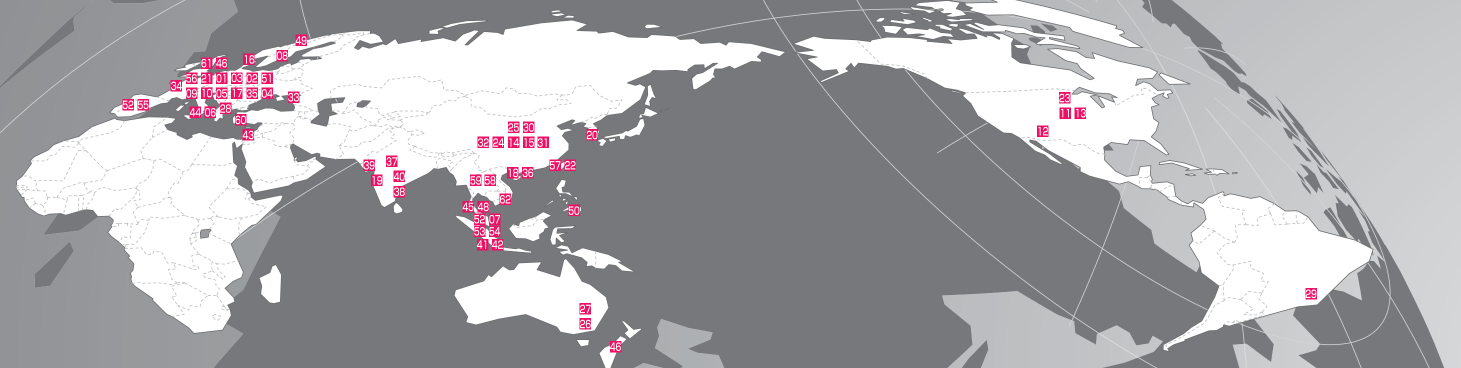
World Wide Network



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MIKI PULLEY

NEW

ETP Hub-Shaft Connector

ETP-E *Plus*

ETP-EXPRESS®

MIKI PULLEY

Transform productivity at your workshop.

ETP-E *Plus*

ETP-EXPRESS®

Rapid improvement in labor effectiveness

Accurate:
Precise phase matching on demand both axially and in the direction of rotation.

Simple:
Easy hydraulic mounting with uniform pressurization–no skill required!

Speedy :
Quick fastening with one bolt.

ETP Transmission AB

"ETP" is a registered trademark of ETP Transmission AB.
"ETP-EXPRESS" is a registered trademark of ETP Transmission AB.

ETP-E *Plus*

ETP EXPRESS®

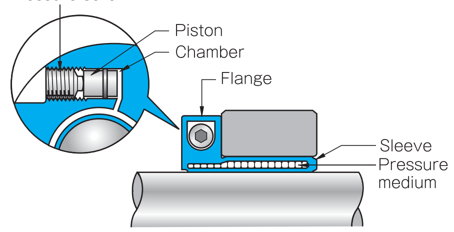
RoHS

The shaft and the hub can be connected easily and quickly with 1 bolt. Since the concentricity is as accurate as 0.02 mm, this model is most suitable for applications that require high accuracy and where the device is frequently attached and detached. It is structured to be tightened from the radial direction to save work space.

Max. rated torque	[N·m]	17000
Max. rated thrust	[N]	280000
Applied shaft diameter	[mm]	φ15～100
Operating temperature	[℃]	−30～85
Backlash		Zero
Concentricity	[mm]	0.02

Operating Principles

Tightening the pressure screw applies pressure to the pressure medium sealed in the chamber so the pressure medium moves into the sleeve. Applying pressure to the pressure medium applies pressure to the sleeve from the inside, so that the shaft side sleeve is shrunk and the hub side sleeve is expanded. Thus, the shaft and the hub are connected through the sleeve.



Variations and Materials

ETP-E N

Standard type of the ETP-E Plus model.

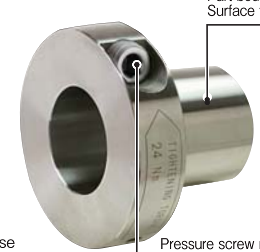
Part body material: SCM435 or an equivalent

Pressure screw material: Alloy steel for machine structural use
Surface finishing: Black coating

ETP-E C

The main body and pressure screw are electroless nickel coated (simple rustproof finishing).

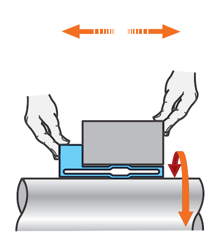
Part body material: SCM435 or an equivalent
Surface finishing: Electroless nickel plating



Pressure screw material: Alloy steel for machine structural use
Surface finishing: Electroless nickel plating

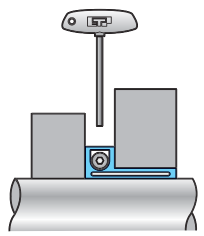
Easy and Precise Positioning

Positioning in the shaft and rotation directions can be performed arbitrarily, and it is easy to mount the device to equipment where accurate sync adjustment is required.



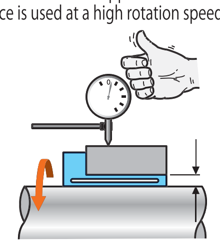
Saving Space

You can design so that the device is connected to the shaft from the radial direction to save space. The device contributes to a compact and lightweight low inertia design.



High Concentricity

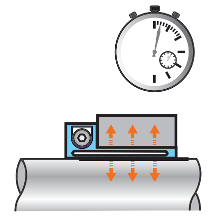
Since the contact pressure on the shaft and hub sides is uniform, high concentricity can be maintained even if the hub's external diameter is reduced. Accordingly, unbalance caused by a centrifugal force can be reduced in applications where the device is used at a high rotation speed.



Secure and Quick Mounting

Secure mounting can be performed by just tightening of one bolt to the specified torque.

* To firmly secure the device with the appropriate contact pressure to the shaft and hub, mount the device so that the shaft and the hub completely contact each other.

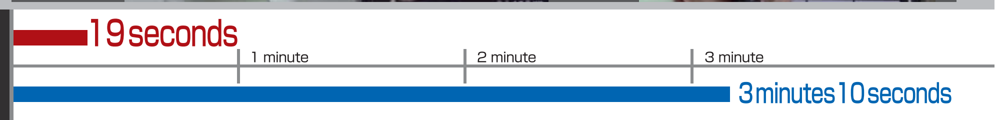


ETP-E *Plus*

ETP-EXPRESS®

Fasten one bolt, and mounting is complete.

Mounting time: hydraulic vs. mechanical



General mechanical fastening elements

Multiple bolts must be fastened uniformly, diagonally and in a sequential manner.

*Installation time varies depending on various conditions.

ETP-E Plus

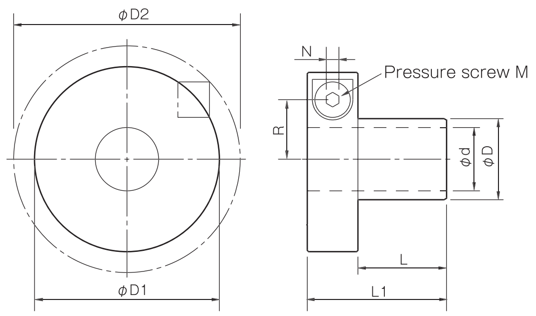
ETP-E N TYPE

Specifications

Model	Shaft tol.		Rated torque	Rated thrust	Rated radial load	Shaft contact pressure	Hub contact pressure	Tightening torque	Moment of inertia	Mass
	h7	k6	[N·m]	[N]	[N]	[N/mm²]	[N/mm²]	[N·m]	[kg·m²]	[kg]
ETP-E-015-N	●		46	5100	500	90	70	7	0.042×10^{-3}	0.16
ETP-E-019-N	●	○	85	7300	1000	90	70	7	0.063×10^{-3}	0.20
ETP-E-020-N	●		110	9100	1000	90	70	7	0.069×10^{-3}	0.21
ETP-E-022-N	●	○	130	9600	1200	90	70	7	0.095×10^{-3}	0.25
ETP-E-024-N	●	○	190	13000	1400	90	70	7	0.109×10^{-3}	0.26
ETP-E-025-N	●		230	15000	1500	90	70	7	0.114×10^{-3}	0.27
ETP-E-028-N	●	○	280	16000	1800	90	70	7	0.166×10^{-3}	0.33
ETP-E-030-N	●		380	21000	2000	90	70	7	0.185×10^{-3}	0.35
ETP-E-032-N	●	○	440	22000	2200	90	70	7	0.244×10^{-3}	0.41
ETP-E-035-N	●		640	30000	2500	90	70	7	0.317×10^{-3}	0.47
ETP-E-038-N	●	○	890	38000	2800	90	70	24	0.756×10^{-3}	0.83
ETP-E-040-N	●		1100	45000	3000	90	70	24	0.836×10^{-3}	0.88
ETP-E-042-N	●	○	1100	43000	3200	90	70	24	0.959×10^{-3}	0.95
ETP-E-045-N	●		1400	51000	3500	90	70	24	1.152×10^{-3}	1.03
ETP-E-048-N	●	○	1700	57000	4000	90	70	24	1.430×10^{-3}	1.09
ETP-E-050-N	●		1900	63000	4500	90	70	24	1.497×10^{-3}	1.18
ETP-E-055-N	●	○	2400	71000	5000	90	70	24	2.130×10^{-3}	1.46
ETP-E-060-N	●		3300	90000	5300	90	70	24	3.089×10^{-3}	1.79
NEW ETP-E-070-N	●		5600	130000	6400	90	70	40	6.951×10^{-3}	2.93
NEW ETP-E-080-N	●		8700	180000	7500	90	70	40	10.02×10^{-3}	3.58
NEW ETP-E-090-N	●		12000	230000	8600	90	70	40	14.84×10^{-3}	4.54
NEW ETP-E-100-N	●		17000	280000	9700	90	70	40	21.00×10^{-3}	5.51

*Sizes with shaft h7 tolerance are denoted with the ● mark. The only sizes that tolerate k6 are those denoted on the chart with an additional mark. Please take this into consideration.
*The rated torque values are those when the thrust is zero and the rated thrust values are those when the torque is zero.
*The rated torque, rated thrust, shaft contact pressure, and hub contact pressure values given are measured values at a temperature of 20℃ .
*ETP-E-70, 80, 90, 100-N are made to order.

Dimensions



How to Place an Order

ETP-E-□-N□

Size
Type:Standard specification
Possible shaft tolerance variations
H : h7 (g6 · h6) shaft tolerance
K : k6 shaft tolerance (option)

Unit [mm]

Model	d	D	D1	D2	L	L1	R	N	M
ETP-E-015-N	15	18	46	50	23	37	15.1	5	1-M10
ETP-E-019-N	19	23	50.5	55	25	39	17.4	5	1-M10
ETP-E-020-N	20	24	51.5	56	27	41	18	5	1-M10
ETP-E-022-N	22	27	55.5	61	29	43	19.3	5	1-M10
ETP-E-024-N	24	29	57.5	63	30	44	20.3	5	1-M10
ETP-E-025-N	25	30	58	63	32	46	20.8	5	1-M10
ETP-E-028-N	28	34	63	70	34	48	22.6	5	1-M10
ETP-E-030-N	30	36	64.5	71	36	50	23.6	5	1-M10
ETP-E-032-N	32	39	68.5	78	38	52	24.8	5	1-M10
ETP-E-035-N	35	42	73	86	41	55	26.4	5	1-M10
ETP-E-038-N	38	46	84.5	92.5	47	67	31	8	1-M16
ETP-E-040-N	40	48	86.5	94	50	70	32	8	1-M16
ETP-E-042-N	42	51	89	96.5	50	70	33.2	8	1-M16
ETP-E-045-N	45	54	93	101	52	72	34.8	8	1-M16
ETP-E-048-N	48	59	97	104	53	73	36.8	8	1-M16
ETP-E-050-N	50	60	98.5	106	54	74	37.5	8	1-M16
ETP-E-055-N	55	67	106	116	59	79	40.5	8	1-M16
ETP-E-060-N	60	73	115.5	123.5	63	83	43.3	8	1-M16
NEW ETP-E-070-N	70	85	135.5	150	77	101	50.8	10	1-M20
NEW ETP-E-080-N	80	97	145.5	160	86	110	56.3	10	1-M20
NEW ETP-E-090-N	90	109	155.5	169	95	119	61.8	10	1-M20
NEW ETP-E-100-N	100	121	166	180	104	128	67.3	10	1-M20

*Dimension φD2 is that before tightening the ETP-E Plus.
*The nominal diameter of the pressure screw M is equal to the quantity minus the nominal diameter of the screw threads.

ETP-E Plus

ETP-E C TYPE (Easy rustproofing method)

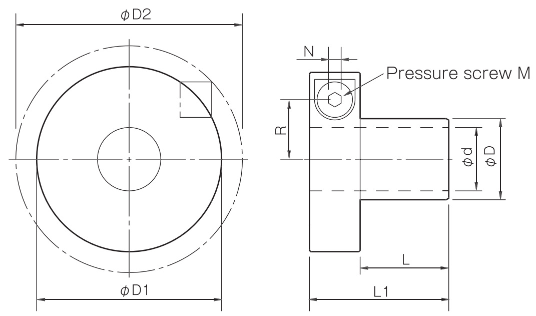
Manufactured upon receipt of orders

Specifications

Model	Shaft tol.		Rated torque	Rated thrust	Rated radial load	Shaft contact pressure	Hub contact pressure	Tightening torque	Moment of inertia	Mass
	h7	k6	[N·m]	[N]	[N]	[N/mm²]	[N/mm²]	[N·m]	[kg·m²]	[kg]
ETP-E-015-C	●		34	3800	500	90	70	7	0.042×10^{-3}	0.16
ETP-E-019-C	●	○	63	5400	1000	90	70	7	0.063×10^{-3}	0.20
ETP-E-020-C	●		82	6800	1000	90	70	7	0.069×10^{-3}	0.21
ETP-E-022-C	●	○	97	7200	1200	90	70	7	0.095×10^{-3}	0.25
ETP-E-024-C	●	○	142	9700	1400	90	70	7	0.109×10^{-3}	0.26
ETP-E-025-C	●		172	11200	1500	90	70	7	0.114×10^{-3}	0.27
ETP-E-028-C	●	○	210	12000	1800	90	70	7	0.166×10^{-3}	0.33
ETP-E-030-C	●		285	15000	2000	90	70	7	0.185×10^{-3}	0.35
ETP-E-032-C	●	○	330	16000	2200	90	70	7	0.244×10^{-3}	0.41
ETP-E-035-C	●		480	22000	2500	90	70	7	0.317×10^{-3}	0.47
ETP-E-038-C	●	○	667	28000	2800	90	70	24	0.756×10^{-3}	0.83
ETP-E-040-C	●		825	33000	3000	90	70	24	0.836×10^{-3}	0.88
ETP-E-042-C	●	○	825	32000	3200	90	70	24	0.959×10^{-3}	0.95
ETP-E-045-C	●		1050	38000	3500	90	70	24	1.152×10^{-3}	1.03
ETP-E-048-C	●	○	1275	42000	4000	90	70	24	1.430×10^{-3}	1.09
ETP-E-050-C	●		1425	47000	4500	90	70	24	1.497×10^{-3}	1.18
ETP-E-055-C	●	○	1800	53000	5000	90	70	24	2.130×10^{-3}	1.46
ETP-E-060-C	●		2475	67000	5300	90	70	24	3.089×10^{-3}	1.79

*Sizes with shaft h7 tolerance are denoted with the ● mark. The only sizes that tolerate k6 are those denoted on the chart with an additional mark. Please take this into consideration.
*The rated torque values are those when the thrust is zero and the rated thrust values are those when the torque is zero.
*The rated torque, rated thrust, shaft contact pressure, and hub contact pressure values given are measured values at a temperature of 20℃ .

Dimensions



How to Place an Order

ETP-E-□-C□

Size
Type C: Easy rustproofing method
(An electroless nickel plating)
Possible shaft tolerance variations
H : h7 (g6 · h6) shaft tolerance
K : k6 shaft tolerance (option)

Unit [mm]

Model	d	D	D1	D2	L	L1	R	N	M
ETP-E-015-C	15	18	46	49	23	37	15.1	5	1-M10
ETP-E-019-C	19	23	50.5	53	25	39	17.4	5	1-M10
ETP-E-020-C	20	24	51.5	55	27	41	18	5	1-M10
ETP-E-022-C	22	27	55.5	61	29	43	19.3	5	1-M10
ETP-E-024-C	24	29	57.5	63	30	44	20.3	5	1-M10
ETP-E-025-C	25	30	58	63	32	46	20.8	5	1-M10
ETP-E-028-C	28	34	63	70	34	48	22.6	5	1-M10
ETP-E-030-C	30	36	64.5	71	36	50	23.6	5	1-M10
ETP-E-032-C	32	39	68.5	78	38	52	24.8	5	1-M10
ETP-E-035-C	35	42	73	86	41	55	26.4	5	1-M10
ETP-E-038-C	38	46	84.5	90	47	67	31	8	1-M16
ETP-E-040-C	40	48	86.5	92	50	70	32	8	1-M16
ETP-E-042-C	42	51	89	94	50	70	33.2	8	1-M16
ETP-E-045-C	45	54	93	101	52	72	34.8	8	1-M16
ETP-E-048-C	48	59	97	104	53	73	36.8	8	1-M16
ETP-E-050-C	50	60	98.5	106	54	74	37.5	8	1-M16
ETP-E-055-C	55	67	106	116	59	79	40.5	8	1-M16
ETP-E-060-C	60	73	115.5	133	63	83	43.3	8	1-M16

*Dimension φD2 is that before tightening the ETP-E Plus.
*The nominal diameter of the pressure screw M is equal to the quantity minus the nominal diameter of the screw threads.

Items Checked for Design Purposes

Selection Procedure

(1) Selection is determined by the used shaft diameter. In general, find the torque, Ta, applied to the connecting element using the output capacity, P, of the driver and usage rotation speed, n. Next, obtain the thrust, Fa, applied to the connecting element.

$$Ta\,[N\cdot m] = 9550 \times \frac{P\,[kW]}{n\,[min^{-1}]}$$

Ta: Torque applied to the connecting element [N·m]　P: Driver's output [kW]
n : Connecting element's rotation speed [min^{-1}]　Fa: Thrust applied to the connecting element [N]

(2) Determine the service factor, K1, based on the load property and obtain the corrected torque, Td, and corrected thrust, Fd, applied to the connecting element.

$$Td = Ta \times K1 \times K2$$

$$Fd = Fa \times K1 \times K2$$

Td: Corrected torque applied to the connecting element [N·m]
Fd: Corrected thrust applied to the connecting element [N]
K1: Load property　K2: Repeated heavy loads

(3) Correct the values according to the load property.

1. For the torque alone

Compare the connecting element's rated torque, T, based on the used diameter with the calculated corrected torque, Td.
For use in conditions 20ºC and under, use the K3 coefficient with T.

$T \geqq Td$　T: Connecting element's rated torque [N·m]

2. For the thrust alone

Compare the connecting element's rated thrust, F, based on the used diameter with the calculated corrected thrust, Fd.
For use in conditions 20ºC and under, use the K3 coefficient with F.

$F \geqq Fd$　F: Connecting element's rated thrust [N]

3. If torque and thrust are applied at the same time

Calculate the combined load, Mr, and compare the result with the rated torque, T.
For use in conditions 20ºC and under, use the K3 coefficient with T.

$$T \geqq Mr \qquad Mr = \sqrt{Td^2 + (Fd \times \frac{d}{2})^2}$$

Mr: Combined load applied to the connecting element [N·m]　d: Shaft diameter [m]

(4) Obtain the hub's minimum external diameter and the hollow shaft's maximum internal diameter.

1. Obtain the hub's minimum external diameter based on the usedhub material's strength.

$$DO \geqq D\sqrt{\frac{\delta_{0.2N} + CP_2}{\delta_{0.2N} - CP_2}} \qquad \begin{array}{ll} C=1 & B=L \\ C=0.8 & L<B<2L \\ C=0.6 & B \geqq 2L \end{array}$$

DO: Hub's minimum external diameter [mm]　B: Hub length [mm]
D: Hub's internal diameter [mm]　L: Effective contact length [mm]
P_2: Hub contact pressure [N/mm^2]　C: Coefficient
$\delta_{0.2N}$: Hub material's yield stress [N/mm^2]

If the hub material's yield stress value is large, make sure the ratio of the hub's minimum external diameter to the hub's internal diameter is more than about 1.3 times to prevent the hub's deformation.

2. Obtain the hollow shaft's maximum internal diameter based on the used hollow shaft material's strength.

$$di \leqq d\sqrt{\frac{\delta_{0.2N} - 2P_1C}{\delta_{0.2N}}}$$

C = 0.6 when using a single one
C = 0.8 when using multiple ones

di: Hollow shaft's maximum internal diameter [mm]　d: Shaft diameter [mm]
$\delta_{0.2N}$: Hollow shaft material's yield stress [N/mm^2]　C: Coefficient
P_1: Shaft contact pressure [N/mm^2]

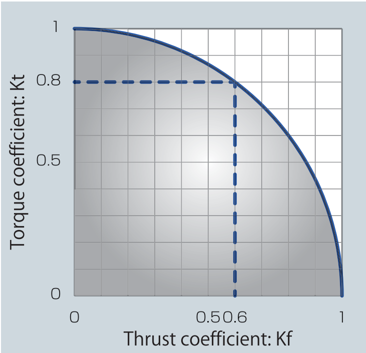
The shaft contact pressure and hub contact pressure vary depending on the operating temperature. You need to correct these values based on the operating temperature. Note that the contact pressure values were those measured at 20 ℃ . If the operating temperature exceeds 20℃ , obtain the hub's minimum external diameter and the hollow shaft's maximum internal diameter with the following formulas.

$P_1 \cdot P_2$ = contact pressure at 20℃ × temperature coefficient (K3)

The operating temperature range is from -30℃ to 85℃ .

Torque and Thrust Coefficients

If torque and thrust are applied to the ETP-E Plus at the same time, the rated values of both decrease. These values can be obtained based on the coefficients in the figure on the right.



Calculation example:
When using the ETP-E-35-N at 20℃.

Maximum rated torque, T, and thrust, F, at 20℃ ,
T = 640 [N·m] and
F = 30000 [N]
The maximum rated torque, Tmax, when the maximum thrust (Fmax = 18000 [N]) is applied can be obtained as follows.

Thrust coefficient (Kf) = Fmax / F × temperature coefficient (K3)
= 18000/30000 × 1.0 = 0.6

The torque coefficient, Kt, when Kf = 0.6 is about 0.8 based on the above figure.
Accordingly, the maximum rated torque, Tmax, in this case is as follows.

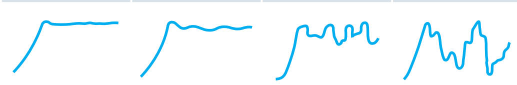
$$Tmax = T \times K3 \times Kt = 640 \times 1.0 \times 0.8 = 512\ [N\cdot m]$$

The relationship between Kt and Kf can be obtained from the following formula.

$$\sqrt{(Kt)^2 + (Kf)^2} = 1$$

Service Factor

Service factor based on the load property: K1

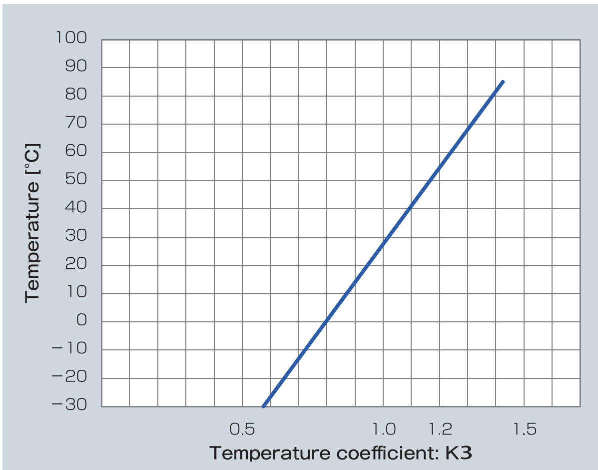


	Constant	Vibrations: Small	Vibrations: Medium	Vibrations: Large
Load property				
K1	1.0	1.25	1.75	2.25

Service factor based on the repeated heavy loads: K2

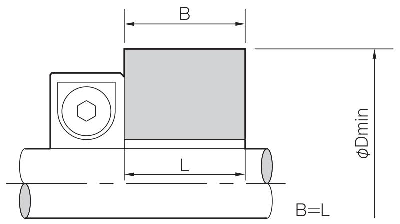
type of torque	Constant	Pulsating	Alternating
K2	1.0	1.35	2.0

Service factor based on the operating temperature (K3)



Hub's Minimum External Diameters

If the stress applied to the hub is too large, the hub may be deformed.
Select the appropriate external diameter size from the hub's minimum external diameters in the table below in the design phase.



φDmin unit [mm]

ETP-E Plus size	Hub contact pressure [N/mm^2]	Material's yield stress $\delta_{0.2}$ [N /mm^2]									
		150	180	210	230	250	280	300	350	400	450
		FC250	FC300 SS330 SC360 FCMB310	FC350 SS400 SC410 FCMB360 SUS304	SC450 S15C SF440	FCD400 SS490 SC480 S20C SF490	S30C SF540 SUS201	FCD450 S35C SF590	FCD500 S45C SUS410	FCD600 S55C SUS403	FCD700 SUS420
015	70	30	28	26	25	24	24	24	24	24	24
019	70	39	35	33	32	31	30	30	30	30	30
020	70	40	37	34	33	32	32	32	32	32	32
022	70	45	41	39	37	36	36	36	36	36	36
024	70	49	44	42	40	39	38	38	38	38	38
025	70	50	46	43	42	40	39	39	39	39	39
028	70	57	52	49	47	46	45	45	45	45	45
030	70	60	55	51	50	48	47	47	47	47	47
032	70	65	59	56	54	52	51	51	51	51	51
035	70	70	64	60	58	56	55	55	55	55	55
038	70	77	70	66	63	62	60	60	60	60	60
040	70	80	73	68	66	64	63	63	63	63	63
042	70	85	77	73	70	68	67	67	67	67	67
045	70	90	82	77	74	72	71	71	71	71	71
048	70	98	89	84	81	79	77	77	77	77	77
050	70	100	91	85	83	80	78	78	78	78	78
055	70	112	102	95	92	90	88	88	88	88	88
060	70	122	111	104	100	98	95	95	95	95	95
070	70	141	129	121	117	114	111	111	111	111	111
080	70	161	147	138	133	130	127	127	127	127	127
090	70	181	165	155	150	146	142	142	142	142	142
100	70	201	183	172	166	162	158	158	158	158	158

＊ Hub contact pressure at an operating temperature of 20℃ . The contact pressure increases as the temperature rises.
＊ If the operating temperature exceeds 20℃ , you need to obtain the hub's minimum external diameter according to the selection procedure on P. 6.
＊ The hub's minimum external diameter shows a value calculated based on C=1 in the selection procedure on P. 6.
＊ The above SUS values are proof stress values (N/mm^2) after quenching and tempering.

Items Checked for Design Purposes

■ Mounting Shaft Tolerance, Mounting Hub Tolerance, and Surface Roughness

Model	Mounting shaft tolerance	Mounting hub tolerance	Surface roughness
ETP-E-□-NH · CH	h7	H7	25S (center line's average roughness 6.3a) or less
ETP-E-□-NK · CK	k6 (option)		

■ Operating Temperature Range

Model	Operating temperature range [℃]
ETP-E-□-N	−30～85
ETP-E-□-C	

■ Concentricity and Balance

Model	Concentricity [mm]	Balance [g-mm/kg]
ETP-E-□-N	0.02	150
ETP-E-□-C		

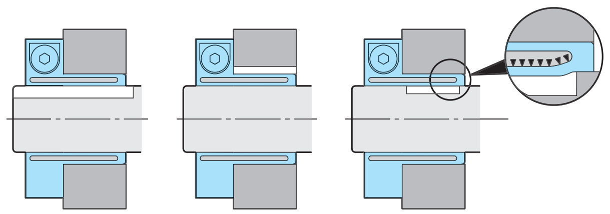
■ Number of Attachments and Detachments

The number of attachments/detachments only applies if you prevent foreign particles from adhering to the pressure screw and make sure oil containing molybdenum-based antifriction material always remains on the pressure screw's surface.
In addition, be sure to use a torque wrench and do not use an impact wrench that has large torque fluctuation.

Model	No. of attachments/detachments
ETP-E-015-N～035-N	3000
ETP-E-038-N～060-N	2000
ETP-E-070-N～100-N	750
ETP-E-015-C～035-C	1500
ETP-E-038-C～060-C	1000

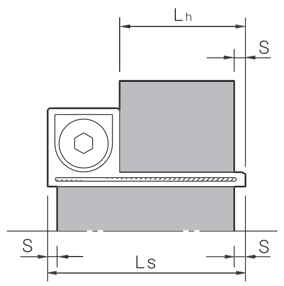
■ Keyway Shape where the ETP-E Plus Cannot Be Detached due to a Deformation of the Sleeve

The ETP-E Plus cannot be used if the shaft and hub have a keyway as shown in the figure below. Note that you can use the ETP-E Plus for the shaft and hub with a keyway if you completely fill the keyway with epoxy putty for metals and then shape it.



■ Allowable Range of Edge

The performance of the ETP-E Plus is based on the case where the shaft and the hub have the effect for the entire standard shaft length, Ls, and the entire standard hub length, Lh, respectively. Accordingly, make sure in the design phase that the shaft and the hub have the effect for the respective entire standard length. If the length of the shaft and hub is limited due to design reasons, make sure it is less than the dimension S in the figure below. If it exceeds the dimension S, stress concentrates on the sleeve edge and the sleeve is deformed, so there is the possibility that the ETP-E Plus cannot be detached.



ETP-E Plus size	S [mm]
015	2
019	2
020	2
022	3
024	3
025	3
028	4
030	4
032	4
035	4
038	5
040	5
042	5
045	5
048	5
050	5
055	5
060	5
070	8
080	8
090	8
100	8

■ Mounting

(1) Wipe the rust, dust, and oil off from the surface of the shaft and hub with a cloth or alcohol solution. In particular, if grease remains, wipe it off completely. If oil remains on the surface of the ETP-E Plus, wipe it off with a cloth, etc.
If the oil is wiped off, the friction coefficient basically changes. Never allow oil containing molybdenum-based antifriction material to contact the surface.

(2) Attach the ETP-E Plus to the hub and mount them to the shaft. If accurate positioning of the shaft and hub is needed, adjust the position of both before tightening the pressure screw.
Never tighten the pressure screw before mounting the ETP-E Plus to the shaft and hub.

(3) Tighten the pressure screw to the specified torque using a torque wrench.

■ Removal

(1) Before starting work, ensure safety by making sure no torque and thrust are applied to the ETP-E Plus and there is no risk of a fall due to the self-weight of the shaft and hub.
The ETP-E Plus does not have a self-locking mechanism. The connecting force is instantaneously released by loosening the pressure screw.

(2) Loosen the pressure screw until the connecting force is released.
The pressure screw should only be loosened. Do not remove it.

Customization Examples

Case of an Application to a Slitter Knife Holder

This is a hydraulic slitter knife holder. This holder is used to position the rotating knife to cut tin, iron, aluminum plates, or paper sheet in any position. Petitioning in the shaft direction can be performed arbitrarily with 1 bolt. For the angular deflection caused by detachment and attachment, a micron meter (μ m) level repeatable accuracy can be maintained.

Case of an Application to the Integration of a Gear

A very accurate concentricity can be maintained by integrating the gear into the device. Positioning in the shaft and fitting directions can be performed easily.

Customization of the Sleeve Length to Meet the Customer's Requirement

If the customer makes a request, the standard sleeve length can be customized (reduced) to enable it to be fitted to the thin part of the mating hub.

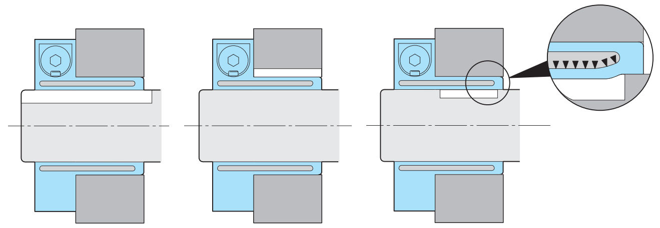
Case of an Application to a Holding Jig

This can be mounted to a work bench as a holder for assembly and machining to ensure stable work. Furthermore, work pieces can be held with an extremely high repeatable hold position accuracy.

FAQ

Q1 Can I use the ETP bushings for the shaft and hub with keyways in them?

A You can use the ETP bushing by completely filling the keyway with epoxy putty for metals and then shaping it. If you use the device with keyways on the shaft and hub, the sleeve may be deformed and the device may become unable to be detached and attached again.



Q2 Can I use the ETP bushing when the shaft and hub do not overlap the entire sleeve length?

A Because sleeve deformation is not controlled for the part where the sleeve and axis/hub do not touch, the deformation volume grows large and problems occur such as plastic deformation occurring in the sleeve or specifications not being satisfied due to insufficient friction. For details, check " Allowable Range of Edge " (P8).

Q3 Can the rated torque be transmitted even if thrust load is applied?

A The allowable torque and allowable thrust force listed are each the maximum allowable values when each is operating independently. When torque and thrust force are applied simultaneously, check the " Torque and Thrust Coefficients " (P6), derive the synthetic load and confirm that it is below the allowable torque.

Q4 If an ETP bushing slips once, can it be reused?

A Whether or not it can be reused depends on the degree of slip. If the degree of slip is small, it can be reused. However, if you reuse it, you need to check it to make sure there is no scratch on the surface of the ETP bushing, shaft, and hub, and there is no deformation on the ETP bushing main body. And, if you reuse it, you need to remove the cause of the slip.