

KOGANEI

<http://www.koganei.co.jp>

No.BK-P409

Long Life Cylinder - LL Series



Koganei's Environmental Activities

●Environmentally friendly manufacturing is realized throughout the product lifecycle

We support our customers' activities to protect the global environment throughout the product lifecycle. We also comply with environmental regulations such as the RoHS Directive and design products that do not contain hazardous substances to reduce the environmental impact at the time of disposal.

●Contributing to resource Conservation

In order to ensure durability performance that satisfies our customers, we have made further efforts to extend the service life of air cylinders and have made design improvements.

This has resulted in a product that contributes to resource conservation and a reduction in the burden of parts replacement.

●4R activities in recognition of the impact on biodiversity

We recognize the impact of our corporate activities on biodiversity, and systematically promote 4R activities.

Reduce (Reduction of usage)

Reuse (Reuse of resources)

Recycle (Collection and recycling)

Renewable (Switch to recycled materials and plant materials)

●Environmental contribution of long-life cylinders

We reduce resource usage and waste generation by providing high durability products. **(Reduce)** Pneumatic cylinders are widely used in industrial and social infrastructure.

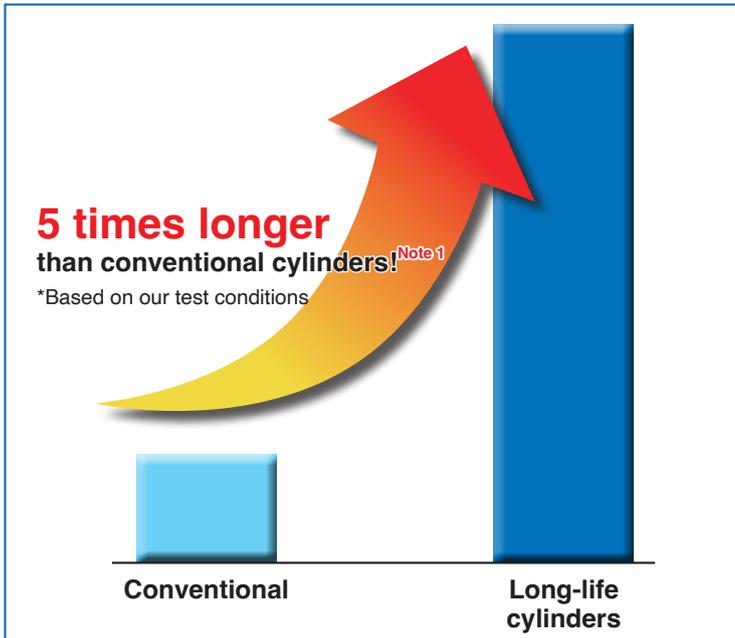
By extending the service life of pneumatic cylinders, we can reduce maintenance time and waste by replacement, and contribute to energy saving and reduction of environmental impact (CO₂ emissions reduction).

●Advantages of long-life cylinders



Long Life Cylinder LL Series

Cylinder durability is improved



Note 1: Cylinder durability performance varies depending on operating conditions and environment.

Variations^{Note 2}

- ① Basic Cylinder
- ② Basic Cylinders with guide
- ③ Slim Cylinder
- ④ Jig Cylinders C Series
- ⑤ Jig Cylinders with guide



Note 2: External dimensions and options are the same as those of standard products (without LL_F).
For details, please refer to each series on our website.



Caution

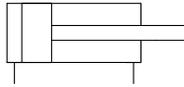
*Before using the product, be sure to read the "Safety Precautions" in the general catalog and on the website.

Basic Cylinders

Double acting type (Long Life)



Symbol



Specifications

● Double acting type

Item	Cylinder bore	6	8	10	12	16	20	25	32	40
		[0.236]	[0.315]	[0.394]	[0.472]	[0.630]	[0.787]	[0.984]	[1.260]	[1.575]
Operating type		Double acting type								
Medium		Air								
Operating pressure range	MPa [psi]	0.12 to 0.7 [17 to 102]			0.06 to 0.7 [9 to 102]			0.05 to 0.7 [7 to 102]		
Proof pressure	MPa [psi]	1.05 [152]								
Operating temperature range	°C [°F]	0 to 60 [32 to 140]								
Operating speed range	mm/s [in/sec]	10 to 500 [0.4 to 20]								
Cushion		Rubber bumper								
Lubrication		Not required								
Port size		M3×0.5			M5×0.8			Rc1/8		

Cylinder bore and stroke

● Double acting type

Cylinder bore	Standard stroke	Maximum available stroke
6, 8, 10 [0.236, 0.315, 0.394]	5, 10, 15, 20, 25, 30	30 [1.18]
12, 16 [0.472, 0.630]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	50 [1.97]
20, 25 [0.787, 0.984]	5 ^{Note1} , 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 75, 80, 90, 100	100 [3.94]
32, 40 [1.260, 1.575]	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 75, 80, 90, 100	100 [3.94]

Note1: Collar stopper is used in this stroke.

Order Codes

LL- BC X - - -

Basic Cylinders

Long Life Cylinder

Cylinder bore x Stroke
 ● See cylinder bores and strokes.

Piston rod Shape of rod end
 Blank: Female thread
 B : Male thread

Bracket
 Blank: No bracket
 BK : With bracket ^{Note 1}

Lead wire length
 A: 1000 mm [39 in]
 B: 3000 mm [118 in]
 G: 300 mm [11.8 in] with M8 connector, only on the ZE175, ZE177, ZE275, ZE277

Sensor switch model
 Blank : No sensor switch
 ZE135 : 2-lead wires, solid state type, horizontal lead wire
 ZE155 : 3-lead wires, solid state NPN output type, horizontal lead wire
 ZE175 : 3-lead wires, solid state PNP output type, horizontal lead wire
 ZE235 : 2-lead wires, solid state type, vertical lead wire
 ZE255 : 3-lead wires, solid state NPN output type, vertical lead wire
 ZE275 : 3-lead wires, solid state PNP output type, vertical lead wire
 ZE137 : 2-lead wires, 2-color LED solid state type, horizontal lead wire
 ZE157 : 3-lead wires, 2-color LED solid state NPN output type, horizontal lead wire
 ZE177 : 3-lead wires, 2-color LED solid state PNP output type, horizontal lead wire
 ZE237 : 2-lead wires, 2-color LED solid state type, vertical lead wire
 ZE257 : 3-lead wires, 2-color LED solid state NPN output type, vertical lead wire
 ZE277 : 3-lead wires, 2-color LED solid state PNP output type, vertical lead wire
 ZE101 : 2-lead wires, reed switch type without indicator, horizontal lead wire^{Note 2}
 ZE102 : 2-lead wires, reed switch type, horizontal lead wire^{Note 2}
 ZE201 : 2-lead wires, reed switch type without indicator, vertical lead wire^{Note 2}
 ZE202 : 2-lead wires, reed switch type, vertical lead wire^{Note 2}

Number of sensor switches
 1: 1 sensor switch
 2: 2 sensor switches
 3: 3 sensor switches
 ⋮

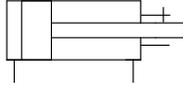
Note 1: Brackets cannot be attached to cylinders that have φ6 [0.236] or φ8 [0.315] cylinder bores.
 2: Reed type sensor switches cannot be attached to cylinders that have φ6 [0.236], φ8 [0.315], φ10 [0.394], or φ12 [0.472] cylinder bores.
 3: When using reed switch type sensor switches, operates at cylinder speed of 30 mm/s [1.2 in/sec] or higher.

Basic Cylinders

Cylinder with guide (Long Life)



Symbol



Specifications

Item	Cylinder bore						
	8 [0.315]	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
Operating type	Double acting type						
Medium	Air						
Operating pressure range	MPa [psi]	0.2 to 0.7 [29 to 102]	0.1 to 0.7 [15 to 102]	0.08 to 0.7 [12 to 102]			
Proof pressure	MPa [psi]	1.05 [152]					
Operating temperature range	°C [°F]	0 to 60 [32 to 140]					
Operating speed range	mm/s [in/sec]	50 to 500 [2 to 20]					
Cushion		Rubber bumper					
Lubrication		Not required					
Port size		M3×0.5	M5×0.8			Rc1/8	
Running parallelism	mm [in]	0.1 [0.004] or less					
Allowable moment N·m [in·lbf]	Pitching	0.12 [1.06]	0.40 [3.54]	1.50 [13.28]	2.18 [19.30]	4.46 [39.48]	6.70 [59.30]
	Rolling	0.12 [1.06]	0.40 [3.54]	1.80 [15.93]	2.18 [19.30]	4.46 [39.48]	8.00 [70.80]
	Yawing	0.21 [1.86]	0.68 [6.02]	2.20 [19.47]	4.18 [37.00]	7.31 [64.70]	13.70 [121.26]

Cylinder bore and stroke

Cylinder bore	Standard stroke
8, 12, 16, 20, 25 [0.315, 0.472, 0.630, 0.787, 0.984]	5 ^{Note} , 10, 15 ^{Note} , 20, 25 ^{Note} , 30, 35 ^{Note} , 40, 45 ^{Note} , 50, 55 ^{Note} , 60
32 [1.260]	10, 15 ^{Note} , 20, 25 ^{Note} , 30, 35 ^{Note} , 40, 45 ^{Note} , 50, 55 ^{Note} , 60
40 [1.575]	10 ^{Note} , 15 ^{Note} , 20, 25 ^{Note} , 30, 35 ^{Note} , 40, 45 ^{Note} , 50, 55 ^{Note} , 60

Note: This stroke has a collar stopper.

Order Codes

LL- BCG [] × [] - [] - [] [] []

Long Life Cylinder

Back side piping block^{Note 1}
 *Available only in $\phi 32$ [1.260] and $\phi 40$ [1.575]
 Blank : Side piping
 BP : Back side piping

Cylinder bore
 ×
Stroke
 ● See cylinder bores and strokes.

Locating pin hole
 Blank : Without pin hole
 N : With pin hole

Basic Cylinders
Double acting type with guide

Lead wire length
 A : 1000 mm [39 in]
 B : 3000 mm [118 in]
 G : 300 mm [11.8 in] with M8 connector, only on the ZE175, ZE177, ZE275, ZE277

Sensor switch model
 Blank : No sensor switch
 ZE135 : 2-lead wires, solid state type, horizontal lead wires
 ZE155 : 3-lead wires, solid state NPN output type, horizontal lead wires
 ZE175 : 3-lead wires, solid state PNP output type, horizontal lead wires
 ZE235 : 2-lead wires, solid state type, vertical lead wires
 ZE255 : 3-lead wires, solid state NPN output type, vertical lead wires
 ZE275 : 3-lead wires, solid state PNP output type, vertical lead wires
 ZE137 : 2-lead wires, 2-color LED solid state type, horizontal lead wires
 ZE157 : 3-lead wires, 2-color LED solid state NPN output type, horizontal lead wires
 ZE177 : 3-lead wires, 2-color LED solid state PNP output type, horizontal lead wires
 ZE237 : 2-lead wires, 2-color LED solid state type, vertical lead wires
 ZE257 : 3-lead wires, 2-color LED solid state NPN output type, vertical lead wires
 ZE277 : 3-lead wires, 2-color LED solid state PNP output type, vertical lead wires
 ZE101 : 2-lead wires, reed switch type without indicator, horizontal lead wire^{Note 2}
 ZE102 : 2-lead wires, reed switch type, horizontal lead wire^{Note 2}
 ZE201 : 2-lead wires, reed switch type without indicator, vertical lead wire^{Note 2}
 ZE202 : 2-lead wires, reed switch type, vertical lead wire^{Note 2}

Number of sensor switches
 1 : 1 sensor switch
 2 : 2 sensor switches
 3 : 3 sensor switches
 ⋮

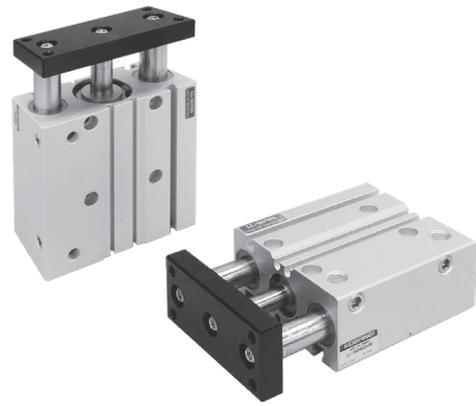
Note 1: Only $\phi 32$ [1.260] and $\phi 40$ [1.575] diameter bore cylinders can be mounted with back side piping blocks. Back side and side piping is possible as standard for $\phi 8$ [0.315] to $\phi 25$ [0.984] models.

2: Reed type sensor switches cannot be attached to cylinders that have $\phi 8$ [0.315] and $\phi 12$ [0.472] cylinder bores.

JIG CYLINDERS WITH GUIDES

Double acting type (Long Life)

Symbols



Specifications

Item	Cylinder bore	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
Operating type		Double acting type					
Medium		Air					
Operating pressure range	MPa [psi]	0.15~1.0 [22~145]			0.1~1.0 [15~145]		
Proof pressure	MPa [psi]	1.5 [218]					
Operating temperature range	°C[°F]	0 to 60 [32 to 140]					
Operating speed range	mm/s [in/sec]	100 to 500 [3.9 to 19.7]					
Cushion		Rubber bumper					
Lubrication		Not required					
Port size		M5×0.8			Rc1/8		
Stroke tolerance	mm[in.]	+1.5 [^{+0.059} in.] ₀					

Cylinder bore and stroke

Cylinder bore	Standard stroke	Maximum available stroke
12 [0.472]	10, 20, 30, 40, 50, 75, 100	100 [3.94]
16 [0.630]		
20 [0.787]	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200	200 [7.87]
25 [0.984]		
32 [1.260]		
40 [1.575]		

Remarks 1. Non-standard strokes are available at 5mm intervals. Since the manufacturing method is collar packed, the total length, etc., are the same dimension as the next size up standard stroke cylinder.

2. For strokes of 75mm or longer, use long bushing type.

Order Codes

LL- SGDA -

Jig Cylinders with guides
Double acting type

Cylinder bore
x
Stroke
● See cylinder bores and strokes.

Lead wire length
A: 1000 mm [39 in]
B: 3000 mm [118 in]
G: 300 mm [11.8 in] with M8 connector, only on the ZE175, ZE177, ZE275, ZE277

Sensor switch model
Blank : No sensor switch
ZE135 : 2-lead wires, solid state type, horizontal lead wire
ZE155 : 3-lead wires, solid state NPN output type, horizontal lead wire
ZE175 : 3-lead wires, solid state PNP output type, horizontal lead wire
ZE235 : 2-lead wires, solid state type, vertical lead wire
ZE255 : 3-lead wires, solid state NPN output type, vertical lead wire
ZE275 : 3-lead wires, solid state PNP output type, vertical lead wire
ZE137 : 2-lead wires, 2-color LED solid state type, horizontal lead wire
ZE157 : 3-lead wires, 2-color LED solid state NPN output type, horizontal lead wire
ZE177 : 3-lead wires, 2-color LED solid state PNP output type, horizontal lead wire
ZE237 : 2-lead wires, 2-color LED solid state type, vertical lead wire
ZE257 : 3-lead wires, 2-color LED solid state NPN output type, vertical lead wire
ZE277 : 3-lead wires, 2-color LED solid state PNP output type, vertical lead wire
ZE101 : 2-lead wires, reed switch type without indicator, horizontal lead wire
ZE102 : 2-lead wires, reed switch type, horizontal lead wire
ZE201 : 2-lead wires, reed switch type without indicator, vertical lead wire
ZE202 : 2-lead wires, reed switch type, vertical lead wire

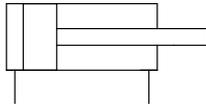
Number of sensor switches
1: 1 sensor switch
2: 2 sensor switches
3: 3 sensor switches
⋮

Long Life Cylinder

SLIM CYLINDERS

Double acting type (Long Life)

Symbols



Specifications

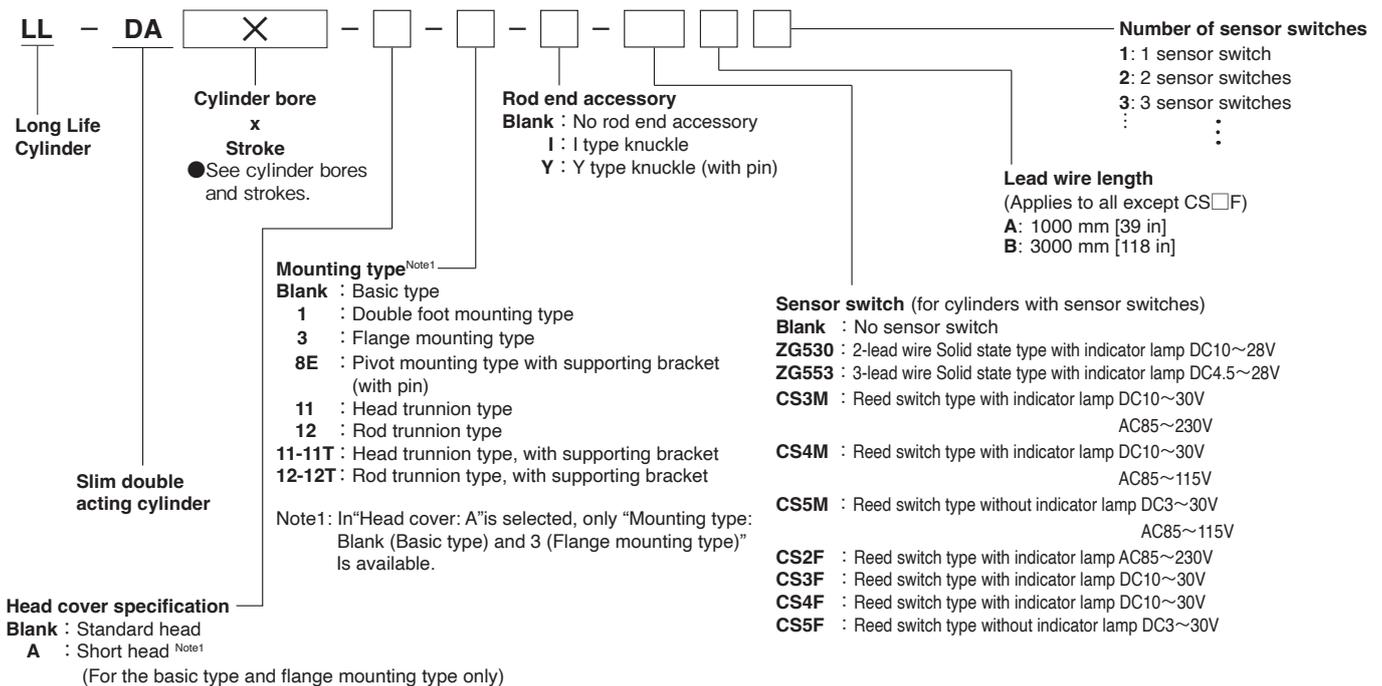
Item	Cylinder bore	20 [0.787] · 25 [0.984] · 32 [1.260] · 40 [1.575]
Operation type		Double acting type
Media		Air
Mounting type		Basic type, Foot type, Flange type, Pivot type, Head trunnion type, Rod trunnion type
Operating pressure range	MPa [psi.]	0.04~0.9 [6~131]
Proof pressure	MPa [psi.]	1.32 [191]
Operating temperature range	°C [°F]	0~70 [32~158]
Operating speed range	mm/s [in./sec.]	30 ~ 800 [1.2 ~ 31.5]
Cushion		Fixed type (Rubber bumper)
Lubrication		Not required
Port size	Rc	1/8

Bore Size and Stroke

Bore size	Standard stroke						Maximum available stroke
	25	50	75	100	125	150	
20 [0.787]							150 [5.91]
25 [0.984]							150 [5.91]
32 [1.260]							150 [5.91]
40 [1.575]							150 [5.91]

Remarks 1: Stroke tolerance $^{+1}_0$ [$^{+0.039}$ in.]
 2: For intermediate stroke, please contact your nearest Koganei office.

Order Codes



Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

URL <http://www.koganei.co.jp>

E-mail: overseas@koganei.co.jp



KOGANEI CORPORATION

OVERSEAS DEPARTMENT

3-11-28, Midori-cho, Koganei City, Tokyo 184-8533, Japan
Tel: (+81)42-383-7271 Fax: (+81)42-383-7276

KOGANEI INTERNATIONAL AMERICA, INC.

48860 Milmont Drive, suite 108C, Fremont, California 94538
Tel: 1-510-744-1626 Fax: 1-510-744-1676

SHANGHAI KOGANEI INTERNATIONAL TRADING CORPORATION

RM2601-2602, Tongda Venture Building No.1, Lane 600, Tianshan Road,
Shanghai, China (200051)
Tel: 86-21-6145-7313 Fax: 86-21-6145-7323

TAIWAN KOGANEI TRADING CO.,LTD

Rm. 2, 16F., No88, Sec. 2, Zhongxiao E. Rd., Zhongzheng Dist., Taipei City 100,
Taiwan(ROC)
Tel: 886-2-2393-2717 Fax: 886-2-2393-2719

KOGANEI KOREA CO.,LTD

A-3001, Heungdeok IT Valley Bldg., Heungkeok 1-ro, 13, Giheung-gu, Yongin-si, Gyeonggi-do,
446-908, KOREA
Tel: 82-31-246-0414 Fax: 82-31-246-0415

KOGANEI (THAILAND) CO.,LTD

555, Rasa Tower 1, 11th Fl., Unit 1107 and 1108, Phaholyothin Road, Chatuchak,
Chatuchak, Bangkok 10900
Tel: +66 (0) 2513-1228-31 Fax: +66 (0) 2513-1232

KOGANEI AUTOMATION (MALAYSIA) SDN, BHD.

Suite 29-2, Level 29, Menara 1MK, No.1, Jalan Kiara, Mont Kiara
50480, Kuala Lumpur, Malaysia
Tel: 60-12-537-7086

KOGANEI ASIA PTE. LTD.

69 Ubi Road 1, #05-18 Oxley Bizhub Singapore 408731
Tel: 65-6293-4512 Fax: 65-6293-4513