

CYPULL



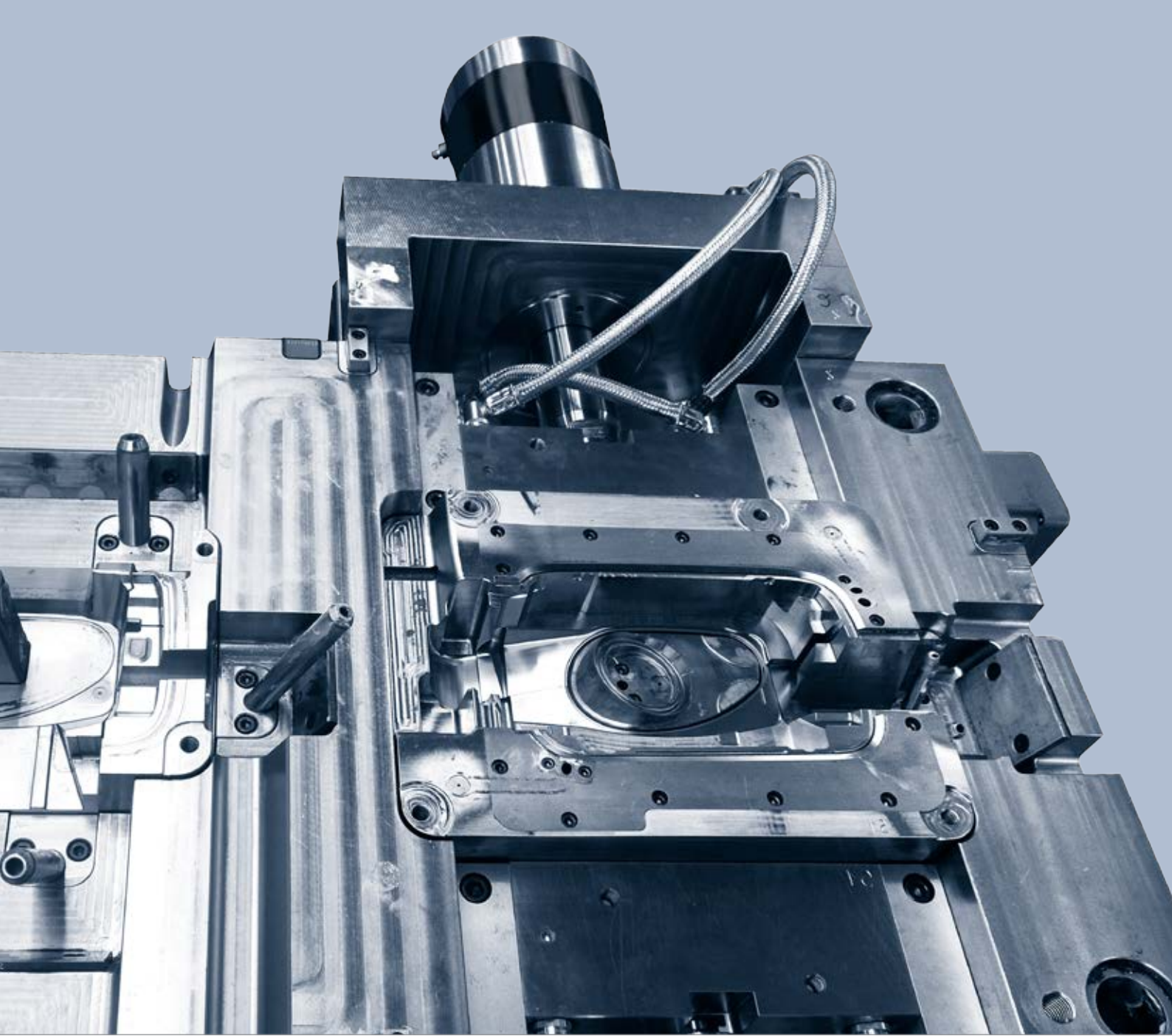
LOCKING CORE-PULLING CYLINDERS
SHORT STROKE BLOCK CYLINDERS

COMPONENTS
PERFECTION.



MADE IN GERMANY





CYPULL... SIMPLIFIES COMPLEX MOULD DESIGN



CYTEC locking core pulling cylinders are a result of profound product know-how gained over many years by CYTEC Zylindertechnik GmbH. They have been used successfully for decades in the plastics processing industry. The latest generation sets new benchmarks for economic production of complex and highly specialised solutions in the mould design and construction.

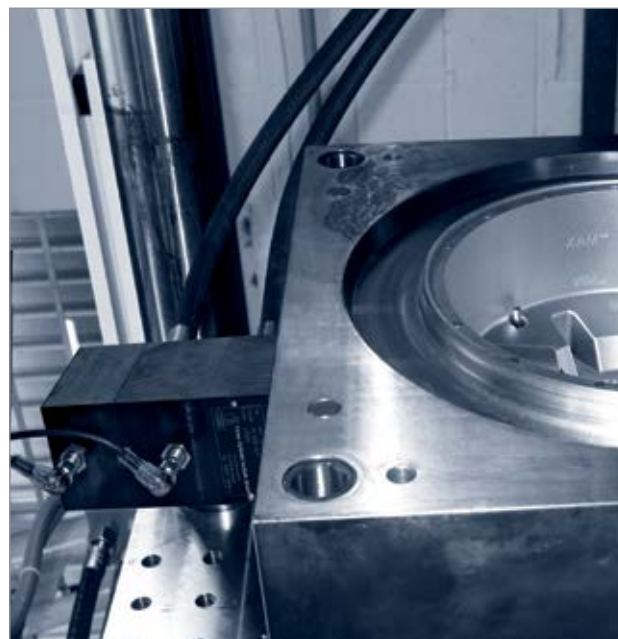
CYPULL cylinders enable technically elegant and simplified concepts, combining high forces with compact structural shape. Significant advantages for the production process: reduced construction, cost and manufacturing effort, minimised susceptibility to trouble and longer production cycles.

Typical features:

- Extremely rigid structure
- Integrated locking
- Maximum process security
- Holding forces are a multiple of the stroke forces
- Exact locking point
- Simple installation
- Compact design
- Revised series
- Maintenance-free
- Wide range of accessories

The cylinder structure, optionally available as round or block design, is extremely rigid. This guarantees constantly high workpiece quality and maintenance-free operation along with reliable productivity.

For almost every application an appropriate CYPULL is available, supported by a wide range of options and accessories (function and status monitoring, mounting solutions etc.).

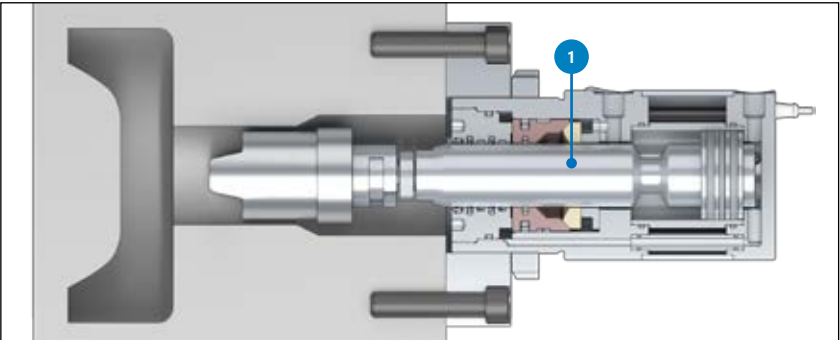




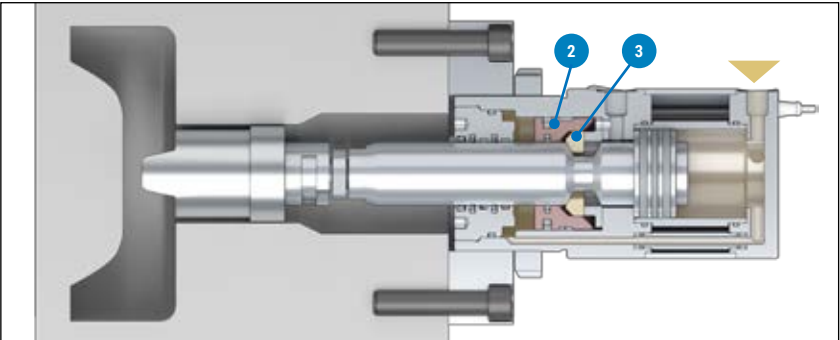
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Series CyPull	Round cylinder		Block cylinder	
Locking principle:	without preload	with preload	without preload	with preload
Locking position:	in end position with extended piston rod			
Nominal sizes (Piston Ø) [mm]:	20 - 200		20 - 80	
Rod Ø [mm]:	14 - 140		14 - 56	
Stroke length standard [mm]:	20 - 200, depending on the particular series			
Holding forces [kN]:	32 up to 3.300 max., depending on the particular series and locking principle			
Locking inquiry:	inductive sensors (on rod side or piston side)			
Optional accessories:	Mounting components (flanges, lock nuts, pressure screws)			

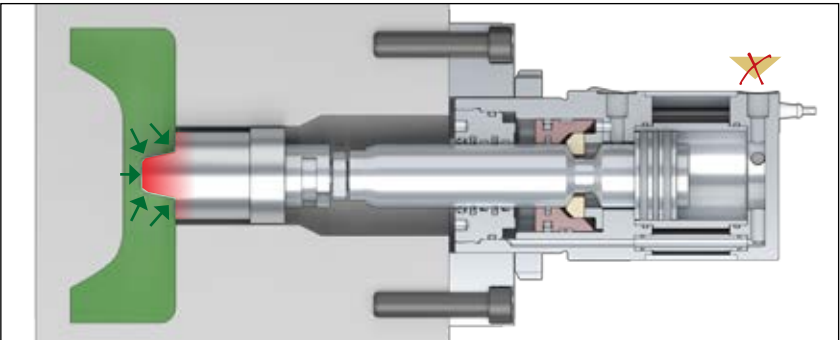
FUNCTION WITHOUT PRELOAD



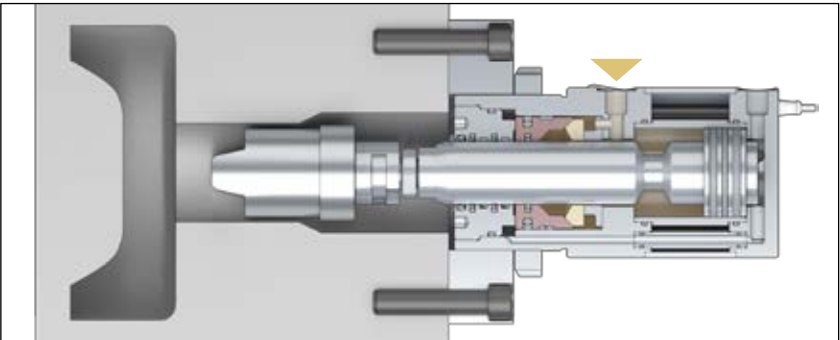
Phase 1



Phase 2

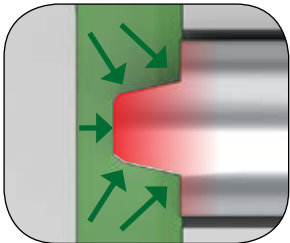


Phase 3



Phase 4

Function example of a cylinder with locking without preload,



completely exposed core, not touching core (series CP-H...-L)

Phase 1:
In the initial position the piston rod (1) is retracted.

Phase 2:
The piston rod is extended by applying hydraulic pressure on the piston side. As soon as the piston reaches the final position, the locking slide moves axially over the three-dimensional locking segments (2) and pushes them into the annular groove of the rod (3). So the segments are fixed in radial and axial direction.

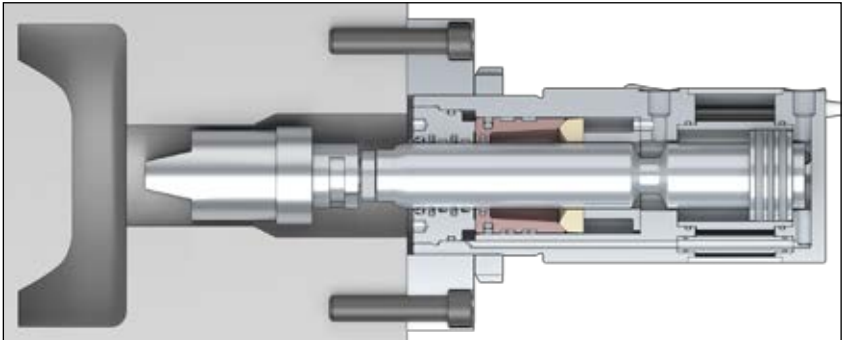
The piston rod is clamped with positive lock.

The hydraulic pressure is switched off, providing a maximum of operational safety.

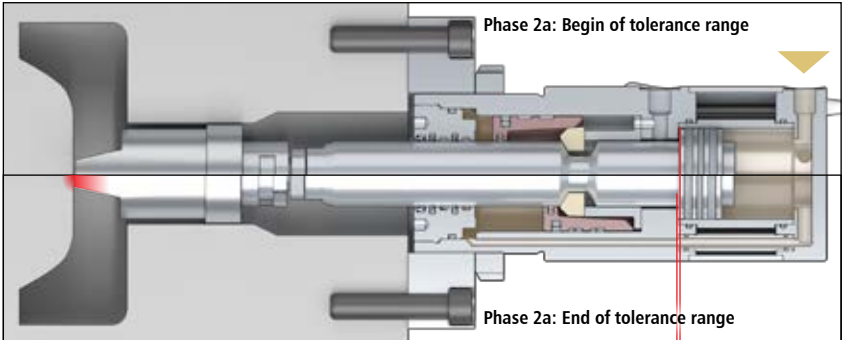
Phase 3:
During the injection process the core is pressurised, but it doesn't recede in any case. The piston rod always reaches the defined final position. The hydraulic pressure is branched off with a by-pass drilling from the main supply ports for extending and retracting, enabling very fast stroke cycles.

Phase 4:
The release port is pressurised, the piston rod unlocks and moves back to the initial position.

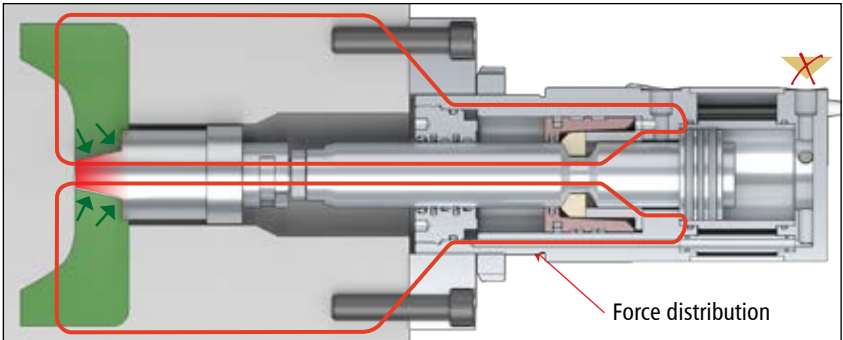
FUNCTION WITH PRELOAD



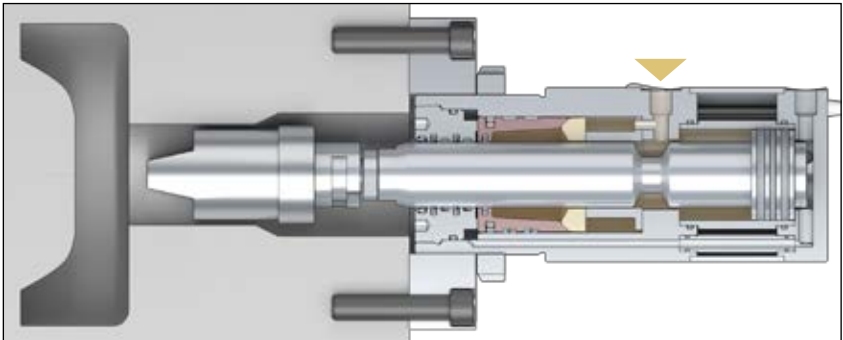
Phase 1



Phase 2

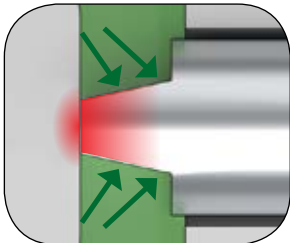


Phase 3



Phase 4

Function example of a cylinder with locking and preload,



touching core (Series CP-H...-P)

Phases 1 to 4:
The mode of operation is similar to series CP-H...-L, but here the segments create an additional preload to provide that the core touches the mould surface reliably.

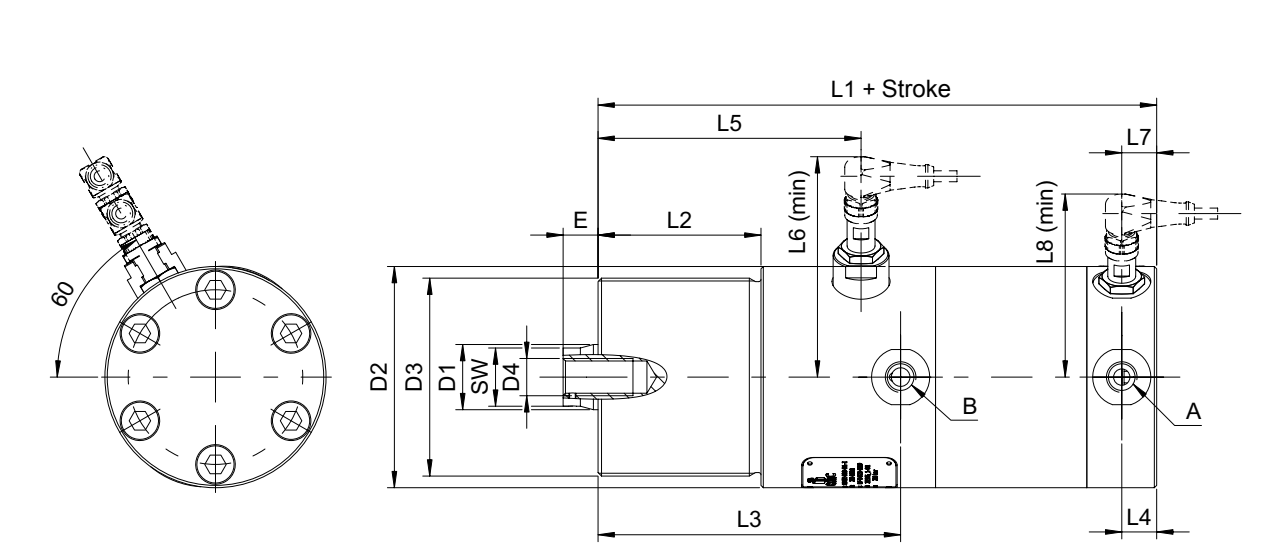
The locking slide and segments have a characteristic cone shaped contour which enables the piston rod to lock within a defined tolerance range. Elasticities which can occur commonly in the mould construction are compensated.

This tolerance range in the final position can reach up to 1 mm stroke.

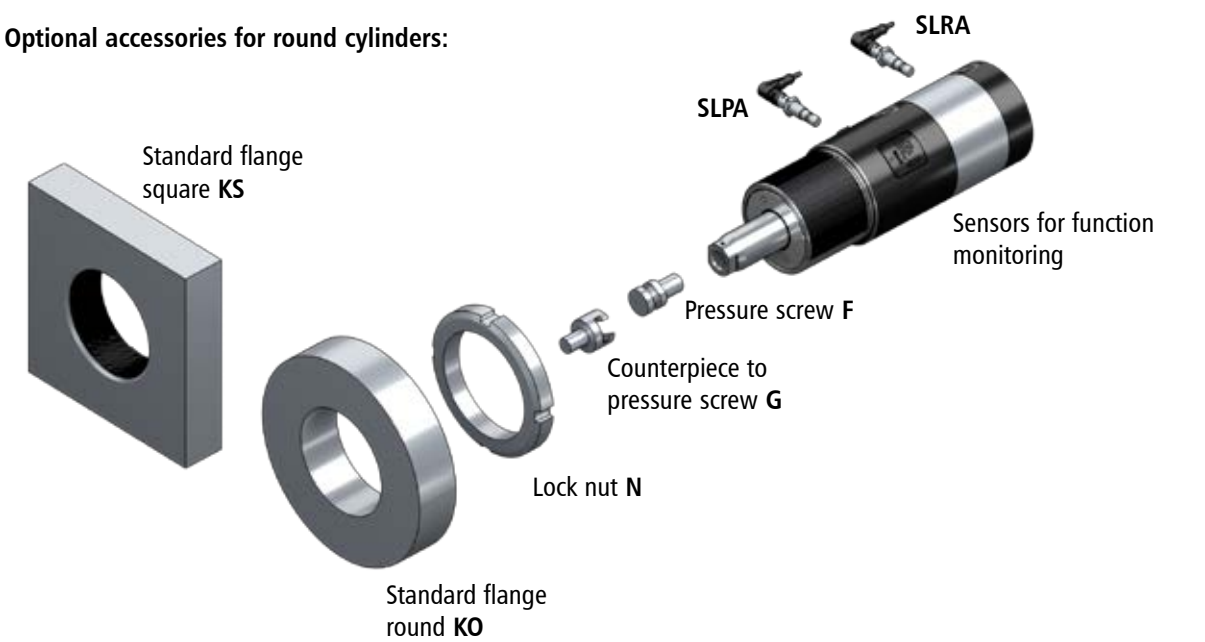
The self-inhibiting locking is maintained permanently and as a result the pressure supply is not necessary. In this range a preload is generated that guarantees reliable operational process and high work-piece quality.

The red curve displays the force distribution as it is achieved in the locked position with positive lock. Core and piston rod withstand the high counter pressure during the following injection cycle definitely. **The core does not recede!**

TECHNICAL DATA ROUND CYLINDER



Optional accessories for round cylinders:



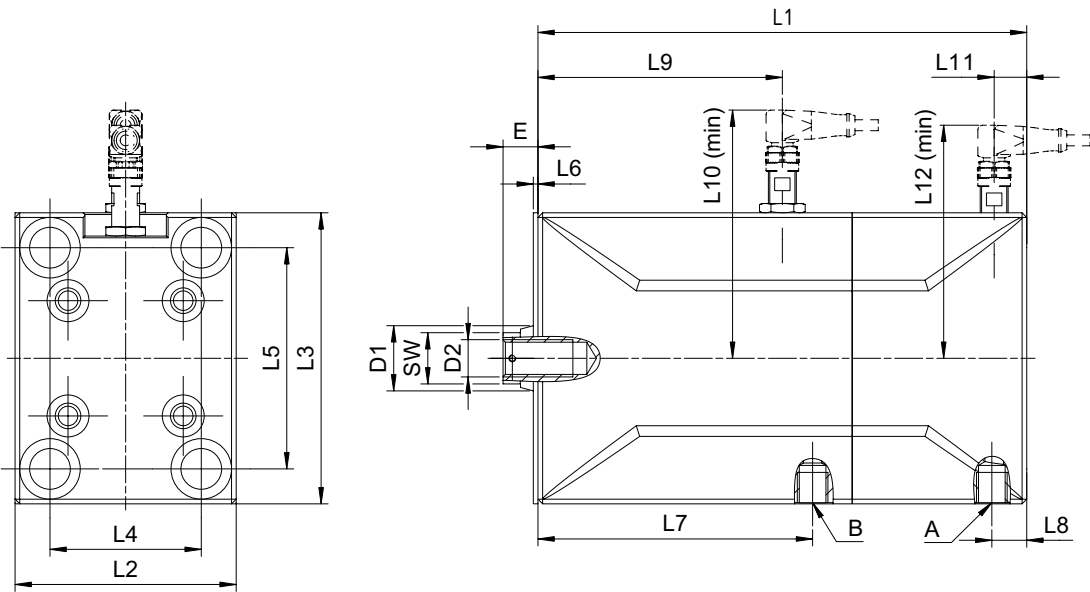
Dimensions and forces series CYPULL CP-HR-P / CP-HR-L

	Nominal size Piston Ø	Type of locking*											Pressure ports	
			D1	L1	Ø D2	L2	D3	E	D4	SW	L3	L4		A/B
Standard	20	P	14	140	55	40	M50x1,5	8	M6x15	11	90	15	G1/4	78
		L		110		30					60			49
	25	P	16	150	60	50	M55x2	10	M8x20	13	100	15		86
		L		120		40					70			58
	32	P	20	180	75	60	M70x2	12	M10x20	17	120	15		105
		L		145		55					85			73
	40	P	28	190	95	70	M85x2	15	M16x25	22	130	15		113
		L		160		70					100			83
	50	P	36	225	100	80	M90x2	21	M20x35	27	160	15	G3/8	144
		L		175		80					110			94
	63	P	45	235	120	90	M110x2	25	M27x45	36	170	15		151
		L		180		80					115			99
	80	P	56	275	150	100	M140x2	28	M30x45	46	200	17,5	G1/2	182
		L		210		100					135			117
	100	P	70	290	170	110	M160x3	33	M42x45	60	215	17,5		195
		L		220		110					145			128
Option	125	P	90	on request			M190x3	33	M56x50	70	on request		G3/4	on request
		L												
	160	P	110				M235x3	40	M64x95	95			G1	
		L												
	200	P	140				M290x3	50	M80x112	115				
		L												

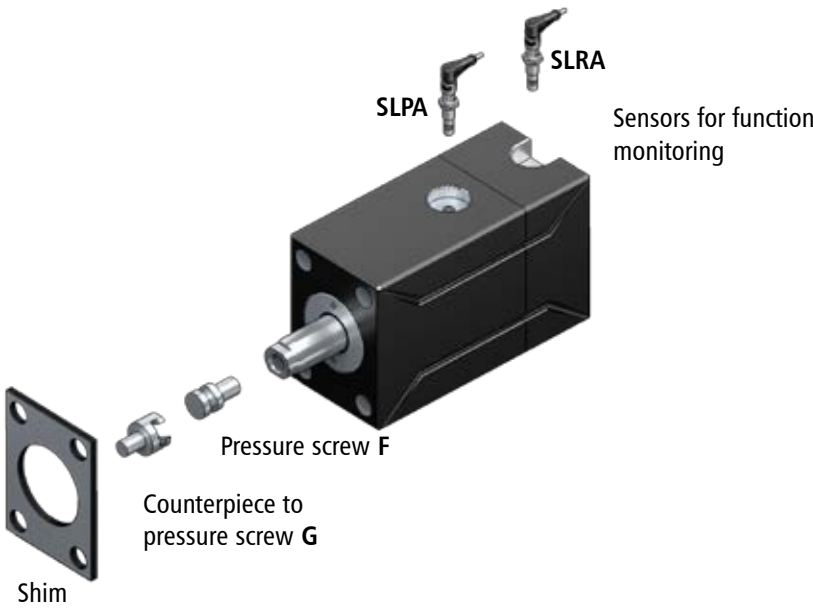
*P: with preload | *L: without preload | Designations in mm respectively Inch

				max. preload distance	Holding force [kN]	Stroke force all series [kN]			Retraction force all series [kN]		
L6	L7	L8	Standard strokes			100 bar	150 bar	200 bar	100 bar	150 bar	200 bar
75	15	66	25/50/75/100 differing stroke lengths available on request	0,5	32	3,1	4,7	6,3	1,6	2,4	3,2
				-							
78	15	66		0,5	50	4,9	7,4	9,8	2,9	4,3	5,8
				-							
98	15	86		0,5	80	8,0	12,1	16,1	4,9	7,4	9,8
				-							
107	15	88		0,5	150	12,6	18,8	25,1	6,4	9,6	12,8
				-							
111	15	91		1,0	240	19,6	29	39,3	9,5	14,0	18,9
				-							
116	15	98		1,0	360	31,2	47	62,3	15,3	23,0	30,5
				-							
125	19	105		1,0	560	50,3	75	100,5	25,6	38,0	51,3
				-							
137	19	112		1,0	880	78,5	118	157,1	40,1	60,0	80,1
				-							
on request			customer specific	1,0	1.280	122,7	184	245,4	59,1	88,7	118,2
				-							
				1,0	2.100	201,1	302	402,1	106,0	159,0	212,1
				-							
				1,0	3.300	314,2	471	628,3	160,2	240,3	320,4
				-							

TECHNICAL DATA BLOCK CYLINDER



Optional accessories for block cylinders:



Dimensions and forces series CYPULL CP-HB-P / CP-HB-L

	Nominal size Piston Ø	Type of locking*		(Stroke 0 ≤ 25)	(Stroke 26 ≤ 50)	(Stroke 51 ≤ 75)	(Stroke 76 ≤ 100)												Pressure ports																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</
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*P: with preload | *L: without preload | Designations in mm respectively Inch

Dimensioning of the cylinder

Condition: $F_{H,cylinder} > F_{process}$
($F_{H,cylinder} >>>$ see technical data)

Calculation example for a touching core and following core situation:

$A = \begin{cases} d \text{ (touching surface)} = 12 \text{ mm} \\ D \text{ (pressurised surface)} = 45 \text{ mm} \end{cases}$
 $p \text{ (injection pressure)} = 1000 \text{ bar}$

Applied formula for the determination of the **required holding force**:

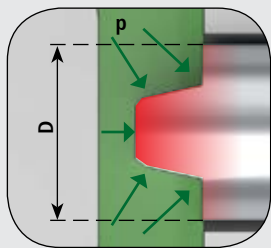
$F_{process} \text{ [kN]} = p \text{ [bar]} \cdot A \text{ [mm}^2] \cdot 10^{-4}$
 $= p \cdot \frac{\pi}{4} \cdot [D^2 - d^2] \cdot 10^{-4}$
 $= 1000 \text{ [bar]} \cdot \frac{\pi}{4} \cdot [(45 \text{ mm})^2 - (12 \text{ mm})^2] \cdot 10^{-4}$
 $= 147 \text{ kN}$

Conclusion:
A cylinder with nom. size **40** (with max. holding force 150 kN) would be sufficient theoretically.
The process force is very near to the maximum holding force of this series (see technical data pages 8 to 11). But it is recommended to provide a force reserve in terms of security reasons, and to choose the next larger series **50**. Thus the maximum preload cannot be exceeded even in case of a possible lift-off of the core.

Recommended cylinder choice as an example:
CP - HR (HB) - P1E - 050 - 036 - - SLPA - SLRA - ...

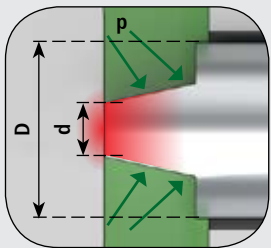
For the inquiry of the locked position and the position of the retracted piston rod, the cylinders can be equipped with inductive proximity sensors, see page 14.

Core situation 1:
completely exposed,
not touching



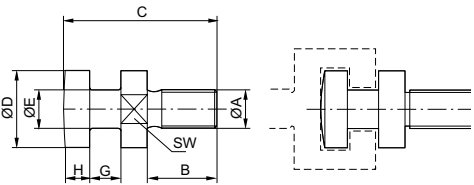
D = pressurised surface
p = injection pressure

Core situation 2:
touching



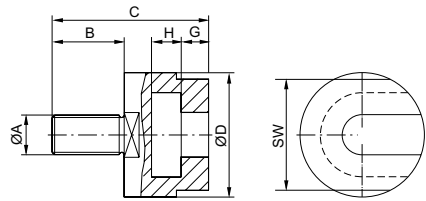
D = pressurised surface
d = touching surface
p = injection pressure

Pressure screw F
with coupling cone for
misalignment compensation



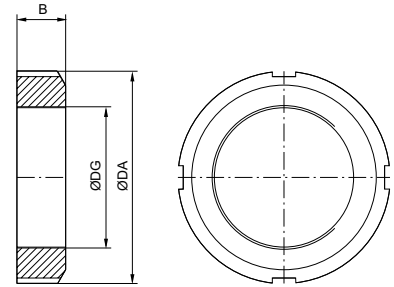
Cyl. nom.- Ø	20	25	32	40	50	63	80	100	125	160	200
A	M6	M8	M10	M16	M20	M27	M30	M42	M56	M64	M80
B	11	14,5	14,5	20	28	39	35	40	45	85	105
C	26	32	32	40	56	75	89	115	135	200	250
D	12	16	20	25	32	40	52	65	80	102	130
E	6	8	10	16	18	24	29,5	40	55	70	90
G	5	6,5	6,5	7	10	13	19	25	30	38	48
H	5	5,5	5,5	6	10	12	19	25	30	38	48
SW	10	14	17	22	27	36	46	55	70	90	110

Counterpiece to pressure screw G



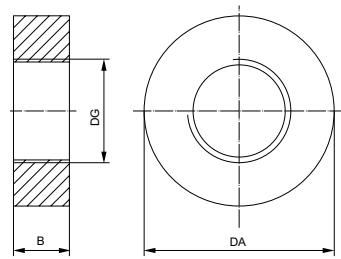
Cyl. nom.- Ø	20	25	32	40	50	63	80	100	125	160	200
A	M6	M8	M10	M16	M20	M27	M30	M42	M56	M64	M80
B	11	14,5	14,5	20	28	39	35	40	45	85	105
C	26	31,5	31,5	41	58	79	92	120	135	200	249,5
G	5,2	5,5	5,5	6	9	12	18	24	29	37	46
H	6	6	6	6,5	10,5	12,5	19,5	25,5	30,5	38,5	49
D	20	25	31	37	47	57	76	92	108	137	173
SW	17	22	26	32	41	50	65	80	90	110	140

Lock nut N
to secure the cylinder against torsion

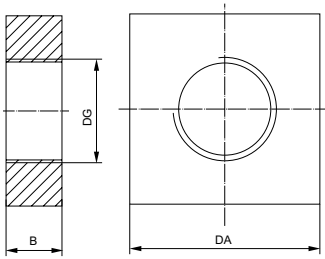


Cyl. nom. Ø	20	25	32	40	50	63
Ø DA	70	75	92	110	120	145
B	11	11	12	16	16	19
Ø DG	M50x1,5	M55x2	M70x2	M85x2	M90x2	M110x2

Cyl. nom. Ø	80	100	125	160	200
Ø DA	180	210	240	285	340
B	22	25	28	28	30
Ø DG	M140x2	M160x3	M190x3	M235x3	M290x3

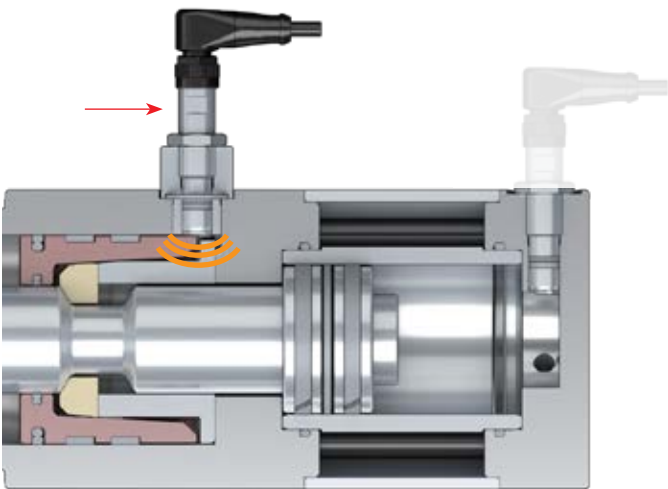


Standard flange
round **KO**

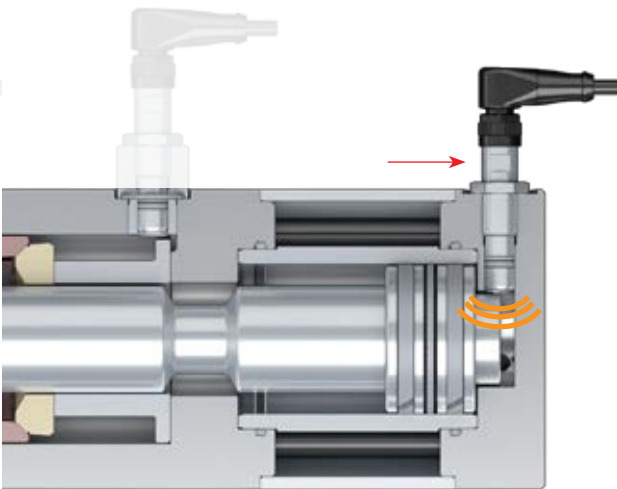


Standard flange
square **KS**

Cylinder nominal Ø	20	25	32	40	50	63	80	100	125	160	200
DA	100	120	130	150	180	210	240	290	380	on request	on request
B	20	25	30	30	40	45	60	70	90		
Ø DG	M50x1,5	M55x2	M70x2	M85x2	M90x2	M110x2	M140x2	M160x3	M190x3		
rec. screw mounting	6xM10	6xM10	6xM12	6xM12	6xM16	8xM16	8xM20	8xM24	8xM30		
rec. pitch circle Ø for version KO	75	95	107	127	150	180	205	245	325		



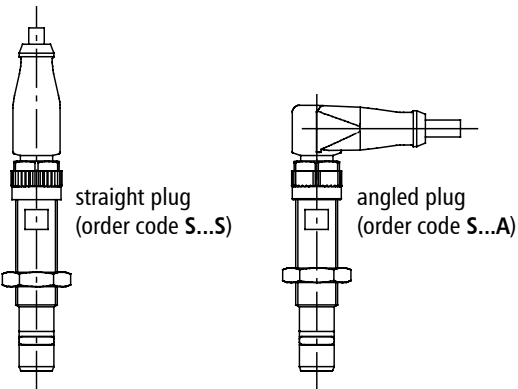
Inductive sensor: inquiry of locking and extended position of the piston rod (order code SL...)



Inductive sensor: inquiry of retracted position of the piston rod (order code SR...)

For the functional monitoring, inductive sensors in the cylinder housing are available, which detect reliably the actual condition of the locking system and the final position (extended, retracted) of the piston rod.

They work contactless, are free of wear and durable.



CYTEC offers them with straight or angled plugs.

Typical features:

- 3 different types:
 - PNP (up to 80°C)
 - PNP high temperature (up to 120°C)
 - NAMUR (up to 80°C)
- self-secure
- free of wear and enduring
- plug design straight or angled
- most simple exchange
- retrofit for all standard series

	Designation	Order code	CP - HR - P1E - 063 - 036 - 0075 - SLPS - SRPS - F - G - N - KS									
			B	L	M			NA H X	NA H X		KO	
Series	Locking core pulling cylinder	CP										
Pressure supply	hydraulic	H										
Structural design	Round cylinder	R										
	Block cylinder	B										
Locking principle	Locking with extended piston rod	1										
	without preload	L										
	with preload	P										
Wiper seal	metal	M										
	Elastomer	E										
Piston	Diameter in mm											
Rod	Diameter in mm											
Stroke	Length in mm											
Sensors	Sensor	S										
	Position rod side (inquiry rod extended/locked)	L										
	Position piston side (inquiry rod retracted/unlocked)	R										
	not used	X										
	PNP sensor	P										
	NAMUR sensor	N										
	high temperature type	H										
	no sensor	X										
	straight plug	S										
	angled plug	A										
	no plug	X										
Accessories	Pressure screw	F										
	Counterpiece to pressure screw	G										
	Lock nut*	N										
	Mounting flange square*	KS										
	Mounting flange round*	KO										

*only for round cylinders



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We reserve the right to make technical modifications. The components/ machines shown here may include options, accessories and control variants.