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.

Hydraulic Work Support

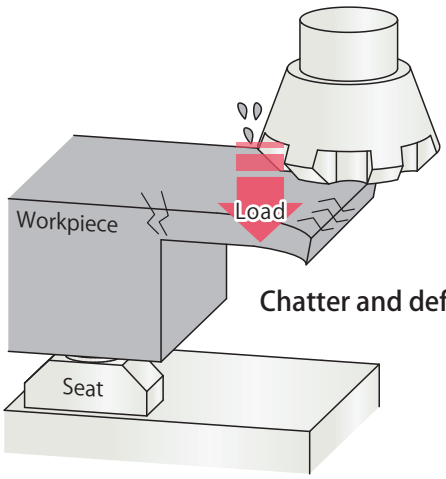
Model LD
Model LC
Model LCW
Model TNC
Model TND
Model TC



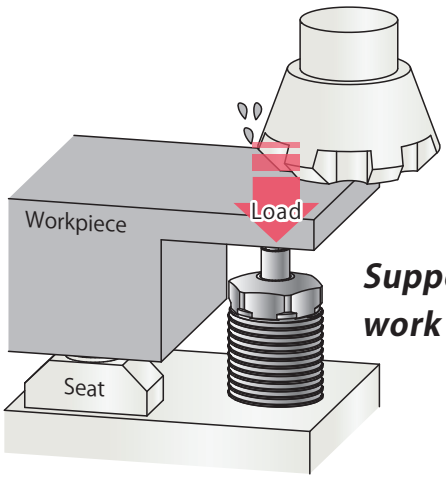
Strong Support from opposite side when load is exerted

Pioneer and leading innovator of hydraulic work support collet technology.

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

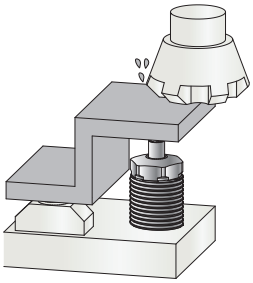


< Without Work Support >

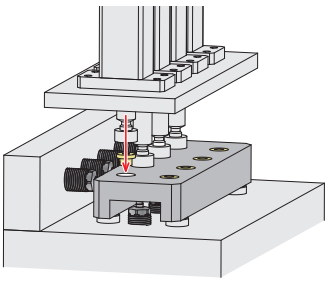


< With Work Support >

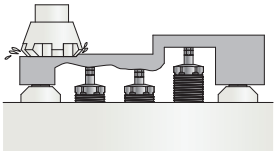
Application Examples



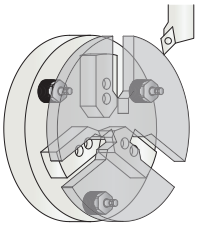
To avoid chattering during machining of thin-walled sections



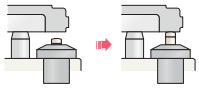
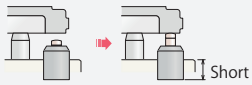
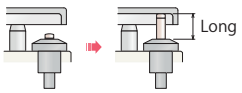
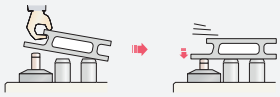
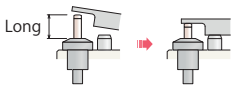
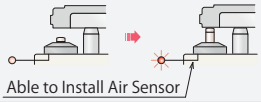
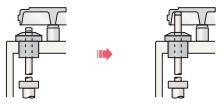
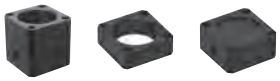
To support a press-fit machine



To support a workpiece with different heights



To avoid the radial chatter on lathe machining
※ Please contact us.

		Model LD → P.721	Model LC → P.745	Model LCW → P.***	Model TNC → P.775	Model TC → P.797
Classification		Low Pressure Threaded	Low Pressure Top Flange	Low Pressure Top Flange	High Pressure Threaded	High Pressure Top Flange
Operating Pressure Range		2.5～7MPa	2.5～7MPa	2.5～7MPa	7～35MPa	7～25MPa
Standard	Hydraulic Advance Model 	External Dimensions → P.731L	External Dimensions → P.757	—	External Dimensions → P.785	External Dimensions → P.807
Options	Hydraulic Advance Short Model 	External Dimensions → P.731L	—	—	—	—
Options	Hydraulic Advance Long Stroke Model 	External Dimensions → P.733	External Dimensions → P.759	—	External Dimensions → P.787	External Dimensions → P.809
Options	Spring Advance Model Spring Advance Short Model 	External Dimensions → P.735L	External Dimensions → P.765	—	External Dimensions → P.789	External Dimensions → P.811
Options	Spring Advance Long Stroke Model 	External Dimensions → P.736L	External Dimensions → P.763	—	External Dimensions → P.789	★
Options	Air Sensing Option 	External Dimensions → P.737	External Dimensions → P.769	External Dimensions → P.***	External Dimensions → P.791	★
Options	Rodless Hollow Model 	—	External Dimensions → P.767	—	—	External Dimensions → P.813
Accessories	Manifold Block 	LZ-C/CQ → P.1337L	LZ-MP → P.1336 LZ-BZS → P.962A	—	—	LZ-MP → P.1336
Accessories	Manifold Block 	LZ-S/SQ DZ-C/R → P.1339	—	—	TNZ-S/SQ → P.1345	—
Accessories	Speed Control Valve Plug 	—	BZL、BZX、JZG BZS → P.947	BZL、BZX、JZG → P.947	—	BZT、BZX、JZG → P.947
Accessories	Air Vent 	—	XLC-VENT → P.817	—	—	XLC-VENT → P.817

※ Please contact us for details of ★ part.

PAT.P.

Hydraulic Work Support

Model LD

Low Pressure (2.5 ~ 7MPa)

Single Action • Threaded Body Model

Powerful Support • Smooth Action



Design number update improved environmental durablity.
New option has been added. Model LD-M-Q

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Specifications — P.726

Performance Curve — P.727

External Dimensions

- Hydraulic Advance Model (Standard) / Hydraulic Advance Short Model (LD/LD-S) — P.731L
- Hydraulic Advance Long Stroke Model (LD-Q) — P.733
- Spring Advance Model / Spring Advance Short Model (LD-E/LD-ES) — P.735L
- Spring Advance Long Stroke Model (LD-EQ) — P.736L
- Air Sensing Option (LD-M/LD-M-E) — P.737

Air Sensing Option — P.739

Air Purge Function — P.741

Plunger Spring Design Dimensions — P.742

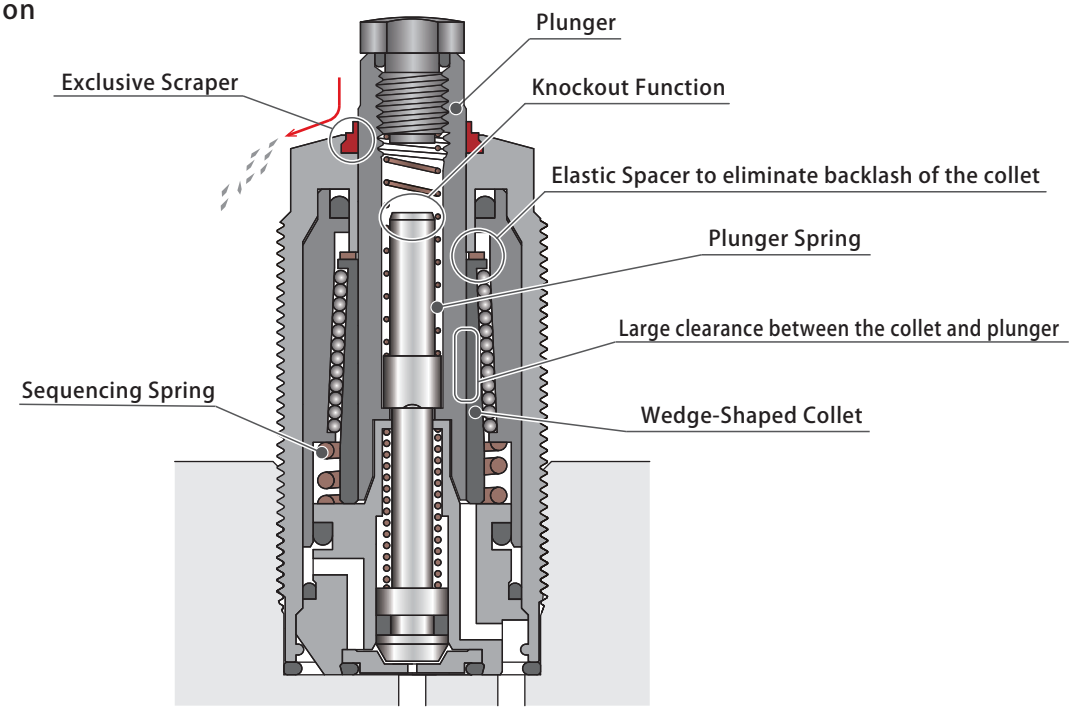
Accessories

- Manifold Block — P.1333
- Manifold Block（Common Items of Other Models） — P.1339

Cautions

- Notes for Hydraulic Work Support — P.819
- Cautions (Common) — P.1355
  - Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
  - Notes on Handling • Maintenance/Inspection • Warranty

Cross Section



Powerful Support and Smooth Action

KOSMEK was the first to develop the collet design in 1996.
Compared with the traditional sleeve design, it ensures powerful gripping force via a wedge effect.
In addition, a larger gap between collet and plunger is designed to prevent sticking and allow smoother action.
The load applied to the workpiece is soft with only plunger spring force.

Concrete Workpiece Touch

As the collet gripping the plunger is always pressed downwards by “Elastic Spacer” , it helps prevent tilting when locked and the clearance with the workpiece.

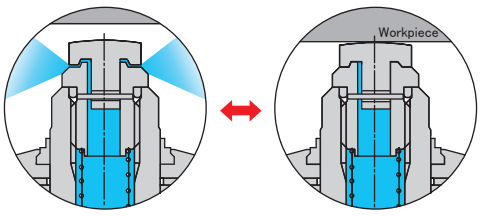
Certain Sequence Action

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

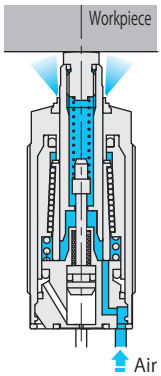
The work support can be used in various environments with "Exclusive Scraper" that prevents the accumulation of cutting chips and other dust, and the built-in "Knockout Function" that releases adherence after a long-time machine stop.

Air Sensing Option



Sensor OPEN (OFF)　　Sensor CLOSE (ON)

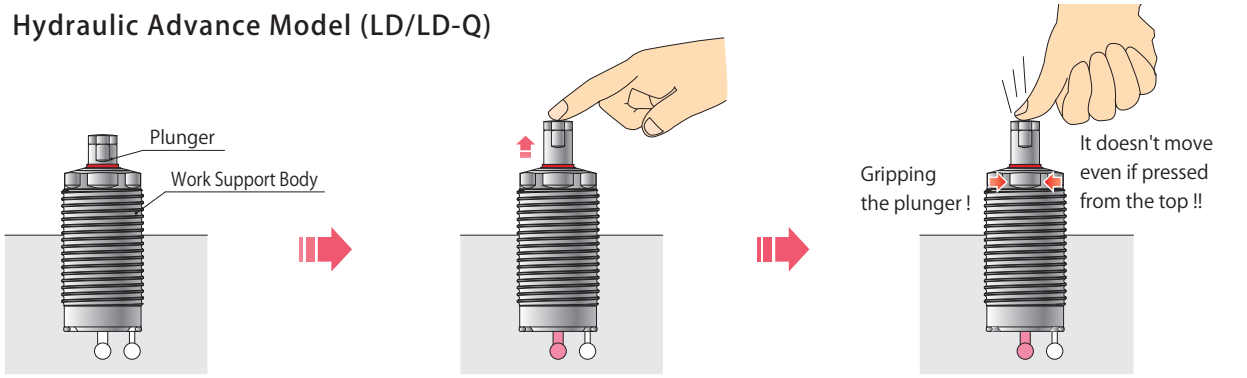
Air Purge Function



High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Action Description

Hydraulic Advance Model (LD/LD-Q)



Hydraulic Pressure : OFF
The state of plunger down.

Hydraulic Pressure : ON
Plunger rises with oil pressure and stops after touching workpiece.

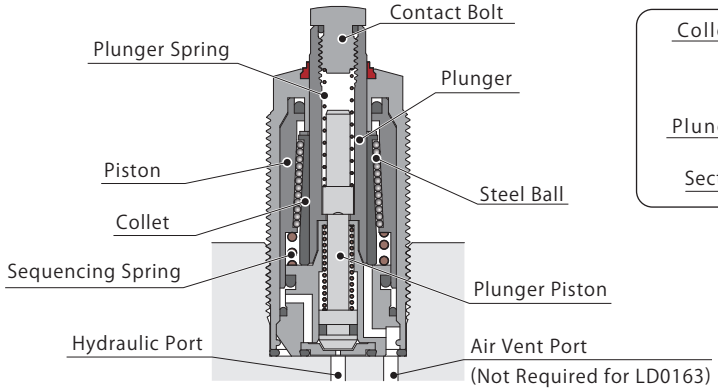
Hydraulic Pressure : ON
Once it is in the stopped position where it touches the workpiece, the plunger doesn't go down even if pressed from above.

Air Sensing Option (LD-M/LD-M-E)

Available to check action by connecting the air sensor at vent port and then detecting differential pressure.
Please refer to the air sensor page for further details.

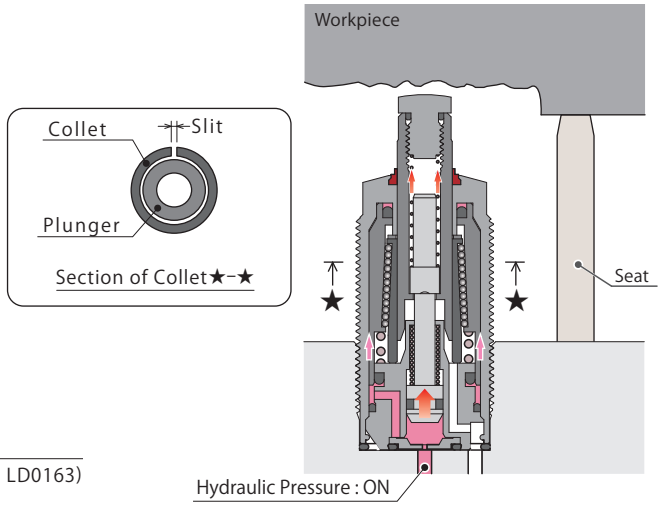
Internal Action Description

Hydraulic Advance model LD



When releasing (Cross Section)

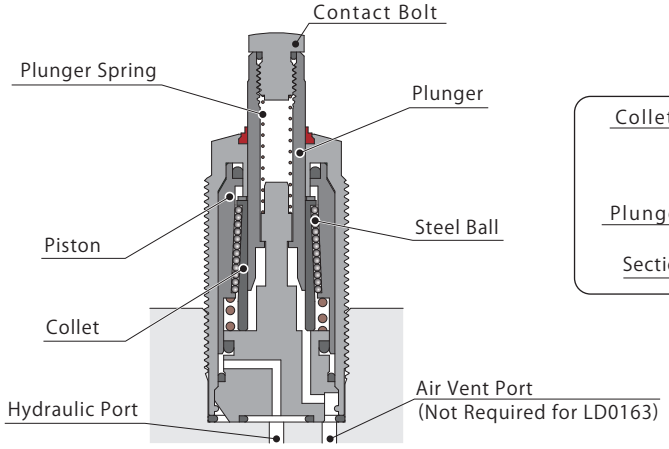
Plunger lowered



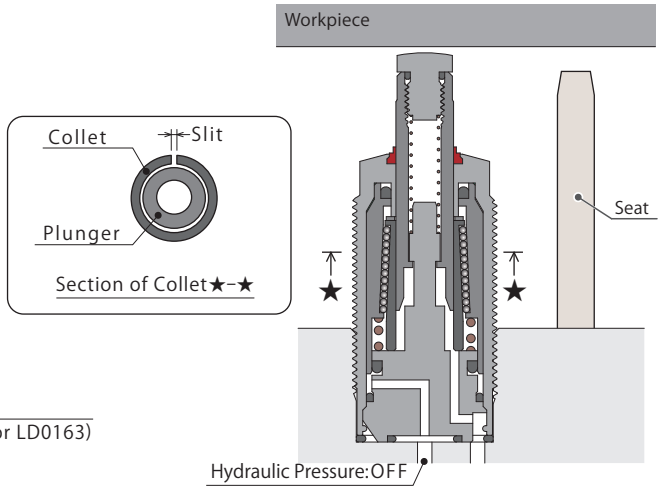
Plunger extends

The plunger piston rises first when hydraulic pressure is supplied. With this action, the plunger is lifted up via the plunger spring.

Spring Advance model LD-E

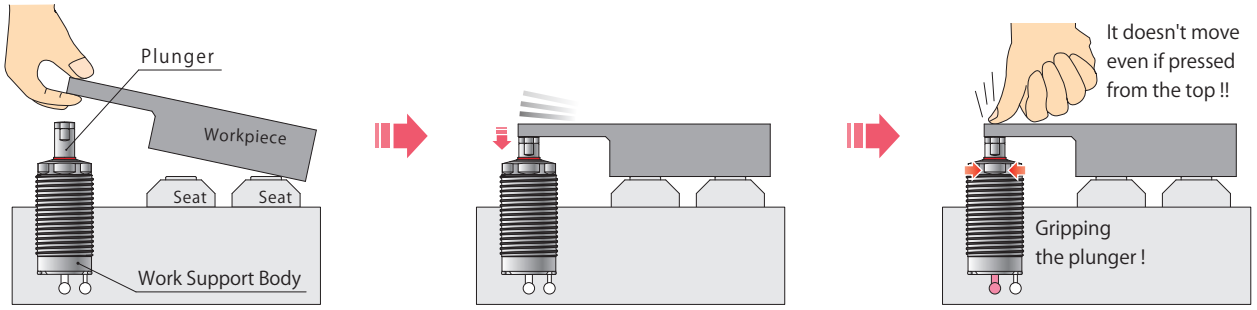


When releasing (Cross Section)



Released State (Plunger extends)

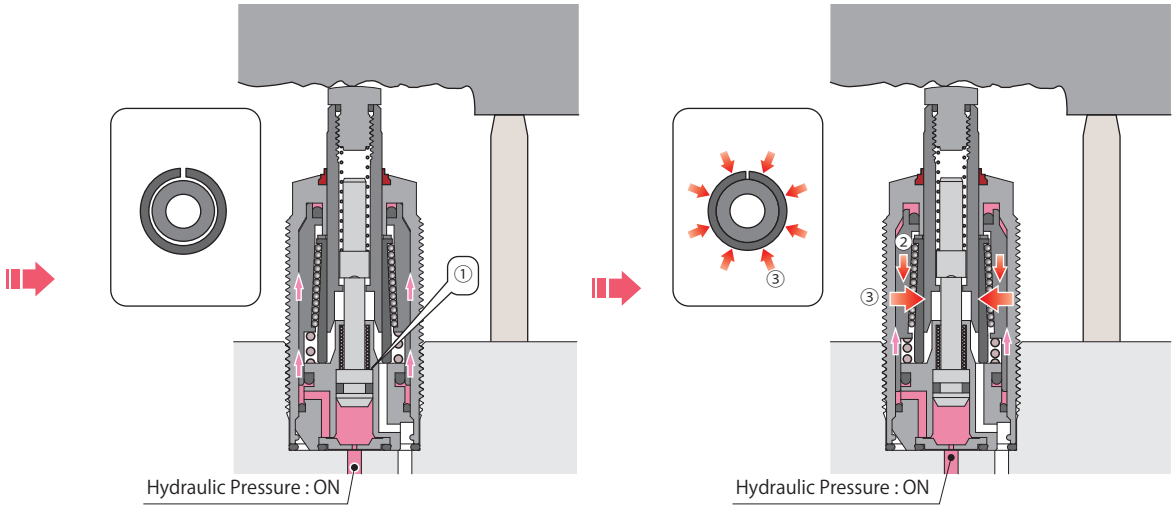
● Spring Advance Model (LD-E/LD-EQ)



Hydraulic Pressure：OFF
The state of plunger up.

Hydraulic Pressure：OFF
When work piece rests on the work support, plunger goes down due to the weight of work piece and is balanced.

Hydraulic Pressure：ON
Once it is in the stopped position where it touches the work piece, the plunger doesn't go down even if pressed from above.

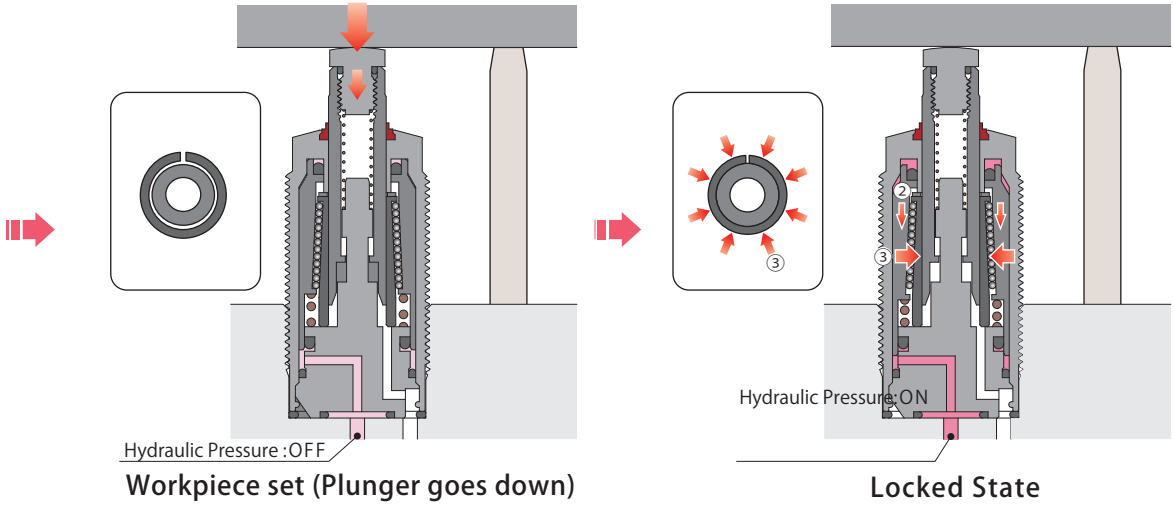


Plunger softly contact a workpiece

After the plunger contacts any part of a workpiece such as its casting surface, hydraulic pressure thrust of the plunger piston stops at the action end shown as ① on above picture.

Locked State

② When the pressure rises more than the sequential spring force, the piston outside of the collet starts to press down.
③ Wedge-shaped collet powerfully grips the plunger via steel balls of tapered surface inside the piston, and locking is completed.



Workpiece set (Plunger goes down)

Locked State

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

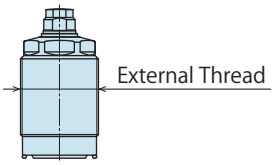
Model No. Indication

LD 026 3 - L □ - □

1 2 3 4 5

1 Body Size

016 : External Thread M16×1.0
022 : External Thread M22×1.5
026 : External Thread M26×1.5
030 : External Thread M30×1.5
036 : External Thread M36×1.5
045 : External Thread M45×1.5



2 Design No.

3 : Revision Number

3 Plunger Spring Force

L : Low Spring Force
H : High Spring Force
Blank : For 5 Option **Q, EQ**

4 Plunger Action Confirmation

Blank : No Action Confirmation (Standard)
M : Air Sensing Option

5 Option

Blank : Hydraulic Advance Model (Standard)
S : Hydraulic Advance Short Model
Q : Hydraulic Advance Long Stroke Model
E : Spring Advance Model
ES : Spring Advance Short Model
EQ : Spring Advance Long Stroke Model

● = Available Option

4 Plunger Action Confirmation Symbol	M16×1.0	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5
5 Option Symbol	LD 0163	LD 0223	LD 0263	LD 0303	LD 0363	LD 0453
Blank	●	●	●	●	●	●
S	●	●	●	●		
Q		●	●	●	●	●
E	●	●	●	●	●	●
ES	●	●	●	●		
EQ		●	●	●	●	●
M			●	●	●	●
M-S			●	●		
M-Q			●	●	●	●
M-E			●	●	●	●
M-EQ			●	●	●	●

Specifications

Option 5 Blank / E

Model No.		LD0163-□ LD0163-□-E	LD0223-□ LD0223-□-E	LD0263-□ LD0263-□M LD0263-□-E LD0263-□M-E	LD0303-□ LD0303-□M LD0303-□-E LD0303-□M-E	LD0363-□ LD0363-□M LD0363-□-E LD0363-□M-E	LD0453-□ LD0453-□M LD0453-□-E LD0453-□M-E
Support Force at 7MPa kN		1.0	2.0	3.0	4.0	5.5	10.0
Support Force (Calculation Formula) ※1 kN		0.182×P−0.273	0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28
Plunger Stroke mm		5	6.5	6.5	8	8	10
Effective Stroke	5 Option **Blank**	4.7	6.0	6.0	7.5	7.5	9.5
Cylinder Capacity	5 Option **Blank**	0.15	0.4	0.6	0.9	1.3	2
cm³	5 Option **E**	0.10	0.2	0.3	0.5	0.6	1.3
Plunger Spring Force ※2 N	**L**:Low Spring Force	1.2～1.7	2.1～3.1	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H:High Spring Force	1.5～2.4	3.0～4.4	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6
Max. Operating Pressure MPa		7.0	7.0				
Min. Operating Pressure MPa		2.5	2.5				
Withstanding Pressure MPa		10.5	10.5				
Operating Temperature ℃		0～70	0～70				
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32					
Weight kg		0.04	0.10	0.20	0.25	0.35	0.75

Option 5 S / ES

Model No.		LD0163-□-S LD0163-□-ES	LD0223-□-S LD0223-□-ES	LD0263-□-S LD0263-□-ES	LD0303-□-S LD0303-□-ES
Support Force at 7MPa kN		0.32	0.6	1.0	2.0
Support Force (Calculation Formula) ※1 kN		0.064×P−0.128	0.12×P−0.24	0.19×P−0.30	0.35×P−0.46
Plunger Stroke mm		4	5	5	6
Effective Stroke	5 Option **S**	3.7	4.7	4.7	5.5
Cylinder Capacity	5 Option **S**	0.07	0.2	0.3	0.5
cm³	5 Option **ES**	0.04	0.1	0.1	0.2
Plunger Spring Force ※2 N	**L**:Low Spring Force	1.0～1.6	1.8～3.1	2.8～4.2	3.5～6.3
	H:High Spring Force	1.2～2.4	2.1～4.3	3.1～5.9	4.0～8.2
Max. Operating Pressure MPa		7.0	7.0		
Min. Operating Pressure MPa		3.0	2.5		
Withstanding Pressure MPa		10.5	10.5		
Operating Temperature ℃		0～70	0～70		
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32			
Weight kg		0.03	0.10	0.10	0.20

Option 5 Q / EQ

Model No.		LD0223-Q	LD0263-Q LD0263-EQ	LD0303-Q LD0303-EQ	LD0363-Q LD0363-EQ	LD0453-Q LD0453-EQ
Support Force at 7MPa kN		2.0	3.0	4.0	5.5	10.0
Support Force (Calculation Formula) ※1 kN		0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28
Plunger Stroke mm		13	13	16	16	20
Effective Stroke	5 Option **Q**	12.5	12.5	15.5	15.5	19.5
Cylinder Capacity	5 Option **Q**	0.6	0.8	1.3	1.9	2.8
cm³	5 Option **EQ**	–	0.3	0.5	0.6	1.3
Plunger Spring Force ※2 N		3.0～5.6	3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4
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	5 Option **Q**	0.15	0.25	0.30	0.45	0.85
kg	5 Option **EQ**	–	0.20	0.25	0.35	0.75

Notes： ※1. P in the formula for support force indicates the 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.
Regarding to workpiece contacting force for 4 **M**：Air Sensing option, please refer to P.739.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Performance Curve (LD-□ : Hydraulic Advance Model / LD-□-E : Spring Advance Model)

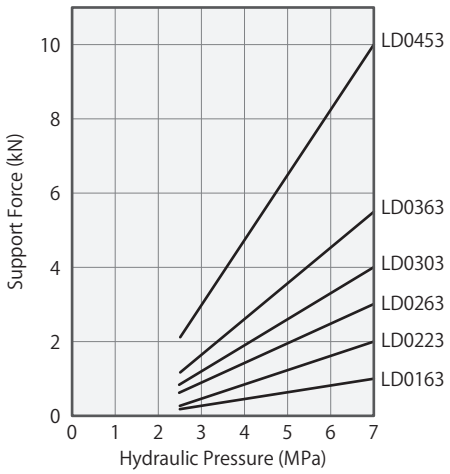
Applicable Model

LD 026 3 - L H - Blank E

1 Body Size

5 Option : Blank, E

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

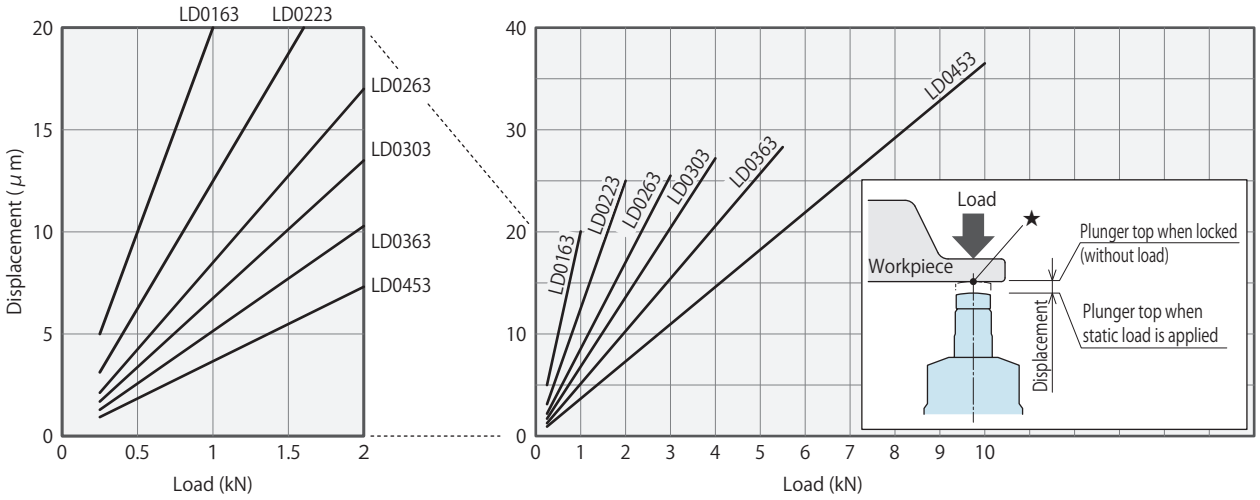


Model No.	Support Force (kN)					
	LD0163-□	LD0223-□	LD0263-□	LD0303-□	LD0363-□	LD0453-□
Hydraulic Pressure (MPa)	LD0163-□-E	LD0223-□-E	LD0263-□-E	LD0303-□-E	LD0363-□-E	LD0453-□-E
7	1.00	2.0	3.0	4.0	5.5	10.0
6.5	0.91	1.8	2.8	3.6	5.0	9.1
6	0.82	1.6	2.5	3.3	4.5	8.2
5.5	0.73	1.4	2.2	2.9	4.0	7.3
5	0.64	1.2	2.0	2.6	3.6	6.5
4.5	0.55	1.0	1.7	2.2	3.1	5.6
4	0.46	0.8	1.4	1.9	2.6	4.7
3.5	0.36	0.6	1.2	1.5	2.1	3.8
3	0.27	0.5	0.9	1.2	1.6	3.0
2.5	0.18	0.3	0.6	0.8	1.2	2.1
Support Force Formula※1 kN	0.182×P−0.273	0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28

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.



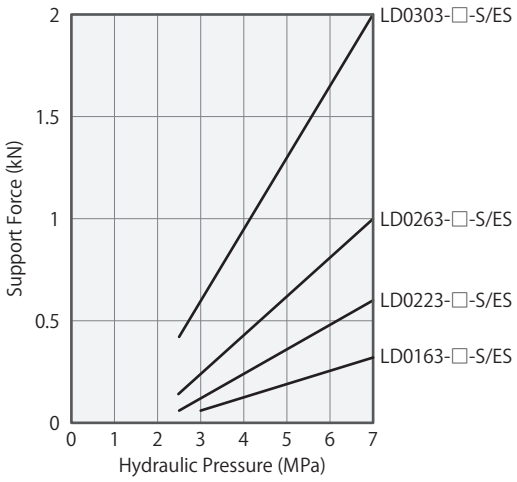
Performance Curve (LD-□-S : Hydraulic Advance Short Model / LD-□-ES : Spring Advance Short Model)

Applicable Model

LD 026 3 - L H - S ES

1 Body Size　　5 Option : S, ES

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

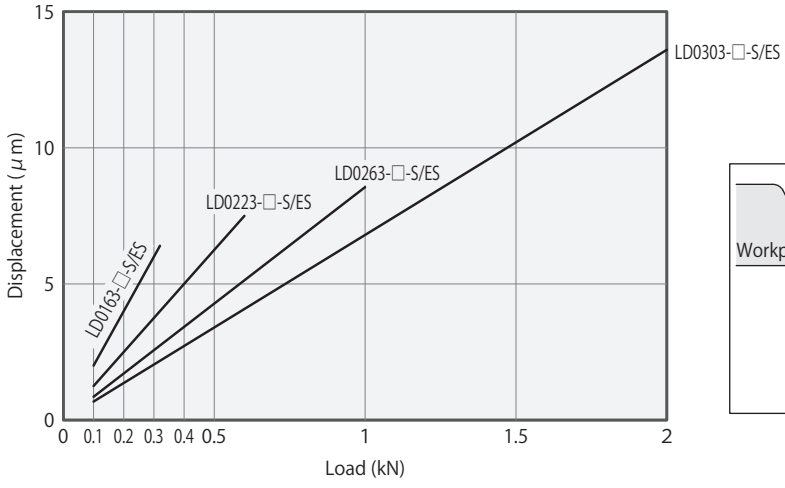


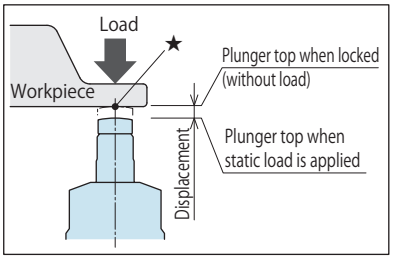
Model No.	Support Force (kN)			
	LD0163-□-S	LD0223-□-S	LD0263-□-S	LD0303-□-S
Hydraulic Pressure (MPa)	LD0163-□-ES	LD0223-□-ES	LD0263-□-ES	LD0303-□-ES
7	0.32	0.6	1.0	2.0
6.5	0.29	0.5	0.9	1.8
6	0.26	0.5	0.8	1.6
5.5	0.22	0.4	0.7	1.5
5	0.19	0.4	0.7	1.3
4.5	0.16	0.3	0.6	1.1
4	0.13	0.2	0.5	0.9
3.5	0.10	0.2	0.4	0.8
3	0.06	0.1	0.3	0.6
2.5	–	0.1	0.2	0.4
Support Force Formula ※1 kN	0.064×P–0.128	0.12×P–0.24	0.19×P–0.30	0.35×P–0.46

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.





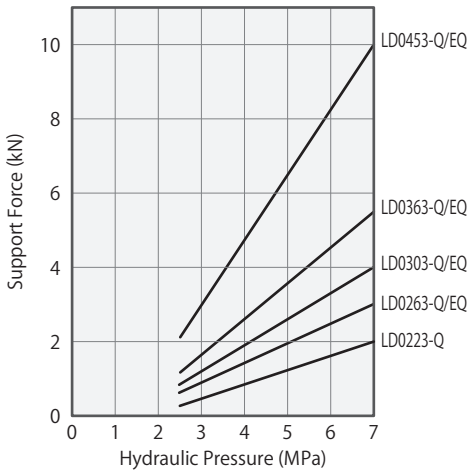
Performance Curve (LD-Q：Hydraulic Advance Long Stroke Model / LD-EQ：Spring Advance Long Stroke Model)

Applicable Model

LD 026 3 - L/H - Q/EQ

1 Body Size　　5 Option：Q, EQ

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

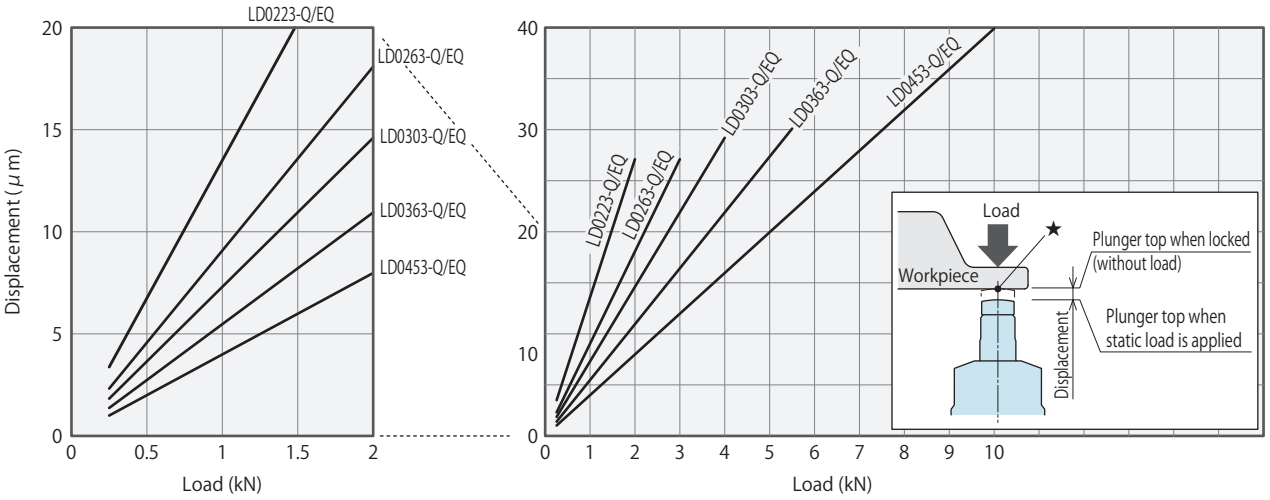


	Support Force (kN)				
Model No.	LD0223-Q	LD0263-Q	LD0303-Q	LD0363-Q	LD0453-Q
Hydraulic Pressure (MPa)	LD0223-EQ	LD0263-EQ	LD0303-EQ	LD0363-EQ	LD0453-EQ
7	2.0	3.0	4.0	5.5	10.0
6.5	1.8	2.8	3.6	5.0	9.1
6	1.6	2.5	3.3	4.5	8.2
5.5	1.4	2.2	2.9	4.0	7.3
5	1.2	2.0	2.6	3.6	6.5
4.5	1.0	1.7	2.2	3.1	5.6
4	0.8	1.4	1.9	2.6	4.7
3.5	0.6	1.2	1.5	2.1	3.8
3	0.5	0.9	1.2	1.6	3.0
2.5	0.3	0.6	0.8	1.2	2.1
Support Force Formula※1kN	0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28

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.



※ The Displacement of LD-Q / LD-EQ：Long Stoke Model is larger than that of LD/LD-E：Standard Model.

Performance Curve (LD-□M : Hydraulic Advance Air Sensing Option / LD-□M-E : Spring Advance Air Sensing Option)

Applicable Model

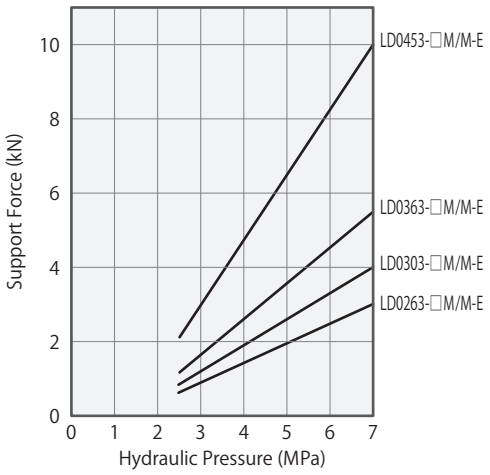
LD 026 3 - L H M - Blank E

1 Body Size

5 Option : Blank, E

4 Plunger Action Confirmation : M

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

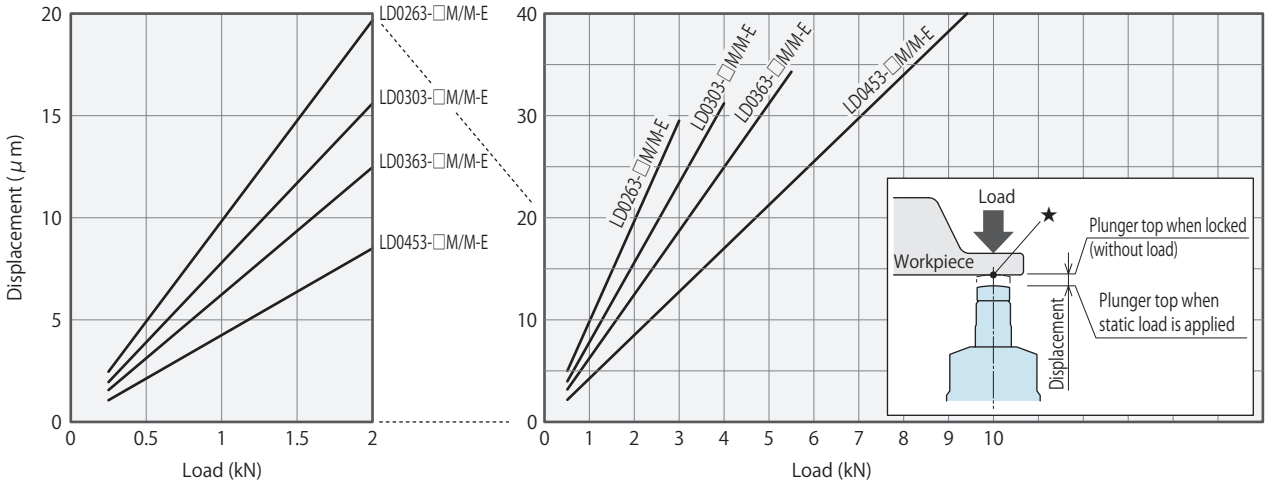


Model No.	Support Force (kN)			
	LD0263-□M	LD0303-□M	LD0363-□M	LD0453-□M
Hydraulic Pressure (MPa)	LD0263-□M-E	LD0303-□M-E	LD0363-□M-E	LD0453-□M-E
7	3.0	4.0	5.5	10.0
6.5	2.8	3.6	5.0	9.1
6	2.5	3.3	4.5	8.2
5.5	2.2	2.9	4.0	7.3
5	2.0	2.6	3.6	6.5
4.5	1.7	2.2	3.1	5.6
4	1.4	1.9	2.6	4.7
3.5	1.2	1.5	2.1	3.8
3	0.9	1.2	1.6	3.0
2.5	0.6	0.8	1.2	2.1
Support Force Formula※1kN	0.53×P-0.68	0.70×P-0.91	0.96×P-1.25	1.75×P-2.28

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

Load / Displacement Graph

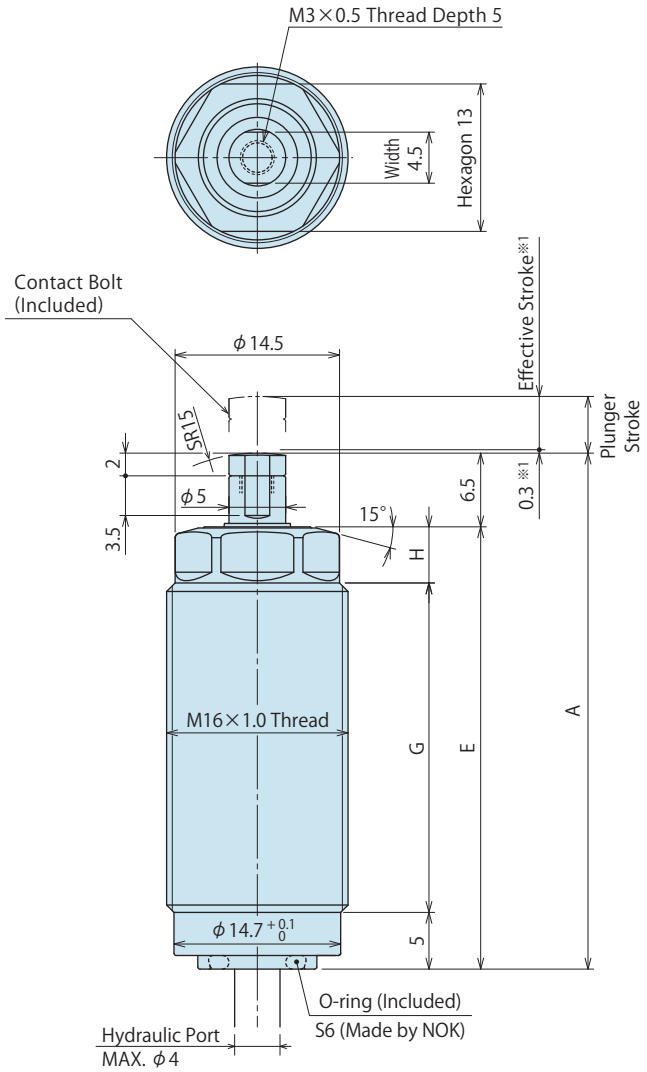
※ This graph shows the displacement of the static load of a single work support at 7MPa hydraulic pressure.
Not including the displacement of the workpiece side due to unevenness at ★ mark and surrounding clamps.



※ The Displacement of LD-□M / LD-□M-E : Air Sensing Model is larger than that of LD/LD-E : Standard Model.
※ Contact us for LD-□M-S / LD-M-Q.

External Dimensions

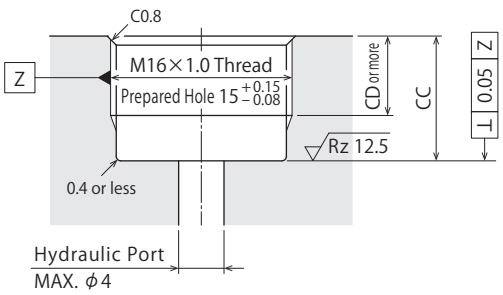
※ This drawing shows the released state of LD0163-□ (before the plunger is lifted).



Note :

※1. When the work support touches a workpiece within 0.3mm 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.

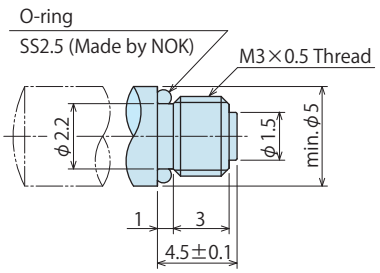
Machining Dimensions of Mounting Area



A vent port is not required for LD0163.

Contact Bolt Design Dimensions

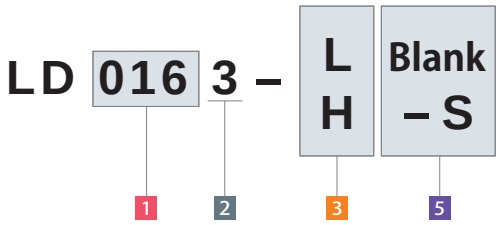
※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.



Tightening Torque for Contact Bolt	0.6 N·m
Reference : Material	Pre-Hardened Steel
Reference : Quenching Hardness	HRC29～33

Model No. Indication

(Format Example：LD0163-H, LD0163-L-S)



1 Body Size

2 Design No.

3 Plunger Spring Force

4 Plunger Action Confirmation (Blank)

5 Option (Blank / S)

Blank：Hydraulic Advance Model (Standard)

S ：Hydraulic Advance Short Model

Refer to P.732L and P.732R for external dimensions of LD0223 and larger.

External Dimensions and Machining Dimensions for Mounting

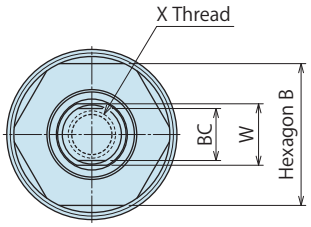
(mm)

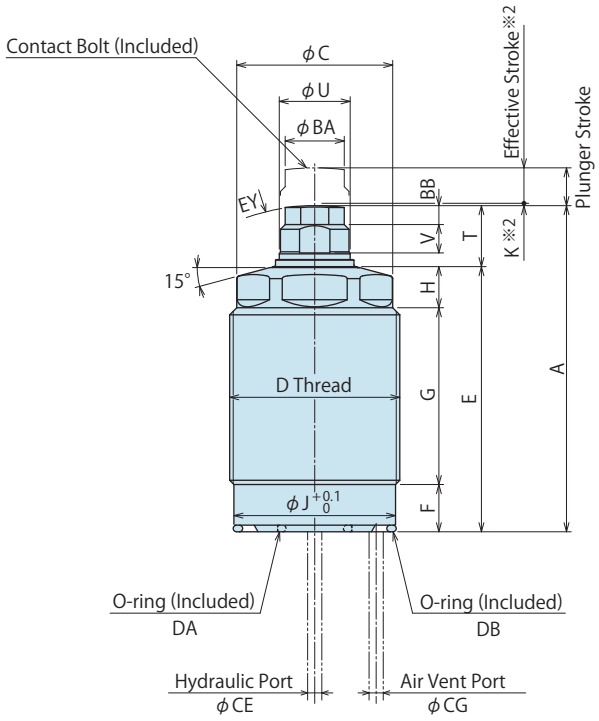
Model No.	LD0163-□	LD0163-□-S (Short Model)
Plunger Stroke	5	4
Effective Stroke	4.7	3.7
A	45.5	35
E	39	28.5
G	29.1	17.6
H	4.9	5.9
CC	10～34	10～23
CD	CC－4	
Tightening Torque for Main Body※2	8 N·m	

Note : ※2. The torque for mounting the body should be as indicated in the table above.
Excessive torque will cause deformation of the body leading to operation failure.
Also, with insufficient torque, O-ring will be loosened and damaged resulting in oil leakage.

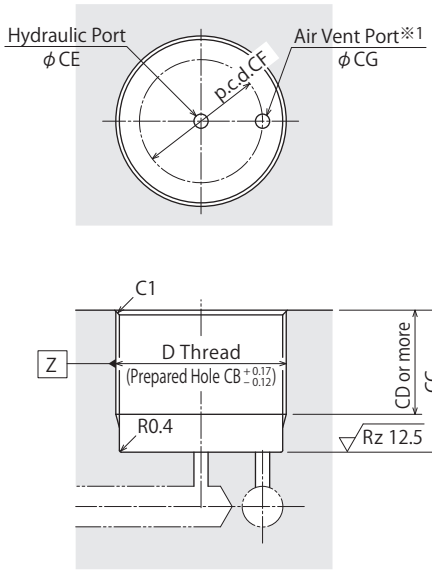
External Dimensions

※This drawing shows the released state of LD-□ (before the plunger is lifted).





Machining Dimensions of Mounting Area

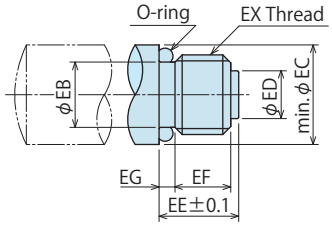


Note :

※1. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
(Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※2. When the work support touches a workpiece within K (mm) 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.

Contact Bolt Design Dimensions



Model No. Indication

LD 026 3 – L/H Blank/–S

(Format Example：LD0453-H, LD0263-L-S)

1 Body Size
2 Design No.
3 Plunger Spring Force
4 Plunger Action Confirmation (Blank)
5 Option (Blank / S)
Blank：Hydraulic Advance Model (Standard)
S ：Hydraulic Advance Short Model

Refer to P.731L and P.731R for external dimensions of LD0163.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0223-□	LD0223-□-S (Short Model)	LD0263-□	LD0263-□-S (Short Model)	LD0303-□	LD0303-□-S (Short Model)	LD0363-□	LD0453-□
Plunger Stroke	6.5	5	6.5	5	8	6	8	10
Effective Stroke	6.0	4.7	6.0	4.7	7.5	5.5	7.5	9.5
A	59.5	45	66	48.5	73	52	69	82
B	18		22		24		30	36
C	20		24		27		33	40
D (Nominal × Pitch)	M22×1.5		M26×1.5		M30×1.5		M36×1.5	M45×1.5
E	51.3	36.8	55.8	38.3	60.1	39.1	56.1	69.1
F	7		9		10		10	10
G	38.6	24.1	39.6	23.1	41.4	21.9	37.4	47.4
H	5.7	5.7	7.2	6.2	8.7	7.2	8.7	11.7
J	20.2		24.2		28.2		34.2	43.2
K	0.5	0.3	0.5	0.3	0.5	0.5	0.5	0.5
T	8.2		10.2		12.9		12.9	12.9
U	7		10		12		15	16
V	3.5		5		6		6	6
W	5.5		8		10		13	13
X (Nominal×Pitch×Depth)	M4×0.7×7		M6×1×9		M8×1.25×12		M10×1.5×11	M10×1.5×11
BA	6.5		9		11.5		12.5	12.5
BB	2.5		3		4		4	4
BC	5.5		8		10		11	11
CB	20.5		24.5		28.5		34.5	43.5
CC	14～43	14～31	16～47	16～32	17～50	17～32	18～48	21～58
CD	CC-6		CC-8		CC-9		CC-9	CC-9
CE	max. 4		max. 8		max. 10		max. 10	max. 12
CF	p.c.d. 15		p.c.d. 19		p.c.d. 22		p.c.d. 26	p.c.d. 30
CG	max. 2.5		max. 2.5		max. 3		max. 5	max. 6
DA	AS568-011 (90)		AS568-013 (90)		AS568-014 (90)		AS568-015 (90)	AS568-016 (90)
DB	AS568-017 (90)		AS568-020 (90)		AS568-022 (90)		AS568-026 (90)	AS568-030 (90)
EY	SR20		SR30		SR30		SR50	SR50
Tightening Torque for Main Body※3	16 N·m		31.5 N·m		50 N·m		63 N·m	80 N·m

Note : ※3. The torque for mounting the body should be as indicated in the table above.
Excessive torque will cause deformation of the body leading to operation failure.
Also, with insufficient torque, O-ring will be damaged resulting in oil leakage.

Contact Bolt Design Dimensions

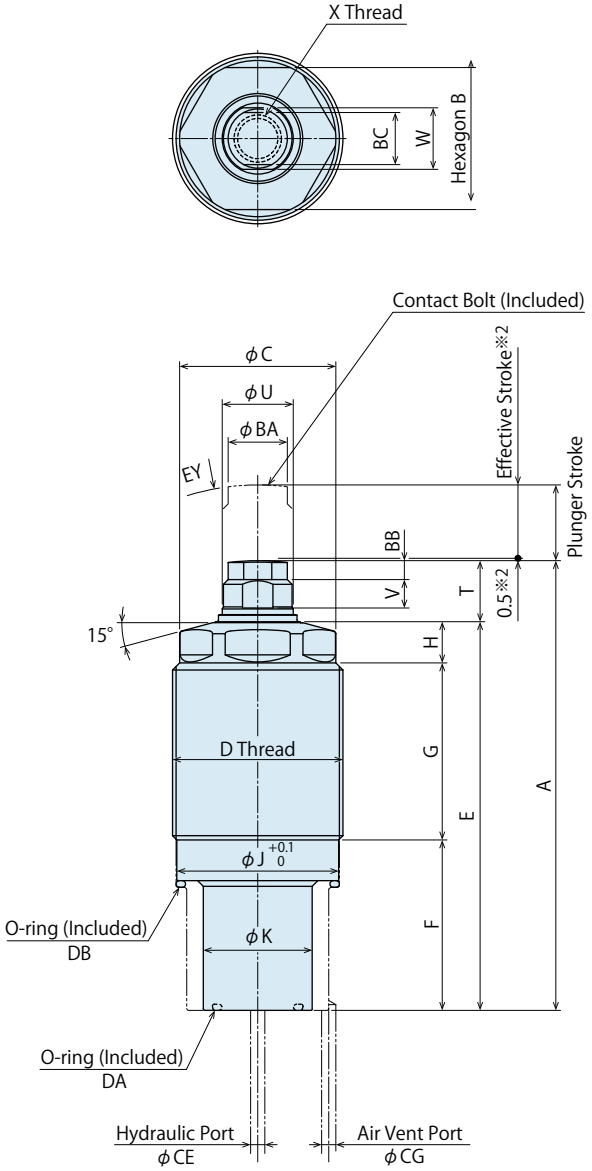
※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

(mm)

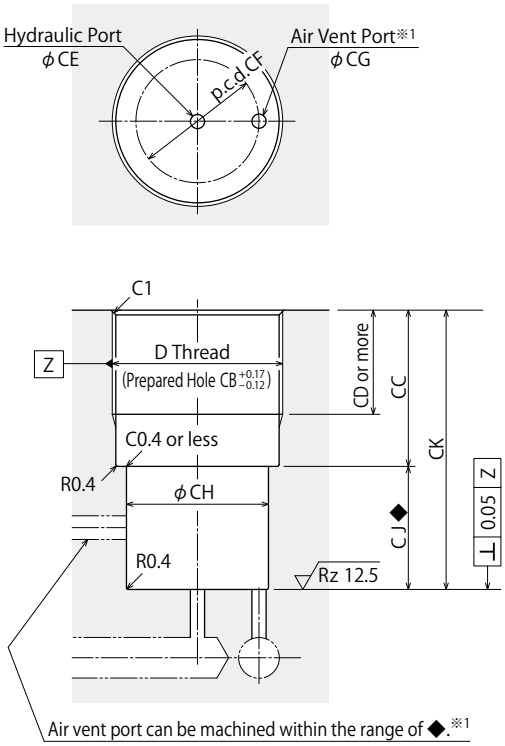
Corresponding Model No.	LD0223-□	LD0223-□-S (Short Model)	LD0263-□	LD0263-□-S (Short Model)	LD0303-□	LD0303-□-S (Short Model)	LD0363-□	LD0453-□
EB	3		4.5		6		8.2	8.2
EC	6		8.5		10		12.5	12.5
ED	2		3.5		5		6	6
EE	6		8		10		10	10
EF	4.5		6		7		7	7
EG	1		1.5		2		2	2
EX (Nominal × Pitch)	M4×0.7		M6×1		M8×1.25		M10×1.5	M10×1.5
O-ring	S53 (Made by NOK)		S5 (Made by NOK)		S6 (Made by NOK)		S8 (Made by NOK)	S8 (Made by NOK)
Tightening Torque for Contact Bolt	1.6N·m		5N·m		10N·m		16N·m	16N·m
Reference：Material	S45C							
Reference：Quenching Hardness	HRC45~50				HRC50~55			
Reference：Surface Finishing	Alkaline Blackening							

External Dimensions

※This drawing shows the released state of LD-Q (before the plunger is lifted).



Machining Dimensions of Mounting Area

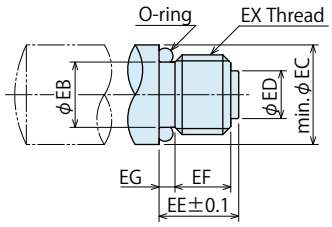


Note :

※1. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
(Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※2. When the work support touches a workpiece within 0.5 mm 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.

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LD0263-Q, LD0453-Q)

LD 026 3 – Q

1 Body Size

2 Design No.

3 Plunger Spring Force (Blank)

4 Plunger Action Confirmation (Blank)

5 Option (Q)

Q ：Hydraulic Advance Long Stroke Model

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0223-Q	LD0263-Q	LD0303-Q	LD0363-Q	LD0453-Q
Plunger Stroke	13	13	16	16	20
Effective Stroke	12.5	12.5	15.5	15.5	19.5
A	83.5	83	92.5	95	112
B	18	22	24	30	36
C	20	24	27	33	40
D (Nominal × Pitch)	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5
E	75.3	72.8	79.6	82.1	99.1
F	26.5	26	29.5	36	40
G	43.1	39.6	41.4	37.4	47.4
H	5.7	7.2	8.7	8.7	11.7
J	20.2	24.2	28.2	34.2	43.2
K	14.5	18.5	21	23	25
T	8.2	10.2	12.9	12.9	12.9
U	7	10	12	15	16
V	3.5	5	6	6	6
W	5.5	8	10	13	13
X (Nominal×Pitch×Depth)	M4×0.7×7	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	6.5	9	11.5	12.5	12.5
BB	2.5	3	4	4	4
BC	5.5	8	10	11	11
CB	20.5	24.5	28.5	34.5	43.5
CC	14～47.5	16～47	17～50	18～48	21～58
CD	CC-6	CC-8	CC-9	CC-9	CC-9
CE	max. 4	max. 8	max. 10	max. 10	max. 12
CF	p.c.d. 16	p.c.d. 20	p.c.d. 24	p.c.d. 26	p.c.d. 30
CG	max. 2	max. 2	max. 3	max. 3	max. 6
CH	16	20	24	30	39
CK	CC+19.5	CC+17	CC+19.5	CC+26	CC+30
CJ	19.5	17	19.5	26	30
DA	AS568-012(90)	AS568-014(90)	AS568-015(90)	AS568-016(90)	AS568-017(90)
DB	AS568-017(90)	AS568-020(90)	AS568-022(90)	AS568-026(90)	AS568-030(90)
EY	SR20	SR30	SR30	SR50	SR50
Tightening Torque for Main Body※3	16 N·m	31.5 N·m	50 N·m	63 N·m	80 N·m

Note : ※3. The torque for mounting the body should be as indicated in the table above.
Excessive torque will cause deformation of the body leading to operation failure.
Also, with insufficient torque, O-ring will be damaged resulting in oil leakage.

Contact Bolt Design Dimensions

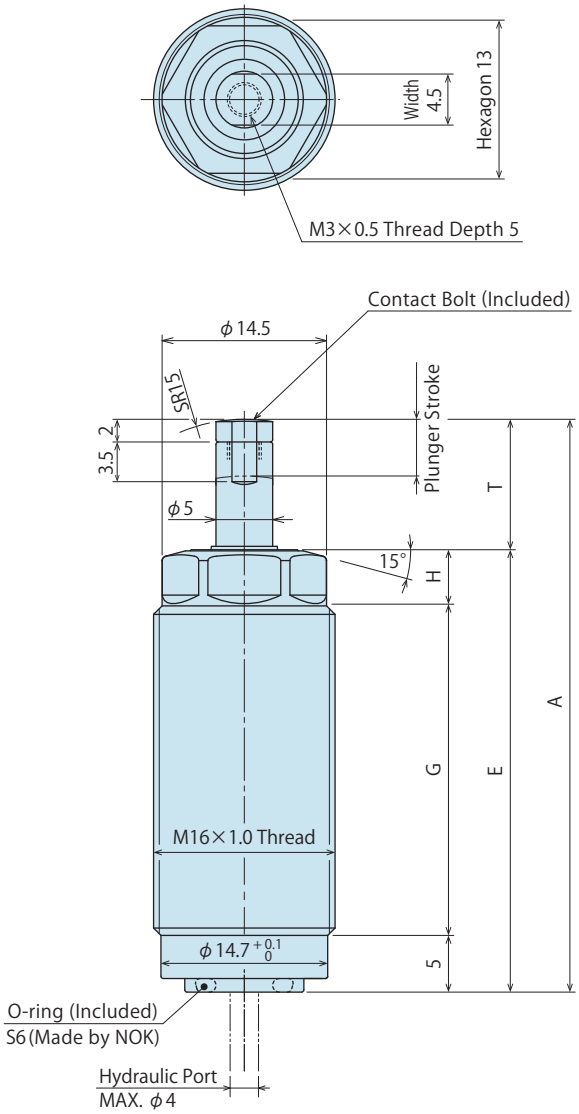
※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

(mm)

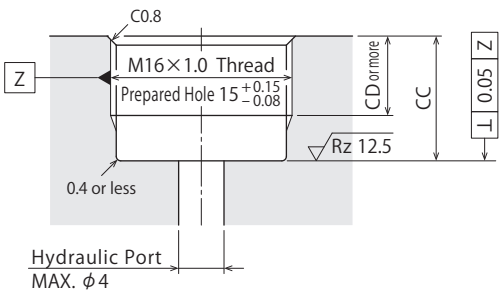
Corresponding Model No.	LD0223-Q	LD0263-Q	LD0303-Q	LD0363-Q	LD0453-Q
EB	3	4.5	6	8.2	8.2
EC	6	8.5	10	12.5	12.5
ED	2	3.5	5	6	6
EE	6	8	10	10	10
EF	4.5	6	7	7	7
EG	1	1.5	2	2	2
EX (Nominal × Pitch)	M4×0.7	M6×1	M8×1.25	M10×1.5	M10×1.5
O-ring	S53 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)
Tightening Torque for Contact Bolt	1.6N·m	5N·m	10N·m	16N·m	16N·m
Reference：Material	S45C				
Reference：Quenching Hardness	HRC45~50		HRC50~55		
Reference：Surface Finishing	Alkaline Blackening				

External Dimensions

※ This drawing shows the released state of LD0163-□-E□ (before the plunger is lifted).



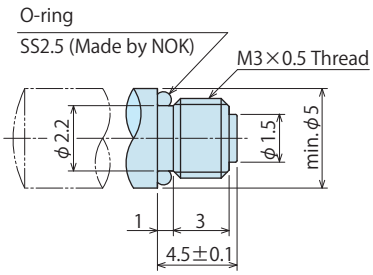
Machining Dimensions of Mounting Area



A vent port is not required for LD0163.

Contact Bolt Design Dimensions

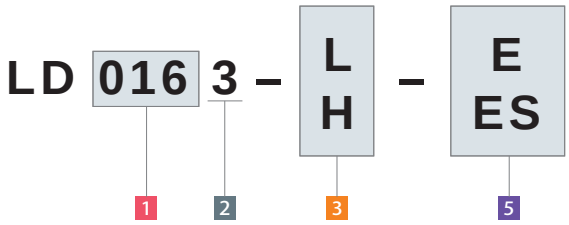
※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.



Tightening Torque for Contact Bolt	0.6 N·m
Reference : Material	Pre-Hardened Steel
Reference : Quenching Hardness	HRC29～33

Model No. Indication

(Format Example：LD0163-H-E, LD0163-L-ES)



1 Body Size
2 Design No.
3 Plunger Spring Force
4 Plunger Action Confirmation (Blank)
5 Option (E / ES)
E ：Spring Advance Model
E S ：Spring Advance Short Model

Refer to P.736L and P.736R for external dimensions of LD0223-□-E/ES and larger.

External Dimensions and Machining Dimensions for Mounting

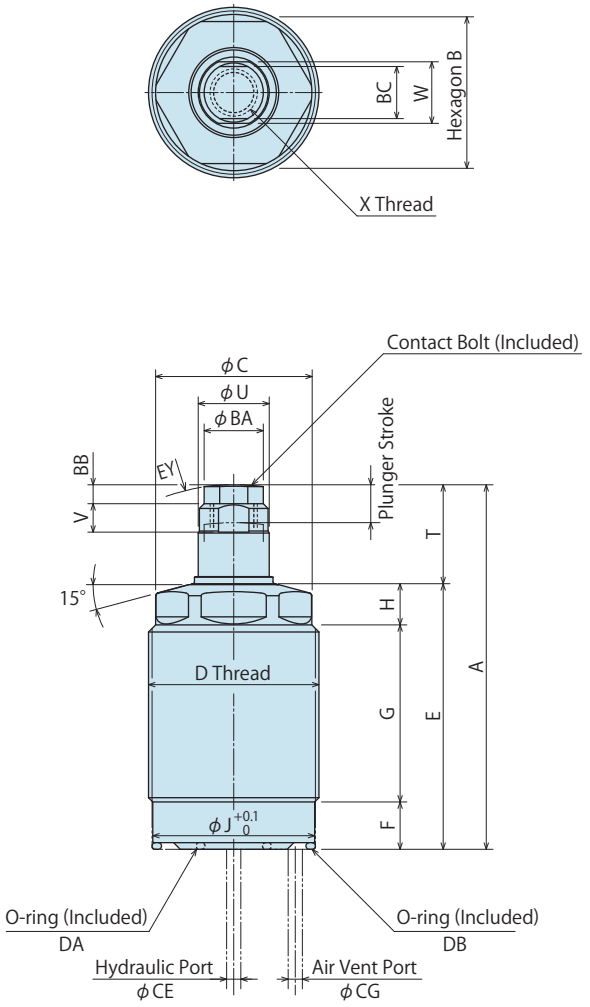
(mm)

Model No.	LD0163-□-E	LD0163-□-ES (Short Model)
Plunger Stroke	5	4
A	50.5	39
E	39	28.5
G	29.1	17.6
H	4.9	5.9
T	11.5	10.5
CC	10～34	10～23
CD	CC－4	
Tightening Torque for Main Body※1	8 N·m	

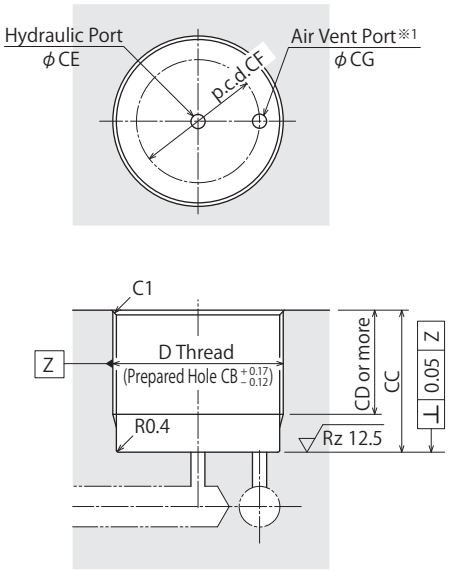
Note : ※1. The torque for mounting the body should be as indicated in the table above.
Excessive torque will cause deformation of the body leading to operation failure.
Also, with insufficient torque, O-ring will be loosened and damaged resulting in oil leakage.

External Dimensions

※This drawing shows the released state of LD-□-E□ (plunger rises).



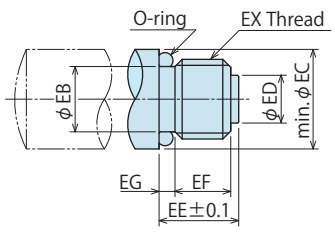
Machining Dimensions of Mounting Area



Note :

※1. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
(Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

Contact Bolt Design Dimensions



Model No. Indication

LD 026 3 – L / H – E / ES

LD 026 3 – EQ

(Format Example：LD0453-H-E, LD0263-L-ES, LD0223-EQ)

1 Body Size
2 Design No.
3 Plunger Spring Force
4 Plunger Action Confirmation (Blank)
5 Option (E / ES/ EQ)
E ：Spring Advance Model
ES ：Spring Advance Short Model
EQ ：Spring Advance Long Stroke Model

Refer to P.735L and P.735R for external dimensions of LD0163-□-E/ES.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0223 -□-E	LD0223 -□-ES	LD0223 -EQ	LD0263 -□-E	LD0263 -□-ES	LD0263 -EQ	LD0303 -□-E	LD0303 -□-ES	LD0303 -EQ	LD0363 -□-E	LD0363 -EQ	LD0453 -□-E	LD0453 -EQ
Plunger Stroke	6.5	5	13	6.5	5	13	8	6	16	8	16	10	20
A	66	50	77	72.5	53.5	79	81	58	89	77	85	92	102
B	18			22			24			30		36	
C	20			24			27			33		40	
D (Nominal × Pitch)	M22×1.5			M26×1.5			M30×1.5			M36×1.5		M45×1.5	
E	51.3	36.8	55.8	55.8	38.3	55.8	60.1	39.1	60.1	56.1		69.1	
F	7			9			10			10		10	
G	38.6	24.1	43.1	39.6	23.1	39.6	41.4	21.9	41.4	37.4		47.4	
H	5.7			7.2	6.2	7.2	8.7	7.2	8.7	8.7		11.7	
J	20.2			24.2			28.2			34.2		43.2	
T	14.7	13.2	21.2	16.7	15.2	23.2	20.9	18.9	28.9	20.9	28.9	22.9	32.9
U	7			10			12			15		16	
V	3.5			5			6			6		6	
W	5.5			8			10			13		13	
X (Nominal×Pitch×Depth)	M4×0.7×7			M6×1×9			M8×1.25×12			M10×1.5×11		M10×1.5×11	
BA	6.5			9			11.5			12.5		12.5	
BB	2.5			3			4			4		4	
BC	5.5			8			10			11		11	
CB	20.5			24.5			28.5			34.5		43.5	
CC	14～43	14～31	14～31	16～47	16～32	16～47	17～50	17～32	17～50	18～48		21～58	
CD	CC-6			CC-8			CC-9			CC-9		CC-9	
CE	max. 4			max. 8			max. 10			max. 10		max. 12	
CF	p.c.d. 15			p.c.d. 19			p.c.d. 22			p.c.d. 26		p.c.d. 30	
CG	max. 2.5			max. 2.5			max. 3			max. 5		max. 6	
DA	AS568-011 (90)			AS568-013 (90)			AS568-014 (90)			AS568-015 (90)		AS568-016 (90)	
DB	AS568-017 (90)			AS568-020 (90)			AS568-022 (90)			AS568-026 (90)		AS568-030 (90)	
EY	SR20			SR30			SR30			SR50		SR50	
Tightening Torque for Main Body※2	16 N·m			31.5 N·m			50 N·m			63 N·m		80 N·m	

Note : ※2. The torque for mounting the body should be as indicated in the table above.
Excessive torque will cause deformation of the body leading to operation failure.
Also, with insufficient torque, O-ring will be damaged resulting in oil leakage.

Contact Bolt Design Dimensions

※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

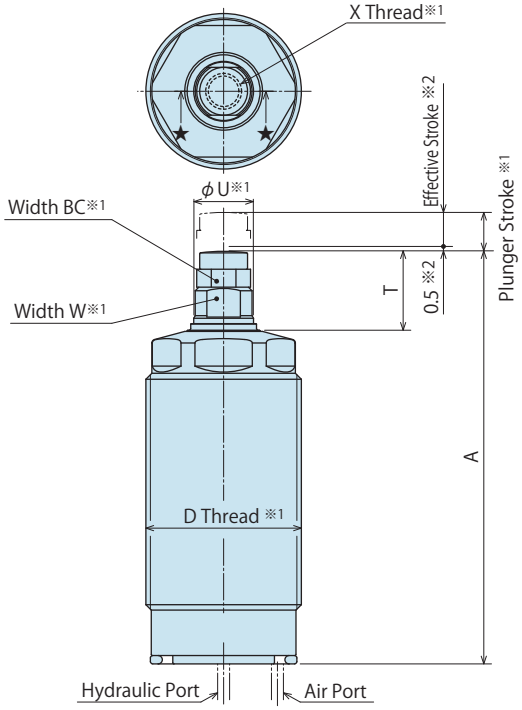
(mm)

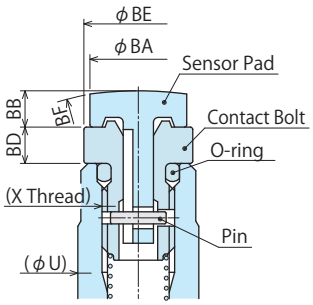
Corresponding Model No.	LD0223 -□-E	LD0223 -□-ES	LD0223 -EQ	LD0263 -□-E	LD0263 -□-ES	LD0263 -EQ	LD0303 -□-E	LD0303 -□-ES	LD0303 -EQ	LD0363 -□-E	LD0363 -EQ	LD0453 -□-E	LD0453 -EQ
EB	3			4.5			6			8.2		8.2	
EC	6			8.5			10			12.5		12.5	
ED	2			3.5			5			6		6	
EE	6			8			10			10		10	
EF	4.5			6			7			7		7	
EG	1			1.5			2			2		2	
EX (Nominal × Pitch)	M4×0.7			M6×1			M8×1.25			M10×1.5		M10×1.5	
O-ring	SS3 (Made by NOK)			S5 (Made by NOK)			S6 (Made by NOK)			S8 (Made by NOK)		S8 (Made by NOK)	
Tightening Torque for Contact Bolt	1.6N·m			5N·m			10N·m			16N·m		16N·m	
Reference：Material	S45C												
Reference：Quenching Hardness	HRC45~50						HRC50~55						
Reference：Surface Finishing	Alkaline Blackening												

External Dimensions

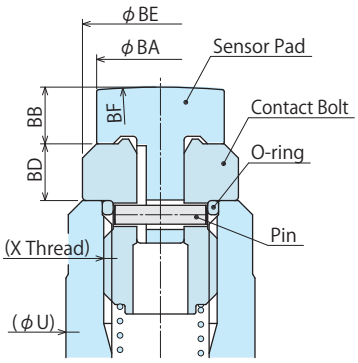
LD-□M : Hydraulic Advance Model

※ This drawing shows the released state of LD-□M (before the plunger is lifted). Refer to Hydraulic Advance Model (Standard) (P.732L, P.732R) for unlisted dimensions.





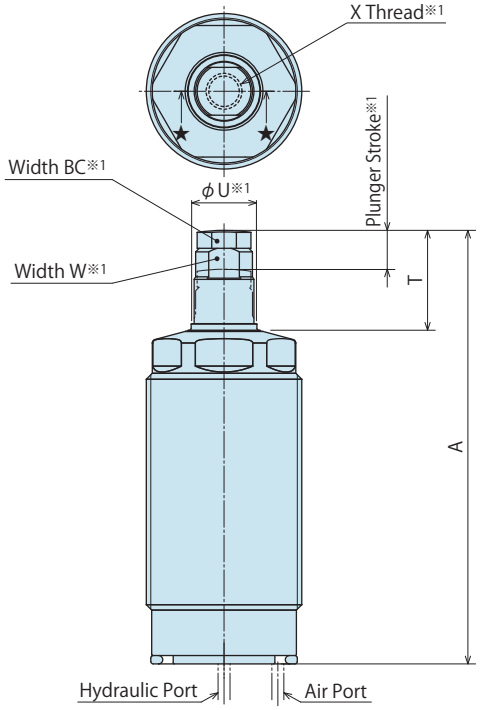
A Section of ★-★
(In the case of LD0263)



A Section of ★-★
(In the case of LD0303/0363/0453)

LD-□M-E : Spring Advance Model

※ This drawing shows the released state of LD-□M-E (plunger rises). Refer to Spring Advance Model (P.736L, P.736R) for unlisted dimensions.



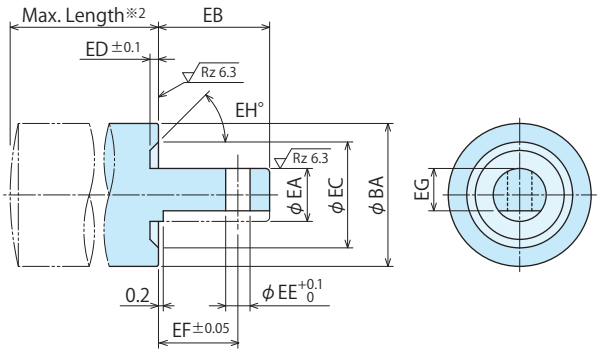
Notes :

※ 1. Dimensions with ※1 are the same as LD Standard Model and LD-E Model.

※ 2. When the work support touches a workpiece within 0.5mm stroke from the plunger retract-end, a force larger than the value calculated by Workpiece Contact Force Formula on P.739 will be applied to the workpiece.
Please use the work support within the effective stroke range.

1. Even if the contact bolt for LD standard model/LD-E model is exchanged with air sensing option, it does not work as air sensing option. Internal parts must be changed with air sensor corresponding product.
2. Please contact us for the dimensions of Long Stroke Model and Short Model.
3. Please refer to P.739 and P.740 for Air Sensing Chart.

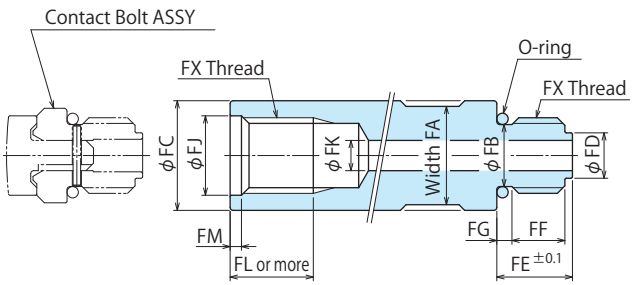
Sensor Pad Design Dimension



※ When changing the sensor pad, please design it according to the sensor pad design dimensions.

※ When replacing the sensor pad, please be careful not to lose the connecting pin.

Contact Bolt Adapter Design Dimension



※When making a contact bolt adapter, please design it referring to the design dimensions shown above.

Model No. Indication

LD 026 3 – L H M Blank – E

1 2 3 4 5

※ Contact us for LD-M-Q, LD-M-EQ, LD-☐M-S or LD-☐M-ES.

(Format Example：LD0453-HM-E, LD0263-LM)

1 Body Size

2 Design No.

3 Plunger Spring Force

4 Plunger Action Confirmation
M ：Air Sensing Option

5 Option (Blank / E)
Blank：Hydraulic Advance Model
E ：Spring Advance Model

External Dimension List

Model No.	LD0263-☐M LD0263-☐M-E	LD0303-☐M LD0303-☐M-E	LD0363-☐M LD0363-☐M-E	LD0453-☐M LD0453-☐M-E
Plunger Stroke※1	6.5	8	8	10
Effective Stroke 5 Option Blank	6.0	7.5	7.5	9.5
A 5 Option Blank	69	77	73	86
A 5 Option E	75.5	85	81	96
D (Nominal×Pitch)※1	M26×1.5	M30×1.5	M36×1.5	M45×1.5
T 5 Option Blank	13.2	16.9	16.9	16.9
T 5 Option E	19.7	24.9	24.9	26.9
U※1	10	12	15	16
W※1	8	10	13	13
X (Nominal×Pitch×Depth)※1	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	8	9.5	10.5	10.5
BB	3	4	4	4
BC※1	8	10	11	11
BD	3	4	4	4
BE	9	11.5	12.5	12.5
BF	SR30	SR30	SR50	SR50
Pin (Diameter×Length)	ϕ1×4	ϕ1×5.8	ϕ1×7.8	ϕ1×7.8
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)

Note： ※ 1. Dimensions with ※1 are the same as LD Standard Model and LD-E Model.

Sensor Pad Design Dimension List

(mm)

Corresponding Model No.	LD0263-☐M LD0263-☐M-E	LD0303-☐M LD0303-☐M-E	LD0363-☐M LD0363-☐M-E	LD0453-☐M LD0453-☐M-E
EA	$2.5g7\ ^{-0.002}_{-0.012}$	$3g7\ ^{-0.002}_{-0.012}$	$4g7\ ^{-0.004}_{-0.016}$	$4g7\ ^{-0.004}_{-0.016}$
EB	9.5	7.5	7.5	7.5
EC	6	7.5	8.5	8.5
ED	0.8	0.8	0.8	0.8
EE	1.4	1.2	1.2	1.2
EF	7.5	5.3	5.3	5.3
EG	1.7	2.1	3.2	3.2
EH	20°	45°	45°	45°
Max. Length※3	max. 6	max. 8	max. 8	max. 8

Note： ※ 3. Sensor response may decrease if the pad is longer than maximum length.

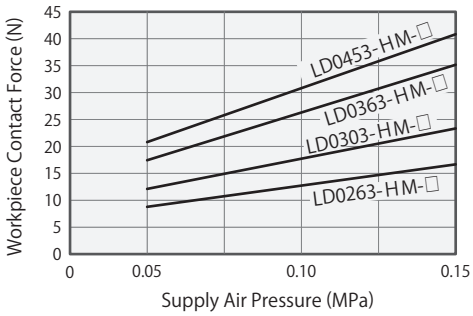
Contact Bolt Adapter Design Dimension List

(mm)

Corresponding Model No.	LD0263-☐M-☐	LD0303-☐M-☐	LD0363-☐M-☐ LD0453-☐M-☐
FA	8	10	13
FB	4.5	6	8.2
FC	9	11.5	14.5
FD	3.5	5	6
FE	8	10	10
FF	6	7	7
FG	1.5	2	2
FJ	6.8	8.3	10.5
FK	2	3	4
FL	9	12	11
FM	1.5	1.5	1.5
FX (Nominal × Pitch)	M6×1	M8×1.25	M10×1.5
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)
Contact Bolt ASSY	XLD-M6SP	XLD-M8SP	XLC-M10SP
Reference：Material	SCM435 Quenched and Tempered Material		
Reference：Surface Finishing	Nitriding		

Workpiece Contact Force Curve (Reference)

This graph shows the workpiece contact force (reference value) when a work support with Plunger Spring Force **H**：High Spring Force contacts a workpiece in the middle of plunger stroke.
※ Refer to P.739 for the calculation formula of workpiece contact force.



Air Sensing Option (Plunger Action Confirmation･･･M：Air Sensing Option)

Plunger action is detected by the circuit at the vent port like the drawing below. This is done by detecting the differential pressure between P1 and P2 with air sensor.

Applicable Model

LD 026 3 - [L / H / Blank] [M] - [Blank / E / Q / EQ]

4 Plunger Action Confirmation：M

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

Structure Drawing

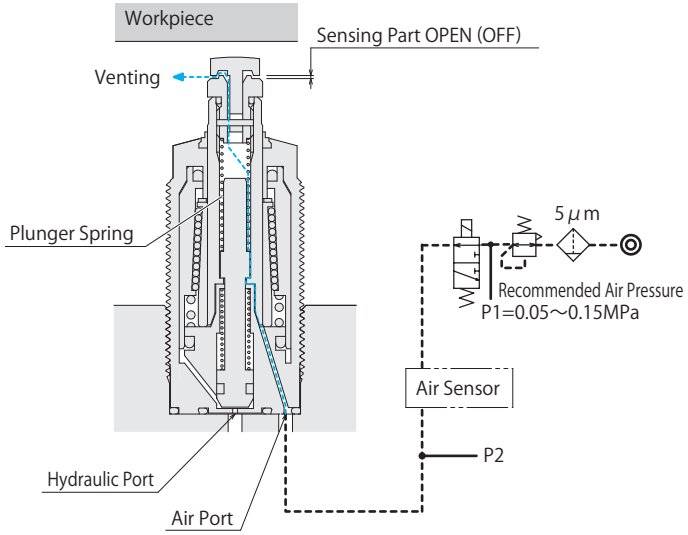
Recommended Air Pressure：0.05 ~ 0.15MPa

Recommended Air Sensor

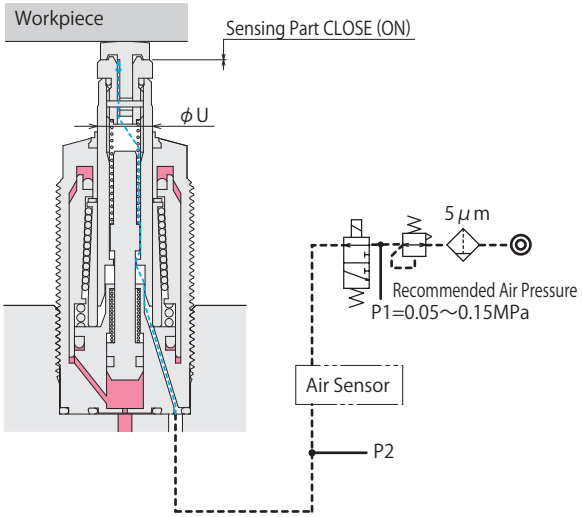
Manufacturer	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-G	GPS3-E

● The Number of Work Supports Connected per Air Sensor：1 ~ 4

LD Released State (Air Sensor OFF)



LD Plunger Extends・Contacts Workpiece (Air Sensor ON)



Workpiece Contact Force Formula when using Air Sensor ※1

Workpiece Contact Force (N) = Plunger Spring Force (N) + Supply Air Pressure (MPa) × U^2 (mm) × π ／4

Model No.		LD0263-□M-□	LD0303-□M-□	LD0363-□M-□	LD0453-□M-□
U mm		10	12	15	16
Plunger Spring Force※2 N	**L** : Low Spring Force	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H : High Spring Force	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6
	Q : Long Stroke Model	3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4
	E Q : Spring Advance Long Stroke Model				

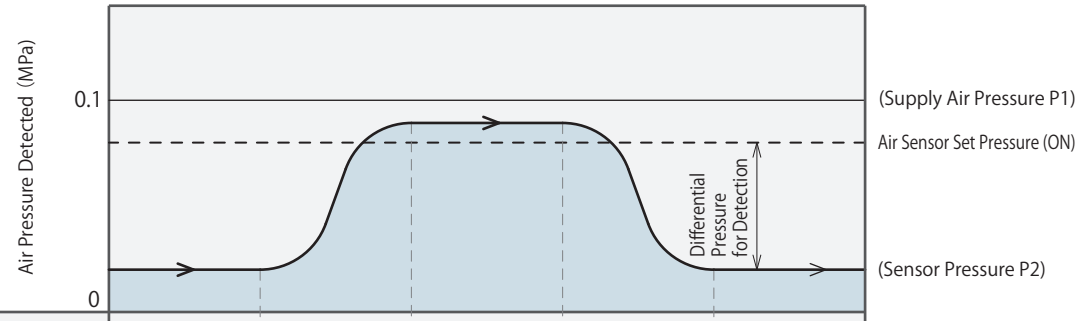
Notes :

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

※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.

Air Sensing Chart

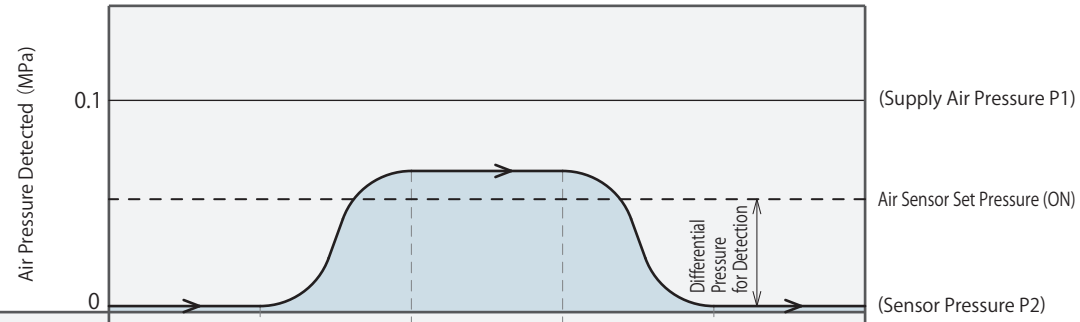
Connect one work support with one air sensor
Supply Pressure of Air Sensor P1=0.1MPa



Air Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Ascending Completed Locking State	Locking Completed	Releasing State Descending State	Releasing Completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Loading Workpiece	Locking Completed	Unloading Workpiece	Releasing Completed

Note : 1. Depending on the usage condition, the detection differential pressure may be decreased by repeated action. Please contact us for overhaul when the detection differential pressure is decreased.

Connect four work supports with one air sensor
Supply Pressure of Air Sensor P1=0.1MPa



Air Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Ascending Completed Locking State	Locking Completed	Releasing State Descending State	Releasing Completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Loading Workpiece	Locking Completed	Unloading Workpiece	Releasing Completed

Notes : 1. Depending on the usage condition, the detection differential pressure may be decreased by repeated action. 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.

Notes

1. This specification is designed for confirming the plunger action of the work support. If it is used for confirming the close contact with the workpiece, other clamping (force) is necessary.
2. If the plunger goes up 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 force. 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 clearance 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. Even if the contact bolt for LD standard model/LD-E model is exchanged with air sensing option, it does not work as air sensing option. Internal parts must be changed with air sensor corresponding product.
5. In certain circumstances it has been known for the plunger to move slower through continued use because of the airflow change in the circuit, turn the operating air supply off fully to reset the work support.

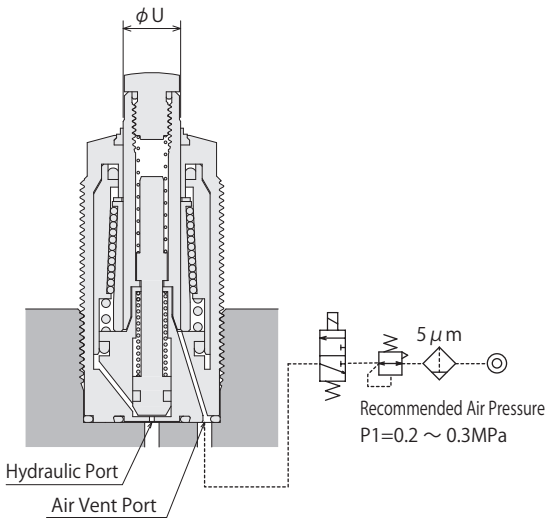
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Air Purge Function

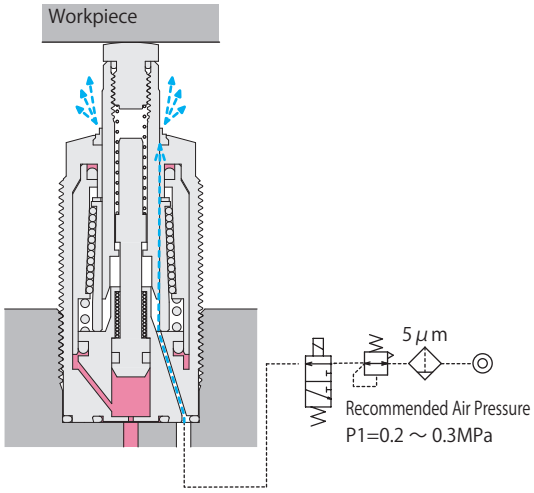
The special dust seal that features low friction and high sealing capabilities is used in LD. However, when using LD in worse condition, air purge function is available by providing the circuit to the air vent port like the drawing below. (Excluding LD0163)

Structure Drawing

LD Plunger Descending and at Releasing State (Air Supply OFF) ※1



LD Plunger Ascending and at Locking State (Air Supply ON) ※1



Workpiece Contact Force Formula when Using Air Purge Function ※2

Workpiece Contact Force (N) = Plunger Spring Force (N) + Supply Air Pressure (MPa) × U^2 (mm) × π ／ 4

Model No.		LD0223-□ LD0223-□-E LD0223-Q LD0223-EQ	LD0263-□ LD0263-□-E LD0263-Q LD0263-EQ	LD0303-□ LD0303-□-E LD0303-Q LD0303-EQ	LD0363-□ LD0363-□-E LD0363-Q LD0363-EQ	LD0453-□ LD0453-□-E LD0453-Q LD0453-EQ
U mm		7	10	12	15	16
Plunger Spring Force※3 N	**L** :Low Spring Force	2.1～3.1	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H :High Spring Force	3.0～4.4	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6
	Q :Long Stroke Model **EQ** :Spring Advance Long Stroke Model	3.0～5.6	3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4

Model No.		LD0223-□-S LD0223-□-ES	LD0263-□-S LD0263-□-ES	LD0303-□-S LD0303-□-ES
U mm		7	10	12
Plunger Spring Force※3 N	**L** :Low Spring Force	1.8～3.1	2.8～4.2	3.5～6.3
	H :High Spring Force	2.1～4.3	3.1～5.9	4.0～8.2

Notes :

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

※3. 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.

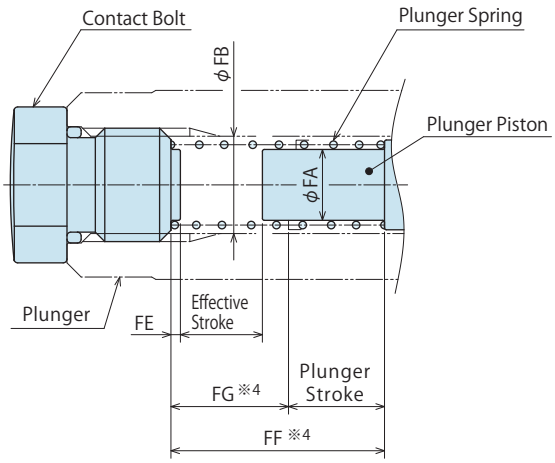
Notes

※1. When the plunger is descending, shut off the air supply. The plunger does not go back when air is supplied.

1. 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 clearance with the workpiece for operation.
2. Air cannot be vented as the air supply pressure is too low because the cracking pressure at the dust seal lip is about 0.1MPa.

Plunger Spring Design Dimension

※Reference for designing a plunger spring by customer other than the included plunger spring.
※This drawing shows the released state.
※Option **E** and **EQ** have no effective stroke range.



(mm)

Corresponding Model No.	LD0163-□ LD0163-□-E	LD0223-□ LD0223-□-E	LD0263-□ LD0263-□M LD0263-□-E LD0263-□M-E	LD0303-□ LD0303-□M LD0303-□-E LD0303-□M-E	LD0363-□ LD0363-□M LD0363-□-E LD0363-□M-E	LD0453-□ LD0453-□M LD0453-□-E LD0453-□M-E
FA	1.5	2	3.5	5	6	6
FB	2.6	3.4	5.1	6.8	8.5	8.5
FE	0.5	0.5	0.5	1	1	1
FF※4	14	19.5	15.9	24.6	17.6	19.6
FG※4	9	13	9.4	16.6	9.6	9.6
Plunger Stroke	5	6.5	6.5	8	8	10
Effective Stroke	4.7	6.0	6.0	7.5	7.5	9.5

(mm)

Corresponding Model No.	LD0163-□-S LD0163-□-ES	LD0223-□-S LD0223-□-ES	LD0263-□-S LD0263-□-ES	LD0303-□-S LD0303-□-ES
FA	1.5	2	3.5	5
FB	2.6	3.4	5.1	6.8
FE	0.5	0.5	0.5	1
FF※4	7.5	9.8	10	12.3
FG※4	3.5	4.8	5	6.3
Plunger Stroke	4	5	5	6
Effective Stroke	3.7	4.7	4.7	5.5

(mm)

Corresponding Model No.	LD0223-Q LD0223-EQ	LD0263-Q LD0263-EQ	LD0303-Q LD0303-EQ	LD0363-Q LD0363-EQ	LD0453-Q LD0453-EQ
FA	2	3.5	5	6	6
FB	3.4	5.1	6.8	8.5	8.5
FE	0.5	0.5	1	1	1
FF※4	29.8	22.6	26.6	28.6	36.2
FG※4	16.8	9.6	10.6	12.6	16.2
Plunger Stroke	13	13	16	16	20
Effective Stroke	12.5	12.5	15.5	15.5	19.5

Note :
※4. When designing a spring, make sure that the spring set length is below FF dimension and the spring contact length is below FG dimension.

Hydraulic Work Support

Model LC

Low Pressure (2.5 ~ 7MPa)

Single Action • Flange Model

Powerful Support • Smooth Action



Design number update improved environmental durablity.
New option has been added. Model LC-M-Q

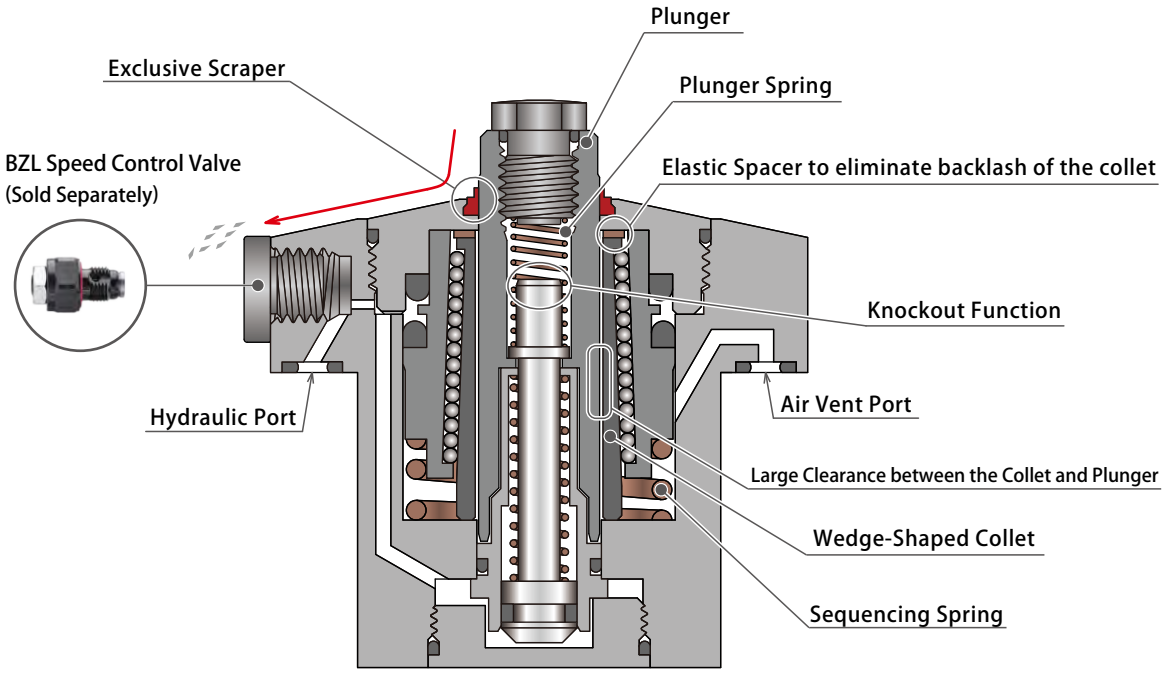
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Performance Curve P.753
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- Spring Advance Long Stroke Model (LC-EQ) P.763
- Spring Advance Model (LC-E) P.765
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- Notes for Hydraulic Work Support P.819
- Cautions (Common) P.1355
  • Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
  • Notes on Handling • Maintenance/Inspection • Warranty

Cross Section



Powerful Support and Smooth Action

KOSMEK was the first to develop the collet design in 1996.
Compared with the traditional sleeve design, it ensures powerful gripping force via a wedge effect.
In addition, a larger gap between collet and plunger is designed to prevent sticking and allow smoother action.
The load applied to the workpiece is soft with only plunger spring force.

Concrete Workpiece Touch

As the collet gripping the plunger is always pressed downwards by “Elastic Spacer” , it helps prevent tilting when locked and the clearance with the workpiece.

Certain Sequence Action

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.

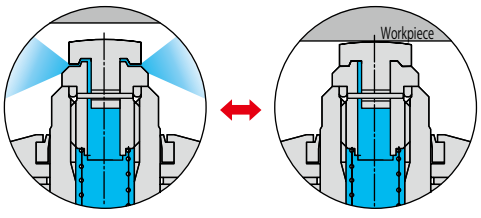
Superior Environmental Durability NEW

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.

Able to Attach Speed Control Valve Directly

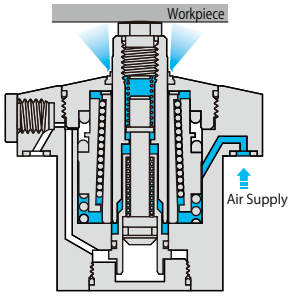
When fitting the gasket (Option -C), it is able to attach the speed control valve with air venting function. (Speed control valve is sold separately.)

Air Sensing Option



Sensor OFF　　Sensor ON

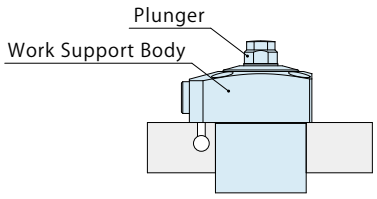
Air Purge Function



High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

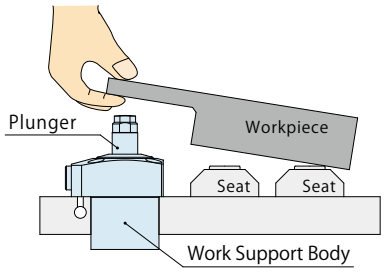
Action Description

● Hydraulic Advance Model (LC/LC-Q)



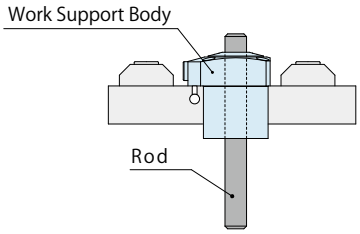
Hydraulic Pressure：OFF
The state of plunger down.

● Spring Advance Model (LC-E/LC-EQ)



Hydraulic Pressure：OFF
The state of plunger up.

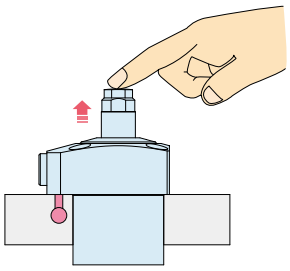
● Rodless Hollow Model (LC-D)



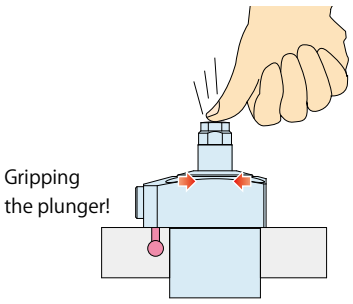
Hydraulic Pressure：OFF
Rod is not gripped.
(The rod is prepared by the customer.)

● Air Sensing Model (LC-M/LC-M-E/LC-M-Q)

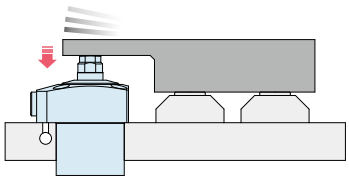
Available to check action by connecting the air sensor at vent port and then detecting differential pressure.
Refer to P.771 for detail.



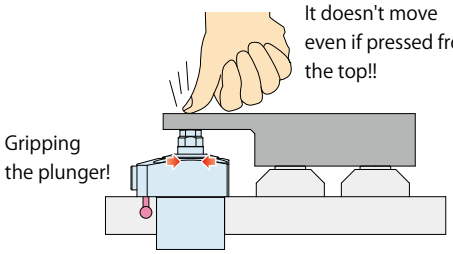
Hydraulic Pressure：ON
Plunger rises with oil pressure
and stops after touching workpiece.



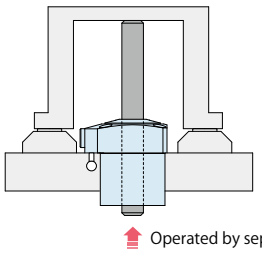
Hydraulic Pressure：ON
Once it is in the stopped position where it touches the workpiece,
the plunger doesn't go down even if pressed from above.



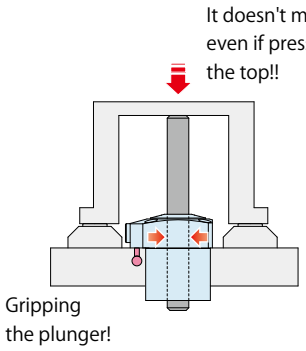
Hydraulic Pressure：OFF
When workpiece rests on the work support, plunger goes
down due to the weight of workpiece and is balanced.



Hydraulic Pressure：ON
Once it is in the stopped position where it touches the workpiece,
the plunger doesn't go down even if pressed from above.



Hydraulic Pressure：OFF
The rod is pushed up by the cylinder which is
prepared separately to make contact with workpiece.



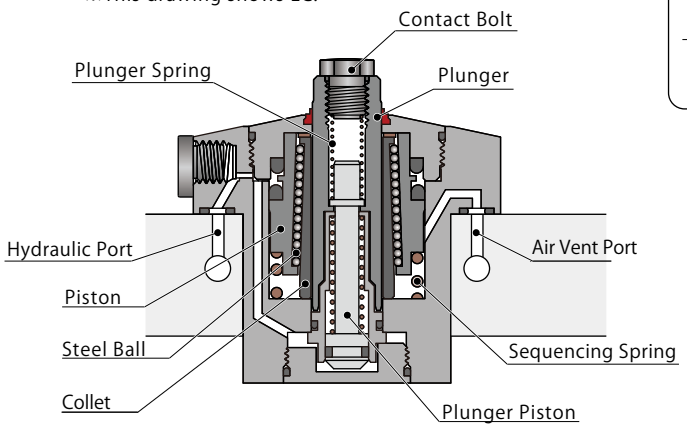
Hydraulic Pressure：ON
After the rod is gripped by hydraulic pressure,
the rod will not go down if pressing from the top.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Internal Action Description

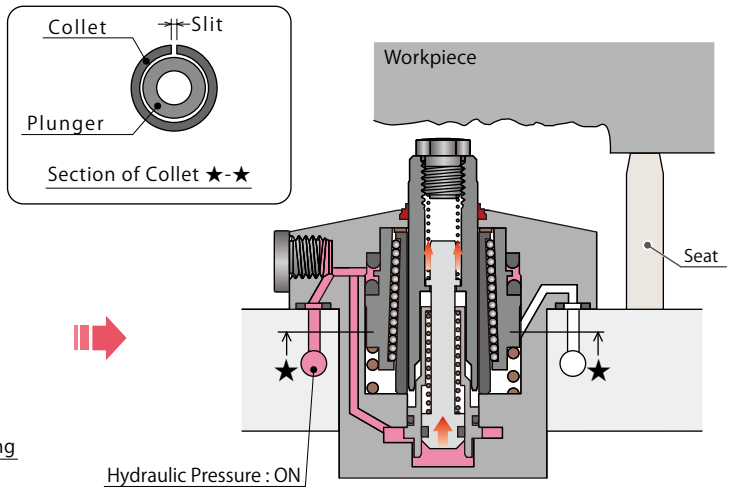
● Hydraulic Advance Model (LC)

※This drawing shows LC.



When releasing (Cross Section)

Plunger lowered

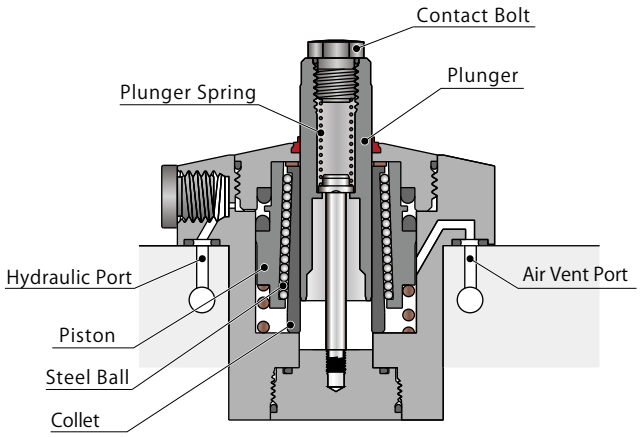


Plunger extends

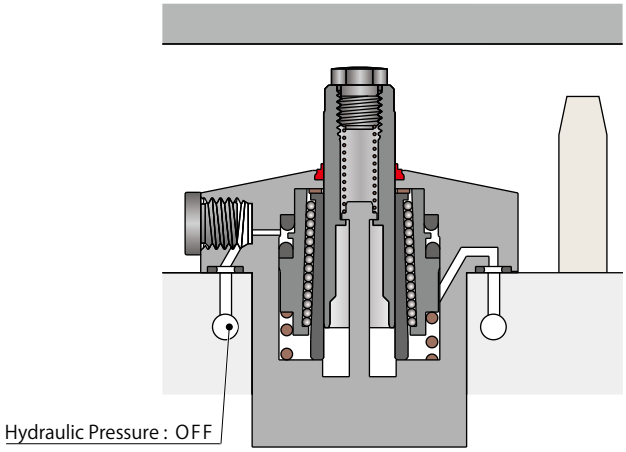
The plunger piston rises first when hydraulic pressure is supplied. With this action, the plunger is lifted up via the plunger spring.

● Spring Advance Model (LC-E)

※This drawing shows LC-E.



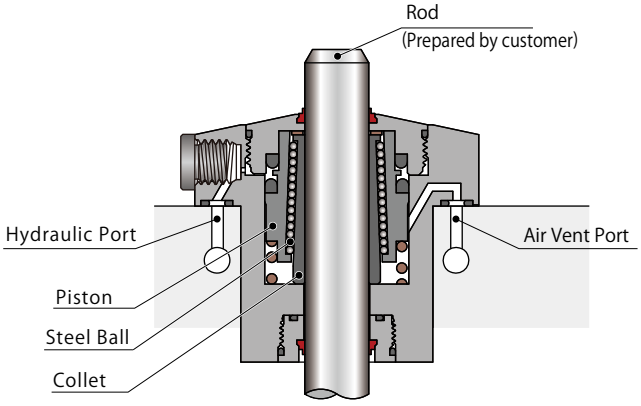
When releasing (Cross Section)



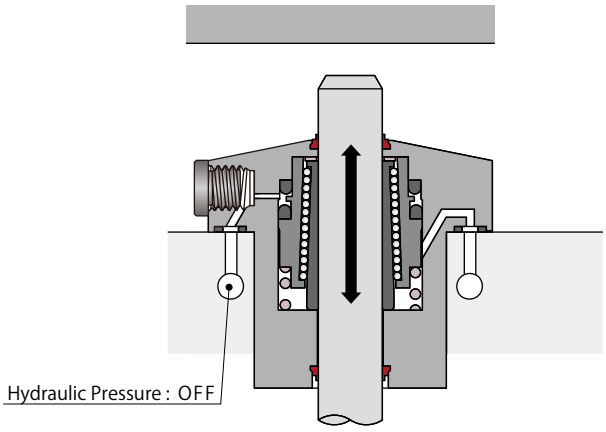
Released State (Plunger extends)

● Rodless Hollow Model (LC-D)

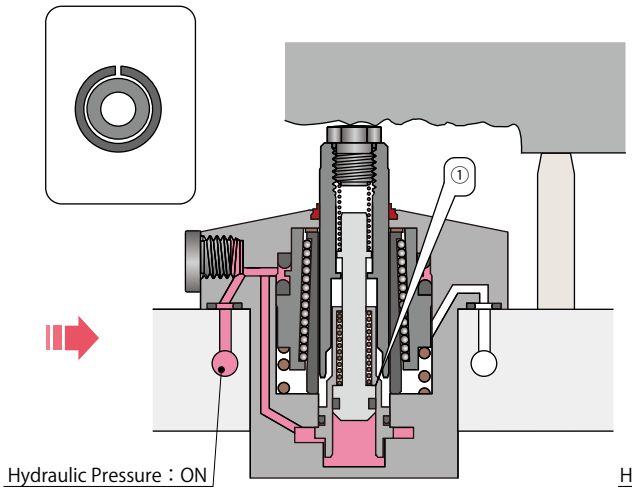
※This drawing shows LC-D.



When releasing (Cross Section)

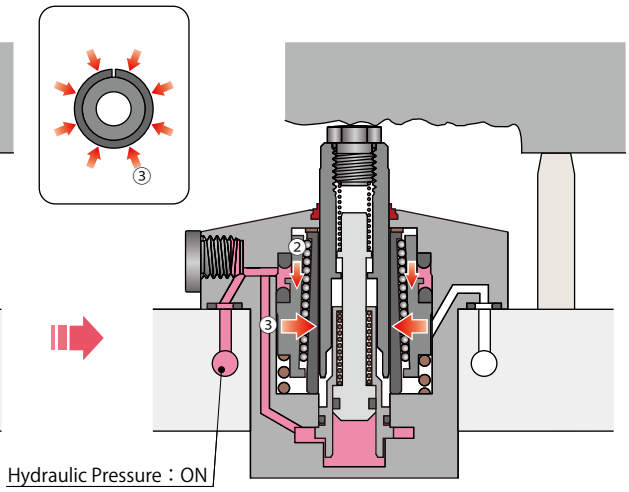


Released State (Rod released)



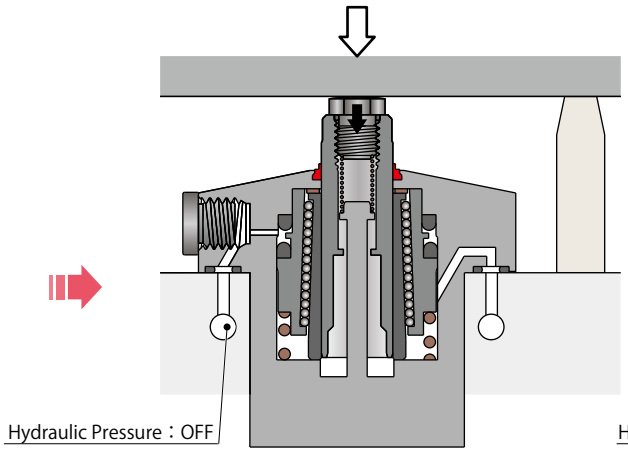
Plunger softly contact a workpiece

After the plunger contacts any part of a workpiece such as its casting surface, hydraulic pressure thrust of the plunger piston stops at the action end shown as ① on above picture.

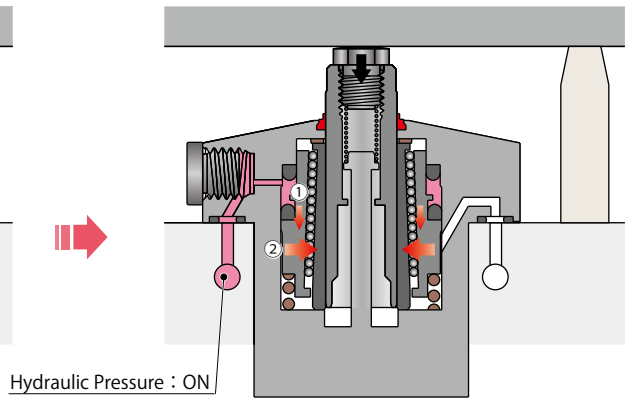


Locked State

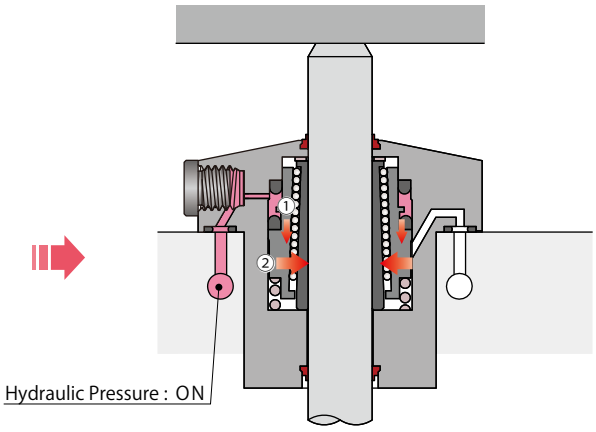
② When the pressure rises more than the sequential spring force, the piston outside of the collet starts to press down.
③ Wedge-shaped collet powerfully grips the plunger via steel balls of tapered surface inside the piston, and locking is completed.



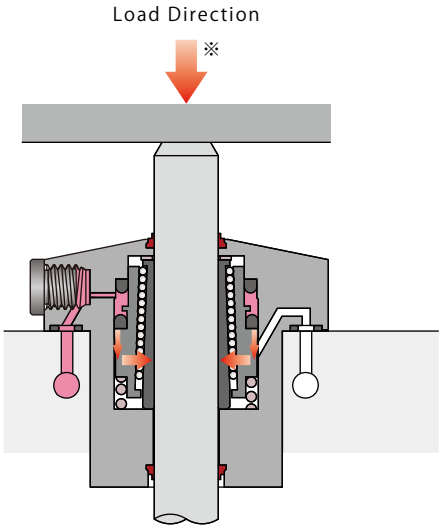
Workpiece set (Plunger goes down)



Locked State



Locked State



With Load

※The load acts towards the arrow shown in the drawing.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

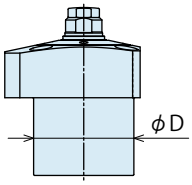
Model No. Indication

LC 055 3 - C L □ - □

1 2 3 4 5 6

1 Body Size

026 : ϕD=26mm
030 : ϕD=30mm
036 : ϕD=36mm
040 : ϕD=40mm
048 : ϕD=48mm
055 : ϕD=55mm
065 : ϕD=65mm
075 : ϕD=75mm
090 : ϕD=90mm



※ Outer diameter (ϕD) of the cylinder.

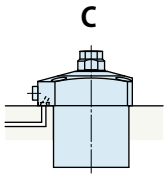
2 Design No.

3 : Revision Number

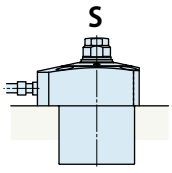
3 Piping Method

C : Gasket Option (With G Thread Plug・Air Bleeding Function)
S : Piping Option (Rc Thread Port)※1

※ Speed control valve (BZL-A) is sold separately.
Please use a meter-in speed control valve for LC.
In case of using Kosmek model, select BZL□-A.
Refer to P.947 for detail.



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



Piping Option
Rc Thread Port
No Gasket Port

4 Plunger Spring Force

L : Low Spring Force
H : High Spring Force
Blank : 6 Q, EQ, D selected

5 Plunger Action Confirmation

Blank : None (Standard)
M : Air Sensing Option ※1 ※2

6 Option

Blank : Hydraulic Advance Model (Standard)
Q : Hydraulic Advance Long Stroke Model ※2
E : Spring Advance Model
EQ : Spring Advance Long Stroke Model ※2
D : Rodless Hollow Model
(The rod is prepared by the customer)

● = Available Option

5 Plunger Action Confirmation Symbol	ϕD=26	ϕD=30	ϕD=36	ϕD=40	ϕD=48	ϕD=55	ϕD=65	ϕD=75	ϕD=90
6 Option Symbol	LC 0263	LC 0303	LC 0363	LC 0403	LC 0483	LC 0553	LC 0653	LC 0753	LC 0903
Blank	●	●	●	●	●	●	●	●	●
Q	●	●	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	●	●
EQ	●	●	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	●	●
M		●	●	●	●	●	●	●	●
M-Q		●	●	●	●	●	●	●	●
M-E		●	●	●	●	●	●	●	●

Notes :
※1. Please contact us for a combination of 3 S : Piping option and 5 M : Air Sensing option.
※2. Please contact us for a combination of 5 M : Air Sensing option and 6 Q , EQ : Long Stroke Model.

Specifications

Option 6 Blank / E

Model No.	LC0263-C□ LC0263-C□-E	LC0303-C□ LC0303-C□-E	LC0363-C□ LC0363-C□-E	LC0403-□□ LC0403-□□M LC0403-□□-E LC0403-□□M-E	LC0483-□□ LC0483-□□M LC0483-□□-E LC0483-□□M-E	LC0553-□□ LC0553-□□M LC0553-□□-E LC0553-□□M-E	LC0653-□□ LC0653-□□M LC0653-□□-E LC0653-□□M-E	LC0753-□□ LC0753-□□M LC0753-□□-E LC0753-□□M-E	LC0903-□□ LC0903-□□M LC0903-□□-E LC0903-□□M-E
Support Force at 7MPa kN	2	3	4	5.5	10	15.5	25	40	65
Support Force (Calculation Formula)※3 kN	0.38×P-0.69	0.53×P-0.68	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	7.02×P-9.12	11.4×P-14.8
Plunger Stroke mm	6.5	6.5	8	8	10	12	14	16	20
Effective Stroke 6 Option Blank	6.0	6.0	7.5	7.5	9.5	11.5	13.5	15.5	19.5
Cylinder Capacity 6 Option Blank	0.4	0.6	0.8	1.2	2	3.3	4.8	8.9	13.1
cm³ 6 Option E	0.2	0.3	0.4	0.6	1.3	2	3.3	5.7	9.1
Plunger※4 L :Low Spring Force	2.2~3.0	2.8~3.8	3.6~5.6	4.7~7.8	5.8~9.7	8.3~14.6	9.8~14.6	12.4~18.8	14.6~21.0
Spring Force N H :High Spring Force	3.0~4.4	3.7~5.5	4.7~7.8	6.2~11.0	7.9~13.6	10.1~21.9	15.8~22.0	18.7~31.9	21.4~34.2
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	0.3	0.4	0.5	0.6	0.9	1.4	2.2	3.6	6.0

Option 6 Q / EQ

Model No.	LC0263-C-Q	LC0303-C-Q	LC0363-C-Q	LC0403-□-Q LC0403-□-EQ	LC0483-□-Q LC0483-□-EQ	LC0553-□-Q LC0553-□-EQ	LC0653-□-Q LC0653-□-EQ	LC0753-□-Q LC0753-□-EQ	LC0903-□-Q LC0903-□-EQ
Support Force at 7MPa kN	2	3	4	5.5	10	15.5	25	40	65
Support Force (Calculation Formula)※3 kN	0.38×P-0.69	0.53×P-0.68	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	7.02×P-9.12	11.4×P-14.8
Plunger Stroke mm	13	13	16	16	20	24	28	32	40
Effective Stroke 6 Option Q	12.5	12.5	15.5	15.5	19.5	23.5	27.5	31.5	39.5
Cylinder Capacity 6 Option Q	0.6	0.8	1.2	1.8	2.8	4.7	6.4	12.1	17.2
cm³ 6 Option EQ	—	—	—	0.6	1.3	2	3.3	5.7	9.1
Plunger Spring Force※4 N	3.0~5.6	3.8~7.4	4.9~11.4	6.2~12.9	7.8~20.4	10.1~24.8	15.8~28.4	18.7~42.3	21.4~44.0
Max. Operating Pressure MPa	7								
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 6 Option Q	0.3	0.4	0.5	0.7	1	1.5	2.4	3.9	6.5
kg 6 Option EQ	—	—	—	0.6	0.9	1.4	2.3	3.7	6.2

Option 6 D

Model No.	LC0263-C-D	LC0303-C-D	LC0363-C-D	LC0403-□-D	LC0483-□-D	LC0553-□-D	LC0653-□-D	LC0753-□-D	LC0903-□-D
Support Force at 7MPa kN	1.3	2	2.8	3.5	6.3	10	16	25	40
Support Force (Calculation Formula)※3 kN	0.25×P-0.45	0.35×P-0.46	0.49×P-0.64	0.58×P-0.58	1.05×P-1.05	1.67×P-1.67	2.67×P-2.67	4.17×P-4.17	6.67×P-6.67
Cylinder Capacity cm³	0.2	0.3	0.4	0.6	1.3	2	3.3	5.7	9.1
Max. Operating Pressure MPa	7								
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	0.2	0.3	0.4	0.5	0.8	1.2	2	3.2	5.4

Notes : ※3. P in the formula for support force indicates the hydraulic pressure (MPa).

※4. 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.

Regarding to workpiece contact force for 5 M : Air Sensing option, please refer to the P.771.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Performance Curve (LC-□□ : Hydraulic Advance Model / LC-□□-E : Spring Advance Model)

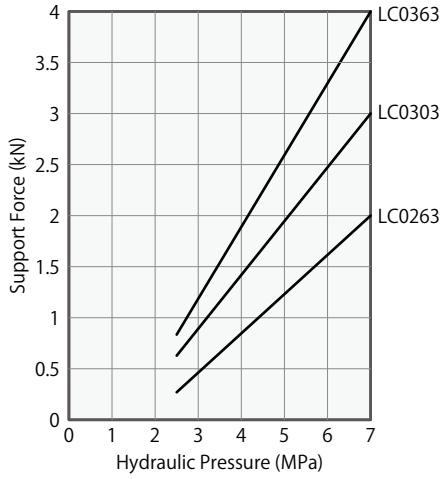
Applicable Model

LC 040 3 - C S L H - Blank E

6 Option : Blank, E

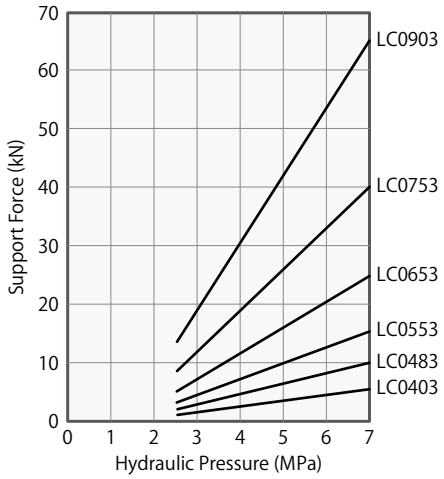
1 Body Size

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



	Support Force (kN)		
Model No.	LC0263-C□	LC0303-C□	LC0363-C□
Hydraulic Pressure (MPa)	LC0263-C□-E	LC0303-C□-E	LC0363-C□-E
7	2.0	3.0	4.0
6.5	1.8	2.8	3.6
6	1.6	2.5	3.3
5.5	1.4	2.2	2.9
5	1.2	2.0	2.6
4.5	1.0	1.7	2.2
4	0.8	1.4	1.9
3.5	0.6	1.2	1.5
3	0.5	0.9	1.2
2.5	0.3	0.6	0.8
Support Force Formula※1 kN	0.38×P-0.69	0.53×P-0.68	0.70×P-0.91

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

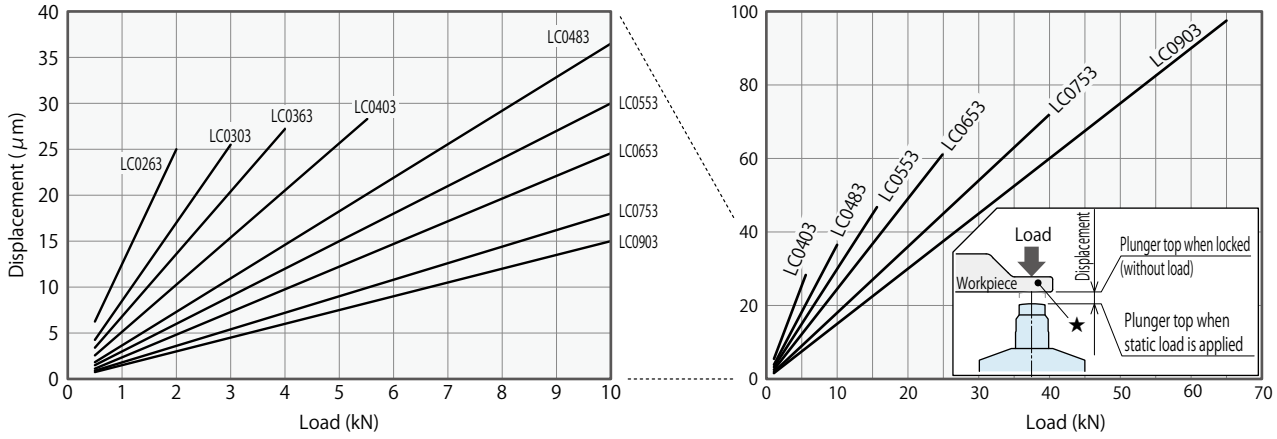


	Support Force (kN)					
Model No.	LC0403-□□	LC0483-□□	LC0553-□□	LC0653-□□	LC0753-□□	LC0903-□□
Hydraulic Pressure (MPa)	LC0403-□□-E	LC0483-□□-E	LC0553-□□-E	LC0653-□□-E	LC0753-□□-E	LC0903-□□-E
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

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.



Performance Curve (LC-□-Q : Hydraulic Advance Long Stroke Model / LC-□-EQ : Spring Advance Long Stroke Model)

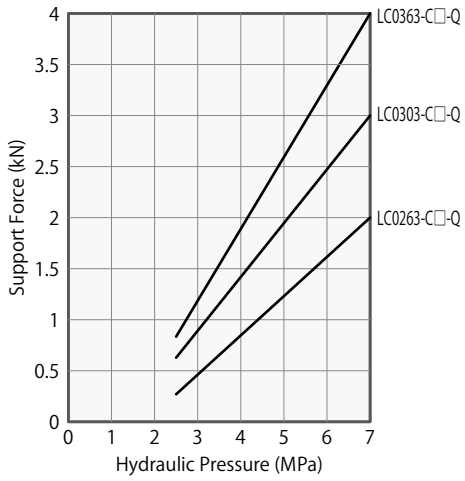
Applicable Model

LC 040 3 - C S - Q EQ

6 Option : Q, EQ

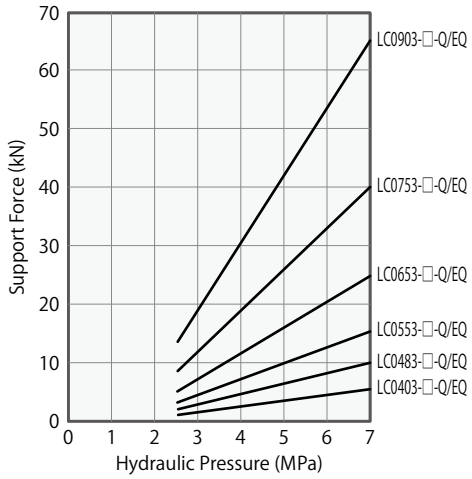
1 Body Size

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



Model No.	Support Force (kN)		
	LC0263-□-Q	LC0303-□-Q	LC0363-□-Q
Hydraulic Pressure (MPa)	LC0263-□-EQ	LC0303-□-EQ	LC0363-□-EQ
7	2.0	3.0	4.0
6.5	1.8	2.8	3.6
6	1.6	2.5	3.3
5.5	1.4	2.2	2.9
5	1.2	2.0	2.6
4.5	1.0	1.7	2.2
4	0.8	1.4	1.9
3.5	0.6	1.2	1.5
3	0.5	0.9	1.2
2.5	0.3	0.6	0.8
Support Force Formula※1 kN	0.38×P-0.69	0.53×P-0.68	0.70×P-0.91

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

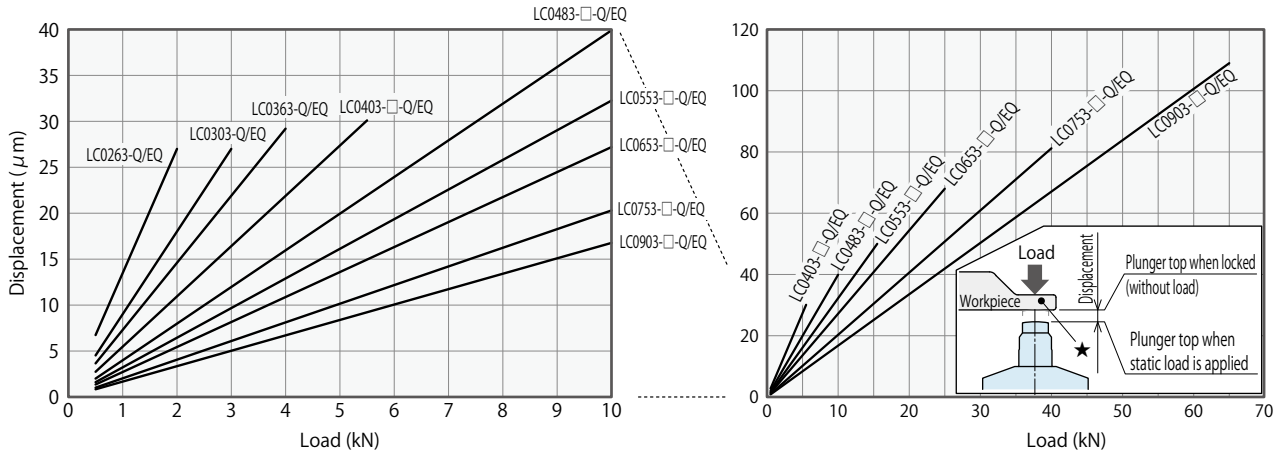


Model No.	Support Force (kN)					
	LC0403-□-Q	LC0483-□-Q	LC0553-□-Q	LC0653-□-Q	LC0753-□-Q	LC0903-□-Q
Hydraulic Pressure (MPa)	LC0403-□-EQ	LC0483-□-EQ	LC0553-□-EQ	LC0653-□-EQ	LC0753-□-EQ	LC0903-□-EQ
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

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.



※ The Displacement of LC-□-Q / LC-□-EQ : Long Stroke Model is larger than that of LC-□□/LC-□□-E : Standard Model.

Performance Curve (LC-□□M：Hydraulic Advance Air Sensing Option / LC-□□M-E：Spring Advance Air Sensing Option)

Applicable Model

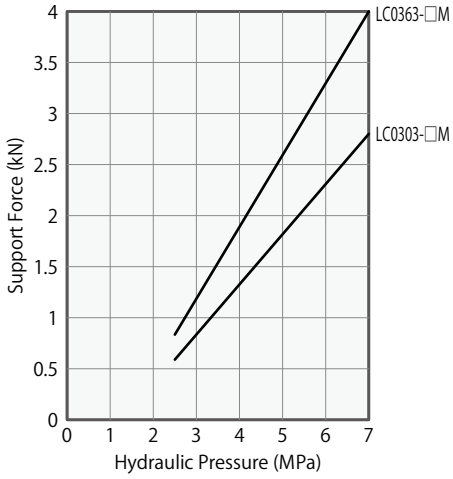
LC 040 3 - C S L H M - Blank E

1 Body Size

5 Plunger Action Confirmation：M

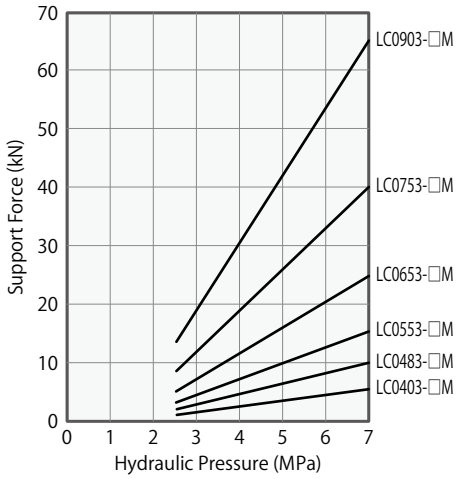
6 Option：Blank, E

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



	Support Force (kN)	
Model No.	LC0303-□□M	LC0363-□□M
Hydraulic Pressure (MPa)	LC0303-□□M-E	LC0363-□□M-E
7	3.0	4.0
6.5	2.8	3.6
6	2.5	3.3
5.5	2.2	2.9
5	2.0	2.6
4.5	1.7	2.2
4	1.4	1.9
3.5	1.2	1.5
3	0.9	1.2
2.5	0.6	0.8
Support Force Formula※1 kN	0.53×P-0.68	0.70×P-0.91

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

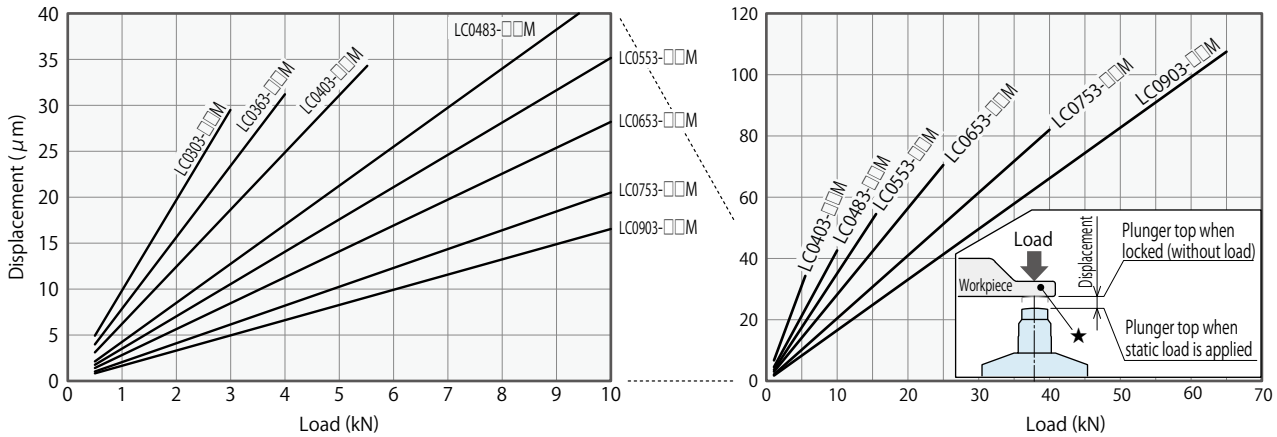


	Support Force (kN)					
Model No.	LC0403-□□M	LC0483-□□M	LC0553-□□M	LC0653-□□M	LC0753-□□M	LC0903-□□M
Hydraulic Pressure (MPa)	LC0403-□□M-E	LC0483-□□M-E	LC0553-□□M-E	LC0653-□□M-E	LC0753-□□M-E	LC0903-□□M-E
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

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.



※ The Displacement of LC-□□M / LC-□□M-E：Air Sensing Option is larger than that of LC-□□/LC-□□-E：Standard Model.

Performance Curve (LC-□-D : Rodless Hollow Model)

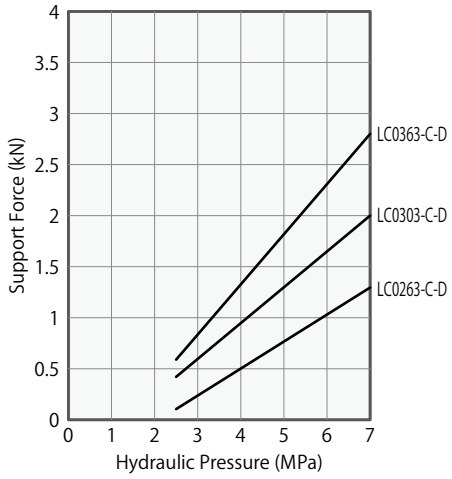
Applicable Model

LC 040 3 - C/S - D

1 Body Size

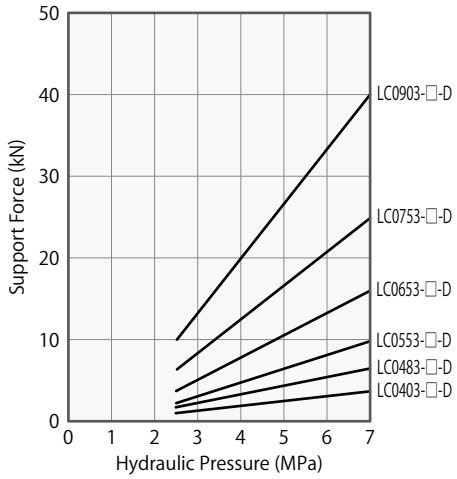
6 Option : D

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



Model No. / Hydraulic Pressure (MPa)	Support Force (kN) LC0263-C-D	LC0303-C-D	LC0363-C-D
7	1.3	2.0	2.8
6.5	1.2	1.8	2.6
6	1.1	1.6	2.3
5.5	0.9	1.5	2.1
5	0.8	1.3	1.8
4.5	0.7	1.1	1.6
4	0.6	0.9	1.3
3.5	0.4	0.8	1.1
3	0.3	0.6	0.8
2.5	0.2	0.4	0.6
Support Force Formula※1 kN	0.25×P-0.45	0.35×P-0.46	0.49×P-0.64

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

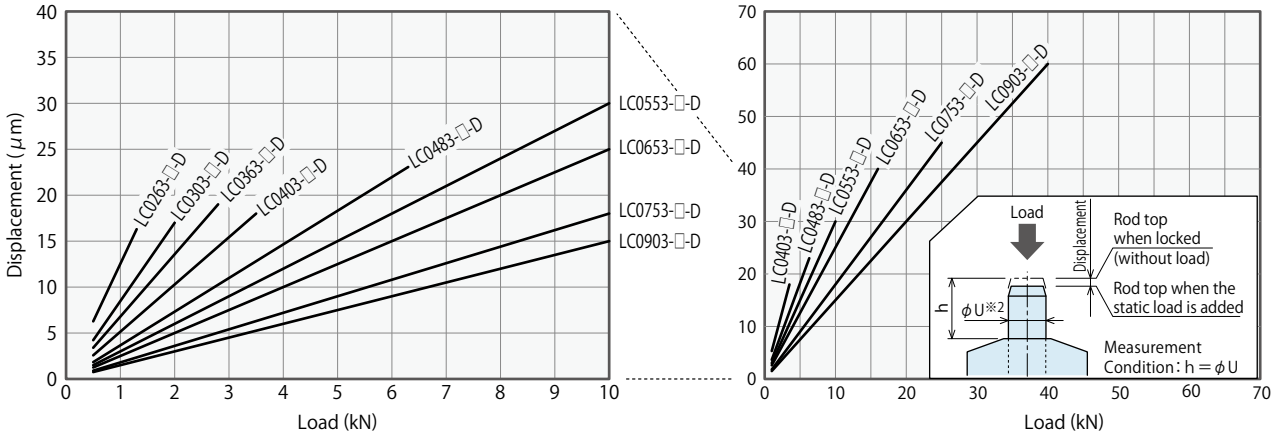


Model No. / Hydraulic Pressure (MPa)	Support Force (kN) LC0403-□-D	LC0483-□-D	LC0553-□-D	LC0653-□-D	LC0753-□-D	LC0903-□-D
7	3.5	6.3	10.0	16.0	25.0	40.0
6.5	3.2	5.8	9.2	14.7	22.9	36.7
6	2.9	5.3	8.4	13.4	20.9	33.4
5.5	2.6	4.7	7.5	12.0	18.8	30.0
5	2.3	4.2	6.7	10.7	16.7	26.7
4.5	2.0	3.7	5.8	9.3	14.6	23.3
4	1.7	3.2	5.0	8.0	12.5	20.0
3.5	1.5	2.6	4.2	6.7	10.4	16.7
3	1.2	2.1	3.3	5.3	8.3	13.3
2.5	0.9	1.6	2.5	4.0	6.3	10.0
Support Force Formula※1 kN	0.58×P-0.58	1.05×P-1.05	1.67×P-1.67	2.67×P-2.67	4.17×P-4.17	6.67×P-6.67

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.
The displacement varies depending on the length of the rod used, so please use it as a reference value.

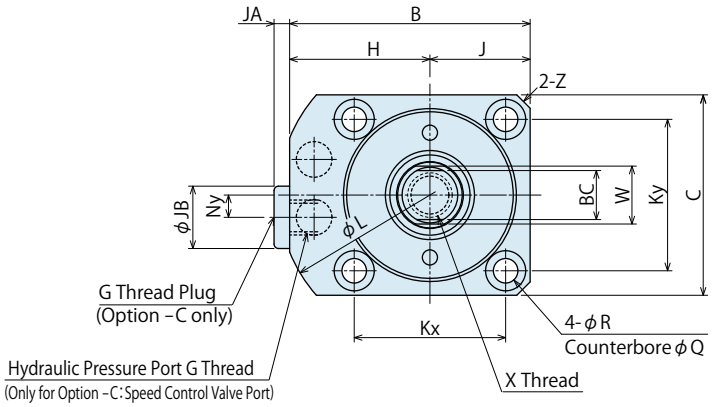


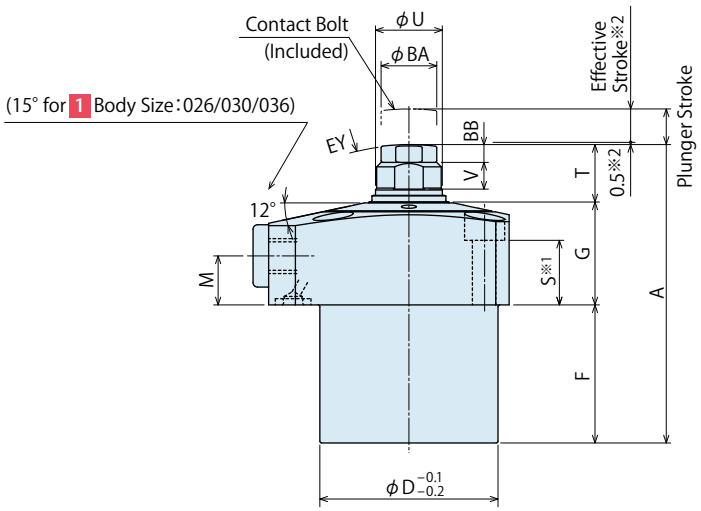
Note : ※2. For the dimension of φU, please refer to "External Dimensions and Machining Dimensions for Mounting" on P.757.

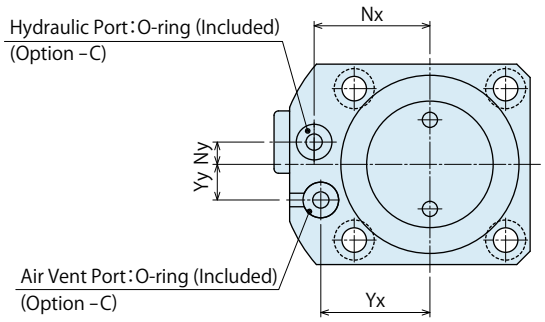
External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows the released state of LC-C□ (before the plunger is lifted).





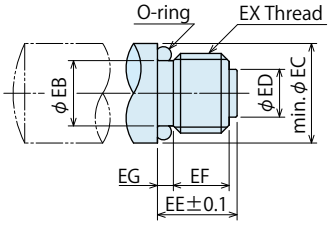


Note：

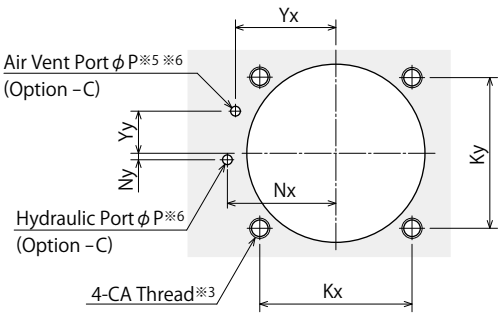
※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

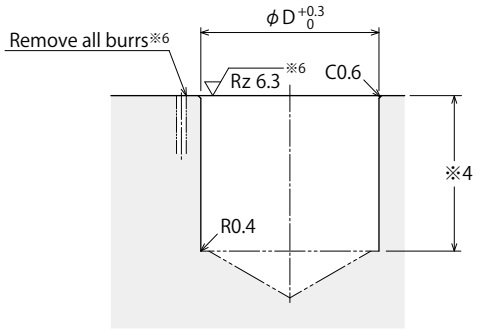
※2. When the work support touches a workpiece within 0.5mm stroke from the plunger retract-end, a larger force than the plunger spring force will be applied to the workpiece. Please use the work support within the effective stroke range.

Contact Bolt Design Dimensions



Machining Dimensions of Mounting Area





Notes：

※3. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

※4. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

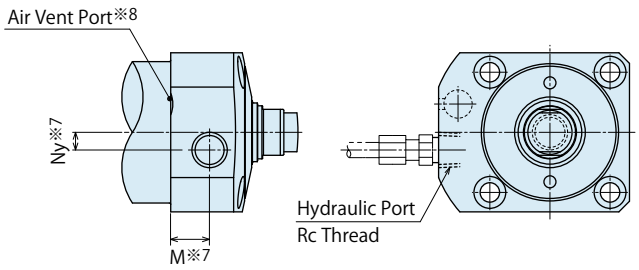
※5. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※6. The machining dimension is for -C：Gasket option.

Piping Method

S：Piping Option (Rc Thread)

※This drawing shows LC-S□.



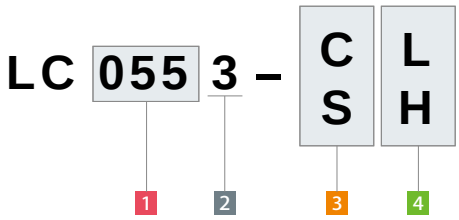
Notes：

※7. The dimensions are the same as -C：Gasket option.

※8. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

Model No. Indication

(Format Example：LC0553-CL, LC0903-SH)



1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force
5 Plunger Action Confirmation (Blank)
6 Option (Blank)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LC0263-□□	LC0303-□□	LC0363-□□	LC0403-□□	LC0483-□□	LC0553-□□	LC0653-□□	LC0753-□□	LC0903-□□
Plunger Stroke		6.5	6.5	8	8	10	12	14	16	20
Effective Stroke		6.0	6.0	7.5	7.5	9.5	11.5	13.5	15.5	19.5
A		56.5	58.5	64	67	75	85	101	126	149
B		40.5	45.5	49	54	61	69	81	92	107
C		29	33	40	45	51	60	70	80	95
D		26	30	36	40	48	55	65	75	90
F		21	21	27.5	31	39	45	56	72	88
G		27.3	27.3	23.6	23.1	23.1	23.1	27.1	31.6	37.1
H		24	26	29	31.5	35.5	39	46	52	59.5
J		16.5	19.5	20	22.5	25.5	30	35	40	47.5
Kx		25	30	31.4	34	40	47	55	63	75
Ky		21	23	31.4	34	40	47	55	63	75
L		52	56	63	68	73	80	94	106	126
M		11	11	11	11	11	11	11	13	13
Nx		18.5	20.5	23.5	26	30	33.5	39.5	45	52.5
Ny		3	3	5	5	0	0	0	0	0
P		3	3	3	3	3	3	5	5	5
Q		6	7.5	7.5	9	9	11	11	14	17.5
R		3.4	4.5	4.5	5.5	5.5	6.8	6.8	9	11
S		21	19	15.5	14.5	13.5	12	14.5	17	18
T		8.2	10.2	12.9	12.9	12.9	16.9	17.9	22.4	23.9
U		7	10	12	15	16	20	22	25	30
V		3.5	5	6	6	6	8	9	9	10.5
W		5.5	8	10	13	13	17	19	22	24
X (Nominal×Pitch×Depth)		M4×0.7×7	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx		18.5	20.5	23.5	26	28	31	37	42.5	50
Yy		7	7	8	8	11	13	14	15	15
Z (Chamfer)		C2.5	C3	C2	C3	C3	R40	C5	R53	R63
BA		6.5	9	11.5	12.5	12.5	16.5	16.5	21.5	21.5
BB		2.5	3	4	4	4	6	6	9	9
BC		5.5	8	10	11	11	14	14	19	19
CA (Nominal × Pitch)		M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY		SR20	SR30	SR30	SR50	SR50	SR80	SR80	SR125	SR125
JA		3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5
JB		14	14	14	14	14	14	14	19	19
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
O-ring (Option -C)		OR NBR-90 P5-N	OR NBR-90 P5-N	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	OR NBR-90 P7-N	OR NBR-90 P7-N

Contact Bolt Design Dimensions

※Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

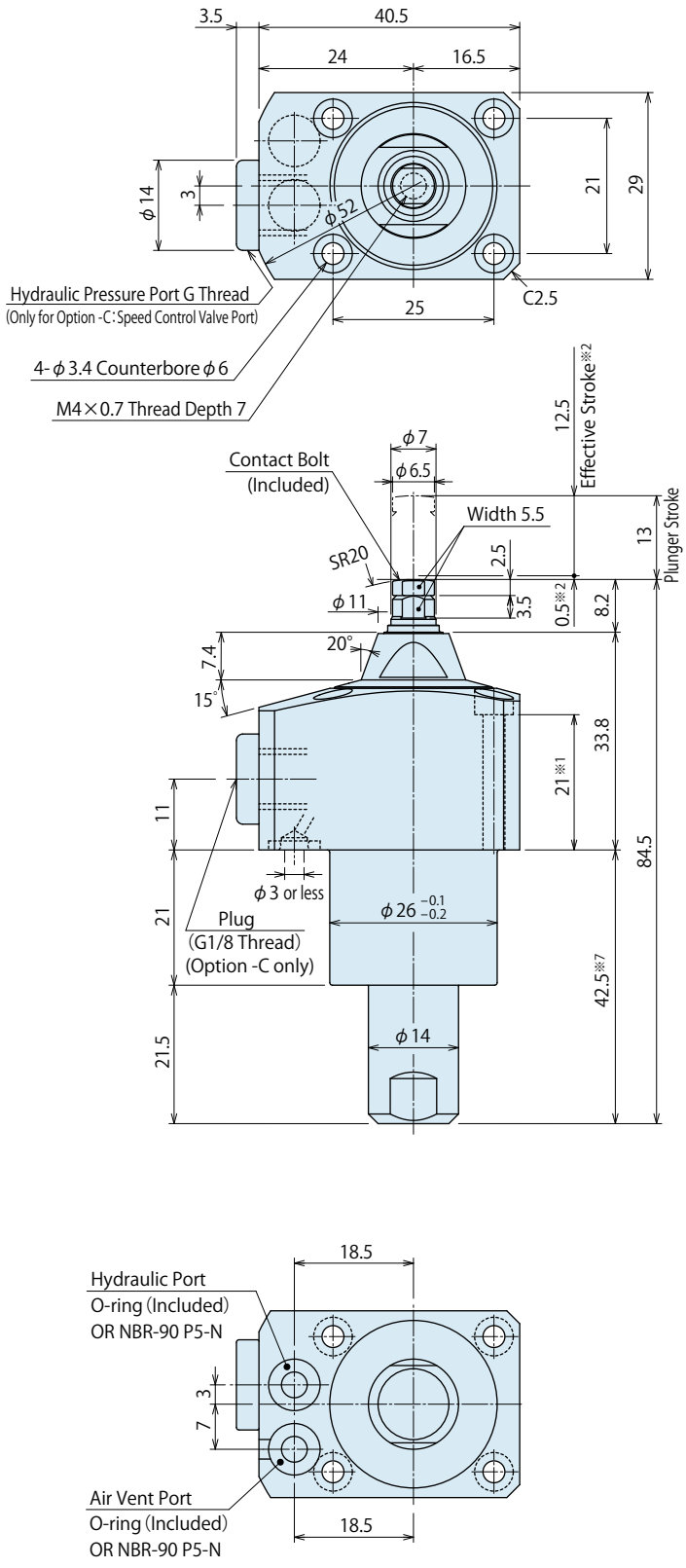
(mm)

Corresponding Model No.	LC0263-□□	LC0303-□□	LC0363-□□	LC0403-□□	LC0483-□□	LC0553-□□	LC0653-□□	LC0753-□□	LC0903-□□
EB	3	4.5	6	8.2	8.2	10	10	13.5	13.5
EC	6	8.5	10.5	12.5	12.5	16.5	16.5	21.5	21.5
ED	2	3.5	5	6	6	7.5	7.5	10.5	10.5
EE	6	8	10	10	10	12	12	16	16
EF	4.5	6	7	7	7	8	8	11	11
EG	1	1.5	2	2	2	3	3	4	4
EX (Nominal × Pitch)	M4×0.7	M6×1	M8×1.25	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	SS3 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70)	AS568-014 (70)

External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows the released state of LC0263-C-Q (before the plunger is lifted).

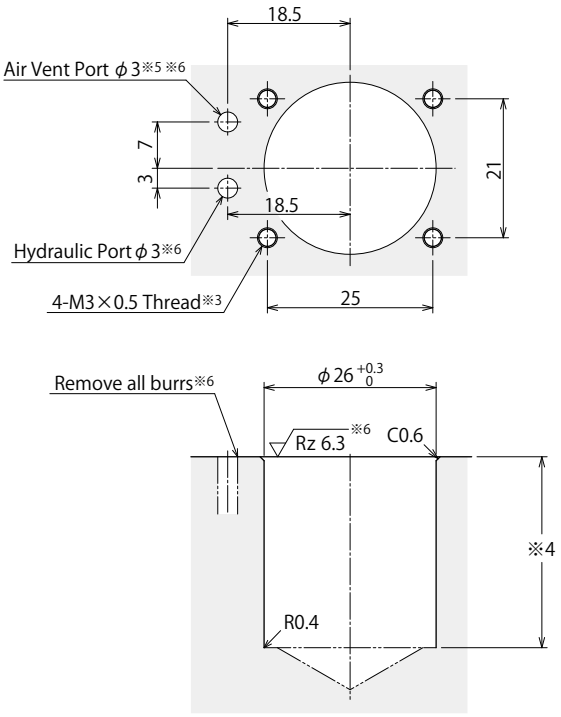


Notes：

※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to ※1 dimension (21).

※2. 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.

Machining Dimensions of Mounting Area



Notes：

※3. Tapping depth of the mounting bolt should be decided according to the mounting height referring to ※1 dimension (21).

※4. The depth of the body mounting hole φ26 should be decided according to the mounting height referring to ※7 dimension (42.5).

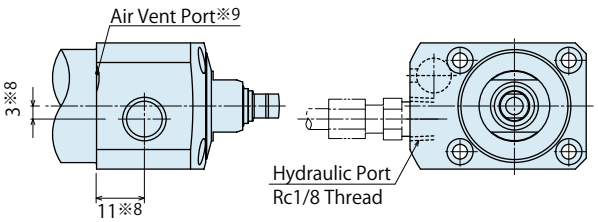
※5. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※6. The machining dimension is for -C：Gasket option.

Piping Method

S: Piping Option (Rc Thread)

※ This drawing shows LC0263-S-Q.



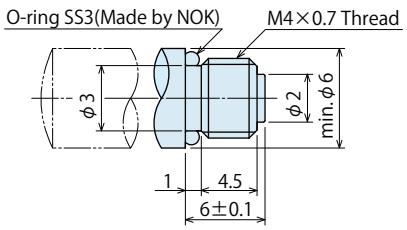
Notes：

※8. The dimensions are the same as -C：Gasket option.

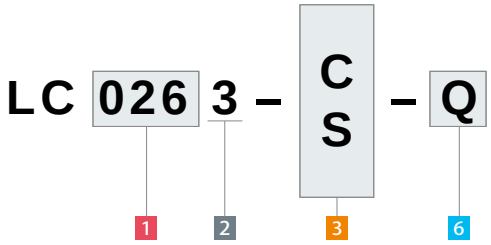
※9. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

Contact Bolt Design Dimensions

※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.



Model No. Indication



(Format Example：LC0263-C-Q)

1 Body Size
Refer to P.761 for 030 or larger.

2 Design No.

3 Piping Method

4 Plunger Spring Force (Blank)

5 Plunger Action Confirmation (Blank)

6 Option Q

Please refer to P.761 ~ P.762 for external dimensions of LC0303 and larger models.

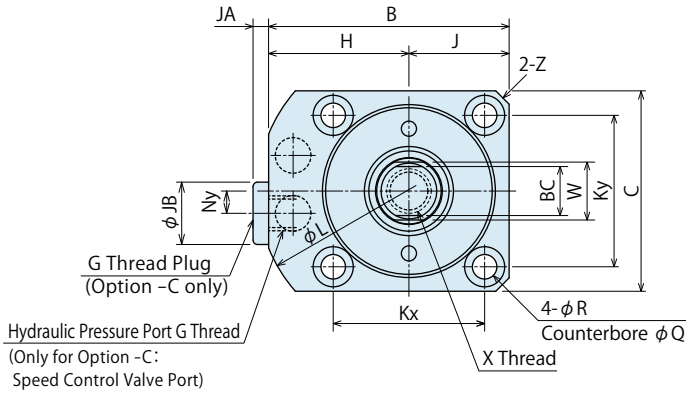
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

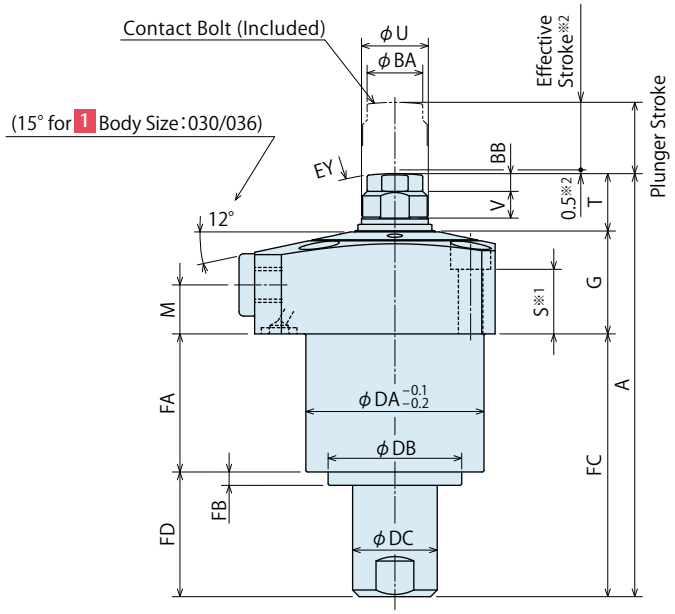
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

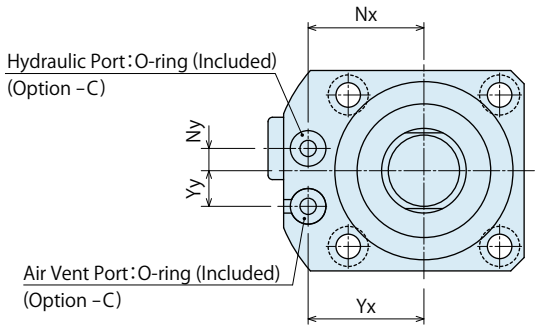
External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows the released state of LC-C-Q (before the plunger is lifted).





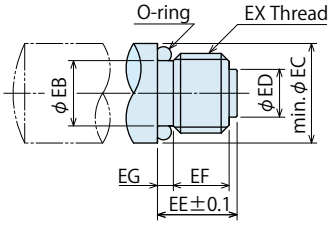


Notes：

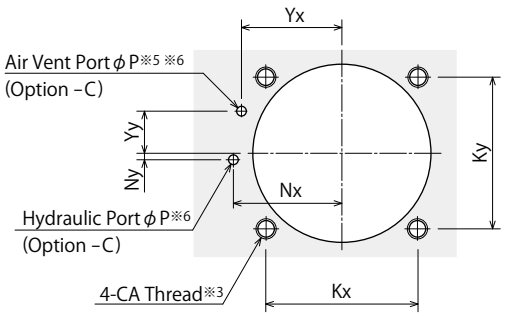
※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

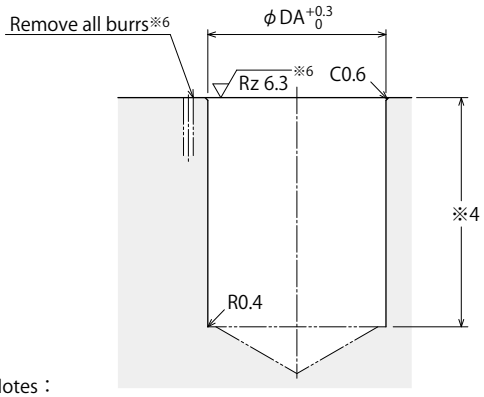
※2. When the work support touches a workpiece within 0.5mm stroke from the plunger retract-end, a larger force than the plunger spring force will be applied to the workpiece. Please use the work support within the effective stroke range.

Contact Bolt Design Dimensions



Machining Dimensions of Mounting Area





Notes：

※3. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

※4. The depth of the body mounting hole ϕDA should be decided according to the mounting height referring to dimension 'FC'.

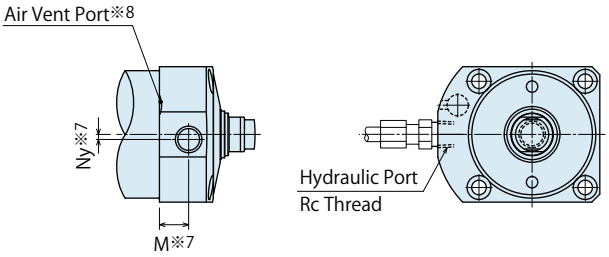
※5. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※6. The machining dimension is for –C：Gasket option.

Piping Method

S：Piping Option (Rc Thread)

※※This drawing shows LC-S-Q.



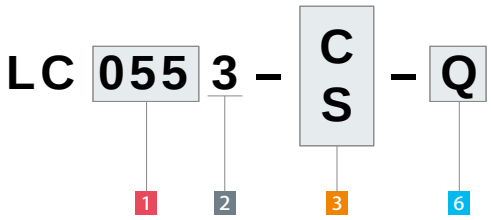
Notes：

※7. The dimensions are the same as -C：Gasket option.

※8. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

Model No. Indication

(Format Example：LC0553-C-Q, LC0903-S-Q)



1 Body Size
Refer to P.759 for 026.

2 Design No.

3 Piping Method

4 Plunger Spring Force (Blank)

5 Plunger Action Confirmation (Blank)

6 Option Q

Please refer to P.759 ~ P.760 for external dimensions of LC0263.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LC0303-□-Q	LC0363-□-Q	LC0403-□-Q	LC0483-□-Q	LC0553-□-Q	LC0653-□-Q	LC0753-□-Q	LC0903-□-Q
Plunger Stroke	13	16	16	20	24	28	32	40
Effective Stroke	12.5	15.5	15.5	19.5	23.5	27.5	31.5	39.5
A	84	92	95	112	131.5	149.5	177.5	212
B	45.5	49	54	61	69	81	92	107
C	33	40	45	51	60	70	80	95
DA	30	36	40	48	55	65	75	90
DB	0	0	0	0	33	36	42	52
DC	15	17	19	19	23	23	30	30
FA	21	27.5	31	39	45	56	72	88
FB	0	0	0	0	3	5	10	14
FC	46.5	55.5	59	76	91.5	104.5	123.5	151
FD	25.5	28	28	37	46.5	48.5	51.5	63
G	27.3	23.6	23.1	23.1	23.1	27.1	31.6	37.1
H	26	29	31.5	35.5	39	46	52	59.5
J	19.5	20	22.5	25.5	30	35	40	47.5
Kx	30	31.4	34	40	47	55	63	75
Ky	23	31.4	34	40	47	55	63	75
L	56	63	68	73	80	94	106	126
M	11	11	11	11	11	11	13	13
Nx	20.5	23.5	26	30	33.5	39.5	45	52.5
Ny	3	5	5	0	0	0	0	0
P	3	3	3	3	3	5	5	5
Q	7.5	7.5	9	9	11	11	14	17.5
R	4.5	4.5	5.5	5.5	6.8	6.8	9	11
S	19	15.5	14.5	13.5	11.5	14.5	17	18
T	10.2	12.9	12.9	12.9	16.9	17.9	22.4	23.9
U	10	12	15	16	20	22	25	30
V	5	6	6	6	8	9	9	10.5
W	8	10	13	13	17	19	22	24
X (Nominal×Pitch×Depth)	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx	20.5	23.5	26	28	31	37	42.5	50
Yy	7	8	8	11	13	14	15	15
Z (Chamfer)	C3	C2	C3	C3	R40	C5	R53	R63
BA	9	11.5	12.5	12.5	16.5	16.5	21.5	21.5
BB	3	4	4	4	6	6	9	9
BC	8	10	11	11	14	14	19	19
CA (Nominal × Pitch)	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY	SR30	SR30	SR50	SR50	SR80	SR80	SR125	SR125
JA	3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5
JB	14	14	14	14	14	14	19	19
Hydraulic Port Option -C	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
Hydraulic Port Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
O-ring (Option -C)	OR NBR-90 P5-N	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	OR NBR-90 P7-N	OR NBR-90 P7-N

Contact Bolt Design Dimensions

※Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

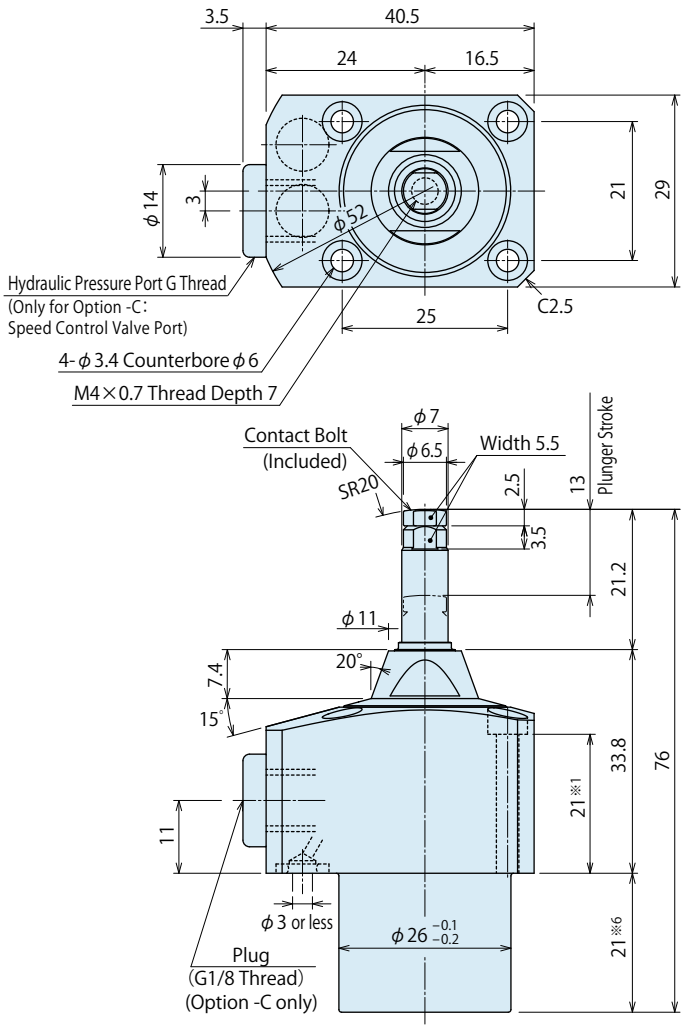
(mm)

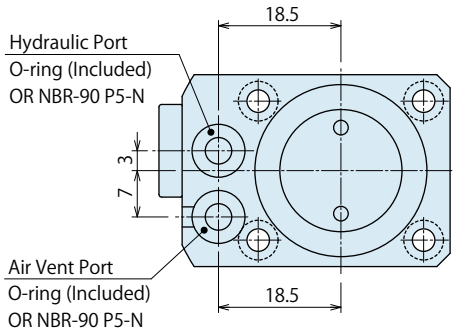
Corresponding Model No.	LC0303-□-Q	LC0363-□-Q	LC0403-□-Q	LC0483-□-Q	LC0553-□-Q	LC0653-□-Q	LC0753-□-Q	LC0903-□-Q
EB	4.5	6	8.2	8.2	10	10	13.5	13.5
EC	8.5	10.5	12.5	12.5	16.5	16.5	21.5	21.5
ED	3.5	5	6	6	7.5	7.5	10.5	10.5
EE	8	10	10	10	12	12	16	16
EF	6	7	7	7	8	8	11	11
EG	1.5	2	2	2	3	3	4	4
EX (Nominal × Pitch)	M6×1	M8×1.25	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70)	AS568-014 (70)

External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows the released state of LC0263-C-EQ (when the plunger is lifted).

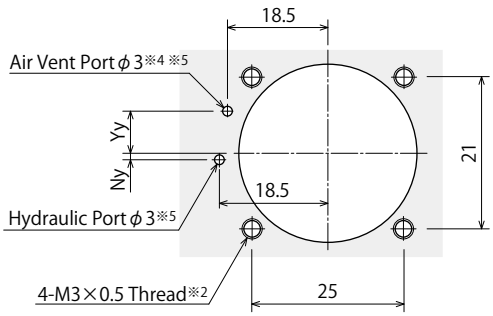


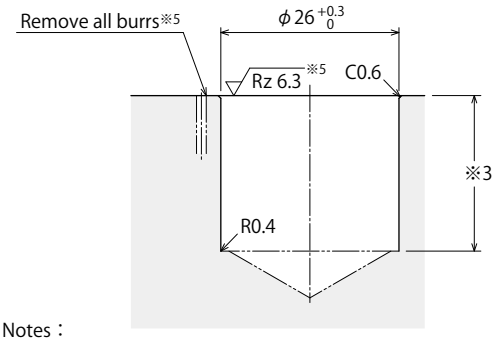


Note：

※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to ※1 dimension (21).

Machining Dimensions of Mounting Area





Notes：

※2. Tapping depth of the mounting bolt should be decided according to the mounting height referring to ※1 dimension (21).

※3. The depth of the body mounting hole ϕ26 should be decided according to the mounting height referring to ※6 dimension (21).

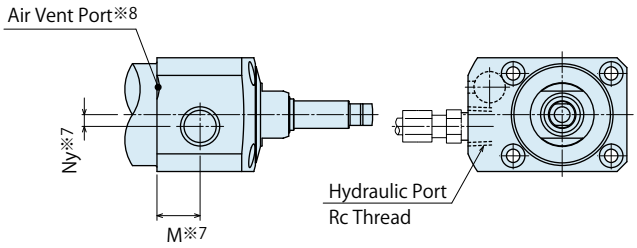
※4. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※5. The machining dimension is for -C：Gasket option.

Piping Method

S：Piping Option (Rc Thread)

※This drawing shows LC-S□-E.



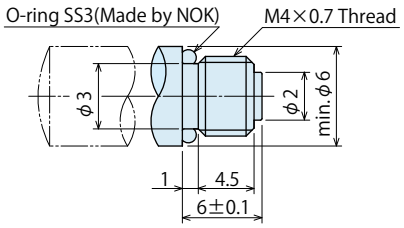
Notes：

※7. The dimensions are the same as -C：Gasket option.

※8. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

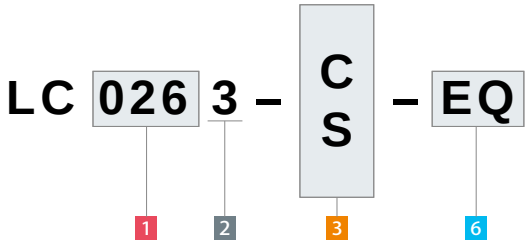
Contact Bolt Design Dimensions

※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.



Model No. Indication

(Format Example：LC0263-C-EQ)



1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force (Blank)
5 Plunger Action Confirmation (Blank)
6 Option EQ

Please refer to P.765 ~ P.766 for external dimensions of LC0303 and larger models.

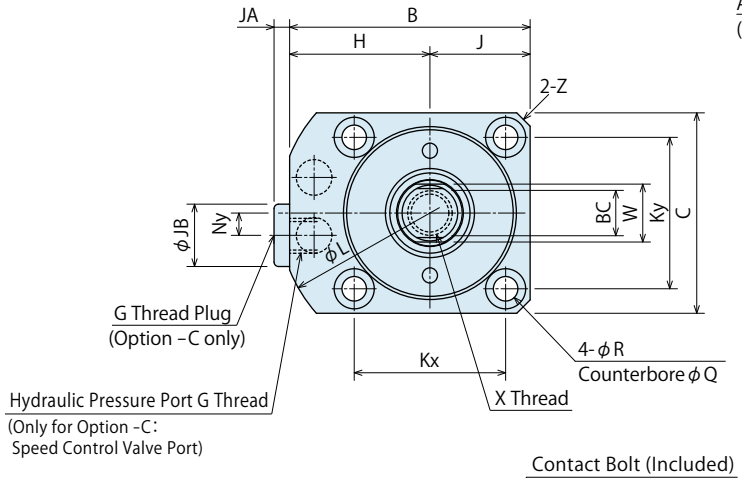
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

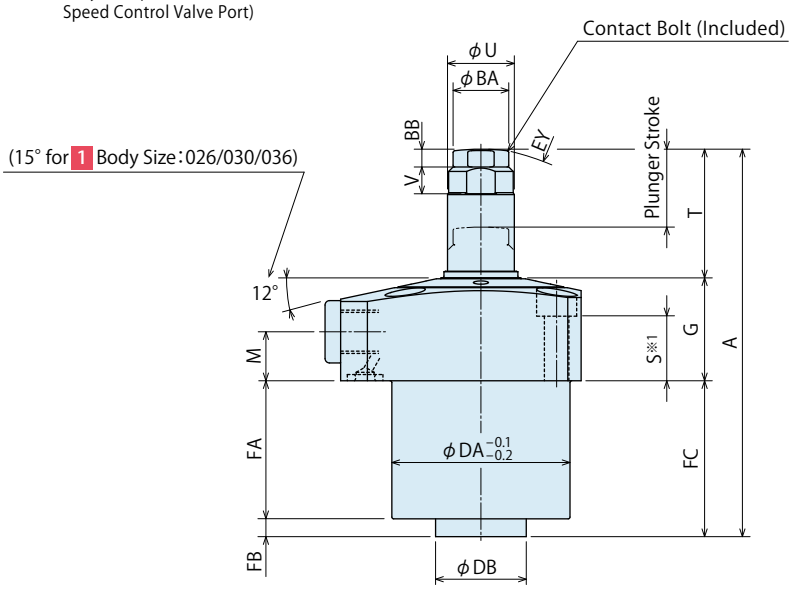
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

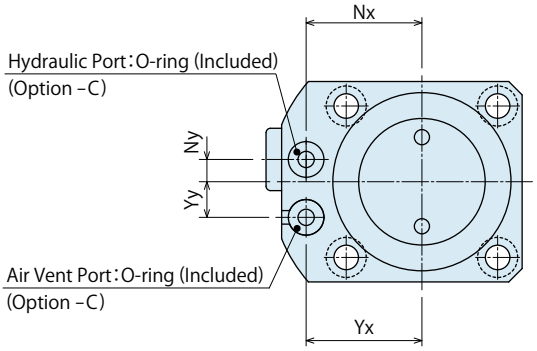
External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows the released state of LC-C-EQ (before the plunger is lifted).



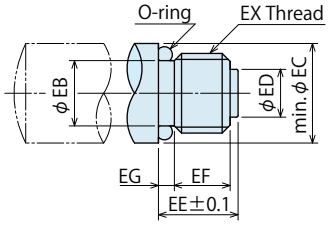




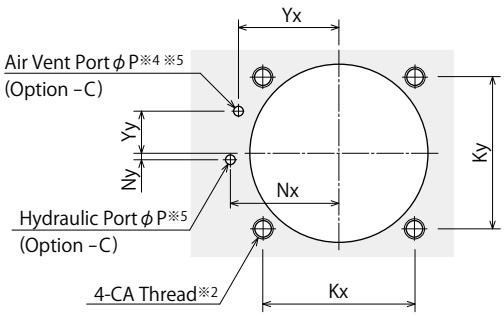
Note：

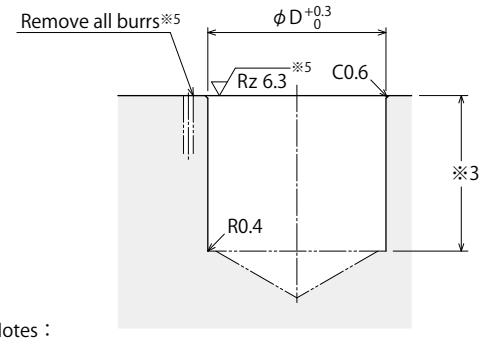
※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

Contact Bolt Design Dimensions



Machining Dimensions of Mounting Area





Notes：

※2. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

※3. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'FC'.

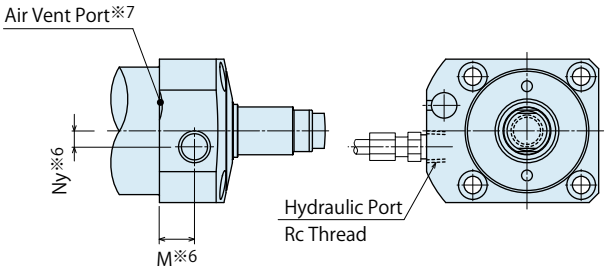
※4. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※5. The machining dimension is for -C：Gasket option.

Piping Method

S：Piping Option (Rc Thread)

※This drawing shows LC-S-EQ.



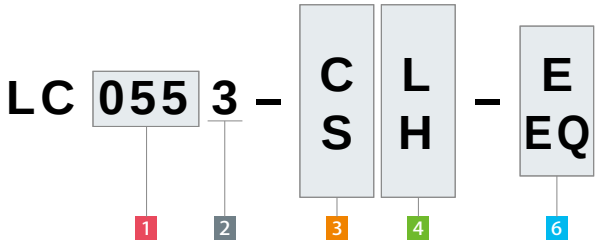
Notes：

※6. The dimensions are the same as -C：Gasket option.

※7. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

Model No. Indication

(Format Example：LC0553-C-EQ, LC0903-S-EQ)



1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force
5 Plunger Action Confirmation (Blank)
6 Option E / EQ

Please refer to P.763～P.764 for external dimensions of LC0263-□-EQ.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LC0263-□E	LC0303-□E	LC0303-□EQ	LC0363-□E	LC0363-□EQ	LC0403-□E	LC0403-□EQ	LC0483-□E	LC0483-□EQ	LC0553-□E	LC0553-□EQ	LC0653-□E	LC0653-□EQ	LC0753-□E	LC0753-□EQ	LC0903-□E	LC0903-□EQ
Plunger Stroke	6.5	6.5	13	8	16	8	16	10	20	12	24	14	28	16	32	20	40
A	63	65	71.5	72	80	75	83	85	95	97	109	115	129	142	158	169	199
B	40.5	45.5		49		54		61		69		81		92		107	
C	29	33		40		45		51		60		70		80		95	
DA	26	30		36		40		48		55		65		75		90	
DB	-	-		-		-		-		-		-		-		-	44
FA	21	21		27.5		31		39		45		56		72		88	
FB	-	-		-		-		-		-		-		-		-	10
FC	-	-	21	-	27.5	-	31	-	39	-	45	-	56	-	72	-	98
G	27.3	27.3		23.6		23.1		23.1		23.1		27.1		31.6		37.1	
H	24	26		29		31.5		35.5		39		46		52		59.5	
J	16.5	19.5		20		22.5		25.5		30		35		40		47.5	
Kx	25	30		31.4		34		40		47		55		63		75	
Ky	21	23		31.4		34		40		47		55		63		75	
L	52	56		63		68		73		80		94		106		126	
M	11	11		11		11		11		11		11		13		13	
Nx	18.5	20.5		23.5		26		30		33.5		39.5		45		52.5	
Ny	3	3		5		5		0		0		0		0		0	
P	3	3		3		3		3		3		5		5		5	
Q	6	7.5		7.5		9		9		11		11		14		17.5	
R	3.4	4.5		4.5		5.5		5.5		6.8		6.8		9		11	
S	21	19		15.5		14.5		13.5		12		14.5		17		18	
T	14.7	16.7	23.2	20.9	28.9	20.9	28.9	22.9	32.9	28.9	40.9	31.9	45.9	38.4	54.4	43.9	63.9
U	7	10		12		15		16		20		22		25		30	
V	3.5	5		6		6		6		8		9		9		10.5	
W	5.5	8		10		13		13		17		19		22		24	
X (Nominal×Pitch×Depth)	M4×0.7×7	M6×1×9		M8×1.25×12		M10×1.5×11		M10×1.5×11		M12×1.75×13		M12×1.75×13		M16×2×20		M16×2×20	
Yx	18.5	20.5		23.5		26		28		31		37		42.5		50	
Yy	7	7		8		8		11		13		14		15		15	
Z (Chamfer)	C2.5	C3		C2		C3		C3		R40		C5		R53		R63	
BA	6.5	9		11.5		12.5		12.5		16.5		16.5		21.5		21.5	
BB	2.5	3		4		4		4		6		6		9		9	
BC	5.5	8		10		11		11		14		14		19		19	
CA (Nominal × Pitch)	M3×0.5	M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M8×1.25		M10×1.5	
EY	SR20	SR30		SR30		SR50		SR50		SR80		SR80		SR125		SR125	
JA	3.5	3.5		3.5		3.5		3.5		3.5		3.5		4.5		4.5	
JB	14	14		14		14		14		14		14		19		19	
Hydraulic Port Option -C	G1/8	G1/8		G1/8		G1/8		G1/8		G1/8		G1/8		G1/4		G1/4	
Hydraulic Port Option -S	Rc1/8	Rc1/8		Rc1/8		Rc1/8		Rc1/8		Rc1/8		Rc1/8		Rc1/4		Rc1/4	
O-ring (Option -C)	OR NBR-90 P5-N											OR NBR-90 P7-N					

Contact Bolt Design Dimensions

※Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.

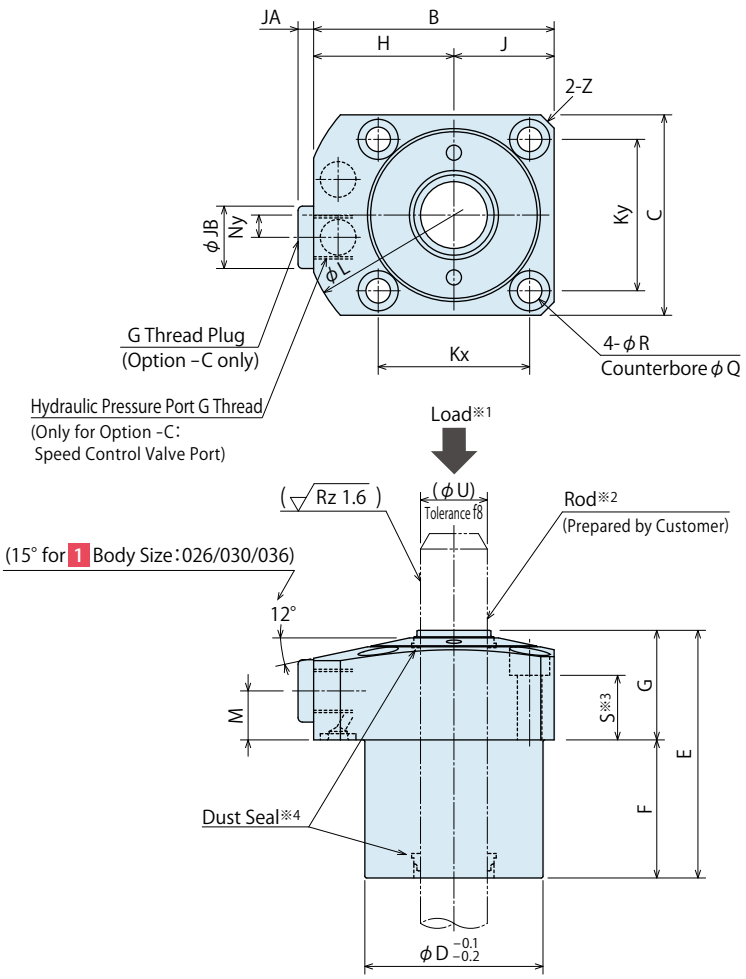
(mm)

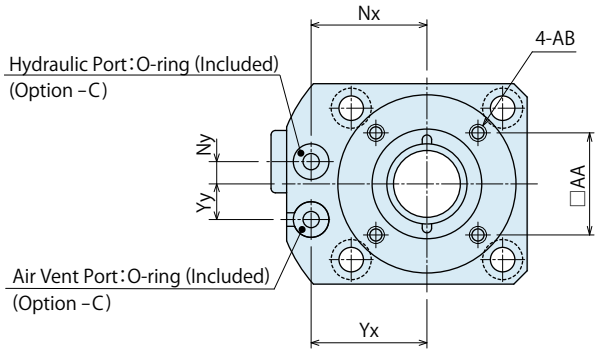
Corresponding Model No.	LC0263-□□-E	LC0303-□□-E LC0303-□-EQ	LC0363-□□-E LC0363-□-EQ	LC0403-□□-E LC0403-□-EQ	LC0483-□□-E LC0483-□-EQ	LC0553-□□-E LC0553-□-EQ	LC0653-□□-E LC0653-□-EQ	LC0753-□□-E LC0753-□-EQ	LC0903-□□-E LC0903-□-EQ
EB	3	4.5	6	8.2	8.2	10	10	13.5	13.5
EC	6	8.5	10.5	12.5	12.5	16.5	16.5	21.5	21.5
ED	2	3.5	5	6	6	7.5	7.5	10.5	10.5
EE	6	8	10	10	10	12	12	16	16
EF	4.5	6	7	7	7	8	8	11	11
EG	1	1.5	2	2	2	3	3	4	4
EX (Nominal × Pitch)	M4×0.7	M6×1	M8×1.25	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	SS3 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70)	AS568-014 (70)

External Dimensions

C：Gasket Option (with G Thread Plug)

※ This drawing shows LC-C-D.





Notes：

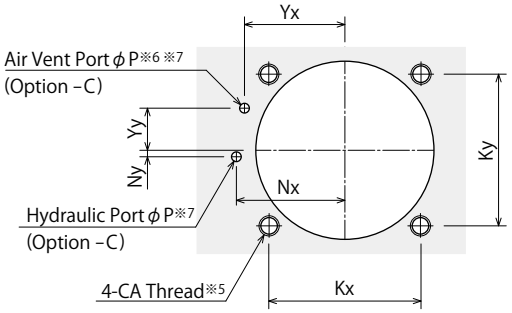
※ 1. The load acts towards the arrow direction (⬇) as shown in the drawing. If used in a reversed position the internal parts are likely to be damaged.

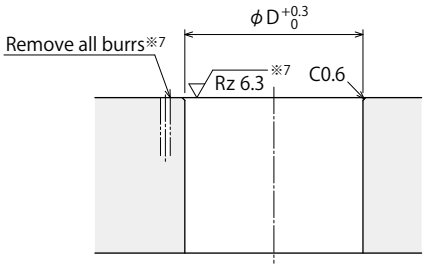
※ 2. The surface hardness of the rod (prepared by the customer) should be above HRC60. (The hard Cr plated metal is acceptable.)

※ 3. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※ 4. Deburr the rod end, and pay attention not to damage the dust seal when the rod is inserted into the body (upper and lower parts).

Machining Dimensions of Mounting Area





Notes：

※5. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

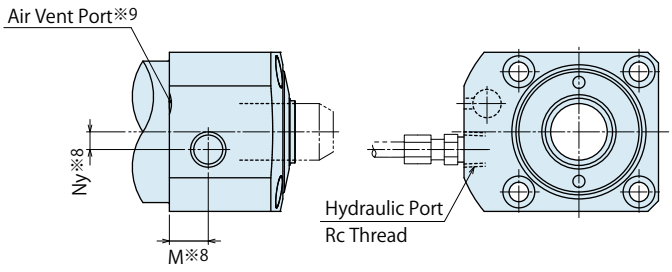
※6. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. (Please refer to "Appropriate Measures for the Air Vent Port (P.819)".)

※7. The machining dimension is for -C：Gasket option.

Piping Method

S：Piping Option (Rc Thread)

※This drawing shows LC-S-D.

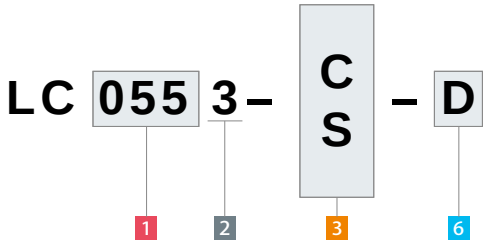


Notes：

※8. The dimensions are the same as -C：Gasket option.

※9. The air vent port must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.

Model No. Indication



(Format Example：LC0553-C-D, LC0903-S-D)

1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force (Blank)
5 Plunger Action Confirmation (Blank)
6 Option D

External Dimensions and Machining Dimensions for Mounting

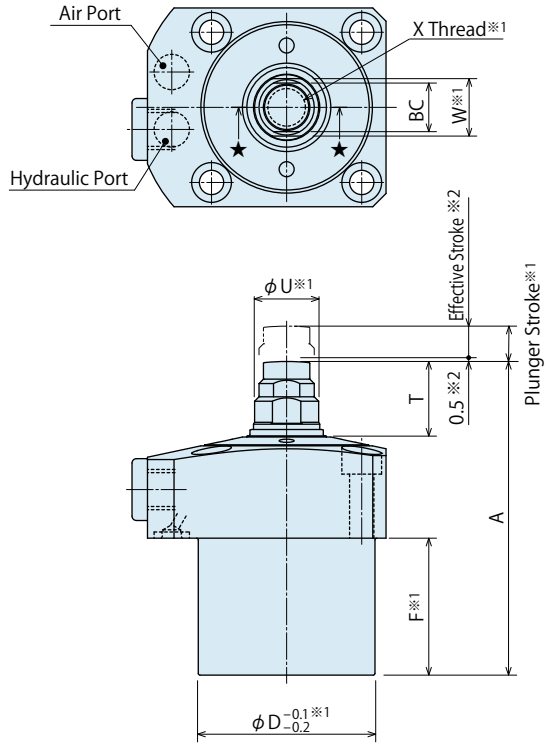
(mm)

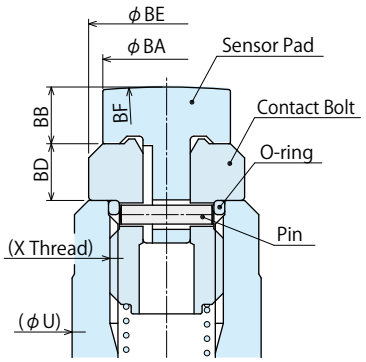
Model No.		LC0263-□-D	LC0303-□-D	LC0363-□-D	LC0403-□-D	LC0483-□-D	LC0553-□-D	LC0653-□-D	LC0753-□-D	LC0903-□-D
B		40.5	45.5	49	54	61	69	81	92	107
C		29	33	40	45	51	60	70	80	95
D		26	30	36	40	48	55	65	75	90
E		49.4	49.4	52.6	55.6	63.6	69.6	84.6	106.1	127.6
F		21	21	27.5	31	39	45	56	72	88
G		28.4	28.4	25.1	24.6	24.6	24.6	28.6	34.1	39.6
H		24	26	29	31.5	35.5	39	46	52	59.5
J		16.5	19.5	20	22.5	25.5	30	35	40	47.5
Kx		25	30	31.4	34	40	47	55	63	75
Ky		21	23	31.4	34	40	47	55	63	75
L		52	56	63	68	73	80	94	106	126
M		11	11	11	11	11	11	11	13	13
Nx		18.5	20.5	23.5	26	30	33.5	39.5	45	52.5
Ny		3	3	5	5	0	0	0	0	0
P		3	3	3	3	3	3	5	5	5
Q		6	7.5	7.5	9	9	11	11	14	17.5
R		3.4	4.5	4.5	5.5	5.5	6.8	6.8	9	11
S		21	19	15.5	14.5	13.5	12	14.5	17	18
U		$8^{-0.013}_{-0.035}$	$10^{-0.013}_{-0.035}$	$12^{-0.016}_{-0.043}$	$15^{-0.016}_{-0.043}$	$16^{-0.016}_{-0.043}$	$20^{-0.020}_{-0.053}$	$22^{-0.020}_{-0.053}$	$25^{-0.020}_{-0.053}$	$30^{-0.020}_{-0.053}$
Yx		18.5	20.5	23.5	25	28	31	37	42.5	50
Yy		7	7	8	8	11	13	14	15	15
Z		C2.5	C3	C2	C3	C3	R40	C5	R53	R63
CA (Nominal × Pitch)		M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
JA		3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5
JB		14	14	14	14	14	14	14	19	19
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
O-ring (Option -C)		OR NBR-90 P5-N	OR NBR-90 P5-N	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	OR NBR-90 P7-N	OR NBR-90 P7-N
AA		-	-	-	-	-	-	34	40	50
AB		-	-	-	-	-	-	M5×0.8 Depth 8	M5×0.8 Depth 8	M6×1 Depth 10

External Dimensions

LC-□M：Hydraulic Advance Model

※This drawing shows the released state of LC-C□M (before the plunger is lifted). Refer to "LC：Hydraulic Advance Model (Standard)" (P.757, P.758) for unlisted dimensions.

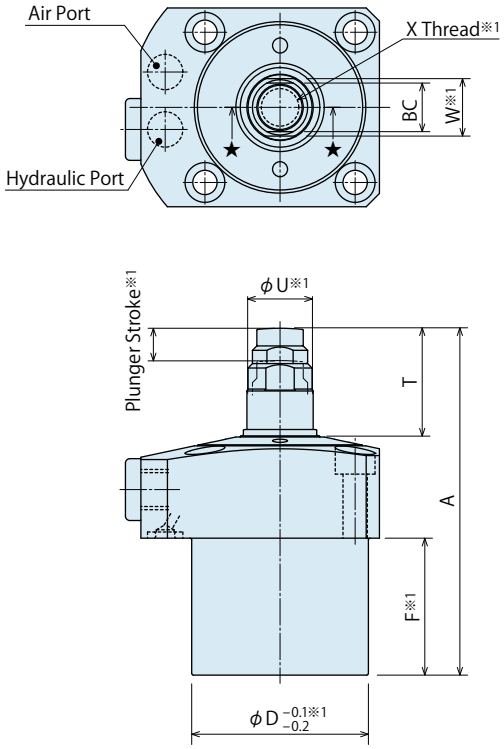




Section of ★-★ (Common)

LC-□M-E：Spring Advance Model

※ This drawing shows the released state of LC-C□M-E (plunger rises). Refer to "LC-E：Spring Advance Model" (P.765, P.766) for unlisted dimensions.



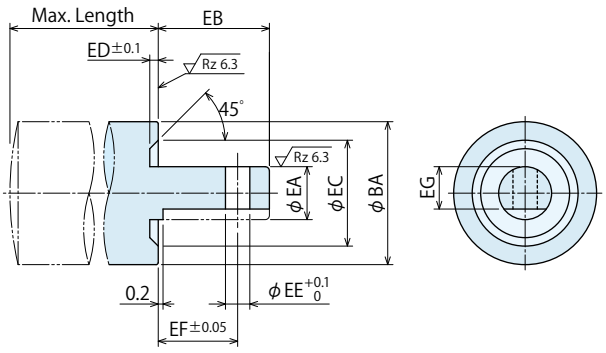
Notes :

※1. Dimensions with ※1 are the same as LC Standard Model and LC-E Model.

2. When the work support touches a workpiece within 0.5mm stroke from the plunger retract-end, a force larger than the value calculated by Workpiece Contact Force Formula on P.771 will be applied to the workpiece.

1. Even if the contact bolt for LC Standard Model/LC-E Model is exchanged with air sensing option, it does not work as air sensing option. Internal part must be changed with air sensor corresponding product.
2. Please contact us for the dimensions of Long Stroke Model.
3. Please refer to P.771, P.772 for Air Sensing Chart.

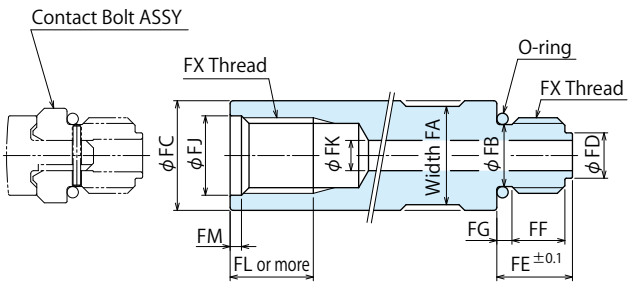
Sensor Pad Design Dimension



※ When replacing the sensor pad, please design it according to the sensor pad design dimensions.

※ When replacing the sensor pad, please be careful not to lose the connecting pin.

Contact Bolt Adapter Design Dimension



※When making a contact bolt adapter, please design it referring to the design dimensions shown above.

Model No. Indication

(Format Example：LC0553-CLM, LC0903-SHM-E)

LC 055 3 – C/S L/H M Blank/– E

1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force
5 Plunger Action Confirmation：M
6 Option

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LC0303-□□M / LC0303-□□M-E	LC0363-□□M / LC0363-□□M-E	LC0403-□□M / LC0403-□□M-E	LC0483-□□M / LC0483-□□M-E	LC0553-□□M / LC0553-□□M-E	LC0653-□□M / LC0653-□□M-E	LC0753-□□M / LC0753-□□M-E	LC0903-□□M / LC0903-□□M-E
Plunger Stroke	6.5	8	8	10	12	14	16	20
Effective Stroke	6.0	7.5	7.5	9.5	11.5	13.5	15.5	19.5
A 6 Blank: Hydraulic Advance	61.5	68	71	79	91	107	135	158
A 6 E: Spring Advance	68	76	79	89	103	121	151	178
D※1	30	36	40	48	55	65	75	90
F※1	21	27.5	31	39	45	56	72	88
T 6 Blank: Hydraulic Advance	13.2	16.9	16.9	16.9	22.9	23.9	31.4	32.9
T 6 E: Spring Advance	19.7	24.9	24.9	26.9	34.9	37.9	47.4	52.9
U※1	10	12	15	16	20	22	25	30
W※1	8	10	13	13	17	19	22	24
X (Nominal×Pitch×Depth)※1	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
BA	8	9.5	10.5	10.5	13.5	13.5	18.5	18.5
BB	3	4	4	4	6	6	9	9
BC	8	10	11	11	14	14	19	19
BD	3	4	4	4	6	6	9	9
BE	9	11.5	12.5	12.5	16.5	16.5	21.5	21.5
BF	SR30	SR30	SR50	SR50	SR80	SR80	SR125	SR125
Pin (Diameter×Length)	ϕ1×4	ϕ1×5.8	ϕ1×7.8	ϕ1×7.8	ϕ2×9.8	ϕ2×9.8	ϕ2×11.8	ϕ2×11.8
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70)	AS568-014 (70)

Note： ※ 1. Dimensions with ※1 are the same as LC Standard Model and LC-E Model.

Sensor Pad Design Dimension List

(mm)

Corresponding Model No.	LC0303-□□M / LC0303-□□M-E	LC0363-□□M / LC0363-□□M-E	LC0403-□□M / LC0403-□□M-E	LC0483-□□M / LC0483-□□M-E	LC0553-□□M / LC0553-□□M-E	LC0653-□□M / LC0653-□□M-E	LC0753-□□M / LC0753-□□M-E	LC0903-□□M / LC0903-□□M-E
EA	$2.5g7^{-0.002}_{-0.012}$	$3g7^{-0.002}_{-0.012}$	$4g7^{-0.004}_{-0.016}$	$4g7^{-0.004}_{-0.016}$	$5g7^{-0.004}_{-0.016}$	$5g7^{-0.004}_{-0.016}$	$6g7^{-0.004}_{-0.016}$	$6g7^{-0.004}_{-0.016}$
EB	9.5	7.5	7.5	7.5	10.5	10.5	13.5	13.5
EC	6	7.5	8.5	8.5	10	10	14	14
ED	0.8	0.8	0.8	0.8	0.8	0.8	1.3	1.3
EE	1.4	1.2	1.2	1.2	2.3	2.3	2.3	2.3
EF	7.5	5.3	5.3	5.3	7.5	7.5	10.5	10.5
EG	1.7	2.1	3.2	3.2	3.9	3.9	5	5
Max. Length※2	max. 6	max. 8	max.8	max.8	max.12	max.12	max.18	max.18

Note： ※2. Sensor response may decrease if the pad is longer than maximum length.

Contact Bolt Adapter Design Dimension List

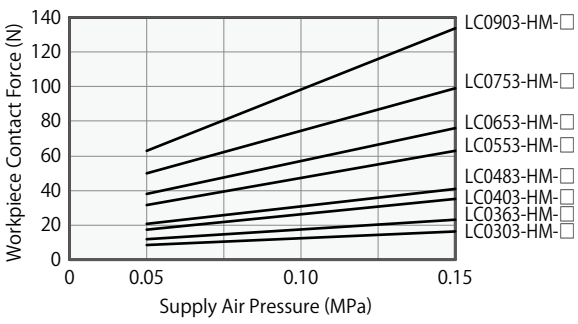
(mm)

Corresponding Model No.	LC0303-□□M-□	LC0363-□□M-□	LC0403-□□M-□ / LC0483-□□M-□	LC0553-□□M-□ / LC0653-□□M-□	LC0753-□□M-□ / LC0903-□□M-□
FA	8	10	13	17	21
FB	4.5	6	8.2	10	13.5
FC	9	11.5	14.5	19.5	24.5
FD	3.5	5	6	7.5	10.5
FE	8	10	10	12	16
FF	6	7	7	8	11
FG	1.5	2	2	3	4
FJ	6.8	8.3	10.5	12.3	16.4
FK	2	3	4	5	6
FL	9	12	11	13	20
FM	1.5	1.5	1.5	1.5	2
FX (Nominal × Pitch)	M6×1	M8×1.25	M10×1.5	M12×1.75	M16×2
O-ring	S5(Made by NOK)	S6(Made by NOK)	S8(Made by NOK)	S10(Made by NOK)	AS568-014(90)
Contact Bolt ASSY	XLD-M6SP	XLD-M8SP	XLC-M10SP	XLC-M12SP	XLC-M16SP
Reference：Material	SCM435 Quenched and Tempered Material				
Reference：Surface Finishing	Nitriding				

Workpiece Contact Force Curve (Reference)

This graph shows the workpiece contact force (reference value) when a work support with Plunger Spring Force **H**：High Spring Force contacts a workpiece in the middle of plunger stroke.

※ Refer to P.771 for the calculation formula of workpiece contact force.



Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Air Sensing Option (Plunger Action Confirmation･･･M：Air Sensing Option)

Plunger action is detected by the circuit at the vent port like the drawing below. This is done by detecting the differential pressure between P1 and P2 with air sensor.

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

Applicable Model

LC 055 3 - [C / S] [L / H / Blank] [M] - [Blank / E / Q / EQ]

5 Plunger Action Confirmation：M

Structure Drawing

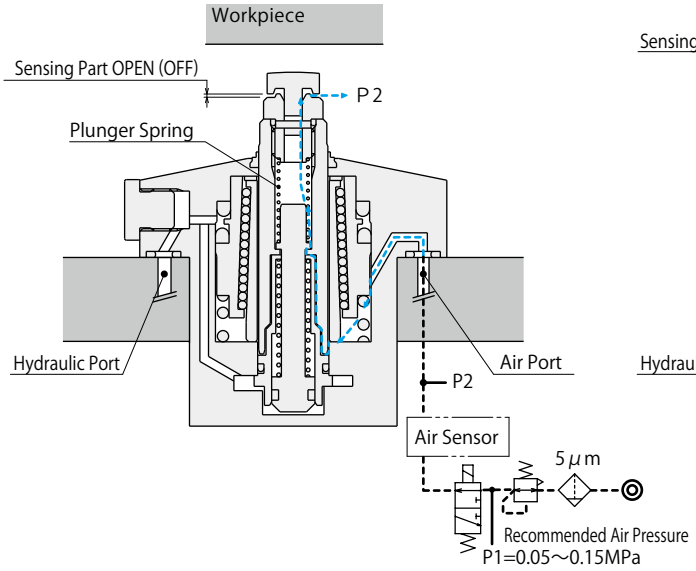
Recommend Air Pressure：0.05 ~ 0.15MPa

Recommended Air Sensor

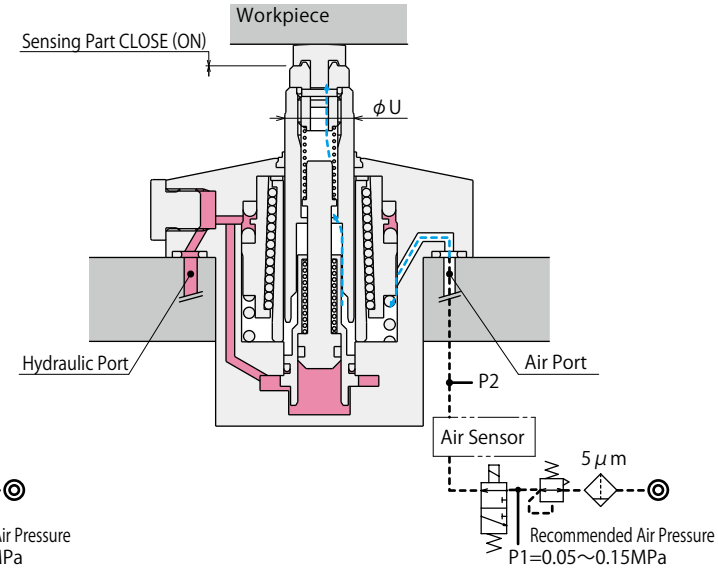
Manufacturer	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model	ISA3-G	GPS3-E

● The Number of Work Supports Connected per Air Sensor：1 ~ 4

LC Released State (Air Sensor OFF)



LC Plunger Extends・Contacts Workpiece (Air Sensor ON)



Workpiece Contact Force Formula when using Air Sensor ※1

$$\text{Workpiece Contact Force (N)} = \text{Plunger Spring Force (N)} + \text{Supply Air Pressure (MPa)} \times U^2\,(\text{mm}) \times \pi \,/\, 4$$

Model No.		LC0303-□□M-□	LC0363-□□M-□	LC0403-□□M-□	LC0483-□□M-□	LC0553-□□M-□	LC0653-□□M-□	LC0753-□□M-□	LC0903-□□M-□
U	mm	10	12	15	16	20	22	25	30
Plunger Spring Force※2	**L**：Low Spring Force	2.8～3.8	3.6～5.6	4.7～7.8	5.8～9.7	8.3～14.6	9.8～14.6	12.4～18.8	14.6～21.0
	H：High Spring Force	3.7～5.5	4.7～7.8	6.2～11.0	7.9～13.6	10.1～21.9	15.8～22.0	18.7～31.9	21.4～34.2
	Q：Long Stroke Model	3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4	10.1～24.8	15.8～28.4	18.7～42.3	21.4～44.0
N	**EQ**：Spring Advance Long Stroke Model								

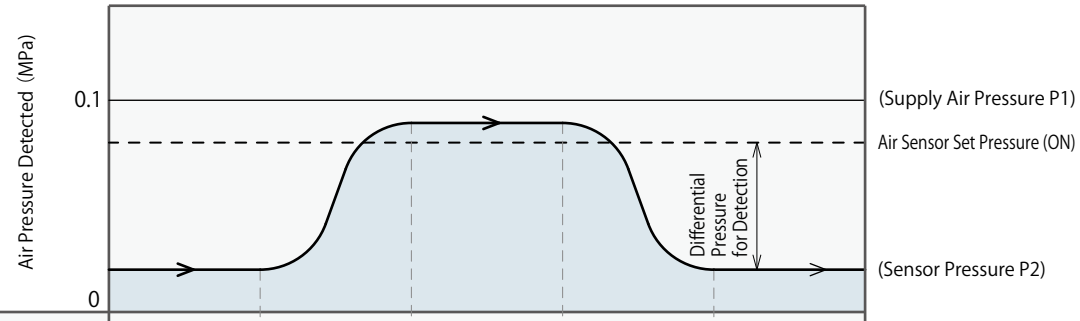
Notes：

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

※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.

Air Sensing Chart

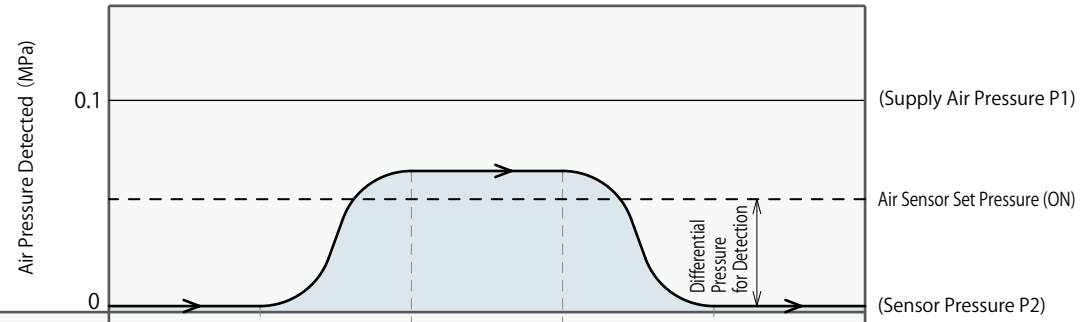
Connect one work support with one air sensor
Supply Pressure of Air Catch Sensor P1=0.1MPa



Air Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Ascending Completed Locking State	Locking Completed	Releasing State Descending State	Releasing Completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Loading Workpiece	Locking Completed	Unloading Workpiece	Releasing Completed

Note : 1. Depending on the usage condition, the detection differential pressure may be decreased by repeated action. Please contact us for overhaul when the detection differential pressure is decreased.

Connect four work supports with one air sensor
Supply Pressure of Air Catch Sensor P1=0.1MPa



Air Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Ascending Completed Locking State	Locking Completed	Releasing State Descending State	Releasing Completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Loading Workpiece	Locking Completed	Unloading Workpiece	Releasing Completed

Notes : 1. Depending on the usage condition, the detection differential pressure may be decreased by repeated action. 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.

Notes

1. This specification is designed for confirming the plunger action of the work support. If it is used for confirming the close contact with the workpiece, other clamping (force) is necessary.
2. If the plunger goes up 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 force. 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 clearance 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. Even if the contact bolt for LC standard model/LC-E model is exchanged with air sensing option, it does not work as air sensing option. Internal part must be changed with air sensor corresponding product.
5. In certain circumstances it has been known for the plunger to move slower through continued use because of the airflow change in the circuit, turn the operating air supply off fully to reset the work support.

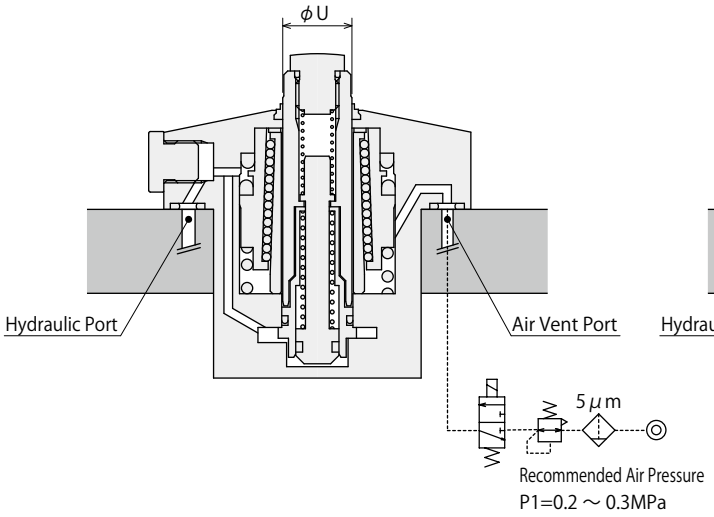
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Air Purge Function

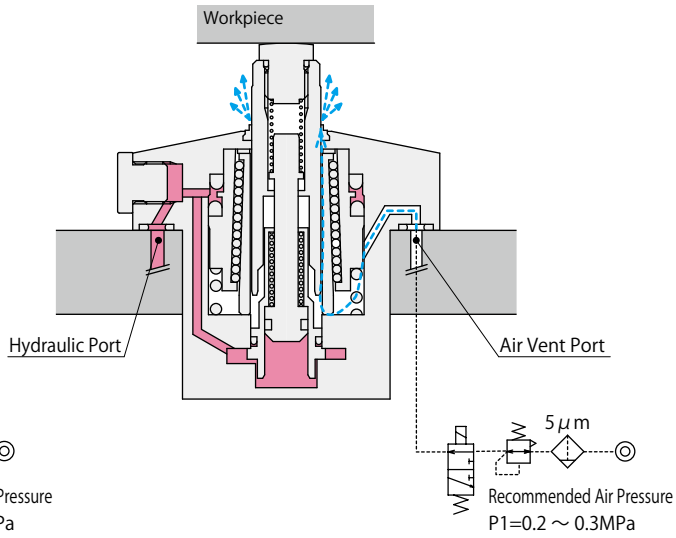
The special dust seal that features low friction and high sealing capabilities is used in LC. However, when using LC in worse condition, air purge function is available by providing the circuit to the air vent port like the drawing below.

Structure Drawing

LC Plunger Descending and at Releasing State (Air Supply OFF) ※1



LC Plunger Ascending and at Locking State (Air Supply ON) ※1



Workpiece Contact Force Formula when Using Air Purge Function ※2

Workpiece Contact Force (N) = Plunger Spring Force (N) + Supply Air Pressure (MPa) × U^2 (mm) × π ／ 4

Model No.		LC0263-□ LC0263-□-E	LC0303-□ LC0303-□-E	LC0363-□ LC0363-□-E	LC0403-□□ LC0403-□□-E	LC0483-□□ LC0483-□□-E	LC0553-□□ LC0553-□□-E	LC0653-□□ LC0653-□□-E	LC0753-□□ LC0753-□□-E	LC0903-□□ LC0903-□□-E
U	mm	7	10	12	15	16	20	22	25	30
Plunger ※3 Spring Force N	**L** :Low Spring Force	2.2~3.0	2.8~3.8	3.6~5.6	4.7~7.8	5.8~9.7	8.3~14.6	9.8~14.6	12.4~18.8	14.6~21.0
	H :High Spring Force	3.0~4.4	3.7~5.5	4.7~7.8	6.2~11.0	7.9~13.6	10.1~21.9	15.8~22.0	18.7~31.9	21.4~34.2

Model No.		LC0263-□-Q LC0263-□-EQ	LC0303-□-Q LC0303-□-EQ	LC0363-□-Q LC0363-□-EQ	LC0403-□-Q LC0403-□-EQ	LC0483-□-Q LC0483-□-EQ	LC0553-□-Q LC0553-□-EQ	LC0653-□-Q LC0653-□-EQ	LC0753-□-Q LC0753-□-EQ	LC0903-□-Q LC0903-□-EQ
U	mm	7	10	12	15	16	20	22	25	30
Plunger Spring Force ※3	N	3.0~5.6	3.8~7.4	4.9~11.4	6.2~12.9	7.8~20.4	10.1~24.8	15.8~28.4	18.7~42.3	21.4~44.0

Notes :

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

※3. 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.

1. Except D：Rodless Hollow Option

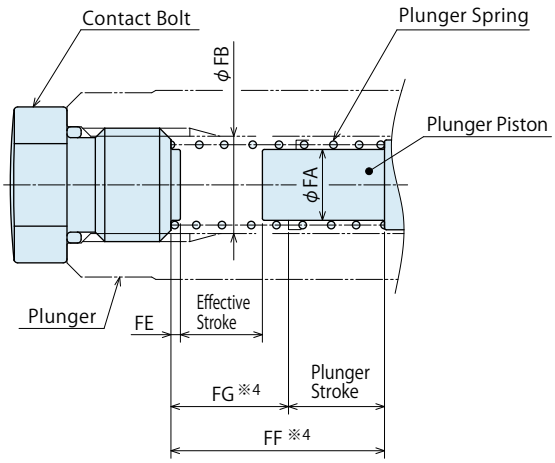
Notes

※1. When the plunger is descending, shut off the air supply. The plunger does not go back when air is supplied.

1. 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 clearance with the workpiece for operation.
2. Air cannot be vented as the air supply pressure is too low because the cracking pressure at the dust seal lip is about 0.1MPa.

Plunger Spring Design Dimension

※Reference for designing a plunger spring by customer other than the included plunger spring.
※This drawing shows the released state.
※Option **E** and **EQ** have no effective stroke range.



Model **LC** 040 **3** - C S L H Blank M - Blank E Q EQ

6 Option

(mm)

Corresponding Model No.	LC0263-□□ LC0263-□-E	LC0303-□□ LC0303-□□M LC0303-□-E LC0303-□□M-E	LC0363-□□ LC0363-□□M LC0363-□-E LC0363-□□M-E	LC0403-□□ LC0403-□□M LC0403-□□-E LC0403-□□M-E	LC0483-□□ LC0483-□□M LC0483-□□-E LC0483-□□M-E	LC0553-□□ LC0553-□□M LC0553-□□-E LC0553-□□M-E	LC0653-□□ LC0653-□□M LC0653-□□-E LC0653-□□M-E	LC0753-□□ LC0753-□□M LC0753-□□-E LC0753-□□M-E	LC0903-□□ LC0903-□□M LC0903-□□-E LC0903-□□M-E
FA	2	3.5	5	6	6	7.5	7.5	10.5	10.5
FB	3.4	5.1	6.8	8.5	8.5	10.3	10.3	14	14
FE	0.5	0.5	1	1	1	1	1	1	1
FF※4	15.9	11.9	15.2	17.6	19.6	22.6	34.6	34.3	46.3
FG※4	9.4	5.4	7.2	9.6	9.6	10.6	20.6	18.3	26.3
Plunger Stroke	6.5	6.5	8	8	10	12	14	16	20
Effective Stroke	6.0	6.0	7.5	7.5	9.5	11.5	13.5	15.5	19.5

(mm)

Corresponding Model No.	LC0263-□-Q LC0263-□-EQ	LC0303-□-Q LC0303-□-EQ	LC0363-□-Q LC0363-□-EQ	LC0403-□-Q LC0403-□-EQ	LC0483-□-Q LC0483-□-EQ	LC0553-□-Q LC0553-□-EQ	LC0653-□-Q LC0653-□-EQ	LC0753-□-Q LC0753-□-EQ	LC0903-□-Q LC0903-□-EQ
FA	2	3.5	5	6	6	7.5	7.5	10.5	10.5
FB	3.4	5.1	6.8	8.5	8.5	10.3	10.3	14	14
FE	0.5	0.5	1	1	1	1	1	1	1
FF※4	29.8	22.6	26.6	28.6	36.2	40.5	49.5	53.5	66.9
FG※4	16.8	9.6	10.6	12.6	16.2	16.5	21.5	21.5	26.9
Plunger Stroke	13	13	16	16	20	24	28	32	40
Effective Stroke	12.5	12.5	15.5	15.5	19.5	23.5	27.5	31.5	39.5

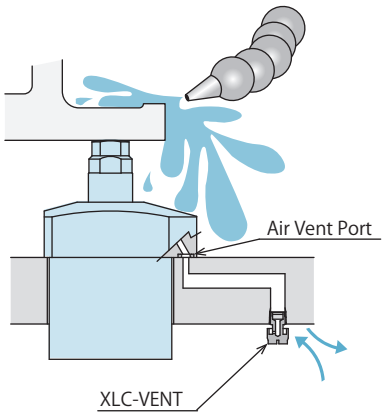
Note :
※4. When designing a spring, make sure that the spring set length is below FF dimension and the spring contact length is below FG dimension.

Accessory (Corresponding Model No. LC / TC-C : Gasket Option)



Appropriate Measures for Air Vent Ports

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 an air vent port, it may not function properly.



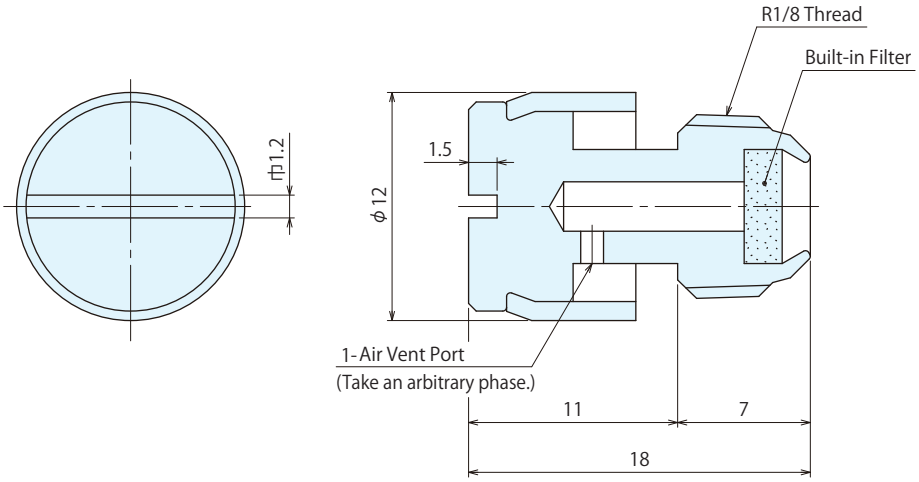
Model No . Indication

XLC-VENT

Specifications

Model No.		XLC-VENT
Filtration Precision of Filter	μm	40
Tightening Torque	N•m	2

Internal Structure



※ For installation, use a screw driver and tighten it with the tightening torque shown above.

MEMO

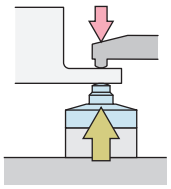
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

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 support force at more than 1.5 times the clamping force.

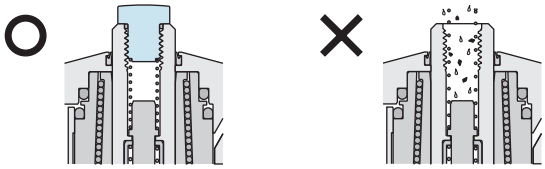


Support Force ≧ Clamping Force × 1.5

2) Notes for Circuit Design
- 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.1356)

3) Install a temporary stopper for a workpiece if necessary.
- When multiple work supports are used for a light workpiece, the plunger spring force may be higher than the workpiece weight, causing the workpiece to be pushed up.

4) An attachment is required for the plunger.
- Make sure that an attachment is installed to the plunger. Otherwise, the plunger does not advance since the plunger spring is free to move.
- Make sure to set the O-ring to the attachment. Otherwise, cutting fluid or other contaminants will get in easily, causing malfunction.

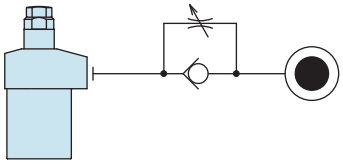


5) Protect the plunger surface when using on a welding fixture.
- If spatter attaches to the sliding surface it may lead to a sliding failure and an insufficient support function.

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.

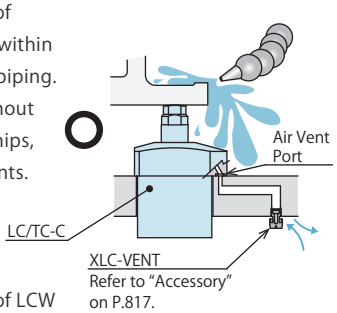
8) Adjust the plunger operation time with flow rate.
- A rough guideline for the full stroke is between 0.5 and 1 second.
- As with single-action cylinders, use a flow regulating valve with a check valve (meter-in) in consideration of the decreasing speed at release.
- If the action speed is too fast, the plunger may bounce back and locks itself resulting in a gap with the workpiece.
- Use a flow regulating 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.



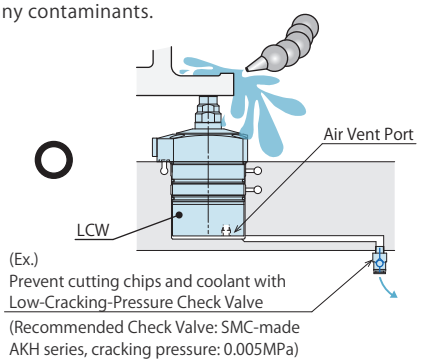
9) Appropriate Measures for the Air Vent Port
- The work support, although only slightly, breathes like a single-acting cylinder. Consider the environment and avoid cutting fluid, coolant or any contaminants.
- If using it without an air vent port, it will not function properly.

【Example】

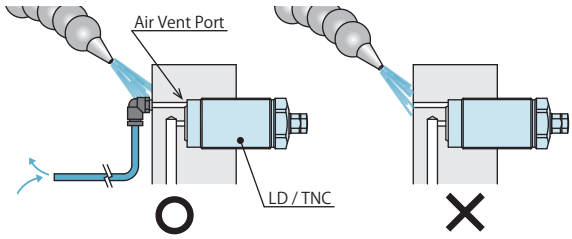
① Prepare the air vent port of LC / TC-C : Gasket Option within the fixture with manifold piping. Make sure it breathes without the influence of cutting chips, coolant or any contaminants.



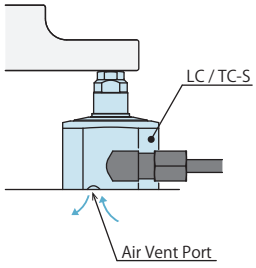
② Prepare the air vent port of LCW within the fixture with manifold piping. Make sure it breathes without the influence of cutting chips, coolant or any contaminants.



③ Prepare the air vent port of LD/TNC with the external piping. Make sure it breathes without the influence of cutting chips, coolant or any contaminants.

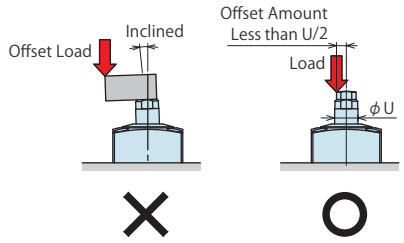


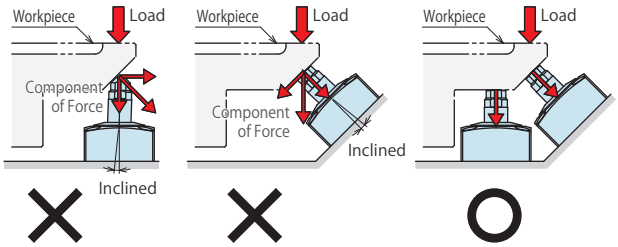
④ The air vent port of LC/TC-S：Piping Option must be open to the atmosphere. Select -C : Gasket Option if coolant or any contaminants enter from the air vent port.



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

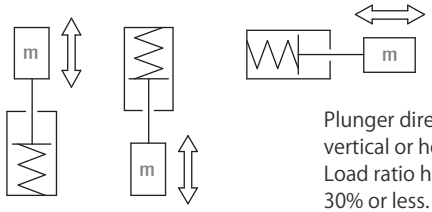
- If using the product as illustrated below, the displacement against load will be increased. Also large load will damage the internal parts.





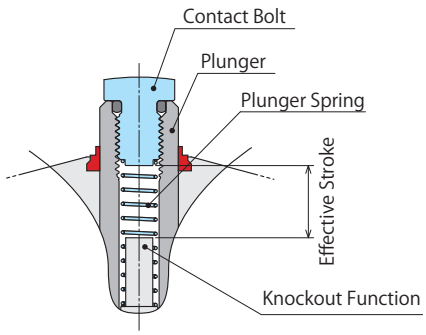
11) The Weight of an Attachment

- When designing an attachment, make sure the attachment weight is 30% or less of the plunger spring force.



Plunger direction either vertical or horizontal : Load ratio has to be 30% or less.

- Ex.) In case of LC0403-L with the plunger spring force 4.7-7.8N.
  The maximum weight of the contact bolt = 4.7×0.3/9.807=0.14kg
  Since it may vary depending on sliding resistance of the plunger and characteristic of the spring, it is recommended to design the contact bolt as light as possible.
- The dimensions of the mounting thread area need to be processed according to the design dimensions for contact bolts as shown on the respective product pages.
  The knockout function is used together to release fixation of plunger spring and adherence after machine stop for a long time. Using an attachment with different thread part dimension leads to inappropriate spring force and effective stroke, causing damage and malfunctions.



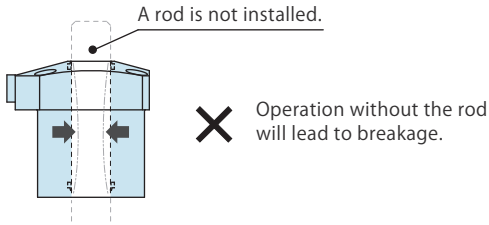
12) For Replacing Sensor Pads of LCW

- Please design a sensor pad according to Sensor Pad Design Dimensions on P.XX. (Contact us for replacing contact bolts.)

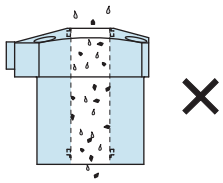
  Sensor response may decrease if the sensor pad is longer than maximum length shown in the sensor pad design dimensions.

13) Notes on **D** : Rodless Hollow Model

- Do not supply hydraulic pressure without a rod installed.
  The collet will be deformed leading to release failure.



- Make sure the rod is always inserted during the operation.
  At the rodless state, contaminants and cutting chips enter into the product leading to malfunctions.



※ Please refer to P.1355 for common cautions.
・Installation Notes ・Hydraulic Fluid List ・Notes on Hydraulic Cylinder Speed Control Circuit
・Notes on Handling ・Maintenance/Inspection ・Warranty

Cautions

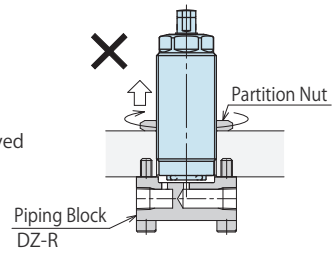
Notes for Design

12) Notes on Mounting Method of LD/TNC (Threaded Model)

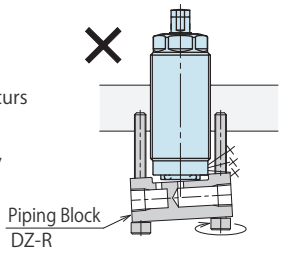
● When mounting LD/TNC, make sure the base is horizontal to the bearing surface, and the load is received at the base. With the following installations, the load cannot be received at the base, leading to increase of displacement amount and damage on the product.

【Examples of Improper Use】

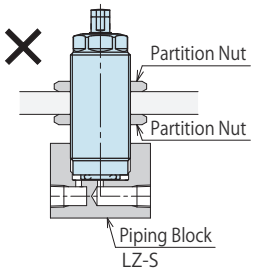
① Work support is lifted up by tightening the partition nut, and the load cannot be received on the bearing surface.



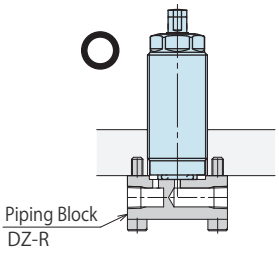
② Bearing surface contact part is not horizontal, a clearance occurs and it cannot receive the load. Moreover, there is a possibility of damaging equipment by tightening bolts.



③ Since the piping block to receive the load is floated, it cannot receive the load.



【Example of Proper Use】



Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1355).

2) Installation of the Product

- When mounting LC/LCW/TC (Flanged Model), use hexagonal 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)
LC	LC0263	M3×0.5	1.3
	LC0303	M4×0.7	3.2
	LC0363	M4×0.7	3.2
	LC0403	M5×0.8	6.3
	LC0483	M5×0.8	6.3
	LC0553	M6×1	10
	LC0653	M6×1	10
	LC0753	M8×1.25	25
	LC0903	M10×1.5	50
LCW	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
TC	TC0403	M5×0.8	6.3
	TC0483	M5×0.8	6.3
	TC0553	M6×1	10
	TC0653	M6×1	10
	TC0753	M8×1.25	25

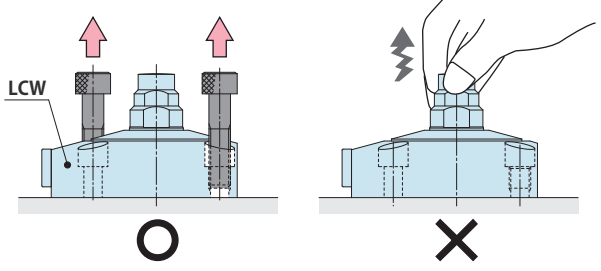
- For LD/TNC (Threaded Model), be careful not to damage the O-ring for sealing the base. Tighten them with the torque shown in the table below.

Model No.		Thread Size	Tightening Torque (N·m)
LD	LD0163	M16×1.0	8
	LD0223	M22×1.5	16
	LD0263	M26×1.5	31.5
	LD0303	M30×1.5	50
	LD0363	M36×1.5	63
	LD0453	M45×1.5	80
TNC	TNC0403	M26×1.5	31.5
	TNC0603	M30×1.5	50
	TNC1003	M36×1.5	63
	TNC1603	M45×1.5	80

- 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.

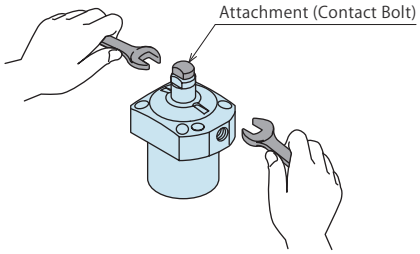
3) Removal of LCW

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



3) Replacement of Attachment

- Be careful not to lose the plunger spring.
- In a state that supplying pressure to the work support is released, stop the plunger with a spanner at its front end and tighten it with the tightening torque as shown in the following table.



Model No.		Head Thread Size	Tightening Torque (N·m)
LC	LC0263	M4×0.7	1.6
	LC0303	M6×1	5
	LC0363	M8×1.25	10
	LC0403	M10×1.5	16
	LC0483	M10×1.5	16
	LC0553	M12×1.75	40
	LC0653	M12×1.75	40
	LC0753	M16×2	80
	LC0903	M16×2	80
LCW	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
TC	TC0403	M10×1.5	16
	TC0483	M12×1.75	40
	TC0553	M12×1.75	40
	TC0653	M16×2	80
	TC0753	M16×2	80
LD	LD0163	M3×0.5	0.6
	LD0223	M4×0.7	1.6
	LD0263	M6×1	5
	LD0303	M8×1.25	10
	LD0363	M10×1.5	16
	LD0453	M10×1.5	16
TNC	TNC0403	M8×1.25	10
	TNC0603	M10×1.5	16
	TNC1003	M10×1.5	16
	TNC1603	M12×1.75	40

※ Please refer to P.1355 for common cautions. • Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit • Notes on Handling • Maintenance/Inspection • Warranty

Cautions

Installation Notes (For Hydraulic Series)

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 prevents foreign materials and contaminants from getting into the circuit.

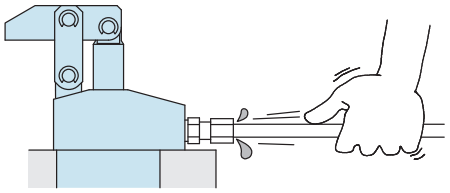
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

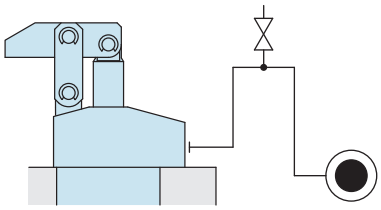
4) Air Bleeding of the Hydraulic Circuit

- 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 clamp by one full turn.
③ Shake 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 release air at the highest point inside the circuit or at the end of the circuit.
(Set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening

- At the beginning of the machine 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	

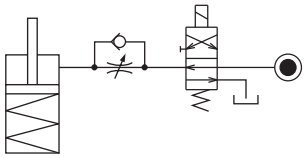
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

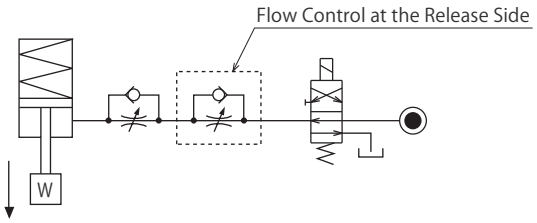
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.



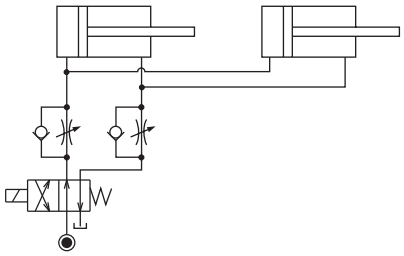
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



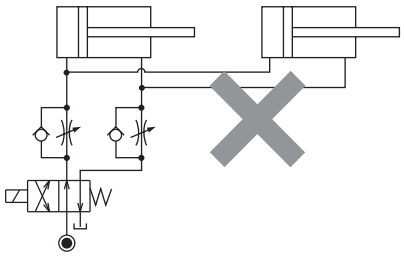
Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.75 for speed adjustment of LKE.
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)

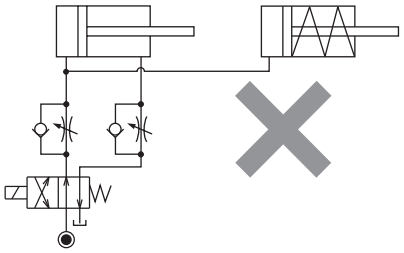


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



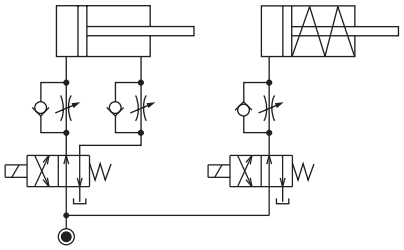
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

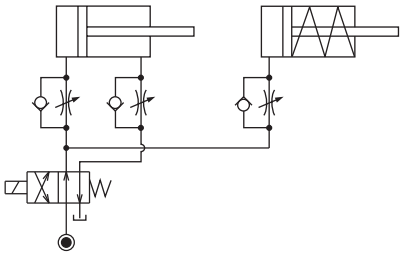


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

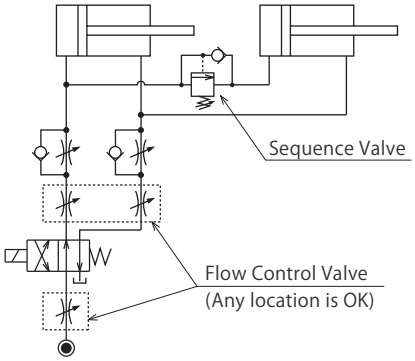
○ Separate the control circuit.



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



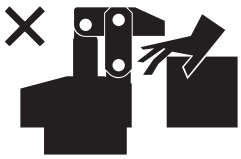
Cautions

Notes on Handling

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

2) Do not operate 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 safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices 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 drops.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured due to clinching.

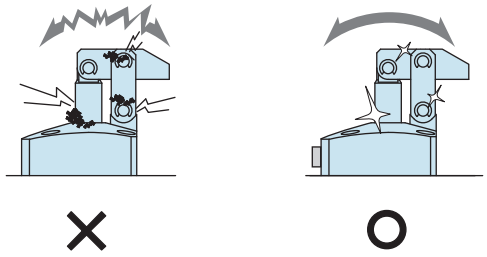


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

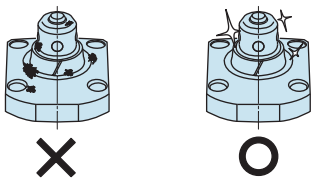
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices 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 piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning and fluid leakage.



3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
- The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
- Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



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

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

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

9) 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 operated in an 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.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Cautions
Installation Notes (For Hydraulic Series)
Hydraulic Fluid List
Notes on Hydraulic Cylinder Speed Control Circuit
Notes on Handling
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Company Profile
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History

Index
Search by Alphabetical Order

Sales Offices

Control Valve

Model BZL
Model BZT
Model BZX
Model JZG
Model BZS



Directly-Attached Speed Control Valve, Air Bleed Valve, G-Thread Plug and Sequence Valve

● Directly Attached to Clamps

Control Valves :
Speed control valve, air bleed valve, G-thread plug and sequence valve attached directly into Kosmek hydraulic clamp G-thread piping option.



Speed Control Valve



Speed Control Valve

Model BZL
Model BZT



Air Bleed Valve

Model BZX



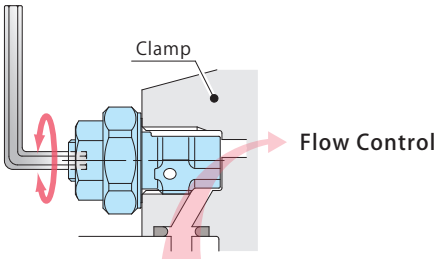
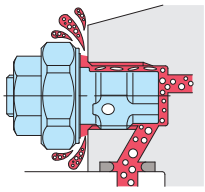
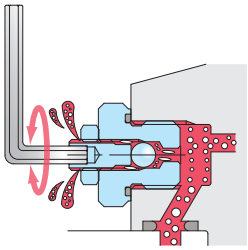
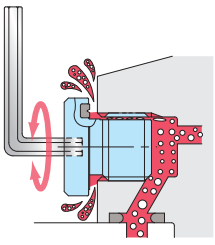
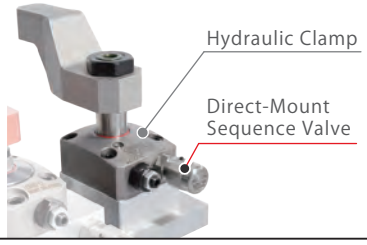
G Thread Plug

Model JZG



Direct-Mount Sequence Valve

Model BZS

	Operating Pressure Range	Action Description
Speed Control Valve (For Low Pressure) Model **BZL** → P.949 	7MPa or less	Adjust the flow rate with a wrench. Able to adjust the clamping speed individually. 
Speed Control Valve (For High Pressure) Model **BZT** → P.953	35MPa or less	Air bleeding in the circuit is possible by loosening the speed control valve. 
Air Bleed Valve Model **BZX** → P.955 	35MPa or less	Air bleeding in the circuit is possible by wrench. 
G Thread Plug Model **JZG** → P.957 	35MPa or less	Air bleeding in the circuit is possible by loosening the G thread plug. 
Direct-Mount Sequence Valve Model **BZS** → P.959 	7MPa or less	Sequence Valve directly attaches to KOSMEK hydraulic clamp's G-thread piping option. Controls the operating sequence of each actuator. 

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

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

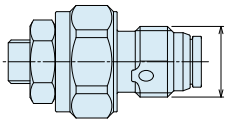


BZL 0 10 1 - B

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread
20 : Thread Part G1/4A Thread
30 : Thread Part G3/8A Thread



2 Design No.

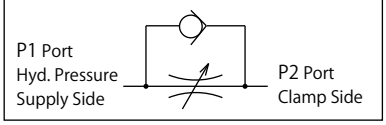
1 : Revision Number

3 Control Method

A : Meter-in
B : Meter-out

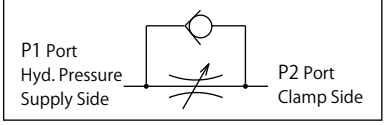
A

Circuit Symbol : Meter-in



B

Circuit Symbol : Meter-out



Specifications

Model No.		BZL0101-A	BZL0201-A	BZL0301-A	BZL0101-B	BZL0201-B	BZL0301-B
Max. Operating Pressure	MPa	7					
Withstanding Pressure	MPa	10.5					
Control Method		Meter-in			Meter-out		
G Thread Size		G1/8A	G1/4A	G3/8A	G1/8A	G1/4A	G3/8A
Cracking Pressure	MPa	0.04			0.12		
Max. Passage Area	mm^2	2.6	5.0	11.6	2.6	5.0	10.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32					
Operating Temperature	℃	0 ~ 70					
Tightening Torque for Main Body	N·m	10	25	35	10	25	35
Weight	g	12	26	48	12	26	48

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 clamps. Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support
BZL0101-A	(DBA0250-C□) (DBA0320-C□)	(DBC0250-C□) (DBC0320-C□)	(FVA0401) (FVA0631) (FVA1001)	(FVC0630)	(FVD1600) (FVD2500)	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□
BZL0101-B	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500		
BZL0201-A	(DBA0400-C□) (DBA0500-C□)	(DBC0400-C□) (DBC0500-C□)		(FVC1000) (FVC1600)	(FVD4000)	LC0753-C□□-□ LC0903-C□□-□	
BZL0201-B	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000		

Applicable Products

Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZL0101-A	(LHA0360-C□□-□) (LHA0400-C□□-□) (LHA0480-C□□-□) (LHA0550-C□□-□)	(LHC0360-C□□-□) (LHC0400-C□□-□) (LHC0480-C□□-□) (LHC0550-C□□-□)	(LHD0400-C□-□) (LHD0480-C□-□) (LHD0550-C□-□)		(LHS0360-C□□-□) (LHS0400-C□□-□) (LHS0480-C□□-□) (LHS0550-C□□-□)	(LHV0400-C□E-□) (LHV0480-C□E-□) (LHV0550-C□E-□)	(LHW0401-C□□-□) (LHW0481-C□□-□) (LHW0551-C□□-□)	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
BZL0101-B	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□		
BZL0201-A	(LHA0650-C□□-□) (LHA0750-C□□-□)	(LHC0650-C□□-□)			(LHS0650-C□□-□) (LHS0750-C□□-□)	(LHV0650-C□E-□) (LHV0750-C□E-□)	(LHW0651-C□□-□) (LHW0751-C□□-□)	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
BZL0201-B	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□		
BZL0301-A	(LHA0900-C□□-□) (LHA1050-C□□-□)				(LHS0900-C□□-□) (LHS1050-C□□-□)				LG0901-C□-□ LG1051-C□-□
BZL0301-B	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				

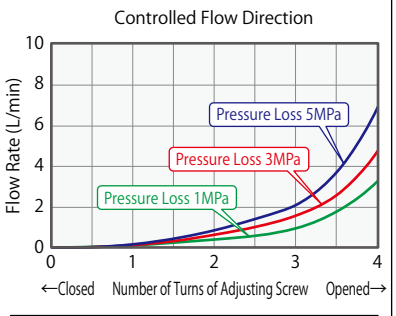
Model No.	LGV (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp
BZL0101-A	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	(LKA0360-C□□-□) (LKA0400-C□□-□) (LKA0480-C□□-□) (LKA0550-C□□-□)	(LKC0400-C□-□) (LKC0480-C□-□) (LKC0550-C□-□)	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	(LKK0360-C-□) (LKK0400-C-□) (LKK0480-C-□) (LKK0550-C-□)	(LKV0400-C□E-□) (LKV0480-C□E-□) (LKV0550-C□E-□)	(LKW0401-C□□-□) (LKW0481-C□□-□) (LKW0551-C□□-□)	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□
BZL0101-B		LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□		LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□		
BZL0201-A	LGV0650-C□□ LGV0750-C□□	(LKA0650-C□□-□) (LKA0750-C□□-□)	(LKC0650-C□-□)		(LKK0650-C-□)	(LKV0650-C□E-□) (LKV0750-C□E-□)	(LKW0651-C□□-□) (LKW0751-C□□-□)	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□
BZL0201-B		LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□		
BZL0301-A		(LKA0900-C□□-□) (LKA1050-C□□-□)							LJ0902-C□ LJ1052-C□
BZL0301-B		LKA0900-C□□-□ LKA1050-C□□-□							

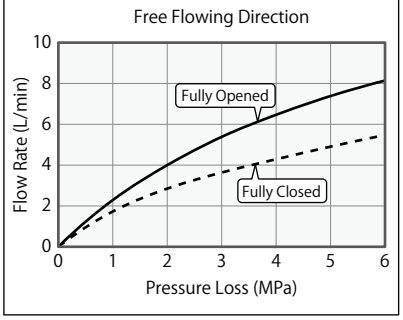
Model No.	LJV (Single Action) Link Clamp	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder
BZL0101-A	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□	(LFW0480-C□J) (LFW0550-C□J)	(LFA0480-C□□) (LFA0550-C□□)	(LSA0360-C-□)	LSE0360-C-□	(LL0360-C□□-□) (LL0400-C□□-□) (LL0480-C□□-□) (LL0550-C□□-□)	(LLR0360-C□□-□-□) (LLR0400-C□□-□-□) (LLR0480-C□□-□-□) (LLR0550-C□□-□-□)	(LLV0360-C□E-□) (LLV0400-C□E-□) (LLV0480-C□E-□)	(LLW0361-C□□-□) (LLW0401C□□-□) (LLW0481-C□□-□)
BZL0101-B		LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□		LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□
BZL0201-A	LJV0650-C□□ LJV0750-C□□	(LFW0650-C□J) (LFW0750-C□J)	(LFA0650-C□□) (LFA0750-C□□)			(LL0650-C□□-□) (LL0750-C□□-□)	(LLR0650-C□□-□-□) (LLR0750-C□□-□-□)		
BZL0201-B		LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□		
BZL0301-A						(LL0900-C□□-□) (LL1050-C□□-□)	(LLR0900-C□□-□-□) (LLR1050-C□□-□-□)		
BZL0301-B						LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□		

Note : 1. Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides (except model LKE/LSE). Meter-in circuits can be adversely affected by any air in the system.

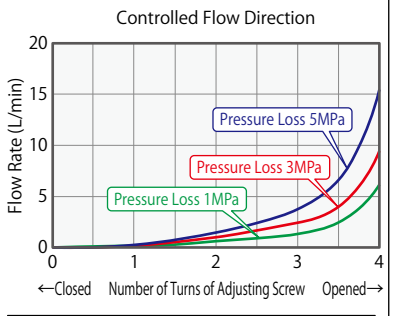
Flow Rate Graph ＜Hydraulic Fluids ISO-VG32（25～35℃）＞

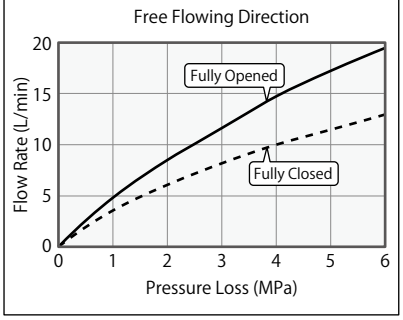
BZL0101-A：Meter-in



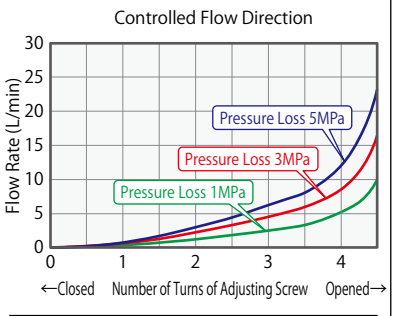


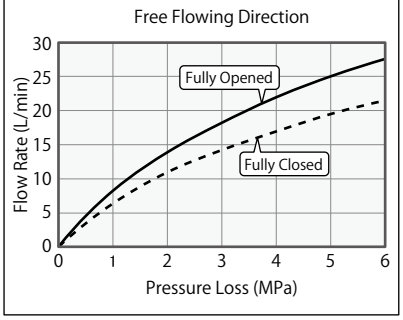
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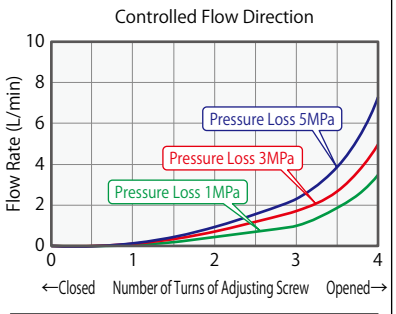


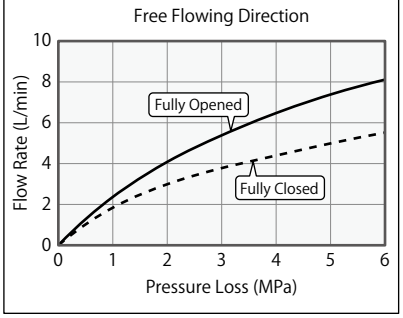
BZL0301-A：Meter-in



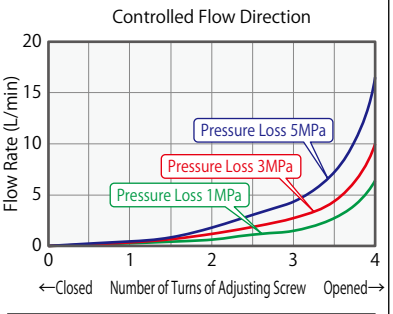


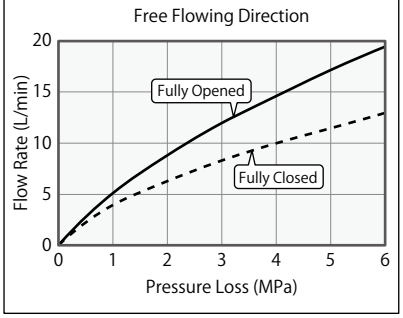
BZL0101-B：Meter-out



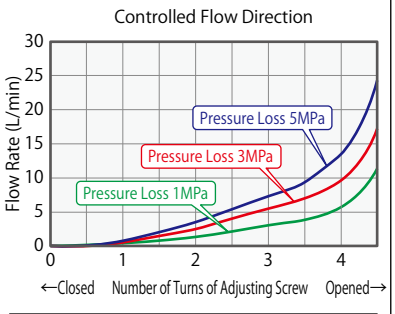


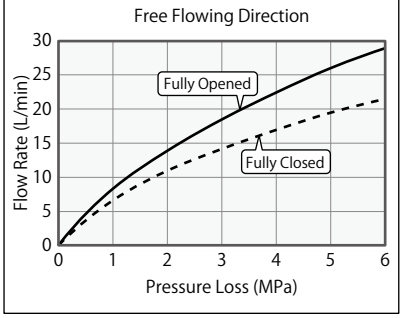
BZL0201-B：Meter-out



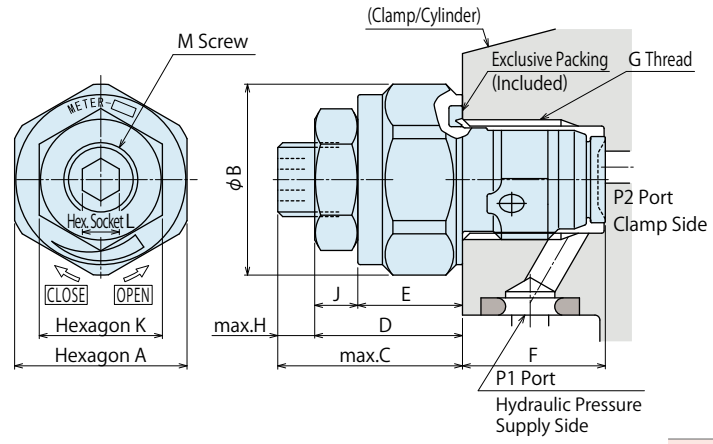


BZL0301-B：Meter-out

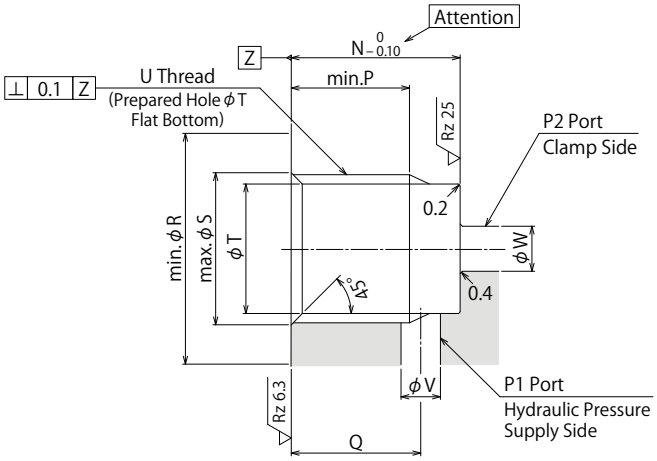




External Dimensions



Machining Dimensions of Mounting Area



(mm)

Model No.	BZL0101-□	BZL0201-□	BZL0301-□
A	14	18	22
B	15.5	20	24
C	15	16	19
D	12	13	16
E	8.5	9.5	11
F	(11.6)	(15.1)	(17.6)
G	G1/8	G1/4	G3/8
H	3	3	3
J	3.5	3.5	5
K	10	10	13
L	3	3	4
M (Nominal×Pitch)	M6×0.75	M6×0.75	M8×0.75
N	11.5	15	17.5
P	8.5	11※1	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Notes :

1. Since the ▽Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ▽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.
5. If mounting plugs or fittings with G thread specification available in the market, the dimension '※1' should be 12.5.

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.1356)
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.)

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Model No. Indication (Air Bleed Valve)

BZX0 1 0

1 2

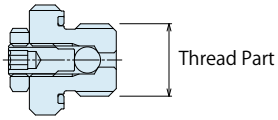


1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



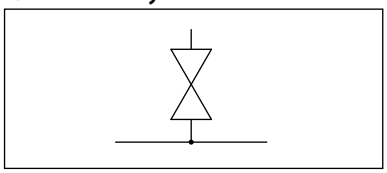
2 Design No.

0 : Revision Number

Specifications

Model No.		BZX010	BZX020	BZX030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body	N·m	10	25	35
Weight	g	12	23	36

Circuit Symbol



Notes : 1. Do not over-loosen the plug during air venting.
(Do not loosen further than 2 turns from the fully closed position.)
2. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
3. Refer to the machining dimensions of BZL mounting area when installing BZX into a hydraulic circuit.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support	TC (Single Action) Work Support
BZX010	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□	TC0403-C□-□-□ TC0483-C□-□-□ TC0553-C□-□-□ TC0653-C□-□-□ TC0753-C□-□-□
BZX020	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000	LC0753-C□□-□ LC0903-C□□-□		

Applicable Products

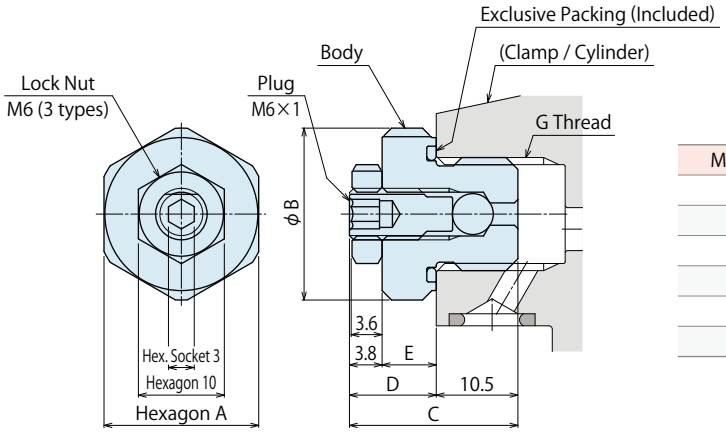
Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZX010	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
BZX020	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
BZX030	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□

Model No.	LGV (Single Action) Swing Clamp
BZX010	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□
BZX020	LGV0650-C□□ LGV0750-C□□
BZX030	

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZX010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
BZX020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
BZX030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

Model No.	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder	TTA (Double Action) Linear Cylinder
BZX010	LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□	TTA0360-C□-□ TTA0400-C□-□ TTA0480-C□-□ TTA0550-C□-□
BZX020	LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□			TTA0650-C□-□
BZX030					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□			

External Dimensions



(mm)

Model No.	BZX010	BZX020	BZX030
A	14	18	22
B	15.5	20	24
C	19.8	20.6	20.6
D	9.3	10.1	10.1
E	5.5	6.3	6.3
G	G1/8	G1/4	G3/8

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Model No. Indication (G Thread Plug with Air Bleeding Function) PAT.

JZG0 1 0

1 2

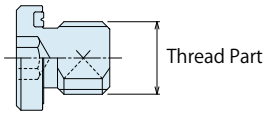


1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



2 Design No.

0 : Revision Number

Specifications

Model No.		JZG010	JZG020	JZG030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body N·m	Female Thread Side Material : Steel	10	25	35
	Female Thread Side Material : Aluminum (For LT/LM※1)	8	20	28
Weight	g	7	15	23

Notes : 1. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
2. Refer to the machining dimensions of BZL mounting area when installing JZG into a hydraulic circuit.
※1. Body material of LT/LM is aluminum alloy, so install it with the tightening torque for aluminum.

Applicable Products

Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
JZG010	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
JZG020	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
JZG030	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□

Model No.	LGV (Single Action) Swing Clamp	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support	TC (Single Action) Work Support
JZG010	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□	TC0403-C□-□-□ TC0483-C□-□-□ TC0553-C□-□-□ TC0653-C□-□-□ TC0753-C□-□-□
JZG020	LGV0650-C□□ LGV0750-C□□	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000	LC0753-C□□-□ LC0903-C□□-□		

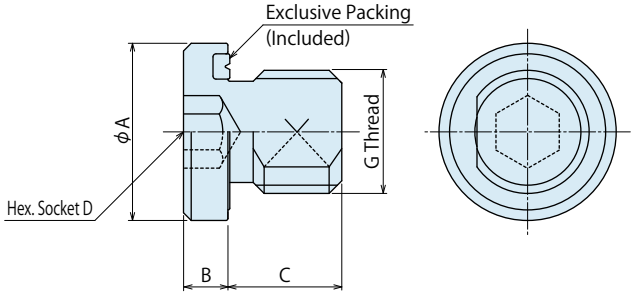
Applicable Products

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
JZG010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
JZG020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
JZG030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

Model No.	TLA-1 (Single Action) Swing Clamp	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLV-2 (Double Action) Swing Clamp	TMA-1 (Double Action) Link Clamp	TMA-2 (Double Action) Link Clamp	TMV-2 (Double Action) Link Clamp
JZG010	TLA0402-1C□ TLA0602-1C□ TLA0802-1C□ TLA1002-1C□ TLA1602-1C□	TLA0401-2C□-□ TLA0601-2C□-□ TLA0801-2C□-□ TLA1001-2C□-□ TLA1601-2C□-□	TLB0401-2C□-□ TLB0601-2C□-□ TLB0801-2C□-□ TLB1001-2C□-□ TLB1601-2C□-□	TLV0800-2C□□ TLV1000-2C□□ TLV1600-2C□□	TMA0250-1C□ TMA0400-1C□ TMA0600-1C□ TMA1000-1C□	TMA0250-2C□ TMA0400-2C□ TMA0600-2C□ TMA1000-2C□	TMV0400-2C□□ TMV0600-2C□□ TMV1000-2C□□
JZG020	TLA2002-1C□ TLA2502-1C□ TLA4002-1C□	TLA2001-2C□-□ TLA2501-2C□-□ TLA4001-2C□-□	TLB2001-2C□-□ TLB2501-2C□-□ TLB4001-2C□-□	TLV2000-2C□□	TMA1600-1C□ TMA2500-1C□ TMA3200-1C□	TMA1600-2C□ TMA2500-2C□ TMA3200-2C□	TMV1600-2C□□

Model No.	LFA (Double Action) Link Clamp	LFW (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder	TTA (Double Action) Linear Cylinder
JZG010	LFA0480-C□□ LFA0550-C□□	LFW0480-C□J LFW0550-C□J	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□	TTA0360-C□-□ TTA0400-C□-□ TTA0480-C□-□ TTA0550-C□-□
JZG020	LFA0650-C□□ LFA0750-C□□	LFW0650-C□J LFW0750-C□J			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□			TTA0650-C□-□
JZG030					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□			

External Dimensions



(mm)

Model No.	JZG010	JZG020	JZG030
A	14	18	22
B	3.5	4.5	4.5
C	8	9	10
D	5	6	8
G	G1/8A	G1/4A	G3/8A

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

PAT.P.

Direct-Mount Sequence Valve

Model BZS



Attaches directly into Kosmek hydraulic clamps G-thread piping option.
Easily and securely controls the operating sequence of actuators.

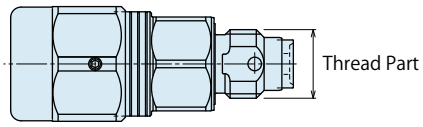
Model No. Indication

BZS 0 10 0

1 2

1 G Thread Size

10 : G1/8A Thread
20 : G1/4A Thread
30 : G3/8A Thread



2 Design No.

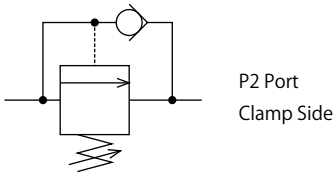
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Specifications

Model No.		BZS0100	BZS0200	BZS0300
Sequence Operating Pressure Adjustable Range MPa		1.0 ~ 6.0		
Operating Pressure Range MPa		2.0 ~ 7.0		
Withstanding Pressure MPa		10.5		
G Thread Size		G1/8A	G1/4A	G3/8A
Cracking Pressure MPa		0.03		
Adjusting Screw Turn Ratio:Reference MPa/Rev		1.5	1.3	1.1
Min. Passage Area	P1 → P2	2.0	5.7	8.5
mm^2	P2 → P1	2.0	5.0	8.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature ℃		0 ~ 70		
Tightening Torque N·m		10	25	35
Weight g		35	82	155

Notes: 1. Please mount to an actuator using Hex. E shown in External Dimensions on P.961A with the tightening torque shown in the list above. Insufficient or excessive tightening torque leads to malfunction.
2. Do not attach a used BZS to other clamps. Sequence movement may not be done because the bottom depth difference of G thread makes metal sealing insufficient.
3. The difference between the set pressure and the supplying pressure should be 1MPa or more.
4. For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
5. Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate. (Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
6. Filter is not built in this product. Please note that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.

Circuit Symbol



※ No built-in filter provided.

What is a Sequence Valve?

The sequence valve controls the clamping and positioning sequence of multiple actuators.

When the incoming side pressure (P1 port) reaches the sequence setting pressure value, the pressure will be supplied to the outgoing side (P2 port). Refer to P.961B for the action description.

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp
BZS0100	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□
BZS0200	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600※1	FVD4000	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□		
BZS0300						LHA0900-C□□-□ LHA1050-C□□-□			

Model No.	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp	LGV (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp
BZS0100	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□
BZS0200	LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□	LGV0650-C□□ LGV0750-C□□	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□	
BZS0300	LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□		LKA0900-C□□-□ LKA1050-C□□-□		

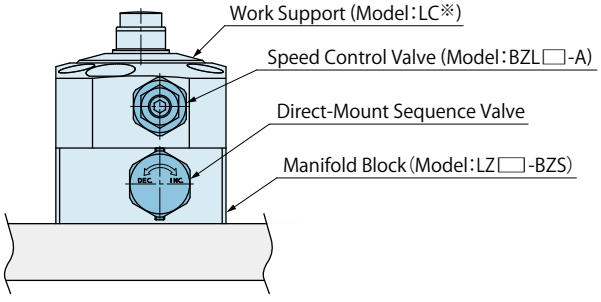
Model No.	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZS0100	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
BZS0200	LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
BZS0300					LJ0902-C□ LJ1052-C□	

Model No.	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder
BZS0100	LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□	LSE0360-C-□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□
BZS0200	LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□		
BZS0300					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□		

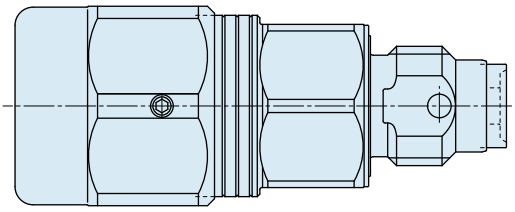
Note : ※1. It is not possible to install two BZS valves to FVC1000.

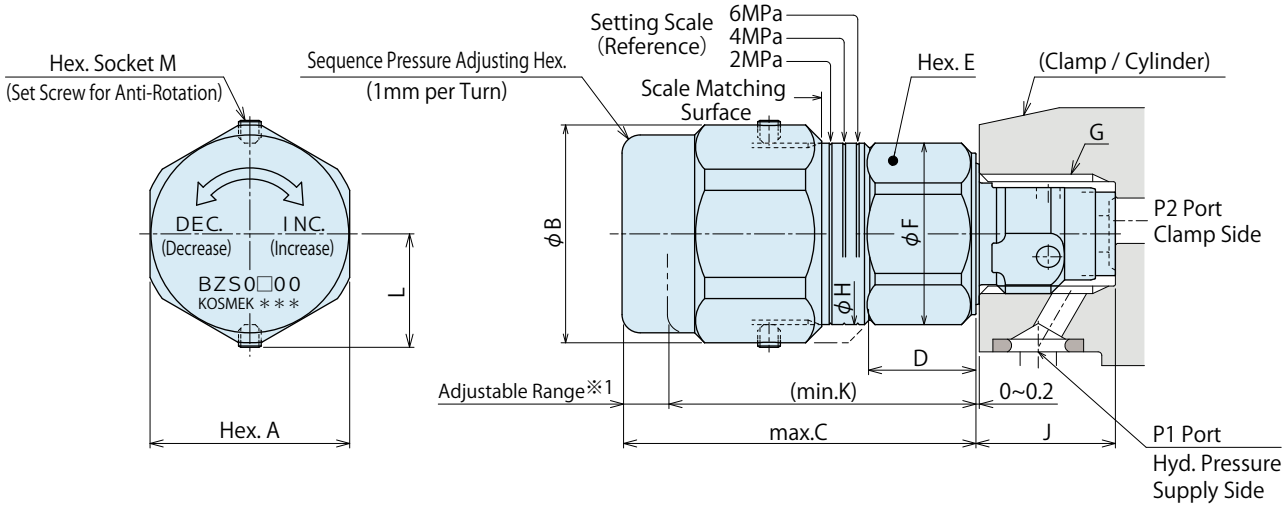
【In case of Work Support】

For using Direct-Mount Sequence Valve for Work Support (Model:LC※), mount Speed Control Valve (Model:BZL□-A) on Work Support and mount Direct-Mount Sequence Valve on the Manifold Block as shown in the drawing below.
Please refer to P.962A for Manifold Block (Model:LZ□-BZS).
※Please contact us when considering the installation to model LCW.

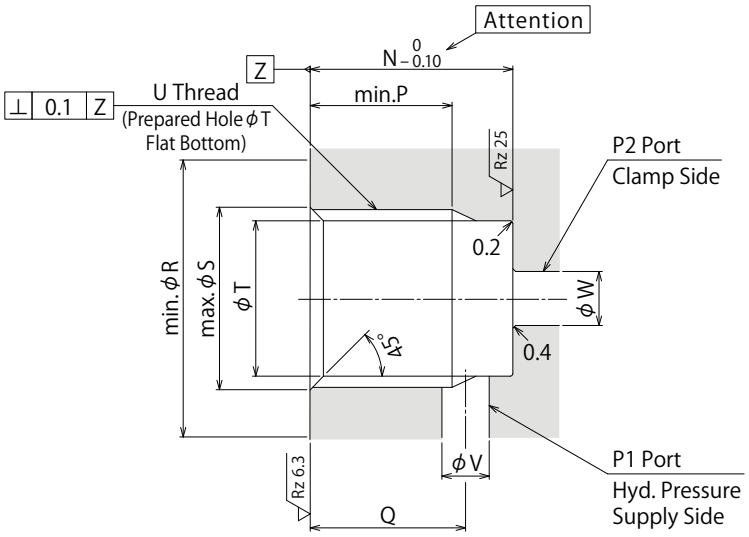


External Dimensions





Machining Dimensions of Mounting Area



(mm)

Model No.	BZS0100	BZS0200	BZS0300
A	16	22	27
B	17.5	24	29.5
C	30.5	39	49.5
D	7.5	12	15
E	14	18	22
F	15.5	20	24
G	G1/8	G1/4	G3/8
H	13.8	20	24
J ※2	(11.6)	(15.1)	(17.6)
K	(26.5)	(34)	(44)
L	9.5	12.5	15
M	1.3	1.3	1.5
N	11.5	15	17.5
P	8.5	11※3	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Notes:

1. Since the ▽Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ▽Rz 12.5 area is the metal sealing part at the edge of BZS, 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 and P2 port as the clamp side.

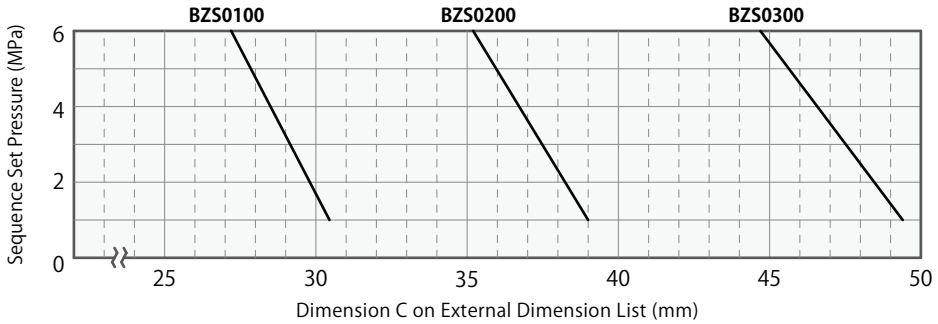
※1. Use the sequence pressure adjusting hex. within the adjustable range of ※2 (the dimensions K~C in the above).
Please note that if it is loosened further than max. C, pressure adjusting hex. part and internal spring will come off.

※2. Dimension when mounted. (+0.5mm before mounted.)

※3. If mounting plugs or fittings with G thread specification available in the market, the dimension '※3' should be 12.5.

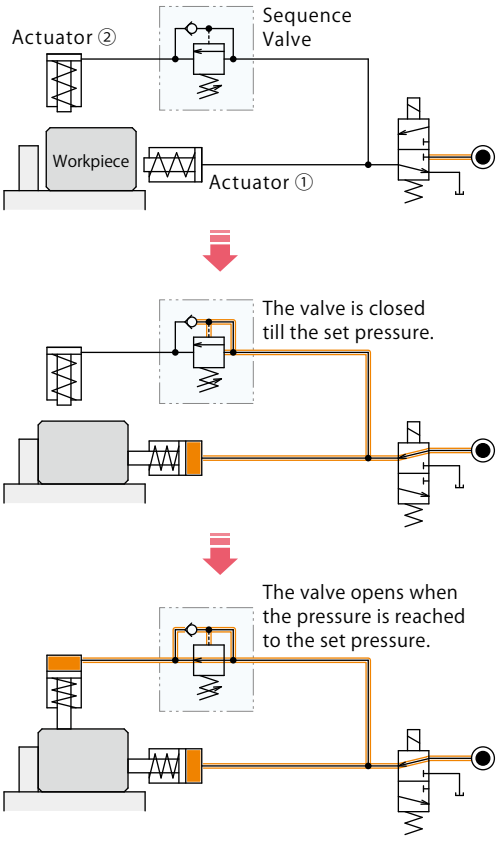
Cautions

1. Please design hydraulic circuit properly. Improper circuit design may lead to malfunctions and damages.
2. Filter is not built in this product. Be aware that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.
3. Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate. (Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
4. The difference between the set pressure and the supplying pressure should be 1MPa or more.
5. For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
6. For using multiple sequence valves to operate cylinders simultaneously, adjust them gradually by checking their actions.
7. Please keep in mind that the minimum passage area of each actuator will be decreased by mounting this product and thus operating time may become longer.
8. Please mount to an actuator using Hex. E shown in External Dimensions on P.961 with the tightening torque shown in the specification list on P.959. Insufficient or excessive tightening torque leads to malfunction.
9. Air bleeding is required as air mixed in the circuit causes malfunction.
10. At shipment, sequence pressure is not adjusted. Please adjust it by referring to the graph below. Install a pressure gauge on the circuit to check pressure as necessary. After adjustment, tighten one or more set screw for anti-rotation. (Tightening torque：0.2N･m)



(This graph is a reference, and the values will not be guaranteed.)

Action Description



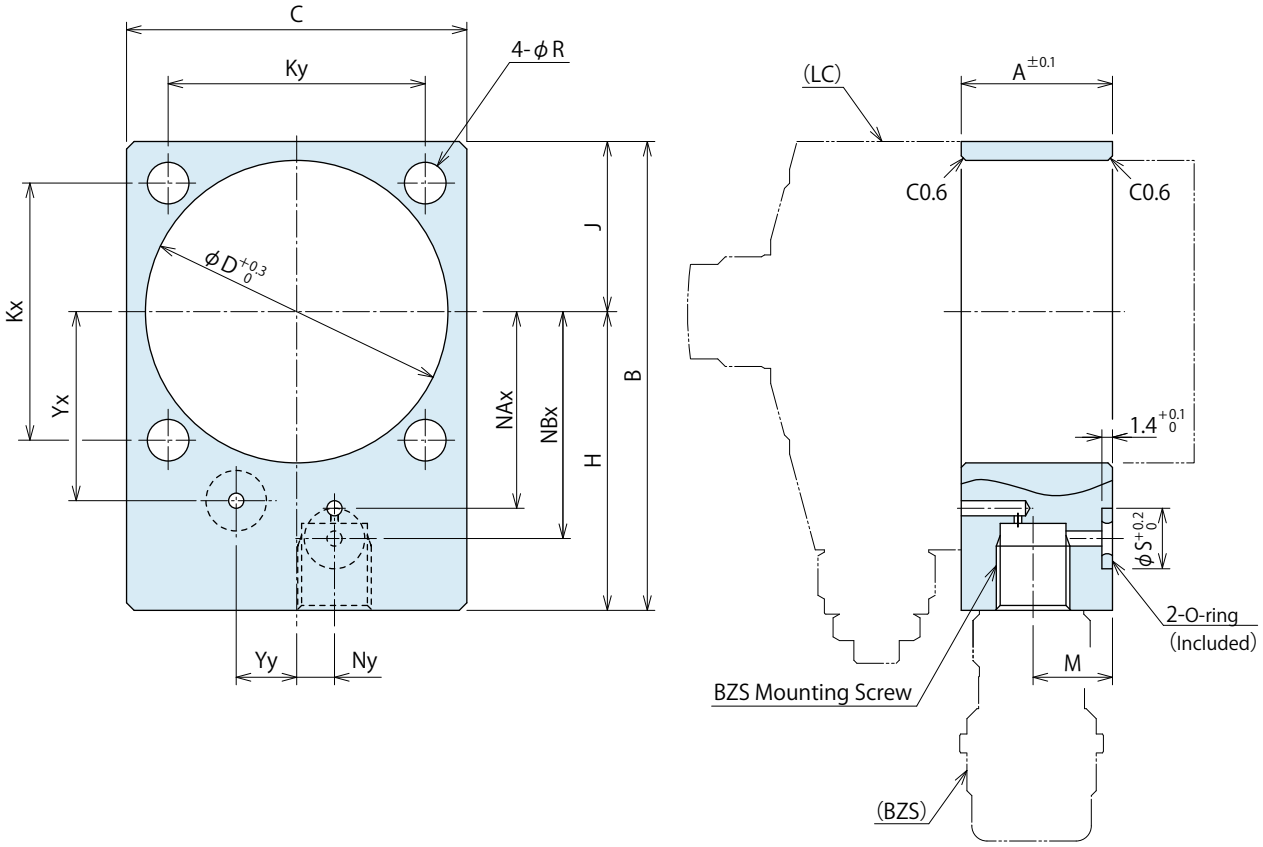
	Operating Procedure	Note
Locking	Hydraulic pressure is ON.	
	Actuator ① is activated.	
	Pressure increases to the sequence operation set pressure.	The difference between the operating pressure and the sequence operation set pressure should be 1MPa or more.
	The sequence valve circuit opens.	
	Actuator ② is activated.	
	Locking action is completed.	
	Machining, etc.	
Releasing	Hydraulic pressure is OFF.	
	The actuators ① and ② are released almost simultaneously.	The check valve in the sequence valve opens when the incoming side pressure decreases.
	Releasing action is completed.	

Accessories：Manifold Block for LC（Direct-Mount Sequence Valve）

Model No. Indication

LZ 040 0 – BZS

- 040: Size (Refer to the table.)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0260-BZS	LZ0300-BZS	LZ0360-BZS	LZ0400-BZS	LZ0480-BZS	LZ0550-BZS	LZ0650-BZS	LZ0750-BZS	LZ0900-BZS
Corresponding Model No.	LC0263 BZL0101-A BZS0100	LC0303 BZL0101-A BZS0100	LC0363 BZL0101-A BZS0100	LC0403 BZL0101-A BZS0100	LC0483 BZL0101-A BZS0100	LC0553 BZL0101-A BZS0100	LC0653 BZL0101-A BZS0100	LC0753 BZL0201 -A BZS0200	LC0903 BZL0201-A BZS0200
A	20	20	20	20	20	20	20	27	27
B	48.5	53.5	57	62	69	77	89	103	118
C	29	34	40	45	51	60	70	80	95
D	26	30	36	40	48	55	65	75	90
H	32	34	37	39.5	43.5	47	54	63	70.5
J	16.5	19.5	20	22.5	25.5	30	35	40	47.5
Kx	25	30	31.4	34	40	47	55	63	75
Ky	21	23	31.4	34	40	47	55	63	75
M	10.5	10.5	10.5	10.5	10.5	10.5	10.5	14.5	14.5
NAx	18.5	20.5	23.5	26	30	33.5	39.5	45	52.5
NBx	22.5	24.5	27.5	30	34	37.5	44.5	50.5	58
Ny	3	3	5	5	0	0	0	0	0
R	3.4	4.5	4.5	5.5	5.5	6.8	6.8	9	11
S	8	8	8	8	8	8	10	10	10
Yx	18.5	20.5	23.5	26	28	31	37	42.5	50
Yy	7	7	8	8	11	13	14	15	15
O-ring	OR NBR-90 P5-N	OR NBR-90 P5-N	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	OR NBR-90 P7-N	OR NBR-90 P7-N
BZS Mounting Screw	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
Weight kg	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.9

Notes : 1. Material S45C Surface Finishing：Alkaline Blackening

2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'A'.

MEMO

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LG/LT
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LJ/LM
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Linear Cylinder / Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA/DBC
Centering Vise
FVA
FVD
FVC
Control Valve
BZL
BZT
BZX/JZG
BZS
Pallet Clamp
VS/VT
Expansion Locating Pin
VFL/VFM
VFJ/VFK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

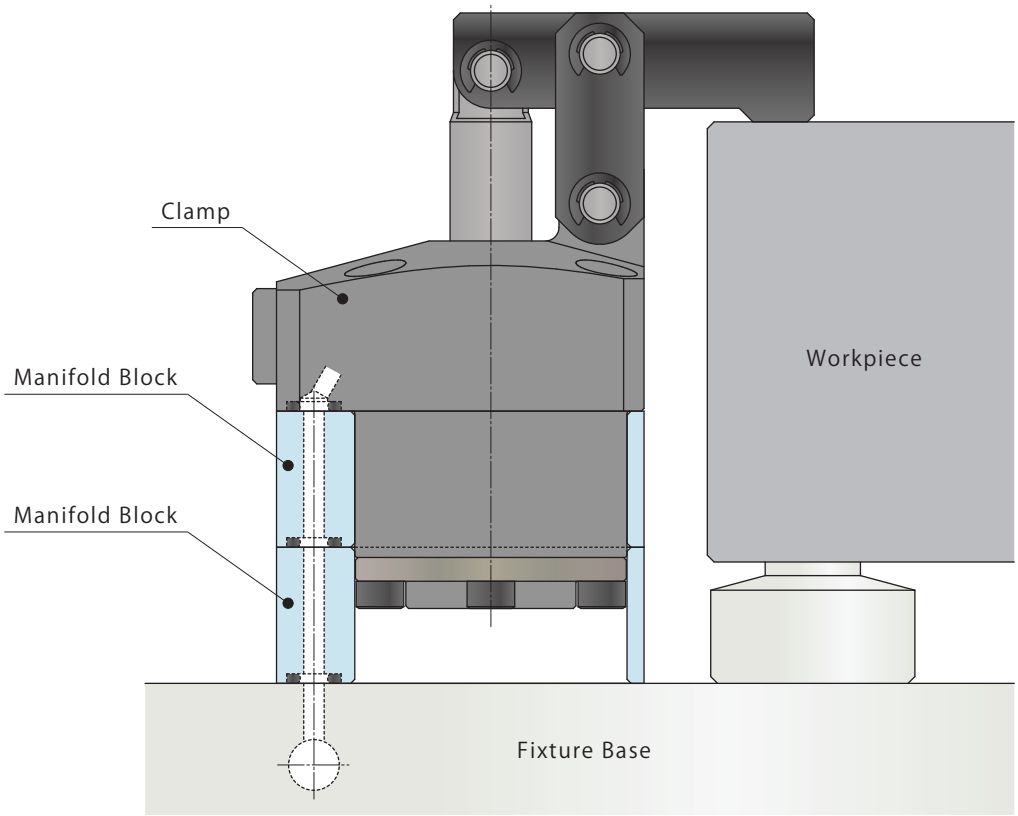
Manifold Block

Model WHZ-MD
Model LZY-MD
Model LZ-MS
Model LZ-MP
Model LZ-C
Model LZ-CQ
Model TMZ-1MB
Model TMZ-2MB
Model DZ-MG□
Model DZ-MS□



Manifold Block

The mounting height of clamp is adjustable with the manifold block.

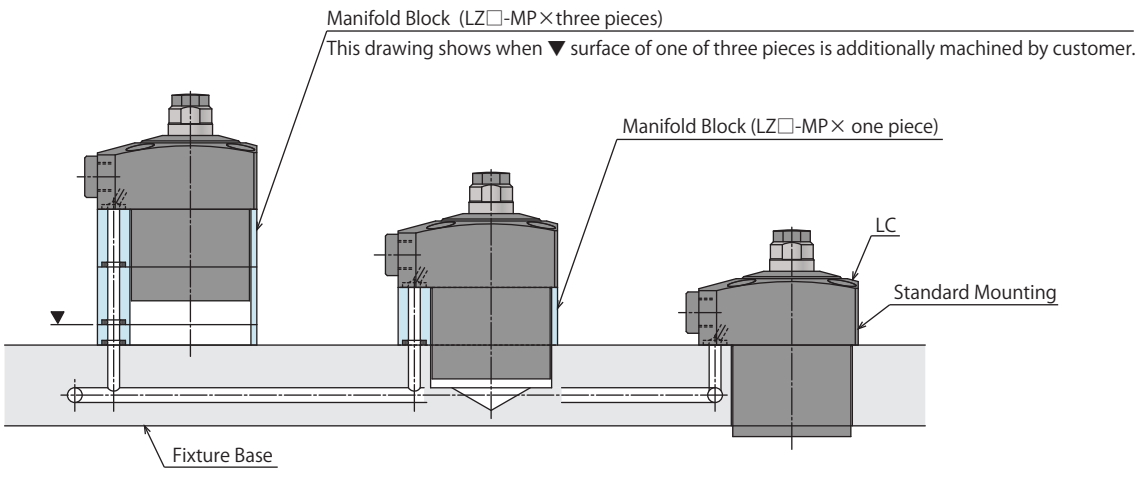


Applicable Model

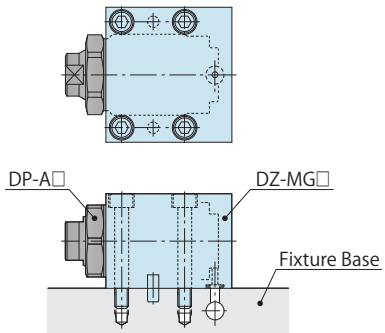
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCA Model WHA Model WCE Model WHE
Model LZY-MD	Model LKA Model LKE Model LHA Model LHE Model LL Model LKC Model LKK Model LHC Model LHS
Model LZ-MS	Model LJ Model LG Model LM Model LT
Model LZ-MP	Model LC Model TC
Model LZ-C	Model LD
Model LZ-CQ	Model LD-Q
Model TMZ-1MB	Model TMA-1
Model TMZ-2MB	Model TMA-2
Model DZ-MG□/MS□	Model DP

Application Examples

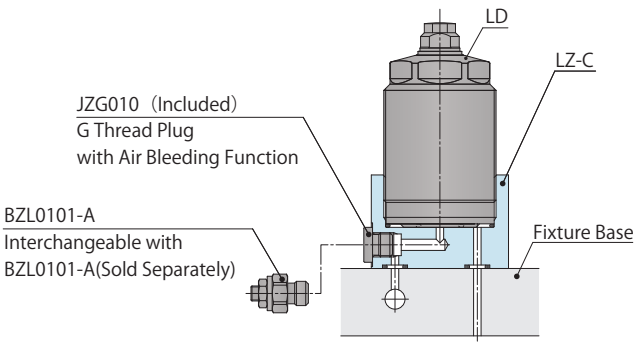
Work Support (LC) Application Example



Push Cylinder (DP) Application Example



Work Support(LD)Application Example

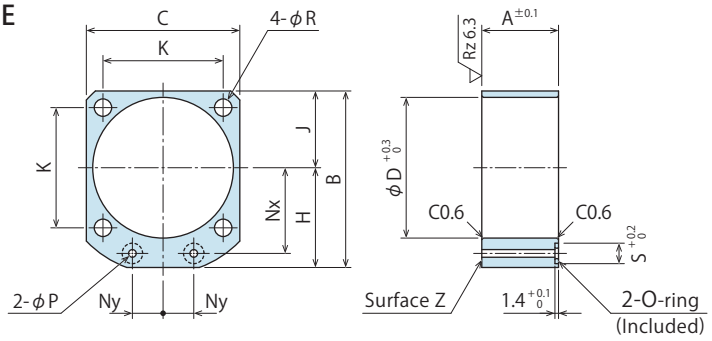


Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

WHZ 040 0 – MD

- 040: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	WHZ0450-MD	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Model No.	WCE0452 WHE0450	WCE0602 WHE0600	WCA0321 WCE1002 WHA0320 WHE1000	WCA0401 WCE1602 WHA0400 WHE1600	WCA0501 WCE2502 WHA0500 WHE2500	WCA0631 WCE4002 WHA0630 WHE4000
A	20	23	25	27	31	35
B	49	54	60	67	77	88.5
C	40	45	50	58	68	81
D	36	40	46	54	64	77
H	29	31.5	35	38	43	48
J	20	22.5	25	29	34	40.5
K	31.4	34	39	45	53	65
Nx	23.5	26	28	31	36	41
Ny	8	9	10	13	15	20
P	3	3	5	5	5	5
R	4.5	5.5	5.5	5.5	6.5	6.5
S	8	8	10	10	10	10
O-ring	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.1	0.1	0.2	0.2

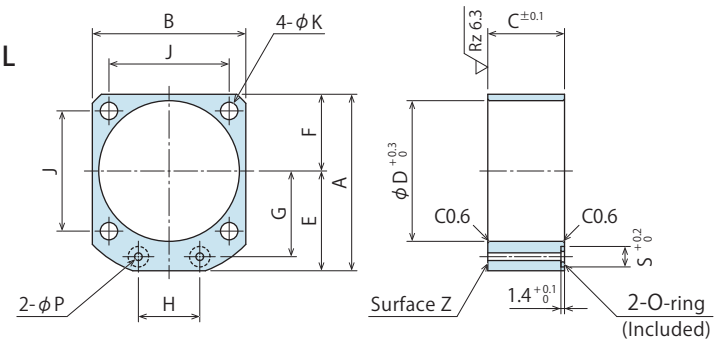
Notes : 1. Material : A2017BE-T4 Surface Finishing : Zircon Finishing (Zirconium Chemical Conversion Treatment)
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LKA/LKC/LKE/LKK/LHA/LHC/LHE/LHS/LL

Model No. Indication

LZY 048 0 – MD

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZY0360-MD	LZY0400-MD	LZY0480-MD	LZY0550-MD	LZY0650-MD	LZY0750-MD	LZY0900-MD	LZY1050-MD
Corresponding Model No.	LKA0360 LKE0360 / LKK0360 LHA0360/ LHC0360 LHE0360 / LHS0360 LL0360	LKA0400 / LKC0400 LKE0400 / LKK0400 LHA0400/ LHC0400 LHE0400 / LHS0400 LL0400	LKA0480 / LKC0480 LKE0480 / LKK0480 LHA0480/ LHC0480 LHE0480 / LHS0480 LL0480	LKA0550 / LKC0550 LKE0550 / LKK0550 LHA0550/ LHC0550 LHE0550 / LHS0550 LL0550	LKA0650 / LKC0650 LKK0650 LHA0650/ LHC0650 LHS0650 LL0650	LKA0750 LHA0750 LHS0750 LL0750	LKA0900 LHA0900 LHS0900 LL0900	LKA1050 LHA1050 LHS1050 LL1050
A	49	54	61	69	81	92	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	29	31.5	35.5	39	46	52	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
G	23.5	26	30	33.5	39.5	45	52.5	60
H	16	18	22	24	30	32	37	45
J	31.4	34	40	47	55	63	75	88
K	4.5	5.5	5.5	6.8	6.8	9	11	14
P	3	3	3	3	5	5	5	5
S	8	8	8	8	10	10	10	10
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

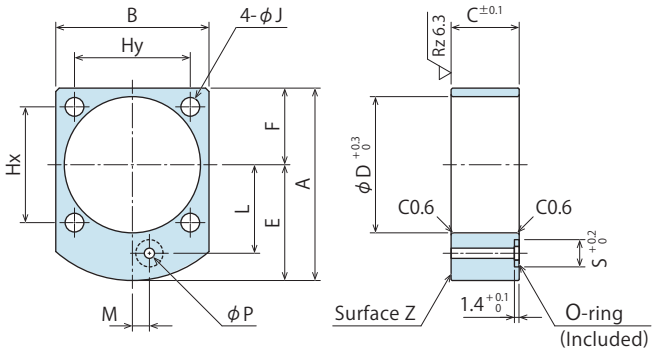
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LJ/LM/LG/LT

Model No. Indication

LZ 048 0 – MS

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0300-MS	LZ0360-MS	LZ0400-MS	LZ0480-MS	LZ0550-MS	LZ0650-MS	LZ0750-MS	LZ0900-MS	LZ1050-MS
Corresponding Model No.	LG0301 / LT0301 LJ0302 / LM0300	LG036□ / LT036□ LJ0362 / LM0360	LG040□ / LT040□ LJ0402 / LM0400	LG048□ / LT048□ LJ0482 / LM0480	LG055□ / LT055□ LJ0552 / LM0550	LG065□ / LT065□ LJ0652 / LM0650	LG075□ / LT075□ LJ0752 / LM0750	LG090□ LJ0902	LG105□ LJ1052
A	48	51.5	56.5	62	70	82	93	107	122
B	34	40	45	51	60	70	80	95	110
C	18	20	20	27	30	32	37	45	50
D	30	36	40	48	55	65	75	90	105
E	28.5	31.5	34	36.5	40	47	53	59.5	67
F	19.5	20	22.5	25.5	30	35	40	47.5	55
Hx	30	31.4	34	40	47	55	63	75	88
Hy	23	31.4	34	40	47	55	63	75	88
J	4.5	4.5	5.5	5.5	6.8	6.8	9	11	14
L	20.5	23.5	26	30	33.5	39.5	45	52.5	60
M	3	5	5	0	0	0	0	0	0
P	3	3	3	3	3	5	5	5	5
S	8	8	8	8	8	10	10	10	10
O-ring	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

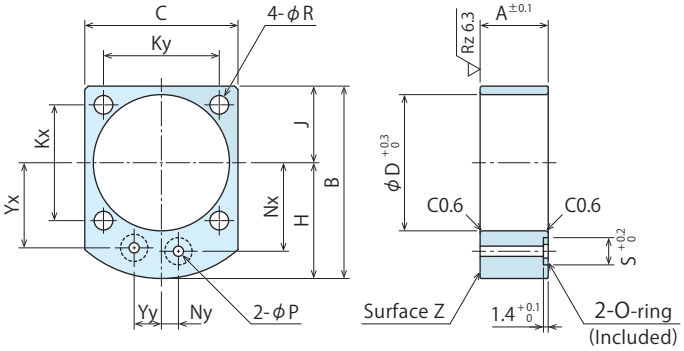
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LC/TC

Model No. Indication

LZ 048 0 – MP

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0260-MP	LZ0300-MP	LZ0360-MP	LZ0400-MP	LZ0480-MP	LZ0550-MP	LZ0650-MP	LZ0750-MP	LZ0900-MP
Corresponding Model No.	LC0263	LC0303	LC0363	LC0403 / TC0403	LC0483 / TC0483	LC0553 / TC0553	LC0653 / TC0653	LC0753 / TC0753	LC0903
A	18	18	20	20	27	30	32	37	45
B	43	48	51.5	56.5	62	70	82	93	107
C	29	34	40	45	51	60	70	80	95
D	26	30	36	40	48	55	65	75	90
H	26.5	28.5	31.5	34	36.5	40	47	53	59.5
J	16.5	19.5	20	22.5	25.5	30	35	40	47.5
Kx	25	30	31.4	34	40	47	55	63	75
Ky	21	23	31.4	34	40	47	55	63	75
Nx	18.5	20.5	23.5	26	30	33.5	39.5	45	52.5
Ny	3	3	5	5	0	0	0	0	0
R	3.4	4.5	4.5	5.5	5.5	6.8	6.8	9	11
Yx	18.5	20.5	23.5	26	28	31	37	42.5	50
Yy	7	7	8	8	11	13	14	15	15
P	3	3	3	3	3	3	5	5	5
S	8	8	8	8	8	8	10	10	10
O-ring	1BP5	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.2

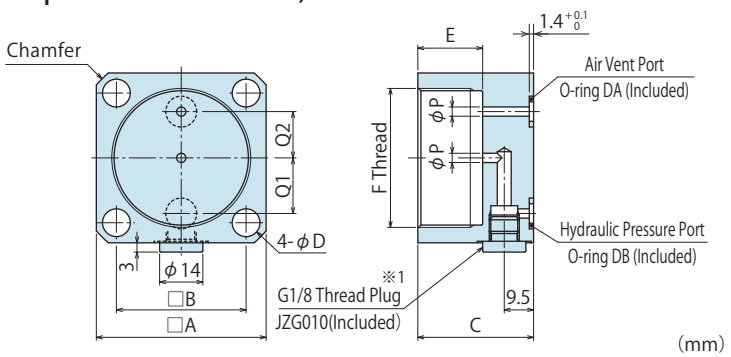
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.
4. Please refer to LZ□-BZS on P.962A when using BZS Direct-Mount Sequence Valve with LC.

Manifold Block for LD (Able to Mount BZL Speed Control Valve※1)

Model No. Indication

LZ 036 0 – C

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0220-C	LZ0260-C	LZ0300-C	LZ0360-C	LZ0450-C
Corresponding Model No.	LD0223※2	LD0263※2	LD0303※2	LD0363※2	LD0453※2
A	28	35	38	45	55
B	21	26	29	35	42
C	30.5	32.5	33.5	34.5	37.5
D	4.5	5.5	5.5	6.8	9
E	14	16	17	18	21
F (Nominal×Pitch)	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5
P	2	2.5	3	3	3
Q1	4.5	8	9.5	13	18
Q2	7	9.5	11	13	15
Chamfer	C2	C3	C3	C3	C4
DA	OR NBR-90 P5-N	OR NBR-90 P7-N			
DB	OR NBR-90 P5-N	OR NBR-90 P7-N			
Weight kg	0.12	0.20	0.24	0.34	0.52

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. When downloading CAD data from our website and making this product, make sure to check the tolerances and notes shown in the machining dimensions of mounting area for LD Work Support on P. 732L and for BZL Speed Control Valve on P. 951. Failure to do so may result in unstable operation or malfunction.

※1. Plunger operating time of LD work support can be adjusted by removing the attached G thread plug (JZG010) and replacing it with the separately ordered speed control valve (BZL0101-A).

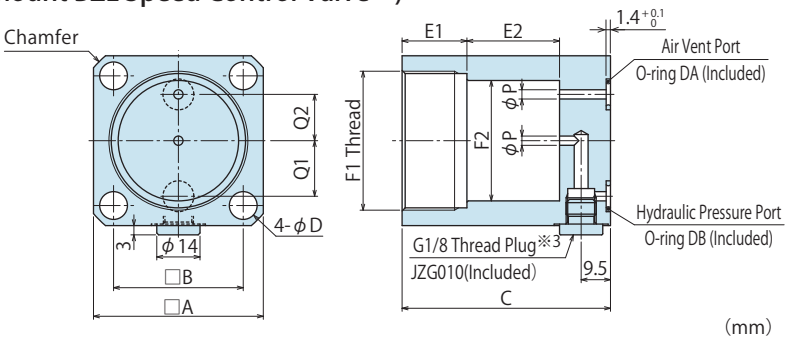
※2. It is not applicable for LD-Q : Work Support Hydraulic Advance Long Stroke Option. (Please select from LZ-CQ.)

Manifold Block for LD-Q用(Able to Mount BZL Speed Control Valve※3)

Model No. Indication

LZ 036 0 – CQ

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0220-CQ	LZ0260-CQ	LZ0300-CQ	LZ0360-CQ	LZ0450-CQ
Corresponding Model No.	LD0223-Q※4	LD0263-Q※4	LD0303-Q※4	LD0363-Q※4	LD0453-Q※4
A	28	35	38	45	55
B	21	26	29	35	42
C	50	49.5	53	60.5	67.5
D	4.5	5.5	5.5	6.8	9
E1	14	16	17	18	21
E2	19.5	17	19.5	26	30
F1 (Nominal×Pitch)	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5
F2	16	20	24	30	39
P	2	2.5	3	3	3
Q1	4.5	8	9.5	13	18
Q2	7	9.5	11	13	15
Chamfer	C2	C3	C3	C3	C4
DA	OR NBR-90 P5-N	OR NBR-90 P7-N			
DB	OR NBR-90 P5-N	OR NBR-90 P7-N			
Weight	0.21	0.31	0.38	0.58	0.89

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. When downloading CAD data from our website and making this product, make sure to check the tolerances and notes shown in the machining dimensions of mounting area for LD-Q Work Support on P. 733 and for BZL Speed Control Valve on P.951. Failure to do so may result in unstable operation or malfunction.

※3. Plunger operating time of LD-Q work support can be adjusted by removing the attached G thread plug (JZG010) and replacing it with the separately ordered speed control valve (BZL0101-A).

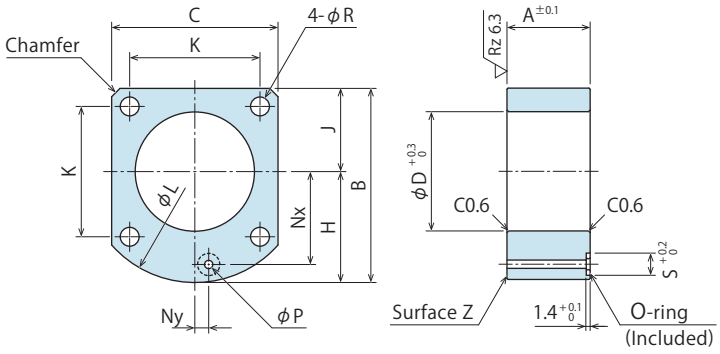
※4. It is not applicable for LD-EQ : Work Support Spring Advance Long Stroke Option. (Please select from LZ-C.)

Manifold Block for TMA-1

Model No. Indication

TMZ 040 0 – 1MB

- 040: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	TMZ0250-1MB	TMZ0400-1MB	TMZ0600-1MB	TMZ1000-1MB	TMZ1600-1MB	TMZ2500-1MB	TMZ3200-1MB
Corresponding Model No.	TMA0250-1	TMA0400-1	TMA0600-1	TMA1000-1	TMA1600-1	TMA2500-1	TMA3200-1
A	18	21	24	28	35	42	46
B	56.5	62	69	83	95	110	122
C	45	51	60	73	85	100	110
D	33	36	43	48	60	70	85
H	34	36.5	39	46.5	52.5	60	67
J	22.5	25.5	30	36.5	42.5	50	55
K	34	40	47	57	65	75	88
L	68	73	80	97	112	129	147
Nx	26	30	33.5	40	45	52.5	60
Ny	5	0	0	0	0	0	0
R	5.5	5.5	6.8	9	11	14	14
P	3	3	3	3	5	5	5
S	8	8	8	8	10	10	10
Chamfer	3	3	(ϕ80)	(ϕ97)	(ϕ112)	(ϕ129)	(ϕ147)
O-ring	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	OR NBR-90 P7-N	OR NBR-90 P7-N
Weight kg	0.2	0.3	0.5	0.9	1.4	2.2	2.6

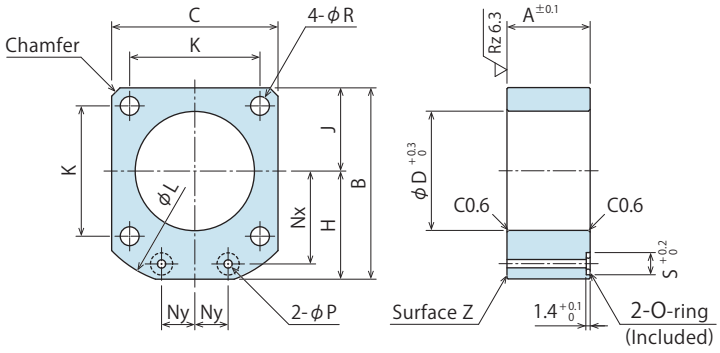
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for TMA-2

Model No. Indication

TMZ 040 0 – 2MB

- 040: Size (Refer to following table)
- 0: Design No. (Revision Number)



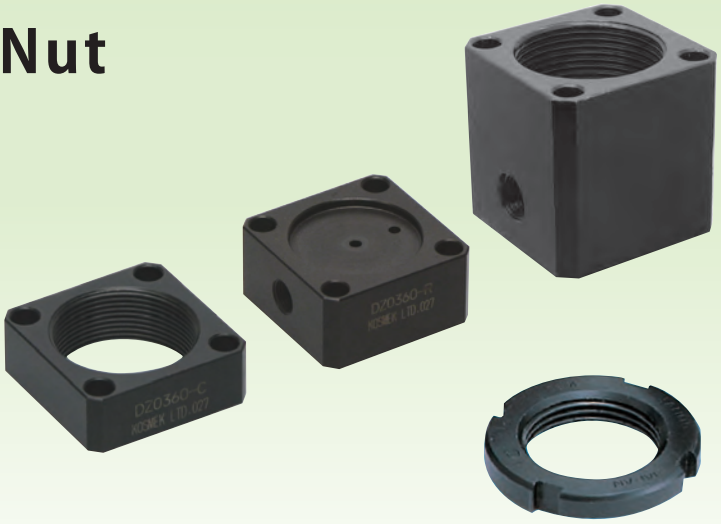
(mm)

Model No.	TMZ0250-2MB	TMZ0400-2MB	TMZ0600-2MB	TMZ1000-2MB	TMZ1600-2MB	TMZ2500-2MB	TMZ3200-2MB
Corresponding Model No.	TMA0250-2	TMA0400-2	TMA0600-2	TMA1000-2	TMA1600-2	TMA2500-2	TMA3200-2
A	15	16	18	20	24	28	32
B	54	61	69	82.5	94.5	109.5	122
C	45	51	60	73	85	100	110
D	33	36	43	48	60	70	85
H	31.5	35.5	39	46	52	59.5	67
J	22.5	25.5	30	36.5	42.5	50	55
K	34	40	47	57	65	75	88
L	68	75	83	100	113	133	147
Nx	26	30	33.5	40	45	52.5	60
Ny	9	10	12	15	16	18.5	20
R	5.5	5.5	6.8	9	11	14	14
P	3	3	3	3	5	5	5
S	8	8	8	8	10	10	10
Chamfer	3	3	3	4	5	8	(ϕ147)
O-ring	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	OR NBR-90 P7-N	OR NBR-90 P7-N
Weight kg	0.2	0.3	0.4	0.6	0.9	1.5	1.8

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block / Nut

Model DZ-R
Model DZ-C
Model DZ-P
Model DZ-B
Model LZ-S
Model LZ-SQ
Model WNZ-SQ
Model TNZ-S
Model TNZ-SQ

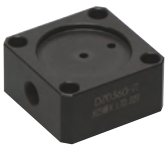


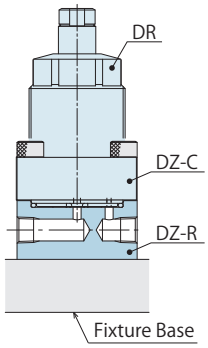
Applicable Model/Application Examples

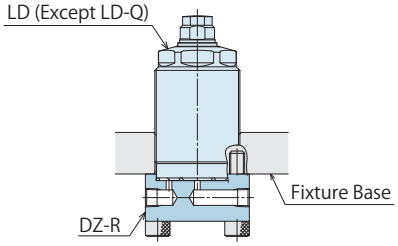
Model DZ-R

Manifold Block for DR/LD/WNC

Corresponding Model：DR / LD / WNC



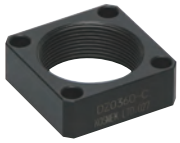


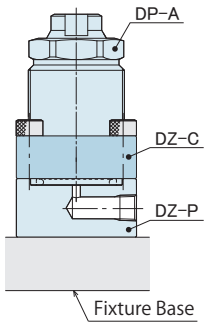


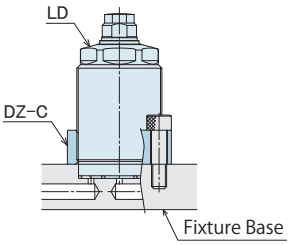
Model DZ-C

Flanged Nut for DP/DR/DS/DT/LD/WNC

Corresponding Model：DP / DR / DS / DT / LD / WNC





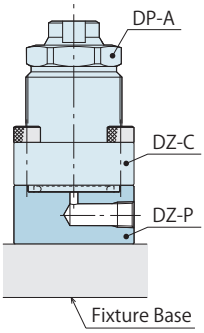


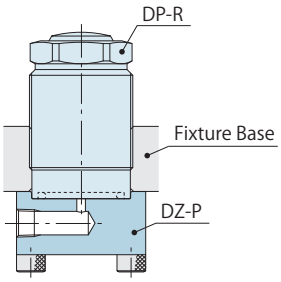
Applicable Model/Application Examples

Model DZ-P
Manifold Block for DP

Corresponding Model : DP



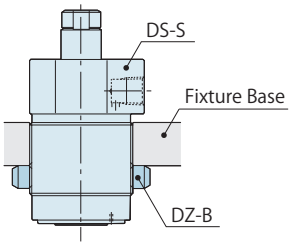


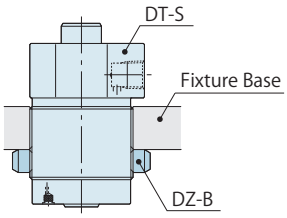


Model DZ-B
Bulkhead Nut for DP/DR/DS/DT

Corresponding Model : DP / DR / DS / DT







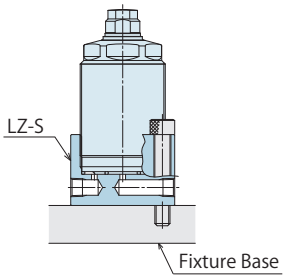
Model LZ-S
Manifold Block for LD/WNC

Corresponding Model : LD / WNC

Model TNZ-S
Manifold Block for TNC

Corresponding Model : TNC





Model LZ-SQ
Manifold Block for LD-Q

Corresponding Model : LD-Q

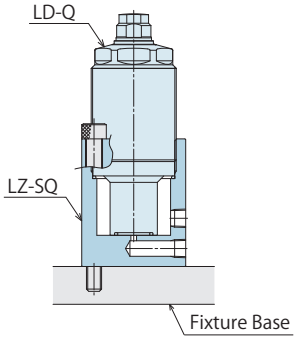
Model WNZ-SQ
Manifold Block for WNC-Q

Corresponding Model : WNC-Q

Model TNZ-SQ
Manifold Block for TNC-Q

Corresponding Model : TNC-Q





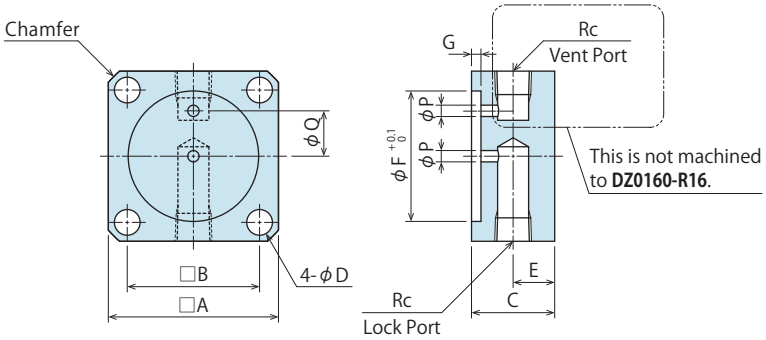
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Screw Locator
VXF/VXE
Manual Expansion Locating Pin
VX
Manifold Block
WHZ-MD
LZY-MD
LZ-MS
LZ-MP
LZ-C
LZ-CQ
TMZ-1MB
TMZ-2MB
DZ-M
Manifold Block / Nut
DZ-R
DZ-C
DZ-P
DZ-B
LZ-S
LZ-SQ
WNZ-SQ
TNZ-S
TNZ-SQ
Pressure Switch
JBA
Pressure Gauge
JGA/JGB
Manifold
JX
Coupler Switch
PS
G-Thread Fitting

Manifold Block for DR/LD/WNC

Model No. Indication

DZ 036 0 – R

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0160-R16	DZ0220-R	DZ0240-R	DZ0260-R	DZ0300-R	DZ0360-R	DZ0450-R	DZ0550-R	DZ0600-R	DZ0650-R	DZ0800-R
Corresponding Model No.	-	DR0221	DR0241	-	DR0301	DR0361	DR0451	DR0551	-	DR0651	DR0801
	LD0163※1	LD0223※1	-	LD0263※1	LD0303※1	LD0363※1	LD0453※1	-	-	-	-
	WNC0103	WNC0353	-	WNC0603	WNC1003	WNC1603	WNC3003	-	WNC6003	-	-
A	25	28	32	35	38	45	55	70	75	80	90
B	18	21	23	26	29	35	42	54	59	62	72
C	19	19	19	19	22	22	25	25	25	25	28
D	4.5	4.5	5.5	5.5	5.5	6.8	9	11	11	14	14
E	9.5	9.5	9.5	9.5	11	11	12.5	12.5	12.5	12.5	14
F	15	20.5	22.5	24.5	28.5	34.5	43.5	53	58	63	78
G	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5	3.5	4
P	2	2	3	2.5	3	3	5	5	5	5	5
Q	-	7	7.5	9.5	10	12.5	15	19	24	24	30
Rc	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
Chamfer	C2	C2	C3	C3	C3	C3	C4	C5	C4	C5.5	C5.5
Weight kg	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.8	0.9	1.0	1.5

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.

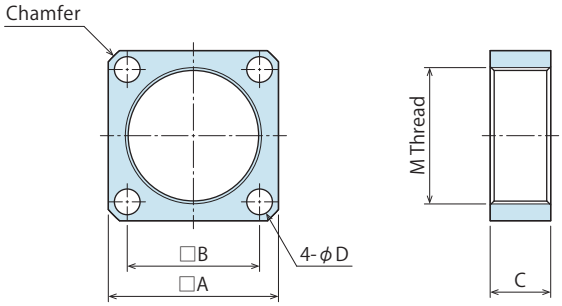
※1. It is not applicable for LD-Q : Work Support Hydraulic Advance Long Stroke Option. (Please select from LZ-SQ.)

Flange Nut for DP/DR/DS/DT/LD/WNC

Model No. Indication

DZ 036 0 – C

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0160-C16	DZ0160-C	DZ0220-C	DZ0240-C	DZ0260-C	DZ0300-C	DZ0360-C	DZ0450-C	DZ0550-C	DZ0600-C	DZ0650-C	DZ0800-C
Corresponding Model No.	-	DP0160	DP0221	DP0241	-	DP0301	DP0361	DP0451	DP0551	-	DP0651	DP0801
	-	-	DR0221	DR0241	-	DR0301	DR0361	DR0451	DR0551	-	DR0651	DR0801
	-	-	DS0221	DS0241	-	DS0301	DS0361	DS0451	DS0551	-	DS0651	DS0801
	-	-	-	-	-	-	DT0361	DT0451	DT0551	-	DT0651	DT0801
	LD0163	-	LD0223	-	LD0263	LD0303	LD0363	LD0453	-	-	-	-
	WNC0103	-	WNC0353	-	WNC0603	WNC1003	WNC1603	WNC3003	-	WNC6003	-	-
A	25	25	28	32	35	38	45	55	70	75	80	90
B	18	18	21	23	26	29	35	42	54	59	62	72
C	8	12	14	14	14	15	16	18	20	22	25	25
D	4.5	4.5	4.5	5.5	5.5	5.5	6.8	9	11	11	14	14
M (Nominal×Pitch)	M16×1.0	M16×1.5	M22×1.5	M24×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5	M55×2	M60×2	M65×2	M80×2
Chamfer	C2	C2	C2	C3	C3	C3	C3	C4	C5	C4	C5.5	C5.5
Weight kg	0.03	0.04	0.04	0.06	0.07	0.08	0.1	0.2	0.4	0.45	0.5	0.6

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

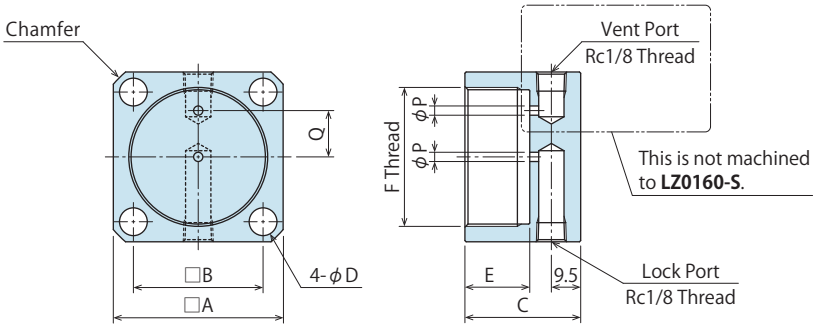
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.

Manifold Block for LD/WNC

Model No. Indication

LZ 036 0 – S

- 036: Size (Refer to the following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0160-S	LZ0220-S	LZ0260-S	LZ0300-S	LZ0360-S	LZ0450-S	LZ0600-S
Corresponding Model No.	LD0163 WNC0103	LD0223※1 WNC0353※2	LD0263※1 WNC0603※2	LD0303※1 WNC1003※2	LD0363※1 WNC1603※2	LD0453※1 WNC3003※2	– WNC6003※2
A	25	28	35	38	45	55	75
B	18	21	26	29	35	42	59
C	26.5	30.5	32.5	33.5	34.5	37.5	41.5
D	4.5	4.5	5.5	5.5	6.8	9	11
E	10	14	16	17	18	21	25
F (Nominal × Pitch)	M16×1.0	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5	M60×2
P	2	2	2.5	3	3	3	3
Q	–	7	9.5	11	13	15	24
Chamfer	C2	C2	C3	C3	C3	C4	C4
Weight kg	0.10	0.12	0.20	0.24	0.34	0.52	1.12

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.

※1. It is not applicable for LD-Q : Long Stroke Option. (Please select from LZ-SQ.)

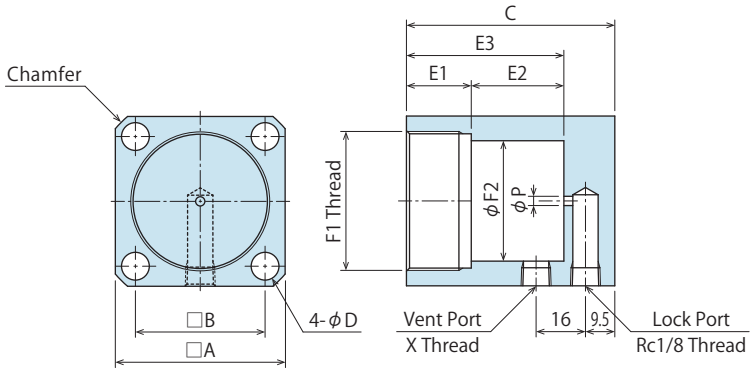
※2. It is not applicable for WNC-Q : Long Stroke Option. (Please select from WNZ-SQ.)

Manifold Block for LD-Q

Model No. Indication

LZ 036 0 – SQ

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0220-SQ	LZ0260-SQ	LZ0300-SQ	LZ0360-SQ	LZ0450-SQ
Corresponding Model No.	LD0223-Q※3	LD0263-Q※3	LD0303-Q※3	LD0363-Q※3	LD0453-Q※3
A	28	35	38	45	55
B	21	26	29	35	42
C	50	49.5	53	60.5	67.5
D	4.5	5.5	5.5	6.8	9
E1	14	16	17	18	21
E2	19.5	17	19.5	26	30
E3	33.5	33	36.5	44	51
F1 (Nominal×Pitch)	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5
F2	16	20	24	30	39
P	3	3	3	3	3
X Thread	M5×0.8	Rc1/8	Rc1/8	Rc1/8	Rc1/8
Chamfer	C2	C3	C3	C3	C4
Weight kg	0.21	0.31	0.38	0.58	0.89

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.

※3. It is not applicable for LD-EQ : Work Support Spring Advance Long Stroke Option. (Please select from LZ-S.)