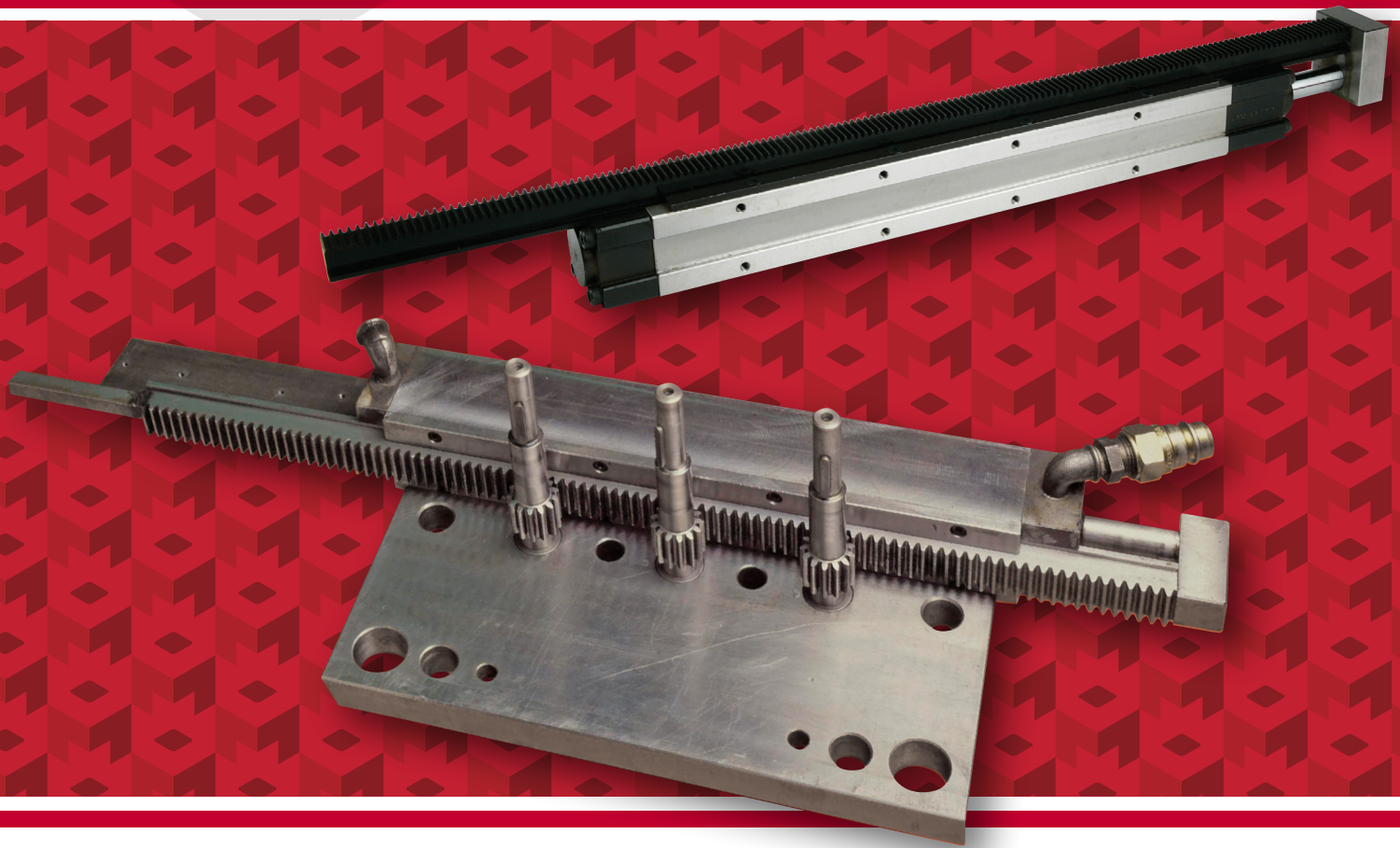




Hydraulic Unscrewing Device

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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P: +31 (0) 20 654 5571
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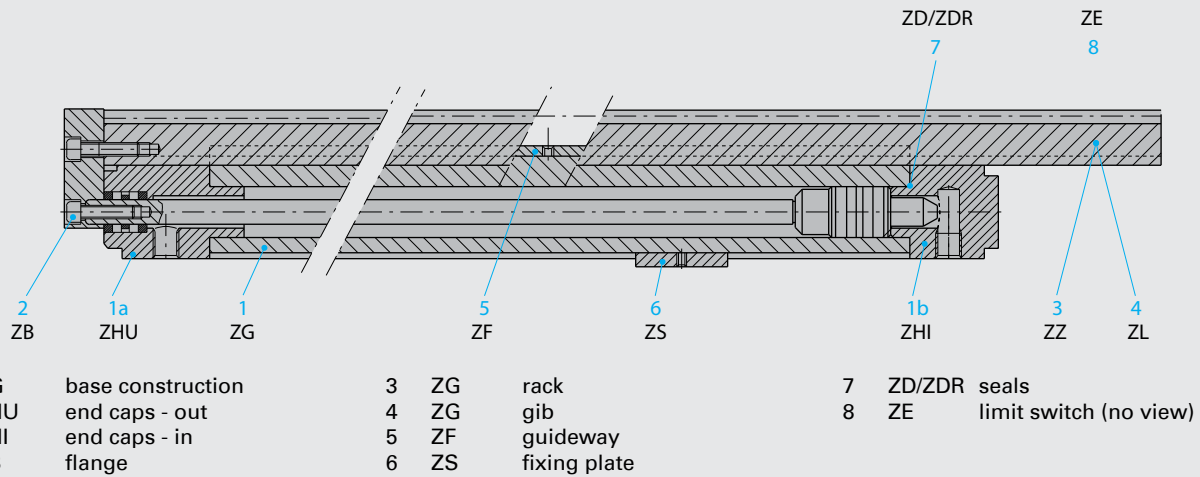
PL
P: +800 331 1312 | +32 15 21 50 92
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dme_polska@milacron.com

PT
P: 800 207 900
F: 800 207 901
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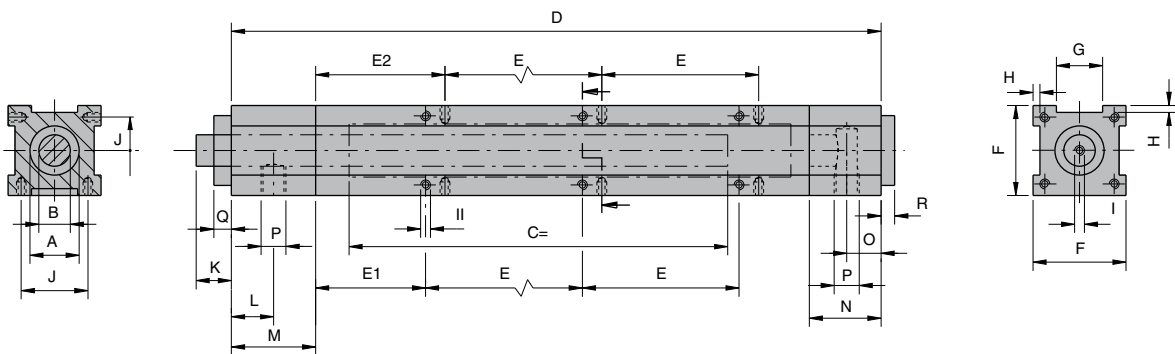
SK
P: 0800 142 451 | +420 572 151 754
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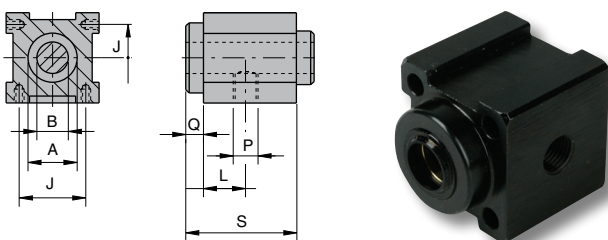
Base construction ZG



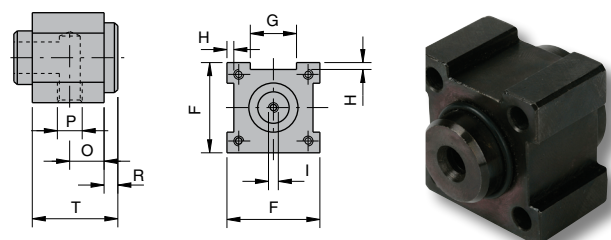
REF	A	B	C	D	E	E1	E2	F	G	H	J	K	L	M	N	O	P	Q	R	I	II
ZG 25 300	ø 25	ø 16	300	424	3x80	56	66	46	20	3,5	34	18	21,5	43	29	11	R 1/4"	9	6	M8x20	SM5x10
ZG 25 400			400	524	3x80	106	116														
ZG 25 500			500	624	5x80	76	86														
ZG 40 300	ø 40	ø 22	300	432	3x80	56	66	56	30	3,5	44	22	34,0	53	27	13	R 1/2"	9	8	M10x30	SM5x10
ZG 40 400			400	532	3x80	106	116														
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

End caps - in ZHI

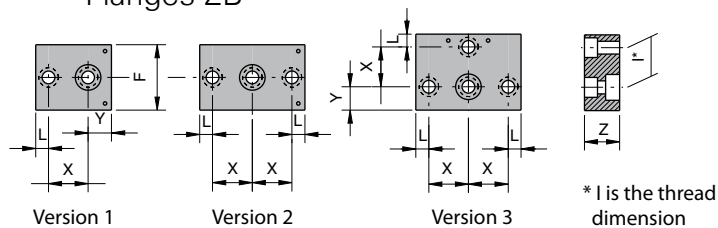


REF	L	Q	P	S
ZHU 25	21,5	9	R 1/4"	52
ZHU 40	34,0	9	R 1/2"	62
ZHU 63	25,0	22	R 3/4"	74



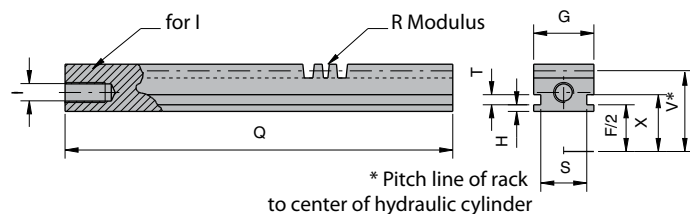
REF	O	R	P	T
ZHI 25	11	6,5	R 1/4"	35
ZHI 40	13	8,5	R 1/2"	35
ZHI 63	16	12,0	R 3/4"	47

Flanges ZB



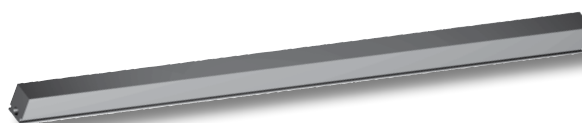
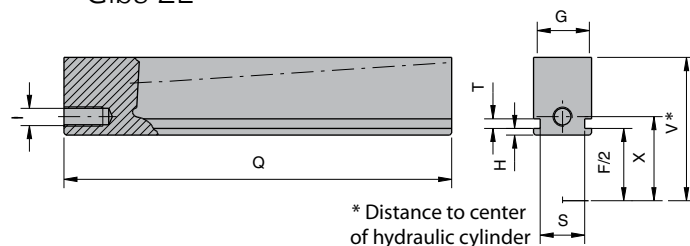
REF	A	X	Y	F	Z	L	I: for
ZB 25-1	ø 25	27	12,5	46	20	10,5	2 x M8 x 20
ZB 25-2							3 x M8 x 20
ZB 25-3							4 x M8 x 20
ZB 40-1	ø 40	34	20,0	56	30	11,0	2 x M10 x 30
ZB 40-2							3 x M10 x 30
ZB 40-3							4 x M10 x 30
ZB 63-1	ø 63	55	30,0	96	40	15,0	1 x M12 x 40 + 1 M16 x 45
ZB 63-2							2 x M12 x 40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

Racks ZZ



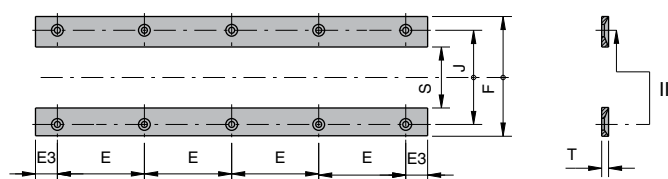
REF	A	F/2	G	H	Q	Modules	S	T	V	X	I
ZZ 25-600/1,0	ø 25	23	20	3,4	600	1,00	13	5	36,2	27	M8 x 20
ZZ 25-800/1,0					800						
ZZ 25-600/1,25					600	1,25					
ZZ 25-800/1,25	ø 40	28	30	3,4	800	1,50	23	5	43,0	34	M10 x 30
ZZ 40-600/1,5					600						
ZZ 40-800/1,5					800	1,50					
ZZ 63-800/2,0	ø 63	48	50	7,9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

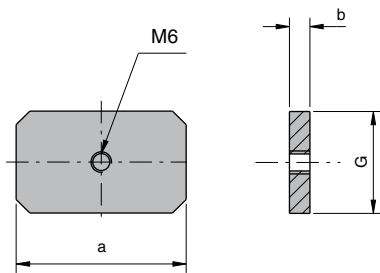
Guideways ZF



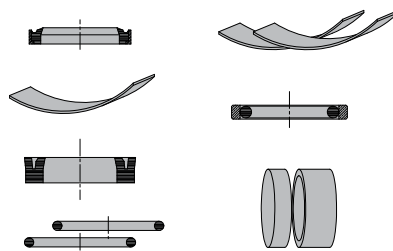
Note: Two guideways are required per Rack or per Gib.

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					

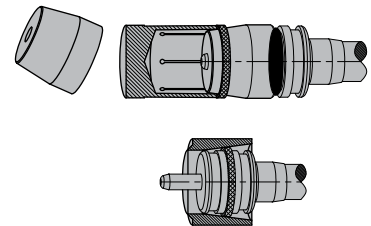
Fixing plates ZS



Seals (kit) ZD



Kit: Seals ZD + Mounting tools ZDR

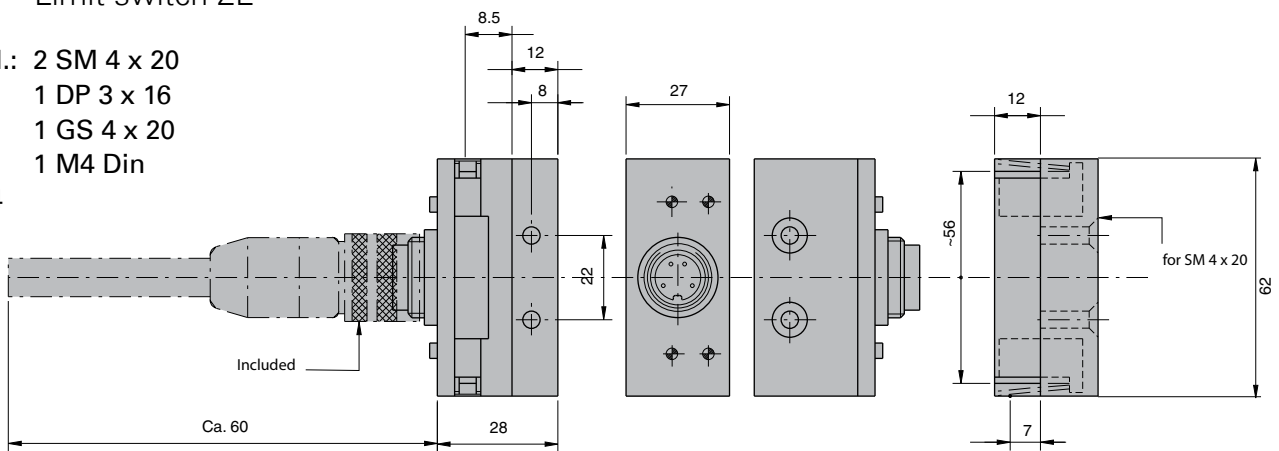


REF	A	G	a	b	REF	REF
ZS 25	ø 25	20	40	6	ZD 25	ZDR 0025
ZS 40	ø 40	30	50	6	ZD 40	ZDR 0040
ZS 63	ø 63	50	80	15	ZD 63	ZDR 0063

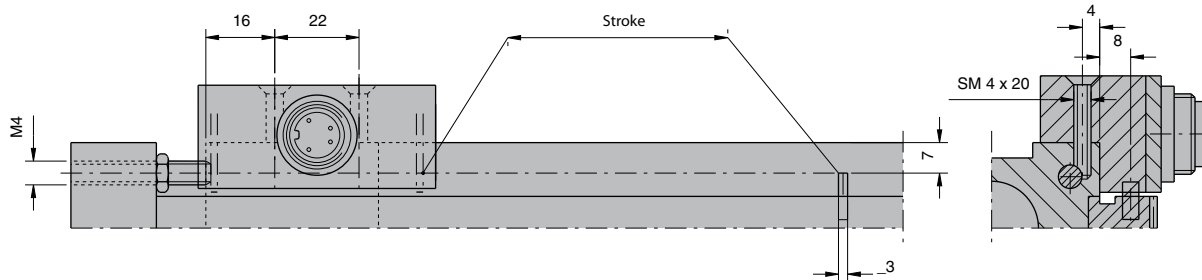
Limit switch ZE

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)

$$= \frac{\text{thread height}}{\text{thread lead}} + \left\{ \begin{array}{l} \text{safety} \\ (\text{min } 0,5 \text{ t}) \end{array} \right.$$

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

b. 1. Required stroke (mm)

$$= \text{pitch circle} \times p \times \text{rev.}$$

$$= 30 \text{ mm} \times 3,14 \times 4,5 \text{ rev.}$$

$$= 424 \text{ mm}$$

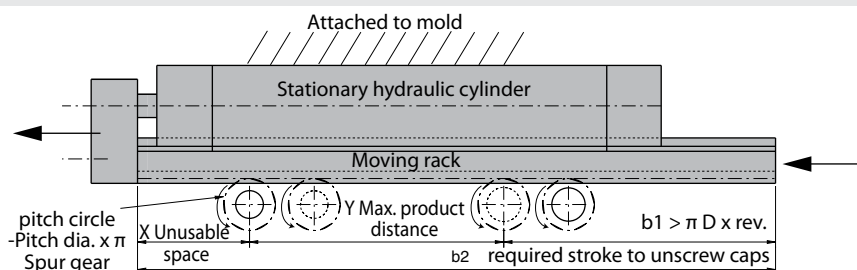
If required stroke is too long, a cog wheel transmission gear should be used

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

c. Stripper stroke (mm)

= cylinder stroke - required rack stroke

$$= 500 \text{ mm} - 424 \text{ mm} = 76 \text{ mm}$$



Calculation example

B. Control Cam calculation

d. Moving cam (∞)

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

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

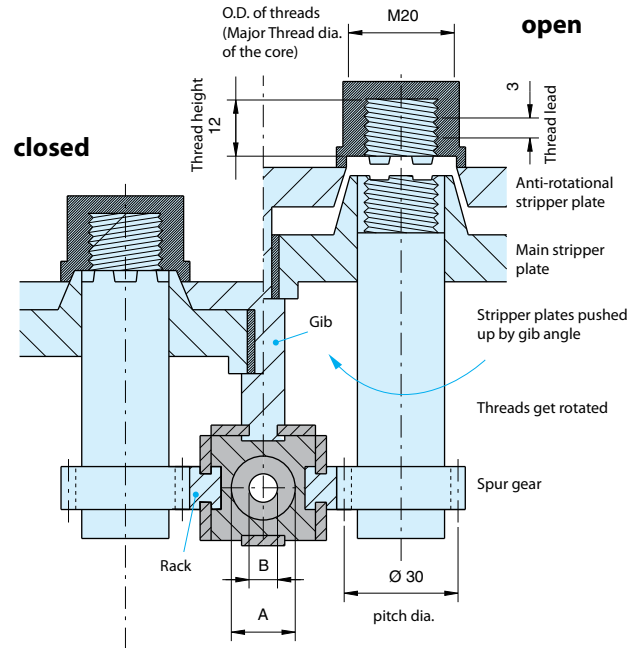
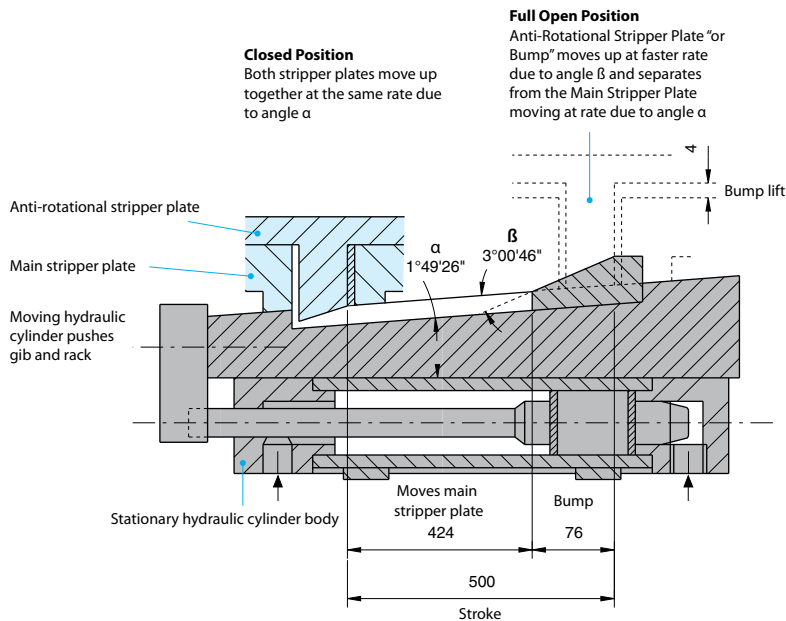
$$\alpha = 1^{\circ}49'26''$$

e. Stripper cam (β)

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

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

$$\beta = 3^{\circ}00'46''$$



Calculation example

C. Unscrewing force*

f. Residual pressure (bar)

$$1/100 \text{ of max. injection pressure}$$

$$= \frac{1000 \text{ bar}}{100} \approx 10 \text{ bar} \approx 1 \text{ N/mm}^2$$

g. Effective core surface area (mm²)

$$= \text{thread dia.} \times p \times \text{thread height} \times 2^*$$

$$= 20 \text{ mm} \times 3,14 \times 12 \text{ mm} \times 2$$

$$= * 1507 \text{ mm}^2$$

* - 2 x height for developed surface (~~~~~)

* - frontal area is neglected

h. Unscrewing torque (Nmm)

$$= \text{Holding pressure} \times \text{surface} \times \text{thread}$$

$$= \text{radius}$$

$$= 1 \text{ N/mm}^2 \times 1507 \text{ mm}^2 \times 10 \text{ mm} = 15070 \text{ Nmm}$$

i. Unscrewing force rack (kN)

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

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

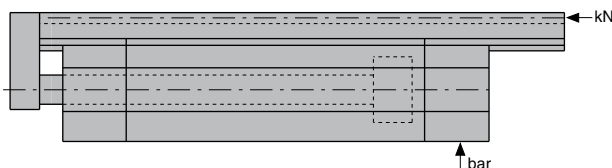
k. Hydraulic force (kN)

$$= \text{Unscrewing force} \times 1,5$$

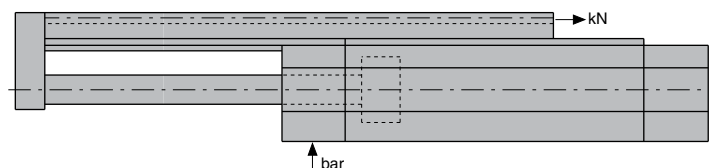
$$= 4,02 \text{ kN} \times 1,5 = 6,03 \text{ kN}$$

(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	kN	Ø 25	Ø 16	kN	2,3	2,9	3,5	4,1	4,4
10,0	12,5	15,1	17,6	18,7		Ø 40	Ø 22		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.

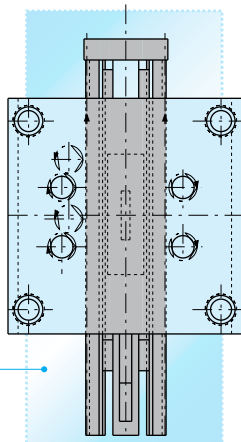
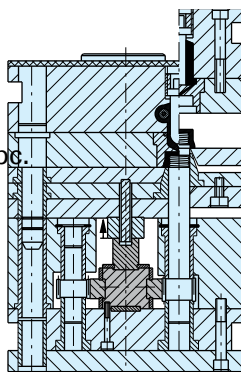
*These figures should only be used as a guideline as many other factors will affect the calculation.
(Material, variation of dimensions, material shrinkage, core surface area, temperature, lubricant, etc...)

Applications

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.

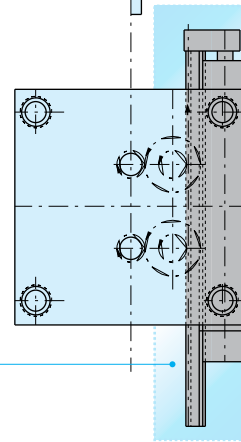
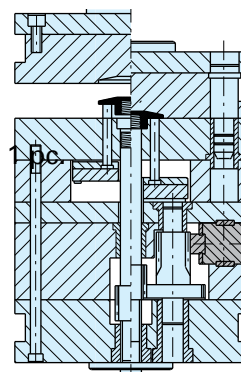


Safety Protection Box
fabricated by mold maker
completely covering full
movement of Unscrewing
Device.

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.

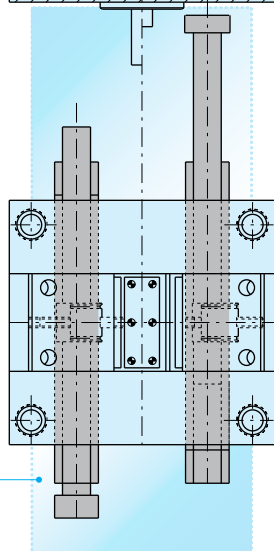
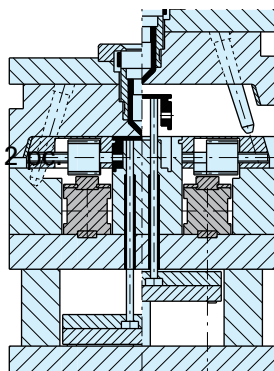


Safety Protection Box
fabricated by mold maker
completely covering full
movement of Unscrewing
Device.

C With guiding thread

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

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

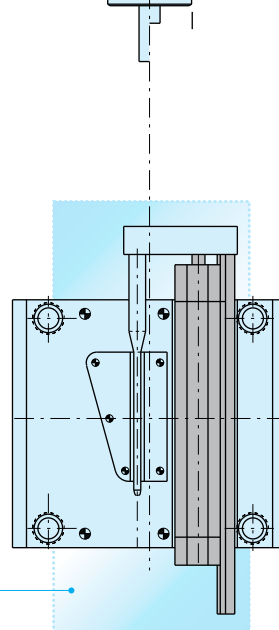
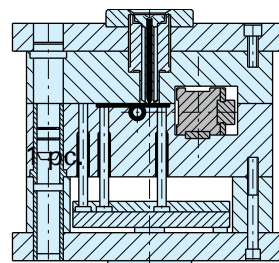


Safety Protection Box
fabricated by mold maker
completely covering full
movement of Unscrewing
Device.

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.