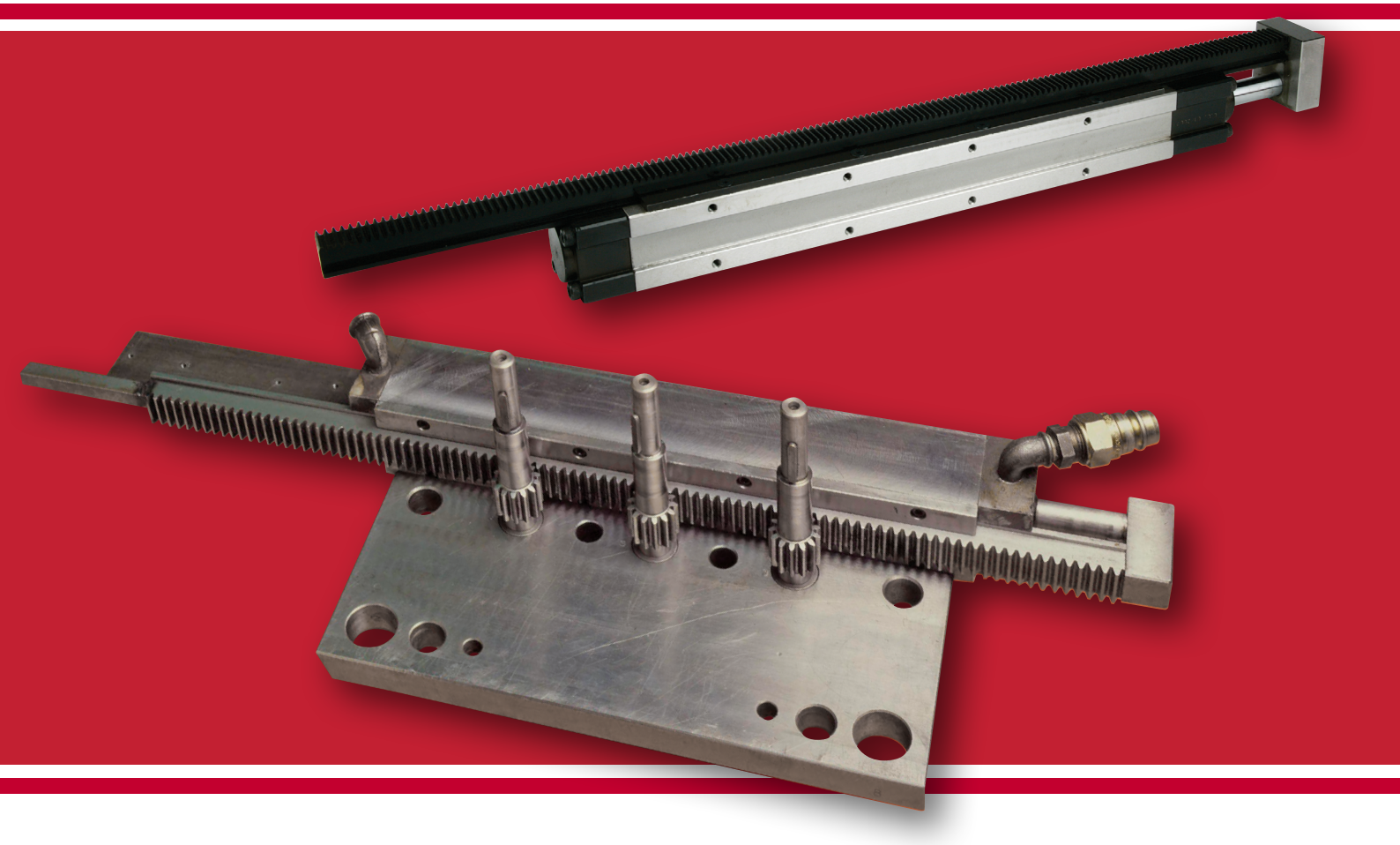

Hydraulic Unscrewing Device

Standardized System for Molding Internal Threads

- Metric-rack design
- Off -the-shelf replacement parts
- Simplifies mold design
- Applicable to different design styles
- Technical and application support
- Rack sized to provide maximum stroke lengths

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Other Countries
P: +32 15 28 87 30
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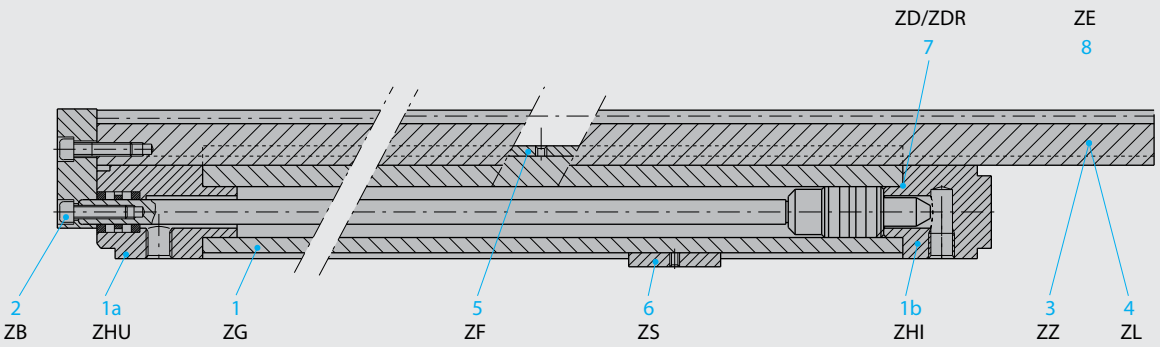
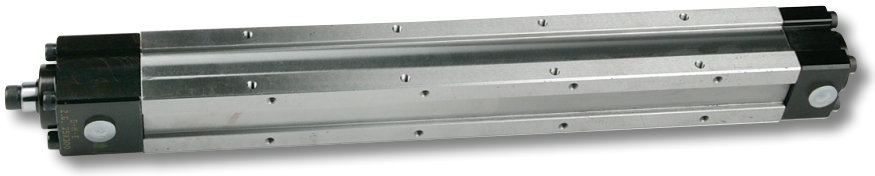
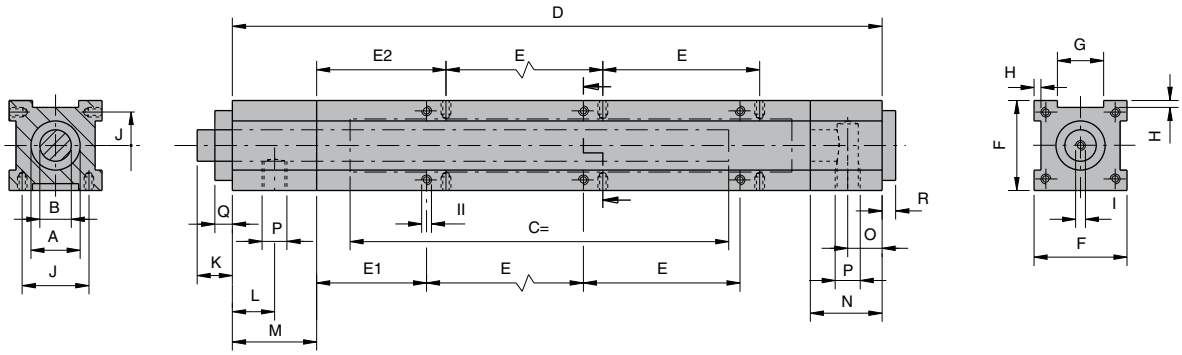


1	ZG	base construction	3	ZG	rack	7	ZD/ZDR	seals
1a	ZHU	end caps - out	4	ZG	gib	8	ZE	limit switch (no view)
1b	ZHI	end caps - in	5	ZF	guideway			
2	ZB	flange	6	ZS	fixing plate			

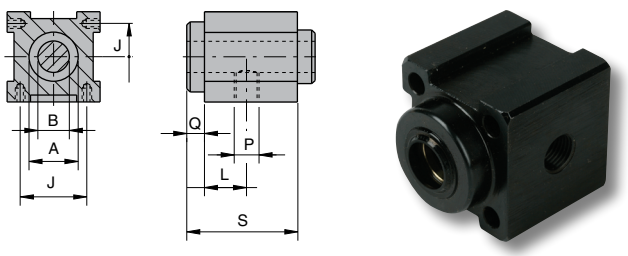
Base construction ZG





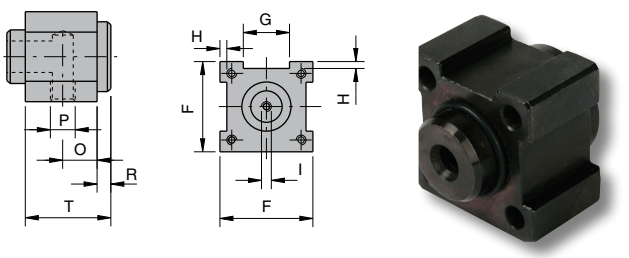
REF	A	B	C	D	E	E1	E2	F	G	H	J	K	L	M	N	O	P	Q	R	I	II
ZG 25 300			300	424	3x80	56	66														
ZG 25 400	ø 25	ø 16	400	524	3x80	106	116	46	20	3,5	34	18	21,5	43	29	11	R 1/4"	9	6	M8x20	SM5x10
ZG 25 500			500	624	5x80	76	86														
ZG 40 300			300	432	3x80	56	66														
ZG 40 400	ø 40	ø 22	400	532	3x80	106	116	56	30	3,5	44	22	34,0	53	27	13	R 1/2"	9	8	M10x30	SM5x10
ZG 40 500			500	632	5x80	76	86														
ZG 63 400	ø 63	ø 36	400	556	3x80	114	124	96	50	8,0	70	38	25,0	52	35	16	R 3/4"	22	12	M12x40	SM8x16
ZG 63 500			500	656	5x80	84	94														

End caps - out ZHU



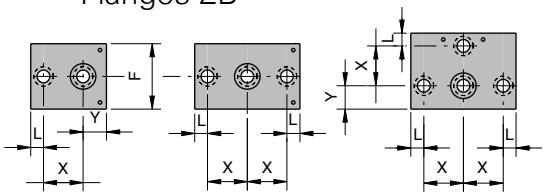
REF	L	Q	P	S
ZHU 25	21,5	9	R 1/4"	52
ZHU 40	34,0	9	R 1/2"	62
ZHU 63	25,0	22	R 3/4"	74

End caps - in ZHI



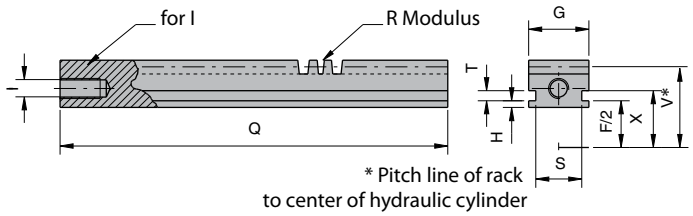
REF	O	R	P	T
ZHI 25	11	6,5	R 1/4"	35
ZHI 40	13	8,5	R 1/2"	35
ZHI 63	16	12,0	R 3/4"	47

Flanges ZB



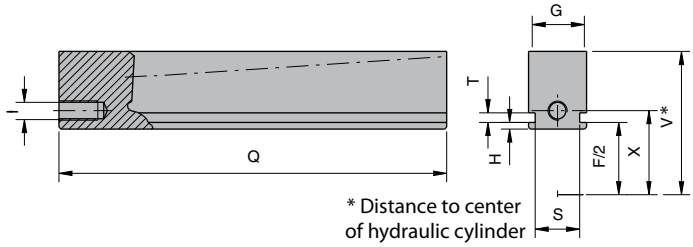
REF	A	X	Y	F	Z	L	I: for
ZB 25-1	ø 25	27	12,5	46	20	10,5	2 x M8 x 20
ZB 25-2							3 x M8 x 20
ZB 25-3							4 x M8 x 20
ZB 40-1	ø 40	34	20,0	56	30	11,0	2 x M10 x 30
ZB 40-2							3 x M10 x 30
ZB 40-3							4 x M10 x 30
ZB 63-1	ø 63	55	30,0	96	40	15,0	1 x M12 x 40 + 1 M16 x 45
ZB 63-2							2 x M12 x 40 + 1 M16 x 45
ZB 63-3							3 x M12 x 40 + 1 M16 x 45

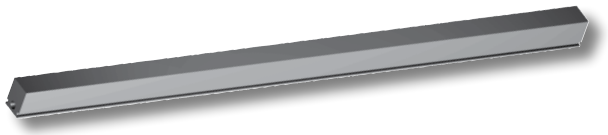
Racks ZZ



REF	A	F/2	G	H	Q	Modules	S	T	V	X	I
ZZ 25-600/1,0	ø 25	23	20	3,4	600	1,00	13	5	36,2	27	M8 x 20
ZZ 25-800/1,0					800						
ZZ 25-600/1,25					600	1,25					
ZZ 25-800/1,25					800						
ZZ 40-600/1,5	ø 40	28	30	3,4	600	1,50	23	5	43,0	34	M10 x 30
ZZ 40-800/1,5					800						
ZZ 63-800/2,0	ø 63	48	50	7,9	800	2,00	40	7	68,0	55	M12 x 40
ZZ 63-900/2,0					900						

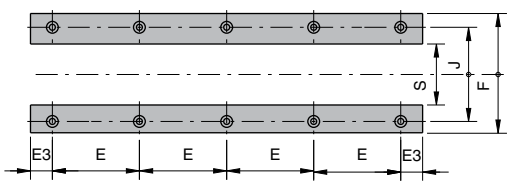
Gibs ZL

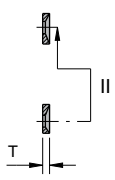




REF	A	F/2	G	H	Q	S	T	V	X	I
ZL 25-800	ø 25	23	20	3,35	800	13	5	49,5	27	M8 x 20
ZL 40-800	ø 40	28	30	3,50	800	23	5	64,5	34	M10 x 30
ZL 63-900	ø 63	48	50	8,00	900	40	7	100,0	55	M12 x 40

Guideways ZF

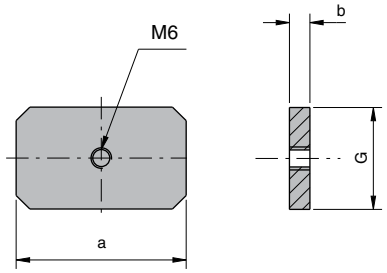




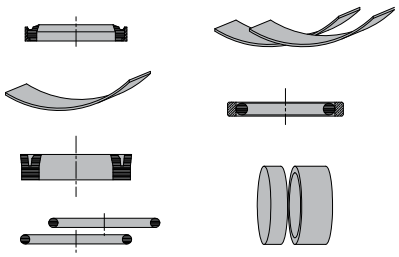
Note: Two guideways are required per Rack or per Gib.

REF	A	C	E	E3	F	J	S	T	II
ZF 25-300	ø 25	300	3x80	46	46	34	14	4	SM 5x10
ZF 25-400		400	3x80	96					
ZF 25-500		500	5x80	66					
ZF 40-300	ø 40	300	3x80	46	56	44	24	4	SM 5x10
ZF 40-400		400	3x80	96					
ZF 40-500		500	5x80	66					
ZF 63-400	ø 63	400	3x80	104	96	70	42	6	SM 8x16
ZF 63-500		500	5x80	74					

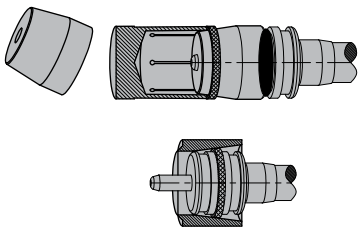
Fixing plates ZS



Seals (kit) ZD



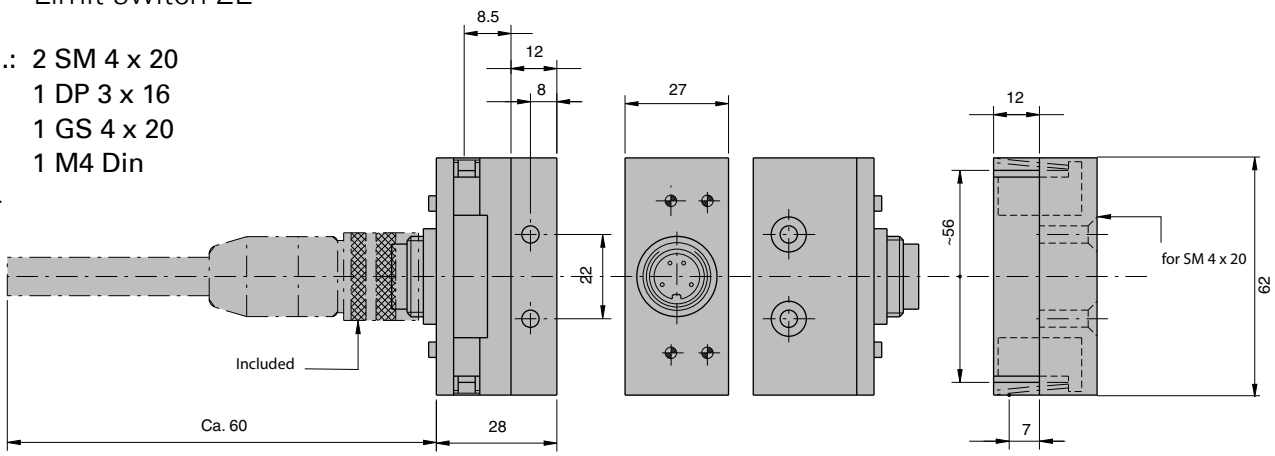
Kit: Seals ZD + Mounting tools ZDR



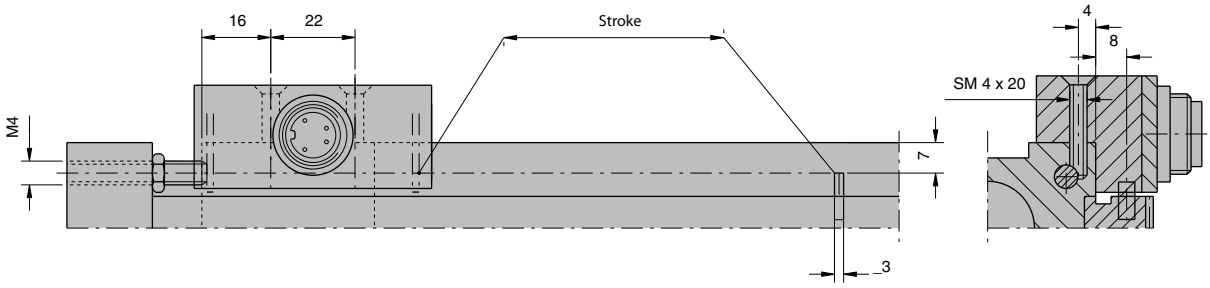
REF	A	G	a	b	REF	REF
ZS 25	ø 25	20	40	6	**ZD 25**	**ZDR 0025**
ZS 40	ø 40	30	50	6	**ZD 40**	**ZDR 0040**
ZS 63	ø 63	50	80	15	**ZD 63**	**ZDR 0063**

Limit switch ZE

Incl.: 2 SM 4 x 20
1 DP 3 x 16
1 GS 4 x 20
1 M4 Din
934



Installation details for Limit Switch ZE-25/40



For gear information please contact ***D-M-E***

REF
ZE 25/40

Calculation example

A. Stroke

a. Required revolutions (thread Acore)

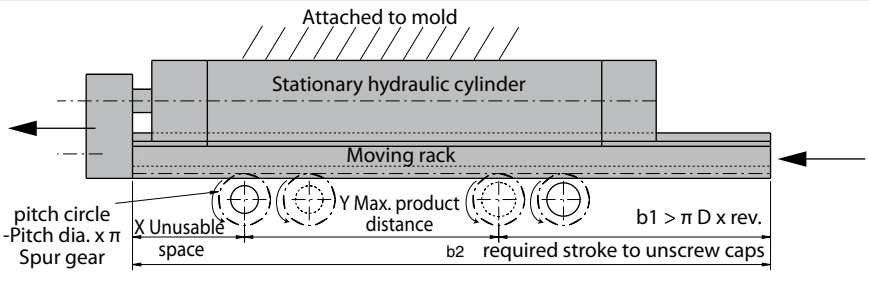
$$= \frac{\text{thread height}}{\text{thread lead}} + \begin{cases} \text{safety} \\ \text{(min 0,5 t)} \end{cases}$$

$$= \frac{12\text{ mm}}{3\text{ mm}} + 0{,}5\text{ rev.} = 4{,}5\text{ rev.}$$

b. 1. Required stroke (mm)
= pitch circle x p x rev.
= 30 mm x 3,14 x 4,5 rev.
= 424 mm If required stroke is too long, a cog wheel transmission gear should be used

2. Length of rack: b2 = X + Y + b1

c. Stripper stroke (mm)
= cylinder stroke - required rack stroke
= 500 mm - 424 mm = 76 mm



Calculation example

B. Control Cam calculation

d. Moving cam (∞)

$$\tan \alpha = \frac{\text{lead}}{\text{dia. pitch circle x } \pi}$$

$$\tan \alpha = \frac{3 \text{ mm}}{30 \text{ mm x } 3{,}14} = 0{,}031847$$

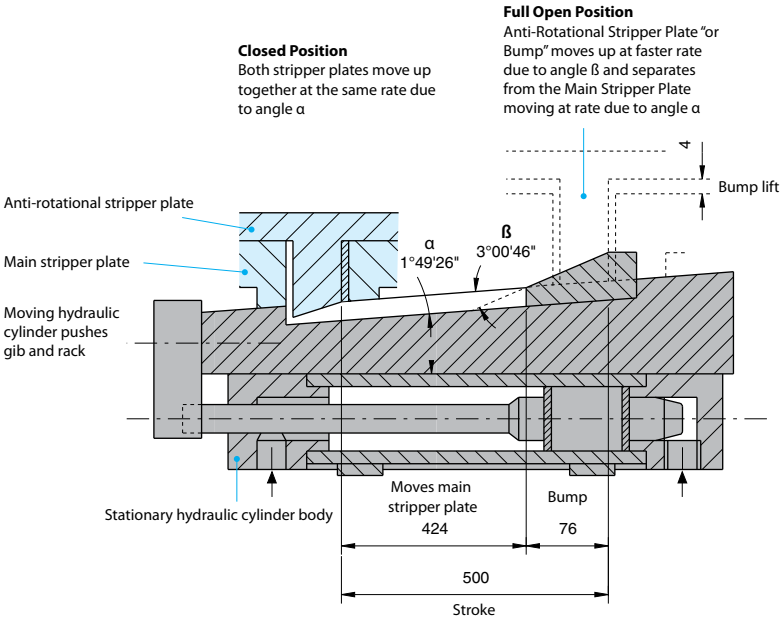
$\alpha = 1°49'26''$

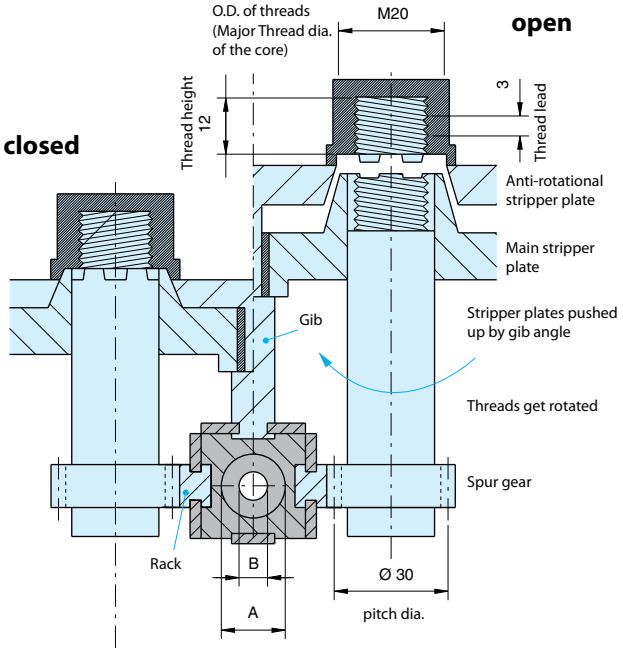
e. Stripper cam (ß)

$$\tan ß = \frac{\text{Stripper height}}{\text{Stripper stroke}}$$

$$\tan ß = \frac{4 \text{ mm}}{76 \text{ mm}} = 0{,}0526315$$

$ß = 3°00'46''$





Calculation example

C. Unscrewing force*

f. Residual pressure (bar)
1/100 of max. injection pressure

$$= \frac{1000 \text{ bar}}{100} \approx 10 \text{ bar} \approx 1 \text{ N/mm2}$$

g. Effective core surface area (mm2)
= thread dia. x p x thread height x 2*
= 20 mm x 3,14 x 12 mm x 2
= * 1507 mm2
* - 2 x height for developped surface (/\/\/\/\ )
* - frontal area is neglected

h. Unscrewing torque (Nmm)
= Holding pressure x surface x thread
= radius
= 1 N/mm2 x 1507 mm2 x 10 mm =
15070 Nmm

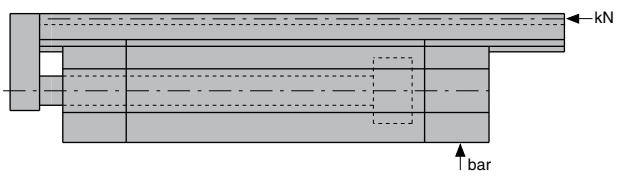
i. Unscrewing force rack (kN)

$$= \frac{\text{unscrewing torque x number of cores}}{\text{radius pitch circle}}$$

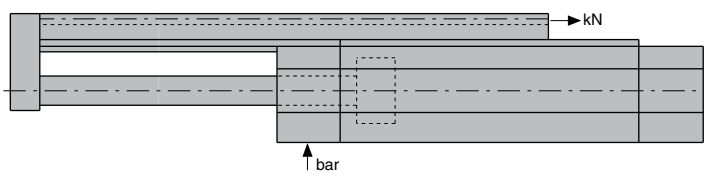
$$= \frac{15070 \text{ Nmm x } 4 = 4019 \text{ N} = 4{,}02 \text{ kN}}{15 \text{ mm}}$$

k. Hydraulic force (kN)
= Unscrewing force x 1,5
= 4,02 kN x 1,5 = 6,03 kN
(50 % safety, hence x 1,5)

Workingstroke



Return Back



80	100	120	140	150	bar	A	B	bar	80	100	120	140	150
3,9	4,9	5,9	6,8	7,4		ø 25	ø 16		2,3	2,9	3,5	4,1	4,4
10,0	12,5	15,1	17,6	18,7	kN	ø 40	ø 22	kN	7,0	8,8	10,5	12,2	13,2
24,9	31,1	37,4	43,6	46,6		ø 63	ø 36		16,8	21,0	25,2	29,3	31,5

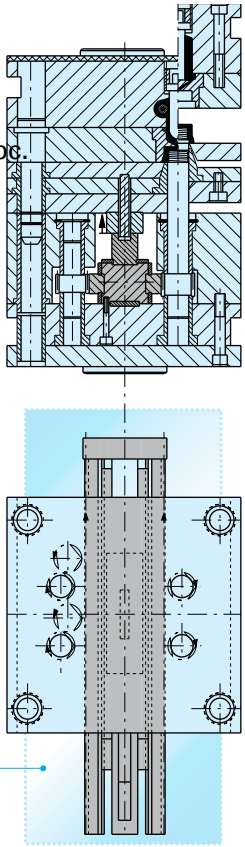
Dimensions only valid for above mentioned example.

*These figures should only be used as a guideline as many other factors will affect the calculation.
(Material, variation of dimensions, material shrinkage, core surface area, temperature, lubricant, etc...)

A Without guiding thread with cam

Required ***D-M-E*** Component List

Hydraulic Cylinder	ZG	1 pc.
Fixing Plate	ZS	2 pcs.
Flange-Version 3	ZB	1 pc.
Racks	ZZ	2 pcs.
Gibs	ZL	1 pc.
Guideways	ZF	6 pcs.

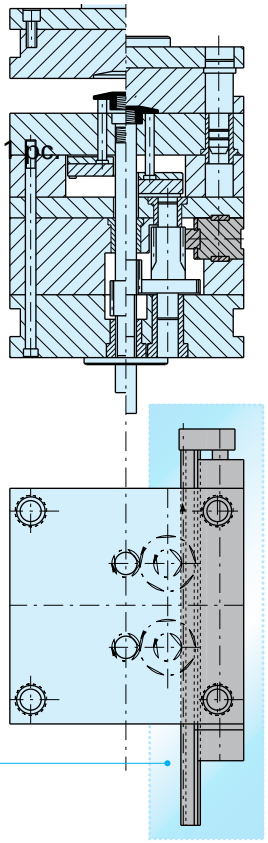


Safety Protection Box fabricated by mold maker completely covering full movement of Unscrewing Device.

B With guiding thread

Required ***D-M-E*** Component List

Hydraulic Cylinder	ZG	1 pc.
Fixing Plate	ZS	4 pcs.
Flange-Version 1	ZB	1 pc.
Racks	ZZ	1 pc.
Guideways	ZF	2 pcs.

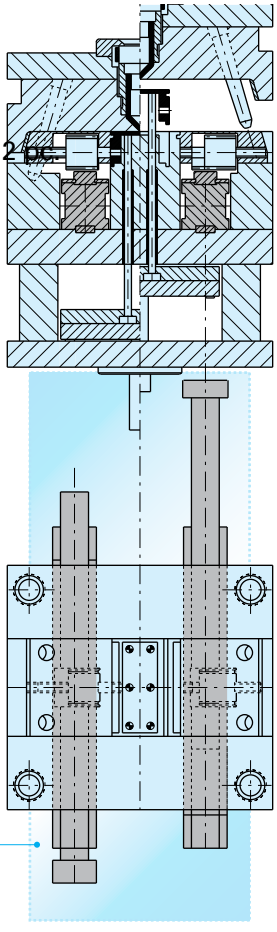


Safety Protection Box fabricated by mold maker completely covering full movement of Unscrewing Device.

C With guiding thread

Required ***D-M-E*** Component List

Hydraulic Cylinder	ZG	2 pc.
Fixing Plate	ZS	4 pcs.
Flange-Version 3	ZB	2 pc.
Racks	ZZ	2 pcs.
Guideways	ZF	4 pcs.

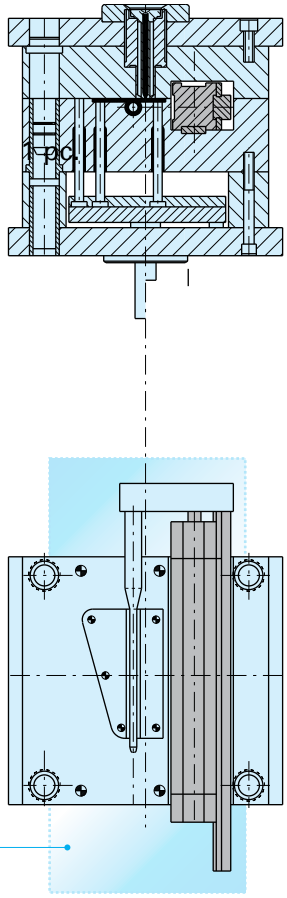


Safety Protection Box fabricated by mold maker completely covering full movement of Unscrewing Device.

D Long guiding cores

Required ***D-M-E*** Component List

Hydraulic Cylinder	ZG	1 pc.
Fixing Plate	ZS	2 pcs.
Flange-Version 2	ZB	1 pc.
Gibs	ZL	1 pc.
Guideways	ZF	2 pcs.



Safety Protection Box fabricated by mold maker completely covering full movement of Unscrewing Device.