

COMBINORM



ELECTROMAGNETIC
CLUTCHES AND BRAKES

02/03

The KEBCO Commitment

To provide the highest quality motion control products for power transmission applications using the most complete, cost effective solution possible.

“GUARANTEED ENGINEERING PERFORMANCE”



KEBCO products provide a reliable, effective, and economical solution to your starting, stopping, positioning, controlling and regulating requirements.

Knowledge, ability and experience has been the basis for the development of our mechanical and electronic drive components.

Product performance and quality is never compromised, making KEBCO your reliable partner.

General

The KEBCO Combinorm is an electromagnetic actuated clutch or brake. Based on the experience we have gained from the industry, all KEBCO products use the latest technology to produce high quality products. High grade material and accurate processing through advanced machines coupled with uncompromising production and performance checks produce a reliable and safe product.

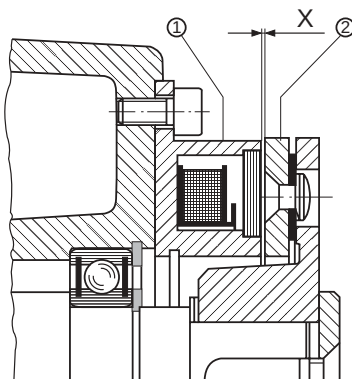
This catalog introduces a series of single-face clutches and brakes. Because of the wide range of applications, we present a variety of sizes and designs to choose from. Along with our wide range of product, we have the ability to customize mechanically and electrically to fulfill any design requirements. Please contact KEBCO engineers for customization details.

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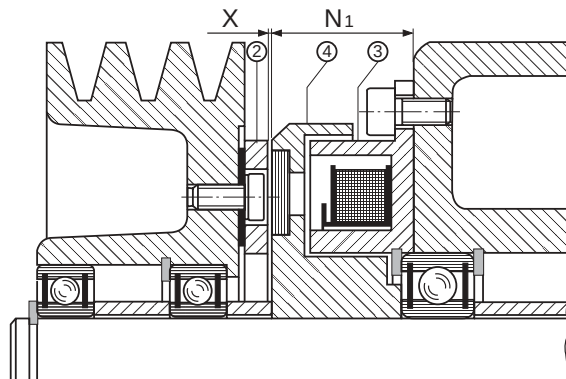
Construction Features

- asbestos-free, wear-resistant and temperature-stable friction linings
- unlimited operating time
- Insulation class B
- CSA approved
- low overrun
- safe layout
- low operating noise
- short switching times
- according to VDE 0580



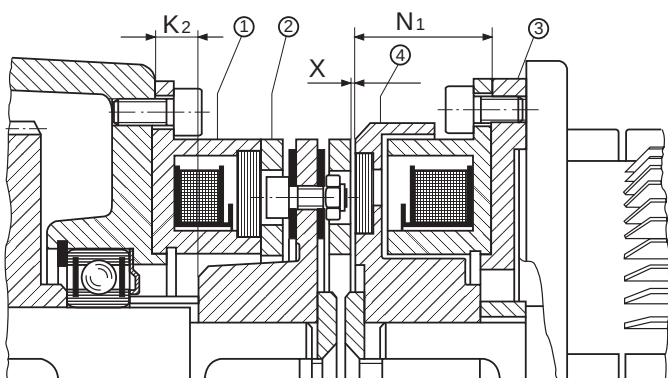
KEBCO COMBINORM-B (Brake)

Type ...02.120

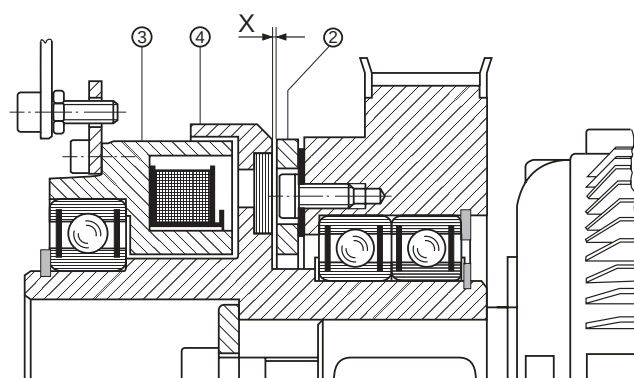


KEBCO COMBINORM-C (Clutch)

Type ...03.110



KEBCO COMBINORM-K (Clutch-brake Combinations) Type ...04.170



Functional Characteristics

After applying DC current to the brake magnet (1) or the clutch magnet (3) the armature disk (2) is attracted by the force of the magnetic field across the air gap "X" to the brake magnet (1) or the clutch rotor (4). This results in a frictionally engaged connection or positive locking connection if using tooth clutches. Flat springs attached to the armature disk (2) are used to release the armature disk after power is turned off.

Type Selection

KEBCO COMBINORM - B:

Single-face brakes for dry operation

KEBCO COMBINORM - C:

Single-face clutches for dry operation

KEBCO COMBINORM - K:

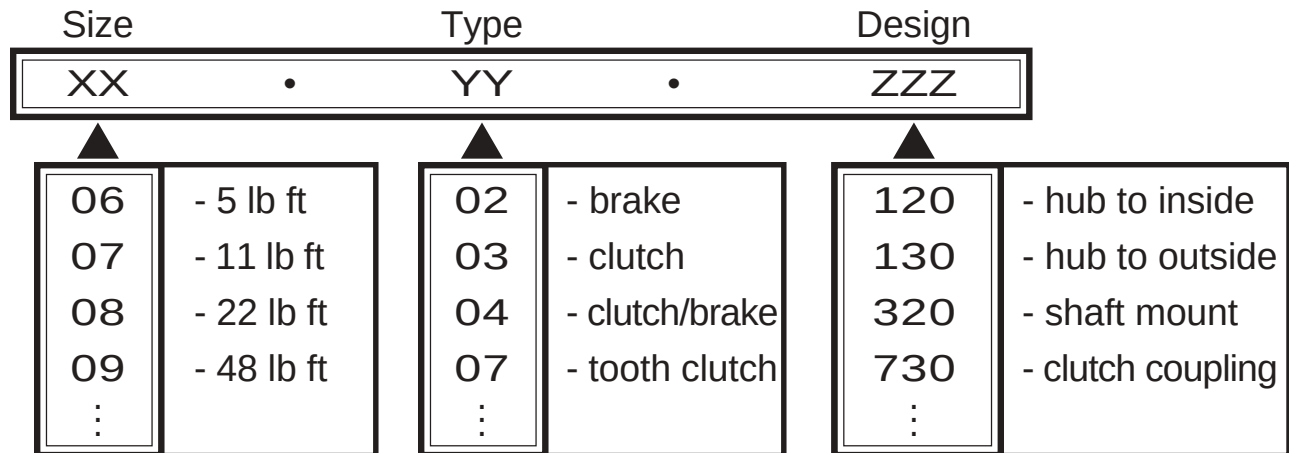
Clutch-brake combinations

KEBCO COMBINORM - T:

Tooth clutches for dry or wet operation

Type Selection

When selecting a KEBCO clutch or brake, three parameters to consider are: the size (torque), the type (clutch or brake), and the design (shaft mount, etc.). KEBCO Model Numbers reflect these parameters as follows:



Examples: 06.02.130 = Flange mounted brake with hub to outside
 94 VDC = Coil voltage → Specified by Customer
 5/8" = Hub bore → Specified by Customer

10.03.730 = Shaft mounted clutch coupling
 24 VDC = Coil voltage → Specified by Customer
 1 3/8" = Hub bore → Specified by Customer
 1 3/8" = Rotor bore → Specified by Customer

Mounting Instructions

Particular attention must be paid to following points.

- Keep grease and oil away from the friction surface (use only sealed bearings).
- For functional reasons the armature disks are not coated with surface protection; therefore, rust prevention agents are applied at the factory. On that account the armature disks should be thoroughly cleaned prior to mounting. Don't apply oil-base solvents to the friction surface.
- The armature disks (2) must be free to move. They are attached to the membrane spring only. Do not center on the internal or external diameter.
- For armatures without hubs (...03.110), provide clearing holes for the rivet heads in the mating part. When attaching armature plate to mating part, be sure to use screws with a head height below the actual contact surface. The mating part should be kept flat without burrs or cavities at the threaded hole to prevent spring deformation when tightening.
- Adjust the air gaps in conformity with the dimensions "X" listed in the tables and ensure that all parts are well secured in axial direction. Take note of the mounting dimension "N1" for the clutches (page 10) (B6) and of the mounting dimension "K2" for KEBCO COMBINORM - K (page 8) (B5).
- For shaft-mounted brakes (page 8) (B4) and clutches (page 10, 12, 13) (B7, 8, 9, 10, 12) the magnets must be secured to prevent rotation. Take care that the bearings are not axially deformed. Depending on the design, brackets or bores in the flange are available to prevent rotation.

ATTENTION:

For KEBCO COMBINORM - C the torque arm must counteract only the bearing friction, in contrast to that the magnets of KEBCO COMBINORM - B serve the purpose of torque transmission and must therefore be secured against twisting.

- For flange-mounted brakes (page 8) (B3, B5) and clutches (pages 8, 10, 13) (B5, B6, B11) magnets and rotors must be accurately centered. Design and rotational inaccuracies may cause premature failure.

For tooth clutches KEBCO COMBINORM - T (page 13) the following additional instructions are applicable.

- Switch-on only during standstill or synchronous operation.
- Armature and rotor are aligned to each other at the factory and may not be exchanged.
- The armature disk must be accurately aligned at the outer dimension before attachment.

For flexible clutches (Type ...03.840, page 12, B10) the following additional instructions are applicable:

- The radial and axial screws connecting the rubber element to the hubs must all be tightened to the torque given in the table, using a torque wrench.
 Ensure that when tightening the screws the aluminium bushings do not twist in the rubber part and that they sit squarely. In order to reduce friction between the screw head and the aluminium bushing smear a small amount of grease under the head of the screw before fitting. If necessary use a suitable tool to apply counter pressure on the element to prevent twisting of the rubber part while tightening the screws. This is particularly important with the radial screws otherwise the curved faces between the aluminium bushing and the hub will not engage on the full area but only across the two sides. This will inevitably lead to slackening of the screws and destruction of the clutch. If the clutch is supplied in a pre-assembled state, do not dismantle it, but fit it in this condition.

Nominal torque

$$T_{2N} = T_{\text{erf}} \cdot K$$

$$T_{\text{erf}} = T_a \pm T_L$$

$$T_a = J \cdot \alpha$$

Acceleration/Deceleration time

$$t = \frac{J \cdot \omega}{T_{2N} \pm T_L} + t_1$$

Heat load

$$W_R = \frac{J}{2} \cdot \omega^2 \frac{T_{2N}}{T_{2N} \pm T_L} \quad W_R \leq W_{R\text{max}} \quad \text{[Table T1]}$$

Friction work per sec.

$$P_R = W_R \cdot S \quad P_R \leq P_{R\text{max}} \quad \text{[Table T1]}$$

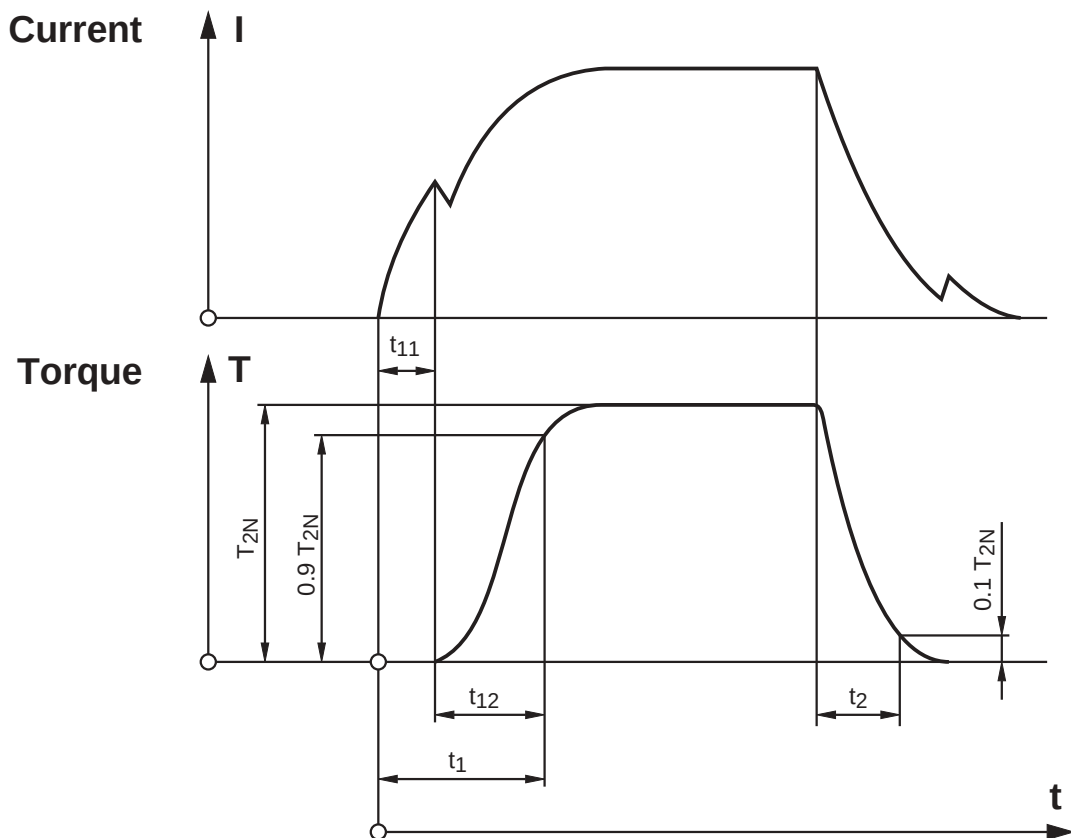
Service life until readjustment

$$L_N = \frac{(X_N - X) \cdot W_{R0.1}}{0.1 \cdot W_R}$$

α	= angular acceleration
J	= moment of inertia ²⁾
K	= safety factor ($K \geq 2$)
L_N	= service life until readjustment ¹⁾
P_R	= friction work per sec.
S	= switching operations per sec.
t	= acceleration/deceleration time
t_1	= engagement time
T_a	= dynamic torque
T_{erf}	= required torque
T_L	= load torque ³⁾
T_{2N}	= static torque
W_R	= friction
$W_{R0.1}$	= friction work up to 0.1 mm wear

$[s^{-2}]$	$W_{R\text{max}}$	= permissible friction per switching operation [J]
$[kgm^2]$	ω	= angular frequency $[s^{-1}]$
$[-]$	X	= rated air gap [mm]
$[-]$	X_n	= clearance at which a readjustment is recommended [mm]
$[J/s]$		
$[s]$	¹⁾	Number of switching operations until readjustment
$[s]$	²⁾	Sum of the moment of inertia related to the accelerated components plus the moment of inertia of the clutch and brake parts
$[Nm]$		
$[Nm]$	³⁾	For the selection of the sign take notice of whether the load torque supports or counteracts the deceleration
$[Nm]$		
$[J]$		
$[J]$		

Current/time and torque/time diagrams of KEBCO electromagnetic clutches and brakes



- t_1 Engagement time: time to reach 90% torque from the time voltage is placed across the coil
- t_{11} Initial delay: time it takes for the armature to contact the pole faces from the time voltage is placed across the coil
- t_{12} Rise time: time it takes to reach 90% torque from the time the armature first makes contact with the pole faces
- t_2 Switch-off time: time it takes to reach 10% torque from the time voltage is removed from the coil
- I Coil current
- T_{2N} Rated torque

Value represents average switching times with nominal air gap. (See page 7)

00.000-3-0149

The DC voltage required by KEBCO COMBINORM is made available by different rectifiers, trafo-rectifiers as well as electronic switches of the series KEBCO COMBITRON. See page 15

For special requirements the rapid switch KEBCO COMBITRON 94 is used.

The values for W_{Rmax} and $W_{R0.1}$ have been determined by tests. Speed, mass moment of inertia and switching frequency have been carefully selected to obtain the maximum permissible operating temperature. Dependent on the actual application, these values may be exceeded.

The stated switching times are achieved with adjusted nominal air gap (X). These are average values whose dispersion depends on the voltage supply and coil temperature.

Single-face clutches and brakes obtain the torques listed in the table without difficulty after a run-in phase of 100 RPM. In the new state or in case of substantially higher speed the torque may under certain circumstances be smaller.

Size			01	02	03	04	05	06	07	08	09	10	11	12
J	Rotors Picture	B5, B6, B8, B11	0.025	0.035	0.15	0.195	0.375	0.825	2.38	7.25	21.9	67.4	200	450
		B7, B12	0.027	0.038	0.17	0.21	0.40	0.9	2.6	8.0	24.0	73.0	220	500
		B9, B10						1.02	3.05	8.76	26.0	82.5	230	520
	Armatures Picture	B3, B6, B7, B8, B9, B10, B11, B12 a)	0.010	0.014	0.045	0.08	0.122	0.366	1.07	3.72	10.6	40.0	115	311
		B3, B6, B7, B8, B11, B12 b)	0.013	0.021	0.068	0.113	0.18	0.53	1.57	5.29	15.1	50.1	159	437
		B4 b)						0.82	2.6	10.3	27.0	101		
		B5 b)						0.99	2.7	9.12	25.4	88.9	272	814
		Hub						0.16	0.49	0.89	3.77	19.9	41.2	118
		Intermediate ring	Picture		B10			1.5	5.0	11.0	30.0	112	253	814
		Rubber element						0.35	1.25	3.3	7.0	50.2	102	450
	switching work, wear	W_{Rmax}	0.04	0.05	0.08	0.09	0.12	0.19	0.31	0.48	0.75	1.25	2.0	2.9
		$W_{R0.1}$	0.23	0.30	0.43	0.50	0.63	0.95	1.63	2.53	4.09	6.66	10.4	16.3
		P_{Rmax} clutch	20.3	28.6	40.6	44.5	58.3	80.6	114	161	228	322	458	647
		P_{Rmax} brake	12.8	18.6	26.9	29.4	38.9	58.3	79.2	114	164	236	339	489
		X_n	0.3	0.45	0.45	0.6	0.6	0.7	0.7	0.7	0.9	1.0	1.2	1.2
		X	0.1	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4
n_{max}			10000	10000	10000	10000	10000	8000	6000	5000	4000	3000	3000	2000
	Exception	B8 type ...03.610/630/640	1500	1500	1500	1500	1500	1500	1500					
Switching times (ms)	clutches	t_{11}	4	5	7	9	10	14	18	23	25	29	37	55
		t_{12}	6	9	10	21	22	34	56	58	65	132	164	240
		t_1	10	14	17	30	32	48	74	81	90	161	201	295
		t_{11}	2	2	3	4	5	6	8	10	12	14	16	25
		t_{12}	3	4	4	10	11	16	25	27	30	55	75	100
		t_1	5	6	7	14	16	22	33	37	42	69	91	125
		t_2 DC	5	6	7	8	10	14	19	40	68	100	130	200
		t_2 AC	17	19	22	25	30	39	61	115	220	400	650	900
	brakes	t_{11}	2	3	3	5	5	6	8	10	13	15	23	35
		t_{12}	3	5	5	10	12	18	30	32	35	70	85	120
		t_1	5	8	8	15	17	24	38	42	48	85	118	155
		t_{11}	1	2	2	3	3	3	4	5	6	8	10	16
		t_{12}	2	2	2	5	5	8	13	15	16	30	40	60
		t_1	3	4	4	8	8	11	17	20	22	38	50	76
		t_2 DC	3	4	5	6	8	10	15	50	85	100	140	200
		t_2 AC	17	20	25	30	40	70	95	240	300	400	600	800

Table T1

a) without hub

b) with hub

W_{Rmax} permissible friction work per switching operation [10⁴J]

$W_{R0.1}$ switching work up to 0,1mm wear [10⁷J]

P_{Rmax} permissible friction work per sec. [J / s]

X_n wear until adjustment [mm]

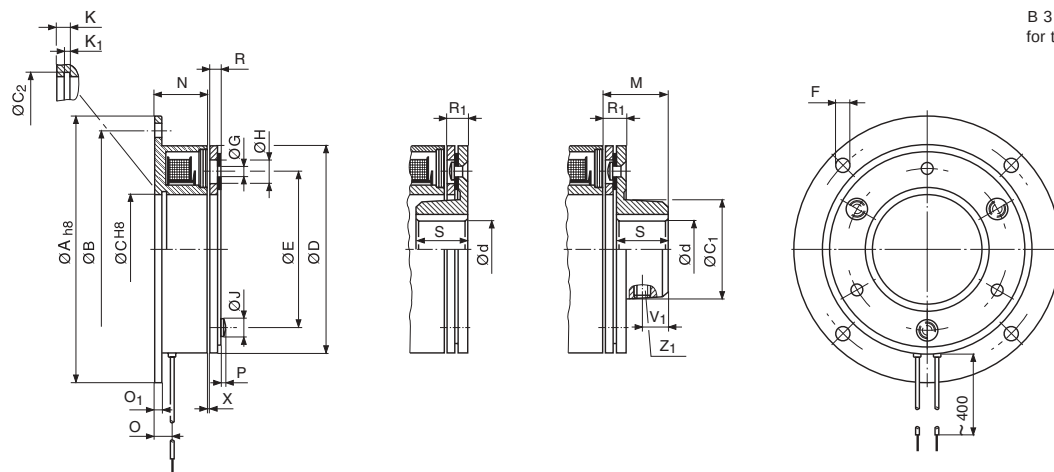
X nominal air gap [mm]

J moment of inertia [10⁻⁴ kgm²]

n_{max} max. speed [RPM]

Combinorm B & K

Flange Mount Brake



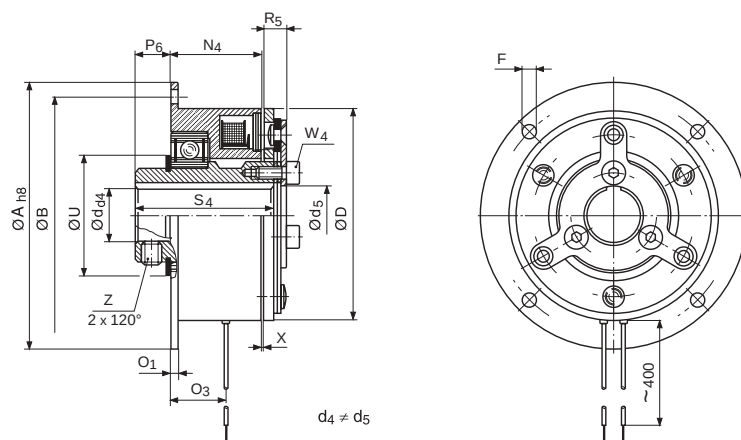
B 3 (refer to pg 7
for technical data)

Front view of ...02.110

Size 01...15 ...02.110 ...02.120 ...02.130

02.001-3-0308

Shaft Mount Brake

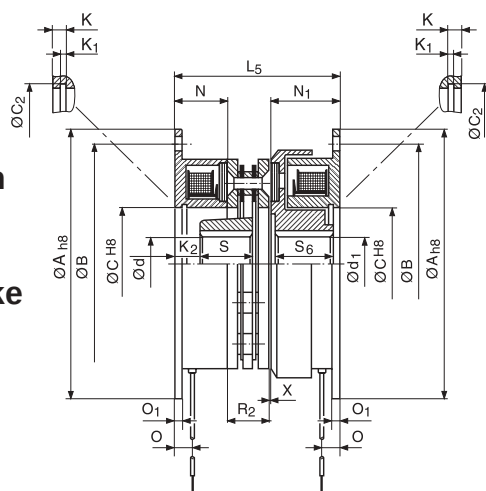


B 4 (refer to pg 7
for technical data)

Size 06...10 ...02.320

02.002-3-0308

Combination Flange Mount Clutch & Brake



B 5 (refer to pg 7
for technical data)

Combinorm K

Size 06...12 ...04.170

04.001-3-0310

bores d, d1, d2 ≤ 9 mm tolerance H8; ≥ 10 mm tolerance H7

Size	Torque		Power		A	B	C	C ₁	C ₂	d ¹⁾ max	d ₁ ¹⁾ max	d ₄ ¹⁾ max	d ₅	d ¹⁾ min	D	E	F
	[lbf·ft]	[Nm]	Brake [W]	Clutch													
01	0.4	0.5	6	-	39	33.5	11	13.5	-	6	-	-	-	-	28	19.5	4 x 3.4
02	0.6	0.75	6	-	45	38	13	16	13.6	8	-	-	-	-	32	23	4 x 3.4
03	1	1.5	8	-	54	47	19	22	20	10	-	-	-	-	40	30	4 x 3.4
04	1.3	1.8	8	-	60	52	18	20	19	10	-	-	-	-	42	29	3 x 4.3
05	2	3	10	-	65	58	26	24	27	15	-	-	-	-	50	38	4 x 3.4
06	5	7	12	15	80	72	35	32	36	18	20	19	18	8	63	50	4 x 4.5
07	11	15	16	20	100	90	42	38	43.5	22	25	22	21	10	80	60	4 x 5.5
08	22	30	21	28	125	112	52	48	53.8	30	30	30	28	12	100	76	4 x 6.6
09	48	65	28	35	150	137	62	58	63.8	35	35	35	35	16	125	95	4 x 6.6
10	96	130	38	50	190	175	80	73	82.1	45	50	45	44	18	160	120	4 x 9
11	185	250	50	68	230	215	100	92	102.1	60	65	-	-	26	200	158	4 x 9
12	370	500	65	85	290	270	125	112	127.4	70	80	-	-	31	250	210	4 x 11
13	554	750	90	On Request													
14	1107	1500	100														
15	2214	3000	120														

Size	G	H	J	K	K ₁	K ₂	L ₅	M	N	N ₁	N ₄	O	O ₁	O ₃	P	P ₆	R	R ₁
01	2 x 2.1	5.3	4.5	-	-	-	-	9.3	13.7	-	-	5	1.5	-	1	-	2.3	4.3
02	3 x 2.6	6	5	3	1.1	-	-	12.1	17	-	-	7.5	2	-	1.3	-	2.1	4.1
03	3 x 3.1	6	5.5	3	1.1	-	-	14.7	20	-	-	7	2	-	1.5	-	2.7	5.3
04	2 x 4.1	8	7	3.5	1.1	-	-	15.8	17	-	-	4.5	2	-	1.5	-	3.8	6.8
05	3 x 3.1	6.5	5.5	3.2	1.3	-	-	15	22	-	-	7.5	2	-	1.5	-	3	6
06	3 x 4.1	10	8	3.5	1.6	11.2	55.1	18.8	18	24	31.2	6	3	19	2	9.3	3.8	7.3
07	3 x 4.1	11	8	4.25	1.85	9.3	61.3	24.3	20	26.5	34.2	7	3	21.5	2	13.2	4.3	8.3
08	3 x 5.1	11.5	10	5	2.15	8.9	71	31	22	30	38	8	4	24	2.5	13.5	6	11
09	3 x 6.1	15	11.5	5.5	2.15	7.9	79.6	36.9	24	33.5	40	9	4	25	3	13.8	6.9	12.9
10	3 x 8.1	21	14.5	6	2.65	5	90.8	46.9	26	37.5	46.3	11	5	31.5	4	17.3	8.9	15.9
11	3 x 10.1	25	17.5	7	3.15	3.4	108.2	59.15	30	44	-	12	5	-	4.5	-	11.15	20.15
12	4 x 12.1	28	20.5	8	4.15	5.1	125.6	68	35	51	-	15	6	-	5	-	13	24
13	On Request																	
14																		
15																		

Size	R ₂	R ₅	S	S ₄	S ₆	U	V ₁	W ₄	X	Z	Z ₁	Weight [kg]			
												110	120/130	04.170	02.320
01	-	-	7	-	-	-	2.5	-	0.1	-	1 x M 3	0.05	0.05	-	-
02	-	-	10	-	-	-	4	-	0.15	-	1 x M 3	0.1	0.1	-	-
03	-	-	12	-	-	-	5	-	0.15	-	1 x M 4	0.15	0.15	-	-
04	-	-	12	-	-	-	5	-	0.2	-	1 x M 4	0.15	0.2	-	-
05	-	-	12	-	-	-	5	-	0.2	-	1 x M 5	0.2	0.25	-	-
06	12.9	6.3	15	45	20	39	6	M 4	0.2	M 6	1 x M 6	0.3	0.3	0.85	0.8
07	14.6	6.9	20	52.5	22	45	8	M 5	0.2	M 8	1 x M 6	0.5	0.6	1.5	1.5
08	18.8	9.3	25	58.5	24.5	56	10	M 6	0.2	M 8	1 x M 8	0.9	1.1	2.7	2.7
09	21.8	10.9	30	62	27.5	61	12	M 8	0.3	M 8	2 x M10	1.7	2	4.8	4.2
10	27	14.1	38	74	31	84	15	M 10	0.3	M 10	2 x M10	3.2	4	9.5	7.8
11	33.8	-	48	-	37	-	19	-	0.4	-	2 x M12	5.9	7	17.9	-
12	39.2	-	55	-	43.5	-	22	-	0.4	-	2 x M12	11.2	13.5	31.5	-
13	On Request														
14															
15															

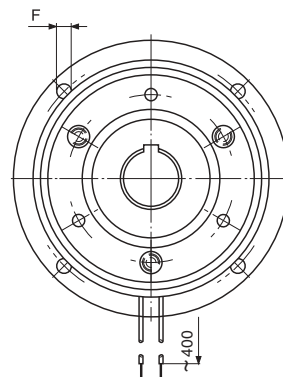
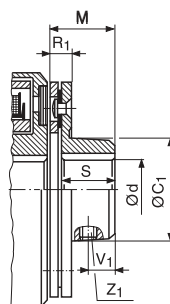
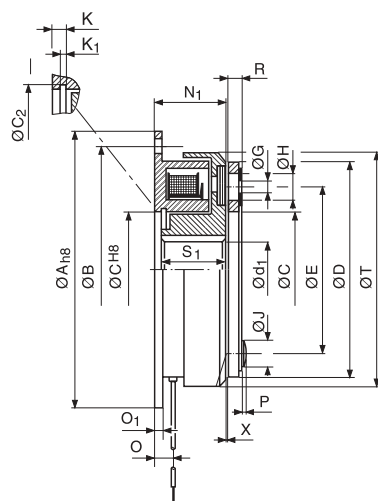
1) with standard keyway according to DIN 6885/1 and ANSI B17.1

Dimensions in mm

T2

Combinorm C

Flange Mount Clutch



Front view of ...03.110

B 6 (refer to pg 7 for technical data)

Size 01... 12

...03.110

...03.130

03.001-3-0309

Size 08... 12 ...03.730

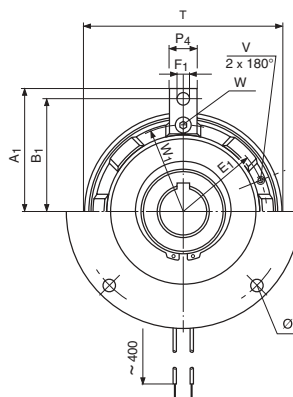
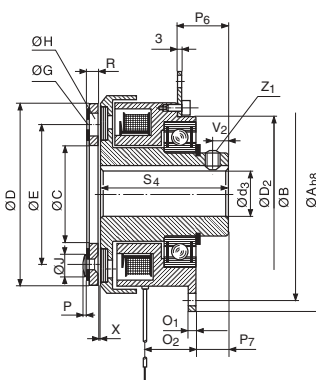
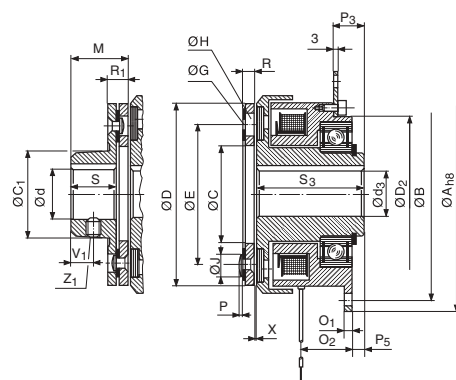
...03.710

Size 08... 12 ...03.930

...03.910

B 7 (refer to pg 7 for technical data)

Shaft Mount Clutch



Size 06 + 07 ...03.230

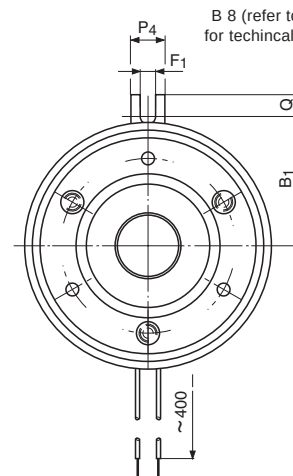
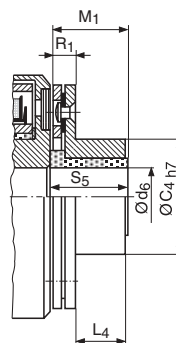
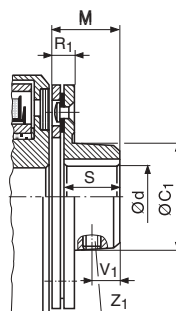
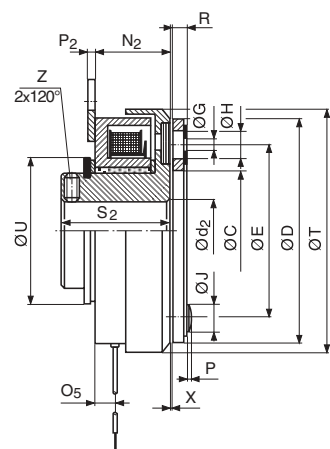
...03.210

Size 06 + 07 ...03.930

...03.910

03.007-3-0121

Low Speed Shaft Mount Clutch



Front view of ...03.610

B 8 (refer to pg 7 for technical data)

Size 01... 07...03.610

...03.630

...03.640

03.002-3-0309

bores d, d1, d2 ≤ 9 mm tolerance H8; ≥ 10 mm tolerance H7

Size	Torque		Power	A	A ₁	B	B ₁	C	C ₁	C ₂	C ₄	d ¹⁾ max	d ₁ ¹⁾ max	d ₂ max	d ₃ ¹⁾ max	d ₆ max	d ¹⁾ min
01	0.4	0.5	6	39	-	33.5	16.8	11	13.5	-	13	6	6	6	-	6	-
02	0.6	0.75	6	45	-	38	20	13	16	13.6	14	8	8	6	-	6	-
03	1	1.5	8	54	-	47	23	19	22	20	18	10	10	10	-	10	-
04	1.3	1.8	8	60	-	52	26	18	20	19	16	10	10	11	-	10	-
05	2	3	10	65	-	58	28	26	24	27	28	15	15	17	-	15	-
06	5	7	15	80	-	72	36	35	32	36	-	18	20	20	17	-	8
07	11	15	20	100	-	90	45	42	38	43.5	-	22	25	25	22	-	10
08	22	30	28	125	62.5	112	56	52	48	53.8	-	30	30	-	30	-	12
09	48	65	35	150	75	137	68.5	62	58	63.8	-	35	35	-	35	-	16
10	96	130	50	190	95	175	87.5	80	73	82.1	-	45	50	-	50	-	18
11	185	250	68	230	115	215	107.5	100	92	102.1	-	60	65	-	50	-	26
12	370	500	85	290	145	270	135	125	112	127.4	-	70	80	-	60	-	31

Size	D	D ₂	E	E ₁	F	F ₁	G	H	J	K	K ₁	L ₄	M	M ₁
01	28	-	19.5	-	4 x 3.4	3.1	2 x 2.1	5.3	4.5	-	-	4.8	9.3	9.3
02	32	-	23	-	4 x 3.4	3.1	3 x 2.6	6	5	3	1.1	7.8	12.1	12.1
03	40	-	30	-	4 x 3.4	3.1	3 x 3.1	6	5.5	3	1.1	9.1	14.7	14.7
04	42	-	29	-	3 x 4.3	3.1	2 x 4.1	8	7	3.5	1.1	8.8	15.8	15.8
05	50	-	38	-	4 x 3.4	3.1	3 x 3.1	6.5	5.5	3.2	1.3	8.8	15	15
06	63	-	50	-	4 x 4.5	5.2	3 x 4.1	10	8	3.5	1.6	-	18.8	-
07	80	-	60	-	4 x 5.5	5.2	3 x 4.1	11	8	4.25	1.85	-	24.3	-
08	100	85	76	45.75	4 x 6.6	6.5	3 x 5.1	11.5	10	5	2.15	-	31	-
09	125	95	95	55	4 x 6.6	6.5	3 x 6.1	15	11.5	5.5	2.15	-	36.9	-
10	160	126	120	72.5	4 x 9	9	3 x 8.1	21	14.5	6	2.65	-	46.9	-
11	200	126	158	88	4 x 9	9	3 x 10.1	25	17.5	7	3.15	-	59.15	-
12	250	160	210	110	4 x 11	11	4 x 12.1	28	20.5	8	4.15	-	68	-

Size	N ₁	N ₂	O	O ₁	O ₂	O ₅	P	P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	Q	R	R ₁	S	S ₁	S ₂
01	18	17.3	5	1.5	-	3.6	1	1.5	-	8	-	-	-	3	2.3	4.3	7	16.5	23.5
02	22.2	19.8	7.5	2	-	5	1.3	1.5	-	8	-	-	-	3	2.1	4.1	10	20.2	26.2
03	25.4	23	7	2	-	5.1	1.5	1.5	-	8	-	-	-	3	2.7	5.3	12	23.4	30.4
04	22.5	20.1	4.5	2	-	4.4	1.5	1.5	-	8	-	-	-	3	3.8	6.8	12	20	27.5
05	28.1	26.1	7.5	2	-	7.8	1.5	1.5	-	8	-	-	-	3	3	6	12	26.1	34.1
06	24	24	6	3	19	6	2	2.5	-	12	4	-	10.2	7	3.8	7.3	15	22	33
07	26.5	26.5	7	3	21.5	7	2	2.5	-	12	4.5	-	12	7	4.3	8.3	20	24	38
08	30	-	8	4	24	-	2.5	-	16.2	12	5.5	23.2	12.4	-	6	11	25	27	-
09	33.5	-	9	4	25	-	3	-	18.7	14	5.5	25.7	12.4	-	6.9	12.9	30	30	-
10	37.5	-	11	5	31.5	-	4	-	21.5	14	7	30.5	16	-	8.9	15.9	38	34	-
11	44	-	12	5	32.5	-	4.5	-	23	20	7	34	18	-	11.15	20.2	48	40	-
12	51	-	15	6	41	-	5	-	27	22	8	38.5	19.5	-	13	24	55	47	-

Size	S ₃	S ₄	S ₅	T	U	V	V ₁	V ₂	W	W ₁	X	Z	Z ₁	Weight [kg]			
														110/610	130/630/640	210/710	230/730
01	-	-	9.4	31	17	-	2.5	-	-	-	0.1	M 3	1 x M 3	0.1	0.1	-	-
02	-	-	12.25	34	21	-	4	-	-	-	0.15	M 3	1 x M 3	0.1	0.1	-	-
03	-	-	14.85	43	23	-	5	-	-	-	0.15	M 4	1 x M 4	0.2	0.2	-	-
04	-	-	16	45	23	-	5	-	-	-	0.2	M 4	1 x M 4	0.2	0.25	-	-
05	-	-	15.2	54	32	-	5	-	-	-	0.2	M 4	1 x M 5	0.35	0.4	-	-
06	41	47	-	67	41	-	6	4.5	-	-	0.2	M 4	1 x M 6	0.5	0.5	0.8	0.9
07	45	52.6	-	85	50	-	8	5.5	-	-	0.2	M 6	1 x M 6	0.9	1	1.5	1.6
08	51.5	58.4	-	106	-	M 5	10	5.5	M 4	46.5	0.2	-	1 x M 8	1.6	1.8	2.3	2.5
09	55	62	-	133	-	M 8	12	5.5	M 5	55	0.3	-	2 x M10	2.8	3.1	3.7	4.1
10	65	74	-	169	-	M 8	15	6.9	M 5	72.5	0.3	-	2 x M10	5.6	6.3	7	7.7
11	82	82	-	212.5	-	M10	19	8	M 6	88	0.4	-	2 x M12	9.7	11	13.1	14.3
12	85	96.5	-	266	-	M10	22	9	M 8	110	0.4	-	2 x M12	17.9	20.3	23	25

1) with standard keyway according to DIN 6885/1 and ANSI B17.1

Dimensions in mm

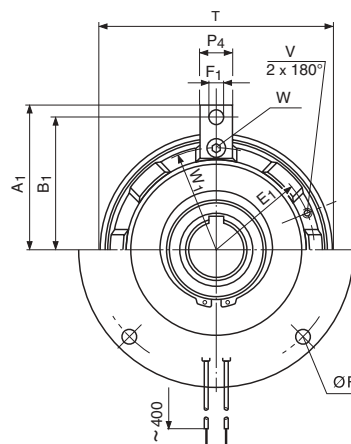
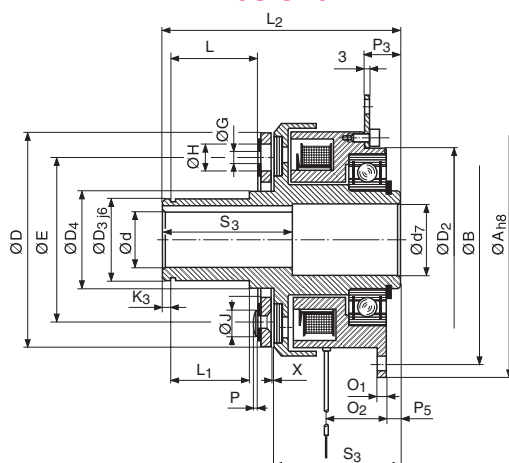
T3

Size 08... 12

...03.810

B 9 (refer to pg 7
for technical data)

Shaft Mounted Clutch for Attachment of Bearing Mounted Pulley



Size 06 + 07

...03.810

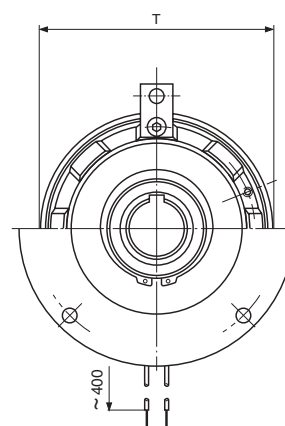
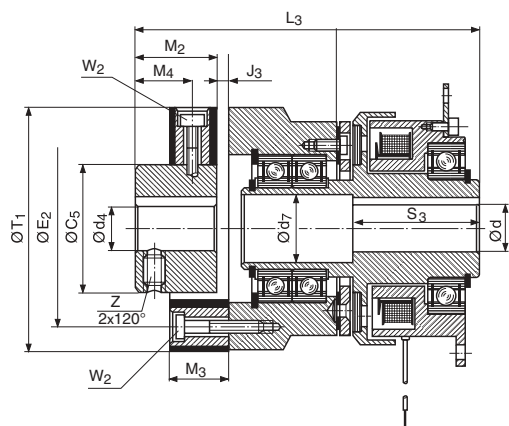
03 007-3-0122

Size 08... 12

...03,840

B 10 (refer to pg 7
for technical data)

Flexible Clutch Coupling



Size 06 + 07

...03.840

03.003-3-0309

Size	Torque		Power	$M_A^{1)}$	A	A_1	B	B_1	C_5	D	D_2	D_3	D_4	d_4	d_7	d	E	E_1	E_2	F	F_1	G	H	J	J_3
	[lbf·ft]	[Nm]	[W]	[Nm]										max		max									
06	5	7	15	10	80	-	72	-	30	63	-	25	29	19	17	16	50	-	44	4x4.5	-	3x 4.1	10	8	2
07	11	15	20	25	100	-	90	-	40	80	-	35	40	26	25	22	60	-	68	4x4.5	-	3x 4.1	11	8	4
08	22	30	28	25	-	62.5	-	56	45	100	85	40	46	30	28.5	25	76	45.75	80	-	6.5	3x 5.1	11.5	10	4
09	48	65	35	50	-	75	-	68.5	60	125	95	50	57	38	33	35	95	55	100	-	6.5	3x 6.1	15	11.5	4
10	96	130	50	140	-	95	-	87.5	85	160	126	70	76	55	41	50	120	72.5	140	-	9	3x 8.1	21	14.5	6
11	185	250	68	220	-	115	-	107.5	100	200	126	70	76	65	48	50	158	88	165	-	9	3x10.1	25	17.5	8
12	370	500	85	500	-	145										60	210	110	215	-	11	4x12.1	28	20.5	8

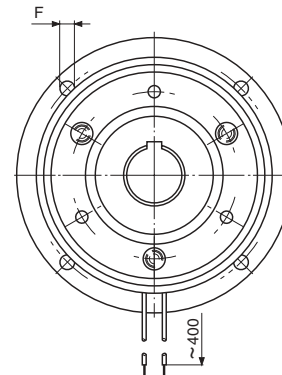
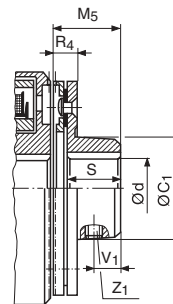
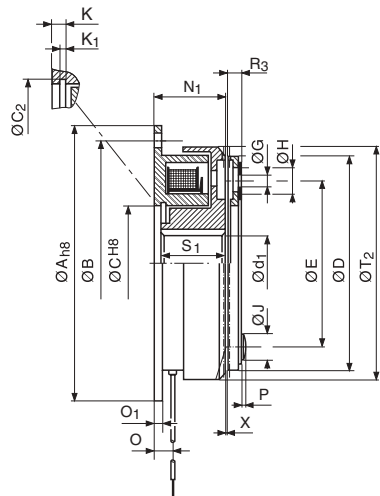
Size	K ₃	L	L ₁	L ₂	L ₃	M ₂	M ₃	M ₄	O ₁	O ₂	P	P ₃	P ₄	P ₅	S ₃	T	T ₁	V	W	W ₁	W ₂	X	Z	Weight	
																								810	840
06	2.1	32.9	25.6	80	117	30	24	19	3	19	2	-	-	4	41	67	56	-	-	-	2xM 6	0.2	M 5	1	1.7
07	2.8	37.7	29.9	90	129	30	24	20	3	21.5	2	-	-	4.5	45	85	85	-	-	-	2xM 8	0.2	M 6	1.8	3
08	3.15	35.15	32.15	96	141	35	28	23	-	24	2.5	16.2	12	5.5	51.5	106	100	M 5	M 4	46.5	3xM 8	0.2	M 8	2.7	4.1
09	3.2	37.6	34.6	103	160	45	32	31	-	25	3	18.7	14	5.5	55	133	120	M 8	M 5	55	3xM 10	0.3	M 10	4.2	7.4
10	4	47.8	43.1	126	200	60	46	40	-	31.5	4	21.5	14	7	65	169	170	M 8	M 5	72.5	3xM 14	0.3	M 10	8.3	14.6
11	4	47.45	43.3	134	217	65	58	40	-	32.5	4.5	23	20	7	71	212.5	200	M10	M 6	88	3xM 16	0.4	M 12	14.5	24.4
12	4	59.6	55.3	162	260	80	70	49	-	41	5	27	22	8	85	266	260	M10	M 8	110	3xM 20	0.4	M 12	26	45.2

1) W_2 Torque

Dimensions in mm

T4

Flange Mounted Tooth Clutch



Front view of ...07.110

B 11 (refer to pg 7 for technical data)

Size 06... 10

...07.110

...07.130

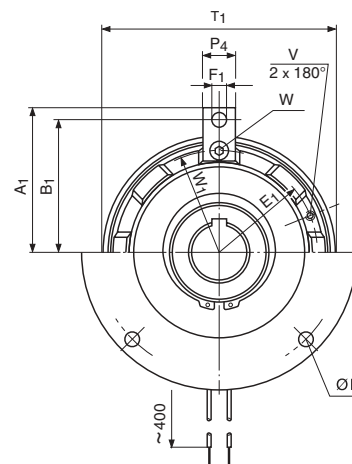
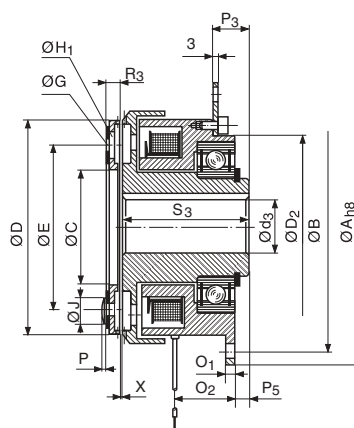
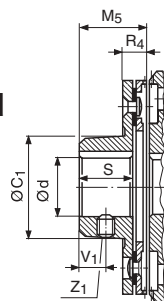
07.001-3-0311

Size 08... 10 ...07.730

...07.710

B 12 (refer to pg 7 for technical data)

Shaft Mounted Tooth Clutch



Size 06 + 07 ...07.230

...07.210

07.002-3-0311

Size	Torque		Power	A	A ₁	B	B ₁	C	C ₁	C ₂	D	d ₁ ¹⁾	D ₂	d ₃ ¹⁾	d ₁ ¹⁾	E	E ₁	F	F ₁	G	H ₁	J	K	K ₁	M ₅	N ₁
	[lbf·ft]	[Nm]	[W]									max		max	max											
06	15	21	15	80	-	72	-	35	32	36	63	20	-	17	18	50	-	4x4.5	-	3x4.1	8	8	3.5	1.6	20.3	24
07	33	45	20	100	-	90	-	42	38	43.5	80	25	-	22	22	60	-	4x5.5	-	3x4.1	8	8	4.25	1.85	26.4	26.5
08	66	90	28	125	62.5	112	56	52	48	53.8	100	30	85	30	30	76	45.75	4x6.6	6.5	3x5.1	11.2	10	5	2.15	33.6	30
09	144	195	35	150	75	137	68.5	62	58	63.8	125	35	95	35	35	95	55	4x6.6	6.5	3x6.1	15	11.5	5.5	2.15	41.2	33.5
10	288	390	50	190	95	175	87.5	80	73	82.1	160	50	126	50	45	120	72.5	4x9	9	3x8.1	16	14.5	6	2.65	50.8	37.5
11																										
12																										

Size	O	O ₁	O ₂	P	P ₃	P ₄	P ₅	R ₃	R ₄	S	S ₁	S ₃	T ₁	T ₂	V	V ₁	W	W ₁	X	Z ₁	Weight [kg]			
																					210/710	230/730	110	130
06	6	3	19	2	-	-	4	5.3	8.8	15	22	41	68	68	-	6	-	-	0.15	1x M 6	1	1	0.7	0.7
07	7	3	21.5	2	-	-	4.5	6.4	10.4	20	24	45	86.5	86.5	-	8	-	-	0.2	1x M 6	1.7	1.8	1.1	1.2
08	8	4	24	2.5	16.2	12	5.5	8.6	13.6	25	27	51.5	108	108	M5	10	M 4	46.5	0.2	1x M 8	2.6	2.8	1.9	2.1
09	9	4	25	3	18.7	14	5.5	11.2	17.2	30	30	55	135	135	M8	12	M 5	55	0.2	2x M10	4.1	4.4	3.2	3.5
10	11	5	31.5	4	21.5	14	7	12.8	19.8	38	34	65	172.2	172.2	M8	15	M 5	72.5	0.25	2x M10	7.5	8.3	6.1	6.9
11																								
12																								

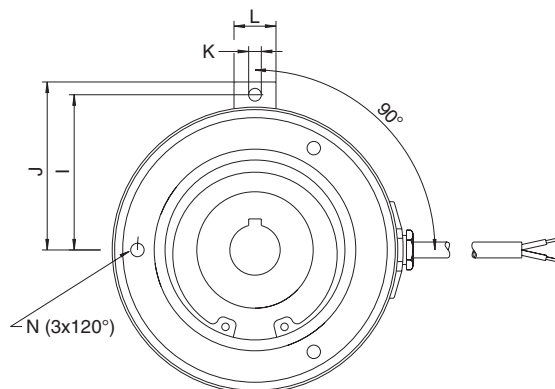
1) with standard keyway according to DIN 6885/1 and ANSI B17.1

Dimensions in mm

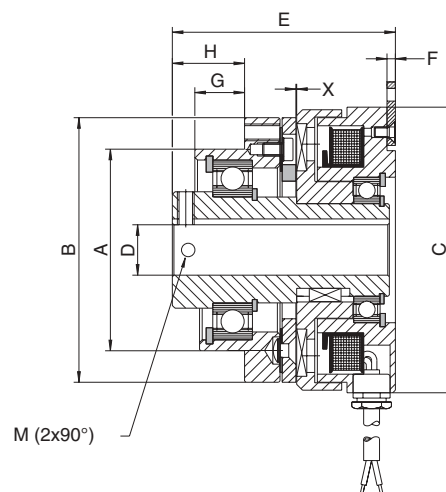
T5

03.822 Series (Shaft-Mounted Clutch)

Shaft Mounted Clutch

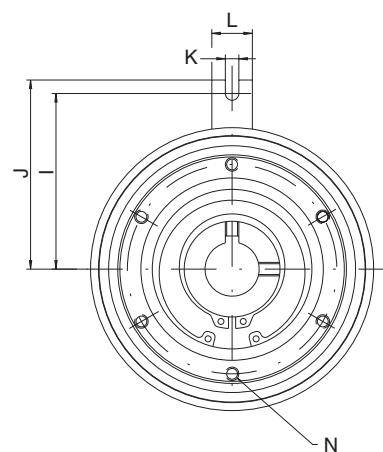


Size 08

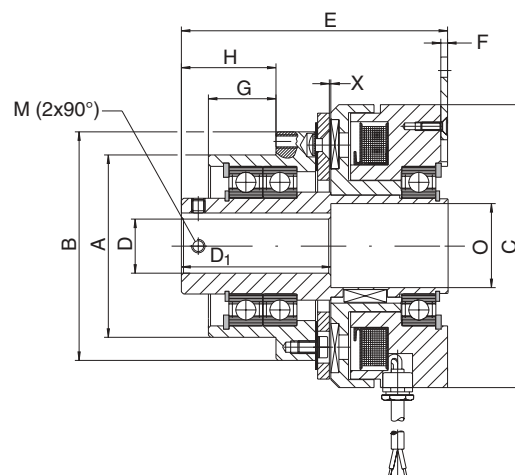


...03.822

Shaft Mounted Clutch



Size 09

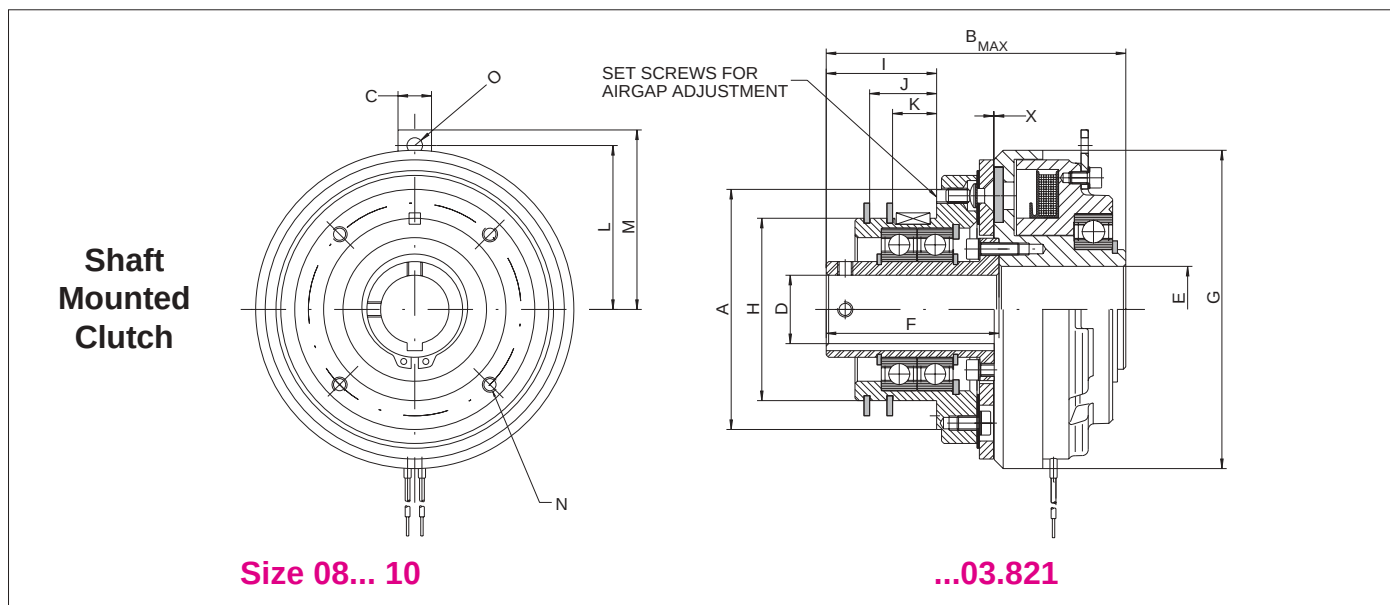


...03.822

Size	Torque		Power	A	B	C	D Max Dia	D ₁	E	F	G	H	Armature Hub Inertia	
	[lb ft]	[Nm]											10 ⁻⁴ kgm ²	10 ⁻⁴ lb ft ²
08	20	27	16	3.000	3.937	4.250	1.000	NA	3.320	0.125	0.740	1.075	7.342	453.220
09	48	65	35	3.375	4.230	5.236	1.125	2.765	4.934	0.125	1.250	1.750	19.123	453.220

Size	I	J	K	L	M	N				O	X
						# of Holes	Thread Size	Bolt Circle	Max Depth		
08	2.310	2.500	0.190	0.625	1/4-20	3	1/4-20	3.5	0.528	NA	0.010
09	3.250	3.500	0.125	0.750	1/4-20	6	1/4-20	3.875	0.731	1.555	0.012

Dimensions in Inches

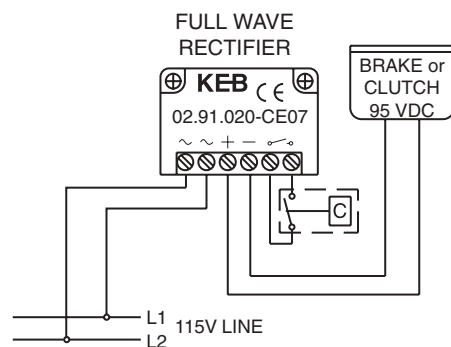


Size	Torque		Power [W]	A Max Dia	B Max	C Dia	D Max Dia	E	F	G	H	Armature Hub Inertia	
	[lb ft]	[Nm]										10 ⁻⁴ kgm ²	10 ⁻⁴ lb ft ²
08	22	30	28	3.600	4.390	0.472	0.875	1.083	2.441	4.177	2.500	6.258	148.400
09	48	65	35	3.950	4.935	0.551	1.125	1.417	2.843	5.236	3.000	18.630	441.800
10	96	130	50	5.250	5.906	0.551	1.500	1.890	3.445	6.693	4.000	58.950	1398.000

Size	I	J	K	L	M	N				O	X
						# of Holes	Thread Size	Bolt Circle	Max Depth		
08	1.680	1.008	0.715	2.205	2.461	3	1/4/20	3	0.431	0.256	0.008
09	1.817	1.113	-	2.953	2.697	4	1/4-20	3.5	0.664	0.256	0.012
10	2.396	1.539	-	3.445	3.74	4	5/16/18	4.75	0.589	0.354	0.012

Dimensions in Inches

KEBCO Combitor Rectifier Specifications



Full or Half Wave Rectifier	V _{in} max. input voltage (VAC)	V _{out} output voltage (VDC)	In nominal current		Switching	V _{max} switch-off voltage	Rectifier part number
			45° C	80° C			
Full	275V	0.9*V in	2.0A	1.0A	AC or DC	450 V	02.91.020-CE07
Full	500V	0.9*V in	2.0A	1.0A	AC or DC	900 V	04.91.020-CE07
Half	275V	0.45*V in	1.0A	0.5A	AC or DC	450 V	02.91.010-CE07
Half	500V	0.45*V in	1.0A	0.5A	AC or DC	900 V	04.91.010-CE07
Half	600V	0.45*V in	1.0A	0.5A	AC	1000 V	05.91.010-CE09
Half	720V	0.45*V in	1.0A	0.5A	AC	1600 V	06.91.010-CE09
Half ¹⁾	275V	0.45*V in	1.0A	0.5A	AC or DC	450 V	02.91.010-CEMV

¹⁾ with EMC Protection

D.C.- side switching.
Separate voltage supply.
Short switching times.

people in motion



KEBCO COMBIVERT F4-S, F4-C

High quality general purpose frequency inverters. Excellent for indexing systems, high speed spindles, complex profiles and high dynamic applications.

Rating: 0.5...400 HP
Connection: 1/3-phase: 230V, 460V



KEBCO COMBIVERT F4-F

High performance flux vector closed loop inverters with an angular synchronization control and an absolute/incremental positioning control built into the drive.

Rating: 1...125 HP
Connection: 230V, 460V



KEBCO COMBIVERT S4

AC-Servo amplifier/motor packages with peak torque ratings of 5x nominal torque. Includes an angular synchronization control and an absolute/incremental positioning control built into the drive.

Torque: 2.6...620 inlbs
Speed: 1000/2000/3000/4000/6000 rpm
Connection: 230V, 460V



KEBCO COMBIGEAR

Compact, high performance integral gearmotors. Helical gearing available in inline, parallel shaft mount, and right angle shaft mount configurations. Gearmotors can be supplied with any combination of spring set brake, encoder, or force cooling fan.

Gearmotors: 1/6...50HP
Motor only: 1/6...400HP



KEBCO COMBIBOX

Clutch-Brake-Modules

KEBCO COMBISTOP

Spring set brakes

KEBCO COMBINORM

Electromagnetic clutches and brakes

KEBCO COMBIPERM

Permanent magnet clutches and brakes

KEBCO COMBITRON

Rectifiers and Controls



A Member of the



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