

KOYO ENGINEERING

PRODUCT CATALOGUE Rev.3



Heart & Technology



Heart & Technology

The Koyo Philosophy

Craftsmanship with Heart and Technology.

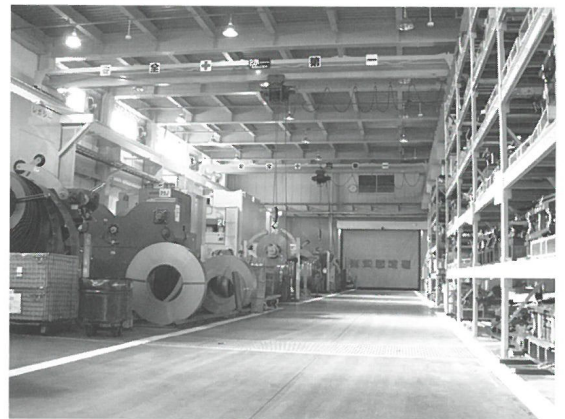
Koyo has over the past 100 years created and manufactured a wide variety of functional components that make the furniture and equipment we use today more user friendly.

Our mission is to blend Heart and Technology to make a contribution to Global markets through a corporate focus on human values, developing products of superior quality & safety.

We will continue to work hard to win the trust and respect of our customers and the partners all over the world.



KOYO HEADQUARTERS (OSAKA/JAPAN)



KOYO PRESS FACILITY (OSAKA/JAPAN)



CHINA FACILITY (GUANGDONG)



ISO 9001 Certified

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LEGMAN

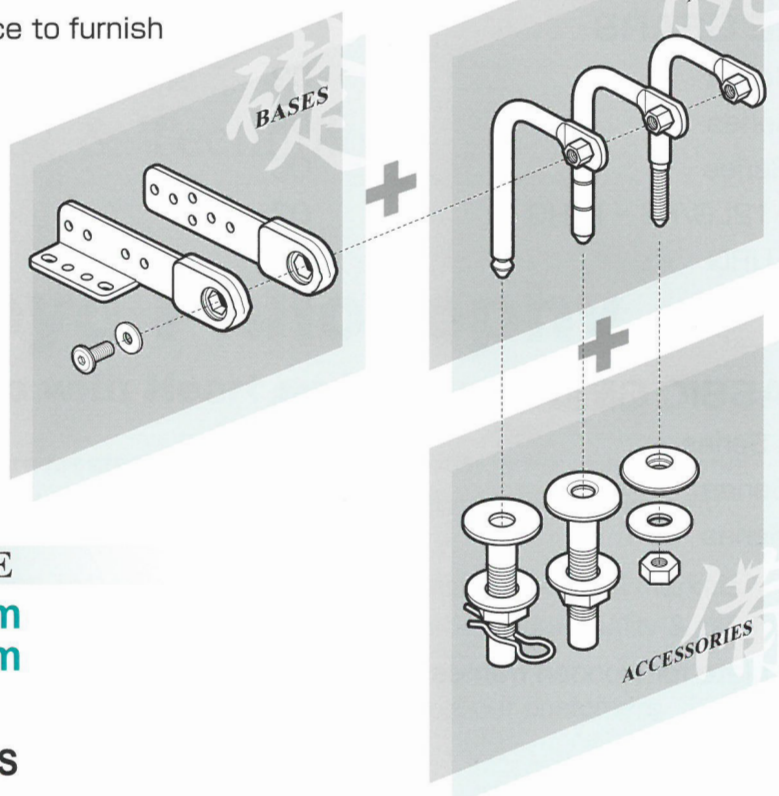
KV	18
KVS	19
KVI	20
KUS/KU	20

Dimensional data not binding. We reserve the right to alter specifications without prior notice.

LS Series

Variable selection of the parts meets your ideal sofa shape.

All you wanted is to have a choice to furnish
& to adjust the angle required



POWERFUL & DURABLE

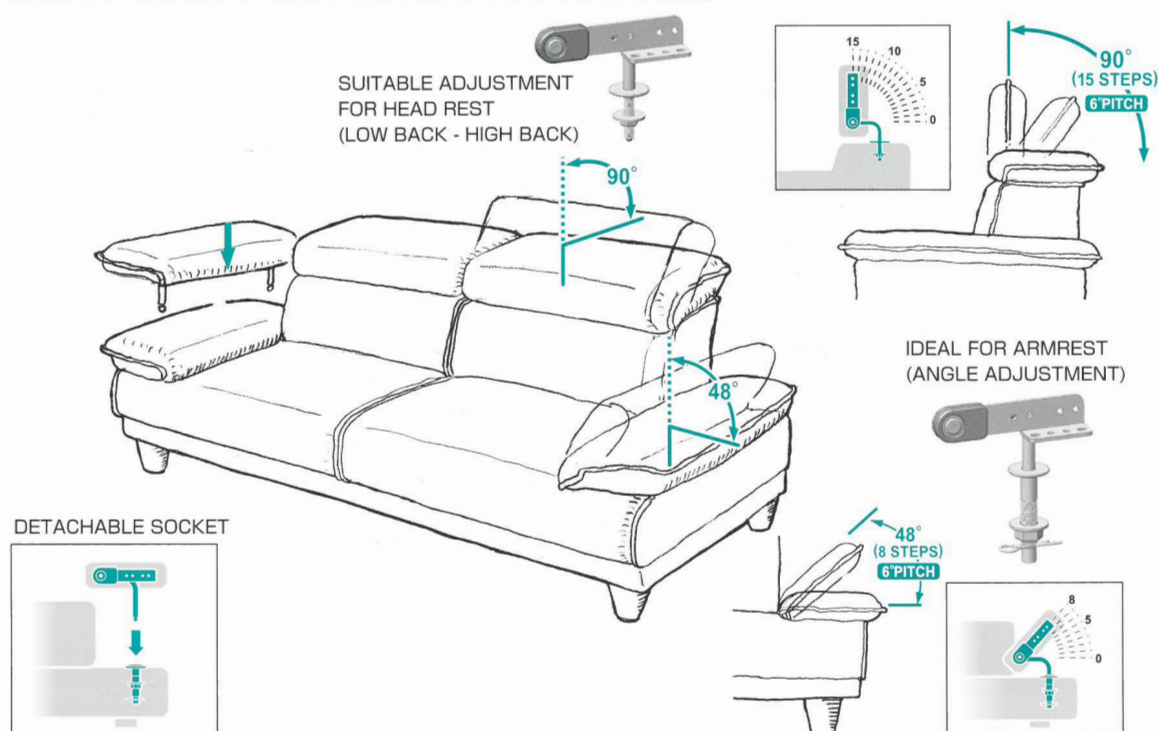
DURABILITY (SAFE LOAD) **LS200** → **200N·m**
LS300 → **300N·m**

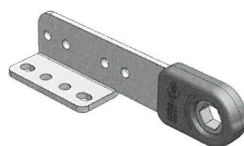
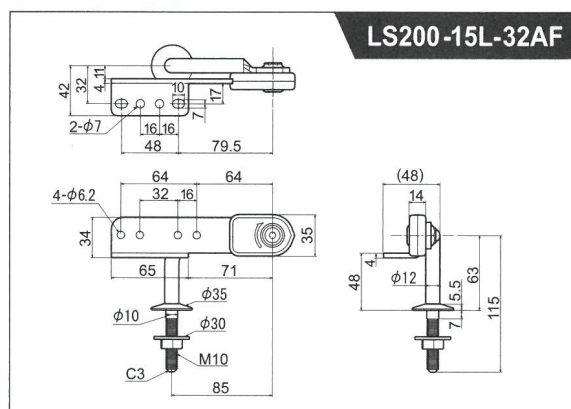
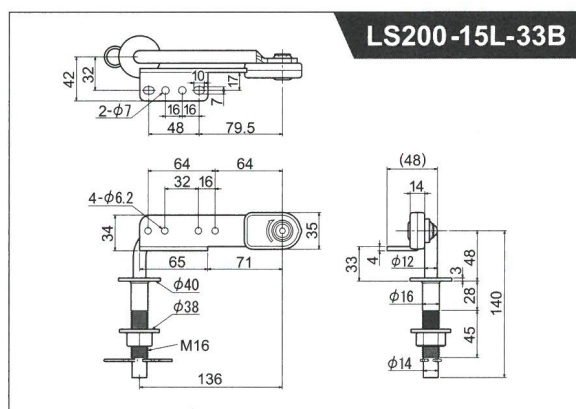
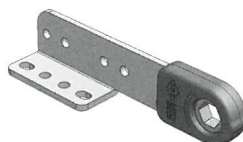
MORE THAN
REPETITION **50,000** CYCLES

PACKING SPEC

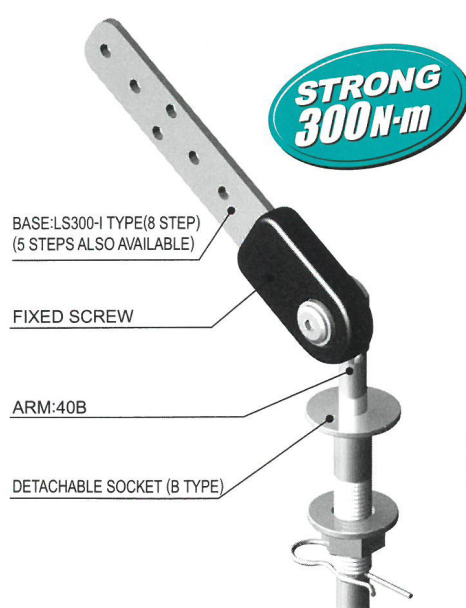
	Set / Carton	Weight / Set(kg)	Weight / Carton(kg)	L×W×H/Carton(mm)
LS200-15L-33B	15	1.2	18.5	250×330×200
LS200-12-32AF	15	0.9	14	250×330×160

"HOW TO USE" & "HOW IT MOVES" (3 DIFFERENT MOTION PATTERNS)



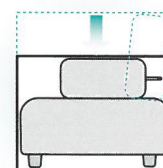
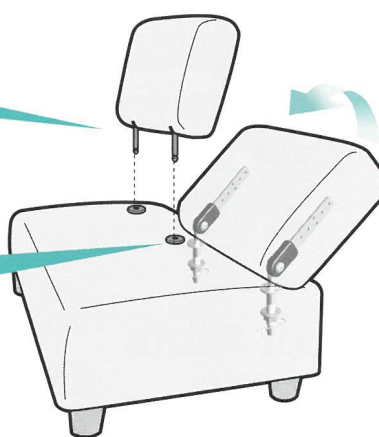
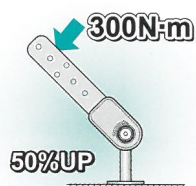
LS200-15L-33B**LS200-12L-32AF****LS300-8I-40B**

Ideal for Back Rest or Large Sized Arm Rest



EASIER DETACHABLE MECHANISM

50% MORE DURABLE THAN STANDARD MODEL



For further information, See LS.IS Gear Catalogue Rev2.

I S Series

Main Features

1. Silent click gear
2. Secured by design: Complete protection for the mechanism inside
3. Easier to assemble with a universal design
4. Developed only for wooden frame sofa's reclining function

fine gear
World-Wide Patents
Acquired

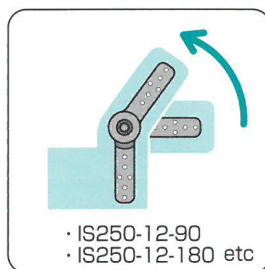
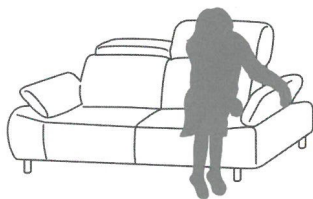


PAT.No.4053049
PAT.No.3766669
PAT CHINA,EU,U.S,TAIWAN

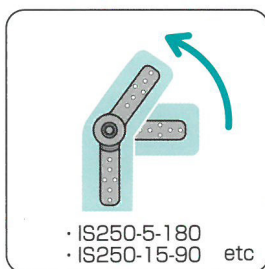
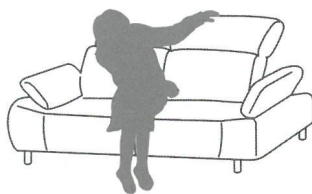
Thickness	15mm
Durability	250N·m
Pitch	6°
Cosmetics	Complete Symmetry
OEM	Possible for different motion patterns/steps

Durability	Weight/pc	PCS/Carton	Weight/Carton	L × W × H / Carton
210N · m	310g	50	16kg	260×330×110

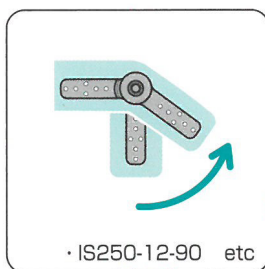
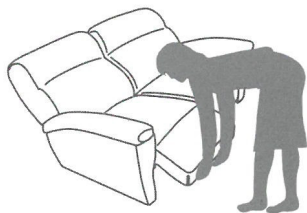
For Arm Rests

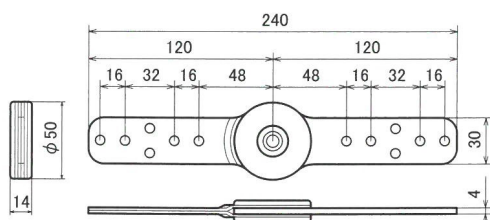
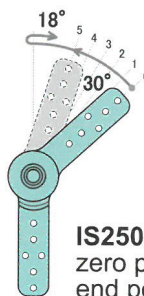


For Head Rests

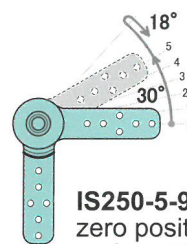


For Foot Rests

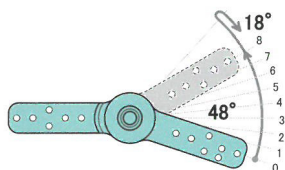


5
STEPS

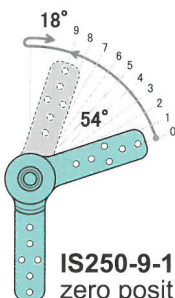
IS250-5-132
zero position=132°
end position= 162°



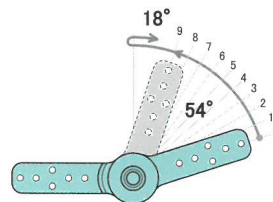
IS250-5-90
zero position= 90°
end position= 120°

8
STEPS

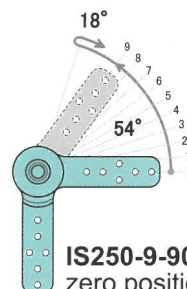
IS250-8-162
zero position=162°
end position= 210°

9
STEPS

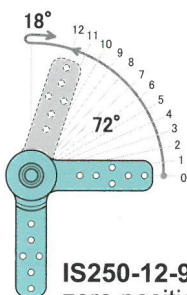
IS250-9-108
zero position=108°
end position= 162°



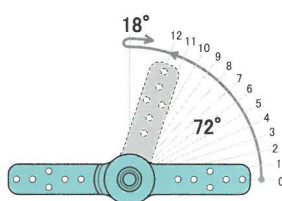
IS250-9-198
zero position=198°
end position= 252°



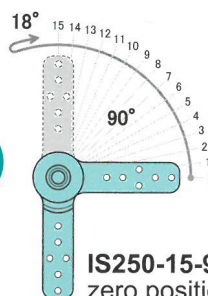
IS250-9-90
zero position=90°
end position= 144°

12
STEPS

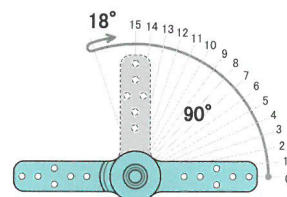
IS250-12-90
zero position=90°
end position= 162°



IS250-12-180
zero position=180°
end position= 252°

15
STEPS

IS250-15-90
zero position=90°
end position= 180°



IS250-15-180
zero position=180°
end position= 270°

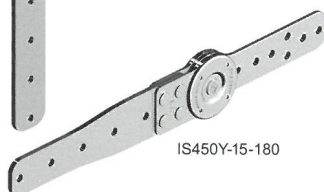
IS450X-15-90 IS450Y-15-180

IS Gear More Powerful Model

STRONG 450N·m

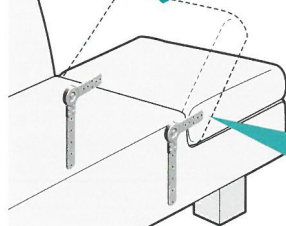


IS450X-15-90



IS450Y-15-180

900N·m
(450N × 2PCS)



IDEAL FOR BACK REST
OR LARGE SIZED ARM REST

THE 1.8 TIMES STRONGER
GEAR THAN OUR REGULAR
MODEL FEEL ASSURED TO
USE FOR THE LARGE
ARM REST

IS250-SS45-15-90

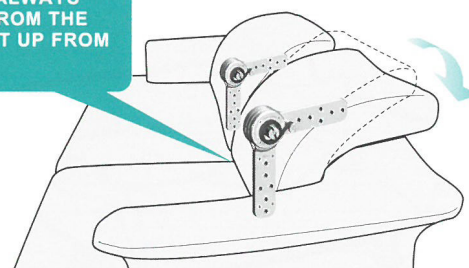
IS Gear with a Spiral Spring Installed

Preventing an Incorrect
Movement from Pulling Strength
of the Upholstry



IDEAL SOLUTION FOR BACK REST
OR ARM REST

THE SPRING ALWAYS
PUSH BACK FROM THE
FORCE TO LIFT UP FROM
THE CUSHION

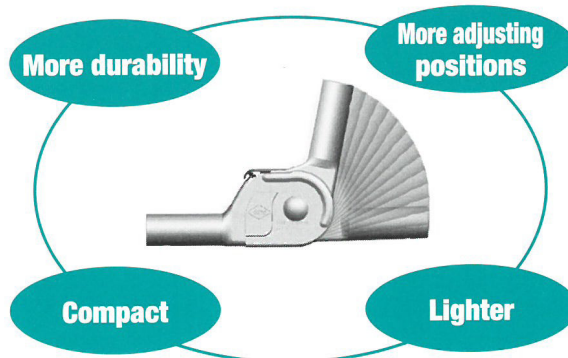


For further information, See LS.IS Gear Catalogue Rev2.

KS Series

INNOVATIVE RECLINING SYSTEM

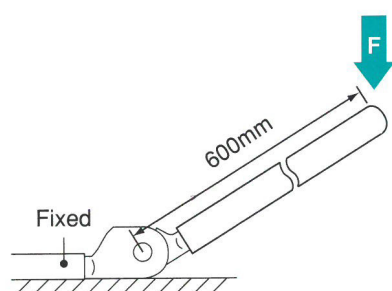
Refined 14 adjusting positions, more flexibility with more strength, and durability.



PAT. No. 3766669 JAPAN
PAT. No. 234443 TAIWAN
PAT. P CHINA, EU, U.S.

LOADING TEST

Product name	Safe load / pc	
KS-12LG	210 N·m	35kg (600mm)
KS-16HG	270 N·m	45kg (600mm)
KS-URG	270 N·m	45kg (600mm)
KS-AMG	360 N·m	60kg (600mm)



Static Loading Test (Single Gear)

Set 2 pcs of "KS 12LG" at 6th positions (at 32 degree) .

Put a load vertical weight at the 600mm point from the center of gear.

Example of Calculation :

Set 2 pcs of "KS 12 LG" gear, measure the load at a distance of 500mm from the center of gear.

$$\frac{35\text{kg} \times (600 \div 500\text{mm}) \times 2\text{pcs}}{\text{From chart} \quad \text{Distance from the center of gear} \quad \text{The number of gear}} = 84\text{kg}$$

Cycle Test : 10,000 repetitions (15 Cycles /Min.)

NOTE

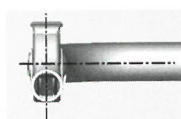
Install a gear at right-angled to pipe frame. ※1

Do not weld onto the area of oblique area, it may cause mechanical problem. ※2

Be careful not to melt inside plastic part when you weld pipe.

When you release the lock of gear, put firmly the back seat forward, then put it back to flat. ※3

※1

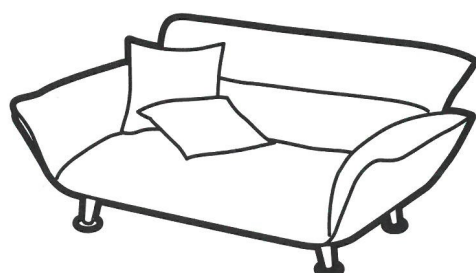
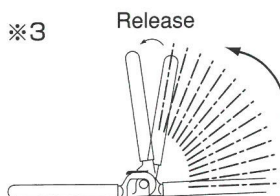


Right-angled

※2



※3

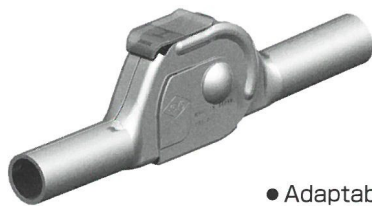


Plastic cover for safety



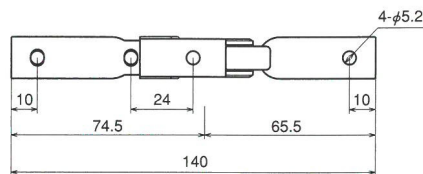
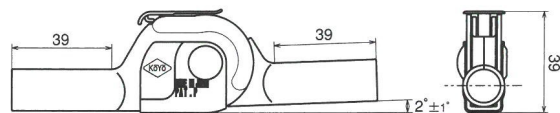
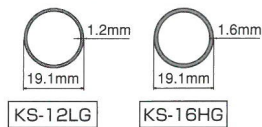
Round shape minimize floor damage

KS-12LG/KS-16HG



● Adaptable frames

- For tubular frames.
- Weight : KS-12LG 140g
KS-16HG 170g
- Finish : Raw steel

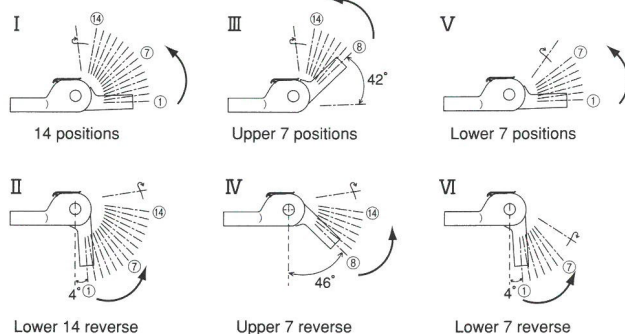


1.2 type $\phi A=16$
1.6 type $\phi A=15$

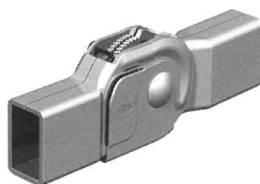
Item No.	Product name	Motions
126001	KS-12LG	I
126003	KS-12LG Upper 7 positions	III
126004	KS-12LG Lower 7 positions	V
126005	KS-12LG Upper 7 reverse	IV
126006	KS-12LG Lower 7 reverse	VI
126011	KS-12LG Lower 14 reverse	II
126102	KS-16HG	I

PCS/Carton	Weight/Carton (kg)	L×W×H/Carton (mm)
100	14.5 (1.2) / 17.5 (1.6)	260×330×145

◆ Motion Patterns (6°/1 Position)

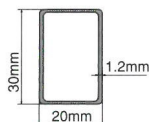


KS-URG



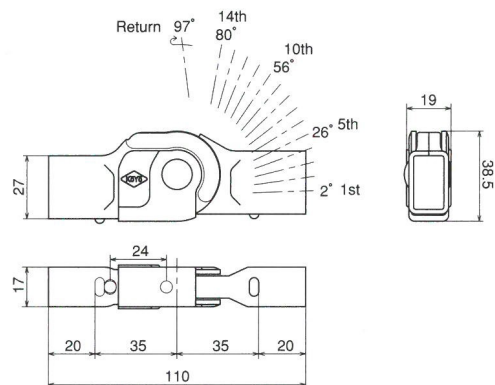
● Adaptable frames

- For square frames
- Weight : 180g
- Finish : Raw steel

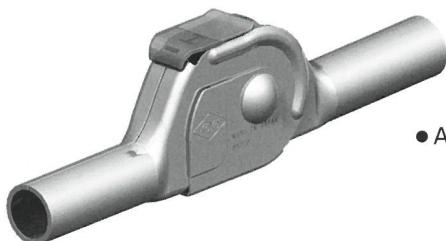


Item No.	Product name
126301	KS-URG

PCS/Carton	Weight/Carton (kg)	L×W×H/Carton (mm)
100	19.0	260×330×145

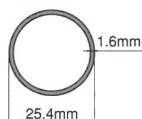


KS-AMG



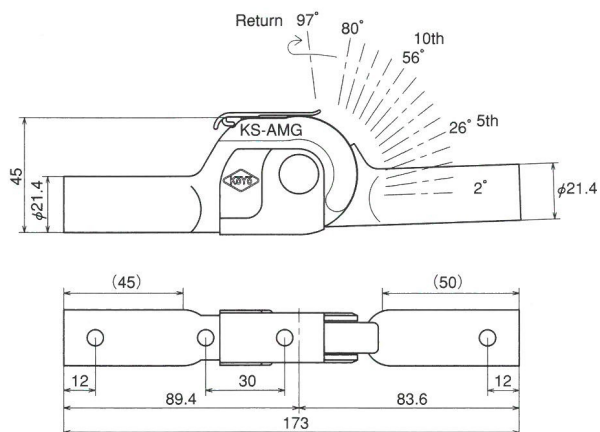
● Adaptable frames

- For inch tubular frames
- The most durable fine gear
- Weight : 280g
- Finish : Raw steel



Item No.	Product name
126201	KS-AMG

PCS/Carton	Weight/Carton (kg)	L×W×H/Carton (mm)
50	14.5	260×330×145



◆CLASSIC GEARS

PRODUCT CODE

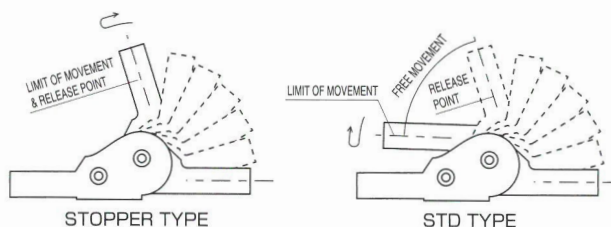
EX.) **KDS-6 1.2 STOPPER**

SERIES APPLICABLE PIPE THICKNESS MOVEMENT TYPE

NUMBER OF ADJUSTING POSITIONS

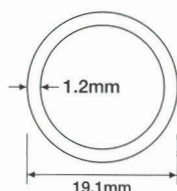
MOVEMENT TYPE

There are two types of movement, STOPPER type and STD type.

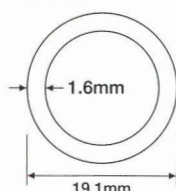


FITTABLE TUBE SIZE

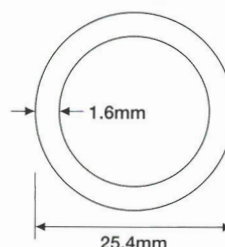
KDS-6 1.2/KLS-1.2



KDS-6 1.6/KD-6 1.6
KL-1.6/KHS-6/KJ-6



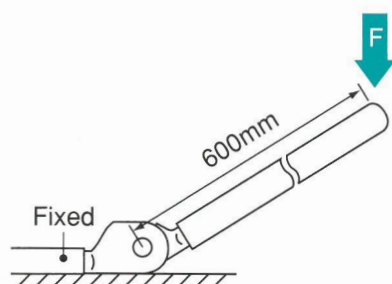
AC-6



Note : Those tube thickness indicate your tube's thickness

LOADING TEST

	Product name	Safe load / pc	
Ratchet Gear	KDS-6 1.2	180 N·m	30kg (600mm)
	KDS-6 1.6	240 N·m	40kg (600mm)
	KD-6	300 N·m	51kg (600mm)
	KL	300 N·m	51kg (600mm)
Lever Type Gear			



Static Loading Test (Single Gear)

①Set 3rd position of a gear.

Note : The chart indicate safe load point.

②Load vertical weight at the 600mm point from the center of gear.

Example of Calculation :

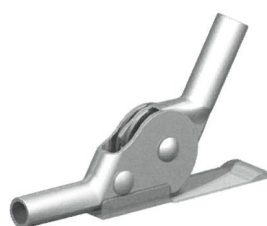
Set 2 pcs "KDS-6 1.2 " gears, measure the load at a distance of 500mm from the center of gear.

$$30\text{kg} \times (600 \div 500\text{mm}) \times 2\text{pcs} = 72\text{kg}$$

From chart Distance from the center of gear The number of gear



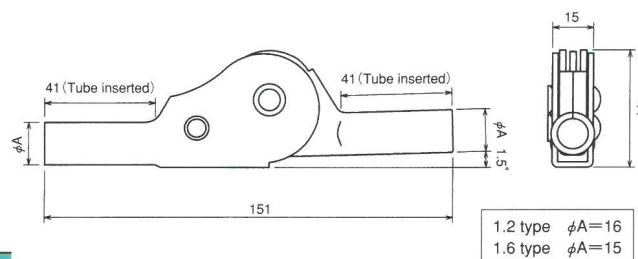
Finish : Raw steel



With KDS Plastic cover

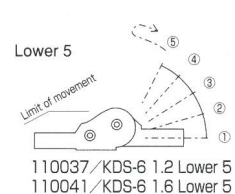
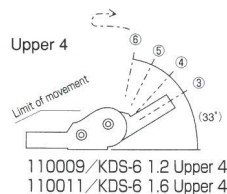
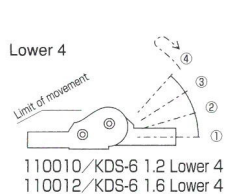
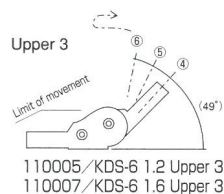
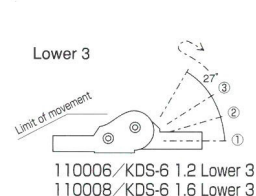
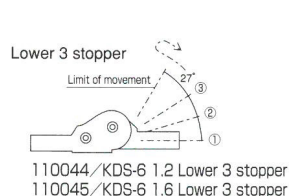
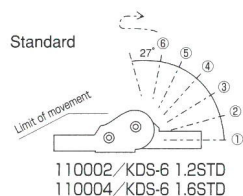
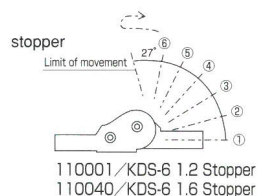
- Floor protection
- Prevention for catching texture

Long-time seller product for reclining.

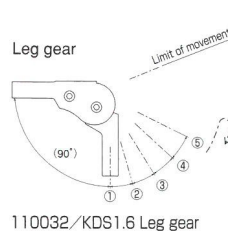
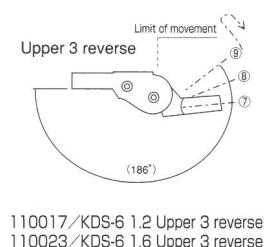
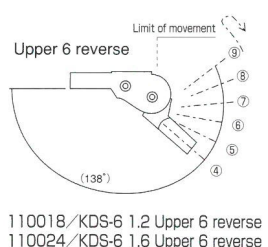
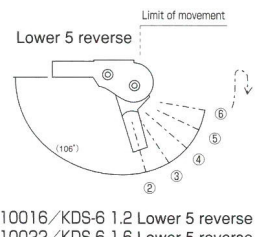
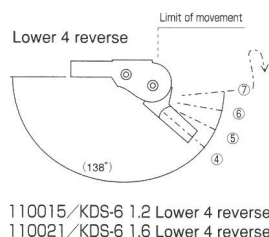
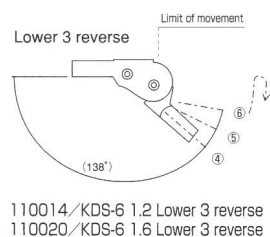
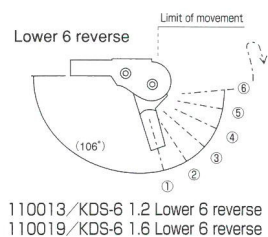


PCS/Carton	Weight/pc (kg)	Weight/Carton (kg)	L×W×H/Carton (mm)
100	0.2	21	260×330×170

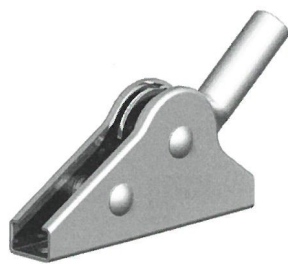
◆Motion Patterns (16°/1Position)



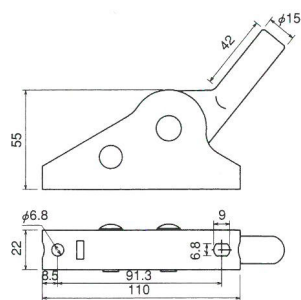
◆Reverse type/Motion Patterns (16°/1Position)



Example of using reverse gear for foot rest.

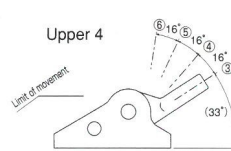


Finish : chrome

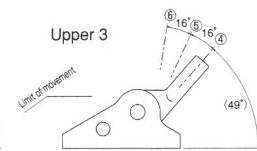


For wooden frames.

◆Motion Patterns



●Item No. : 114003



●Item No. : 114001/114002

Item No.	Product name
114001/114002	KL-3 1.6STD (R) / (L)
114003	KL-4 1.6STD (R/L)

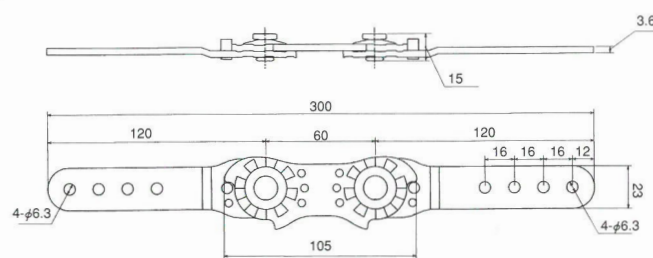
PCS/Carton	Weight/pc(kg)	Weight/Carton(kg)	L×W×H/Carton(mm)
100	0.28	29	310×360×190

KA Series

◆KA-90
KA-90B

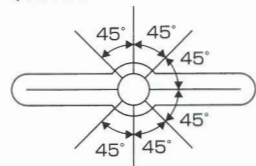


◆KA-180



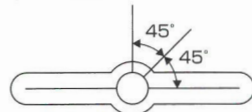
◆Motion Patterns

◆KA-90



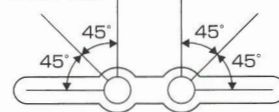
●Item No. : 115019

◆KA-90B



●Item No. : 115020

◆KA-180



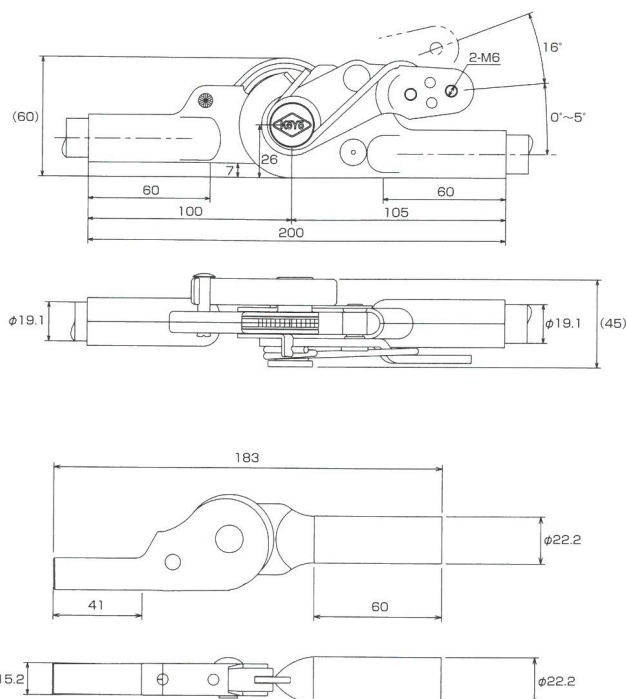
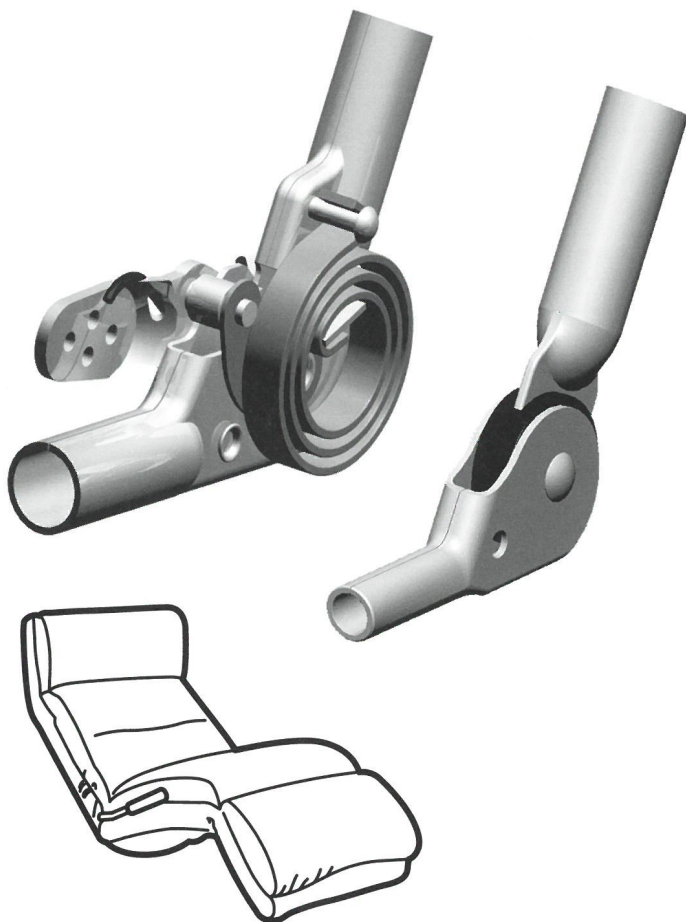
●Item No. : 115018

Item No.	Product name	PCS/Carton	Weight/pc(kg)	Weight/Carton(kg)	L×W×H/Carton(mm)
115018	KA-180	100	0.2	21	260×330×190
115019	KA-90	100	0.17	18	260×330×190
115020	KA-90B	100	0.17	18	260×330×190

●Finish : Uni-chrome

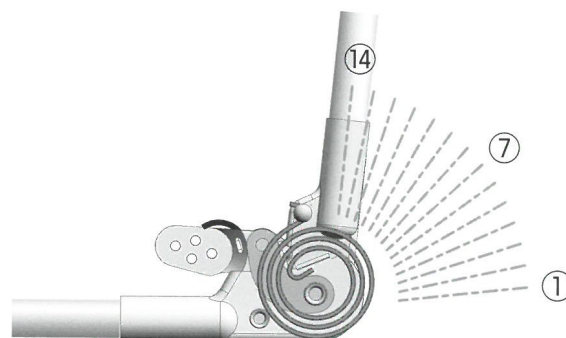
◆RECLINING WITH LEVER

KX-14



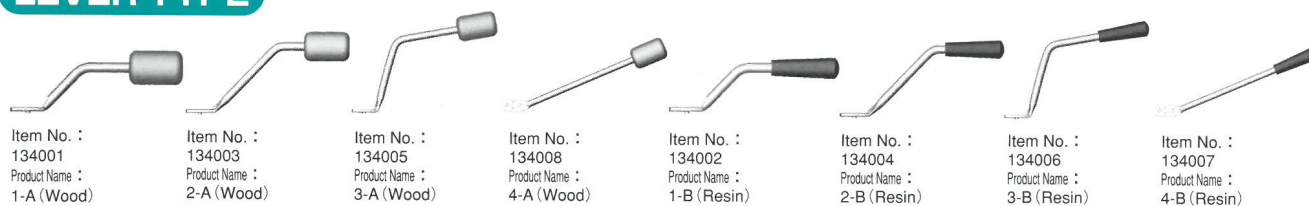
■SPECIFICATION

STEPS: 14 STEPS WITH 6° PITCH
 LOADING CAPACITY: 420Nm (70kgs at 0.6m)
 TOTAL WEIGHT: 0.67kgs
 TYPE: LEFT/RIGHT HANDED



14 STEPS(6°/pitch) ADJUSTABLE WITH A LEVER

LEVER TYPE

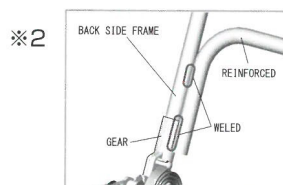
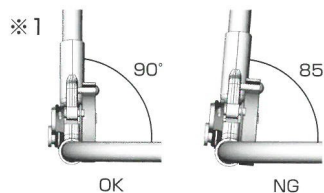


⚠ CAUTION ON WELDING

- Weld the gear at 90° vertical to pipe frame as show (See ※1 right)
- Reinforced frame at back side needed.
- Weld the pipe and the gear as shown ※2 right, which enable the frame structure stiffness stronger.

⚠ CAUTION IN USE

- Be careful about the back side at the time of return to the upright position after you pull the lever. (During the assembling)
- Do not pull the lever when you lean on the back side.
- Do not lean on the back without fixing the lever downward.
- Use your hands to move upward if the upper top step catches the gear with difficulties.



◆SWIVEL

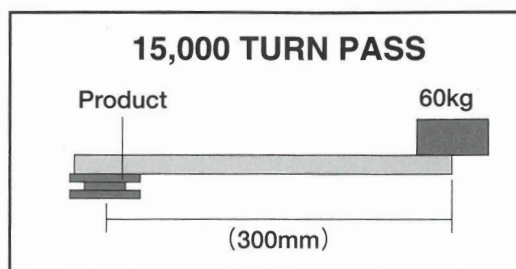
Our original production expertise realizes smooth rotation and low noise.
Our swivels are used for dining chairs, massage chairs and sofa for a person.
The durability and reliability are far beyond any other swivels.

TESTS

■LOAD TEST

Loading 60kg weight at the point of 300mm or 250mm from the center of a swivel, and rotate 38 rpm.

SWIVEL	ROTATION / DISTANCE FROM CENTER
LIGHT	CLEAR 10,000 CYCLES / 250mm
STD	CLEAR 10,000 CYCLES / 250mm
RR	CLEAR 15,000 CYCLES / 250mm
185 PITCH	CLEAR 15,000 CYCLES / 300mm



■VERTICAL LOAD TEST

Test the condition of each swivel loaded 150kg weight at the center.
Irregular noise and other abnormal matter do not appear to all swivels.

■FREE FALL TEST

Test the condition of each swivel free-fallen from the 200mm height.
Appearance and function are not damaged.



SUITABLE SWIVEL

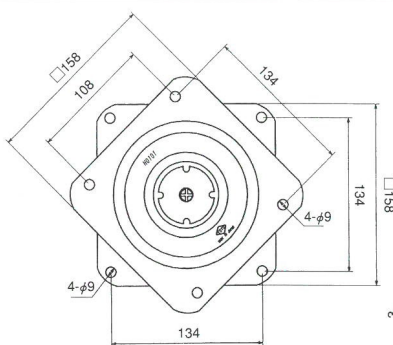
WIDTH OF CHAIR	SWIVEL
LESS 500mm	LIGHT
500mm	STD
600mm	RR
800mm	185 PITCH

Note : This data is only a reference for your choice of swivel.
After assembling it to the chair, please inspect it once again
before shipping to the market.

LIGHT

STD

RR



◆LIGHT

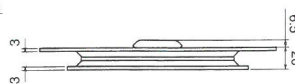
- The best choice for less than 450mm wide chair.

◆STD

- The best choice for less than 500mm wide chair.

◆RR

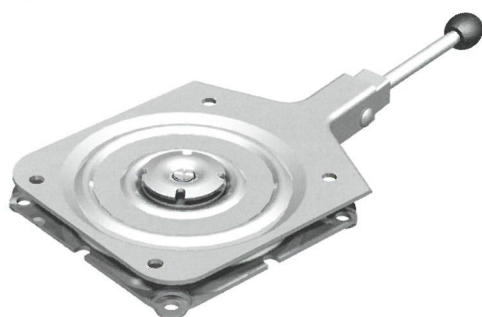
- The best choice for less than 600mm wide chair.



Finish : Uni-chrome
(LIGHT : Chromate plating)

Item No.	Product name	PCS/Carton	Weight/pc(kg)	Weight/Carton(kg)	LxWxH/Carton(mm)	Spec.
116003	LIGHT	20	1.1	22.3	255×330×190	360°(120°/180° stoppable)
116001	STD	20	1.32	26.6	255×330×190	360°(120°/180° stoppable)
116002	RR	20	1.35	27.3	255×330×190	360°(120°/180° stoppable)

COMBO



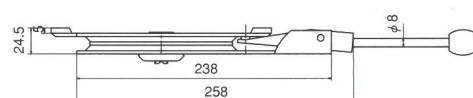
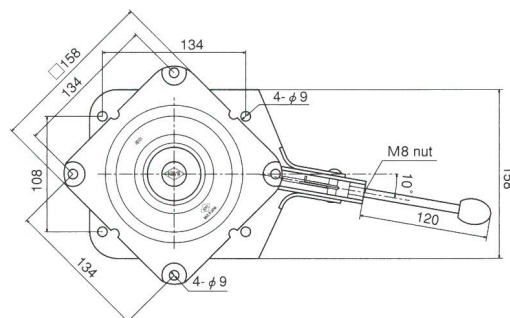
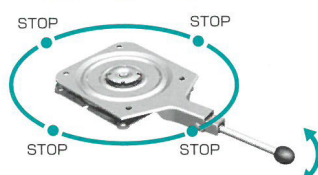
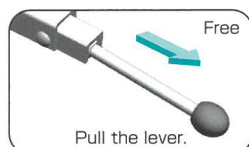
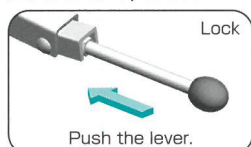
◆COMBO

- The combination of 360° free swivel and 90°×4 locking.

◆LEVER STOP

- 90°×4 locking swivel by lever operation.

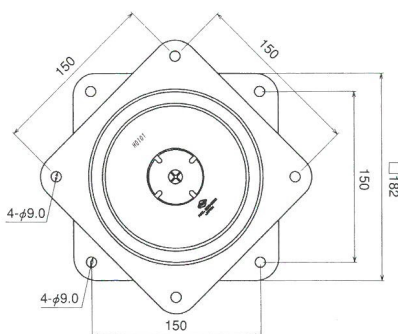
■How to operate



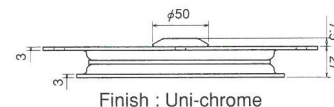
Finish : Uni-chrome

Item No.	Product name	PCS/Carton	Weight/pc(kg)	Weight/Carton(kg)	LxWxH/Carton(mm)	Spec.
116008	Lever Stop	10	1.7	18	255×330×190	Every 90° lock
116021	COMBO	10	1.7	18	255×330×190	Every 90° lock + free Swivel

185 PITCH



- The highest rank of durability.
- The best choice for 800mm wide chair.



Finish : Uni-chrome

Item No.	Product name	PCS/carton	Weight/pc(kg)	Weight/Carton(kg)	LxWxH/Carton(mm)	Spec.
116004	185 PITCH	12	1.75	21	255×330×190	360°(140°/180° Stoppable)

◆SOFA BED

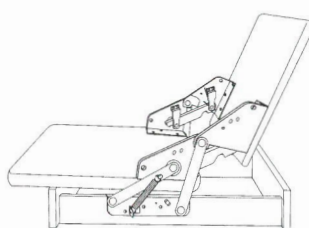
TESTS

■LOAD TEST

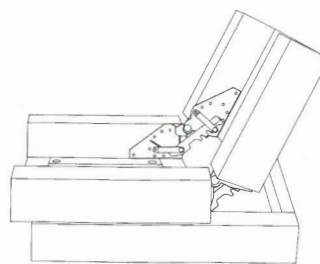
FITTING	WEIGHT
KK-4SP	155kg
RK	158kg

Static Loading Test (1set of gear)

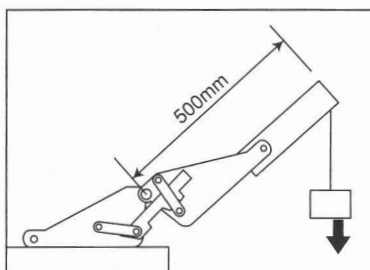
- ①Fix at 42 degree.
 - ②Load vertical weight at the point 500mm from the center of gear
- Following data indicate safe load points.



RK



KK-4SP



KK-4SP

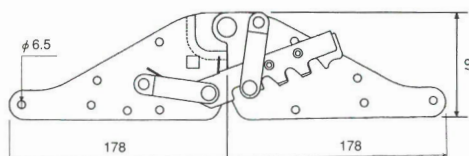
Durability

155kg : At 600mm from the center/42°

Cycle test : 6,000 repetitions
(30 cycle/min.)

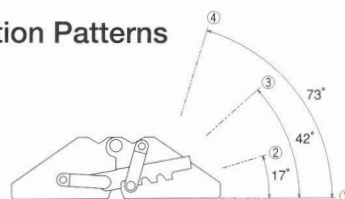


- 4 adjusting positions (17°, 42°, 73°)



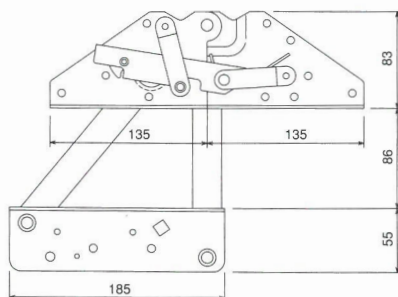
Finish : Raw steel

◆Motion Patterns



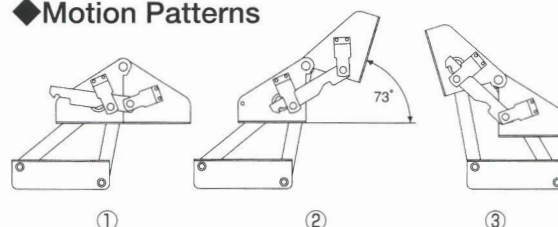
Item No.	Product Name	Set/Carton	Weight/Carton(kg)	Weight/Set(kg)	L×W×H/Carton(mm)
119004	KK-4SP	20	24	1.2	380×380×245

RK



Finish : Chromate

◆Motion Patterns



Bed

Sofa

Rolling

Durability

158kg : At 600mm from the center/42°

Cycle test : 6,000 repetitions (30 cycle/min.)

Item No.	Product name	Set/Carton	Weight/Carton(kg)	Weight/Set(kg)	L×W×H/Carton(mm)
119002	RK	10	24.8	2.42	380×380×270

◆The KOYO LEGMAN™ System

is a revolutionary modular solution to the requirements for flexibility in our work environments. The System has many applications such as store fixtures, office/contract, nursing home, training rooms, laboratories, libraries, hotels, geriatric and residential furniture.

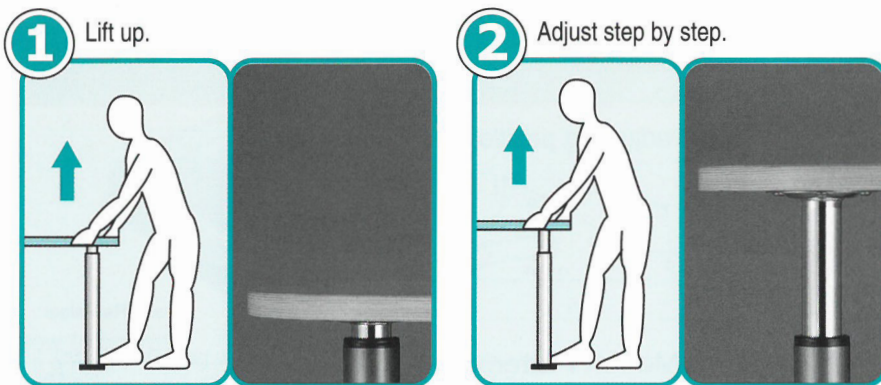
The System offers:

- An Economic, Ergonomic, Mechanical Alternative to electrical or Pneumatic systems.
- Fast, Safe and Easy operation.
- Excellent Adjustment range.
- Mobile or Stationary Solutions via Choice of Casters or Levelers.

Quick, Smooth and Safe Adjustment. No tools required. Original Patented "STEP" Lock Mechanism.

U.S. Patent No. US 6,299,113B1 EU Patent No. EP101395 B1, China Patent No. ZL99127775.9

How to adjust upward.



Mode of Operation :
The LEGMAN operates on a step-by-step ratchet system. Each position is 3/4 inch (20mm) apart, and the legs have 4, 8 and 12 inch (100mm, 200mm and 300mm) adjustment ranges.

How to adjust downward...with slowdown effect.



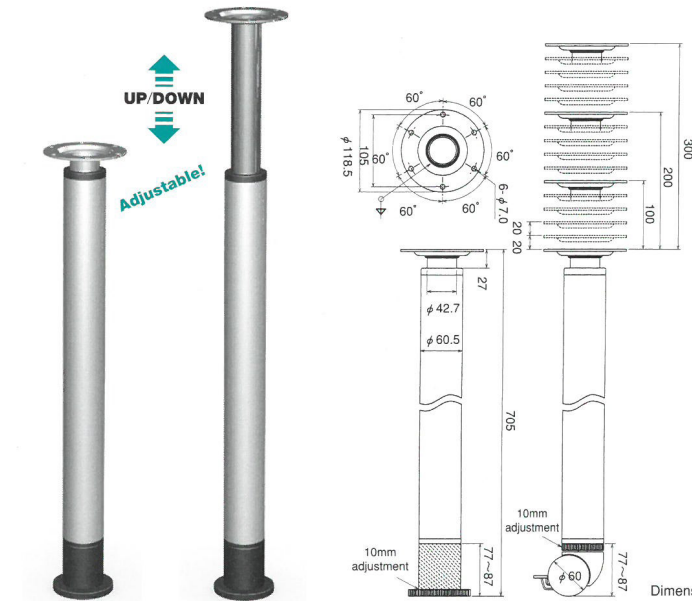
Load Capacity Exceeding all International Table Test Standards. Meets or exceeds ANSI / BIFMA requirements.

Load Test : 1,980 Lbs. per leg (vertical load).

Cycle Tested to 20,000 repetitions. (For KV, KVI)

Notes:

- * Used where adjustability is only needed periodically, for instance when new employee occupies a desk.
- * Remove objects from table top before adjusting table height to prevent objects from falling.
- * Regularly tighten screws under table top when tables frequently moved to prevent screws from working loose.
- * Occasionally, a drop of oil can be applied on inner tube to make up/down movement smoother.



Product Name STATIC LEG	Adjustable range(mm)	Steps	Per Step (mm)	Height range (mm) Min-Max
KV 705	0	0	0	705

Product Name ADJUSTABLE LEG	Adjustable range(mm)	Steps	Per Step (mm)	Height range (mm) Min-Max
KV 705-1	100	5	20	705-805
KV 705-2	200	10	20	705-905
KV 705-3	200	5	40	705-905
KV 705-4	300	15	20	705-1005

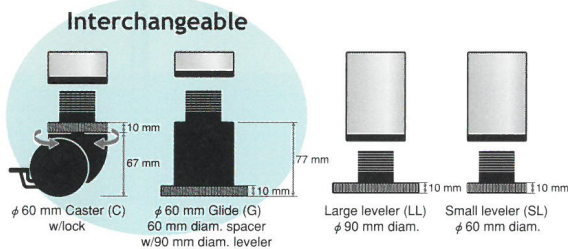
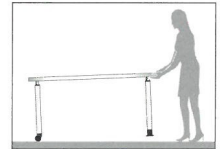
Diameter of leg available : 60.5 mm

Note : Casters / Glides not included (order separately)

Formula of Product Code

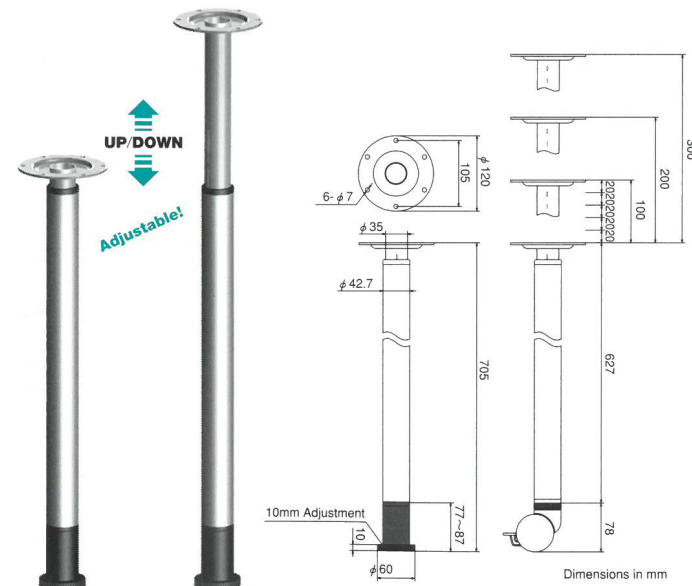
KV 705- 1

Minimum Height
(Included Caster / Glide) Type of Adjustable
range/step



Package

External Dimensions
645mm×345mm×145mm
4PCS/13kg/1CTN
2,500 legs per 20ft container
5,000 legs per 40ft container
Screws are not included
Accessories are packed separately



Product Name STATIC LEG	Adjustable range(mm)	Steps	Per Step (mm)	Height range (mm) Min-Max
KVS 705	0	0	0	705

Product Name ADJUSTABLE LEG	Adjustable range(mm)	Steps	Per Step (mm)	Height range (mm) Min-Max
KVS 705-1	100	5	20	705-805
KVS 705-2	200	10	20	705-905
KVS 705-3	200	5	40	705-905
KVS 705-4	300	15	20	705-1005

Diameter of leg available : 42.7mm

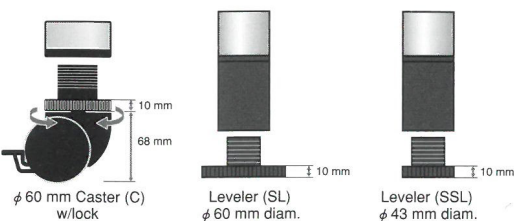
450kg loading capacity per leg.

Note: Do not twist inner tube and outer tube at the same time. It may damage its mechanism.

Formula of Product Code

KVS 705- 1

Minimum Height
(Included Caster / Leveler) Type of Adjustable
range/step



Note : Caster and leveler are interchangeable, but tube's length is different.

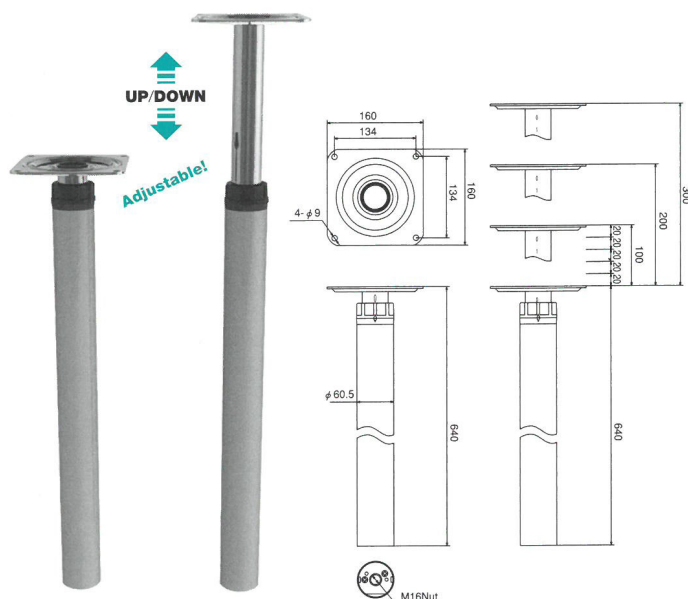
Package

External Dimensions
645mm×345mm×145mm
4PCS/8kg/1CTN
2,500 legs per 20ft container
5,000 legs per 40ft container
Screws are not included
Accessories are packed separately



KVI

PEDESTAL LEG APPLICATION W / ANTI-ROTATION DEVICE



Product Name ADJUSTABLE LEG	Adjustable range(mm)	Steps	Per Step (mm)	Height range (mm) Min-Max
KVI 640W-1	100	5	20	640-740
KVI 640W-2	200	10	20	640-840
KVI 640W-3	200	5	40	640-840
KVI 640W-4	300	15	20	640-940

Diameter of leg available : 60.5 mm

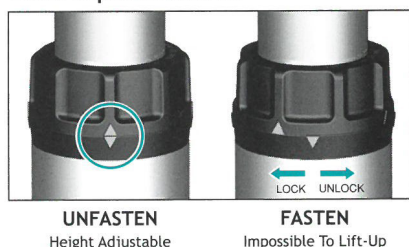
Koyo will upon customer requests modify the base fitting of the Legman to fit customers requirements (minimum quantities apply).

Formula of Product Code

KVI 640W- 1

Minimum Height
(without base)Type of Adjustable range/step
(See Backside)

Lock Cap Mechanism



Package for Standard Square Mounting Plate

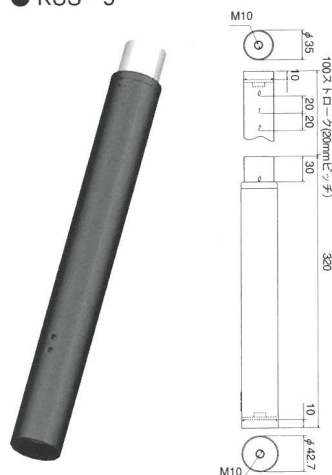
External Dimensions
680mm×290mm×180mm
2PCS/8kg/1CTN
1,140 legs per 20ft container
2,280 legs per 40ft container
Screws are not included



KUS/KU

PAT.1432153.1731474.1847567.1976113

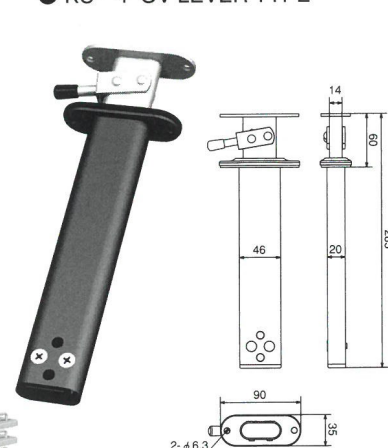
● KUS-5



● KU-4 OV HR



● KU-4 OV LEVER TYPE



Product Name	Adjustable range(mm)	Steps	Per Step	Height range (mm) Min.-Max.	Loading capacity/pc
KUS-5	100mm	5	20mm	320~420mm	400kg
KUS-10	200mm	10	20mm	420~620mm	400kg
KUS-15	300mm	15	20mm	520~820mm	400kg
KU-4 OV HR	100mm	4	25mm	270~370mm	500kg
KU-6 OV HR	150mm	6	25mm	320~470mm	500kg
KU-4 OV LEVER TYPE	100mm	4	25mm	285~385mm	500kg

Koyo Provides The Best Solution For You.

Design & Automated Production in Japan

High Standard Quality Control

Assemble Factory in China

Global Marketing



Product



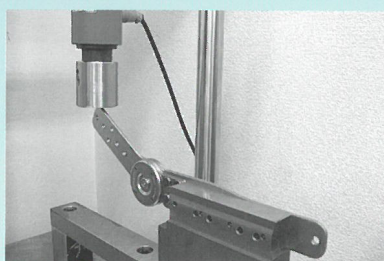
Quality Control

Dimension Measurement



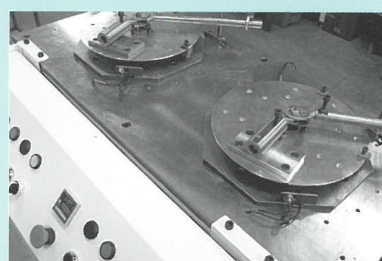
Optical Testing Equipment

Loading Measurement

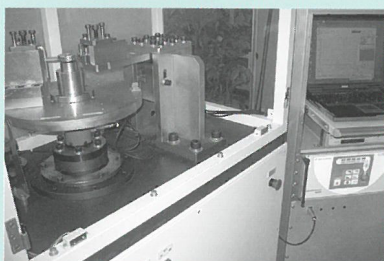


Loading Testing

Durability Measurement

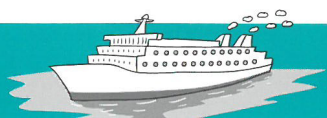


Cycle Testing

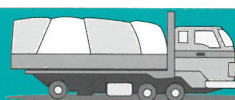


Torque Testing

PASS



Shipment





Heart & Technology®

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Dongguan City, Guangdong Province 523-660, China
Phone : +86-769-87845858 Fax : +86-769-87845811
Email : koyochina@koyoeng.co.jp
<http://www.koyoeng.co.jp/chinese>