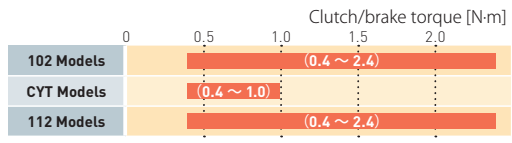
ELECTROMAGNETIC-ACTUATED MICRO CLUTCHES & BRAKES



Application	Automated teller machines, sorters, office equipment, weighing and packaging machinery, printing machinery, bookbinding machinery, optical equipment

Micro Clutches and Micro Brakes for Precise Control of Compact Precision Equipment

These micro clutches and micro brakes are ideal for compact precision equipment where variations in torque and response must be avoided, such as office equipment, communication equipment, and automobiles. In addition to the 102 (clutch) and 112 (brake) models, which share the same basic clutch/brake design, we also provide CYT models (clutches), which can be customized into a wide variety of types to meet customer needs.

Available Models

Series	Applications	Lineup	
MICRO CLUTCHES & BRAKES	Micro clutches	102	» P.260
	Custom micro clutches	CYT	» P.264
	Micro brakes	112	» P.266

For details on selection, see P.310 to 317.

Micro Clutches

102-□-□□

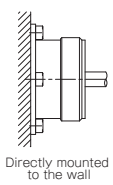
- □ (Size)
- □ (Mounting)
- □ (Shaft coupling system (armature))

■ Mounting

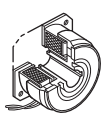
102-□-1□

Wall-mounted type

Uses a flange-mounted stator. Designed to be short in the axial direction, requiring less installation space.



Directly mounted to the wall

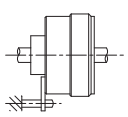


Flange-mounted type

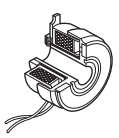
102-□-3□, CYT

Shaft-mounted type

Uses a bearing-mounted stator. Designed to be relatively easy to mount, reducing the processing and work required for mounting.



Mounted onto the shaft



Bearing-mounted type

■ Shaft coupling system (armatures)

102-□-□3

Butt and parallel shaft type (Armature type-3)

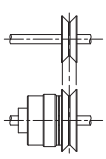
These incorporate non-armature parts provided by the customer such as V pulleys, enabling use in designs that use either butt shafts or through-shafts.

Armature type-3

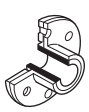
102-□-□5

Directly coupled type wound around the parallel axis (armature type-5)

Uses an armature assembly designed for use with through-shafts. Ensures that mounting is relatively easy to complete as well as extremely efficient in its approach.



Directly coupled by being wound around the parallel shaft

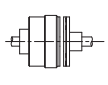


Armature type-5

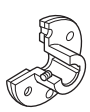
102-□-□1

Butt type (Armature type-1)

Uses an armature assembly designed for use with butt shafts. May be difficult to mount due to the need for centering and other adjustments, may require the use of a fitting flange, or may require use in combination with flexible couplings.



Coupled directly to the butt shaft



Armature type-1

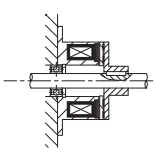
Micro Brakes

112-□-1□

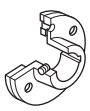
- □ (Size)
- □ (Shaft Coupling System (Armature))

Shaft-mounted type

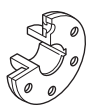
These use axial braking in most cases, the effectiveness of which depends on how efficiently parts are mounted.



Mounted to the shaft



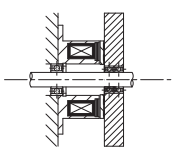
Armature type-1



Armature type-2

Rotor-mounted type

Uses an armature assembly mounted directly to an inertial body not fastened to the shaft that continues to move even after the shaft has stopped.



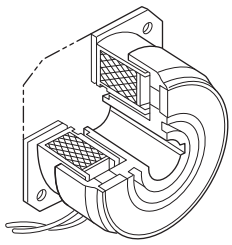
Mounted to the rotor

Armature type-3

Product Lineup

102-□-1□ Electromagnetic-actuated Micro Clutches - Flange-mounted Type

RoHS-compliant

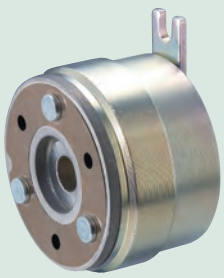


Flange-mounted type

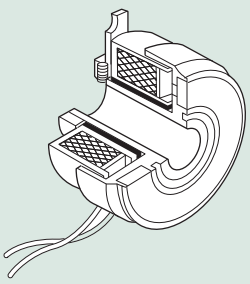
Stator and rotor are combined and directly mounted on stationary parts, such as frames, and fixed in place. These are short in the axial direction and can use space near walls effectively. Select the armature according to the coupling type used (through-shaft, butt shaft, etc.).

Clutch torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

102-□-3□ Electromagnetic-actuated Micro Clutches - Bearing-mounted Type



RoHS-compliant



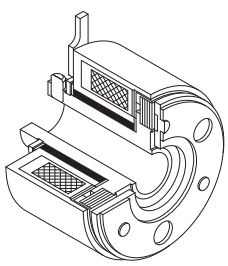
Bearing-mounted type

These integrate the stator and rotor, which are held to the stationary parts of the machine by a drive pin arm; the rotor is locked to the rotation shaft by a set screw. They are designed to be relatively easy to mount, reducing the processing work required for mounting. Select the armature according to the coupling type used (through-shaft, butt shaft, etc.).

Clutch torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

CYT Electromagnetic-actuated Micro Clutches - Custom Type

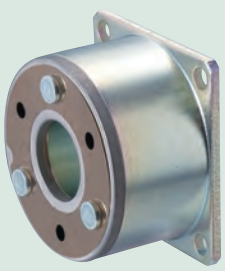
RoHS-compliant



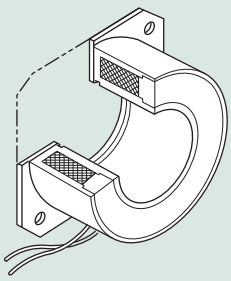
The CYT models are the basic building blocks for customized micro-clutches. The basic model is bearing mounted. Two types are available for different shaft rotation speeds: a dry metal type and a ball bearing type. Armature type-3 is standard, but many customizations are possible.

Clutch torque	[N·m]	0.4～1.0
Operating temperature	[℃]	−10～+40
Backlash		Zero

112 Electromagnetic-actuated Micro Brakes



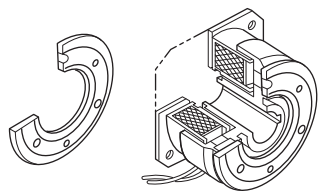
RoHS-compliant (except size #02)



Brakes are used to brake and hold rotating bodies. The flange of the stator is locked securely to a strong stationary part. Select an armature that factors in the mounting space available.

Brake torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

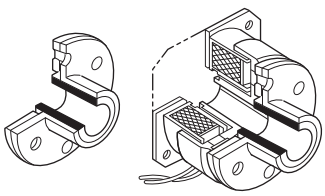
Types for through-shaft or butt shaft



Armature type-3 102- □ -13

» P.260

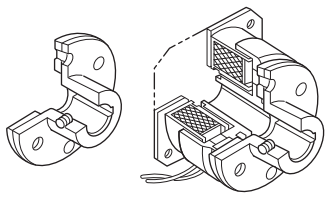
Through-shaft (coupled by winding around parallel shaft) type



Armature type-5 102- □ -15

» P.261

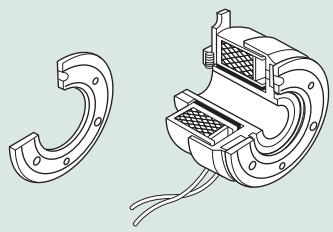
Butt shaft type



Armature type-1 102- □ -11

» P.261

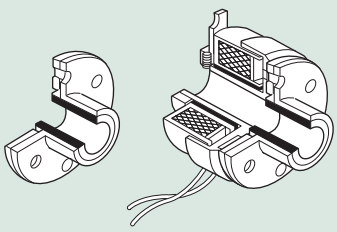
Types for through-shaft or butt shaft



Armature type-3 102- □ -33

» P.262

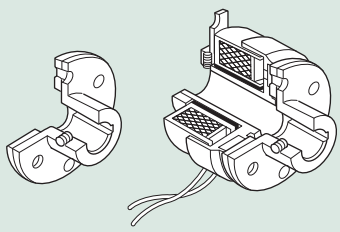
Through-shaft (coupled by winding around parallel shaft) type



Armature type-5 102- □ -35

» P.263

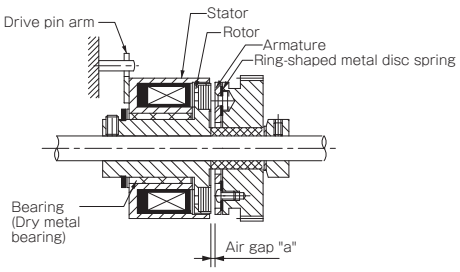
Butt shaft type



Armature type-1 102- □ -31

» P.263

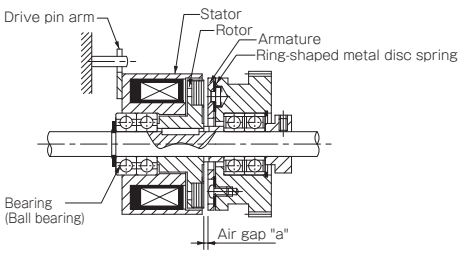
Dry metal type



CYT- □ -33M

» P.264

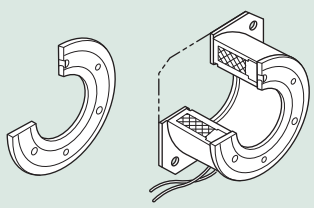
Ball bearing type



CYT- □ -33B

» P.265

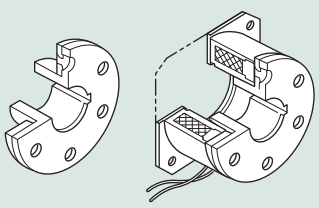
Types with many applications



Armature type-3 112- □ -13

» P.266

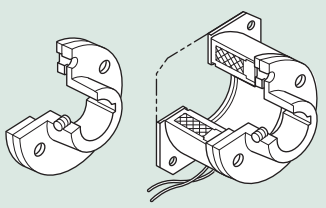
Slim, space-saving type



Armature type-2 112- □ -12

» P.267

Easy-to-use standard-shape type



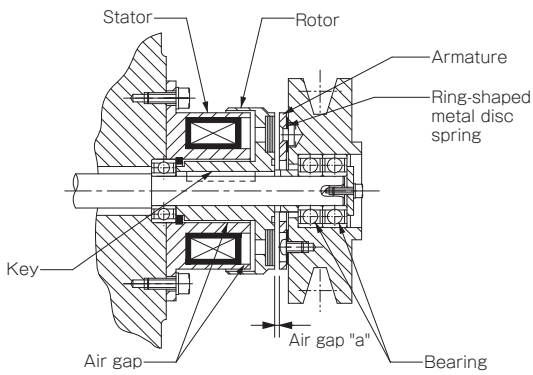
Armature type-1 112- □ -11

» P.267

Mounting and CYT Customization Examples

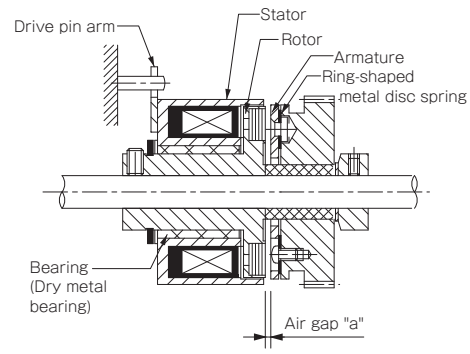
Flange-mounting example with 102

The stator is directly mounted on a stationary part, such as a frame, by a mounting flange, and fixed in place. The rotor is locked to the rotation shaft using a key. The stator and rotor are combined via a narrow air gap that serves as part of the magnetic circuit to form a magnetic pole.



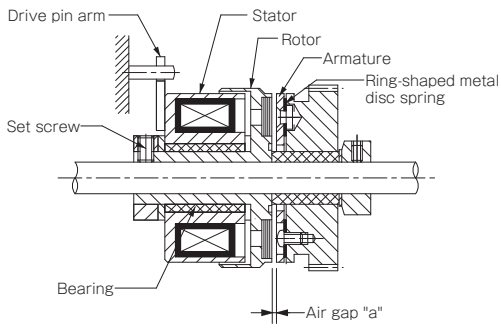
Dry-metal type mounting example with CYT

The stator is integrated with the rotor via dry metal, and held to the stationary parts of the machine by a drive pin arm. The rotor is locked to the rotation shaft using a set screw. The stator and rotor form a magnetic pole via the dry metal.



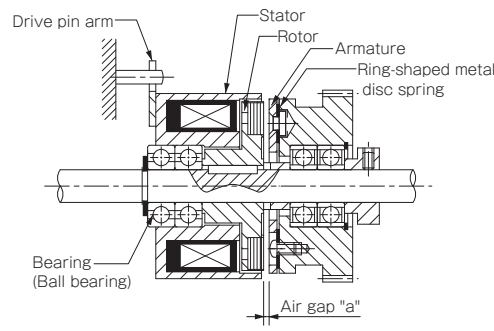
Bearing-mounting example with 102.

The stator is integrated with the rotor via a bearing and held to the stationary parts of the machine by a drive pin arm. The rotor is locked to the rotation shaft using a set screw. The stator and rotor form a magnetic pole via the bearing (ferrous oil-impregnated metal).



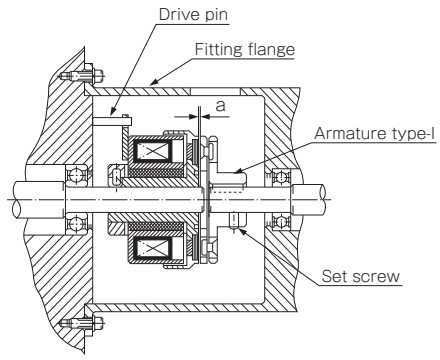
Ball-bearing type mounting example with CYT

The stator is mounted on the shaft via a bearing and held to the stationary parts of the machine by a drive pin arm. The stator and rotor are combined via a narrow air gap that serves as part of the magnetic circuit to form a magnetic pole.



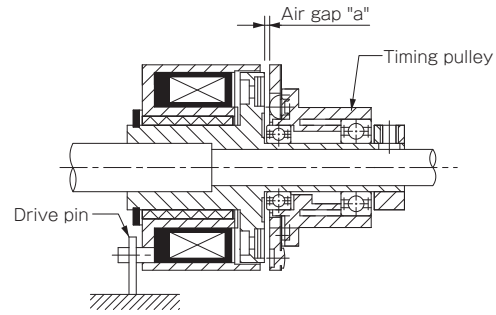
Butt shaft mounting example with 102

In designs that use butt shafts, the two shafts can be reliably centered using fitting flanges, as shown in the figure.



Dry-metal type embedding example with CYT

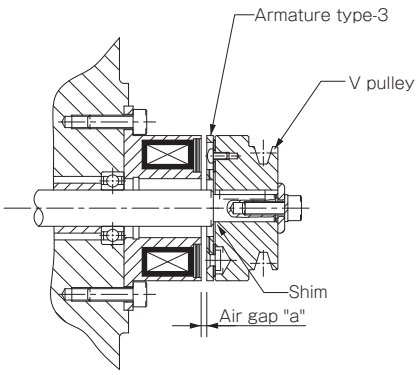
We design to your requirements using timing pulleys, gears and the like mounted on armature type-3.



Mounting and CYT Customization Examples

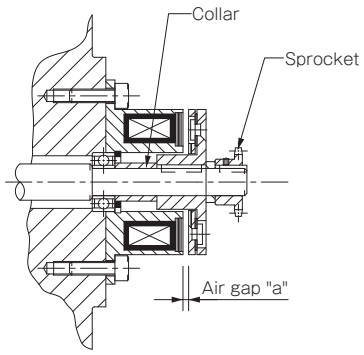
Armature type-3 mounting example with 112

Armature type-3 is used by directly mounting it to a transmission element such as a V-pulley or to a rotating body that stops inertial force.
The shaft of the brake part requires no processing. The shaft diameter may also be determined freely. Air gap "a" can be set easily using collars and shims. Corrections are easily accomplished by adding or removing shims.



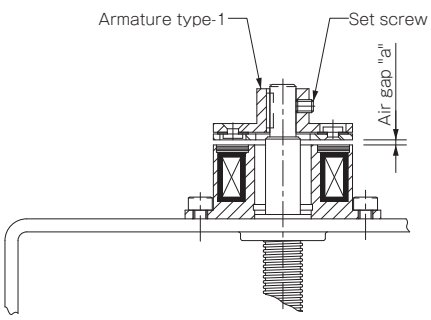
Armature type-2 mounting example with 112

Armature type-2 has the smallest mounting-space footprint of any of the armatures, so overhang is not a concern even when a sprocket or the like is mounted on the brake tip.
Air gap "a" can be set easily using collars and shims.
Corrections are easily accomplished by adding or removing shims.



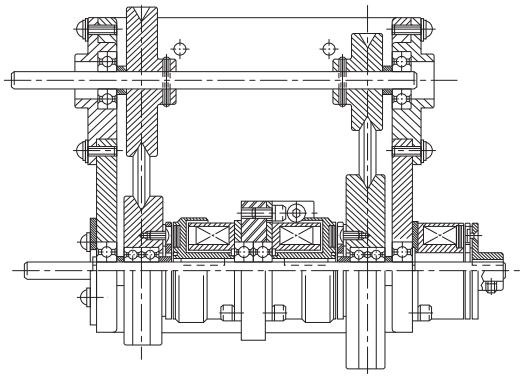
Armature type-1 mounting example on vertical shaft with 112

Since there is no restriction on mounting direction, there is no running torque or abnormal wear even when mounted on vertical shafts.
It is easy to set air gap a: simply move armature type-1 and lock it in place with a set screw.



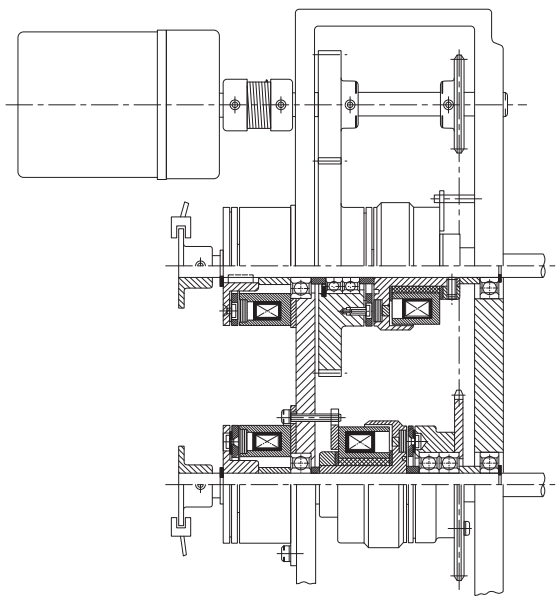
Example of the combination of clutches and brakes

This example uses a two-step speed-change mechanism combining two clutches and a brake.



Example of the combination of clutches and brakes

Shaft drive is both forward and reverse in combination with a clutch in this example. Start and stop freely by mounting brakes on each shaft.



102-□-1□ Types Electromagnetic Micro Clutches - Flange-mounted Type

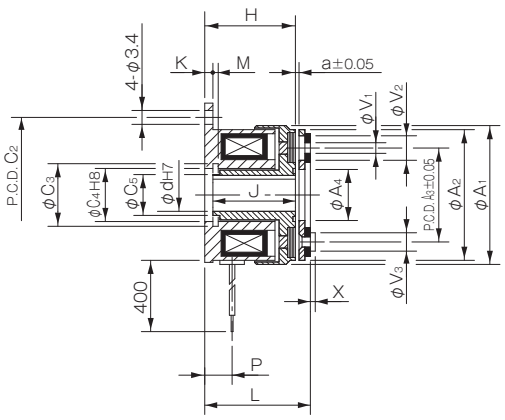
Specifications

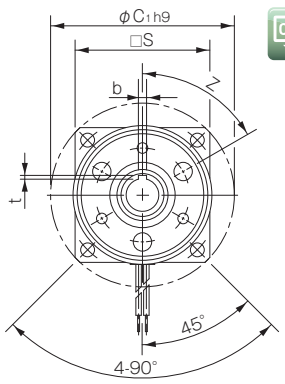
Model	Size	Dynamic friction torque Td [N·m]	Coil (at 20°C) Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]	Heat resistance class	Max. rotation speed [min⁻¹]	Rotating part moment of inertia J Armature [kg·m²]	Rotor [kg·m²]	Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
102-02-13								10000	6.75×10^{-7}							0.075
102-02-15	02	0.4	DC24	6	0.25	96	B	500	1.00×10^{-6}	2.45×10^{-6}	1500	2×10^{6}	0.009	0.019	0.017	0.081
102-02-11								10000	1.00×10^{-6}							0.079
102-03-13								10000	1.30×10^{-6}							0.096
102-03-15	03	0.6	DC24	6	0.25	96	B	500	1.95×10^{-6}	3.25×10^{-6}	2300	3×10^{6}	0.009	0.022	0.020	0.105
102-03-11								10000	1.95×10^{-6}							0.103
102-04-13								10000	4.38×10^{-6}							0.178
102-04-15	04	1.2	DC24	8	0.33	72	B	500	6.15×10^{-6}	1.41×10^{-5}	4500	6×10^{6}	0.011	0.028	0.030	0.195
102-04-11								10000	6.15×10^{-6}							0.191
102-05-13								10000	9.08×10^{-6}							0.310
102-05-15	05	2.4	DC24	10	0.42	58	B	500	1.38×10^{-5}	3.15×10^{-5}	9000	9×10^{6}	0.012	0.031	0.040	0.335
102-05-11								10000	1.38×10^{-5}							0.325

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The moment of inertia of a rotating body and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (102-□-13)

(For direct mounting)





Unit [mm]

Size	Shaft bore dimensions d_1 H7	Models compliant with the new JIS standards b P9	t	Models compliant with the old JIS standards b E9	t
02	5	—	—		
03	6	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
04	8	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
05	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
	15	$5\ ^{-0.012}_{-0.042}$	$2\ ^{+0.5}_{0}$	$5\ ^{+0.050}_{+0.020}$	$2\ ^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions A_1	A_2	A_3	A_4	C_1	C_2	C_3	C_4	C_5	S	V_1	V_2	V_3	Z	Axial direction dimensions H	J	K	L	P	M	a	X
02	31	28	19.5	10.5	39	33.5	11.4	11	8	—	2-2.1	2-5.3	2-4	4-90°	18	16.5	1.5	20.5	5	1.1	0.1	0.8
03	34	32	23	12.5	45	38	13.6	13	10	33	3-2.6	3-6	3-4.5	6-60°	22.2	20.2	2	24.5	6.7	1.3	0.15	1.2
04	43	40	30	18.5	54	47	20	19	15.5	41	3-3.1	3-6	3-5	6-60°	25.4	23.4	2	28.2	7	1.3	0.15	1.5
05	54	50	38	25.5	65	58	27.2	26	22	51	3-3.1	3-6.5	3-5.5	6-60°	28.1	26.1	2	31.3	8.2	1.5	0.2	1.5

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

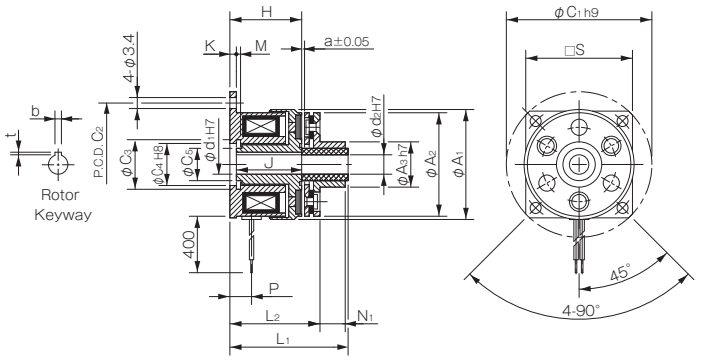
102-03-13 24V 6DIN

- 102-03-13: Size — Rotor bore diameter (dimensional symbol d)
- 24V: Coil voltage
- 6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (102- □ -15)

(For through-shafts)



Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards: b P9	t	Models compliant with the old JIS standards: b E9	t
02	5	5	—	—		
03	6	6	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
04	8	8	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
05	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
	15	15	$5^{-0.012}_{-0.042}$	$2^{+0.5}_{0}$	$5^{+0.050}_{+0.020}$	$2^{+0.5}_{0}$

* The armature type-5 bore d_2 is a straight bore.

Unit [mm]

Size	Radial direction dimensions									Axial direction dimensions								
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	C_5	S	H	J	K	L_1	L_2	M	P	N_1	a
02	31	28	13	39	33.5	11.4	11	8	—	18	16.5	1.5	27.5	22.4	1.1	5	4.8	0.1
03	34	32	14	45	38	13.6	13	10	33	22.2	20.2	2	34.5	26.5	1.3	6.7	7.8	0.15
04	43	40	18	54	47	20	19	15.5	41	25.4	23.4	2	40.2	30.8	1.3	7	9.1	0.15
05	54	50	28	65	58	27.2	26	22	51	28.1	26.1	2	43.3	34.3	1.5	8.2	8.8	0.2

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

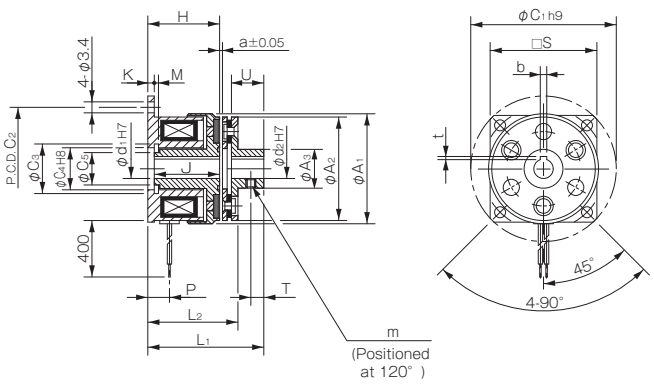
102-03-15 24V R6DIN A6

- 102-03-15: Size
- Rotor bore diameter (dimensional symbol d1)
- R6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- A6: Armature bore diameter (dimensional symbol d2)

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (102- □ -11)

(For butt shafts)



Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards: b P9	t	Models compliant with the old JIS standards: b E9	t
02	5	5	—	—		
03	6	6	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
04	8	8	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
05	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
	15	15	$5^{-0.012}_{-0.042}$	$2^{+0.5}_{0}$	$5^{+0.050}_{+0.020}$	$2^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions										Axial direction dimensions									
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	C_5	S	m	H	J	K	L_1	L_2	M	P	U	T	a
02	31	28	9.5	39	33.5	11.4	11	8	—	M3	18	16.5	1.5	27.5	22.5	1.1	5	7	2.5	0.1
03	34	32	12	45	38	13.6	13	10	33	2-M3	22.2	20.2	2	34.5	26.5	1.3	6.7	10	4	0.15
04	43	40	17	54	47	20	19	15.5	41	2-M3	25.4	23.4	2	40.2	30.8	1.3	7	12	5	0.15
05	54	50	24	65	58	27.2	26	22	51	2-M4	28.1	26.1	2	43.3	34.3	1.5	8.2	12	5	0.2

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

102-03-11 24V R6DIN A6DIN

- 102-03-11: Size
- Rotor bore diameter (dimensional symbol d1)
- R6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- A6DIN: Armature bore diameter (dimensional symbol d2)
- Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

102-□-3□ Types Electromagnetic Micro Clutches - Bearing-mounted Type

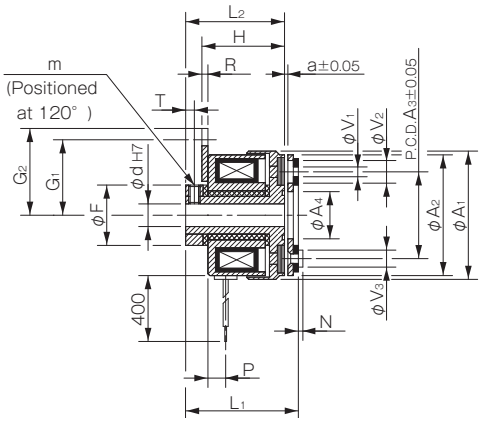
Specifications

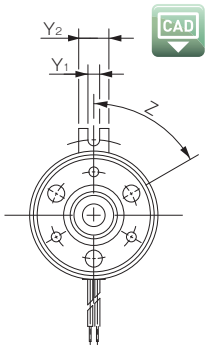
Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Rotating part moment of inertia J		Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]			Armature [kg·m^2]	Rotor [kg·m^2]						
102-02-33									6.75×10^{-7}							0.076
102-02-35	02	0.4	DC24	6	0.25	96	B	500	1.00×10^{-6}	2.75×10^{-6}	1500	2×10^{6}	0.009	0.019	0.017	0.082
102-02-31									1.00×10^{-6}							0.080
102-03-33									1.30×10^{-6}							0.101
102-03-35	03	0.6	DC24	6	0.25	96	B	500	1.95×10^{-6}	4.08×10^{-6}	2300	3×10^{6}	0.009	0.022	0.020	0.110
102-03-31									1.95×10^{-6}							0.108
102-04-33									4.38×10^{-6}							0.183
102-04-35	04	1.2	DC24	8	0.33	72	B	500	6.15×10^{-6}	1.44×10^{-5}	4500	6×10^{6}	0.011	0.028	0.030	0.200
102-04-31									6.15×10^{-6}							0.196
102-05-33									9.08×10^{-6}							0.321
102-05-35	05	2.4	DC24	10	0.42	58	B	500	1.38×10^{-5}	2.90×10^{-5}	9000	9×10^{6}	0.012	0.031	0.040	0.346
102-05-31									1.38×10^{-5}							0.336

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The moment of inertia of a rotating body and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (102-□-33)

(For direct mounting)





Unit [mm]

Size	Shaft bore dimensions
	d H7
02	5
03	6
04	8
	10
05	10
	15

Unit [mm]

Size	Radial direction dimensions														Axial direction dimensions							
	A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	Y_1	Y_2	Z	m	H	R	L_1	L_2	P	N	T	a
02	31	28	19.5	10.5	14	2-2.1	2-5.3	2-4	16.8	20	3.1	8	4-90°	2-M3	19.5	1.6	25.9	23.5	5	0.8	2.5	0.1
03	34	32	23	12.5	16	3-2.6	3-6	3-4.5	20	23	3.1	8	6-60°	2-M3	21.9	1.6	28.5	26.2	4.7	1.2	2.3	0.15
04	43	40	30	18.5	22	3-3.1	3-6	3-5	23	26	3.1	8	6-60°	2-M4	25.1	1.6	33.2	30.4	5	1.5	2.8	0.15
05	54	50	38	25.5	30	3-3.1	3-6.5	3-5.5	28	31	3.1	8	6-60°	2-M5	27.9	1.6	37.3	34.1	6	1.5	3.3	0.2

How to Place an Order

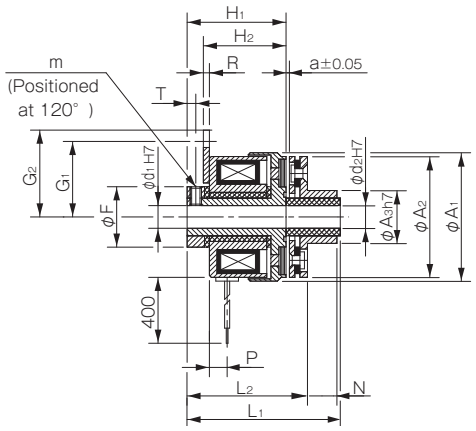
102-03-33 24V 6

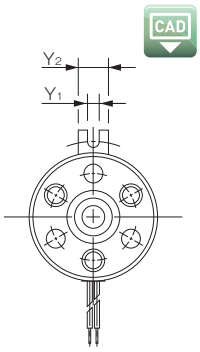
Size

Rotor bore diameter (dimensional symbol d)

Dimensions (102- □ -35)

(For through-shafts)





Unit [mm]

Size	Shaft bore dimensions	
	d_1 H7	d_2 H7
02	5	5
03	6	6
04	8	8
	10	10
05	10	10
	15	15

Unit [mm]

Size	Radial direction dimensions									Axial direction dimensions								
	A_1	A_2	A_3	F	G_1	G_2	Y_1	Y_2	m	H_1	H_2	R	L_1	L_2	P	N	T	a
02	31	28	13	14	16.8	20	3.1	8	2-M3	23.5	19.5	1.6	33	27.9	5	4.8	2.5	0.1
03	34	32	14	16	20	23	3.1	8	2-M3	26.2	21.9	1.6	38.5	30.5	4.7	7.8	2.3	0.15
04	43	40	18	22	23	26	3.1	8	2-M4	30.4	25.1	1.6	45.2	35.8	5	9.1	2.8	0.15
05	54	50	28	30	28	31	3.1	8	2-M5	34.1	27.9	1.6	49.3	40.3	6	8.8	3.3	0.2

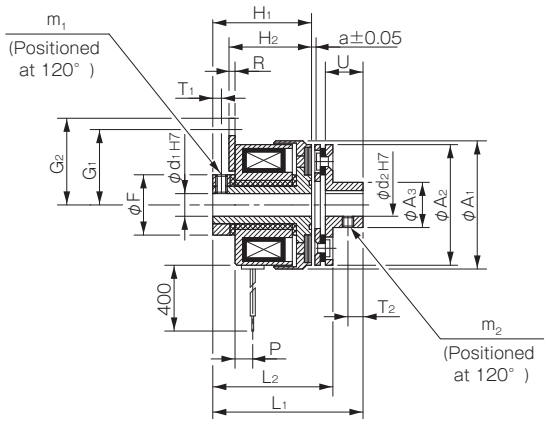
How to Place an Order

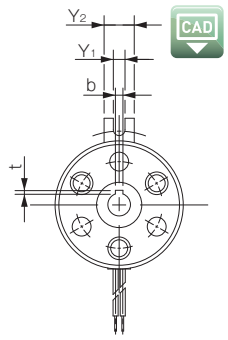
102-03-35 24V R6 A6

- 102-03-35: Size
- R6: Rotor bore diameter (dimensional symbol d1)
- A6: Armature bore diameter (dimensional symbol d2)

Dimensions (102- □ -31)

(For butt shafts)





Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
			b P9	t	b E9	t
02	5	5	—	—		
03	6	6	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
04	8	8	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
	10	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
05	10	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
	15	15	$5\ ^{-0.012}_{-0.042}$	$2\ ^{+0.5}_{0}$	$5\ ^{+0.050}_{+0.020}$	$2\ ^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions										Axial direction dimensions									
	A_1	A_2	A_3	F	G_1	G_2	Y_1	Y_2	m_1	m_2	H_1	H_2	R	L_1	L_2	P	U	T_1	T_2	a
02	31	28	9.5	14	16.8	20	3.1	8	2-M3	M3	23.5	19.5	1.6	33	27.9	5	7	2.5	2.5	0.1
03	34	32	12	16	20	23	3.1	8	2-M3	2-M3	26.2	21.9	1.6	38.5	30.5	4.7	10	2.3	4	0.15
04	43	40	17	22	23	26	3.1	8	2-M4	2-M3	30.4	25.1	1.6	45.2	35.8	5	12	2.8	5	0.15
05	54	50	24	30	28	31	3.1	8	2-M5	2-M4	34.1	27.9	1.6	49.3	40.3	6	12	3.3	5	0.2

How to Place an Order

102-03-31 24V R6 A6DIN

- 102-03-31: Size
- R6: Rotor bore diameter (dimensional symbol d1)
- A6DIN: Armature bore diameter (dimensional symbol d2)
- DIN: Keyway standards — Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

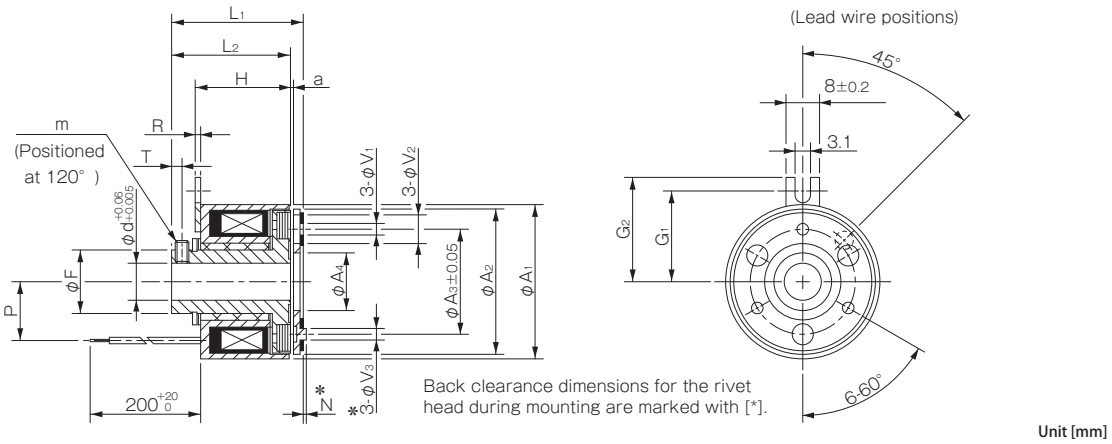
CYT Models Electromagnetic Micro Clutches - Bearing-mounted Type

Specifications

Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Rotating part moment of inertia		Allowable engaging energy $E_{ea\ell}$ [J]	Total work E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]			Armature [kg·m^2]	Rotor [kg·m^2]						
CYT-025-33B	025	0.4	DC24	4.5	0.188	128	B	3600	1.00×10^{-6}	1.43×10^{-6}	800	1.0×10^{6}	0.014	0.028	0.030	0.07
CYT-03-33B	03	0.5	DC24	5.5	0.23	105	B	3600	1.30×10^{-6}	1.85×10^{-6}	900	1.5×10^{6}	0.015	0.030	0.040	0.13
CYT-03-33M								500		1.90×10^{-6}						0.11
CYT-04-33B	04	1.0	DC24	5.9	0.25	98	B	3600	5.15×10^{-6}	1.00×10^{-5}	1900	2.0×10^{6}	0.030	0.040	0.040	0.26
CYT-04-33M								500		1.05×10^{-5}						0.23

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The rotating part moment of inertia and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage. Also, be careful that energization does not exceed 50%.

Dimensions (CYT-□-33M)



Unit [mm]

Size	Radial direction dimensions												Axial direction dimensions							
	d	A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	m	H	R	L_1	L_2	P	N	T	a
03	6 8	34	32	23	12.5	14	3-2.6	3-5.5	3-6	20	23	M3	21	1.2	28.6	26.2	13	3	2.3	0.2 ±0.05
04	8 10	45	42	30	18.5	18	3-3.1	3-6	3-6	25	27.5	M4	25.3	1.2	35.1	32.4	17.5	3.5	3	0.2 +0.05 −0.1

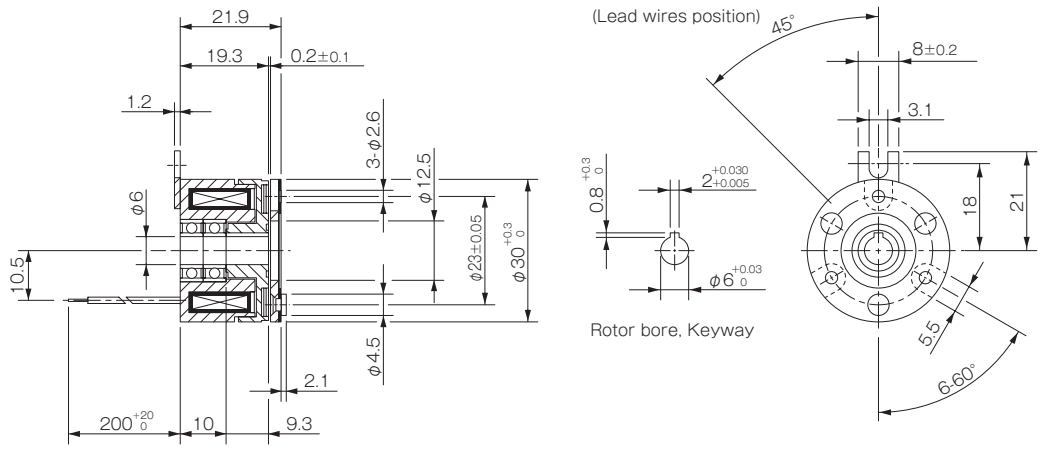
* Dimensional symbols N and V3 indicate the clearance dimensions for the rivet head during mounting.

How to Place an Order

CYT-03-33M 24V 6

Size — Rotor bore diameter (dimensional symbol d)

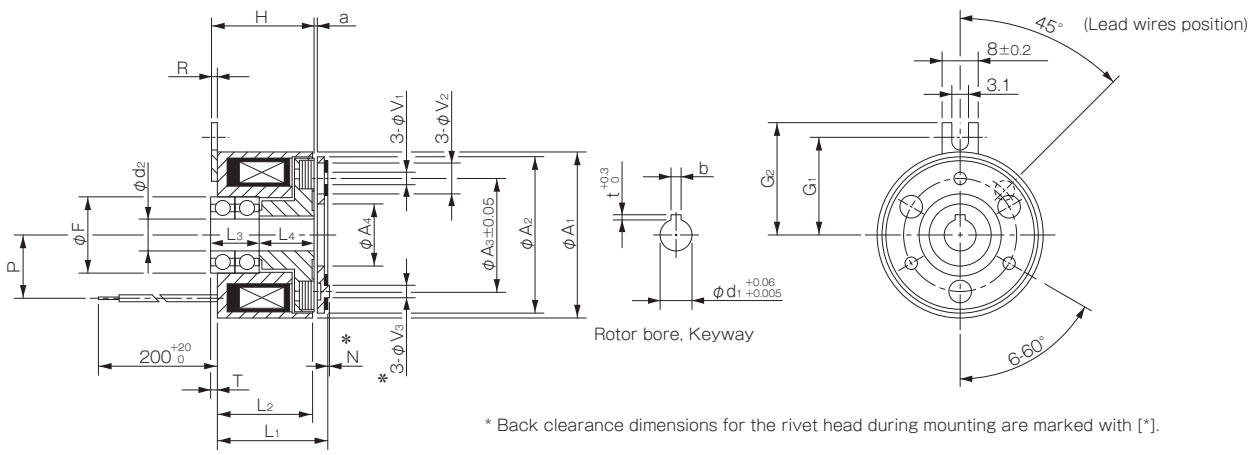
Dimensions (CYT-025-33B)



How to Place an Order

CYT-025-33B 24V 6

Dimensions (CYT-□-33B)



* Back clearance dimensions for the rivet head during mounting are marked with [*].

Unit [mm]

Size	Nominal diameter	Radial direction dimensions										Axial direction dimensions										Shaft bore dimensions			
		A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	H	R	L_1	L_2	L_3	L_4	P	N	T	a	d_2	d_1	b	t
03	6	34	32	23	12.5	15	3-2.6	3-5.5	3-6	20	23	21	1.2	22.2	19.8	10	11.3	13	3	1.5	0.2 ±0.05	6	6	2 +0.030 +0.005	0.8 +0.3 0
	8	34	32	23	12.5	16	3-2.6	3-5.5	3-6	20	23	21	1.2	22.2	19.8	10	11.3	13	3	1.5	0.2 ±0.05	8	8	2 +0.030 +0.005	0.8 +0.3 0
04	8	45	42	30	18.5	19	3-3.1	3-6	3-6	25	28	25.3	1.2	26.8	24.1	12	13	17.5	3.5	0.9	0.2 +0.05 −0.1	8	8	2 +0.030 +0.005	0.8 +0.3 0
	10	45	42	30	18.5	19	3-3.1	3-6	3-6	25	28	25.3	1.2	26.8	24.1	14	11	17.5	3.5	0.9	0.2 +0.05 −0.1	10	10	3 +0.025 0	1.2 +0.3 0

* Dimensional symbols N and V3 indicate the clearance dimensions for the rivet head during mounting.

How to Place an Order

CYT-03-33B 24V 6

Size — Nominal diameter

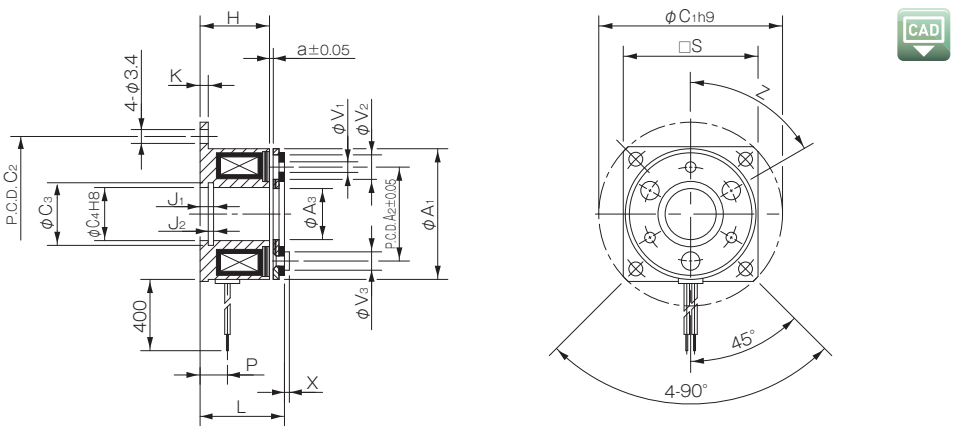
112 Models Electromagnetic Micro Brakes

Specifications

Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Armature moment of inertia J [kg·m^2]	Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until Readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque build-up time t_p [s]	Torque decaying time td [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]									
112-02-13									6.75×10^{-7}						0.053
112-02-12	02	0.4	DC24	6	0.25	96	B	10000	1.00×10^{-6}	1500	2×10^6	0.004	0.010	0.010	0.057
112-02-11									1.00×10^{-6}						0.057
112-03-13									1.30×10^{-6}						0.072
112-03-12	03	0.6	DC24	6	0.25	96	B	10000	1.95×10^{-6}	2300	3×10^6	0.005	0.012	0.008	0.079
112-03-11									1.95×10^{-6}						0.079
112-04-13									4.38×10^{-6}						0.118
112-04-12	04	1.2	DC24	8	0.33	72	B	10000	6.15×10^{-6}	4500	6×10^6	0.007	0.016	0.010	0.131
112-04-11									6.15×10^{-6}						0.131
112-05-13									9.08×10^{-6}						0.200
112-05-12	05	2.4	DC24	10	0.42	58	B	10000	1.38×10^{-5}	9000	9×10^6	0.010	0.023	0.012	0.215
112-05-11									1.38×10^{-5}						0.215

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The rotating part moment of inertia and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (112- □ -13)



Unit [mm]

Size	Radial direction dimensions												Axial direction dimensions							
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	S	V_1	V_2	V_3	Z	H	K	J_1	J_2	L	P	X	a
02	28	19.5	10.5	39	33.5	11.4	11	—	2-2.1	2-5.3	2-4	4-90°	13.7	1.5	2.6	1.3	16.1	5	0.8	0.1
03	32	23	12.5	45	38	13.6	13	33	3-2.6	3-6	3-4.5	6-60°	17	2	3.3	1.3	19.3	6.7	1.2	0.15
04	40	30	18.5	54	47	20	19	41	3-3.1	3-6	3-5	6-60°	20	2	3.3	1.3	22.8	7	1.6	0.15
05	50	38	25.5	65	58	27.2	26	51	3-3.1	3-6.5	3-5.5	6-60°	22	2	3.5	1.5	25.2	8	1.6	0.2

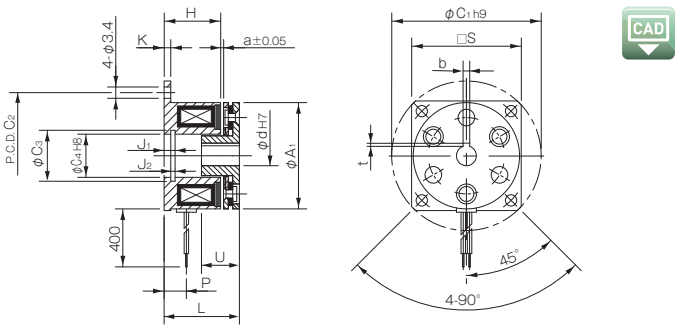
* Size 02 is a rounded flange.

How to Place an Order

112-03-13 24V

Size

Dimensions (112- □ -12)



CAD

Unit [mm]

Size	Shaft bore dimensions				
	d H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
		b P9	t	b E9	t
02	5	—	—		
03	6	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
04	8	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
05	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
	15	5 $^{-0.012}_{-0.042}$	2 $^{+0.5}_{0}$	5 $^{+0.050}_{+0.020}$	2 $^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions						Axial direction dimensions							
	A_1	C_1	C_2	C_3	C_4	S	H	K	J_1	J_2	L	P	U	a
02	28	39	33.5	11.4	11	—	13.7	1.5	2.6	1.3	18.1	5	7	0.1
03	32	45	38	13.6	13	33	17	2	3.3	1.3	21.3	6.7	10	0.15
04	40	54	47	20	19	41	20	2	3.3	1.3	25.5	7	12	0.15
05	50	65	58	27.2	26	51	22	2	3.5	1.5	28.2	8	12	0.2

* Size 02 is a rounded flange.
* The armature hub of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

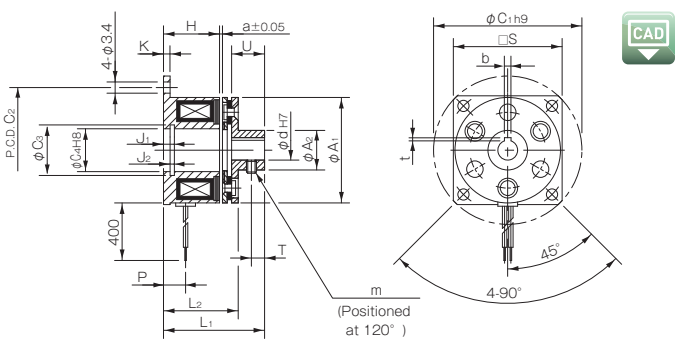
How to Place an Order

112-03-12 24V 6DIN

- Size: 112-03-12
- Keyway standards: DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- Armature bore diameter (dimensional symbol d): 6DIN

* Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (112- □ -11)



CAD

Unit [mm]

Size	Shaft bore dimensions				
	d H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
		b P9	t	b E9	t
02	5	—	—		
03	6	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
04	8	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
05	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
	15	5 $^{-0.012}_{-0.042}$	2 $^{+0.5}_{0}$	5 $^{+0.050}_{+0.020}$	2 $^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions								Axial direction dimensions									
	A_1	A_2	C_1	C_2	C_3	C_4	S	m	H	K	J_1	J_2	L_1	L_2	P	U	T	a
02	28	9.5	39	33.5	11.4	11	—	M3	13.7	1.5	2.6	1.3	23.1	18.1	5	7	2.5	0.1
03	32	12	45	38	13.6	13	33	2-M3	17	2	3.3	1.3	29.3	21.3	6.7	10	4	0.15
04	40	17	54	47	20	19	41	2-M3	20	2	3.3	1.3	34.8	25.5	7	12	5	0.15
05	50	24	65	58	27.2	26	51	2-M4	22	2	3.5	1.5	37.2	28.2	8	12	5	0.2

* Size 02 is a rounded flange.

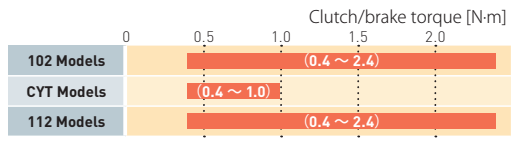
How to Place an Order

112-03-11 24V 6DIN

- Size: 112-03-11
- Keyway standards: DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- Armature bore diameter (dimensional symbol d): 6DIN

* Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

ELECTROMAGNETIC-ACTUATED MICRO CLUTCHES & BRAKES



Application	Automated teller machines, sorters, office equipment, weighing and packaging machinery, printing machinery, bookbinding machinery, optical equipment

Micro Clutches and Micro Brakes for Precise Control of Compact Precision Equipment

These micro clutches and micro brakes are ideal for compact precision equipment where variations in torque and response must be avoided, such as office equipment, communication equipment, and automobiles. In addition to the 102 (clutch) and 112 (brake) models, which share the same basic clutch/brake design, we also provide CYT models (clutches), which can be customized into a wide variety of types to meet customer needs.

Available Models

Series	Applications	Lineup	
MICRO CLUTCHES & BRAKES	Micro clutches	102	» P.260
	Custom micro clutches	CYT	» P.264
	Micro brakes	112	» P.266

For details on selection, see P.310 to 317.

Micro Clutches

102-□-□□

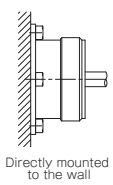
- □ (Size)
- □ (Mounting)
- □ (Shaft coupling system (armature))

■ Mounting

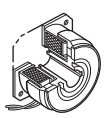
102-□-1□

Wall-mounted type

Uses a flange-mounted stator. Designed to be short in the axial direction, requiring less installation space.



Directly mounted to the wall

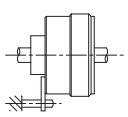


Flange-mounted type

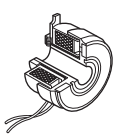
102-□-3□, CYT

Shaft-mounted type

Uses a bearing-mounted stator. Designed to be relatively easy to mount, reducing the processing and work required for mounting.



Mounted onto the shaft



Bearing-mounted type

■ Shaft coupling system (armatures)

102-□-□3

Butt and parallel shaft type (Armature type-3)

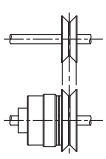
These incorporate non-armature parts provided by the customer such as V pulleys, enabling use in designs that use either butt shafts or through-shafts.

Armature type-3

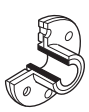
102-□-□5

Directly coupled type wound around the parallel axis (armature type-5)

Uses an armature assembly designed for use with through-shafts. Ensures that mounting is relatively easy to complete as well as extremely efficient in its approach.



Directly coupled by being wound around the parallel shaft

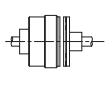


Armature type-5

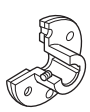
102-□-□1

Butt type (Armature type-1)

Uses an armature assembly designed for use with butt shafts. May be difficult to mount due to the need for centering and other adjustments, may require the use of a fitting flange, or may require use in combination with flexible couplings.



Coupled directly to the butt shaft



Armature type-1

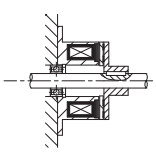
Micro Brakes

112-□-1□

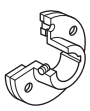
- □ (Size)
- □ (Shaft Coupling System (Armature))

Shaft-mounted type

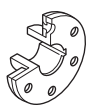
These use axial braking in most cases, the effectiveness of which depends on how efficiently parts are mounted.



Mounted to the shaft



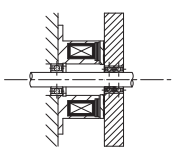
Armature type-1



Armature type-2

Rotor-mounted type

Uses an armature assembly mounted directly to an inertial body not fastened to the shaft that continues to move even after the shaft has stopped.



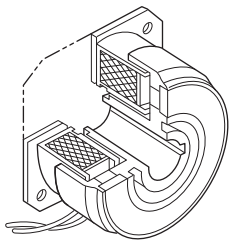
Mounted to the rotor

Armature type-3

Product Lineup

102-□-1□ Electromagnetic-actuated Micro Clutches - Flange-mounted Type

RoHS-compliant

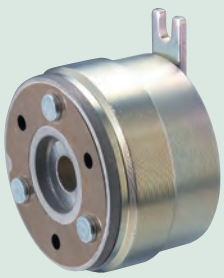


Flange-mounted type

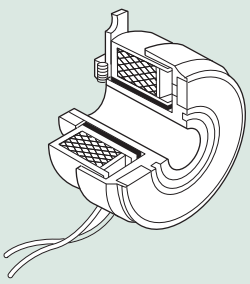
Stator and rotor are combined and directly mounted on stationary parts, such as frames, and fixed in place. These are short in the axial direction and can use space near walls effectively. Select the armature according to the coupling type used (through-shaft, butt shaft, etc.).

Clutch torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

102-□-3□ Electromagnetic-actuated Micro Clutches - Bearing-mounted Type



RoHS-compliant



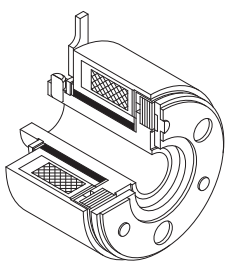
Bearing-mounted type

These integrate the stator and rotor, which are held to the stationary parts of the machine by a drive pin arm; the rotor is locked to the rotation shaft by a set screw. They are designed to be relatively easy to mount, reducing the processing work required for mounting. Select the armature according to the coupling type used (through-shaft, butt shaft, etc.).

Clutch torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

CYT Electromagnetic-actuated Micro Clutches - Custom Type

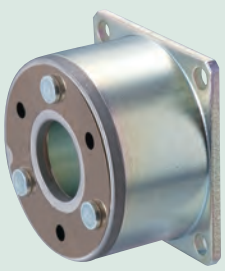
RoHS-compliant



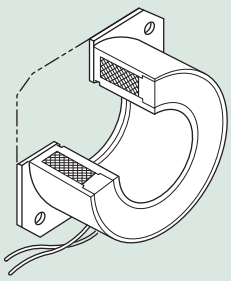
The CYT models are the basic building blocks for customized micro-clutches. The basic model is bearing mounted. Two types are available for different shaft rotation speeds: a dry metal type and a ball bearing type. Armature type-3 is standard, but many customizations are possible.

Clutch torque	[N·m]	0.4～1.0
Operating temperature	[℃]	−10～+40
Backlash		Zero

112 Electromagnetic-actuated Micro Brakes



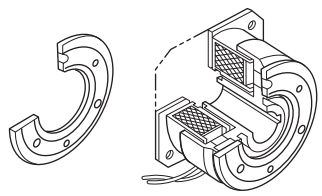
RoHS-compliant (except size #02)



Brakes are used to brake and hold rotating bodies. The flange of the stator is locked securely to a strong stationary part. Select an armature that factors in the mounting space available.

Brake torque	[N·m]	0.4～2.4
Operating temperature	[℃]	−10～+40
Backlash		Zero

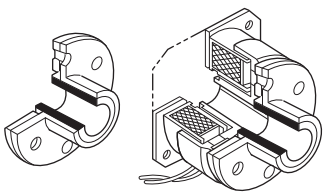
Types for through-shaft or butt shaft



Armature type-3 102- □ -13

» P.260

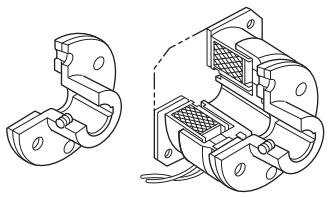
Through-shaft (coupled by winding around parallel shaft) type



Armature type-5 102- □ -15

» P.261

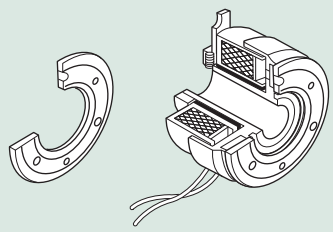
Butt shaft type



Armature type-1 102- □ -11

» P.261

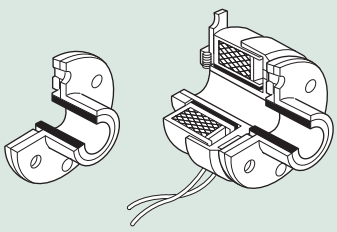
Types for through-shaft or butt shaft



Armature type-3 102- □ -33

» P.262

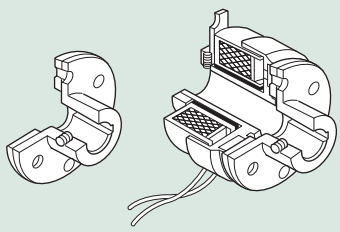
Through-shaft (coupled by winding around parallel shaft) type



Armature type-5 102- □ -35

» P.263

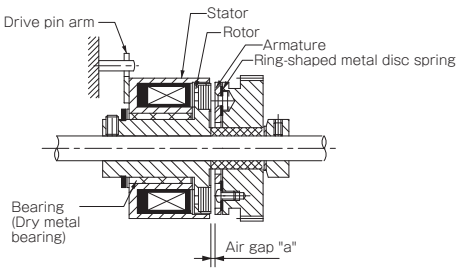
Butt shaft type



Armature type-1 102- □ -31

» P.263

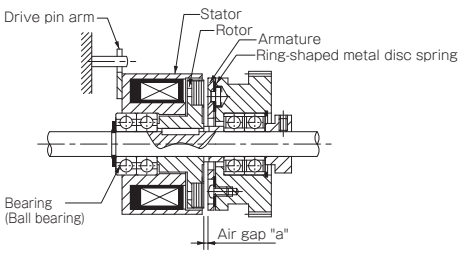
Dry metal type



CYT- □ -33M

» P.264

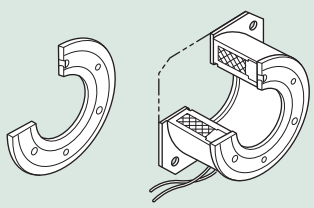
Ball bearing type



CYT- □ -33B

» P.265

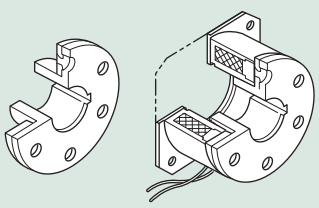
Types with many applications



Armature type-3 112- □ -13

» P.266

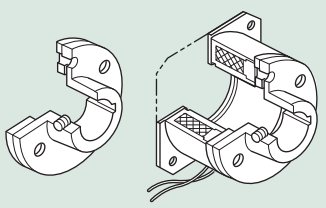
Slim, space-saving type



Armature type-2 112- □ -12

» P.267

Easy-to-use standard-shape type



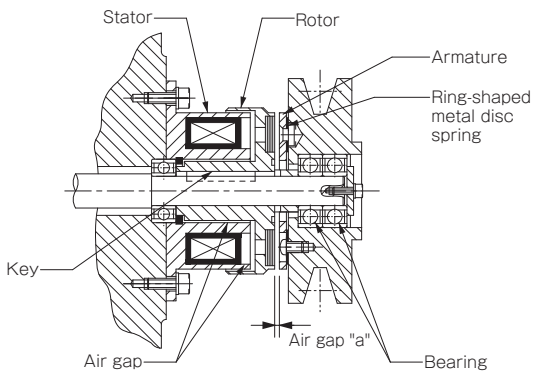
Armature type-1 112- □ -11

» P.267

Mounting and CYT Customization Examples

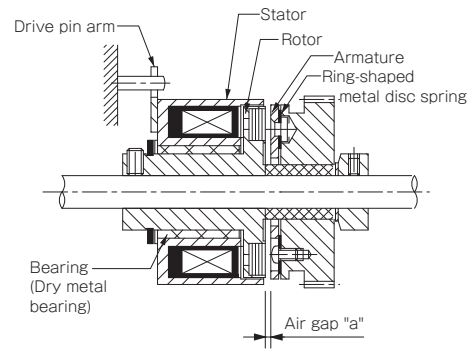
Flange-mounting example with 102

The stator is directly mounted on a stationary part, such as a frame, by a mounting flange, and fixed in place. The rotor is locked to the rotation shaft using a key. The stator and rotor are combined via a narrow air gap that serves as part of the magnetic circuit to form a magnetic pole.



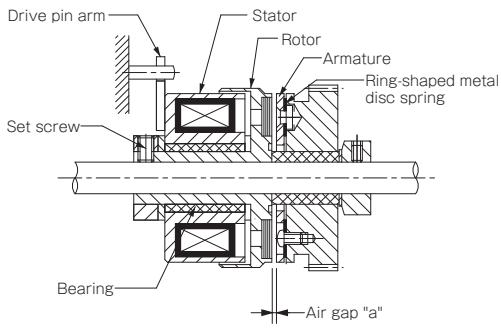
Dry-metal type mounting example with CYT

The stator is integrated with the rotor via dry metal, and held to the stationary parts of the machine by a drive pin arm. The rotor is locked to the rotation shaft using a set screw. The stator and rotor form a magnetic pole via the dry metal.



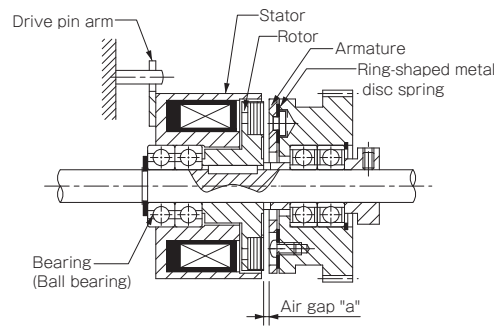
Bearing-mounting example with 102.

The stator is integrated with the rotor via a bearing and held to the stationary parts of the machine by a drive pin arm. The rotor is locked to the rotation shaft using a set screw. The stator and rotor form a magnetic pole via the bearing (ferrous oil-impregnated metal).



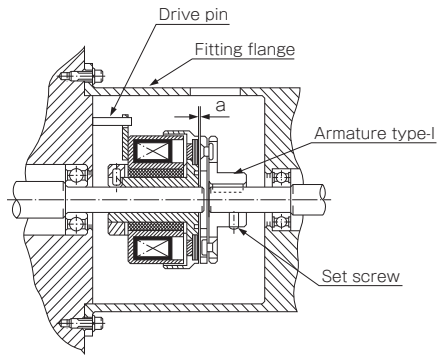
Ball-bearing type mounting example with CYT

The stator is mounted on the shaft via a bearing and held to the stationary parts of the machine by a drive pin arm. The stator and rotor are combined via a narrow air gap that serves as part of the magnetic circuit to form a magnetic pole.



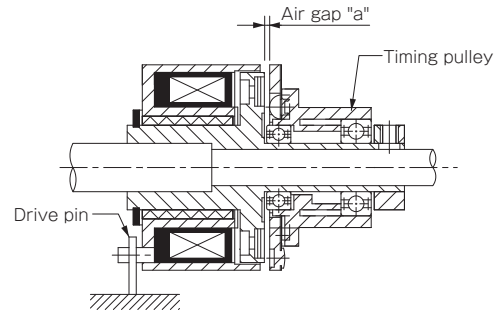
Butt shaft mounting example with 102

In designs that use butt shafts, the two shafts can be reliably centered using fitting flanges, as shown in the figure.



Dry-metal type embedding example with CYT

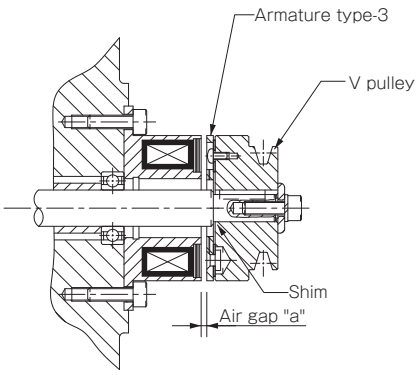
We design to your requirements using timing pulleys, gears and the like mounted on armature type-3.



Mounting and CYT Customization Examples

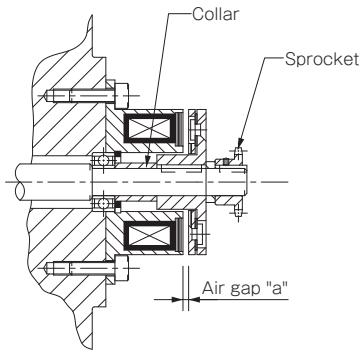
Armature type-3 mounting example with 112

Armature type-3 is used by directly mounting it to a transmission element such as a V-pulley or to a rotating body that stops inertial force.
The shaft of the brake part requires no processing. The shaft diameter may also be determined freely. Air gap "a" can be set easily using collars and shims. Corrections are easily accomplished by adding or removing shims.



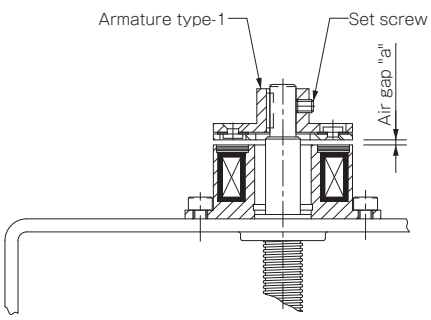
Armature type-2 mounting example with 112

Armature type-2 has the smallest mounting-space footprint of any of the armatures, so overhang is not a concern even when a sprocket or the like is mounted on the brake tip.
Air gap "a" can be set easily using collars and shims.
Corrections are easily accomplished by adding or removing shims.



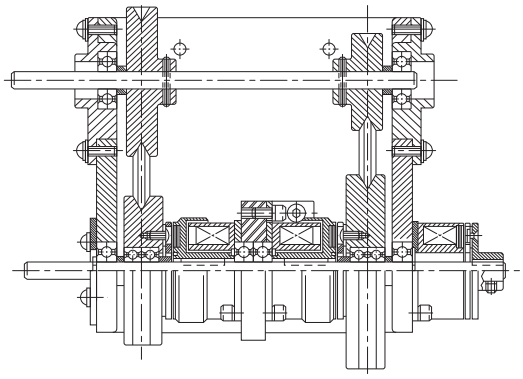
Armature type-1 mounting example on vertical shaft with 112

Since there is no restriction on mounting direction, there is no running torque or abnormal wear even when mounted on vertical shafts.
It is easy to set air gap a: simply move armature type-1 and lock it in place with a set screw.



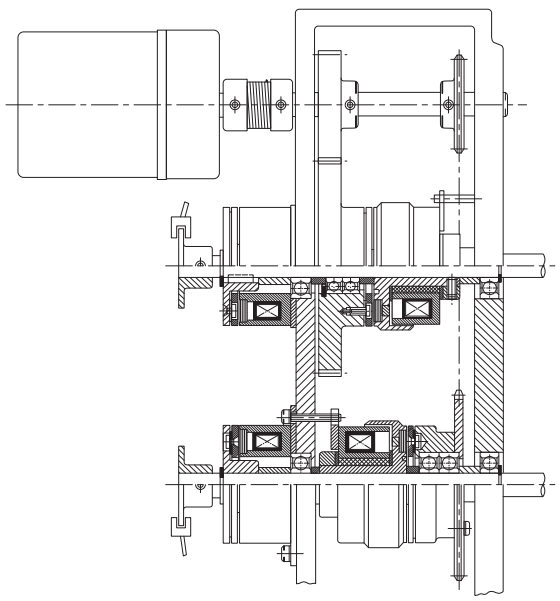
Example of the combination of clutches and brakes

This example uses a two-step speed-change mechanism combining two clutches and a brake.



Example of the combination of clutches and brakes

Shaft drive is both forward and reverse in combination with a clutch in this example. Start and stop freely by mounting brakes on each shaft.



102-□-1□ Types Electromagnetic Micro Clutches - Flange-mounted Type

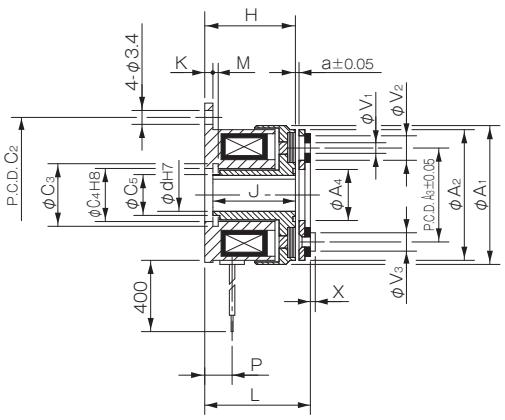
Specifications

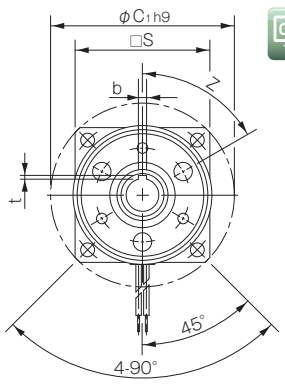
Model	Size	Dynamic friction torque Td [N·m]	Coil (at 20°C) Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]	Heat resistance class	Max. rotation speed [min⁻¹]	Rotating part moment of inertia J Armature [kg·m²]	Rotor [kg·m²]	Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
102-02-13								10000	6.75×10^{-7}							0.075
102-02-15	02	0.4	DC24	6	0.25	96	B	500	1.00×10^{-6}	2.45×10^{-6}	1500	2×10^{6}	0.009	0.019	0.017	0.081
102-02-11								10000	1.00×10^{-6}							0.079
102-03-13								10000	1.30×10^{-6}							0.096
102-03-15	03	0.6	DC24	6	0.25	96	B	500	1.95×10^{-6}	3.25×10^{-6}	2300	3×10^{6}	0.009	0.022	0.020	0.105
102-03-11								10000	1.95×10^{-6}							0.103
102-04-13								10000	4.38×10^{-6}							0.178
102-04-15	04	1.2	DC24	8	0.33	72	B	500	6.15×10^{-6}	1.41×10^{-5}	4500	6×10^{6}	0.011	0.028	0.030	0.195
102-04-11								10000	6.15×10^{-6}							0.191
102-05-13								10000	9.08×10^{-6}							0.310
102-05-15	05	2.4	DC24	10	0.42	58	B	500	1.38×10^{-5}	3.15×10^{-5}	9000	9×10^{6}	0.012	0.031	0.040	0.335
102-05-11								10000	1.38×10^{-5}							0.325

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The moment of inertia of a rotating body and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (102-□-13)

(For direct mounting)





Unit [mm]

Size	Shaft bore dimensions d_1 H7	Models compliant with the new JIS standards b P9	t	Models compliant with the old JIS standards b E9	t
02	5	—	—		
03	6	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
04	8	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
05	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
	15	$5\ ^{-0.012}_{-0.042}$	$2\ ^{+0.5}_{0}$	$5\ ^{+0.050}_{+0.020}$	$2\ ^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions A_1	A_2	A_3	A_4	C_1	C_2	C_3	C_4	C_5	S	V_1	V_2	V_3	Z	Axial direction dimensions H	J	K	L	P	M	a	X
02	31	28	19.5	10.5	39	33.5	11.4	11	8	—	2-2.1	2-5.3	2-4	4-90°	18	16.5	1.5	20.5	5	1.1	0.1	0.8
03	34	32	23	12.5	45	38	13.6	13	10	33	3-2.6	3-6	3-4.5	6-60°	22.2	20.2	2	24.5	6.7	1.3	0.15	1.2
04	43	40	30	18.5	54	47	20	19	15.5	41	3-3.1	3-6	3-5	6-60°	25.4	23.4	2	28.2	7	1.3	0.15	1.5
05	54	50	38	25.5	65	58	27.2	26	22	51	3-3.1	3-6.5	3-5.5	6-60°	28.1	26.1	2	31.3	8.2	1.5	0.2	1.5

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

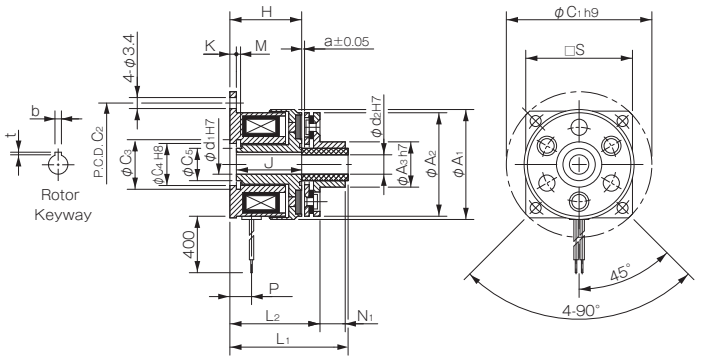
102-03-13 24V 6DIN

- 102-03-13: Size — Rotor bore diameter (dimensional symbol d)
- 24V: Coil voltage
- 6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (102- □ -15)

(For through-shafts)



Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards: b P9	t	Models compliant with the old JIS standards: b E9	t
02	5	5	—	—		
03	6	6	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
04	8	8	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
05	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
	15	15	$5^{-0.012}_{-0.042}$	$2^{+0.5}_{0}$	$5^{+0.050}_{+0.020}$	$2^{+0.5}_{0}$

* The armature type-5 bore d_2 is a straight bore.

Unit [mm]

Size	Radial direction dimensions									Axial direction dimensions								
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	C_5	S	H	J	K	L_1	L_2	M	P	N_1	a
02	31	28	13	39	33.5	11.4	11	8	—	18	16.5	1.5	27.5	22.4	1.1	5	4.8	0.1
03	34	32	14	45	38	13.6	13	10	33	22.2	20.2	2	34.5	26.5	1.3	6.7	7.8	0.15
04	43	40	18	54	47	20	19	15.5	41	25.4	23.4	2	40.2	30.8	1.3	7	9.1	0.15
05	54	50	28	65	58	27.2	26	22	51	28.1	26.1	2	43.3	34.3	1.5	8.2	8.8	0.2

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

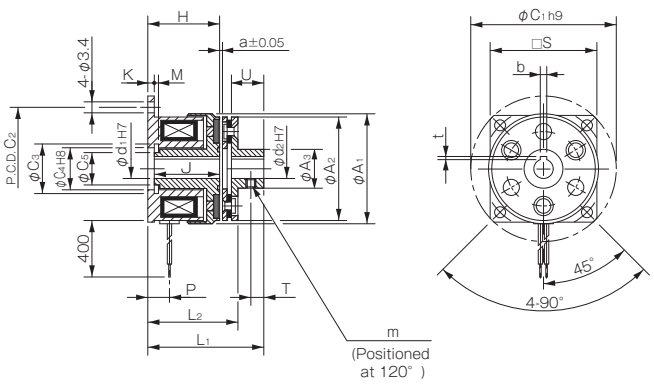
102-03-15 24V R6DIN A6

- 102-03-15: Size
- Rotor bore diameter (dimensional symbol d1)
- R6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- A6: Armature bore diameter (dimensional symbol d2)

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (102- □ -11)

(For butt shafts)



Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards: b P9	t	Models compliant with the old JIS standards: b E9	t
02	5	5	—	—		
03	6	6	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
04	8	8	$2^{-0.006}_{-0.031}$	$0.8^{+0.3}_{0}$		
	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
05	10	10	$3^{-0.006}_{-0.031}$	$1.2^{+0.3}_{0}$	$4^{+0.050}_{+0.020}$	$1.5^{+0.5}_{0}$
	15	15	$5^{-0.012}_{-0.042}$	$2^{+0.5}_{0}$	$5^{+0.050}_{+0.020}$	$2^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions										Axial direction dimensions									
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	C_5	S	m	H	J	K	L_1	L_2	M	P	U	T	a
02	31	28	9.5	39	33.5	11.4	11	8	—	M3	18	16.5	1.5	27.5	22.5	1.1	5	7	2.5	0.1
03	34	32	12	45	38	13.6	13	10	33	2-M3	22.2	20.2	2	34.5	26.5	1.3	6.7	10	4	0.15
04	43	40	17	54	47	20	19	15.5	41	2-M3	25.4	23.4	2	40.2	30.8	1.3	7	12	5	0.15
05	54	50	24	65	58	27.2	26	22	51	2-M4	28.1	26.1	2	43.3	34.3	1.5	8.2	12	5	0.2

* Size 02 is a rounded flange.
* The rotor of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

How to Place an Order

102-03-11 24V R6DIN A6DIN

- 102-03-11: Size
- Rotor bore diameter (dimensional symbol d1)
- R6DIN: Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- A6DIN: Armature bore diameter (dimensional symbol d2)
- Keyway standards — DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

102-□-3□ Types Electromagnetic Micro Clutches - Bearing-mounted Type

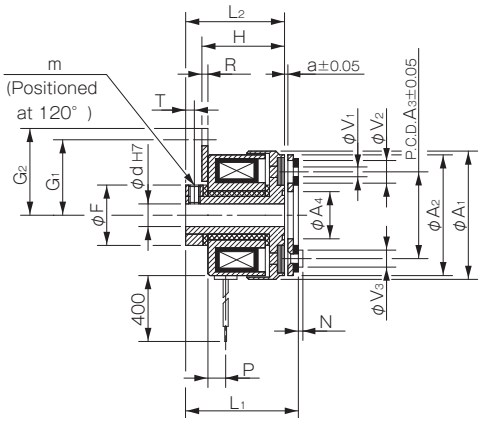
Specifications

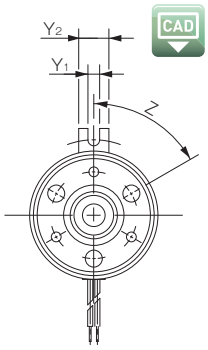
Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Rotating part moment of inertia J		Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]			Armature [kg·m^2]	Rotor [kg·m^2]						
102-02-33									6.75×10^{-7}							0.076
102-02-35	02	0.4	DC24	6	0.25	96	B	500	1.00×10^{-6}	2.75×10^{-6}	1500	2×10^{6}	0.009	0.019	0.017	0.082
102-02-31									1.00×10^{-6}							0.080
102-03-33									1.30×10^{-6}							0.101
102-03-35	03	0.6	DC24	6	0.25	96	B	500	1.95×10^{-6}	4.08×10^{-6}	2300	3×10^{6}	0.009	0.022	0.020	0.110
102-03-31									1.95×10^{-6}							0.108
102-04-33									4.38×10^{-6}							0.183
102-04-35	04	1.2	DC24	8	0.33	72	B	500	6.15×10^{-6}	1.44×10^{-5}	4500	6×10^{6}	0.011	0.028	0.030	0.200
102-04-31									6.15×10^{-6}							0.196
102-05-33									9.08×10^{-6}							0.321
102-05-35	05	2.4	DC24	10	0.42	58	B	500	1.38×10^{-5}	2.90×10^{-5}	9000	9×10^{6}	0.012	0.031	0.040	0.346
102-05-31									1.38×10^{-5}							0.336

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The moment of inertia of a rotating body and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (102-□-33)

(For direct mounting)





Unit [mm]

Size	Shaft bore dimensions
	d H7
02	5
03	6
04	8
	10
05	10
	15

Unit [mm]

Size	Radial direction dimensions														Axial direction dimensions							
	A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	Y_1	Y_2	Z	m	H	R	L_1	L_2	P	N	T	a
02	31	28	19.5	10.5	14	2-2.1	2-5.3	2-4	16.8	20	3.1	8	4-90°	2-M3	19.5	1.6	25.9	23.5	5	0.8	2.5	0.1
03	34	32	23	12.5	16	3-2.6	3-6	3-4.5	20	23	3.1	8	6-60°	2-M3	21.9	1.6	28.5	26.2	4.7	1.2	2.3	0.15
04	43	40	30	18.5	22	3-3.1	3-6	3-5	23	26	3.1	8	6-60°	2-M4	25.1	1.6	33.2	30.4	5	1.5	2.8	0.15
05	54	50	38	25.5	30	3-3.1	3-6.5	3-5.5	28	31	3.1	8	6-60°	2-M5	27.9	1.6	37.3	34.1	6	1.5	3.3	0.2

How to Place an Order

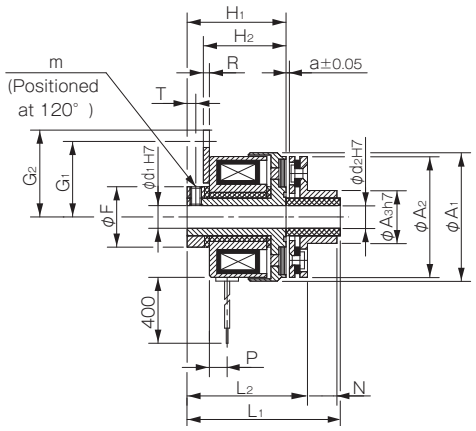
102-03-33 24V 6

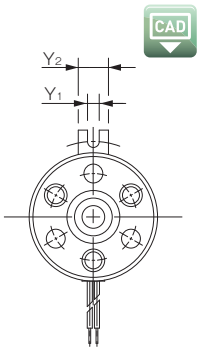
Size

Rotor bore diameter (dimensional symbol d)

Dimensions (102- □ -35)

(For through-shafts)





Unit [mm]

Size	Shaft bore dimensions	
	d_1 H7	d_2 H7
02	5	5
03	6	6
04	8	8
	10	10
05	10	10
	15	15

Unit [mm]

Size	Radial direction dimensions									Axial direction dimensions								
	A_1	A_2	A_3	F	G_1	G_2	Y_1	Y_2	m	H_1	H_2	R	L_1	L_2	P	N	T	a
02	31	28	13	14	16.8	20	3.1	8	2-M3	23.5	19.5	1.6	33	27.9	5	4.8	2.5	0.1
03	34	32	14	16	20	23	3.1	8	2-M3	26.2	21.9	1.6	38.5	30.5	4.7	7.8	2.3	0.15
04	43	40	18	22	23	26	3.1	8	2-M4	30.4	25.1	1.6	45.2	35.8	5	9.1	2.8	0.15
05	54	50	28	30	28	31	3.1	8	2-M5	34.1	27.9	1.6	49.3	40.3	6	8.8	3.3	0.2

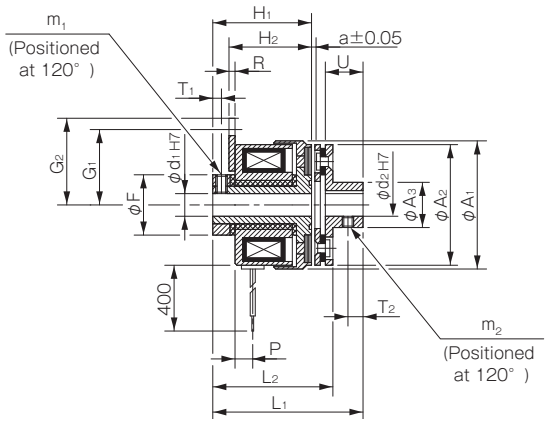
How to Place an Order

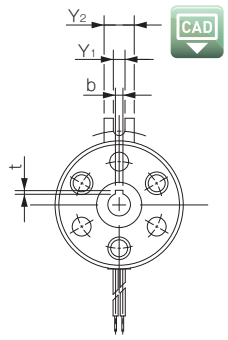
102-03-35 24V R6 A6

- 102-03-35: Size
- R6: Rotor bore diameter (dimensional symbol d1)
- A6: Armature bore diameter (dimensional symbol d2)

Dimensions (102- □ -31)

(For butt shafts)





Unit [mm]

Size	Shaft bore dimensions					
	d_1 H7	d_2 H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
			b P9	t	b E9	t
02	5	5	—	—		
03	6	6	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
04	8	8	$2\ ^{-0.006}_{-0.031}$	$0.8\ ^{+0.3}_{0}$		
	10	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
05	10	10	$3\ ^{-0.006}_{-0.031}$	$1.2\ ^{+0.3}_{0}$	$4\ ^{+0.050}_{+0.020}$	$1.5\ ^{+0.5}_{0}$
	15	15	$5\ ^{-0.012}_{-0.042}$	$2\ ^{+0.5}_{0}$	$5\ ^{+0.050}_{+0.020}$	$2\ ^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions										Axial direction dimensions									
	A_1	A_2	A_3	F	G_1	G_2	Y_1	Y_2	m_1	m_2	H_1	H_2	R	L_1	L_2	P	U	T_1	T_2	a
02	31	28	9.5	14	16.8	20	3.1	8	2-M3	M3	23.5	19.5	1.6	33	27.9	5	7	2.5	2.5	0.1
03	34	32	12	16	20	23	3.1	8	2-M3	2-M3	26.2	21.9	1.6	38.5	30.5	4.7	10	2.3	4	0.15
04	43	40	17	22	23	26	3.1	8	2-M4	2-M3	30.4	25.1	1.6	45.2	35.8	5	12	2.8	5	0.15
05	54	50	24	30	28	31	3.1	8	2-M5	2-M4	34.1	27.9	1.6	49.3	40.3	6	12	3.3	5	0.2

How to Place an Order

102-03-31 24V R6 A6DIN

- 102-03-31: Size
- R6: Rotor bore diameter (dimensional symbol d1)
- A6DIN: Armature bore diameter (dimensional symbol d2)
- DIN: Keyway standards — Compliant with the new JIS standards; JIS: Compliant with the old JIS standards

*Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

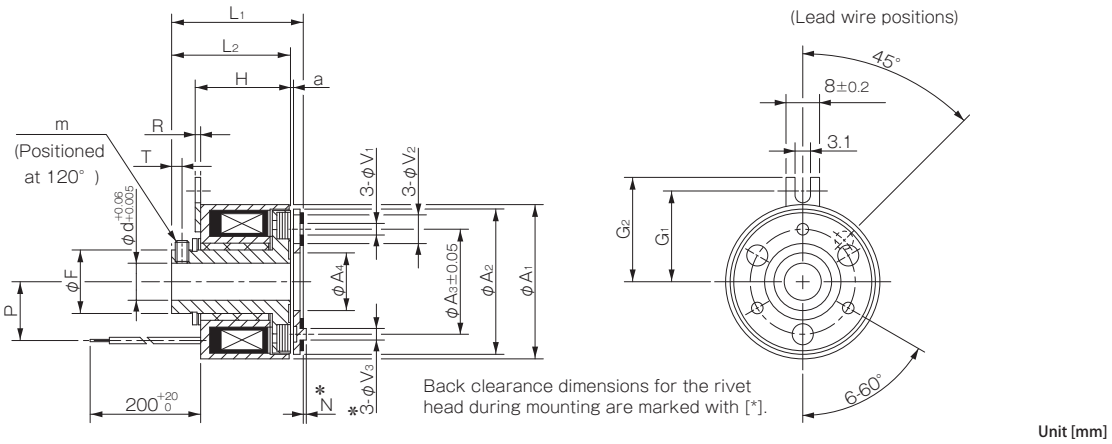
CYT Models Electromagnetic Micro Clutches - Bearing-mounted Type

Specifications

Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Rotating part moment of inertia		Allowable engaging energy $E_{ea\ell}$ [J]	Total work E_T [J]	Armature pull-in time t_a [s]	Torque rise time t_p [s]	Torque extinction time t_d [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]			Armature [kg·m^2]	Rotor [kg·m^2]						
CYT-025-33B	025	0.4	DC24	4.5	0.188	128	B	3600	1.00×10^{-6}	1.43×10^{-6}	800	1.0×10^{6}	0.014	0.028	0.030	0.07
CYT-03-33B	03	0.5	DC24	5.5	0.23	105	B	3600	1.30×10^{-6}	1.85×10^{-6}	900	1.5×10^{6}	0.015	0.030	0.040	0.13
CYT-03-33M								500		1.90×10^{-6}						0.11
CYT-04-33B	04	1.0	DC24	5.9	0.25	98	B	3600	5.15×10^{-6}	1.00×10^{-5}	1900	2.0×10^{6}	0.030	0.040	0.040	0.26
CYT-04-33M								500		1.05×10^{-5}						0.23

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The rotating part moment of inertia and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage. Also, be careful that energization does not exceed 50%.

Dimensions (CYT-□-33M)



Unit [mm]

Size	Radial direction dimensions												Axial direction dimensions							
	d	A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	m	H	R	L_1	L_2	P	N	T	a
03	6 8	34	32	23	12.5	14	3-2.6	3-5.5	3-6	20	23	M3	21	1.2	28.6	26.2	13	3	2.3	0.2 ±0.05
04	8 10	45	42	30	18.5	18	3-3.1	3-6	3-6	25	27.5	M4	25.3	1.2	35.1	32.4	17.5	3.5	3	0.2 +0.05 −0.1

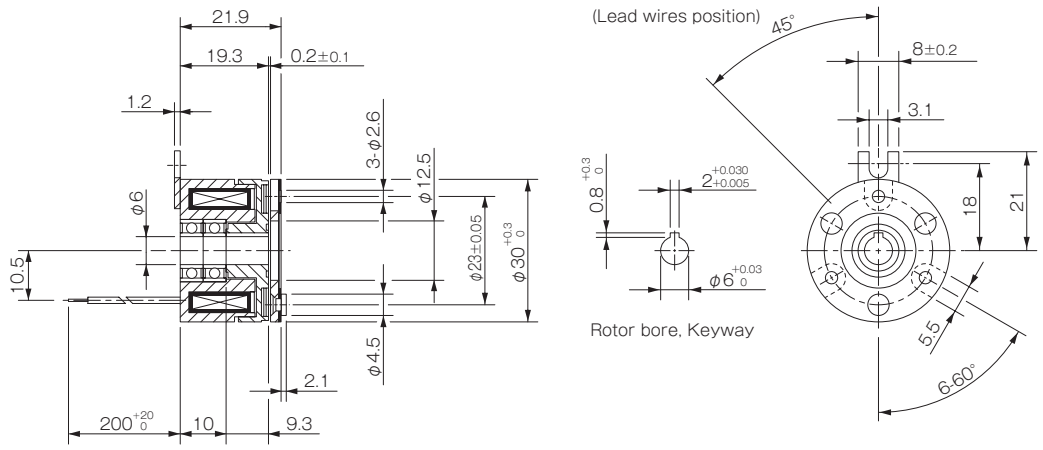
* Dimensional symbols N and V3 indicate the clearance dimensions for the rivet head during mounting.

How to Place an Order

CYT-03-33M 24V 6

Size — Rotor bore diameter (dimensional symbol d)

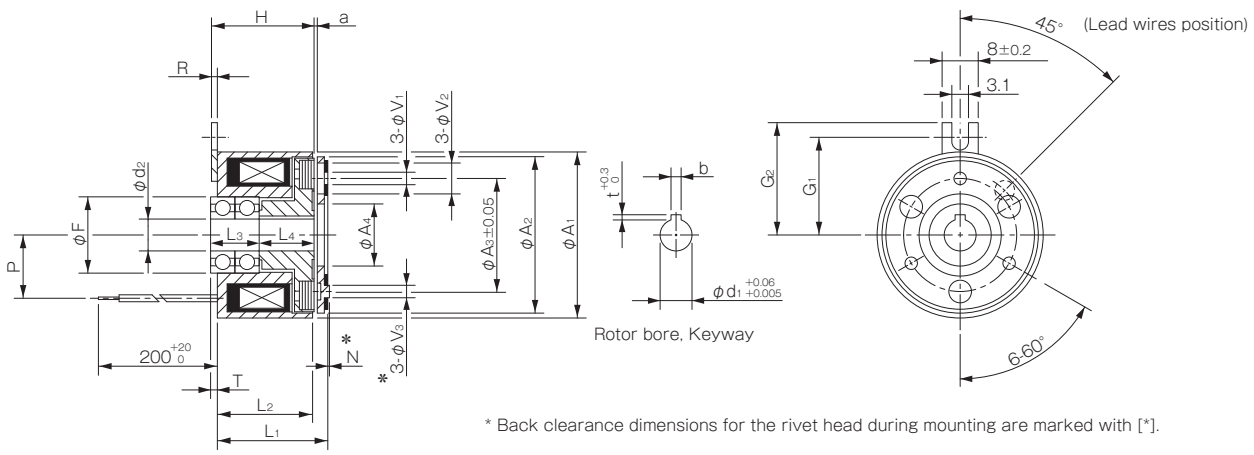
Dimensions (CYT-025-33B)



How to Place an Order

CYT-025-33B 24V 6

Dimensions (CYT-□-33B)



* Back clearance dimensions for the rivet head during mounting are marked with [*].

Unit [mm]

Size	Nominal diameter	Radial direction dimensions										Axial direction dimensions										Shaft bore dimensions			
		A_1	A_2	A_3	A_4	F	V_1	V_2	V_3	G_1	G_2	H	R	L_1	L_2	L_3	L_4	P	N	T	a	d_2	d_1	b	t
03	6	34	32	23	12.5	15	3-2.6	3-5.5	3-6	20	23	21	1.2	22.2	19.8	10	11.3	13	3	1.5	0.2 ±0.05	6	6	2 +0.030 +0.005	0.8 +0.3 0
	8	34	32	23	12.5	16	3-2.6	3-5.5	3-6	20	23	21	1.2	22.2	19.8	10	11.3	13	3	1.5	0.2 ±0.05	8	8	2 +0.030 +0.005	0.8 +0.3 0
04	8	45	42	30	18.5	19	3-3.1	3-6	3-6	25	28	25.3	1.2	26.8	24.1	12	13	17.5	3.5	0.9	0.2 +0.05 −0.1	8	8	2 +0.030 +0.005	0.8 +0.3 0
	10	45	42	30	18.5	19	3-3.1	3-6	3-6	25	28	25.3	1.2	26.8	24.1	14	11	17.5	3.5	0.9	0.2 +0.05 −0.1	10	10	3 +0.025 0	1.2 +0.3 0

* Dimensional symbols N and V3 indicate the clearance dimensions for the rivet head during mounting.

How to Place an Order

CYT-03-33B 24V 6

Size — Nominal diameter

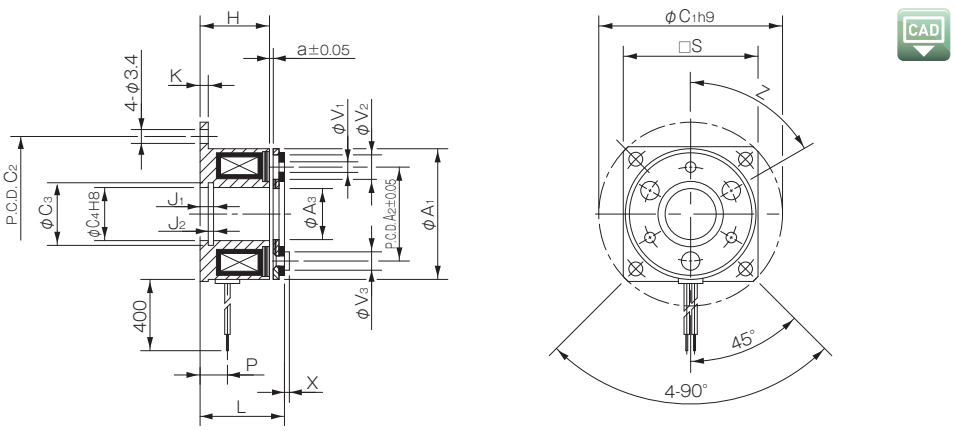
112 Models Electromagnetic Micro Brakes

Specifications

Model	Size	Dynamic friction torque T_d [N·m]	Coil (at 20℃)				Heat resistance class	Max. rotation speed [min^{-1}]	Armature moment of inertia J [kg·m^2]	Allowable engaging energy $E_{ea\ell}$ [J]	Total work performed until Readjustment of the air gap E_T [J]	Armature pull-in time t_a [s]	Torque build-up time t_p [s]	Torque decaying time td [s]	Mass [kg]
			Voltage [V]	Wattage [W]	Current [A]	Resistance [Ω]									
112-02-13									6.75×10^{-7}						0.053
112-02-12	02	0.4	DC24	6	0.25	96	B	10000	1.00×10^{-6}	1500	2×10^6	0.004	0.010	0.010	0.057
112-02-11									1.00×10^{-6}						0.057
112-03-13									1.30×10^{-6}						0.072
112-03-12	03	0.6	DC24	6	0.25	96	B	10000	1.95×10^{-6}	2300	3×10^6	0.005	0.012	0.008	0.079
112-03-11									1.95×10^{-6}						0.079
112-04-13									4.38×10^{-6}						0.118
112-04-12	04	1.2	DC24	8	0.33	72	B	10000	6.15×10^{-6}	4500	6×10^6	0.007	0.016	0.010	0.131
112-04-11									6.15×10^{-6}						0.131
112-05-13									9.08×10^{-6}						0.200
112-05-12	05	2.4	DC24	10	0.42	58	B	10000	1.38×10^{-5}	9000	9×10^6	0.010	0.023	0.012	0.215
112-05-11									1.38×10^{-5}						0.215

* The dynamic friction torque, T_d, is measured at a relative speed of 100 min^{-1}.
* The rotating part moment of inertia and mass are measured for the maximum bore diameter.
* Keep supply voltage fluctuation to within 10% of coil voltage.

Dimensions (112- □ -13)



Unit [mm]

Size	Radial direction dimensions												Axial direction dimensions							
	A_1	A_2	A_3	C_1	C_2	C_3	C_4	S	V_1	V_2	V_3	Z	H	K	J_1	J_2	L	P	X	a
02	28	19.5	10.5	39	33.5	11.4	11	—	2-2.1	2-5.3	2-4	4-90°	13.7	1.5	2.6	1.3	16.1	5	0.8	0.1
03	32	23	12.5	45	38	13.6	13	33	3-2.6	3-6	3-4.5	6-60°	17	2	3.3	1.3	19.3	6.7	1.2	0.15
04	40	30	18.5	54	47	20	19	41	3-3.1	3-6	3-5	6-60°	20	2	3.3	1.3	22.8	7	1.6	0.15
05	50	38	25.5	65	58	27.2	26	51	3-3.1	3-6.5	3-5.5	6-60°	22	2	3.5	1.5	25.2	8	1.6	0.2

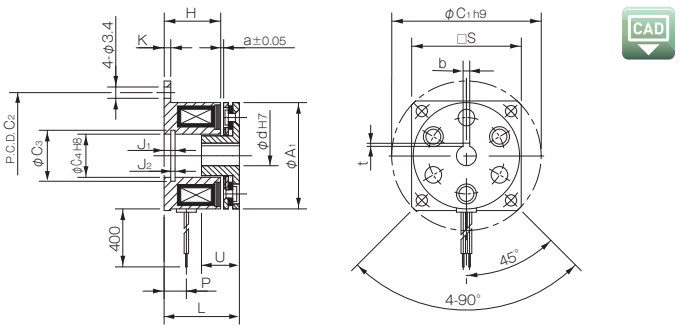
* Size 02 is a rounded flange.

How to Place an Order

112-03-13 24V

Size

Dimensions (112- □ -12)



CAD

Unit [mm]

Size	Shaft bore dimensions				
	d H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
		b P9	t	b E9	t
02	5	—	—		
03	6	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
04	8	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
05	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
	15	5 $^{-0.012}_{-0.042}$	2 $^{+0.5}_{0}$	5 $^{+0.050}_{+0.020}$	2 $^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions						Axial direction dimensions							
	A_1	C_1	C_2	C_3	C_4	S	H	K	J_1	J_2	L	P	U	a
02	28	39	33.5	11.4	11	—	13.7	1.5	2.6	1.3	18.1	5	7	0.1
03	32	45	38	13.6	13	33	17	2	3.3	1.3	21.3	6.7	10	0.15
04	40	54	47	20	19	41	20	2	3.3	1.3	25.5	7	12	0.15
05	50	65	58	27.2	26	51	22	2	3.5	1.5	28.2	8	12	0.2

* Size 02 is a rounded flange.
* The armature hub of size 02 has no keyway. Lock it in place by press-fitting it onto the shaft or the like.

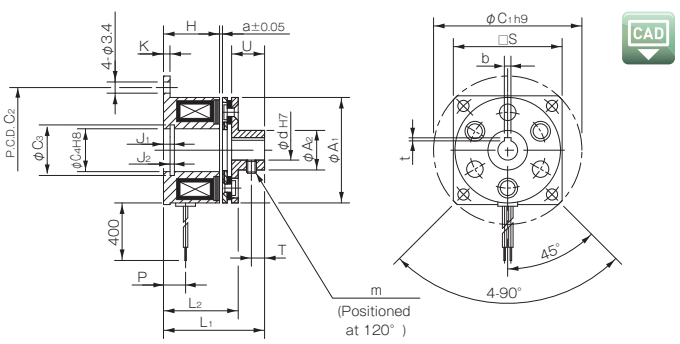
How to Place an Order

112-03-12 24V 6DIN

- Size: 112-03-12
- Keyway standards: DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- Armature bore diameter (dimensional symbol d): 6DIN

* Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

Dimensions (112- □ -11)



CAD

Unit [mm]

Size	Shaft bore dimensions				
	d H7	Models compliant with the new JIS standards		Models compliant with the old JIS standards	
		b P9	t	b E9	t
02	5	—	—		
03	6	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
04	8	2 $^{-0.006}_{-0.031}$	0.8 $^{+0.3}_{0}$		
	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
05	10	3 $^{-0.006}_{-0.031}$	1.2 $^{+0.3}_{0}$	4 $^{+0.050}_{+0.020}$	1.5 $^{+0.5}_{0}$
	15	5 $^{-0.012}_{-0.042}$	2 $^{+0.5}_{0}$	5 $^{+0.050}_{+0.020}$	2 $^{+0.5}_{0}$

Unit [mm]

Size	Radial direction dimensions								Axial direction dimensions									
	A_1	A_2	C_1	C_2	C_3	C_4	S	m	H	K	J_1	J_2	L_1	L_2	P	U	T	a
02	28	9.5	39	33.5	11.4	11	—	M3	13.7	1.5	2.6	1.3	23.1	18.1	5	7	2.5	0.1
03	32	12	45	38	13.6	13	33	2-M3	17	2	3.3	1.3	29.3	21.3	6.7	10	4	0.15
04	40	17	54	47	20	19	41	2-M3	20	2	3.3	1.3	34.8	25.5	7	12	5	0.15
05	50	24	65	58	27.2	26	51	2-M4	22	2	3.5	1.5	37.2	28.2	8	12	5	0.2

* Size 02 is a rounded flange.

How to Place an Order

112-03-11 24V 6DIN

- Size: 112-03-11
- Keyway standards: DIN: Compliant with the new JIS standards; JIS: Compliant with the old JIS standards
- Armature bore diameter (dimensional symbol d): 6DIN

* Models for which there are no keyway standards (models marked by [-]) on the Shaft Bore Dimensions table need not be marked with a keyway standards designation. Products with standards marked by diagonal lines are not set as standard products.

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