BBS

Balancer Unit

ø50, ø63, ø80, ø100

CONTENTS

Heavy objects up to 285 kg can be easily operated with air assistance

Balancer unit integrating a unique balance mechanism, automatic load detection function, and brake mechanism into a low-friction cylinder.

Workpiece weight to be balanced is...

In case of many types

Automatic Pressure Adjustment Type

BBS-A

Supports multi-product workpieces with load detection function

Even when the load changes for each workpiece to be transferred, it recognizes it with simple operation and maintains optimal balance.

In case of 1 type

Fixed Pressure Adjustment type

BBS-O

Control Box Integrated type

BBS-OB

Balanced state simultaneously with air source connection

Once the balance pressure is adjusted according to the workpiece weight, no further adjustment is necessary. It becomes a balanced state simultaneously with air connection.

Brake considering safety is standardly equipped

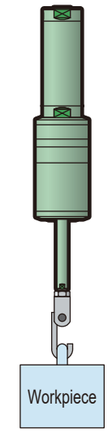
Highly reliable brake standardly equipped. Even if the air source is cut off, there is no workpiece falling or bouncing after recovery.

Also supports all-air system (option)

Supports all-air system that does not require electricity. Can also be used in atmospheres requiring explosion-proof.

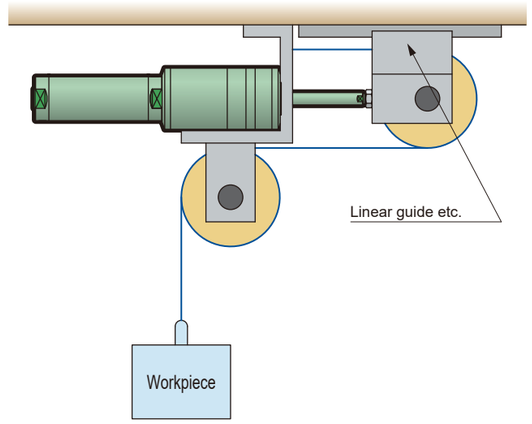
Application Example

Standard use



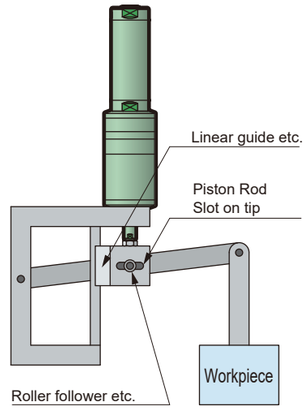
Hang BBS vertically and move the workpiece up and down.

Horizontal facing usage



Mounting the BBS horizontally can suppress the height of the entire unit.

Lever use



Use the BBS and link mechanism together.

BBS Series Product System

Variation

Pressure adjustment method	Model No.	Bore Size (mm)	Stroke Range (mm)
Automatic Pressure Adjustment Type	BBS-A	ø50 ø63 ø80 ø100	100 to 1500
Fixed Pressure Adjustment Type Control box separate type	BBS-O		
Fixed Pressure Adjustment Type Control box integrated type	BBS-OB		300 to 1500

Load range

Bore Size (mm)	Load		
	Minimum *1 (kg)	Minimum Workpiece *2 (kg)	Maximum *3 (kg)
ø50	10	20	70
ø63	16	31	115
ø80	25	51	180
ø100	40	80	285

*1: This is the load of the jig only without a workpiece.
*2: Applicable only to automatic pressure adjustment type.
*3: At 0.6 MPa. Jig+Workpiece load. Varies depending on Operating Pressure.

System Related Products

Control Box (For automatic pressure adjustment type)

- For electric system
- For electric, 2-stage speed switchable
- For air system

Operation Switch (For automatic pressure adjustment air system)

- Push type
- Hand type
- Lever type
- Grip type

Balancer Unit
BBS Series

●: Standard, ◎: Option ■: Not available

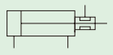
Variation	Model No.	Bore Size (mm)	Stroke (mm)		Max Stroke (mm)	Min Stroke (mm)	Mounting Style: Basic type 00	Mounting Style: Single clevis type CA	Mounting Style: Double Clevis Type CB	Mounting Style: Rod Side Flange Type FA	Mounting Style: Head Side Flange Type FB	Accessories: Single knuckle I	Accessories: Double Knuckle Y	Page
Automatic Pressure Adjustment Type	BBS-A	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	100	●	●		●	●	●	●	1038
		ø80, ø100					●		●	●	●	●	●	
Fixed Pressure Adjustment Type Control box separate type	BBS-O	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	100	●	●		●	●	●	●	1054
		ø80, ø100					●		●	●	●	●	●	
Fixed Pressure Adjustment Type Control box integrated type	BBS-OB	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	300	●	●		●	●	●	●	1054
		ø80, ø100					●		●	●	●	●	●	

Balancer Unit
Automatic Pressure Adjustment Type

BBS-A Series

Do not disassemble

● Bore Size: ø50, ø63, ø80, ø100

JIS Symbol 

For compatible detailed model No.s, please visit the CKD website.

Model No. Notation

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

- BBS-A: Model No.
- A: ❶ System
- D: ❷ Load Direction
- 1: ❸ Cylinder orientation (Piston Rod direction)
- CB: ❹ Mounting type
- 80: ❺ Bore Size
- D: ❻ Stroke
- 300: ❻ Stroke
- Y: ❼ Accessories

❶ System

Code	Content
Blank	Electric system (24 VDC)
*1 A	Air system

*1: When automatic pressure adjustment is selected for the air method, be sure to use the control box (BBS-A-TB P. 1050).

❷ Load Direction

Code	Content	
D	Push side	
U	Retraction side	

Note: Load Direction refers to the input direction of the load to the cylinder.

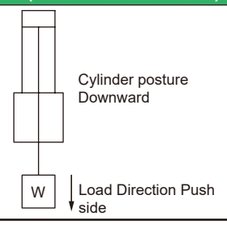
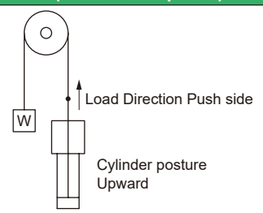
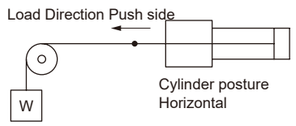
❸ Cylinder orientation (Piston Rod direction)

Code	Content
Blank	Downward
1	Upward
2	Horizontal

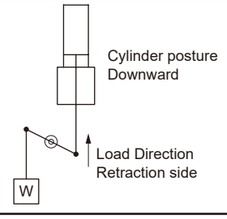
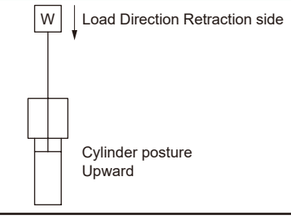
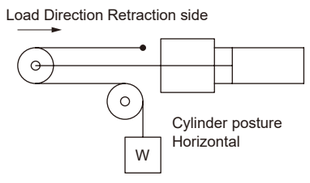
Note: Cylinder posture refers to the posture of the cylinder at the time of installation. Please refer to the diagram below.

Load Direction and cylinder posture

Load Direction Push side (D)

D (Piston Rod downward)	D1 (Piston Rod upward)	D2 (Piston Rod horizontal)
		

Load Direction Retract side (U)

U (Piston Rod downward)	U1 (Piston Rod upward)	U2 (Piston Rod horizontal)
		

❹ Mounting type

Mounting bracket is included with the product.

Code	Content	
OO	Basic type	
CA	Single Yoke Clevis (ø50, ø63) (Pin and Retaining Ring attached)	
CB	Double Yoke Clevis (ø80, ø100) (Pin and Retaining Ring attached)	
FA	Rod Side Flange	
FB	Head Side Flange	

❺ Bore Size (mm)

Code	Content
50	ø50
63	ø63
80	ø80
100	ø100

❻ Stroke (mm)

Model No.	Bore Size	Stroke
BBS-A	ø50 to ø100	100 to 1500

❼ Accessories

Code	Content	
I	Single Knuckle	
Y	Double Knuckle (pin and Retaining Ring included)	

Note: I and "Y" cannot be selected simultaneously.

Specifications

Item \ Model No.	BBS-A-50	BBS-A-63	BBS-A-80	BBS-A-100
Operating Fluid	Clean compressed air			
Max Operating Pressure MPa	0.60			
Min Operating Pressure MPa	0.25			
Proof Pressure MPa	0.90			
Ambient Temperature °C	-5 to 50 (however, no freezing)			
Bore Size mm	ø50	ø63	ø80	ø100
Max Stroke mm	1500			
Operating Piston Speed mm/s	1 to 200			
Cushion	Rubber Cushion			
Lubrication	Not allowed			
Minimum load (jig) kg	10	16	25	40
Minimum load (workpiece) (Reference) kg	20	31	51	80
Maximum load (jig+workpiece) *1 kg	70	115	180	285
Operating force N	Refer to P. 1052 BBS Operating Force Data			
Holding Force N	1539		3940	

***1: Please refer to P. 1052 BBS Maximum Load Data for Operating Pressure.**

Stroke

Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100

Note: Intermediate strokes can be produced in 1 mm increments.

Weight Table

(Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: Added weight per 100 mm
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	7.22	7.62	-	8.35	7.56	0.44
ø63	7.52	8.20	-	8.65	8.02	0.52
ø80	10.96	-	11.67	12.88	11.67	0.70
ø100	12.09	-	13.37	14.01	13.44	0.86

Mounting Bracket Model No. Notation

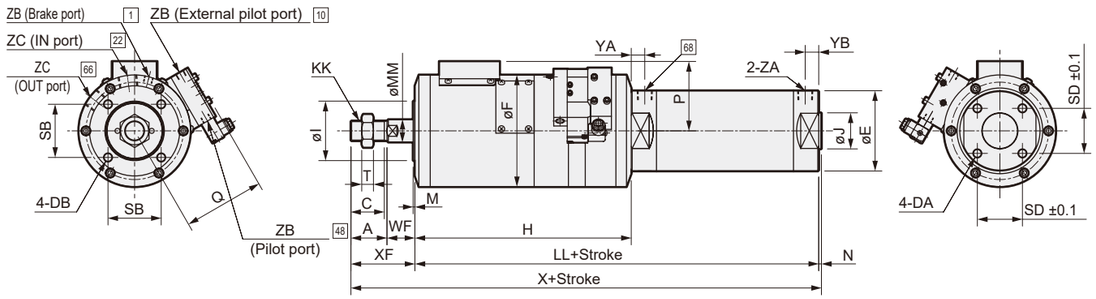
Bore Size (mm) / Mounting bracket	ø50	ø63	ø80	ø100
Flange (FA)	BBS-FA-50	BBS-FA-50	BBS-FA-80	BBS-FA-80
Flange (FB)	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Single clevis (CA)	SCM-CA-50	SCM-CA-63	-	-
Double Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

Note: Mounting bolts are included with each mounting bracket.

MEMO

Dimensional Drawings

● Basic Type (OO) Load Direction Push Side (D)



● Basic Type (OO) Load Direction Retract Side (U)

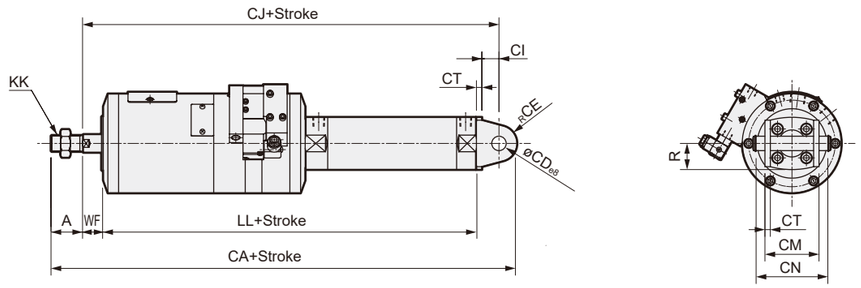
Note : Inside □ indicates the piping connection number in the air circuit diagram.

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

Code / Bore Size (mm)	M	N	P	Q	SB	SD	T	WF	X	XF	YA	YB	YC	YD	ZA	ZB	ZC
ø50	2	2	57	81	50	32	11	23	374	58	15	12	32	52	Rc1/4	Rc1/8	Rc3/8
ø63	2	2	57	81	50	38	11	23	374	58	15	12	32	52	Rc1/4	Rc1/8	Rc3/8
ø80	2	3	77	90	59	50	13	31	422	71	15	15	34	55.7	Rc3/8	Rc1/8	Rc 1/2
ø100	2	3	77	90	59	60	13	31	422	71	15	15	34	55.7	Rc 1/2	Rc1/8	Rc 1/2

Dimensional Drawings

● Single Yoke Clevis Type (CA) Load Direction Push Side (D)

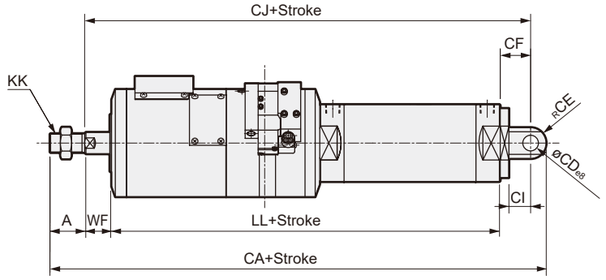


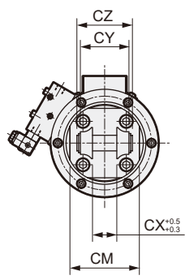
● Single Yoke Clevis Type (CA) Load Direction Retract Side (U)

Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

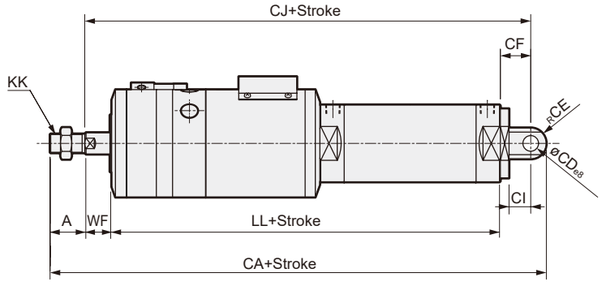
Dimensional Drawings

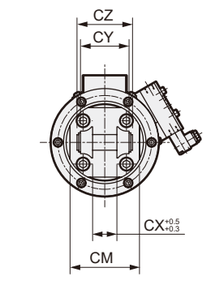
● Double Yoke Clevis Type (CB) Load Direction Push Side (D)





● Double Yoke Clevis Type (CB) Load Direction Retract Side (U)

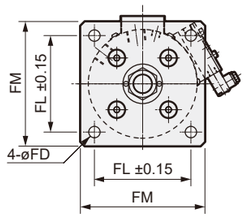


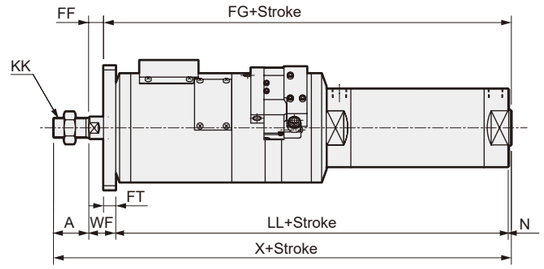


Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

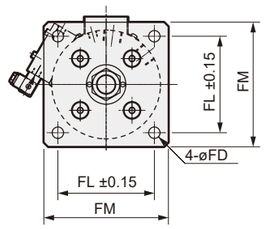
Dimensional Drawings

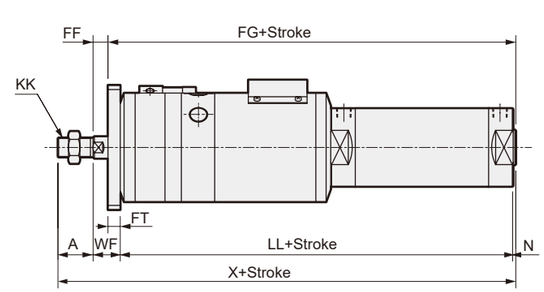
● Rod Side Flange Type (FA) Load Direction Push Side (D)





● Rod Side Flange Type (FA) Load Direction Retract Side (U)

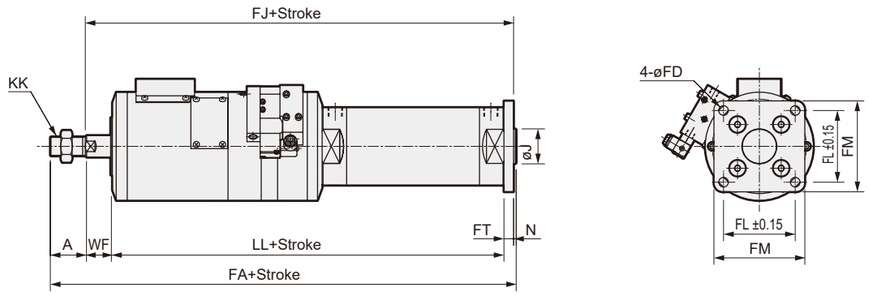




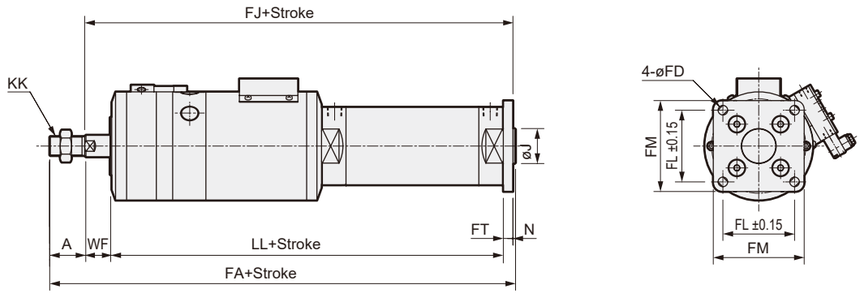
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Head Side Flange Type (FB) Load Direction Push Side (D)



● Head Side Flange Type (FB) Load Direction Retract Side (U)

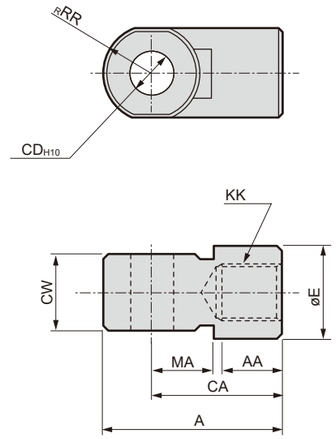


Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Accessory External Dimensions

● Rod eye

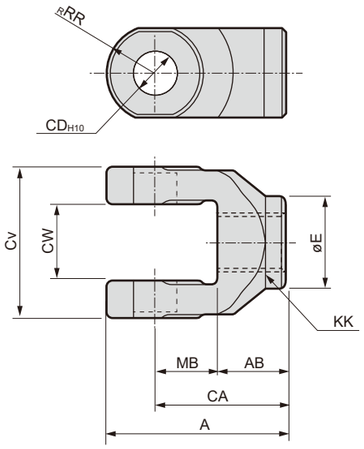
Material: Cast Iron, Painting



Part No.	Applicable Bore Size (mm)	A	AA	CA	CD	CW	E	KK	MA	RR	Weight (g)
SCM-I-50	50, 63	56	18	40	14	22 $^{-0.3}_{-0.5}$	28	M18×1.5	20	16	158
SCM-I-80	80, 100	71	21	50	18	28 $^{-0.3}_{-0.5}$	38	M22×1.5	27	21	395

● Rod clevis

Material: Cast Iron, Painting

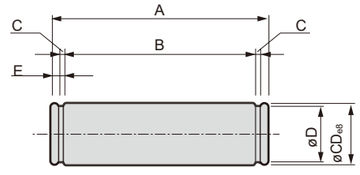


Part No.	Applicable Bore Size (mm)	A	AB	CA	CD	Cv	CW	E	KK	MB	RR	Applicable Pin Part Number	Weight (g)
SCM-Y-50	50, 63	56	20	40	14	44	22 $^{+0.5}_{+0.3}$	28	M18×1.5	20	16	SCM-P-50	258
SCM-Y-80	80, 100	71	23	50	18	56	28 $^{+0.5}_{+0.3}$	38	M22×1.5	27	21	SCM-P-80	590

Note: The pin and Retaining Ring are included.

● Pin for clevis

Material: Steel, Zinc Chromate plating

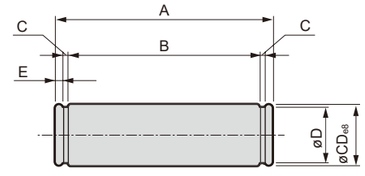


Part No.	Applicable Bore Size (mm)	A	B	C	CD	D	E	Retaining Ring Used	Weight (g)
SCM-P1-50	50	86	79.6	1.15	16	15.2	2.1	C-type for Shaft 16	133
SCM-P1-63	63	105.4	97.8	1.35	18	17	2.5	C-type for Shaft 18	207

Note: For ø80, ø100, it is shared with knuckle pin.

● Pin for rod eye

Material: Steel, Zinc Chromate plating



Part No.	Applicable Bore Size (mm)	A	B	C	CD	D	E	Retaining Ring Used	Weight (g)
SCM-P-50	50, 63	50.6	44.2	1.15	14	13.4	2.1	C-type 14 for Shaft	60
SCM-P-80	80, 100	64	56.2	1.35	18	17	2.6	C-type for Shaft 18	126

Control Box (For electric system)

Model No. Notation

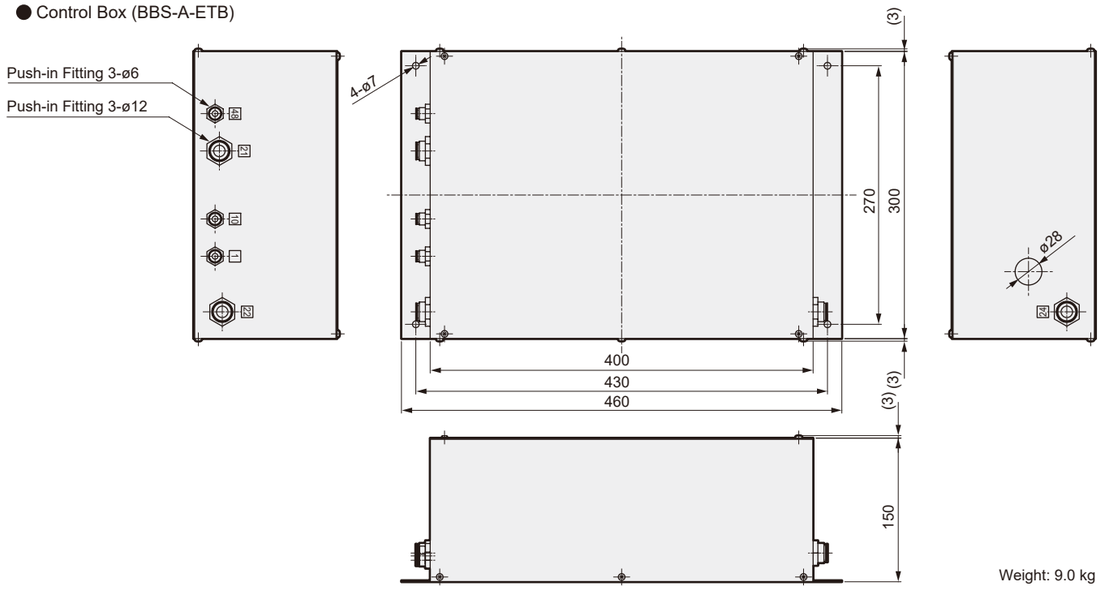
BBS-A - ETB

Model No.

Control Box

Dimensional Drawings

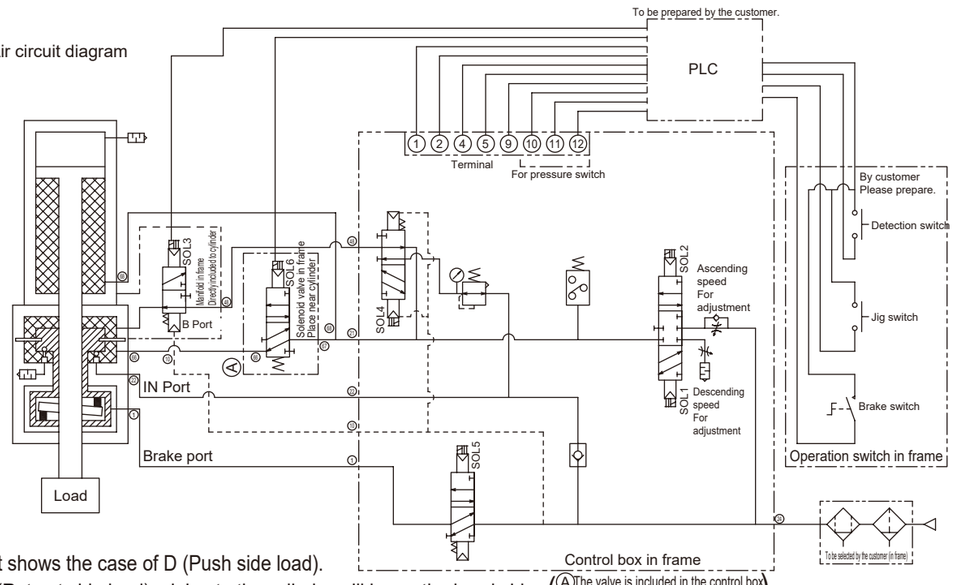
● Control Box (BBS-A-ETB)



Weight: 9.0 kg

Air circuit diagram

● Control Box (BBS-A-ETB) Air circuit diagram



The above circuit shows the case of D (Push side load).
In the case of U (Retract side load), piping to the cylinder will be on the head side.

Control Box (For electric system, 2-speed switching type)

Model No. Notation

BBS-A - ETB2

Model No.

Control Box

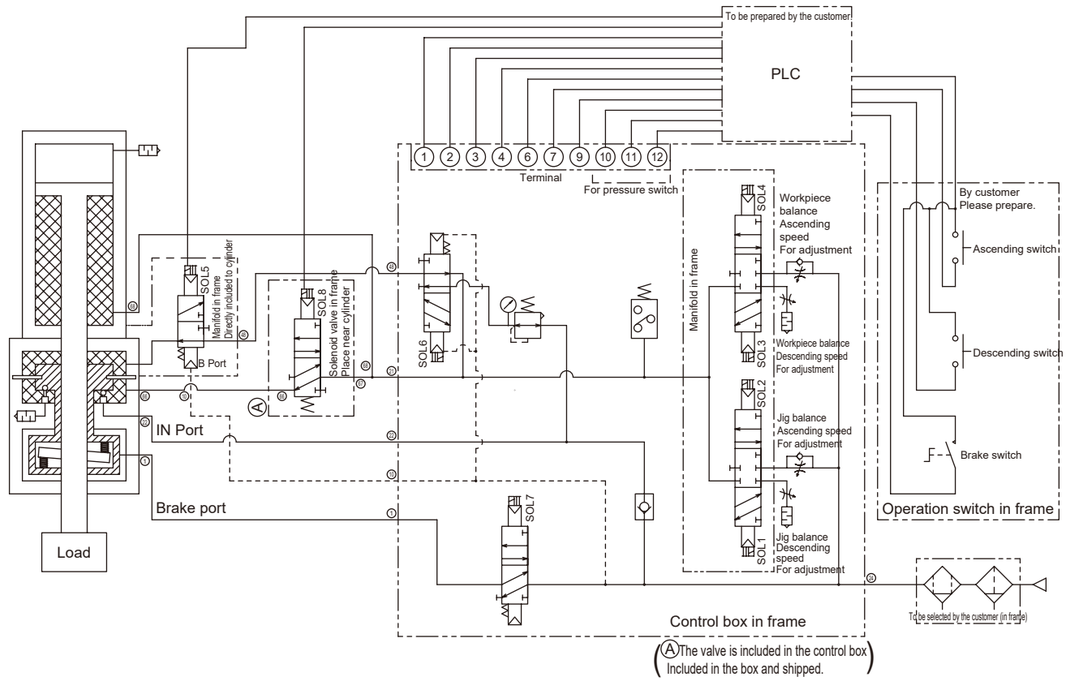
Dimensional Drawings

● Same as Control Box (BBS-A-ETB). Please refer to P. 1048.

Weight: 9.5 kg

Air circuit diagram

● Control Box (BBS-A-ETB2) Air circuit diagram



The above circuit shows the case of D (Push side load). In the case of U (Retract side load), piping to the cylinder will be on the head side.

Control Box (For air system)

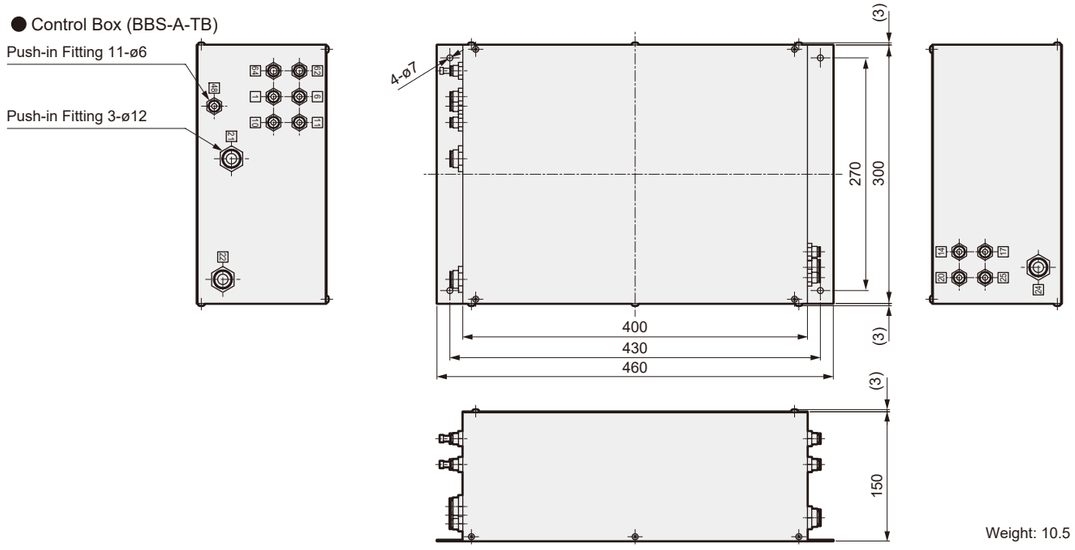
Model No. Notation

BBS-A - TB

- BBS-A: Model No.
- TB: Control Box

Dimensional Drawings

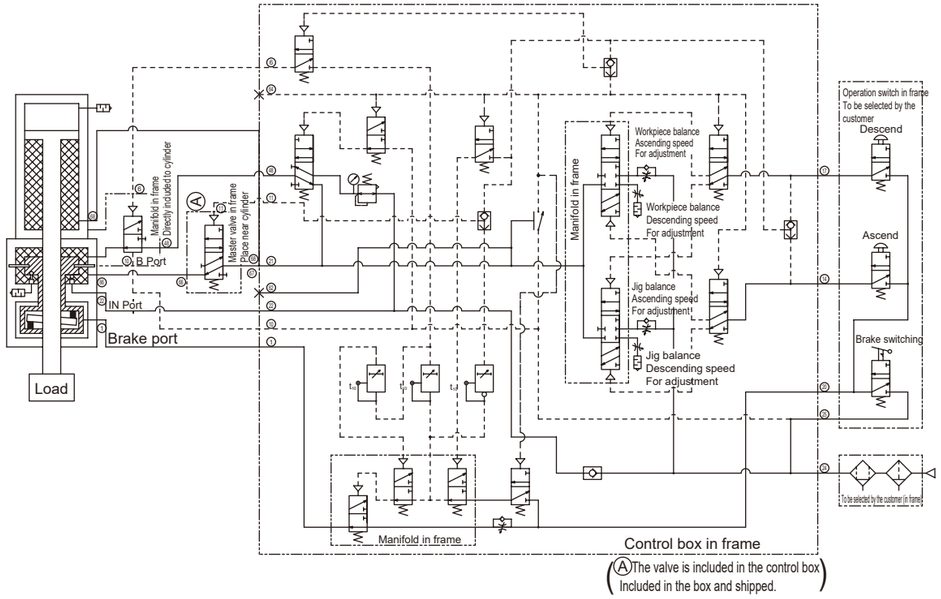
● Control Box (BBS-A-TB)



Weight: 10.5 kg

Air circuit diagram

● Control Box (BBS-A-TB) Air circuit diagram



The above circuit shows the case of D (Push side load). In the case of U (Retract side load), piping to the cylinder will be on the head side.

Operation Switch (For air system)

Model No. Notation

BBS - CSW - R

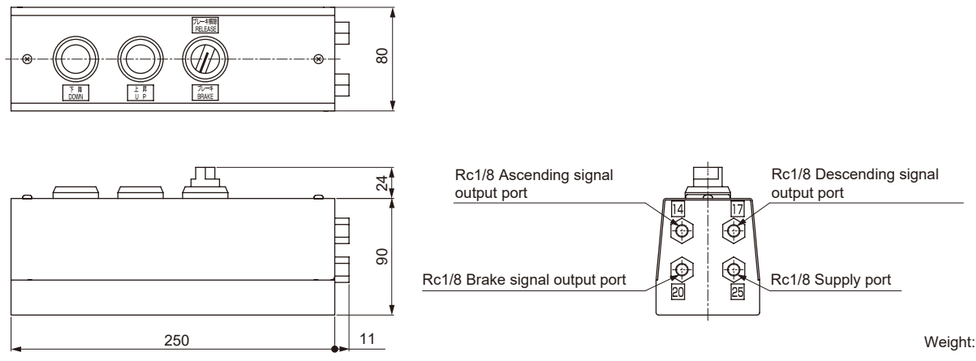
- BBS: Model No.
- CSW: Operation switch
- R: ❶ Type

❶ Type

Code	Content
P	Push type
H	Hand type
R	Lever type
G	Grip type

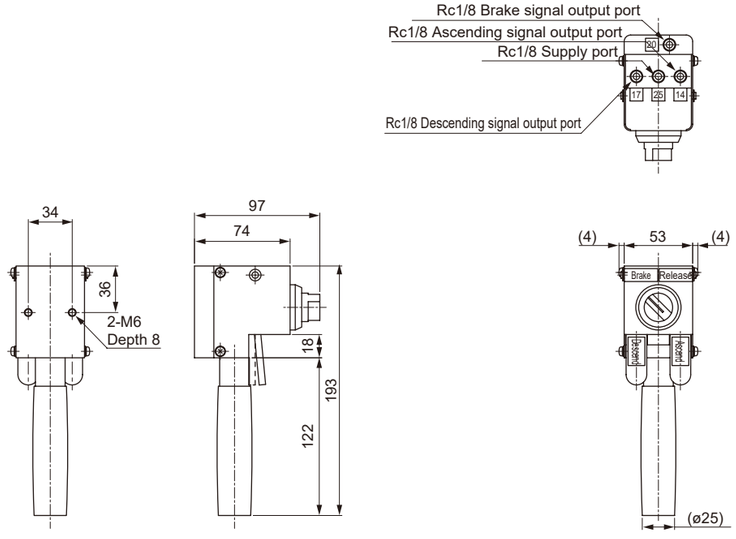
Operation Switch External View Diagram

● Push Type (BBS-CSW-P)



Weight: 1.4 kg

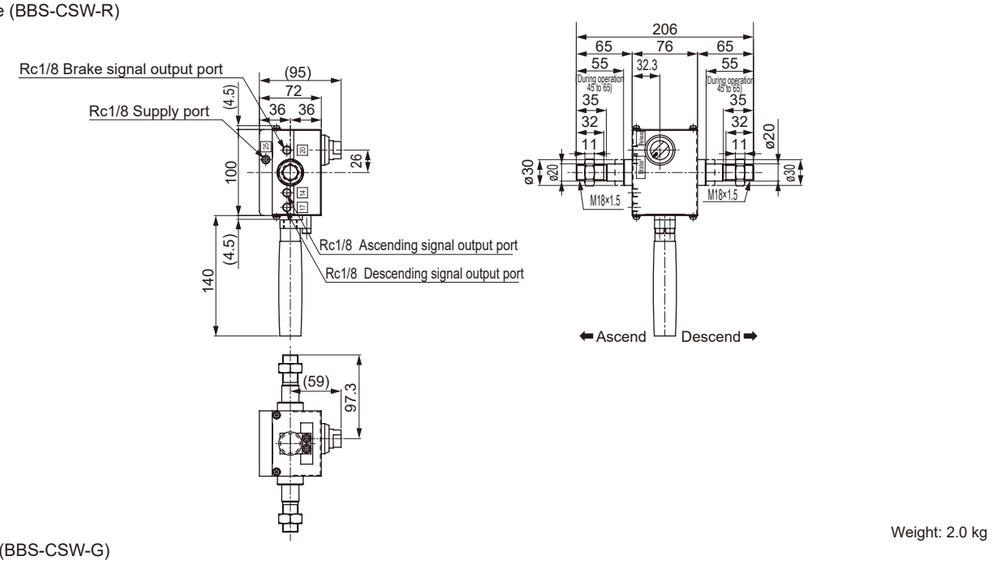
● Hand Type (BBS-CSW-H)



Weight: 1.0 kg

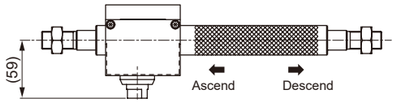
Operation Switch External View Diagram

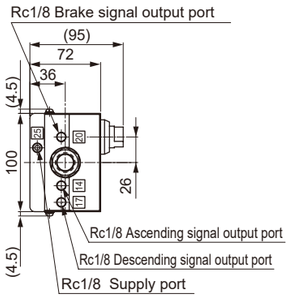
● Lever Type (BBS-CSW-R)

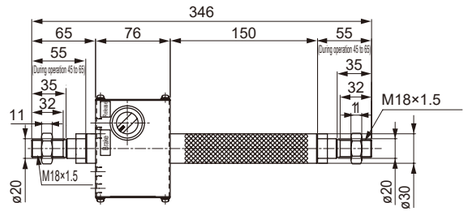


Weight: 2.0 kg

● Grip Type (BBS-CSW-G)



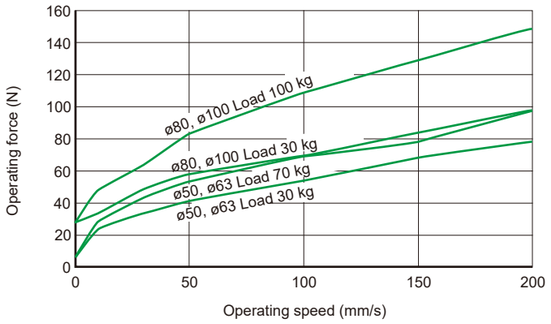




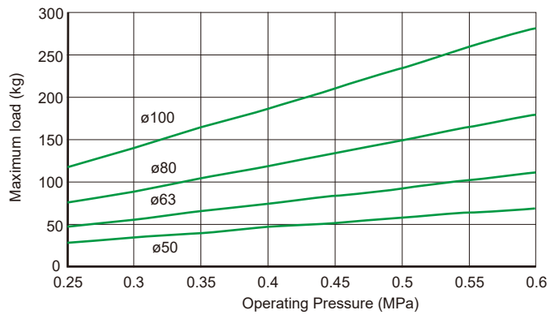
Weight: 2.5 kg

Please use the lever type and grip type operation switches by assembling them to the Piston Rod.

Operating force (Reference)



Maximum load for Operating Pressure



MEMO

Balancer Unit
Fixed Pressure Adjustment Type
Control box separated

BBS-O Series

● Bore Size: ø50, ø63, ø80, ø100

Do not disassemble

Control box integrated

BBS-OB Series

RoHS

Model No. Notation

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

1 Model No. | 2 Load Direction | 3 Mounting type | 4 Bore Size | 5 Stroke | 6 Accessories

1 Model No.

	Code	Content
*1	BBS-O	Control box separate type
	BBS-OB	Control box integrated type

*1: BBS-O control boxes are attached separately. Connection with the cylinder is the customer's responsibility.

2 Load Direction

Code	Content	
D	Push side	
U	Retraction side	

Note: Load Direction refers to the input direction of the load to the cylinder.

3 Mounting type

Mounting bracket is included with the product.

Code	Content	
OO	Basic type	
CA	Single Yoke Clevis (ø50, ø63) (Pin and Retaining Ring attached)	
CB	Double Yoke Clevis (ø80, ø100) (Pin and Retaining Ring attached)	
FA	Rod Side Flange	
FB	Head Side Flange	

4 Bore Size (mm)

Code	Content
50	ø50
63	ø63
80	ø80
100	ø100

5 Stroke (mm)

Model No.	Bore Size	Stroke
BBS-O	ø50 to ø100	100 to 1500
BBS-OB	ø50 to ø100	300 to 1500

6 Accessories

Code	Content	
I	Single knuckle	
Y	Double Knuckle (pin and Retaining Ring included)	

Note: "I" and "Y" cannot be selected together.

Specifications

Item \ Model No.	BBS-O-50	BBS-O-63	BBS-O-80	BBS-O-100
Operating Fluid	Clean compressed air			
Max Operating Pressure MPa	0.60			
Min Operating Pressure MPa	0.25 (36 psi)			
Proof Pressure MPa	0.90			
Ambient Temperature °C	-5 to 50 (however, no freezing)			
Bore Size mm	ø50	ø63	ø80	ø100
Max Stroke (mm)	1500			
Operating Piston Speed mm/s	1 to 200			
Cushion	Rubber Cushion			
Lubrication	Not allowed			
Minimum load (jig) kg	10	16	25	40
Minimum load (workpiece) (Reference) kg	20	31	51	80
Maximum load (jig+workpiece) *1 kg	70	115	180	285
Operating force N	Refer to P. 1052 BBS Operating Force Data			
Holding Force N	1539		3940	

***1: Please refer to P. 1052 BBS Maximum Load Data for Operating Pressure.**

Stroke

Model	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)
BBS-O	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100
BBS-OB	300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	300

Note: Intermediate strokes can be produced in 1 mm increments.

Weight Table

● Control Box Separate Type BBS-O (Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: 100 mm Added weight per
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	7.22	7.62	|	8.35	7.56	0.44
ø63	7.52	8.20	|	8.65	8.02	0.52
ø80	10.96	|	11.67	12.88	11.67	0.70
ø100	12.09	|	13.37	14.01	13.44	0.86

● Control Box Integrated Type BBS-OB (Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: 100 mm Added weight per
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	11.14	11.54	|	12.27	11.48	0.58
ø63	11.44	12.12	|	12.57	11.94	0.66
ø80	14.78	|	15.49	16.70	15.49	0.84
ø100	15.91	|	17.19	17.83	17.26	1.00

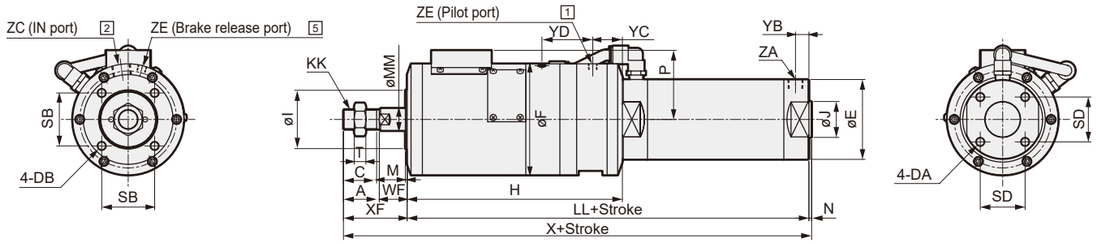
Mounting Bracket Model No. Notation

Bore Size (mm) \ Mounting bracket	ø50	ø63	ø80	ø100
Flange (FA)	BBS-FA-50	BBS-FA-50	BBS-FA-80	BBS-FA-80
Flange (FB)	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Single clevis (CA)	SCM-CA-50	SCM-CA-63	-	-
Double Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

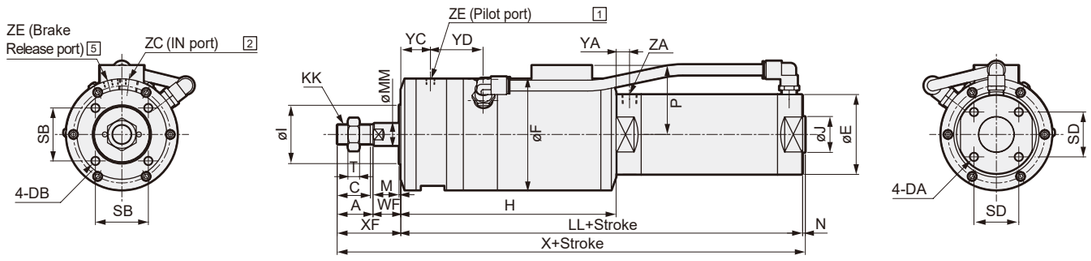
Note: Mounting bolts are included with each mounting bracket.

Dimensional Drawings

● Control Box Separate Type, Basic Type (OO), Load Direction Push Side (D)



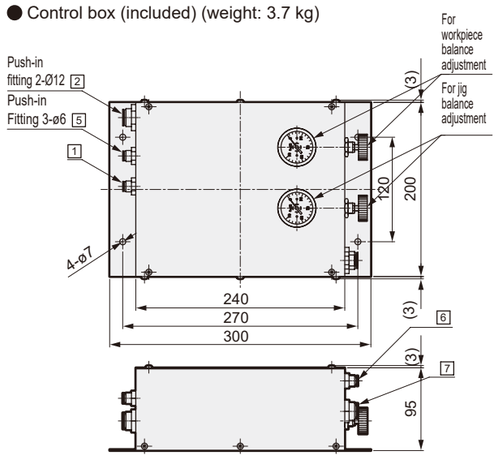
● Control Box Separate Type, Basic Type (OO), Load Direction Retract Side (U)



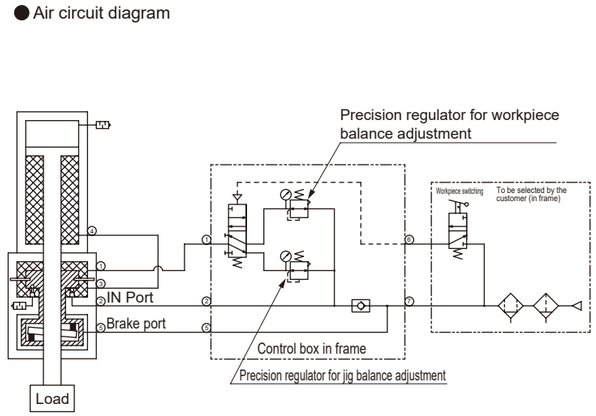
Code / Bore Size (mm)	A	C	DA	DB	E	F	H	I	J	KK	LL	MM	M	N
ø50	35	32	M8×1.25 Depth 16	M8×1.25 Depth 15	58	110	224	60	30	M18×1.5	314	20	2	2
ø63	35	32	M10×1.5 Depth 16	M8×1.25 Depth 15	72	110	224	60	32	M18×1.5	314	20	2	2
ø80	40	37	M10×1.5 Depth 22	M10×1.5 Depth 15	89	124	240	66	40	M22×1.5	348	25	2	3
ø100	40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

Code / Bore Size (mm)	P	SB	SD	T	WF	X	XF	YA	YB	YC	YD	ZA	ZE	ZC
ø50	57	50	32	11	23	374	58	15	12	37	48.5	Rc1/4	Rc1/8	Rc3/8
ø63	57	50	38	11	23	374	58	15	12	37	48.5	Rc1/4	Rc1/8	Rc3/8
ø80	77	59	50	13	31	422	71	15	15	33	56.7	Rc3/8	Rc1/8	Rc 1/2
ø100	77	59	60	13	31	422	71	15	15	33	56.7	Rc 1/2	Rc1/8	Rc 1/2

● Control box (included) (weight: 3.7 kg)

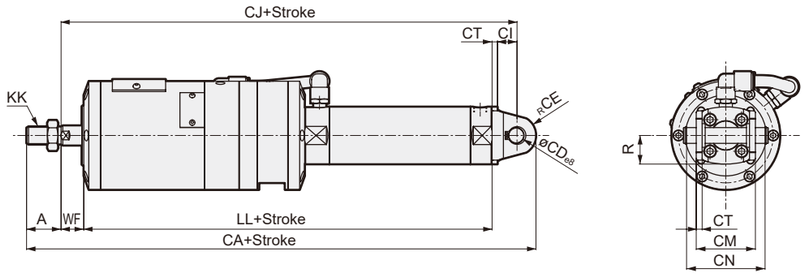


● Air circuit diagram

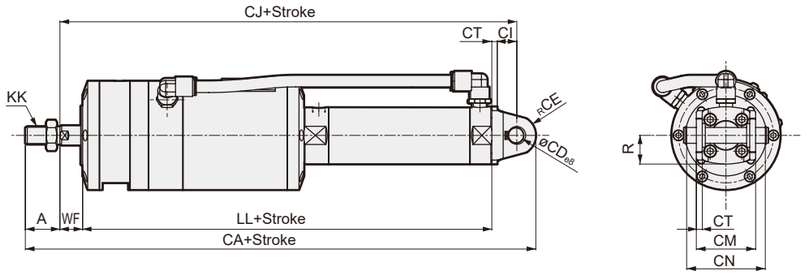


Dimensional Drawings

● Control Box Separate Type, Single Yoke Clevis Type (CA), Load Direction Push Side (D)



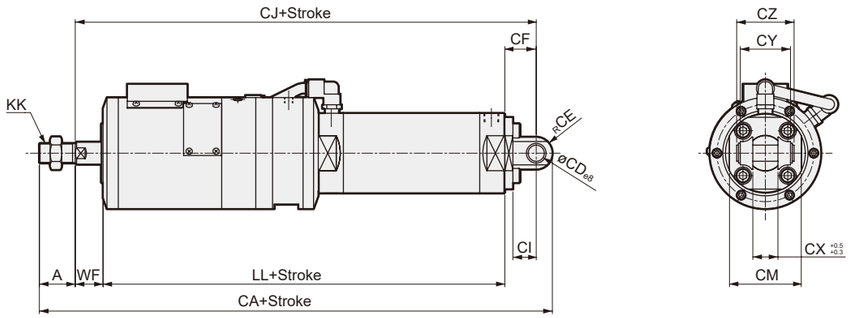
● Control Box Separate Type, Single Yoke Clevis Type (CA), Load Direction Retract Side (U)



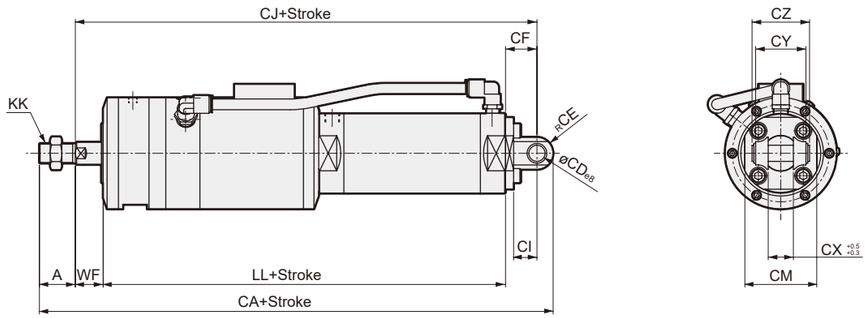
Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

Dimensional Drawings

● Control Box Separate Type, Double Yoke Clevis Type (CB), Load Direction Push Side (D)



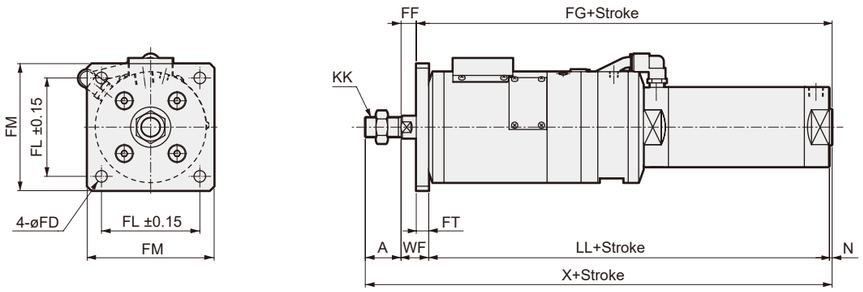
● Control Box Separate Type, Double Yoke Clevis Type (CB), Load Direction Retract Side (U)



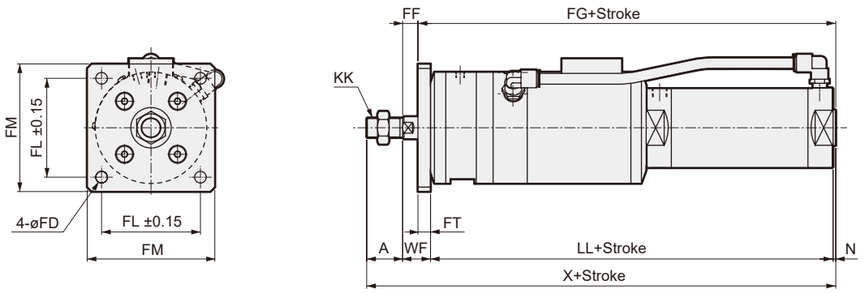
Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

Dimensional Drawings

● Control Box Separate Type, Rod Side Flange Type (FA), Load Direction Push Side (D)



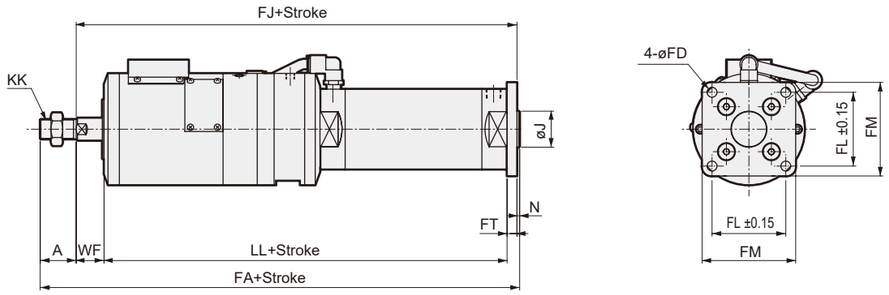
● Control Box Separate Type, Rod Side Flange Type (FA), Load Direction Retract Side (U)



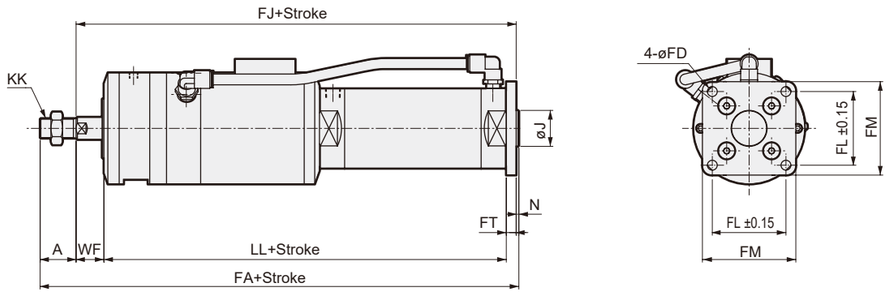
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Control Box Separate Type, Head Side Flange Type (FB), Load Direction Push Side (D)



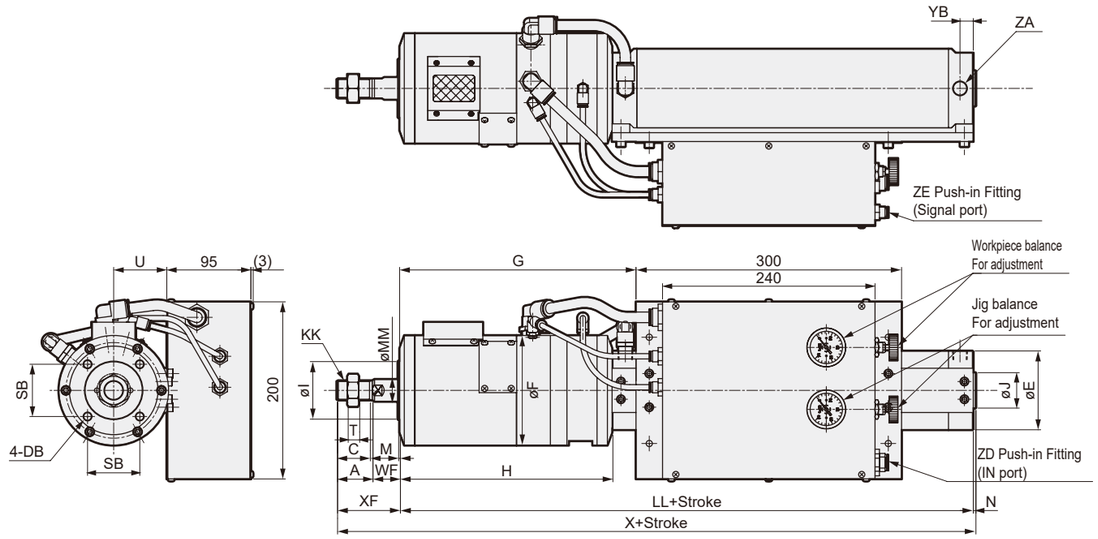
● Control Box Separate Type, Head Side Flange Type (FB), Load Direction Retract Side (U)



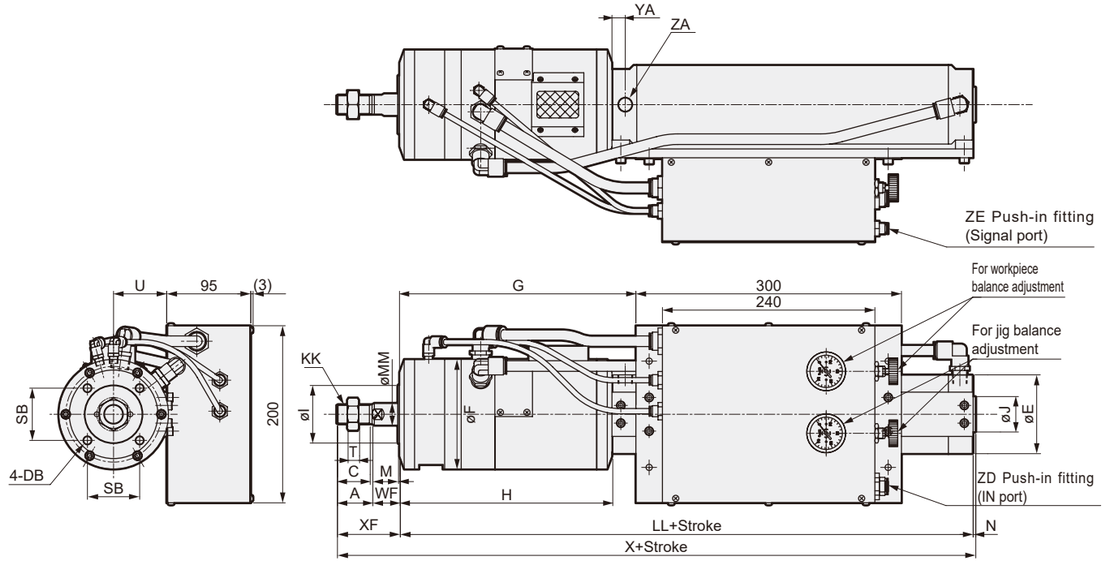
Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Dimensional Drawings

● Control Box Integrated Type, Basic Type (OO), Load Direction Push Side (D)



● Control Box Integrated Type, Basic Type (OO), Load Direction Retract Side (U)

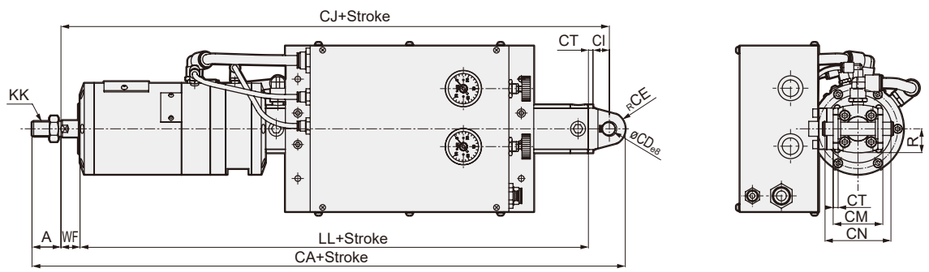


Code / Bore Size (mm)	A	C	(DA)	DB	E	F	G	H	I	J	KK	LL
ø50	35	32	M8×1.25 Depth 16	M8×1.25 Depth 15	58	110	248	224	60	30	M18×1.5	314
ø63	35	32	M10×1.5 Depth 16	M8×1.25 Depth 15	72	110	248	224	60	32	M18×1.5	314
ø80	40	37	M10×1.5 Depth 22	M10×1.5 Depth 15	89	124	267	240	66	40	M22×1.5	348
ø100	40	37	M12×1.5 Depth 22	M10×1.5 Depth 15	110	124	267	240	66	50	M22×1.5	348

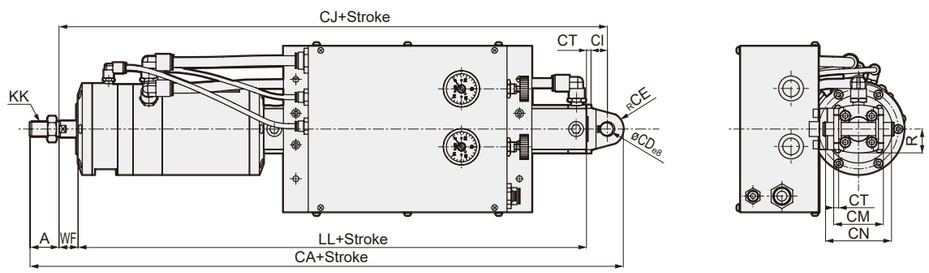
Code / Bore Size (mm)	MM	M	N	SB	(SD)	T	U	WF	X	XF	YA	YB	ZA	ZD	ZE
ø50	20	2	2	50	32	11	47.5	23	374	58	15	12	Rc1/4	ø12	ø6
ø63	20	2	2	50	38	11	54.5	23	374	58	15	12	Rc1/4	ø12	ø6
ø80	25	2	3	59	50	13	60	31	422	71	15	15	Rc3/8	ø12	ø6
ø100	25	2	3	59	60	13	70	31	422	71	15	15	Rc 1/2	ø12	ø6

Dimensional Drawings

● Control Box Integrated Type, Single Yoke Clevis Type (CA), Load Direction Push Side (D)



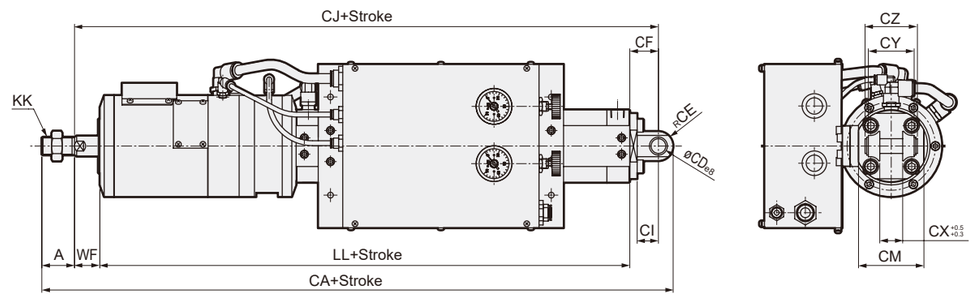
● Control Box Integrated Type, Single Yoke Clevis Type (CA), Load Direction Retract Side (U)



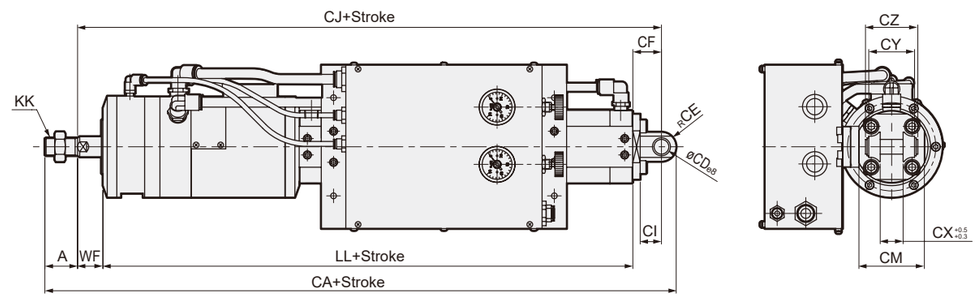
Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

Dimensional Drawings

● Control Box Integrated Type, Double Yoke Clevis Type (CB), Load Direction Push Side (D)



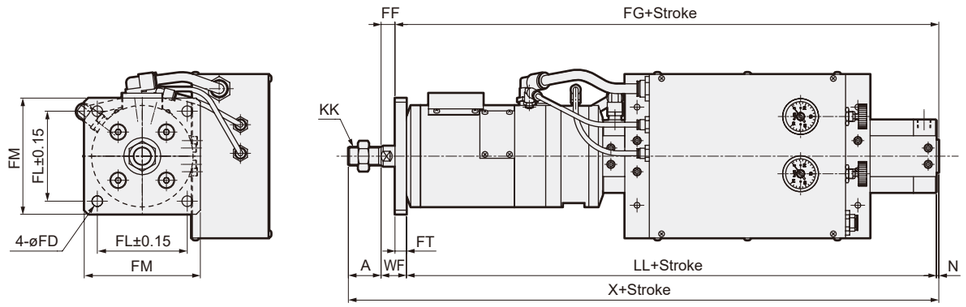
● Control Box Integrated Type, Double Yoke Clevis Type (CB), Load Direction Retract Side (U)



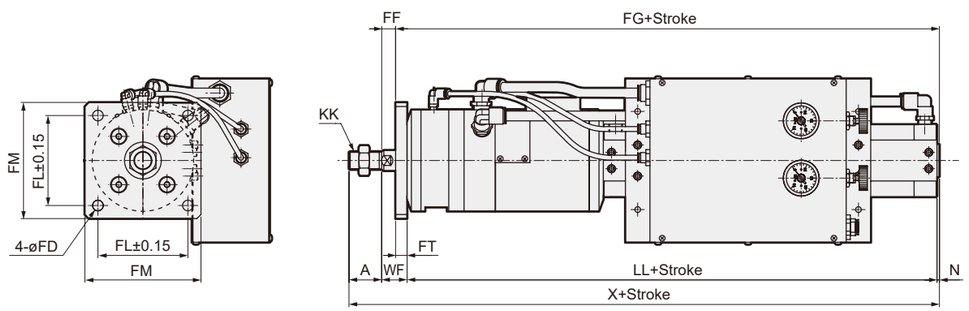
Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

Dimensional Drawings

● Control Box Integrated Type, Rod Side Flange Type (FA), Load Direction Push Side (D)



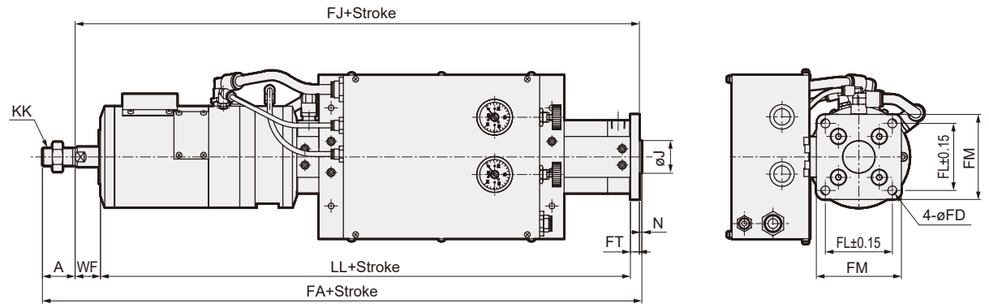
● Control Box Integrated Type, Rod Side Flange Type (FA), Load Direction Retract Side (U)



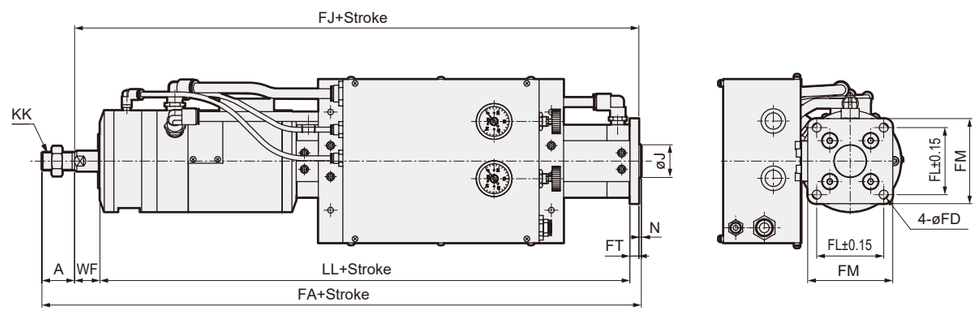
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Control Box Integrated Type, Head Side Flange Type (FB), Load Direction Push Side (D)

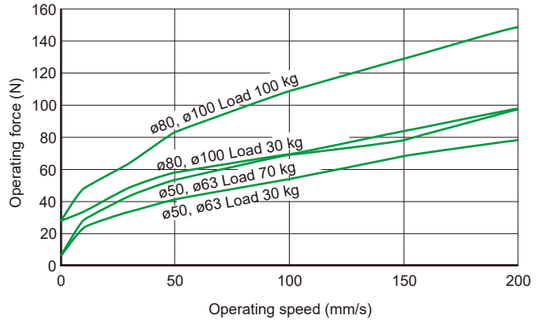


● Control Box Integrated Type, Head Side Flange Type (FB), Load Direction Retract Side (U)

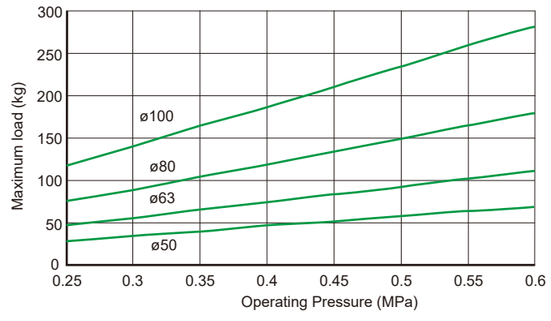


Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Operating force (Reference)



Maximum load for Operating Pressure



BBS-A Series (Automatic pressure adjustment type) Operation Method

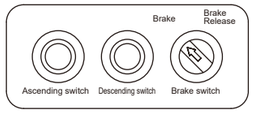
Perform the operation in the following procedure.

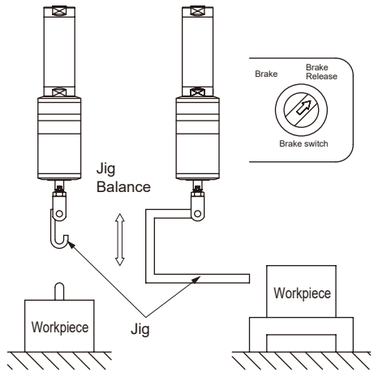
1) Check if the brake switch is on the brake side (brake is applied).

2) Supply air.

3) Operate the brake switch to release the brake. (Jig balance state)

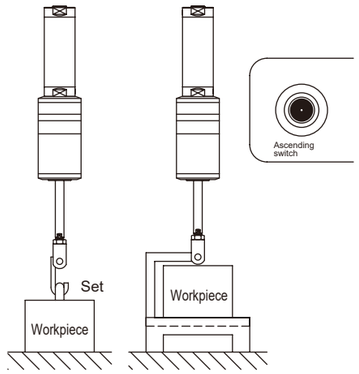
4) Ascending, descending switches, manually operable.





5) Set the jig on the workpiece.

6) Press and hold the ascending switch to raise, and release the ascending switch when the workpiece has risen about 50 mm. Workpiece balance will be achieved after about 1 second.
(Note) The weight detection time is about 1 second from the time the switch is released. If external force is applied to the workpiece, jig, etc. during that time, it will be detected up to that force, resulting in poor balance, so please be careful.

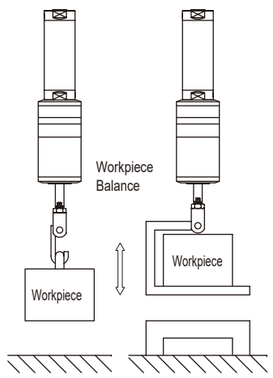


7) Ascending, descending switches, manually operable. However, continuous operation (inching operation) by switch is not possible.

8) Set the workpiece to the specified position and press the descending switch for about 1 second to achieve jig balance.

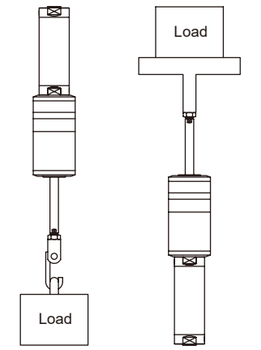
Return to 4) and proceed to the next operation.

If the main air source is shut off due to trouble, etc., the built-in brake will activate the fall prevention function. Also, for safety, switch the brake switch to the brake side after work is complete.



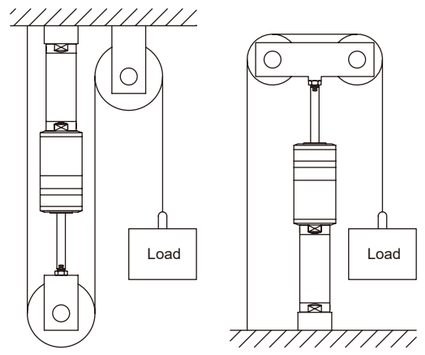
To use the balancer unit more effectively

Standard use



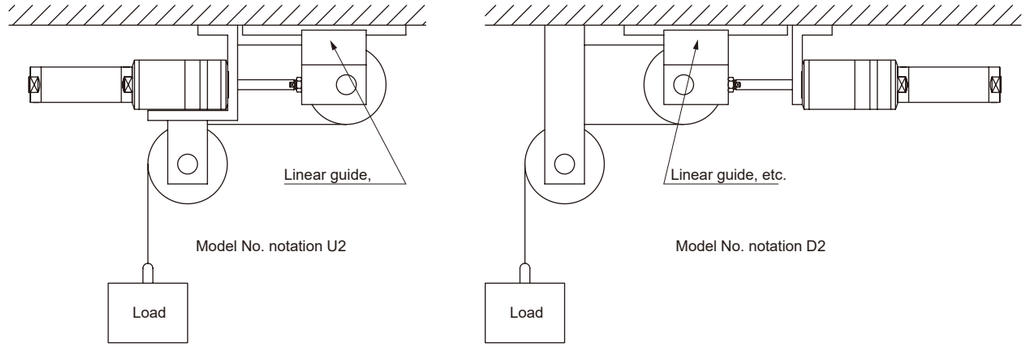
This is the easiest way to use it. If the cylinder stroke is long, the overall height of the entire unit will be long. When moving the workpiece at high speed, the operating force becomes slightly heavier due to flow resistance.

Double speed use



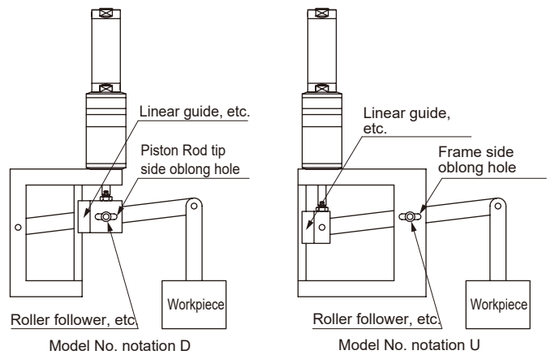
Compared to standard use, the cylinder stroke is halved, so the overall height of the entire unit is shortened. (At double speed) Theoretically, the operating force is half of standard use, but the allowable maximum load is also halved.

Horizontal double speed use



The basic specifications are the same as for double speed use, but since the cylinder is horizontal, the overall height of the entire unit is significantly shortened. (At double speed) Theoretically, the operating force is half of standard use, but the allowable maximum load is also halved. It is necessary to use a linear guide, etc. and be careful not to apply self-weight moment to the Piston Rod and cylinder.

Lever use



Compared to double speed use, the lever ratio can be freely selected, expanding design flexibility. Theoretically, the operating force is the value divided by the lever ratio multiplier. However, the allowable maximum load is also the load divided by the lever ratio multiplier. It is necessary to use a linear guide, etc. to prevent eccentric load on the Piston Rod, and to use a roller follower, etc. and be careful that the lever ratio does not change due to vertical movement.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Balancer unit BBS Series

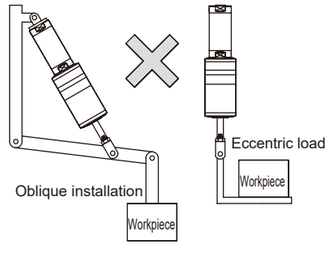
Design / Selection

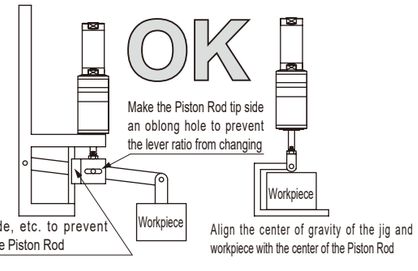
Warning

- Do not use the balancer unit exceeding the maximum Operating Pressure or operating piston speed.
- Do not rotate the Piston Rod while the brake is applied. This will cause damage.
- Do not disassemble.

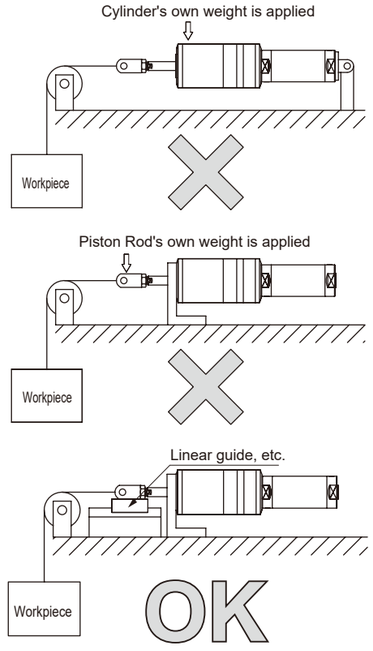
CAUTION

- If the automatic pressure adjustment air system is selected, be sure to use the control box (BBS-A-TB).
- Lubrication is not required for this unit. Also, if lubricated, it will cause trouble, so please refrain from doing so.
- This balancer unit should basically be used indoors. Although the unit can be used outdoors in a mobile manner, please move it indoors and store it after use.
- Since this balancer unit has a mechanism to automatically detect the load applied to the Piston Rod, please install it so that no eccentric load (oblique installation, eccentric load, etc.) is applied to the Piston Rod. The Piston Rod will operate poorly if an eccentric load is applied, requiring additional operating force. Furthermore, the automatic detection function may produce inaccurate results.

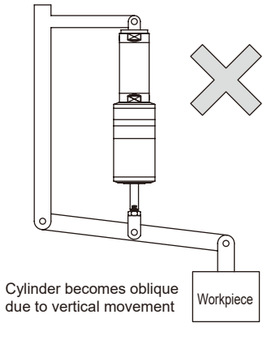


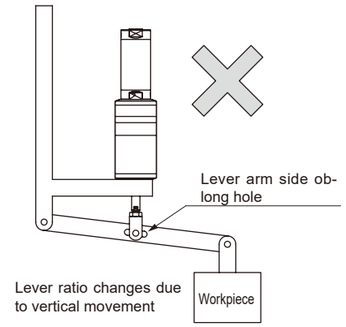


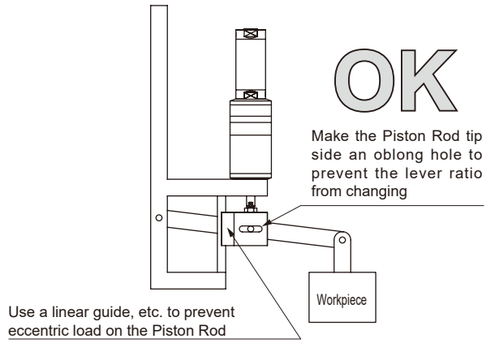
- When using the balancer horizontally, please consider so that no moment due to the Piston Rod and its own weight is applied.



- When used in a link type, please use a structure where the lever ratio does not change. (Example: Fulcrum 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 the load is held by the brake. Since the Piston Rod, brake, and detection part are connected, applying rotational torque may damage the detection part and brake.
- Consider the supplied air flow rate when piping between the balancer unit and control box. Moreover, the control box should be placed as close to the balancer as possible in order to reduce the piping length. If the flow rate is low or the piping is long, the operating force will increase.
- If BBS-A air system is selected, a pressure gauge and air lamp (two pressure gauges are also acceptable) are used for initial setting. Please prepare these devices by yourself.
- Use clean, dry air that has passed through an air filter and oil mist filter as the compressed air. For this reason, use a filter in the circuit, and pay attention to the filter's filtration degree (preferably 5 μm or less), flow rate, mounting position (close to the control circuit), etc.
- Please note that the operating force may change during operation depending on the usage conditions.

During Use

CAUTION

- Periodically drain the accumulated condensate in the filter before it exceeds the specified line.
- If compressor oil carbides (carbon or tar-like substances) enter the circuit, valves and cylinders will malfunction. Pay close attention to compressor maintenance and inspection.
- If left unattended during work, be sure to apply the brake. There is a risk of serious accidents such as falling jigs or workpieces.
- Since the pilot chamber valve is included with the product, do not loosen or remove the bolts. This will cause air leakage, lower the detection pressure, and may cause jigs, workpieces, etc. to fall during operation.
- For safety, switch the brake switch to the brake side after work is complete.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.