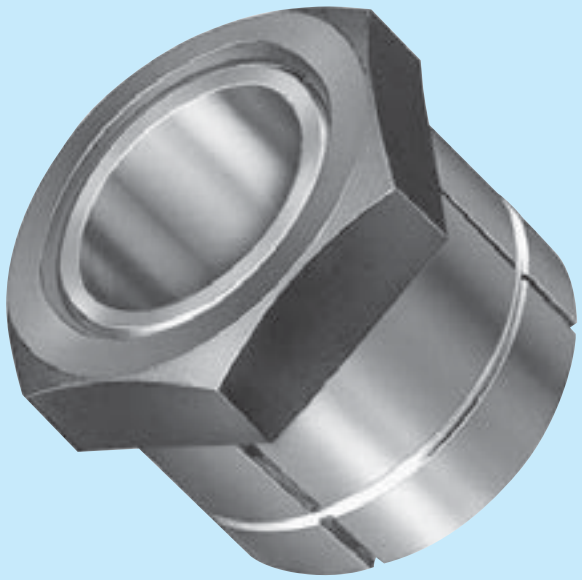
Power-Lock® ML Series

Sizes：φ5～φ75
Shaft tolerance：h8
Hub bore tolerance：H8
Surface roughness：Ra1.6



RoHS compliant.

Features

1 Self-Centering
These units provide accurate shaft-hub alignment and concentricity, allowing straight bore mounting.

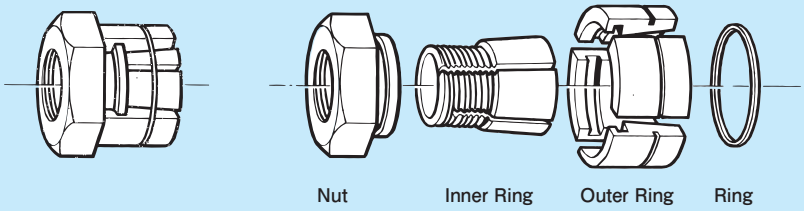
2 Suitable for Narrow Hubs
Suitable for both narrow and wide hubs. Also suitable for hubs whose lengths are shorter than the widths of "Power Lock" ML (MG) Series shaft-hub locking devices.

3 Easy to Install and Remove
Installs or removes just by the loosening or tightening of bolts. No need to hassle with adjusting keyways and thermal fittings.

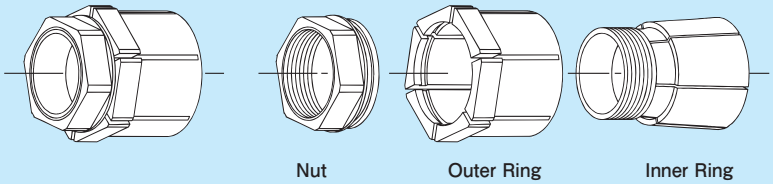
4 Compact Design
Compact and space saving.

Parts

ML



MG



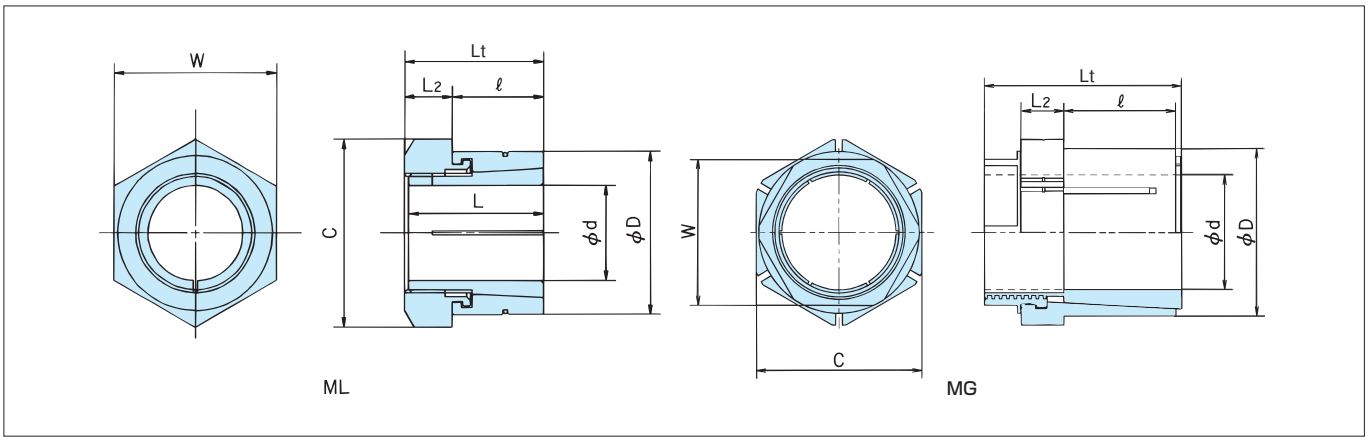
"Power Lock" ML Series shaft-hub locking devices are simply constructed of the following four parts: inner and outer rings, a nut and retaining ring. The outer ring is divided into four parts. The nut and outer ring are designed to interlock with each other while the retaining ring holds the outer ring in place.

Reference Number System

PL 040 X 067 MG

- MG ……MG
- M……ML
- 067 — Outer Diameter mm
- 040 — Shaft Diameter mm
- PL — Power-Lock

Model Numbers and Specifications



* Note) 4

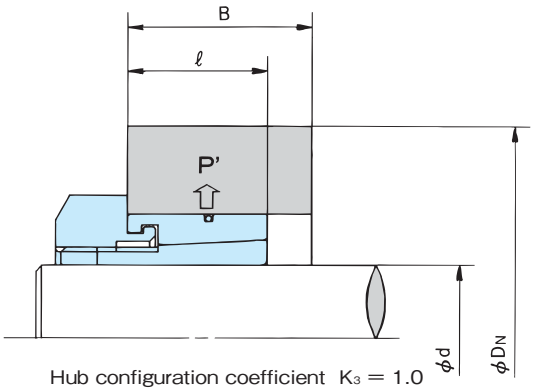
Model No. d X D Shaft Diameter X× Outer Diameter mm		Dimensions mm						Transmissible Torque Mt		Transmissible Thrust Pax		Contact Pressure Shaft P		Contact Pressure Hub P'		Tightening Torque MA		Mass
		Lt	ℓ	L2	L	W	C	N・m	{kgf・m}	kN	{kgf}	MPa	{kgf/mm²}	MPa	{kgf/mm²}	N・m	{kgf・m}	kg
ML	**PL 005 X 016 M**	15	10	5	14	17	19.6	6.76	0.69	2.65	270	181	18.5	45	4.6	5.39	0.55	0.02
	PL 006 X 016 M							8.13	0.83			161	16.4					0.02
	PL 007 X 021 M	21	14	7	20	22	25.4	22.5	2.3	6.57	670	179	18.3	60	6.1	16.7	1.7	0.05
	PL 008 X 021 M							26.5	2.7			163	16.6					0.05
	PL 009 X 021 M							29.4	3.0			150	15.3					0.05
	PL 010 X 024 M	22	14	8	21	24	27.7	42.1	4.3	8.43	860	180	18.4	68	6.9	24.5	2.5	0.06
	PL 011 X 024 M							46.1	4.7			172	17.5					0.06
	PL 012 X 024 M							50.0	5.1			164	16.7					0.06
	PL 014 X 031 M	27	17	10	26	32	37	108	11	16.1	1640	186	19.0	81	8.3	60.8	6.2	0.13
	PL 015 X 031 M							118	12			179	18.3					0.13
	PL 016 X 031 M							127	13			173	17.7					0.12
	PL 017 X 036 M	33	21	12	32	36	41.6	196	20	22.8	2330	181	18.5	80	8.2	104	10.6	0.20
	PL 018 X 036 M							206	21			175	17.9					0.19
	PL 019 X 036 M							216	22			171	17.4					0.19
	PL 020 X 041 M	35	23	12	34	41	47.3	245	25	24.9	2540	156	15.9	71	7.2	129	13.2	0.27
	PL 022 X 041 M							274	28			149	15.2					0.25
	PL 024 X 041 M							294	30			144	14.7					0.23
	PL 025 X 046 M	37	25	12	36	46	53.1	374	38	30.1	3070	138	14.1	70	7.1	178	18.2	0.33
	PL 028 X 046 M							421	43			131	13.4					0.30
	PL 030 X 050 M	41	28	13	40	50	57.7	451	46	30.1	3070	111	11.3	66	6.7	274	28.0	0.41
	PL 032 X 050 M							480	49			104	10.6					0.37
MG	※ PL 034 X 060 MG D = 60.5	70.0	38.0	13.0	–	50	60.3	570	58	33.7	3430	65	6.6	39	4.0	260	26.6	0.77
	※ PL 035 X 060 MG D = 60.5							590	60			63	6.4					
	※ PL 036 X 060 MG D = 60.5							600	61			61	6.2					
	※ PL 038 X 060 MG D = 60.5							640	65			58	5.9					
	PL 040 X 067 MG	79.5	43.0	17.5	–	60	66.7	720	73	36.2	3690	53	5.4	34	3.5	316	32.3	1.05
	PL 042 X 067 MG							760	77			51	5.2					
	PL 045 X 067 MG							810	82			47	4.8					
	PL 048 X 073 MG	90.5	51.0	19.0	–	65	73.0	1350	137	57.5	5860	60	6.1	42	4.3	554	56.6	1.36
	PL 050 X 073 MG							1430	145			57	5.8					
	PL 055 X 080 MG	95.3	54.0	20.5	–	70	79.4	1560	159	56.8	5790	49	5.0	38	3.9	600	61.3	2.13
	PL 060 X 086 MG	98.4	57.2	19.0	–	75	85.7	1650	168	55.1	5620	41	4.2	30	3.1	635	64.8	2.27
	PL 065 X 092 MG	103.2	60.3	20.5	–	82	92.1	1770	180	54.5	5560	36	3.7	27	2.8	680	69.4	2.68
	PL 070 X 092 MG							1900	193			33	3.4					
	PL 075 X 100 MG	108.0	63.5	20.5	–	90	98.4	2000	204	56.0	5710	30	3.1	24	2.4	750	76.6	2.72

Notes) 1. Note that model numbers marked with an asterik do not indicate the exact outer diameter dimensions.
2. Stocked models are in bold.
3. Mt indicates torque at 0 transmissible thrust, while Pax indicates transmissible thrust at 0 torque. If transmissible torque and thrust apply simultaneously calculate and compare the combined value with the transmissible torque provided in the table.
4. Dimensions when this product is attached to the shaft and hub.

Hub Diameters for ML Models

Hub diameters when B ≧ ℓ

D_N is the minimum hub diameter required to tolerate P' or the pressure exerted from within the hub.



Hub configuration coefficient $K_3 = 1.0$

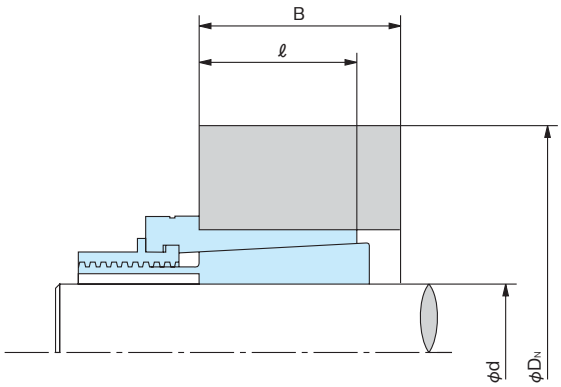
Hub Configuration Coefficient $K_3 = 1.0$

Minimum hub diameter ϕD_N(mm)

Model No. d X D Shaft Diameter X Outer Diameter mm	Tightening Torque	Contact Pressure Hub P' MPa	Contact Pressure Hub P' {kgf/mm²}	Yield Point of Hub Material σ 0.2 MPa 147	176	206	225	245	274	294	343	392	441
				kgf/mm² 15	18	21	23	25	28	30	35	40	45
				FC250	FC300 SS330 SC360 FCMB310	FC350 SS400 SC410 S10C FCMB360	SC450 S15C SF440	FCD400 SS490 SC480 S20C SF490	S30C SF540	FCD450 S35C SF590	FCD500 S45C	FCD600 S55C	FCD700
PL 005 X 016 M	M_{A50}	22.5	2.3	20	20	20	20	20	20	20	20	20	20
〃	M_{A75}	33.3	3.4	21	20	20	20	20	20	20	20	20	20
PL 006 X 016 M	M_A	45.0	4.6	22	21	20	20	20	20	20	20	20	20
PL 007 X 021 M	M_{A50}	30.4	3.1	26	26	26	26	26	26	26	26	26	26
〃	M_{A75}	46.1	4.7	30	28	27	26	26	26	26	26	26	26
PL 009 X 021 M	M_A	60.0	6.1	33	30	29	28	27	27	26	26	26	26
PL 010 X 024 M	M_{A50}	33.3	3.4	31	30	29	29	29	29	29	29	29	29
〃	M_{A75}	51.9	5.3	35	33	32	31	30	30	29	29	29	29
PL 012 X 024 M	M_A	68.0	6.9	40	36	34	33	32	31	31	30	29	29
PL 014 X 031 M	M_{A50}	41.2	4.2	42	40	38	38	38	38	38	38	38	38
〃	M_{A75}	60.8	6.2	49	45	43	41	40	39	39	38	38	38
PL 016 X 031 M	M_A	81.0	8.3	58	51	47	46	44	42	42	42	39	38
PL 017 X 036 M	M_{A50}	41.2	4.2	48	46	44	44	44	44	44	44	44	44
〃	M_{A75}	60.8	6.2	56	52	49	48	47	46	45	44	44	44
PL 019 X 036 M	M_A	80.0	8.2	65	59	55	53	51	49	48	46	45	44
PL 020 X 041 M	M_{A50}	35.3	3.6	53	51	50	50	50	50	50	50	50	50
〃	M_{A75}	53.9	5.5	61	57	54	53	52	50	50	50	50	50
PL 024 X 041 M	M_A	71.0	7.2	70	63	59	57	56	54	53	51	50	50
PL 025 X 046 M	M_{A50}	35.3	3.6	59	57	56	56	56	56	56	56	56	56
〃	M_{A75}	51.9	5.3	67	63	60	59	57	56	56	56	56	56
PL 028 X 046 M	M_A	70.0	7.1	77	70	66	64	62	60	59	57	56	56
PL 030 X 050 M	M_{A50}	33.3	3.4	62	60	58	58	57	56	56	55	54	53
〃	M_{A75}	49.0	5.0	70	66	63	62	61	59	59	57	56	55
PL 032 X 050 M	M_A	66.0	6.7	80	73	69	67	65	63	62	60	59	58

Note) 1. The above figures do not take safety rates into account. Consider them prior to operation.

Hub Diameters for MG Models



Hub configuration coefficient $K_3 = 1.0$

Note) When the hub length is smaller than ℓ or when B < ℓ, use the formula below to calculate the hub diameter.

$$D_N \geqq D\sqrt{\frac{\sigma_{0.2}+P'_K}{\sigma_{0.2}-P'_K}}$$

$$P'_K = P' \times \frac{\ell}{B}$$

$\sigma_{0.2}$: Hub material yield point. MPa {kgf/mm²}
P'_K : Contact pressure exerted from within the hub. Pa {kgf/mm²}

Hub Configuration Coefficient $K_3 = 1.0$

Minimum hub diameter ϕD_N(mm)

Model No. d X D Shaft Diameter X Outer Diameter	Hub Contact Pressure P′		Yield Point of Hub Material $\sigma_{0.2}$									
MPa	147	176	206	225	245	274	294	343	392	441
{kgf/mm²}	15	18	21	23	25	28	30	35	40	45
	FC250	FC300 SS330 SC360 FCMB310	FC350 SS400 SC410 S10C FCMB360	SC450 S15C SF440	FCD400 SS490 SC480 S20C SF490	S30C SF540	FCD450 S35C SF590	FCD500 S45C	FCD600 S55C	FCD700
mm	MPa	{kgf/mm²}										
※ PL034 X 060 MG D=60.5	39	4.0	80	76	74	73	72	70	70	68	67	67
※ PL035 X 060 MG D=60.5	39	4.0	80	76	74	73	72	70	70	68	67	67
※ PL036 X 060 MG D=60.5	39	4.0	80	76	74	73	72	70	70	68	67	67
※ PL038 X 060 MG D=60.5	39	4.0	80	76	74	73	72	70	70	68	67	67
PL040 X 067 MG	34	3.5	85	82	80	78	78	76	76	75	74	73
PL042 X 067 MG	34	3.5	85	82	80	78	78	76	76	75	74	73
PL045 X 067 MG	34	3.5	85	82	80	78	78	76	76	75	74	73
PL048 X 073 MG	42	4.3	98	94	90	89	87	86	85	83	82	81
PL050 X 073 MG	42	4.3	98	94	90	89	87	86	85	83	82	81
PL055 X 080 MG	38	3.9	105	100	97	95	94	92	92	90	89	88
PL060 X 086 MG	30	3.1	106	103	100	99	98	96	96	94	93	93
PL065 X 092 MG	27	2.8	111	108	105	104	103	102	101	100	99	98
PL070 X 092 MG	27	2.8	111	108	105	104	103	102	101	100	99	98
PL075 X 100 MG	24	2.4	118	115	113	112	111	110	109	108	107	106

Notes) 1. The above figures do not take safety rates into account. Consider them prior to operation.
2. Note that model numbers marked with an astarik do not indicate the exact outer diameter dimensions.

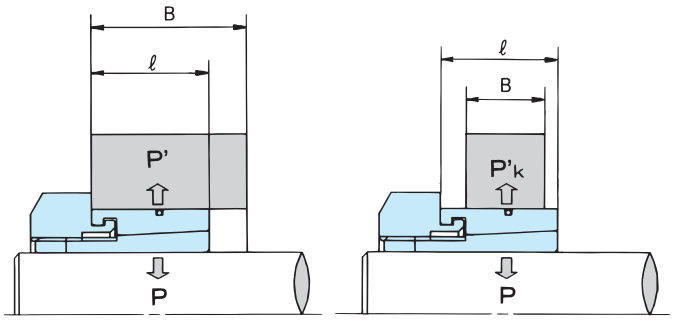
Notes on Non-Ferrous Materials

Hubs made from non-ferrous materials may be used. However, since $\sigma_{0.2B} \leqq 1.4P'(P'_K)$ avoid using shafts consisting of such materials.

Doing so will cause the coefficient of friction for steel and the shaft material to change, which may affect the features of the product.

ML Model Tightening Torque and its Effects

The transmissible torque, thrust, and contact pressure of "Power-Lock" ML Series shaft-hub locking devices are all proportional to the tightening torque. Below shows tightening torque M_A at 1/2 or 3/4 of the M_A values indicated in the Model Numbers and Specifications table. Refer to the table below when reducing your tightening or transmissible torque and contact pressure. Note that allowable range for M_A is 1/2 M_A ~1.1 M_A.



B ≧ ℓ　　B < ℓ

Note) When the hub length is less than ℓ or when B < ℓ , use the formula below to calculate the hub contact pressure P'K.

$$P'_K = P' \times \frac{\ell}{B}$$

Model No. d X D Shaft Diameter X Outer Diameter	$M_{A50} = 0.5M_A$										$M_{A75} = 0.75M_A$									
	Transmissible Torque Mt_{50}		Transmissible Thrust Pax_{50}		Contact Pressure Shaft P_{50}		Contact Pressure Hub P'_{50}		Tightening Torque M_{A50}		Transmissible Torque Mt_{75}		Transmissible Thrust Pax_{75}		Contact Pressure Shaft P_{75}		Contact Pressure Hub P'_{75}		Tightening Torque M_{A75}	
mm	N・m	{kgf・m}	kN	{kgf}	MPa	{kgf/mm²}	MPa	{kgf/mm²}	N・m	{kgf・m}	N・m	{kgf・m}	kN	{kgf}	MPa	{kgf/mm²}	MPa	{kgf/mm²}	N・m	{kgf・m}
PL 005 X 016 M	3.33	0.34	1.27	130	89.0	9.1	23	2.3	2.65	0.27	4.90	0.5	1.86	190	132	13.5	33	3.4	3.92	0.4
PL 006 X 016 M	3.92	0.40			79.0	8.1					5.90	0.6			118	12.0				
PL 007 X 021 M	11.8	1.2	3.23	330	90.0	9.2	30	3.1	8.33	0.85	16.7	1.7	5.00	510	137	14.0	46	4.7	12.7	1.3
PL 008 X 021 M	12.7	1.3			81.0	8.3					19.6	2.0			124	12.7				
PL 009 X 021 M	14.7	1.5			75.0	7.7					22.5	2.3			115	11.7				
PL 010 X 024 M	19.6	2.0	4.02	410	87.0	8.9	33	3.4	11.8	1.2	31.4	3.2	6.37	650	137	14.0	52	5.3	18.6	1.9
PL 011 X 024 M	21.6	2.2			82.0	8.4					34.3	3.5			130	13.3				
PL 012 X 024 M	23.5	2.4			79.0	8.1					37.2	3.8			124	12.7				
PL 014 X 031 M	53.9	5.5	8.04	820	93.0	9.5	41	4.2	30.4	3.1	79.4	8.1	11.9	1210	138	14.1	61	6.2	45.1	4.6
PL 015 X 031 M	58.8	6.0			90.0	9.2					87.2	8.9			133	13.6				
PL 016 X 031 M	63.7	6.5			87.0	8.9					94.1	9.6			129	13.2				
PL 017 X 036 M	98.0	10.0	11.6	1180	93.0	9.5	41	4.2	52.9	5.4	147	15.0	17.2	1750	137	14.0	61	6.2	78.4	8.0
PL 018 X 036 M	103	10.5			90.0	9.2					152	15.5			132	13.5				
PL 019 X 036 M	108	11.0			87.0	8.9					162	16.5			129	13.2				
PL 020 X 041 M	123	12.5	12.4	1270	78.0	8.0	35	3.6	64.7	6.6	181	18.5	18.8	1920	119	12.1	54	5.5	98.0	10.0
PL 022 X 041 M	137	14.0			74.0	7.6					206	21.0			114	11.6				
PL 024 X 041 M	147	15.0			73.0	7.4					216	22.0			110	11.2				
PL 025 X 046 M	186	19	15.2	1550	71.0	7.2	35	3.6	90.2	9.2	274	28	22.4	2290	104	10.6	52	5.3	133	13.6
PL 028 X 046 M	206	21			67.0	6.8					314	32			99.0	10.1				
PL 030 X 050 M	225	23	15.0	1530	56.0	5.7	33	3.4	137	14.0	333	34	22.5	2300	83.3	8.5	50	5.1	206	21
PL 032 X 050 M	235	24			52.0	5.3					353	36			78.4	8.0				

Note) 1. The above figures do not take safety rates into account. Consider them prior to operation.

Innovation in Motion

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