

Hydraulic Linear Cylinder / Compact Cylinder

Model LL

Model LLR

Model LLU

Model DP

Model DR

Model DS

Model DT



Compact and Simple Linear Cylinder

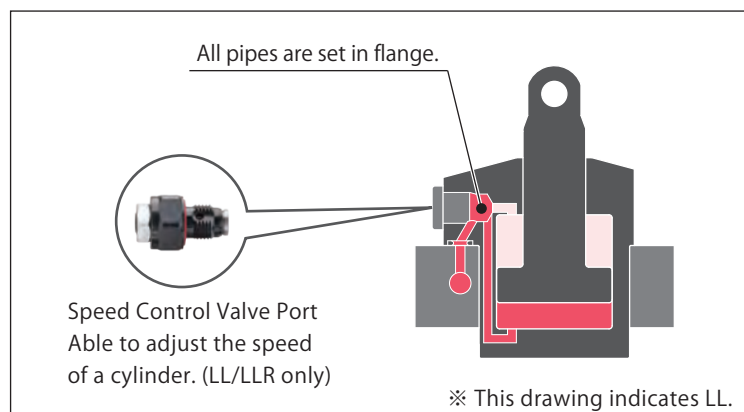
LL/LLR/LLU : Able to set the stroke in 1mm increments.

- **LL/LLR/LLU : Linear Cylinder (Double-Acting Linear Cylinder)**

Stroke is selectable in 1mm increments (1mm ~ 200mm).
The most compact double-acting cylinders for small footprint fixtures.

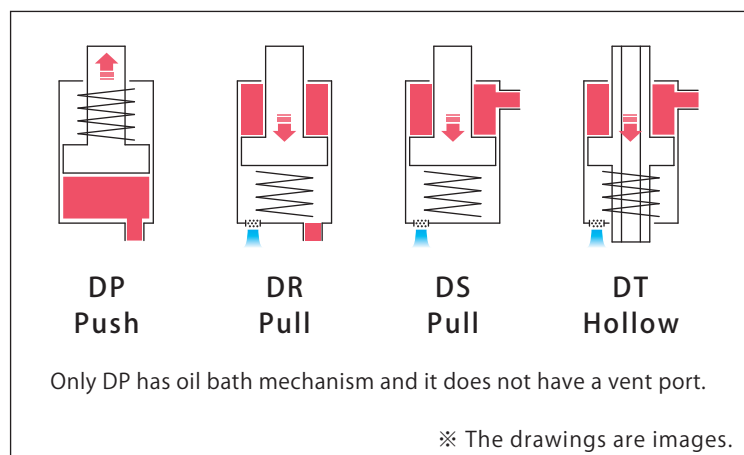
Two piping options available.

- Gasket option : Needs no piping on a fixture.
- Piping option : Enables simple piping with all ports set in flange.



- **DP/DR/DS/DT : Compact Cylinder (Single-Acting Linear Cylinder)**

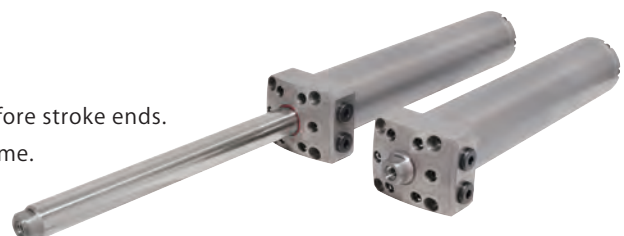
The compact single-acting linear cylinders corresponding to the pressure range from low to high.

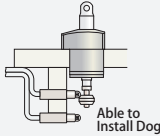
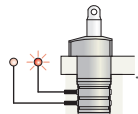


- **NEW LLP : Linear Cylinder with Cushion**

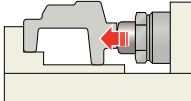
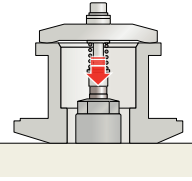
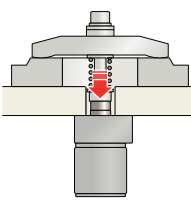
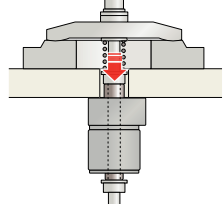
Cushioning mechanism allows the cylinder to slow its speed just before stroke ends.
For higher speed in the middle of the stroke and the shorter cycle time.

※ Refer to our website for further information of LLP.



Double-Acting Model MAX. 7MPa		 Model LL → P.837	 Model LLR → P.837	 Model LLU → P.837
Classification		Linear Cylinder Top Flange	Linear Cylinder Bottom Flange	Linear Cylinder Bottom Flange (Compact)
Operating Pressure Range		0.5 ~ 7MPa ※ 1	0.5 ~ 7MPa	0.5 ~ 7MPa
Standard Model		External Dimensions → P.847	External Dimensions → P.869	External Dimensions → P.875
Action Confirmation	Double End Rod Option for Dog 	External Dimensions → P.851	External Dimensions → P.873	External Dimensions → P.879
	Air Sensing Manifold Option 	External Dimensions → P.853	—	—
	Air Sensing Piping Option 	External Dimensions → P.855	—	—
	Air Sensing Manifold Option for Retract End 	External Dimensions → P.859	—	—
	Air Sensing Piping Option for Retract End 	External Dimensions → P.863	—	—
Accessories	Speed Control Valve Plug 	BZL, BZX, JZG, BZS → P.947		

※ 1. The operating pressure range of the air sensing option for retract end is 1 ~ 7MPa.

Single-Acting Model MAX. 25MPa	 Model DP → P.881	 Model DR → P.891	 Model DS → P.897	 Model DT → P.905
Classification	Push Cylinder Threaded Body	Pull Cylinder Threaded Body	Pull Cylinder Threaded Body / Bottom Flange	Hollow Cylinder Threaded Body / Bottom Flange
Operating Pressure	0.8 ~ 25MPa	1 ~ 25MPa	1 ~ 25MPa	1 ~ 25MPa
Action				
Accessories Piping Block → P.1333, P.1339	DZ-M DZ-P DZ-C DZ-B	DZ-R DZ-C DZ-B	DZ-C DZ-B	DZ-C DZ-B

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

Hydraulic Double-Acting Linear Cylinder

Model LL/LLR/LLU

Low Pressure (0.5 ~ 7MPa)

Compact • Rich Variation



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• Top Flange • Air Sensing Piping Option (LL-N□)	P.855
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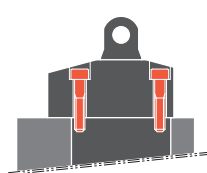
Maximum Stroke with Minimum Space

Linear motion compact cylinder

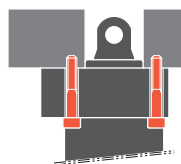
with **1 mm stroke increments** and **a variety of styles**.

Mounting Methods : 3 Options

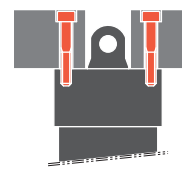
Multiple mounting options
to optimize space restrictions.



LL : Top Flange



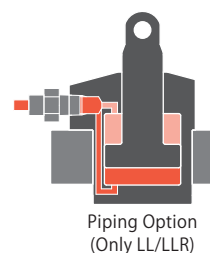
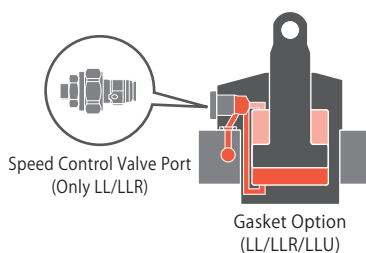
LLR : Bottom Flange



LLU : Bottom Flange
(Compact)

Piping Methods : 2 Options

Gasket option needs no
piping on a fixture.
Piping option enables
simple piping because
all ports are set in flange.



Shape of Piston Tip : 4 Options



Female Threaded



Female Threaded
(With Anti-Rotation Pinhole)



Male Threaded



Pin-Hole Option

Detecting Methods : 6 Options

4 air sensing options are
available for model LL.



Standard
Model



Double End Rod
Option for Dog



Air Sensing
Manifold Option



Air Sensing
Piping Option



Air Sensing
Manifold Option
for Retract End

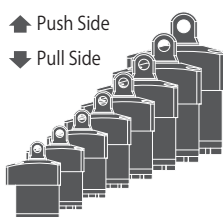


Air Sensing
Piping Option
for Retract End

Body Size : 8 Options

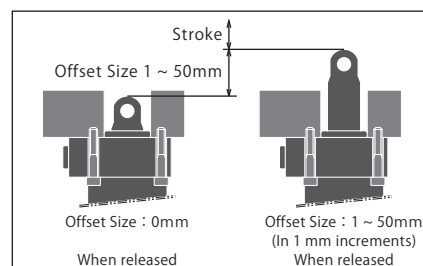
Cylinder Output (Push Side)
About 0.2 ~ 35.2kN

Cylinder Output (Pull Side)
About 0.1 ~ 24kN



Offset Position

Able to specify the offset position
in 1mm increments (up to 50 mm).
This makes fixture design simple.
※ LLR/LLU only.



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

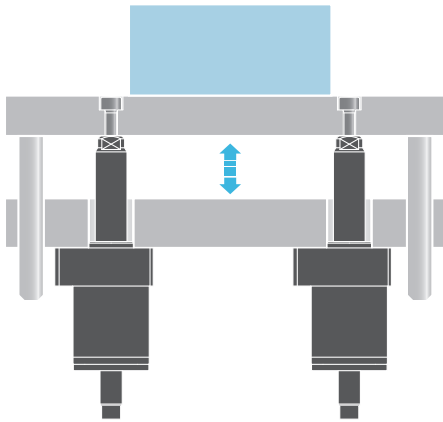
FP
FQ

Customized Spring Cylinder

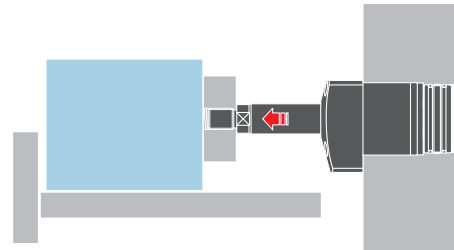
DWA/DWB

Application Examples

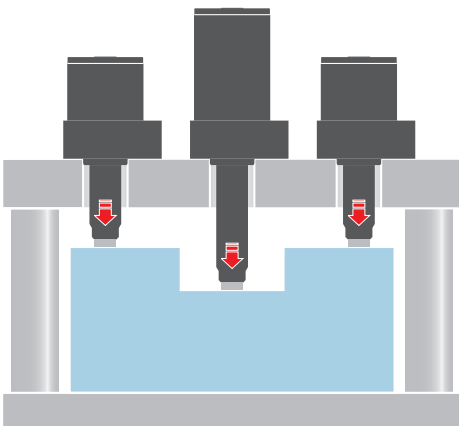
As a Lifter



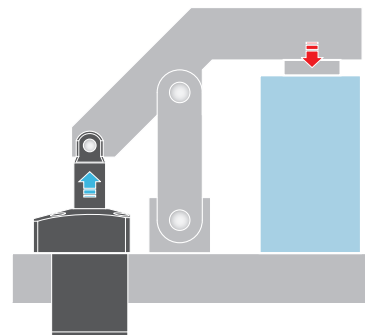
As a Shifter/Pusher



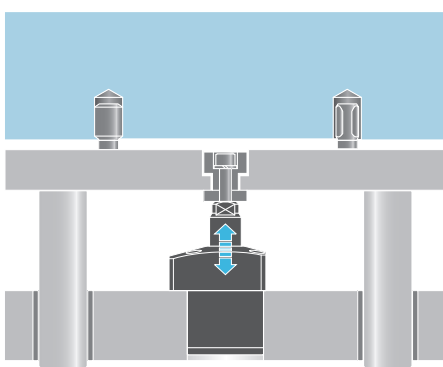
As a Clamp/Press-Fit



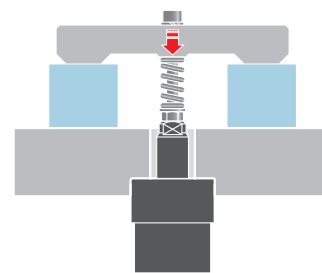
As a Link Mechanism



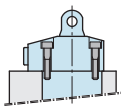
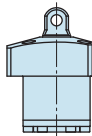
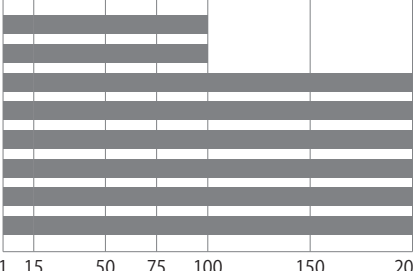
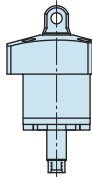
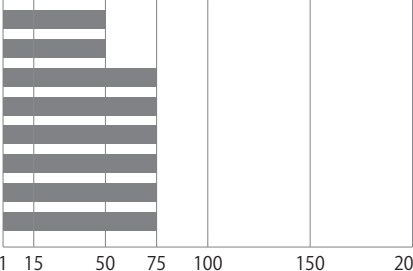
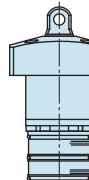
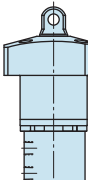
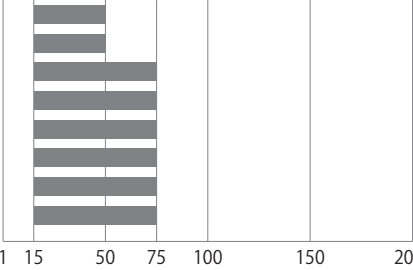
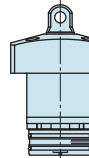
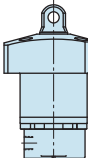
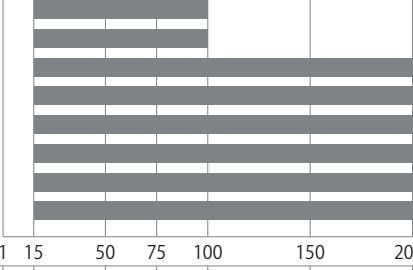
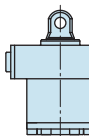
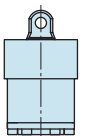
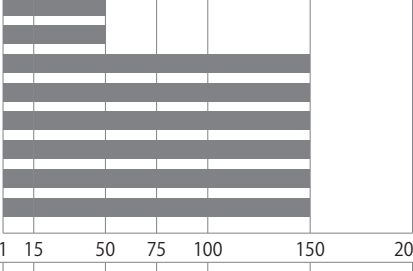
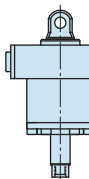
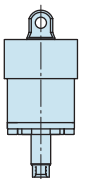
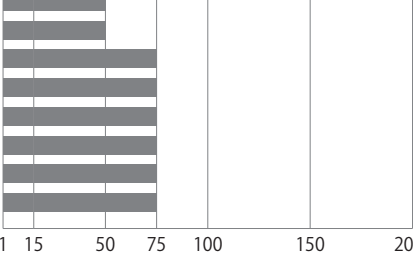
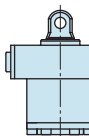
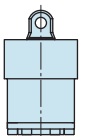
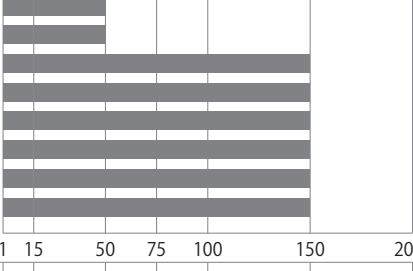
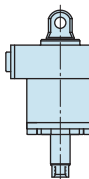
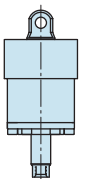
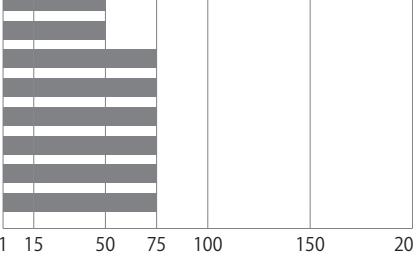
As a Slide Positioning Pin



As a Pull Cylinder



● Allowable Stroke Chart

Model	Mounting Methods	Action Confirmation Method	Body Size	Allowable Stroke (mm)
LL		Single Rod (Standard)		
		Double End Rod for Dog		
Air Sensing Manifold Option Air Sensing Piping Option		 		
Air Sensing Manifold Option for Retract End Air Sensing Piping Option for Retract End		 		
Single Rod (Standard)		 		
Double End Rod for Dog		 		
LLR LLU	 	Single Rod (Standard)	 	
LLR-D LLU-D		Double End Rod for Dog	 	

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

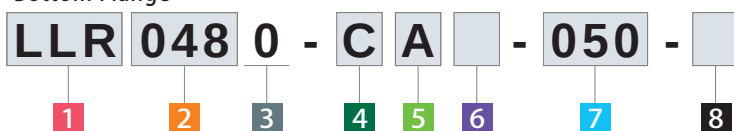
DWA/DWB

Model No. Indication

Top Flange



Bottom Flange



Bottom Flange (Compact)

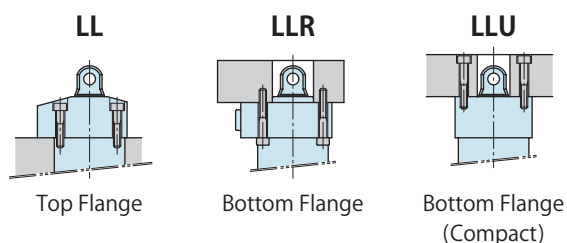


1 Mounting Methods

LL : Top Flange

LLR : Bottom Flange

LLU : Bottom Flange (Compact)



2 Body Size

036 : $\phi D=36\text{mm}$

040 : $\phi D=40\text{mm}$

048 : $\phi D=48\text{mm}$

055 : $\phi D=55\text{mm}$

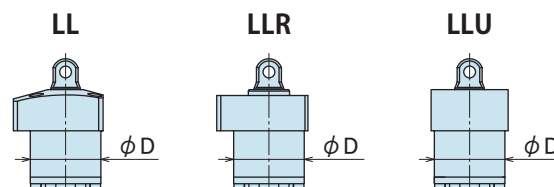
065 : $\phi D=65\text{mm}$

075 : $\phi D=75\text{mm}$

090 : $\phi D=90\text{mm}$

105 : $\phi D=105\text{mm}$

※ Outer diameter (ϕD) of the Cylinder.



3 Design No.

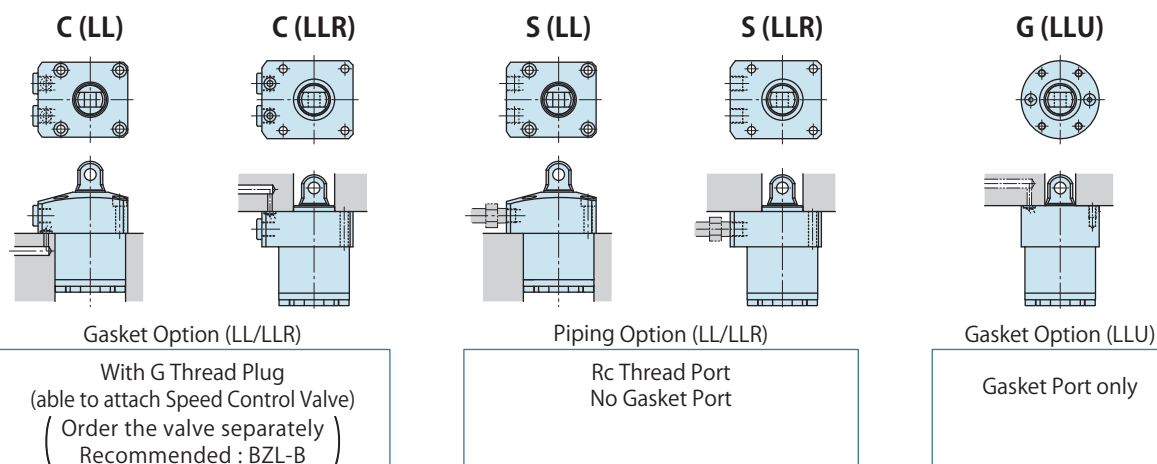
0 : Revision Number

4 Piping Method

C : Gasket Option (With G Thread Plug, Apply to LL/LLR)

S : Piping Option (Rc Thread Port, Apply to LL/LLR)

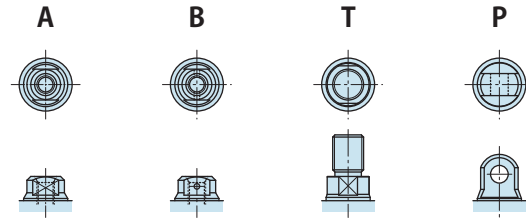
G : Gasket Option (Gasket Port only, Apply to LLU)



※ Speed control valve (BZL) is sold separately. Refer to the P.947.

5 Shape of Piston Tip

- A** : Female Threaded
B : Female Threaded (With Anti-Rotation Pinhole)
T : Male Threaded
P : Pin-Hole Option



6 Action Confirmation Method

Blank : Standard Model

LL ... Refer to P.847 ~ P.850

LLR ... Refer to P.869 ~ P.872

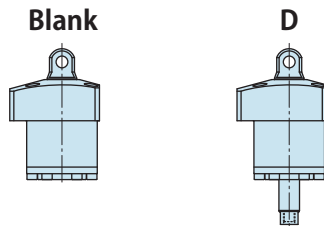
LLU ... Refer to P.875 ~ P.878

D : Double End Rod Option for Dog

LL ... Refer to P.851 ~ P.852

LLR ... Refer to P.873 ~ P.874

LLU ... Refer to P.879 ~ P.880



Action Confirmation is only for LL (Top Flange)

M□ : Air Sensing Manifold Option

... Refer to P.853 ~ P.854, P.857 ~ P.858 (Refer to P.857 for the number in □)

N□ : Air Sensing Piping Option

(**N□** : Standard Air Sensing Port Phase)

(**NC□/NL□/NR□** : Refer to external dimensions for air sensor port phase.)

... Refer to P.855 ~ P.856, P.857 ~ P.858 (Refer to P.857 for the number in □)

RM : Air Sensing Manifold Option for Retract End

... Refer to P.859 ~ P.862, P.867 ~ P.868

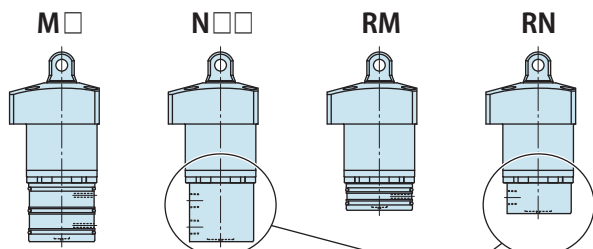
RN : Air Sensing Piping Option for Retract End

(**RN** : Standard Air Sensing Port Phase)

(**RNC/RNL/RNR** : Refer to external dimensions for air sensor port phase.)※

※ Only RN : Standard Phase is available for the body size 0360/0400.

... Refer to P.863 ~ P.866, P.867 ~ P.868



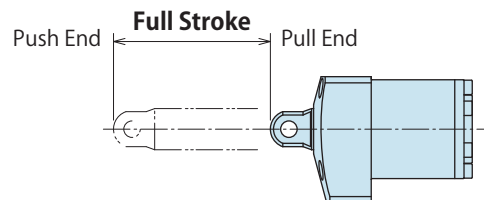
Air sensor port phase is selectable from four directions.
(Refer to external dimensions.)

7 Stroke

Stroke Value : Full Stroke

※ Full stroke can be set in 1 mm increments within the allowable stroke range.
(Refer to P.840.)

Example : Full Stroke of 1mm : 001
 Full Stroke of 53mm : 053
 Full Stroke of 175mm : 175



8 Offset Position

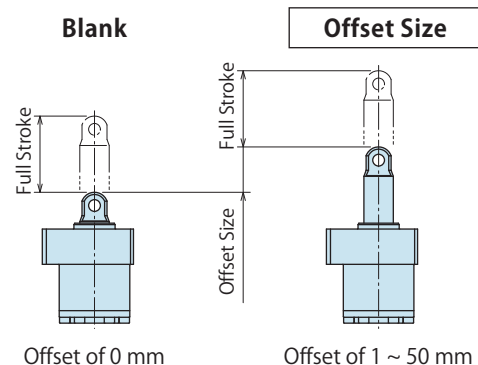
Only for LLR/LLU (Bottom Flange)

Blank : Offset of 0 mm

Offset Size : Offset of 1-50 mm

※ Offset size can be set in 1 mm increments within 1-50 mm.

Example : Offset of 1mm : 01
 Offset of 35mm : 35



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

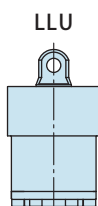
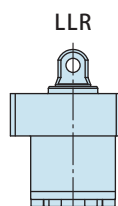
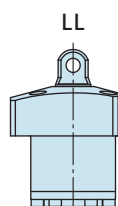
Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

● Performance Curve (Action Confirmation Method・・・Blank : Single Rod Model (Standard))



Applicable Model



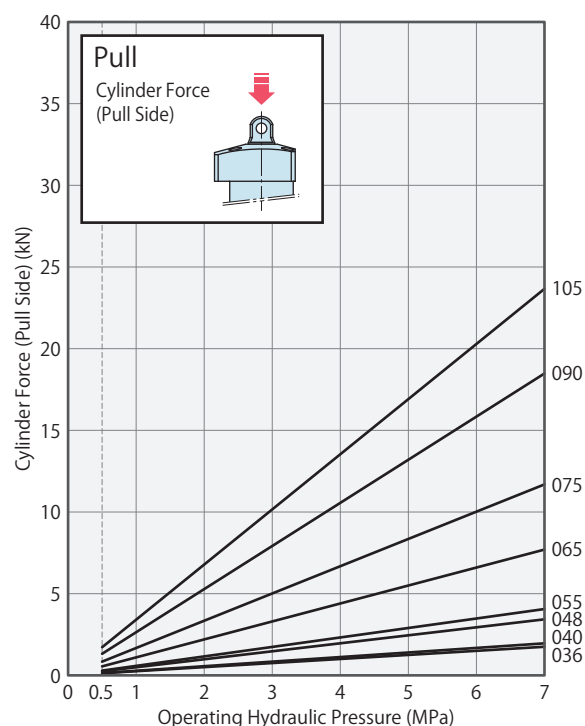
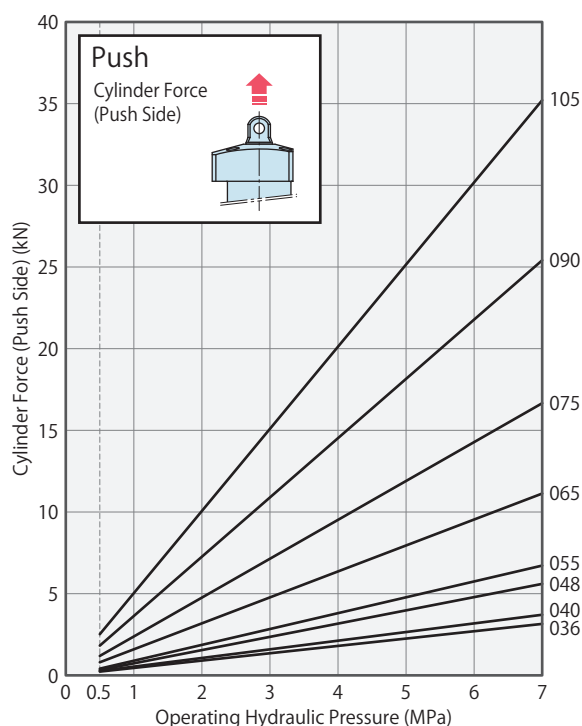
1 Body Size

6 Action Confirmation Method : Blank

Max. Operating Pressure : 7 MPa
Min. Operating Pressure : 0.5 MPa

Body Size	Cylinder Inside Diameter (mm)	Rod Diameter (mm)	Cylinder Area (Push Side) (cm ²)	Cylinder Force (Push Side) Calculation Formula (kN) ^{※1}	Cylinder Area (Pull Side) (cm ²)	Cylinder Force (Pull Side) Calculation Formula (kN) ^{※1}
036	φ24	φ16	4.5	$F = P \times 0.45$	2.5	$F = P \times 0.25$
040	φ26	φ18	5.3	$F = P \times 0.53$	2.8	$F = P \times 0.28$
048	φ32	φ20	8.0	$F = P \times 0.80$	4.9	$F = P \times 0.49$
055	φ35	φ22	9.6	$F = P \times 0.96$	5.8	$F = P \times 0.58$
065	φ45	φ25	15.9	$F = P \times 1.59$	11.0	$F = P \times 1.10$
075	φ55	φ30	23.8	$F = P \times 2.38$	16.7	$F = P \times 1.67$
090	φ68	φ35.5	36.3	$F = P \times 3.63$	26.4	$F = P \times 2.64$
105	φ80	φ45	50.3	$F = P \times 5.03$	34.4	$F = P \times 3.44$

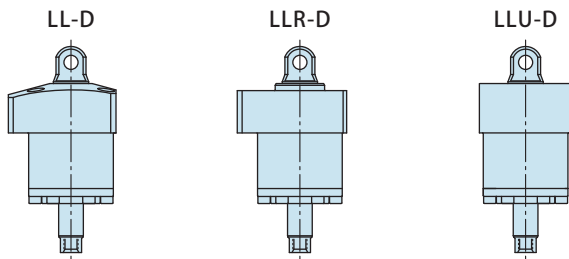
Body Size	Cylinder Force (Push Side) (kN)							Cylinder Force (Pull Side) (kN)						
	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa
036	0.4	0.9	1.3	1.8	2.2	2.7	3.1	0.2	0.5	0.7	1.0	1.2	1.5	1.7
040	0.5	1.0	1.5	2.1	2.6	3.1	3.7	0.2	0.5	0.8	1.1	1.4	1.6	1.9
048	0.8	1.6	2.4	3.2	4.0	4.8	5.6	0.4	0.9	1.4	1.9	2.4	2.9	3.4
055	0.9	1.9	2.8	3.8	4.8	5.7	6.7	0.5	1.1	1.7	2.3	2.9	3.4	4.0
065	1.5	3.1	4.7	6.3	7.9	9.5	11.1	1.1	2.2	3.3	4.4	5.5	6.6	7.7
075	2.3	4.7	7.1	9.5	11.9	14.2	16.6	1.6	3.3	5.0	6.6	8.3	10.0	11.6
090	3.6	7.2	10.8	14.5	18.1	21.7	25.4	2.6	5.2	7.9	10.5	13.2	15.8	18.4
105	5.0	10.0	15.0	20.1	25.1	30.1	35.2	3.4	6.8	10.3	13.7	17.2	20.6	24.0



Notes :

- ※1. F : Cylinder Force (kN), P : Operating Hydraulic Pressure (MPa)
- 1. Tables and graphs show the relationship between the cylinder output and the supply hydraulic pressure.
- 2. Cylinder Force F (kN) is the theoretical value. Actual output may decrease because of friction and pressure loss.

● Performance Curve (Action Confirmation Method··· D : Double End Rod for Dog)



Applicable Model

LL
LLR
LLU

0 - CSG

ABTP

D - 050

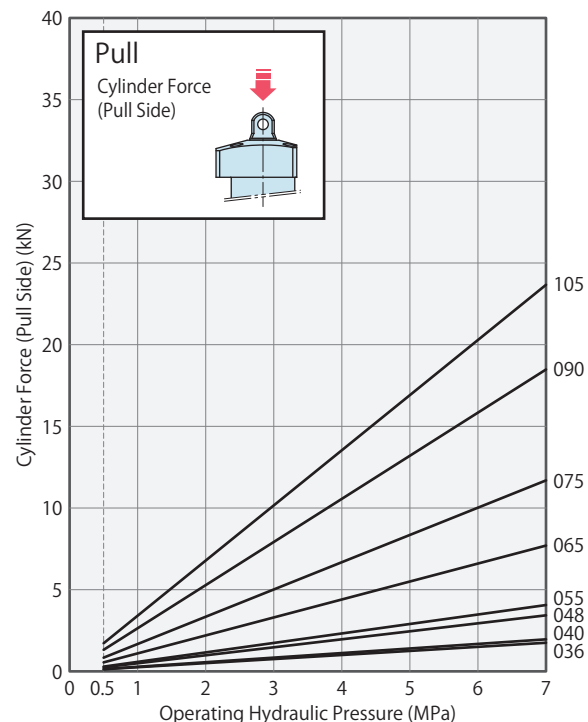
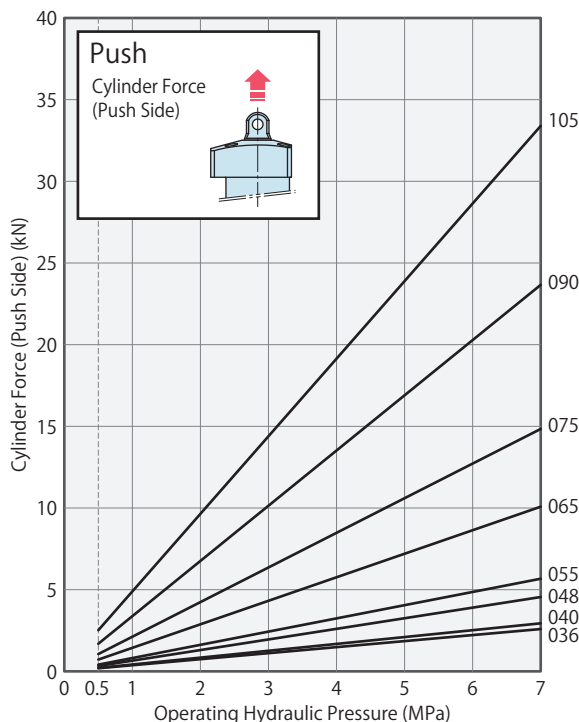
1 Body Size

6 Action Confirmation Method : D

Max. Operating Pressure : 7 MPa
Min. Operating Pressure : 0.5 MPa

Body Size	Cylinder Inside Diameter (mm)	Rod Diameter (mm)	Sensor Area of Rod Diameter (mm)	Cylinder Area (Push Side) (cm ²)	Cylinder Force (Push Side) Calculation Formula (kN)※1	Cylinder Area (Pull Side) (cm ²)	Cylinder Force (Pull Side) Calculation Formula (kN)※1
036	φ 24	φ 16	φ 10	3.7	F = P × 0.37	2.5	F = P × 0.25
040	φ 26	φ 18	φ 12	4.2	F = P × 0.42	2.8	F = P × 0.28
048	φ 32	φ 20	φ 14	6.5	F = P × 0.65	4.9	F = P × 0.49
055	φ 35	φ 22	φ 14	8.1	F = P × 0.81	5.8	F = P × 0.58
065	φ 45	φ 25	φ 14	14.4	F = P × 1.44	11.0	F = P × 1.10
075	φ 55	φ 30	φ 18	21.2	F = P × 2.12	16.7	F = P × 1.67
090	φ 68	φ 35.5	φ 18	33.8	F = P × 3.38	26.4	F = P × 2.64
105	φ 80	φ 45	φ 18	47.7	F = P × 4.77	34.4	F = P × 3.44

Body Size	Cylinder Force (Push Side) (kN)							Cylinder Force (Pull Side) (kN)						
	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa
036	0.3	0.7	1.1	1.4	1.8	2.2	2.5	0.2	0.5	0.7	1.0	1.2	1.5	1.7
040	0.4	0.8	1.2	1.6	2.1	2.5	2.9	0.2	0.5	0.8	1.1	1.4	1.6	1.9
048	0.6	1.3	1.9	2.6	3.2	3.9	4.5	0.4	0.9	1.4	1.9	2.4	2.9	3.4
055	0.8	1.6	2.4	3.2	4.0	4.8	5.6	0.5	1.1	1.7	2.3	2.9	3.4	4.0
065	1.4	2.8	4.3	5.7	7.2	8.6	10.0	1.1	2.2	3.3	4.4	5.5	6.6	7.7
075	2.1	4.2	6.3	8.4	10.6	12.7	14.8	1.6	3.3	5.0	6.6	8.3	10.0	11.6
090	3.3	6.7	10.1	13.5	16.9	20.2	23.6	2.6	5.2	7.9	10.5	13.2	15.8	18.4
105	4.7	9.5	14.3	19.0	23.8	28.6	33.3	3.4	6.8	10.3	13.7	17.2	20.6	24.0



Notes :

※1. F : Cylinder Force (kN), P : Operating Hydraulic Pressure (MPa)

- Tables and graphs show are the relationship between the cylinder output and the supply hydraulic pressure.
- Cylinder Force F (kN) is the theoretical value. Actual output may decrease because of friction and pressure loss.

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

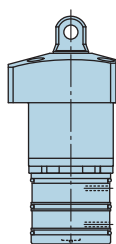
Customized Spring Cylinder

DWA/DWB

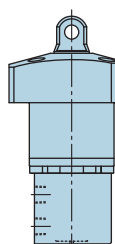
Performance Curve

(Action Confirmation Method ··· M□ : Air Sensing Manifold Option / N□ : Air Sensing Piping Option)

LL-M□



LL-N□



Applicable Model

LL

0

1 Body Size

C
S
GA
B
T
P

M□
N□
NC□
NL□
NR□

6 Action Confirmation Method :
M□/N□/NC□/NL□/NR□

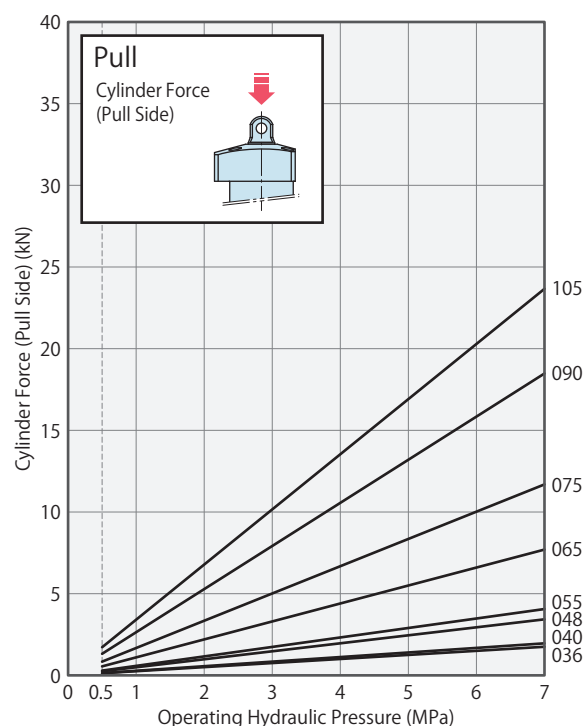
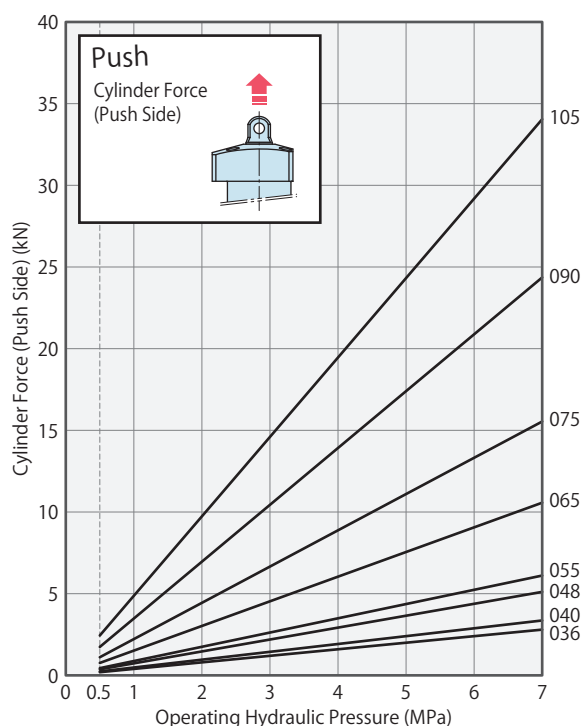
- 050

Max. Operating Pressure : 7 MPa

Min. Operating Pressure : 0.5 MPa

Body Size	Cylinder Inside Diameter (mm)	Rod Diameter (mm)	Sensor Area of Rod Diameter (mm)	Cylinder Area (Push Side) (cm ²)	Cylinder Force (Push Side) Calculation Formula (kN) ^{※1}	Cylinder Area (Pull Side) (cm ²)	Cylinder Force (Pull Side) Calculation Formula (kN) ^{※1}
036	φ24	φ16	φ8	4.0	$F = P \times 0.40$	2.5	$F = P \times 0.25$
040	φ26	φ18	φ8	4.8	$F = P \times 0.48$	2.8	$F = P \times 0.28$
048	φ32	φ20	φ10	7.3	$F = P \times 0.73$	4.9	$F = P \times 0.49$
055	φ35	φ22	φ10	8.8	$F = P \times 0.88$	5.8	$F = P \times 0.58$
065	φ45	φ25	φ10	15.1	$F = P \times 1.51$	11.0	$F = P \times 1.10$
075	φ55	φ30	φ14	22.2	$F = P \times 2.22$	16.7	$F = P \times 1.67$
090	φ68	φ35.5	φ14	34.8	$F = P \times 3.48$	26.4	$F = P \times 2.64$
105	φ80	φ45	φ14	48.7	$F = P \times 4.87$	34.4	$F = P \times 3.44$

Body Size	Cylinder Force (Push Side) (kN)							Cylinder Force (Pull Side) (kN)						
	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa
036	0.4	0.8	1.2	1.6	2.0	2.4	2.8	0.2	0.5	0.7	1.0	1.2	1.5	1.7
040	0.4	0.9	1.4	1.9	2.4	2.8	3.3	0.2	0.5	0.8	1.1	1.4	1.6	1.9
048	0.7	1.4	2.1	2.9	3.6	4.3	5.1	0.4	0.9	1.4	1.9	2.4	2.9	3.4
055	0.8	1.7	2.6	3.5	4.4	5.2	6.1	0.5	1.1	1.7	2.3	2.9	3.4	4.0
065	1.5	3.0	4.5	6.0	7.5	9.0	10.5	1.1	2.2	3.3	4.4	5.5	6.6	7.7
075	2.2	4.4	6.6	8.8	11.1	13.3	15.5	1.6	3.3	5.0	6.6	8.3	10.0	11.6
090	3.4	6.9	10.4	13.9	17.4	20.8	24.3	2.6	5.2	7.9	10.5	13.2	15.8	18.4
105	4.8	9.7	14.6	19.4	24.3	29.2	34.0	3.4	6.8	10.3	13.7	17.2	20.6	24.0



Notes :

※1. F : Cylinder Force (kN), P : Operating Hydraulic Pressure (MPa)

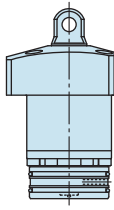
1. Tables and graphs show the relationship between the cylinder output and the supply hydraulic pressure.

2. Cylinder Force F (kN) is the theoretical value. Actual output may decrease because of friction and pressure loss.

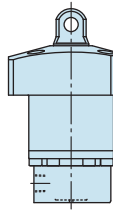
Performance Curve

(Action Confirmation Method ··· RM : Air Sensing Manifold Option for Retract End / RN : Air Sensing Piping Option for Retract End)

LL-RM



LL-RN



Applicable Model

LL

1 Body Size

0 - C S G A B T P

RM
RN
RNC
RNL
RNR

6 Action Confirmation Method :
RM/RN/RNC/RNL/RNR

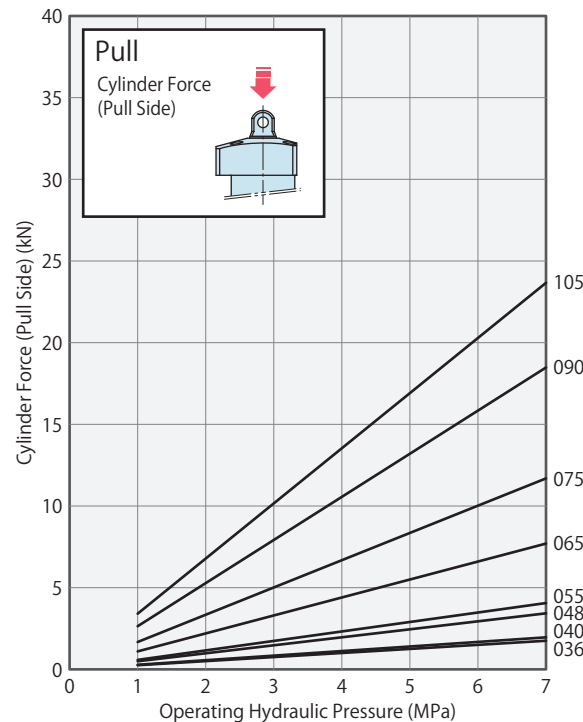
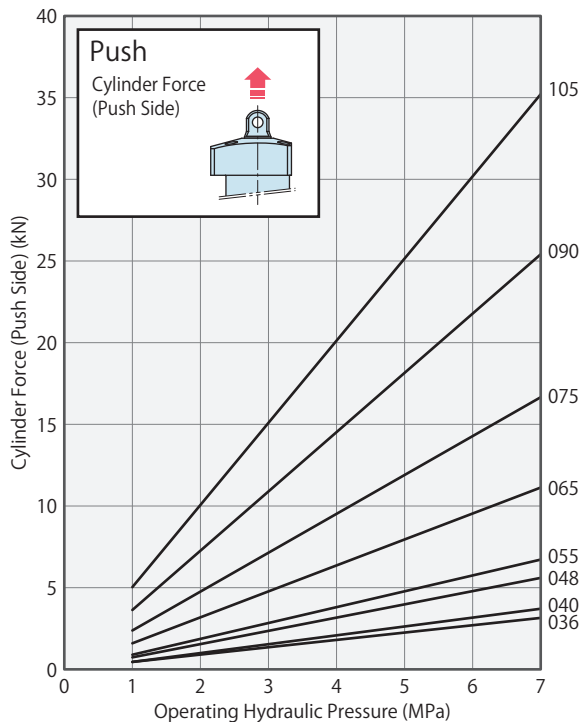
- 050

Max. Operating Pressure : 7 MPa

Min. Operating Pressure : 1 MPa

Body Size	Cylinder Inside Diameter (mm)	Rod Diameter (mm)	Cylinder Area (Push Side) (cm ²)	Cylinder Force (Push Side) Calculation Formula (kN) ^{※1}	Cylinder Area (Pull Side) (cm ²)	Cylinder Force (Pull Side) Calculation Formula (kN) ^{※1}
036	φ 24	φ 16	4.5	$F = P \times 0.45$	2.5	$F = P \times 0.25$
040	φ 26	φ 18	5.3	$F = P \times 0.53$	2.8	$F = P \times 0.28$
048	φ 32	φ 20	8.0	$F = P \times 0.80$	4.9	$F = P \times 0.49$
055	φ 35	φ 22	9.6	$F = P \times 0.96$	5.8	$F = P \times 0.58$
065	φ 45	φ 25	15.9	$F = P \times 1.59$	11.0	$F = P \times 1.10$
075	φ 55	φ 30	23.8	$F = P \times 2.38$	16.7	$F = P \times 1.67$
090	φ 68	φ 35.5	36.3	$F = P \times 3.63$	26.4	$F = P \times 2.64$
105	φ 80	φ 45	50.3	$F = P \times 5.03$	34.4	$F = P \times 3.44$

Body Size	Cylinder Force (Push Side) (kN)							Cylinder Force (Pull Side) (kN)						
	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa	1MPa	2MPa	3MPa	4MPa	5MPa	6MPa	7MPa
036	0.4	0.9	1.3	1.8	2.2	2.7	3.1	0.2	0.5	0.7	1.0	1.2	1.5	1.7
040	0.5	1.0	1.5	2.1	2.6	3.1	3.7	0.2	0.5	0.8	1.1	1.4	1.6	1.9
048	0.8	1.6	2.4	3.2	4.0	4.8	5.6	0.4	0.9	1.4	1.9	2.4	2.9	3.4
055	0.9	1.9	2.8	3.8	4.8	5.7	6.7	0.5	1.1	1.7	2.3	2.9	3.4	4.0
065	1.5	3.1	4.7	6.3	7.9	9.5	11.1	1.1	2.2	3.3	4.4	5.5	6.6	7.7
075	2.3	4.7	7.1	9.5	11.9	14.2	16.6	1.6	3.3	5.0	6.6	8.3	10.0	11.6
090	3.6	7.2	10.8	14.5	18.1	21.7	25.4	2.6	5.2	7.9	10.5	13.2	15.8	18.4
105	5.0	10.0	15.0	20.1	25.1	30.1	35.2	3.4	6.8	10.3	13.7	17.2	20.6	24.0



Notes :

※1. F : Cylinder Force (kN), P : Operating Hydraulic Pressure (MPa)

- Tables and graphs show the relationship between the cylinder output and the supply hydraulic pressure.
- Cylinder Force F (kN) is the theoretical value. Actual output may decrease because of friction and pressure loss.

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

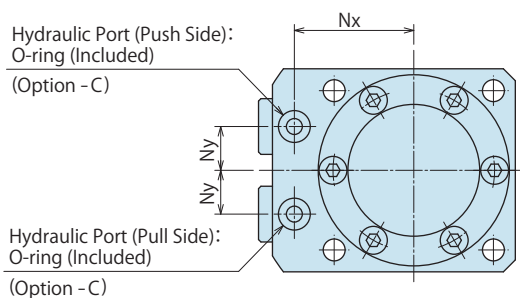
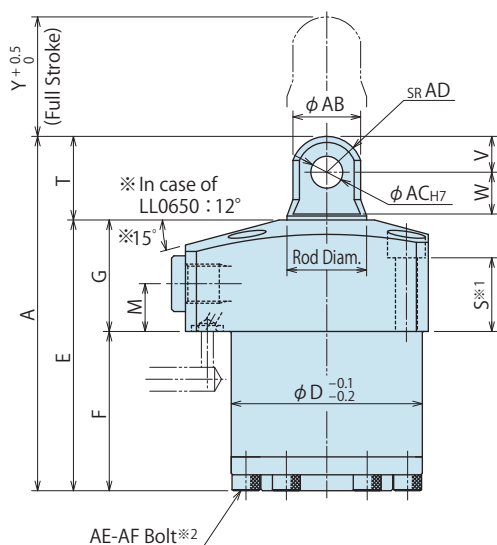
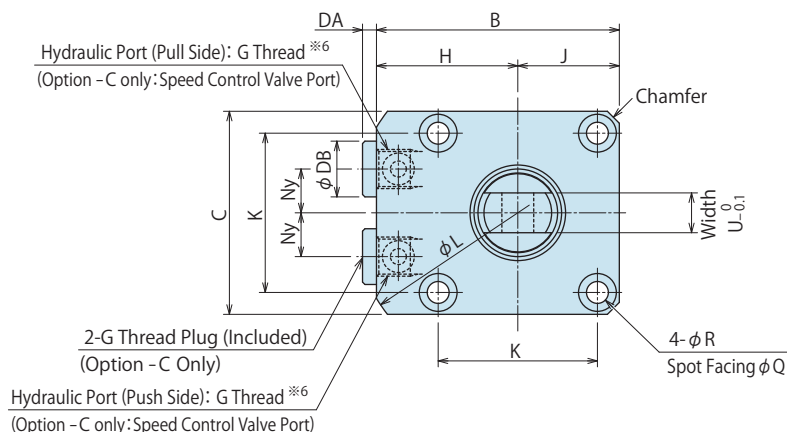
Customized Spring Cylinder

DWA/DWB

External Dimensions

C: Gasket Option (with G Thread Plug) P: Pin-Hole Option

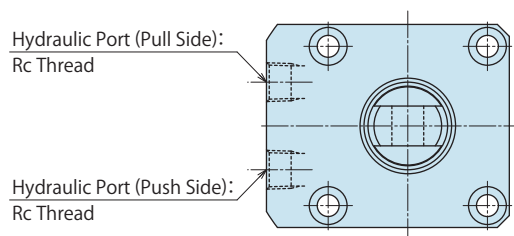
※This drawing shows LL-CP.



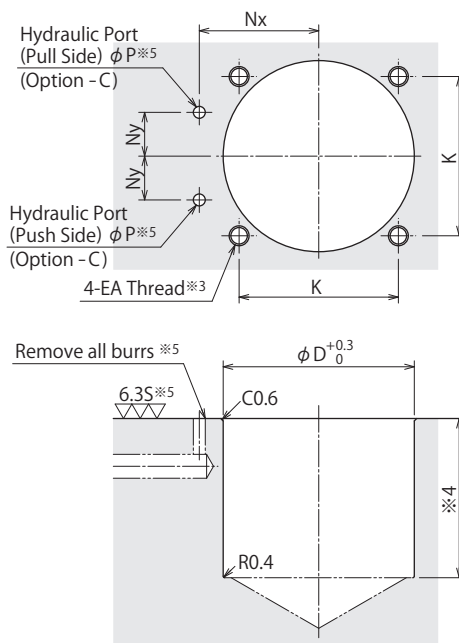
● Piping Method

S : Rc Thread Piping Option

※The drawing shows LL-SP.



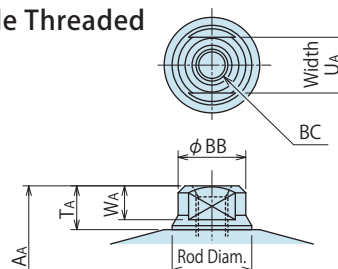
● Machining Dimensions of Mounting Area



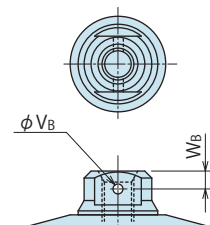
 Tip Shape

Refer to **P** Pin-Hole Option
for unlisted dimensions.

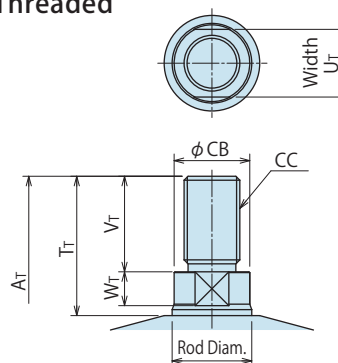
A: Female Threaded



B: Female Thread (with Anti-Rotation Pinhole)



T: Male Threaded



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. EA 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. The machining dimension is for -C : Gasket option.
- ※ 6. Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LL0360-□□	LL0400-□□	LL0480-□□	LL0550-□□	LL0650-□□	LL0750-□□	LL0900-□□	LL1050-□□
Full Stroke Y	mm	Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area cm ²	Push Side	4.5	5.3	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula) kN	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula) cm ³	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.6	1.3 ~ 2.1	1.9 ~ 3.1	2.8 ~ 4.1	4.3 ~ 6.1	5.9 ~ 8.0

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ In case of Full Stroke Y=1~14mm: the same external dimensions as Stroke = 15mm.
(Ex.) LL0360-□P-010 [Y=10, A=63, E=48, F=23]
LL0360-□P-030 [Y=30, A=78, E=63, F=38]

[P] : Pin-Hole Option

Model No.	LL0360-□P		LL0400-□P		LL0480-□P		LL0550-□P		LL0650-□P		LL0750-□P		LL0900-□P		LL1050-□P	
Full Stroke Y	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75
A	63	Y+48	70	Y+55	74	Y+59	80	Y+65	90	Y+75	101	Y+86	114	Y+99	127	Y+112
B	49		54		61		69		81		92		107		122	
C	40		45		51		60		70		80		95		110	
D	36		40		48		55		65		75		90		105	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41	62	Y+47	68	Y+53	77	Y+62	81	Y+66
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13	32	Y+17	31	Y+16	37	Y+22	36	Y+21
G	25		25		28		28		30		37		40		45	
H	29		31.5		35.5		39		46		52		59.5		67	
J	20		22.5		25.5		30		35		40		47.5		55	
K	31.4		34		40		47		55		63		75		88	
L	66		73		83		88		106		116		136		152	
M	11		11		12		12		13		16		16		17	
Nx	23.5		26		30		33.5		39.5		45		52.5		60	
Ny	8		9		11		12		15		16		18.5		22.5	
P	3		3		3		3		5		5		5		5	
Q	7.5		9.5		9.5		11		11		14		17.5		20	
R	4.5		5.5		5.5		6.8		6.8		9		11		14	
S	16		14		15.5		13		15.5		17.5		16.5		17.5	
T	15		19		21		24		28		33		37		46	
U	6		8		10		11		13		16		19		22	
V	6		8		9		10		12		14		16		21	
W	7.5		9.5		10.5		12		14		17		19		23	
Chamfer	C2		C3		C3		C3		C4		C5		C6		C6	
AB	12		15		17		19		22		27		32		42	
AC	6 ^{+0.012} ₀		8 ^{+0.015} ₀		8 ^{+0.015} ₀		10 ^{+0.015} ₀		12 ^{+0.018} ₀		14 ^{+0.018} ₀		16 ^{+0.018} ₀		20 ^{+0.021} ₀	
AD	6		8		9		10		12		14		16		21	
AE	5		4		6		4		6		6		8		10	
AF (Nominal×Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M6×1	
DA	3.5		3.5		3.5		3.5		4.5		4.5		4.5		4.5	
DB	14		14		14		14		19		19		22		22	
EA (Nominal×Pitch)	M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M8×1.25		M10×1.5		M12×1.75	
Hydraulic Port	Option -C	G1/8	G1/8		G1/8		G1/8		G1/4		G1/4		G3/8		G3/8	
	Option -S	Rc1/8	Rc1/8		Rc1/8		Rc1/8		Rc1/4		Rc1/4		Rc3/8		Rc3/8	
O-ring	1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7	

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions.

Model No.	LL0360-□A		LL0400-□A		LL0480-□A		LL0550-□A		LL0650-□A		LL0750-□A		LL0900-□A		LL1050-□A	
A ^A	57	Y+42	61	Y+46	64	Y+49	68	Y+53	75	Y+60	83	Y+68	93	Y+78	99	Y+84
T ^A	9		10		11		12		13		15		16		18	
U ^A	12		13		14		17		19		24		30		36	
W ^A	7.5		7.5		8.5		9		10		12		13		15	
BB	14		15		17		19		22		27		33		42	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20		M12×1.75×24		M16×2×32		M20×2.5×40		M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions.

Model No.	LL0360-□B	LL0400-□B	LL0480-□B	LL0550-□B	LL0650-□B	LL0750-□B	LL0900-□B	LL1050-□B
V ^B	2	2.5	2.5	2.5	3	4	5	6
W ^B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to P Pin-Hole Option for for unlisted dimensions.

Model No.	LL0360-□T	LL0400-□T	LL0480-□T	LL0550-□T	LL0650-□T	LL0750-□T	LL0900-□T	LL1050-□T
A ^T	73	Y+58	81	Y+66	88	Y+73	96	Y+81
T ^T	25		30		35		40	
U ^T	12		14		17		19	
V ^T	16		20		24		28	
W ^T	7.5		7.5		8.5		9	
CB	14		17		19		21	
CC (Nominal×Pitch)	M10×1.25		M12×1.25		M14×1.5		M16×1.5	
					M20×1.5		M24×1.5	
							M30×1.5	
								M36×1.5

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

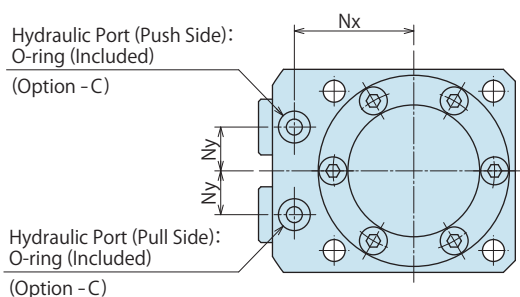
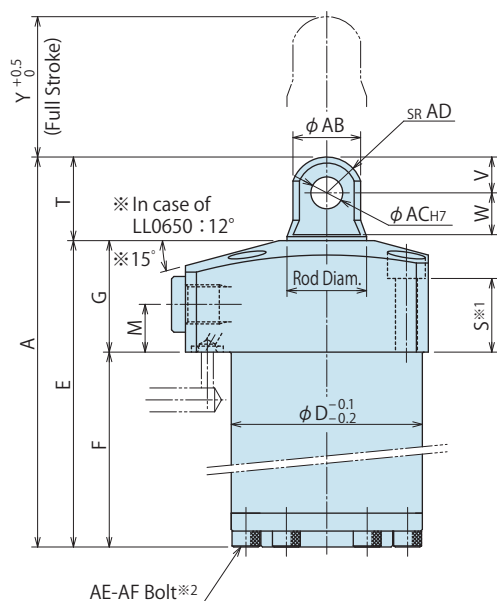
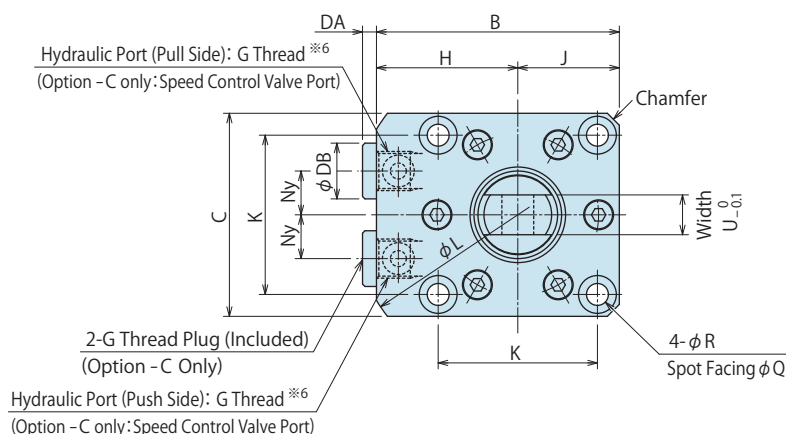
Customized Spring Cylinder

DWA/DWB

External Dimensions

C: Gasket Option (with G Thread Plug) [P]: Pin-Hole Option

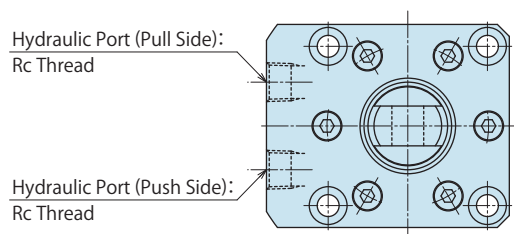
※This drawing shows LL-CP.



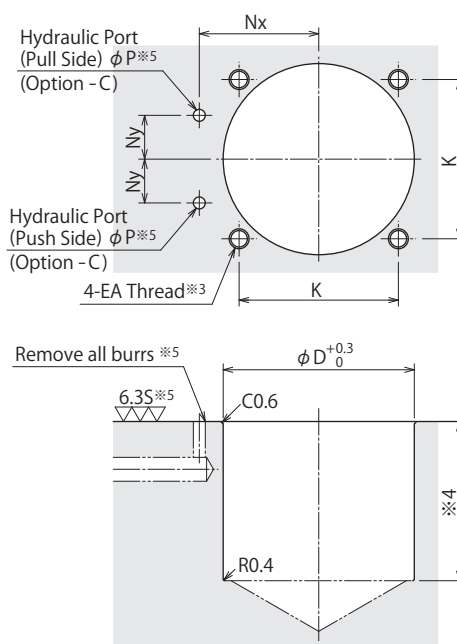
Piping Method

S: Rc Thread Piping Option

※The drawing shows LL-SP.



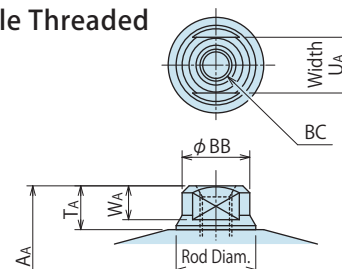
Machining Dimensions of Mounting Area



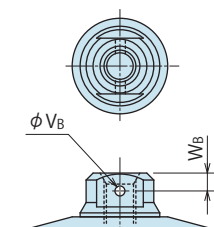
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

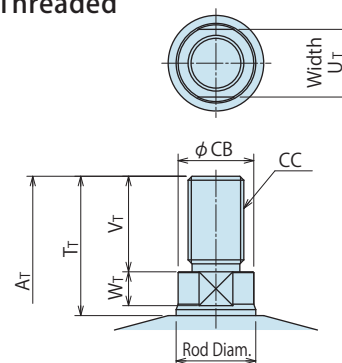
[A]: Female Threaded



[B]: Female Thread (with Anti-Rotation Pinhole)



[T]: Male Threaded



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. EA 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. The machining dimension is for -C : Gasket option.
- ※ 6. Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LL0360-□□	LL0400-□□	LL0480-□□	LL0550-□□	LL0650-□□	LL0750-□□	LL0900-□□	LL1050-□□
Full Stroke Y	mm	Y : 51 ~ 100			Y : 76 ~ 200				
Cylinder Area cm ²	Push Side	4.5	5.3	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula) kN	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula) cm ³	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.9 ~ 1.2	1.0 ~ 1.4	1.7 ~ 3.0	2.3 ~ 4.1	3.2 ~ 5.4	4.4 ~ 7.1	6.5 ~ 10.1	9.0 ~ 13.0

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LL0360-□P-070 [Y=70, A=133, E=118, F=93] (mm)

Model No.	LL0360-□P	LL0400-□P	LL0480-□P	LL0550-□P	LL0650-□P	LL0750-□P	LL0900-□P	LL1050-□P
Full Stroke Y	51 ~ 100	51 ~ 100	76 ~ 200	76 ~ 200	76 ~ 200	76 ~ 200	76 ~ 200	76 ~ 200
A	Y+63	Y+70	Y+76	Y+81	Y+91	Y+107	Y+121	Y+138
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+48	Y+51	Y+55	Y+57	Y+63	Y+74	Y+84	Y+92
F	Y+23	Y+26	Y+27	Y+29	Y+33	Y+37	Y+44	Y+47
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal×Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal×Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
Hydraulic Port	Option - C	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Option - S	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□A	LL0400-□A	LL0480-□A	LL0550-□A	LL0650-□A	LL0750-□A	LL0900-□A	LL1050-□A
AA	Y+57	Y+61	Y+66	Y+69	Y+76	Y+89	Y+100	Y+110
TA	9	10	11	12	13	15	16	18
UA	12	13	14	17	19	24	30	36
WA	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions. (mm)

Model No.	LL0360-□B	LL0400-□B	LL0480-□B	LL0550-□B	LL0650-□B	LL0750-□B	LL0900-□B	LL1050-□B
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□T	LL0400-□T	LL0480-□T	LL0550-□T	LL0650-□T	LL0750-□T	LL0900-□T	LL1050-□T
AT	Y+73	Y+81	Y+90	Y+97	Y+108	Y+124	Y+146	Y+164
Tr	25	30	35	40	45	50	62	72
UT	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
WT	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal×Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

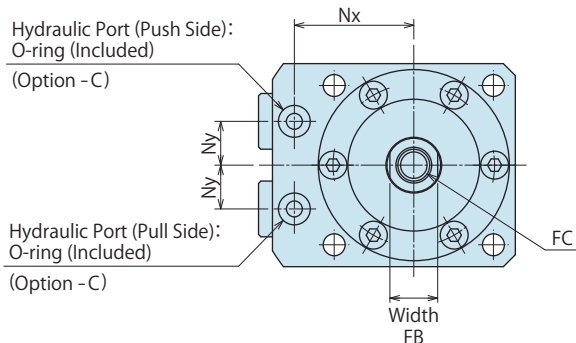
FQ

Customized Spring Cylinder

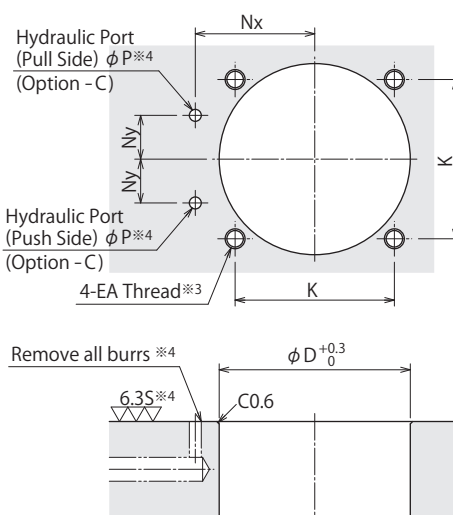
DWA/DWB

● Machining Dimensions of Mounting Area

※This drawing indicates LL-CPD.



※The drawing shows LL-SPD.



Refer to **P** Pin-Hole Option
for unlisted dimensions.

The diagram illustrates a threaded rod and nut assembly. The rod is shown in cross-section with a diameter labeled ϕBB . The nut is shown in cross-section with a width labeled $Width U_A$. The assembly is shown in a side view with dimensions AA (total height), T_A (nut height), and W_A (nut width). The rod is labeled "Rod Diam." and the nut is labeled "BC".

Technical drawing of a rod end bearing. The top view shows a circular cross-section with dimensions ϕCB (outer diameter) and U_T (width). The side view shows the bearing assembly with dimensions A_T (total height), T_T (bearing height), V_T (rod height), W_T (rod diameter), and CC (center of curvature). The rod diameter is labeled as $Rod\ Diam.$

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※ 4. The machining dimension is for -C : Gasket option.
- ※ 5. Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LL0360-□□D	LL0400-□□D	LL0480-□□D	LL0550-□□D	LL0650-□□D	LL0750-□□D	LL0900-□□D	LL1050-□□D
Full Stroke Y		mm Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area cm ²	Push Side	3.7	4.2	6.5	8.1	14.4	21.2	33.8	47.7
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula) kN	Push Side	P×0.37	P×0.42	P×0.65	P×0.81	P×1.44	P×2.12	P×3.38	P×4.77
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula) cm ³	Push Side	Y×0.37	Y×0.42	Y×0.65	Y×0.81	Y×1.44	Y×2.12	Y×3.38	Y×4.77
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.7	1.3 ~ 2.2	2.0 ~ 3.2	2.9 ~ 4.3	4.5 ~ 6.4	6.1 ~ 8.3

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=1-14 mm and Y= 15 mm or more.

(Ex.) LL0360-□PD-010 [Y=10, A= 83.5, E=48, F=23]

LL0360-□PD-030 [Y=30, A=118.5, E=63, F=38] (mm)

[P] : Pin-Hole Option

Model No.	LL0360-□PD		LL0400-□PD		LL0480-□PD		LL0550-□PD		LL0650-□PD		LL0750-□PD		LL0900-□PD		LL1050-□PD	
Full Stroke Y	1~14	15~50	1~14	15~50	1~14	15~75	1~14	15~75	1~14	15~75	1~14	15~75	1~14	15~75	1~14	15~75
A	Y+73.5	2Y+58.5	Y+80.5	2Y+65.5	Y+84.5	2Y+69.5	Y+90.5	2Y+75.5	Y+100.5	2Y+85.5	Y+111.5	2Y+96.5	Y+124.5	2Y+109.5	Y+137.5	2Y+122.5
B	49		54		61		69		81		92		107		122	
C	40		45		51		60		70		80		95		110	
D	36		40		48		55		65		75		90		105	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41	62	Y+47	68	Y+53	77	Y+62	81	Y+66
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13	32	Y+17	31	Y+16	37	Y+22	36	Y+21
G	25		25		28		28		30		37		40		45	
H	29		31.5		35.5		39		46		52		59.5		67	
J	20		22.5		25.5		30		35		40		47.5		55	
K	31.4		34		40		47		55		63		75		88	
L	66		73		83		88		106		116		136		152	
M	11		11		12		12		13		16		16		17	
Nx	23.5		26		30		33.5		39.5		45		52.5		60	
Ny	8		9		11		12		15		16		18.5		22.5	
P	3		3		3		3		5		5		5		5	
Q	7.5		9.5		9.5		11		11		14		17.5		20	
R	4.5		5.5		5.5		6.8		6.8		9		11		14	
S	16		14		15.5		13		15.5		17.5		16.5		17.5	
T	15		19		21		24		28		33		37		46	
U	6		8		10		11		13		16		19		22	
V	6		8		9		10		12		14		16		21	
W	7.5		9.5		10.5		12		14		17		19		23	
Chamfer	C2		C3		C3		C3		C4		C5		C6		C6	
AB	12		15		17		19		22		27		32		42	
AC	6 ^{+0.012} ₀		8 ^{+0.015} ₀		8 ^{+0.015} ₀		10 ^{+0.015} ₀		12 ^{+0.018} ₀		14 ^{+0.018} ₀		16 ^{+0.018} ₀		20 ^{+0.021} ₀	
AD	6		8		9		10		12		14		16		21	
AE	5		4		6		4		6		6		8		10	
AF (Nominal×Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M6×1	
DA	3.5		3.5		3.5		3.5		4.5		4.5		4.5		4.5	
DB	14		14		14		14		19		19		22		22	
EA (Nominal×Pitch)	M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M8×1.25		M10×1.5		M12×1.75	
FA	10		12		14		14		14		18		18		18	
FB	8		10		12		12		12		16		16		16	
FC (Nominal×Pitch×Depth)	M5×0.8×12		M6×1×15		M8×1.25×18		M8×1.25×18		M8×1.25×18		M10×1.5×21		M10×1.5×21		M10×1.5×21	
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	G1/4	G1/4	G3/8	G3/8	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc3/8	Rc3/8	Rc3/8	Rc3/8
O-ring	1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7	

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□AD		LL0400-□AD		LL0480-□AD		LL0550-□AD		LL0650-□AD		LL0750-□AD		LL0900-□AD		LL1050-□AD	
AA	Y+67.5	2Y+52.5	Y+71.5	2Y+56.5	Y+74.5	2Y+59.5	Y+78.5	2Y+63.5	Y+85.5	2Y+70.5	Y+93.5	2Y+78.5	Y+103.5	2Y+88.5	Y+109.5	2Y+94.5
TA	9		10		11		12		13		15		16		18	
UA	12		13		14		17		19		24		30		36	
WA	7.5		7.5		8.5		9		10		12		13		15	
BB	14		15		17		19		22		27		33		42	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20		M12×1.75×24		M16×2×32		M20×2.5×40		M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LL0360-□BD	LL0400-□BD	LL0480-□BD	LL0550-□BD	LL0650-□BD	LL0750-□BD	LL0900-□BD	LL1050-□BD
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□TD	LL0400-□TD	LL0480-□TD	LL0550-□TD	LL0650-□TD	LL0750-□TD	LL0900-□TD	LL1050-□TD
AT	Y+83.5	2Y+68.5	Y+91.5	2Y+76.5	Y+98.5	2Y+83.5	Y+106.5	2Y+91.5
Tr	25		30		35		40	
Ur	12		14		17		19	
Vr	16		20		24		28	
Wr	7.5		7.5		8.5		9	
CB	14		17		19		21	
CC (Nominal×Pitch)	M10×1.25		M12×1.25		M14×1.5		M16×1.5	
					M20×1.5		M24×1.5	
							M30×1.5	
								M36×1.5

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

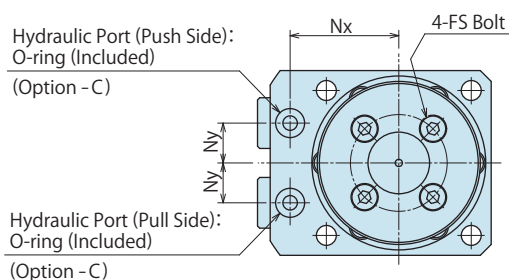
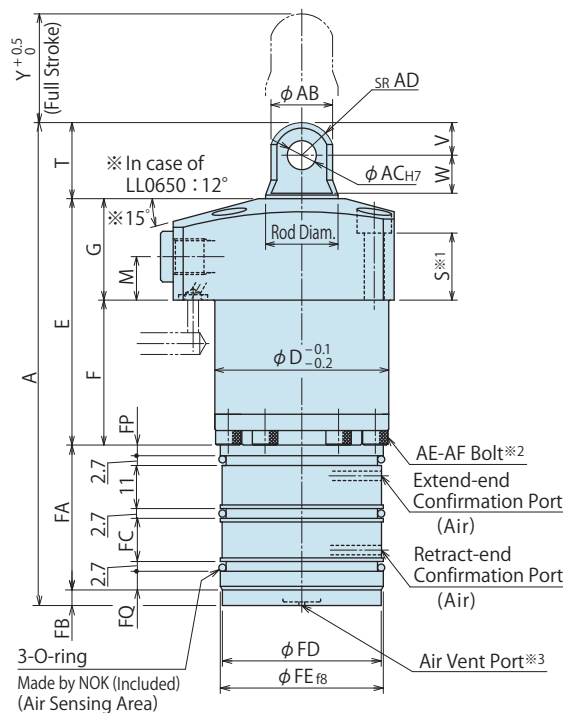
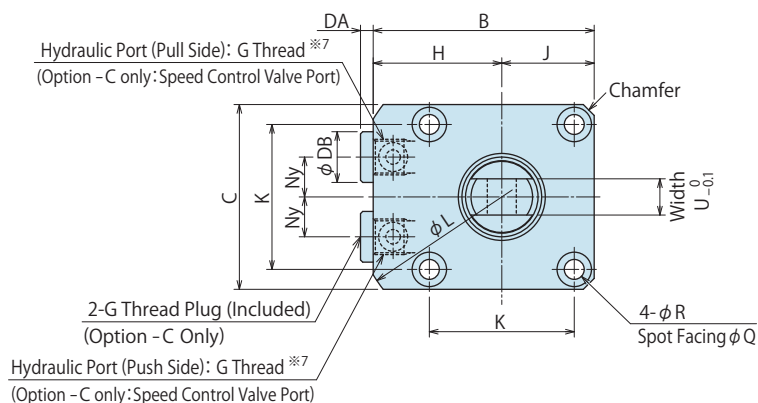
Customized Spring Cylinder

DWA/DWB

External Dimensions

C: Gasket Option (with G Thread Plug) P: Pin-Hole Option

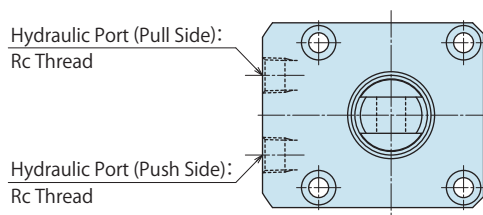
※ This drawing shows LL-CPM.



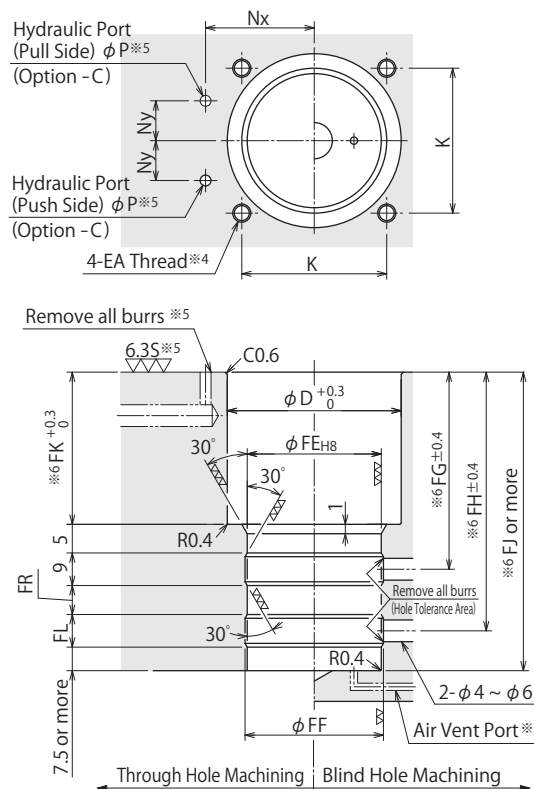
Piping Method

S: Rc Thread Piping Option

※ The drawing shows LL-SPM.



Machining Dimensions of Mounting Area

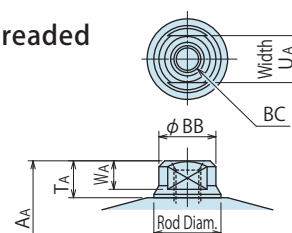


Notes:

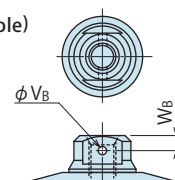
1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
2. The size and number of AF bolt vary depending on the model.
3. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
5. The machining dimension is for -C: Gasket option.
6. The dimensions indicate those under the flange.
7. Speed control valve is not provided. Please refer to P.947.

Tip Shape Refer to P Pin-Hole Option for unlisted dimensions.

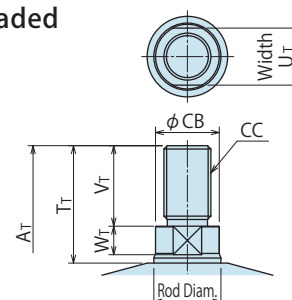
A: Female Threaded



B: Female Thread (with Anti-Rotation Pinhole)



T: Male Threaded



Specifications

Model No.		LL0360-□□M□	LL0400-□□M□	LL0480-□□M□	LL0550-□□M□	LL0650-□□M□	LL0750-□□M□	LL0900-□□M□	LL1050-□□M□	
Full Stroke Y	mm	Y: 15 ~ 50			Y: 15 ~ 75					
Cylinder Area	cm ²	Push Side	4.0	4.8	7.3	8.8	15.1	22.2	34.8	48.7
		Pull Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	kN	Push Side	P×0.40	P×0.48	P×0.73	P×0.88	P×1.51	P×2.22	P×3.48	P×4.87
		Pull Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	cm ³	Push Side	Y×0.40	Y×0.48	Y×0.73	Y×0.88	Y×1.51	Y×2.22	Y×3.48	Y×4.87
		Pull Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80	
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45	
Air Sensing Area Rod Diameter	mm	φ8			φ10		φ14			
Max. Operating Pressure	MPa	7.0					10.5			
Min. Operating Pressure	MPa	0.5					0.2			
Withstanding Pressure	MPa	10.5					15.0			
Recommended Operating Air Pressure※8	MPa	0.2					0.2			
Recommended Air Catch Sensor※8		ISA3-G (Made by SMC) / GPS3-E (Made by CKD)								
Operating Temperature	°C	0 ~ 70								
Weight	kg	0.8 ~ 1.4	0.9 ~ 1.5	1.2 ~ 2.6	1.5 ~ 3.2	2.2 ~ 4.0	3.2 ~ 5.4	4.8 ~ 7.5	6.4 ~ 9.4	

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

※8. The number of connected cylinders should be no more than 4 per air catch sensor.

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=15-24 mm and Y= 25 mm or more.

(Ex.) LL0360-□PM-020 [Y=20, A=107.5, FA=39.5, FB= 0, FC=15.7, FJ= 70, FL=14]

LL0360-□PM-040 [Y=40, A=146.5, FA=34.5, FB=24, FC=10.7, FJ=109, FL= 9] (mm)

Model No.	LL0360-□PM□	LL0400-□PM□	LL0480-□PM□	LL0550-□PM□	LL0650-□PM□	LL0750-□PM□	LL0900-□PM□	LL1050-□PM□
Full Stroke Y	15~24	25~50	15~24	25~50	15~24	25~75	15~24	25~75
A	2Y+67.5	2Y+66.5	2Y+76.5	2Y+75.5	2Y+80.5	2Y+79.5	2Y+86.5	2Y+85.5
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+33	Y+36	Y+38	Y+41	Y+47	Y+53	Y+62	Y+66
F	Y+8	Y+11	Y+10	Y+13	Y+17	Y+16	Y+22	Y+21
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 + ^{+0.012} ₀	8 + ^{+0.015} ₀	8 + ^{+0.015} ₀	10 + ^{+0.015} ₀	12 + ^{+0.018} ₀	14 + ^{+0.018} ₀	16 + ^{+0.018} ₀	20 + ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal×Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal×Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
FA	Y+19.5	34.5	Y+21.5	36.5	Y+21.5	36.5	Y+21.5	36.5
FB	0	Y-16	0	Y-16	0	Y-16	0	Y-16
FC	Y-4.3	10.7	Y-3.3	11.7	Y-3.3	11.7	Y-3.3	11.7
FD	33.5	37	44	44	44	52	52	52
FE _R	34.5 - ^{-0.025} _{-0.064}	38 - ^{-0.025} _{-0.064}	45 - ^{-0.025} _{-0.064}	45 - ^{-0.025} _{-0.064}	45 - ^{-0.025} _{-0.064}	53 - ^{-0.030} _{-0.076}	53 - ^{-0.030} _{-0.076}	53 - ^{-0.030} _{-0.076}
FE _H	34.5 + ^{+0.039} ₀	38 + ^{+0.039} ₀	45 + ^{+0.039} ₀	45 + ^{+0.039} ₀	45 + ^{+0.039} ₀	53 + ^{+0.046} ₀	53 + ^{+0.046} ₀	53 + ^{+0.046} ₀
FF	35.7	39.2	46.2	46.2	54.2	54.2	54.2	54.2
FG	Y+18	Y+21.4	Y+20.4	Y+23.4	Y+27.4	Y+26.4	Y+32.4	Y+31.4
FH	Y+33	Y+37.9	Y+36.9	Y+39.9	Y+43.9	Y+42.9	Y+48.9	Y+47.9
FJ	2Y+30	2Y+29	2Y+34.7	2Y+33.7	2Y+36.7	2Y+35.7	2Y+40.7	2Y+39.7
FK	Y+8.5	Y+12	Y+11	Y+14	Y+18	Y+17	Y+23	Y+22
FL	Y-6	9	Y-6	9	Y-6	9	Y-6	9
FP	3	3.2	3.2	3.2	3.2	3.2	3.2	3.2
FQ	1.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5
FR	6	7.2	7.2	7.2	7.2	7.2	7.2	7.2
FS (Nominal×Pitch)	M3×0.5	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7
Hydraulic Port	Option - C	G1/8	G1/8	G1/8	G1/8	G1/4	G3/8	G3/8
	Option - S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc3/8	Rc3/8
O-ring (Hydraulic Port Area)	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
O-ring (Air Sensing Area)	CO0524A(S31.5)	CO0527A(S35)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0538A(S50)	CO0538A(S50)	CO0538A(S50)

A) : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□AM□	LL0400-□AM□	LL0480-□AM□	LL0550-□AM□	LL0650-□AM□	LL0750-□AM□	LL0900-□AM□	LL1050-□AM□
AA	2Y+61.5	2Y+60.5	2Y+67.5	2Y+66.5	2Y+70.5	2Y+69.5	2Y+74.5	2Y+73.5
TA	9	10	11	12	12	13	15	18
UA	12	13	14	17	19	24	30	36
WA	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

B) : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LL0360-□BM□	LL0400-□BM□	LL0480-□BM□	LL0550-□BM□	LL0650-□BM□	LL0750-□BM□	LL0900-□BM□	LL1050-□BM□
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

T) : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□TM□	LL0400-□TM□	LL0480-□TM□	LL0550-□TM□	LL0650-□TM□	LL0750-□TM□	LL0900-□TM□	LL1050-□TM□
At	2Y+77.5	2Y+76.5	2Y+87.5	2Y+86.5	2Y+94.5	2Y+93.5	2Y+102.5	2Y+101.5
Tr	25	30	35	40	45	50	62	72
Ur	12	14	17	17	19	24	30	36
Vr	16	20	24	28	32	35	46	54
Wr	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal×Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Home 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

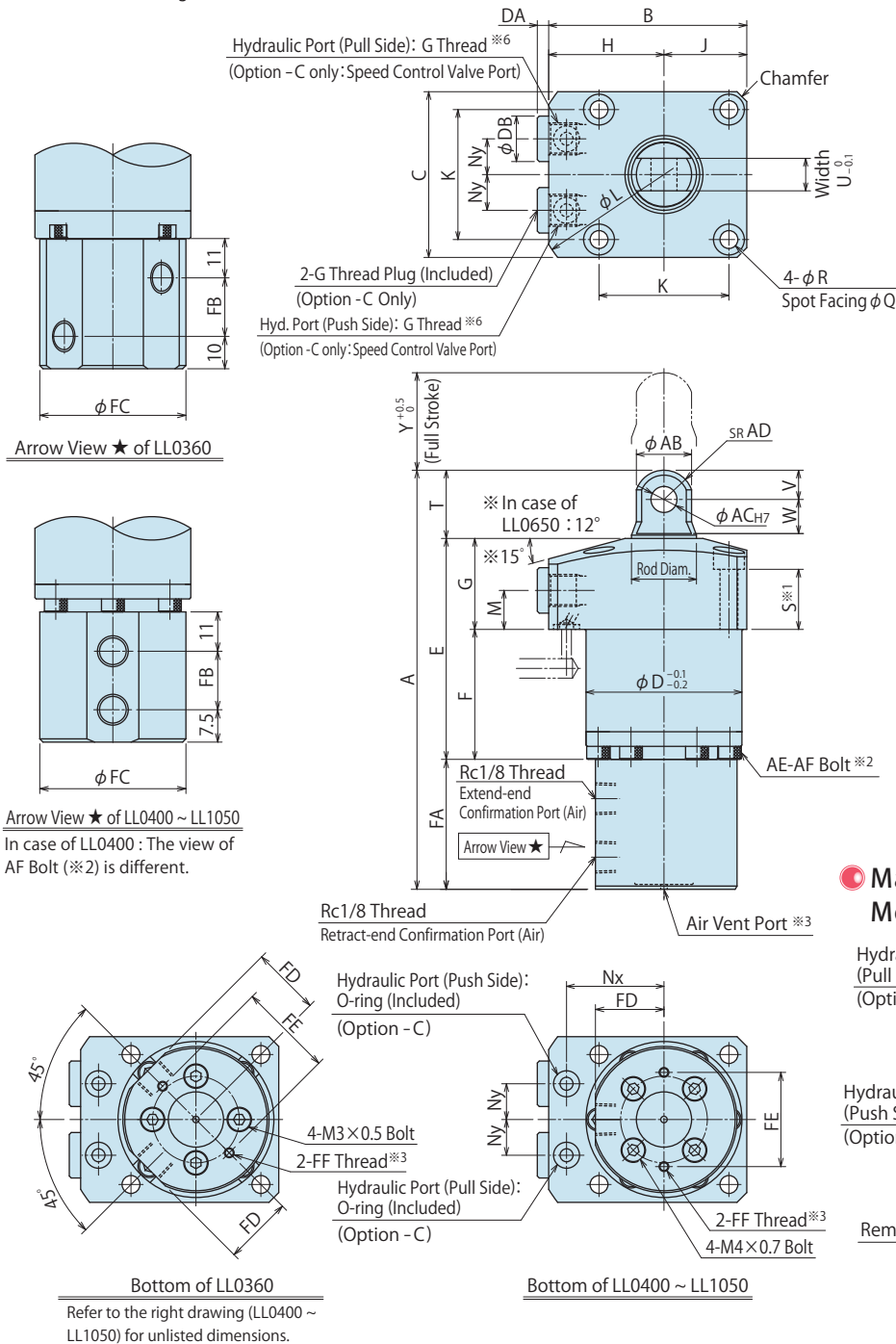
Customized Spring Cylinder

DWA/DWB

External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

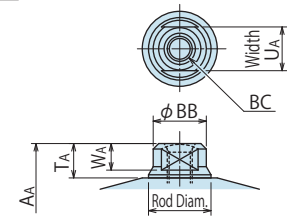
※ This drawing shows LL-CPN.



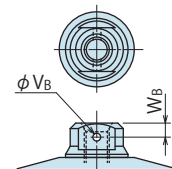
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

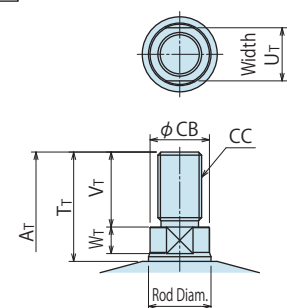
A : Female Threaded



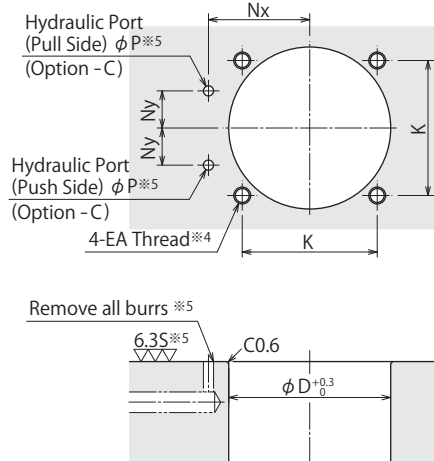
B : Female Thread (with Anti-Rotation Pinhole)



T : Male Threaded



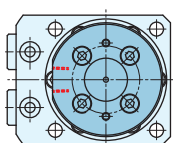
Machining Dimensions of Mounting Area



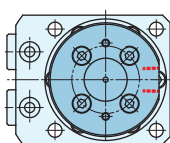
Push/Pull Confirmation Port Phase

※ The drawings show LL0400 ~ LL1050.

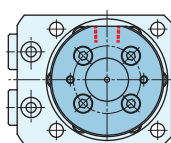
N: Standard Phase



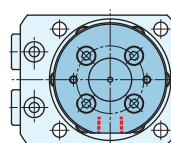
NC



NR



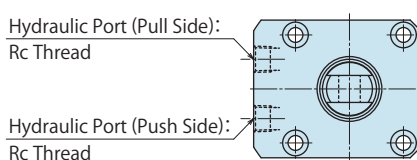
NL



Piping Method

S : Rc Thread Piping Option

※ The drawing shows LL-SPN.



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. If exposed to coolant, use FF thread and install an attachment to prevent contamination, but do not block the air vent port.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- Speed control valve is not provided. Please refer to P.947.

1. Please refer to P.857, P.858 for Air Sensing Chart.

Specifications

Model No.		LL0360-□□N□□	LL0400-□□N□□	LL0480-□□N□□	LL0550-□□N□□	LL0650-□□N□□	LL0750-□□N□□	LL0900-□□N□□	LL1050-□□N□□
Full Stroke Y		Y : 15 ~ 50			Y : 15 ~ 75				
Cylinder Area	mm	4.0	4.8	7.3	8.8	15.1	22.2	34.8	48.7
	cm ²	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	Push Side	P×0.40	P×0.48	P×0.73	P×0.88	P×1.51	P×2.22	P×3.48	P×4.87
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	Push Side	Y×0.40	Y×0.48	Y×0.73	Y×0.88	Y×1.51	Y×2.22	Y×3.48	Y×4.87
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Air Sensing Area Rod Diameter	mm	φ8			φ10		φ14		
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Recommended Operating Air Pressure※7	MPa	0.2							
Recommended Air Catch Sensor※7		ISA3-G (Made by SMC) / GPS3-E (Made by CKD)							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.8 ~ 1.4	0.9 ~ 1.5	1.2 ~ 2.6	1.5 ~ 3.2	2.2 ~ 4.0	3.2 ~ 5.4	4.8 ~ 7.5	6.4 ~ 9.4

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

※7. The number of connected cylinders should be no more than 4 per air catch sensor.

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LL0360-□PN□□-02Q [Y=20, A=107.5, E=53, F=28, FA=39.5, FB=18.5] (mm)

Model No.	LL0360-□PN□□	LL0400-□PN□□	LL0480-□PN□□	LL0550-□PN□□	LL0650-□PN□□	LL0750-□PN□□	LL0900-□PN□□	LL1050-□PN□□
Full Stroke Y	15~50	15~50	15~75	15~75	15~75	15~75	15~75	15~75
A	2Y+67.5	2Y+76.5	2Y+80.5	2Y+86.5	2Y+96.5	2Y+107.5	2Y+120.5	2Y+133.5
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+33	Y+36	Y+38	Y+41	Y+47	Y+53	Y+62	Y+66
F	Y+8	Y+11	Y+10	Y+13	Y+17	Y+16	Y+22	Y+21
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal×Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal×Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
FA	Y+19.5				Y+21.5			
FB	Y-1.5				Y+3			
FC	35.5	38	45	45	45	53	53	53
FD	16.5	18	21.5	21.5	21.5	25.5	25.5	25.5
FE	25	29	29	29	29	38	38	38
FF (Nominal×Pitch×Depth)	M3×0.5×6	M3×0.5×6	M3×0.5×6	M3×0.5×6	M3×0.5×6	M4×0.7×7	M4×0.7×7	M4×0.7×7
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc3/8	Rc3/8
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□AN□□	LL0400-□AN□□	LL0480-□AN□□	LL0550-□AN□□	LL0650-□AN□□	LL0750-□AN□□	LL0900-□AN□□	LL1050-□AN□□
A _A	2Y+61.5	2Y+67.5	2Y+70.5	2Y+74.5	2Y+81.5	2Y+89.5	2Y+99.5	2Y+105.5
T _A	9	10	11	12	13	15	16	18
U _A	12	13	14	17	19	24	30	36
W _A	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions. (mm)

Model No.	LL0360-□BN□□	LL0400-□BN□□	LL0480-□BN□□	LL0550-□BN□□	LL0650-□BN□□	LL0750-□BN□□	LL0900-□BN□□	LL1050-□BN□□
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□TN□□	LL0400-□TN□□	LL0480-□TN□□	LL0550-□TN□□	LL0650-□TN□□	LL0750-□TN□□	LL0900-□TN□□	LL1050-□TN□□
A _T	2Y+77.5	2Y+87.5	2Y+94.5	2Y+102.5	2Y+113.5	2Y+124.5	2Y+145.5	2Y+159.5
T _T	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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 Sensing Option (Action Confirmation Method···M□ : Air Sensing Manifold Option / N□ : Air Sensing Piping Option)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor connected to push-side confirmation port and pull-side confirmation port.

Applicable Model

LL 048 0 -

Air Sensor Port Phase Symbol
Refer to the external dimensions (P.855)
(Standard Phase : Blank)

6 Action Confirmation Method : M□/N□

Full Stroke

Push Side Detection Distance :
Specify the distance in 1mm increments
within the range of 1~6mm.

(Example) **1** : Push Side Detection Distance=1mm
6 : Push Side Detection Distance=6mm

About Air Catch Sensor

The air catch sensor is necessary to confirm the piston rod action.

Recommended Operating Air Pressure : 0.2 MPa

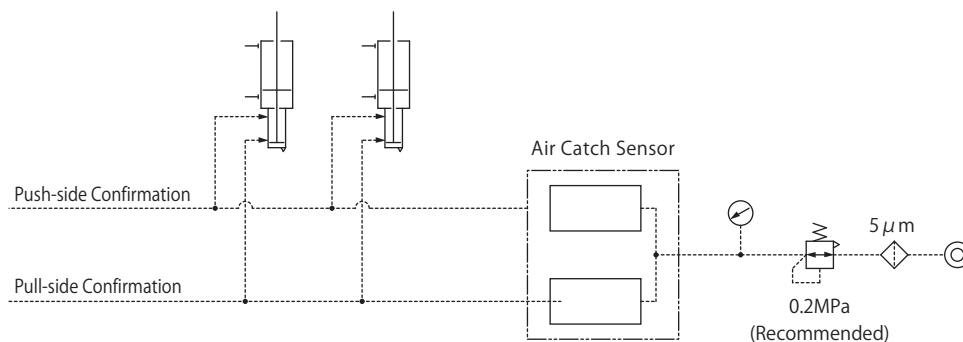
Recommended Air Catch Sensor

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

In order to carry out stabilized detection, the number of clamps connected per air catch sensor should be no more than 4.

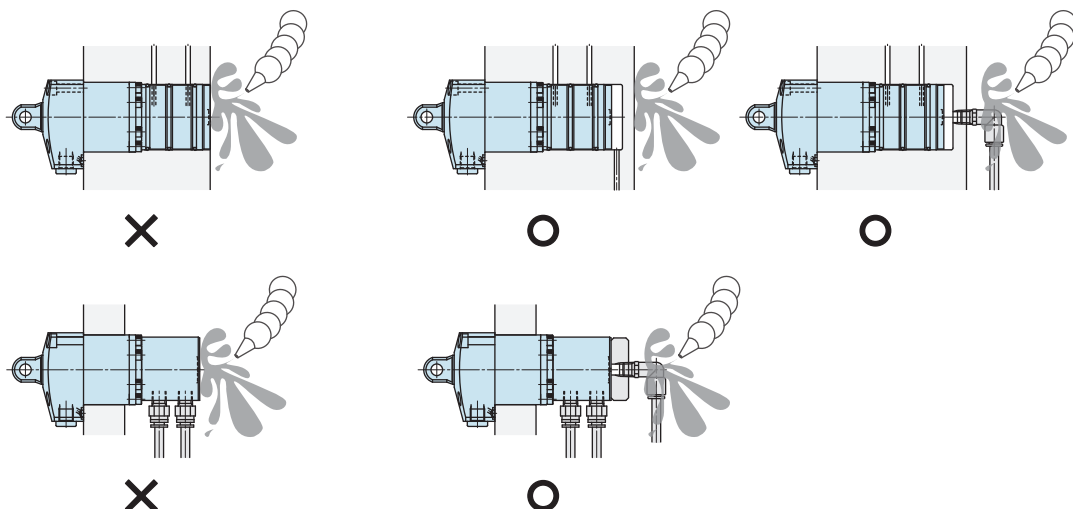
The air pressure to the air catch sensor should be 0.2MPa.

Refer to the drawing below for the air circuit structure.



Notes for Use and Installation

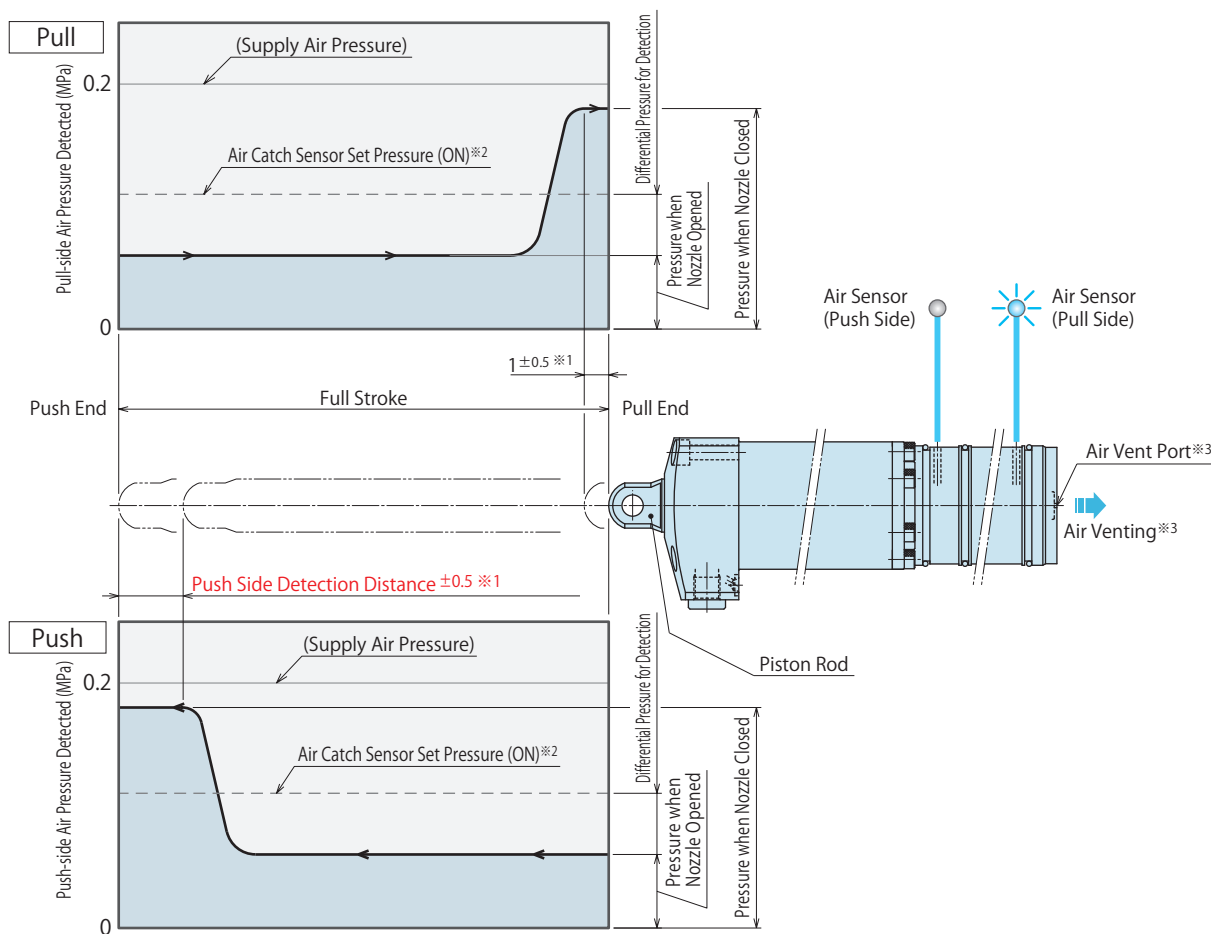
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
The air sensor can malfunction if the air vent port is blocked.



- In case of M□ : Manifold Model, apply adequate amounts of grease on O-ring of the manifold before mounting.
The O-ring can be twisted or damaged when in a dry state. If too much grease is applied, the air catch sensor can malfunction due to overflow grease blocking the detection port.

Air Sensing Chart

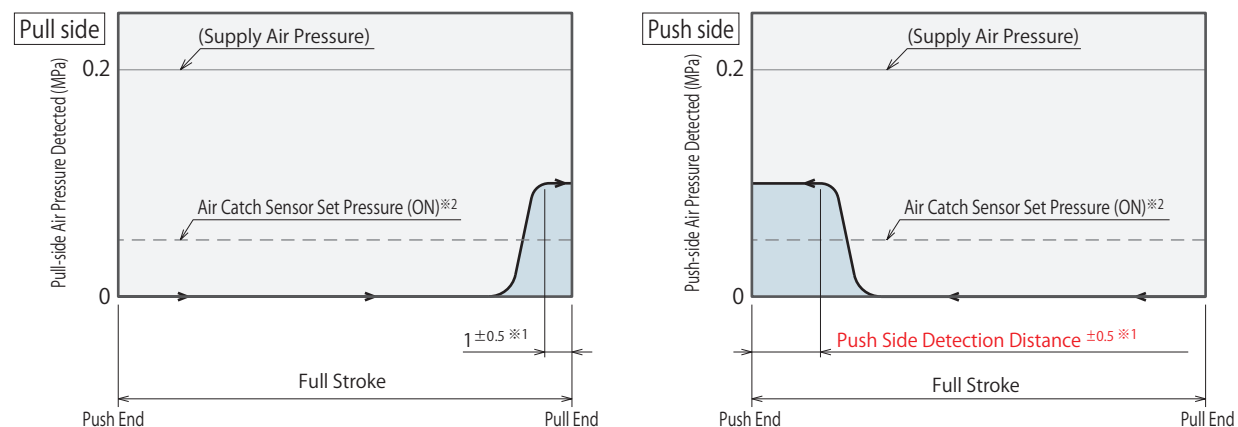
Number directly connected to clamp : 1



Notes :

1. The sensing chart shows the relationship between the cylinder stroke and detection circuit pressure.
 2. The detection pressure varies depending on the number of cylinders connected per circuit. (Maximum number of cylinders connected : 4)
 3. The features may vary depending on the air circuit structure. Please contact us for further information.
- ※1. There is certain tolerance with regard to the position where the pressure for fully closing the detection nozzle is reached depending on the cylinder structure. (Refer to the sensing chart.)
- ※2. The location of a signal from air sensor output varies depending on the sensor setting.
- ※3. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.

Number directly connected to cylinder : 4 (for reference)



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

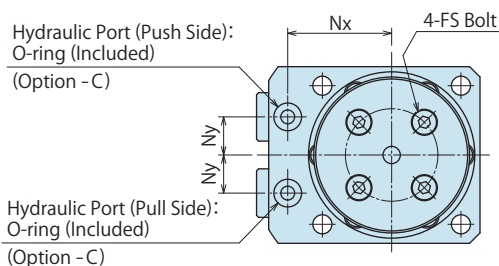
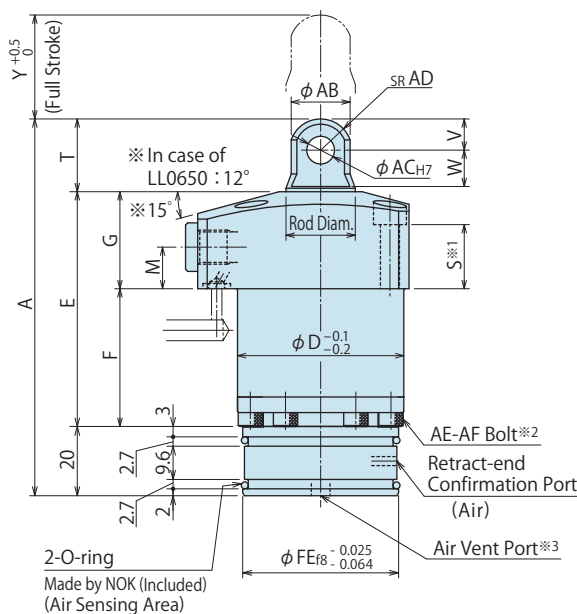
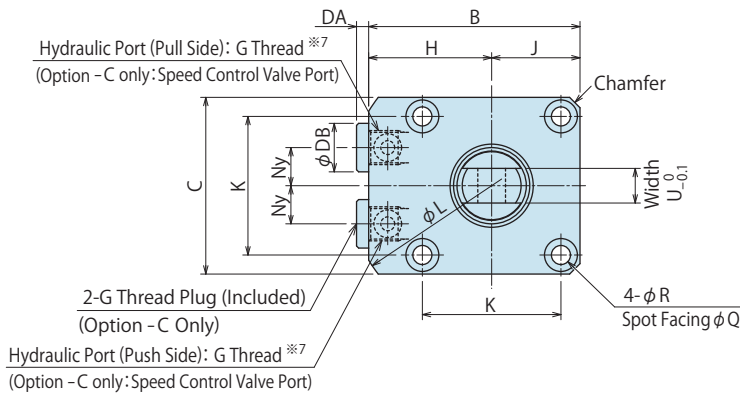
Pull Stud Clamp
FP
FQ

Customized Spring Cylinder
DWA/DWB

External Dimensions

C: Gasket Option (with G Thread Plug) [P]: Pin-Hole Option

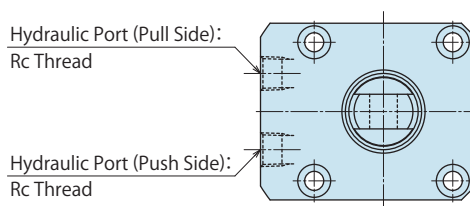
※ This drawing shows LL-CPRM.



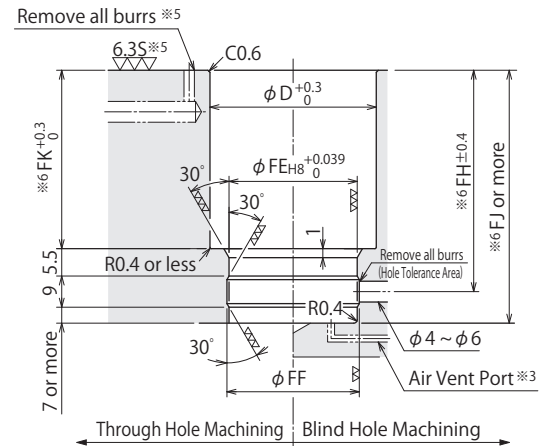
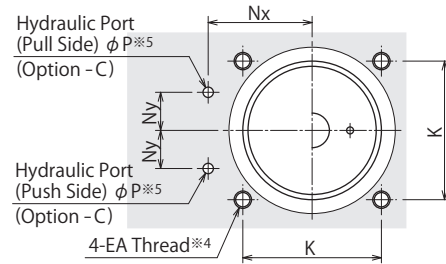
Piping Method

S: Rc Thread Piping Option

※ The drawing shows LL-SPRM.

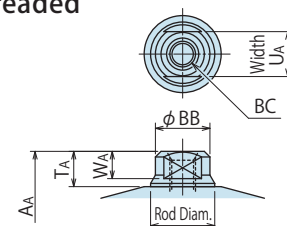


Machining Dimensions of Mounting Area

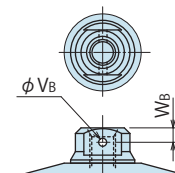


Tip Shape Refer to [P] Pin-Hole Option for unlisted dimensions.

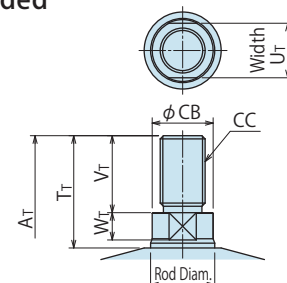
A: Female Threaded



B: Female Thread (with Anti-Rotation Pinhole)



T: Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- The dimensions indicate those under the flange.
- Speed control valve is not provided. Please refer to P.947.

1. Please refer to P.867, P.868 for Air Sensing Chart.

Specifications

Model No.		LL0360-□□RM	LL0400-□□RM	LL0480-□□RM	LL0550-□□RM	LL0650-□□RM	LL0750-□□RM	LL0900-□□RM	LL1050-□□RM
Full Stroke Y	mm	Y : 15 ~ 50			Y : 15 ~ 75				
Cylinder Area	cm ²	4.5	5.3	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Air Sensing Area Rod Diameter	mm	φ4							
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	1.0							
Withstanding Pressure	MPa	10.5							
Recommended Operating Air Pressure	MPa	0.2							
Recommended Air Catch Sensor		ISA3-G (Made by SMC) / GPS3-E (Made by CKD)							
Operating Temperature	°C	0 ~ 70							
Weight	kg	0.7 ~ 0.9	0.8 ~ 1.0	1.2 ~ 1.8	1.5 ~ 2.3	2.1 ~ 3.3	3.0 ~ 4.3	4.5 ~ 6.3	6.1 ~ 8.2

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

		(Ex.) LL0360-□PRM-Q20 [Y=20, A=88, E=53, F=28, FH=38.5, FJ=50, FK=28.5]								(mm)
Model No.		LL0360-□PRM	LL0400-□PRM	LL0480-□PRM	LL0550-□PRM	LL0650-□PRM	LL0750-□PRM	LL0900-□PRM	LL1050-□PRM	
Full Stroke Y		15 ~ 50	15 ~ 50	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75	
A		Y+68	Y+75	Y+79	Y+85	Y+95	Y+106	Y+119	Y+132	
B		49	54	61	69	81	92	107	122	
C		40	45	51	60	70	80	95	110	
D		36	40	48	55	65	75	90	105	
E		Y+33	Y+36	Y+38	Y+41	Y+47	Y+53	Y+62	Y+66	
F		Y+8	Y+11	Y+10	Y+13	Y+17	Y+16	Y+22	Y+21	
G		25	25	28	28	30	37	40	45	
H		29	31.5	35.5	39	46	52	59.5	67	
J		20	22.5	25.5	30	35	40	47.5	55	
K		31.4	34	40	47	55	63	75	88	
L		66	73	83	88	106	116	136	152	
M		11	11	12	12	13	16	16	17	
Nx		23.5	26	30	33.5	39.5	45	52.5	60	
Ny		8	9	11	12	15	16	18.5	22.5	
P		3	3	3	3	5	5	5	5	
Q		7.5	9.5	9.5	11	11	14	17.5	20	
R		4.5	5.5	5.5	6.8	6.8	9	11	14	
S		16	14	15.5	13	15.5	17.5	16.5	17.5	
T		15	19	21	24	28	33	37	46	
U		6	8	10	11	13	16	19	22	
V		6	8	9	10	12	14	16	21	
W		7.5	9.5	10.5	12	14	17	19	23	
Chamfer		C2	C3	C3	C3	C4	C5	C6	C6	
AB		12	15	17	19	22	27	32	42	
AC		6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀	
AD		6	8	9	10	12	14	16	21	
AE		5	4	6	4	6	6	8	10	
AF (Nominal × Pitch)		M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1	
DA		3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5	
DB		14	14	14	14	19	19	22	22	
EA (Nominal × Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75	
FE		34.5	34.5	45	45	45	45	45	45	
FF		35.7	35.7	46.2	46.2	46.2	46.2	46.2	46.2	
FH		Y+18.5	Y+21.5	Y+20.5	Y+23.5	Y+27.5	Y+26.5	Y+32.5	Y+31.5	
FJ		Y+30	Y+33	Y+32	Y+35	Y+39	Y+38	Y+44	Y+43	
FK		Y+8.5	Y+11.5	Y+10.5	Y+13.5	Y+17.5	Y+16.5	Y+22.5	Y+21.5	
FS (Nominal × Pitch)		M3×0.5	M3×0.5	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8	
O-ring (Hydraulic Port Area)		1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7	
O-ring (Air Sensing Area)		CO0524A(S31.5)	CO0524A(S31.5)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

Model No.	LL0360-□ARM	LL0400-□ARM	LL0480-□ARM	LL0550-□ARM	LL0650-□ARM	LL0750-□ARM	LL0900-□ARM	LL1050-□ARM
A _A	Y+62	Y+66	Y+69	Y+73	Y+80	Y+88	Y+98	Y+104
T _A	9	10	11	12	13	15	16	18
U _A	12	13	14	17	19	24	30	36
W _A	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

Model No.	LL0360-□BRM	LL0400-□BRM	LL0480-□BRM	LL0550-□BRM	LL0650-□BRM	LL0750-□BRM	LL0900-□BRM	LL1050-□BRM
V _B	2	2.5	2.5	3	4	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

Model No.	LL0360-□TRM	LL0400-□TRM	LL0480-□TRM	LL0550-□TRM	LL0650-□TRM	LL0750-□TRM	LL0900-□TRM	LL1050-□TRM
A _T	Y+78	Y+86	Y+93	Y+101	Y+112	Y+123	Y+144	Y+158
T _T	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal×Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

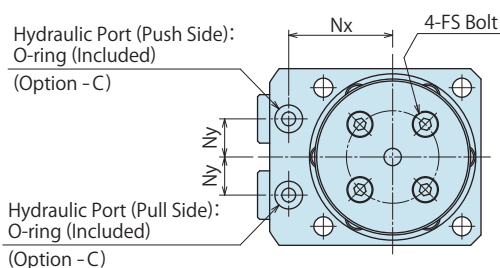
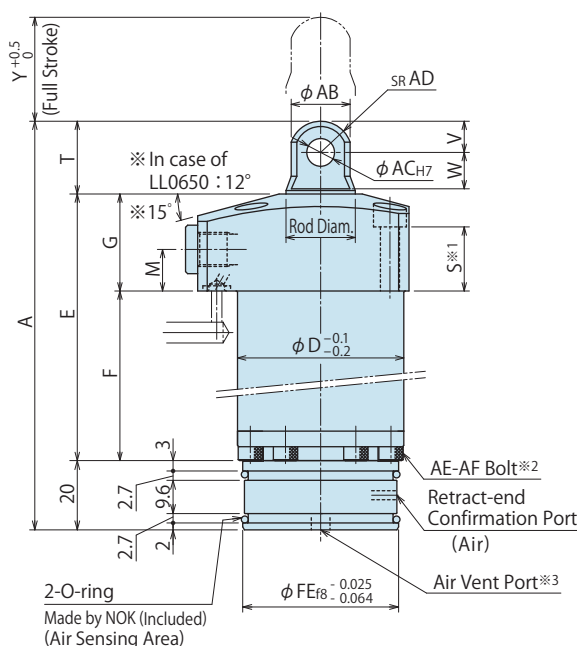
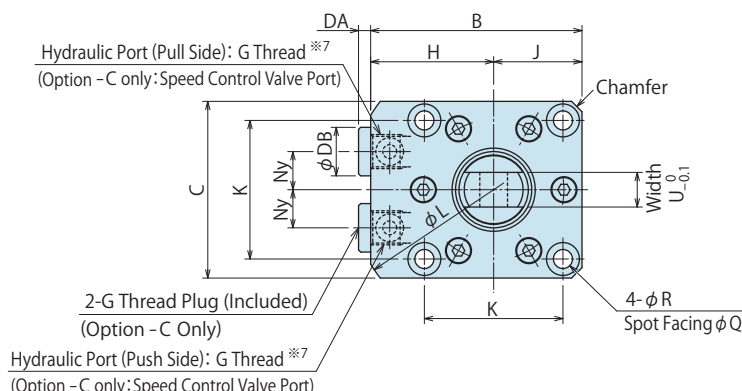
Customized Spring Cylinder

DWA/DWB

External Dimensions

C: Gasket Option (with G Thread Plug) [P]: Pin-Hole Option

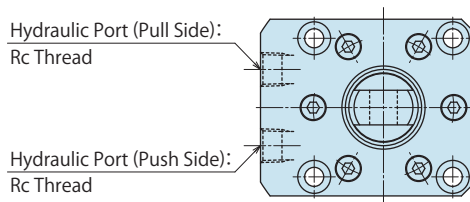
※This drawing indicates LL-CPRM.



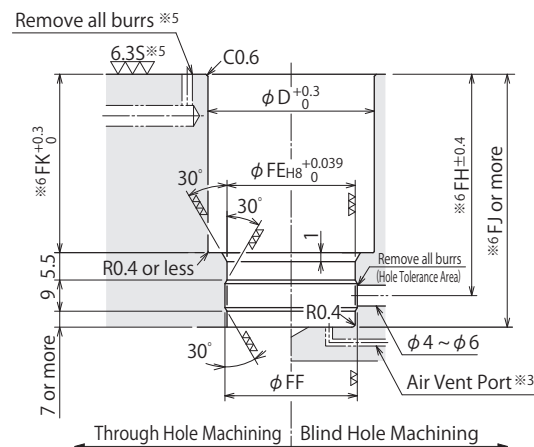
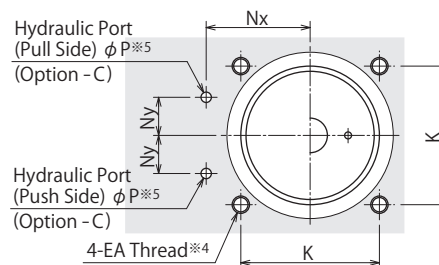
Piping Method

S: Rc Thread Piping Option

※The drawing shows LL-SPRM.

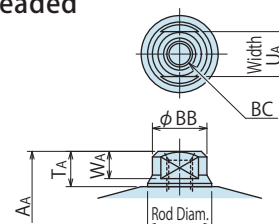


Machining Dimensions of Mounting Area

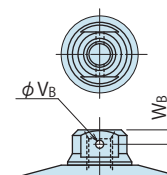


Tip Shape Refer to [P] Pin-Hole Option for unlisted dimensions.

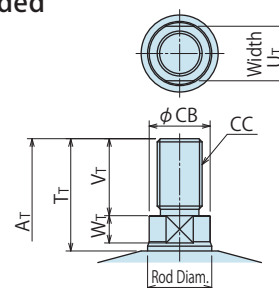
A: Female Threaded



B: Female Thread (with Anti-Rotation Pinhole)



T: Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- The dimensions indicate those under the flange.
- Speed control valve is not provided. Please refer to P.947.

1. Please refer to P.867, P.868 for Air Sensing Chart.

Specifications

Model No.		LL0360-□□RM	LL0400-□□RM	LL0480-□□RM	LL0550-□□RM	LL0650-□□RM	LL0750-□□RM	LL0900-□□RM	LL1050-□□RM
Full Stroke Y	mm	Y : 51 ~ 100			Y : 76 ~ 200				
Cylinder Area	cm ²	Push Side	4.5	5.3	8.0	9.6	15.9	23.8	36.3
		Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4
Cylinder Force (Calculation Formula)	kN	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63
		Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64
Cylinder Capacity (Calculation Formula)	cm ³	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63
		Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Air Sensing Area Rod Diameter	mm	φ4							
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	1.0							
Withstanding Pressure	MPa	10.5							
Recommended Operating Air Pressure	MPa	0.2							
Recommended Air Catch Sensor		ISA3-G (Made by SMC) / GPS3-E (Made by CKD)							
Operating Temperature	°C	0 ~ 70							
Weight	kg	1.0 ~ 1.3	1.1 ~ 1.5	1.9 ~ 3.2	2.5 ~ 4.3	3.4 ~ 5.6	4.6 ~ 7.3	6.7 ~ 10.3	9.2 ~ 13.2

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LL0360-□PRM-Q70 [Y=70, A=153, E=118, F=93, FH=103.5, FJ=115, FK=93.5] (mm)

Model No.	LL0360-□PRM	LL0400-□PRM	LL0480-□PRM	LL0550-□PRM	LL0650-□PRM	LL0750-□PRM	LL0900-□PRM	LL1050-□PRM
Full Stroke Y	51~100	51~100	76~200	76~200	76~200	76~200	76~200	76~200
A	Y+83	Y+90	Y+96	Y+101	Y+111	Y+127	Y+141	Y+158
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+48	Y+51	Y+55	Y+57	Y+63	Y+74	Y+84	Y+92
F	Y+23	Y+26	Y+27	Y+29	Y+33	Y+37	Y+44	Y+47
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal × Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal × Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
FE	34.5	34.5	45	45	45	45	45	45
FF	35.7	35.7	46.2	46.2	46.2	46.2	46.2	46.2
FH	Y+33.5	Y+36.5	Y+37.5	Y+39.5	Y+43.5	Y+47.5	Y+54.5	Y+57.5
FJ	Y+45	Y+48	Y+49	Y+51	Y+55	Y+59	Y+66	Y+69
FK	Y+23.5	Y+26.5	Y+27.5	Y+29.5	Y+33.5	Y+37.5	Y+44.5	Y+47.5
FS (Nominal × Pitch)	M3×0.5	M3×0.5	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc3/8	Rc3/8
O-ring (Hydraulic Port Area)		1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
O-ring (Air Sensing Area)	CO0524A(S31.5)	CO0524A(S31.5)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)	CO0533A(S42)

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□ARM	LL0400-□ARM	LL0480-□ARM	LL0550-□ARM	LL0650-□ARM	LL0750-□ARM	LL0900-□ARM	LL1050-□ARM
A _A	Y+77	Y+81	Y+86	Y+89	Y+96	Y+109	Y+120	Y+130
T _A	9	10	11	12	13	15	16	18
U _A	12	13	14	17	19	24	30	36
W _A	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions. (mm)

Model No.	LL0360-□BRM	LL0400-□BRM	LL0480-□BRM	LL0550-□BRM	LL0650-□BRM	LL0750-□BRM	LL0900-□BRM	LL1050-□BRM
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LL0360-□TRM	LL0400-□TRM	LL0480-□TRM	LL0550-□TRM	LL0650-□TRM	LL0750-□TRM	LL0900-□TRM	LL1050-□TRM
A _T	Y+93	Y+101	Y+110	Y+117	Y+128	Y+144	Y+166	Y+184
T _T	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal×Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

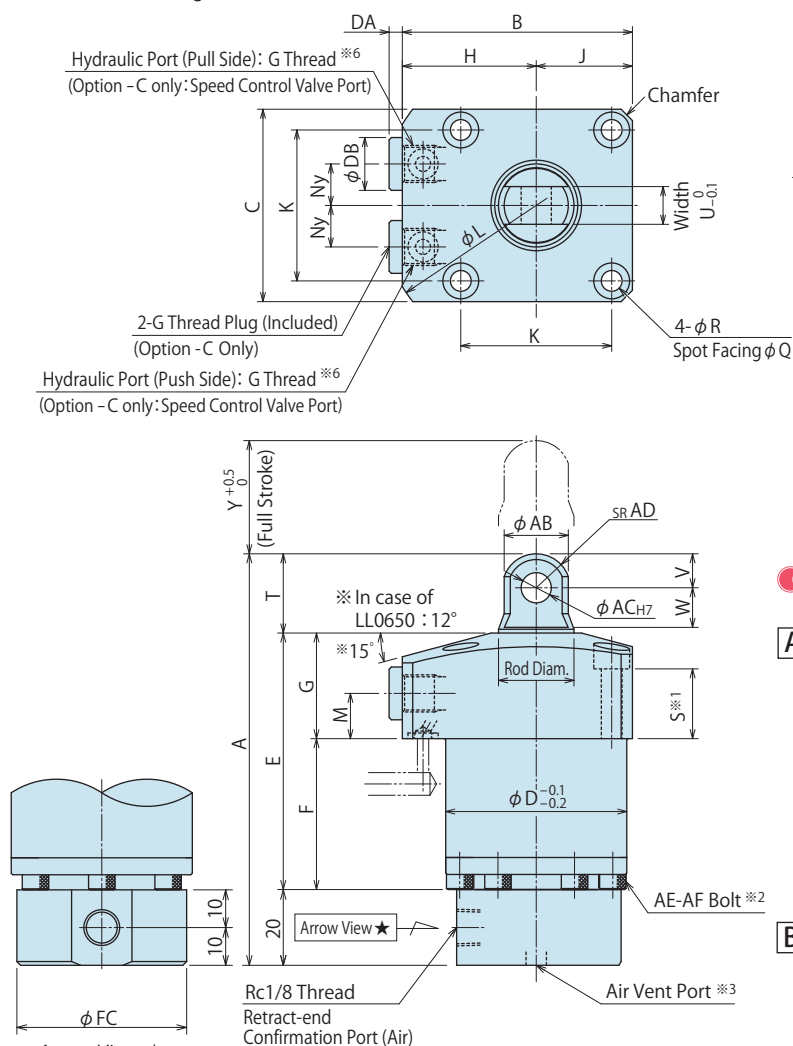
Spring Cylinder

DWA/DWB

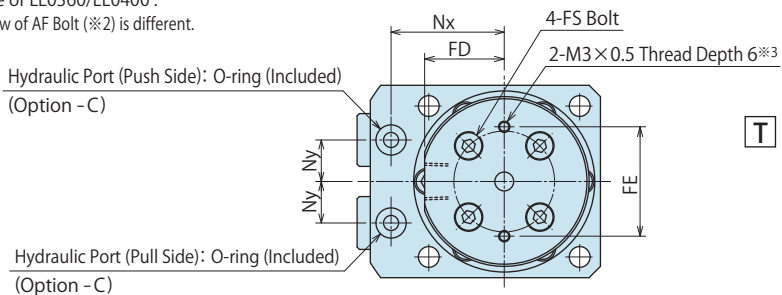
External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

※ This drawing shows LL-CPRN.



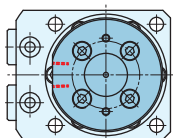
In case of LL0360/LL0400 :
The view of AF Bolt (※2) is different.



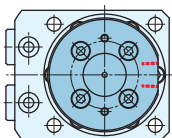
Push/Pull Confirmation Port Phase

※ In case of LL0360 / LL0400 : Standard Phase Only.

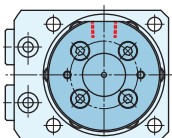
RN: Standard Phase



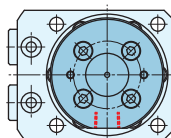
RNC



RNR



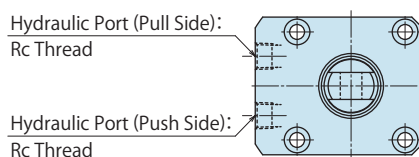
RNL



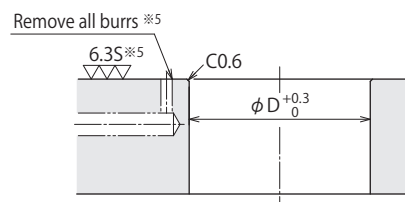
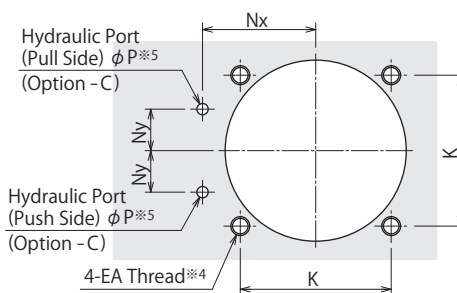
Piping Method

S : Rc Thread Piping Option

※ The drawing shows LL-SPRN.



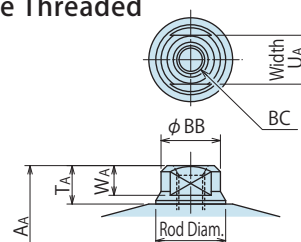
Machining Dimensions of Mounting Area



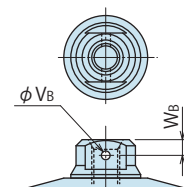
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

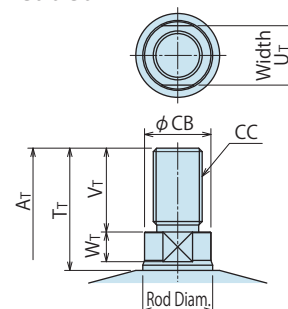
A : Female Threaded



B : Female Thread (with Anti-Rotation Pinhole)



T : Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. If exposed to coolant, use M3 x 0.5 thread and install an attachment to prevent contamination, but do not block the air vent port.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LL0360-□□RN	LL0400-□□RN	LL0480-□□RN	LL0550-□□RN	LL0650-□□RN	LL0750-□□RN	LL0900-□□RN	LL1050-□□RN
Full Stroke Y	mm	Y : 15 ~ 50			Y : 15 ~ 75				
Cylinder Area	cm ²	Push Side	4.5	5.3	8	9.6	15.9	23.8	36.3
		Retract (Pull) Side	2.5	2.8	4.9	5.8	11	16.7	26.4
Cylinder Force (Calculation Formula)	kN	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63
		Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64
Cylinder Capacity (Calculation Formula)	cm ³	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63
		Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Air Sensing Area Rod Diameter	mm	φ4							
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	1.0							
Withstanding Pressure	MPa	10.5							
Recommended Operating Air Pressure	MPa	0.2							
Recommended Air Catch Sensor		ISA3-G (Made by SMC) / GP53-E (Made by CKD)							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.7 ~ 0.9	0.8 ~ 1.0	1.2 ~ 1.8	1.5 ~ 2.3	2.1 ~ 3.3	3.0 ~ 4.3	4.5 ~ 6.3	6.1 ~ 8.2

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LL0360-□PRN-02Q [Y=20, A=88, E=53, F=28] (mm)

Model No.	LL0360-□PRN	LL0400-□PRN	LL0480-□PRN	LL0550-□PRN	LL0650-□PRN	LL0750-□PRN	LL0900-□PRN	LL1050-□PRN
Full Stroke Y	15 ~ 50	15 ~ 50	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75	15 ~ 75
A	Y+68	Y+75	Y+79	Y+85	Y+95	Y+106	Y+119	Y+132
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+33	Y+36	Y+38	Y+41	Y+47	Y+53	Y+62	Y+66
F	Y+8	Y+11	Y+10	Y+13	Y+17	Y+16	Y+22	Y+21
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal × Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal × Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
FC	35.5	35.5	45	45	45	45	45	45
FD	16.5	16.5	21.5	21.5	21.5	21.5	21.5	21.5
FE	25	25	29	29	29	29	29	29
FS (Nominal × Pitch)	M3×0.5	M3×0.5	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□ARN	LL0400-□ARN	LL0480-□ARN	LL0550-□ARN	LL0650-□ARN	LL0750-□ARN	LL0900-□ARN	LL1050-□ARN
A _A	Y+62	Y+66	Y+69	Y+73	Y+80	Y+88	Y+98	Y+104
T _A	9	10	11	12	13	15	16	18
U _A	12	13	14	17	19	24	30	36
W _A	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LL0360-□BRN	LL0400-□BRN	LL0480-□BRN	LL0550-□BRN	LL0650-□BRN	LL0750-□BRN	LL0900-□BRN	LL1050-□BRN
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□TRN	LL0400-□TRN	LL0480-□TRN	LL0550-□TRN	LL0650-□TRN	LL0750-□TRN	LL0900-□TRN	LL1050-□TRN
A _T	Y+78	Y+86	Y+93	Y+101	Y+112	Y+123	Y+144	Y+158
T _T	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

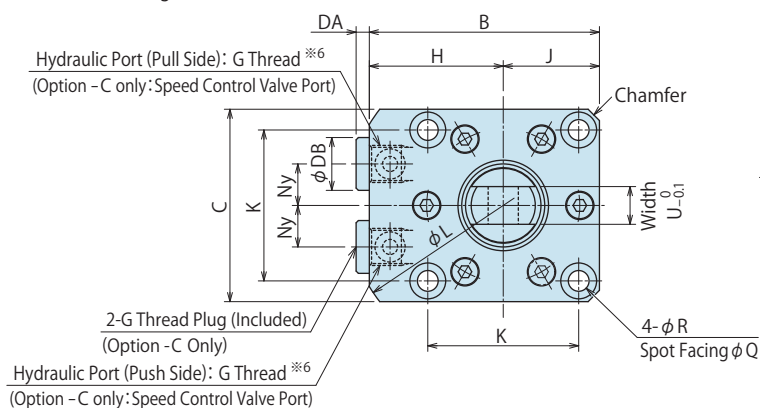
Customized Spring Cylinder

DWA/DWB

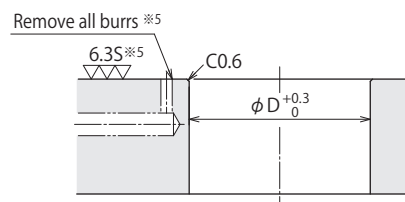
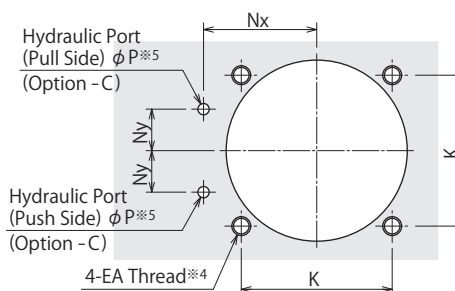
External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

※ This drawing shows LL-CPRN.

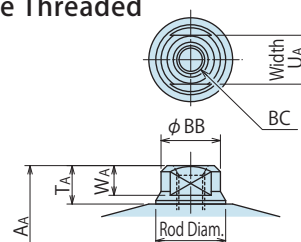


Machining Dimensions of Mounting Area

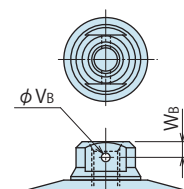


Tip Shape Refer to [P] Pin-Hole Option for unlisted dimensions.

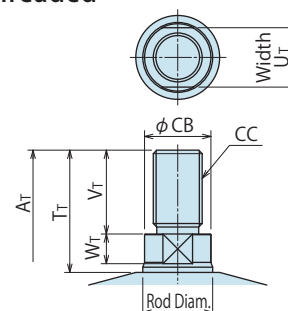
[A] : Female Threaded



[B] : Female Thread (with Anti-Rotation Pinhole)



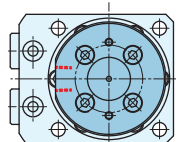
[T] : Male Threaded



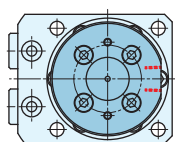
Push/Pull Confirmation Port Phase

※ In case of LL0360 / LL0400 : Standard Phase Only.

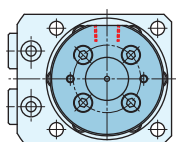
RN: Standard Phase



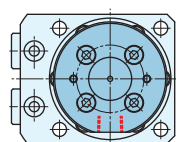
RNC



RNR



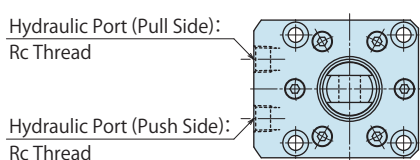
RNL



Piping Method

S : Rc Thread Piping Option

※ The drawing shows LL-SPRN.



Notes :

- Mounting bolts are not provided.
Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
If exposed to coolant, use M3×0.5 thread and install an attachment to prevent contamination, but do not block the air vent port.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LL0360-□□RN	LL0400-□□RN	LL0480-□□RN	LL0550-□□RN	LL0650-□□RN	LL0750-□□RN	LL0900-□□RN	LL1050-□□RN
Full Stroke Y	mm	Y : 51 ~ 100			Y : 76 ~ 200				
Cylinder Area	cm ²	4.5	5.3	8	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	kn	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	cm ³	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Air Sensing Area Rod Diameter	mm	φ4							
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	1.0							
Withstanding Pressure	MPa	10.5							
Recommended Operating Air Pressure	MPa	0.2							
Recommended Air Catch Sensor		ISA3-G (Made by SMC) / GP53-E (Made by CKD)							
Operating Temperature	℃	0 ~ 70							
Weight	kg	1.0 ~ 1.3	1.1 ~ 1.5	1.9 ~ 3.2	2.5 ~ 4.3	3.4 ~ 5.6	4.6 ~ 7.3	6.7 ~ 10.3	9.2 ~ 13.2

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LL0360-□□PRN-070 [Y=70, A=153, E=118, F=93] (mm)

Model No.	LL0360-□□PRN	LL0400-□□PRN	LL0480-□□PRN	LL0550-□□PRN	LL0650-□□PRN	LL0750-□□PRN	LL0900-□□PRN	LL1050-□□PRN
Full Stroke Y	51~100	51~100	76~200	76~200	76~200	76~200	76~200	76~200
A	Y+83	Y+90	Y+96	Y+101	Y+111	Y+127	Y+141	Y+158
B	49	54	61	69	81	92	107	122
C	40	45	51	60	70	80	95	110
D	36	40	48	55	65	75	90	105
E	Y+48	Y+51	Y+55	Y+57	Y+63	Y+74	Y+84	Y+92
F	Y+23	Y+26	Y+27	Y+29	Y+33	Y+37	Y+44	Y+47
G	25	25	28	28	30	37	40	45
H	29	31.5	35.5	39	46	52	59.5	67
J	20	22.5	25.5	30	35	40	47.5	55
K	31.4	34	40	47	55	63	75	88
L	66	73	83	88	106	116	136	152
M	11	11	12	12	13	16	16	17
Nx	23.5	26	30	33.5	39.5	45	52.5	60
Ny	8	9	11	12	15	16	18.5	22.5
P	3	3	3	3	5	5	5	5
Q	7.5	9.5	9.5	11	11	14	17.5	20
R	4.5	5.5	5.5	6.8	6.8	9	11	14
S	16	14	15.5	13	15.5	17.5	16.5	17.5
T	15	19	21	24	28	33	37	46
U	6	8	10	11	13	16	19	22
V	6	8	9	10	12	14	16	21
W	7.5	9.5	10.5	12	14	17	19	23
Chamfer	C2	C3	C3	C3	C4	C5	C6	C6
AB	12	15	17	19	22	27	32	42
AC	6 ^{+0.012} ₀	8 ^{+0.015} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	6	8	9	10	12	14	16	21
AE	5	4	6	4	6	6	8	10
AF (Nominal × Pitch)	M3×0.5	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	14	14	19	19	22	22
EA (Nominal × Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
FC	35.5	35.5	45	45	45	45	45	45
FD	16.5	16.5	21.5	21.5	21.5	21.5	21.5	21.5
FE	25	25	29	29	29	29	29	29
FS (Nominal × Pitch)	M3×0.5	M3×0.5	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7	M4×0.7
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□□ARN	LL0400-□□ARN	LL0480-□□ARN	LL0550-□□ARN	LL0650-□□ARN	LL0750-□□ARN	LL0900-□□ARN	LL1050-□□ARN
A _A	Y+77	Y+81	Y+86	Y+89	Y+96	Y+109	Y+120	Y+130
T _A	9	10	11	12	13	15	16	18
U _A	12	13	14	17	19	24	30	36
W _A	7.5	7.5	8.5	9	10	12	13	15
BB	14	15	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M6×1×12	M8×1.25×16	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LL0360-□□BRN	LL0400-□□BRN	LL0480-□□BRN	LL0550-□□BRN	LL0650-□□BRN	LL0750-□□BRN	LL0900-□□BRN	LL1050-□□BRN
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LL0360-□□TRN	LL0400-□□TRN	LL0480-□□TRN	LL0550-□□TRN	LL0650-□□TRN	LL0750-□□TRN	LL0900-□□TRN	LL1050-□□TRN
A _T	Y+93	Y+101	Y+110	Y+117	Y+128	Y+144	Y+166	Y+184
T _T	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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 Sensing Option (Action Confirmation Method···RM : Air Sensing Manifold Option for Retract End / RN : Air Sensing Piping Option for Retract End)

Action confirmation of pull side can be conducted by detecting differential pressure with the air catch sensor connected to pull-side confirmation port.

Applicable Model

LL 048 0 -

CSG
ABTP
RM
RN
RNC
RNL
RNR

050

Full Stroke

6 Action Confirmation Method
: RM/RN/RNC/RNL/RNR

About Air Catch Sensor

The air catch sensor is necessary to confirm the piston rod action.

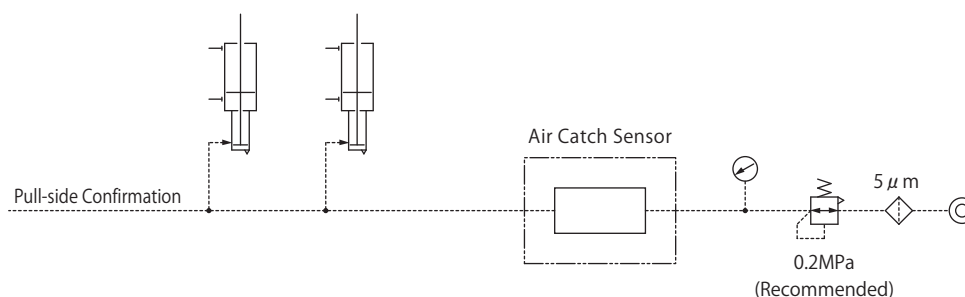
Recommended Operating Air Pressure : 0.2 MPa

Recommended Air Catch Sensor

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

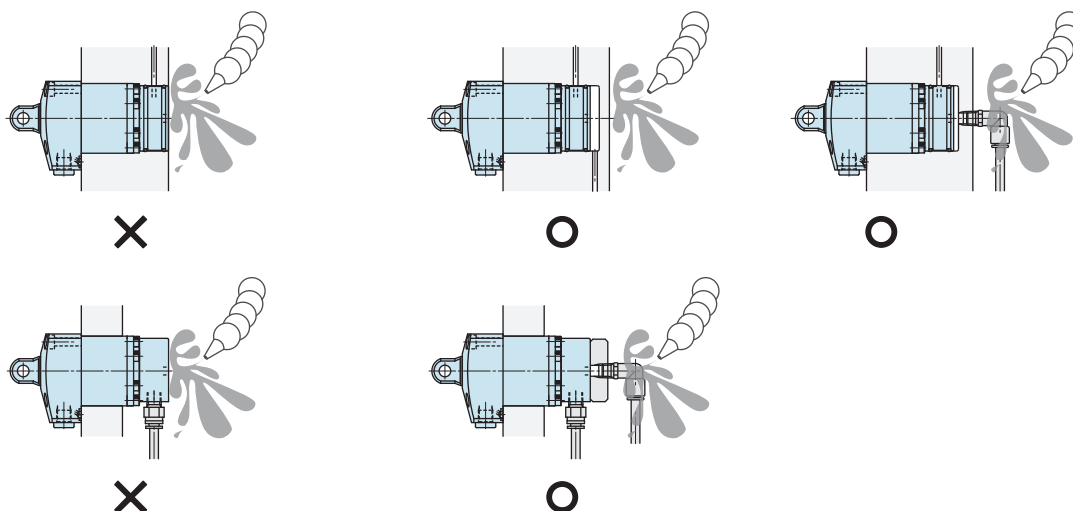
The air pressure to the air catch sensor should be 0.2MPa.

Refer to the drawing below for the air circuit structure.



Notes for Use and Installation

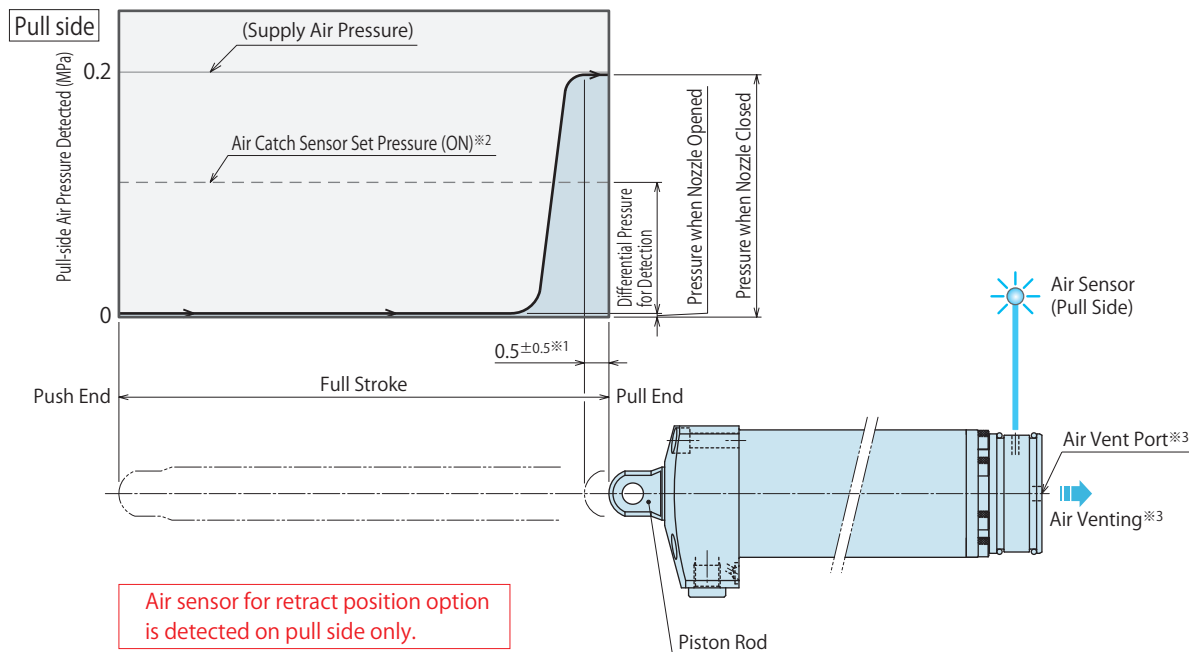
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
The air sensor can malfunction if the air vent port is blocked.



- Before mounting RM : Retract-end Manifold Option, apply adequate amounts of grease on O-ring of the manifold.
The O-ring can be twisted or damaged when in a dry state. If too much grease is applied, the air catch sensor can malfunction due to overflow grease blocking the detection port.

Air Sensing Chart

Number directly connected to clamp: 1



Notes :

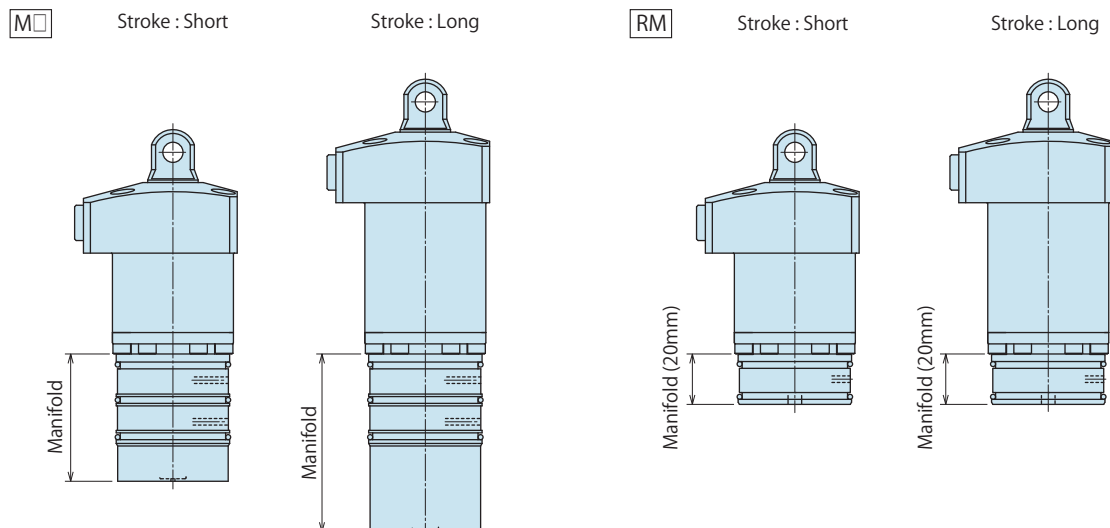
- The sensing chart shows the relationship between the cylinder stroke and detection circuit pressure.
 - The features may vary depending on the air circuit structure. Please contact us for further information.
- ※1. There is certain tolerance with regard to the position where the pressure for fully closing the detection nozzle is reached depending on the cylinder structure. (Refer to the sensing chart.)
- ※2. The location of a signal from air sensor output varies depending on the sensor setting.
- ※3. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.

(Reference) Outline Dimension Comparison of Air Sensing Option

M□ / N□ Manifold dimension depends on full stroke.

RM / RN Manifold dimension is the same.

※This drawing shows manifold option with air sensor.



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

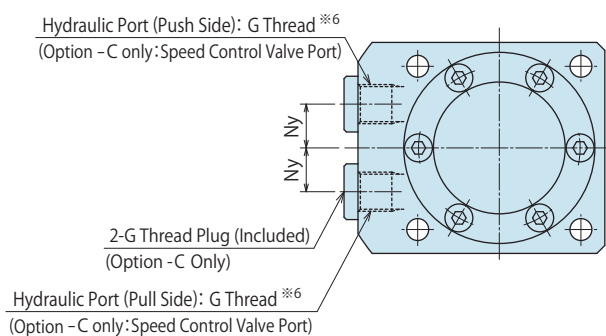
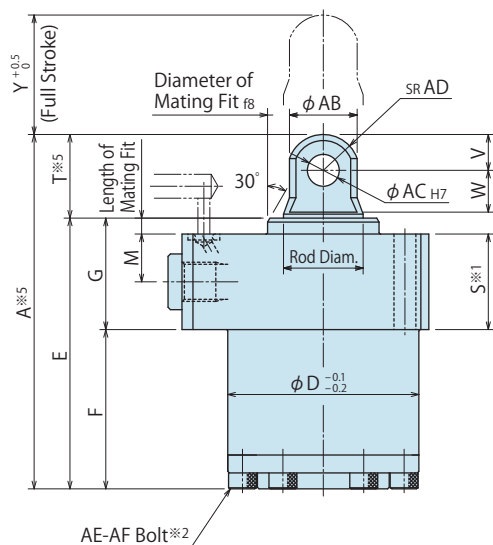
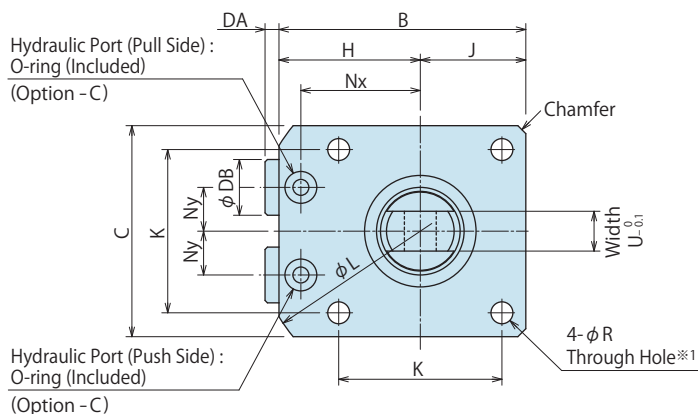
Customized Spring Cylinder

DWA/DWB

External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

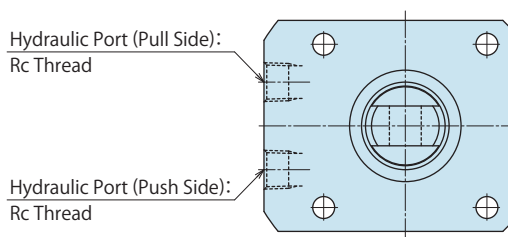
※This drawing shows LLR-CP.



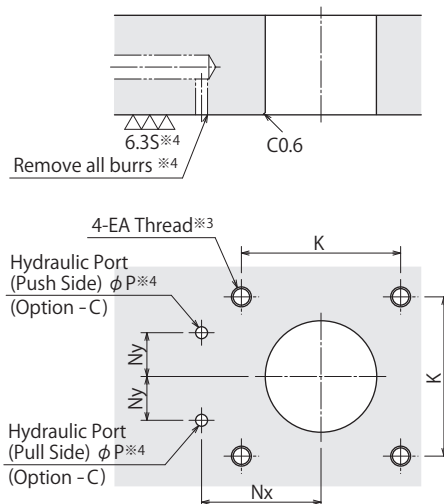
Piping Method

S : Rc Thread Piping Option

※The drawing shows LLR-SP.



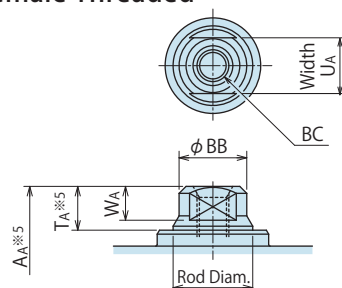
Machining Dimensions of Mounting Area



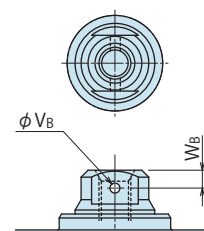
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

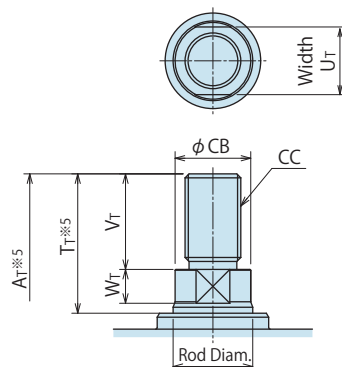
A : Female Threaded



B : Female Thread (with Anti-Rotation Pinhole)



T : Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- The drawing shows when offset is 0mm.
Dimensions of [5] = External Dimensions in the Table + Offset Size
(Ex.) LLR0360-□P-030-05
[Offset Size=5, Y=30, A=78+5=83, T=15+5=20]
- Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LLR0360-□□	LLR0400-□□	LLR0480-□□	LLR0550-□□	LLR0650-□□	LLR0750-□□	LLR0900-□□	LLR1050-□□
Full Stroke Y	mm	Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area	Push Side	4.5	5.3	8	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.6	1.3 ~ 2.1	1.9 ~ 3.1	2.8 ~ 4.1	4.3 ~ 6.1	5.9 ~ 8.0

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=1-14 mm and Y= 15 mm or more.

(Ex.) LLR0360-□P-Q1Q [Y=10, A=63, E=48, F=23]

LLR0360-□P-Q3Q [Y=30, A=78, E=63, F=38]

[P] : Pin-Hole Option

Model No.	LLR0360-□□P		LLR0400-□□P		LLR0480-□□P		LLR0550-□□P		LLR0650-□□P		LLR0750-□□P		LLR0900-□□P		LLR1050-□□P	
Full Stroke Y	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75
A ^{#5}	63	Y+48	70	Y+55	74	Y+59	80	Y+65	90	Y+75	101	Y+86	114	Y+99	127	Y+112
B	49		55		62		69		81		93		108		122	
C	40		47		53		60		70		82		97		110	
D	36		40		48		55		65		75		90		105	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41	62	Y+47	68	Y+53	77	Y+62	81	Y+66
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13	32	Y+17	31	Y+16	37	Y+22	36	Y+21
G	25		25		28		28		30		37		40		45	
H	29		31.5		35.5		39		46		52		59.5		67	
J	20		23.5		26.5		30		35		41		48.5		55	
K	31.4		36		41		47		55		64		76		88	
L	66		73		83		88		106		116		136		152	
M	11		11		12		12		13		16		16		17	
Nx	23.5		26		30		33.5		39.5		45		52.5		60	
Ny	8		9		11		12		15		16		18.5		22.5	
P	3		3		3		3		5		5		5		5	
R	4.5		5.5		5.5		6.8		6.8		9		11		14	
S	21		21		24		24		26		32		35		39	
The Diameter of Mating Fit	23 ^{+0.020 -0.053}		25 ^{+0.020 -0.053}		28 ^{+0.030 -0.053}		32 ^{+0.025 -0.064}		38 ^{+0.025 -0.064}		44 ^{+0.025 -0.064}		50 ^{+0.025 -0.064}		60 ^{+0.030 -0.076}	
The Length of Mating Fit	4		4		4		4		4		5		5		6	
T ^{#5}	15		19		21		24		28		33		37		46	
U	6		8		10		11		13		16		19		22	
V	6		8		9		10		12		14		16		21	
W	7.5		9.5		10.5		12		14		17		19		23	
Chamfer	C2		C2		C3		C3		C4		C5		C6		C6	
AB	12		15		17		19		22		27		32		42	
AC	6 ^{+0.012 0}		8 ^{+0.015 0}		8 ^{+0.015 0}		10 ^{+0.015 0}		12 ^{+0.018 0}		14 ^{+0.018 0}		16 ^{+0.018 0}		20 ^{+0.021 0}	
AD	6		8		9		10		12		14		16		21	
AE	5		4		6		4		6		6		8		10	
AF (Nominal × Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M6×1	
DA	3.5		3.5		3.5		3.5		4.5		4.5		4.5		4.5	
DB	14		14		14		14		19		19		22		22	
EA (Nominal × Pitch)	M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M8×1.25		M10×1.5		M12×1.75	
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	G1/4	G1/4	G3/8	G3/8	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc3/8	Rc3/8	Rc3/8	Rc3/8
O-ring	1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7	

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions.

Model No.	LLR0360-□□A		LLR0400-□□A		LLR0480-□□A		LLR0550-□□A		LLR0650-□□A		LLR0750-□□A		LLR0900-□□A		LLR1050-□□A	
A _A ^{#5}	57	Y+42	61	Y+46	64	Y+49	68	Y+53	75	Y+60	83	Y+68	93	Y+78	99	Y+84
T _A ^{#5}	9		10		11		12		13		15		16		18	
U _A	12		13		14		17		19		24		30		36	
W _A	7.5		7.5		8.5		9		10		12		13		15	
BB	14		15		17		19		22		27		33		42	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20		M12×1.75×24		M16×2×32		M20×2.5×40		M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions.

Model No.	LLR0360-□□B	LLR0400-□□B	LLR0480-□□B	LLR0550-□□B	LLR0650-□□B	LLR0750-□□B	LLR0900-□□B	LLR1050-□□B
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to P Pin-Hole Option for unlisted dimensions.

Model No.	LLR0360-□□T	LLR0400-□□T	LLR0480-□□T	LLR0550-□□T	LLR0650-□□T	LLR0750-□□T	LLR0900-□□T	LLR1050-□□T
A _T ^{#5}	73	Y+58	81	Y+66	88	Y+73	96	Y+81
T _T ^{#5}	25		30		35		40	
U _T	12		14		17		19	
V _T	16		20		28		32	
W _T	7.5		7.5		8.5		9	
CB	14		17		19		24	
CC (Nominal × Pitch)	M10×1.25		M12×1.25		M14×1.5		M16×1.5	
					M20×1.5		M24×1.5	
							M30×1.5	
								M36×1.5

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

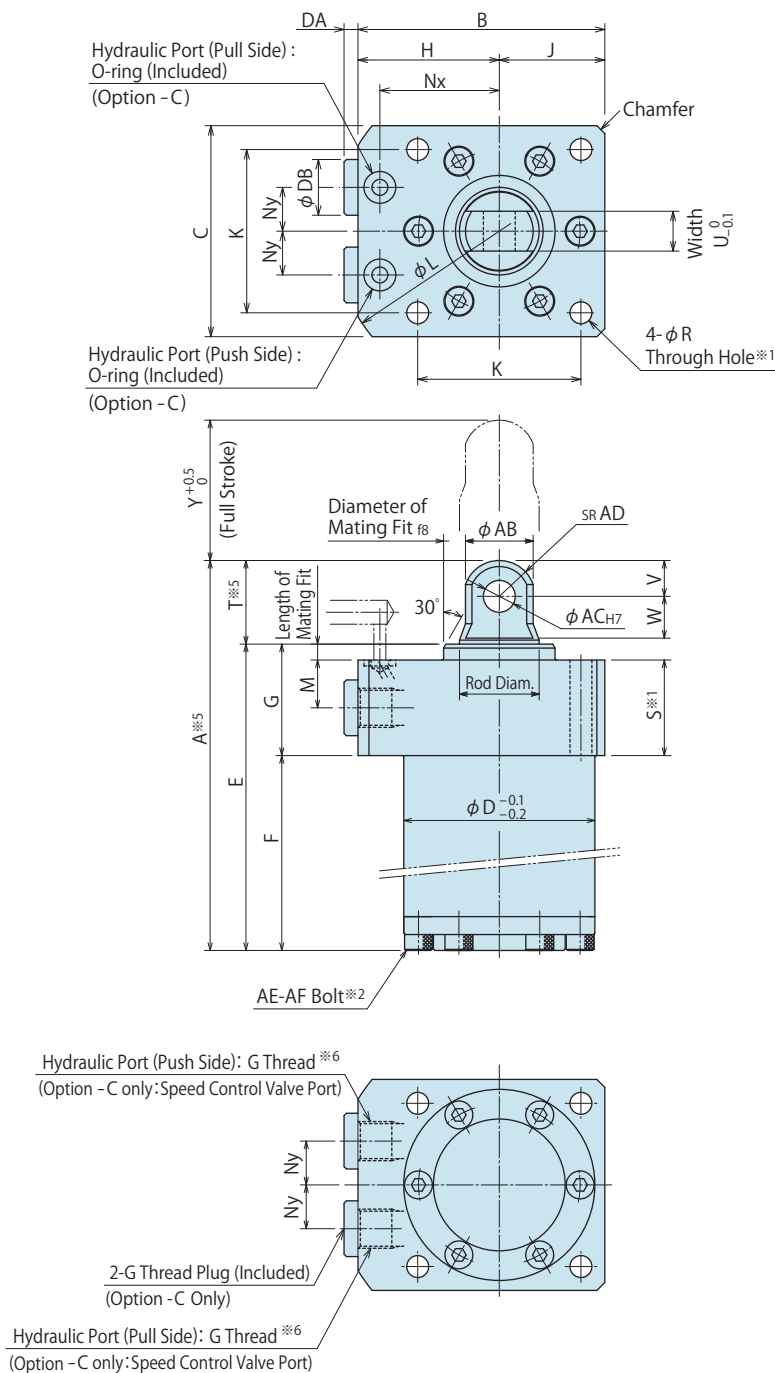
Spring Cylinder

DWA/DWB

External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

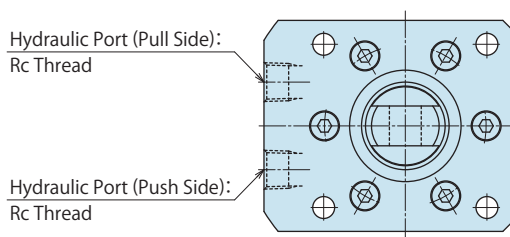
※This drawing shows LLR-CP.



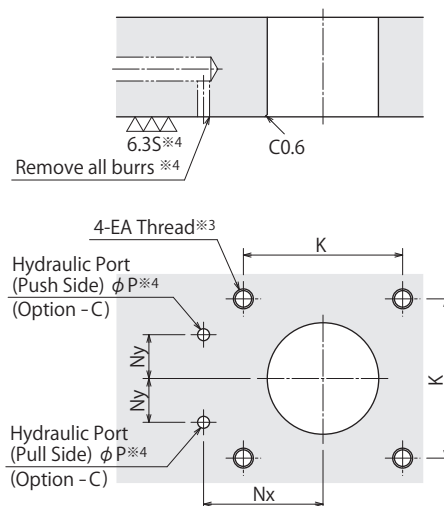
Piping Method

S : Rc Thread Piping Option

※The drawing shows LLR-SP.



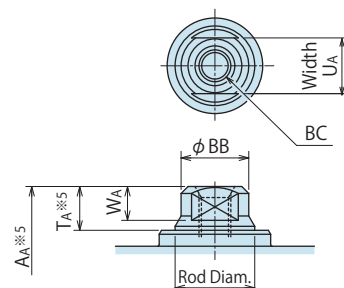
Machining Dimensions of Mounting Area



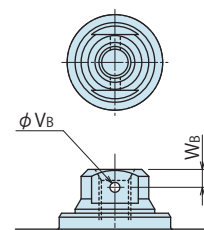
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

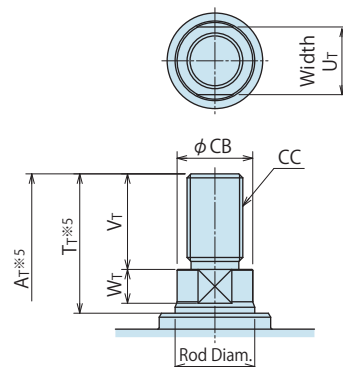
A : Female Threaded



B : Female Thread (with Anti-Rotation Pinhole)



T : Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for - C : Gasket option.
- The drawing shows when offset is 0mm.

Dimensions of ※5 = [External Dimensions in the Table] + [Offset Size]
(Ex.) LLR0480-□P-100-05

[Offset Size=5, Y=100, A=176+5=181, T=21+5=26]

※6. Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.		LLR0480-□□	LLR0550-□□	LLR0650-□□	LLR0750-□□	LLR0900-□□	LLR1050-□□
Full Stroke Y	mm	Y : 76 ~ 150					
Cylinder Area	Push Side	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	Push Side	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	Push Side	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0					
Min. Operating Pressure	MPa	0.5					
Withstanding Pressure	MPa	10.5					
Operating Temperature	°C	0 ~ 70					
Weight	kg	1.7 ~ 2.3	2.3 ~ 3.1	3.2 ~ 4.1	4.4 ~ 5.3	6.5 ~ 7.6	9.0 ~ 9.8

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LLR0480-□P-100 [Y=100, A=176, E=155, F=127] (mm)

Model No.	LLR0480-□P	LLR0550-□P	LLR0650-□P	LLR0750-□P	LLR0900-□P	LLR1050-□P
Full Stroke Y	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150
A ※5	Y+76	Y+81	Y+91	Y+107	Y+121	Y+138
B	62	69	81	93	108	122
C	53	60	70	82	97	110
D	48	55	65	75	90	105
E	Y+55	Y+57	Y+63	Y+74	Y+84	Y+92
F	Y+27	Y+29	Y+33	Y+37	Y+44	Y+47
G	28	28	30	37	40	45
H	35.5	39	46	52	59.5	67
J	26.5	30	35	41	48.5	55
K	41	47	55	64	76	88
L	83	88	106	116	136	152
M	12	12	13	16	16	17
Nx	30	33.5	39.5	45	52.5	60
Ny	11	12	15	16	18.5	22.5
P	3	3	5	5	5	5
R	5.5	6.8	6.8	9	11	14
S	24	24	26	32	35	39
The Diameter of Mating Fit	28 ^{+0.020} _{-0.053}	32 ^{-0.025} _{-0.064}	38 ^{-0.025} _{-0.064}	44 ^{-0.025} _{-0.064}	50 ^{-0.025} _{-0.064}	60 ^{-0.030} _{-0.076}
The Length of Mating Fit	4	4	4	5	5	6
T ※5	21	24	28	33	37	46
U	10	11	13	16	19	22
V	9	10	12	14	16	21
W	10.5	12	14	17	19	23
Chamfer	C3	C3	C4	C5	C6	C6
AB	17	19	22	27	32	42
AC	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	9	10	12	14	16	21
AE	6	4	6	6	8	10
AF (Nominal × Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
DA	3.5	3.5	4.5	4.5	4.5	4.5
DB	14	14	19	19	22	22
EA (Nominal × Pitch)	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75
Hydraulic Port	Option -C	G1/8	G1/8	G1/4	G3/8	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/4	Rc3/8	Rc3/8
O-ring	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LLR0480-□A	LLR0550-□A	LLR0650-□A	LLR0750-□A	LLR0900-□A	LLR1050-□A
A _A ※5	Y+66	Y+69	Y+76	Y+89	Y+100	Y+110
T _A ※5	11	12	13	15	16	18
U _A	14	17	19	24	30	36
W _A	8.5	9	10	12	13	15
BB	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions. (mm)

Model No.	LLR0480-□B	LLR0550-□B	LLR0650-□B	LLR0750-□B	LLR0900-□B	LLR1050-□B
V _B	2.5	2.5	3	4	5	6
W _B	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to P Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LLR0480-□T	LLR0550-□T	LLR0650-□T	LLR0750-□T	LLR0900-□T	LLR1050-□T
A _T ※5	Y+90	Y+97	Y+108	Y+124	Y+146	Y+164
T _T ※5	35	40	45	50	62	72
U _T	17	17	19	24	30	36
V _T	24	28	32	35	46	54
W _T	8.5	9	10	12	13	15
CB	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

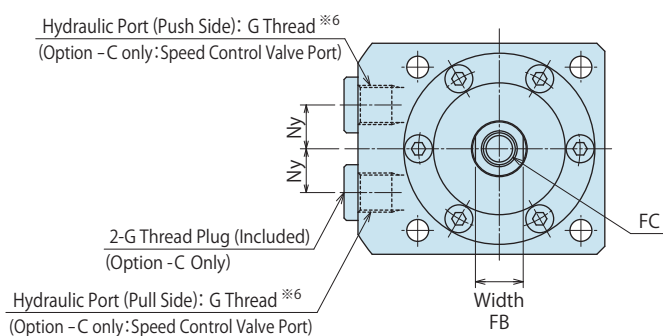
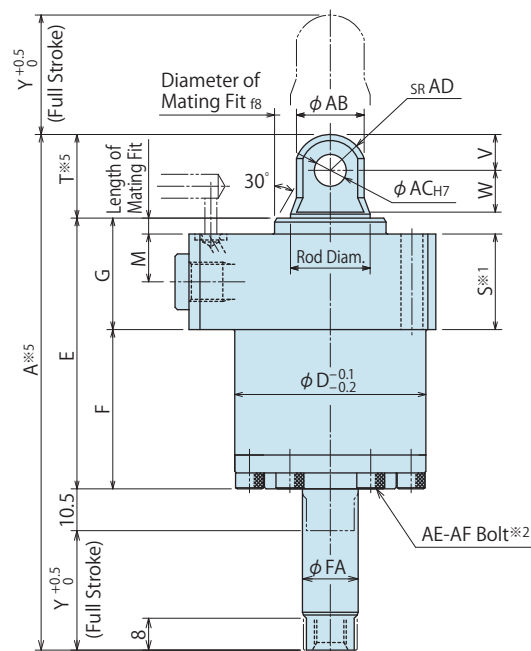
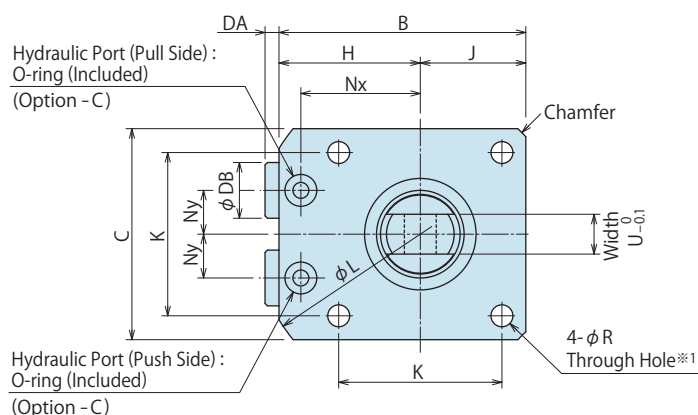
Customized Spring Cylinder

DWA/DWB

External Dimensions

C : Gasket Option (with G Thread Plug) [P] : Pin-Hole Option

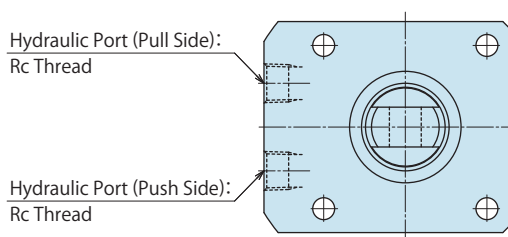
※This drawing shows LLR-CPD.



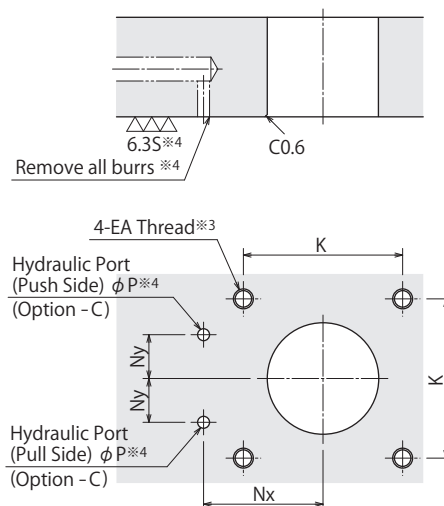
Piping Method

S : Rc Thread Piping Option

※The drawing shows LLR-SPD.



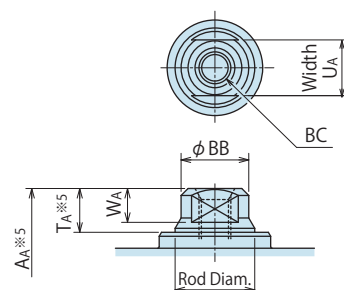
Machining Dimensions of Mounting Area



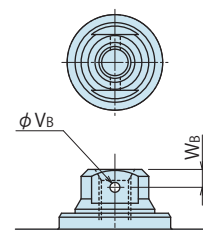
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

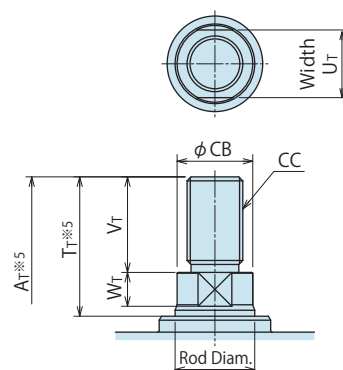
A : Female Threaded



B : Female Thread (with Anti-Rotation Pinhole)



T : Male Threaded



Notes :

- Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- The size and number of AF bolt vary depending on the model.
- EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- The machining dimension is for -C : Gasket option.
- The drawing shows when offset is 0mm.
 Dimensions of ※5 = [External Dimensions in the Table] + [Offset Size]
 (Ex.) LLR0360-□PD-030-Q5
 [Offset Size=5, Y=30, A=118.5+5=123.5, T=15+5=20]
- Speed control valve is not provided. Please refer to P.947.

Specifications

Model No.	LLR0360-□□D	LLR0400-□□D	LLR0480-□□D	LLR0550-□□D	LLR0650-□□D	LLR0750-□□D	LLR0900-□□D	LLR1050-□□D
Full Stroke Y	Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area	mm ²	3.7	4.2	6.5	8.1	14.4	21.2	33.8
Cylinder Force	cm ²	2.5	2.8	4.9	5.8	11.0	16.7	26.4
(Calculation Formula)	kN	P×0.37	P×0.42	P×0.65	P×0.81	P×1.44	P×2.12	P×3.38
Cylinder Capacity	cm ³	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64
(Calculation Formula)	cm ³	Y×0.37	Y×0.42	Y×0.65	Y×0.81	Y×1.44	Y×2.12	Y×3.38
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5
Max. Operating Pressure	MPa	7.0						
Min. Operating Pressure	MPa	0.5						
Withstanding Pressure	MPa	10.5						
Operating Temperature	°C	0 ~ 70						
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.7	1.3 ~ 2.2	2.0 ~ 3.2	2.9 ~ 4.3	4.5 ~ 6.4
		6.1 ~ 8.3						

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=1-14 mm and Y= 15 mm or more.

(Ex.) LLR0360-□PD-010 [Y=10, A=83.5, E=48, F=23]

LLR0360-□PD-030 [Y=30, A=118.5, E=63, F=38] (mm)

[P] : Pin-Hole Option

Model No.	LLR0360-□PD	LLR0400-□PD	LLR0480-□PD	LLR0550-□PD	LLR0650-□PD	LLR0750-□PD	LLR0900-□PD	LLR1050-□PD
Full Stroke Y	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75
A ^{※5}	Y+73.5	2Y+58.5	Y+80.5	2Y+65.5	Y+84.5	2Y+69.5	Y+90.5	2Y+75.5
B	49		55		62		69	
C	40		47		53		60	
D	36		40		48		55	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13
G	25		25		28		30	
H	29		31.5		35.5		39	
J	20		23.5		26.5		30	
K	31.4		36		41		47	
L	66		73		83		88	
M	11		11		12		13	
Nx	23.5		26		30		33.5	
Ny	8		9		11		12	
P	3		3		3		3	
R	4.5		5.5		5.5		6.8	
S	21		21		24		24	
The Diameter of Mate Fit	23 ^{+0.020 -0.053}		25 ^{+0.020 -0.053}		28 ^{+0.020 -0.053}		32 ^{+0.025 -0.064}	
The Length of Mate Fit	4		4		4		4	
T ^{※5}	15		19		21		24	
U	6		8		10		11	
V	6		8		9		10	
W	7.5		9.5		10.5		12	
Chamfer	C2		C2		C3		C4	
AB	12		15		17		19	
AC	6 ^{+0.012 0}		8 ^{+0.015 0}		8 ^{+0.015 0}		10 ^{+0.015 0}	
AD	6		8		9		10	
AE	5		4		6		4	
AF (Nominal × Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8	
DA	3.5		3.5		3.5		4.5	
DB	14		14		14		19	
EA (Nominal × Pitch)	M4×0.7		M5×0.8		M5×0.8		M6×1	
FA	10		12		14		14	
FB	8		10		12		12	
FC (Nominal×Pitch×Depth)	M5×0.8×12		M6×1×15		M8×1.25×18		M8×1.25×18	
Hydraulic Port	Option -C	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8
	Option -S	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8
O-ring	1BP5		1BP5		1BP5		1BP7	

[A] : Female Threaded

Refer to P Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLR0360-□AD	LLR0400-□AD	LLR0480-□AD	LLR0550-□AD	LLR0650-□AD	LLR0750-□AD	LLR0900-□AD	LLR1050-□AD
A ^{※5}	Y+67.5	2Y+52.5	Y+71.5	2Y+56.5	Y+74.5	2Y+59.5	Y+78.5	2Y+63.5
T ^{※5}	9		10		11		12	
U _A	12		13		14		17	
W _A	7.5		7.5		8.5		9	
BB	14		15		17		19	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20	
							M12×1.75×24	
							M16×2×32	
							M20×2.5×40	
							M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to P Pin-Hole Option / A Female Thread Option for unlisted dimensions.

(mm)

Model No.	LLR0360-□BD	LLR0400-□BD	LLR0480-□BD	LLR0550-□BD	LLR0650-□BD	LLR0750-□BD	LLR0900-□BD	LLR1050-□BD
V _B	2		2.5		2.5		3	
W _B	5.5		5		6		7	
							8.5	
							9	
							10.5	

[T] : Male Threaded

Refer to P Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLR0360-□TD	LLR0400-□TD	LLR0480-□TD	LLR0550-□TD	LLR0650-□TD	LLR0750-□TD	LLR0900-□TD	LLR1050-□TD
A ^{※5}	Y+83.5	2Y+68.5	Y+91.5	2Y+76.5	Y+98.5	2Y+83.5	Y+106.5	2Y+91.5
T ^{※5}	25		30		35		40	
U _T	12		14		17		17	
V _T	16		20		24		28	
W _T	7.5		7.5		8.5		9	
CB	14		17		19		21	
CC (Nominal × Pitch)	M10×1.25		M12×1.25		M14×1.5		M16×1.5	
							M20×1.5	
							M24×1.5	
							M30×1.5	
							M36×1.5	

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

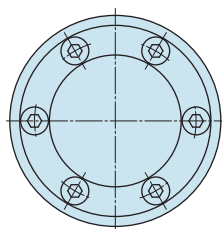
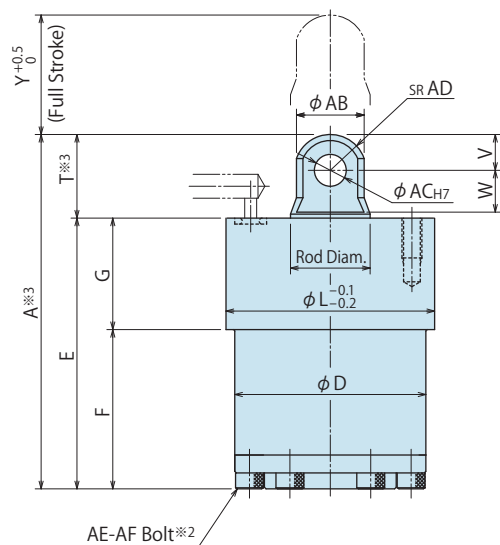
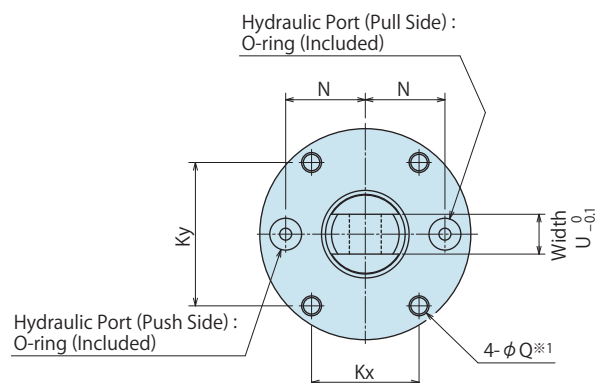
Customized Spring Cylinder

DWA/DWB

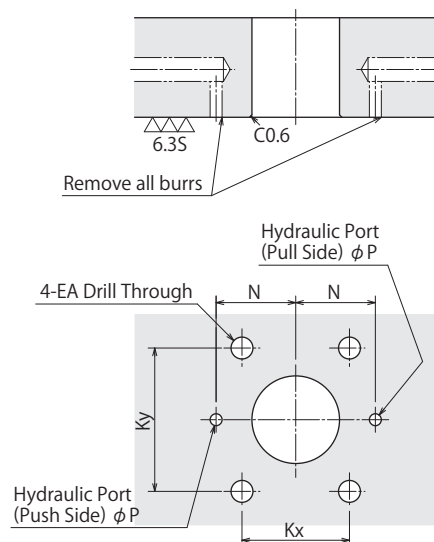
External Dimensions

G : Gasket Option [P] : Pin-Hole Option

※This drawing shows LLU-GP.



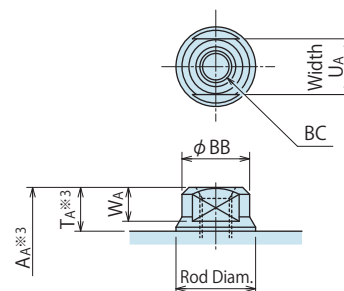
Machining Dimensions of Mounting Area



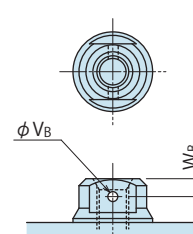
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

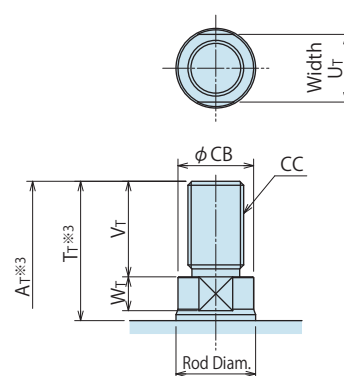
[A] : Female Threaded



[B] : Female Thread (with Anti-Rotation Pinhole)



[T] : Male Threaded



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'Q'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. The drawing shows when offset is 0mm.

Dimensions of ※3 = External Dimensions in the Table + Offset Size
(Ex.) LLU0360-GP-030-05 [Offset Size=5, Y=30, A=78+5=83, T=15+5=20]

Specifications

Model No.		LLU0360-G□	LLU0400-G□	LLU0480-G□	LLU0550-G□	LLU0650-G□	LLU0750-G□	LLU0900-G□	LLU1050-G□
Full Stroke Y	mm	Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area	Push Side	4.5	5.3	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	Push Side	P×0.45	P×0.53	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	Push Side	Y×0.45	Y×0.53	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	℃	0 ~ 70							
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.6	1.3 ~ 2.1	1.9 ~ 3.1	2.8 ~ 4.1	4.3 ~ 6.1	5.9 ~ 8.0

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=1-14 mm and Y= 15 mm or more.
 (Ex.) LLU0360-GP-010 [Y=10, A=63, E=48, F=23]
 LLU0360-GP-020 [Y=30, A=78, E=63, F=38] (mm)

[P] : Pin-Hole Option

Model No.	LLU0360-GP		LLU0400-GP		LLU0480-GP		LLU0550-GP		LLU0650-GP		LLU0750-GP		LLU0900-GP		LLU1050-GP	
Full Stroke Y	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75
A ※3	63	Y+48	70	Y+55	74	Y+59	80	Y+65	90	Y+75	101	Y+86	114	Y+99	127	Y+112
D	36		40		48		55		65		75		90		105	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41	62	Y+47	68	Y+53	77	Y+62	81	Y+66
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13	32	Y+17	31	Y+16	37	Y+22	36	Y+21
G	25		25		28		28		30		37		40		45	
Kx	23		24		27		30		36		42		54		65	
Ky	30		32		36		40		48		56		64		65	
L	45		48		53		60		70		83		100		116	
N	17		18		20		22.5		27.5		32.5		39.5		46	
P	3		3		3		3		5		5		5		5	
Q (Nominal×Pitch×Depth)	M4×0.7×8		M5×0.8×10		M5×0.8×10		M6×1×12		M6×1×12		M8×1.25×16		M10×1.5×20		M12×1.75×24	
T ※3	15		19		21		24		28		33		37		46	
U	6		8		10		11		13		16		19		22	
V	6		8		9		10		12		14		16		21	
W	7.5		9.5		10.5		12		14		17		19		23	
AB	12		15		17		19		22		27		32		42	
AC	6 ^{+0.012} ₀		8 ^{+0.015} ₀		8 ^{+0.015} ₀		10 ^{+0.015} ₀		12 ^{+0.018} ₀		14 ^{+0.018} ₀		16 ^{+0.018} ₀		20 ^{+0.021} ₀	
AD	6		8		9		10		12		14		16		21	
AE	5		4		6		4		6		6		8		10	
AF (Nominal × Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M6×1	
EA	4.5		5.5		5.5		6.8		6.8		9		11		14	
O-ring	1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7	

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GA		LLU0400-GA		LLU0480-GA		LLU0550-GA		LLU0650-GA		LLU0750-GA		LLU0900-GA		LLU1050-GA	
A _A ※3	57	Y+42	61	Y+46	64	Y+49	68	Y+53	75	Y+60	83	Y+68	93	Y+78	99	Y+84
T _A ※3	9		10		11		12		13		15		16		18	
U _A	12		13		14		17		19		24		30		36	
W _A	7.5		7.5		8.5		9		10		12		13		15	
BB	14		15		17		19		22		27		33		42	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20		M12×1.75×24		M16×2×32		M20×2.5×40		M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GB	LLU0400-GB	LLU0480-GB	LLU0550-GB	LLU0650-GB	LLU0750-GB	LLU0900-GB	LLU1050-GB
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GT	LLU0400-GT	LLU0480-GT	LLU0550-GT	LLU0650-GT	LLU0750-GT	LLU0900-GT	LLU1050-GT
A _T ※3	73	Y+58	81	Y+66	88	Y+73	96	Y+81
T _T ※3	25	30	35	40	45	50	62	72
U _T	12	14	17	17	19	24	30	36
V _T	16	20	24	28	32	35	46	54
W _T	7.5	7.5	8.5	9	10	12	13	15
CB	14	17	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

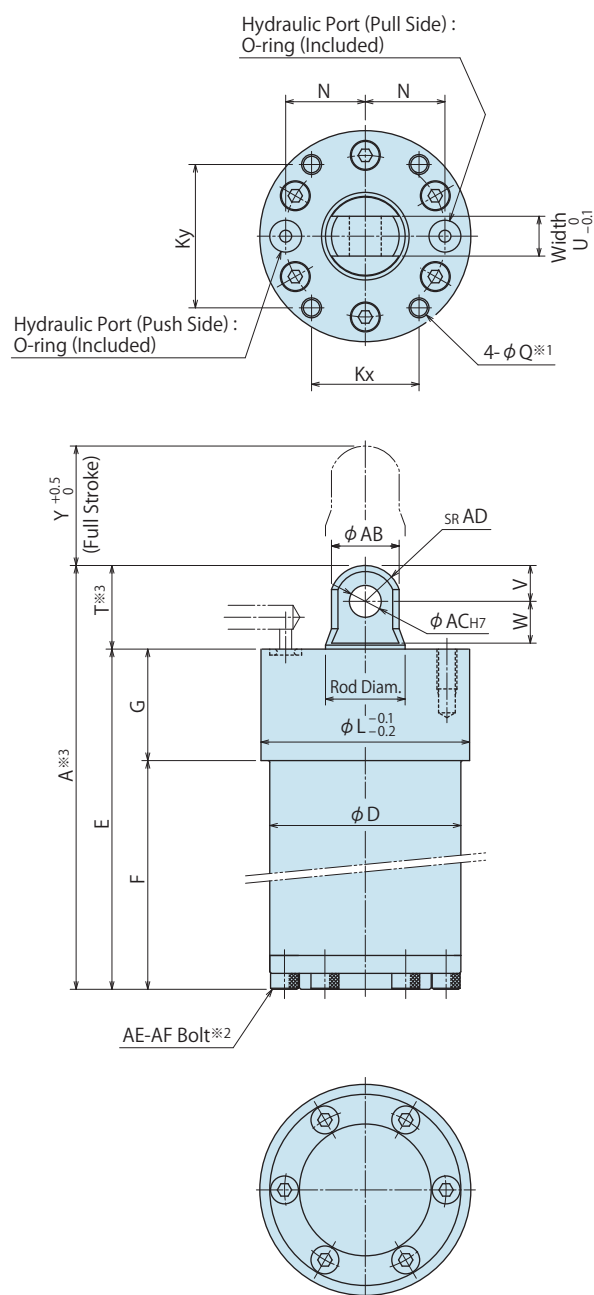
Customized Spring Cylinder

DWA/DWB

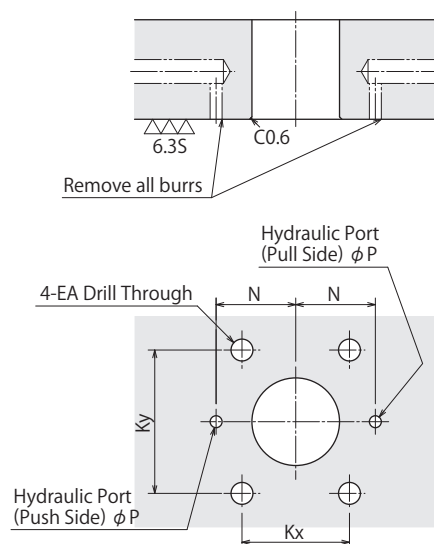
External Dimensions

G : Gasket Option [P] : Pin-Hole Option

※This drawing shows LLU-GP.



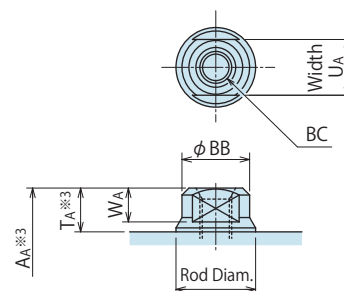
Machining Dimensions of Mounting Area



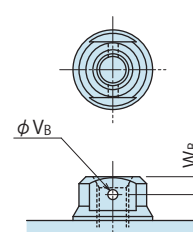
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

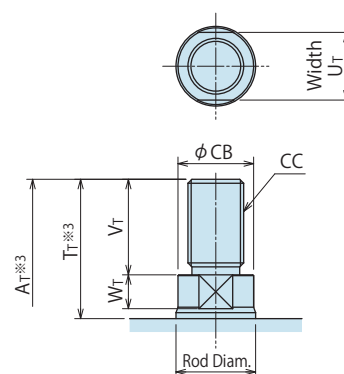
[A] : Female Threaded



[B] : Female Thread (with Anti-Rotation Pinhole)



[T] : Male Threaded



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'Q'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. The drawing shows when offset is 0mm.

Dimensions of ※3 = External Dimensions in the Table + Offset Size

(Ex.) LLU0480-GP-100-05 [Offset size=5, Y=100, A=176+5=181, T=21+5=26]

Specifications

Model No.		LLU0480-G□	LLU0550-G□	LLU0650-G□	LLU0750-G□	LLU0900-G□	LLU1050-G□
Full Stroke Y	mm	Y : 76 ~ 150					
Cylinder Area	cm ² Push Side	8.0	9.6	15.9	23.8	36.3	50.3
	Retract (Pull) Side	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula)	kN Push Side	P×0.80	P×0.96	P×1.59	P×2.38	P×3.63	P×5.03
	Retract (Pull) Side	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula)	cm ³ Push Side	Y×0.80	Y×0.96	Y×1.59	Y×2.38	Y×3.63	Y×5.03
	Retract (Pull) Side	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0					
Min. Operating Pressure	MPa	0.5					
Withstanding Pressure	MPa	10.5					
Operating Temperature	℃	0 ~ 70					
Weight	kg	1.7 ~ 2.3	2.3 ~ 3.1	3.2 ~ 4.1	4.4 ~ 5.3	6.5 ~ 7.6	9.0 ~ 9.8

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

[P] : Pin-Hole Option

(Ex.) LLU0480-□P-100 [Y=100, A=176, E=155, F=127] (mm)

Model No.	LLU0480-GP	LLU0550-GP	LLU0650-GP	LLU0750-GP	LLU0900-GP	LLU1050-GP
Full Stroke Y	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150	76 ~ 150
A ※3	Y+76	Y+81	Y+91	Y+107	Y+121	Y+138
D	48	55	65	75	90	105
E	Y+55	Y+57	Y+63	Y+74	Y+84	Y+92
F	Y+27	Y+29	Y+33	Y+37	Y+44	Y+47
G	28	28	30	37	40	45
Kx	27	30	36	42	54	65
Ky	36	40	48	56	64	65
L	53	60	70	83	100	116
N	20	22.5	27.5	32.5	39.5	46
P	3	3	5	5	5	5
Q (Nominal×Pitch×Depth)	M5×0.8×10	M6×1×12	M6×1×12	M8×1.25×16	M10×1.5×20	M12×1.75×24
T ※3	21	24	28	33	37	46
U	10	11	13	16	19	22
V	9	10	12	14	16	21
W	10.5	12	14	17	19	23
AB	17	19	22	27	32	42
AC	8 ^{+0.015} ₀	10 ^{+0.015} ₀	12 ^{+0.018} ₀	14 ^{+0.018} ₀	16 ^{+0.018} ₀	20 ^{+0.021} ₀
AD	9	10	12	14	16	21
AE	6	4	6	6	8	10
AF (Nominal × Pitch)	M4×0.7	M5×0.8	M5×0.8	M6×1	M6×1	M6×1
EA	5.5	6.8	6.8	9	11	14
O-ring	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LLU0480-GA	LLU0550-GA	LLU0650-GA	LLU0750-GA	LLU0900-GA	LLU1050-GA
A _A ※3	Y+66	Y+69	Y+76	Y+89	Y+100	Y+110
T _A ※3	11	12	13	15	16	18
U _A	14	17	19	24	30	36
W _A	8.5	9	10	12	13	15
BB	17	19	22	27	33	42
BC (Nominal×Pitch×Depth)	M8×1.25×16	M10×1.5×20	M12×1.75×24	M16×2×32	M20×2.5×40	M24×3×48

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions. (mm)

Model No.	LLU0480-GB	LLU0550-GB	LLU0650-GB	LLU0750-GB	LLU0900-GB	LLU1050-GB
V _B	2.5	2.5	3	4	5	6
W _B	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions. (mm)

Model No.	LLU0480-GT	LLU0550-GT	LLU0650-GT	LLU0750-GT	LLU0900-GT	LLU1050-GT
A _T ※3	Y+90	Y+97	Y+108	Y+124	Y+146	Y+164
T _T ※3	35	40	45	50	62	72
U _T	17	17	19	24	30	36
V _T	24	28	32	35	46	54
W _T	8.5	9	10	12	13	15
CB	19	21	24	29	34.5	42
CC (Nominal × Pitch)	M14×1.5	M16×1.5	M20×1.5	M24×1.5	M30×1.5	M36×1.5

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

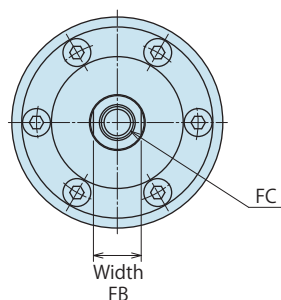
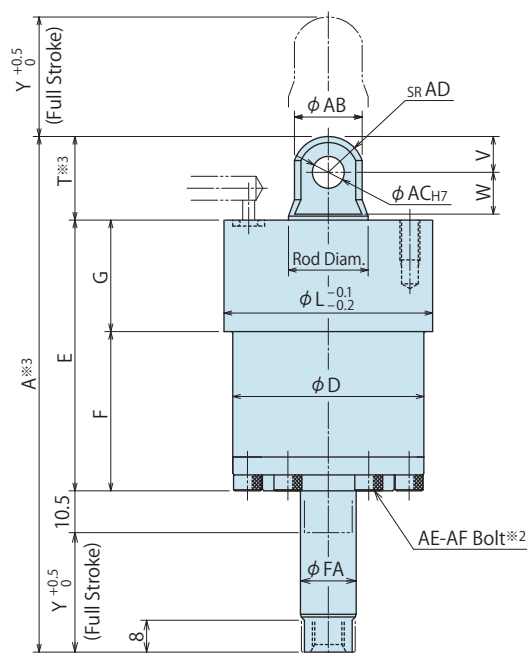
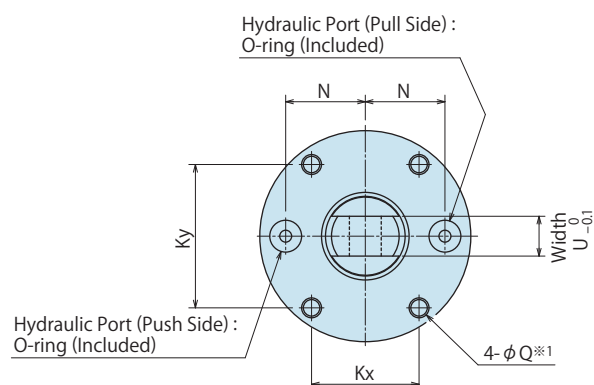
Customized Spring Cylinder

DWA/DWB

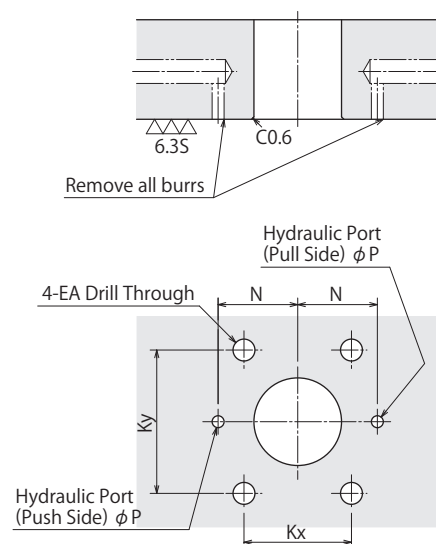
External Dimensions

G : Gasket Option [P] : Pin-Hole Option

※ This drawing shows LLU-GPD.



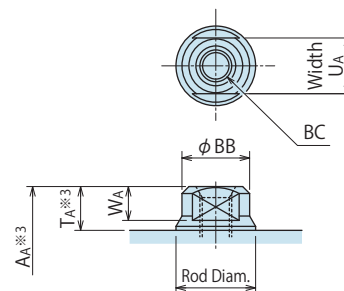
Machining Dimensions of Mounting Area



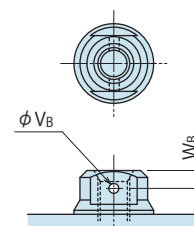
Tip Shape

Refer to [P] Pin-Hole Option for unlisted dimensions.

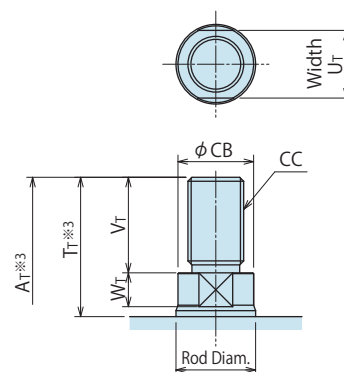
[A] : Female Threaded



[B] : Female Thread (with Anti-Rotation Pinhole)



[T] : Male Threaded



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'Q'.
- ※ 2. The size and number of AF bolt vary depending on the model.
- ※ 3. The drawing shows when offset is 0mm.

Dimensions of ※3 = External Dimensions in the Table + Offset Size

(Ex.) LLU0360-GPD-030-05 [Offset Size=5, Y=30, A=118.5+5=123.5, T=15+5=20]

Specifications

Model No.		LLU0360-G□D	LLU0400-G□D	LLU0480-G□D	LLU0550-G□D	LLU0650-G□D	LLU0750-G□D	LLU0900-G□D	LLU1050-G□D
Full Stroke Y	mm	Y : 1 ~ 50			Y : 1 ~ 75				
Cylinder Area cm ²	Push Side	3.7	4.2	6.5	8.1	14.4	21.2	33.8	47.7
	Retract (Pull) Side	2.5	2.8	4.9	5.8	11.0	16.7	26.4	34.4
Cylinder Force (Calculation Formula) kN	Push Side	P×0.37	P×0.42	P×0.65	P×0.81	P×1.44	P×2.12	P×3.38	P×4.77
	Retract (Pull) Side	P×0.25	P×0.28	P×0.49	P×0.58	P×1.10	P×1.67	P×2.64	P×3.44
Cylinder Capacity (Calculation Formula) cm ³	Push Side	Y×0.37	Y×0.42	Y×0.65	Y×0.81	Y×1.44	Y×2.12	Y×3.38	Y×4.77
	Retract (Pull) Side	Y×0.25	Y×0.28	Y×0.49	Y×0.58	Y×1.10	Y×1.67	Y×2.64	Y×3.44
Cylinder Inner Diameter	mm	φ24	φ26	φ32	φ35	φ45	φ55	φ68	φ80
Rod Diameter	mm	φ16	φ18	φ20	φ22	φ25	φ30	φ35.5	φ45
Max. Operating Pressure	MPa	7.0							
Min. Operating Pressure	MPa	0.5							
Withstanding Pressure	MPa	10.5							
Operating Temperature	°C	0 ~ 70							
Weight	kg	0.6 ~ 0.8	0.7 ~ 0.9	1.0 ~ 1.7	1.3 ~ 2.2	2.0 ~ 3.2	2.9 ~ 4.3	4.5 ~ 6.4	6.1 ~ 8.3

P : Supply Hydraulic Pressure (MPa), Y : Full Stroke (mm)

External Dimensions and Machining Dimensions for Mounting

※ Calculation formula is different between Full Stroke: Y=1-14 mm and Y= 15 mm or more.

(Ex.) LLU0360-GPD-010 [Y=10, A=83.5, E=48, F=23]

LLU0360-GPD-030 [Y=30, A=118.5, E=63, F=38] (mm)

[P] : Pin-Hole Option

Model No.	LLU0360-GPD		LLU0400-GPD		LLU0480-GPD		LLU0550-GPD		LLU0650-GPD		LLU0750-GPD		LLU0900-GPD		LLU1050-GPD	
Full Stroke Y	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 50	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75	1 ~ 14	15 ~ 75
A ※3	Y+73.5	2Y+58.5	Y+80.5	2Y+65.5	Y+84.5	2Y+69.5	Y+90.5	2Y+75.5	Y+100.5	2Y+85.5	Y+111.5	2Y+96.5	Y+124.5	2Y+109.5	Y+137.5	2Y+122.5
D	36		40		48		55		65		75		90		105	
E	48	Y+33	51	Y+36	53	Y+38	56	Y+41	62	Y+47	68	Y+53	77	Y+62	81	Y+66
F	23	Y+8	26	Y+11	25	Y+10	28	Y+13	32	Y+17	31	Y+16	37	Y+22	36	Y+21
G	25		25		28		28		30		37		40		45	
Kx	23		24		27		30		36		42		54		65	
Ky	30		32		36		40		48		56		64		65	
L	45		48		53		60		70		83		100		116	
N	17		18		20		22.5		27.5		32.5		39.5		46	
P	3		3		3		3		5		5		5		5	
Q (Nominal×Pitch×Depth)	M4×0.7×8		M5×0.8×10		M5×0.8×10		M6×1×12		M6×1×12		M8×1.25×16		M10×1.5×20		M12×1.75×24	
T ※3	15		19		21		24		28		33		37		46	
U	6		8		10		11		13		16		19		22	
V	6		8		9		10		12		14		16		21	
W	7.5		9.5		10.5		12		14		17		19		23	
AB	12		15		17		19		22		27		32		42	
AC	6 ^{+0.012} ₀		8 ^{+0.015} ₀		8 ^{+0.015} ₀		10 ^{+0.015} ₀		12 ^{+0.018} ₀		14 ^{+0.018} ₀		16 ^{+0.018} ₀		20 ^{+0.021} ₀	
AD	6		8		9		10		12		14		16		21	
AE	5		4		6		4		6		6		8		10	
AF (Nominal × Pitch)	M3×0.5		M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1		M6×1		M6×1	
EA	4.5		5.5		5.5		6.8		6.8		9		11		14	
FA	10		12		14		14		14		18		18		18	
FB	8		10		12		12		12		16		16		16	
FC (Nominal×Pitch×Depth)	M5×0.8×12		M6×1×15		M8×1.25×18		M8×1.25×18		M8×1.25×18		M10×1.5×21		M10×1.5×21		M10×1.5×21	
O-ring	1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7	

[A] : Female Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GAD		LLU0400-GAD		LLU0480-GAD		LLU0550-GAD		LLU0650-GAD		LLU0750-GAD		LLU0900-GAD		LLU1050-GAD	
A _A ※3	Y+67.5	2Y+52.5	Y+71.5	2Y+56.5	Y+74.5	2Y+59.5	Y+78.5	2Y+63.5	Y+85.5	2Y+70.5	Y+93.5	2Y+78.5	Y+103.5	2Y+88.5	Y+109.5	2Y+94.5
T _A ※3	9		10		11		12		13		15		16		18	
U _A	12		13		14		17		19		24		30		36	
W _A	7.5		7.5		8.5		9		10		12		13		15	
BB	14		15		17		19		22		27		33		42	
BC (Nominal×Pitch×Depth)	M6×1×12		M8×1.25×16		M8×1.25×16		M10×1.5×20		M12×1.75×24		M16×2×32		M20×2.5×40		M24×3×48	

[B] : Female Thread with Anti-Rotation Pinhole

Refer to **P** Pin-Hole Option / **A** Female Thread Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GBD	LLU0400-GBD	LLU0480-GBD	LLU0550-GBD	LLU0650-GBD	LLU0750-GBD	LLU0900-GBD	LLU1050-GBD
V _B	2	2.5	2.5	2.5	3	4	5	6
W _B	5.5	5	6	6.5	7	8.5	9	10.5

[T] : Male Threaded

Refer to **P** Pin-Hole Option for unlisted dimensions.

(mm)

Model No.	LLU0360-GTD		LLU0400-GTD		LLU0480-GTD		LLU0550-GTD		LLU0650-GTD		LLU0750-GTD		LLU0900-GTD		LLU1050-GTD	
A _T ※3	Y+83.5	2Y+68.5	Y+91.5	2Y+76.5	Y+98.5	2Y+83.5	Y+106.5	2Y+91.5	Y+117.5	2Y+102.5	Y+128.5	2Y+113.5	Y+149.5	2Y+134.5	Y+163.5	2Y+148.5
T _T ※3	25		30		35		40		45		50		62		72	
U _T	12		14		17		17		19		24		30		36	
V _T	16		20		24		28		32		35		46		54	
W _T	7.5		7.5		8.5		9		10		12		13		15	
CB	14		17		19		21		24		29		34.5		42	
CC (Nominal × Pitch)	M10×1.25		M12×1.25		M14×1.5		M16×1.5		M20×1.5		M24×1.5		M30×1.5		M36×1.5	

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

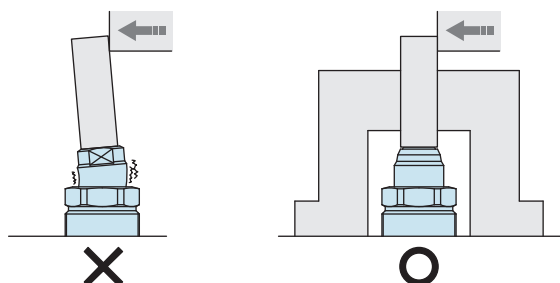
Cautions

Notes for Design

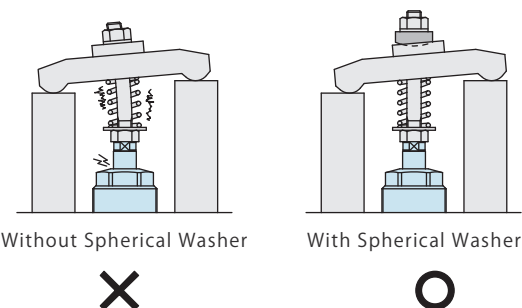
For LL/LLR/LLU/DP/DR/DS/DT

- 1) Check Specifications
 - Please use each product according to the specifications.
- 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)
 - Ensure there is no possibility of supplying hydraulic pressure to the push side and the pull side simultaneously.
- 3) Notes for Pipe Design
 - It is recommended to select as large diameter pipes as possible. The back pressure is proportional to the pipe size, so if the pipes are small the release and lock times will be longer. Please note that the single-acting models in particular are largely affected by the number of cylinders, the pipe length and the inner diameter of pipes and hoses.
- 4) Protect the exposed area of the piston rod when using on a welding fixture.
 - If spatter attaches to the sliding surface it could lead to malfunction and fluid leakage.
- 5) The Load Direction Given to the Piston Rod
 - Make sure no force is applied to the piston rod except from the axial direction. Usage like the one shown in the figure below will apply a large bending stress to the piston rod and must be avoided.

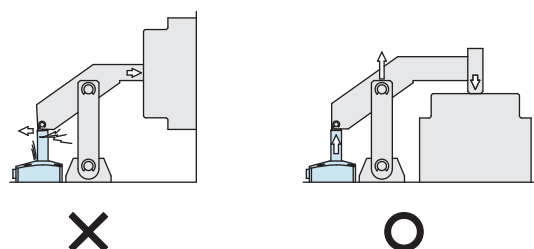
In case a load is applied except from the axial direction



When clamping workpieces of different heights

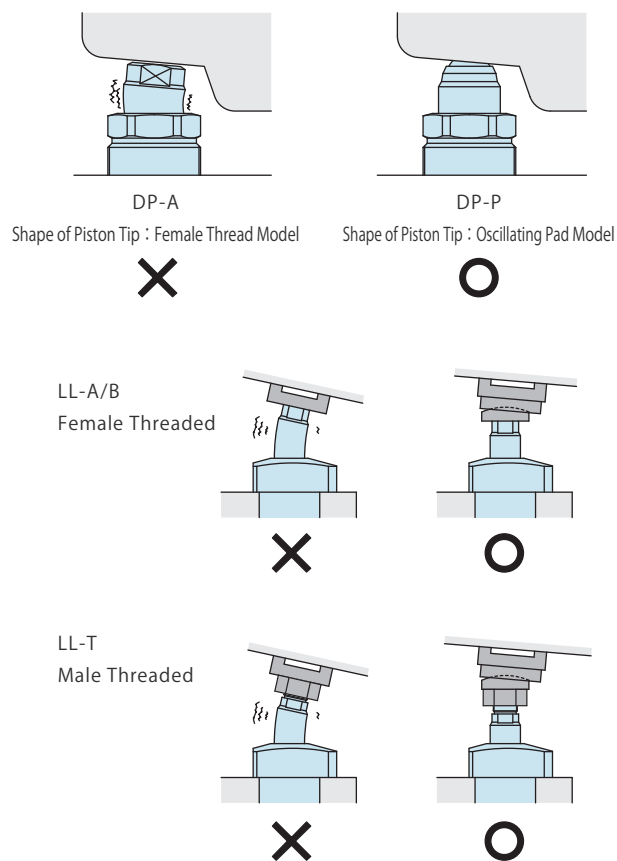


A Combination with Link Mechanism



- 6) When Clamping on a Sloped Surface of a Workpiece
 - When clamping an inclined surface, make sure that the clamping area is level when looking from the cylinder side. The clamping surface and the cylinder mounting surface should be parallel. A workpiece may move and a piston rod may slip when a cylinder is used on an inclined surface. (When the workpiece is a casting, it is recommended that a spiked attachment be used for a cylinder on draft angle.)

When clamping an inclined surface



7) LLR/LLU : Offset Size

- The exterior dimension of LLR/LLU on this catalog are when offset dimension is 0mm. When setting offset size, please check the notes on each page.

8) DP/DR/DS/DT : Considerations for Attachments

- Whenever possible, use lightweight attachments. Using attachments that weigh more than the release spring force will result in releasing failures.

● Installation Notes For LL/LLR/LLU

1) Check the Usable Fluid

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

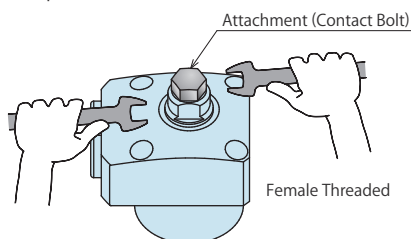
2) Installation of the Cylinder

- When mounting the cylinder, use four hexagonal socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can dent the seating surface or break the bolt.

Model No.	Thread Size	Tightening Torque (N·m)
LL/LLR/LLU0360	M4×0.7	3.2
LL/LLR/LLU0400	M5×0.8	6.3
LL/LLR/LLU0480	M5×0.8	6.3
LL/LLR/LLU0550	M6×1	10
LL/LLR/LLU0650	M6×1	10
LL/LLR/LLU0750	M8×1.25	25
LL/LLR/LLU0900	M10×1.5	50
LL/LLR/LLU1050	M12×1.75	80

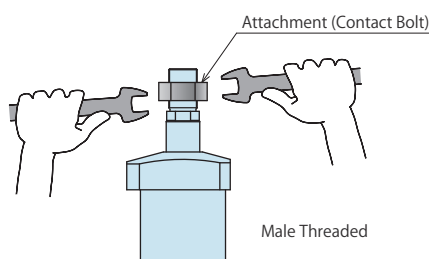
3) Installation / Removal of Attachment

- When installing or removing an attachment, always use a wrench on the piston rod to keep it from turning, and tighten it with the torque shown below.



LL/LLR/LLU□-□A/B : Female Threaded

Model No.	Thread Size	Tightening Torque (N·m)
LL/LLR/LLU0360-□A/B	M6×1	10
LL/LLR/LLU0400-□A/B	M8×1.25	16
LL/LLR/LLU0480-□A/B	M8×1.25	16
LL/LLR/LLU0550-□A/B	M10×1.5	40
LL/LLR/LLU0650-□A/B	M12×1.75	63
LL/LLR/LLU0750-□A/B	M16×2	100
LL/LLR/LLU0900-□A/B	M20×2.5	125
LL/LLR/LLU1050-□A/B	M24×3	250



LL/LLR/LLU□-□T : Male Threaded

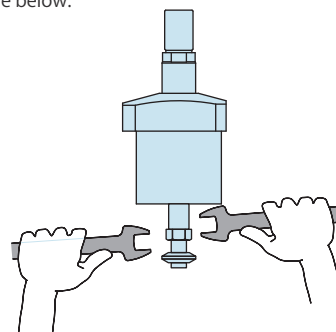
Model No.	Thread Size	Tightening Torque (N·m)
LL/LLR/LLU0360-□T	M10×1.25	40
LL/LLR/LLU0400-□T	M12×1.25	63
LL/LLR/LLU0480-□T	M14×1.5	80
LL/LLR/LLU0550-□T	M16×1.5	100
LL/LLR/LLU0650-□T	M20×1.5	125
LL/LLR/LLU0750-□T	M24×1.5	250
LL/LLR/LLU0900-□T	M30×1.5	315
LL/LLR/LLU1050-□T	M36×1.5	400

4) Speed Adjustment

- Adjust the rod operating speed less than 100mm/sec both the push and pull operation.
If the cylinder operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed accurately with air mixed in the circuit.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

5) Notes on dual rod option (-D) for dog application.

- When attaching dog, set up the piston so that it will not turn around. Please secure the dog or cam and prevent any rotation or torque on the piston rod. Tightening torque of mounting screw is shown in the table below.



Model No.	Thread Size	Tightening Torque (N·m)
LL/LLR/LLU0360-□□D	M5×0.8	6.3
LL/LLR/LLU0400-□□D	M6×1	10
LL/LLR/LLU0480-□□D	M8×1.25	25
LL/LLR/LLU0550-□□D	M8×1.25	25
LL/LLR/LLU0650-□□D	M8×1.25	25
LL/LLR/LLU0750-□□D	M10×1.5	50
LL/LLR/LLU0900-□□D	M10×1.5	50
LL/LLR/LLU1050-□□D	M10×1.5	50

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

※ 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 and Installation DP

- 1) Be careful not to damage the O-ring.
 - When mounting to a fixture, be careful not to damage the O-ring on the bottom mounting surface.
Apply an appropriate amount of grease to the O-ring.
(O-ring may be damaged without grease.)
- 2) Be careful not to let the piston fall out.
 - If the piston falls out of the cylinder during assembly, make sure to attach the O-ring to the bottom after inserting the piston into the cylinder. If the O-ring is inserted first it could get crushed and severed.

3) Installation of the Cylinder

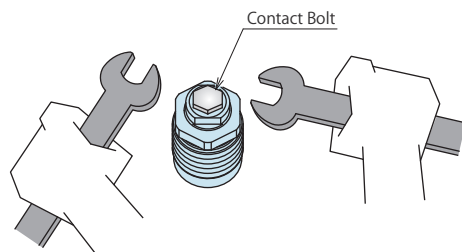
- When mounting the cylinder, tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DP0160	M16×1.5	16
DP0221	M22×1.5	40
DP0241	M24×1.5	63
DP0301	M30×1.5	100
DP0361	M36×1.5	250
DP0451	M45×1.5	400
DP0551	M55×2	※630
DP0651	M65×2	※1000
DP0801	M80×2	※1600

(It shows the tightening torque when using the product with max. operating pressure.)
※ The torque is large, so use an impact tightening tool or a locking device.

4) Installation of the Contact Bolt

- ① When installing or removing the contact bolt always use a wrench on the piston rod to keep it from turning.



- ② When mounting the contact bolt, tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DP0160	M5×0.8	4.0
DP0221	M6×1	5.0
DP0241	M6×1	8.0
DP0301	M8×1.25	16
DP0361	M8×1.25	25
DP0451	M10×1.5	50
DP0551	M12×1.75	100
DP0651	M16×2	200
DP0801	M20×2.5	400

(It shows the tightening torque when using the product with max. operating pressure.)

- ③ The DP-Q type has a thread hole at the end for attachments.
When removing an attachment or attaching it to the end, make sure that no cutting oil or other contaminants get inside through the thread hole and perform the work in a clean environment.
Do not use the cylinder without the attachment in place.

5) Check the Usable Fluid

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

Notes for Design and Installation DR

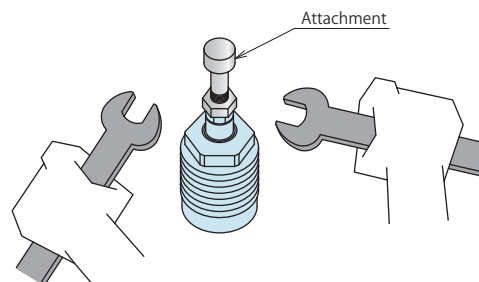
- 1) Be careful not to damage the O-ring.
 - When mounting to a fixture, be careful not to damage the O-ring on the bottom mounting surface.
Apply an appropriate amount of grease to the O-ring.
(O-ring may be damaged without grease.)
- 2) Installation of the Cylinder
 - When mounting the cylinder, tighten it with the torque shown in the table below.

Model No.	Thread size	Tightening Torque (N·m)
DR0221	M22×1.5	20
DR0241	M24×1.5	32
DR0301	M30×1.5	63
DR0361	M36×1.5	125
DR0451	M45×1.5	250
DR0551	M55×2	400
DR0651	M65×2	※800
DR0801	M80×2	※1600

(It shows the tightening torque when using the product with max. operating pressure.)
※ The torque is large, so use an impact tightening tool or a locking device.

3) Installation of Attachment

- ① When installing or removing an attachment, always use a wrench on the piston rod to keep it from turning.



- ② When mounting an attachment, tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DR0221	M6×1	4.0
DR0241	M6×1	6.3
DR0301	M8×1.25	12.5
DR0361	M8×1.25	25
DR0451	M10×1.5	50
DR0551	M12×1.75	100
DR0651	M16×2	200
DR0801	M20×2.5	400

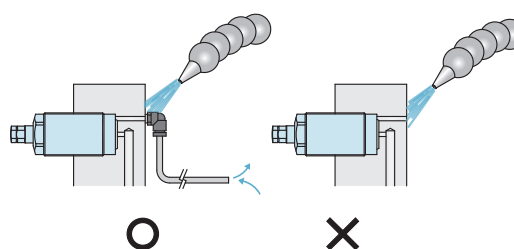
(It shows the tightening torque when using the product with max. operating pressure.)

4) Check the Usable Fluid

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

5) Appropriate Measures for the Vent Port

- There is an air vent at the bottom of the cylinder. Consider the environment and avoid cutting fluid, coolant or any contaminants.
- If using it without air vent port, it will not function properly.

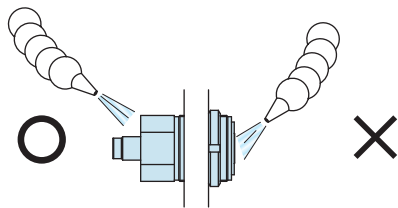


※ Please refer to P.1355 for common cautions.

• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
• Notes on Handling • Maintenance/Inspection • Warranty

● Notes for Design and Installation DS

- 1) There is an air vent at the bottom of the cylinder. Consider the environment and avoid cutting fluid, coolant or any contaminants.



- 2) Installation of the Cylinder

- When mounting, tighten it with the torque shown in the table below.

- ① When Mounting the Cylinder with External Thread

Model No.	Thread Size	Tightening Torque (N·m)
DS0221	M22×1.5	20
DS0241	M24×1.5	32
DS0301	M30×1.5	63
DS0361	M36×1.5	125
DS0451	M45×1.5	250
DS0551	M55×2	400
DS0651	M65×2	※800
DS0801	M80×2	※1600

(It shows the tightening torque when using the product with max. operating pressure.)

※ The torque is large, so use an impact tightening tool or a locking device.

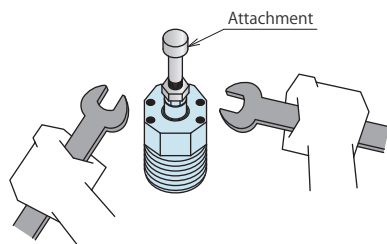
- ② When Mounting the Cylinder with Bolts

Use four bolts (Strength Grade : 12.9) and tighten them with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DS0221	M4×0.7	4.0
DS0241	M4×0.7	4.0
DS0301	M5×0.8	6.3
DS0361	M5×0.8	6.3
DS0451	M6×1	16
DS0551	M6×1	16
DS0651	M8×1.25	25
DS0801	M8×1.25	25

- 3) Installation of Attachment

- ① When installing or removing an attachment, always use a wrench on the piston rod to keep it from turning.



- ② When mounting an attachment, tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DS0221	M6×1	6.3
DS0241	M6×1	8.0
DS0301	M8×1.25	16
DS0361	M8×1.25	30
DS0451	M10×1.5	50
DS0551	M12×1.75	100
DS0651	M16×2	200
DS0801	M20×2.5	400

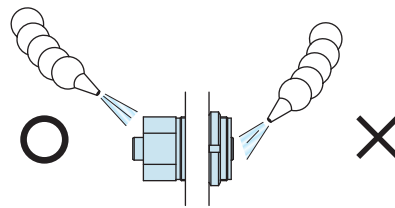
(It shows the tightening torque when using the product with max. operating pressure.)

- 4) Check the Usable Fluid

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

● Notes for Design and Installation DT

- 1) There is an air vent at the bottom of the cylinder. Consider the environment and avoid cutting fluid, coolant or any contaminants.



- 2) Installation of the Cylinder

- When mounting, tighten it with the torque shown in the table below.

- ① When Mounting the Cylinder with External Thread

Model No.	Thread Size	Tightening Torque (N·m)
DT0361	M36×1.5	125
DT0451	M45×1.5	250
DT0551	M55×2	400
DT0651	M65×2	※800
DT0801	M80×2	※1600

(It shows the tightening torque when using the product with max. operating pressure.)

※ The torque is large, so use an impact tightening tool or a locking device.

- ② When Mounting the Cylinder with Bolts

Use four bolts (Strength Grade : 12.9) and tighten them with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DT0361	M5×0.8	6.3
DT0451	M6×1	16
DT0551	M6×1	16
DT0651	M8×1.25	25
DT0801	M8×1.25	25

- 3) Installation of Attachment

- ① When mounting an attachment, tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
DT0361	M8 × 1.25 (φ 8.5)	30
DT0451	M10 × 1.5 (φ 10.5)	50
DT0551	M12 × 1.75 (φ 12.5)	100
DT0651	M16 × 2 (φ 16.5)	200
DT0801	M20 × 2.5 (φ 20.5)	400

(It shows the tightening torque when using the product with max. operating pressure.)

Values in () shows the size of the through hole in the cylinder center.

- 4) Check the Usable Fluid

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

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

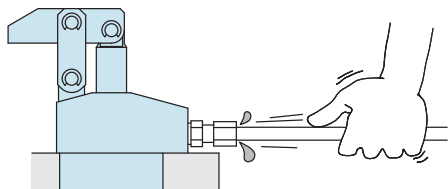
※ Please refer to P.1355 for common cautions.

• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
• Notes on Handling • Maintenance/Inspection • Warranty

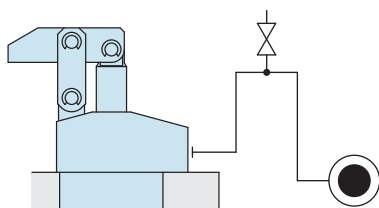
Cautions

● 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.

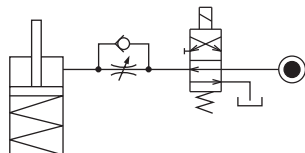
● Notes on Hydraulic Cylinder Speed Control Unit



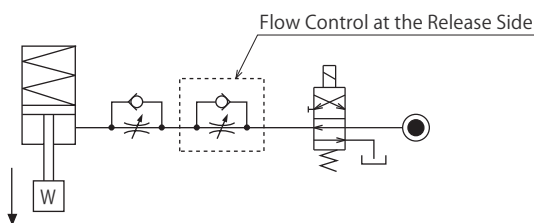
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● 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

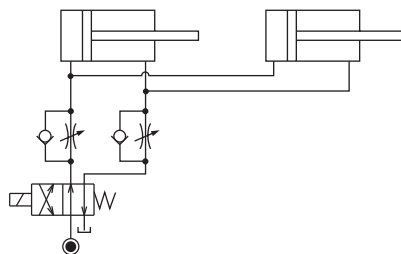
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

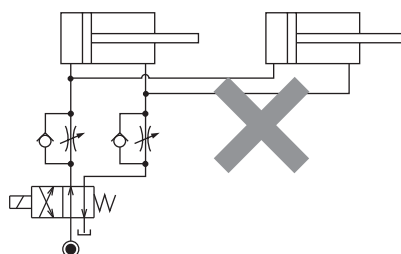
Refer to P.75 for speed adjustment of LKE.

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)

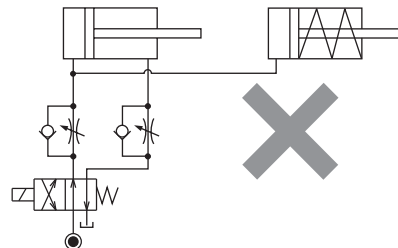


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



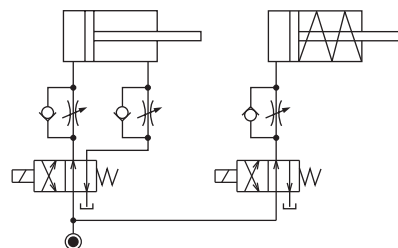
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

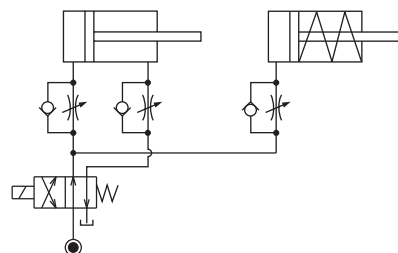


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

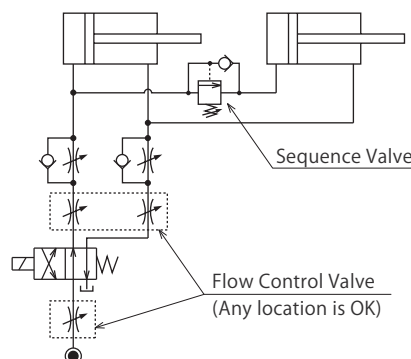
- Separate the control circuit.



- 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.



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

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Company Profile

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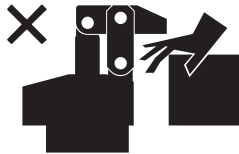
Search by
Alphabetical Order

Sales Offices

● Cautions

● Notes on Handling

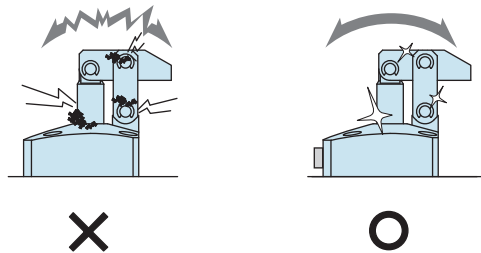
- 1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when 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.



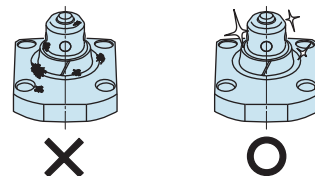
- 4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● 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.

Cautions[Installation Notes
\(For Hydraulic Series\)](#)[Hydraulic Fluid List](#)[Notes on Hydraulic Cylinder
Speed Control Circuit](#)[Notes on Handling](#)[Maintenance/
Inspection](#)[Warranty](#)**Company Profile**[Company Profile](#)[Our Products](#)[History](#)**Index**[Search by](#)[Alphabetical Order](#)**Sales Offices**

● 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.

Control Valve

Model BZL

Model BZT

Model BZX

Model JZG

Model BZS

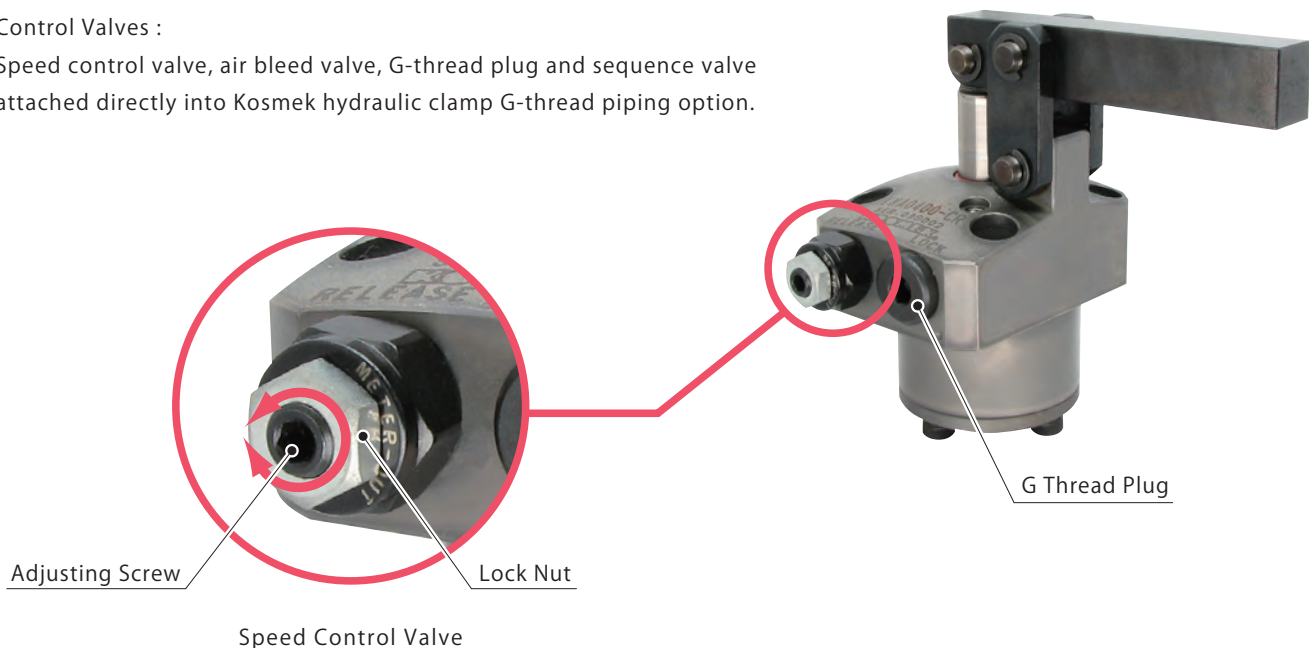


Directly-Attached Speed Control Valve, Air Bleed Valve, G-Thread Plug and Sequence Valve

• 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

Model BZL
Model BZT



Air Bleed Valve

Model BZX



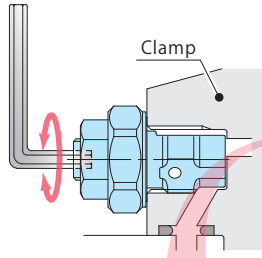
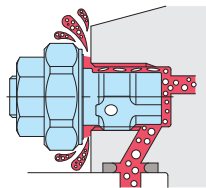
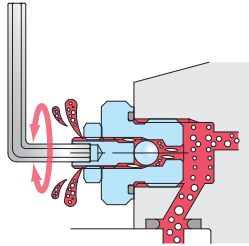
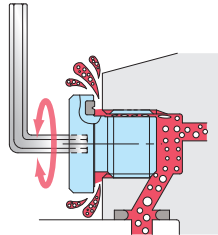
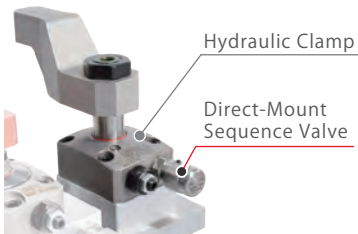
G Thread Plug

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	25MPa 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)

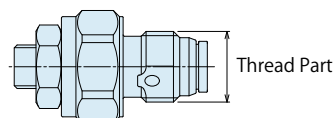
BZL 0 10 1 - B

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

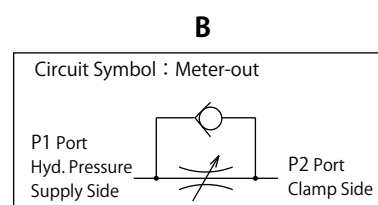
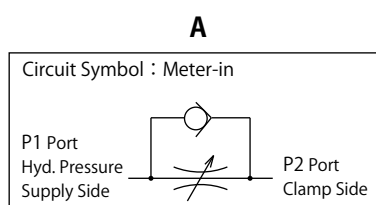


2 Design No.

- 1** : Revision Number

3 Control Method

- A** : Meter-in
B : Meter-out



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 °C	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□□□) (LHV0480-C□□□) (LHV0550-C□□□)	(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□□□ LHV0480-C□□□ LHV0550-C□□□	LHW0401-C□□□ LHW0481-C□□□ LHW0551-C□□□	/	/
BZL0201-A	(LHA0650-C□□□) (LHA0750-C□□□)	(LHC0650-C□□□)	/	/	(LHS0650-C□□□) (LHS0750-C□□□)	(LHV0650-C□□□) (LHV0750-C□□□)	(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□□□ LHV0750-C□□□	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□□□) (LKV0480-C□□□) (LKV0550-C□□□)	(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□□□ LKV0480-C□□□ LKV0550-C□□□	LKW0401-C□□□ LKW0481-C□□□ LKW0551-C□□□	/	/
BZL0201-A	LGV0650-C□□□ LGV0750-C□□□	(LKA0650-C□□□) (LKA0750-C□□□)	(LKC0650-C□□□)	/	(LKK0650-C□□□)	(LKV0650-C□□□) (LKV0750-C□□□)	(LKW0651-C□□□) (LKW0751-C□□□)	LM0650-C□□□ LM0750-C□□□	LJ0652-C□□□ LJ0752-C□□□
BZL0201-B	/	LKA0650-C□□□ LKA0750-C□□□	LKC0650-C□□□	/	LKK0650-C□□□	LKV0650-C□□□ LKV0750-C□□□	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□□□) (LFW0550-C□□□)	(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□□□) (LLV0400-C□□□) (LLV0480-C□□□)	(LLW0361-C□□□) (LLW0401-C□□□) (LLW0481-C□□□)
BZL0101-B	/	LFW0480-C□□□ LFW0550-C□□□	LFA0480-C□□□ LFA0550-C□□□	LSA0360-C□□□	/	LL0360-C□□□ LL0400-C□□□ LL0480-C□□□ LL0550-C□□□	LLR0360-C□□□ LLR0400-C□□□ LLR0480-C□□□ LLR0550-C□□□	LLV0360-C□□□ LLV0400-C□□□ LLV0480-C□□□	LLW0361-C□□□ LLW0401-C□□□ LLW0481-C□□□
BZL0201-A	LJV0650-C□□□ LJV0750-C□□□	(LFW0650-C□□□) (LFW0750-C□□□)	(LFA0650-C□□□) (LFA0750-C□□□)	/	/	(LL0650-C□□□) (LL0750-C□□□)	(LLR0650-C□□□) (LLR0750-C□□□)	/	/
BZL0201-B	/	LFW0650-C□□□ LFW0750-C□□□	LFA0650-C□□□ LFA0750-C□□□	/	/	LL0650-C□□□ LL0750-C□□□	LLR0650-C□□□ LLR0750-C□□□	/	/
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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.

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

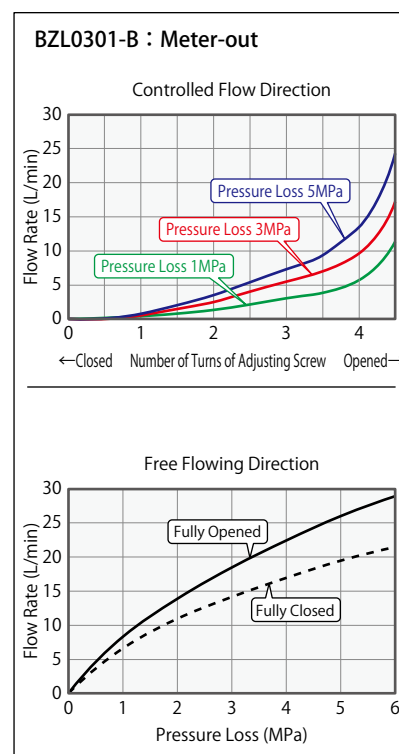
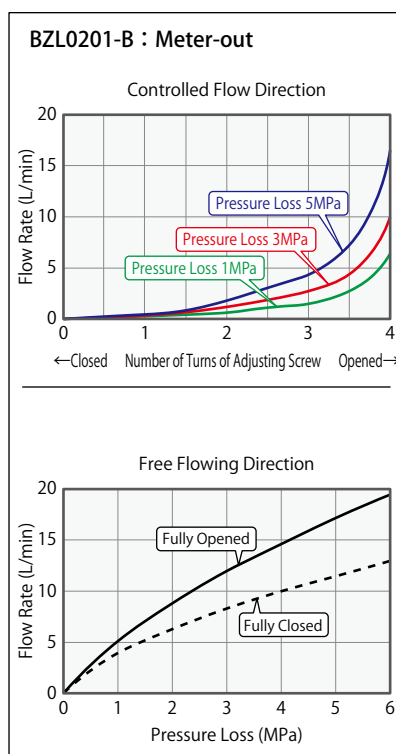
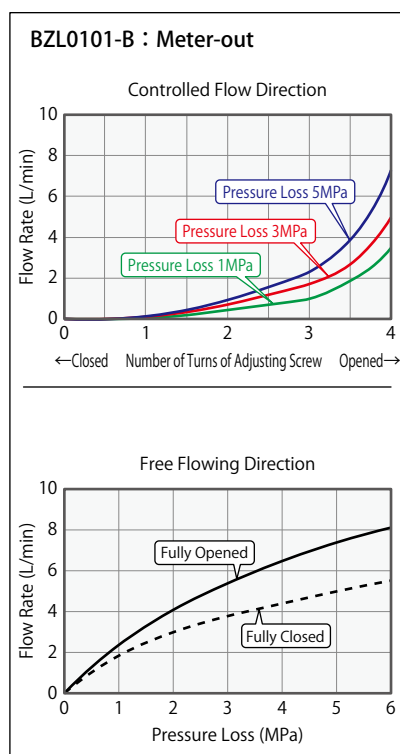
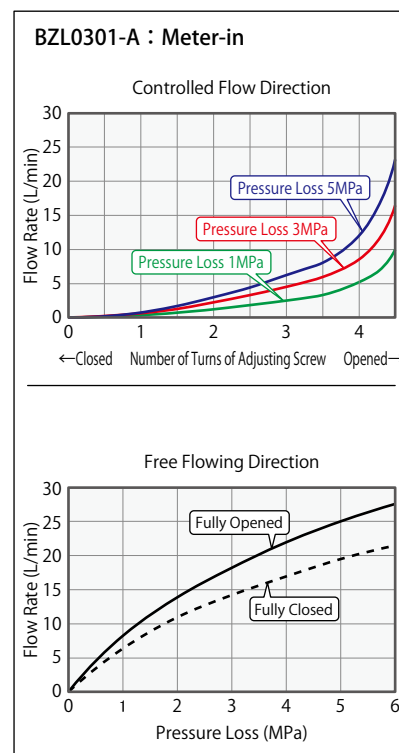
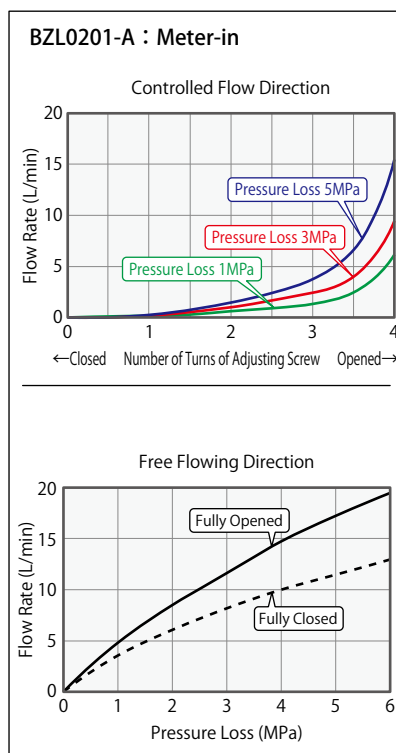
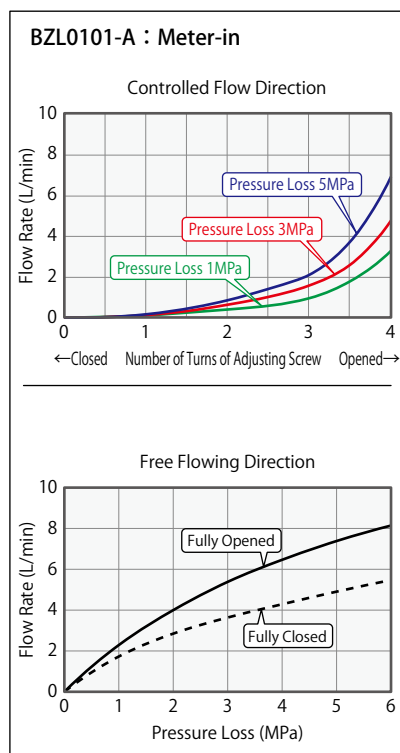
Pull Stud Clamp

FP
FQ

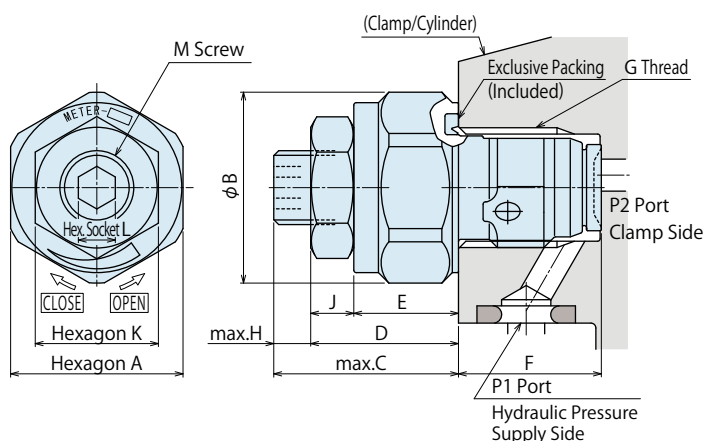
Customized Spring Cylinder

DWA/DWB

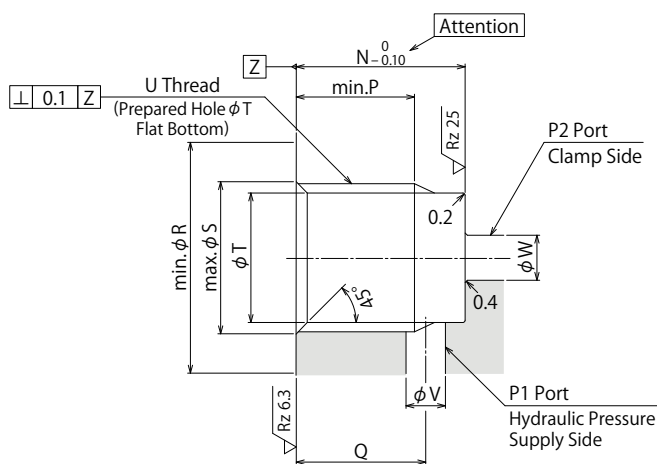
● Flow Rate Graph < Hydraulic Fluids ISO-VG32 (25~35°C) >



External Dimensions



Machining Dimensions of Mounting Area



Notes :

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

(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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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
TCAir Sensing
Lift Cylinder

LLW

Linear Cylinder /
Compact CylinderLL
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 PinVFL/VFM
VFJ/VFK

Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

Model No. Indication (Air Bleed Valve)

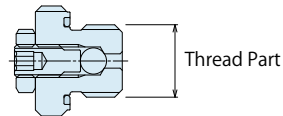
BZX0 **1** **0**

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.

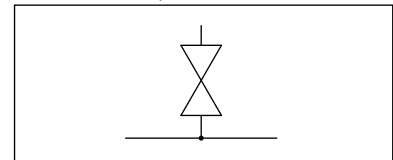
- 0** : Revision Number

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 °C	0 ~ 70		
Tightening Torque for Main Body N·m	10	25	35
Weight g	12	23	36

- Notes :
- Do not over-loosen the plug during air venting.
(Do not loosen further than 2 turns from the fully closed position.)
 - 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)
 - Refer to the machining dimensions of BZL mounting area when installing BZX into a hydraulic circuit.

Circuit Symbol



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□	DBC0250-C□	FVA0401	FVC0630	FVD1600	LC0263-C□-□	LCW0363-C□	TC0403-C□-□-□
	DBA0320-C□	DBC0320-C□	FVA0631		FVD2500	LC0303-C□□-□	LCW0403-C□	TC0483-C□-□-□
			FVA1001			LC0363-C□□-□	LCW0483-C□	TC0553-C□-□-□
						LC0403-C□□-□	LCW0553-C□	TC0653-C□-□-□
						LC0483-C□□-□	LCW0653-C□	TC0753-C□-□-□
						LC0553-C□□-□		
						LC0653-C□□-□		
BZX020	DBA0400-C□	DBC0400-C□		FVC1000	FVD4000	LC0753-C□□-□		
	DBA0500-C□	DBC0500-C□		FVC1600		LC0903-C□□-□		

● Applicable Products

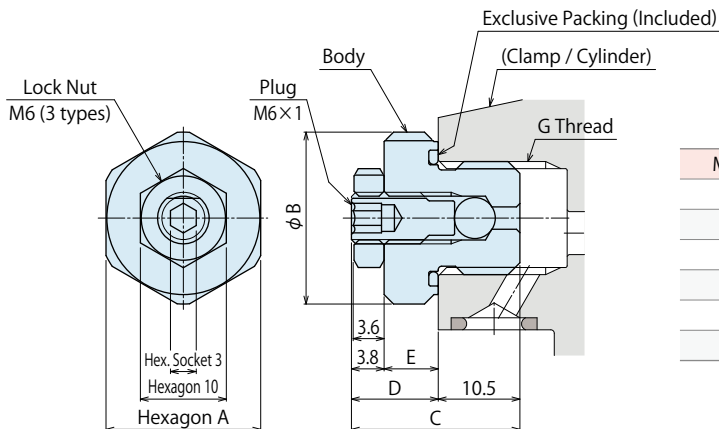
Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZX010	LHA0360-C□□□	LHC0360-C□□□	LHD0400-C□□□	LHE0300-C□	LHS0360-C□□□	LHV0400-C□□□	LHW0401-C□□□	LT0301-C□□□	LG0301-C□□□
	LHA0400-C□□□	LHC0400-C□□□	LHD0480-C□□□	LHE0360-C□	LHS0400-C□□□	LHV0480-C□□□	LHW0481-C□□□	LT0361-C□□□	LG0361-C□□□
	LHA0480-C□□□	LHC0480-C□□□	LHD0550-C□□□	LHE0400-C□	LHS0480-C□□□	LHV0550-C□□□	LHW0551-C□□□	LT0401-C□□□	LG0401-C□□□
	LHA0550-C□□□	LHC0550-C□□□		LHE0480-C□	LHS0550-C□□□			LT0481-C□□□	LG0481-C□□□
BZX020	LHA0650-C□□□	LHC0650-C□□□			LHS0650-C□□□	LHV0650-C□□□	LHW0651-C□□□	LT0651-C□□□	LG0651-C□□□
	LHA0750-C□□□				LHS0750-C□□□	LHV0750-C□□□	LHW0751-C□□□	LT0751-C□□□	LG0751-C□□□
BZX030	LHA0900-C□□□				LHS0900-C□□□				LG0901-C□□□
	LHA1050-C□□□				LHS1050-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□□□	LKC0400-C□□□	LKE0300-C□	LKK0360-C□□	LKV0400-C□□□	LKW0401-C□□□	LM0300-C□	LJ0302-C□	LJV0400-C□□□
	LKA0400-C□□□	LKC0480-C□□□	LKE0360-C□	LKK0400-C□□	LKV0480-C□□□	LKW0481-C□□□	LM0360-C□	LJ0362-C□	LJV0480-C□□□
	LKA0480-C□□□	LKC0550-C□□□	LKE0400-C□	LKK0480-C□□	LKV0550-C□□□	LKW0551-C□□□	LM0400-C□	LJ0402-C□	LJV0550-C□□□
	LKA0550-C□□□		LKE0480-C□	LKK0550-C□□			LM0480-C□	LJ0482-C□	
BZX020	LKA0650-C□□□	LKC0650-C□□□		LKK0650-C□□	LKV0650-C□□□	LKW0651-C□□□	LM0650-C□	LJ0652-C□	LJV0650-C□□□
	LKA0750-C□□□				LKV0750-C□□□	LKW0751-C□□□	LM0750-C□	LJ0752-C□	LJV0750-C□□□
BZX030	LKA0900-C□□□							LJ0902-C□	
	LKA1050-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□□	LFA0480-C□□	LSA0360-C□	LSE0360-C□	LL0360-C□□□	LLR0360-C□□□	LLV0360-C□□□	LLW0361-C□□□	TTA0360-C□□□
	LFW0550-C□□	LFA0550-C□□			LL0400-C□□□	LLR0400-C□□□	LLV0400-C□□□	LLW0401-C□□□	TTA0400-C□□□
					LL0480-C□□□	LLR0480-C□□□	LLV0480-C□□□	LLW0481-C□□□	TTA0480-C□□□
					LL0550-C□□□	LLR0550-C□□□			TTA0550-C□□□
BZX020	LFW0650-C□□	LFA0650-C□□			LL0650-C□□□	LLR0650-C□□□			TTA0650-C□□□
	LFW0750-C□□	LFA0750-C□□			LL0750-C□□□	LLR0750-C□□□			
BZX030					LL0900-C□□□	LLR0900-C□□□			
					LL1050-C□□□	LLR1050-C□□□			

● External Dimensions



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.

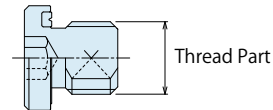
JZG0 1 0

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	°C	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□□□	LHC0360-C□□□	LHD0400-C□□□	LHE0300-C□	LHS0360-C□□□	LHV0400-C□□□	LHW0401-C□□□	LT0301-C□□□	LG0301-C□□□
	LHA0400-C□□□	LHC0400-C□□□	LHD0480-C□□□	LHE0360-C□	LHS0400-C□□□	LHV0480-C□□□	LHW0481-C□□□	LT0361-C□□□	LG0361-C□□□
	LHA0480-C□□□	LHC0480-C□□□	LHD0550-C□□□	LHE0400-C□	LHS0480-C□□□	LHV0550-C□□□	LHW0551-C□□□	LT0401-C□□□	LG0401-C□□□
	LHA0550-C□□□	LHC0550-C□□□		LHE0480-C□	LHS0550-C□□□			LT0481-C□□□	LG0481-C□□□
JZG020	LHA0650-C□□□	LHC0650-C□□□			LHS0650-C□□□	LHV0650-C□□□	LHW0651-C□□□	LT0651-C□□□	LG0651-C□□□
	LHA0750-C□□□				LHS0750-C□□□	LHV0750-C□□□	LHW0751-C□□□	LT0751-C□□□	LG0751-C□□□
JZG030	LHA0900-C□□□				LHS0900-C□□□				LG0901-C□□□
	LHA1050-C□□□				LHS1050-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□□□	DBA0250-C□	DBC0250-C□	FVA0401	FVC0630	FVD1600	LC0263-C□□□	LCW0363-C□	TC0403-C□□□
	LGV0480-C□□□	DBA0320-C□	DBC0320-C□	FVA0631		FVD2500	LC0303-C□□□	LCW0403-C□	TC0483-C□□□
	LGV0550-C□□□			FVA1001			LC0363-C□□□	LCW0483-C□	TC0553-C□□□
							LC0403-C□□□	LCW0553-C□	TC0653-C□□□
							LC0483-C□□□	LCW0653-C□	TC0753-C□□□
JZG020	LGV0650-C□□□	DBA0400-C□	DBC0400-C□		FVC1000	FVD4000	LC0753-C□□□		
	LGV0750-C□□□	DBA0500-C□	DBC0500-C□		FVC1600		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□□□	LKC0400-C□□□	LKE0300-C□	LKK0360-C-□	LKV0400-C□□□	LKW0401-C□□□	LM0300-C□	LJ0302-C□	LJV0400-C□□□
	LKA0400-C□□□	LKC0480-C□□□	LKE0360-C□	LKK0400-C-□	LKV0480-C□□□	LKW0481-C□□□	LM0360-C□	LJ0362-C□	LJV0480-C□□□
	LKA0480-C□□□	LKC0550-C□□□	LKE0400-C□	LKK0480-C-□	LKV0550-C□□□	LKW0551-C□□□	LM0400-C□	LJ0402-C□	LJV0550-C□□□
	LKA0550-C□□□		LKE0480-C□	LKK0550-C-□			LM0480-C□	LJ0482-C□	
JZG020	LKA0650-C□□□	LKC0650-C□□□		LKK0650-C-□	LKV0650-C□□□	LKW0651-C□□□	LM0650-C□	LJ0652-C□	LJV0650-C□□□
	LKA0750-C□□□				LKV0750-C□□□	LKW0751-C□□□	LM0750-C□	LJ0752-C□	LJV0750-C□□□
JZG030	LKA0900-C□□□							LJ0902-C□	
	LKA1050-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□	TLA0401-2C□□	TLB0401-2C□□	TLV0800-2C□□	TMA0250-1C□	TMA0250-2C□	TMV0400-2C□□
	TLA0602-1C□	TLA0601-2C□□	TLB0601-2C□□	TLV1000-2C□□	TMA0400-1C□	TMA0400-2C□	TMV0600-2C□□
	TLA0802-1C□	TLA0801-2C□□	TLB0801-2C□□	TLV1600-2C□□	TMA0600-1C□	TMA0600-2C□	TMV1000-2C□□
	TLA1002-1C□	TLA1001-2C□□	TLB1001-2C□□		TMA1000-1C□	TMA1000-2C□	
	TLA1602-1C□	TLA1601-2C□□	TLB1601-2C□□				
JZG020	TLA2002-1C□	TLA2001-2C□□	TLB2001-2C□□	TLV2000-2C□□	TMA1600-1C□	TMA1600-2C□	TMV1600-2C□□
	TLA2502-1C□	TLA2501-2C□□	TLB2501-2C□□		TMA2500-1C□	TMA2500-2C□	
	TLA4002-1C□	TLA4001-2C□□	TLB4001-2C□□		TMA3200-1C□	TMA3200-2C□	

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□□	LFW0480-C□□	LSA0360-C-□	LSE0360-C-□	LL0360-C□□□	LLR0360-C□□□	LLV0360-C□□□	LLW0361-C□□□	TTA0360-C□□□
	LFA0550-C□□	LFW0550-C□□			LL0400-C□□□	LLR0400-C□□□	LLV0400-C□□□	LLW0401-C□□□	TTA0400-C□□□
					LL0480-C□□□	LLR0480-C□□□	LLV0480-C□□□	LLW0481-C□□□	TTA0480-C□□□
					LL0550-C□□□	LLR0550-C□□□			TTA0550-C□□□
JZG020	LFA0650-C□□	LFW0650-C□□			LL0650-C□□□	LLR0650-C□□□			TTA0650-C□□□
	LFA0750-C□□	LFW0750-C□□			LL0750-C□□□	LLR0750-C□□□			
JZG030					LL0900-C□□□	LLR0900-C□□□			
					LL1050-C□□□	LLR1050-C□□□			

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

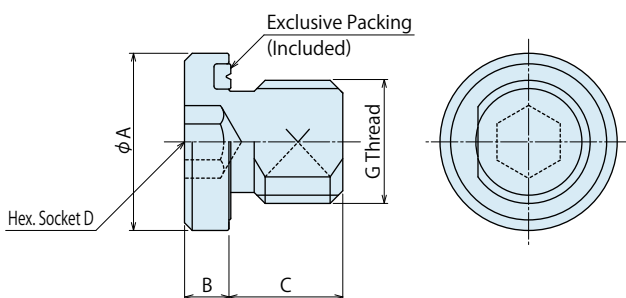
VFL/VFM
VFJ/VFK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB



Model No.	(mm)		
	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

External Dimensions

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.



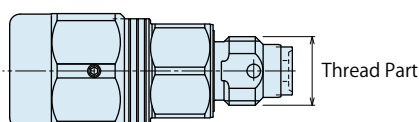
Model No. Indication

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.

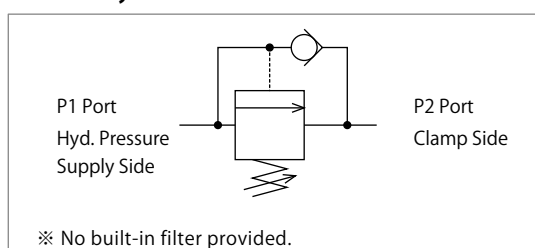
- 0** : Revision Number

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 mm ²	P1 → P2	2.0	5.7	8.5
	P2 → P1	2.0	5.0	8.2
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32			
Operating Temperature	°C	0 ~ 70		
Tightening Torque	N·m	10	25	35
Weight	g	35	82	155

- Notes:
- 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.
 - 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.
 - The difference between the set pressure and the supplying pressure should be 1MPa or more.
 - For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
 - 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.)
 - 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



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□□□ LHV0480-C□□□ LHV0550-C□□□	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□□□ LHV0750-C□□□	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□□□ LKV0480-C□□□ LKV0550-C□□□	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□□□ LKV0750-C□□□	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□□ LFW0550-C□□	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□□□ LLV0400-C□□□ LLV0480-C□□□	LLW0361-C□□□ LLW0401-C□□□ LLW0481-C□□□
BZS0200	LFW0650-C□□ LFW0750-C□□	LFA0650-C□□ LFA0750-C□□			LL0650-C□□□ LL0750-C□□□	LLR0650-C□□□ LLR0750-C□□□		
BZS0300					LL0900-C□□□ LL1050-C□□□	LLR0900-C□□□ LLR1050-C□□□		

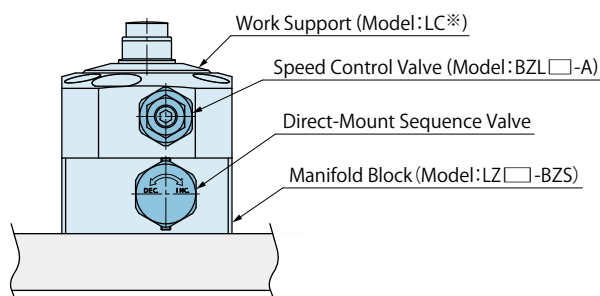
Note : ※1. It is not possible to install two BZS valves to FVC1000.

[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.



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

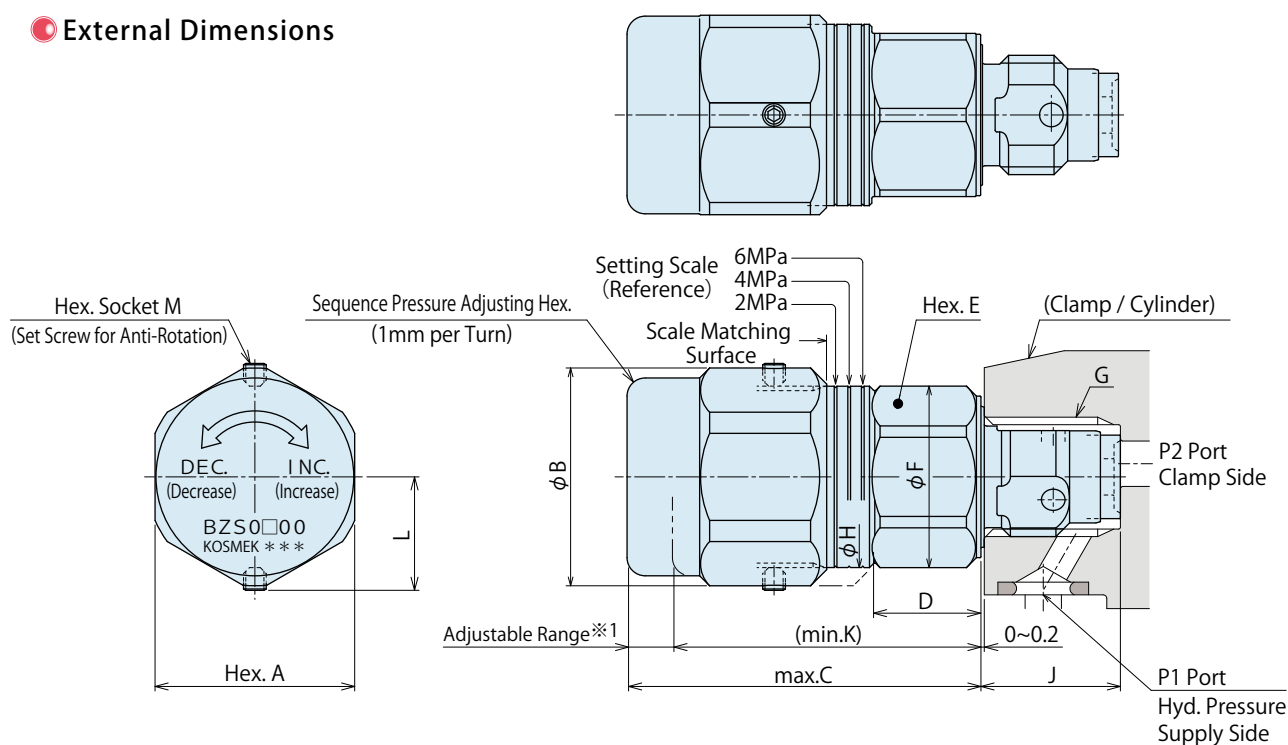
Pull Stud Clamp

FP
FQ

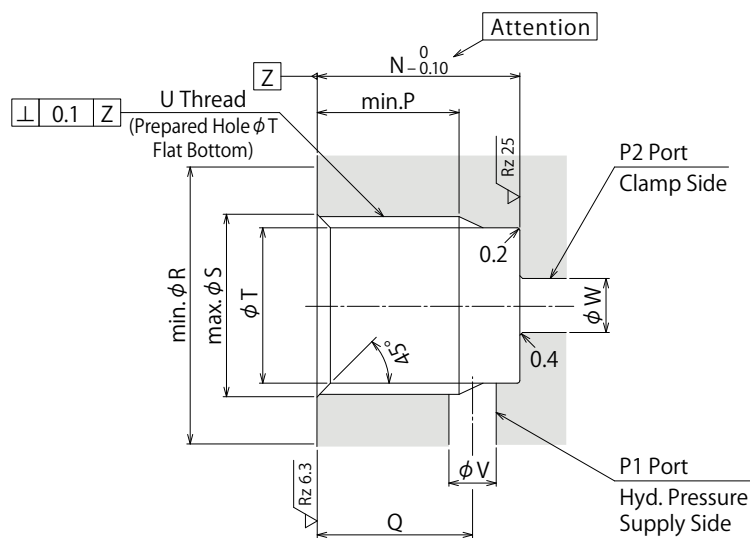
Customized Spring Cylinder

DWA/DWB

External Dimensions



Machining Dimensions of Mounting Area



(mm)

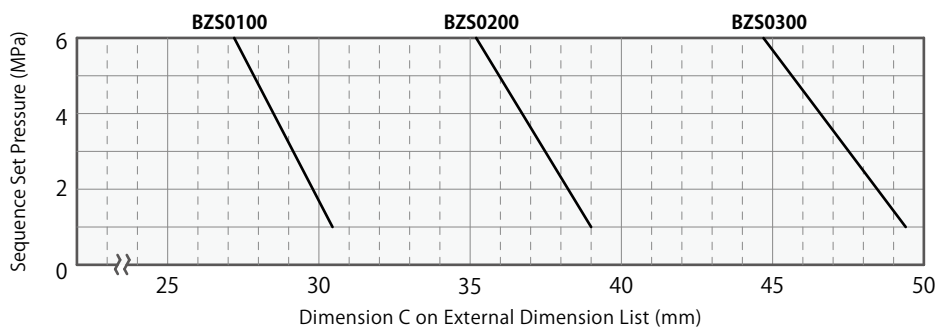
Model No.	BZS0100	BZS0200	BZS0300
A	16	22	27
B	17.5	24	29.5
C	30.5	39	49.5
D	7.5	12	15
E	14	18	22
F	15.5	20	24
G	G1/8	G1/4	G3/8
H	13.8	20	24
J ※2	(11.6)	(15.1)	(17.6)
K	(26.5)	(34)	(44)
L	9.5	12.5	15
M	1.3	1.3	1.5
N	11.5	15	17.5
P	8.5	11※3	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17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

- Since the $\sqrt{Rz 6.3}$ area is sealing part, be careful not to damage it.
 - Since the $\sqrt{Rz 12.5}$ area is the metal sealing part at the edge of BZS, be careful not to damage it (especially when deburring).
 - No cutting chips or burr should be at the tolerance part of machining hole.
 - 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.

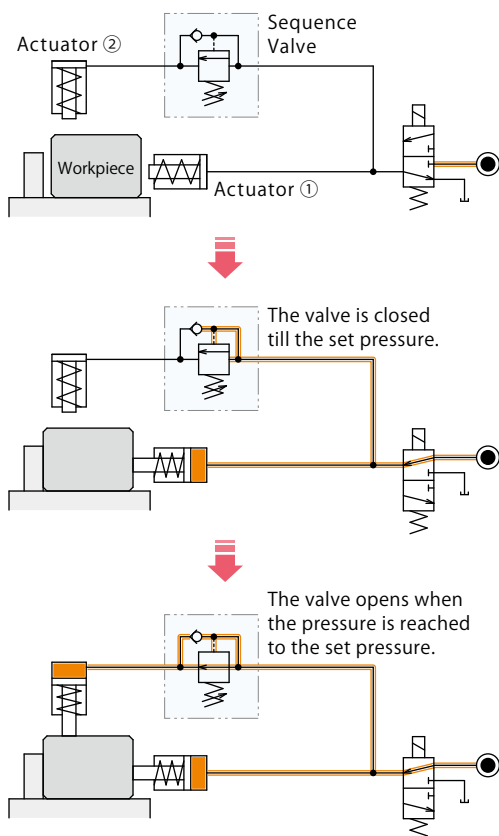
Cautions

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.	
Releasing	Locking action is completed.	
	Machining, etc.	
	Hydraulic pressure is OFF.	
Releasing	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.	

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

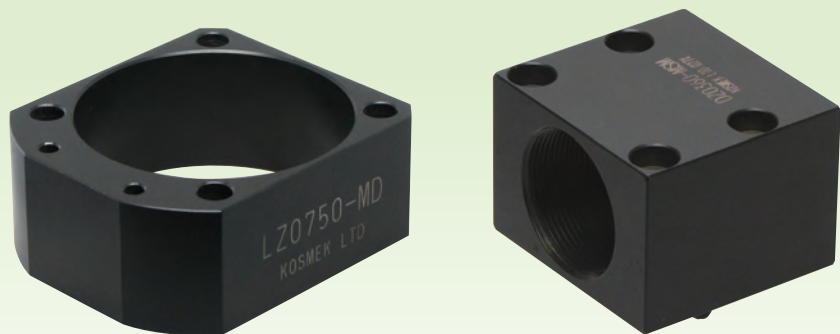
Model LZ-MP

Model TMZ-1MB

Model TMZ-2MB

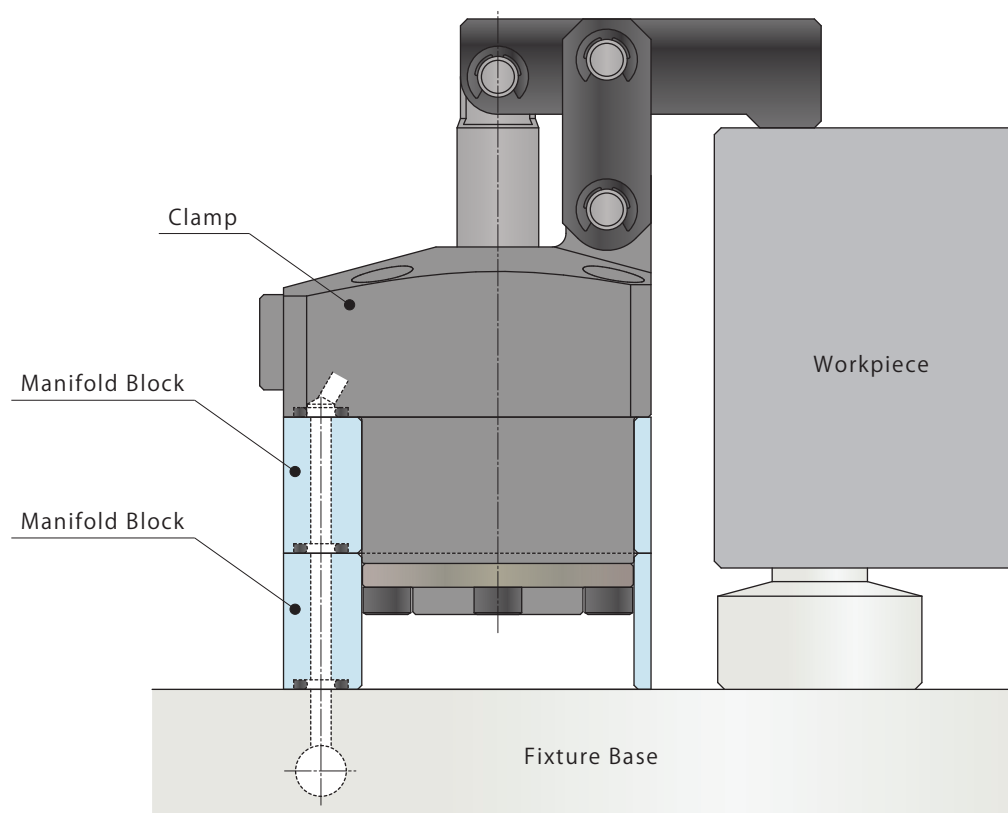
Model DZ-MG ☐

Model DZ-MS ☐



● Manifold Block

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

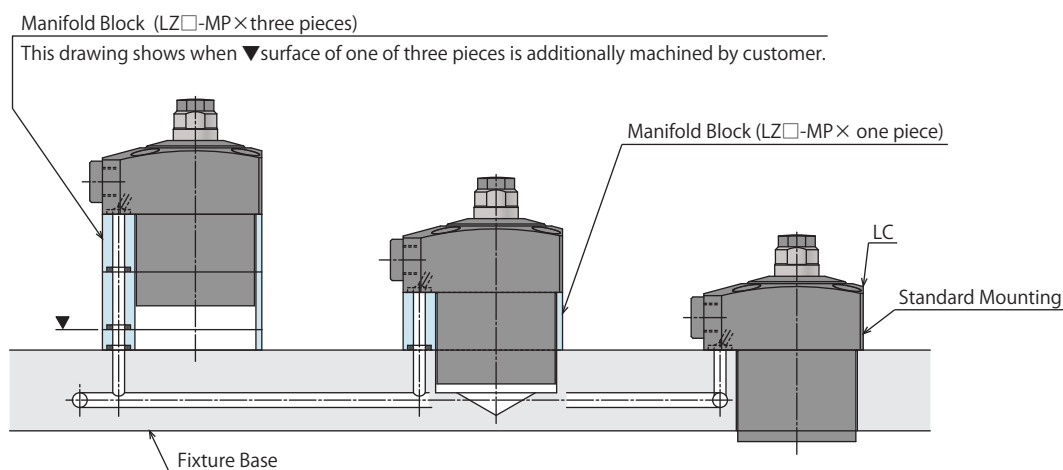


Applicable Model

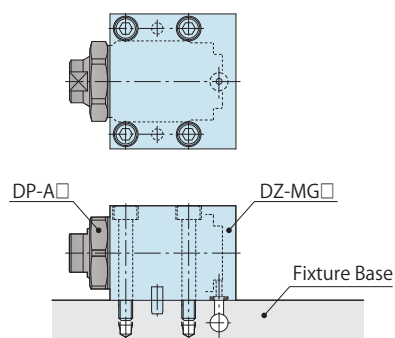
Manifold Block Model No.	Corresponding Item Model No.			
Model WHZ-MD	Model WCA Model WCE	Model WHA Model WHE		
Model LZY-MD	Model LKA Model LKC	Model LKE Model LHA	Model LHC Model LHE	Model LHS Model LL
Model LZ-MS	Model LJ Model LM	Model LG Model LT		
Model LZ-MP	Model LC	Model TC		
Model TMZ-1MB	Model 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



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

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

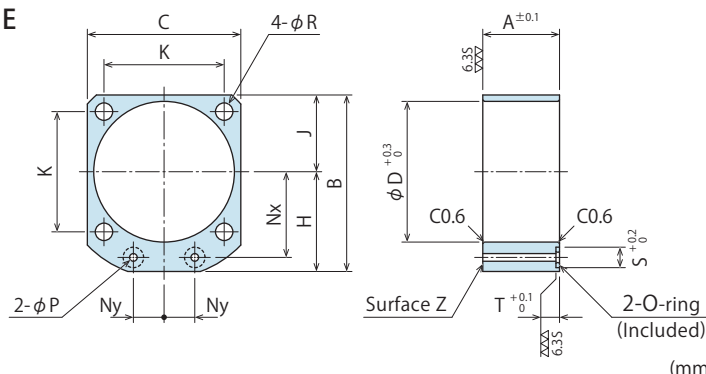
G-Thread Fitting

Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

WHZ 048 0 – MD

Size
(Refer to
following table)

Design No.
(Revision Number)


(mm)

Model No.	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Model No.	WCE0602 WHE0600	WCA0321 WHA0320	WCE1002 WHE1000	WCA0401 WHA0400	WCE1602 WHE1600
A	23	25	27	31	35
B	54	60	67	77	88.5
C	45	50	58	68	81
D	40	46	54	64	77
H	31.5	35	38	43	48
J	22.5	25	29	34	40.5
K	34	39	45	53	65
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	3	5	5	5	5
R	5.5	5.5	5.5	6.5	6.5
S	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.1	0.2	0.2

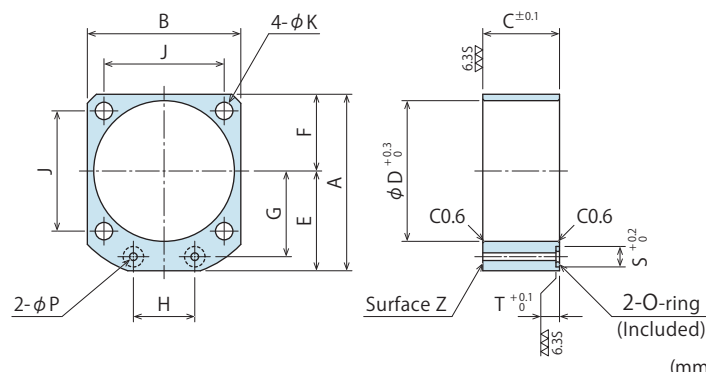
- Notes:
1. Material: A2017BE-T4 Surface Finishing: Zircon Finishing (Zirconium Chemical Conversion Treatment)
 2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
 3. For other block thickness (dim. A), machine the surface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

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

Model No. Indication

LZY 048 0 – MD

Size
(Refer to
following table)

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 LHA0360 / LHC0360 LHE0360 / LHS0360 LLO360	LKA0400 / LKC0400 LKE0400 / LHA0400 LHC0400 / LHE0400 LHS0400 / LLO400	LKA0480 / LKC0480 LKE0480 / LHA0480 LHC0480 / LHE0480 LHS0480 / LLO480	LKA0550 / LKC0550 LKE0550 / LHA0550 LHC0550 / LHE0550 LHS0550 / LLO550	LKA0650 / LKC0650 LHA0650 / LHC0650 LHS0650 LLO650	LKA0750 LHA0750 LHS0750 LLO750	LKA0900 LHA0900 LHS0900 LLO900	LKA1050 LHA1050 LHS1050 LLO1050
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
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
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.

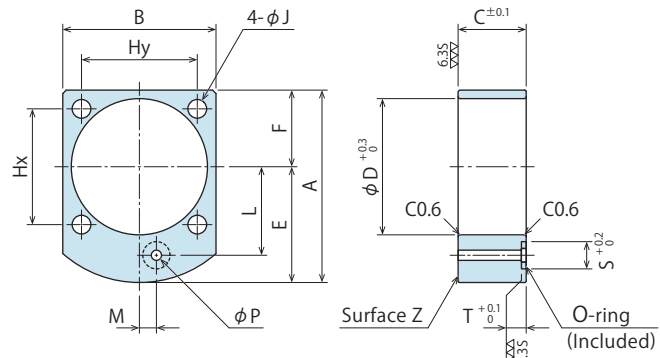
Manifold Block for LJ/LM/LG/LT

Model No. Indication

LZ 048 0 - MS

Size
(Refer to
following table)

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	LG0361 / LT0361 LJ0362 / LM0360	LG0401 / LT0401 LJ0402 / LM0400	LG0481 / LT0481 LJ0482 / LM0480	LG0551 / LT0551 LJ0552 / LM0550	LG0651 / LT0651 LJ0652 / LM0650	LG0751 / LT0751 LJ0752 / LM0750	LG0901 / LT0901 LJ0902	LG1051 / LT1051 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
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
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.

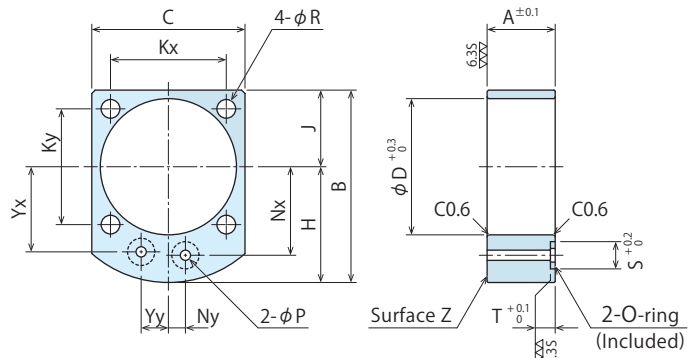
Manifold Block for LC/TC

Model No. Indication

LZ 048 0 - MP

Size
(Refer to
following table)

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.	LC0262	LC0302	LC0362	LC0402 / TC0402	LC0482 / TC0482	LC0552 / TC0552	LC0652 / TC0652	LC0752 / TC0752	LC0902
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	25	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
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
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.

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
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

Sales Offices

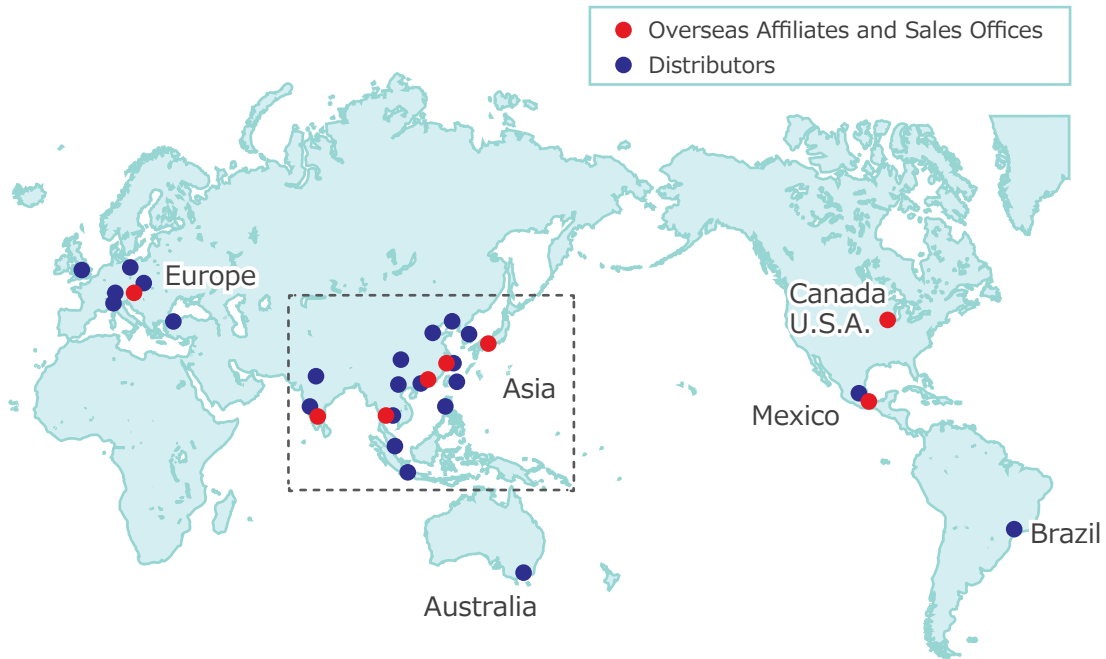
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Asia Detailed Map

