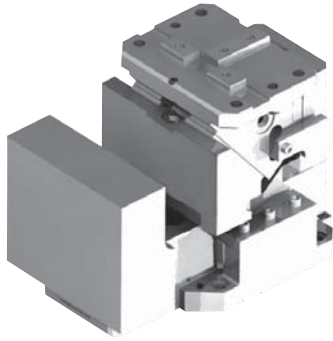


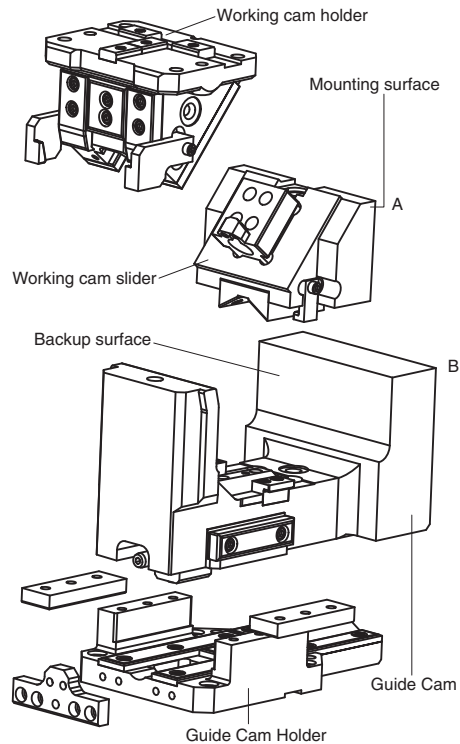
General Description of Special Cam Unit

DOUBLE CAM UNIT

Double cam unit WCMS series is the optimum part for drilling the flat countersunk head screw holes at the door inner panel lock.

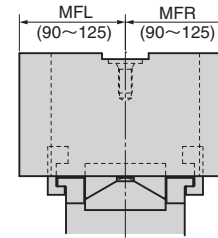


Types and Features of Double Cam Unit



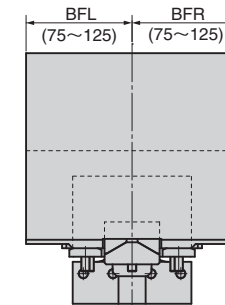
- Cam slider returns safely by positive return.
- Since the cam is an aerial type, the overall design is made compact.
- If the working angle is changed, the cam shut height is constant.
- Available angle is 0.0° to 10.0° at increments of 0.5° .
The angle can be specified at increments of 0.1° from 1.6° to 3.9° .
- Dimensions for the working cam mounting surface and the guide cam backup surface can be designated from the center line.
- The standard working force is 98 kN and the travel of the guide cam is 6 mm.
- Two types with/without the guide cam holder are available. Select the type without holder for direct mounting on the die.

● Designation of mounting surface (View A)



Dimension can be designated from the center line in the range of 90 to 125 for the left (MFL) and the right (MFR). (Increments of 5mm)

● Dimensional designation of backup surface (View B)



Dimension can be designated from the center line in the range of 75 to 125 for the left (BFL) and the right (BFR). (Increments of 5mm) To maintain the same relation as the mounting surface, L and R are determined when viewed from the back of the backup surface (View B).

■ Spring specification

For double cam unit WCMS series, the pressure source can be selected. Either ISO type coil spring or gas spring (Kaller) can be selected.

● Breakdown of spring types

Spring Type	Working cam	Guide Cam
ISO	TJM32-152	TJM40-76
GK(by KALLER)	X350-50-7.0	X500-13-7.0

● Spring Force

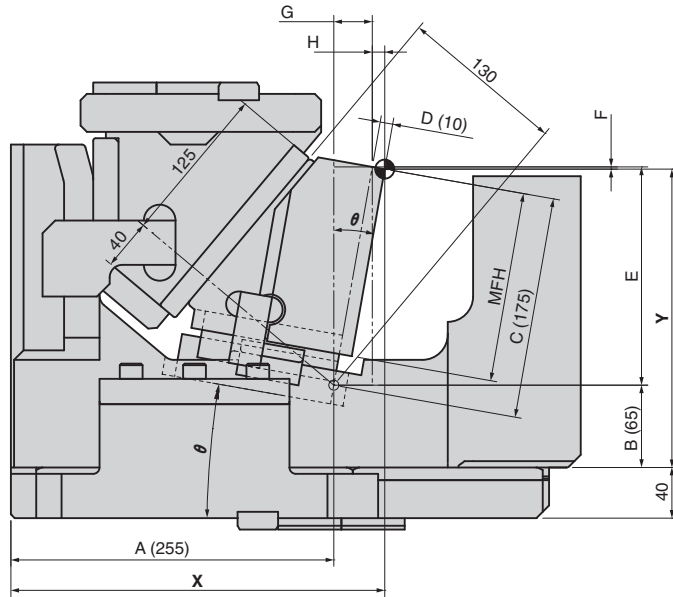
Spring Type		Initial Load N	Final Load N
ISO	For working cam TJM32-152(38.6N/mm)	424.6	1968.6
	For Guide Cam TJM40-76(105.3N/mm)	1263.6	1895.4
GK	For working cam X350-50-7.0	1407	2389
	For Guide Cam X500-13-7.0	2198	2720

General Description of Special Cam Unit Coordinates of reference point

DOUBLE CAM UNIT

Coordinates of working cam reference point

- Calculation of X and Y coordinates



$$X = A + C \times \sin \theta + D \times \cos \theta$$

$$Y = B + C \times \cos \theta - D \times \sin \theta$$

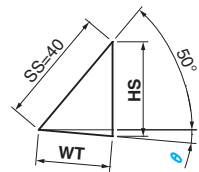
$$E = C \times \cos \theta = 175 \times \cos \theta$$

$$F = D \times \sin \theta = 10 \times \sin \theta$$

$$G = C \times \sin \theta = 175 \times \sin \theta$$

$$H = D \times \cos \theta = 10 \times \cos \theta$$

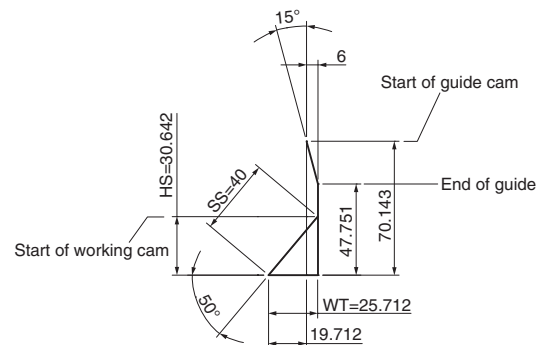
- Calculation of cam travel (WT) and press travel (HS)



$$HS = 40 \times (\sin 50 + \cos 50 \times \tan \theta)$$

$$WT = 40 \times \cos 50 / \cos \theta$$

- Cam diagram (Example of 0.0°)



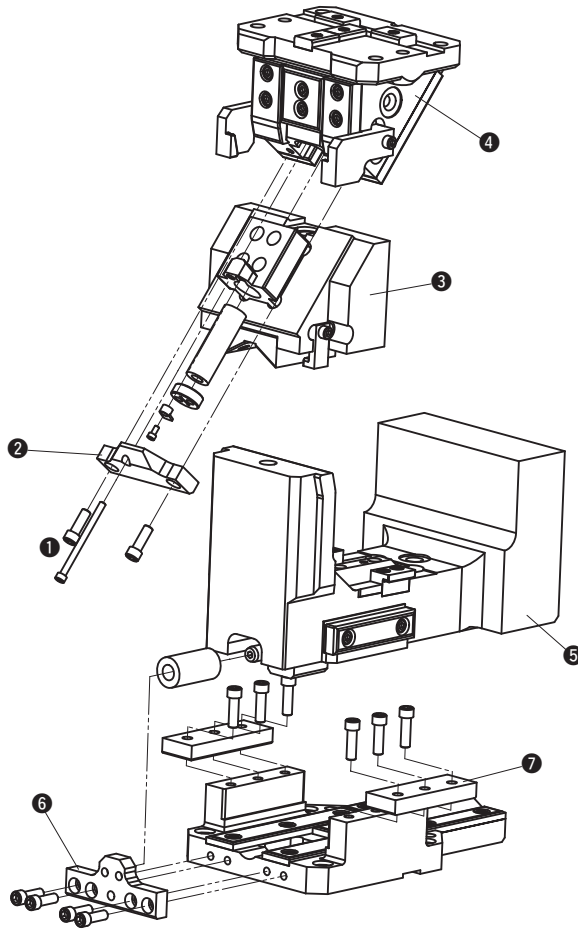
- Values of XY coordinates and cam diagram

θ	X	Y	MFH	WT	HS
0.0	265.000	240.000	140.0	25.712	30.642
0.5	266.527	239.906	140.0	25.712	30.866
1.0	268.053	239.799	140.0	25.715	31.091
1.5	269.578	239.678	145.0	25.720	31.315
1.6	269.882	239.653	145.0	25.722	31.360
1.7	270.187	239.626	145.0	25.723	31.405
1.8	270.492	239.600	145.0	25.724	31.450
1.9	270.797	239.572	145.0	25.726	31.495
2	271.101	239.544	145.0	25.727	31.540
2.1	271.406	239.516	145.0	25.729	31.585
2.2	271.710	239.487	145.0	25.730	31.630
2.3	272.015	239.458	145.0	25.732	31.674
2.4	272.319	239.428	145.0	25.734	31.719
2.5	272.624	239.397	145.0	25.736	31.764
2.6	272.928	239.366	145.0	25.738	31.809
2.7	273.233	239.335	145.0	25.740	31.854
2.8	273.537	239.303	145.0	25.742	31.899
2.9	273.841	239.270	145.0	25.744	31.944
3	274.145	239.237	145.0	25.747	31.989
3.1	274.449	239.203	145.0	25.749	32.034
3.2	274.753	239.169	145.0	25.752	32.079
3.3	275.057	239.134	145.0	25.754	32.124
3.4	275.361	239.099	145.0	25.757	32.169
3.5	275.665	239.063	145.0	25.760	32.214
3.6	275.969	239.027	145.0	25.762	32.259
3.7	276.272	238.990	145.0	25.765	32.304
3.8	276.576	238.953	145.0	25.768	32.350
3.9	276.880	238.915	145.0	25.771	32.395
4	277.183	238.876	145.0	25.774	32.440
4.5	278.700	238.676	145.0	25.791	32.665
5	280.214	238.463	145.0	25.810	32.891
5.5	281.727	238.236	150.0	25.830	33.118
6	283.238	237.996	150.0	25.853	33.344
6.5	284.746	237.743	150.0	25.878	33.571
7	286.253	237.477	150.0	25.905	33.799
7.5	287.757	237.198	150.0	25.933	34.027
8	289.258	236.905	150.0	25.964	34.255
8.5	290.757	236.600	150.0	25.997	34.484
9	292.253	236.281	150.0	26.032	34.714
9.5	293.746	235.950	150.0	26.069	34.944
10	295.237	235.605	150.0	26.108	35.175

General Description of Special Cam Unit

DOUBLE CAM UNIT

■ Structure and Assembly/Disassembly of WCMSH



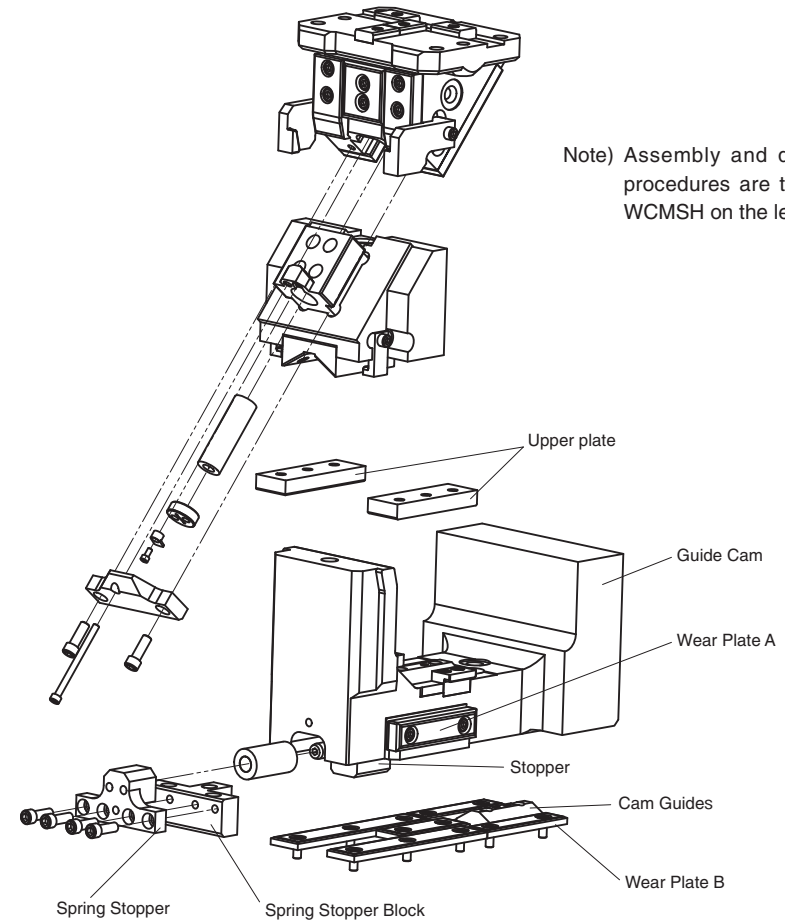
● Disassembly method of WCMSH

- 1) Remove hexagon socket head bolt (1) and remove stopper plate (2).
 - 2) Pull and remove cam slider (3) from cam holder (4) to the rear.
- * Guide cam (5) can be removed upward by removing stopper plate (6) and upper plate (7).

● Assembly method of WCMSH

- 1) Assemble components in the reverse order of disassembly.
 - Make sure that there is no foreign matter on the sliding area and assemble components.
 - The clearance between the cam slider and the cam holder is controlled. Match the stamped serial number on the holder and slider before assembly.
 - When cam is disassembled and then reassembled, please do not forget to assemble all bolts provided.

■ Structure and Assembly/Disassembly of WCMS



Note) Assembly and disassembly procedures are the same as WCMSH on the left page.

- The guide cam mounting surface (mounting surface of wear plate B) is machined for mounting the stopper and the spring stopper block.
- Guide plate A wall surface for forward/backward movement of the guide cam is provided. Fixing and sliding is controlled with the upper plate.

General Description of Special Cam Unit

DOUBLE CAM UNIT

■ Table of Components – WCM SH

No.	Description	Qty	Material and Remark	No.	Description	Qty	Material and Remark
①	Cam Holder A	1	FCD550	②⑥	Wear Plate	1	SESW75-75
②	Guide Cam	1	FCD550	②⑦	Key	8	SS400 LKU32-50-14
③	Cam Slider	1	FCD550	②⑧	Stopper	2	Urethane
④	Cam Holder B	1	FCD550	②⑨	Dowel Pin with Female Thread	8	SUJ2 φ 10-40
⑤	Cam Upper Plate	2	MCUF52-150	③⑩	Spring Plug	2	NH10
⑥	Side Plate	2	SESW38-150	③①	Hexagon Socket Head Bolt	6	SCM435 M10×30
⑦	Spring Guide Block	1	SO#50SP7	③②	Hexagon Socket Head Bolt	2	SCM435 M10×35
⑧	Cam Slide Guide	1	CBSPL65-100	③③	Hexagon Socket Head Bolt	16	SCM435 M10×25
⑨	Cam Slide Guide	1	CBSL65-100	③④	Hexagon Socket Head Bolt	4	SCM435 M10×40
⑩	Cam Slide Guide	1	S45C	③⑤	Hexagon Socket Head Bolt	2	SCM435 M10×50
⑪	Cam Slide Guide	1	SO#50SP2	③⑥	Hexagon Socket Head Bolt	4	SCM435 M12×30
⑫	Cam Stroke Plate	2	SO#50SP2	③⑦	Hexagon Socket Head Bolt	4	SCM435 M12×40
⑬	Slide Plate R	1	SO#220	③⑧	Hexagon Socket Head Bolt	6	SCM435 M12×35
⑭	Slide Plate L	1	SO#220	③⑨	Hexagon Socket Head Bolt	1	SCM435 M 8×110
⑮	Positive Return Block	2	S45C	④⑩	Hexagon Socket Head Bolt	8	SCM435 M 8×15
⑯	Positive Return	2	SP2	④①	Hexagon Socket Head Bolt	1	SCM435 M 6×16
⑰	Positive Return R	1	SP2	④②	Hexagon Socket Head Bolt	2	SCM435 M10×45
⑱	Positive Return L	1	SP2	④③	Hexagon Socket Brazier Head Bolt	12	SCM435 M10×20
⑲	Spring Stopper A	1	S45C	④④	Lock Plate	1	S45C
⑳	Stopper Plate	1	S45C	④⑤	Hexagon Socket Head Bolt	2	SCM435 M12×35
㉑	Spring Stopper B	1	S45C	④⑥	Spring Guide Pin	1	S45C ISO Specification only
㉒	Stopper	1	S45C	④⑦	Spring	1	Refer to Page 1622
㉓	Wear Plate	2	TWX38-150	④⑧	Spring Guide Pin	1	S45C ISO Specification only
㉔	Wear Plate	2	TWX48-250	④⑨	Spring	1	Refer to Page 1622
㉕	Wear Plate	1	TWX48-125				

■ Table of Components – WCM S

No.	Description	Qty	Material and Remark	No.	Description	Qty	Material and Remark
②	Guide Cam	1	FCD550	②⑥	Wear Plate	1	SESW75-75
③	Cam Slider	1	FCD550	②⑦	Key	4	SS400 LKU32-50-14
④	Cam Holder B	1	FCD550	②⑧	Stopper	2	Urethane
⑤	Cam Upper Plate	2	MCUF52-150	②⑨	Dowel Pin with Female Thread	6	SUJ2 φ 10-40
⑥	Side Plate	2	SESW38-150	③⑩	Spring Plug	2	NH10
⑦	Spring Guide Block	1	SO#50SP7	③①	Hexagon Socket Head Bolt	4	SCM435 M10×30
⑧	Cam Slide Guide	1	CBSPL65-100	③②	Hexagon Socket Head Bolt	2	SCM435 M10×35
⑨	Cam Slide Guide	1	CBSL65-100	③③	Hexagon Socket Head Bolt	16	SCM435 M10×25
⑩	Cam Slide Guide	1	S45C	③④	Hexagon Socket Head Bolt	4	SCM435 M10×40
⑪	Cam Slide Guide	1	SO#50SP2	③⑤	Hexagon Socket Head Bolt	2	SCM435 M10×50
⑫	Cam Stroke Plate	2	SO#50SP2	③⑦	Hexagon Socket Head Bolt	4	SCM435 M12×30
⑬	Slide Plate R	1	SO#220	③⑧	Hexagon Socket Head Bolt	6	SCM435 M12×35
⑭	Slide Plate L	1	SO#220	③⑨	Hexagon Socket Head Bolt	1	SCM435 M 8×110
⑮	Positive Return Block	2	S45C	④⑩	Hexagon Socket Head Bolt	4	SCM435 M 8×15
⑯	Positive Return	2	SP2	④①	Hexagon Socket Head Bolt	1	SCM435 M 6×16
⑰	Positive Return R	1	SP2	④②	Hexagon Socket Head Bolt	2	SCM435 M10×45
⑱	Positive Return L	1	SP2	④③	Hexagon Socket Brazier Head Bolt	12	SCM435 M10×20
⑲	Spring Stopper A	1	S45C	④④	Lock Plate	1	S45C
⑳	Stopper Plate	1	S45C	④⑤	Hexagon Socket Head Bolt	2	SCM435 M12×35
㉑	Spring Stopper B	1	S45C	④⑥	Spring Guide Pin	1	S45C ISO Specification only
㉒	Stopper	1	S45C	④⑦	Spring	1	Refer to Page 1624
㉓	Wear Plate	2	TWX38-150	④⑧	Spring Guide Pin	1	S45C ISO Specification only
㉔	Wear Plate	2	TWX48-250	⑤①	Spring	1	Refer to Page 1624
㉕	Wear Plate	1	TWX48-125	⑤②	Spring Stopper Block	1	S45C

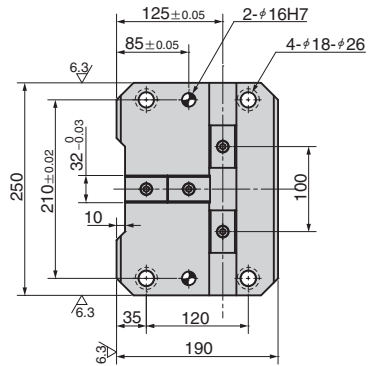
Double Cam Unit

WITHOUT HOLDER

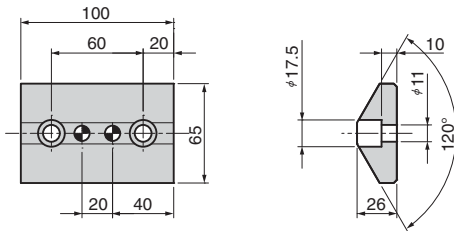


WCMS

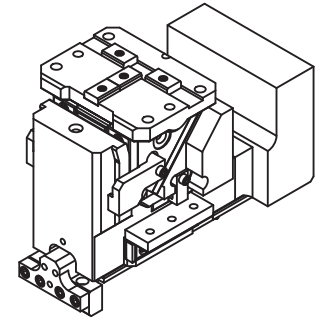
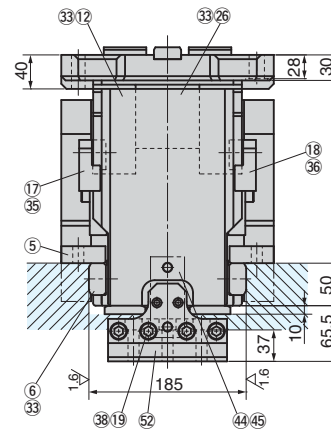
■ X Y Coordinates (Refer to page P.000)



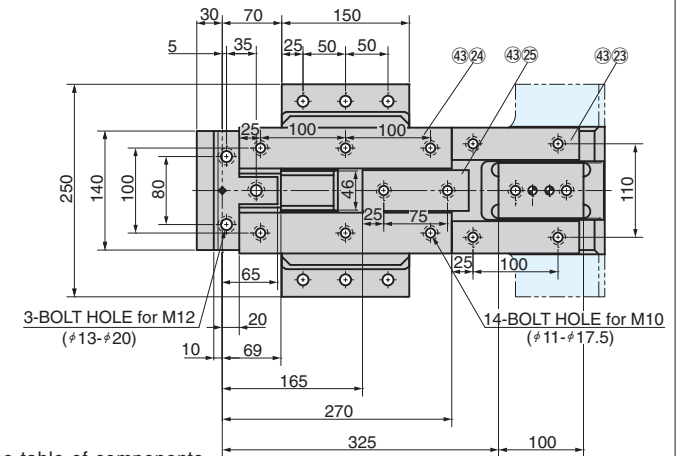
■ Cam Slide Guide(8)



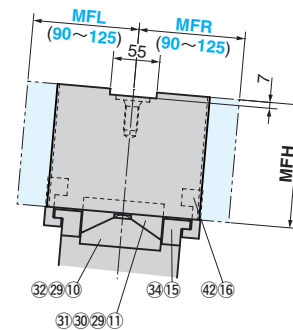
Arrow A View



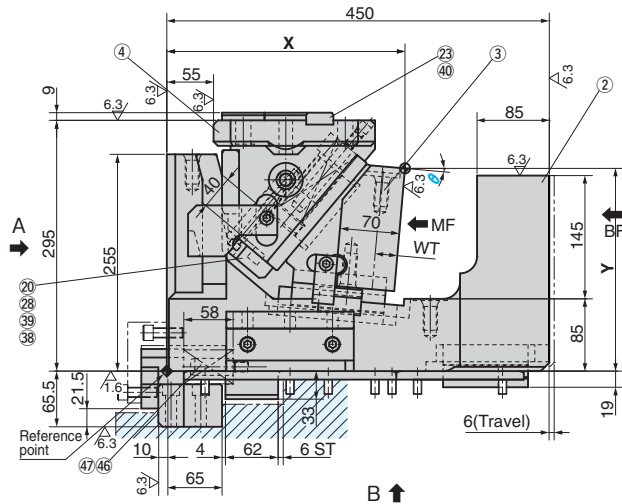
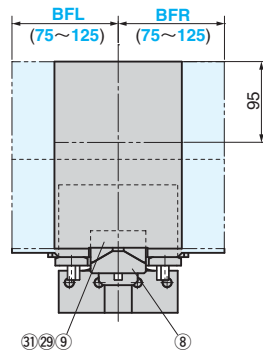
Arrow B View



• Mount Face(MF View)



• Backup Face(BF View)



Refer to page 1780 for the table of components, and page 1785 for details of the cam diagram.

Catalog No.	Nominal	Mounting Surface Increments of 5mm		*θ Increments of 0.5°	Backup Surface Increments of 5mm		*PS Spring Type
		MFL	MFR		BFL	BFR	
WCMS	250	90~125	90~125	0.0~10.0	75~125	75~125	ISO·GK

Order **Catalog No.** **Nominal** - **MFL** - **MFR** - **θ** - **BFL** - **BFR** - **PS**
WCMS **250** - **100** - **90** - **5.0** - **100** - **90** - **ISO**

*θ The angle can be specified at increments of 0.1° from 1.6° to 3.9°.
 *PS Refer to page 1784 (or page 1774) for the spring type specification.

■ Spring specifications

Spring Type(PS)	Working Cam Spring Force N		Guide Cam Spring Force N	
	Initial Load	Final Load	Initial Load	Final Load
ISO	424.6	1968.6	1263.6	1895.4
GK	1407	2389	2198	2720

* ISO... For Working Cam TJM32-152(38.6N/mm)
 For Guide Cam TJM40-76(105.3N/mm)

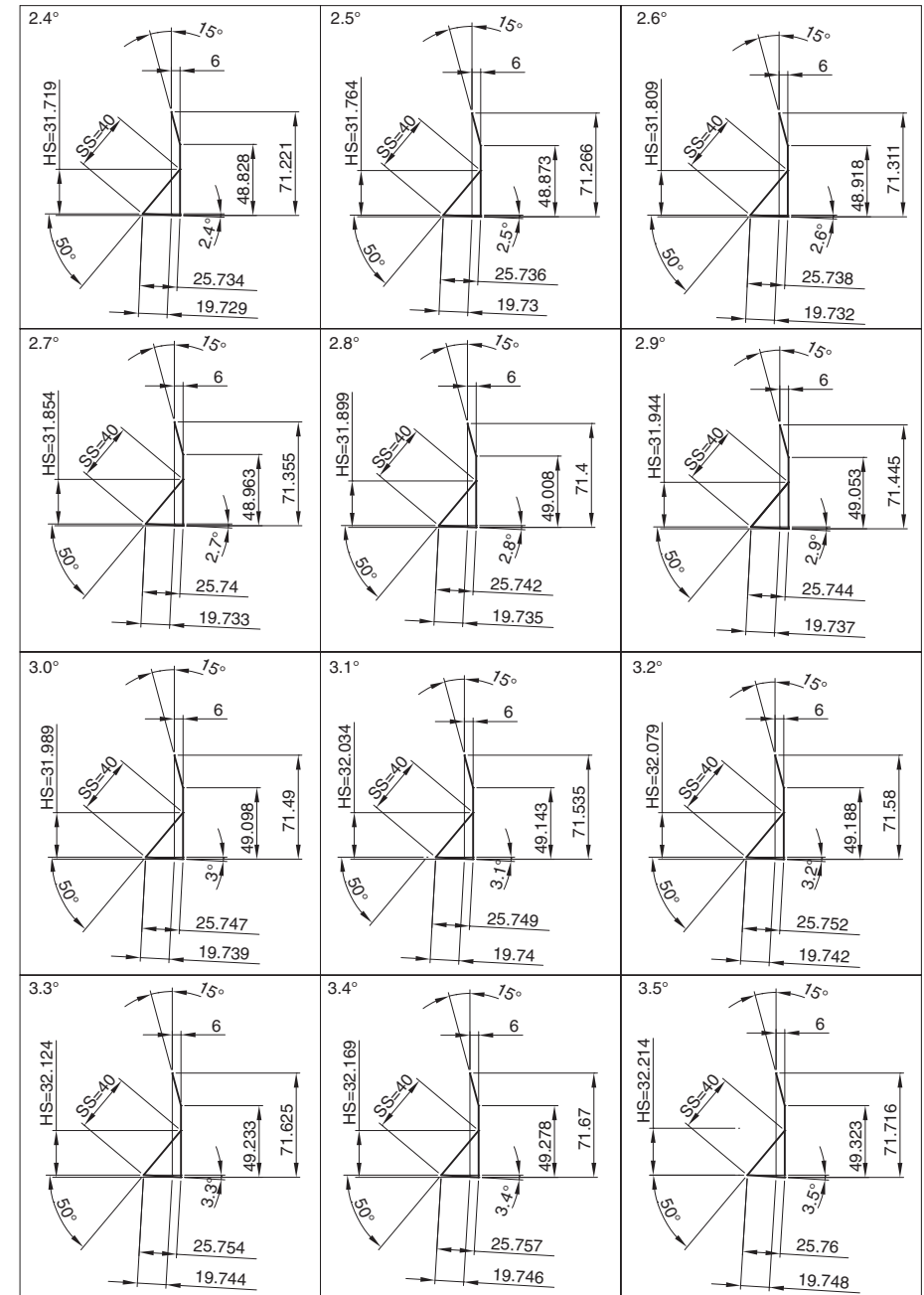
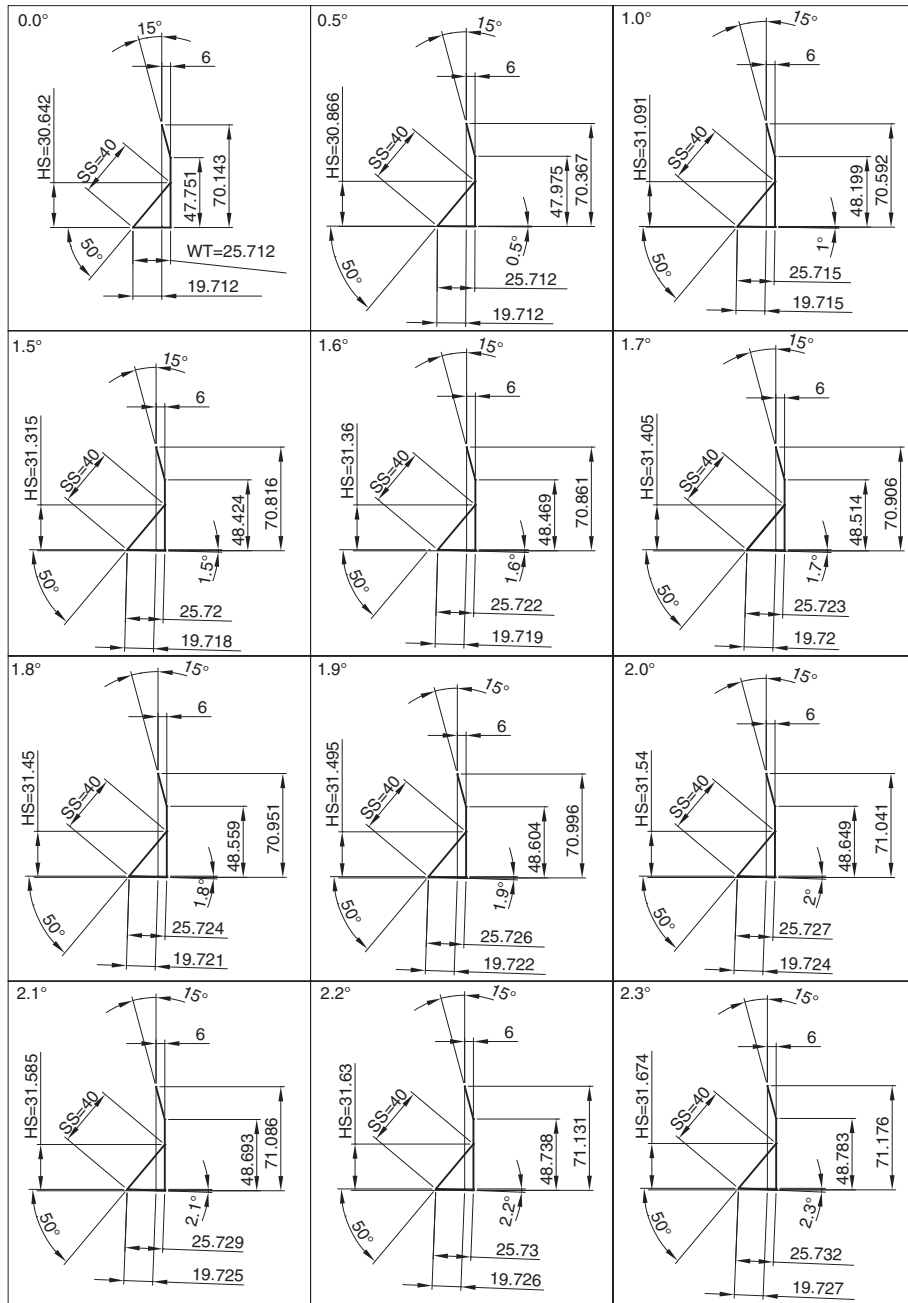
■ Working force (working cam)

98kN

* GK... For Working Cam X350-50-7.0
 For Guide Cam X500-13-7.0

Double Cam Unit

CAM DIAGRAM



Double Cam Unit

CAM DIAGRAM

