October 17,2022

Announcement of Design Number Change for Work Support (model LD / model LDD / model LC / model LCW)

model LD / LDD

model LC / LCW

Dear Valued Customers,

First of all, thank you very much for your continuous use of our products. Today, please confirm below about the subject.

Notes

Design number [Model number] has been changed as below for the improvement for environmental resistance.

1. Model Number

Model Name	Existing Model	After Changing Design No.
Work Support	LD□□□ **2**	LD□□□ **3**
	LDD□□□ **0**	LDD□□□ **3**
	LC□□□ **2**	LC□□□ **3**
	LCW□□□ **0**	LCW□□□ **3**

2. nterchangeability with Existing Item

There is no change for mounting dimension and basic specification. It is interchangeable with existing model.

3. Schedule

Model No.	Schedule
LD	2022/12/1 ～ 2023/1/15
LDD	
LC	2023/2/1 ～ 2023/3/15
LCW	

It is going to be changed sequentially as above.
If the items whose size, option and so on are different are ordered in one order, old and new items may be mixed. [Mixing old and new models will not be happening in case of one same model number].

※Regarding supplying to overseas, the update timing is different, depending on overseas office or dealers.

Please contact our salesperson for further inquiries.

Yours Sincerely
KOSMEK LTD.

New Lock/Release Confirmation

Air Sensing Work Support

Model LCW

KOSMEK
Harmony in Innovation

Air Sensing Work Support (Lock/Release Confirmation)

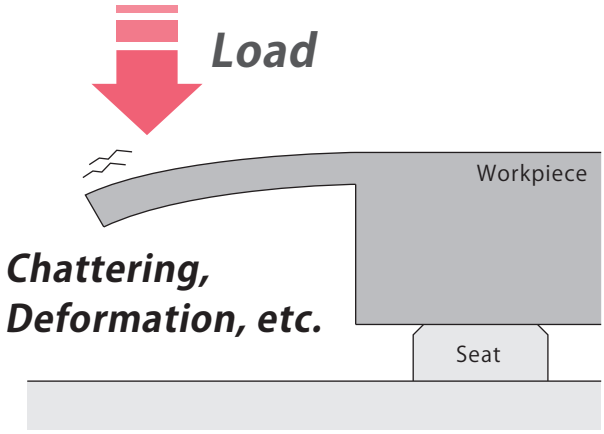
Model LCW

PAT.P.

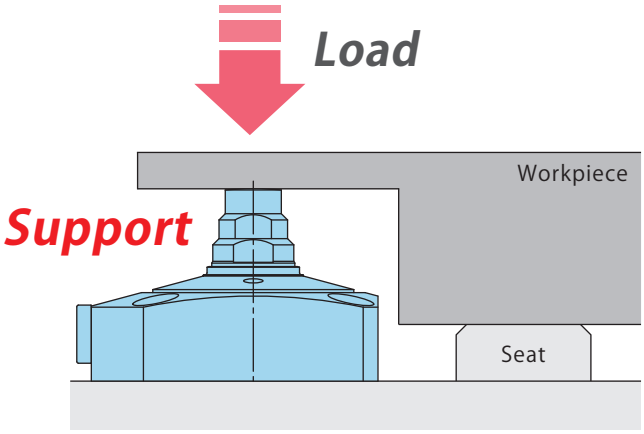
Firmly Supports the Workpiece Counter to the Load

Action confirmation for both lock and release ends enables secure automation and interlock control.

Work support eliminates chattering while machining and prevents deformation by cutting load.

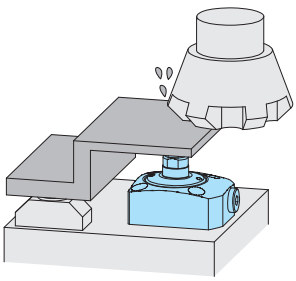


< Without Work Support >

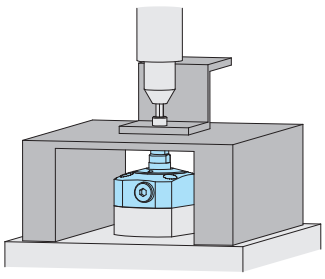


< With Work Support >

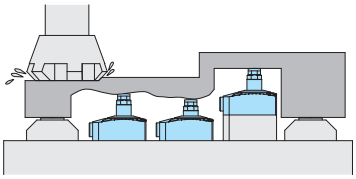
Application Examples



To avoid chattering during machining of thin workpiece

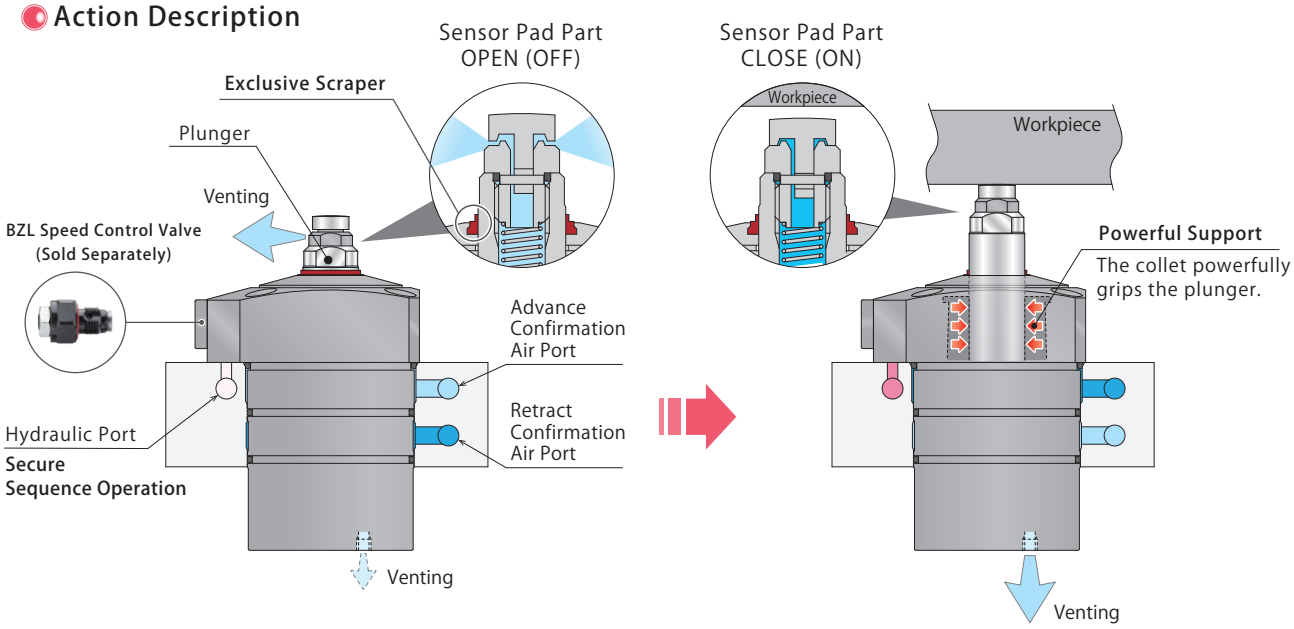


To back up the screw fastener and nut runner



Workpiece with Different Heights

Action Description



Released State (When pressure is released.)

The plunger is retracted.
Retract confirmation air is increased by internal circuit.

Hyd. Pressure	Advance Confirmation Air Sensor	Retract Confirmation Air Sensor
OFF	OFF	ON

Locked State (When pressure is supplied.)

The plunger advances by supplying hydraulic pressure, and stops when it touches a workpiece.
↓
The internal part, collet, powerfully holds the plunger.
After holding is completed, the plunger does not retract even when pressed from the top. When it touches a workpiece, the gap at the sensor pad of the plunger top will be closed and advance confirmation air will be increased.

Hyd. Pressure	Advance Confirmation Air Sensor	Retract Confirmation Air Sensor
ON	ON	OFF

Strong Support and Smooth Action

With the same collet mechanism as our model LC, "Wedge Effect" ensures more powerful gripping force. In addition, a larger gap between collet and plunger is designed to allow smoother action.

Certain Sequence Operation

As it is equipped with a powerful sequencing spring, the action sequences as such; Plunger goes up → workpiece touches → collet locks. This is carried out via one hydraulic circuit system.

Superior Environmental Durability NEW

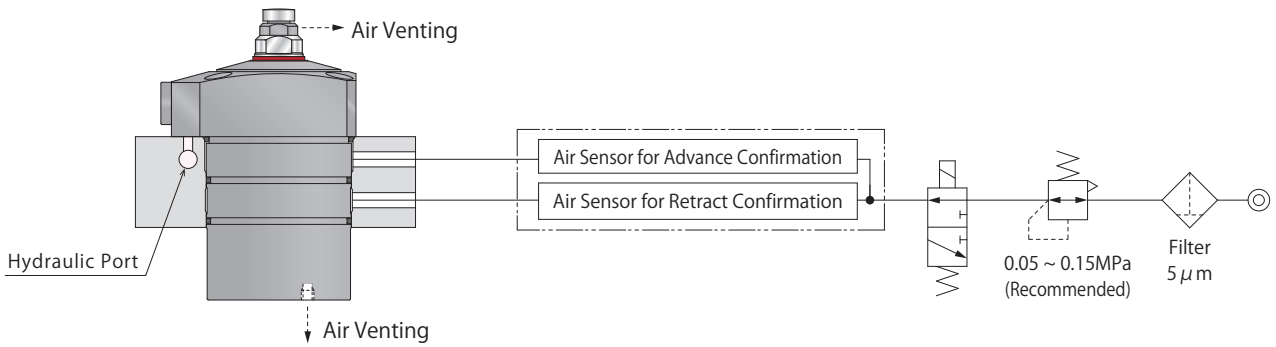
The work support can be used in various environments with "Exclusive Scraper" that prevents the accumulation of cutting chips and other dust, and the built-in "Knockout Function" that releases adherence after a long-time machine stop.

Direct Mount Speed Control Valve

Speed control valve with air bleeding function can be directly mounted to the product. (Speed control valve is sold separately.)

Circuit Connection Image

Refer to P.11 ~ P.12 for further information of air sensing circuit.



Model No. Indication

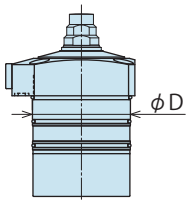
LCW 048 3 - C L

1 2 3 4

1 Body Size

036 : φD=36mm
040 : φD=40mm
048 : φD=48mm
055 : φD=55mm
065 : φD=65mm

※ Indicates the cylinder outer diameter (φD).



2 Design No.

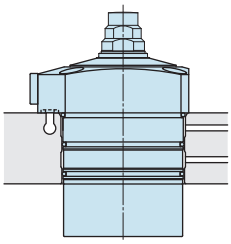
3 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug)

※ Speed control valve (BZL-A) is sold separately.
Please use a meter-in speed control valve for LCW.
In case of using Kosmek model, select BZL□-A.
Refer to P.13 for detail.

C



Gasket Option

With G Thread Plug (able to attach Speed Control Valve)
(Order the valve (BZL-A) separately)

4 Plunger Spring Force

L : Low Spring Force
H : High Spring Force

Specifications

Model No.		LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
Supporting Force (at 7MPa) kN		4	5.5	10	15.5	25
Supporting Force (Calculation Formula) ※1 kN		0.70×P-0.91	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70
Plunger Stroke mm		8	8	10	12	14
Effective Stroke mm		7.5	7.5	9.5	11.5	13.5
Cylinder Capacity cm^3		0.8	1.2	2	3.3	4.8
Plunger Spring Force※2 N	4 **L** : Low Spring	3.6～5.6	4.7～7.8	5.8～9.7	8.3～14.6	9.8～14.6
	4 **H** : High Spring	4.7～7.8	6.2～11.0	7.9～13.6	10.1～21.9	15.8～22.0
Workpiece Contact Force		Refer to the table below.				
Max. Operating Pressure MPa		7.0				
Min. Operating Pressure MPa		2.5				
Withstanding Pressure MPa		10.5				
Operating Temperature ℃		0 ~ 70				
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32				
Weight kg		0.6	0.7	1.1	1.6	2.6

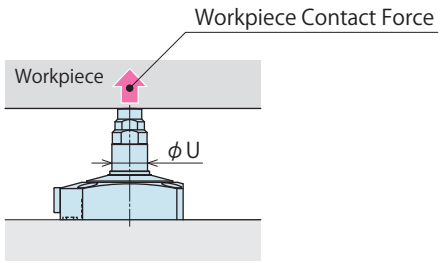
Notes : ※ 1. P in the formula for supporting force indicates the supply hydraulic pressure (MPa).
※ 2. The plunger spring force indicates the spring design value. It may vary depending on sliding resistance of the plunger and characteristic of the spring, etc. Please read it as a reference value of workpiece contact force.
Workpiece contact force varies depending on the air pressure supplied to the advance confirmation port.
Please refer to the following table for workpiece contact force.

Calculation Formula of Workpiece Contact Force ※3

Workpiece Contact Force (N) = Plunger Spring Force (N) + Air Pressure to Advance Confirmation Port (MPa) × U^2 (mm) × $\pi / 4$

Model No.		LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
Plunger Diameter U mm		12	15	16	20	22
Workpiece Contact Force N	Air Pressure 0.15MPa	20.6 ～ 22.6	31.2 ～ 34.3	36 ～ 39.9	55.4 ～ 61.7	66.8 ～ 71.6
Plunger Spring Force	Air Pressure 0.10MPa	14.9 ～ 16.9	22.4 ～ 25.5	25.9 ～ 29.8	39.7 ～ 46.0	47.8 ～ 52.6
4 **L** : Low Spring Force	Air Pressure 0.05MPa	9.3 ～ 11.3	13.5 ～ 16.6	15.9 ～ 19.8	24 ～ 30.3	28.8 ～ 33.6
Workpiece Contact Force N	Air Pressure 0.15MPa	21.7 ～ 24.8	32.7 ～ 37.5	38.1 ～ 43.8	57.2 ～ 69.0	72.8 ～ 79.0
Plunger Spring Force	Air Pressure 0.10MPa	16 ～ 19.1	23.9 ～ 28.7	28 ～ 33.7	41.5 ～ 53.3	53.8 ～ 60.0
4 **H** : High Spring Force	Air Pressure 0.05MPa	10.4 ～ 13.5	15 ～ 19.8	18 ～ 23.7	25.8 ～ 37.6	34.8 ～ 41.0

Note :
※3. Please prepare a stopper if necessary when using light and/or thin workpiece. Otherwise it might be pushed up by work support.



Locking State
(When touching the workpiece)

Performance Curve

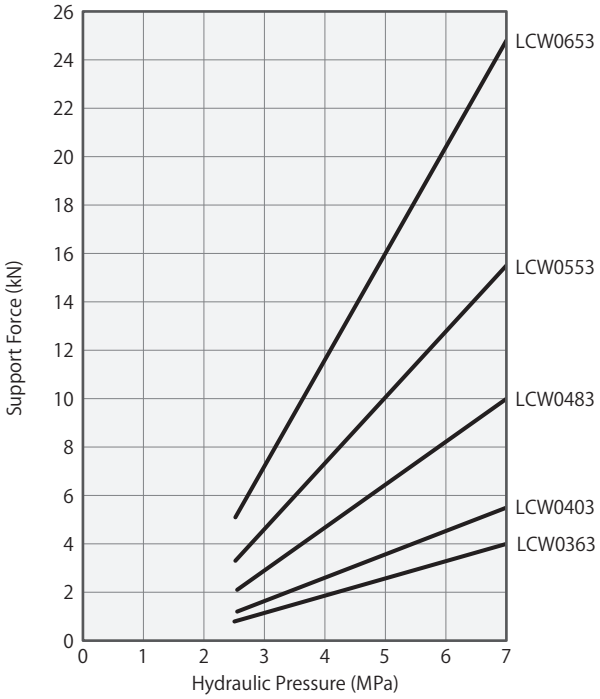
Applicable Model

LCW 048 3 - C L H

1 Body Size

Support Force Graph

※ This graph shows the support force under static load condition.

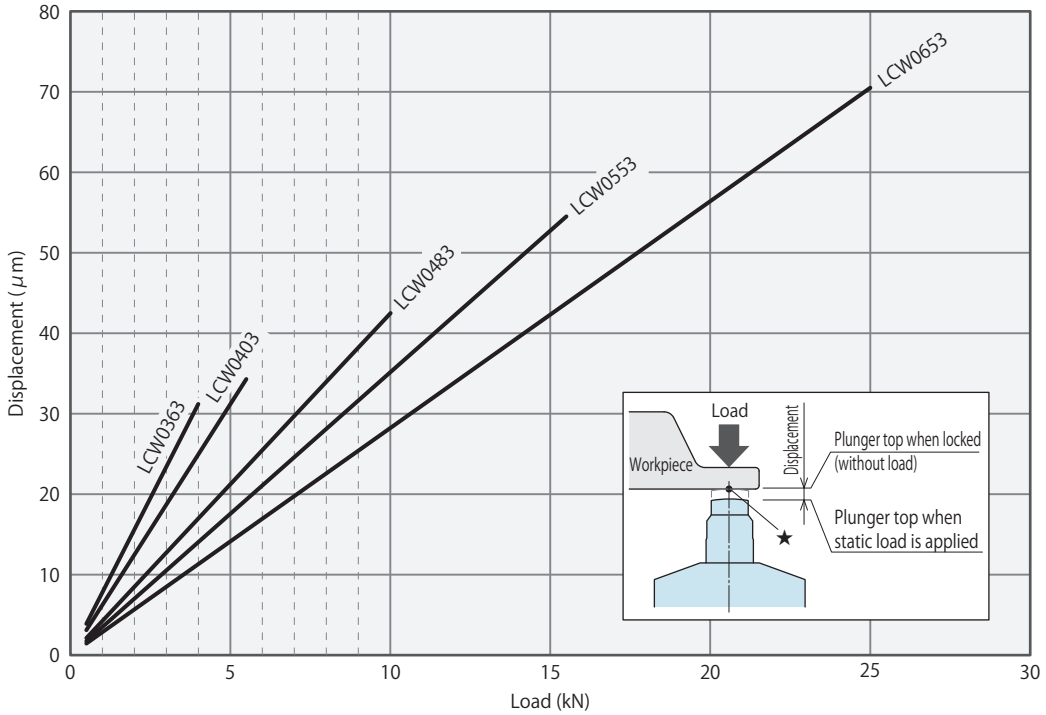


Model No.	Support Force (kN)				
Hydraulic Pressure (MPa)	LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
7	4.0	5.5	10.0	15.5	25.0
6.5	3.6	5.0	9.1	14.1	22.8
6	3.3	4.5	8.2	12.8	20.6
5.5	2.9	4.0	7.3	11.4	18.4
5	2.6	3.6	6.5	10.1	16.3
4.5	2.2	3.1	5.6	8.7	14.1
4	1.9	2.6	4.7	7.3	11.9
3.5	1.5	2.1	3.8	6.0	9.7
3	1.2	1.6	3.0	4.6	7.5
2.5	0.8	1.2	2.1	3.3	5.3
Support Force Formula ※1 kN	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28	2.72×P−3.54	4.39×P−5.70

Note : ※1. P : Operating Hydraulic Pressure (MPa)

Load / Displacement Graph

※ This graph shows the displacement of the static load of a single work support at 7MPa hydraulic pressure.
Not including the displacement of the workpiece side due to unevenness at ★ mark and surrounding clamps.

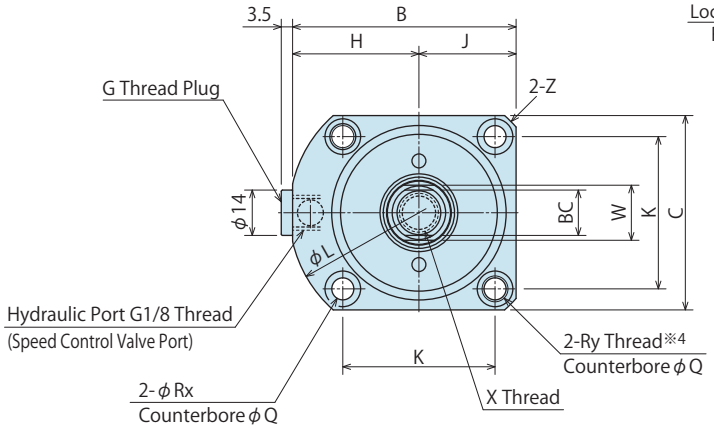


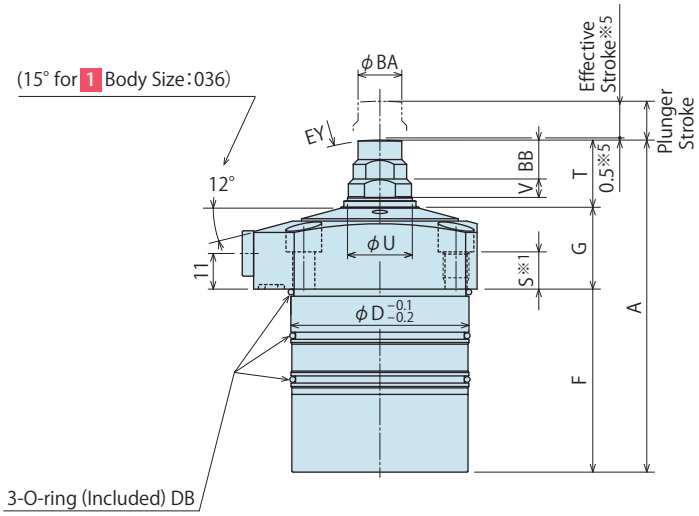
MEMO

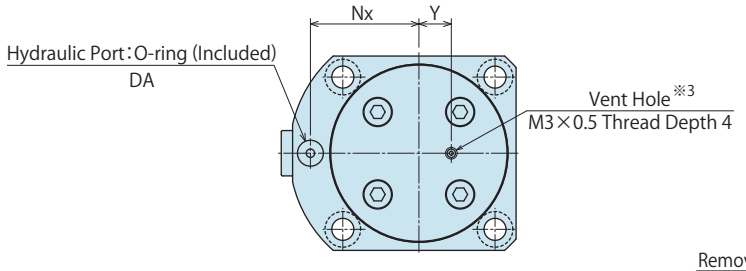
External Dimensions

C : Gasket Option (with G Thread Plug)

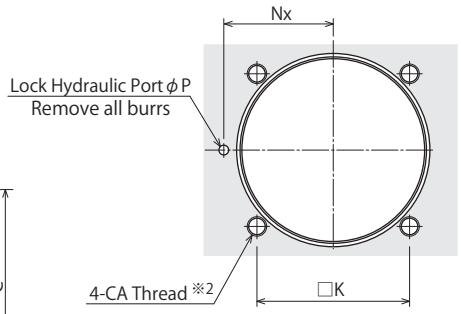
※ This drawing shows the released state of LCW-C□
(when hydraulic and air pressure are released).



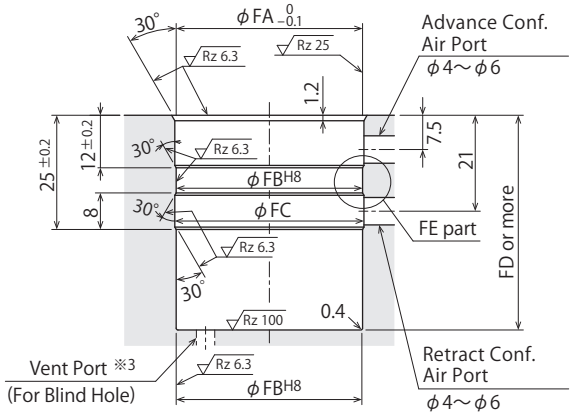




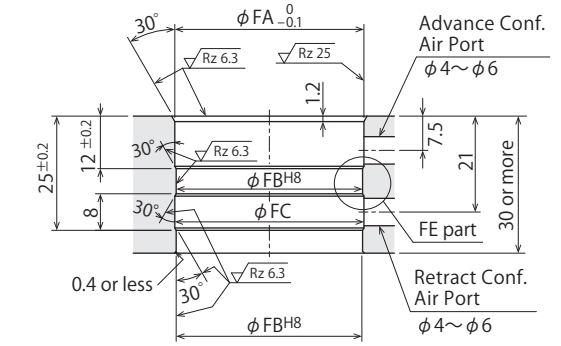
Machining Dimensions of Mounting Area

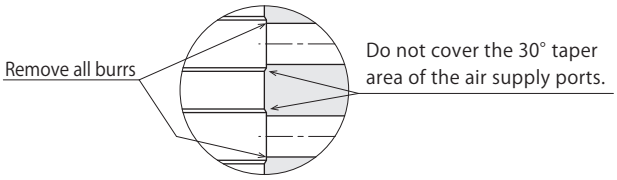


For Blind Hole



For Through Hole



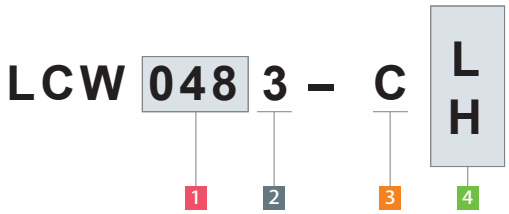


Detail of FE Part

Notes :

※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
※2. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
※3. Air vent hole must be open to the atmosphere, and prevent coolant and chips from entering the air vent hole.
(Please refer to "Appropriate Measures for the Air Vent Hole (P.17)".)
※4. When removing the product for maintenance, etc., insert a bolt to the two ※4 parts and pull them out straight.
※5. When the work support touches a workpiece within 0.5mm stroke from the plunger retract-end, a larger force than the plunger spring force will be applied to the workpiece. Please use the work support within the effective stroke range.

Model No. Indication



(Format Example：LCW0553-CL)

1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force

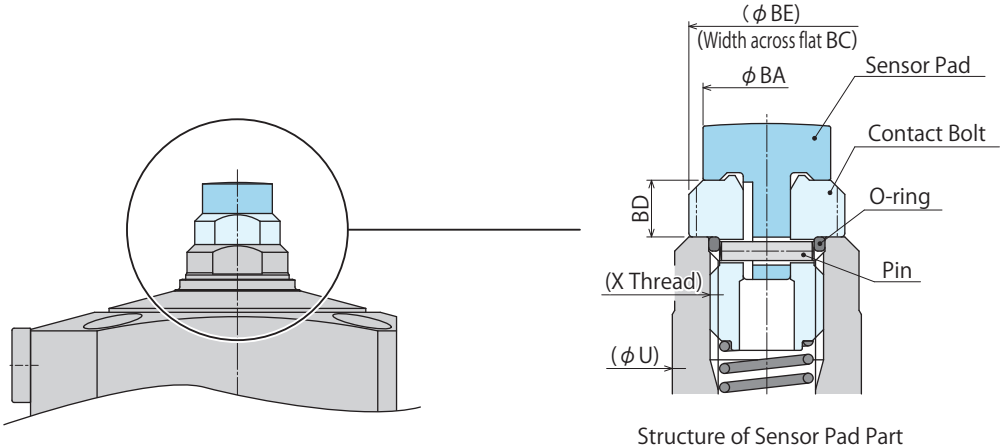
External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
Plunger Stroke		8	8	10	12	14
Effective Stroke		7.5	7.5	9.5	11.5	13.5
A		76	79	94	102.5	120.5
B		49.5	54	61	69	81
C		40	45	51	60	70
D		36	40	48	55	65
F		35.5	39	54	56.5	69.5
G		23.6	23.1	23.1	23.1	27.1
H		29.5	31.5	35.5	39	46
J		20	22.5	25.5	30	35
K		31.4	34	40	47	55
L		61	65	73	80	94
Nx		24	26	30	33.5	39.5
P		3	3	3	3	5
Q		7.5	9	9	11	11
Rx		4.5	5.5	5.5	6.8	6.8
Ry (Nominal×Pitch×Depth)		M5×0.8×5	M6×1×6	M6×1×6	M8×1.25×8	M8×1.25×8
S		14	13	13	11	14
T		16.9	16.9	16.9	22.9	23.9
U		12	15	16	20	22
V		6	6	6	8	9
W		10	13	13	17	19
X (Nominal×Pitch×Depth)		M8×1.25×12	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13
Y		7.5	8.5	8.5	10	10
Z (Chamfer)		C2	C3	C3	R40	R47
BA		9.5	10.5	10.5	13.5	13.5
BB		8	8	8	12	12
BC		10	11	11	14	14
CA (Nominal×Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1
EY		SR30	SR50	SR50	SR80	SR80
O-ring	DA	OR NBR-90 P5-N	OR NBR-90 P5-N	OR NBR-90 P5-N	OR NBR-90 P5-N	OR NBR-90 P7-N
	DB	AS568-026(70)	AS568-028(70)	AS568-031(70)	AS568-033(70)	AS568-036(70)
FA		37	40.8	49	56	66
FB		$36^{+0.039}_{0}$	$40^{+0.039}_{0}$	$48^{+0.039}_{0}$	$55^{+0.046}_{0}$	$65^{+0.046}_{0}$
FC		36.6	40.6	48.6	55.6	65.6
FD		36	39.5	54.5	57	70

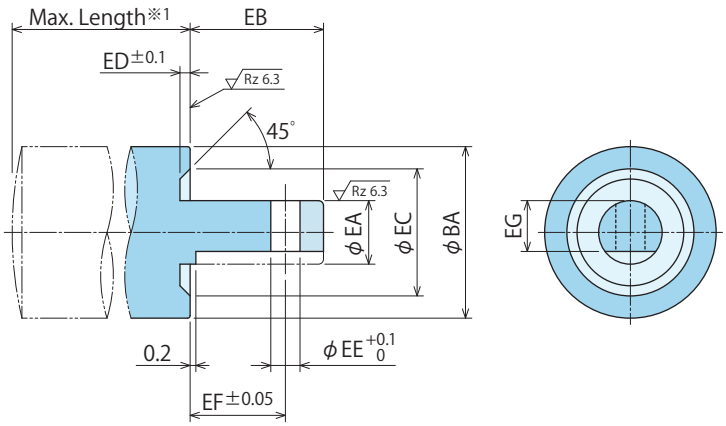
Sensor Pad Design Dimension

※ When changing to another sensor pad other than the attached one, please design it according to the sensor pad design dimensions.
※ When replacing the sensor pad, please be careful no to lose the connecting pin.



Structure of Sensor Pad Part

This is the image when the attached sensor pad is mounted.



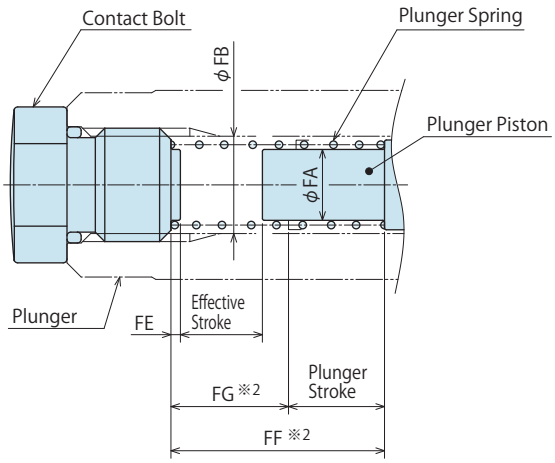
(mm)

Corresponding Model No.		LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
BA		9.5	10.5	10.5	13.5	13.5
EA		3g7 $^{-0.002}_{-0.012}$	4g7 $^{-0.004}_{-0.016}$	4g7 $^{-0.004}_{-0.016}$	5g7 $^{-0.004}_{-0.016}$	5g7 $^{-0.004}_{-0.016}$
EB		7.5	7.5	7.5	10.5	10.5
EC		7.5	8.5	8.5	10	10
ED		0.8	0.8	0.8	0.8	0.8
EE		1.2	1.2	1.2	2.3	2.3
EF		5.3	5.3	5.3	7.5	7.5
EG		2.1	3.2	3.2	3.9	3.9
Max. Length ※1		max.8	max.8	max.8	max.12	max.12
Dimensions other than Sensor Pad part	BC (Width across Flat)	10	11	11	14	14
	BD	4	4	4	6	6
	BE	11.5	12.5	12.5	16.5	16.5
	U	12	15	16	20	22
	X (Nominal×Pitch×Depth)	M8×1.25×12	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13
	Pin (Diam.×Length)	ϕ1×5.8	ϕ1×7.8	ϕ1×7.8	ϕ2×9.8	ϕ2×9.8
	O-ring	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)

Note : ※1. Sensor response may decrease if the sensor pad is longer than maximum length.

Plunger Spring Design Dimension

※ Reference for designing a plunger spring by customer other than the attached plunger spring.
※ This drawing shows the released state.



(mm)

Corresponding Model No.	LCW0363-C□	LCW0403-C□	LCW0483-C□	LCW0553-C□	LCW0653-C□
FA	5	6	6	7.5	7.5
FB	6.8	8.5	8.5	10.3	10.3
FE	1	1	1	1	1
FF ※2	15.2	17.6	19.6	22.6	34.6
FG ※2	7.2	9.6	9.6	10.6	20.6
Plunger Stroke	8	8	10	12	14
Effective Stroke	7.5	7.5	9.5	11.5	13.5

Note : ※2. The spring set length should be below dimension FF, and the spring contact length should be below dimension FG.

Action Description (Air Sensing Chart Explanation)

Action confirmation can be conducted by detecting differential pressure with the air sensor.

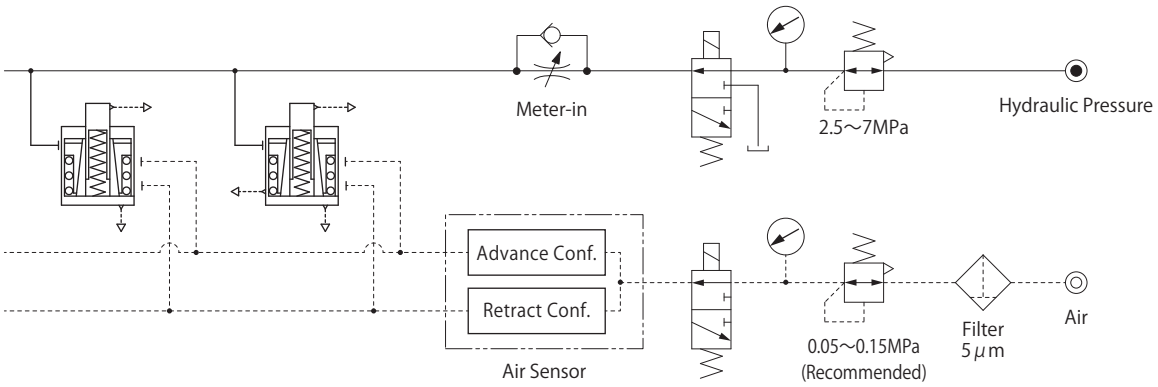
- Workpieces even with rough, casting or forged surface can be accurately detected since the structure does not detect the workpiece surface directly.
- Detects with higher accuracy compared to a switch detection with a dog, etc.
- Designed to prevent coolant from entering into the sensing area.

Air Sensor

- Air sensor is required in order to conduct the action confirmation.
  Sensing can be done by the air sensor with small air flow.
- Recommended Operating Air Pressure：0.05～0.15MPa
- Recommended Air Sensor

Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-G	GPS3-E

- Number of Work Supports Connected per Air Sensor：1 ~ 4 pcs.
- Please refer to maker's catalog etc. for the detail of the air sensor.
- Continuously supply air pressure when in use.
- Refer to the drawing below for the air circuit construction.



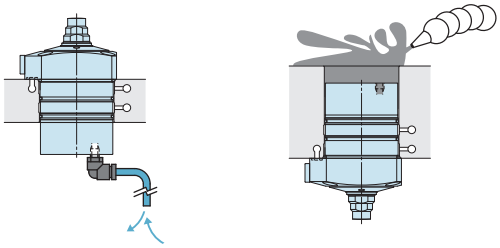
Notes

1. This model is designed for confirming actions of the plunger. When using for a workpiece contact confirmation, another counter clamping (force) is required.

2. If the plunger ascends too fast, it may bounce back and locks itself resulting in a gap with the workpiece, and possible damage to the internal parts due to the impact. Set the plunger action time at 0.5-1.0 sec. to adjust the air supply with the flow control valve with check valve (meter-in), and make sure that there is no gap with the workpiece for operation.

3. The sensor air port needs to have air supply at all the times. If it is used when the air supply is shut off, the coolant or cutting chips may contaminate the sensing area, leading to malfunctioning of the work support and breakage of the air sensor.

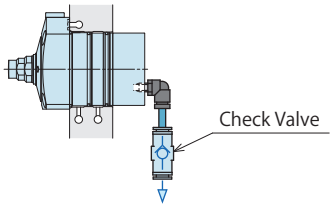
4. Air vent hole must be open to the atmosphere, and prevent coolant and chips from entering the air vent hole. The air sensor can malfunction if the air vent hole is blocked.



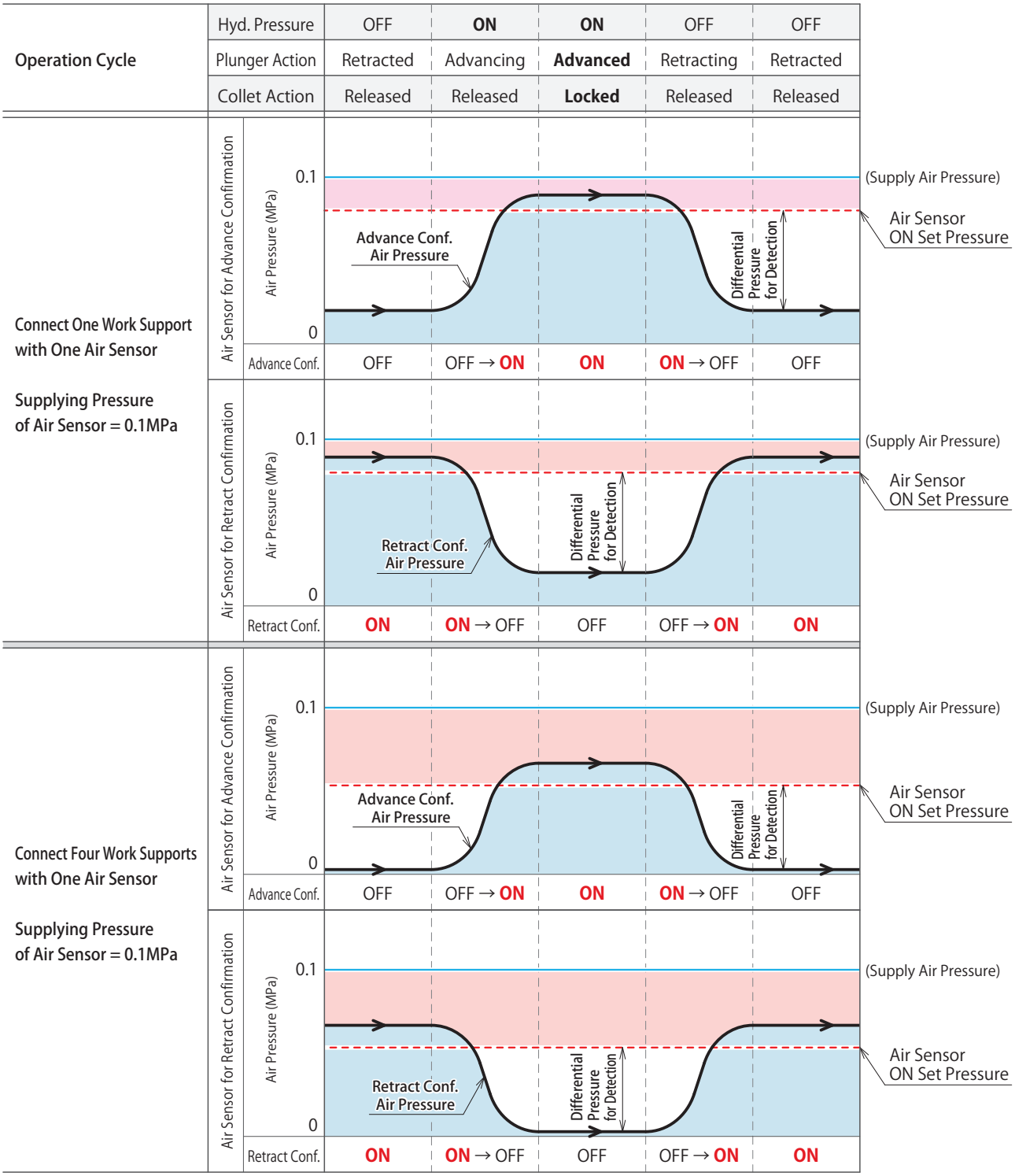
○ The air vent hole is open to the atmosphere.

× Coolant and chips enter from the air vent hole.

【Prevention of Foreign Substance to the Air Vent Port】
Coolant and chips can be prevented by setting a check valve with low cracking pressure. (Recommended Check Valve: SMC-made AKH series, cracking pressure: 0.005MPa)



Air Sensing Chart



Notes : 1. Depending on the usage condition, the detection differential pressure may be decreased by repeated operation.
Please contact us for overhaul when the detection differential pressure is decreased.
2. In order to carry out stabilized detection, the number of work supports connected per air sensor should be four or less.

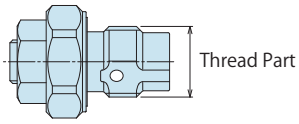
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 1 - A

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread



2 Design No.

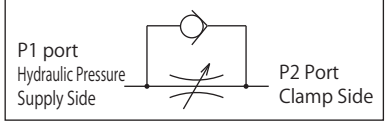
1 : Revision Number

3 Control Method

A : Meter-in

A

Circuit Symbol : Meter-in



Specifications

Model No.		**BZL0101-A**
Max. Operating Pressure	MPa	7
Withstanding Pressure	MPa	10.5
Control Method		Meter-in
G Thread Size		G1/8A
Cracking Pressure	MPa	0.04
Max. Passage Area	mm^2	2.6
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32
Operating Temperature	℃	0 ~ 70
Tightening Torque for Main Body	N·m	10
Weight	g	12

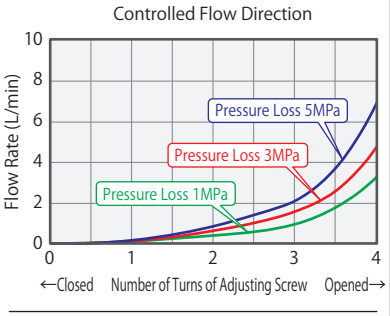
Notes : 1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
2. Do not attach a used BZL to other cylinders. Flow control may not be done because the bottom depth difference of G thread makes metal sealing insufficient.

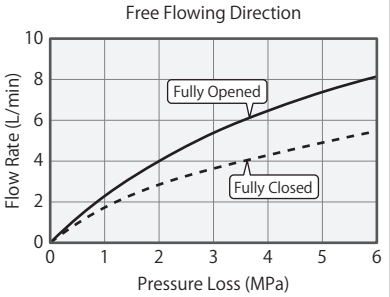
Applicable Products

Model No.	**LCW** (Single Action) Work Support
BZL0101-A	LCW0363-C□
	LCW0403-C□
	LCW0483-C□
	LCW0553-C□
	LCW0653-C□

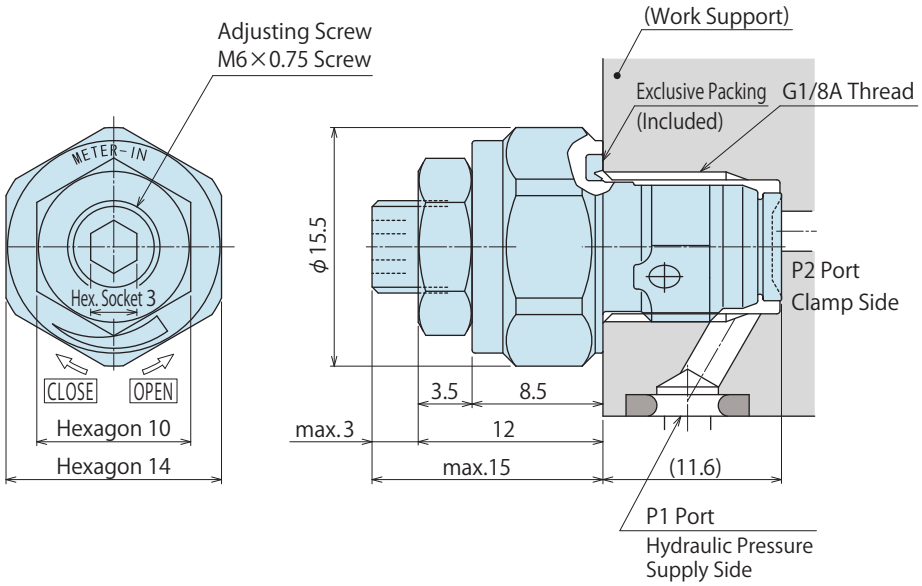
Flow Rate Graph ＜Hydraulic Fluids ISO-VG32 (25～35℃)>

BZL0101-A：Meter-in

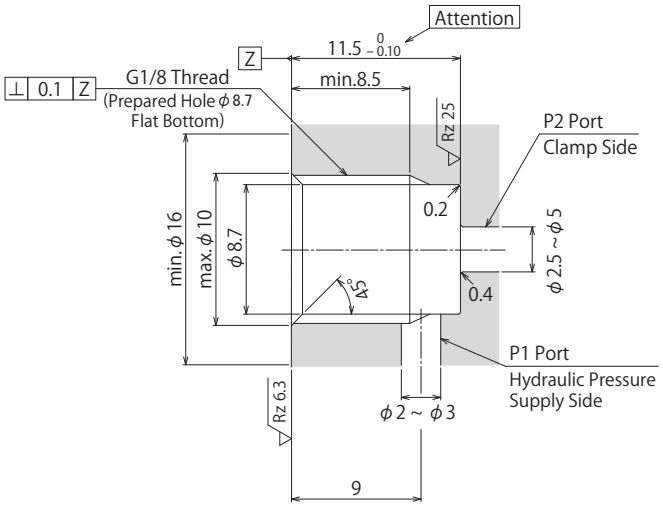




External Dimensions



Machining Dimensions of Mounting Area



Notes :

1. Since the $\sqrt{Rz\ 6.3}$ area is sealing part, be careful not to damage it.
2. Since the $\sqrt{Rz\ 12.5}$ area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply side and P2 port as the clamp side.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design.
   Improper circuit design may lead to malfunctions and damages. (Refer to P.20)
2. It is dangerous to release the air under high pressure. It must be done under lower pressure.
   (For reference : the minimum operating range of the product within the circuit.)

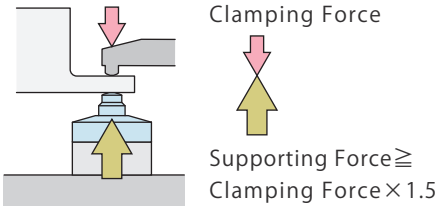
MEMO

Cautions

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.
- When using a work support opposite to the clamp, set the supporting force at more than 1.5 times the clamping force.



2) Notes for Circuit Design

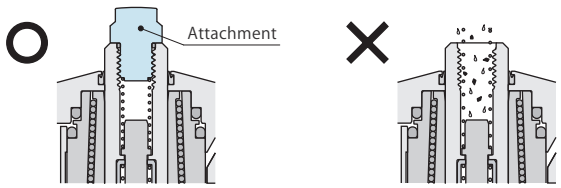
- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P.20 to assist with proper hydraulic circuit designing. Improper circuit design may lead to malfunctions and damages.

3) Install temporary stopper for workpiece if necessary.

- When multiple work supports are used for a light workpiece, the plunger spring force may be higher than the weight of the workpiece causing it to lift the workpiece.

4) Contact bolt or attachment is required for the plunger.

- Always use contact bolt or attachment with the plunger. Plunger does not rise since plunger spring is free to move.
- You must set an O-ring to the attachment. Otherwise, cutting fluid or other foreign material will get in easily, causing malfunction.



5) When using on a welding fixture, plunger surface should be protected.

- If spatter gets onto the sliding surface it may lead to a sliding failure and an insufficient support function.

6) Do not expose the plunger directly to high-pressure coolant.

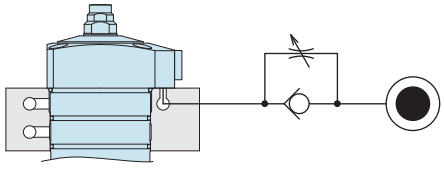
- It will cause intrusion of the coolant and damage to the internal components.

7) For Using on a Lathe, High-Speed Tilting Table, and etc.

- When using in a cycle where the centrifugal force is acting, the work support should be in a locked state. Please contact us for further information.

8) Adjust plunger operation time with flow rate.

- A rough guideline for the full stroke is between 0.5 and 1 sec.
- As with single-acting cylinders, use a speed control valve with a check valve (meter-in) in consideration of the decreasing speed at release.
- If the action speed is too fast, the plunger may bounce back and locks itself resulting in a gap with the workpiece.
- Use a speed control valve with check valve that has 0.1 MPa or less of cracking pressure. If the cracking pressure is too high, the plunger will not move at the time of release.

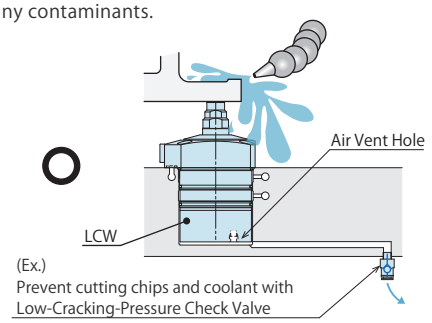


9) Appropriate Measures for Air Vent Hole

- The work support, although only slightly, breathes like a single-acting cylinder. Consider the environment and avoid cutting fluid, coolant or any contaminants.
- If using it without air vent hole, it will not function properly.

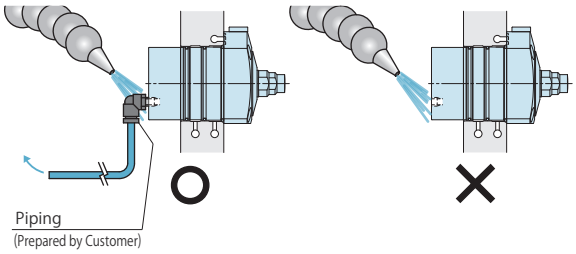
【Example】

① Prepare the air vent hole within the fixture with manifold piping. Make sure it breathes without the influence of cutting chips, coolant or any contaminants.



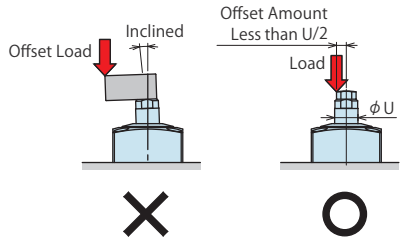
(Ex.)
Prevent cutting chips and coolant with Low-Cracking-Pressure Check Valve
(Recommended Check Valve: SMC-made AKH series, cracking pressure: 0.005MPa)

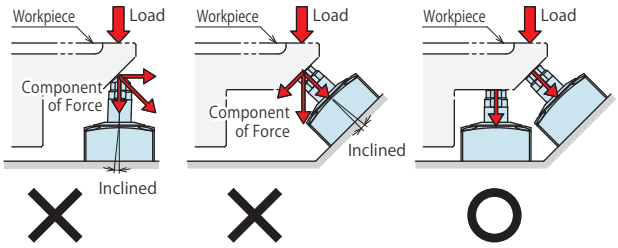
② Prepare the external piping. If it is impossible to prepare manifold piping like the case ①, move the vent hole by using fitting and steel piping etc. to the place without influence of coolant or any contaminants.



10) Make sure that offset load and component of force do not affect the product.

- If using the product as illustrated below, the displacement against load will be increased. Also large load will damage the internal parts.





11) For Replacing Sensor Pads

- Please design a sensor pad according to Sensor Pad Design Dimensions on P.9. When replacing the sensor pad, please be careful not to lose the connecting pin.
  Sensor response may decrease if the sensor pad is longer than maximum length shown in the sensor pad design dimensions.

Cautions

Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
- The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with Kosmek's product except for a part of valves which prevent foreign materials and contaminants from getting into the circuit.

3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.

4) Installation of the Product

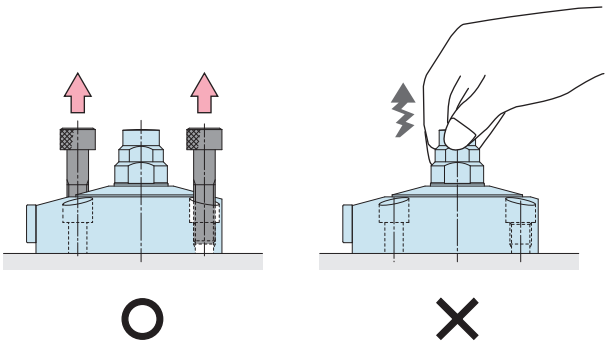
- When mounting LCW, use hexagon socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
LCW0363-C□	M4×0.7	3.2
LCW0403-C□	M5×0.8	6.3
LCW0483-C□	M5×0.8	6.3
LCW0553-C□	M6×1	10
LCW0653-C□	M6×1	10

- Apply an adequate amount of grease to the O-ring.
- If it is mounted under dry state, the O-ring may have twisting or be defective.
- If it is tightened with higher torque, it may lead to malfunction.

5) Removal of the Product

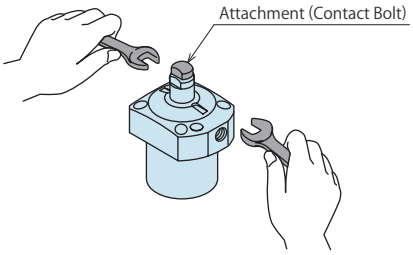
- When removing the product for maintenance, etc., insert a bolt to the two mounting bolt holes and pull them out straight.
  If the plunger part is pulled out, the internal parts will be damaged.



O ×

6) Replacement of Attachment

- Do not lose the plunger spring when the attachment (contact bolt) is removed.
- When mounting the attachment, stop the plunger with a spanner at edge and tighten it with torque as shown in the table below.

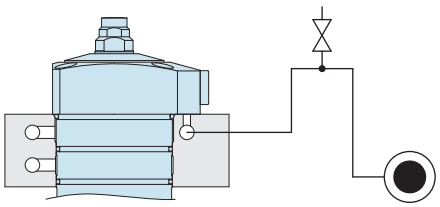


Model No.	Head Thread Size	Tightening Torque (N·m)
LCW0363-C□	M8×1.25	10
LCW0403-C□	M10×1.5	16
LCW0483-C□	M10×1.5	16
LCW0553-C□	M12×1.75	40
LCW0653-C□	M12×1.75	40

7) Air Bleeding of the Hydraulic Circuit

- If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

① Reduce hydraulic pressure to less than 2MPa.
② Loosen the cap nut of pipe fitting closest to the work support by one full turn.
③ Wiggle the pipeline to loosen the outlet of pipe fitting. Hydraulic fluid mixed with air comes out.
④ Tighten the cap nut after bleeding.
⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.



8) Checking Looseness and Retightening

- At the beginning of the product installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

Maker	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	
Castrol	Hyspin AWS 32	

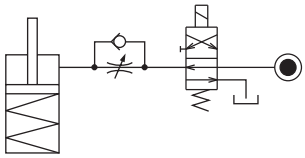
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

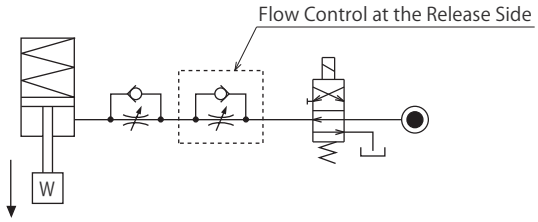
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Speed Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disturb release action. The preferred method is to control the flow during the lock action only. It is also preferred to provide a flow control valve at each actuator which has limited action speed (swing clamp, hydraulic compact cylinder, etc.)



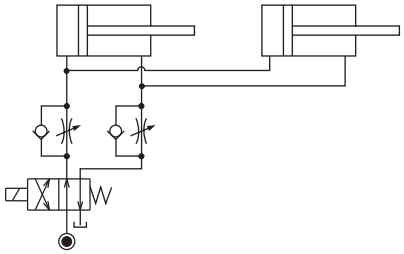
If the cylinder may be damaged by the load from the releasing action direction, provide the flow control valve to the releasing side as well. (Provide the flow control valve to the releasing side if the lever weight is applied during release action.)



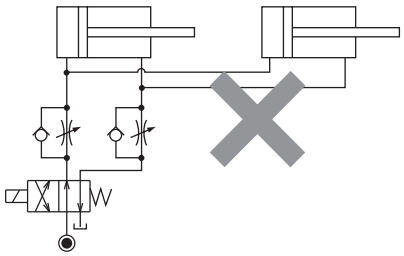
Speed Control Circuit for Double Acting Cylinder

Speed control circuit for double action cylinder should have meter-out circuits for both the lock and release sides (except model LKE/TLA/TMA). Meter-in circuits can be adversely affected by any air in the system. However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

【Meter-out Circuit】(Except LKE/TMA/TLA)

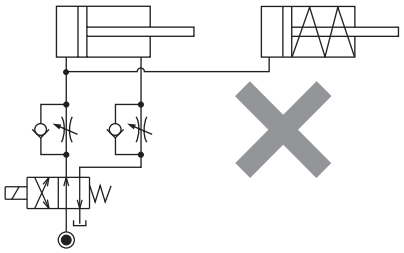


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



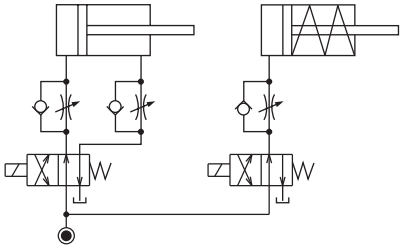
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

① Single acting components should not be used in the same flow control circuit as the double acting components.
The release action of the single acting cylinders may become erratic or very slow.

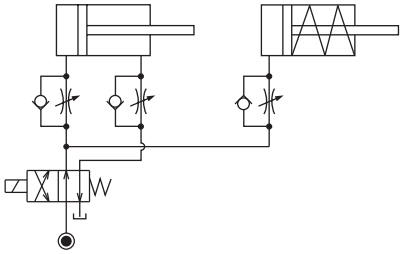


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

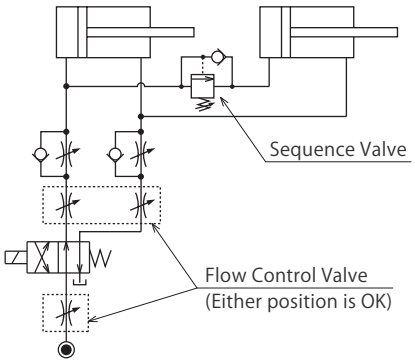
○ Separate the control circuit.



○ Reduce the influence of double acting cylinder control unit.
However, due to the back pressure in tank line, single acting cylinder is activated after double acting cylinder works.



② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection. If the back pressure is more than the set pressure then the system will not work as it is designed to.



Cautions

Notes on Handling

1) It should be handled by qualified personnel.
- The hydraulic machine and air compressor should be handled and maintained by qualified personnel.

2) Do not handle or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
② Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature cools down.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

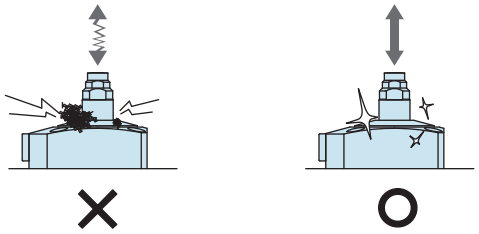
3) Do not touch work supports while they are working.
Otherwise, your hands may be injured due to clinching.

4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before the product is removed, make sure that safety measures and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.



3) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

4) Regularly tighten piping, mounting bolts and etc., to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) Make sure there is smooth action and no abnormal noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

7) The products should be stored in the cool and dark place without direct sunshine or moisture.

8) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or handled in inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

KOSMEK
Harmony in Innovation

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- For Further Information on Unlisted Specifications and Sizes, Please call us.
- Specifications in this Leaflet are Subject to Change without Notice.

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