



OPTIMIZED CAM SERIES

O-KS | O-BS | O-ES

The optimized cam series for highest precision and performance



FORMING TOMORROW

Lacher Camtec GmbH
www.lacher-camtec.com

**LACHER
CAM
TEC**



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Lacher CAMTEC

Your innovative and reliable partner

Lacher Camtec is a worldwide leading company and specialist for standard parts, maintenance-free sliding elements and cam units. We convince especially in the automotive, toolmaking, injection moulding and specialized industries with the highest product quality, reliability and fast delivery times.

Our broad product portfolio offers suitable solutions for every requirement:

- » Cam units
- » Sliding elements & standard parts
- » ALZEN®

Industries:

- » Automotive
- » Toolmaking
- » Injection moulding
- » Specialized industries

With our broad product portfolio and individual customized products, we are able to offer personalized solutions for every requirement. Thanks to global locations, subsidiaries and holdings, we can react flexibly and quickly to your concerns and ensure the highest quality of service on site. Our dedicated team of specialists takes care of your individual needs globally.

SIMPLE, FAST AND TARGETED TO THE OPTIMUM SOLUTION!

In our Product-Finder you will find detailed information on products, 3D downloads and on orders. Find out now:

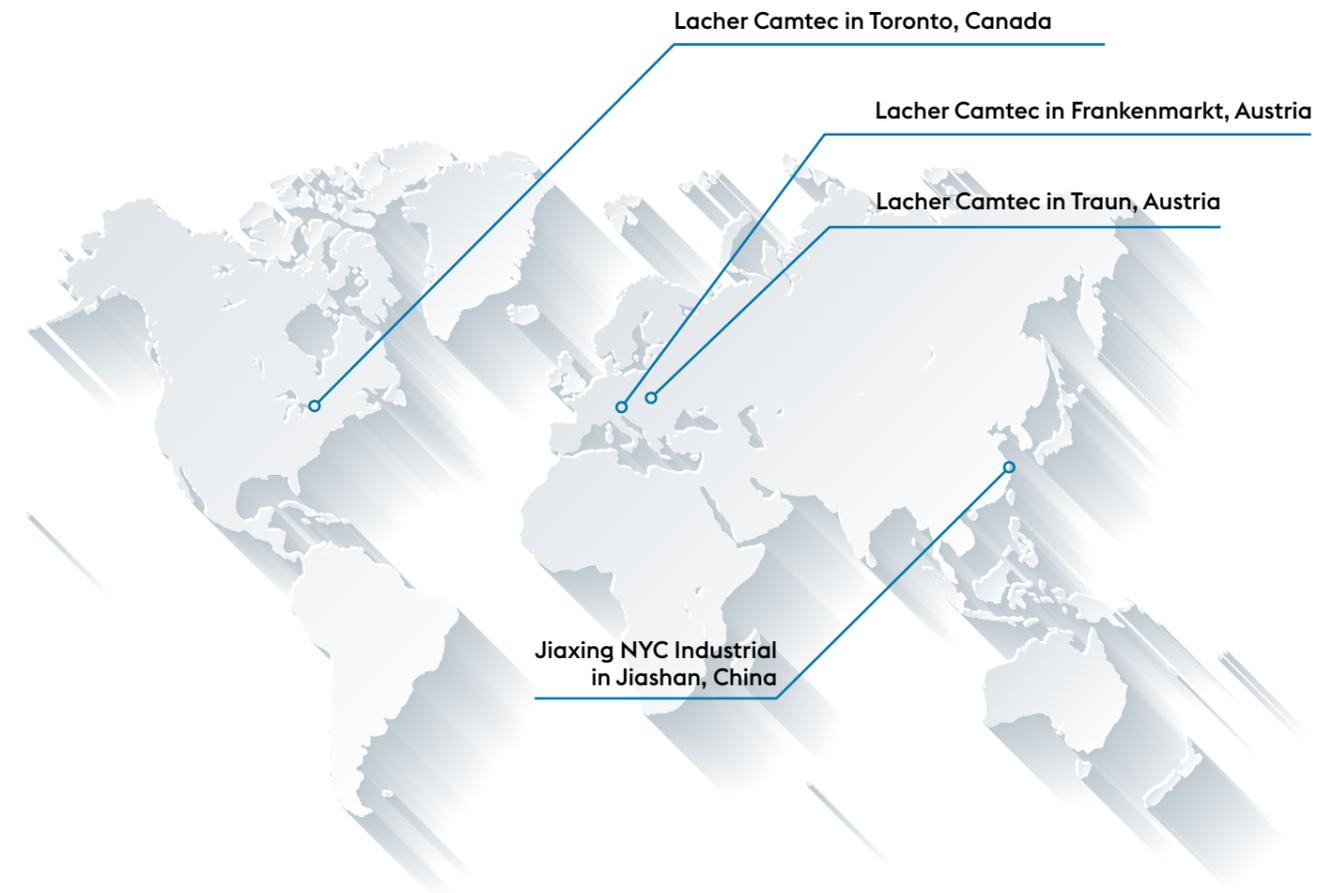
www.camtec-normalien.com

Click here to go directly to the Product-Finder



WORLDWIDE PRODUCT AVAILABILITY AND CUSTOMER SERVICE

Due to our global locations, subsidiaries and holdings, we can react flexibly and quickly to your concerns and ensure the highest quality of service on a very local level.



Lacher Camtec in Toronto, Canada

Lacher Camtec in Frankenmarkt, Austria

Lacher Camtec in Traun, Austria

Jiaxing NYC Industrial in Jiashan, China

Our highly dedicated team of specialists will take care of your individual needs globally. Find your contact person online at www.lacher-camtec.com or contact us at sales@lacher-camtec.com



OPTIMIZED CAM SERIES

For highest precision and performance

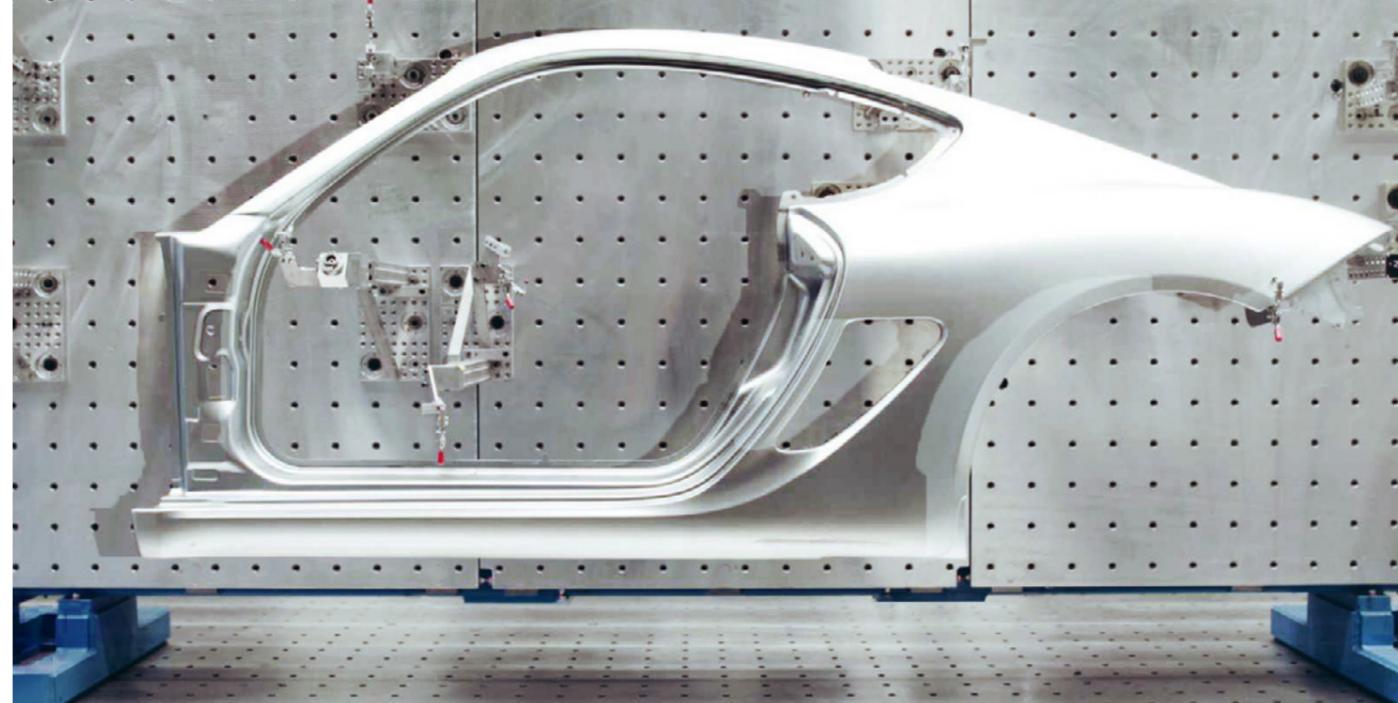
The optimized cam series (O-Series) was specially developed for the most complex industries and the most technical challenges and is convincing with maximum precision, durability, quality and innovative advantages.

The models consist of the optimized elementary, basic and compact cam units and combine effective product design and optimized application options. The outcome is a line of well thought-out cam units with optimum value added.

Advantages:

- » Long service life
 - due to robust design & high (material) quality
 - due to high precision
- » Consistent power transmission & precise centering
 - due to double prism guidance
- » High retraction forces
 - due to reinforced gas springs
- » Uncomplicated maintenance
 - in installed condition
- » 24 h emergency storage in Austria, Canada and China
- » Special cam units - individual solutions & dimensions

Switch now to the optimized cam unit series and to more power in the tool.
Inform now to find out more!



	O-KS optimized compact cam unit	O-BS optimized basic cam unit	O-ES optimized elementary cam unit
Average service life	2,000,000 strokes*	1,500,000 strokes*	1,000,000 strokes*
Guaranteed service life	1,000,000 strokes	500,000 / 750,000 strokes*	300,000 strokes
Sliding surfaces	at least Rz 6.3, hardened	at least Rz 6.3, unhardened	at least Rz 6.3, unhardened
Field of application	shaping, bending, punching, cutting	shaping, bending, punching, cutting	shaping, bending, punching, cutting
Angle range	0° - 75°	0° - 75°	0° - 75°
Tensile strength of driver, sliding element and cam base materials	700 N/mm ² minimum	600 N/mm ² minimum	400 N/mm ² minimum
Available widths (mm)	60, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500	60, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500	50, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500
Lock Out System	yes	yes	yes
Sliding element removable to the rear	yes	yes	yes
Guide clamps	1.7225 / Sinter	1.7225 / Sinter	1.7225 + Graphite
Positive return	both sides	both sides	both sides
Measuring holes	yes	yes	yes
Gas spring	yes	yes	yes
Special cam unit options	yes	yes	no
Compliant with VDI	yes	yes	yes
NAAMs insert point	yes	yes	yes
Pre-machining	yes	yes	yes

*depending on load

O-SERIES – OPTIMIZED CAM UNITS

For more performance in the tool

HIGHLY COMPACT DESIGN AND REDUCED COMPLEXITY

resulting from reduced number of components

STRONG RETRACTION FORCES

for the processing of medium to high-strength steels

PATENTED 1° ANGLE

of side plates

IMPRESSIVE PRODUCTION QUALITY

by using proven materials and optimum surface finishes

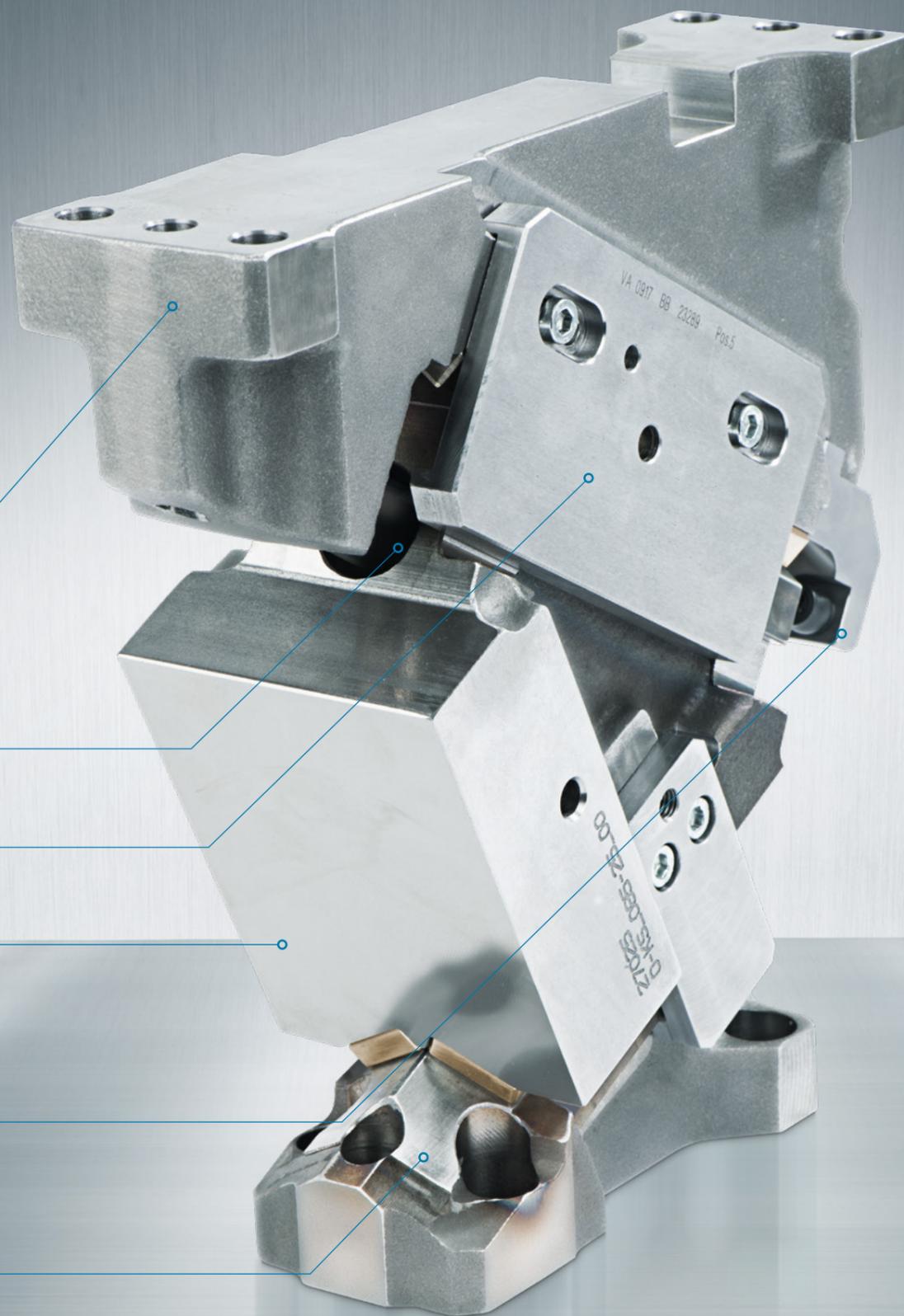
FLEXIBLY EXCHANGEABLE

from the back or the side – for improved handling and more efficient tool usage

PROVEN DESIGN

for easy maintenance

Discover all current series in our Product-Finder:
www.camtec-normalien.com

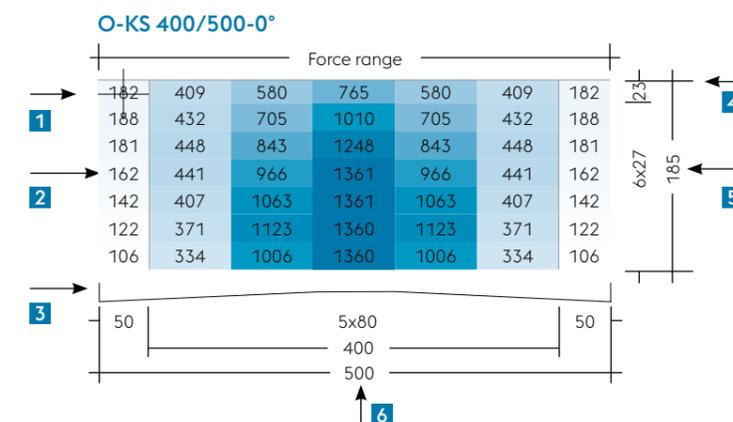


CAM FORCES

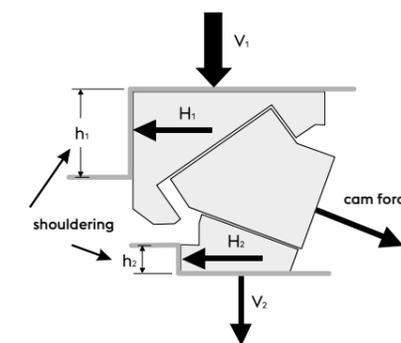
- 1 Force in the midpoint of each field
- 2 Force value in kN
- 3 lower cam part
- 4 Work surface top
- 5 Height of the work surface
- 6 Width of the work surface



The coloring in the force diagrams reflects tendencies in the range of values from the smallest force to the maximum cam force for each method of support.



The cam unit force is distributed as shown in the sketch:



Shouldering:
h₁ (top)
h₂ (bottom)

Press:
V₁ (vertical)

Cam base:
H₁ (horizontal)

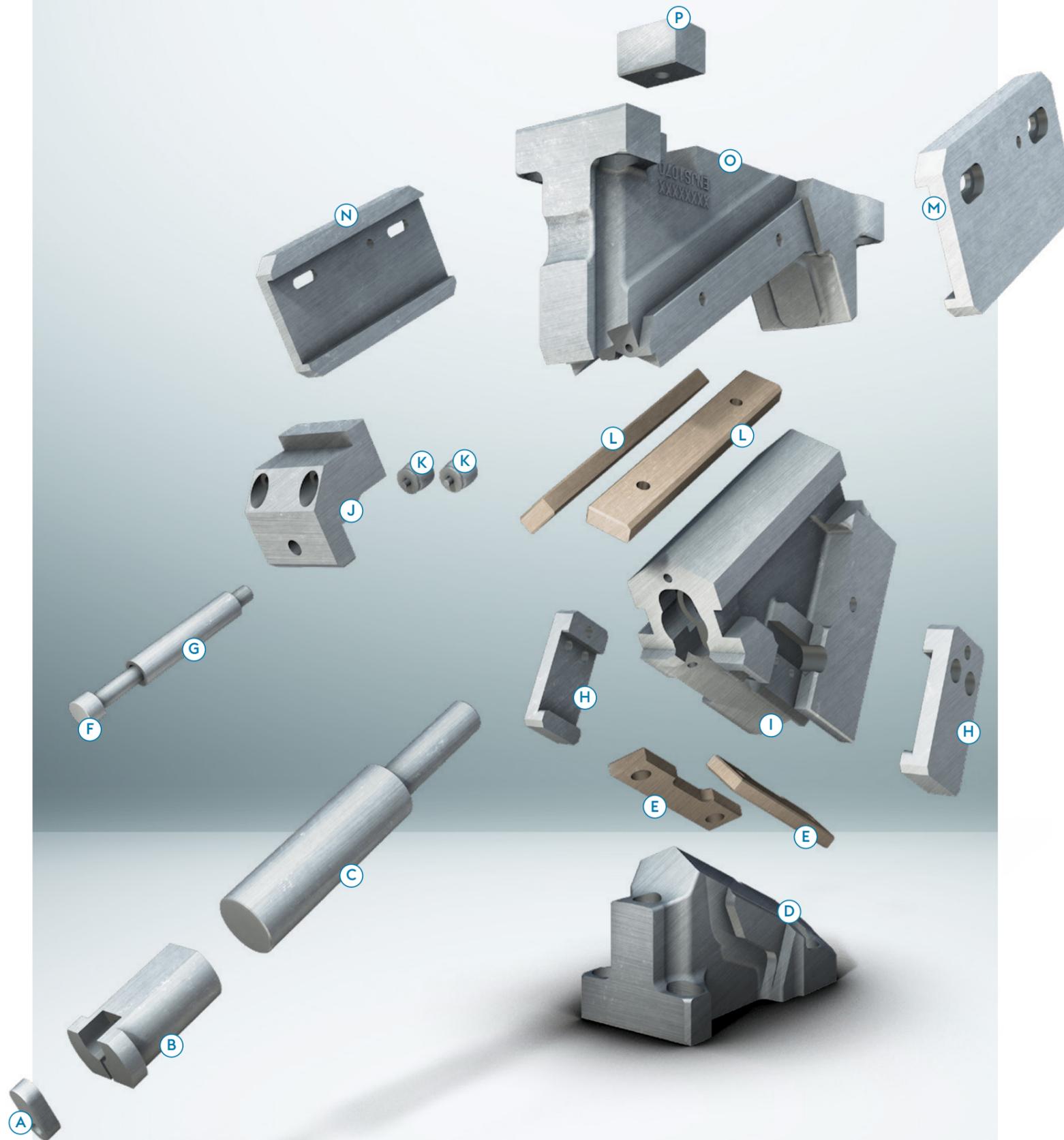
Driver:
H₂ (horizontal)
V₂ (vertical)



Technical details and additional information:
www.camtec-normalien.com

HIGH- PRECISION DESIGN

The O-Series consists of very few components, which guarantees high-quality initial installation and maintenance.



- Ⓐ Lock plate
- Ⓑ Lock screw
- Ⓒ Gas spring
- Ⓓ Driver
- Ⓔ Wear plates
- Ⓕ Lock-out screw
- Ⓖ Lock-out tube
- Ⓗ Positive return
- Ⓘ Cam slider
- Ⓝ Stop block
- Ⓚ Tubus damper
- Ⓛ Wear plates
- Ⓜ Side plate (left)
- Ⓝ Side plate (right)
- Ⓞ Cam base
- Ⓟ Fitting key

PERFORMANCE LEVELS

For uninterrupted operation, Lacher Camtec guarantees two different service lives in the O-Series:

- 1** A shorter service life with increased maximum cam unit forces
- 2** A longer service life with reduced maximum cam unit force

SIMPLE, FAST AND TARGETED TO THE OPTIMUM SOLUTION!

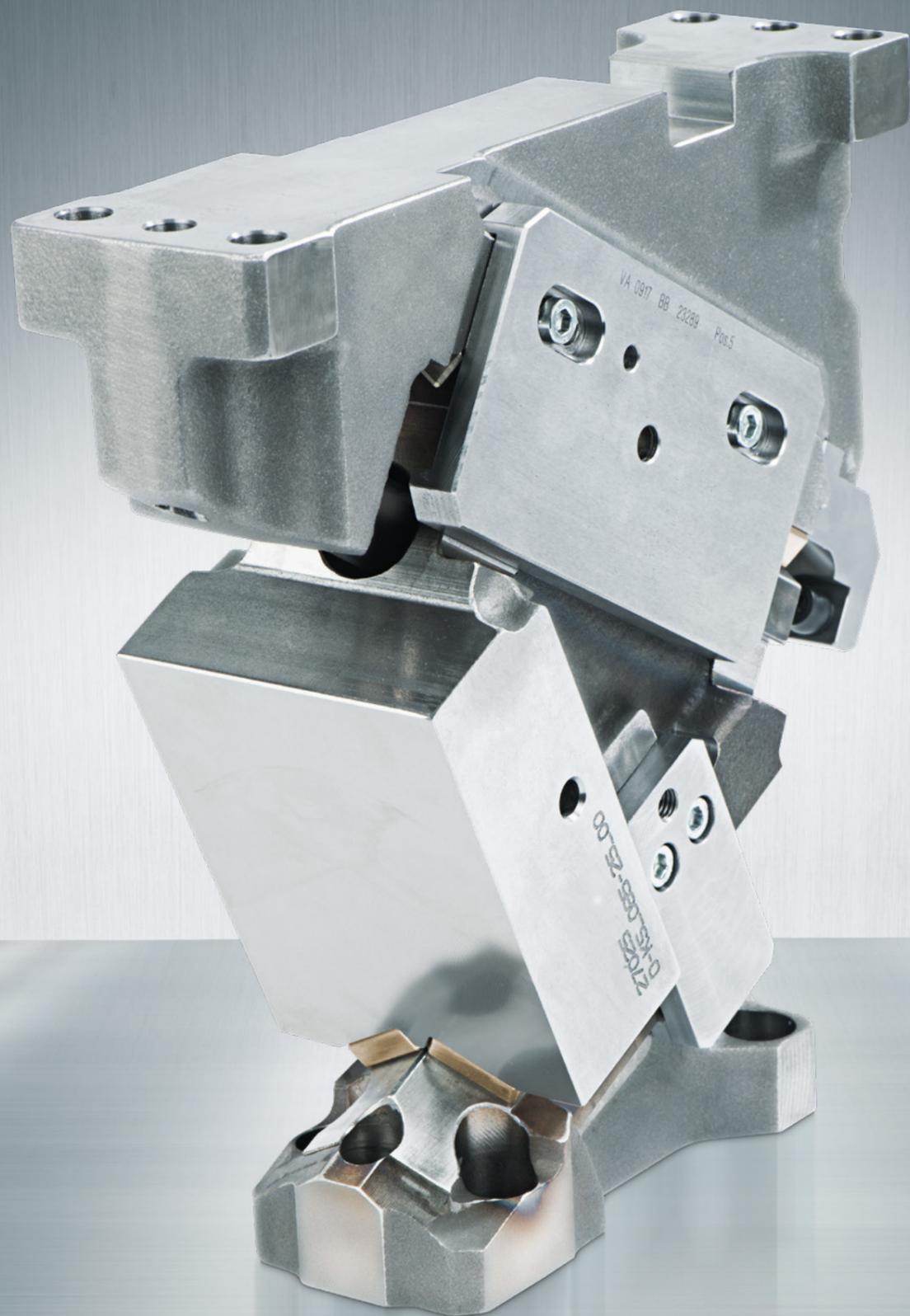


Our product finder:
www.camtec-normalien.com

In our Product-Finder you will find all product information and data for design, ordering and spare parts management quickly and easily.



O-KS
OPTIMIZED
COMPACT CAM UNIT



TECHNICAL DETAILS

O-KS

Important information at a glance

Here you will find important technical data for the optimized compact cam unit. Should you have any further questions about O-KS, our experienced team of specialists will be happy to assist you at any time. Please contact us at sales@lacher-camtec.com

	O-KS
Average service life	2,000,000 strokes*
Guaranteed service life	1,000,000 strokes*
Sliding surfaces	at least Rz 6.3, unhardened
Field of application	shaping, beveling, punching, cutting
Angle range	0° - 75°
Tensile strength of driver, sliding element and cam base materials	700 N/mm ² minimum
Available widths (mm)	60, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500
Lock Out System	yes
Sliding element removable to the rear	yes
Guide clamps	1.7225 / Sinter
Positive return	both sides
Measuring holes	yes
Gas spring	yes
Special cam unit options	yes
Compliant with VDI	yes
NAAMs insert point	yes
Pre-machining	yes

*depending on load

Discover all current O-KS models including force diagrams on our website: www.camtec-normalien.com

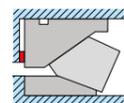
O-KS SIZE 0

FORCE DISTRIBUTION

Cam unit specifications O-KS 60

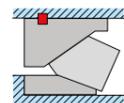
ident. no.	designation	angle [degree]	weight [kg]	stroke [mm]	height cam unit [mm]	length cam unit [mm]
27080	O-KS 60-0°	0°	11	21,85	205	195
27081	O-KS 60-5°	5°	11	21,94	205	195
27082	O-KS 60-10°	10°	11	26,45	205	195
27083	O-KS 60-15°	15°	11	26,96	205	195
27084	O-KS 60-20°	20°	11	25,81	205	195
27085	O-KS 60-25°	25°	11	26,76	205	195
27086	O-KS 60-30°	30°	11	21,23	205	195
27087	O-KS 60-35°	35°	11	22,44	205	199
27088	O-KS 60-40°	40°	11	23,74	205	197
27089	O-KS 60-45°	45°	12	25,72	205	201
27090	O-KS 60-50°	50°	12	28,29	205	196
27091	O-KS 60-55°	55°	12	31,71	205	198
27092	O-KS 60-60°	60°	11	35,45	205	195
27093	O-KS 60-65°	65°	11	41,95	205	195
27094	O-KS 60-70°	70°	11	51,83	205	195
27095	O-KS 60-75°	75°	11	68,49	205	195

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

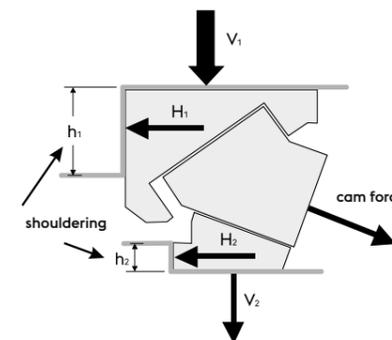
O-KS SIZE 0

PERMISSIBLE CAM FORCES

Cam unit force distribution O-KS 60, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	124	72	86	72	0	145	26	3,7
5°	131	72	86	64	6	145	26	4,1
10°	119	84	70	69	12	120	26	3,7
15°	126	84	71	61	16	120	26	4,1
20°	119	96	55	67	24	106	48	3,4
25°	126	95	55	57	27	106	48	3,8
30°	152	89	75	34	20	120	48	6,1
35°	157	89	75	25	17	120	48	8,1
40°	153	100	58	30	26	106	48	6,1
45°	157	100	58	21	21	106	48	8,1
50°	160	99	57	13	15	106	48	12,0
55°	162	100	58	6	8	106	48	18,0
60°	154	114	20	20	34	50	90	5,8
65°	162	117	21	13	28	50	90	7,6
70°	161	114	20	7	19	50	90	11,4
75°	162	116	20	3	10	50	90	18,0

The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
H₂ (horizontal)
Driver: V₂ (vertical)

O-KS SIZE 0

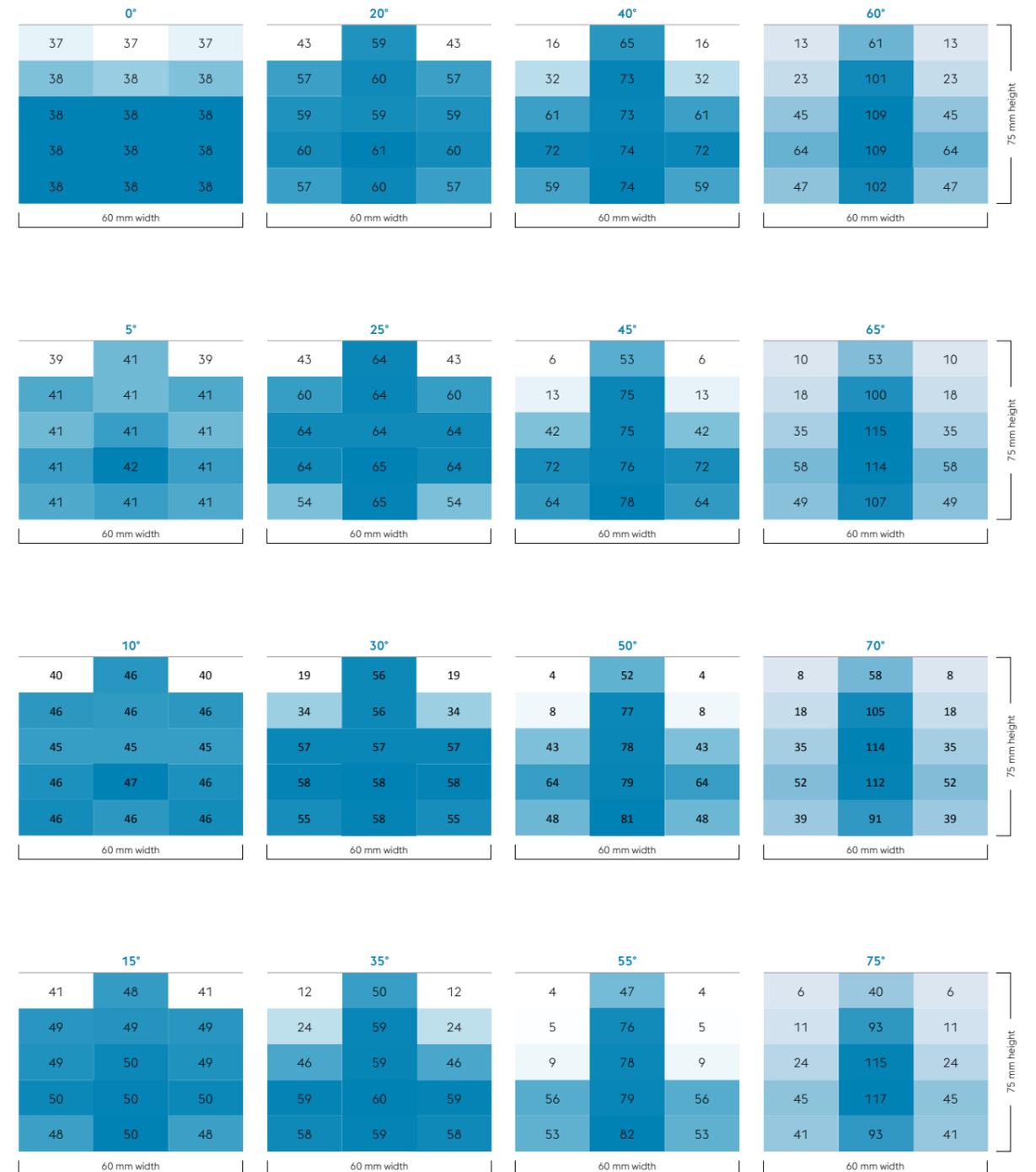
O-KS 60 | support via cast shoulder



rounded values

O-KS SIZE 0

O-KS-60 | support via fitting key



rounded values

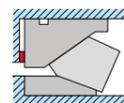
O-KS SIZE 1

FORCE DISTRIBUTION

Cam unit specifications O-KS 65-85

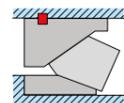
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 65	O-KS 85	size	size		O-KS 65	O-KS 85			
27000	27020	O-KS 65-0°	O-KS 85-0°	0°	16	17	28,93	225	227
27001	27021	O-KS 65-5°	O-KS 85-5°	5°	16	17	29,04	225	227
27002	27022	O-KS 65-10°	O-KS 85-10°	10°	16	17	35,00	225	229
27003	27023	O-KS 65-15°	O-KS 85-15°	15°	16	17	35,69	225	232
27004	27024	O-KS 65-20°	O-KS 85-20°	20°	16	17	36,86	225	247
27005	27025	O-KS 65-25°	O-KS 85-25°	25°	16	17	38,22	225	247
27006	27026	O-KS 65-30°	O-KS 85-30°	30°	16	16	35,38	225	236
27007	27027	O-KS 65-35°	O-KS 85-35°	35°	16	17	37,41	225	239
27008	27028	O-KS 65-40°	O-KS 85-40°	40°	16	17	39,57	225	247
27009	27029	O-KS 65-45°	O-KS 85-45°	45°	16	17	42,87	225	247
27010	27030	O-KS 65-50°	O-KS 85-50°	50°	16	17	47,16	225	247
27011	27031	O-KS 65-55°	O-KS 85-55°	55°	16	17	52,85	225	247
27012	27032	O-KS 65-60°	O-KS 85-60°	60°	16	17	49,24	225	247
27013	27033	O-KS 65-65°	O-KS 85-65°	65°	16	17	46,61	225	252
27014	27034	O-KS 65-70°	O-KS 85-70°	70°	16	17	57,59	225	252
27015	27035	O-KS 65-75°	O-KS 85-75°	75°	16	17	76,10	225	252

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

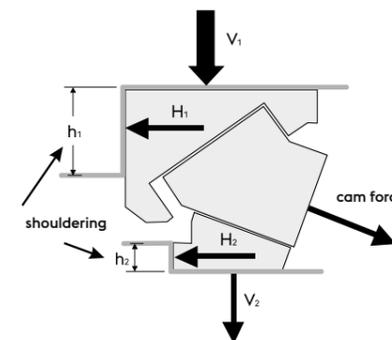
O-KS SIZE 1

PERMISSIBLE CAM FORCES

Cam unit force distribution size 1 O-KS, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	184	154	184	154	0	155	20	6,8
5°	209	164	195	146	13	155	20	7,6
10°	186	186	156	154	27	125	30	6,8
15°	202	189	159	137	37	125	30	7,6
20°	187	211	122	147	54	100	60	6,5
25°	203	215	124	129	60	100	60	7,3
30°	200	163	137	63	36	105	60	12,2
35°	205	163	136	45	32	105	60	16,1
40°	208	192	111	58	49	100	80	11,6
45°	213	191	110	40	40	100	80	15,3
50°	217	191	110	25	29	100	80	22,9
55°	220	191	110	11	16	100	80	20,5
60°	212	222	39	39	67	40	110	11,6
65°	218	222	39	25	53	40	110	13,8
70°	222	222	39	13	37	40	110	20,5
75°	225	222	39	5	19	40	110	20,5

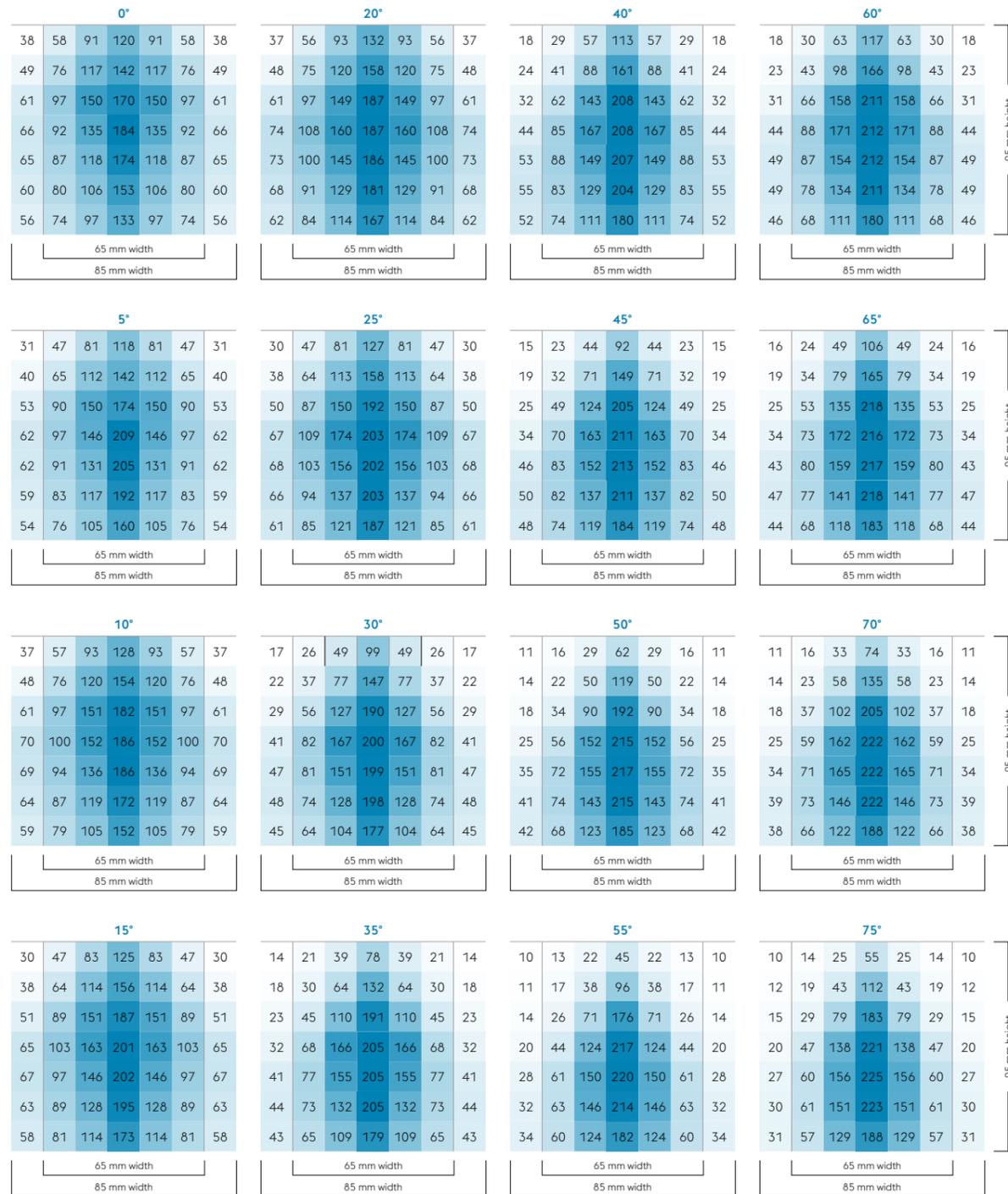
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
H₂ (horizontal)
Driver: V₂ (vertical)

O-KS SIZE 1

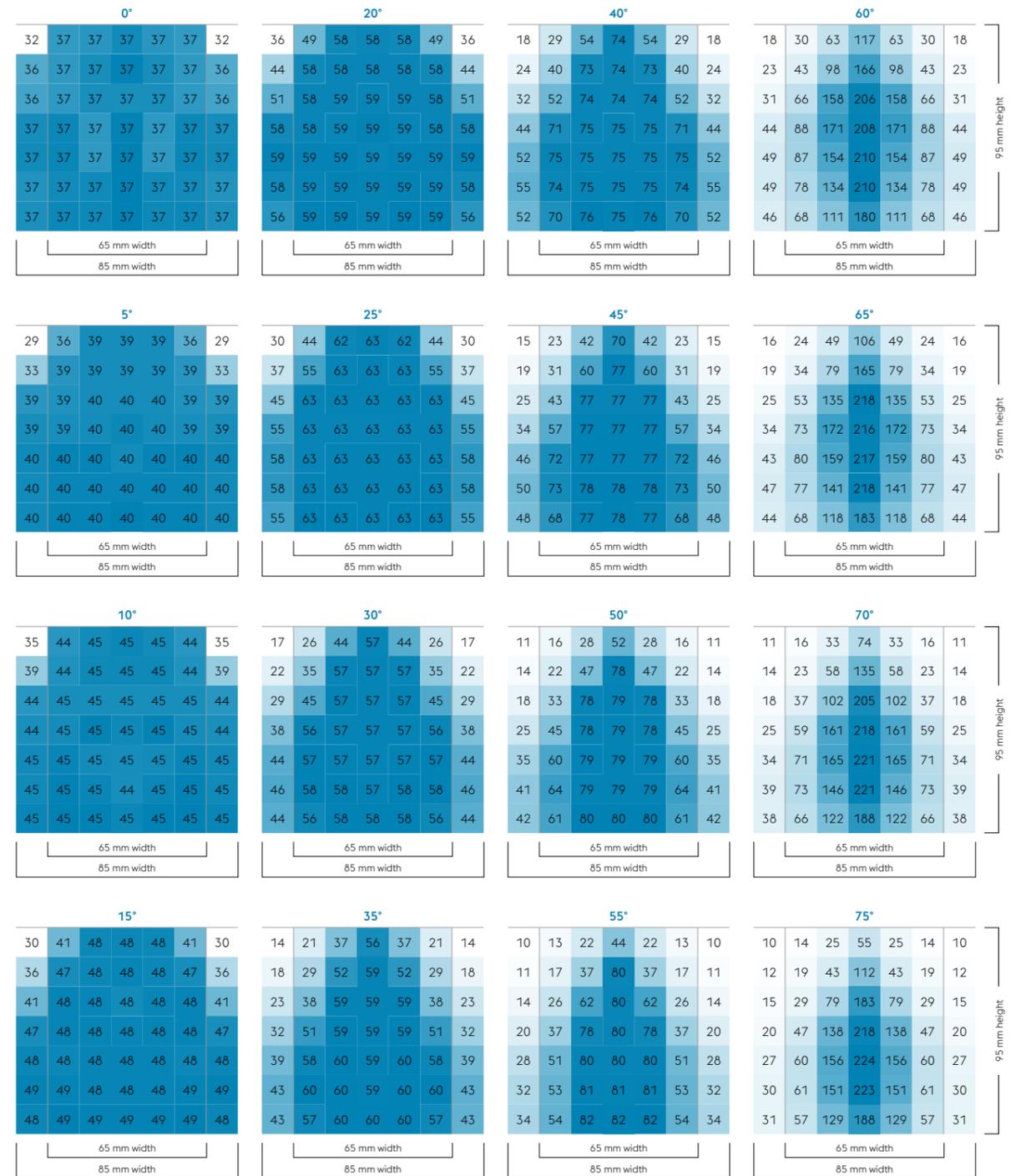
O-KS 65-85 | support via cast shoulder



rounded values

O-KS SIZE 1

O-KS 65-85 | support via fitting key



rounded values

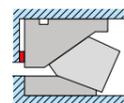
O-KS SIZE 2

FORCE DISTRIBUTION

Cam unit specifications O-KS 90-100

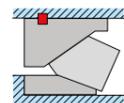
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 90	O-KS 110	size	size		O-KS 90	O-KS 110			
27040	27060	O-KS 90-0°	O-KS 110-0°	0°	35	36	28,93	275	277
27041	27061	O-KS 90-5°	O-KS 110-5°	5°	35	36	29,04	275	277
27042	27062	O-KS 90-10°	O-KS 110-10°	10°	35	36	35,00	275	302
27043	27063	O-KS 90-15°	O-KS 110-15°	15°	35	36	35,69	275	302
27044	27064	O-KS 90-20°	O-KS 110-20°	20°	34	35	36,86	275	302
27045	27065	O-KS 90-25°	O-KS 110-25°	25°	34	35	38,22	275	302
27046	27066	O-KS 90-30°	O-KS 110-30°	30°	34	36	35,38	275	302
27047	27067	O-KS 90-35°	O-KS 110-35°	35°	35	36	37,41	275	302
27048	27068	O-KS 90-40°	O-KS 110-40°	40°	34	35	39,57	275	302
27049	27069	O-KS 90-45°	O-KS 110-45°	45°	34	35	42,89	275	302
27050	27070	O-KS 90-50°	O-KS 110-50°	50°	34	35	47,16	275	302
27051	27071	O-KS 90-55°	O-KS 110-55°	55°	34	36	52,85	275	303
27052	27072	O-KS 90-60°	O-KS 110-60°	60°	33	34	49,24	275	300
27053	27073	O-KS 90-65°	O-KS 110-65°	65°	33	34	46,61	275	300
27054	27074	O-KS 90-70°	O-KS 110-70°	70°	34	35	57,59	275	300
27055	27075	O-KS 90-75°	O-KS 110-75°	75°	34	35	76,10	275	300

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

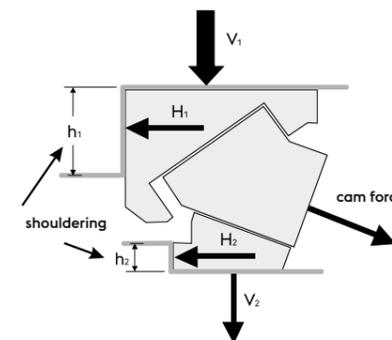
O-KS SIZE 2

PERMISSIBLE CAM FORCES

Cam unit force distribution size 2 O-KS, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	247	207	247	207	0	190	30	6,8
5°	297	233	278	207	18	190	30	7,6
10°	308	308	258	255	45	148	30	6,7
15°	323	302	253	218	59	148	30	7,5
20°	325	367	212	256	93	109	65	6,4
25°	347	367	212	220	103	109	65	7,2
30°	361	294	247	114	66	143	65	12,2
35°	372	295	248	82	57	143	65	16,1
40°	370	341	197	103	87	102	105	11,7
45°	373	334	193	71	71	102	105	15,4
50°	385	339	195	44	52	102	105	24,4
55°	390	339	196	20	28	102	105	25,3
60°	366	384	68	67	115	52	135	11,1
65°	376	383	68	43	91	52	135	14,0
70°	384	384	68	23	64	52	135	22,1
75°	388	384	68	9	33	52	135	25,2

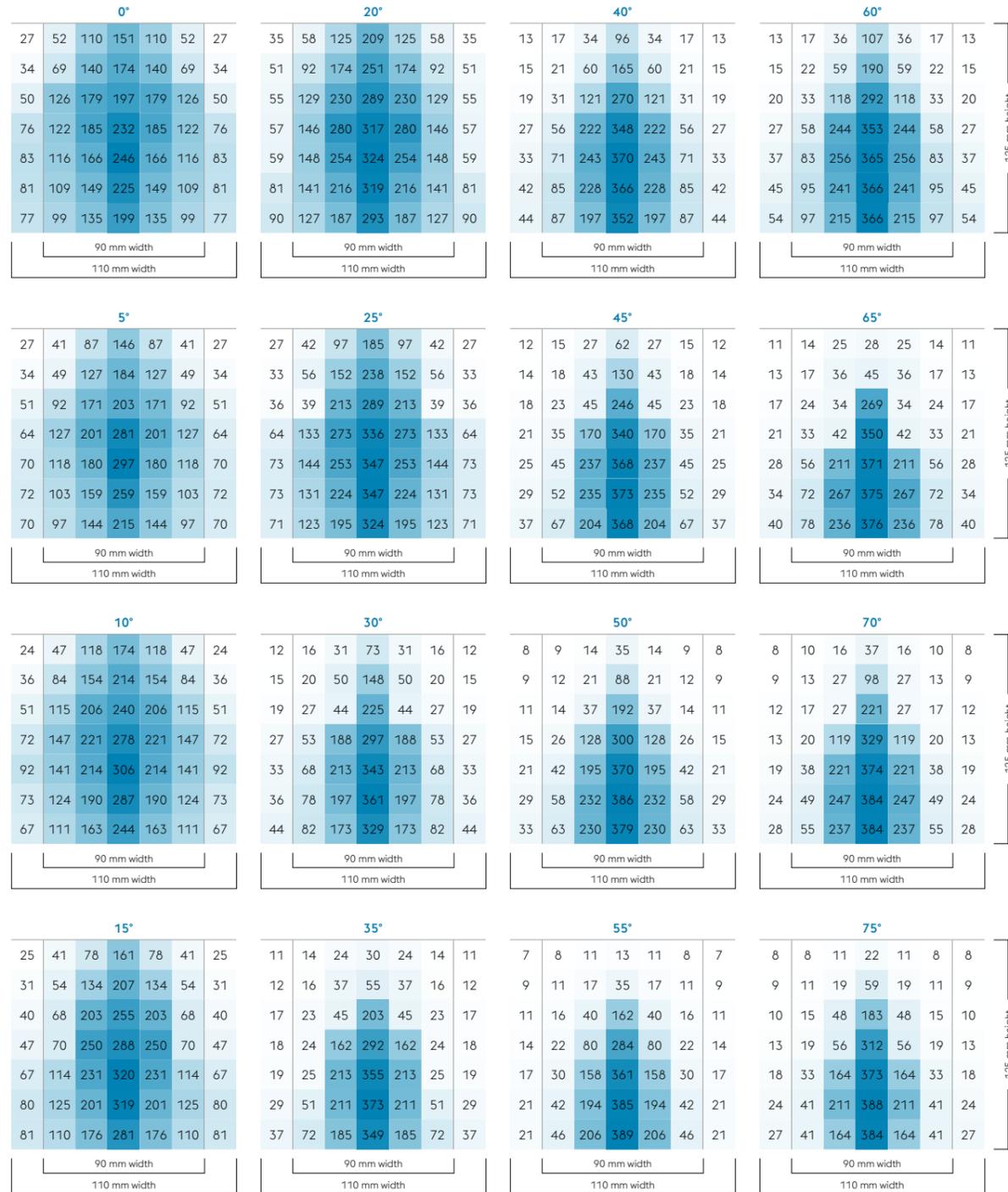
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-KS SIZE 2

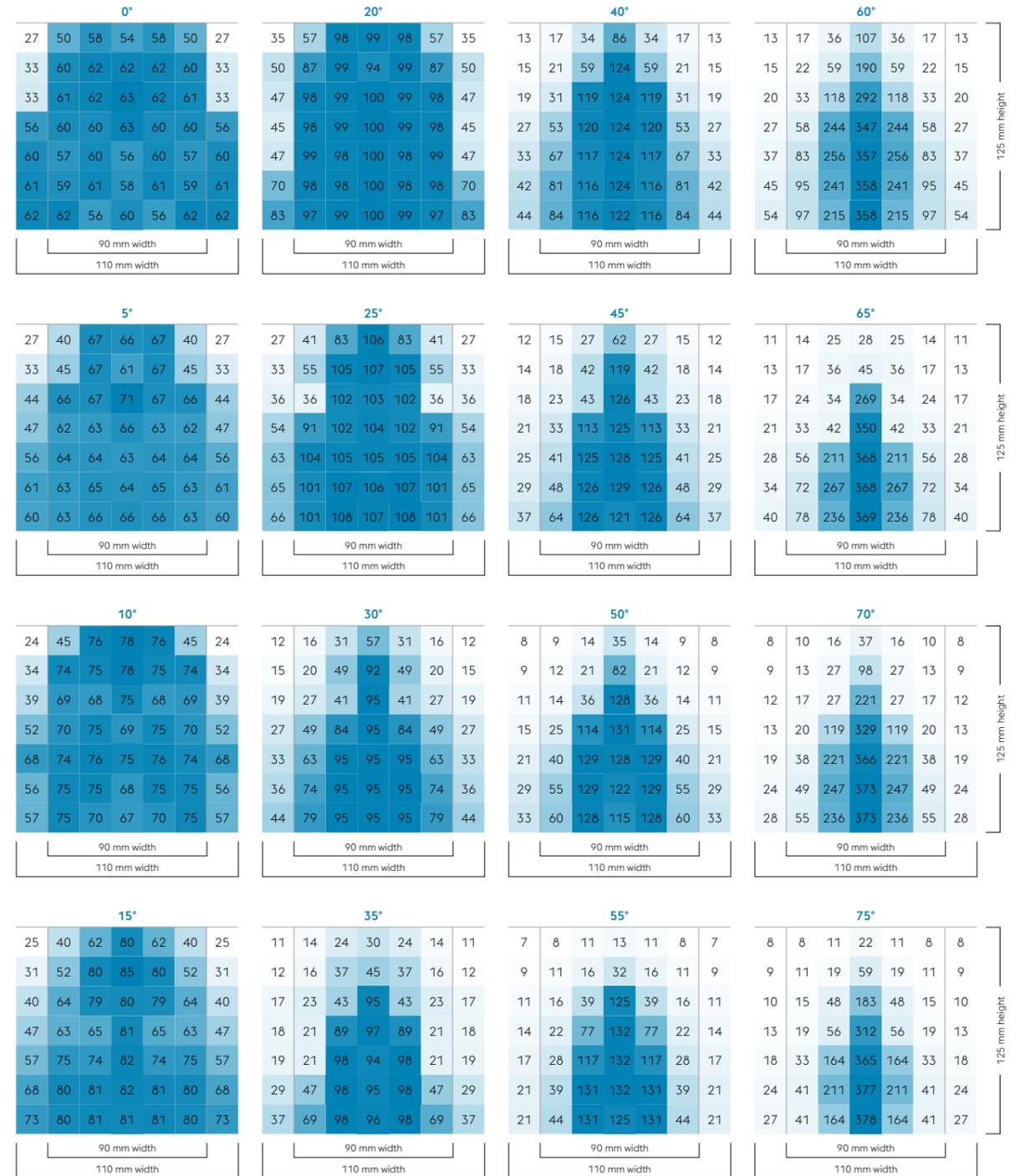
O-KS 90-110 | support via cast shoulder



rounded values

O-KS SIZE 2

O-KS 90-110 | support via fitting key



rounded values

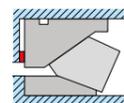
O-KS SIZE 3

FORCE DISTRIBUTION

Cam unit specifications O-KS 125-160

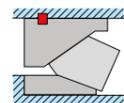
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 125	O-KS 160	size	size		O-KS 125	O-KS 160			
27100	27120	O-KS 125-0°	O-KS 160-0°	0°	58	60	35,35	300	300
27101	27121	O-KS 125-5°	O-KS 160-5°	5°	57	60	35,49	300	298
27102	27122	O-KS 125-10°	O-KS 160-10°	10°	57	60	42,78	300	288
27103	27123	O-KS 125-15°	O-KS 160-15°	15°	57	59	43,62	300	290
27104	27124	O-KS 125-20°	O-KS 160-20°	20°	57	59	46,08	300	301
27105	27125	O-KS 125-25°	O-KS 160-25°	25°	57	59	47,78	300	298
27106	27126	O-KS 125-30°	O-KS 160-30°	30°	54	56	44,23	300	323
27107	27127	O-KS 125-35°	O-KS 160-35°	35°	54	57	46,76	300	322
27108	27128	O-KS 125-40°	O-KS 160-40°	40°	54	57	50,87	300	323
27109	27129	O-KS 125-45°	O-KS 160-45°	45°	54	57	55,11	300	323
27110	27130	O-KS 125-50°	O-KS 160-50°	50°	55	57	48,50	300	323
27111	27131	O-KS 125-55°	O-KS 160-55°	55°	55	58	54,36	300	323
27112	27132	O-KS 125-60°	O-KS 160-60°	60°	55	57	49,24	300	333
27113	27133	O-KS 125-65°	O-KS 160-65°	65°	55	57	46,61	300	328
27114	27134	O-KS 125-70°	O-KS 160-70°	70°	55	57	57,59	300	323
27115	27135	O-KS 125-75°	O-KS 160-75°	75°	55	57	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

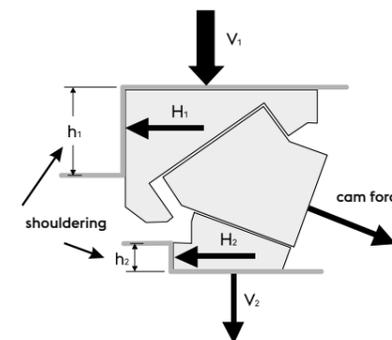
O-KS SIZE 3

PERMISSIBLE CAM FORCES

Cam unit force distribution size 3 O-KS, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	302	253	302	253	0	190	40	9,2
5°	305	239	285	213	19	190	40	10,3
10°	376	376	316	311	55	150	40	9,2
15°	395	369	310	267	72	150	40	10,3
20°	392	443	256	309	113	115	85	8,8
25°	422	446	258	268	125	115	85	9,9
30°	405	330	277	128	74	130	85	17,6
35°	420	333	280	92	65	130	85	23,2
40°	422	389	225	118	99	105	135	16,8
45°	440	394	228	83	83	105	135	22,2
50°	430	378	218	49	58	105	135	28,9
55°	445	387	223	22	32	105	135	28,6
60°	428	449	79	78	135	53	160	14,8
65°	441	450	79	50	107	53	160	18,6
70°	460	460	81	28	76	53	160	27,7
75°	445	440	78	10	38	53	160	28,5

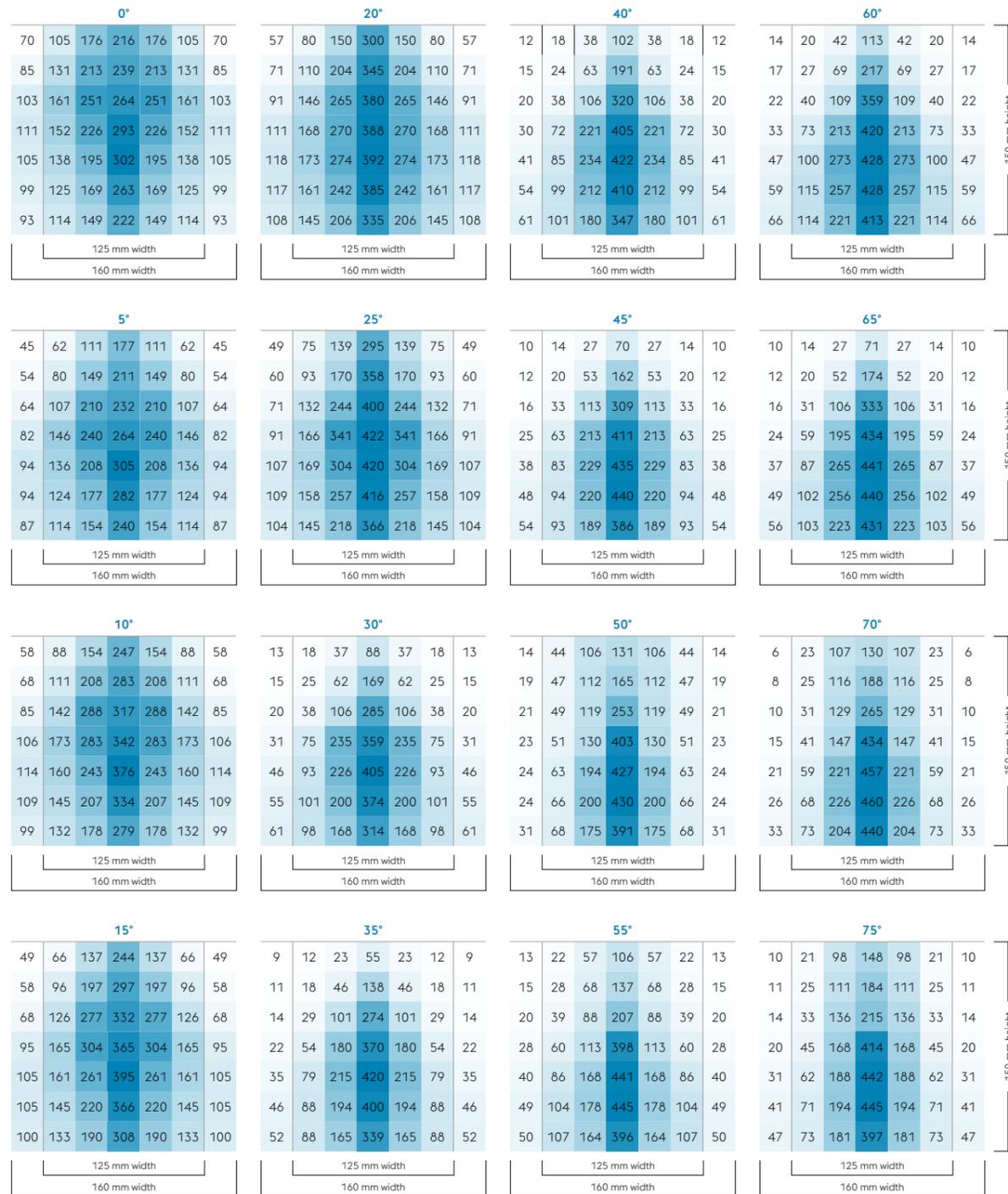
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-KS SIZE 3

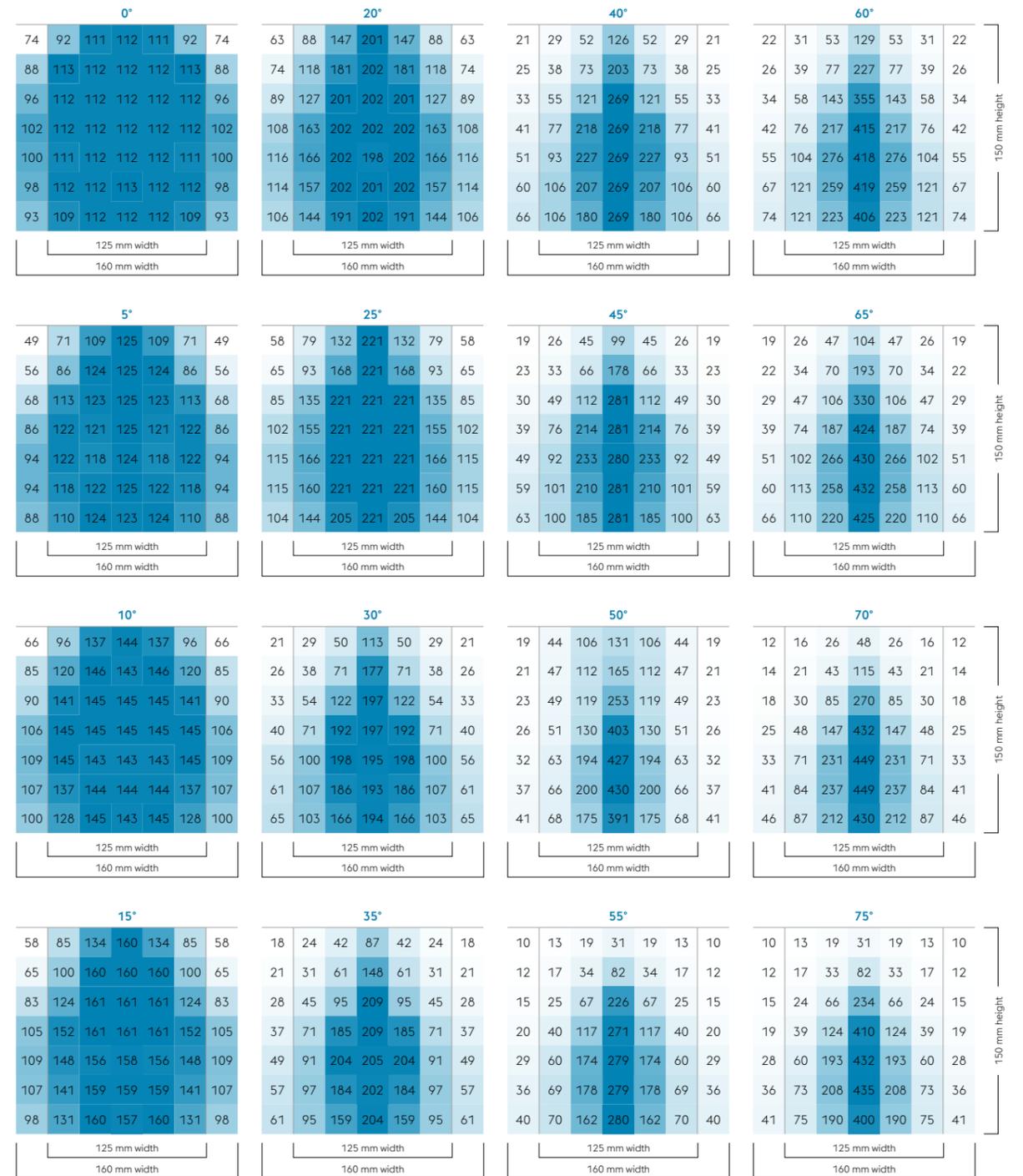
O-KS 125-160 | support via cast shoulder



rounded values

O-KS SIZE 3

O-KS 125-160 | support via fitting key



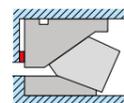
O-KS SIZE 4

FORCE DISTRIBUTION

Cam unit specifications O-KS 175-220

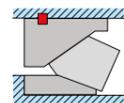
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 175	O-KS 220	size	size		O-KS 175	O-KS 220			
27140	27160	O-KS 175-0°	O-KS 220-0°	0°	86	88	41,78	300	300
27141	27161	O-KS 175-5°	O-KS 220-5°	5°	85	88	41,94	300	298
27142	27162	O-KS 175-10°	O-KS 220-10°	10°	84	87	50,56	300	304
27143	27163	O-KS 175-15°	O-KS 220-15°	15°	84	87	51,55	300	310
27144	27164	O-KS 175-20°	O-KS 220-20°	20°	82	85	55,30	300	323
27145	27165	O-KS 175-25°	O-KS 220-25°	25°	82	85	57,33	300	323
27146	27166	O-KS 175-30°	O-KS 220-30°	30°	79	82	53,07	300	306
27147	27167	O-KS 175-35°	O-KS 220-35°	35°	80	83	56,11	300	311
27148	27168	O-KS 175-40°	O-KS 220-40°	40°	79	82	62,18	300	323
27149	27169	O-KS 175-45°	O-KS 220-45°	45°	79	82	67,36	300	323
27150	27170	O-KS 175-50°	O-KS 220-50°	50°	80	83	60,63	300	323
27151	27171	O-KS 175-55°	O-KS 220-55°	55°	80	83	67,94	300	328
27152	27172	O-KS 175-60°	O-KS 220-60°	60°	80	83	68,94	300	323
27153	27173	O-KS 175-65°	O-KS 220-65°	65°	79	82	60,59	300	323
27154	27174	O-KS 175-70°	O-KS 220-70°	70°	80	83	74,86	300	323
27155	27175	O-KS 175-75°	O-KS 220-75°	75°	79	82	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

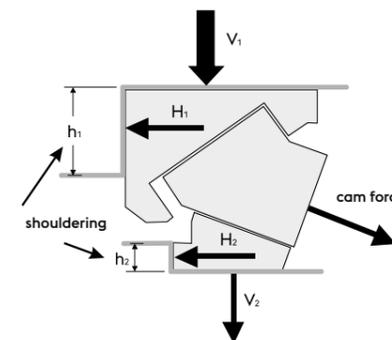
O-KS SIZE 4

PERMISSIBLE CAM FORCES

Cam unit force distribution size 4 O-KS, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	404	339	404	339	0	190	38	15,6
5°	456	358	426	318	28	190	38	17,5
10°	566	566	475	468	82	148	38	15,5
15°	606	567	476	410	110	148	38	17,3
20°	576	651	376	454	165	115	82	14,9
25°	605	640	369	384	179	115	82	16,7
30°	562	458	384	177	102	130	82	28,3
35°	544	431	362	119	84	130	82	37,4
40°	605	558	322	169	142	100	130	28,8
45°	615	551	318	117	117	100	130	38,0
50°	650	572	330	74	88	100	130	44,9
55°	643	559	323	32	46	100	130	44,4
60°	637	668	118	116	201	50	148	25,9
65°	638	650	115	72	155	50	148	31,4
70°	663	663	117	40	110	50	148	44,7
75°	662	654	115	15	56	50	148	44,3

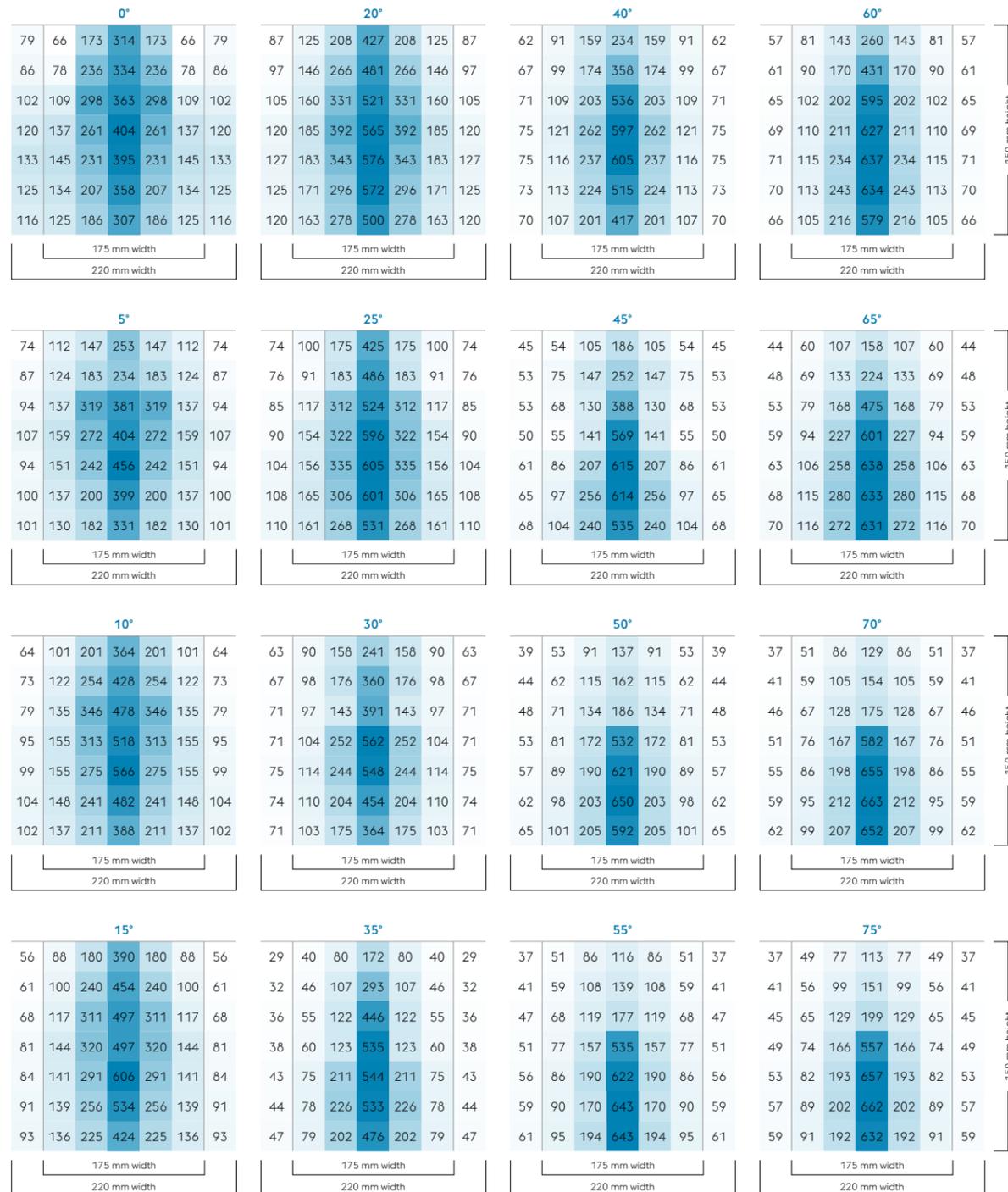
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-KS SIZE 4

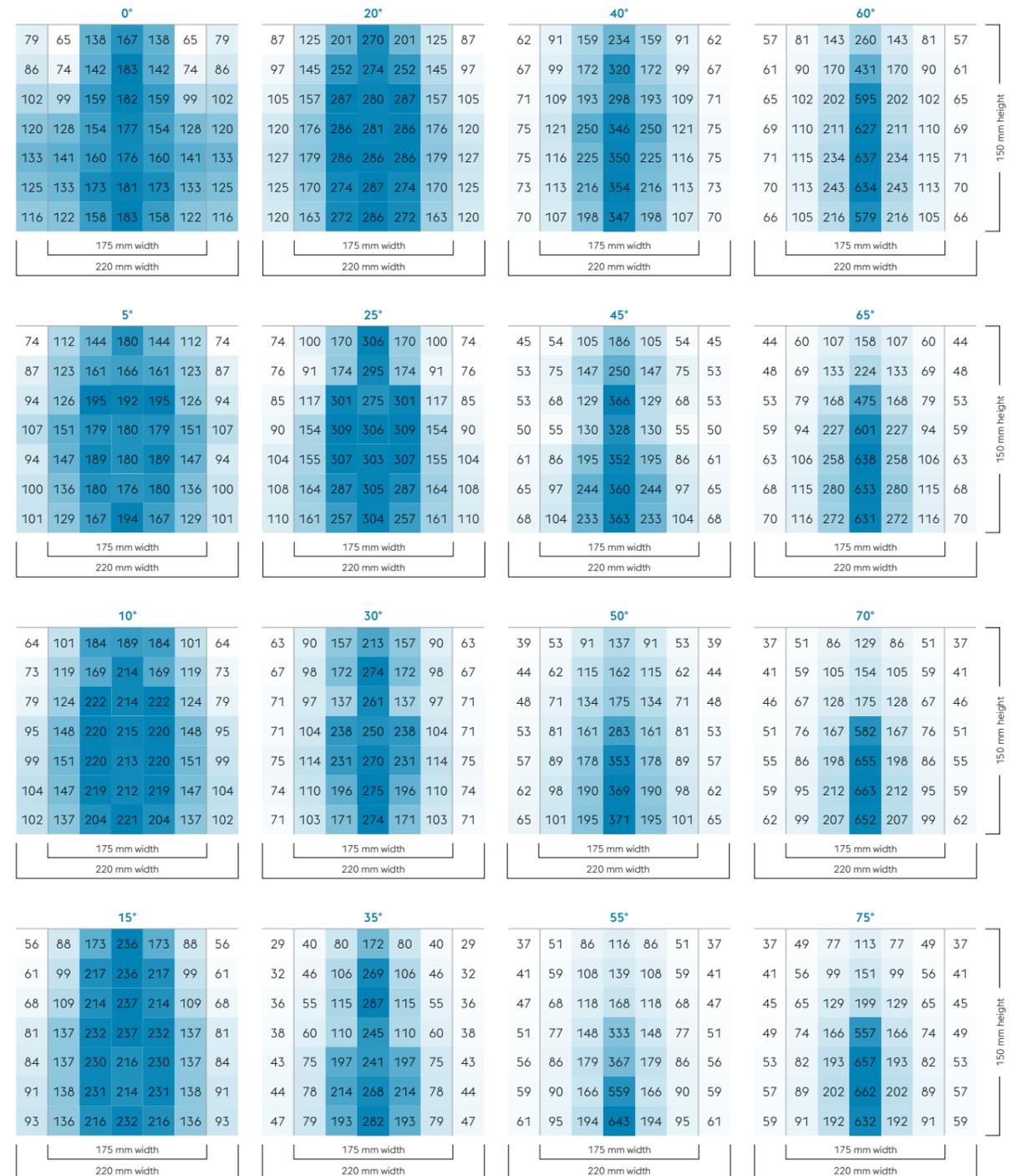
O-KS 175-220 | support via cast shoulder



rounded values

O-KS SIZE 4

O-KS 175-220 | support via fitting key



rounded values

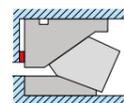
O-KS SIZE 5

FORCE DISTRIBUTION

Cam unit specifications O-KS 260-330

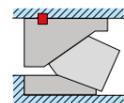
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 260	O-KS 330	size	size		O-KS 260	O-KS 330			
27180	27200	O-KS 260-0°	O-KS 330-0°	0°	152	157	41,78	300	310
27181	27201	O-KS 260-5°	O-KS 330-5°	5°	151	157	42,75	300	305
27182	27202	O-KS 260-10°	O-KS 330-10°	10°	149	154	52,04	300	305
27183	27203	O-KS 260-15°	O-KS 330-15°	15°	149	154	53,68	300	305
27184	27204	O-KS 260-20°	O-KS 330-20°	20°	148	153	57,82	300	311
27185	27205	O-KS 260-25°	O-KS 330-25°	25°	148	153	61,50	300	306
27186	27206	O-KS 260-30°	O-KS 330-30°	30°	142	148	56,61	300	325
27187	27207	O-KS 260-35°	O-KS 330-35°	35°	143	148	60,26	300	325
27188	27208	O-KS 260-40°	O-KS 330-40°	40°	141	146	67,04	300	330
27189	27209	O-KS 260-45°	O-KS 330-45°	45°	141	146	73,32	300	325
27190	27210	O-KS 260-50°	O-KS 330-50°	50°	142	147	64,94	300	325
27191	27211	O-KS 260-55°	O-KS 330-55°	55°	142	147	75,63	300	325
27192	27212	O-KS 260-60°	O-KS 330-60°	60°	143	149	68,94	300	325
27193	27213	O-KS 260-65°	O-KS 330-65°	65°	143	149	60,59	300	325
27194	27214	O-KS 260-70°	O-KS 330-70°	70°	143	149	74,86	300	325
27195	27215	O-KS 260-75°	O-KS 330-75°	75°	143	148	98,93	300	325

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

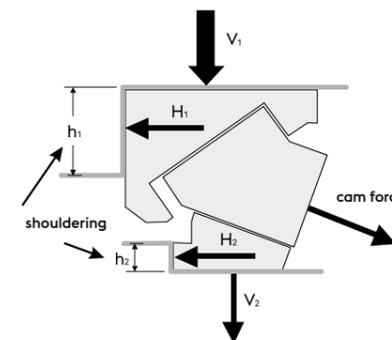
O-KS SIZE 5

PERMISSIBLE CAM FORCES

Cam unit force distribution size 5 O-KS, 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	781	655	781	655	0	186	48	30,9
5°	827	649	773	577	50	186	48	34,6
10°	802	802	673	663	117	142	48	30,7
15°	857	801	672	580	155	142	48	34,4
20°	773	874	505	610	222	110	82	29,6
25°	827	874	505	525	245	110	82	33,2
30°	806	657	551	254	147	125	83	47,8
35°	829	657	552	182	127	125	83	47,0
40°	830	765	442	231	194	95	145	48,0
45°	846	759	438	160	160	95	145	47,2
50°	536	471	272	61	72	95	145	45,6
55°	725	630	364	36	52	95	145	44,2
60°	830	870	153	151	262	45	180	47,4
65°	849	866	153	96	206	45	190	46,2
70°	666	666	117	40	110	45	190	45,3
75°	639	632	111	14	54	45	190	44,0

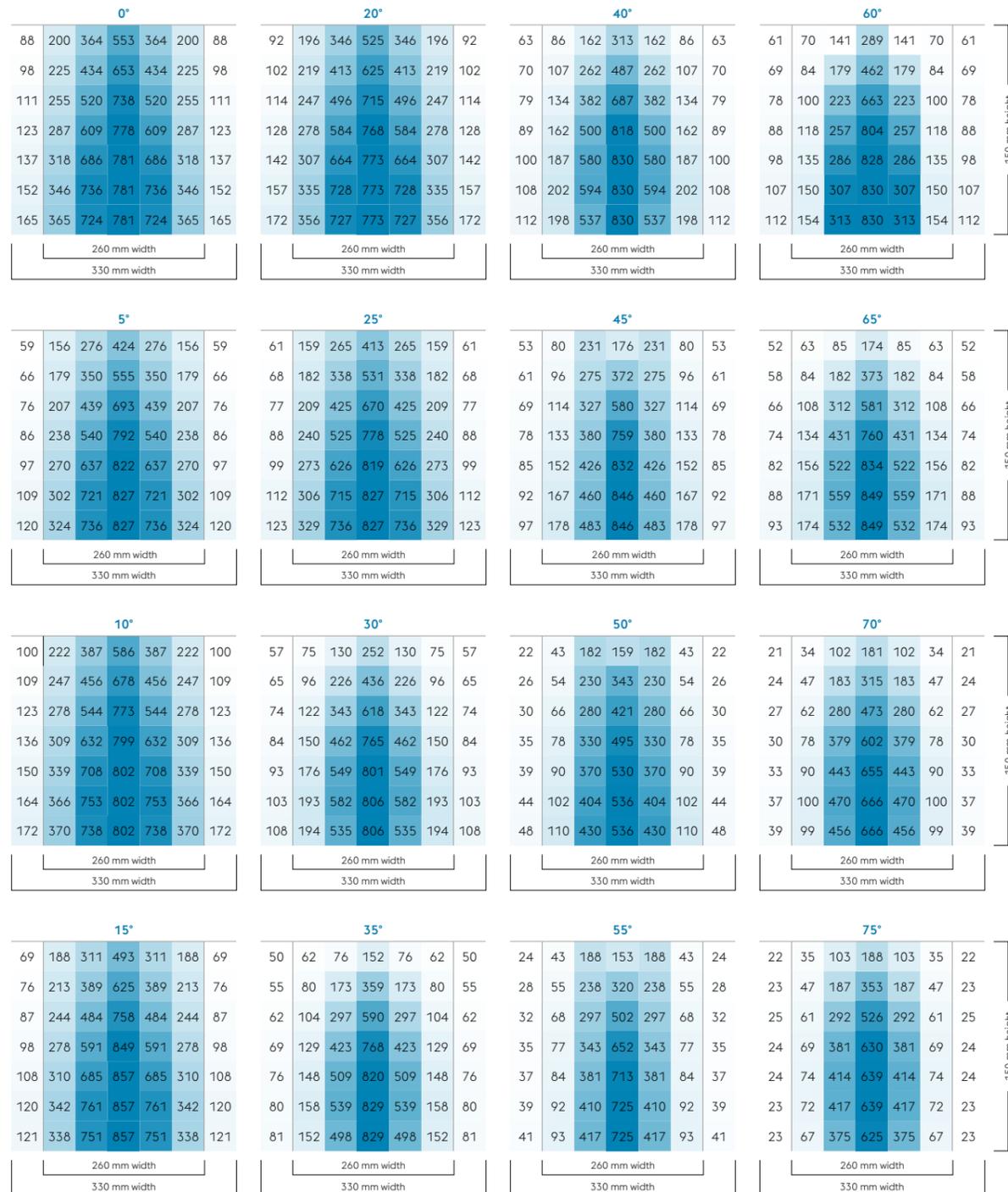
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-KS SIZE 5

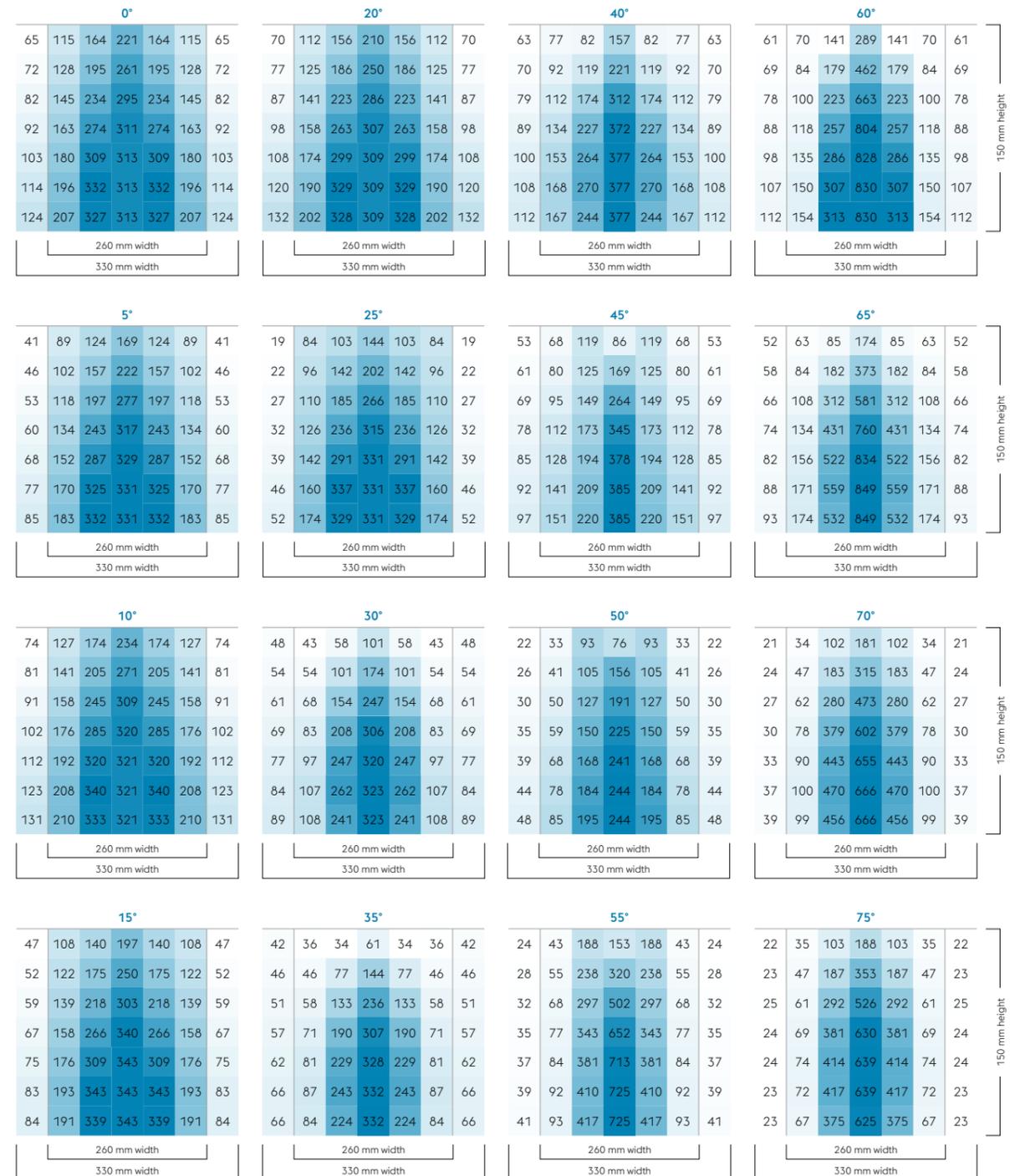
O-KS 260-330 | support via cast shoulder



rounded values

O-KS SIZE 5

O-KS 260-330 | support via fitting key



rounded values

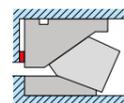
O-KS SIZE 6

FORCE DISTRIBUTION

Cam unit specifications O-KS 400-500

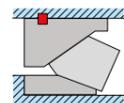
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-KS 400	O-KS 500	size	size		O-KS 400	O-KS 500			
27220	27240	O-KS 400-0°	O-KS 500-0°	0°	309	321	41,78	375	407
27221	27241	O-KS 400-5°	O-KS 500-5°	5°	307	320	42,75	375	407
27222	27242	O-KS 400-10°	O-KS 500-10°	10°	301	313	52,04	375	407
27223	27243	O-KS 400-15°	O-KS 500-15°	15°	300	313	53,68	375	407
27224	27244	O-KS 400-20°	O-KS 500-20°	20°	295	307	57,82	375	406
27225	27245	O-KS 400-25°	O-KS 500-25°	25°	294	307	61,50	375	406
27226	27246	O-KS 400-30°	O-KS 500-30°	30°	284	296	56,61	375	407
27227	27247	O-KS 400-35°	O-KS 500-35°	35°	288	301	60,26	375	407
27228	27248	O-KS 400-40°	O-KS 500-40°	40°	280	293	67,04	375	406
27229	27249	O-KS 400-45°	O-KS 500-45°	45°	287	300	73,32	375	406
27230	27250	O-KS 400-50°	O-KS 500-50°	50°	288	301	64,94	375	406
27231	27251	O-KS 400-55°	O-KS 500-55°	55°	292	304	75,62	375	406
27232	27252	O-KS 400-60°	O-KS 500-60°	60°	281	293	68,94	375	421
27233	27253	O-KS 400-65°	O-KS 500-65°	65°	285	298	60,59	375	426
27234	27254	O-KS 400-70°	O-KS 500-70°	70°	289	302	74,86	375	431
27235	27255	O-KS 400-75°	O-KS 500-75°	75°	289	301	98,93	375	431

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

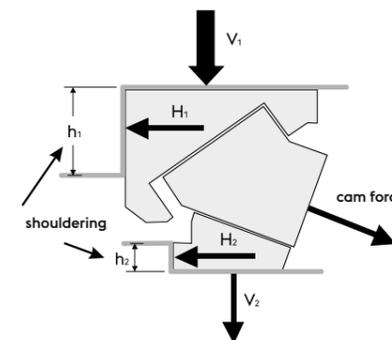
O-KS SIZE 6

PERMISSIBLE CAM FORCES

Cam unit force distribution size 6 O-KS , 1,000,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	1361	1142	1361	1142	0	228	30	78,4
5°	1453	1140	1359	1014	89	228	41	75,1
10°	1264	1264	1061	1045	184	179	45	78,4
15°	1179	1103	925	797	214	179	45	75,1
20°	1358	1535	886	1071	390	135	79	77,0
25°	1449	1532	884	920	429	135	90	73,8
30°	1237	1008	846	390	225	157	90	66,1
35°	1148	910	764	252	176	157	90	61,0
40°	1125	1037	599	314	263	120	140	65,3
45°	1156	1036	598	219	219	120	160	60,5
50°	1090	959	553	124	147	120	160	54,3
55°	1013	881	508	51	73	120	160	49,0
60°	1131	1185	209	206	356	59	155	62,3
65°	1151	1173	207	130	280	59	170	57,1
70°	1174	1174	207	71	195	59	185	52,9
75°	1022	1010	178	23	86	59	185	48,2

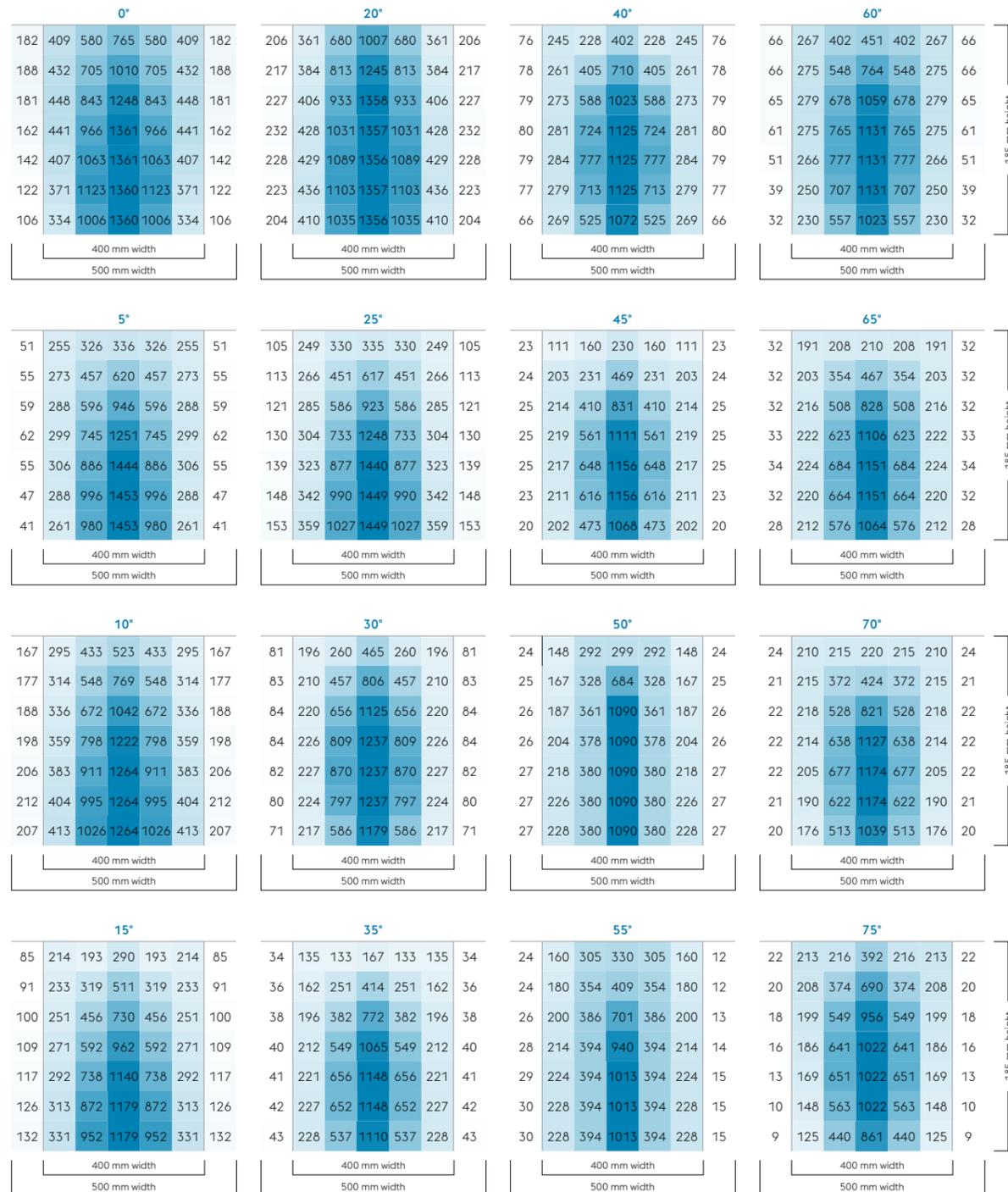
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-KS SIZE 6

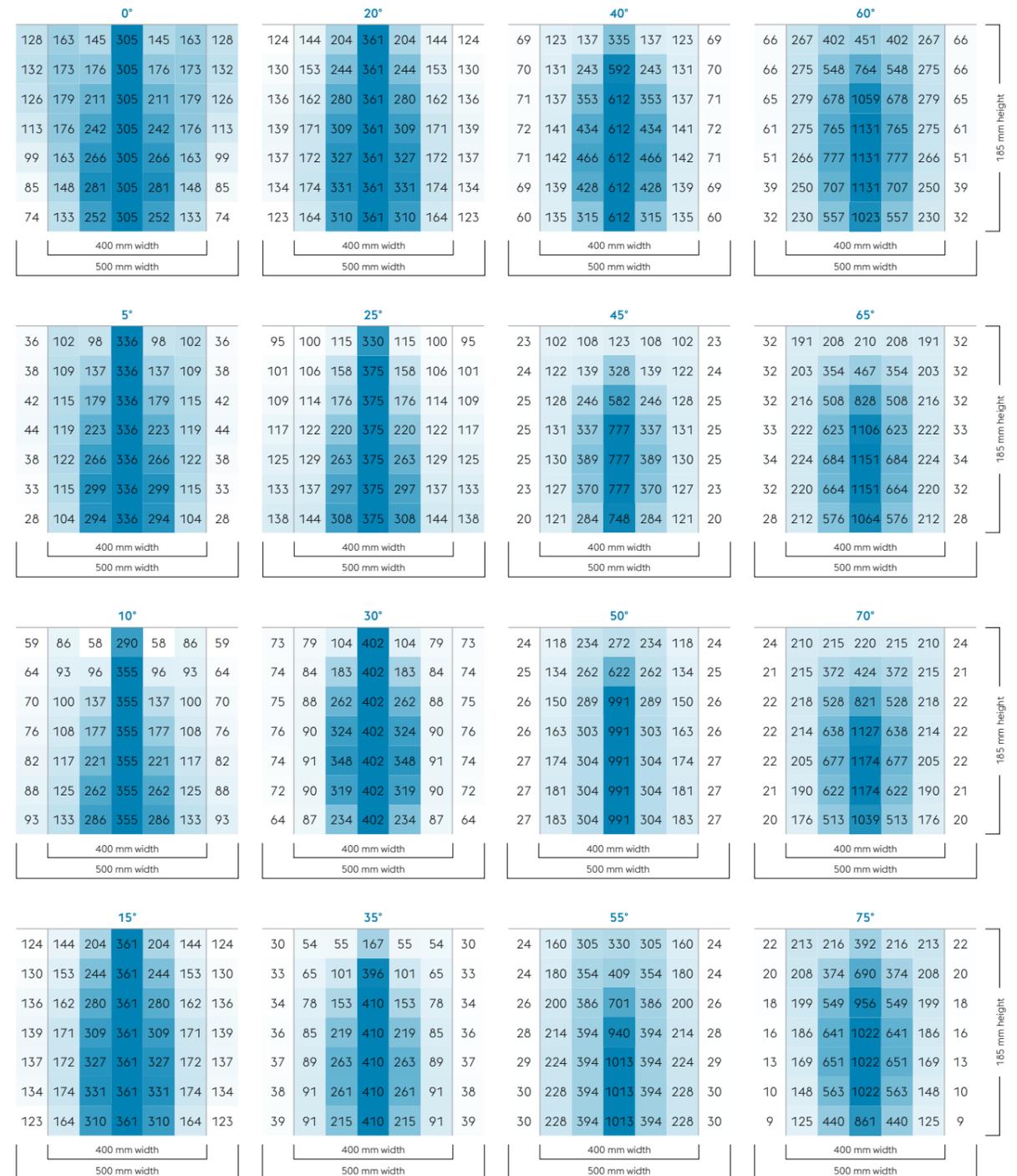
O-KS 400-500 | support via cast shoulder



rounded values

O-KS SIZE 6

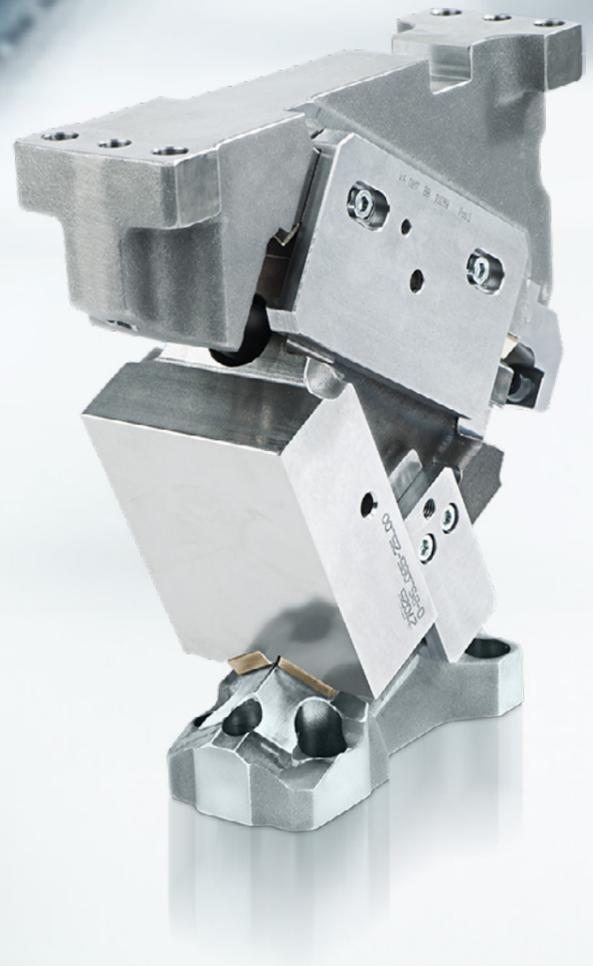
O-KS 400-500 | support via fitting key

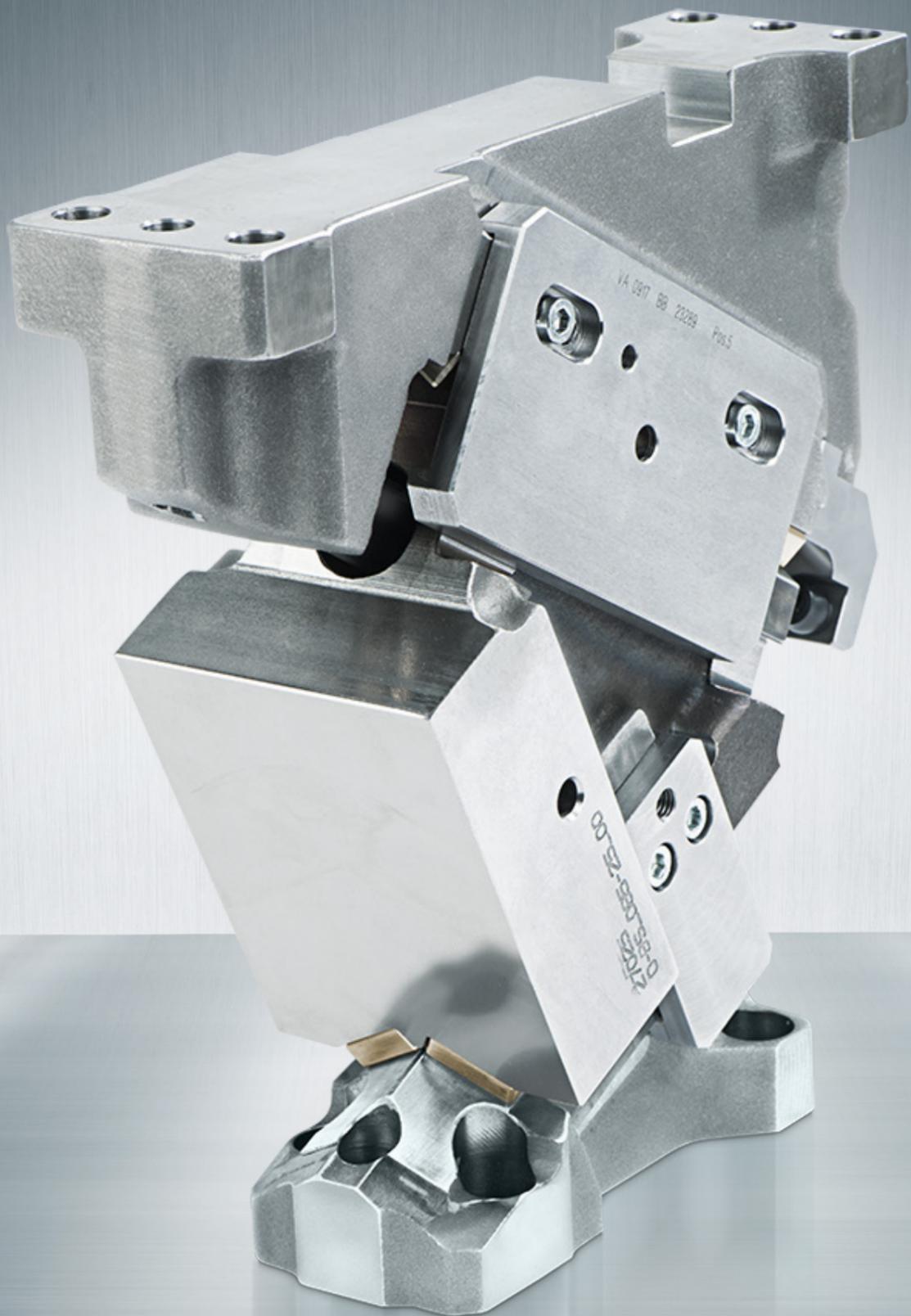


rounded values



O-BS
OPTIMIZED
BASIC CAM UNIT





TECHNICAL DETAILS

O-BS

Important information at a glance

Here you will find important technical data for the optimized basic cam unit. Should you have any further questions about O-BS, our experienced team of specialists will be happy to assist you at any time. Please contact us at sales@lacher-camtec.com

	O-BS
Average service life	1.500.000 strokes*
Guaranteed service life	500.000 / 750.000 strokes*
Sliding surfaces	at least Rz 6.3, unhardened
Field of application	shaping, beveling, punching, cutting
Angle range	0° - 75°
Tensile strength of driver, sliding element and cam base materials	600 N/mm ² minimum
Available widths [mm]	60, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500
Lock Out System	yes
Sliding element removable to the rear	yes
Guide clamps	1.7225 / Sinter
Positive return	both sides
Measuring holes	yes
Gas spring	yes
Special cam unit options	yes
Compliant with VDI	yes
NAAMs insert point	yes
Pre-machining	yes

*depending on load

Discover all current O-BS models including force diagrams on our website: www.camtec-normalien.com

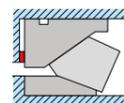
O-BS SIZE 0

FORCE DISTRIBUTION

Cam unit specifications O-BS 60

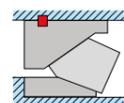
ident. no.	designation	angle [degree]	weight [kg]	stroke [mm]	height cam unit [mm]	length cam unit [mm]
27580	O-BS 60-0°	0°	11	21,85	205	195
27581	O-BS 60-5°	5°	11	21,94	205	195
27582	O-BS 60-10°	10°	11	26,45	205	195
27583	O-BS 60-15°	15°	11	26,96	205	195
27584	O-BS 60-20°	20°	11	25,81	205	195
27585	O-BS 60-25°	25°	11	26,76	205	195
27586	O-BS 60-30°	30°	11	21,23	205	195
27587	O-BS 60-35°	35°	11	22,44	205	199
27588	O-BS 60-40°	40°	11	23,74	205	197
27589	O-BS 60-45°	45°	12	25,72	205	201
27590	O-BS 60-50°	50°	12	28,29	205	196
27591	O-BS 60-55°	55°	12	31,71	205	198
27592	O-BS 60-60°	60°	11	35,45	205	195
27593	O-BS 60-65°	65°	11	41,95	205	195
27594	O-BS 60-70°	70°	11	51,83	205	195
27595	O-BS 60-75°	75°	11	68,49	205	195

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 0

PERMISSIBLE CAM FORCES

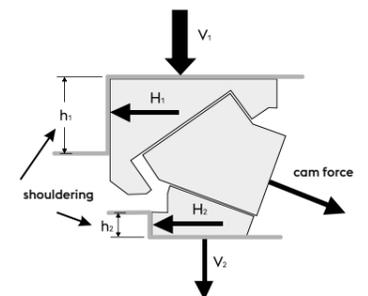
Cam unit force distribution O-BS 60 Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	93	54	65	54	0	145	26	3,7
5°	98	54	65	48	4	145	26	4,1
10°	89	63	53	52	9	120	26	3,7
15°	95	63	53	46	12	120	26	4,1
20°	89	72	42	50	18	106	48	3,4
25°	95	71	41	43	20	106	48	3,8
30°	114	67	56	26	15	120	48	6,1
35°	118	67	56	18	13	120	48	8,1
40°	115	75	44	23	19	106	48	6,1
45°	118	75	43	16	16	106	48	8,1
50°	120	75	43	10	11	106	48	12,0
55°	122	75	43	4	6	106	48	18,0
60°	116	86	15	15	26	50	90	5,8
65°	122	88	16	10	21	50	90	7,6
70°	121	86	15	5	14	50	90	11,4
75°	122	87	15	2	7	50	90	18,0

Cam unit force distribution O-BS 60 Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	62	36	43	36	0	145	20	3,7
5°	66	36	43	32	3	145	20	4,1
10°	60	42	35	35	6	120	20	3,7
15°	63	42	35	30	8	120	20	4,1
20°	60	48	28	34	12	106	30	3,4
25°	63	48	27	29	13	106	30	3,8
30°	76	44	37	17	10	120	30	6,1
35°	79	44	37	12	9	120	30	8,1
40°	77	50	29	15	13	106	30	6,1
45°	79	50	29	11	11	106	50	8,1
50°	80	50	29	6	8	106	50	12,0
55°	81	50	29	3	4	106	60	18,0
60°	77	57	10	10	17	50	60	5,8
65°	81	59	10	7	14	50	80	7,6
70°	81	57	10	3	9	50	80	11,4
75°	81	58	10	1	5	50	80	18,0

The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-BS SIZE 0

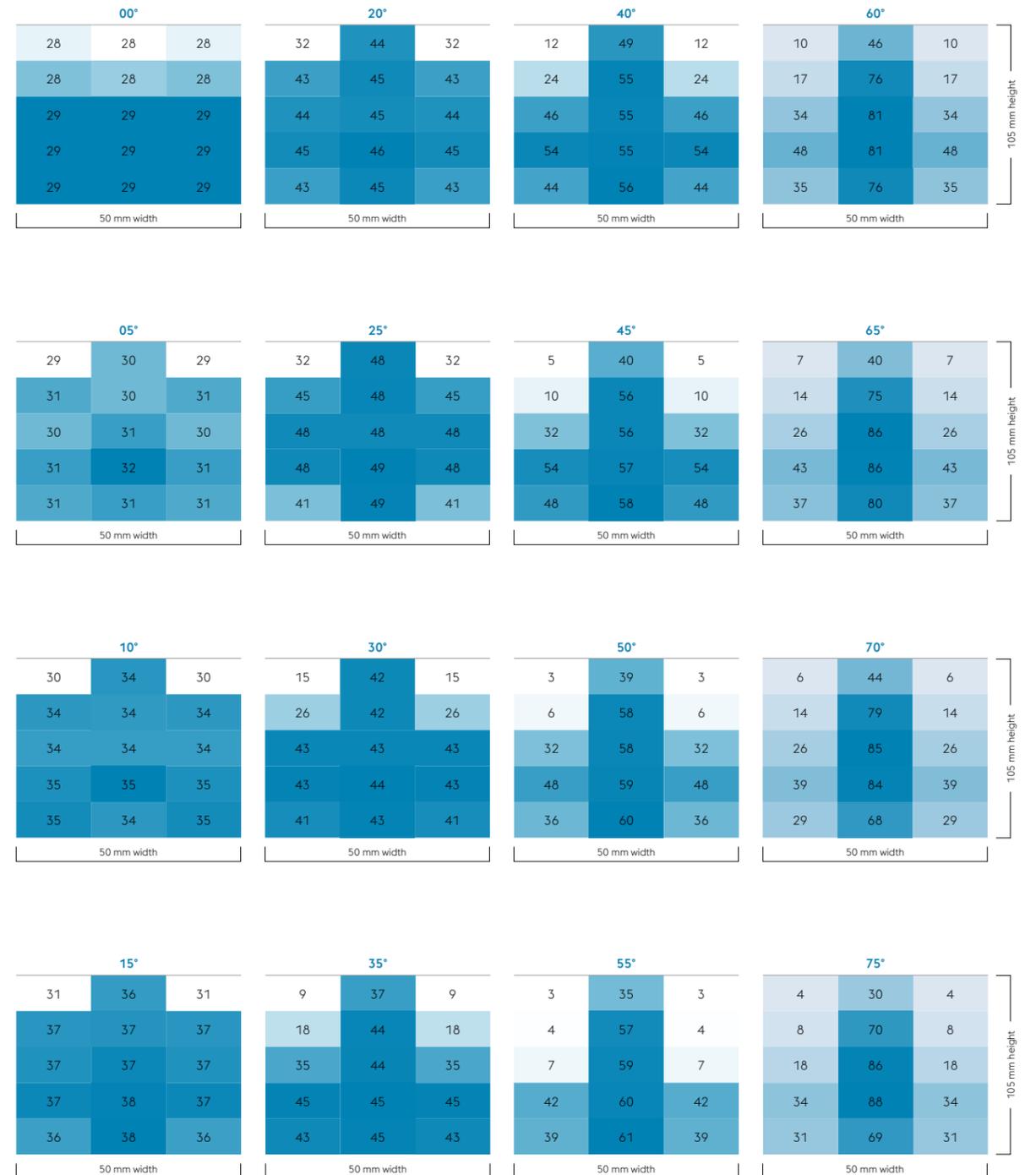
O-BS 60 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 0

O-BS-60 | support via fitting key, Level 1



rounded values

O-BS SIZE 0

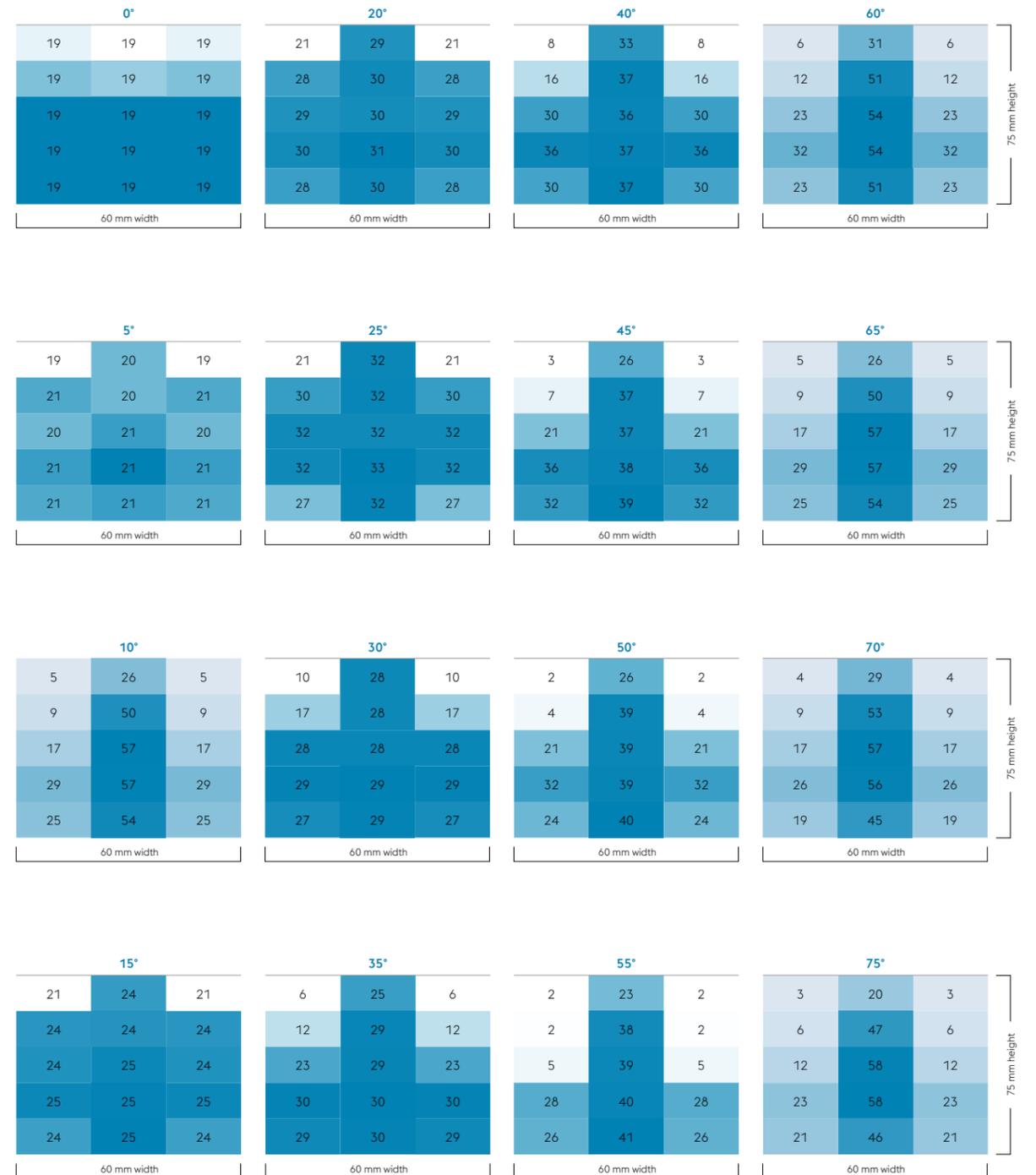
O-BS 60 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 0

O-BS-60 | support via fitting key, Level 2



rounded values

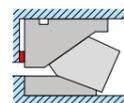
O-BS SIZE 1

FORCE DISTRIBUTION

Cam unit specifications O-BS 65-85

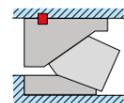
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 65	O-BS 85	size	size		O-BS 65	O-BS 85			
27500	27520	O-BS 65-0°	O-BS 85-0°	0°	16	17	28,93	225	227
27501	27521	O-BS 65-5°	O-BS 85-5°	5°	16	17	29,04	225	227
27502	27522	O-BS 65-10°	O-BS 85-10°	10°	16	17	35,00	225	229
27503	27523	O-BS 65-15°	O-BS 85-15°	15°	16	17	35,69	225	232
27504	27524	O-BS 65-20°	O-BS 85-20°	20°	16	17	36,86	225	247
27505	27525	O-BS 65-25°	O-BS 85-25°	25°	16	17	38,22	225	247
27506	27526	O-BS 65-30°	O-BS 85-30°	30°	16	16	35,38	225	236
27507	27527	O-BS 65-35°	O-BS 85-35°	35°	16	17	37,41	225	239
27508	27528	O-BS 65-40°	O-BS 85-40°	40°	16	17	39,57	225	247
27509	27529	O-BS 65-45°	O-BS 85-45°	45°	16	17	42,87	225	247
27510	27530	O-BS 65-50°	O-BS 85-50°	50°	16	17	47,16	225	247
27511	27531	O-BS 65-55°	O-BS 85-55°	55°	16	17	52,85	225	247
27512	27532	O-BS 65-60°	O-BS 85-60°	60°	16	17	49,24	225	247
27513	27533	O-BS 65-65°	O-BS 85-65°	65°	16	17	46,61	225	252
27514	27534	O-BS 65-70°	O-BS 85-70°	70°	16	17	57,59	225	252
27515	27535	O-BS 65-75°	O-BS 85-75°	75°	16	17	76,10	225	252

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 1

PERMISSIBLE CAM FORCES

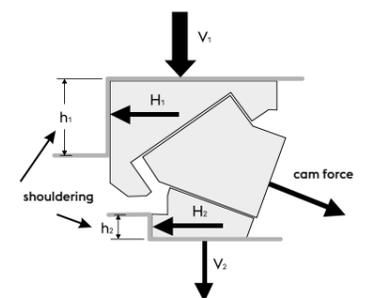
Cam unit force distribution size 1 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	138	116	138	116	0	155	20	6,8
5°	157	123	147	109	10	155	20	7,6
10°	140	140	117	115	20	125	30	6,8
15°	152	142	119	102	27	125	30	7,6
20°	140	159	92	111	40	100	60	6,5
25°	152	161	93	97	45	100	60	7,3
30°	150	122	103	47	27	105	60	12,2
35°	154	122	102	34	24	105	60	16,1
40°	156	144	83	44	37	100	80	11,6
45°	160	143	83	30	30	100	80	15,3
50°	163	143	83	18	22	100	80	22,9
55°	165	143	83	8	12	100	80	20,5
60°	159	167	29	29	50	40	110	11,6
65°	164	167	29	19	40	40	110	13,8
70°	167	167	29	10	28	40	110	20,5
75°	169	167	29	4	14	40	110	20,5

Cam unit force distribution size 1 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	92	77	92	77	0	155	20	6,8
5°	105	82	98	73	6	155	20	7,6
10°	93	93	78	77	14	125	30	6,8
15°	101	94	79	68	18	125	30	7,6
20°	94	106	61	74	27	100	60	6,5
25°	102	107	62	64	30	100	60	7,3
30°	100	82	68	32	18	105	60	12,2
35°	103	81	68	23	16	105	60	16,1
40°	104	96	55	29	24	100	80	11,6
45°	107	95	55	20	20	100	80	15,3
50°	109	95	55	12	15	100	80	22,9
55°	110	96	55	6	8	100	80	20,5
60°	106	111	20	19	33	40	110	11,6
65°	109	111	20	12	26	40	110	13,8
70°	111	111	20	7	18	40	110	20,5
75°	113	111	20	3	10	40	110	20,5

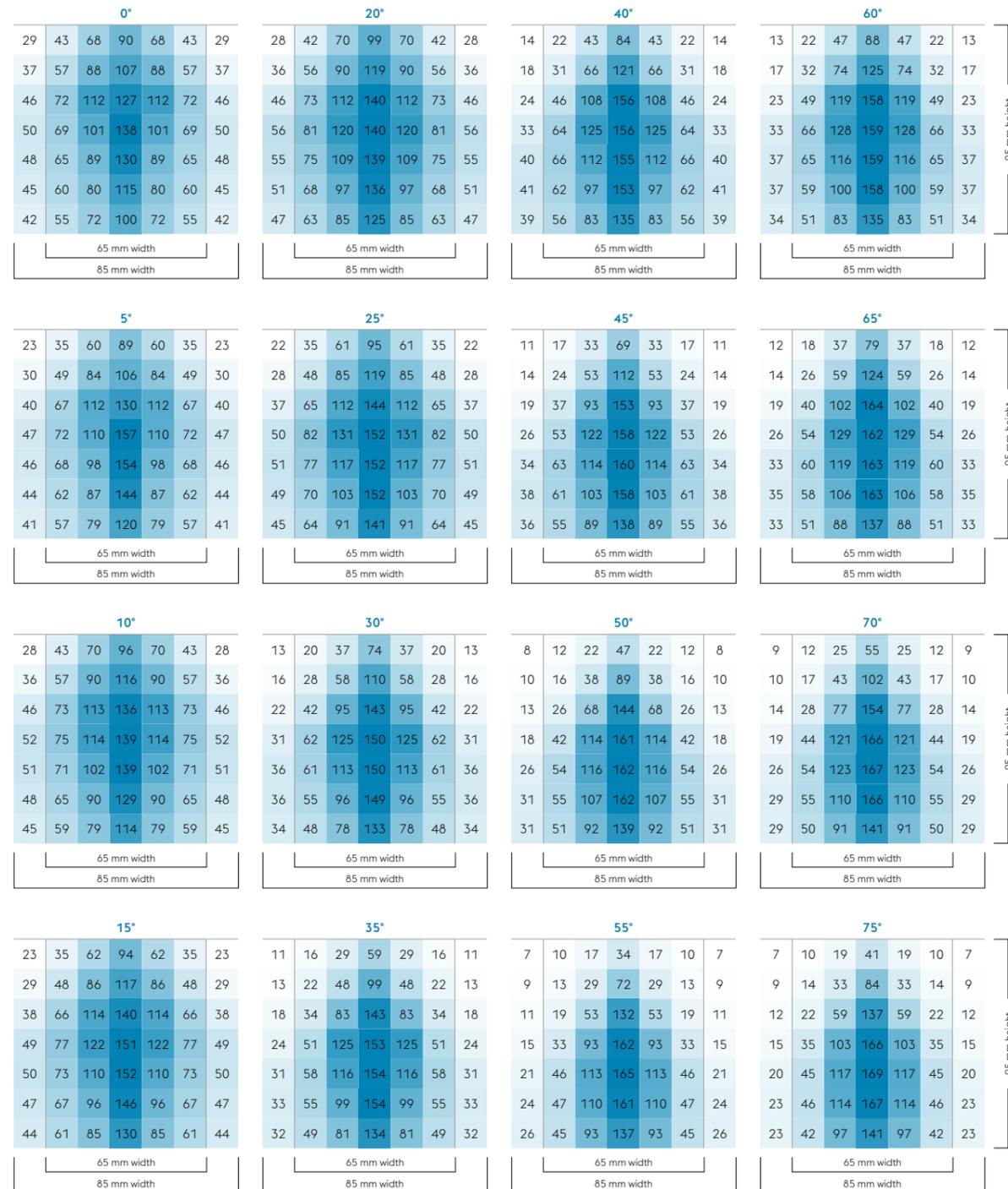
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-BS SIZE 1

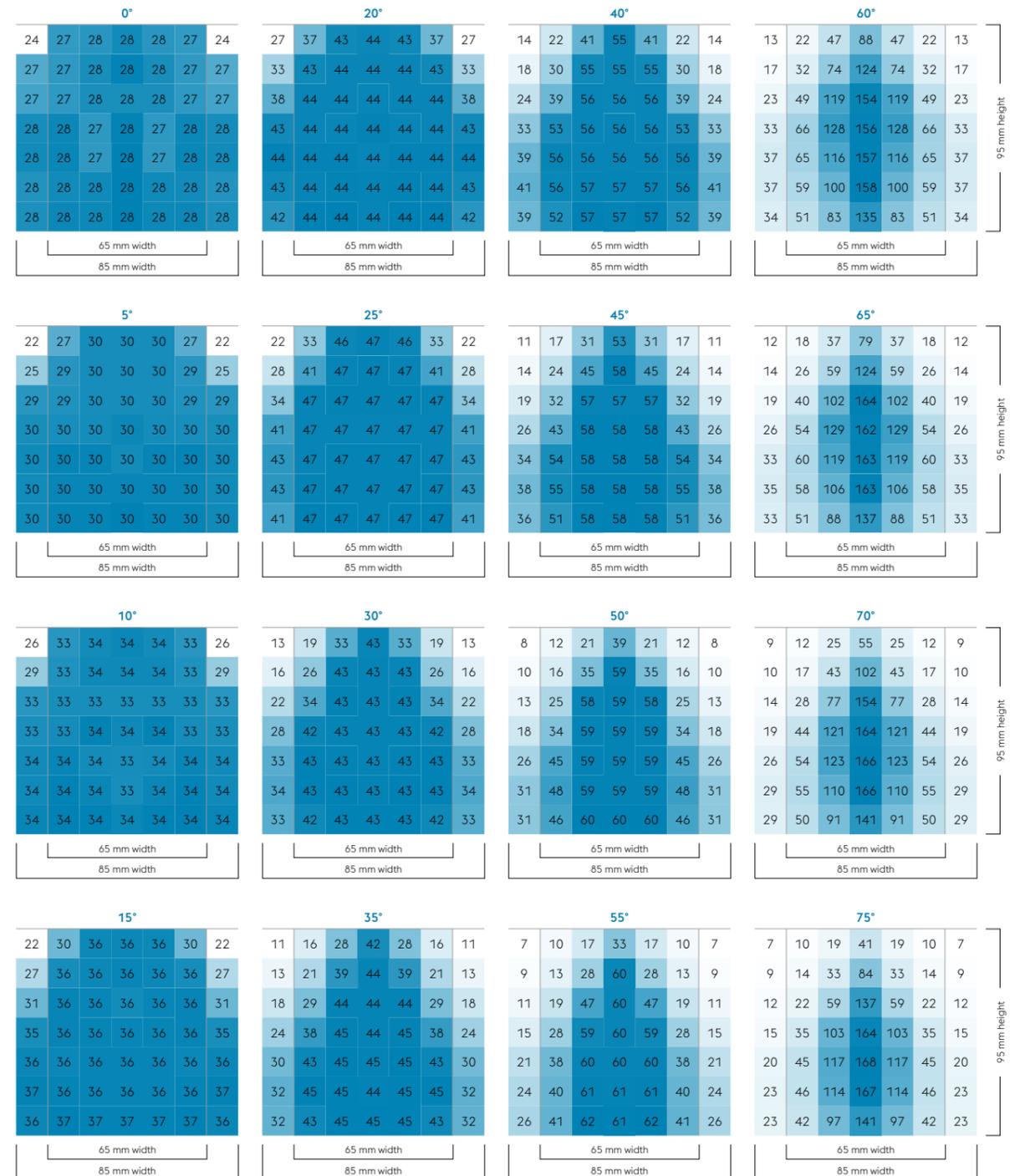
O-BS 65-85 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 1

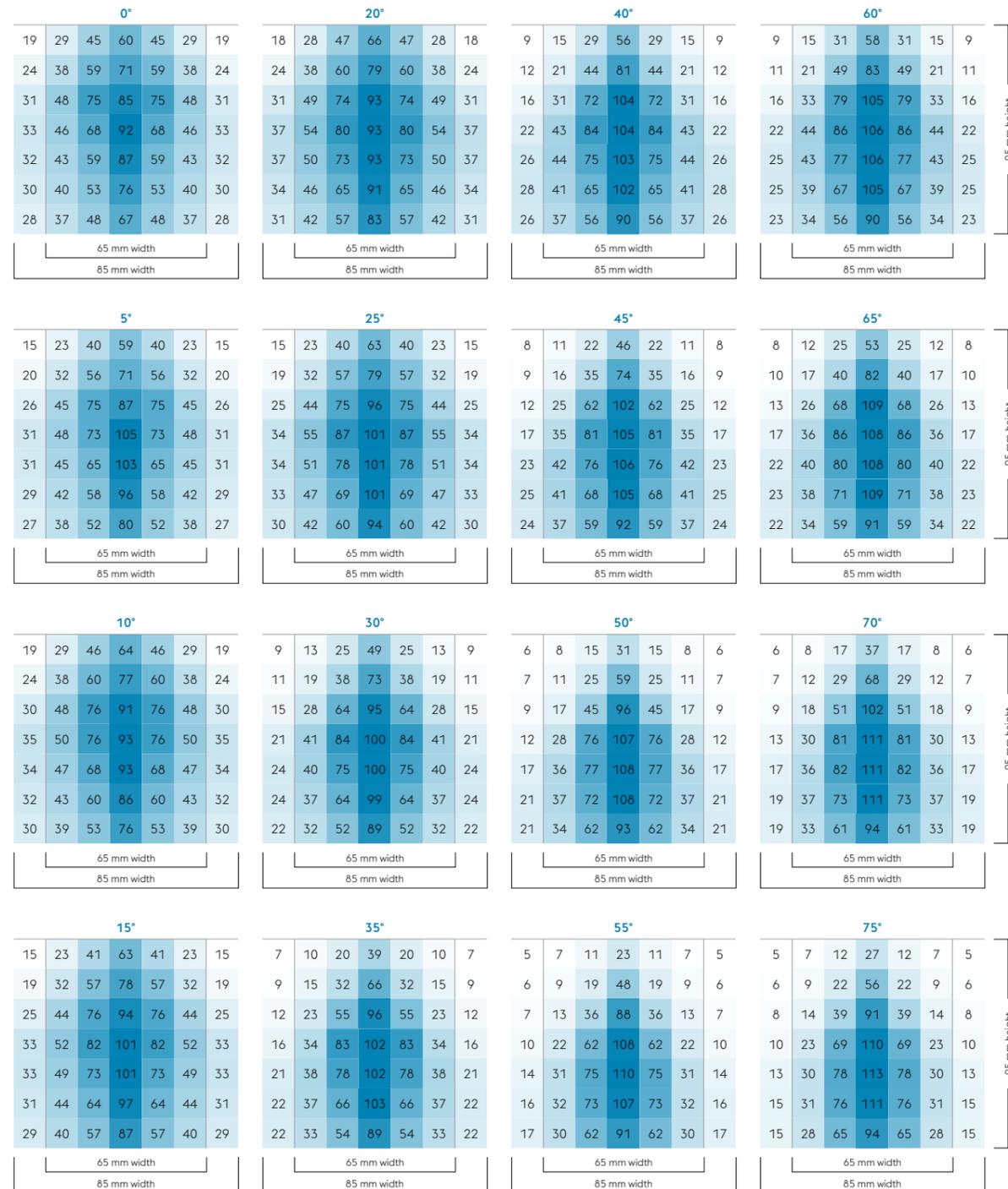
O-BS 65-85 | support via fitting key, Level 1



rounded values

O-BS SIZE 1

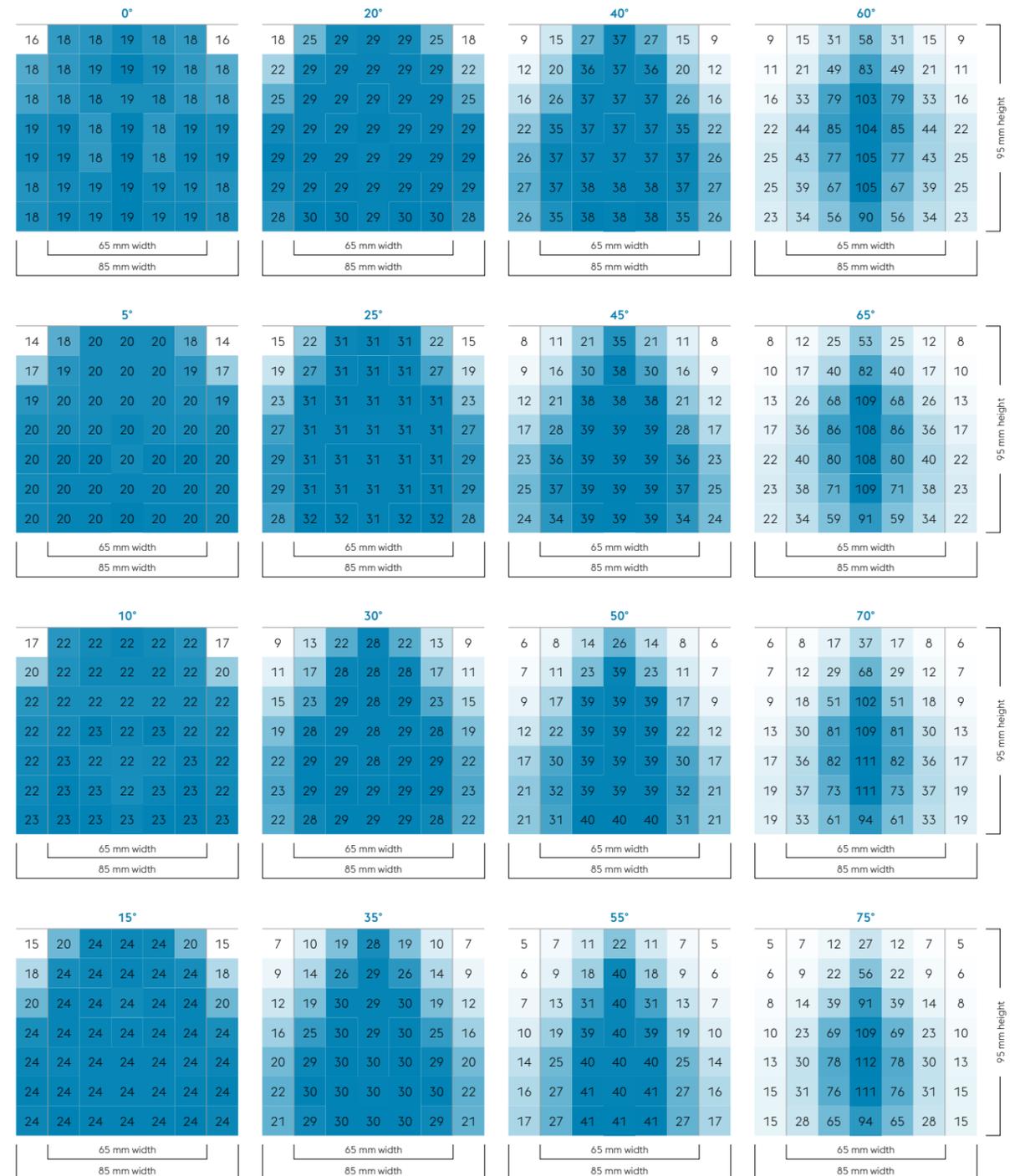
O-BS 65-85 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 1

O-BS 65-85 | support via fitting key, Level 2



rounded values

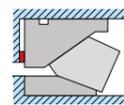
O-BS SIZE 2

FORCE DISTRIBUTION

Cam unit specifications O-BS 90-100

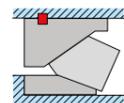
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 90	O-BS 110	size	size		O-BS 90	O-BS 110			
27540	27560	O-BS 90-0°	O-BS 110-0°	0°	35	36	28,93	275	277
27541	27561	O-BS 90-5°	O-BS 110-5°	5°	35	36	29,04	275	277
27542	27562	O-BS 90-10°	O-BS 110-10°	10°	35	36	35,00	275	302
27543	27563	O-BS 90-15°	O-BS 110-15°	15°	35	36	35,69	275	302
27544	27564	O-BS 90-20°	O-BS 110-20°	20°	34	35	36,86	275	302
27545	27565	O-BS 90-25°	O-BS 110-25°	25°	34	35	38,22	275	302
27546	27566	O-BS 90-30°	O-BS 110-30°	30°	34	36	35,38	275	302
27547	27567	O-BS 90-35°	O-BS 110-35°	35°	35	36	37,41	275	302
27548	27568	O-BS 90-40°	O-BS 110-40°	40°	34	35	39,57	275	302
27549	27569	O-BS 90-45°	O-BS 110-45°	45°	34	35	42,89	275	302
27550	27570	O-BS 90-50°	O-BS 110-50°	50°	34	35	47,16	275	302
27551	27571	O-BS 90-55°	O-BS 110-55°	55°	34	36	52,85	275	303
27552	27572	O-BS 90-60°	O-BS 110-60°	60°	33	34	49,24	275	300
27553	27573	O-BS 90-65°	O-BS 110-65°	65°	34	34	46,61	275	300
27554	27574	O-BS 90-70°	O-BS 110-70°	70°	34	35	57,59	275	300
27555	27575	O-BS 90-75°	O-BS 110-75°	75°	34	35	76,10	275	300

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 2

PERMISSIBLE CAM FORCES

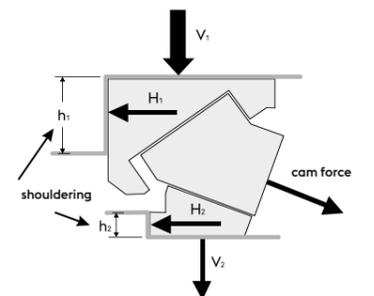
Cam unit force distribution size 2 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	185	155	185	155	0	190	30	6,8
5°	223	175	209	155	14	190	30	7,6
10°	231	231	194	191	34	148	30	6,7
15°	242	227	190	164	44	148	30	7,5
20°	244	275	159	192	70	109	65	6,4
25°	260	275	159	165	77	109	65	7,2
30°	271	221	185	86	50	143	65	12,2
35°	279	221	186	62	43	143	65	16,1
40°	278	256	148	77	65	102	105	11,7
45°	280	251	145	53	53	102	105	15,4
50°	289	254	146	33	39	102	105	24,4
55°	293	254	147	15	21	102	105	25,3
60°	275	288	51	50	86	52	135	11,1
65°	282	287	51	32	68	52	135	14,0
70°	288	288	51	17	48	52	135	22,1
75°	291	288	51	7	25	52	135	25,2

Cam unit force distribution size 2 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	124	104	124	104	0	190	30	6,8
5°	149	117	139	104	9	190	30	7,6
10°	154	154	129	128	23	148	30	6,7
15°	162	151	127	109	30	148	30	7,5
20°	163	184	106	128	47	109	65	6,4
25°	174	184	106	110	52	109	65	7,2
30°	181	147	124	57	33	143	65	12,2
35°	186	148	124	41	29	143	65	16,1
40°	185	171	99	52	44	102	105	11,7
45°	187	167	97	36	36	102	105	15,4
50°	193	170	98	22	26	102	105	24,4
55°	195	170	98	10	14	102	105	25,3
60°	183	192	34	34	58	52	135	11,1
65°	188	192	34	22	46	52	135	14,0
70°	192	192	34	12	32	52	135	22,1
75°	194	192	34	5	17	52	135	25,2

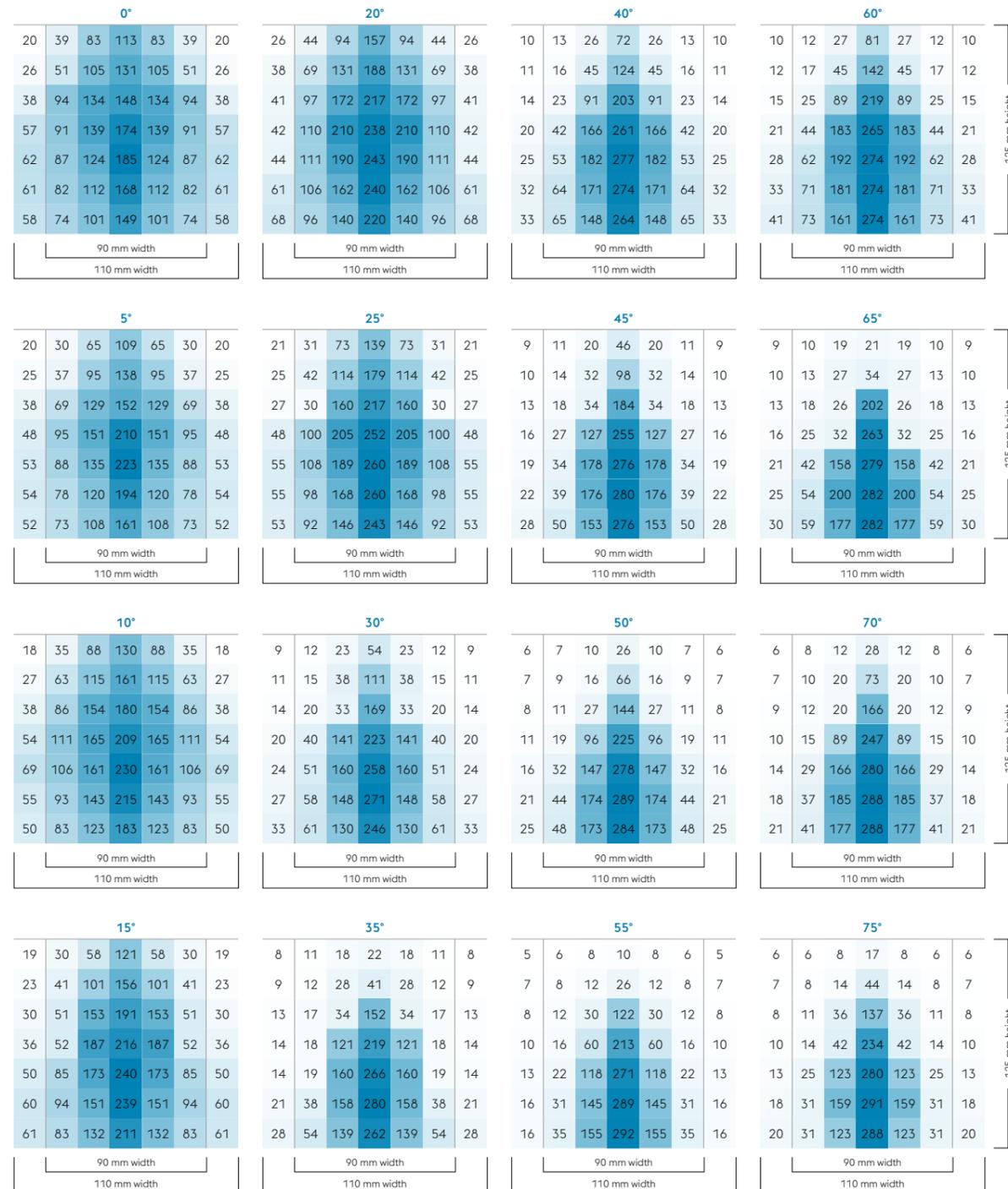
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-BS SIZE 2

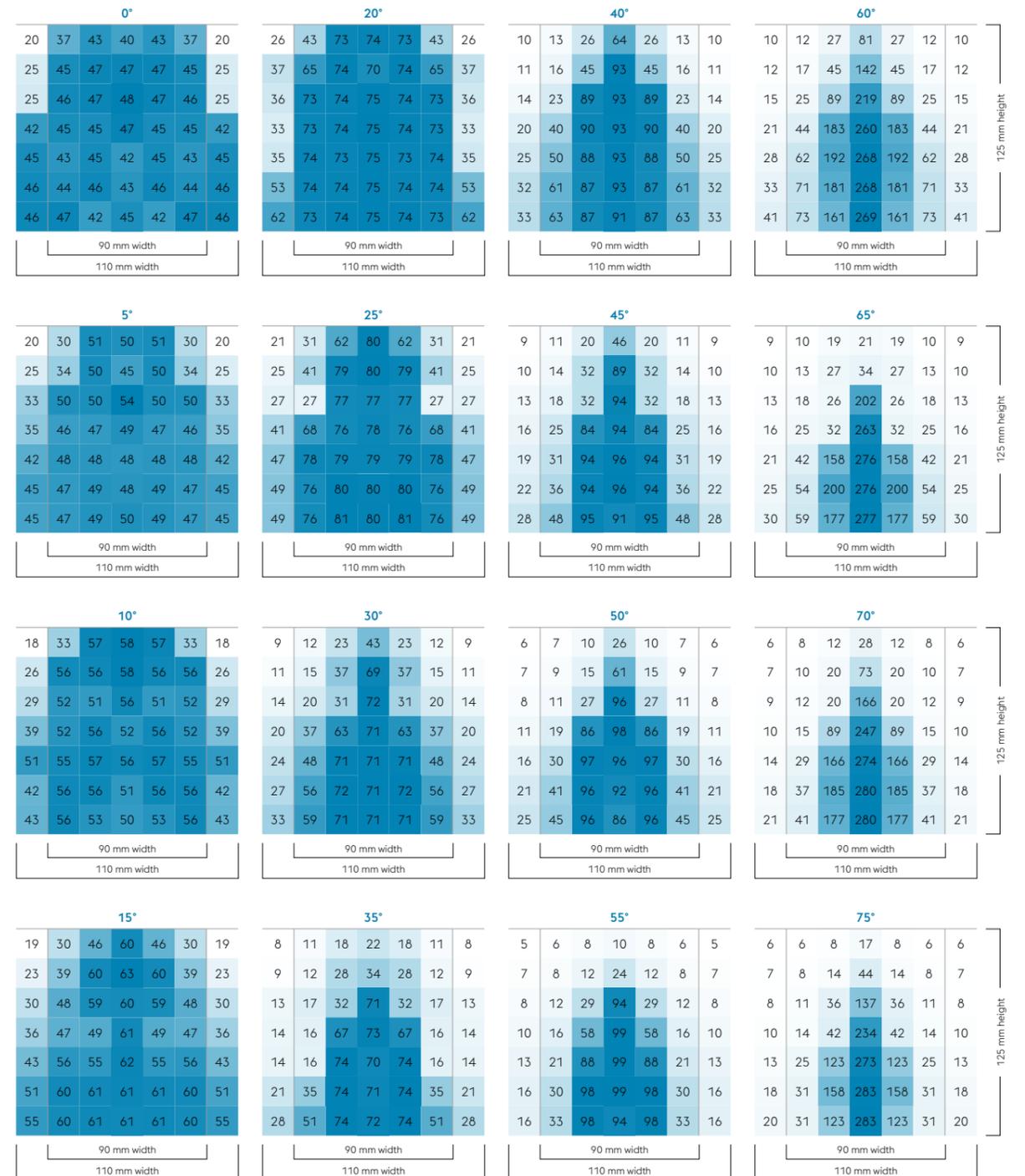
O-BS 90-110 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 2

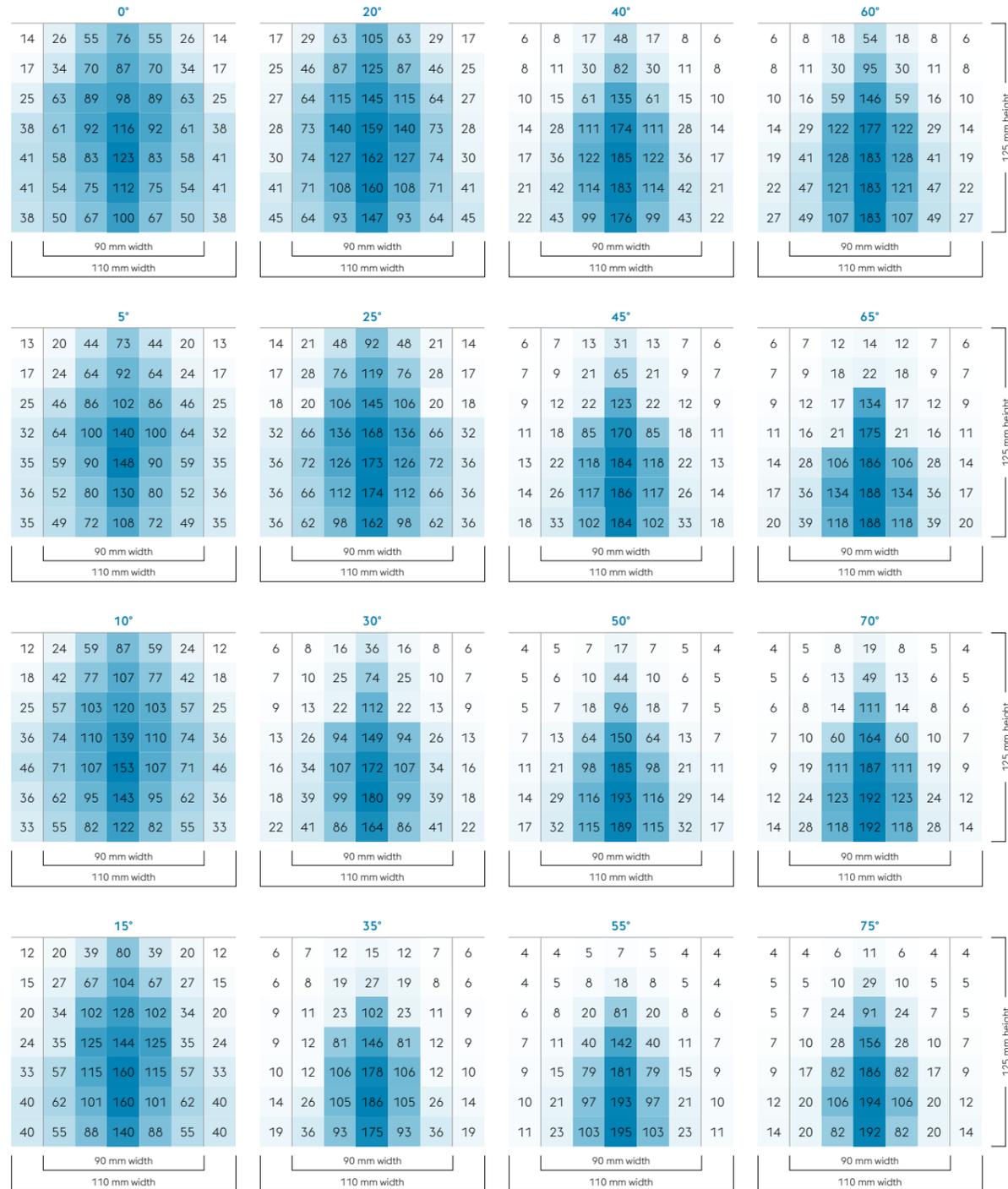
O-BS 90-110 | support via fitting key, Level 1



rounded values

O-BS SIZE 2

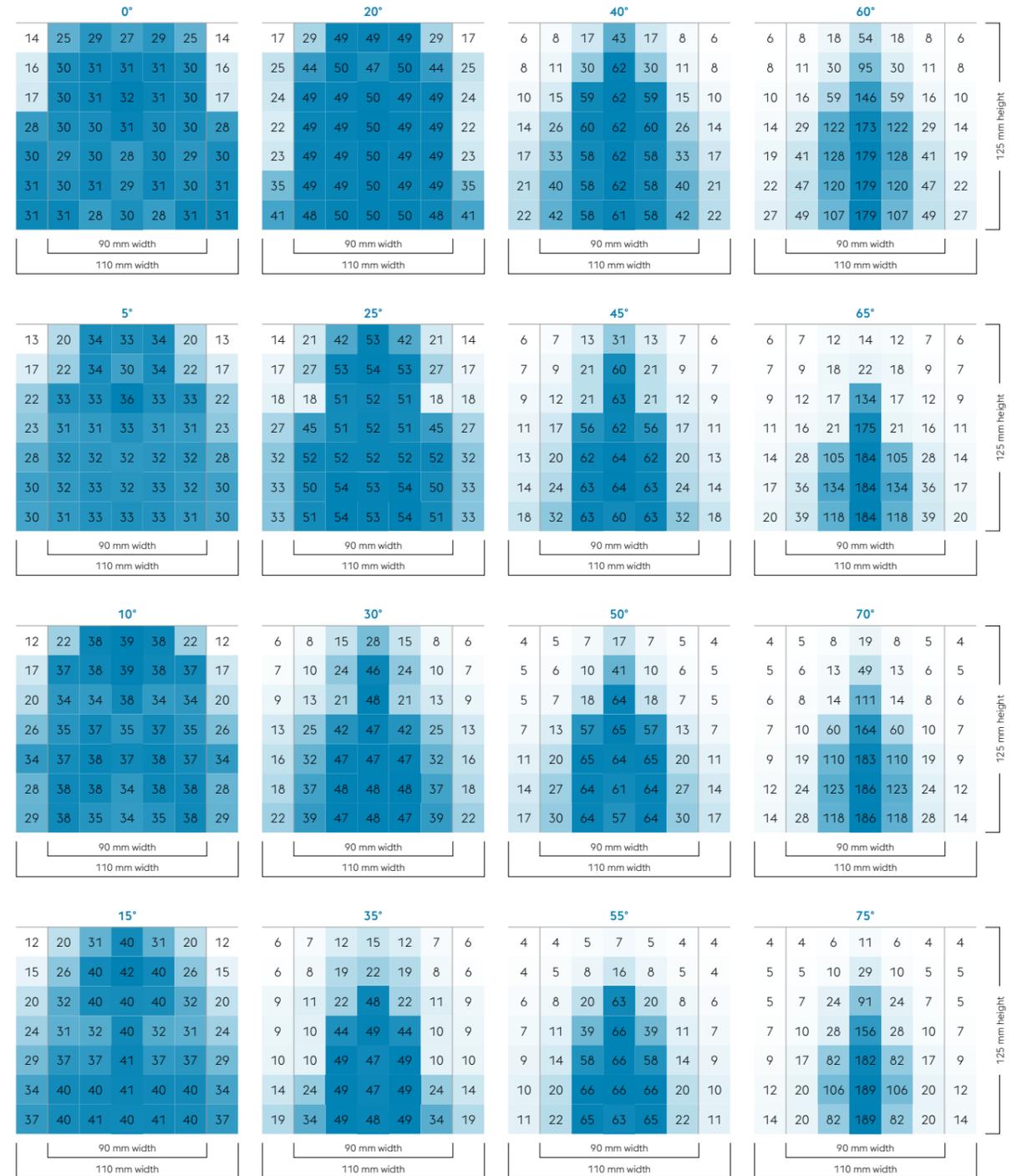
O-BS 90-110 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 2

O-BS 90-110 | support via fitting key, Level 2



rounded values

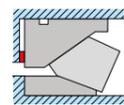
O-BS SIZE 3

FORCE DISTRIBUTION

Cam unit specifications O-BS 125-160

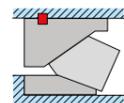
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 125	O-BS 160	size	size		O-BS 125	O-BS 160			
27600	27620	O-BS 125-0°	O-BS 160-0°	0°	58	60	35,35	300	300
27601	27621	O-BS 125-5°	O-BS 160-5°	5°	57	60	35,49	300	298
27602	27622	O-BS 125-10°	O-BS 160-10°	10°	57	59	42,78	300	288
27603	27623	O-BS 125-15°	O-BS 160-15°	15°	57	59	43,62	300	290
27604	27624	O-BS 125-20°	O-BS 160-20°	20°	57	59	46,08	300	301
27605	27625	O-BS 125-25°	O-BS 160-25°	25°	57	59	47,78	300	298
27606	27626	O-BS 125-30°	O-BS 160-30°	30°	54	56	44,23	300	323
27607	27627	O-BS 125-35°	O-BS 160-35°	35°	54	57	46,76	300	322
27608	27628	O-BS 125-40°	O-BS 160-40°	40°	54	56	50,87	300	323
27609	27629	O-BS 125-45°	O-BS 160-45°	45°	54	57	55,11	300	323
27610	27630	O-BS 125-50°	O-BS 160-50°	50°	55	57	48,50	300	323
27611	27631	O-BS 125-55°	O-BS 160-55°	55°	55	58	54,36	300	323
27612	27632	O-BS 125-60°	O-BS 160-60°	60°	55	57	49,24	300	333
27613	27633	O-BS 125-65°	O-BS 160-65°	65°	55	57	46,61	300	328
27614	27634	O-BS 125-70°	O-BS 160-70°	70°	55	57	57,59	300	323
27615	27635	O-BS 125-75°	O-BS 160-75°	75°	55	57	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 3

PERMISSIBLE CAM FORCES

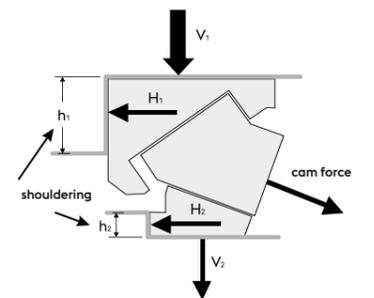
Cam unit force distribution size 3 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	227	190	227	190	0	190	40	9,2
5°	229	179	214	160	14	190	40	10,3
10°	282	282	237	233	41	150	40	9,2
15°	296	277	233	200	54	150	40	10,3
20°	294	332	192	232	85	115	85	8,8
25°	317	335	194	201	94	115	85	9,9
30°	304	248	208	96	56	130	85	17,6
35°	315	250	210	69	49	130	85	23,2
40°	317	292	169	89	74	105	135	16,8
45°	330	296	171	62	62	105	135	22,2
50°	323	284	164	37	44	105	135	28,9
55°	334	290	167	17	24	105	135	28,6
60°	321	337	59	59	101	53	160	14,8
65°	331	338	59	38	80	53	160	18,6
70°	345	345	61	21	57	53	160	27,7
75°	334	330	59	8	29	53	160	28,5

Cam unit force distribution size 3 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	151	127	151	127	0	190	40	9,2
5°	153	120	143	107	10	190	40	10,3
10°	188	188	158	156	28	150	40	9,2
15°	198	185	155	134	36	150	40	10,3
20°	196	222	128	155	57	115	85	8,8
25°	211	223	129	134	63	115	85	9,9
30°	203	165	139	64	37	130	85	17,6
35°	210	167	140	46	33	130	85	23,2
40°	211	195	113	59	50	105	135	16,8
45°	220	197	114	42	42	105	135	22,2
50°	215	189	109	25	29	105	135	28,9
55°	223	194	112	11	16	105	135	28,6
60°	214	225	40	39	68	53	160	14,8
65°	221	225	40	25	54	53	160	18,6
70°	230	230	41	14	38	53	160	27,7
75°	223	220	39	5	19	53	160	28,5

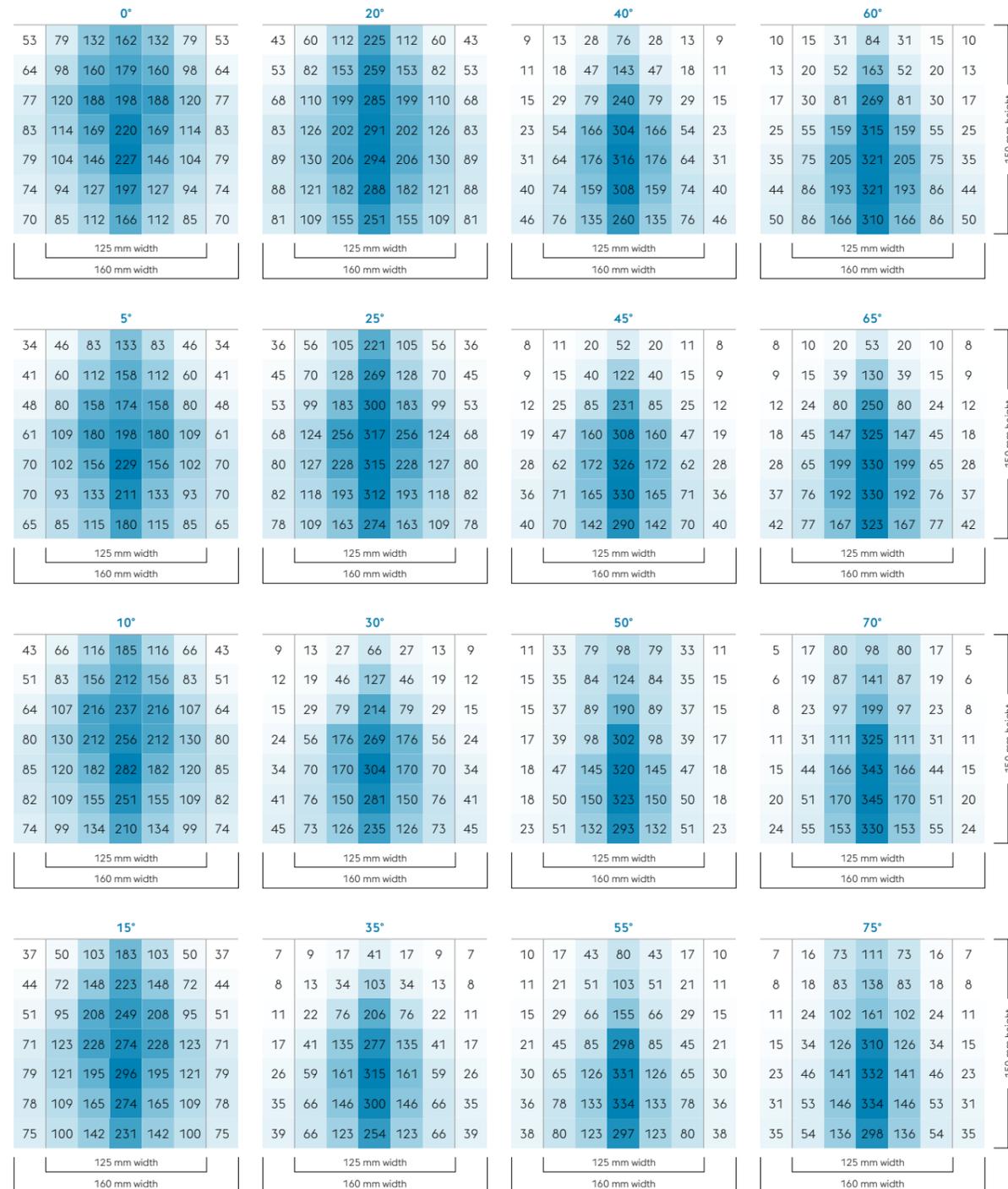
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-BS SIZE 3

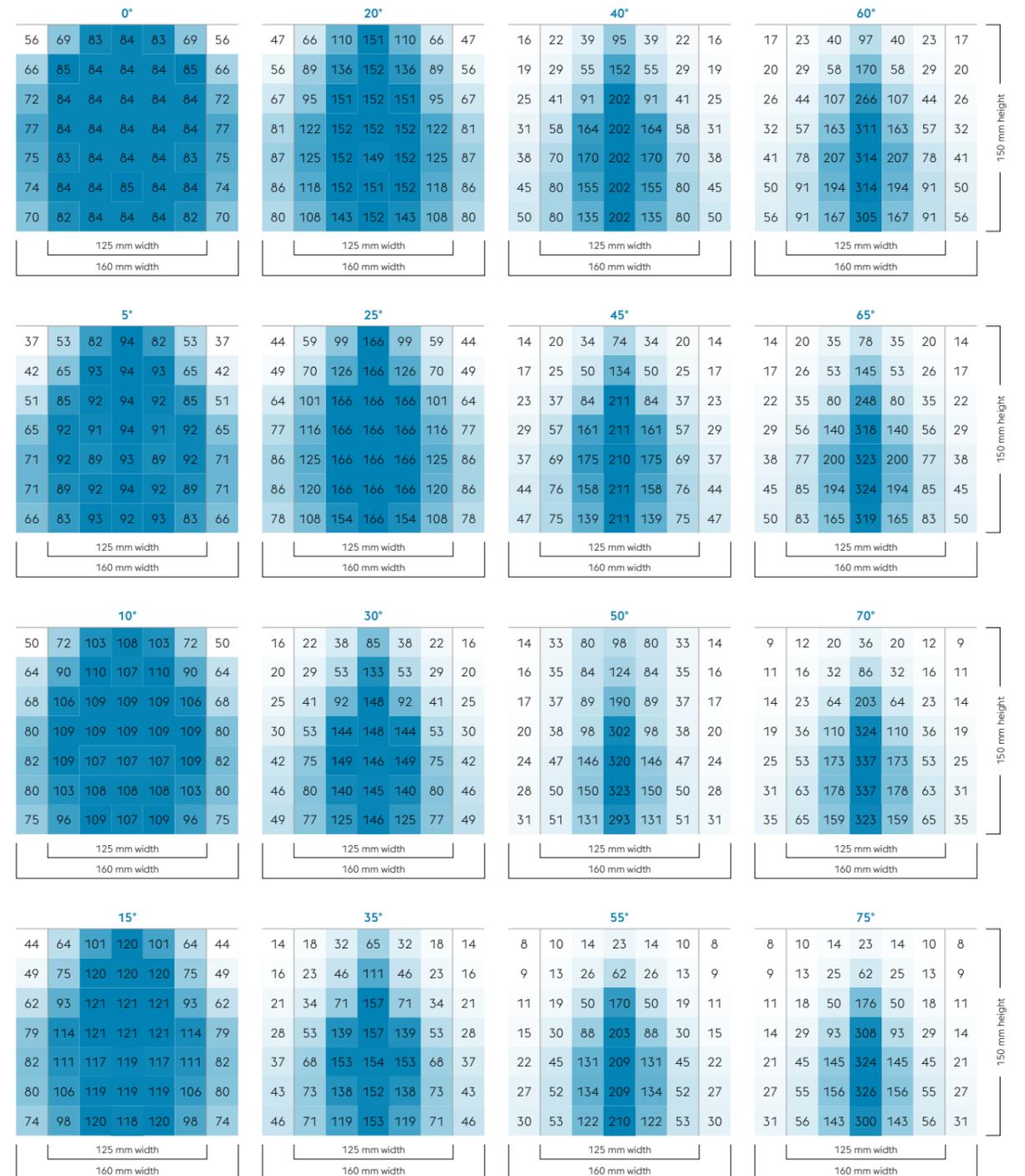
O-BS 125-160 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 3

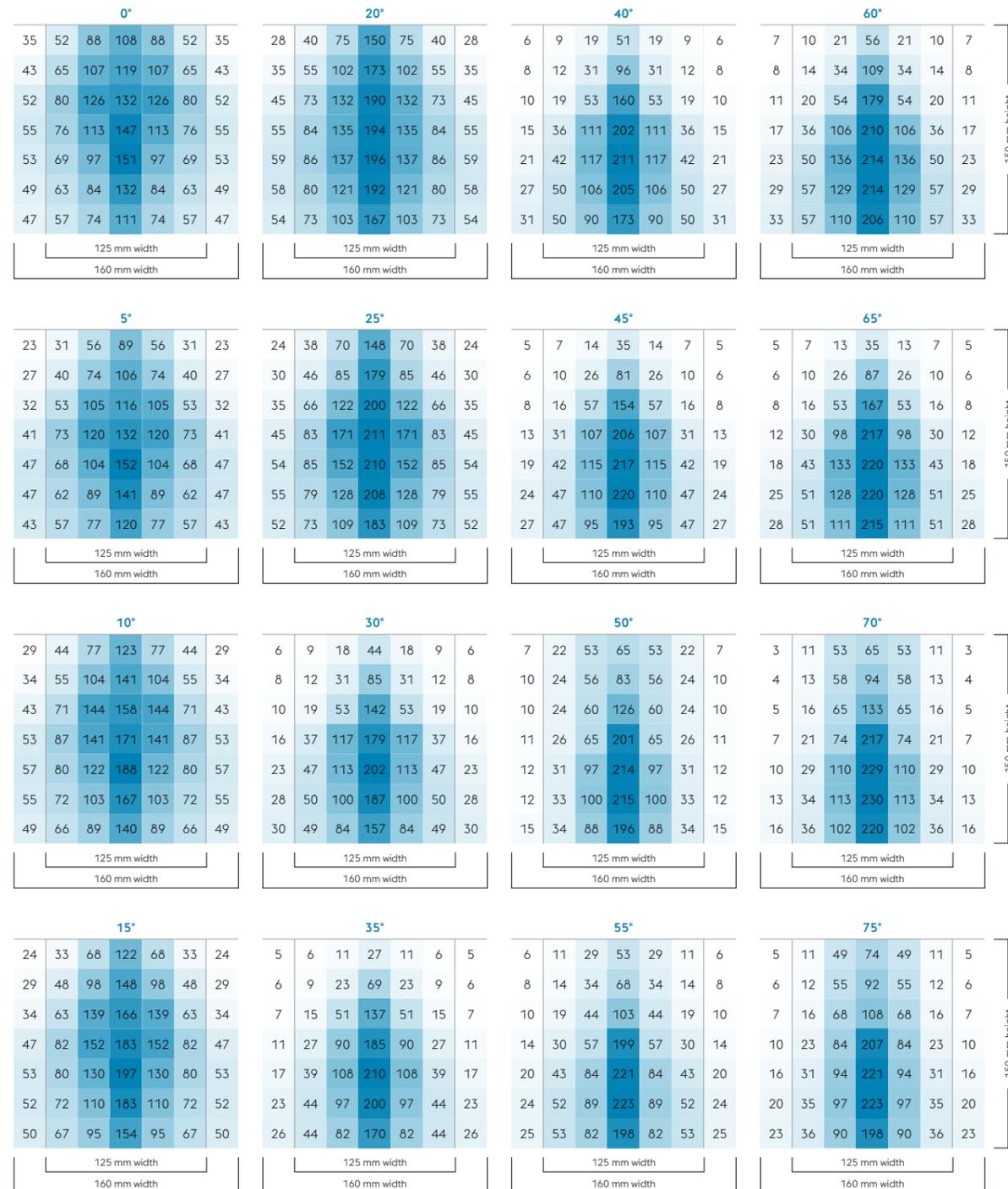
O-BS 125-160 | support via fitting key, Level 1



rounded values

O-BS SIZE 3

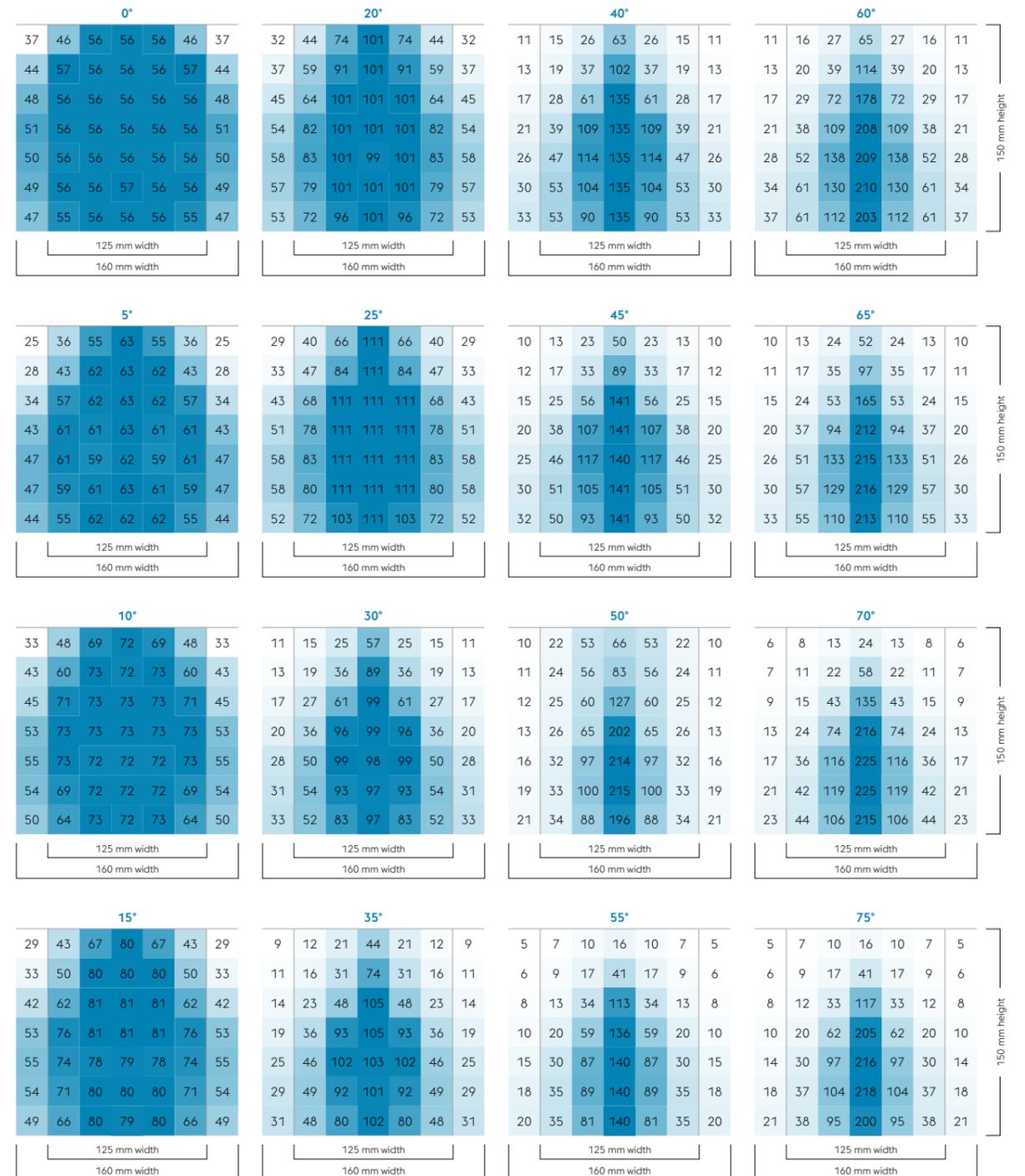
O-BS 125-160 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 3

O-BS 125-160 | support via fitting key, Level 2



rounded values

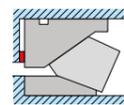
O-BS SIZE 4

FORCE DISTRIBUTION

Cam unit specifications O-BS 175-220

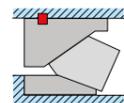
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 175	O-BS 220	size	size		O-BS 175	O-BS 220			
27640	27660	O-BS 175-0°	O-BS 220-0°	0°	86	88	41,78	300	300
27641	27661	O-BS 175-5°	O-BS 220-5°	5°	85	88	41,94	300	298
27642	27662	O-BS 175-10°	O-BS 220-10°	10°	84	87	50,56	300	304
27643	27663	O-BS 175-15°	O-BS 220-15°	15°	84	87	51,55	300	310
27644	27664	O-BS 175-20°	O-BS 220-20°	20°	82	85	55,30	300	323
27645	27665	O-BS 175-25°	O-BS 220-25°	25°	82	82	57,33	300	323
27646	27666	O-BS 175-30°	O-BS 220-30°	30°	79	82	53,07	300	306
27647	27667	O-BS 175-35°	O-BS 220-35°	35°	80	83	56,11	300	311
27648	27668	O-BS 175-40°	O-BS 220-40°	40°	79	82	62,18	300	323
27649	27669	O-BS 175-45°	O-BS 220-45°	45°	79	82	67,36	300	323
27650	27670	O-BS 175-50°	O-BS 220-50°	50°	80	83	60,63	300	323
27651	27671	O-BS 175-55°	O-BS 220-55°	55°	80	83	67,94	300	328
27652	27672	O-BS 175-60°	O-BS 220-60°	60°	80	83	68,94	300	323
27653	27673	O-BS 175-65°	O-BS 220-65°	65°	79	82	60,59	300	323
27654	27674	O-BS 175-70°	O-BS 220-70°	70°	80	83	74,86	300	323
27655	27675	O-BS 175-75°	O-BS 220-75°	75°	79	82	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 4

PERMISSIBLE CAM FORCES

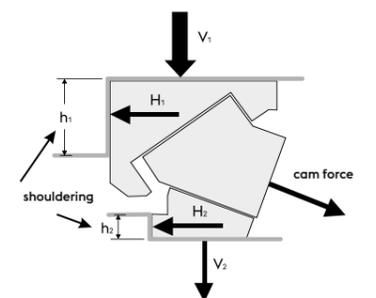
Cam unit force distribution size 4 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	303	254	303	254	0	190	38	15,6
5°	342	268	320	239	21	190	38	17,5
10°	425	425	356	351	62	148	38	15,5
15°	455	425	357	307	82	148	38	17,3
20°	432	488	282	341	124	115	82	14,9
25°	454	480	277	288	134	115	82	16,7
30°	422	344	288	133	77	130	82	28,3
35°	408	324	272	90	63	130	82	37,4
40°	454	418	241	127	106	100	130	28,8
45°	461	414	239	87	87	100	130	38,0
50°	488	429	248	55	66	100	130	44,9
55°	482	419	242	24	35	100	130	44,4
60°	478	501	88	87	151	50	148	25,9
65°	479	488	86	54	116	50	148	31,4
70°	497	497	88	30	82	50	148	44,7
75°	497	491	87	11	42	50	148	44,3

Cam unit force distribution size 4 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	202	169	202	169	0	190	38	15,6
5°	228	179	213	159	14	190	38	17,5
10°	283	283	237	234	41	148	38	15,5
15°	303	283	238	205	55	148	38	17,3
20°	288	326	188	227	83	115	82	14,9
25°	303	320	185	192	90	115	82	16,7
30°	281	229	192	89	51	130	82	28,3
35°	272	216	181	60	42	130	82	37,4
40°	303	279	161	84	71	100	130	28,8
45°	308	276	159	58	58	100	130	38,0
50°	325	286	165	37	44	100	130	44,9
55°	322	279	161	16	23	100	130	44,4
60°	319	334	59	58	100	50	148	25,9
65°	319	325	57	36	77	50	148	31,4
70°	332	332	58	20	55	50	148	44,7
75°	331	327	58	7	28	50	148	44,3

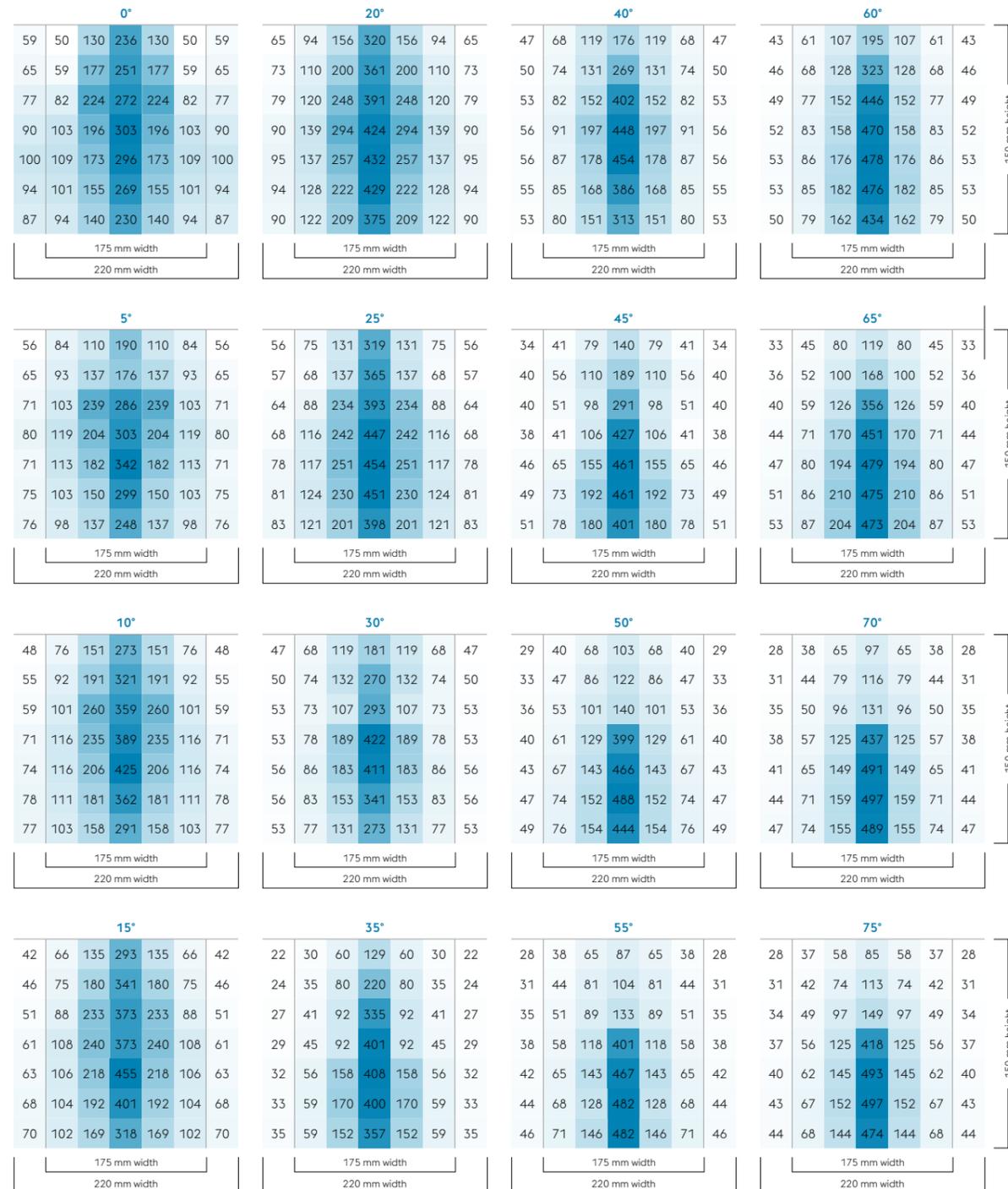
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-BS SIZE 4

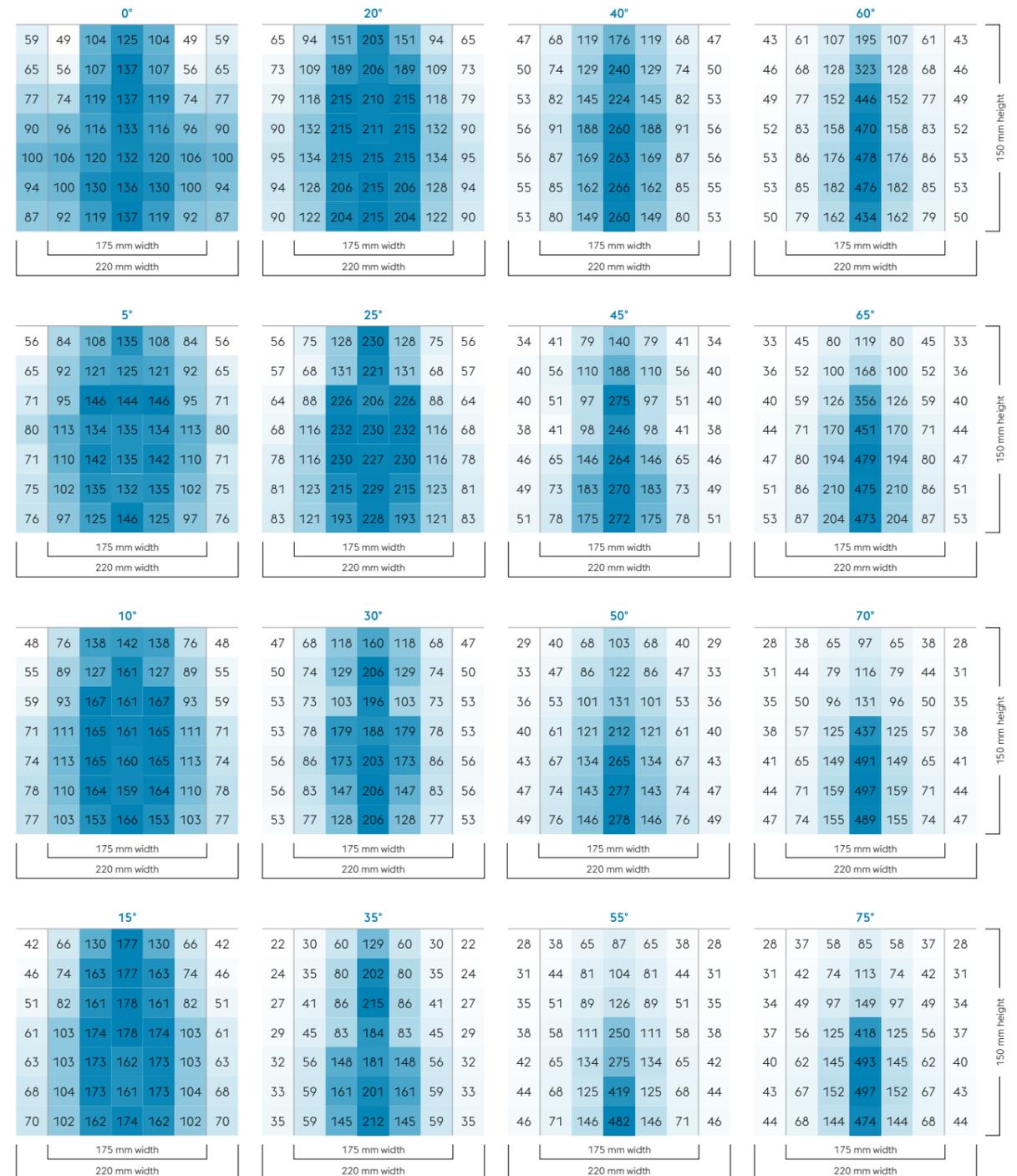
O-BS 175-220 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 4

O-BS 175-220 | support via fitting key, Level 1

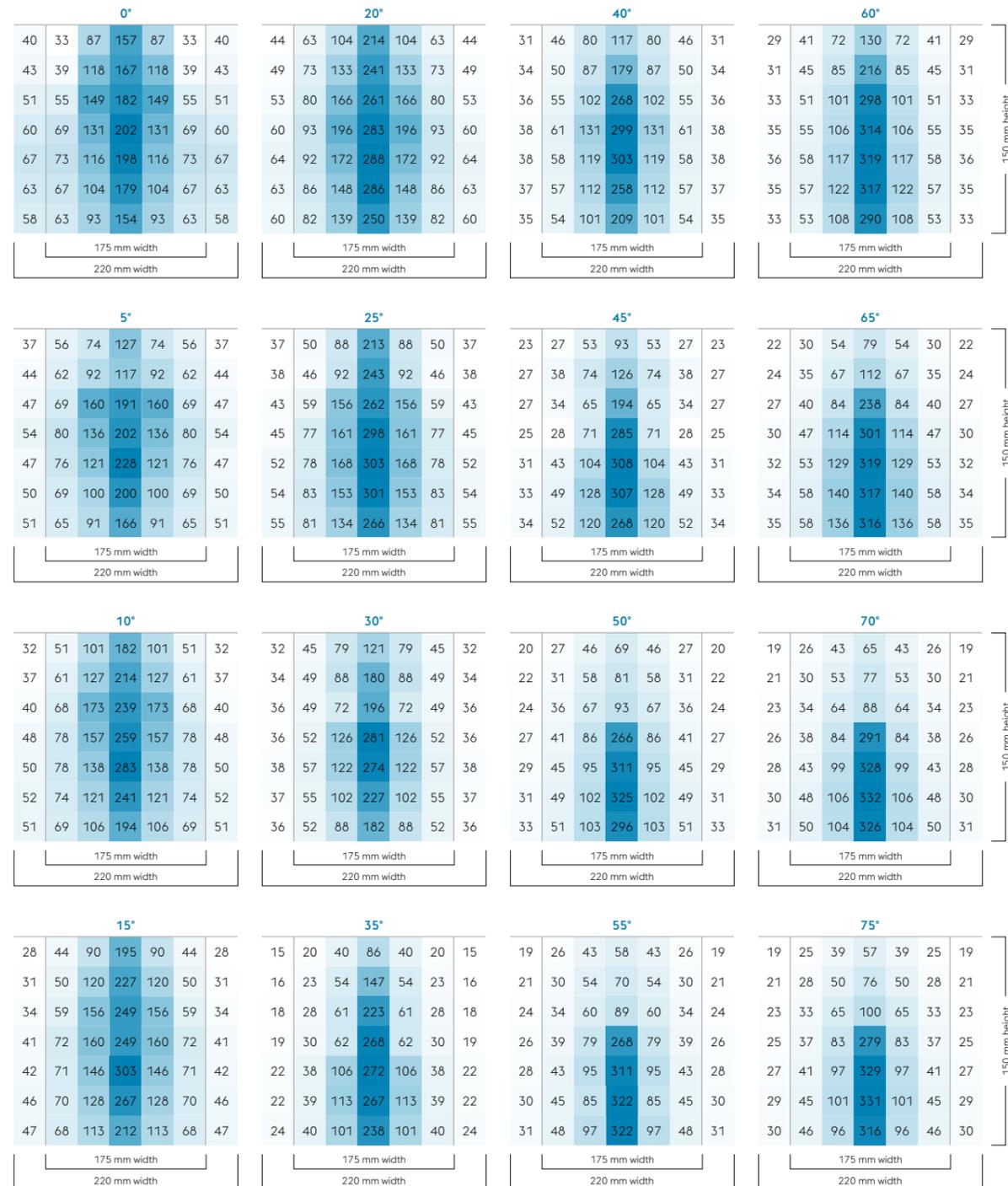


rounded values

O-BS SERIES

O-BS SIZE 4

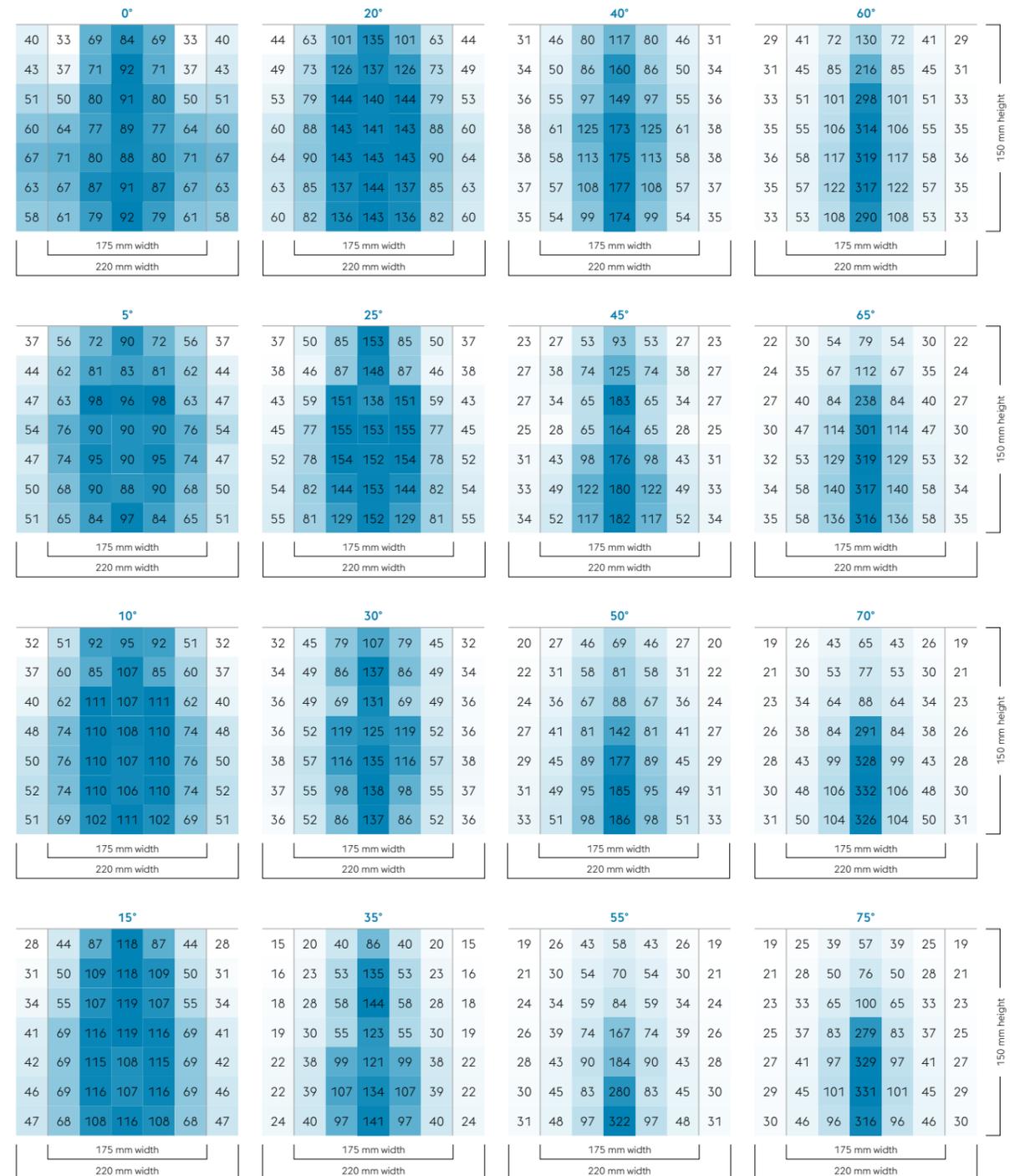
O-BS175-220 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 4

O-BS 175-220 | support via fitting key, Level 2



rounded values

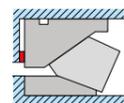
O-BS SIZE 5

FORCE DISTRIBUTION

Cam unit specifications O-BS 260-330

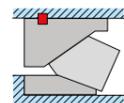
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 260	O-BS 330	size	size		O-BS 260	O-BS 330			
27680	27700	O-BS 260-0°	O-BS 330-0°	0°	152	157	41,78	300	310
27681	27701	O-BS 260-5°	O-BS 330-5°	5°	151	157	42,75	300	305
27682	27702	O-BS 260-10°	O-BS 330-10°	10°	149	154	52,04	300	305
27683	27703	O-BS 260-15°	O-BS 330-15°	15°	149	154	53,68	300	305
27684	27704	O-BS 260-20°	O-BS 330-20°	20°	148	153	57,82	300	311
27685	27705	O-BS 260-25°	O-BS 330-25°	25°	148	153	61,50	300	306
27686	27706	O-BS 260-30°	O-BS 330-30°	30°	142	148	56,61	300	325
27687	27707	O-BS 260-35°	O-BS 330-35°	35°	143	148	60,26	300	325
27688	27708	O-BS 260-40°	O-BS 330-40°	40°	141	146	67,04	300	330
27689	27709	O-BS 260-45°	O-BS 330-45°	45°	141	146	73,32	300	325
27690	27710	O-BS 260-50°	O-BS 330-50°	50°	142	147	64,94	300	325
27691	27711	O-BS 260-55°	O-BS 330-55°	55°	141	147	75,63	300	325
27692	27712	O-BS 260-60°	O-BS 330-60°	60°	143	149	68,94	300	325
27693	27713	O-BS 260-65°	O-BS 330-65°	65°	143	149	60,59	300	325
27694	27714	O-BS 260-70°	O-BS 330-70°	70°	143	149	74,86	300	325
27695	27715	O-BS 260-75°	O-BS 330-75°	75°	143	148	98,93	300	325

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 5

PERMISSIBLE CAM FORCES

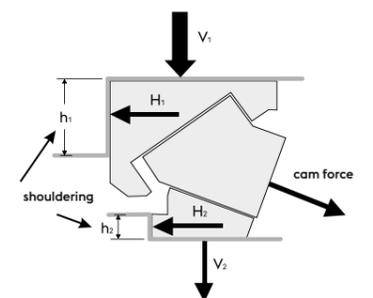
Cam unit force distribution size 5 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	586	492	586	492	0	186	48	30,9
5°	620	487	580	433	38	186	48	34,6
10°	602	602	505	497	88	142	48	30,7
15°	643	601	504	435	116	142	48	34,4
20°	580	655	378	457	166	110	82	29,6
25°	620	656	379	394	184	110	82	33,2
30°	605	493	414	191	110	125	83	47,8
35°	622	493	414	136	96	125	83	47,0
40°	623	574	331	174	146	95	145	48,0
45°	635	569	328	120	120	95	145	47,2
50°	402	354	204	46	54	95	145	45,6
55°	544	473	273	27	39	95	145	44,2
60°	623	652	115	113	196	45	180	47,4
65°	637	649	114	72	155	45	190	46,2
70°	500	500	88	30	83	45	190	45,3
75°	479	474	84	11	41	45	190	44,0

Cam unit force distribution size 5 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	391	328	391	328	0	186	48	30,9
5°	414	324	387	288	25	186	48	34,6
10°	401	401	336	331	58	142	48	30,7
15°	429	401	336	290	78	142	48	34,4
20°	387	437	252	305	111	110	82	29,6
25°	414	437	252	262	122	110	82	33,2
30°	403	329	276	127	73	125	83	47,8
35°	415	329	276	91	64	125	83	47,0
40°	415	382	221	116	97	95	145	48,0
45°	423	379	219	80	80	95	145	47,2
50°	268	236	136	30	36	95	145	45,6
55°	363	315	182	18	26	95	145	44,2
60°	415	435	77	76	131	45	180	47,4
65°	425	433	76	48	103	45	190	46,2
70°	333	333	59	20	55	45	190	45,3
75°	320	316	56	7	27	45	190	44,0

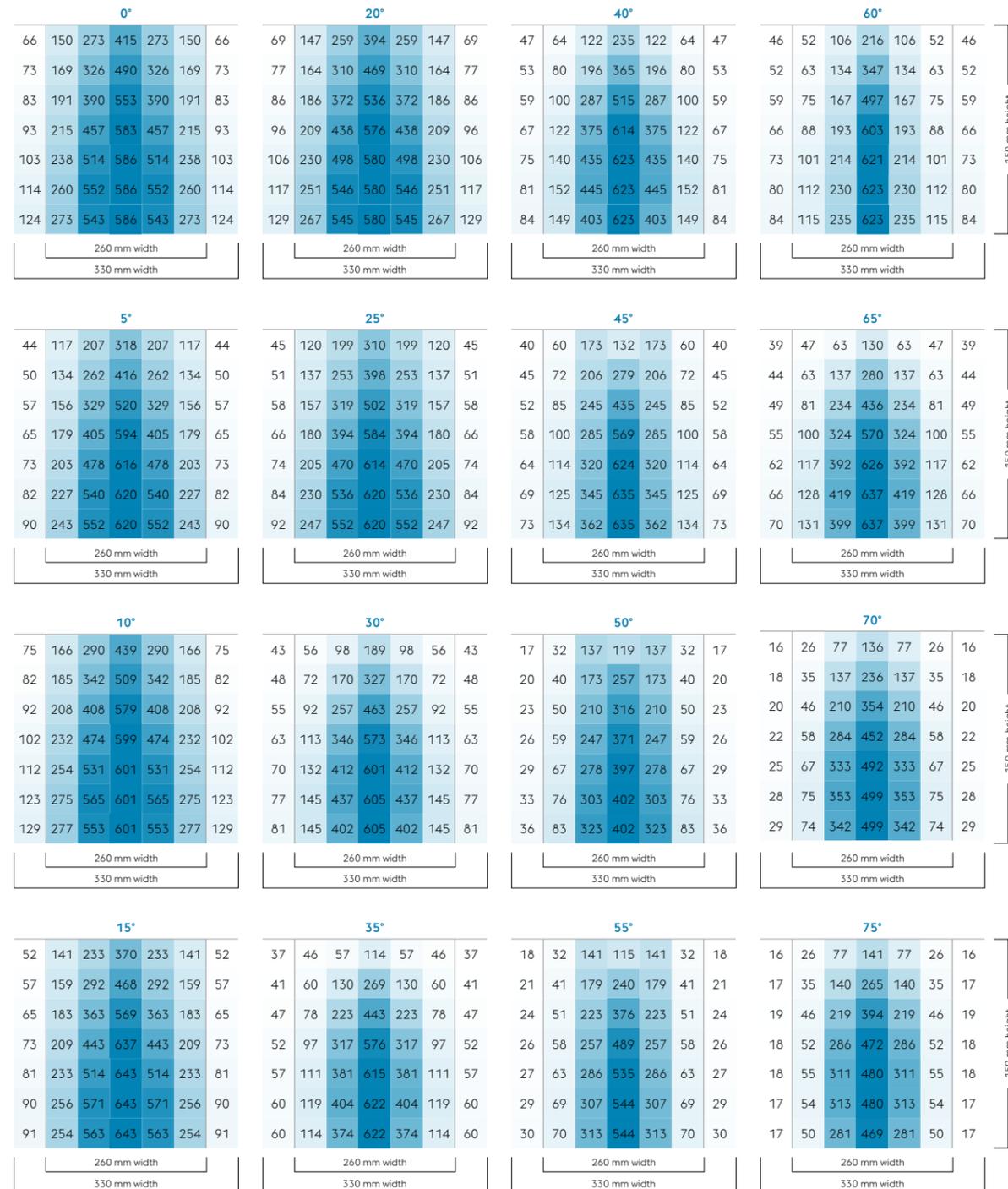
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-BS SIZE 5

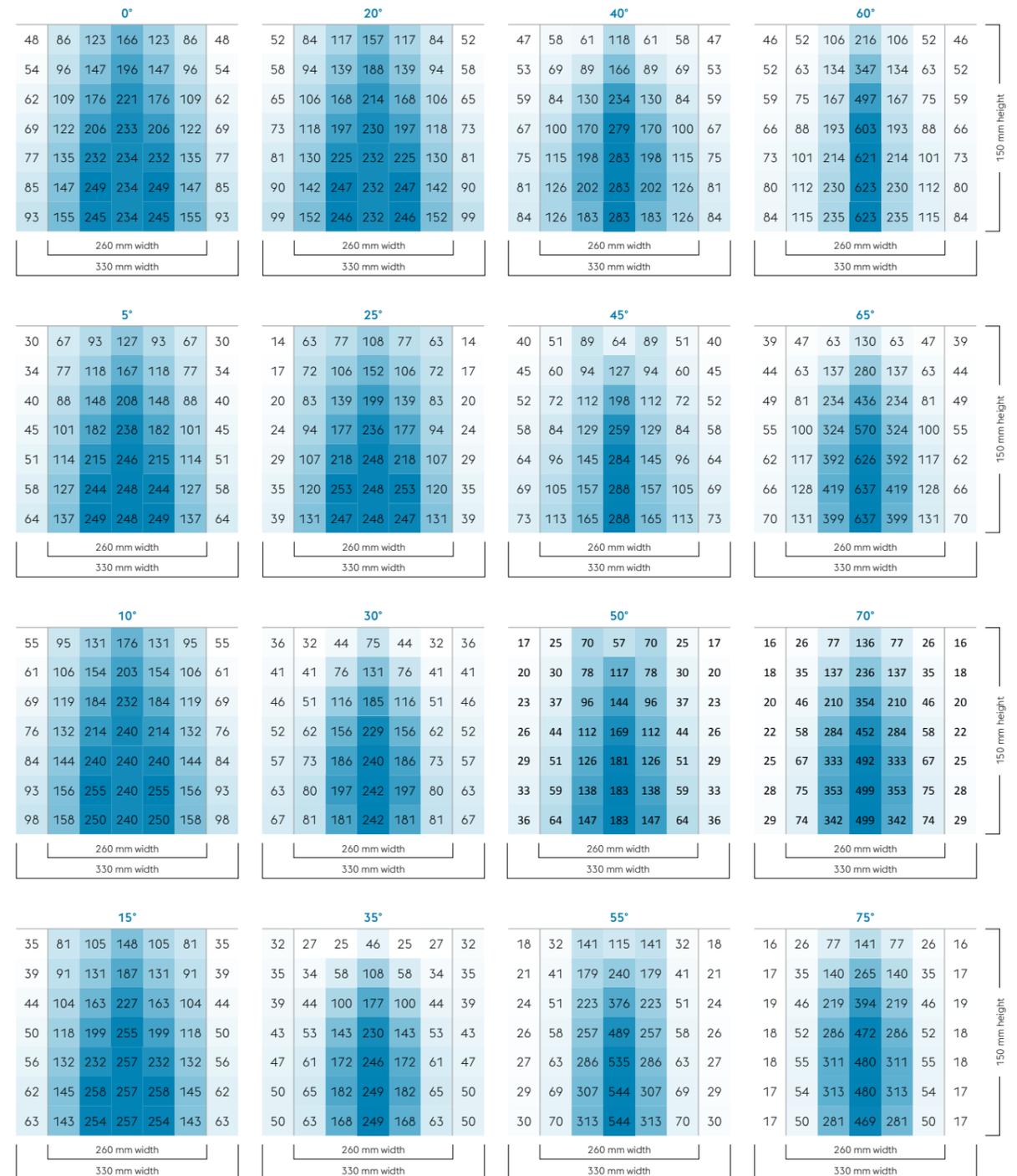
O-BS 260-330 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 5

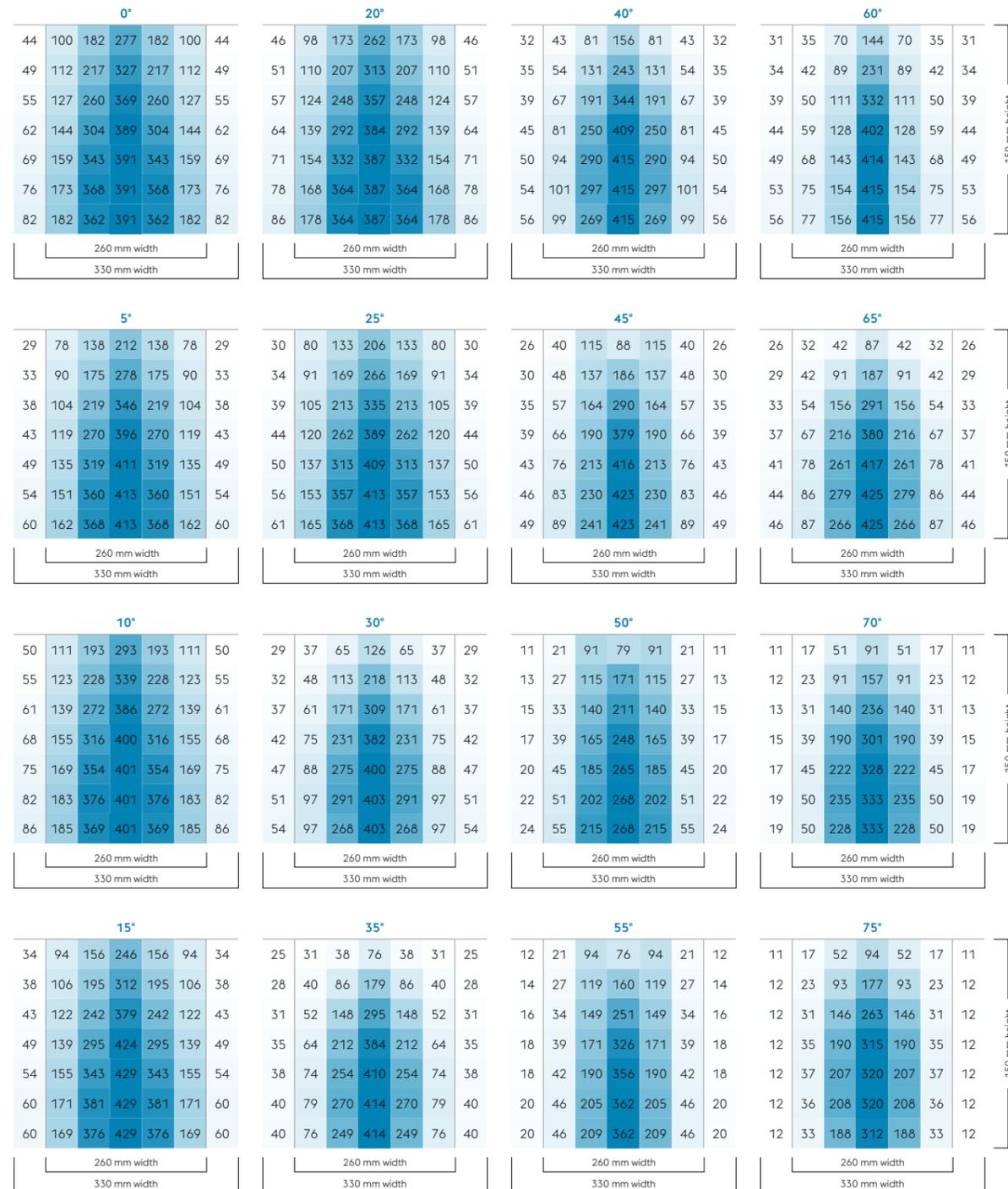
O-BS 260-330 | support via fitting key, Level 1



rounded values

O-BS SIZE 5

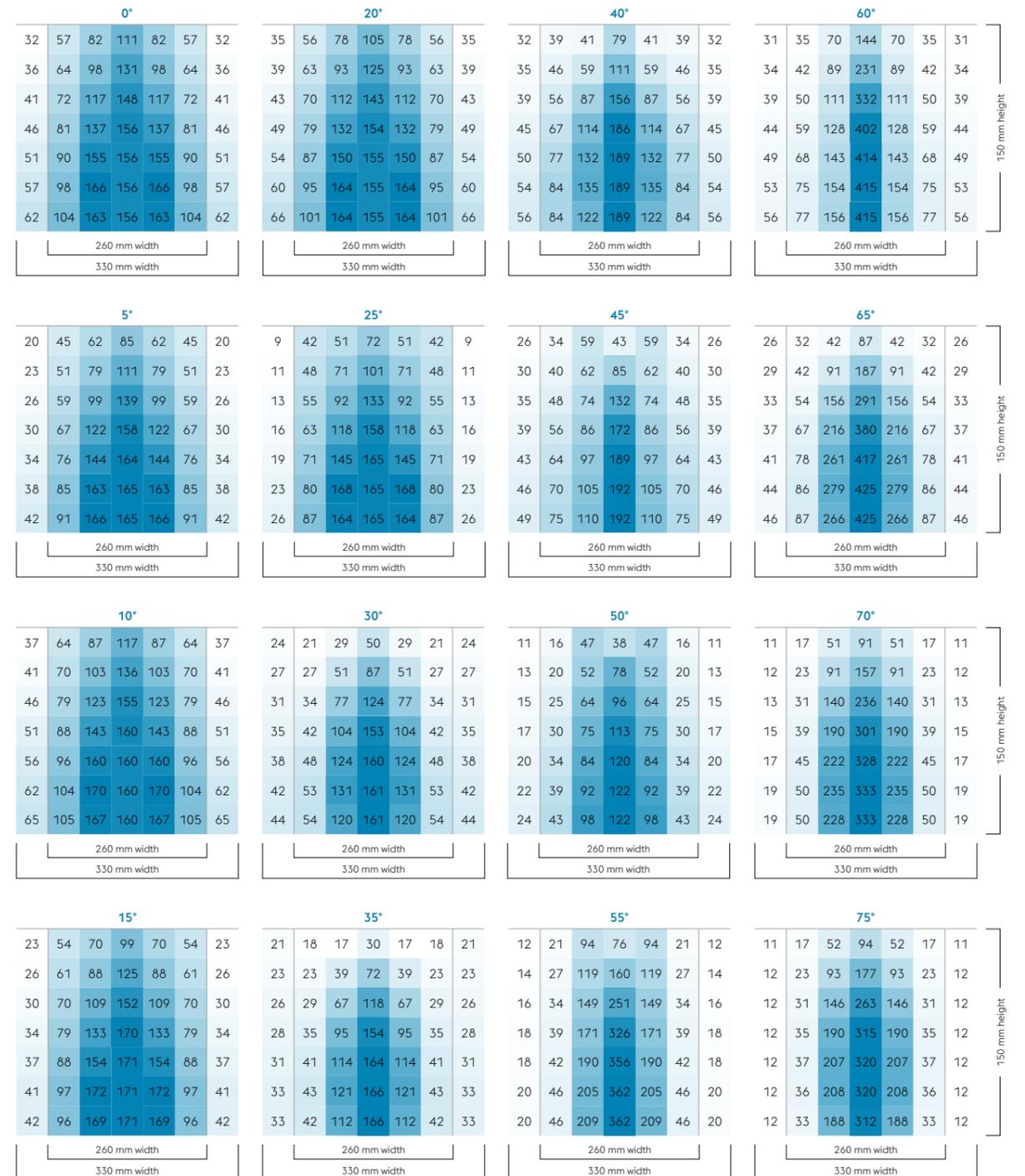
O-BS 260-330 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 5

O-BS 260-330 | support via fitting key, Level 2



rounded values

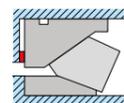
O-BS SIZE 6

FORCE DISTRIBUTION

Cam unit specifications O-BS 400-500

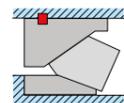
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-BS 400	O-BS 500	size	size		O-BS 400	O-BS 500			
27720	27740	O-BS 400-0°	O-BS 500-0°	0°	309	321	41,78	375	407
27721	27741	O-BS 400-5°	O-BS 500-5°	5°	307	320	42,75	375	407
27722	27742	O-BS 400-10°	O-BS 500-10°	10°	301	313	52,04	375	407
27723	27743	O-BS 400-15°	O-BS 500-15°	15°	300	313	53,68	375	407
27724	27744	O-BS 400-20°	O-BS 500-20°	20°	295	307	57,82	375	406
27725	27745	O-BS 400-25°	O-BS 500-25°	25°	294	307	61,50	375	406
27726	27746	O-BS 400-30°	O-BS 500-30°	30°	284	296	56,61	375	407
27727	27747	O-BS 400-35°	O-BS 500-35°	35°	288	301	60,26	375	407
27728	27748	O-BS 400-40°	O-BS 500-40°	40°	280	293	67,04	375	406
27729	27749	O-BS 400-45°	O-BS 500-45°	45°	287	300	73,32	375	406
27730	27750	O-BS 400-50°	O-BS 500-50°	50°	288	301	64,94	375	406
27731	27751	O-BS 400-55°	O-BS 500-55°	55°	292	304	75,62	375	406
27732	27752	O-BS 400-60°	O-BS 500-60°	60°	280	293	68,94	375	421
27733	27753	O-BS 400-65°	O-BS 500-65°	65°	285	298	60,59	375	426
27734	27754	O-BS 400-70°	O-BS 500-70°	70°	289	302	74,86	375	431
27735	27755	O-BS 400-75°	O-BS 500-75°	75°	289	301	98,93	375	431

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

O-BS SIZE 6

PERMISSIBLE CAM FORCES

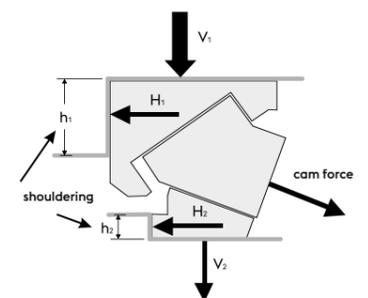
Cam unit force distribution size 6 O-BS, Level 1, 500,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	1021	857	1021	857	0	228	30	78,4
5°	1090	855	1019	760	67	228	41	75,1
10°	948	948	795	783	138	179	45	78,4
15°	884	827	694	598	160	179	45	75,1
20°	1019	1151	665	803	292	135	79	77,0
25°	1087	1149	663	690	322	135	90	73,8
30°	928	756	635	292	169	157	90	66,1
35°	861	683	573	189	132	157	90	61,0
40°	844	778	449	235	197	120	140	65,3
45°	867	777	449	164	164	120	160	60,5
50°	818	719	415	93	110	120	160	54,3
55°	760	660	381	38	54	120	160	49,0
60°	848	889	157	154	267	59	155	62,3
65°	863	880	155	98	210	59	170	57,1
70°	881	881	155	53	146	59	185	52,9
75°	767	758	134	17	65	59	185	48,2

Cam unit force distribution size 6 O-BS, Level 2, 750,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	681	571	681	571	0	228	30	78,4
5°	727	570	679	507	44	228	41	75,1
10°	632	632	530	522	92	179	45	78,4
15°	590	551	463	399	107	179	45	75,1
20°	679	768	443	535	195	135	79	77,0
25°	725	766	442	460	214	135	90	73,8
30°	619	504	423	195	113	157	90	66,1
35°	574	455	382	126	88	157	90	61,0
40°	563	518	299	157	132	120	140	65,3
45°	578	518	299	110	110	120	160	60,5
50°	545	479	277	62	74	120	160	54,3
55°	507	440	254	25	36	120	160	49,0
60°	566	593	105	103	178	59	155	62,3
65°	576	587	103	65	140	59	170	57,1
70°	587	587	104	35	97	59	185	52,9
75°	511	505	89	12	43	59	185	48,2

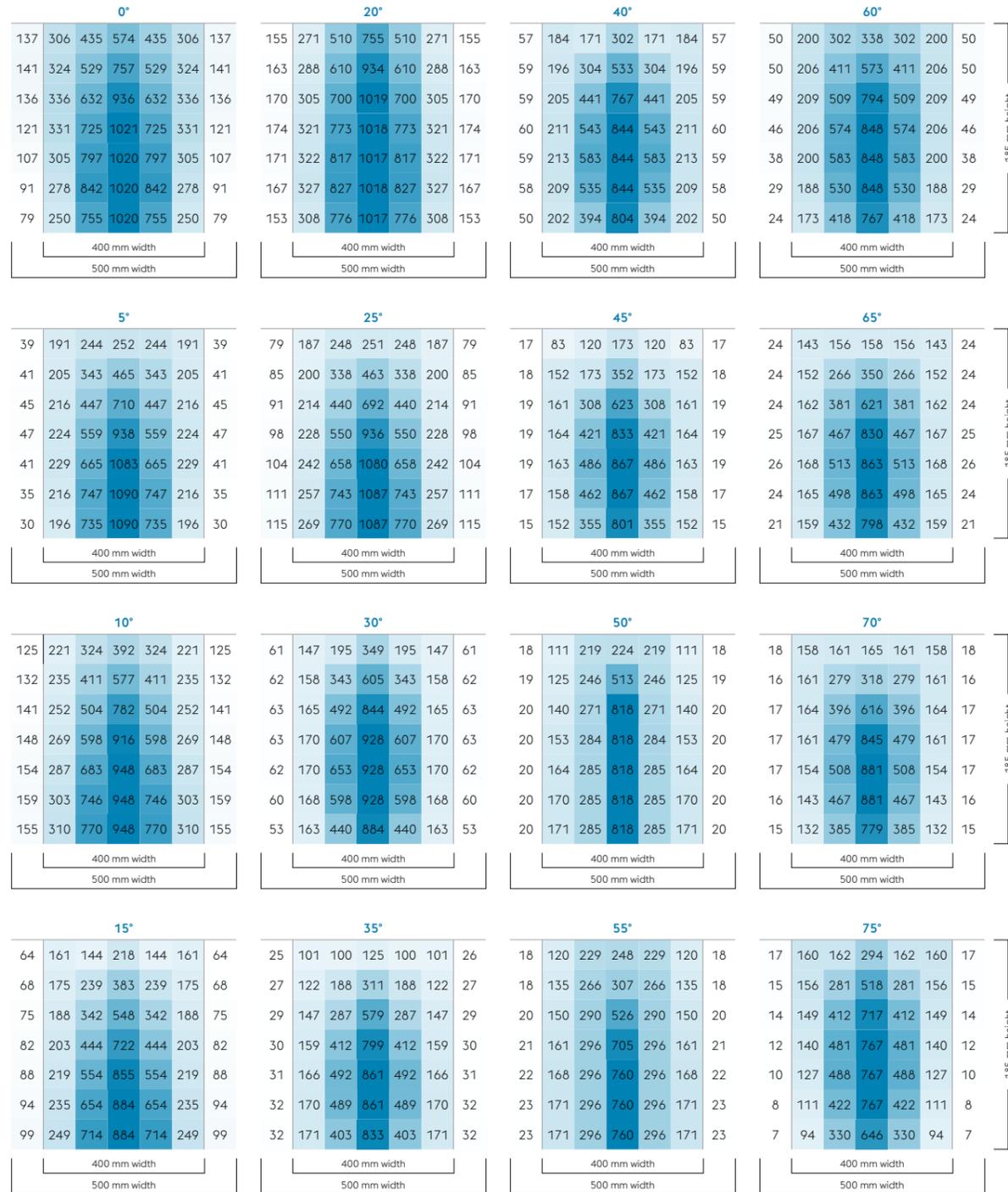
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-BS SIZE 6

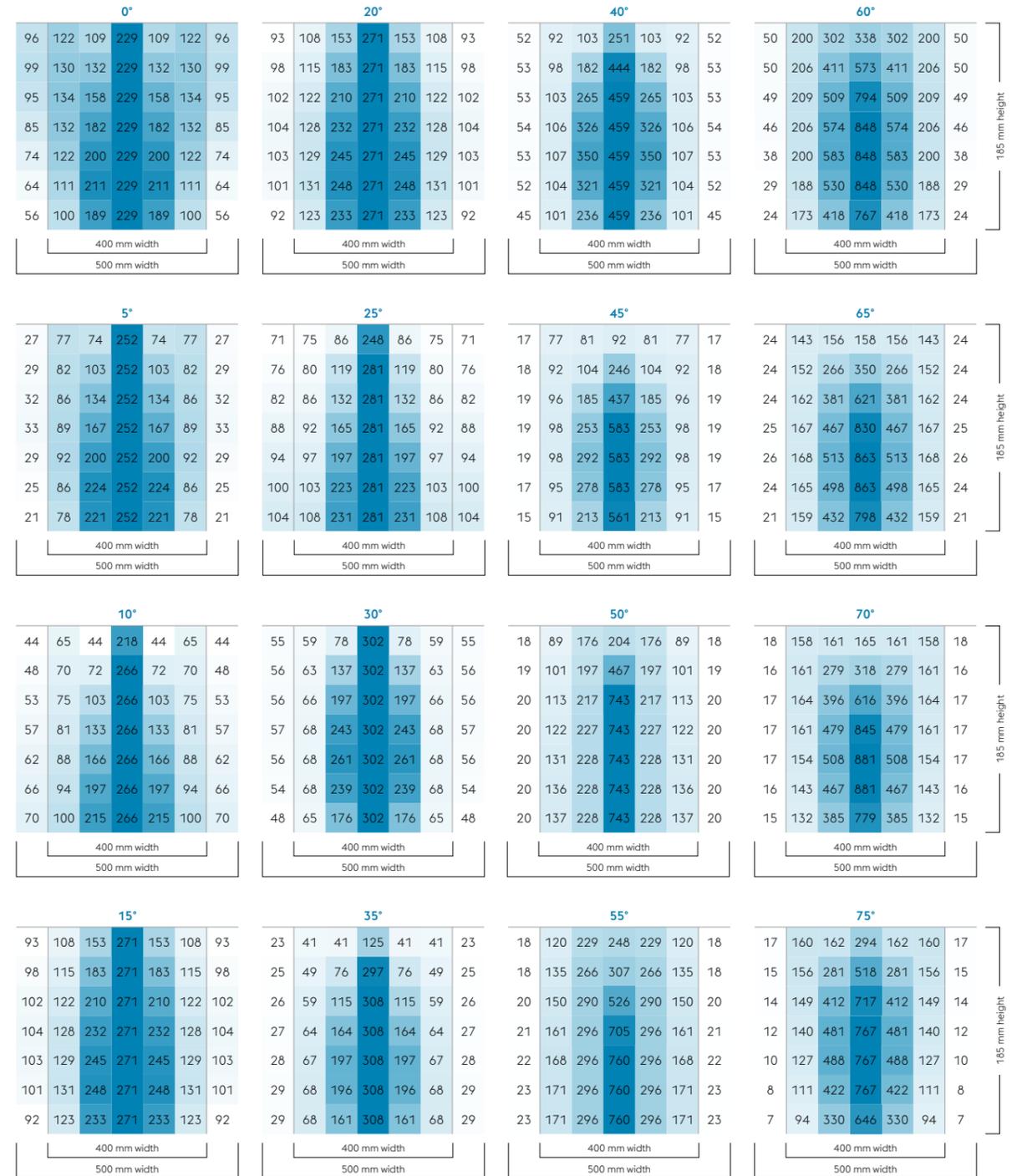
O-BS 400-500 | support via cast shoulder, Level 1



rounded values

O-BS SIZE 6

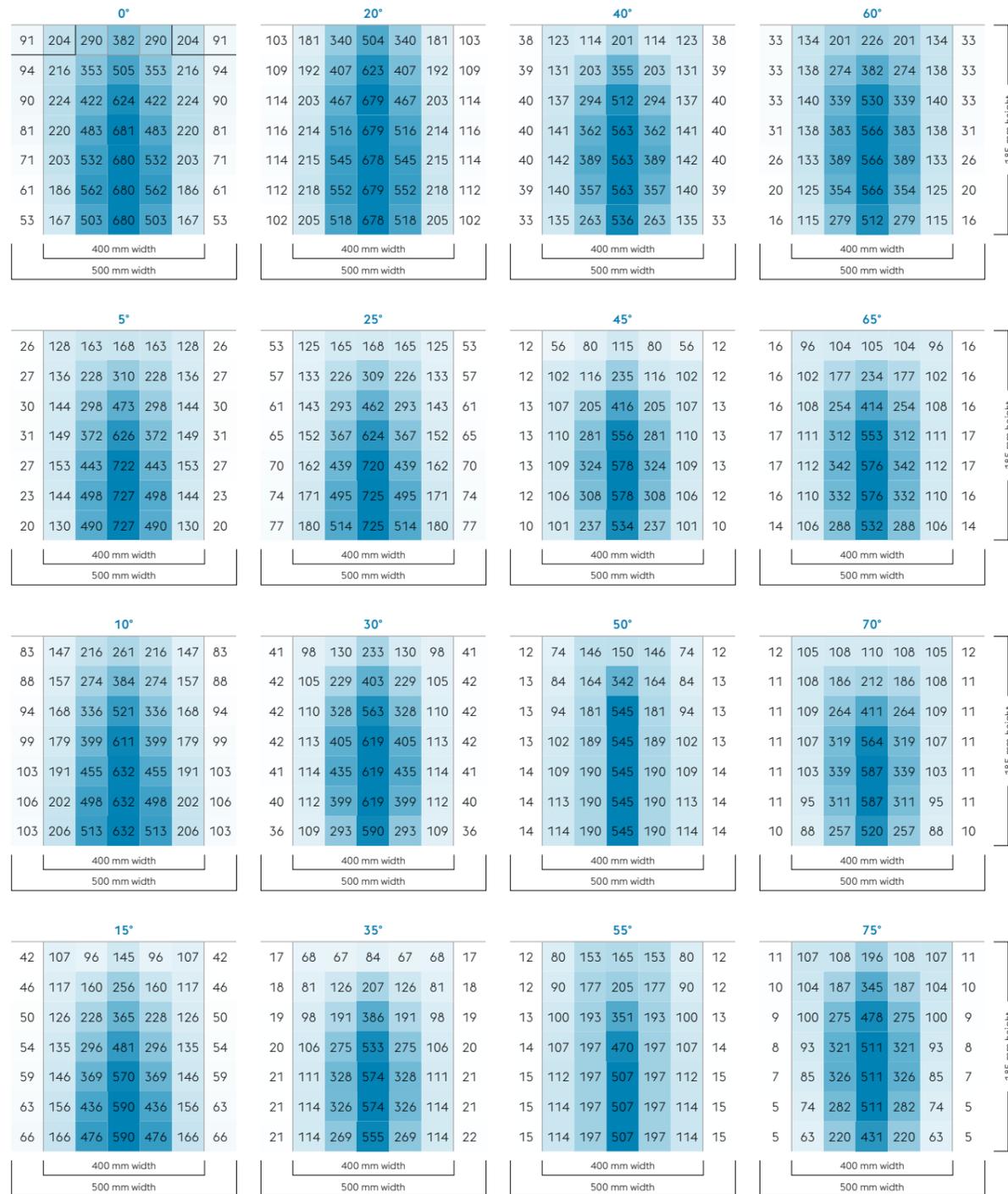
O-BS 400-500 | support via fitting key, Level 1



rounded values

O-BS SIZE 6

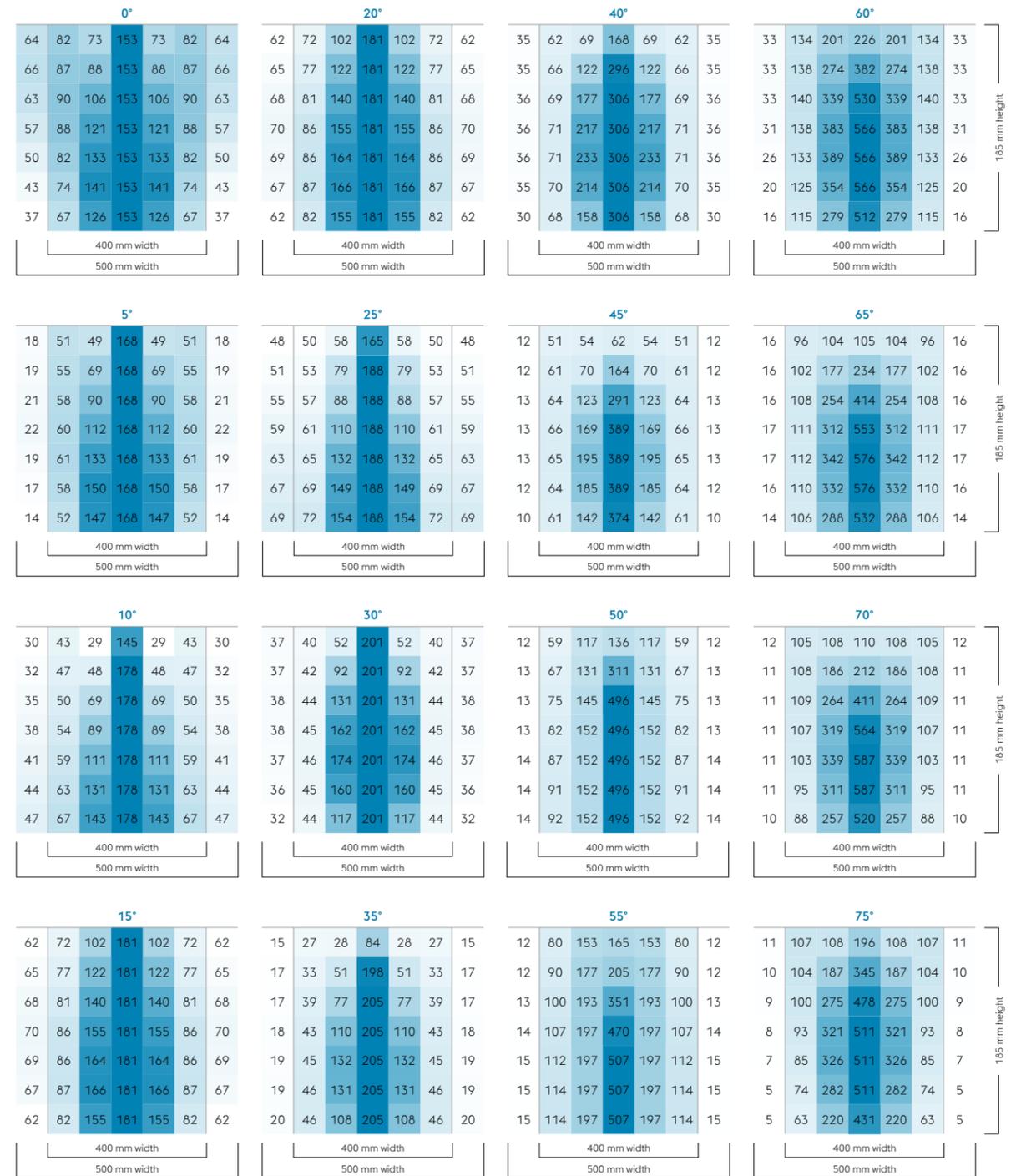
O-BS 400-500 | support via cast shoulder, Level 2



rounded values

O-BS SIZE 6

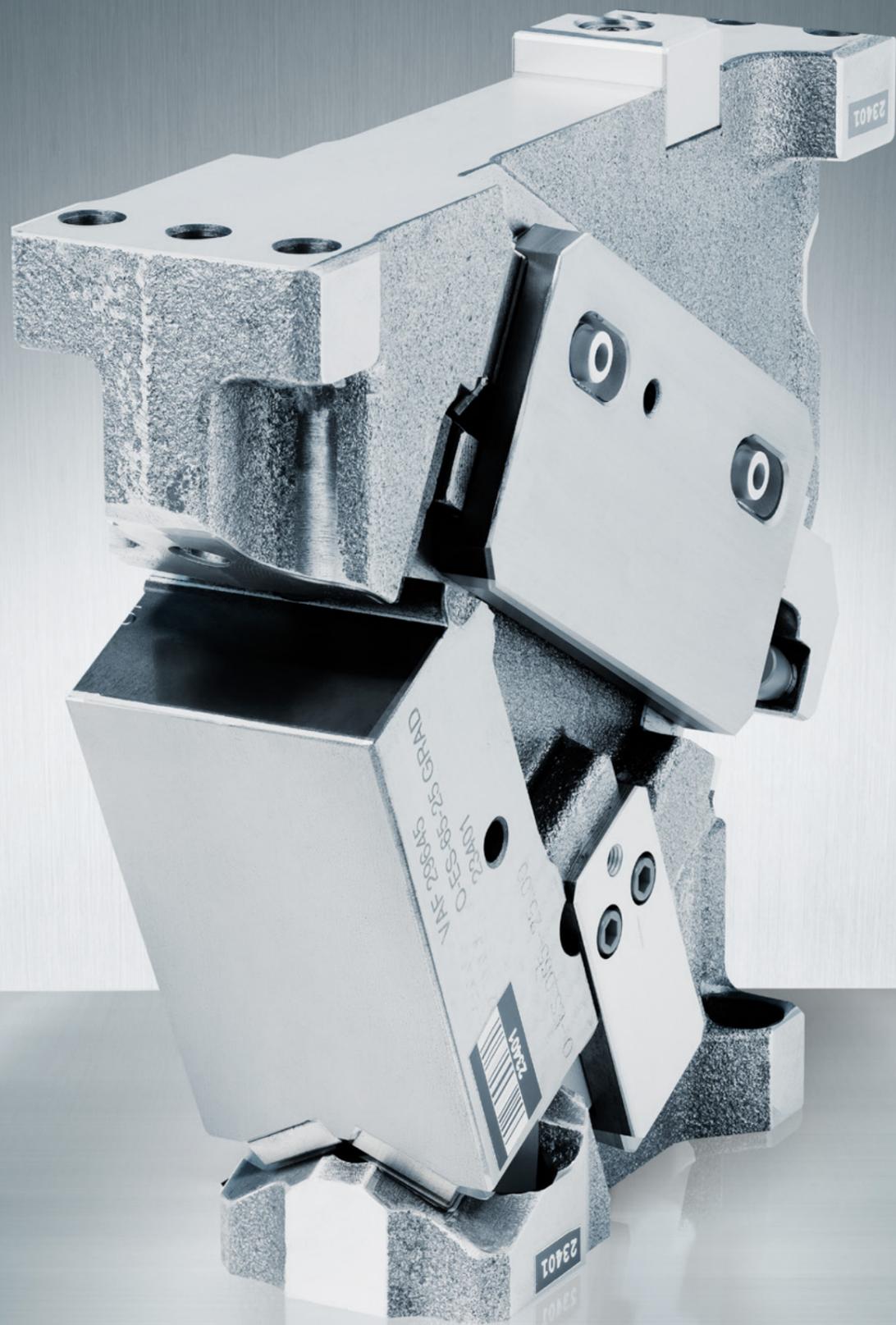
O-BS 400-500 | support via fitting key, Level 2



rounded values



O-ES
OPTIMIZED
ELEMENTARY CAM



TECHNICAL DETAILS

O-ES

Important information at a glance

Here you will find important technical data for the optimized elementary cam unit. Should you have any further questions about O-ES, our experienced team of specialists will be happy to assist you at any time. Please contact us at sales@lacher-camtec.com

	O-ES
Average service life	1.000.000 strokes*
Guaranteed service life	300.000 strokes*
Sliding surfaces	at least Rz 6.3, unhardened
Field of application	shaping, beveling, punching, cutting
Angle range	0° - 75°
Tensile strength of driver, sliding element and cam base materials	400 N/mm ² minimum
Available widths (mm)	50, 65/85, 90/110, 125/160, 175/220, 260/330, 400/500
Lock Out System	yes
Sliding element removable to the rear	yes
Guide clamps	1.7225 + Graphite
Positive return	both sides
Measuring holes	yes
Gas spring	yes
Special cam unit options	no
Compliant with VDI	yes
NAAMs insert point	yes
Pre-machining	yes

*depending on load

Discover all current O-ES models including force diagrams on our website: www.camtec-normalien.com

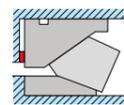
O-ES SIZE 0

FORCE DISTRIBUTION

Cam unit specifications O-ES 50

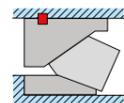
ident. no.	designation	angle [degree]	weight [kg]	stroke [mm]	height cam unit [mm]	length cam unit [mm]
29600	O-ES 50-0°	0°	9	19,28	210	200
29601	O-ES 50-5°	5°	11	21,29	210	200
29602	O-ES 50-10°	10°	11	23,34	210	210
29603	O-ES 50-15°	15°	11	23,79	210	210
29604	O-ES 50-20°	20°	11	26,15	210	220
29605	O-ES 50-25°	25°	11	28,67	210	220
29606	O-ES 50-30°	30°	11	28,37	210	220
29607	O-ES 50-35°	35°	11	31,70	210	220
29608	O-ES 50-40°	40°	11	35,49	210	225
29609	O-ES 50-45°	45°	12	34,75	210	225
29610	O-ES 50-50°	50°	12	40,42	210	225
29611	O-ES 50-55°	55°	12	47,40	210	227
29612	O-ES 50-60°	60°	12	56,38	210	227
29613	O-ES 50-65°	65°	12	68,57	210	240
29614	O-ES 50-70°	70°	11	57,58	210	240
29615	O-ES 50-75°	75°	11	76,10	210	240

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

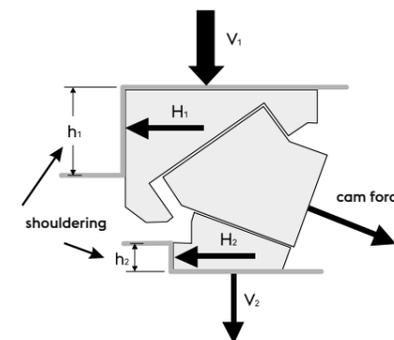
O-ES SIZE 0

PERMISSIBLE CAM FORCES

Cam unit force distribution O-ES 50, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	54	45	54	45	0	60	20	3,0
5°	54	50	50	46	4	60	20	3,0
10°	42	42	35	35	6	60	20	3,0
15°	48	79	29	66	18	60	20	3,3
20°	50	50	35	33	12	60	30	3,3
25°	52	55	32	33	15	50	30	3,3
30°	58	52	36	23	13	50	30	4,5
35°	65	62	36	25	17	50	30	4,5
40°	61	61	28	22	18	50	30	4,5
45°	57	47	33	7	7	50	50	6,5
50°	61	53	31	7	8	40	50	6,5
55°	60	55	26	6	9	40	60	6,5
60°	54	51	19	5	8	40	60	6,5
65°	65	64	17	5	10	40	80	6,5
70°	65	65	11	4	11	40	80	6,5
75°	65	64	11	1	5	40	80	6,5

The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-ES SIZE 0

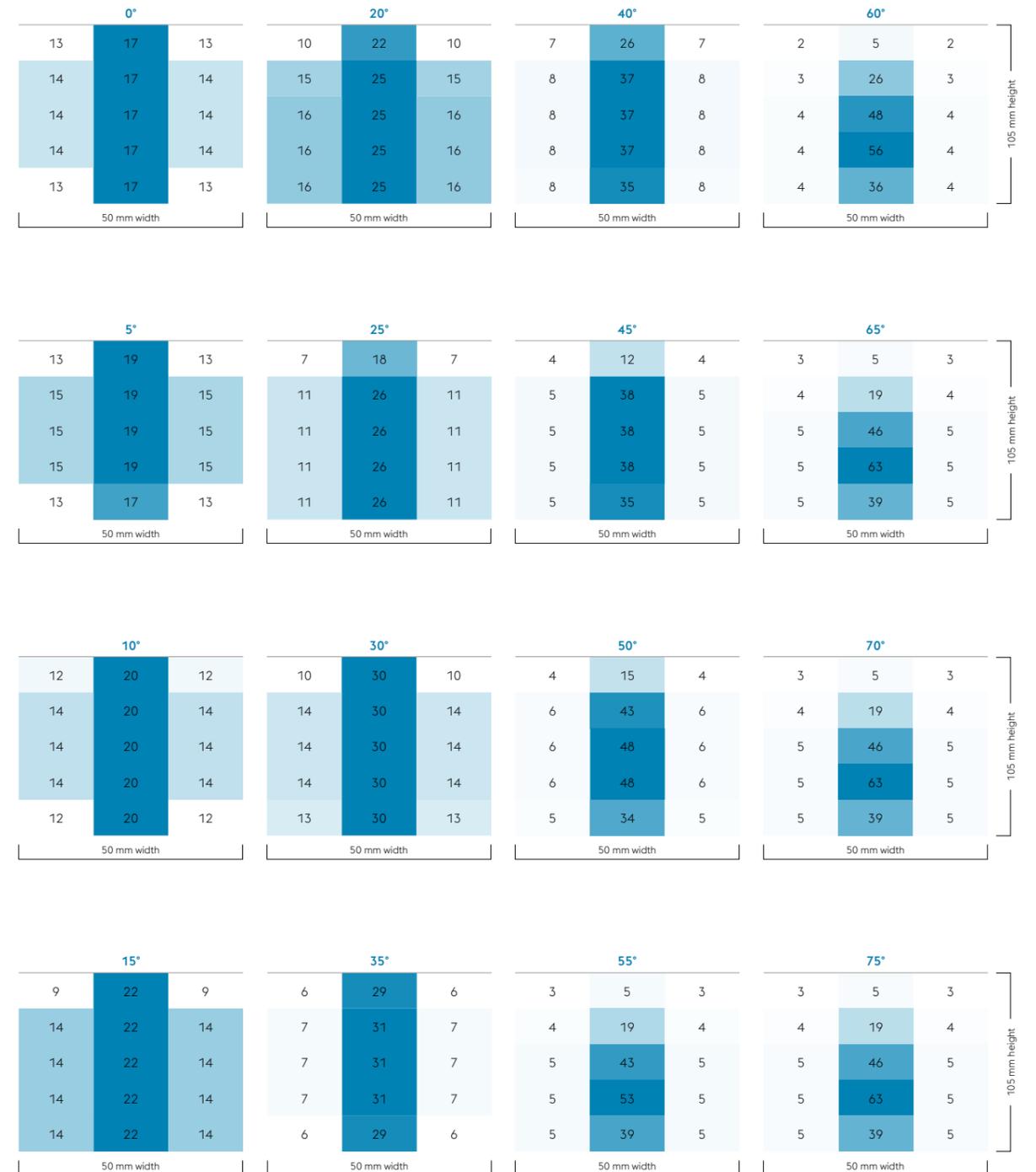
O-ES 50 | support via cast shoulder



rounded values

O-ES SIZE 0

O-ES-50 | support via fitting key



rounded values

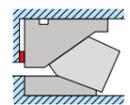
O-ES SIZE 1

FORCE DISTRIBUTION

Cam unit specifications O-ES 65-85

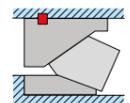
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 65	O-ES 85	size	size		O-ES 65	O-ES 85			
29640	29660	O-ES 65-0°	O-ES 85-0°	0°	16	17	28,93	225	227
29641	29661	O-ES 65-5°	O-ES 85-5°	5°	16	17	29,04	225	227
29642	29662	O-ES 65-10°	O-ES 85-10°	10°	16	17	35,00	225	229
29643	29663	O-ES 65-15°	O-ES 85-15°	15°	16	17	35,69	225	232
29644	29664	O-ES 65-20°	O-ES 85-20°	20°	16	17	36,86	225	247
29645	29665	O-ES 65-25°	O-ES 85-25°	25°	16	17	38,22	225	247
29646	29666	O-ES 65-30°	O-ES 85-30°	30°	16	16	35,38	225	236
29647	29667	O-ES 65-35°	O-ES 85-35°	35°	16	17	37,41	225	239
29648	29668	O-ES 65-40°	O-ES 85-40°	40°	16	17	39,57	225	247
29649	29669	O-ES 65-45°	O-ES 85-45°	45°	16	17	42,87	225	247
29650	29670	O-ES 65-50°	O-ES 85-50°	50°	16	17	47,16	225	247
29651	29671	O-ES 65-55°	O-ES 85-55°	55°	16	17	52,85	225	247
29652	29672	O-ES 65-60°	O-ES 85-60°	60°	16	17	49,24	225	247
29653	29673	O-ES 65-65°	O-ES 85-65°	65°	16	17	46,61	225	252
29654	29674	O-ES 65-70°	O-ES 85-70°	70°	16	17	57,59	225	252
29655	29675	O-ES 65-75°	O-ES 85-75°	75°	16	17	76,10	225	252

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

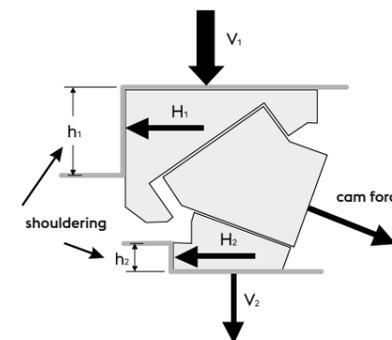
O-ES SIZE 1

PERMISSIBLE CAM FORCES

Cam unit force distribution size 1 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	74	62	74	62	0	155	20	6,8
5°	84	66	78	58	5	155	20	7,6
10°	74	74	62	61	11	125	20	6,8
15°	81	76	63	55	15	125	20	7,6
20°	75	85	49	59	21	100	30	6,5
25°	81	86	50	52	24	100	30	7,3
30°	80	65	55	25	15	105	30	8,6
35°	82	65	55	18	13	105	30	8,4
40°	83	77	44	23	19	100	30	8,7
45°	85	76	44	16	16	100	30	8,5
50°	87	76	44	10	12	100	40	8,3
55°	88	77	44	4	6	100	40	8,0
60°	85	89	16	15	27	40	60	8,9
65°	87	89	16	10	21	40	60	8,6
70°	89	89	16	5	15	40	60	8,5
75°	90	89	16	2	8	40	60	8,2

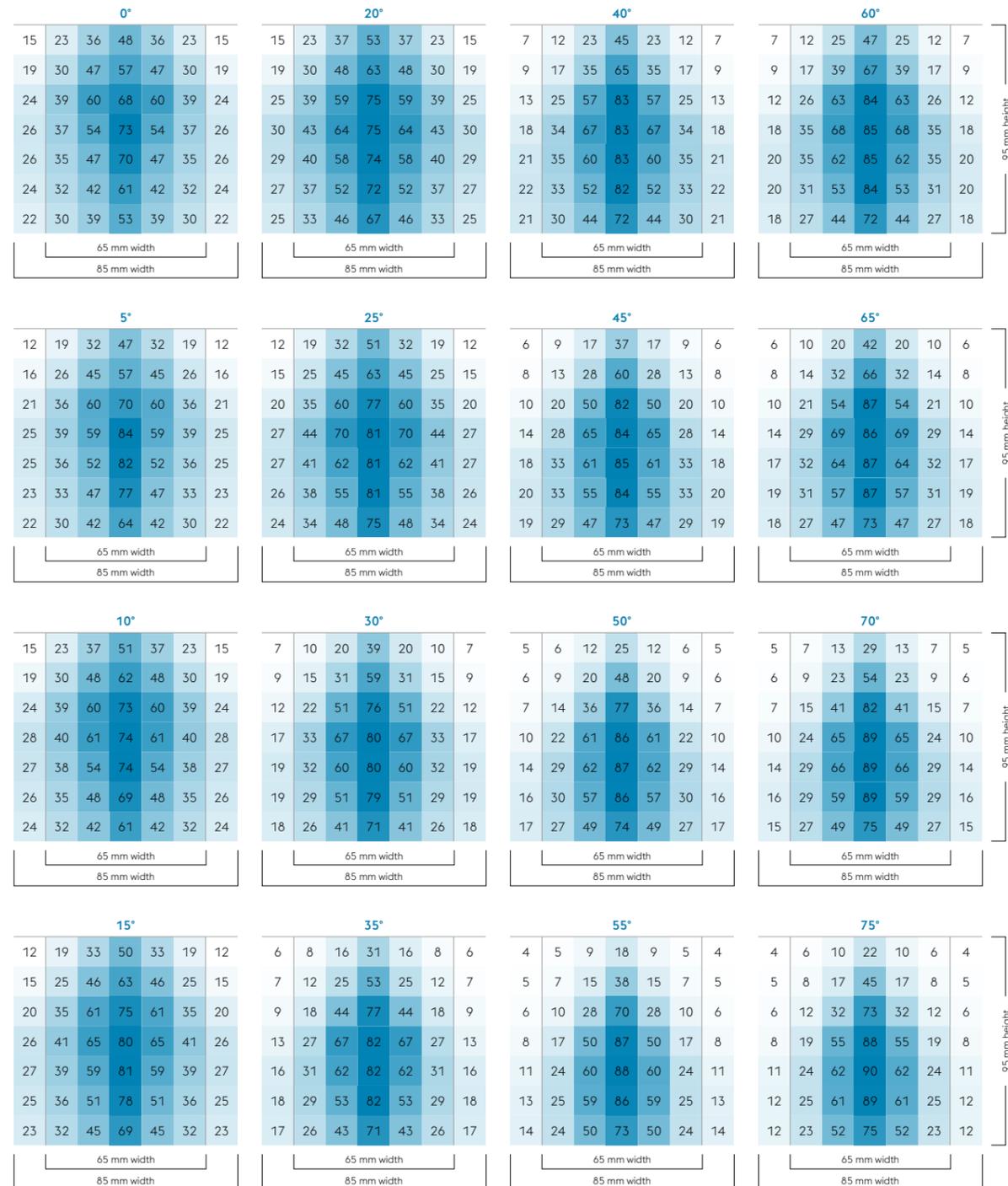
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
H₂ (horizontal)
Driver: V₂ (vertical)

O-ES SIZE 1

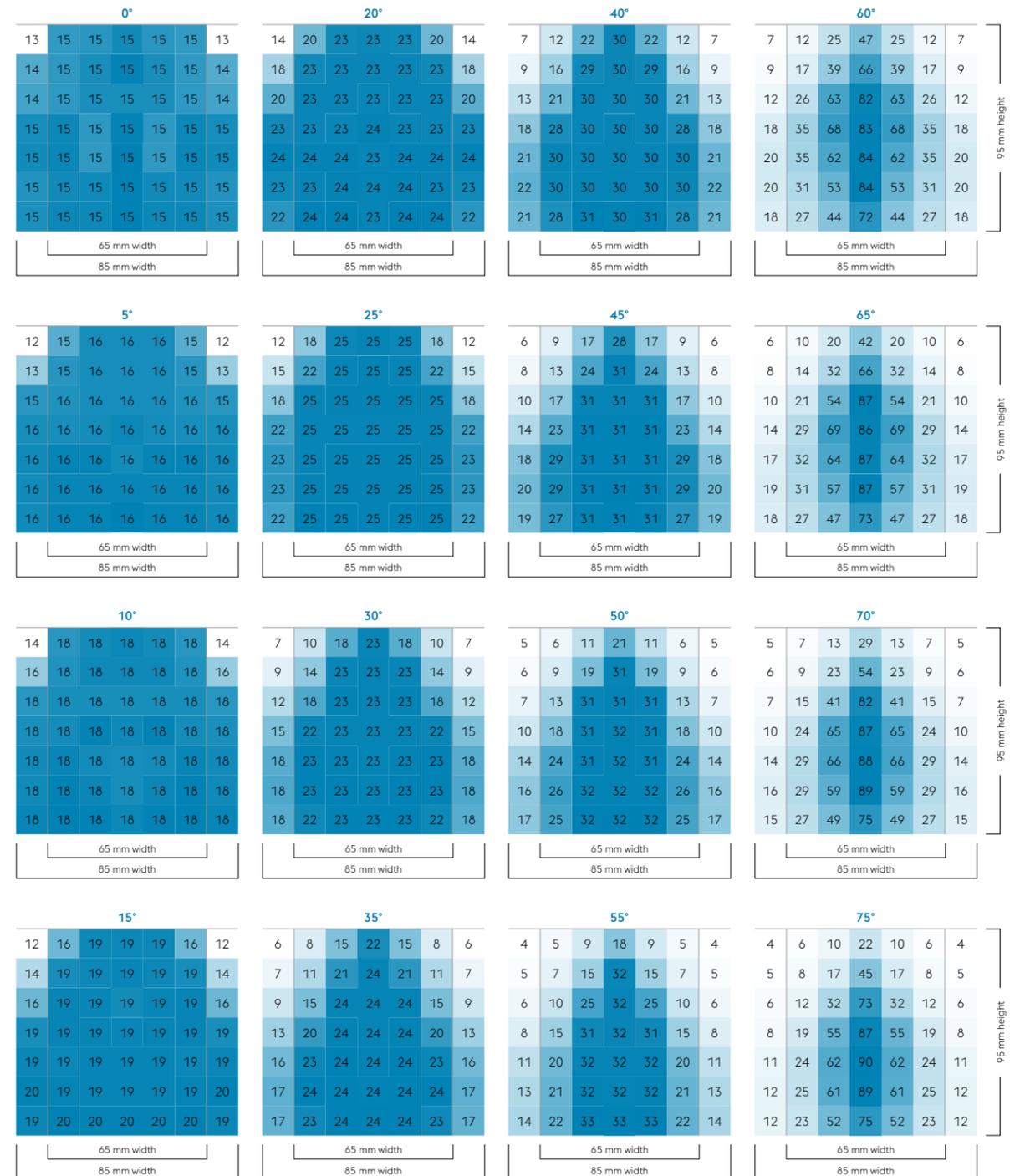
O-ES 65-85 | support via cast shoulder



rounded values

O-ES SIZE 1

O-ES 65-85 | support via fitting key



rounded values

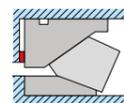
O-ES SIZE 2

FORCE DISTRIBUTION

Cam unit specifications O-ES 90-110

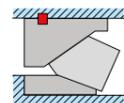
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 90	O-ES 110	size	size		O-ES 90	O-ES 110			
29680	29700	O-ES 90-0°	O-ES 110-0°	0°	35	36	28,93	275	277
29681	29701	O-ES 90-5°	O-ES 110-5°	5°	35	36	29,04	275	277
29682	29702	O-ES 90-10°	O-ES 110-10°	10°	35	36	35,00	275	302
29683	29703	O-ES 90-15°	O-ES 110-15°	15°	35	36	35,69	275	302
29684	29704	O-ES 90-20°	O-ES 110-20°	20°	34	35	36,86	275	302
29685	29705	O-ES 90-25°	O-ES 110-25°	25°	34	35	38,22	275	302
29686	29706	O-ES 90-30°	O-ES 110-30°	30°	34	36	35,38	275	302
29687	29707	O-ES 90-35°	O-ES 110-35°	35°	35	36	37,41	275	302
29688	29708	O-ES 90-40°	O-ES 110-40°	40°	34	35	39,57	275	302
29689	29709	O-ES 90-45°	O-ES 110-45°	45°	34	35	42,89	275	302
29690	29710	O-ES 90-50°	O-ES 110-50°	50°	34	35	47,16	275	302
29691	29711	O-ES 90-55°	O-ES 110-55°	55°	34	36	52,85	275	303
29692	29712	O-ES 90-60°	O-ES 110-60°	60°	33	34	49,24	275	300
29693	29713	O-ES 90-65°	O-ES 110-65°	65°	33	34	46,61	275	300
29694	29714	O-ES 90-70°	O-ES 110-70°	70°	34	35	57,59	275	300
29695	29715	O-ES 90-75°	O-ES 110-75°	75°	34	35	76,10	275	300

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

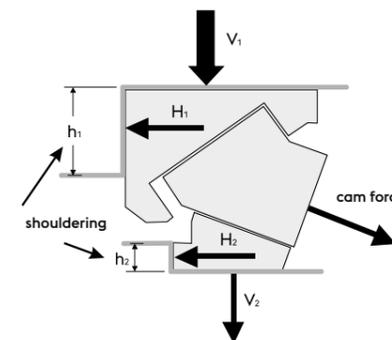
O-ES SIZE 2

PERMISSIBLE CAM FORCES

Cam unit force distribution size 2 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	99	83	99	83	0	190	30	6,8
5°	119	93	111	83	7	190	30	7,6
10°	123	123	103	102	18	148	30	6,7
15°	129	121	101	87	24	148	30	7,5
20°	130	147	85	102	37	109	40	6,4
25°	139	147	85	88	41	109	40	7,2
30°	144	118	99	46	26	143	40	12,2
35°	149	118	99	33	23	143	40	16,1
40°	148	136	79	41	35	102	40	11,7
45°	149	134	77	28	28	102	40	15,4
50°	154	136	78	18	21	102	60	16,2
55°	156	136	78	8	11	102	60	16,5
60°	146	154	27	27	46	52	90	11,1
65°	150	153	27	17	36	52	90	14
70°	154	154	27	9	26	52	90	16,2
75°	155	154	27	4	13	52	90	16,2

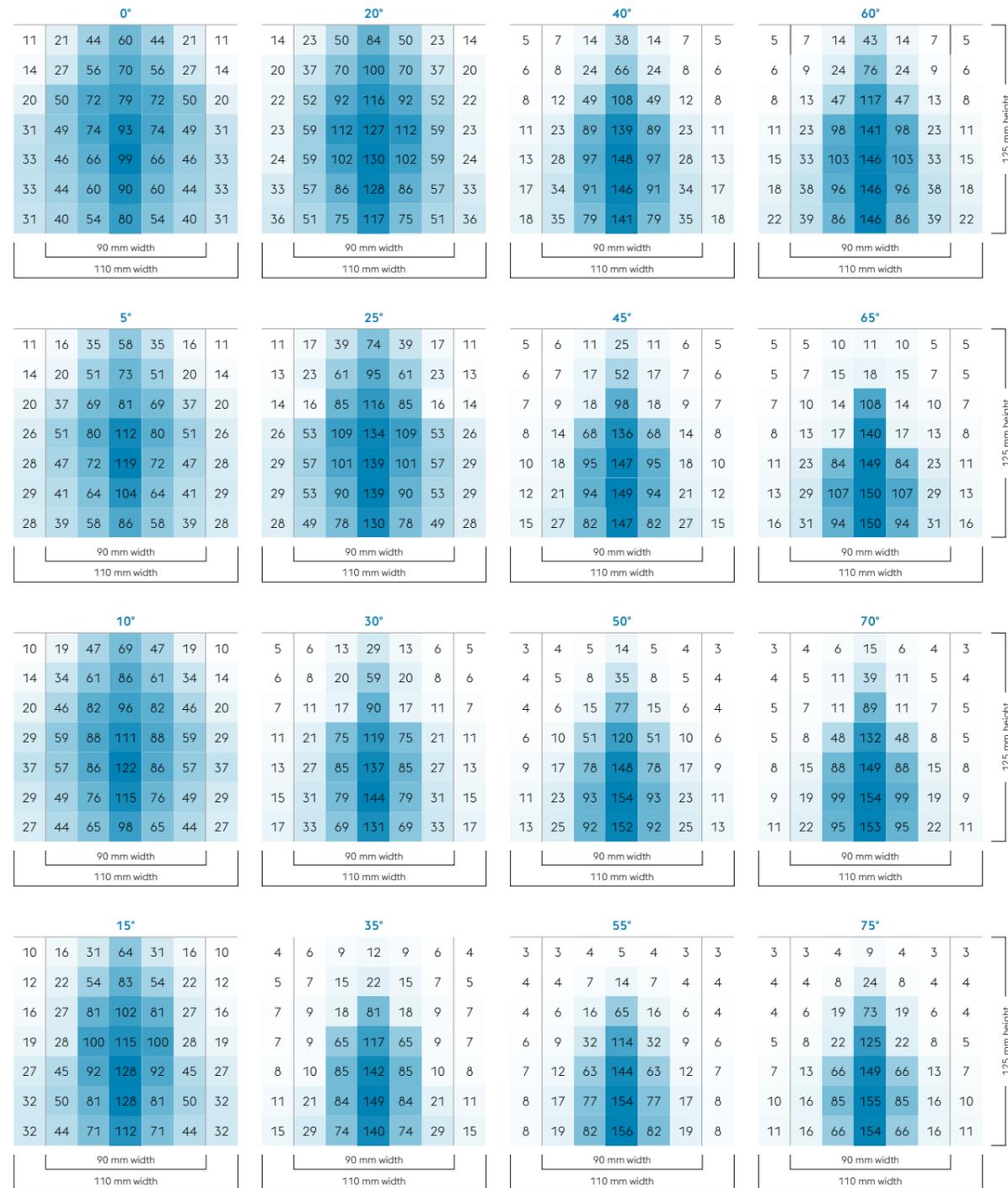
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
H₂ (horizontal)
Driver: V₂ (vertical)

O-ES SIZE 2

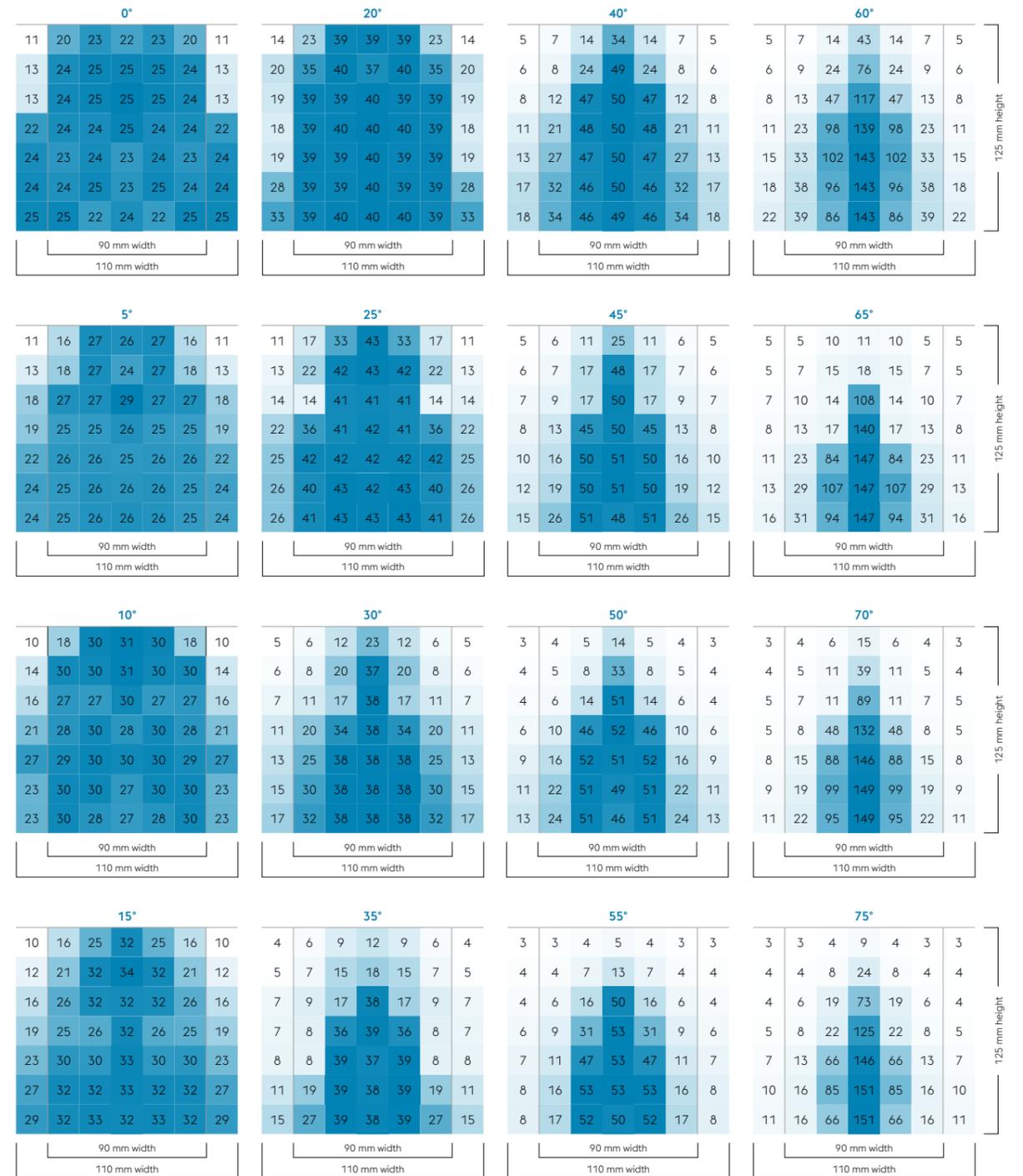
O-ES 90-110 | support via cast shoulder



rounded values

O-ES SIZE 2

O-ES 90-110 | support via fitting key



rounded values

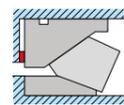
O-ES SIZE 3

FORCE DISTRIBUTION

Cam unit specifications O-ES 125-160

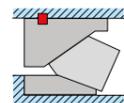
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 125	O-ES 160	size	size		O-ES 125	O-ES 160			
29720	29740	O-ES 125-0°	O-ES 160-0°	0°	58	60	35,35	300	300
29721	29741	O-ES 125-5°	O-ES 160-5°	5°	57	59	35,49	300	298
29722	29742	O-ES 125-10°	O-ES 160-10°	10°	57	59	42,78	300	288
29723	29743	O-ES 125-15°	O-ES 160-15°	15°	57	59	43,62	300	290
29724	29744	O-ES 125-20°	O-ES 160-20°	20°	57	59	46,08	300	301
29725	29745	O-ES 125-25°	O-ES 160-25°	25°	57	59	47,78	300	298
29726	29746	O-ES 125-30°	O-ES 160-30°	30°	54	56	44,23	300	323
29727	29747	O-ES 125-35°	O-ES 160-35°	35°	54	57	46,76	300	322
29728	29748	O-ES 125-40°	O-ES 160-40°	40°	54	56	50,87	300	323
29729	29749	O-ES 125-45°	O-ES 160-45°	45°	54	57	55,11	300	323
29730	29750	O-ES 125-50°	O-ES 160-50°	50°	55	57	48,50	300	323
29731	29751	O-ES 125-55°	O-ES 160-55°	55°	55	58	54,36	300	323
29732	29752	O-ES 125-60°	O-ES 160-60°	60°	55	57	49,24	300	333
29733	29753	O-ES 125-65°	O-ES 160-65°	65°	55	57	46,61	300	328
29734	29754	O-ES 125-70°	O-ES 160-70°	70°	55	57	57,59	300	323
29735	29755	O-ES 125-75°	O-ES 160-75°	75°	55	57	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

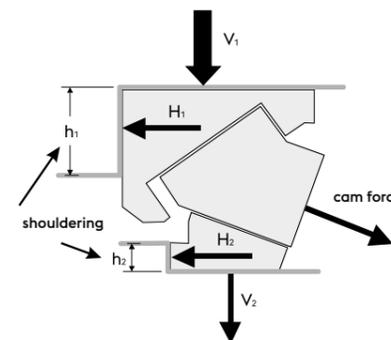
O-ES SIZE 3

PERMISSIBLE CAM FORCES

Cam unit force distribution size 3 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	121	101	121	101	0	190	30	9,2
5°	122	96	114	85	8	190	30	10,3
10°	150	150	126	124	22	150	30	9,2
15°	158	148	124	107	29	150	30	10,3
20°	157	177	102	124	45	115	50	8,8
25°	169	178	103	107	50	115	50	9,9
30°	162	132	111	51	30	130	50	17,6
35°	168	133	112	37	26	130	50	18,0
40°	169	156	90	47	40	105	50	16,8
45°	176	158	91	33	33	105	50	18,0
50°	172	151	87	20	23	105	80	18,0
55°	178	155	89	9	13	105	80	18,0
60°	171	180	32	31	54	53	100	14,8
65°	176	180	32	20	43	53	100	18,6
70°	184	184	32	11	30	53	100	19,0
75°	178	176	31	4	15	53	100	19,0

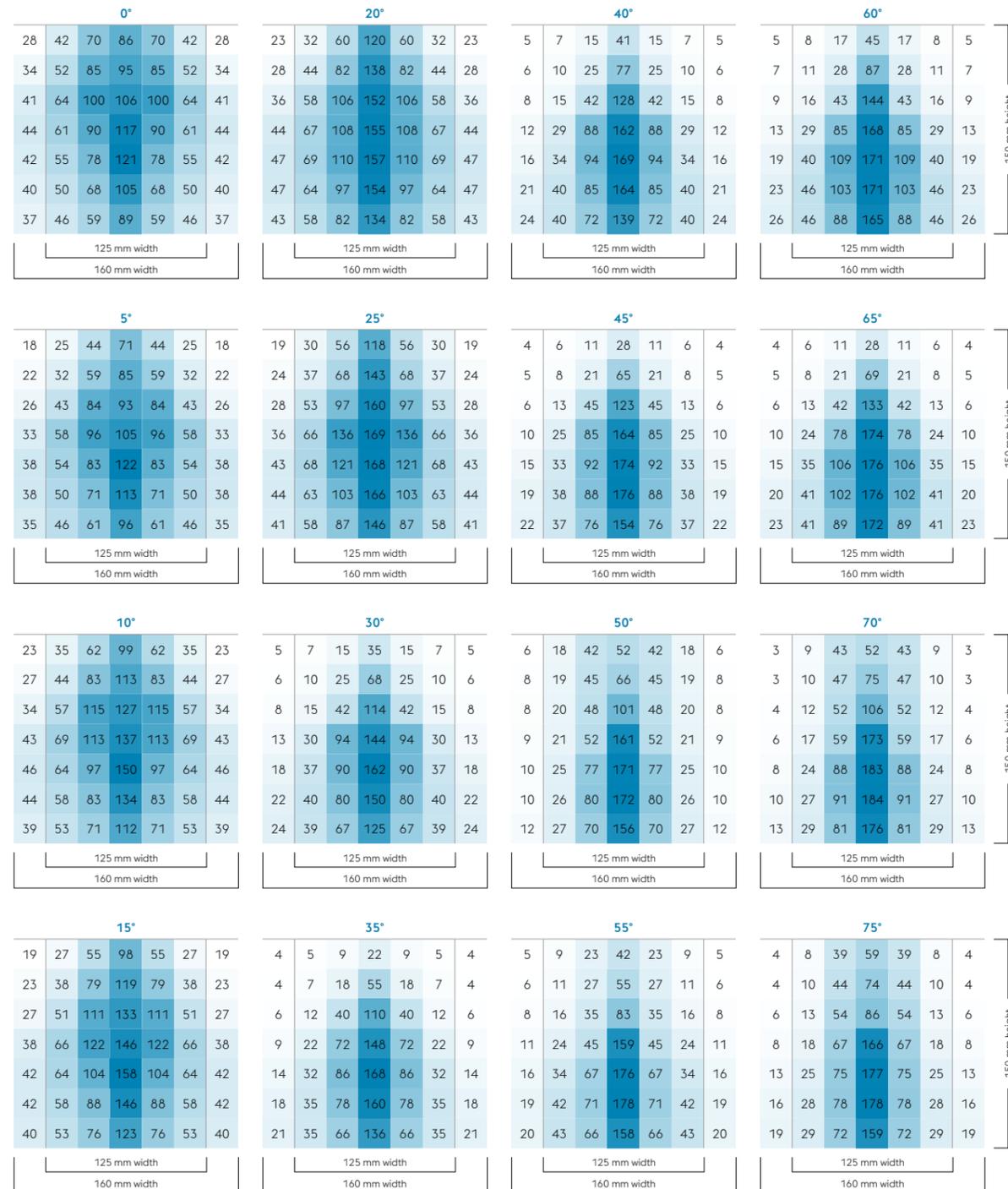
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-ES SIZE 3

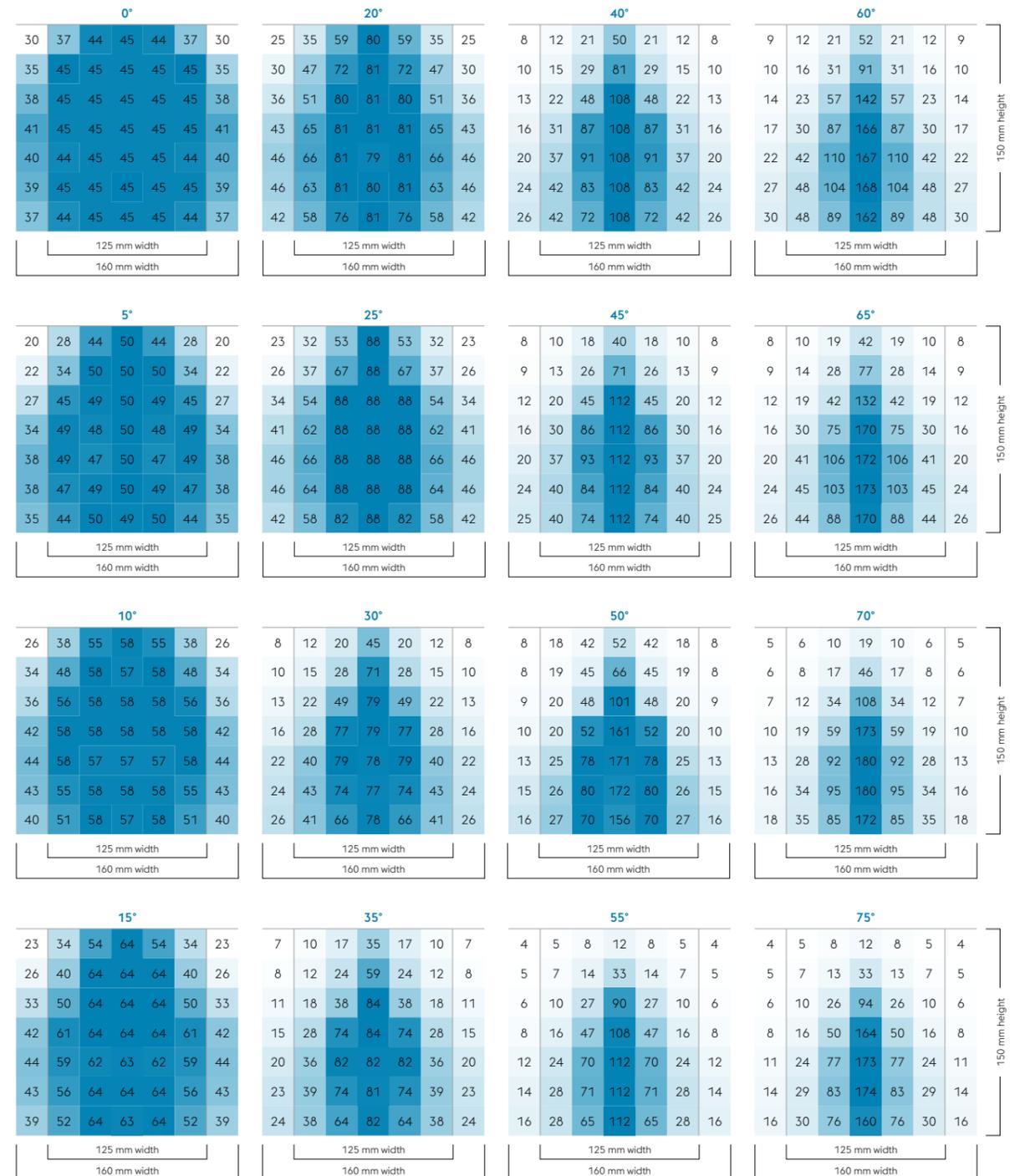
O-ES 125-160 | support via cast shoulder



rounded values

O-ES SIZE 3

O-ES 125-160 | support via fitting key



rounded values

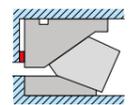
O-ES SIZE 4

FORCE DISTRIBUTION

Cam unit specifications O-ES 175-220

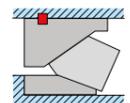
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 175	O-ES 220	Baureihe	Baureihe		O-ES 175	O-ES 220			
29760	29780	O-ES 175-0°	O-ES 220-0°	0°	86	88	41,78	300	300
29761	29781	O-ES 175-5°	O-ES 220-5°	5°	85	88	41,94	300	298
29762	29782	O-ES 175-10°	O-ES 220-10°	10°	84	87	50,56	300	304
29763	29783	O-ES 175-15°	O-ES 220-15°	15°	84	87	51,55	300	310
29764	29784	O-ES 175-20°	O-ES 220-20°	20°	82	85	55,30	300	323
29765	29785	O-ES 175-25°	O-ES 220-25°	25°	82	85	57,33	300	323
29766	29786	O-ES 175-30°	O-ES 220-30°	30°	79	82	53,07	300	306
29767	29787	O-ES 175-35°	O-ES 220-35°	35°	80	83	56,11	300	311
29768	29788	O-ES 175-40°	O-ES 220-40°	40°	79	82	62,18	300	323
29769	29789	O-ES 175-45°	O-ES 220-45°	45°	79	82	67,36	300	323
29770	29790	O-ES 175-50°	O-ES 220-50°	50°	80	83	60,63	300	323
29771	29791	O-ES 175-55°	O-ES 220-55°	55°	80	83	67,94	300	328
29772	29792	O-ES 175-60°	O-ES 220-60°	60°	80	83	68,94	300	323
29773	29793	O-ES 175-65°	O-ES 220-65°	65°	79	82	60,59	300	323
29774	29794	O-ES 175-70°	O-ES 220-70°	70°	80	83	74,86	300	323
29775	29795	O-ES 175-75°	O-ES 220-75°	75°	79	82	76,10	300	323

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

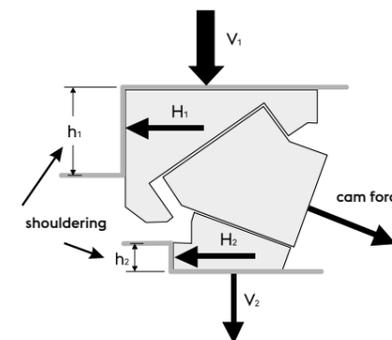
O-ES SIZE 4

PERMISSIBLE CAM FORCES

Cam unit force distribution size 4 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam forc [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	162	136	162	136	0	190	30	15,6
5°	182	143	171	127	11	190	30	17,5
10°	226	226	190	187	33	148	30	15,5
15°	242	227	190	164	44	148	30	17,3
20°	230	260	150	182	66	115	30	14,9
25°	242	256	148	154	72	115	30	16,7
30°	225	183	154	71	41	130	30	23,0
35°	218	173	145	48	33	130	30	23,0
40°	242	223	129	67	57	100	30	25,0
45°	246	221	127	47	47	100	30	26,0
50°	260	229	132	29	35	100	90	28,0
55°	257	224	129	13	18	100	90	28,0
60°	255	267	47	46	80	50	110	25,9
65°	255	260	46	29	62	50	110	26,0
70°	265	265	47	16	44	50	130	27,0
75°	265	262	46	6	22	50	130	27,0

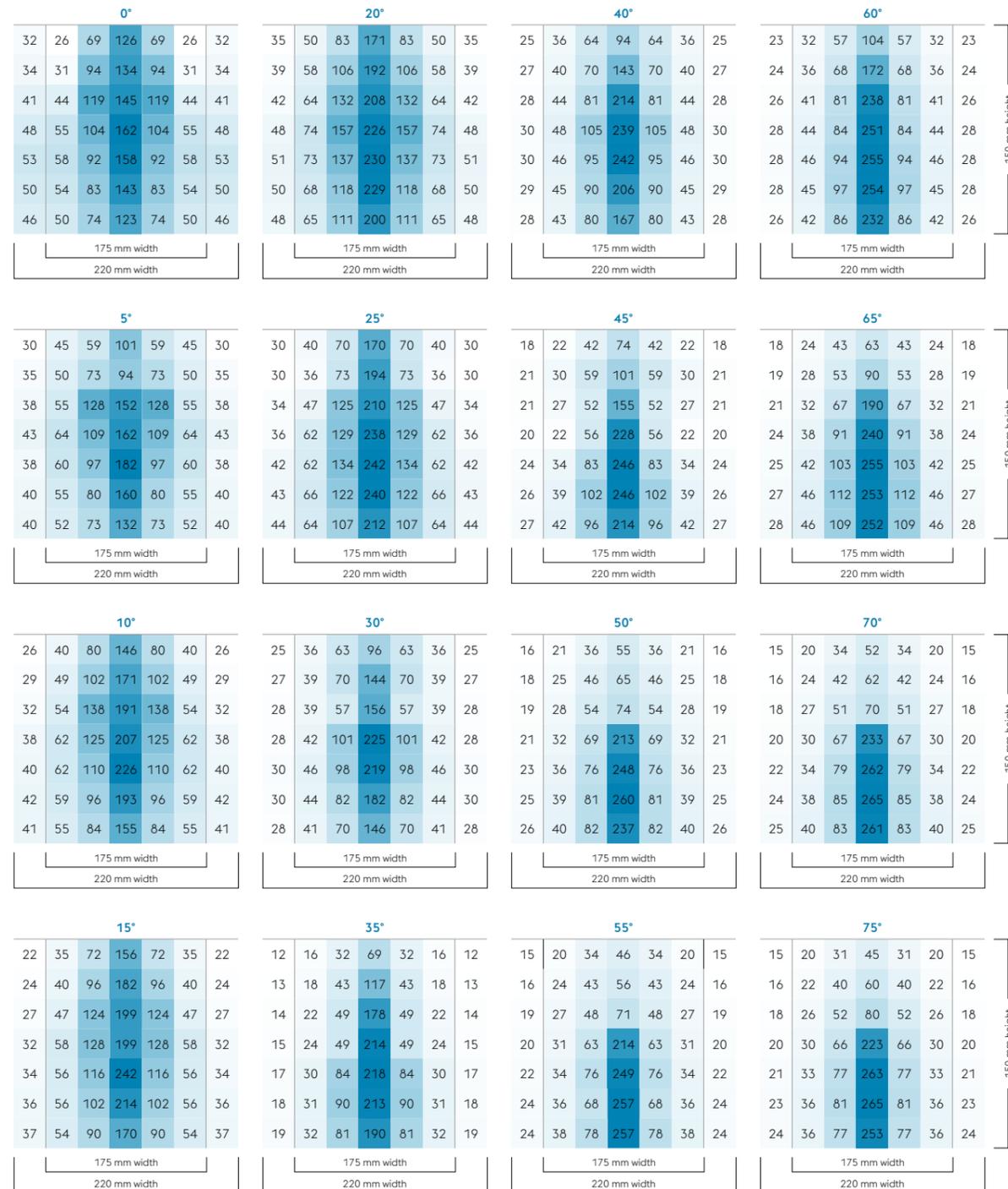
The cam unit force is distributed as shown in the sketch:



Shouldering: h₁ (top)
h₂ (bottom)
Press: V₁ (vertical)
Cam base: H₁ (horizontal)
Driver: H₂ (horizontal)
V₂ (vertical)

O-ES SIZE 4

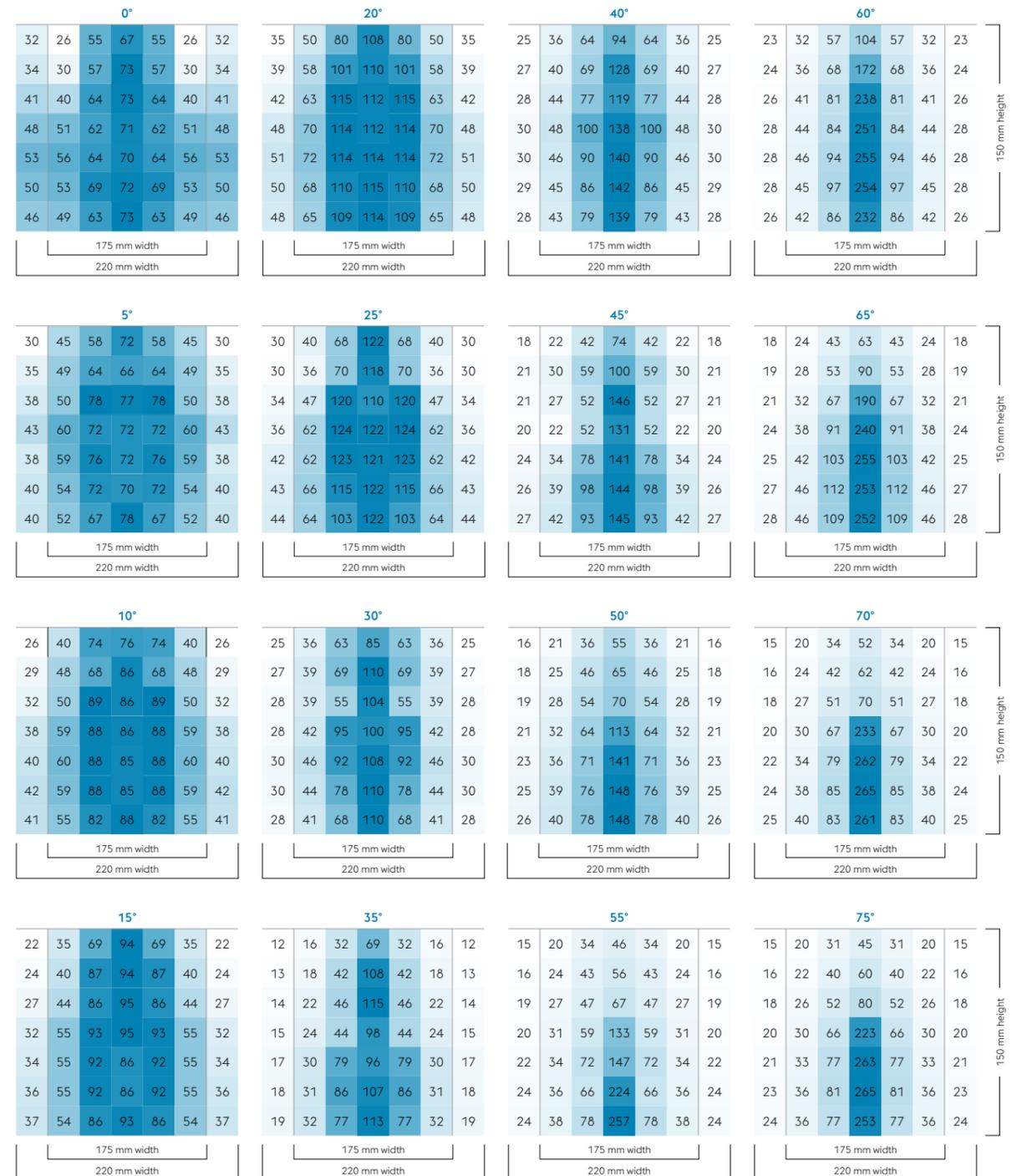
O-ES 175-220 | support via cast shoulder



rounded values

O-ES SIZE 4

O-ES 175-220 | support via fitting key



rounded values

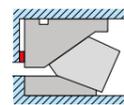
O-ES SIZE 5

FORCE DISTRIBUTION

Cam unit specifications O-ES 260-330

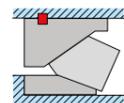
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 260	O-ES 330	size	size		O-ES 260	O-ES 330			
29800	29820	O-ES 260-0°	O-ES 330-0°	0°	152	157	41,78	300	310
29801	29821	O-ES 260-5°	O-ES 330-5°	5°	151	157	42,75	300	305
29802	29822	O-ES 260-10°	O-ES 330-10°	10°	149	154	52,04	300	305
29803	29823	O-ES 260-15°	O-ES 330-15°	15°	149	154	53,68	300	305
29804	29824	O-ES 260-20°	O-ES 330-20°	20°	148	153	57,82	300	311
29805	29825	O-ES 260-25°	O-ES 330-25°	25°	148	153	61,50	300	306
29806	29826	O-ES 260-30°	O-ES 330-30°	30°	142	148	56,61	300	325
29807	29827	O-ES 260-35°	O-ES 330-35°	35°	143	148	60,26	300	325
29808	29828	O-ES 260-40°	O-ES 330-40°	40°	141	146	67,04	300	330
29809	29829	O-ES 260-45°	O-ES 330-45°	45°	141	146	73,32	300	325
29810	29830	O-ES 260-50°	O-ES 330-50°	50°	142	147	64,94	300	325
29811	29831	O-ES 260-55°	O-ES 330-55°	55°	141	147	75,63	300	325
29812	29832	O-ES 260-60°	O-ES 330-60°	60°	143	149	68,94	300	325
29813	29833	O-ES 260-65°	O-ES 330-65°	65°	143	149	60,59	300	325
29814	29834	O-ES 260-70°	O-ES 330-70°	70°	143	149	74,86	300	325
29815	29835	O-ES 260-75°	O-ES 330-75°	75°	143	148	98,93	300	325

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

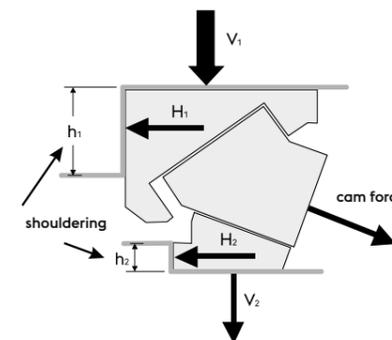
O-ES SIZE 5

PERMISSIBLE CAM FORCES

Cam unit force distribution size 5 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	312	262	312	262	0	186	30	30,9
5°	331	260	309	231	20	186	30	34,6
10°	321	321	269	265	47	142	30	30,7
15°	343	321	269	232	62	142	30	34,4
20°	309	350	202	244	89	110	30	29,6
25°	331	350	202	210	98	110	30	33,2
30°	322	263	221	102	59	125	30	35,0
35°	332	263	221	73	51	125	30	35,0
40°	332	306	177	93	78	95	30	35,0
45°	338	303	175	64	64	95	30	35,0
50°	214	189	109	24	29	95	95	30,0
55°	290	252	146	15	21	95	95	30,0
60°	332	348	61	60	105	45	115	34,0
65°	340	346	61	38	82	45	115	36,0
70°	266	266	47	16	44	45	150	40,0
75°	256	253	45	6	22	45	150	40,0

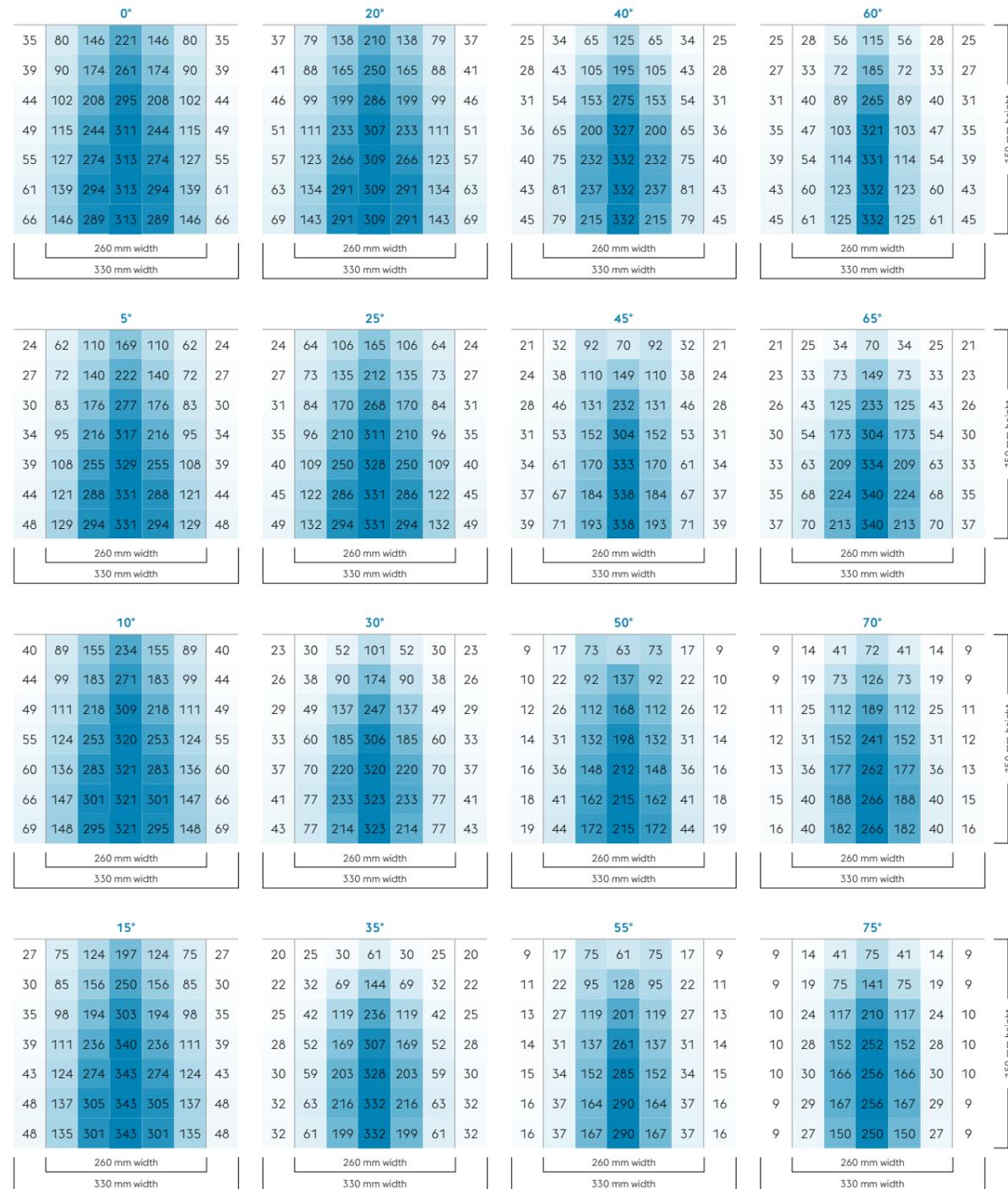
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-ES SIZE 5

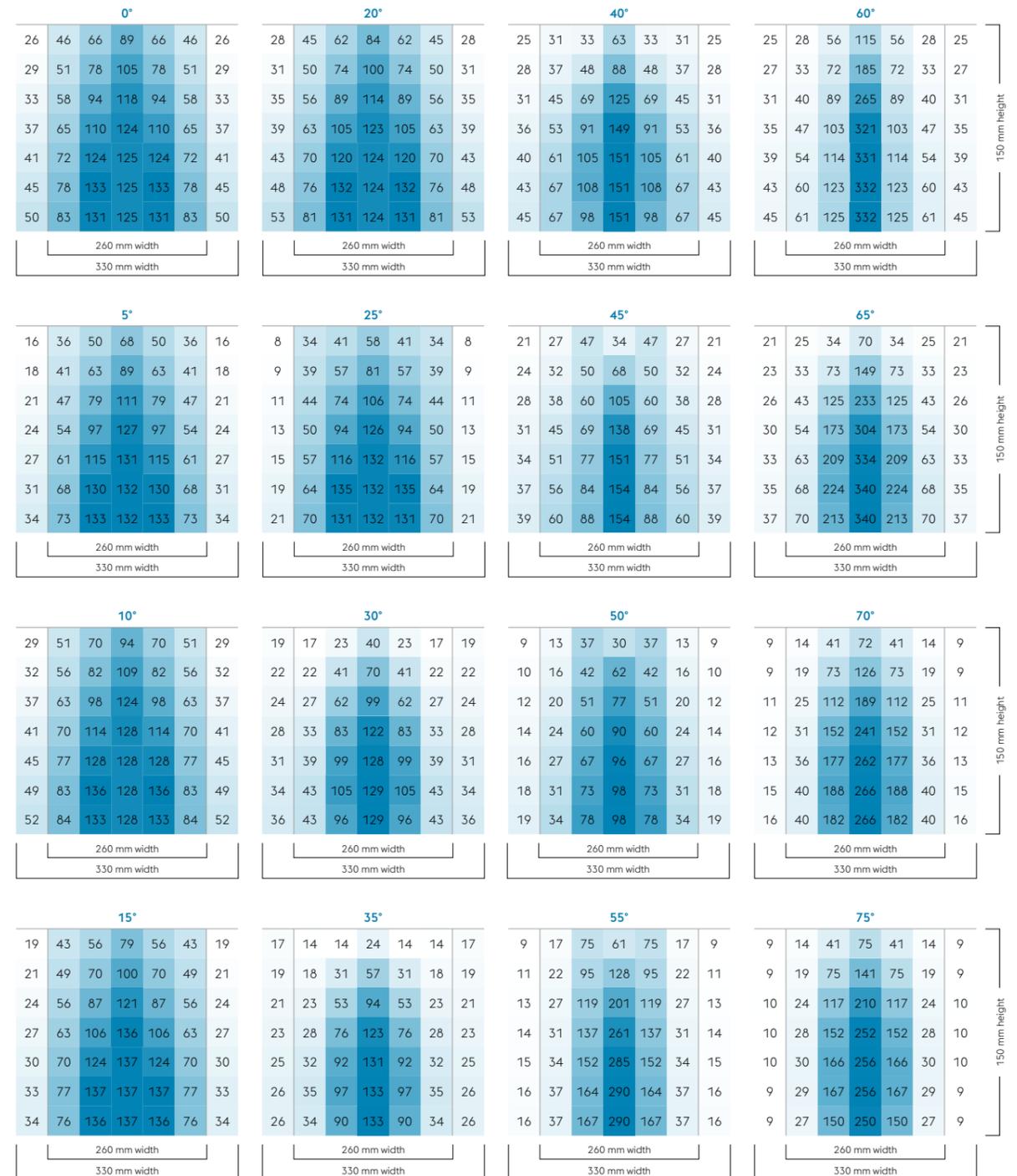
O-ES 260-330 | support via cast shoulder



rounded values

O-ES SIZE 5

O-ES 260-330 | support via fitting key



rounded values

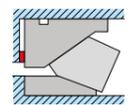
O-ES SIZE 6

FORCE DISTRIBUTION

Cam unit specifications O-ES 400-500

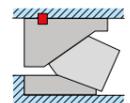
ident. no.		designation		angle [degree]	weight [kg]		stroke [mm]	height cam unit [mm]	length cam unit [mm]
O-ES 400	O-ES 500	size	size		O-ES 400	O-ES 500			
29840	29860	O-ES 400-0°	O-ES 500-0°	0°	309	321	41,78	375	407
29841	29861	O-ES 400-5°	O-ES 500-5°	5°	307	320	42,75	375	407
29842	29862	O-ES 400-10°	O-ES 500-10°	10°	301	313	52,04	375	407
29843	29863	O-ES 400-15°	O-ES 500-15°	15°	300	313	53,68	375	407
29844	29864	O-ES 400-20°	O-ES 500-20°	20°	295	307	57,82	375	406
29845	29865	O-ES 400-25°	O-ES 500-25°	25°	294	307	61,50	375	406
29846	29866	O-ES 400-30°	O-ES 500-30°	30°	284	296	56,61	375	407
29847	29867	O-ES 400-35°	O-ES 500-35°	35°	288	301	60,26	375	407
29848	29868	O-ES 400-40°	O-ES 500-40°	40°	280	293	67,04	375	406
29849	29869	O-ES 400-45°	O-ES 500-45°	45°	287	300	73,32	375	406
29850	29870	O-ES 400-50°	O-ES 500-50°	50°	288	301	64,94	375	406
29851	29871	O-ES 400-55°	O-ES 500-55°	55°	292	304	75,62	375	406
29852	29872	O-ES 400-60°	O-ES 500-60°	60°	280	293	68,94	375	421
29853	29873	O-ES 400-65°	O-ES 500-65°	65°	285	298	60,59	375	426
29854	29874	O-ES 400-70°	O-ES 500-70°	70°	289	302	74,86	375	431
29855	29875	O-ES 400-75°	O-ES 500-75°	75°	289	301	98,93	375	431

Permissible size of the cam forces



Shouldering

Top and bottom support by shouldering



Fitting key

Top support by fitting key, bottom support by shouldering

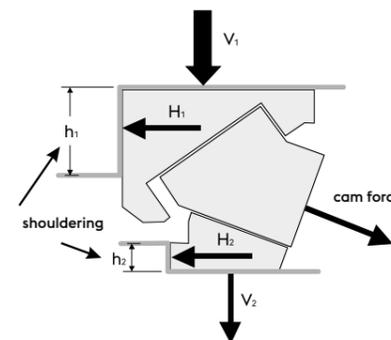
O-ES SIZE 6

PERMISSIBLE CAM FORCES

Cam unit force distribution size 5 O-ES, 300,000 strokes

cam unit angle [degree]	max. cam force [kN]	force distribution at max. cam force [kN]				shouldering [mm]		retraction force [kN]
		V1	H1	V2	H2	h1	h2	
0°	544	457	544	457	0	228	30	74,5
5°	581	456	544	405	35	228	30	71,4
10°	506	506	424	418	74	179	30	74,5
15°	472	441	370	319	85	179	30	71,4
20°	543	614	355	428	156	135	40	73,1
25°	580	613	354	368	172	135	40	70,2
30°	495	403	338	156	90	157	40	62,8
35°	459	364	306	101	71	157	40	58,0
40°	450	415	239	125	105	120	40	62,1
45°	462	415	239	88	88	120	40	57,4
50°	436	383	221	49	59	120	100	51,6
55°	405	352	203	20	29	120	100	47,5
60°	452	474	84	82	143	59	150	59,2
65°	460	469	83	52	112	59	150	54,2
70°	470	470	83	28	78	59	150	52,9
75°	409	404	71	9	35	59	150	47,2

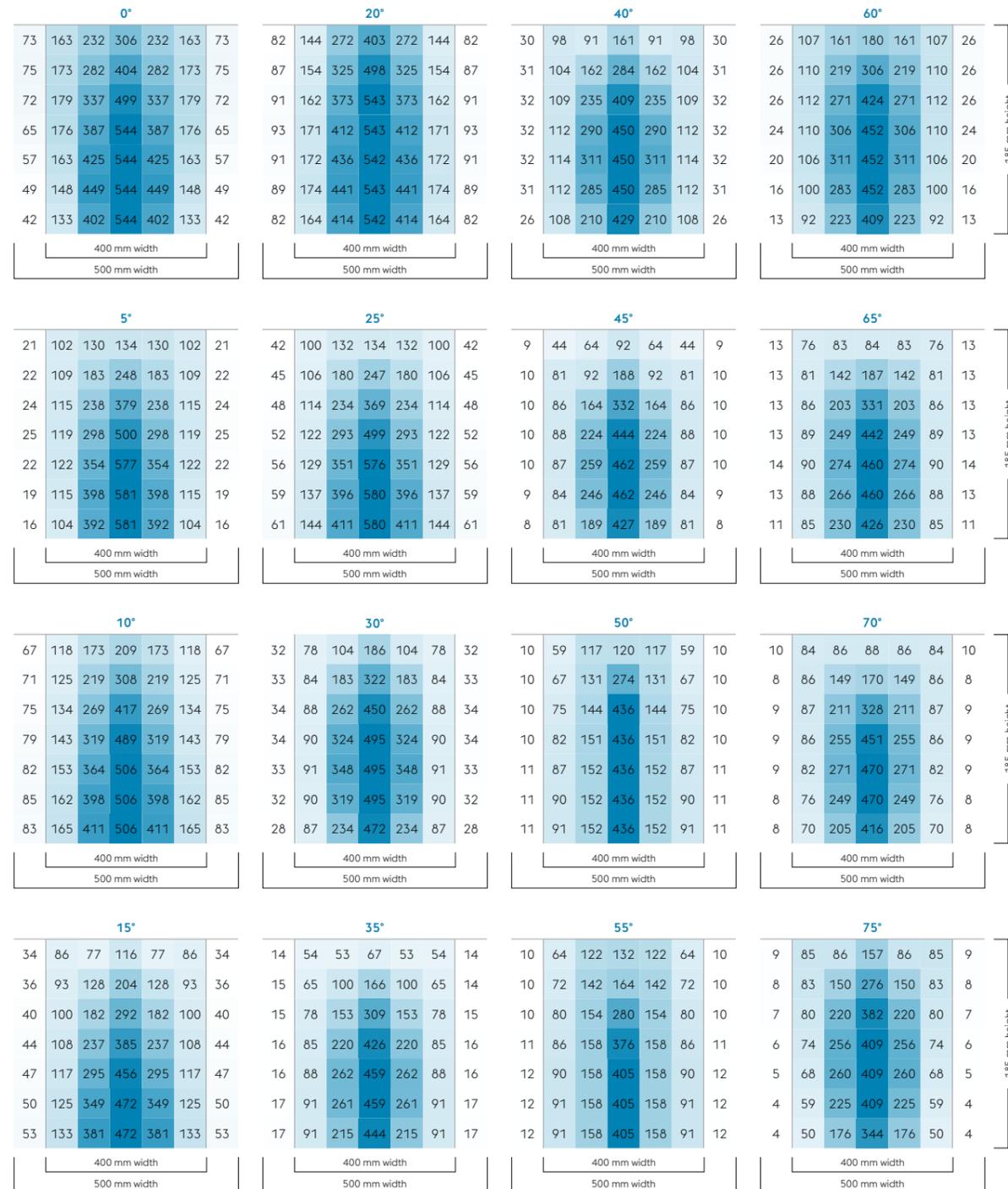
The cam unit force is distributed as shown in the sketch:



Shouldering: h_1 (top)
 h_2 (bottom)
 Press: V_1 (vertical)
 Cam base: H_1 (horizontal)
 H_2 (horizontal)
 Driver: V_2 (vertical)

O-ES SIZE 6

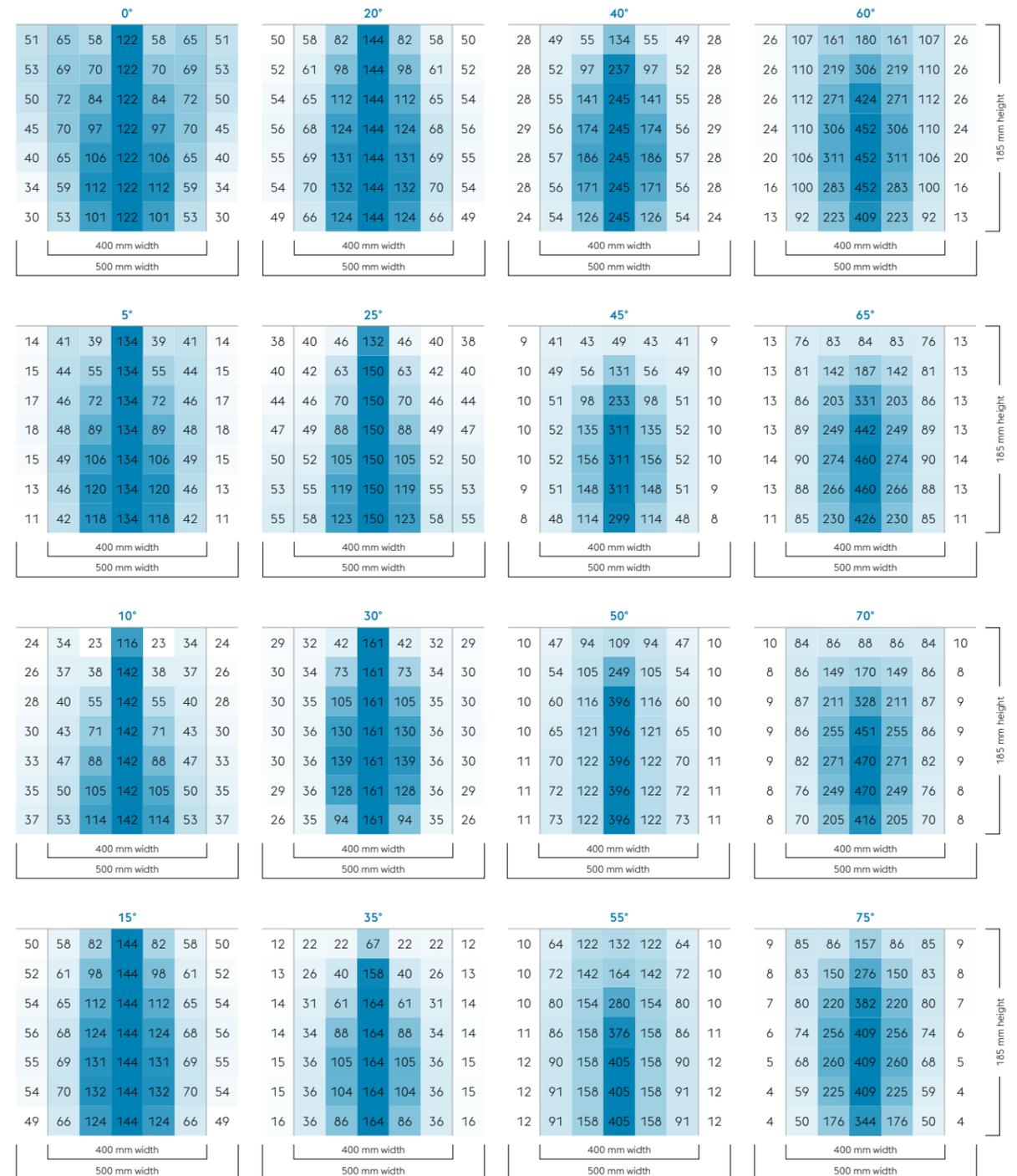
O-ES 400-500 | support via cast shoulder



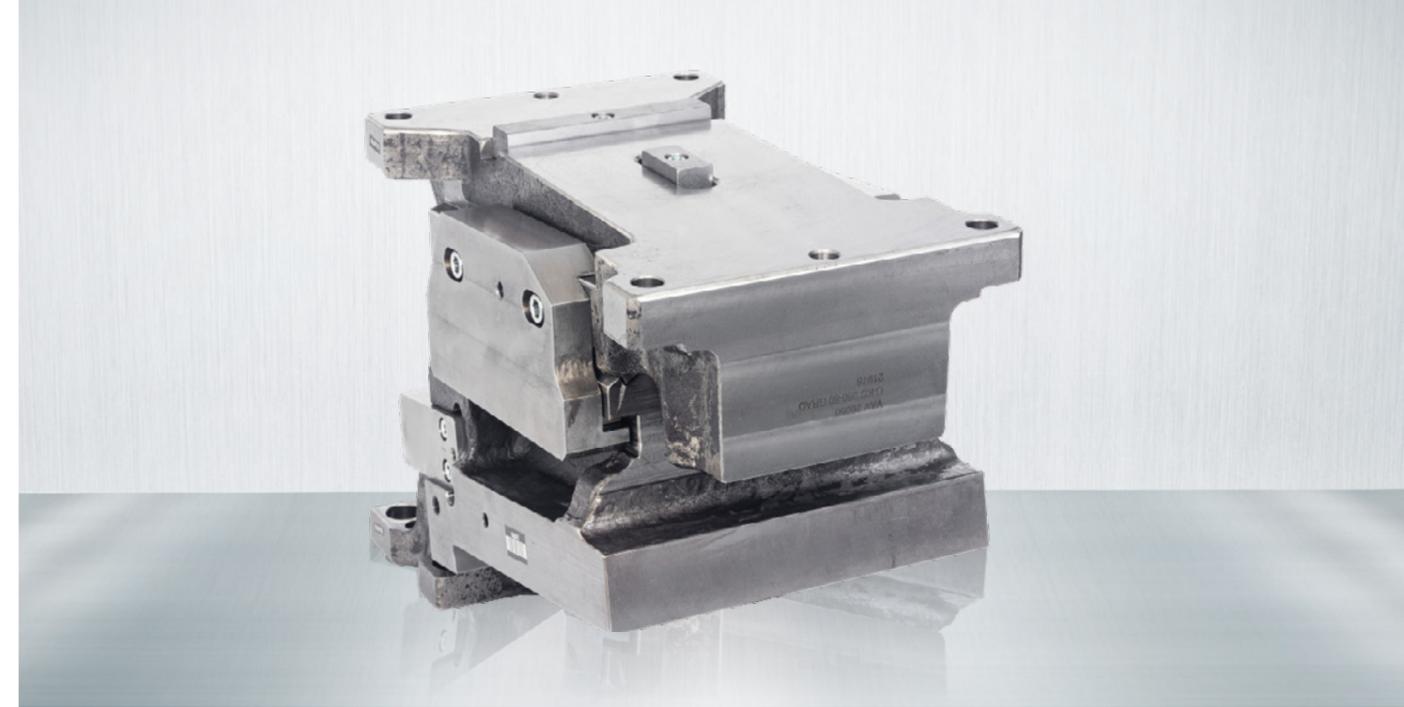
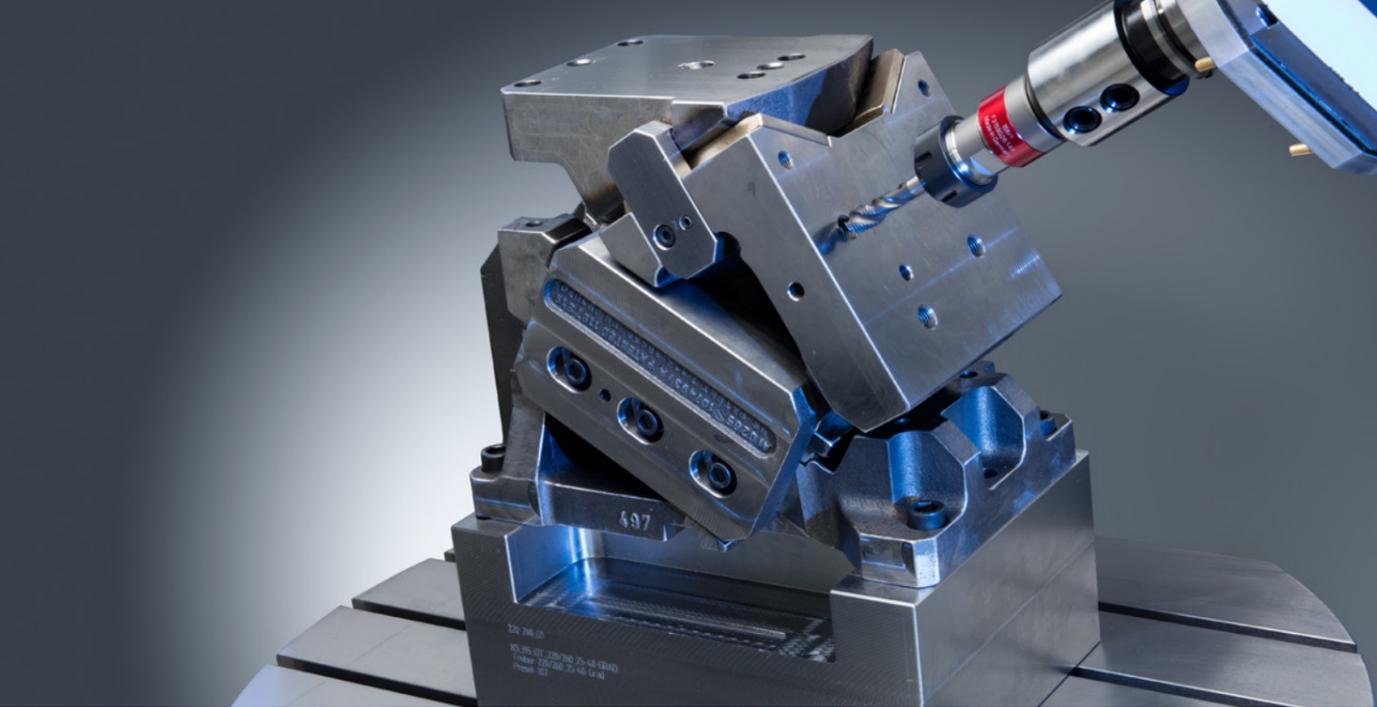
rounded values

O-ES SIZE 6

O-ES 400-500 | support via fitting key



rounded values



PRE-MACHINING

Flexible, accurate and economical

Lacher Camtec offers various pre-machining options:

- » Individual and flexible adjustment of the work surface width (e.g. from 110 to 105 mm)
- » Pre-machining of threads, fitting holes and milling according to your CAD data set for mounting the add-on parts on the cam units

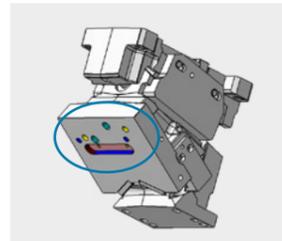
Our pre-machining will save time and guarantees maximum flexibility and costefficiency.

For inquiries about standard cam face machining and our extended processing options, please contact our engineering team at engineering@lacher-camtec.com

EXAMPLE PRE-MACHINING AT O-KS

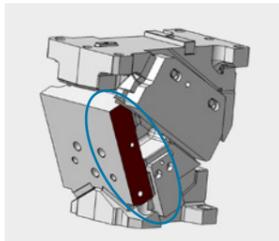
Pre-machining only on the work surface

Standard pre-machining



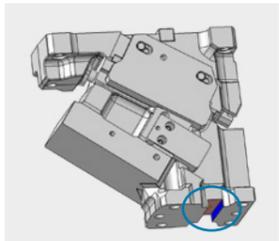
Pre-machining the work surface width

Advanced pre-machining



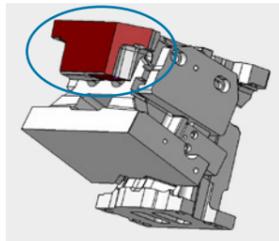
Pre-machining on the cam unit (fitting key)

Advanced pre-machining



Pre-machining on the cam base

Advanced pre-machining



SPECIAL CAM UNITS

Individually manufactured based on your requirements

Individual requirements often require unique design. In addition to our flexible product portfolio, we are pleased to offer customized cam units. We rely on proven standard components and individual solutions.

THERE ARE ALMOST NO LIMITS TO YOUR REQUIREMENTS.

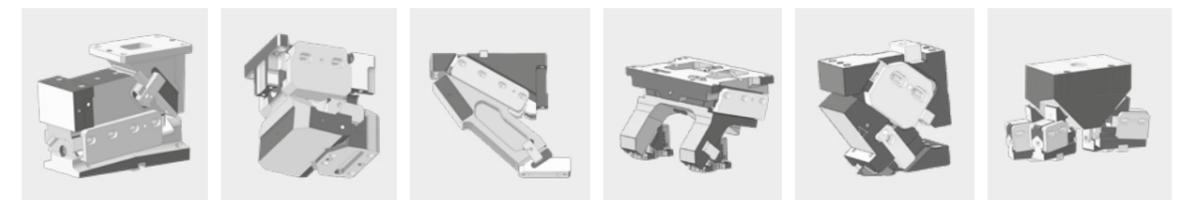
Modifications and individualisation according to your needs:

- » Work surface: width, height, angle
- » Cam slider asymmetrical / symmetrical
- » Position of the driver
- » Force direction (Pull/push cam unit)
- » Stroke
- » Forces (retracting & working force)
- » Customised pre-machining

Of course, we also deliver your special cam unit with pre-machining based on your specifications.

For inquiries about standard processing of the work surface and our extended processing options, please contact our engineering team at engineering@lacher-camtec.com

The QR code leads you directly to the special cam units website



Change of cam stroke

Special angles

Driver position

Pull cam

Die mount cam

Bottom cam unit

PARAMETERIZED CAM UNIT ADAPTER

Flexible, precise and economical for more efficiency in construction

The innovative parameterized slide adapter from Lacher Camtec offers a significant simplification in construction. Once placed in CATIA, slide parameters (e.g. slide model, angle, width) can be easily exchanged using the selection menu. An exchange in the course of the design construction, method planning or similar is therefore no longer necessary - this saves valuable construction time.

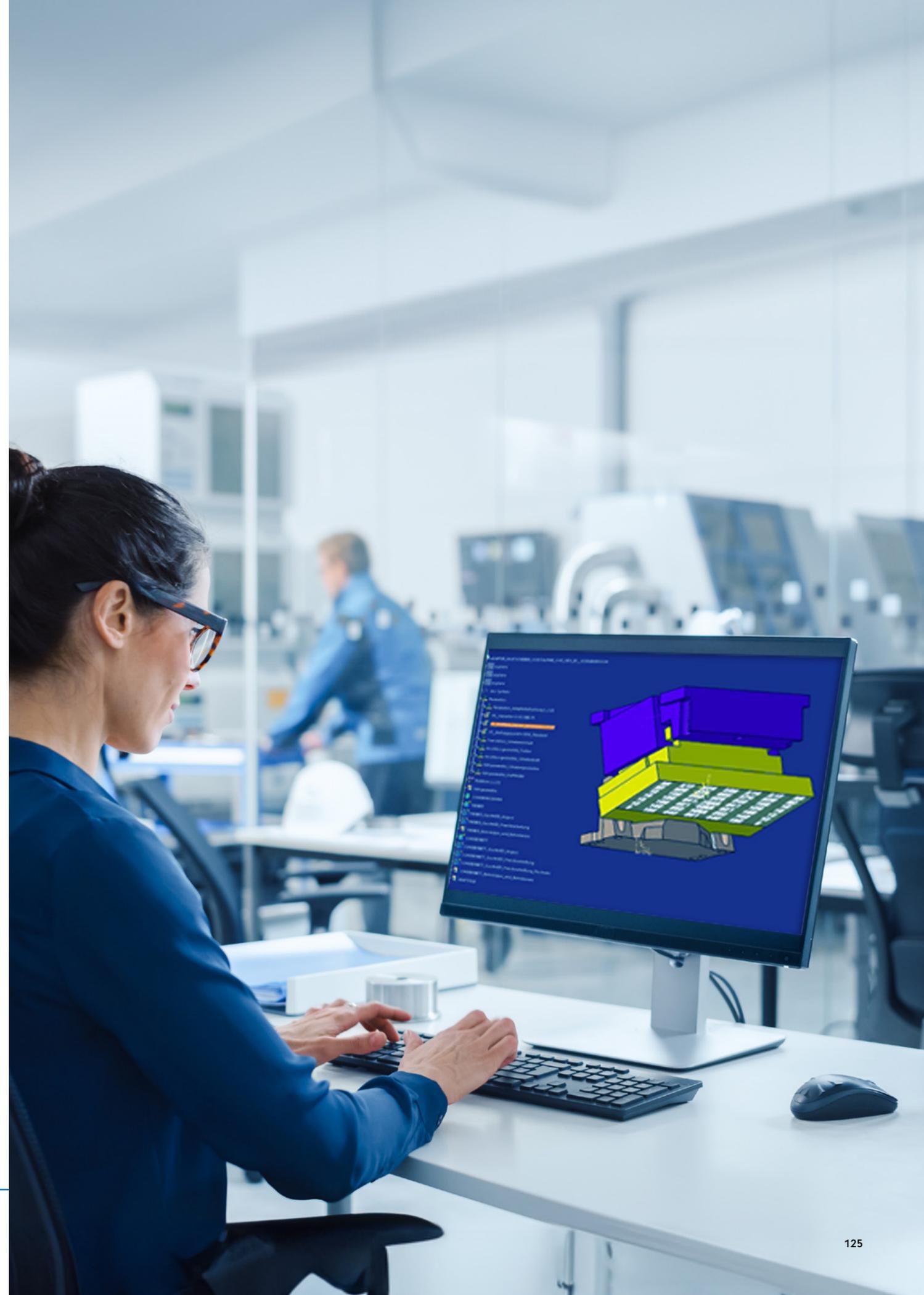
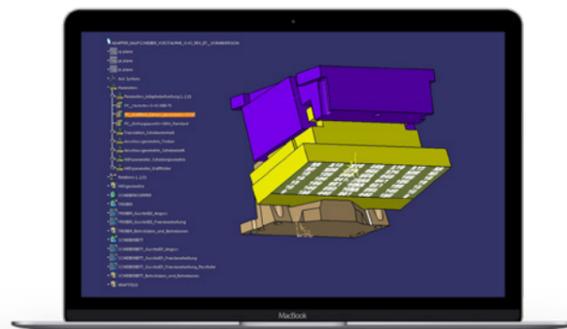
ONE MODEL, 1,000 OPTIONS

Your advantages:

- » Savings in construction time
 - One cam adapter for all standard OT cams
 - Simple integration into CATIA tool design (suitable for BMW & VW)
 - No need to replace the adapter in the event of changes (width, angle, cam type)
- » Easier handling
 - No external links to customer models required
 - Detailed information on the connection geometry (stop surfaces, threaded & fitting holes, etc.)
 - Features for load time optimization (force fields can be shown & hidden)
 - Simple and individual adaptation of the cam unit configuration
- » Use also in the method planning process possible
 - Representation of rough models without extensive details (installation space)
 - Reduced geometry

The cam unit adapter includes:

- » All angles and widths of the O-series
- » Stroke rate-dependent force fields
- » Cam geometry
 - Incl. information on cast machining, e.g. trigger body for milling, sprue, shouldering
- » Removal chamber of the cam unit
- » Visualization of the pre-machining area
 - For milling, position for threads & pins
- » Information on the mounting geometry: mounting hole, fitting hole
- » Parts list information



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