CKD

Lightly supporting heavy objects just with air **New Product**

Balancing Unit
BBS Series

Balancing Unit BBS Series

CKD Corporation
CC-960A

Move objects weighing up to 200 kg effortlessly!

Balancing Unit

BBS Series

BBS-A <Automatic pressure adjustment type>
BBS-O <Fixed pressure adjustment type>

- Force of 5 kg or less move objects weighing up to 200 kg!
- Ensure personnel safety at sites where heavy objects are handled.
- No more inching along! Objects glide as if guided by hand.

RoHS

RoHS-Compatible
All substances adversely affecting the environment, including lead and hexavalent chrome, have been eliminated.

Φ50 **Φ63** **Φ80** **Φ100**

Flexibly handle changes in weight (without adjustment)
Even if weight changes with the transported workpiece, these changes are automatically recognized so a suitable balance is maintained. (BBS-A type)

Balance immediately after air source is connected
If workpiece weight does not change, balance pressure is only adjusted at the beginning and is attained as soon as air is connected. (BBS-O type)

Standard brakes to ensure safety
Highly reliable brakes are standard. Even if the air source is cut off, the workpiece does not drop or pop up when air is restored.

Compatible with all-air methods (option)
An all-air method that does not need electricity can be set up.
This is applicable in atmospheres that must be explosion-proof.

PAT.PEND

Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

⚠ WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance of specifications.

This product must be used within its stated specifications. It must not be modified or machined.
This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

❶ Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B8370 (pneumatic system rules)
JFPS2008 (principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

⚠ WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Disclaimer

1. CKD cannot be held liable for any business interruption, loss of profit, personal injury, delay cost, or any other ancillary or indirect loss, cost, or damage resulting from the use of or faults in the use of CKD products.
2. CKD cannot be held responsible for the following damage.
   ① Damage resulting from disaster or failure of CKD parts due to fire from reasons not attributable to CKD, or by intentional or negligence of a third party or customer.
   ② When a CKD product is assembled into customer equipment, damage that could have been avoided if customer equipment were provided with functions and structure, etc., generally accepted in the industry.
   ③ Damage resulting from use exceeding the scope of specifications provided in CKD catalogs or instruction manuals, etc., or from actions not following precautions for installation, adjustment, or maintenance, etc.
   ④ Damage resulting from product modifications not approved by CKD, or from faults due to combination with other software or other connected devices.

Pneumatic components

Safety precautions

Always read this section before starting use.
Refer to "Pneumatic Cylinders I (No. CB-29SA)" for the general cylinder or cylinder switch.

Balancing Unit BBS Series

Design & Selection

⚠ WARNING

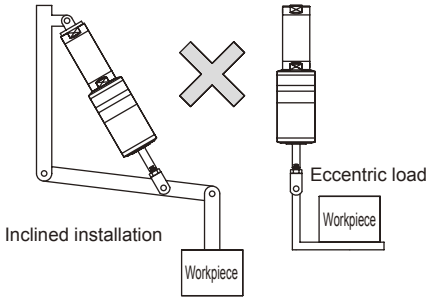
- Do not use the balancing cylinder at pressures exceeding the max. working pressure or working piston speed.
- Do not disassemble the Balancing Unit.
- Do not rotate the piston rod while brakes are on. Otherwise damage may occur.

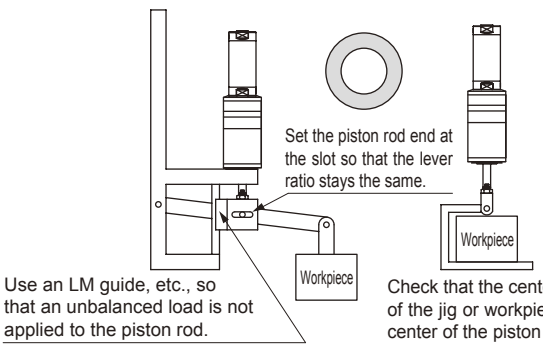
⚠ CAUTION

- Compressed air must be clean and dry and passed through an air or oil mist filter. Install a filter on the circuit and note the filtration rate (5μm or less required), flow rate, and mounting location (near the control circuit).
- Discharge drainage accumulating at the filter regularly, before it exceeds the designated line.
- The valve or cylinder could malfunction if carbonized compressor oil (carbon or tar, etc.) enters the circuit. Service and inspect the compressor carefully.
- This cylinder does not need oil. Oiling it could cause problems.
- This Balancing Unit is used indoors. It can be used outdoors as a movable unit, but must be returned and stored indoors after use.
- Apply brakes when leaving the device. Otherwise serious accidents such as jigs or workpieces dropping could result.

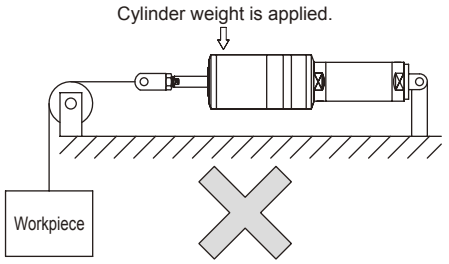
Installation & Adjustment

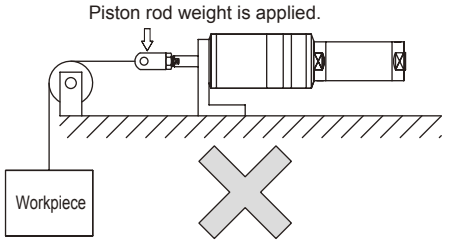
- This balance unit automatically detects the load applied to the piston rod. Install so that unbalanced loads are not applied -- (inclined installation, eccentric load, etc.). Unbalanced loads hamper position rod movement and raise operating force, and may cause detection faults during automatic detection.

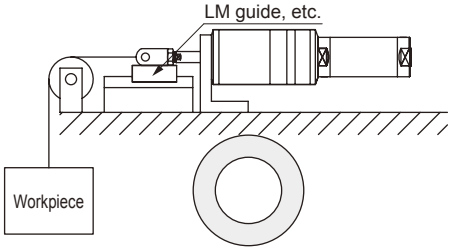




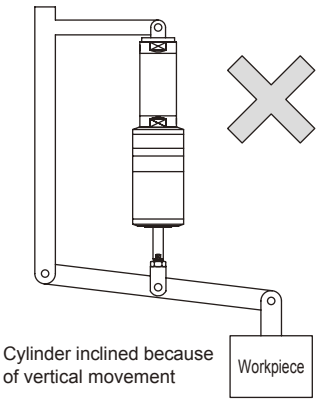
- When using the balance horizontally, check that the piston rod and weight moment are not applied.

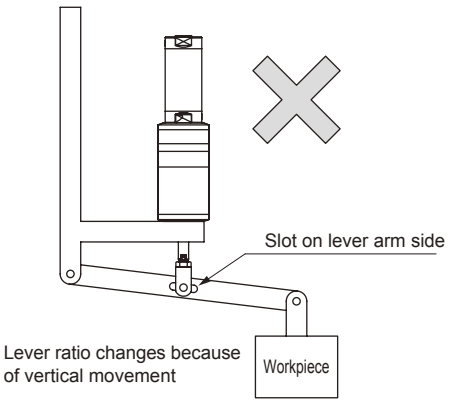


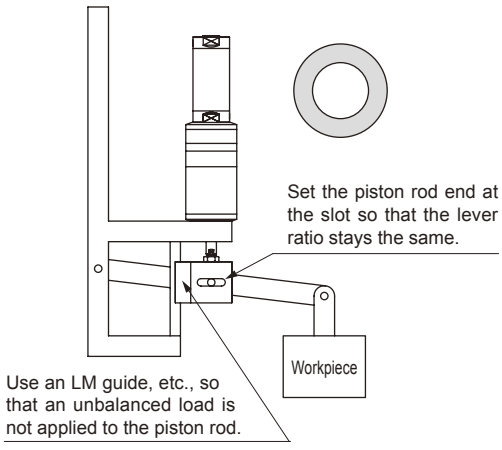




■ When using with linkage, use so that the lever ratio stays the same. Example: Support point movement: If the lever ratio changes with vertical movement, the load could move up or down depending on the detection position regardless of manual operation.







■ Do not rotate the piston rod while holding the load with brakes.
The piston rod, brakes, and detection section are coupled, so applying rotary torque could damage the detection section and brakes.

■ The pilot chamber valve (D) is mounted on the product. Do not loosen the bolt or remove the valve. Otherwise air leaks could cause detection pressure to drop and drop the jig or workpiece during operation.

■ Consider the supplied air flow rate when piping between the balancing unit cylinder and control box. Match wire numbers when connecting. Keep the control box as close to the balance unit as possible to minimize piping length. Operating force increases if the flow rate is too low or piping too long.

During use & maintenance

⚠CAUTION

■ If the main air source is cutoff, position locking will be activated by the built-in brakes.
For safety, set the brake selection switch to the brake side when finished with work.

MEMO

Balancing cylinder
Automatic pressure adjustment type

BBS-A Series

● Bore size: ø50, ø63, ø80, ø100

RoHS

Specifications

Model no. / Descriptions	BBS-A-50	BBS-A-63	BBS-A-80	BBS-A-100
Working fluid	Filtrated air			
Max. working pressure MPa	0.60			
Min. working pressure MPa	0.25			
Withstanding pressure MPa	0.90			
Ambient temperature °C	-5 to 50 (no freezing)			
Bore size mm	ø50	ø63	ø80	ø100
Max. stroke length mm	1500			
Working piston speed mm/s	1 to 200			
Cushion	Rubber cushion			
Lubrication	Do not lubricate.			
Necessary min. load kg	10	16	25	40
Max. load range Note 1 kg	70	115	180	285
Operating force N	Refer to page 11 for BBS operating force information.			
Holding force N	1539		3940	

Note 1: Refer to page 11 on the max. load range information for BBS working pressure.

Stroke length

Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100

How to order

BBS-A - A D 1 - CB - 80 D - 300 - Y

- BBS-A: Automatic pressure adjustment type balancing cylinder
- A: Method
- B: Load direction Note 1
- C: Cylinder posture (Piston rod) Note 1
- D: Mounting style
- E: Bore size
- F: Stroke length
- G: Accessory

Symbol	Descriptions
A Method	
Blank	Electric method (24 VDC)
A	Air method
B Load direction	
D	Extend side
U	Retracting side
C Cylinder posture (piston rod)	
Blank	Downward
1	Upward
2	Horizontal
D Mounting style	
OO	Basic type
CA	Eye (ø50, ø63)
CB	Clevis (ø80, ø100)
FB	Head end flange
E Bore size (mm)	
50	ø50
63	ø63
80	ø80
100	ø100
F Stroke length (mm)	
	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500
G Accessory	
I	Rod eye
Y	Rod clevis

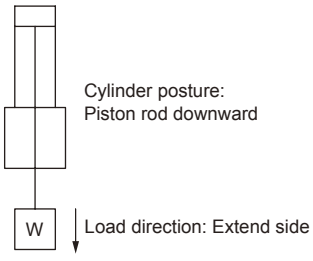
⚠ Note on model no. selection

Note 1: The load direction refers to the direction in which the load to the cylinder is input.
Cylinder position refers to that of the cylinder at installation. Refer to the drawings below for details.

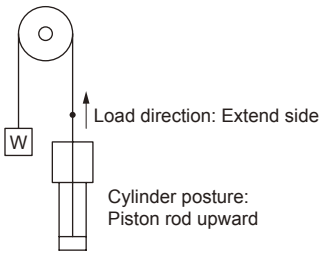
C Cylinder posture

Load direction extend side (D)

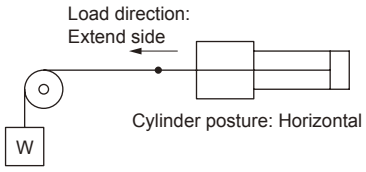
D (piston rod downward)



D1 (piston rod upward)

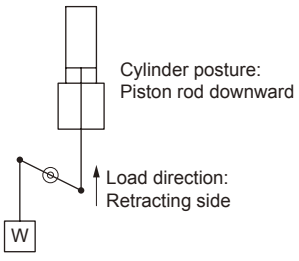


D2 (piston rod horizontal)

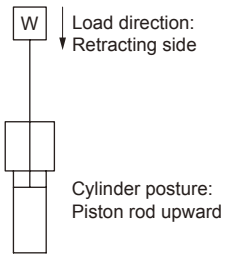


Load direction retracting side (U)

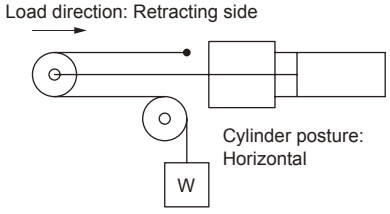
U (piston rod downward)



U1 (piston rod upward)



U2 (piston rod horizontal)

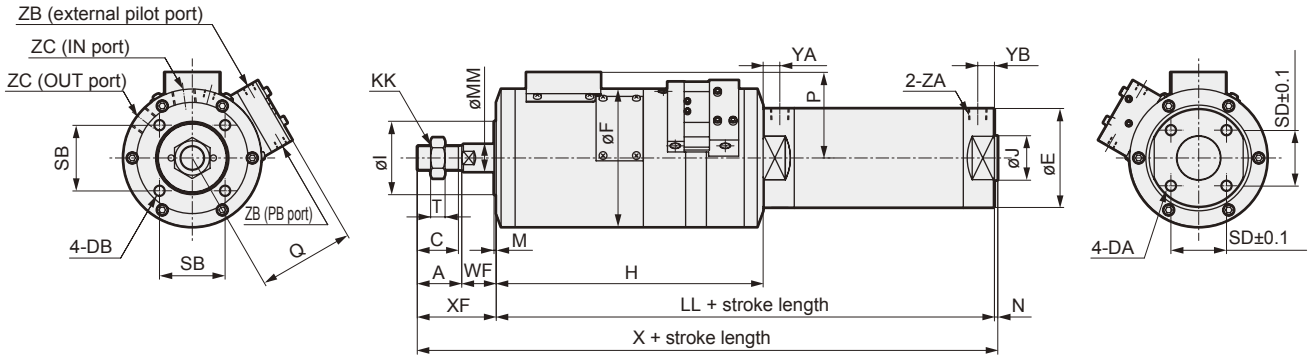


How to order mounting bracket

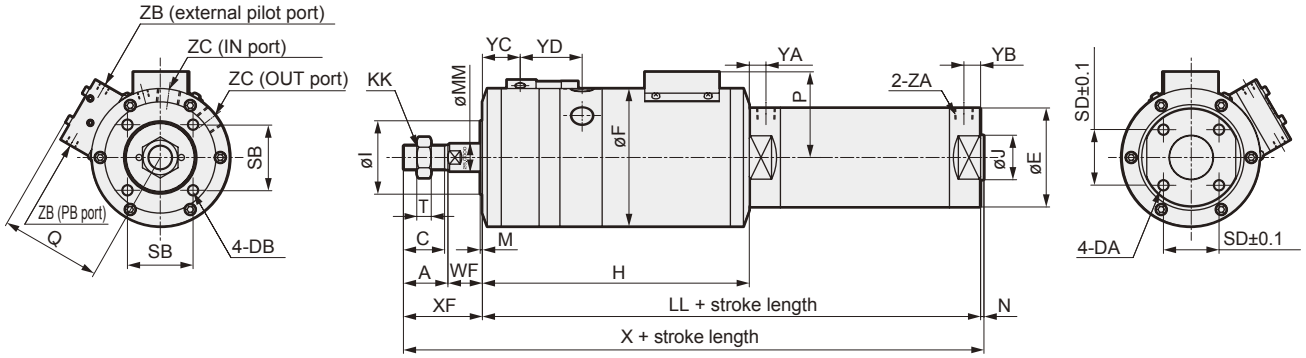
Bore size (mm) / Mounting bracket	ø50	ø63	ø80	ø100
Flange (FB)	SCM-FB-50	SCM-FB-63	SCM-FB-80	SCM-FB-100
Eye (CA)	SCM-CA-50	SCM-CA-63	-	-
Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

Dimensions

● Basic type (OO) Load direction extend side (D)



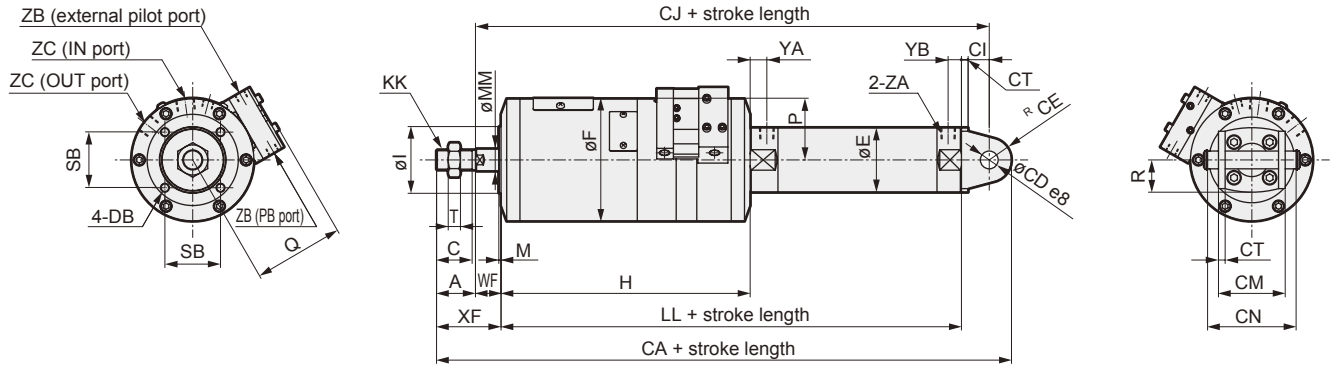
● Basic type (OO) Load direction retracting side (U)



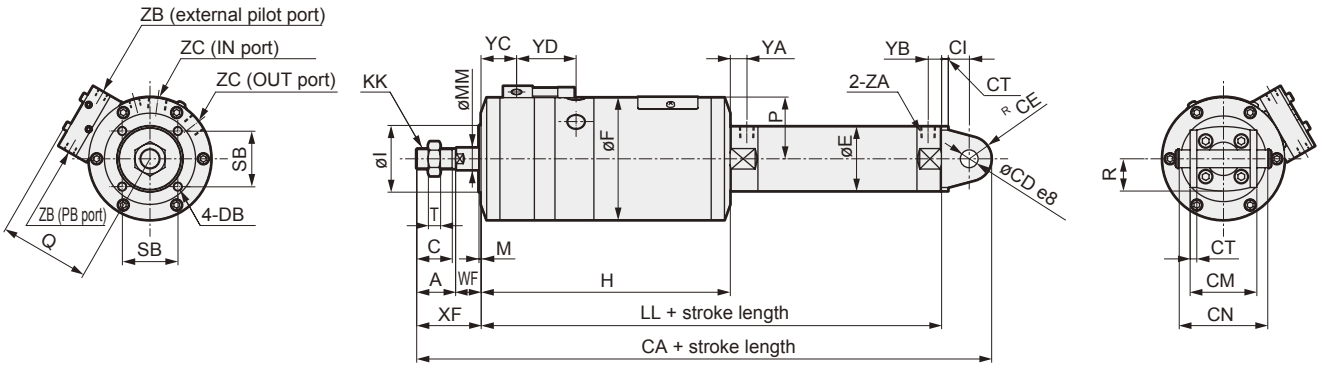
Symbol / Bore size (mm)	A	C	DA	DB	E	F	H	I	J	KK	LL	MM	M	N	P	Q	SB	SD	T	WF	X	XF	YA	YB	YC	YD	ZA	ZB	ZC
ø50	35	32	M8 x 1.25 depth 16	M8 x 1.25 depth 15	58	110	224	60	30	M18 x 1.5	314	20	2	2	56	81	50	32	11	23	374	58	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8
ø63	35	32	M10 x 1.5 depth 16	M8 x 1.25 depth 15	72	110	224	60	32	M18 x 1.5	314	20	2	2	56	81	50	38	11	23	374	58	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8
ø80	40	37	M10 x 1.5 depth 22	M10 x 1.5 depth 15	89	124	240	66	40	M22 x 1.5	348	25	2	3	77	90	59	50	13	31	422	71	15	15	34	55.7	Rc3/8	Rc1/8	Rc1/2
ø100	40	37	M12 x 1.5 depth 22	M10 x 1.5 depth 15	110	124	240	66	50	M22 x 1.5	348	25	2	3	77	90	59	60	13	31	422	71	15	15	34	55.7	Rc1/2	Rc1/8	Rc1/2

Dimensions

● Eye type (CA) Load direction extend side (D)



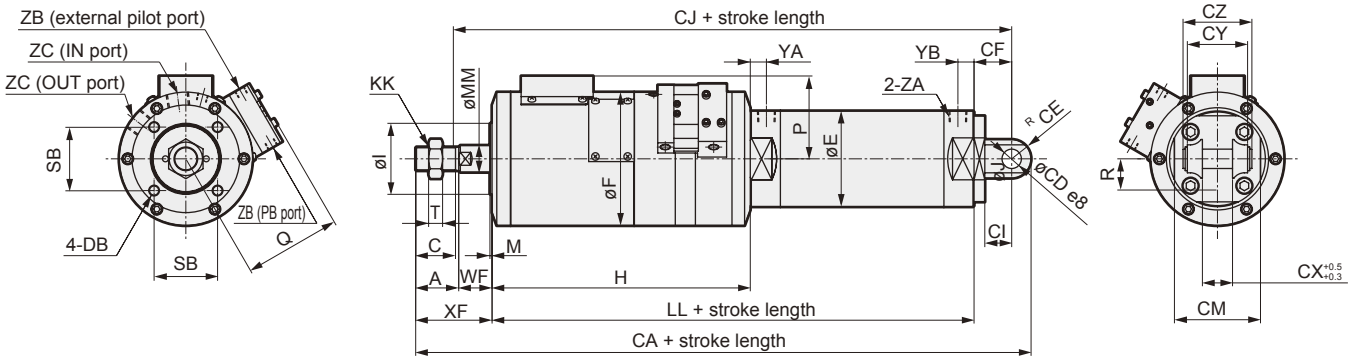
● Eye type (CA) Load direction retracting side (U)



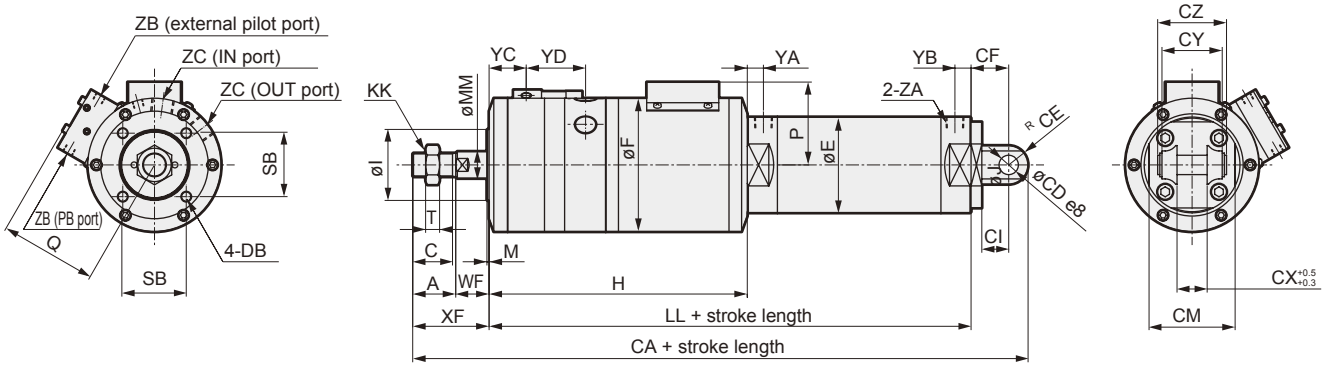
Symbol / Bore size (mm)	A	C	DB	E	F	H	I	KK	LL	MM	M	P	Q	R	SB	T	WF	XF	CA	CD	CE	CI	CT	CJ	CM	CN	YA	YB	YC	YD	ZA	ZB	ZC
ø50	35	32	M8 x 1.25 depth 15	58	110	224	60	M18 x 1.5	314	20	2	56	81	29	50	11	23	58	417	16	20	19	6	362	60	79.6	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8
ø63	35	32	M8 x 1.25 depth 15	72	110	224	60	M18 x 1.5	314	20	2	56	81	36	50	11	23	58	424	18	22	22	8	367	74	97.8	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8

Dimensions

● Clevis type (CB) Load direction extend side (D)



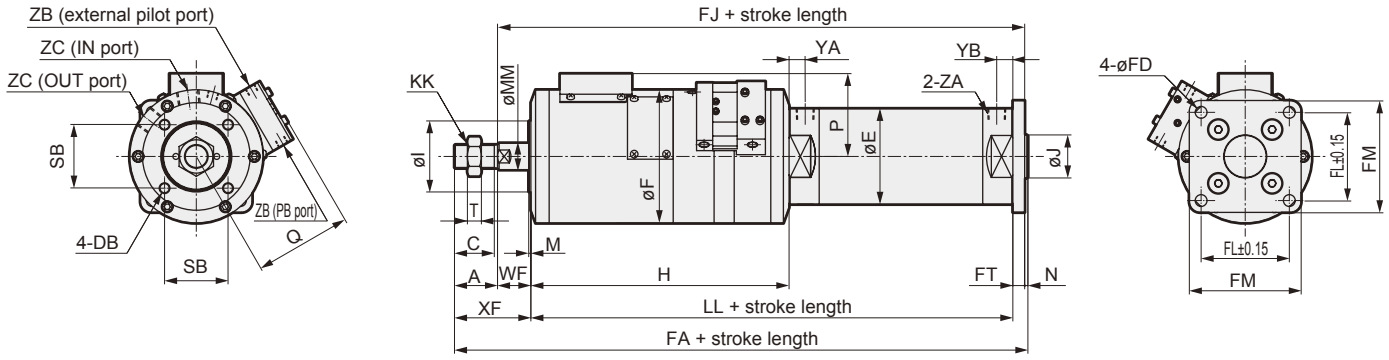
● Clevis type (CB) Load direction retracting side (U)



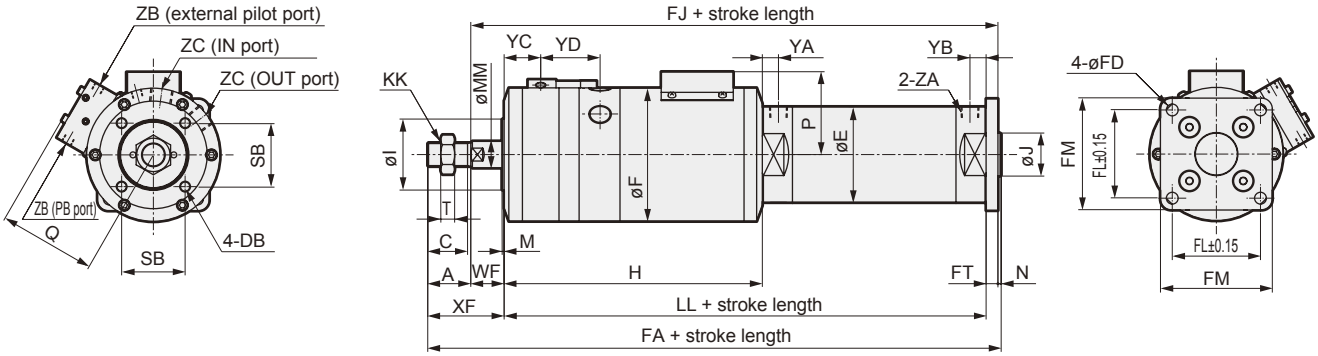
Symbol / Bore size (mm)	A	C	DB	E	F	H	I	J	KK	LL	MM	M	P	Q	SB	T	WF	XF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ	YA	YB	YC	YD	ZA	ZB	ZC
ø80	40	37	M10 x 1.5 depth 15	89	124	240	66	40	M22 x 1.5	348	25	2	77	90	59	13	31	71	472	18	18	35	25	385	80	28	56	64	15	15	34	55.7	Rc3/8	Rc1/8	Rc1/2
ø100	40	37	M10 x 1.5 depth 15	110	124	240	66	50	M22 x 1.5	348	25	2	77	90	59	13	31	71	484	22	22	43	31	393	100	32	64	72	15	15	34	55.7	Rc1/2	Rc1/8	Rc1/2

Dimensions

● Head side flange (FB) Load direction extend side (D)



● Head side flange (FB) Load direction retracting side (U)



Symbol / Bore size (mm)	A	C	DB	E	F	H	I	J	KK	LL	MM	M	N	P	Q	SB	T	WF	XF	FA	FD	FJ	FL	FM	FT	YA	YB	YC	YD	ZA	ZB	ZC
ø50	35	32	M8 x 1.25 depth 15	58	110	224	60	30	M18 x 1.5	314	20	2	2	56	81	50	11	23	58	383	9	346	58	76	9	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8
ø63	35	32	M8 x 1.25 depth 15	72	110	224	60	32	M18 x 1.5	314	20	2	2	56	81	50	11	23	58	383	11	346	70	92	9	15	12	32	53.5	Rc1/4	Rc1/8	Rc3/8
ø80	40	37	M10 x 1.5 depth 15	89	124	240	66	40	M22 x 1.5	348	25	2	3	77	90	59	13	31	71	433	11	390	82	104	11	15	15	34	55.7	Rc3/8	Rc1/8	Rc1/2
ø100	40	37	M10 x 1.5 depth 15	110	124	240	66	50	M22 x 1.5	348	25	2	3	77	90	59	13	31	71	436	14	393	100	128	14	15	15	34	55.7	Rc1/2	Rc1/8	Rc1/2

Control box (electric method)

How to order

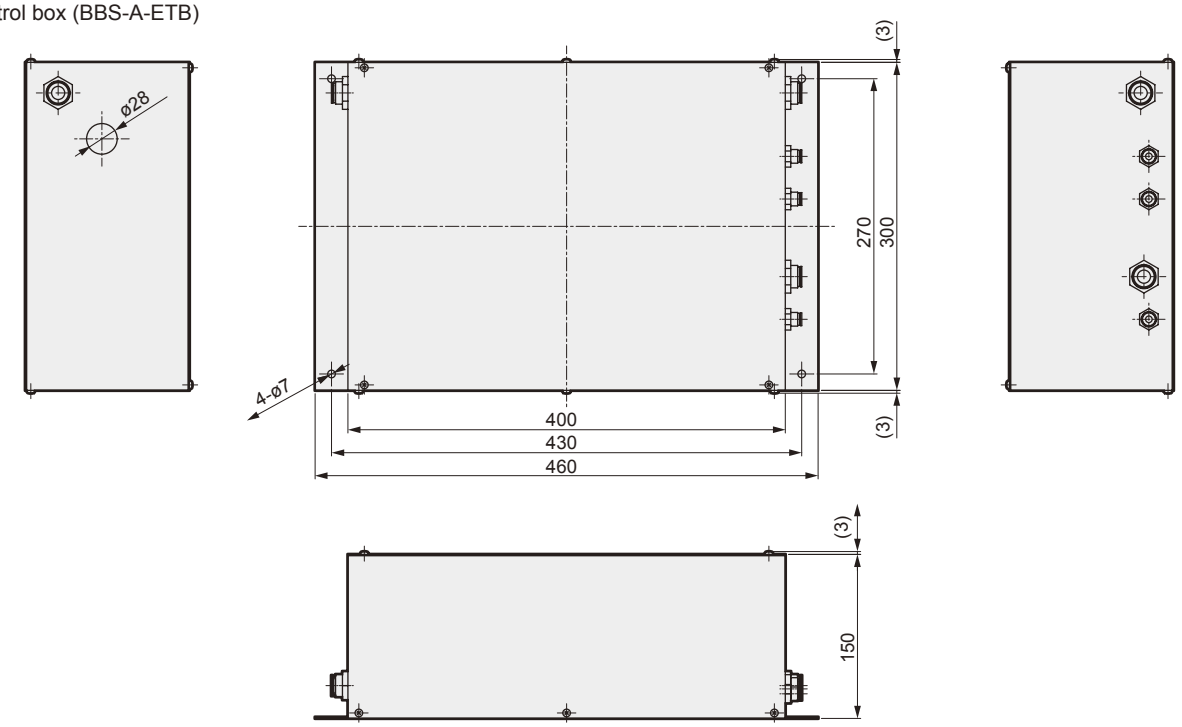
BBS-A - **ETB**

- BBS-A: Automatic pressure adjustment type balancing cylinder
- ETB: Control box

Custom orders for circuits are available depending on the required working state. Contact CKD for details.

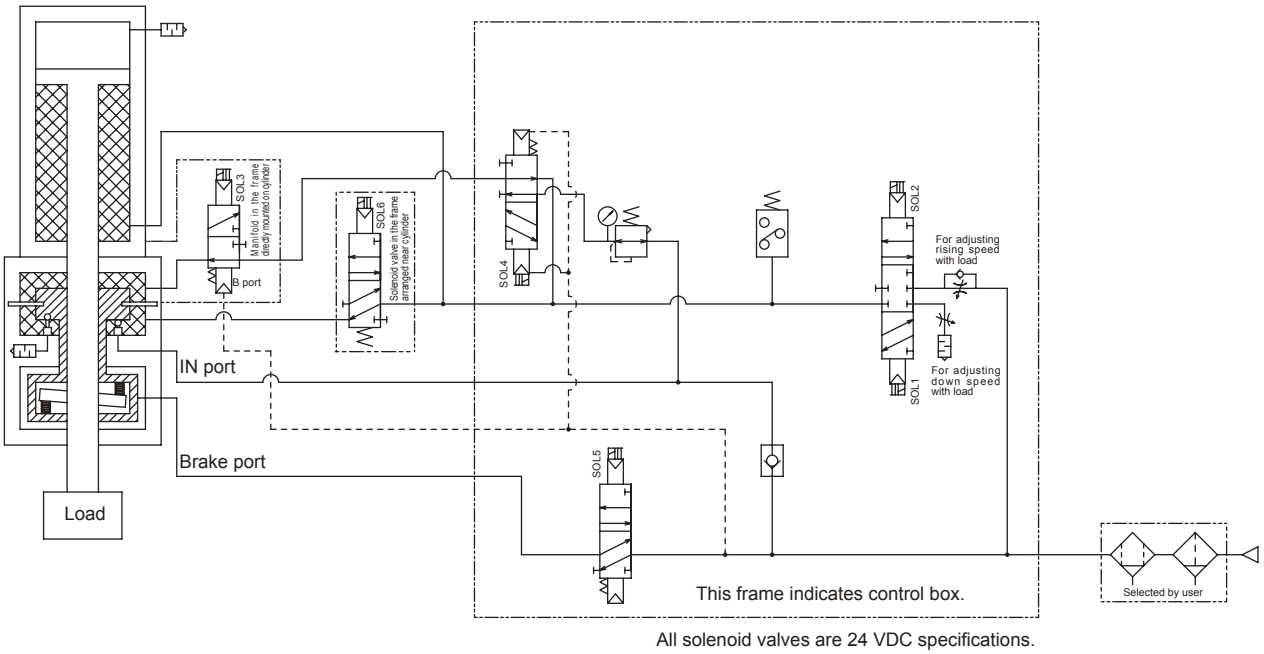
Dimensions

● Control box (BBS-A-ETB)



Air circuit diagram

● Control box (BBS-A-ETB) air circuit diagram



All solenoid valves are 24 VDC specifications.

Control box (speed 2 step switchover type for electric method)

How to order

BBS-A - **ETB2**

Automatic pressure adjustment type balancing cylinder

Control box

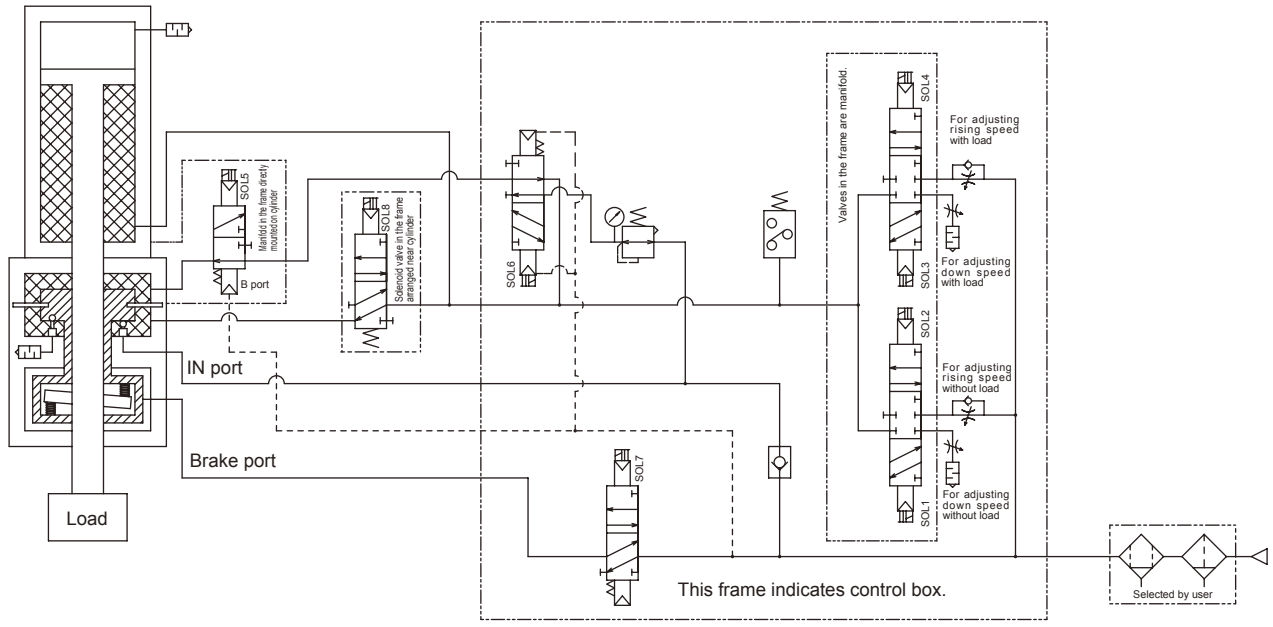
Custom orders for circuits are available depending on the required working state. Contact CKD for details.

Dimensions

● This is the same as the control box (BBS-A-ETB). Refer to Page 7.

Air circuit diagram

● Control box (BBS-A-ETB2) air circuit diagram



All solenoid valves are 24 VDC specifications.

Control box (air method)

How to order

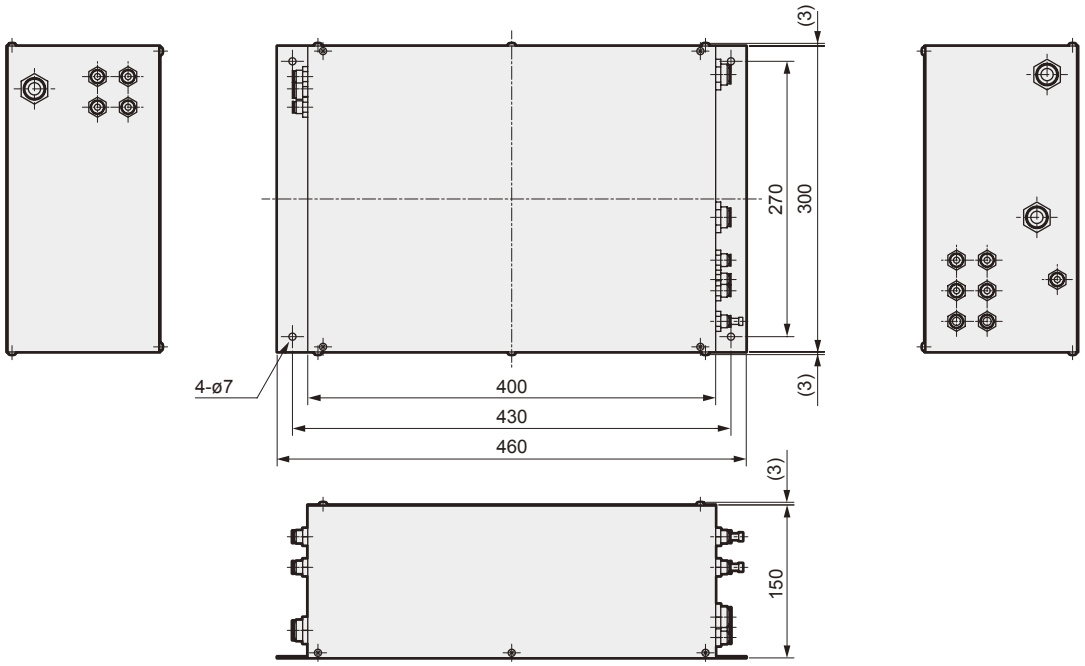
BBS-A - **TB**

- BBS-A: Automatic pressure adjustment type balancing cylinder
- TB: Control box

Custom orders for circuits are available depending on the required working state. Contact CKD for details.

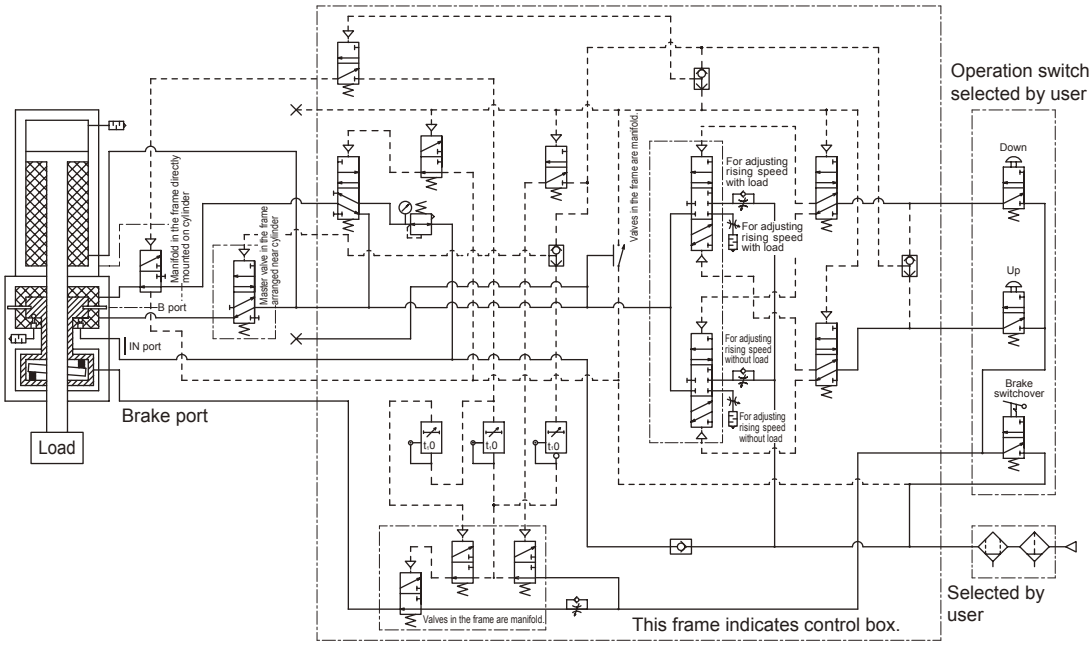
Dimensions

● Control box (BBS-A-TB)



Air circuit diagram

● Control box (BBS-A-TB) air circuit diagram



Operation switch (air method)

How to order

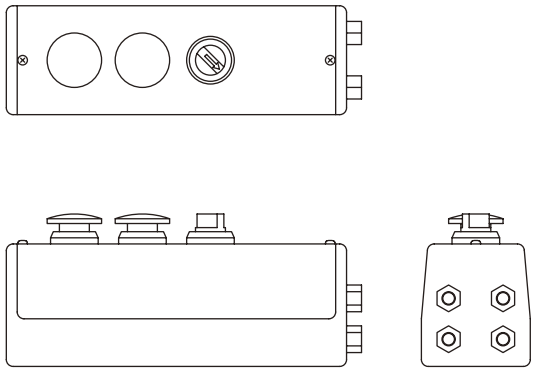
BBS - **CSW** - **R**

Balancing cylinder | Operation switch

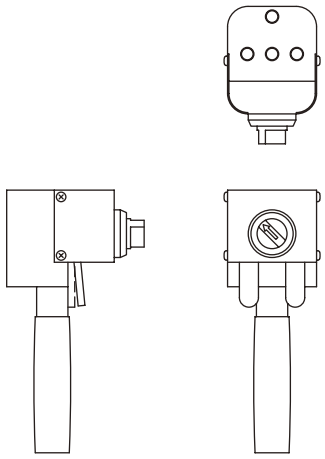
Symbol	Descriptions
Ⓐ Type	
P	Push type
H	Hand type
R	Lever type
G	Grip type

Operation switch appearance image

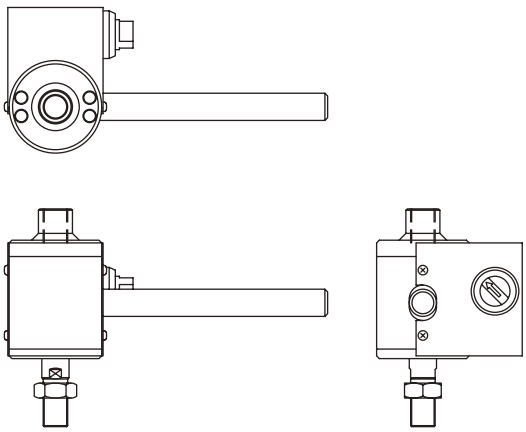
● Push type (BBS-CSW-P)



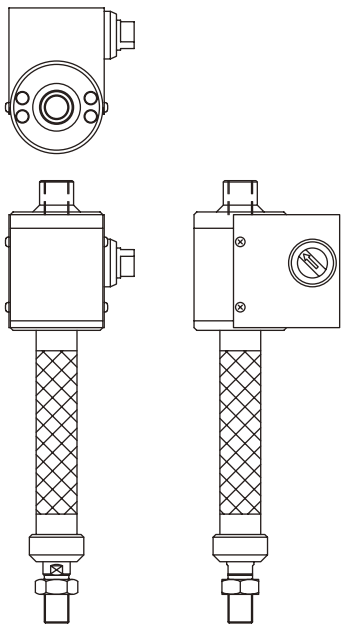
● Hand type (BBS-CSW-H)



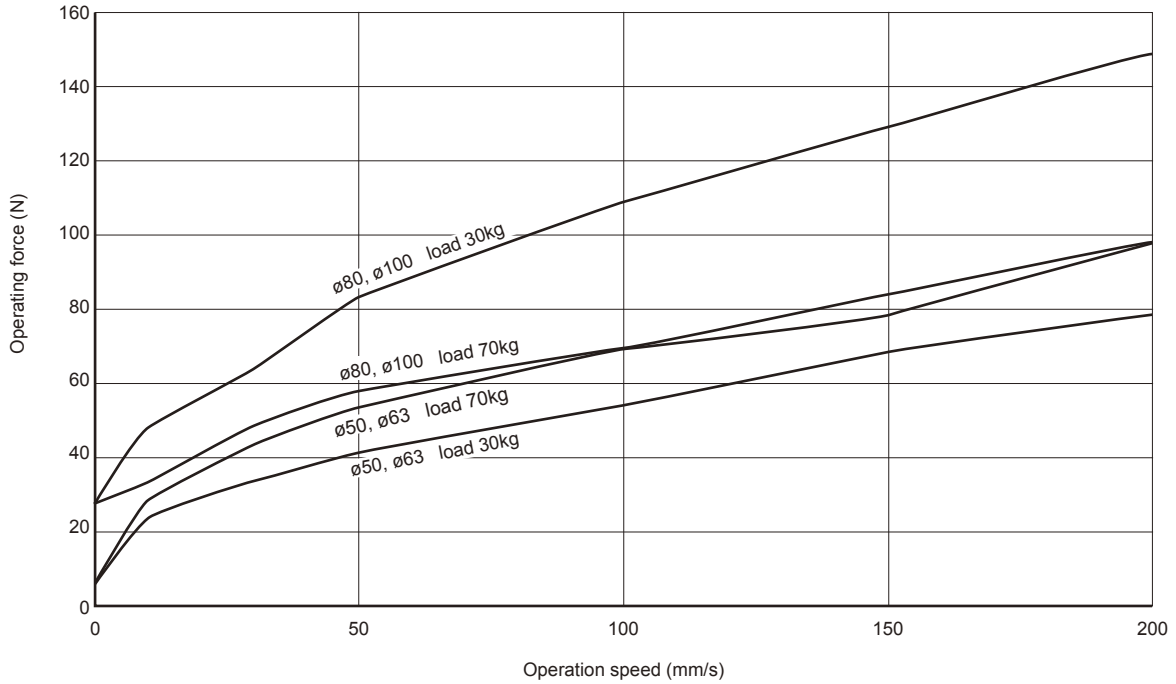
● Lever type (BBS-CSW-R)



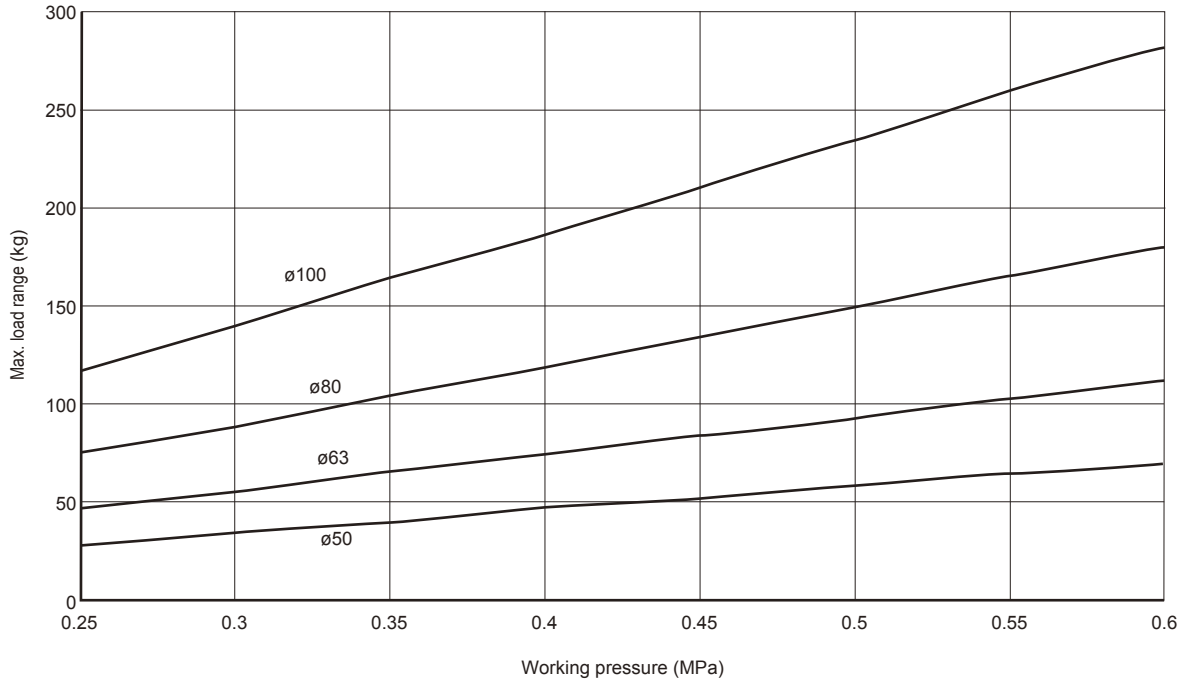
● Grip type (BBS-CSW-G)



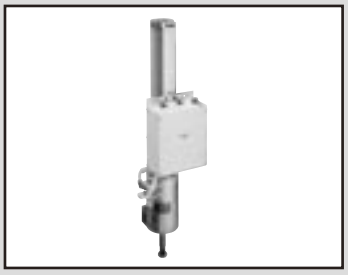
Operating force



Max. load range for working pressure



MEMO



Balancing cylinder
Fixed pressure adjustment type
Standalone control box

BBS-O Series

● Bore size: ø50, ø63, ø80, ø100

Integrated control box

BBS-OB Series

RoHS

Specifications

Model no. / Descriptions	BBS-O-50	BBS-O-63	BBS-O-80	BBS-O-100
Working fluid	Filtrated air			
Max. working pressure MPa	0.60			
Min. working pressure MPa	0.25			
Withstanding pressure MPa	0.90			
Ambient temperature °C	-5 to 50 (no freezing)			
Bore size mm	ø50	ø63	ø80	ø100
Max. stroke length mm	1500			
Working piston speed mm/s	1 to 200			
Cushion	Rubber cushion			
Lubrication	Do not lubricate.			
Min. load range kg	10	16	25	40
Max. load range Note 1 kg	70	115	180	285
Operating force N	Refer to page 11 for BBS operating force information.			
Holding force N	1539		3940	

Note 1: Refer to page 11 on the max. load range information for BBS working pressure.

Stroke length

Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100

How to order

BBS-O - D - CB - 80 - 300 - Y

- Ⓐ Model no.
- Ⓑ Load direction Note 1
- Ⓒ Mounting style
- Ⓓ Bore size
- Ⓔ Stroke length
- Ⓕ Accessory

Symbol	Descriptions
Ⓐ Model no.	
BBS-O	Standalone control box
BBS-OB	Control box integrated type
Ⓑ Load direction	
D	Extend side
U	Retracting side
Ⓒ Mounting style	
OO	Basic type
CA	Eye (ø50, ø63)
CB	Clevis (ø80, ø100)
FB	Head end flange
Ⓓ Bore size (mm)	
50	ø50
63	ø63
80	ø80
100	ø100
Ⓔ Stroke length (mm)	
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	
Ⓕ Accessory	
I	Rod eye
Y	Rod clevis

⚠ Note on model no. selection

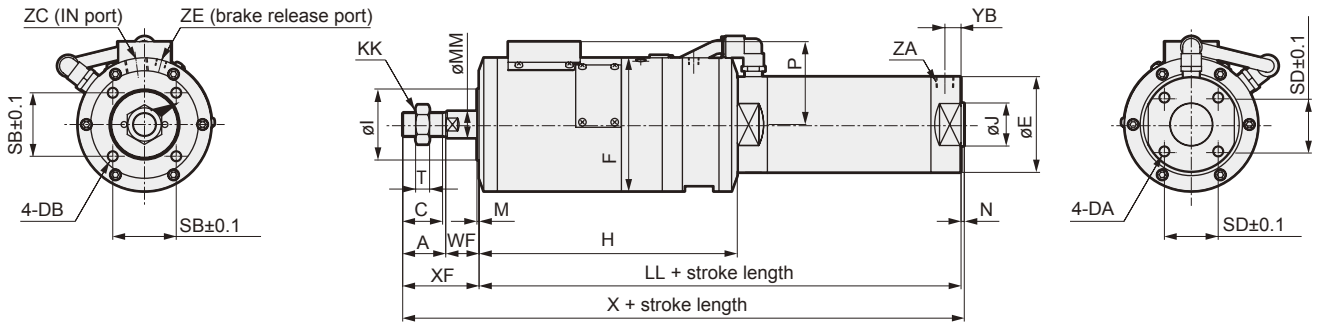
Note 1: The load direction refers to the direction in which the load to the cylinder is input.

How to order mounting bracket

Bore size (mm) / Mounting bracket	ø50	ø63	ø80	ø100
Flange (FB)	SCM-FB-50	SCM-FB-63	SCM-FB-80	SCM-FB-100
Eye (CA)	SCM-CA-50	SCM-CA-63	-	-
Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

Dimensions

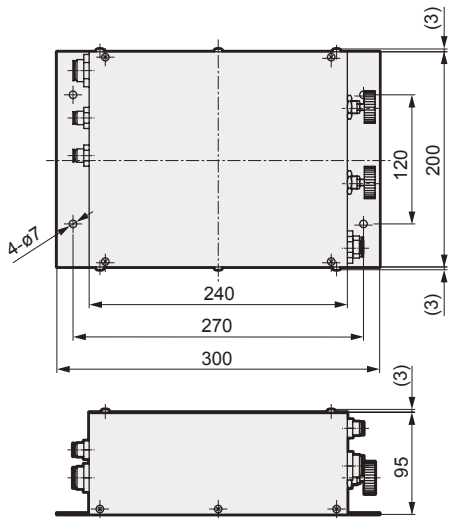
● Standalone control box, Basic type (OO) Load direction extend side (D)



Symbol / Bore size (mm)	A	C	DA	DB	E	F	H	I	J	KK	LL	MM	M	N
ø50	35	32	M8 x 1.25 depth 16	M8 x 1.25 depth 15	58	110	224	60	30	M18 x 1.5	314	20	2	2
ø63	35	32	M10 x 1.5 depth 16	M8 x 1.25 depth 15	72	110	224	60	32	M18 x 1.5	314	20	2	2
ø80	40	37	M10 x 1.5 depth 22	M10 x 1.5 depth 15	89	124	240	66	40	M22 x 1.5	348	25	2	3
ø100	40	37	M12 x 1.5 depth 22	M10 x 1.5 depth 15	110	124	240	66	50	M22 x 1.5	348	25	2	3

Symbol / Bore size (mm)	P	SB	SD	T	WF	X	XF	YB	ZA	ZE	ZC
ø50	56	50	32	11	23	374	58	12	Rc1/4	Rc1/8	Rc3/8
ø63	56	50	38	11	23	374	58	12	Rc1/4	Rc1/8	Rc3/8
ø80	77	59	50	13	31	422	71	15	Rc3/8	Rc1/8	Rc1/2
ø100	77	59	60	13	31	422	71	15	Rc1/2	Rc1/8	Rc1/2

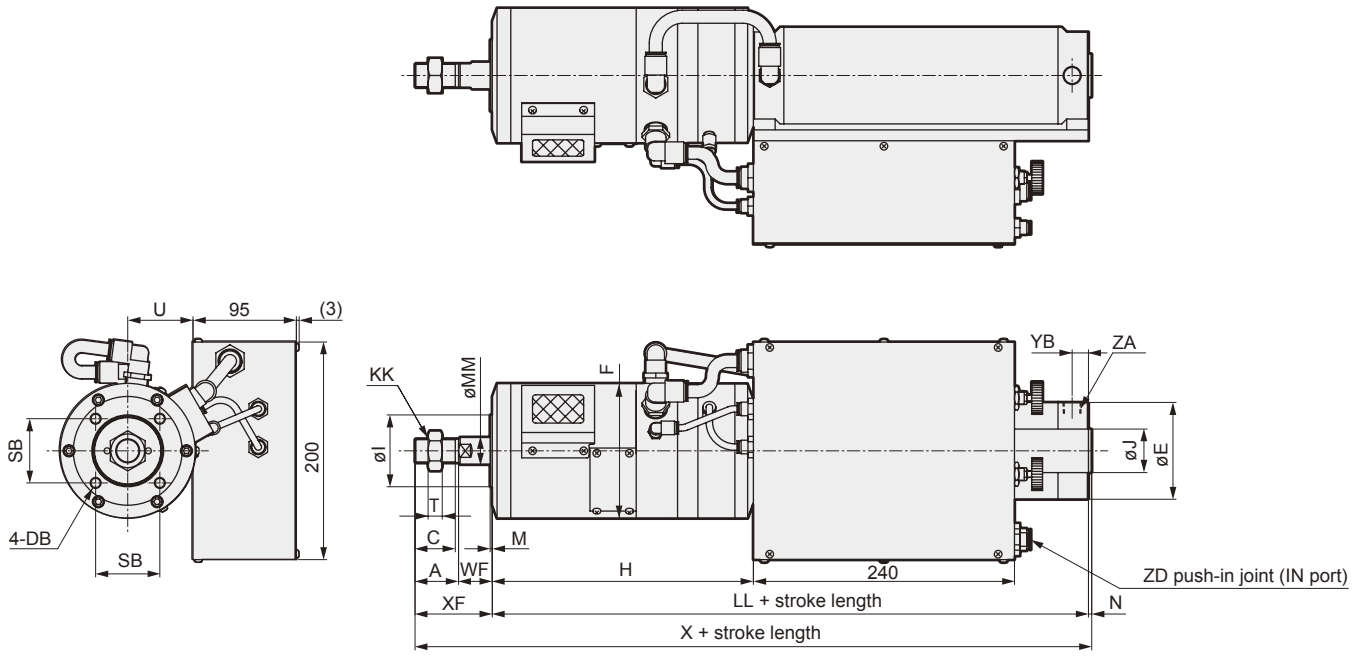
● Control box



Each mounting style installation dimension is the same as BBS-A. Refer to pages 3 to 6.

Dimensions

● Control box integrated type, Basic type (OO) Load direction extend side (D)



Symbol / Bore size (mm)	A	C	(DA)	DB	E	F	H	I	J	KK	LL	MM	M	N	SB	(SD)	T	U	WF	X	XF	YB	ZA	ZD
ø50	35	32	M8 x 1.25 depth 16	M8 x 1.25 depth 15	58	110	224	60	30	M18 x 1.5	314	20	2	2	50	32	11	47.5	23	374	58	12	Rc1/4	ø12
ø63	35	32	M10 x 1.5 depth 16	M8 x 1.25 depth 15	72	110	224	60	32	M18 x 1.5	314	20	2	2	50	38	11	54.5	23	374	58	12	Rc1/4	ø12
ø80	40	37	M10 x 1.5 depth 22	M10 x 1.5 depth 15	89	124	240	66	40	M22 x 1.5	348	25	2	3	59	50	13	60	31	422	71	15	Rc3/8	ø12
ø100	40	37	M12 x 1.5 depth 22	M10 x 1.5 depth 15	110	124	240	66	50	M22 x 1.5	348	25	2	3	59	60	13	70	31	422	71	15	Rc1/2	ø12

Each mounting style installation dimension is same as BBS-A. Refer to pages 3 to 6.

Technical data

Operation

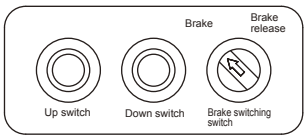
Operation process

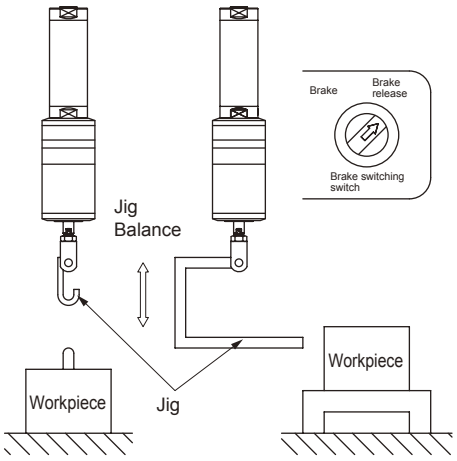
1) Confirm that the brake selection switch is set to the brake side (brakes are applied).

2) Supply air.

3) Operate the brake selection switch and release brakes. (Jig balanced)

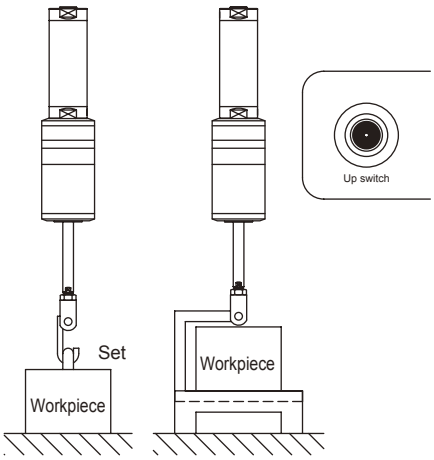
4) The load can be moved manually with the UP and DOWN switches.





5) Set the jig on the workpiece.

6) Press the UP switch to raise the load and release the UP switch when the workpiece has risen 50 mm.
The workpiece is balanced in one second or so.
Note: Weight is detected roughly one second after the switch is released. If external force is applied to the workpiece or jig at this time, this force is also detected and a balance fault occurs.

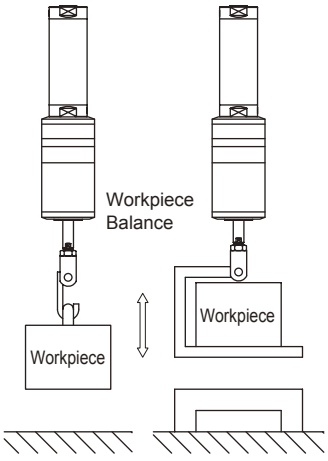


7) The load can be moved manually with the UP and DOWN switches.

8) Set the workpiece at the specified position, and press the DOWN switch for roughly one second. The jig will be balanced.

Return to step 4) and do the next operation.

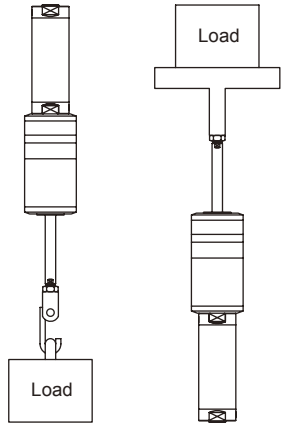
If the main air source is cutoff, position locking will be activated by the built-in brakes.
For safety, set the brake selection switch to the brake side when finished with work.



Technical data

Using the balancing cylinder effectively

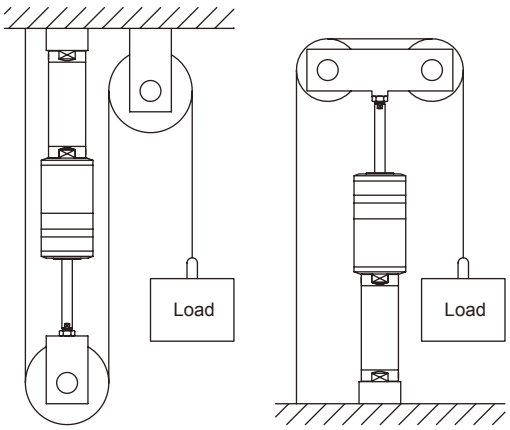
Standard used



Model no.: D　　Model no.: U

This operation is easiest.
If the cylinder stroke is long, total unit height increases.
When the workpiece is moved at high speed, operating force increases slightly because of flow rate resistance.

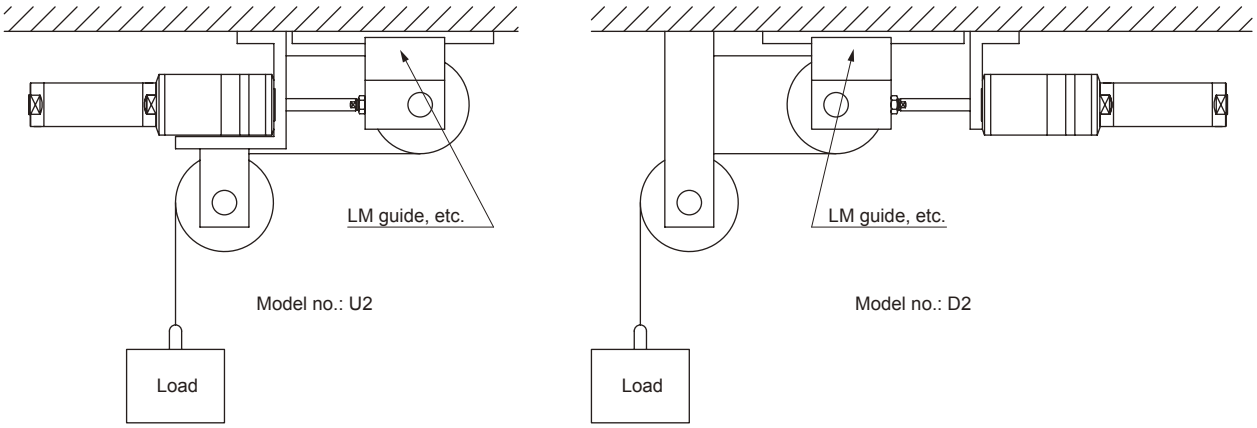
Double speed



Model no.: U1　　Model no.: U

The cylinder stroke is half of standard usage, so total unit height is lower.
Theoretically during double speed, operating force is half of the standard, but the tolerable maximum load is also halved.

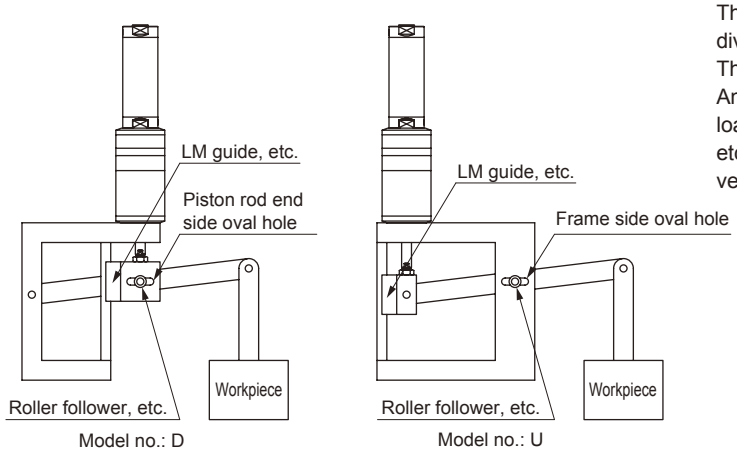
Horizontal double speed



Model no.: U2　　Model no.: D2

Basically, specifications are the same as double speed, but the cylinder is set horizontally so total unit height is reduced greatly.
Theoretically, during double speed, operating force is half of the standard, but the tolerable maximum load is also halved.
Take care to prevent the piston rod and cylinder weight from being applied by using an LM guide, etc.

Lever used



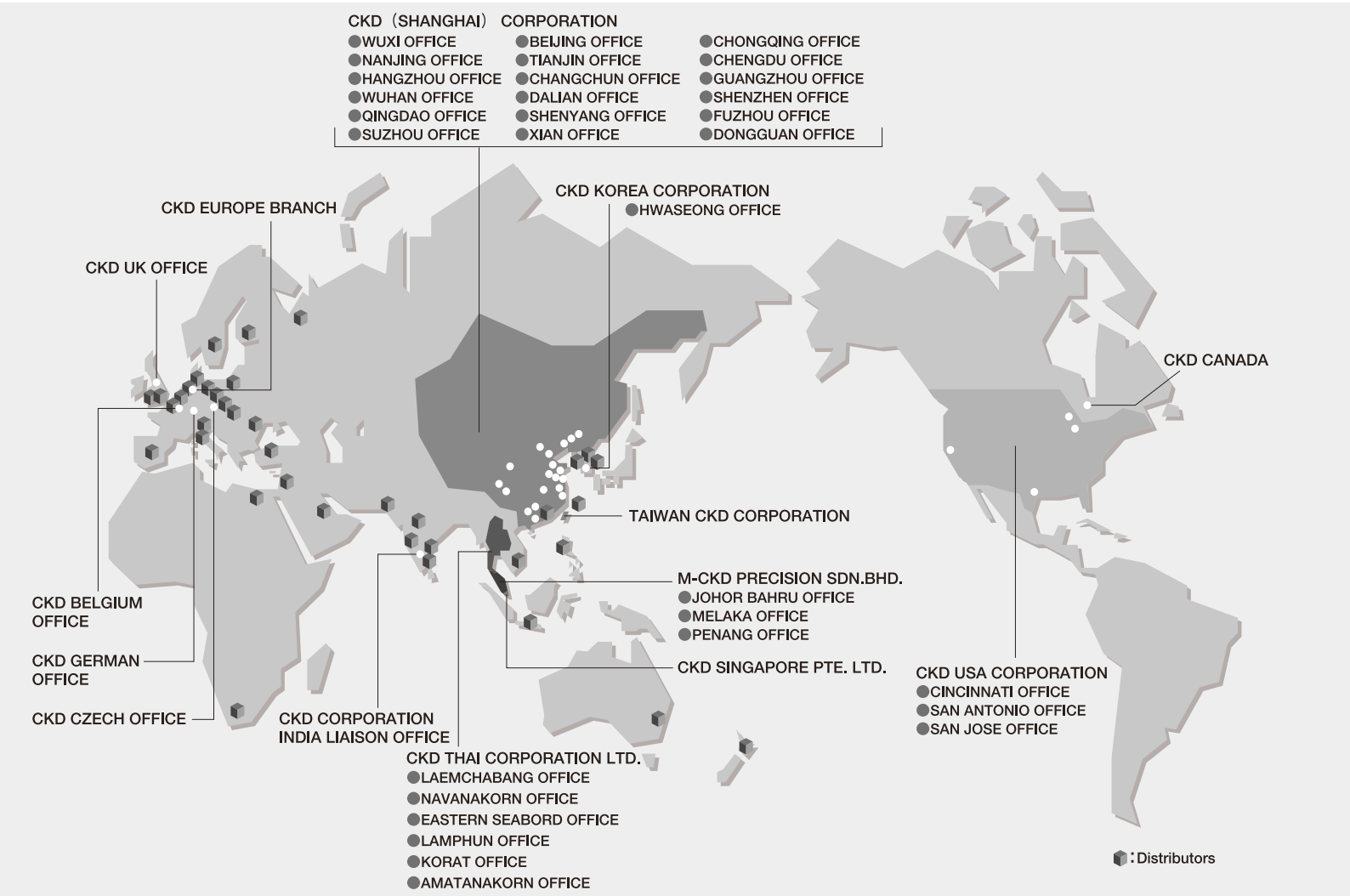
Model no.: D　　Model no.: U

The lever ratio is selected freely compared to double speed, increasing design freedom.
Theoretically, the operating force is the value obtained by dividing operating force by the lever ratio scale.
The max. load is also the load divided by the lever ratio scale.
An LM guide, etc., must be used to prevent an unbalanced load from being applied to the piston rod, and a roller follower, etc., must be used so that the lever ratio stays the same with vertical movement.

MEMO

MEMO

WORLD-NETWORK



CKD Corporation

Website http://www.ckd.co.jp/

☐ OVERSEAS DPT. SALES DIV. 2-250 Ouji Komaki, Aichi 485-8551, Japan
☐ PHONE +81-(0)568-74-1338 FAX +81-(0)568-77-3461

U.S.A
CKD USA CORPORATION
● HEADQUARTERS
4080 Winnetka Avenue, Rolling Meadows, IL 60008 USA
PHONE +1-847-368-0539 FAX +1-847-788-0575

EUROPE
CKD EUROPE BRANCH
De Fruittuinen 28 Hoofddorp 2132NZ The Netherlands
PHONE +31-(0)23-5541490 FAX +31-(0)23-5541491

Malaysia
M-CKD PRECISION SDN.BHD.
● HEADQUARTERS
Lot No.6,Jalan Modal 23/2, Seksyen 23, Kawasan, MIEL,
Fasa 8, 40300 Shah Alam,Selangor Darul Ehsan, Malaysia
PHONE +60-(0)3-5541-1468 FAX +60-(0)3-5541-1533

Thailand
CKD THAI CORPORATION LTD.
● SALES HEADQUARTERS-BANGKOK OFFICE
Suwan Tower, 14/1 Soi Saladaeng 1, North Sathorn Rd., Bangrak,
Bangkok 10500 Thailand
PHONE +66-(0)2-267-6300 FAX +66-(0)2-267-6305

Singapore
CKD SINGAPORE PTE LTD.
705 Sims Drive #03-01/02, Shun Li Industrial Complex,
387384 Singapore
PHONE +65-6744-2623 FAX +65-6744-2486

Taiwan
TAIWAN CKD CORPORATION
1F., No.16, Wucyuan 5th Rd., Wugu Township, Taipei Country 248,
Taiwan (R.O.C)
PHONE +886-(0)2-2298-2866 FAX +886-(0)2-2298-0322

China
CKD (SHANGHAI) CORPORATION
● SALES HEADQUARTERS / SHANGHAI OFFICE
Room 1903, 333 Jiujiang Road, Shanghai, 200001, China
PHONE +86-(0)21-63602277 FAX +86-(0)21-63511661

Korea
CKD KOREA CORPORATION
3rd FL, Sam Young B/D, 371-20
Sinsu-Dong, Mapo-Gu, Seoul, 121-110, Korea
PHONE +82-(0)2-783-5201～5203 FAX +82-(0)2-783-5204

The goods and their replicas, or the technology and software in this catalog are subject to complementary export regulations by Foreign Exchange and Foreign Trade Law of Japan.
If the goods and their replicas, or the technology and software in this catalog are to be exported, laws require the exporter to make sure they will never be used for the development or the manufacture of weapons for mass destruction.

●Specifications are subject to change without notice. © CKD Corporation 2008 All copy rights reserved.

2008.9.ACC