Balance cylinder series

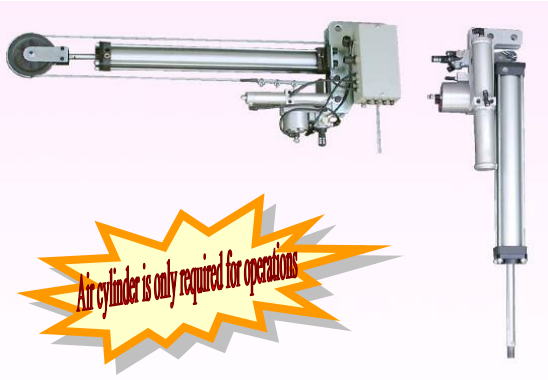
THING TECH Co., Ltd.

Full-automatic air balancer enables smooth up and down operations of heavy parts

The air balancer supports up and down operations of heavy parts with ease.

Cylinder type	Automatic weight setting: PASCA Manual weight setting: PASCM
Drum type	Automatic weight setting: ABCP

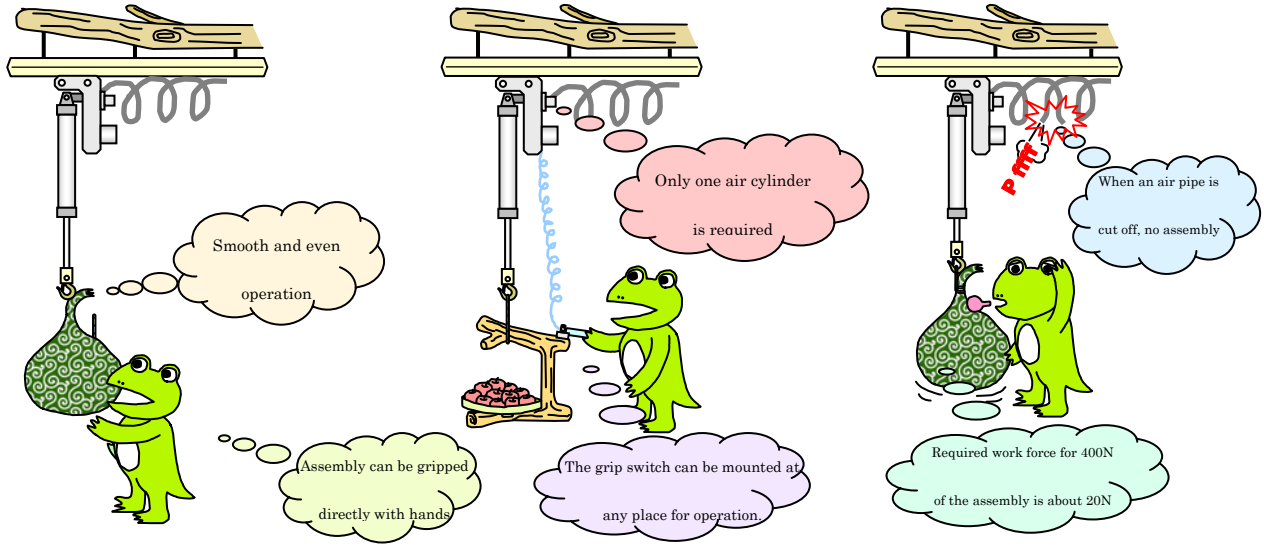
Description



This balancer enables light up and down operations with an assembly gripped directly.

The smooth operation of the balancer prevents the assembly from knocking. It meets various uses such as soft installation on the ground, fine alignment, assembly, and transfer.

This is an optimal balancer for following operations;
Gently assembling with a material gripped!
Gently pulling down with a material gripped!



Specifications/Models

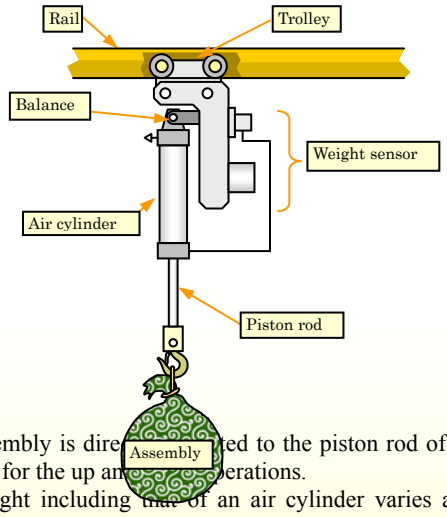
Type	Weight setting method	Model	Hanging load (N) 0.4MPa	0.5MPa	0.7MPa	Service Pressure range (MPa)	Stroke (mm)	Allowable offset load torque (Nm)	Mass (Kg)
Cylinder type [Vertical model]	Manual Automatic	PASC□-32V-****-*-**	260	330	460				8
		PASC□-50V-****-*-**	640	800	1120				10
		PASC□-80V-****-*-**	1800	2250	3150				15
Cylinder type [Horizontal model]	Manual Automatic	PASC□-40H-****-*-**	240	300	420		200~1000 (1100~is possible by special order)		
		PASC□-63H-****-*-**	630	790	1100				30
		PASC□-100H-****-*-**	1550	1940	2700				
Cylinder type [Off-set model]	Manual Automatic	PASC□-32G-****-*-**	240	300	420	0.3 to 0.9		200	☆11.4
		PASC□-50G-****-*-**	600	750	1050			400	☆15.4
		PASC□-63G-****-*-**	960	1200	1680			1000	☆31.0
Drum type	Automatic	ABCP-100-700	200	250	350		700		34
		ABCP-150-1900	250	320	450		1900		41
		ABCP-225-1800	420	530	740		1800		47
		ABCP-225-2900	420	530	740		2900		52
		ABCP-350-1800	580	730	1000		1800		52
		ABCP-500-2000	800	1000	1400		2000		61
		ABCP-700-1300	1080	1360	1900		1300		66

☆Mass when a stroke is 200mm.

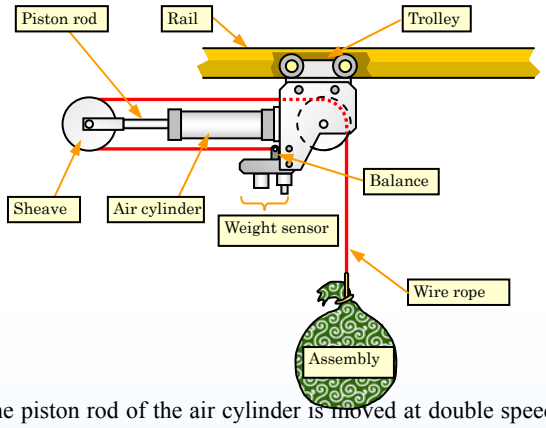
[For allowable offset load of the cylinder offset type] The offset type is designed enough to handle the offset load which is the applicable value for the flange attached to the elevating arm. For example, when the offset load is 200Nm for PASC□ -32G, the assembly whose weight is 200N can be handled at the distance of 1m from the center of the hanging gravity. In addition, the offset load at the distance of 0.5m is 400N, and the maximum hanging load is 455N (including arms, jigs, and assemblies).

Operation Principle

Soft Touch Series

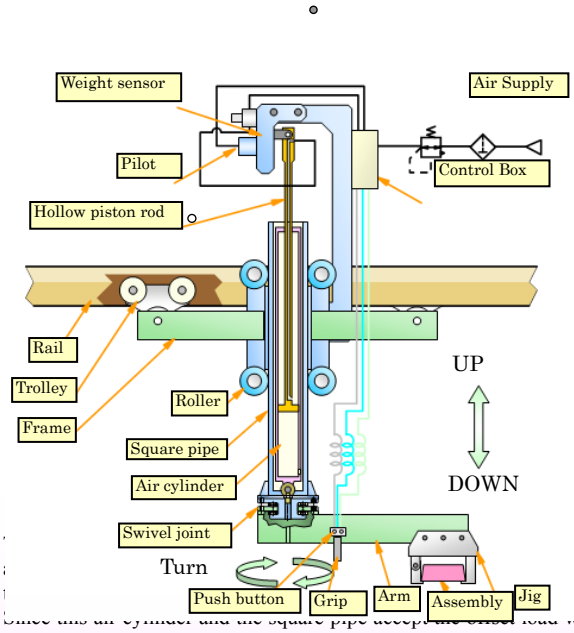


The assembly is dire[illegible]ted to the piston rod of the air cylinder for the up an[illegible]erations.
The weight including that of an air cylinder varies as the assembly is moved up and down. This variation in weight is transmitted to the balance to change the balancing pressure, which enables the light operation of the assembly.



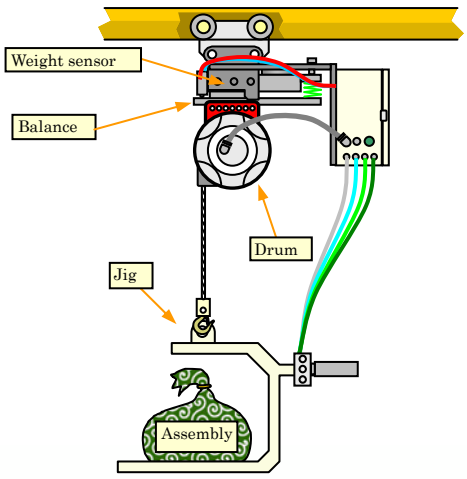
The piston rod of the air cylinder is moved at double speed with a sheave and the assembly is moved up and down with a wire rope.
The tension of the wire rope is developed when the assembly is moved up and down. This variation in tension is transmitted to the balance to change the balancing pressure, which enables the light operation of the assembly.

Cylinder type: Offset Model



[illegible] roller, the up and down operation of the cylinder by controlled air rotates the roller slightly and leads to the very light movement against the offset load to the jig.
Furthermore, the jig and the arm or the like is directly held with hands to balance it for the up and down operations by a mechanism of the weight sensor.
Switching of the balance or the up and down operations when the assembly is taken out or the like, is controlled by the push buttons installed at the optional position.

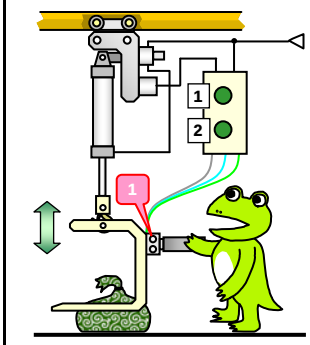
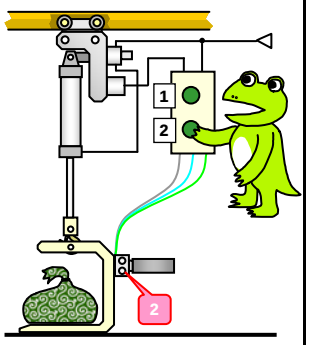
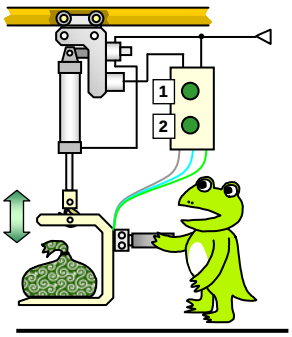
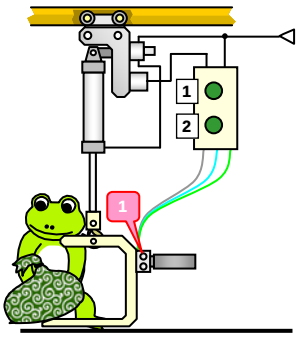
Drum type



A wire rope take-up spool rotates through the ball screw in the air cylinder with the large diameter mounted into the drum to move the assembly up and down.
The tension of the wire rope (including the drum) is developed when the assembly is moved up and down manually. This variation in tension is transmitted to the balance to change the balancing pressure, which enables the light operation of the assembly.

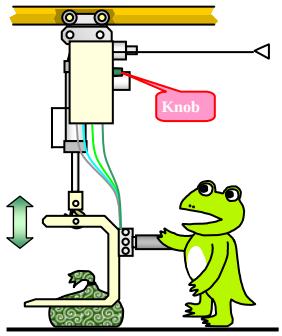
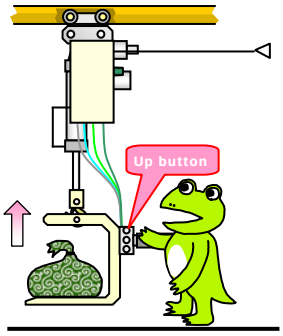
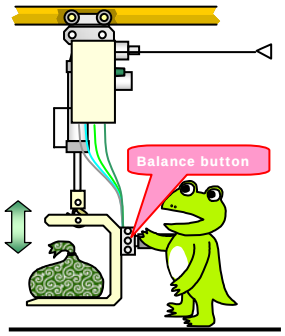
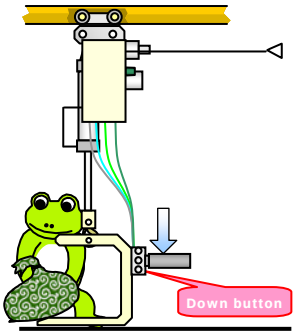
Manual weight setting type (when two values of weighs are set)

This type is useful for alignment in the vertical direction, positioning, and removal while several types of assemblies having defined weights are put.

1	2	3	4
			
Turn the switch button to “1” and adjust the knob 1 to balance only with a jig. Hold a jig to move up and down lightly.	After the assembly is mounted, turn the switch button to “2”. Turn the knob 2 to adjust so as to balance the jig or the assembly.	Hold the jig or the assembly to move up and down lightly.	Hold the jig or the assembly to be landed and turn the switch button to “1”, which returns to be balanced with the jig only. And remove the assembly.

Automatic weight setting type (Standard balance method B)

The balance is set after each weight is measured whenever several assemblies with different weights are lifted together.

1	2	3	4
			
Mount the jig and balance with the weight of the jig. And then, adjust a knob to move up and down lightly with a jig. Hold and move down the jig to be landed.	Push the up button continuously while the assembly is put on the jig, and release it in place. The jig and the assembly are stayed at that place and transported with the jig or the assembly.	After having moved the assembly to the prescribed position, push the balance button to be balanced and hold the jig or the assembly to move up and down lightly.	Land with the jig or the assembly held and continue to push the down button to remove the assembly. After the assembly is removed, push the balance button to be balanced only with the jig and move up and down with a jig lightly.

We also have U and D methods other than above standard balance method B. When ordered, please select the balance method.

Balance method	Operation method
U (Two buttons)	Push the up button to elevate the assembly, and then, release the button. After 0.5 seconds, it is balanced automatically to move up and down with the jig or the assembly lightly. Next, land with the jig or the assembly and continue to push the down button to remove the assembly.
D (Two buttons)	Push the up button to elevate the assembly. And then, release the button to hold the assembly at the height. Move the assembly to the prescribed position. Push and then release the down button. After 0.5 seconds, it is balanced automatically, which enables to move up and down with the jig or the assembly lightly. After landed with the jig or the assembly, continue to push the down button to remove the assembly.

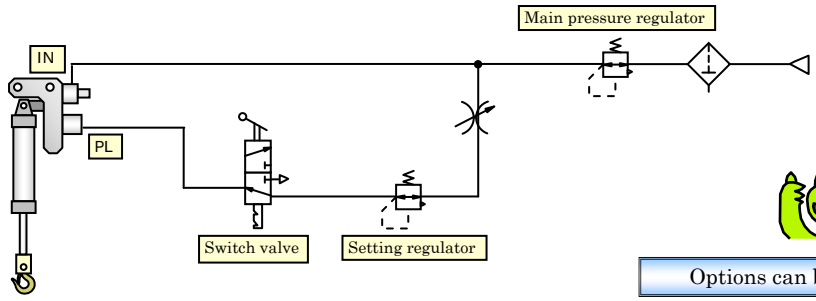
Air Circuit Example of Manual Weight Setting Type

Soft Touch Series

For the balance setting of the manual type, pressures produced with a regulator are supplied to the PL port.

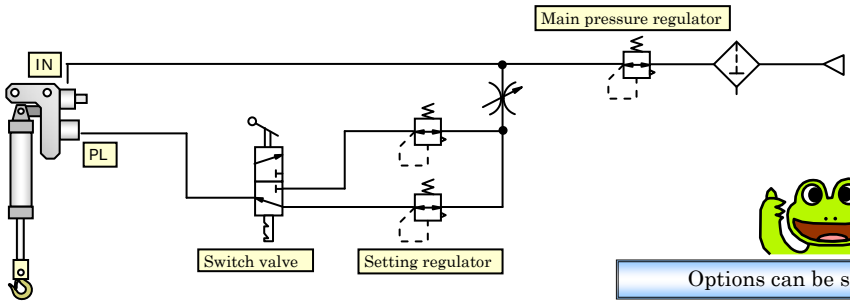
We show here some examples of the circuits. Please prepare the circuit according to your specifications.

One type of weight setting:
A switch valve is used to select between the zero kilogram balance and the constant weight setting.



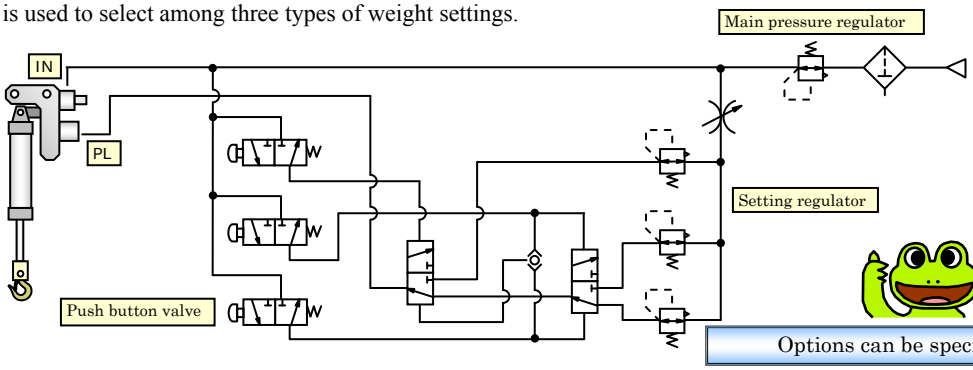
Options can be specified

Two types of weight setting;
The switch valve is used to select between two types of weight settings.



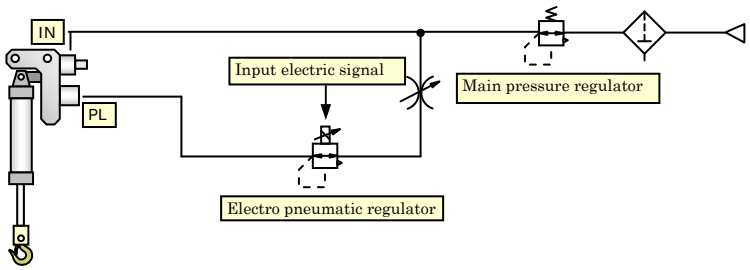
Options can be specified

Three types of weight setting;
The push button is used to select among three types of weight settings.

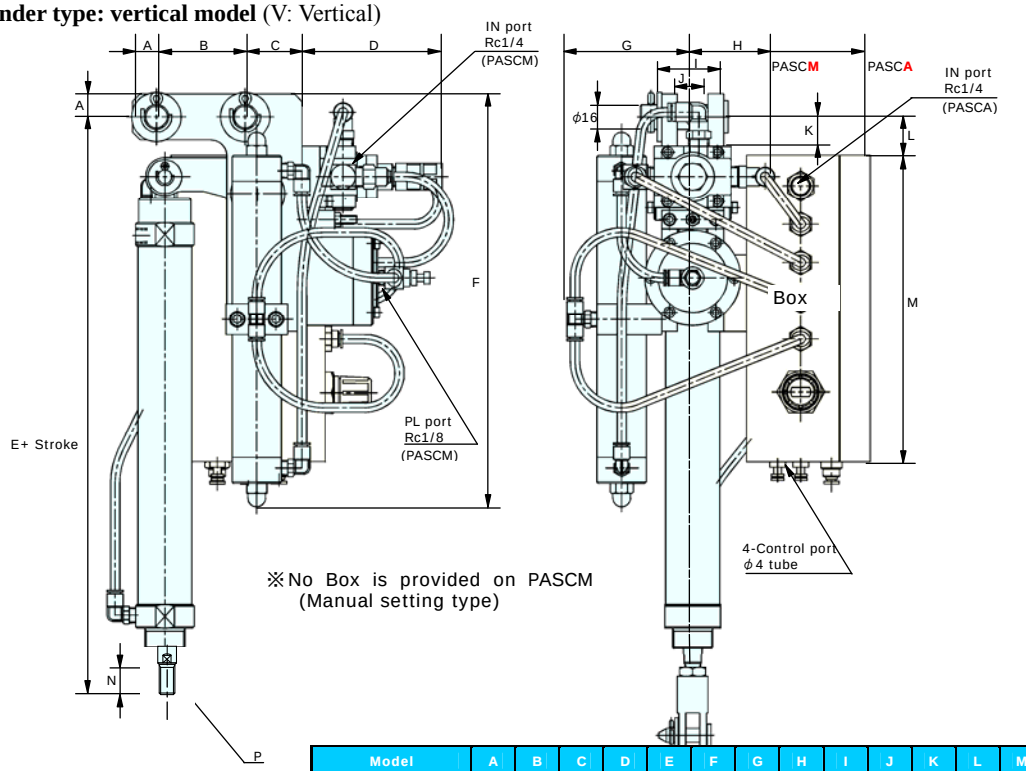


Options can be specified

Multiple types of weight setting;
An electro pneumatic regulator is used to select among multiple types of weight settings with the electrical signals input to the regulator.



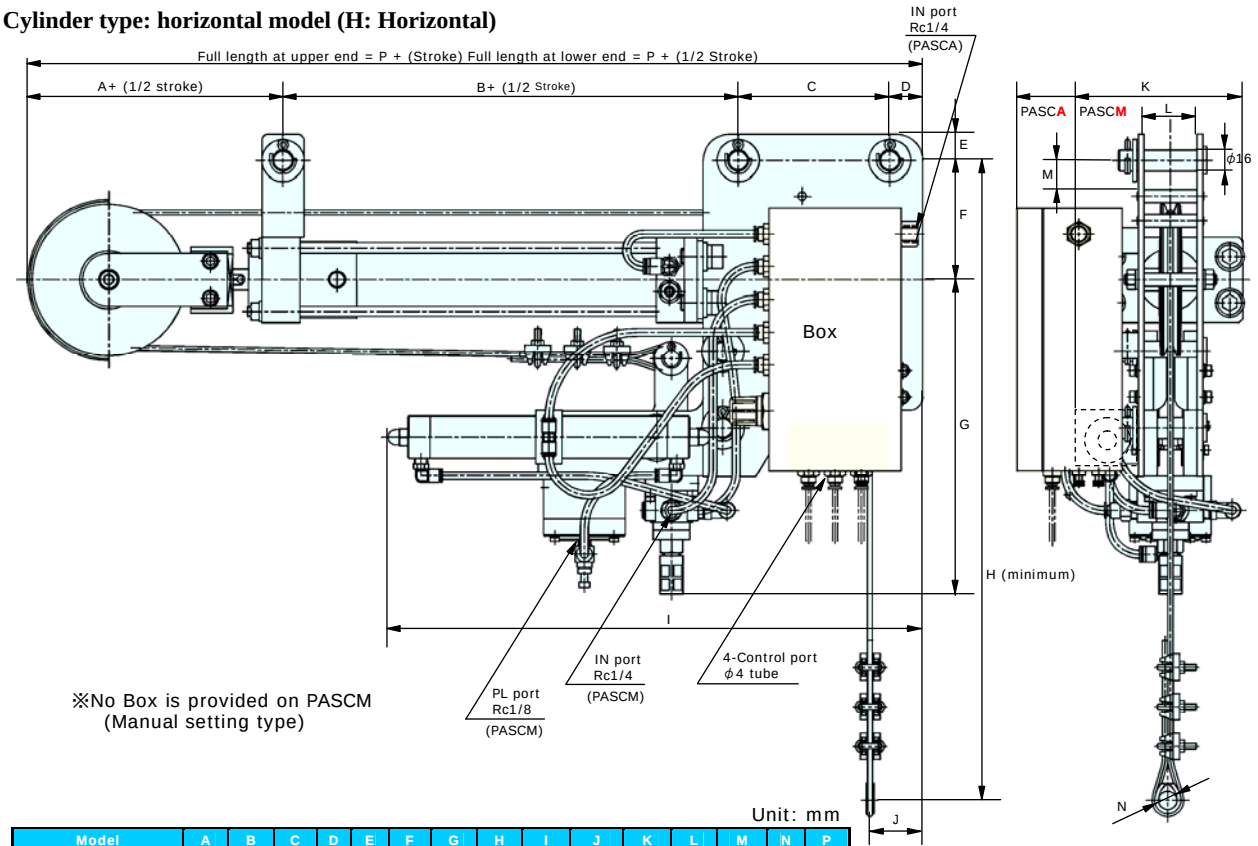
Cylinder type: vertical model (V: Vertical)



Unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
PASCA-32V- Stroke	15.5	58	37	90	182	269	82	115	40	20	19	25	200	19.5	M10x1.25
PASCA-50V- Stroke	20	58	52	124	264	391	102	127	44	20	30	30	200	28	M18x1.5
PASCA-80V- Stroke	30	115	45	131	325	574	150	135	50	20	35	30	250	36	M22x1.5
PASCM-32V- Stroke	15.5	58	37	90	182	269	82	57	40	20	19	-	-	19.5	M10x1.25
PASCM-50V- Stroke	20	58	52	124	264	391	102	57	44	20	30	-	-	28	M18x1.5
PASCM-80V- Stroke	30	115	45	131	325	574	150	78	50	20	35	-	-	36	M22x1.5

Cylinder type: horizontal model (H: Horizontal)

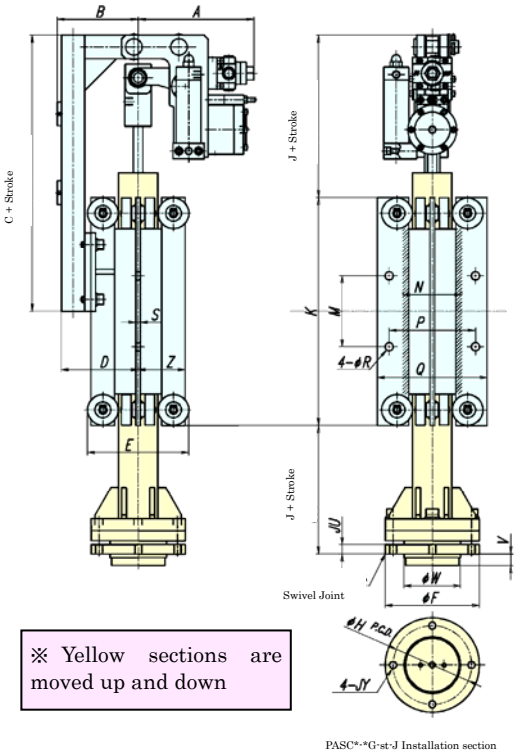


Unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
PASCA-40H- Stroke	194	145	115	25	20	91	240	350	406	40	172	40	22	14	479
PASCA-63H- Stroke	251	176	115	46	20	100	266	370	561	40	195	45	20.5	13	588
PASCA-100H- Stroke	362	298	115	40	25	145	398	470	728	40	240	50	27	20	815
PASCM-40H- Stroke	194	145	115	25	20	91	240	350	406	40	127	40	22	14	479
PASCM-63H- Stroke	251	176	115	46	20	100	266	370	561	40	157	45	20.5	13	588
PASCM-100H- Stroke	362	298	115	40	25	145	398	470	728	40	214	50	27	20	815

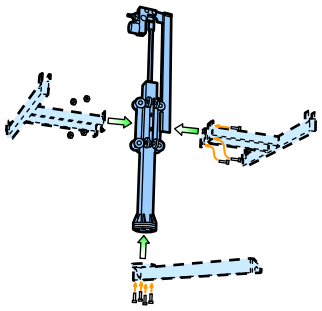
Outline Drawing

Offset type



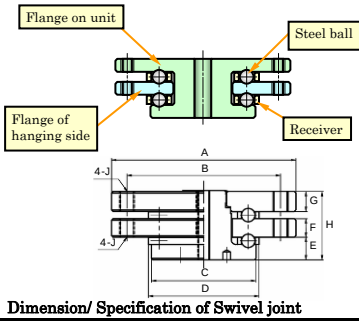
※ Yellow sections are moved up and down

PASC*-*G-st-J Installation section



As shown in the drawings, this unit is fastened to the anchored section with the bolt according to the customer's requirements.
The jig or the like is mounted to the flange. The swivel joint can work as a horizontal rotation mechanism.

In the example, this unit is fastened to the rail installation frame and the arm is mounted to the flange.



Description

The swivel joint (horizontal rotation mechanism) is usually adopted to the vertical model.
The arm equipped with the flange is mounted to the swivel joint which can be used as a slewing arm easily.

Internal structure

The flange at the hanging side is situated between the flange on the unit and the steel ball, which can be turned lightly.

Dimension/ Specification of Swivel joint

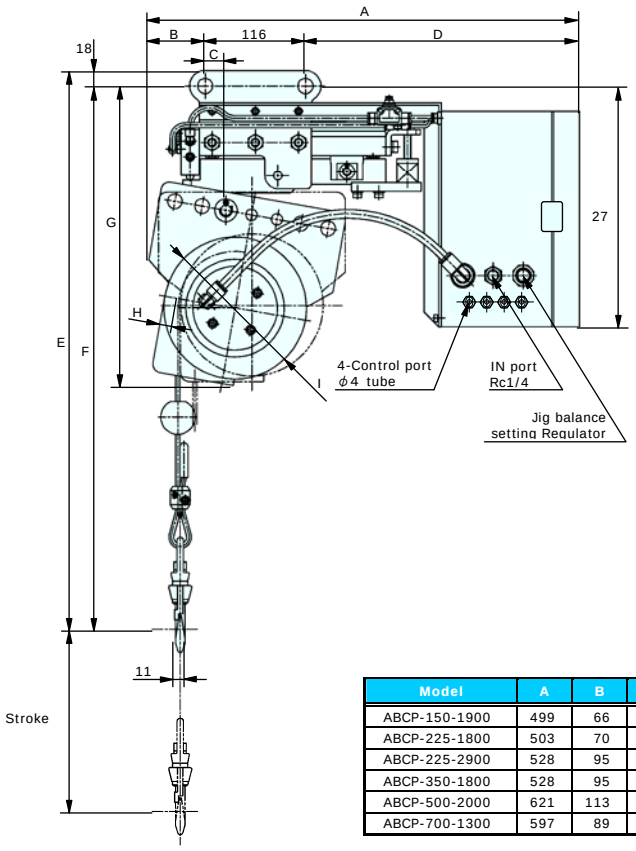
Unit: mm

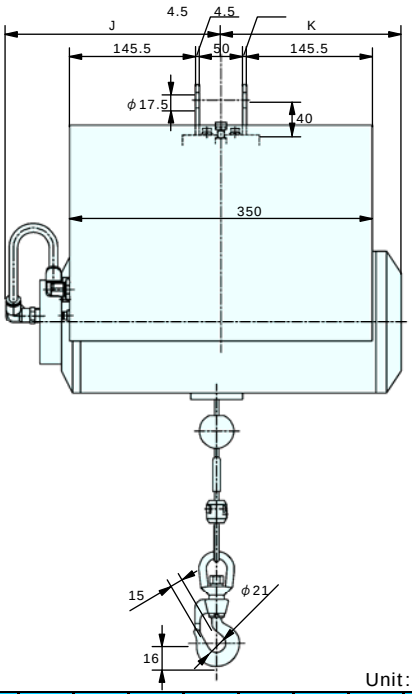
Model	A	B	C	D	E	F	G	H	J	Allowable offset torque (Nm)	Allowable load (N)	Mass (kg)
32G	120	100	68	72	15	12	13	45	M10	200	455	2.86
50G	150	120	83	87	15	12	13	45	M12	400	1155	4.00
63G	170	140	91	94	19	15	15	58	M14	1000	3250	6.70

Unit: mm

Model	A	B	C	D	E	F	H	J	K	M	N	P	Q	R	S	T	JT	JU	V	W	Y	JY	Z
PAS□-32G-Stroke	147.5	103	251	98	129	120	100	106	290	90	75	110	140	10.5	6	77	93.7	12	14.7	72	10.5	M10	60
PAS□-50G-Stroke	160.5	163	382	158	219	150	120	167	350	100	115	160	200	11	8	94	110.7	12	14.7	87	12.5	M12	90
PAS□-63G-Stroke	250	205.5	465	200.5	259.5	170	140	230	410	150	140	200	255	11	6	116	140	15	19	94	15	M14	112.5

Drum type



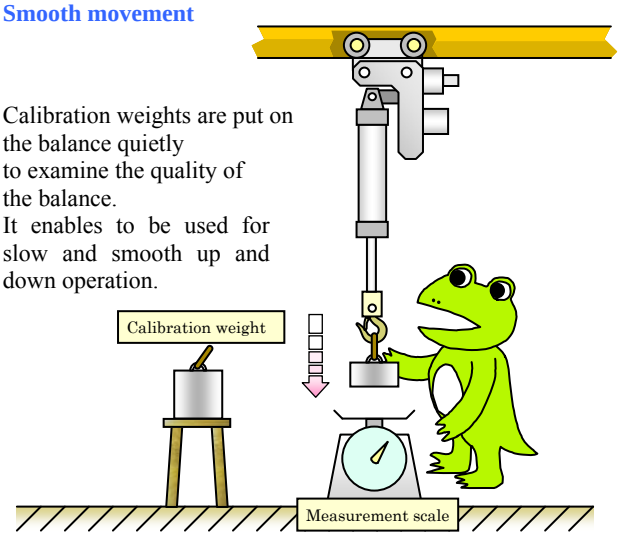


Unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K
ABCP-150-1900	499	66	24	317	648	630	347	17.5	165	249	209
ABCP-225-1800	503	70	44	317	703	685	400	23	218	262	204
ABCP-225-2900	528	95	44	317	753	735	458	35	272	276	204
ABCP-350-1800	528	95	44	317	753	735	458	35	272	279	200
ABCP-500-2000	621	113	26	392	753	735	458	35	272	335	275
ABCP-700-1300	597	89	50	392	753	735	458	35	272	335	270

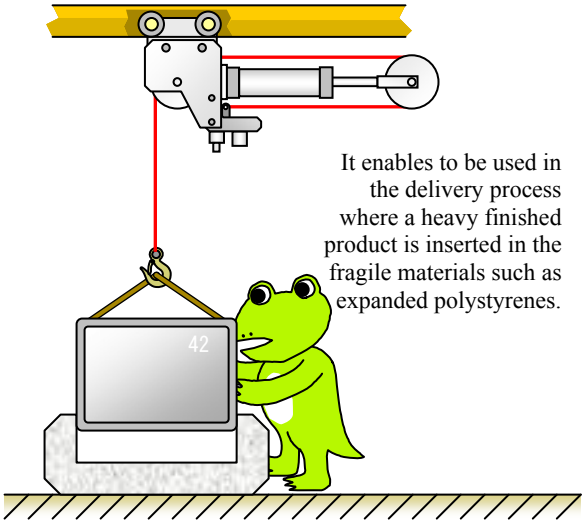
Smooth movement

Calibration weights are put on the balance quietly to examine the quality of the balance.
It enables to be used for slow and smooth up and down operation.



Light movement

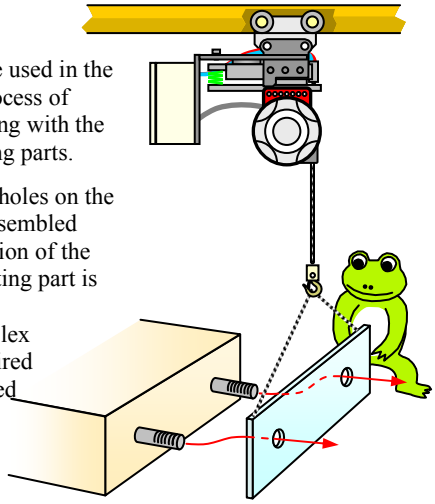
It enables to be used in the delivery process where a heavy finished product is inserted in the fragile materials such as expanded polystyrenes.



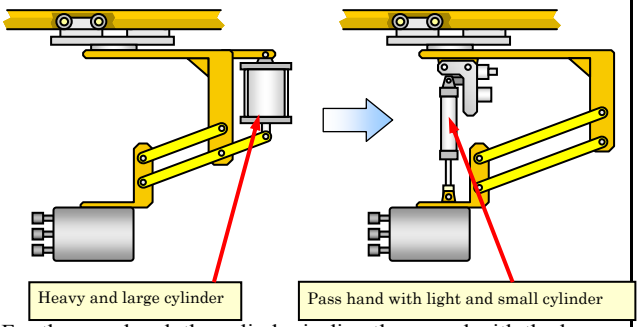
Correct positioning

It enables to be used in the assembling process of heavy parts hung with the jig to the mating parts.

The mounting holes on the parts can be assembled while the position of the bolt on the mating part is checked.
No more complex facility is required for the advanced positioning process.



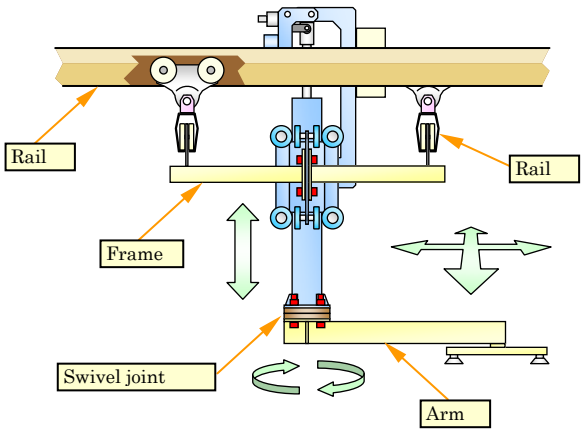
Weight reduction of device



For the pass hand, the cylinder is directly moved with the less operation force, therefore, there is no need to depend on a conventional double speed mechanism.
It is possible to design the equipment with a small diameter of the cylinder to reduce the weight of the device.

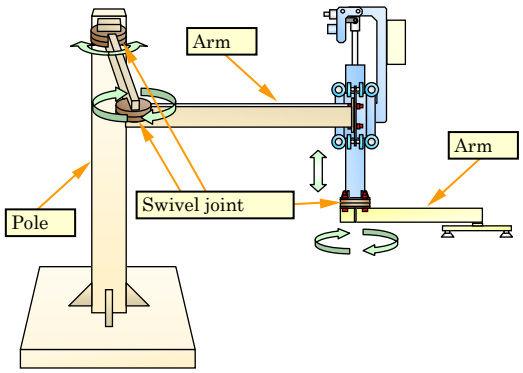
Two-rail type

This unit is installed into the horizontal traveling frame, and the arm is installed to a swivel joint to be the balancer which can be swiveled at the same time with the up and down operations.
Ex: Instrument panel devices of vehicles



Pole type

This polar coordinate type balancer consists of the pole, the arm, and the swivel joint.
Ex: Battery transfer equipment



Model Indications

Soft Touch Series

[Cylinder type] **PASCM-32V-500-2-G2**

Weight setting method	
Code	Setting method
PASCM	Manual
PASCA	Automatic

<Vertical model> Cylinder size	
Code	Diameter of cylinder (mm)
32V	32
50V	50
80V	80

<Horizontal model> Cylinder size	
Code	Diameter of cylinder (mm)
40H	40
63H	63
100H	100

<Off-set model> Cylinder size	
Code	Diameter of cylinder (mm)
32G	32
50G	50
63G	63

Required stroke (by 50 mm)	
Code	Required stroke (mm)
100	100
to	to
1000	1000
Custom order for 1050 or more	

<PASCM>*Optional Selection of balance switching box	
No.	Number of balance setting weight
0	No option
1	1- weight
2	2- weight
3	3- weight
Custom made for 4 and more weight	

<PASCA><PASKP> Selection of balance setting method	
Code	Button setting
B	U: Move up and fix at the location where the button is released. B: Balanced D: Move down or remove assemblies
U	U: Move up and be balanced automatically when the button is released. D: Move down or remove assemblies
D	U: Move up D: Move down and be balanced or remove the assembly when released.

Operation Switch *Optional			
Code	Type of switch	PASCM	PASCA / PASKP
XX	None	–	–
S2	Two-way selector SW	Balance setting: 1 or 2	–
G2	Two-button grip SW	Balance setting: 1 or 2	Operation U or D
G3	Three-button grip SW	Balance setting: 1, 2, or 3	Operation B
B2	Two-button box Switch	Balance setting: 1 or 2	Operation U or D
B3	Three-button box Switch	Balance setting: 1, 2, or 3	Operation B
SG	Slide grip SW	Balance setting: 1 or 2	Operation U or D
SB	With slide grip button	Balance setting: 1, 2, or 3	Operation B

[Drum type] **ABCP-150-1900-B-G2**

Select from models specified in Page 1

PASCM Balance Switching Box (Optional parts)

One weight type

Directly mounting to the weight sensor

Two-weight type

Box dimensions **75 x 150 x 45** (other than protrusions)

Three-weight type

Box dimension **75 x 222 x 45** (other than protrusions)

Operation SW (Optional parts)

Selector switch

Two-way switch type (S2)
80 x 50 x 120

Grip switch
(with 1,000 mm of straight tube)

Two buttons (G2) 46 x 47 x 138

Three buttons (G3) 56 x 47 x 138

Button switch
(with 1,000 mm of straight tube)

Two buttons (B2) Three button (B3)

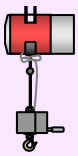
Reference: 60 x 110 x 30

Slide grip switch
(with 1,000 mm of straight tube)

Up and down action (GS) with button (SB)

Reference: 55 x 206 x 70

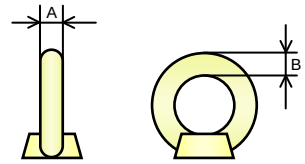
Performance Comparison List

Series					
Type		Cylinder	Drum	Cylinder	Drum
Model		PASE	ABC	PASC	ABCP
Features	Up/down operation with assembly gripped	Easy	Easy	Allowable	Allowable
	Height of ceiling installed	High	Low	High (Low for horizontal type)	Low
	Location to install the function part	Center of hanging gravity	Center of hanging gravity	Optional	Optional
	Inertial force sensor	Included	Included	Not Included	Not Included
	Up/down operation speed (when balanced)	300mm/sec	300mm/sec	150mm/sec	150mm/sec
	400N load control force	15N	15N	20N	20N
	1500N load control force	30N	30N	40N	40N
	Operation feeling	Slightly flapping	Slightly flapping	Smooth	Smooth

Mounting Section Dimension List

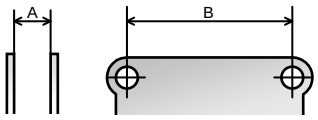
-For details, refer to the outline drawings-

Cylinder type



Mounting hole	A	B
Φ35	12.5	12.5

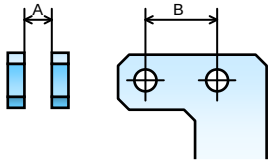
Drum type



Mounting hole	A	B
Φ17	50	115

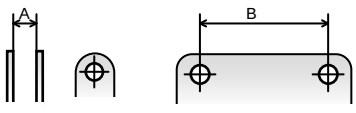
Unit: mm

Cylinder type: Vertical model



Size	Mounting hole	A	B
32□	Φ17	20	58
50□	Φ17	20	58
80□	Φ17	20	115

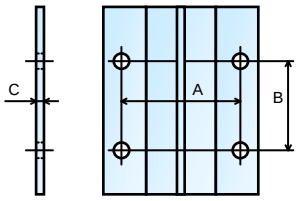
Cylinder type: Horizontal model



Size	Mounting hole	A	B
40□	Φ17	40	115
63□	Φ17	45	115
100□	Φ17	50	115

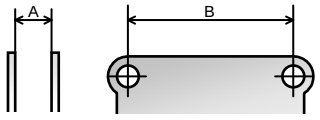
Unit: mm

Cylinder type: Offset model



Size	Mounting hole	A	B	C
32□	Φ11	110	90	6
50□	Φ11	160	100	8
63□	Φ11	200	150	6

Drum type



Mounting hole	A	B
Φ17	50	115

Unit: mm

Be careful to the handling of the unit considering the following matters.

The secondary or supporting safety measures are required as needed.

If air flow is interrupted at the source while the assembly is lifted, the fall prevention system is activated to prevent the assembly from a sudden fall. If the assembly, however, is left as it is, it might be moved down slowly.

This fall prevention system activates only when the air supply is cut at once.
Be careful of the air supply and the protection of the pipes because the assembly may be moved downward according to the leakage amount when air pressure decreases gradually due to the leakage by the improper piping, etc.

Pay fully attention to the protection of tubes or the like.
If air pressure decreases or air supply stops due to cut-off (removed) of tubes on the weight sensor or around the control box, the assembly may be dropped according to the leakage amount of the air.

Note that the unit is installed properly because the balance is unstable or unable to be set if the weight sensor is not stayed in the right position.

When hanging jigs or assemblies are removed while air is supplied, the tips of them may be jumped up. Therefore, install them securely to prevent from removal (For the drum type, wires are locked in 0.02 to 0.1 seconds after removal).

Supply the air under the dry condition before use without any moisture or oil.