heavy disk springs maintain the clamping force - hydraulic pressure is used for release
- Single acting design allows easy setup of hydraulic system
- Hollow plunger design allows easy retrofit for mechanical clamping
- Custom buttons can be fitted into the plunger for clamping directly against a workpiece
- Threaded body allows easy cylinders mounting directly into fixture plate
- Internal threaded plunger allows accessories to be used easily for retrofit applications

i Positive clamping operation

The applied clamping force is determined by how far the cylinder's plunger is being retracted when engaging contact with the workpiece (referred to as the effective clamping stroke).

Use the diagrams on the next page as a guide to your fixture set-up. Note that in order to load and unload the workpiece, the plunger must be retracted somewhat further than the effective clamping stroke.



Hydraulic pressure applied

- Plunger retracts
- Workpiece is released
- New workpiece is loaded

Hydraulic pressure released

- Springs apply force
- Workpiece is clamped
- Machining can take place

i Product selection

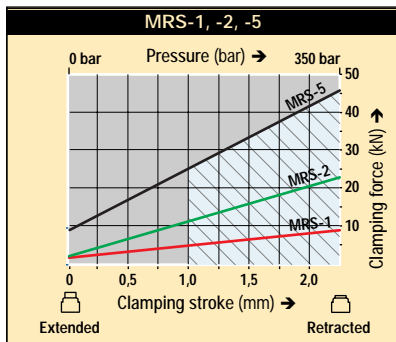
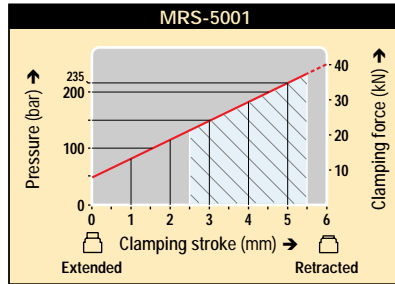
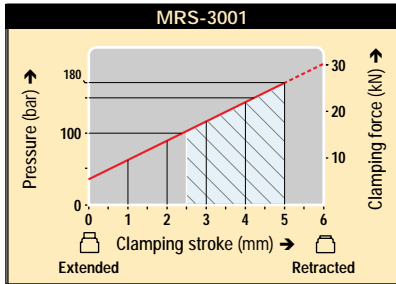
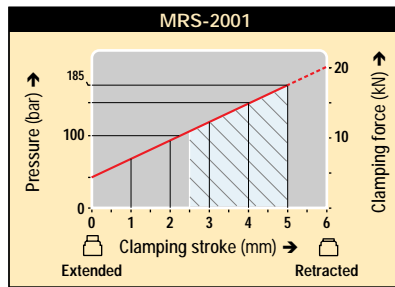
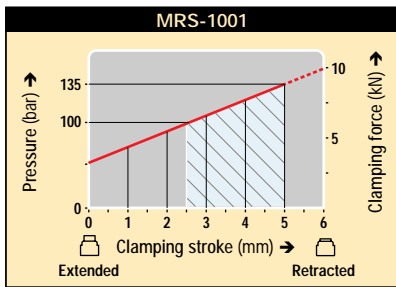
Cylinder capacity at 350 bar	Effective clamping stroke	Model number	Required operating pressure ¹⁾	Max. tensioning stroke	Oil capacity
kN	mm		bar	mm	cm ³
8,6	2,2	MRS-1	350	2,2	0,8
22,5	2,2	MRS-2	350	2,2	1,7
45,9	2,2	MRS-5	350	2,2	3,2
8,5	2,5	MRS-1001	135	5,0	3,5
16,5	2,5	MRS-2001	185	5,0	4,7
26,0	2,5	MRS-3001	180	5,0	7,9
38,0	3,0	MRS-5001	235	5,5	8,7

¹⁾ Minimum operating pressure to fully retract the plunger.

Note: Seal material Buna-N, Polyurethane.



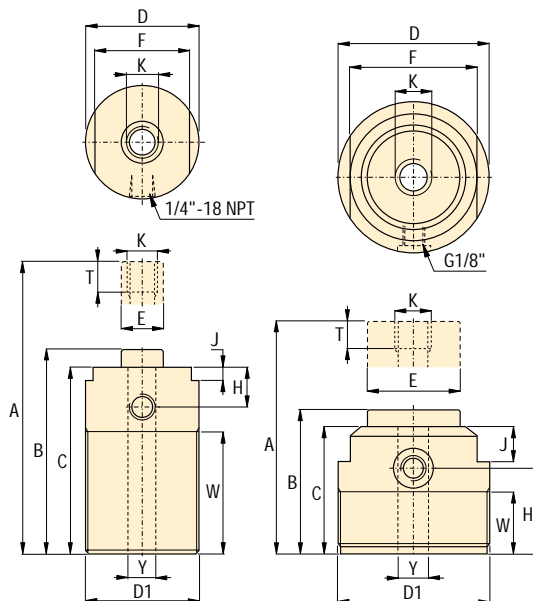
Stroke/force diagrams



= Suggested Clamping Range

MRS-1, 2, 5

other MRS models



Product dimensions in mm

Model number	A	B	C	D	D1	E	F	H	J	K	T	W	Y	kg
MRS-1	85	82,8	79	36	M36 x 1,5	12,7	30	18	6	M8 x 1,25	36	50	9	0,5
MRS-2	90	87,8	84	48	M48 x 1,5	17,4	40	20	7	M10 x 1,5	38	50	11	0,9
MRS-5	125	122,8	119	60	M60 x 2	22,1	50	21	7	M16 x 2	40	85	17	1,8
MRS-1001	62	57,0	53	65	M65 x 1,5	40,0	55	35	15	M12 x 1,75	20	25	13	1,2
MRS-2001	65	60,0	57	80	M80 x 2	55,0	65	38	15	M 16 x 2	20	29	17	2,1
MRS-3001	74	69,0	66	95	M95 x 2	60,0	80	46	17	M20 x 2,5	20	37	21	3,0
MRS-5001	96	90,5	66	95	M95 x 2	60,0	80	46	17	M20 x 2,5	20	37	21	3,5

Force: 8,5 - 45,9 kN

Stroke: 2,2 - 5,5 mm

Pressure: 135 - 350 bar

- E** Cilindros de amarre
- F** Vérins de bridage positif
- D** Federspannzylinder



Options

Contact bolts 72 ▶

Flange nuts 72 ▶

Collet-Lok® work supports 34 ▶

Important

Be sure to refer to the force/stroke chart when selecting cylinders for an application.

Piece parts with a large variation at the clamping point may be prone to having to variations in clamping force.

Depending on the number of cycle operations and the extent to which the full stroke is used the internal disk springs may need to be replaced at scheduled intervals.

Universal cylinders - Single-acting *Application & selection*

Swing cylinders
Work supports

Linear cylinders

Shown: RW-50, BRW-104, MRW-50F



► Used when high cylinder forces or long strokes are required in a confined area. Can handle a wide range of production tooling applications.

■ Enerpac BRW-101 cylinders used in a high pressure toggle style clamping set-up.



Heavy duty cylinders

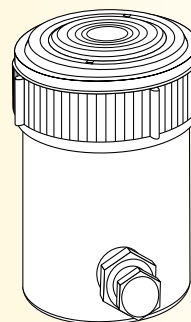
...handle a variety of applications

- High pressure design when additional force is required
- Long stroke lengths in a compact design, well suited for welding applications
- Collar mounting threads and base mounting holes allow flexible mounting options
- Cylinders are provided with hardened saddles for additional plunger protection
- Snap-in saddles are easily removed for adapting to different plunger devices
- Chrome plated plunger with bronze upper and lower bearing provides a long cylinder life

i Block and cylindrical models

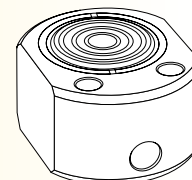
Cylindrical models

- Long stroke
- Flexible in fixture design
- Variety of attachments



Block models

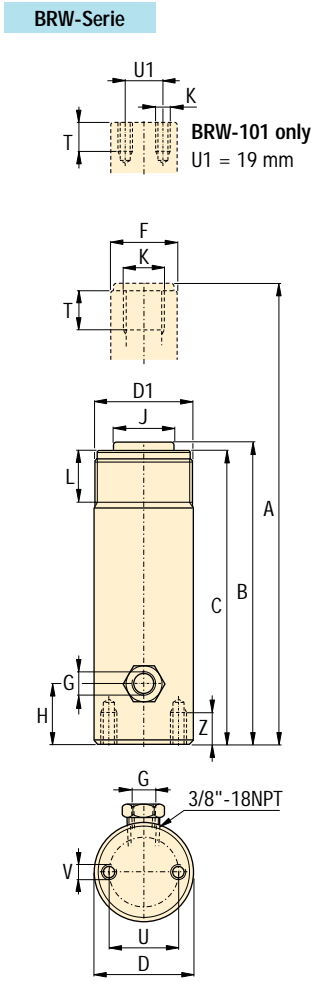
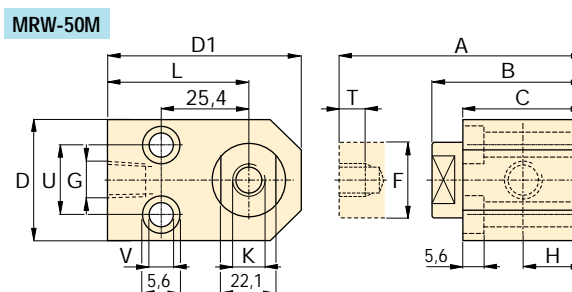
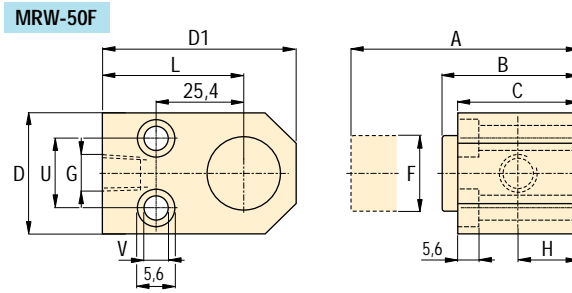
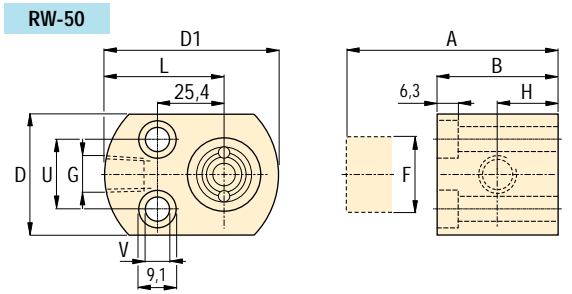
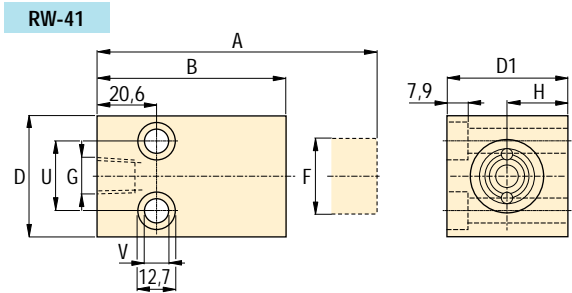
- Easily mounted
- Compact design



Product selection

Cylinder capacity at 350 bar	Stroke	Model number	Effective area	Oil capacity	Operating pressure
kN	mm		cm ²	cm ³	bar
▼ Block models					
22,1	15,7	RW-41	6,39	10,16	6-550
22,1	15,7	RW-50	6,39	10,16	40-700
22,1	15,0	MRW-50F	6,39	10,16	6-550
22,1	15,0	MRW-50M	6,39	10,16	6-550
▼ Cylindrical models					
22,1	25,4	BRW-51	6,39	16,22	40-700
22,1	76,2	BRW-53	6,39	48,67	40-700
22,1	127,0	BRW-55	6,39	81,12	40-700
50,6	25,4	BRW-101	14,39	36,54	40-700
50,6	54,1	BRW-102	14,39	77,84	40-700
50,6	104,9	BRW-104	14,39	150,92	40-700
50,6	155,7	BRW-106	14,39	224,01	40-700
50,6	257,3	BRW-1010	14,39	370,18	40-700

Note: Seal material: Buna-N, Polyurethane, Teflon.



Force: 22,1 - 101,2 kN

Stroke: 15,7 - 257,3 mm

Pressure: 6 - 700 bar

- E** Universal cylinders
- F** Vérins universels
- D** Universelle Linearzylinder



Options

Cylinder accessories 72 ▶

Important

These cylinders are intended for medium cycle applications. The return spring is intended for retracting the plunger and heavy devices should not be attached to it.

Plungers should be shielded in welding applications to prevent splatter from sticking to chrome plating.

Do not use these cylinders continuously at full stroke or damage to return spring may result.

Product dimensions in mm

Model number	A	B	C	D	D1	F	G	H	J	K	L	T	U	V	Z	kg	
							NPT										
▼ Block models																	
RW-41	80,8	65,0	-	41,1	41,1	25,4	.250-18	20,6	-	-	-	-	25,4	8,6	-	0,8	
RW-50	57,2	41,4	-	41,1	58,7	28,4	.375-18	19,1	-	-	38,1	-	28,4	5,6	-	0,8	
MRW-50F	55,9	40,9	40,9	41,1	65,0	25,4	.375-18	20,6	-	-	44,5	-	28,4	5,6	-	0,8	
MRW-50M	66,0	51,1	40,9	41,1	65,0	25,4	.375-18	20,6	-	M8 x 1,25	44,5	6,1	28,4	5,6	-	0,8	
▼ Cylindrical models																	
BRW-51	135,6	110,2	103,9	38,1	M38 x 1,5	25,4	.250-18	19,1	25,4	M18 x 2,5	28,7	14,2	25,4	M6 x 1	14,2	1,0	
BRW-53	241,3	165,1	158,8	38,1	M38 x 1,5	25,4	.250-18	19,1	25,4	M18 x 2,5	28,7	14,2	25,4	M6 x 1	14,2	1,4	
BRW-55	342,9	215,9	209,6	38,1	M38 x 1,5	25,4	.250-18	19,1	25,4	M18 x 2,5	28,7	14,2	25,4	M6 x 1	14,2	1,8	
BRW-101	115,1	89,7	83,3	57,2	M56 x 2	38,1	.250-18	19,1	-	M5 x 0,8	26,9	6,4	39,6	M8 x 1,25	12,7	1,7	
BRW-102	175,5	121,4	115,1	57,2	M56 x 2	38,1	.250-18	19,1	35,1	M22 x 1,5	28,7	19,1	39,6	M8 x 1,25	12,7	2,2	
BRW-104	276,4	171,5	165,1	57,2	M56 x 2	38,1	.250-18	19,1	35,1	M22 x 1,5	28,7	19,1	39,6	M8 x 1,25	12,7	3,2	
BRW-106	403,4	247,7	241,3	57,2	M56 x 2	38,1	.250-18	19,1	35,1	M22 x 1,5	28,7	19,1	39,6	M8 x 1,25	12,7	4,4	
BRW-1010	606,6	349,3	342,9	57,2	M56 x 2	38,1	.250-18	19,1	35,1	M22 x 1,5	28,7	19,1	39,6	M8 x 1,25	12,7	6,3	

Linear cylinders
Power sources
Valves
System components
Yellow pages

Universal cylinders - Double-acting *Application & selection*

Shown: BRD-2510, BRD-96, BRD-256, BRD-41, BRD-166



► Used when high cylinder forces with a powered return stroke is required in a confined area.

Cylinders can push or pull a workpiece into position and the threaded plunger allows adapting standard clevis attachments.

■ *Clamping application using Enerpac BRD cylinders (with clevis eye attachments on both ends) for their high pressure capability and mounting flexibility.*



Swing cylinders
Work supports

Linear cylinders

99142

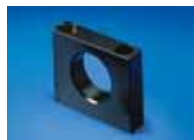
Heavy duty cylinders

...provide push as well as pull forces

- High pressure design when additional force is required for push or pull applications
- Long strokes in a compact design are well suited for custom toggle style clamping
- Various features for mounting
- Threaded plunger allows a wide range of mounting adapter devices
- Chrome plated plunger provides a long cylinder life

i Optional cylinder attachments

For added cylinder flexibility, a selection of interchangeable mountings is available to fit plunger or cylinder threads.



Foot mounting

Mounts onto cylinder collar thread. Retainer nut included.



Flange mounting

Mounts onto cylinder collar thread. Retainer nut included.



Retainer nut

Locking foot or flange mountings. Mounts onto cylinder base or collar threads. Included with foot and flange mountings.



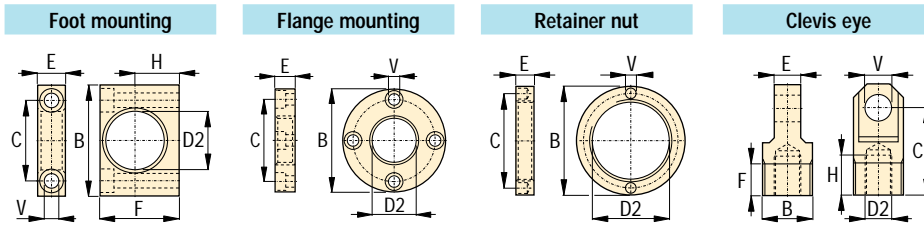
Clevis eye

Threads onto plunger or base.

Product selection

Cylinder capacity at 350 bar		Stroke mm	Model number	Effective area		Oil capacity	
push kN	pull kN			push cm ²	pull cm ²	push cm ³	pull cm ³
17,4	7,7	28,7	BRD-41	5,10	2,19	14,58	6,55
17,4	7,7	79,5	BRD-43	5,10	2,19	40,48	18,03
17,4	7,7	155,7	BRD-46	5,10	2,19	79,31	34,41
40,0	21,8	28,7	BRD-91	11,42	6,32	32,77	18,03
40,0	21,8	79,5	BRD-93	11,42	6,32	90,78	49,16
40,0	21,8	155,7	BRD-96	11,42	6,32	178,29	98,32
40,0	21,8	257,3	BRD-910	11,42	6,32	293,98	162,23
69,0	36,9	158,8	BRD-166	20,32	10,71	322,33	170,42
69,0	36,9	260,4	BRD-1610	20,32	10,71	528,64	278,58
109,0	47,8	158,8	BRD-256	31,74	13,87	503,57	219,59
109,0	47,8	260,4	BRD-2510	31,74	13,87	825,90	360,51

Call Enerpac to order models with imperial mounting threads.



Cylinder attachments in mm [⊕]

Cylinder capacity at		D2	Model number	B	C	E	F	H	V	kg
350 bar kN	700 bar kN									
▼ Foot mounting with retainer nut										
17,4	34,8	42,1	BAD-141	80,0	58,0	20,0	57,0	31,8	10,5	0,4
40,0	80,0	56,1	BAD-171	105,0	78,0	25,0	82,5	44,5	13,5	1,2
69,0	138,0	70,1	BAD-181	127,0	95,2	35,0	100,0	52,4	20,0	2,9
109,0	218,0	85,1	BAD-191	159,0	117,5	45,0	125,0	63,5	26,5	4,5
▼ Flange mounting with retainer nut										
17,4	34,8	42,1	BAD-142	98,4	78,6	19,0	-	-	11,0	1,0
40,0	80,0	56,1	BAD-172	120,5	98,4	25,4	-	-	11,0	2,1
69,0	138,0	70,1	BAD-182	143,0	115,9	35,0	-	-	13,4	3,8
109,0	218,0	85,1	BAD-192	165,0	135,7	44,5	-	-	17,0	6,0
▼ Retainer nut										
17,4	34,8	M42 x 1,5	BAD-143	57,0	49,5	9,5	-	-	6,3	0,1
40,0	80,0	M56 x 2	BAD-173	75,0	63,5	12,7	-	-	6,7	0,3
69,0	138,0	M70 x 2	BAD-183	92,0	79,4	19,0	-	-	6,7	0,6
109,0	218,0	M85 x 2	BAD-193	108,0	95,2	25,4	-	-	6,7	0,8
▼ Clevis eye										
17,4	34,8	M16 x 1,5	BAD-150	M30 x 1,5	52,4	15,9	19,1	23,8	16,0	0,2
40,0	80,0	M22 x 1,5	BAD-151	M42 x 1,5	57,1	25,4	25,4	23,8	20,0	0,6
69,0	138,0	M30 x 1,5	BAD-152	M56 x 2	77,8	31,9	25,4	30,2	25,0	1,3
109,0	218,0	M42 x 1,5	BAD-153	M70 x 2	77,8	38,2	25,4	27,0	32,0	2,1

Force: 17,4 - 109,0 kN


Stroke: 28,7 - 260,4 mm

Pressure: 35 - 700 bar

- E** Cilindros universales
- F** Vérins universels
- D** Universelle Linearzylinder



Options

Cylinder accessories 

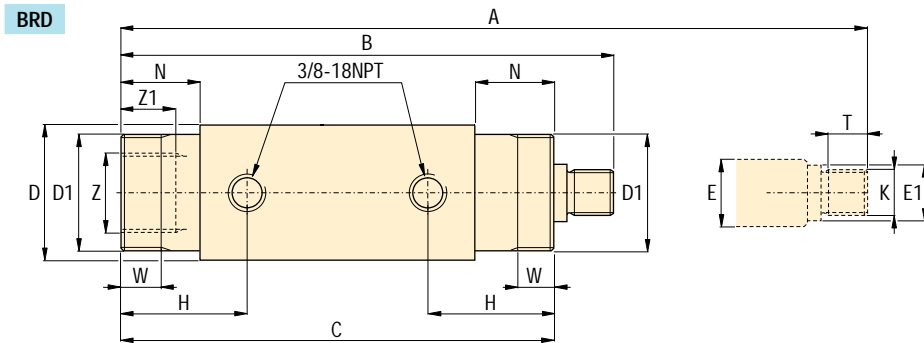
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Important

Be certain that the mounting devices can handle forces in the push and pull direction.

BRD series cylinders are designed for a maximum operating pressure of 700 bar.

When applying 700 bar cylinder capacities double as well.



Product dimensions in mm [⊕]

Model number	A	B	C	D	D1	E	E1	H	K	N	T	W	Z	Z1	kg
BRD-41	214,4	185,7	162,1	50,8	M42x1,5	19,1	17,5	46,7	M16x1,5	28,7	19,1	11,2	M30x1,5	8,9	2,2
BRD-43	316,0	236,5	212,9	50,8	M42x1,5	19,1	17,5	46,7	M16x1,5	28,7	19,1	11,2	M30x1,5	8,9	2,9
BRD-46	468,4	312,7	289,1	50,8	M42x1,5	19,1	17,5	46,7	M16x1,5	28,7	19,1	11,2	M30x1,5	8,9	4,1
BRD-91	251,0	222,3	198,1	63,5	M56x2	25,4	23,9	57,2	M22x1,5	38,1	19,1	14,2	M42x1,5	14,0	4,1
BRD-93	353,3	273,8	248,9	63,5	M56x2	25,4	23,9	57,2	M22x1,5	38,1	19,1	14,2	M42x1,5	14,0	5,0
BRD-96	505,7	350	325,1	63,5	M56x2	25,4	23,9	57,2	M22x1,5	38,1	19,1	14,2	M42x1,5	14,0	6,3
BRD-910	708,9	451,6	427,0	63,5	M56x2	25,4	23,9	57,2	M22x1,5	38,1	19,1	14,2	M42x1,5	14,0	8,6
BRD-166	547,6	388,9	358,9	76,2	M70x2	35,1	32,0	73,2	M30x1,5	54,1	25,4	22,4	M56x2	23,9	10,0
BRD-1610	750,8	490,5	460,0	76,2	M70x2	35,1	32,0	73,2	M30x1,5	54,1	25,4	22,4	M56x2	23,9	13,2
BRD-256	582,7	423,9	397,0	92,2	M85x2	47,8	45,0	88,9	M42x1,5	69,9	25,4	28,7	M70x2	25,9	16,3
BRD-2510	785,9	525,5	498,1	92,2	M85x2	47,8	45,0	88,9	M42x1,5	69,9	25,4	28,7	M70x2	25,9	20,9

Cylinder accessories *Dimensions*

Shown: Cylinder accessories



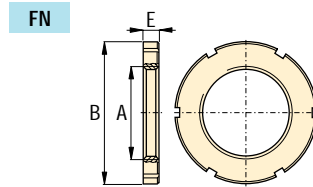
► These accessories are provided so that you can effectively position, mount and actuate Enerpac hydraulic cylinders according to your specific fixturing or production applications.

- **Mounting flanges**
For bolting cylinders to suit the application
- **Flange nuts**
For mounting threaded body cylinders in any position
- **Contact bolts**
Allow cylinders to act as a datum point in your clamping applications, and protect the piston when cylinders are used for pushing applications

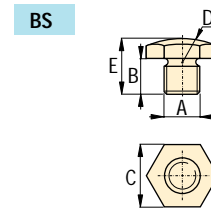
■ Enerpac work support locked in position using an FN series self-locking flange nut.



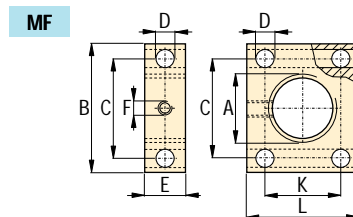
For optimum mounting and fixture flexibility
...to match specific applications



A mm	Model number	B	E
▼ Flange Nuts – self-locking DIN 1804			
M12 x 1,5	FN-122	27,9	6,1
M20 x 1,5	FN-202	36,1	7,9
M28 x 1,5	FN-282	50,0	9,9
M35 x 1,5	FN-352	55,1	10,9
M42 x 1,5	FN-422	62,0	11,9
M48 x 1,5	FN-482	74,9	13,0
M55 x 1,5	FN-552	80,0	13,0
M65 x 1,5	FN-652	95,0	14,0
M80 x 2	FN-802	115,1	16,0



A mm	Model number	B	C	D	E
▼ Spherical Contact Bolts					
M4 x 0,7	BS-42	7,0	8,0	8,0	11,0
M6 x 1,0	BS-62	8,0	11,0	11,0	14,0
M8 x 1,25	BS-82	10,0	14,0	14,0	17,0
M10 x 1,5	BS-102	10,0	17,0	17,0	18,0
M16 x 2,0	BS-162	12,0	22,0	22,0	24,0



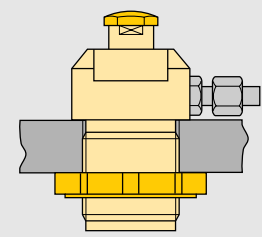
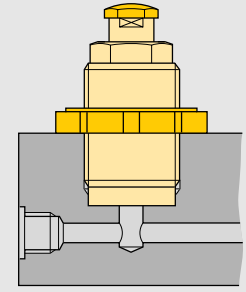
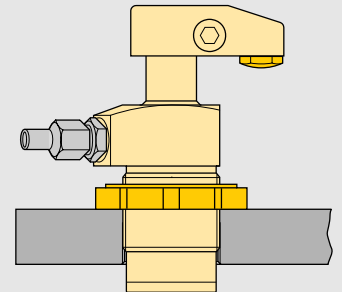
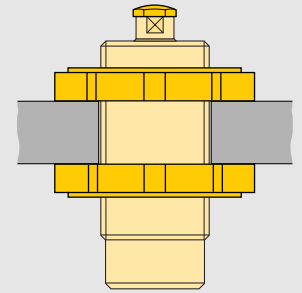
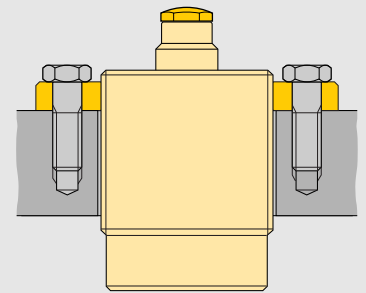
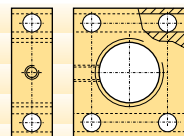
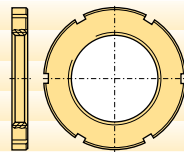
A mm	Model number	B	C	D	E	F	K	L
▼ Mounting Flanges								
M12 x 1,5	MF-122	39,9	24,9	6,3	24,9	M4 x 0,7	24,9	39,9
M20 x 1,5	MF-202	65,0	44,5	10,1	39,9	M4 x 0,7	45,0	65,0
M28 x 1,5	MF-282	74,9	50,8	10,1	39,9	M4 x 0,7	50,8	74,9
M35 x 1,5	MF-352	80,0	57,1	10,1	39,9	M6 x 1	57,1	80,0
M42 x 1,5	MF-422	89,9	63,5	10,1	39,9	M6 x 1	63,5	89,9
M48 x 1,5	MF-482	95,0	69,9	10,1	39,9	M6 x 1	69,9	95,0
M55 x 1,5	MF-552	110,0	82,5	11,2	44,5	M6 x 1	82,5	110,0
M65 x 1,5	MF-652	115,1	88,9	11,2	44,5	M6 x 1	88,9	115,1
M80 x 2	MF-802	134,9	108,0	11,2	44,5	M6 x 1	108,0	134,9



- E** Accesorios de cilindro
- F** Accessoires pour vérins
- D** Zubehör für Zylinder

A Installation information

Thread mm	Model number	Used with cylinder
▼ Flange Nuts – self-locking DIN 1804		
M12 x 1,5	FN-122	CST-272, CST-2102, CST-2132
M20 x 1,5	FN-202	CST-572, CST-5132, CST-5192, CST-5252, CST-5382
M28 x 1,5	FN-282	CST-10..., ST...-22, PT...-22
M35 x 1,5	FN-352	CST-18..., WFT-72, WFL-112, WST-72, WSL-112, ST...-52, PT...-52
M42 x 1,5	FN-422	CST-27..., BRD-41, BRD-43, BRD-46, BRD-256, BRD-2510
M48 x 1,5	FN-482	CST-40..., CDT-18..., ST...-92, PT...-92, MPTR-100, MPTC-210, LU...-32, MRH-20, MRS-2
M55 x 1,5	FN-552	CDT-27...
M65 x 1,5	FN-652	CDT-40..., ST...-202, HCS-50, MRS-1001, LU...-82
M80 x 2	FN-802	ST...-352, MPTR-300, MPTS-200, PT...-352, MRS-2001, LU...-122
▼ Spherical Contact Bolts		
M4 x 0,7	BS-42	CST-572, CST-5132, CST-5192, CST-5252, CST-5382, CSM-572, CSM-5132
M6 x 1	BS-62	CST-10..., CSM-10..., CAS-22, BS/BD/BMS/BMD-10...
M8 x 1,25	BS-82	CST-18..., CDT-18..., CDT-27..., CSM-18..., CSM-27..., CAS-52, MA-540, MPFS-100, MPTS-100, PU.../PL.../PT...-52, MRS-1, MPFC-110, MPTC-110, BS/BD/BMS/BMD-18...
M10 x 1,5	BS-102	CST-40..., CDT-40..., CAS-92, MA-1050, PU.../PL.../PT...-92, MPFC-210, WFM-72, WFT-72, WFC-72, WSM-72, WST-72, WSC-72, WFC-112, WFL-112, WSL-112, WSC-112, MPTC-210, MRS-2,
M16 x 2	BS-162	CAS-352, MA-3070, PU.../PL.../PT...-352, MPFC-410, MPTC-410, MRS-5, MRS-2001, BS/BD/BMS/BMD-40...
▼ Mounting flanges		
M12 x 1,5	MF-122	CST-272, CST-2102, CST-2132
M20 x 1,5	MF-202	CST-572, CST-5132, CST-5192, CST-5252, CST-5382
M28 x 1,5	MF-282	CST-10..., ST...-22, PT...-22
M35 x 1,5	MF-352	CST-18..., WFT-72, WST-72, WFL-112, WSL-112, ST...-52, PT...-52
M42 x 1,5	MF-422	CST-27..., BRD-41, BRD-43, BRD-46, BRD-256, BRD-2510
M48 x 1,5	MF-482	CST-40..., CDT-18..., ST...-92, PT...-92, MPTR-100, MPTC-210, LU...-32, MRH-20, MRS-2
M55 x 1,5	MF-552	CDT-27...
M65 x 1,5	MF-652	CDT-40..., ST...-202, MRS-1001, HCS-50, LU...-52
M80 x 2	MF-802	ST...-352, MPTR-300, PT...-352, MPTS-200, MRS-2001, LU...-122



Linear cylinders
Power sources
Valves
System components
Yellow pages