Power-Lock® EF Series

Sizes : φ10～φ120
Shaft tolerance : h8
Hub bore tolerance : H8
Surface roughness : Ra1.6

RoHS compliant.

Features

1 Same Inner and Outer Diameters as the EL Series

Designed with the same inner and outer diameters as a "Power-Lock" EL Series shaft-hub locking device.

2 Self-Centering

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

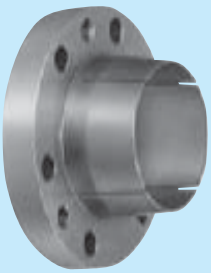
3 Simple Construction

Constructed with only an inner and an outer ring and locking bolts. Simply tighten these bolts to achieve a completely secure connection.

Parts

Locking Bolts

Inner Ring



Outer Ring

"Power-Lock" EF Series shaft-hub locking devices are simply constructed of the following three parts : inner and outer rings, and locking bolts. Simply tighten these bolts to achieve a completely secure connection.

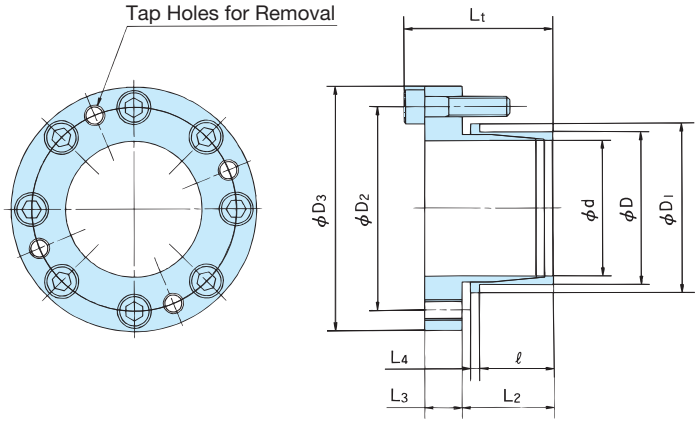
EF

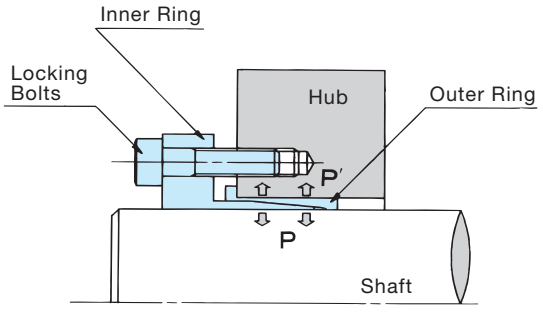
Reference Number System

PL 018 X 022 EF

- EF — Series
- 022 — Outer Diameter mm
- 018 — Shaft Diameter mm
- PL — Power-Lock

Model Numbers and Specifications





P and P' represent the average Contact Pressure applied to the shaft and hub respectively. These values may vary within ±20% depending on the amount of friction applied to the bolts. Transmissible torque Mt and transmissible thrust Pax are calculated from the minimum allowable Contact Pressure.

* Note) 3

Model No. (d X D Shaft Diameter X Outer Diameter) mm	Dimensions mm									Locking Bolts			
	ℓ	L Required tap depth	L2	L3	L4	Lt	D1	D2	D3	Quantity	Size	Tightening Torque (MA) N·m	Tightening Torque (MA) {kgf·m}
PL 010 X 013 EF	11.5	9.5	14.5	5	1.5	23.5	16	22	30	3	M 4×16	4.0	0.41
PL 011 X 014 EF	11.5	9.5	14.5	5	1.5	23.5	17	23	31	3	M 4×16	4.0	0.41
PL 012 X 015 EF	11.5	9.5	14.5	5	1.5	23.5	18	24	32	3	M 4×16	4.0	0.41
PL 014 X 018 EF	16.0	10.0	20.0	6	2.0	30.0	22	27	35	4	M 4×18	4.0	0.41
PL 015 X 019 EF	16.0	10.0	20.0	6	2.0	30.0	23	28	36	4	M 4×18	4.0	0.41
PL 016 X 020 EF	16.0	9.0	20.0	7	2.0	31.0	24	29	37	6	M 4×18	4.0	0.41
PL 017 X 021 EF	16.0	9.0	20.0	7	2.0	31.0	25	30	38	6	M 4×18	4.0	0.41
PL 018 X 022 EF	16.0	11.0	20.0	7	2.0	32.0	26	33	43	4	M 5×20	8.3	0.85
PL 019 X 024 EF	16.0	11.0	20.0	7	2.0	32.0	28	35	45	4	M 5×20	8.3	0.85
PL 020 X 025 EF	16.0	11.0	20.0	7	2.0	32.0	29	36	46	4	M 5×20	8.3	0.85
PL 022 X 026 EF	16.0	11.0	20.0	7	2.0	32.0	30	38	48	4	M 5×20	8.3	0.85
PL 024 X 028 EF	16.0	11.0	20.0	7	2.0	32.0	32	40	50	4	M 5×20	8.3	0.85
PL 025 X 030 EF	16.0	11.0	20.0	7	2.0	32.0	34	42	52	4	M 5×20	8.3	0.85
PL 028 X 032 EF	16.0	15.0	20.5	8	2.0	33.5	36	44	54	6	M 5×25	8.3	0.85
PL 030 X 035 EF	16.0	15.0	20.5	8	2.0	33.5	39	47	57	6	M 5×25	8.3	0.85
PL 032 X 036 EF	16.0	13.5	21.0	9	2.5	35.0	41	49	59	6	M 5×25	8.3	0.85
PL 035 X 040 EF	17.5	13.5	22.5	9	2.5	36.5	45	53	63	6	M 5×25	8.3	0.85
PL 038 X 044 EF	17.5	15.5	23.0	10	2.5	39.0	49	58	70	6	M 6×28	13.7	1.4
PL 040 X 045 EF	20.0	15.5	25.5	10	2.5	41.5	50	59	71	6	M 6×28	13.7	1.4
PL 042 X 048 EF	20.0	14.5	25.5	11	2.5	42.5	53	62	74	8	M 6×28	13.7	1.4
PL 045 X 052 EF	25.0	19.0	31.5	13	3.0	52.5	58	69	84	6	M 8×35	34.3	3.5
PL 048 X 055 EF	25.0	19.0	31.5	13	3.0	52.5	61	72	87	6	M 8×35	34.3	3.5
PL 050 X 057 EF	25.0	19.0	31.5	13	3.0	52.5	63	74	89	6	M 8×35	34.3	3.5
PL 055 X 062 EF	25.0	19.0	31.5	13	3.0	52.5	68	79	94	6	M 8×35	34.3	3.5
PL 060 X 068 EF	27.0	18.5	34.0	13	3.5	55.0	75	86	101	6	M 8×35	34.3	3.5
PL 065 X 073 EF	27.0	21.5	34.0	15	3.5	57.0	80	91	106	8	M 8×40	34.3	3.5
PL 070 X 079 EF	31.0	21.5	38.0	15	3.5	61.0	86	97	112	8	M 8×40	34.3	3.5
PL 075 X 084 EF	31.0	20.5	38.5	16	3.5	62.5	91	102	117	10	M 8×40	34.3	3.5
PL 080 X 091 EF	34.0	19.0	42.0	17	4.0	67.0	99	110	125	10	M 8×40	34.3	3.5
PL 085 X 096 EF	34.0	22.0	42.5	19	4.0	71.5	104	118	137	8	M10×45	67.6	6.9
PL 090 X 101 EF	34.0	22.0	42.5	19	4.0	71.5	109	123	142	8	M10×45	67.6	6.9
PL 095 X 106 EF	34.0	22.0	42.5	19	4.0	71.5	114	128	147	8	M10×45	67.6	6.9
PL 100 X 114 EF	42.0	21.0	50.5	20	4.0	80.5	122	136	155	10	M10×45	67.6	6.9
PL 110 X 124 EF	42.0	21.0	50.5	20	4.0	80.5	132	146	165	10	M10×45	67.6	6.9
PL 120 X 134 EF	42.0	24.0	50.5	22	4.0	82.5	142	156	175	12	M10×50	67.6	6.9

Note) 1. Stocked models are in bold.
2. 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.
3. Dimensions when this product is attached to the shaft and hub.

Model Numbers and Specifications

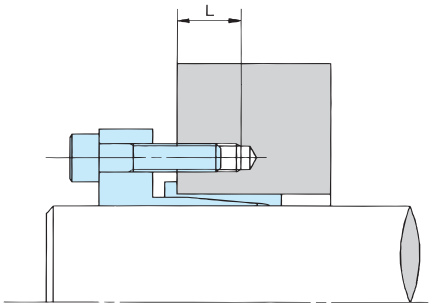
■ Hub Tap Holes

The locking bolts for "Power-Lock" EF Series shaft-hub locking devices are equally spaced. Prepare hub screw holes accordingly. The depths of tap holes should be determined by the following formula.

L = (The nominal length of bolts) − (L_3 + L_4)

L_3 : Inner Ring Flange Thickness

L_4 : Outer Ring Flange Thickness



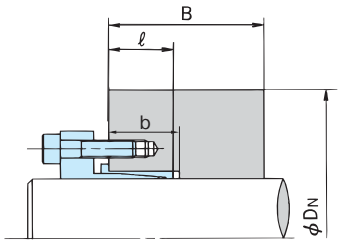
Model No. d X D Shaft Diameter X Outer Diameter mm	Transmissible Torque Mt		Transmissible Thrust Pax		Shaft Contact Pressure P		Hub Contact Pressure P'		Mass
	N·m	{kgf·m}	kN	{kgf}	MPa	{kgf/mm²}	MPa	{kgf/mm²}	Kg
PL 010 X 013 EF	39	4.0	7.79	795	292	29.8	224	22.9	0.04
PL 011 X 014 EF	43	4.4	7.79	795	266	27.1	209	21.3	0.04
PL 012 X 015 EF	47	4.8	7.79	795	243	24.8	195	19.9	0.04
PL 014 X 018 EF	73	7.4	10.4	1060	209	21.3	163	16.6	0.06
PL 015 X 019 EF	78	8.0	10.4	1060	195	19.9	154	15.7	0.07
PL 016 X 020 EF	124	12.7	15.6	1590	273	27.9	219	22.3	0.08
PL 017 X 021 EF	132	13.5	15.6	1590	258	26.3	209	21.3	0.08
PL 018 X 022 EF	154	15.7	17.1	1740	267	27.2	218	22.2	0.10
PL 019 X 024 EF	163	16.6	17.1	1740	252	25.7	200	20.4	0.11
PL 020 X 025 EF	171	17.4	17.1	1740	240	24.5	192	19.6	0.12
PL 022 X 026 EF	186	19.0	17.1	1740	218	22.2	184	18.8	0.12
PL 024 X 028 EF	206	21.0	17.1	1740	200	20.4	172	17.5	0.12
PL 025 X 030 EF	216	22.0	17.1	1740	192	19.6	160	16.3	0.16
PL 028 X 032 EF	353	36.0	25.6	2610	257	26.2	224	22.9	0.16
PL 030 X 035 EF	382	39.0	25.6	2610	240	24.5	206	21.0	0.19
PL 032 X 036 EF	412	42.0	25.6	2610	224	22.9	200	20.4	0.20
PL 035 X 040 EF	451	46.0	25.6	2610	178	18.2	157	16.0	0.23
PL 038 X 044 EF	686	70.0	36.1	3680	231	23.6	200	20.4	0.33
PL 040 X 045 EF	725	74.0	36.1	3680	180	18.4	161	16.4	0.33
PL 042 X 048 EF	1010	103	48.0	4900	229	23.4	201	20.5	0.40
PL 045 X 052 EF	1490	152	66.3	6770	244	24.9	211	21.5	0.65
PL 048 X 055 EF	1600	163	66.3	6770	228	23.3	199	20.3	0.68
PL 050 X 057 EF	1660	169	66.3	6770	220	22.4	192	19.6	0.69
PL 055 X 062 EF	1820	186	66.3	6770	199	20.3	176	18.0	0.74
PL 060 X 068 EF	1990	203	66.3	6770	164	16.7	144	14.7	0.86
PL 065 X 073 EF	2870	293	88.5	9030	201	20.5	179	18.3	1.1
PL 070 X 079 EF	3100	316	88.5	9030	177	18.1	158	16.1	1.2
PL 075 X 084 EF	4150	423	111	11290	207	21.1	185	18.9	1.3
PL 080 X 091 EF	4420	451	111	11290	176	18.0	155	15.8	1.7
PL 085 X 096 EF	5980	610	141	14360	212	21.6	187	19.1	2.2
PL 090 X 101 EF	6330	646	141	14360	200	20.4	178	18.2	2.3
PL 095 X 106 EF	6680	682	141	14360	189	19.3	170	17.3	2.4
PL 100 X 114 EF	8790	897	176	17950	165	16.8	144	14.7	3.0
PL 110 X 124 EF	9670	987	176	17950	150	15.3	133	13.6	3.3
PL 120 X 134 EF	12600	1290	211	21540	165	16.8	148	15.1	3.8

Hub Diameters (1)

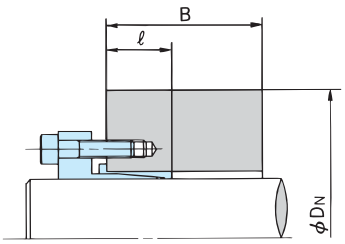
(1) Installing to hubs with a guide portion when B ≧ 2 ℓ
(See Installation Example A)

(2) Installing to hubs without a guide portion when B ≧ 2 ℓ
(See Installation Example B)

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



Installation Example(A)
When installing to hubs with a guide portion, the hub configuration coefficient is as follows: $K_3 = 0.8$



Installation Example(B)
When installing to hubs without a guide portion, the hub configuration coefficient is as follows: $K_3 = 0.8$

Hub Configuration Coefficient $K_3 = 0.8$

Minimum hub diameter φDN(mm)

Model No. d X D (Shaft Diameter X Outer Diameter) mm	Hub Contact Pressure P' MPa	Hub Contact Pressure P' {kgf/mm²}	Yield Point of Hub Material σ 0.2 MPa (kgf/mm²) 245 (25) FCD400 SS490 SC480 S20C SF490	274 (28) S30C SF540	294 (30) FCD450 S35C SF590	343 (35) FCD500 S45C	392 (40) FCD600 S55C	441 (45) FCD700	Hub boring depth b (mm)
PL 010 X 013 EF	224	22.9	38	33	31	31	31	31	13
PL 011 X 014 EF	209	21.3	37	33	31	31	31	31	13
PL 012 X 015 EF	195	19.9	36	33	32	32	32	32	13
PL 014 X 018 EF	163	16.6	37	35	35	35	35	35	17
PL 015 X 019 EF	154	15.7	38	38	38	38	38	38	17
PL 016 X 020 EF	219	22.3	53	47	44	40	37	37	17
PL 017 X 021 EF	209	21.3	53	47	45	40	38	38	17
PL 018 X 022 EF	218	22.2	59	52	49	44	44	44	17
PL 019 X 024 EF	200	20.4	58	52	50	45	45	45	17
PL 020 X 025 EF	192	19.6	58	53	50	46	46	46	17
PL 022 X 026 EF	184	18.8	58	53	51	50	50	50	17
PL 024 X 028 EF	172	17.5	58	54	52	52	52	52	17
PL 025 X 030 EF	160	16.3	59	55	53	53	53	53	17
PL 028 X 032 EF	224	22.9	87	75	71	63	58	55	17
PL 030 X 035 EF	206	21.0	85	76	71	65	60	57	17
PL 032 X 036 EF	200	20.4	84	76	72	65	61	60	17
PL 035 X 040 EF	157	16.0	76	71	69	64	64	64	19
PL 038 X 044 EF	200	20.4	103	92	87	79	74	71	19
PL 040 X 045 EF	161	16.4	87	81	78	73	73	73	21
PL 042 X 048 EF	201	20.5	112	100	95	86	81	77	21
PL 045 X 052 EF	211	21.5	129	115	108	98	91	86	26
PL 048 X 055 EF	199	20.3	128	115	109	99	93	89	26
PL 050 X 057 EF	192	19.6	128	116	110	101	95	91	26
PL 055 X 062 EF	176	18.0	128	118	113	105	99	95	26
PL 060 X 068 EF	144	14.7	122	115	111	105	101	101	28
PL 065 X 073 EF	179	18.3	151	139	133	122	116	111	28
PL 070 X 079 EF	158	16.1	148	138	134	125	119	115	32
PL 075 X 084 EF	185	18.9	178	162	155	142	134	128	32
PL 080 X 091 EF	155	15.8	167	157	151	141	135	130	35
PL 085 X 096 EF	187	19.1	206	188	179	164	154	147	35
PL 090 X 101 EF	178	18.2	207	190	182	168	158	152	35
PL 095 X 106 EF	170	17.3	208	193	185	172	163	156	35
PL 100 X 114 EF	144	14.7	200	189	183	172	165	159	43
PL 110 X 124 EF	133	13.6	208	197	192	182	174	169	43
PL 120 X 134 EF	148	15.1	238	223	216	203	194	187	43

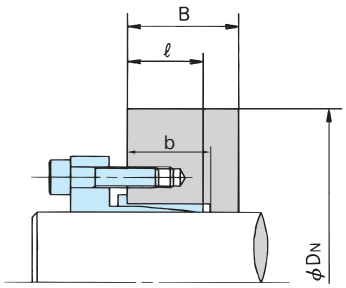
Notes) 1. The above figures do not take safety rates into account. Consider them prior to operation.
2. Calculate hub diameters using the formula K_3=0.8 as discussed in Selection Procedure.

Hub Diameters (2)

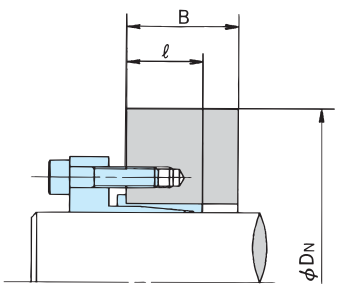
(3) Installing to hubs with a guide portion
when $\ell < B < 2\ell$
(See Installation Example C)

(4) Installing to hubs without a guide portion
when $\ell < B < 2\ell$
(See Installation Example D)

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



Installation Example(C)
When installing to hubs with a guide portion, the hub configuration coefficient is as follows: $K_3 = 1.0$



Installation Example(D)
When installing to hubs without a guide portion, the hub configuration coefficient is as follows: $K_3 = 1.0$

Hub Configuration Coefficient $K_3 = 1.0$

Minimum hub diameter ϕD_N(mm)

Model No. d X D (Shaft Diameter X Outer Diameter) mm	Hub Contact Pressure P' MPa	Hub Contact Pressure P' {kgf/mm²}	Yield Point of Hub Material σ 0.2 MPa (kgf/mm²) 245 (25) FCD400 SS490 SC480 S20C SF490	274 (28) S30C SF540	294 (30) FCD450 S35C SF590	343 (35) FCD500 S45C	392 (40) FCD600 S55C	441 (45) FCD700	Hub boring depth b (mm)
PL 010 X 013 EF	224	22.9	67	46	40	33	33	33	13
PL 011 X 014 EF	209	21.3	54	42	38	33	33	33	13
PL 012 X 015 EF	195	19.9	49	41	38	33	33	33	13
PL 014 X 018 EF	163	16.6	45	40	38	35	35	35	17
PL 015 X 019 EF	154	15.7	44	40	38	38	38	38	17
PL 016 X 020 EF	219	22.3	88	64	57	47	42	39	17
PL 017 X 021 EF	209	21.3	79	61	55	47	43	40	17
PL 018 X 022 EF	218	22.2	96	70	62	52	47	43	17
PL 019 X 024 EF	200	20.4	81	66	60	52	48	45	17
PL 020 X 025 EF	192	19.6	77	65	60	53	48	48	17
PL 022 X 026 EF	184	18.8	75	64	60	53	49	49	17
PL 024 X 028 EF	172	17.5	72	64	60	54	50	50	17
PL 025 X 030 EF	160	16.3	71	64	61	55	52	52	17
PL 028 X 032 EF	224	22.9	158	107	93	75	67	62	17
PL 030 X 035 EF	206	21.0	124	98	89	76	68	64	17
PL 032 X 036 EF	200	20.4	119	96	88	76	69	64	17
PL 035 X 040 EF	157	16.0	91	82	78	71	67	64	19
PL 038 X 044 EF	200	20.4	145	118	107	92	84	78	19
PL 040 X 045 EF	161	16.4	105	95	90	81	76	72	21
PL 042 X 048 EF	201	20.5	159	129	117	100	91	85	21
PL 045 X 052 EF	211	21.5	198	152	136	115	103	96	26
PL 048 X 055 EF	199	20.3	179	146	134	115	105	98	26
PL 050 X 057 EF	192	19.6	172	144	133	116	106	99	26
PL 055 X 062 EF	176	18.0	162	141	133	118	109	103	26
PL 060 X 068 EF	144	14.7	142	130	125	115	108	104	28
PL 065 X 073 EF	179	18.3	194	168	157	139	128	121	28
PL 070 X 079 EF	158	16.1	178	161	152	138	130	123	32
PL 075 X 084 EF	185	18.9	234	199	185	162	149	140	32
PL 080 X 091 EF	155	15.8	200	181	172	157	147	140	35
PL 085 X 096 EF	187	19.1	273	231	214	188	172	162	35
PL 090 X 101 EF	178	18.2	265	230	215	190	176	166	35
PL 095 X 106 EF	170	17.3	259	229	215	193	179	169	35
PL 100 X 114 EF	144	14.7	234	215	205	189	178	171	43
PL 110 X 124 EF	133	13.6	239	221	213	197	187	180	43
PL 120 X 134 EF	148	15.1	280	255	244	223	210	200	43

Notes) 1. The above figures do not take safety rates into account. Consider them prior to operation.
2. Calculate hub diameters using the formula K_3=1.0 as discussed in Selection Procedure.

EF

Innovation in Motion

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