NEW

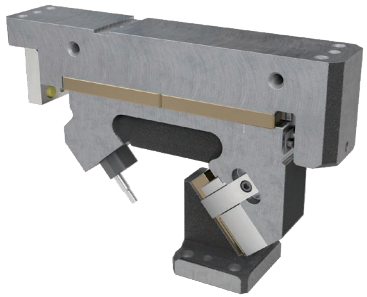
PULL CAM SAPLC · SAPLS · SAPLU [Overview]

Panel Avoidance Cam

For Pierce

Product Information

- Added size variations that allow to choose the cam length and driver height
- Minimal rear space removal and ease of cam slider disassembly
- Compact design for back angle piercing
- Spring option : Gas or Coil Spring



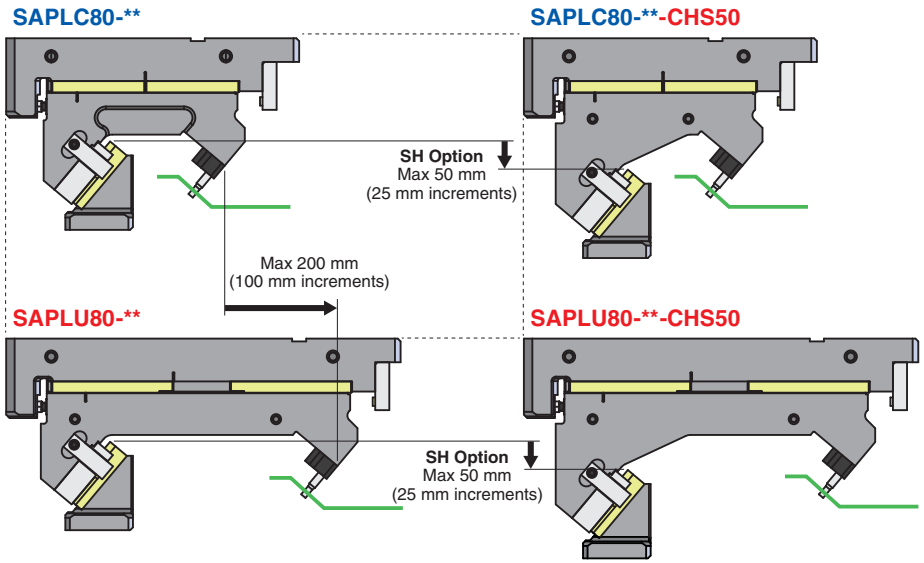
■Features

Variety of choices

・Added cam length extension variations that allow to select the cam length depending on the machining position.

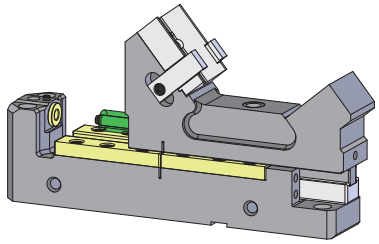
SAPLC (Standard) , **SAPLS** (+100 mm) , **SAPLU** (+200 mm)

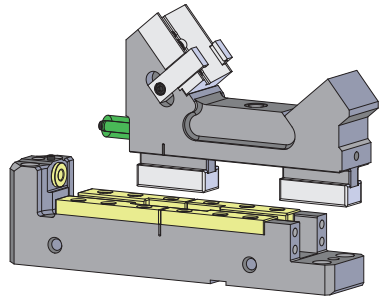
・Added the option to change the height of the cam driver. **(−CHS)**



Structure with ease of cam slider disassembly

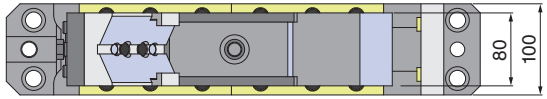
The SAPL series uses an upper plate notch structure, which greatly reduces the space required for removal at the rear.



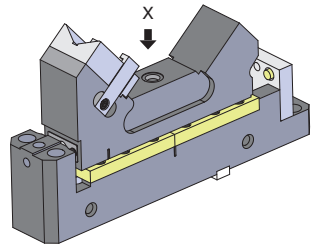


Compact design for back angle piercing

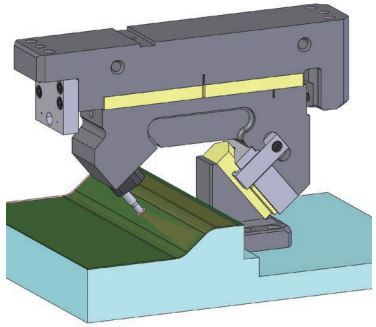
The width of the mounting surface is 80 mm. Overall cam width is 100 mm.
It is now possible to design with less space than before.



View X



■Application Example



For panels that are difficult to process with normal aerial cam units because the application requires to pierce a hole on a back or reverse angle.
e.g. body side panels
back door panels

Special Cam Units

SAPLC
SAPLS
SAPLU

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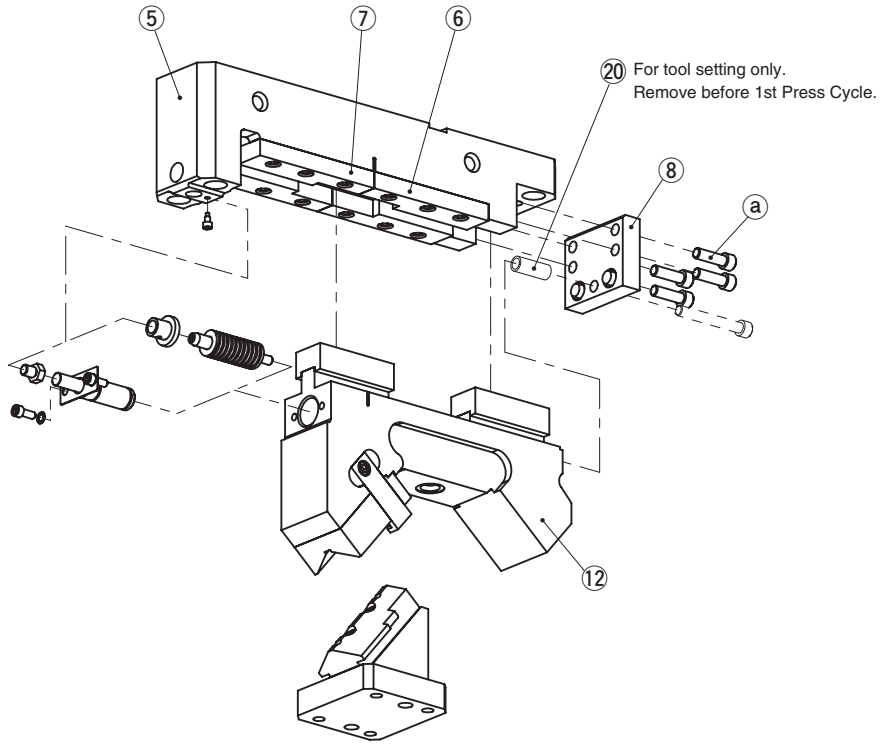
■SAPLC·SAPLS·SAPLU Assembly Instructions



● Disassembly

1) Remove Hexagon Socket Head Bolts (ⓐ), to pull out Stopper Plate (⑧).
2) Slide Cam Slider (⑫) back to the corresponding notch placed between (⑥) and (⑦).
3) Pull up Cam Slider from Cam Holder (⑤).

● Assembly

Assembly is the reverse procedure of disassembly.

- Ensure that all parts are clean, particularly the sliding components to which a small amount of lubricant is applied and is then placed in position.
- Take care that the respective tolerances are observed when assembling Cam Slider and Cam Holder, which also should be identified by the same serial number.
- Make sure that all bolts are tighten to the recommended torque after assembly and disassembly.

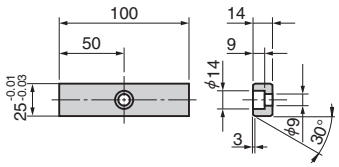
⚠ Gas Spring

Please contact your local sales representative if you prefer to use a gas spring not specified in our catalog. For use and maintenance of gas spring, please contact the manufacturer directly.

■Option

● **Key Specification (−K)**

LKU25-100 (A M8 Bolt is included.)



■Thrust Pad Installation

When the unit is used for trimming, it is recommended a thrust pad be included so an extreme lateral load is eliminated from trimming line to the unit.

■Do not use for restriking

The cam unit would break.

■Coil Spring life expectancy

Coil Spring life expectancy is approximately 300,000 cycles.
Note that 300,000 cycles is a manufacturer guideline, not a guarantee.
It may break earlier than the life expectancy depending on usage conditions.

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NEW

PULL CAM

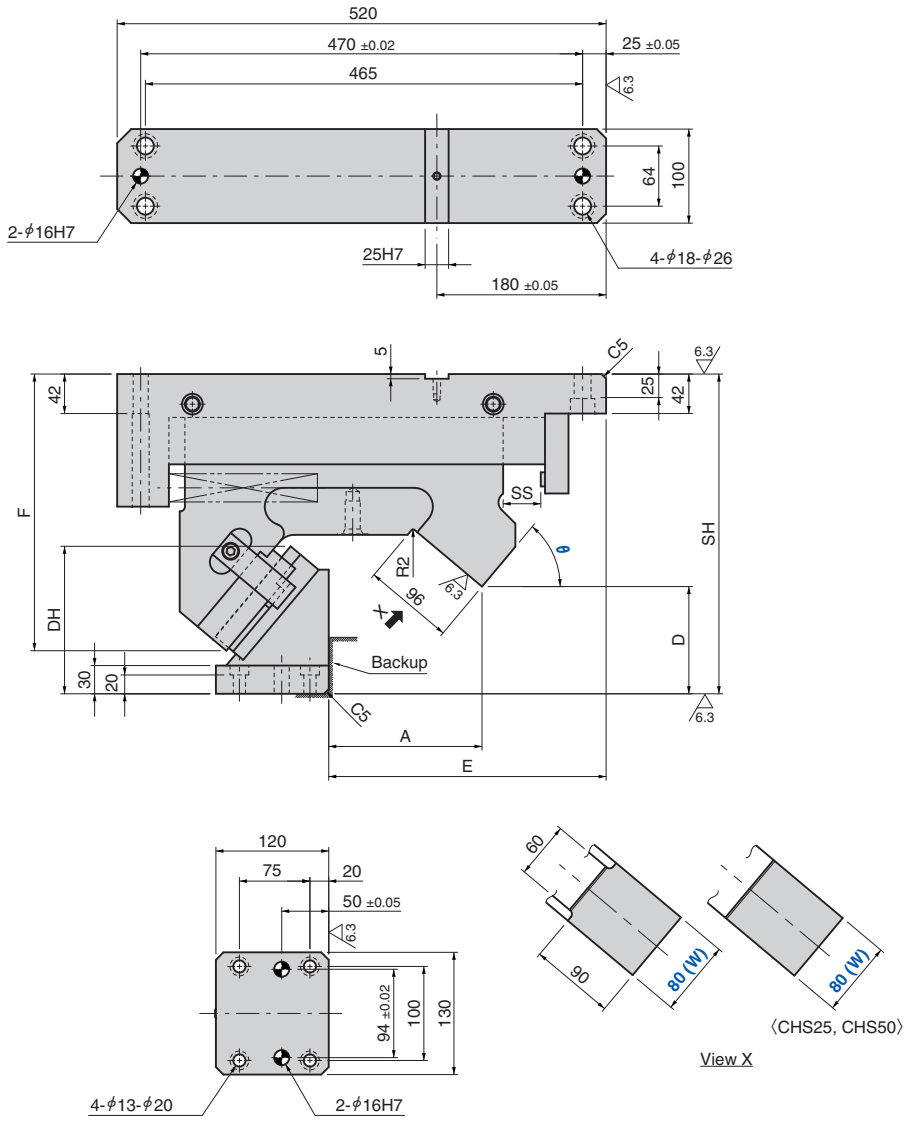
Panel Avoidance Cam

Aerial Cam Unit

For Pierce

SAPLC80

CAD FILE



Working Force [kN (tonf)] 1,000,000 strokes	Catalog No.	W	θ 5° increments	Spring Type PS
39.2 (4.0)	SAPLC	80	50～80	No Code (Coil Spring) GK NGK GD NGD GSS NGSS

No Code: Coil Spring GK: Gas Spring (KALLER) GD: Gas Spring (DADCO) GSS: Gas Spring (Special Springs)
NGK/NGD/NGSS: Without Gas Spring Parts for spring assembly are included.

Order

Catalog No.	W	–	θ	–	Option CHS	–	PS	–	Option
SAPLC	80	–	50						
SAPLC	80	–	50	–	CHS25				
SAPLC	80	–	50	–	CHS50	–	GK	– NF – K	

Option

Option Code	Specification
NF	Nitrogen gas not charged.
K	Key attached.

Option Code CHS	Specification
CHS25	The Cam Driver's mounting position will be lowered by 25 mm.
CHS50	The Cam Driver's mounting position will be lowered by 50 mm.

Refer to page 377 for the machining details of tapped holes and dowel holes for retainer mounting.
Refer to page 4 for key specification.

θ	SS	Option Code CHS	E	SH	A	D	DH	F
		–		340		114.0		294.2
50		CHS25	295	365	163	139.0	156.8	319.2
		CHS50		390		164.0		344.2
		–		340		120.5		295.8
55	40	CHS25	287	365	159	145.5	160.8	320.8
		CHS50		390		170.5		345.8
		–		345		132.0		302.5
60		CHS25	279	370	155	157.0	163.8	327.5
		CHS50		395		182.0		352.5
		–		345		140.0		302.2
65	34	CHS25	270	370	150	165.0	167.8	327.2
		CHS50		395		190.0		352.2
		–		350		152.5		308.9
70	28	CHS25	260	375	145	177.5	168.8	333.9
		CHS50		400		202.5		358.9
		–		350		160.0		308.7
75	21	CHS25	250	375	139	185.0	170.8	333.7
		CHS50		400		210.0		358.7
		–		350		168.0		310.5
80	14	CHS25	240	375	133	193.0	169.9	335.5
		CHS50		400		218.0		360.5

Refer to page 14 for Table of Components.

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NEW

PULL CAM

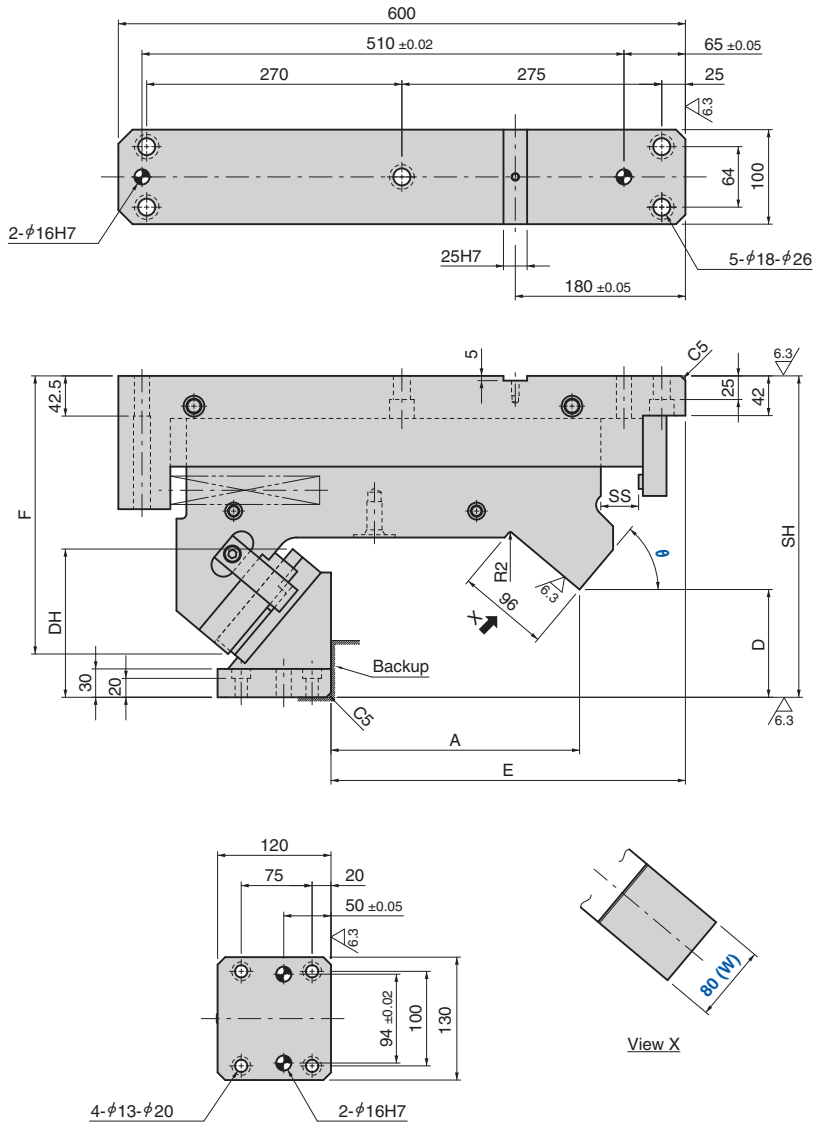
Panel Avoidance Cam

Aerial Cam Unit

For Pierce

SAPLS80

CAD FILE



Working Force [kN (tonf)] 1,000,000 strokes	Catalog No.	W	θ 5° increments	Spring Type PS
39.2 (4.0)	SAPLS	80	50～80	No Code (Coil Spring) GK NGK GD NGD GSS NGSS

No Code: Coil Spring GK: Gas Spring (KALLER) GD: Gas Spring (DADCO) GSS: Gas Spring (Special Springs)
NGK/NGD/NGSS: Without Gas Spring Parts for spring assembly are included.

Order

Catalog No.	W	–	θ	–	Option CHS	–	PS	–	Option
SAPLS	80	–	50						
SAPLS	80	–	50	–	CHS25				
SAPLS	80	–	50	–	CHS50	–	GK	– NF – K	

Option

Option Code	Specification
NF	Nitrogen gas not charged.
K	Key attached.

Option Code CHS	Specification
CHS25	The Cam Driver's mounting position will be lowered by 25 mm.
CHS50	The Cam Driver's mounting position will be lowered by 50 mm.

Refer to page 377 for the machining details of tapped holes and dowel holes for retainer mounting.
Refer to page 4 for key specification.

θ	SS	Option Code CHS	E	SH	A	D	DH	F
		–		340		114.0		294.2
50		CHS25	375	365	263	139.0	156.8	319.2
		CHS50		390		164.0		344.2
		–		340		120.5		295.8
55	40	CHS25	367	365	259	145.5	160.8	320.8
		CHS50		390		170.5		345.8
		–		345		132.0		302.5
60		CHS25	359	370	255	157.0	163.8	327.5
		CHS50		395		182.0		352.5
		–		345		140.0		302.2
65	34	CHS25	350	370	250	165.0	167.8	327.2
		CHS50		395		190.0		352.2
		–		350		152.5		308.9
70	28	CHS25	340	375	245	177.5	168.8	333.9
		CHS50		400		202.5		358.9
		–		350		160.0		308.7
75	21	CHS25	330	375	239	185.0	170.8	333.7
		CHS50		400		210.0		358.7
		–		350		168.0		310.5
80	14	CHS25	320	375	233	193.0	169.9	335.5
		CHS50		400		218.0		360.5

Refer to page 14 for Table of Components.

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NEW

PULL CAM

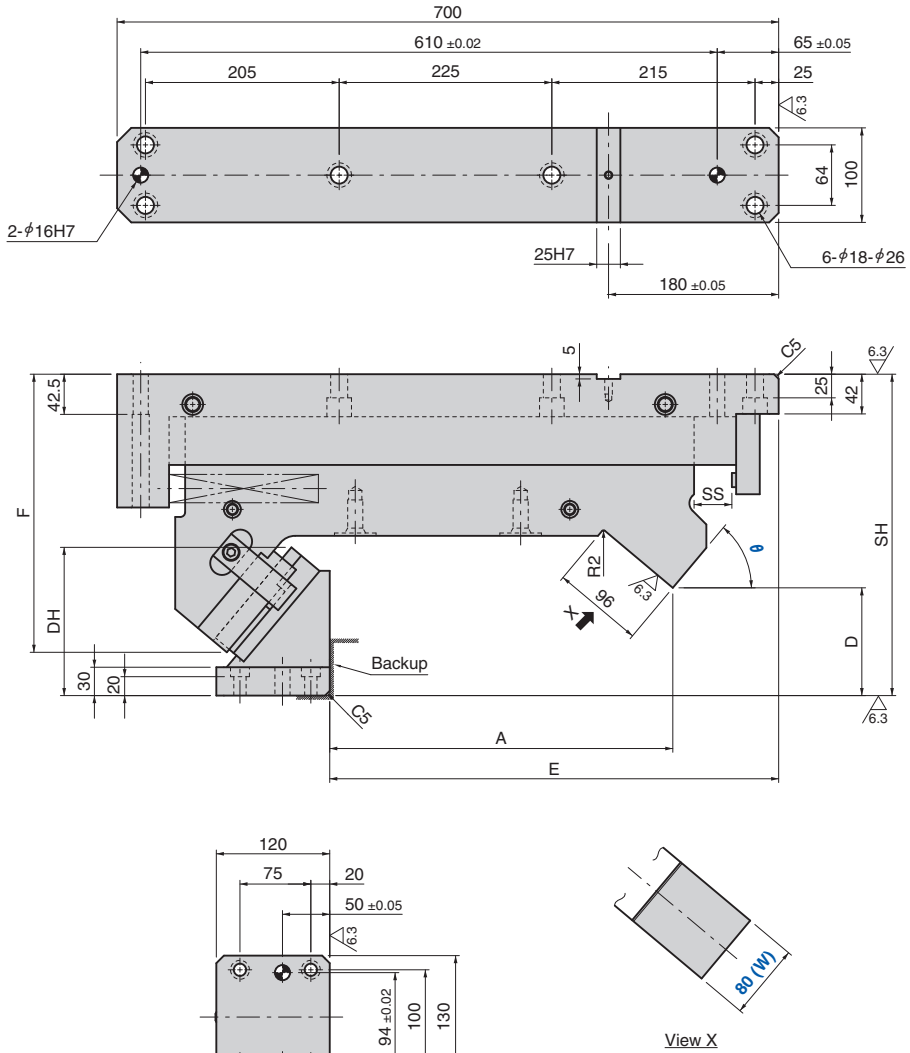
Panel Avoidance Cam

Aerial Cam Unit

For Pierce

SAPLU80

CAD FILE



Refer to page 14 for Table of Components.

Working Force [kN (tonf)] 1,000,000 strokes	Catalog No.	W	θ 5° increments	Spring Type PS
39.2 (4.0)	SAPLU	80	50～80	No Code (Coil Spring) GK NGK GD NGD GSS NGSS

No Code: Coil Spring GK: Gas Spring (KALLER) GD: Gas Spring (DADCO) GSS: Gas Spring (Special Springs)
NGK/NGD/NGSS: Without Gas Spring Parts for spring assembly are included.

Order

Catalog No.	W	–	θ	–	Option CHS	–	PS	–	Option
SAPLU	80	–	50						
SAPLU	80	–	50	–	CHS25				
SAPLU	80	–	50	–	CHS50	–	GK	– NF – K	

Option

Option Code	Specification
NF	Nitrogen gas not charged.
K	Key attached.

Option Code CHS	Specification
CHS25	The Cam Driver's mounting position will be lowered by 25 mm.
CHS50	The Cam Driver's mounting position will be lowered by 50 mm.

Refer to page 377 for the machining details of tapped holes and dowel holes for retainer mounting.
Refer to page 4 for key specification.

θ	SS	Option Code CHS	E	SH	A	D	DH	F
		–		340		114.0		294.2
50		CHS25	475	365	363	139.0	156.8	319.2
		CHS50		390		164.0		344.2
		–		340		120.5		295.8
55	40	CHS25	467	365	359	145.5	160.8	320.8
		CHS50		390		170.5		345.8
		–		345		132.0		302.5
60		CHS25	459	370	355	157.0	163.8	327.5
		CHS50		395		182.0		352.5
		–		345		140.0		302.2
65	34	CHS25	450	370	350	165.0	167.8	327.2
		CHS50		395		190.0		352.2
		–		350		152.5		308.9
70	28	CHS25	440	375	345	177.5	168.8	333.9
		CHS50		400		202.5		358.9
		–		350		160.0		308.7
75	21	CHS25	430	375	339	185.0	170.8	333.7
		CHS50		400		210.0		358.7
		–		350		168.0		310.5
80	14	CHS25	420	375	333	193.0	169.9	335.5
		CHS50		400		218.0		360.5

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NEW

PULL CAM [Table of Components]

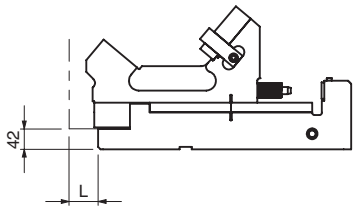
Panel Avoidance Cam

For Pierce

Aerial Cam Unit

SAPLC·SAPLS·SAPLU

■Rear Removal Space



Catalog No.	L
SAPLC	60.0
SAPLS	100.0
SAPLU	

■Spring Force

● Coil Spring

θ	SS	Spring Model	Initial Load		Final Load		Return Force	
			N	kgf	N	kgf	N	kgf
50							3412.9	348.3
55	40	TH30-200	440.7	45.0	2644.3	269.8	3713.9	379.0
60							4105.6	418.9
65	34	TH30-175	503.7	51.4	2644.3	269.8	4629.7	472.4
70	28	TH30-150	587.7	60.0	2644.6	269.9	5352.0	546.1
75	21	TH30-100	330.6	33.7	2644.6	269.9	6401.0	653.2
80	14	TH30-75	587.6	60.0	2644.4	269.8	8037.7	820.2

Life expectancy of Coil Spring is approximately 300,000 strokes.

● Gas Spring

θ	SS	Spring Model	Final Load		Return Force	
		GK	N	kgf	N	kgf
50					3317.8	338.6
55	40	X320-50	2573.0	262.6	3610.4	368.4
60					3991.1	407.3
65	34	X320-50	2407.3	245.6	4204.3	429.0
70	28	X320-38	2474.4	252.5	4998.8	510.1
75	21	X320-25	2567.9	262.0	6210.4	633.7
80	14	X320-19	2386.0	243.5	7233.2	738.1

Gas filling pressure: 10 Mpa

θ	SS	Spring Model	Final Load		Return Force	
		GD	N	kgf	N	kgf
50					3299.3	336.7
55	40	U.0325.050	2558.9	261.1	3590.2	366.4
60					3968.8	405.0
65	34	U.0325.050	2396.9	244.6	4185.6	427.1
70	28	U.0325.038	2462.5	251.3	4974.2	507.6
75	21	U.0325.025	2588.1	264.1	6260.4	638.8
80	14	U.0325.019	2427.9	247.7	7363.7	751.4

Gas filling pressure: 10 Mpa

θ	SS	Spring Model	Final Load		Return Force	
		GSS	N	kgf	N	kgf
50					3475.9	354.7
55	40	RV320-050-C	2692.7	274.8	3782.4	386.0
60					4181.3	426.7
65	34	RV320-050-C	2495.2	256.7	4361.6	445.1
70	28	RV320-038-C	2553.5	260.6	5162.5	526.8
75	21	RV320-025-C	2651.1	270.5	6416.4	654.7
80	14	RV320-019-C	2441.6	249.1	7406.3	755.7

Gas filling pressure: 10 Mpa

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NEW

PULL CAM [Table of Components]

Panel Avoidance Cam

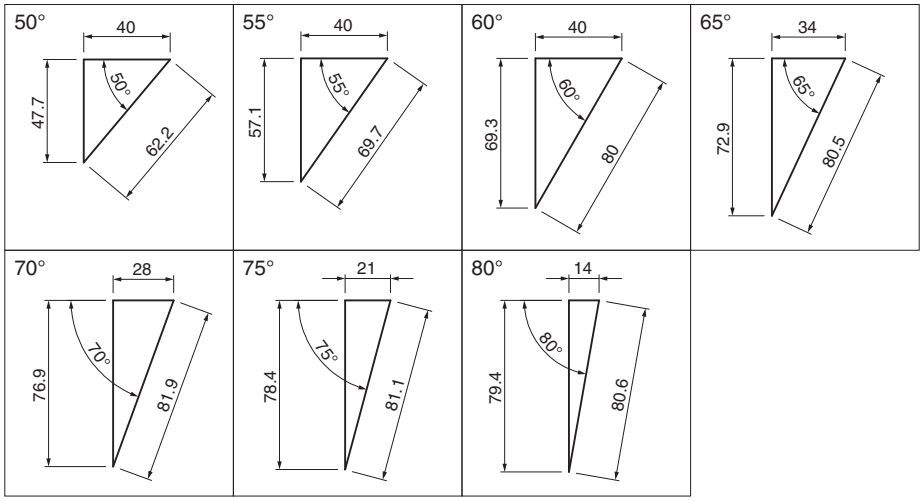
For Pierce

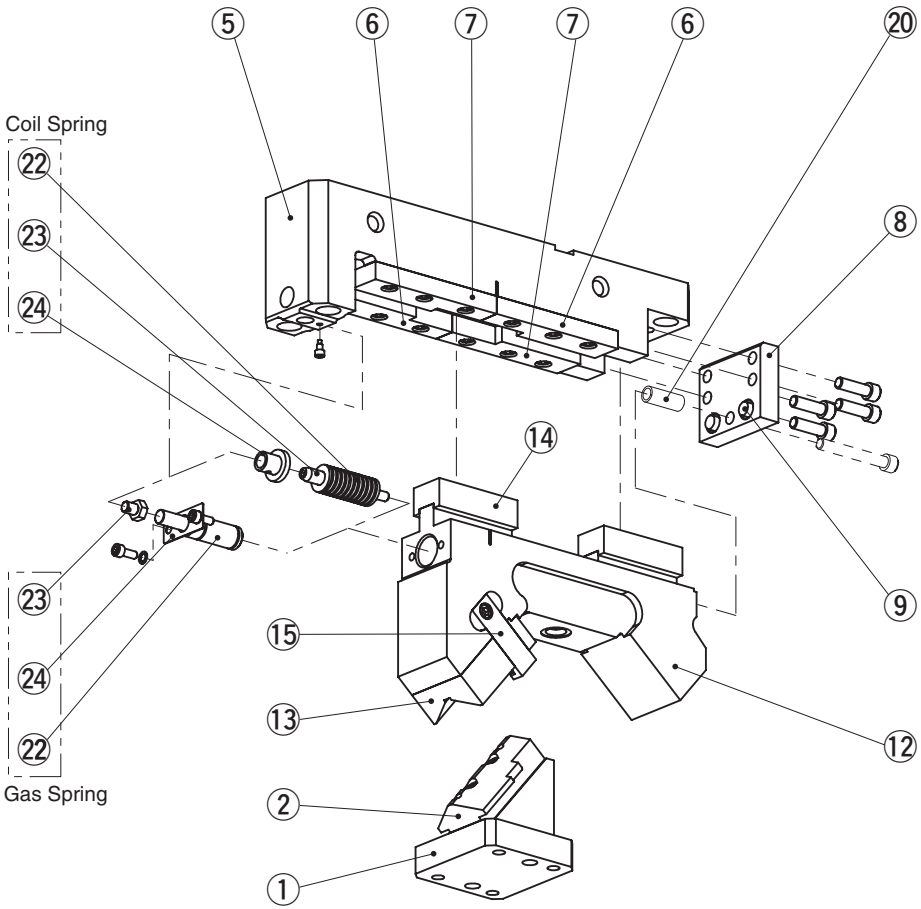
Aerial Cam Unit

■Weight

θ	Option Code CHS	Slider Weight (kg)			Total Weight (kg)			Tool installation Weight (kg)
		SAPLC	SAPLS	SAPLU	SAPLC	SAPLS	SAPLU	Common
	—	22.7	29.7	34.3	59.2	70.9	79.8	
50	CHS25	26.3	31.9	36.5	62.7	73.1	82.0	6.0
	CHS50	29.5	35.1	39.7	65.9	76.3	85.2	
	—	22.7	29.6	34.2	59.4	71.0	79.9	
55	CHS25	26.1	31.7	36.3	62.8	73.1	82.0	6.0
	CHS50	29.1	34.7	39.3	65.8	76.2	85.0	
	—	23.0	29.9	34.6	59.9	71.6	80.5	
60	CHS25	26.4	32.0	36.6	63.3	73.7	82.5	6.0
	CHS50	29.3	35.0	39.6	66.2	76.6	85.5	
	—	23.2	30.2	34.8	60.3	72.0	80.9	
65	CHS25	26.5	32.2	36.8	63.7	74.0	82.9	6.0
	CHS50	29.3	35.0	39.7	66.4	76.9	85.8	
	—	24.0	31.0	35.7	61.3	73.0	81.9	
70	CHS25	27.3	33.0	37.7	64.6	75.0	83.9	6.0
	CHS50	29.9	35.9	40.6	67.2	77.9	86.8	
	—	24.5	31.6	36.2	61.9	73.7	82.6	
75	CHS25	27.7	33.6	38.2	65.1	75.7	84.6	6.0
	CHS50	30.3	36.4	41.1	67.7	78.5	87.5	
	—	25.1	32.3	36.9	62.7	74.5	83.4	
80	CHS25	28.2	34.2	38.8	65.7	76.5	85.4	6.0
	CHS50	30.8	37.0	41.7	68.3	79.3	88.3	

■Cam Diagram





No.	Description	Qty
1	Cam Driver	1
2	Cam Bottom Guide	1
5	Cam Holder	1
6	Cam Upper Plate A	2
7	Cam Upper Plate B	2
8	Stopper Plate	1
9	Stopper	2
12	Cam Slider	1
13	Cam Bottom Slide	1

No.	Description	Qty
14	Cam Lower Slider	2
15	Positive Return	2
20	Collar	1
22	Coil Spring	1
23	Spring Guide Pin	1
24	Spring Guide Washer	1
22	Gas Spring	1
23	Stop Pin	1
24	Spring Stopper	1

Bolts, nuts, dowels, and washers for assembly are not indicated.

Special Cam Units

SAPLC
SAPLS
SAPLU

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Cam Units [Overview]

Additional Machining

Information

■Tapped Hole and Dowel Hole (Prepared Hole, Finish) Machining for Retainer Mounting

Instruction method for machining

Indicate the tapped hole diameter and the dowel hole (or prepared hole) diameter with the XY coordinates.

To indicate the coordinates

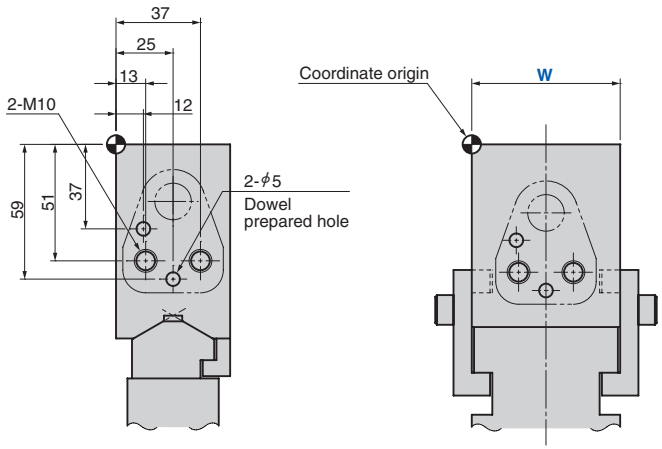
- The origin is positioned at the upper left corner of the mount face. (However, machining uses our machining datum as the reference.)
- Indication symbol

  –M···Tapped hole, **–N**···Dowel prepared hole, **–K**···Dowel finish hole

Machining standard

- Tapped holes and dowel prepared holes are machined to general tolerances.
- The hole depth is 2.5 times the diameter for both tapped holes and dowel holes. The dowel pilot hole is processed for 2 times the diameter.
- The dowel hole spacing is machined to the tolerance of ±0.02.The hole tolerance is H7.

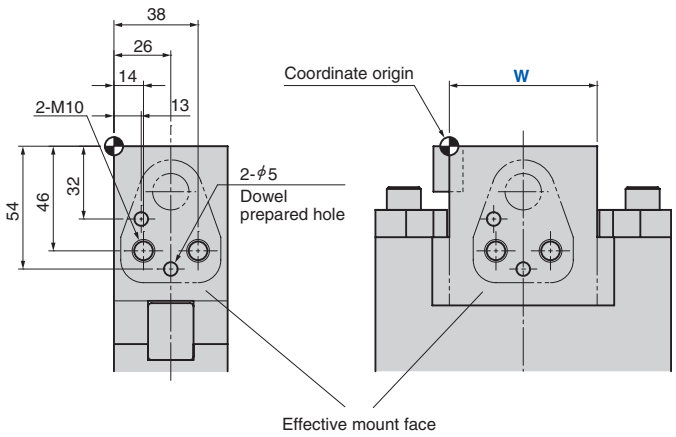
〈Example of Aerial Cam Unit〉



Order

Catalog No.	W	–	θ	– Additional Machining
SACE	52	–	00	– M10 – X (13.0) – Y (–51.0)
				– M10 – X (37.0) – Y (–51.0)
				– K5.0 – X (12.0) – Y (–37.0)
				– K5.0 – X (25.0) – Y (–59.0)

〈Example of Die Mounted Cam Unit〉



Order

Catalog No.	W	–	θ	–	S	– Additional Machining
CMSD	52	–	00	–	55	– M10 – X (14.0) – Y (–46.0)
						– M10 – X (38.0) – Y (–46.0)
						– K5.0 – X (13.0) – Y (–32.0)
						– K5.0 – X (26.0) – Y (–54.0)

■Other machining

Please give instructions on a separate drawing for drilling or cutting other than tapped holes and dowel holes.

Cam Units

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