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ELECTROMAGNETIC Powder Brakes and Clutches

TYPE P...



Technical description

Powder brakes and clutches make it possible to design drives where the (braking) torque may be adjusted smoothly (programmed), as needed by the user, from the minimum value M_r (residual torque $M_r \leq 1\% M_n$), up to the rated torque M_n (Table).

Upon engagement, the torque is smoothly increased with a certain delay t_{09} [ms] (the time for reaching 90% of M_n), and upon disengagement the torque decays, also smoothly, with a delay t_{01} [ms] (the time for reaching 10% of M_n), whereas its value depends (almost linearly) on the coil current value (see charts).

For braking torque adjustment, we recommend using the EZP-51 controller with coil current set with a 0-10 k Ω potentiometer, or with a signal from 0-10 V (inductive, proximity, force etc.) sensors, or with a 4-20 mA current signal. The set torque is maintained with an accuracy of 5%, irrespective of the number of revolutions per minute or of the slipping between the body and the rotor.

The acceptable rpm ranges are as follows:

- 50-3,000 [min⁻¹] for brakes,
- 50-1,500 [min⁻¹] for clutches.

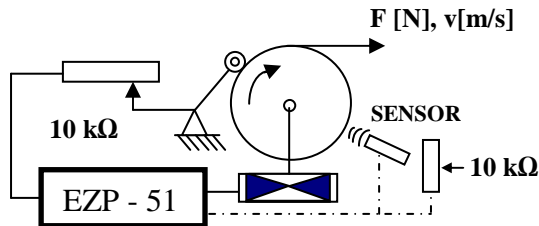
Powder brakes and clutches may operate with continuous slip, provided that the acceptable heat dissipation rating values specified in the table are not exceeded.

Note:

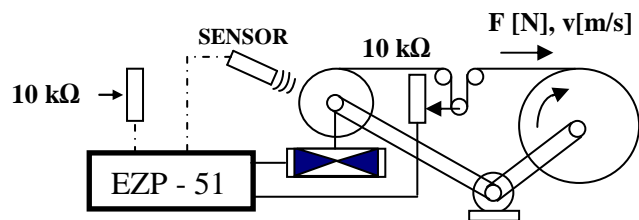
For clutches and brakes to operate properly, their rotation axis must be horizontal.

Sample fields of application :

Any type of winders, drawing machines or printing machines where the material must be smoothly tensioned, with the tensioning element slipping.

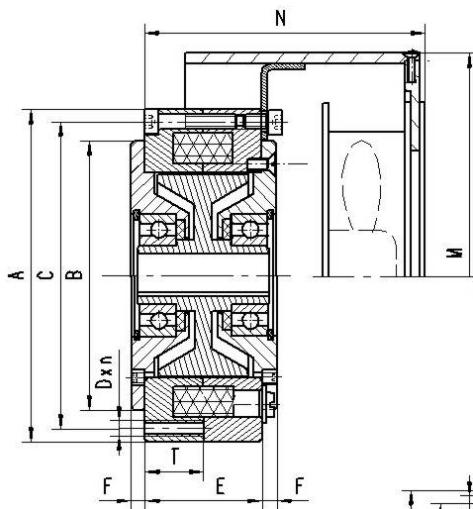


POWDER BRAKE

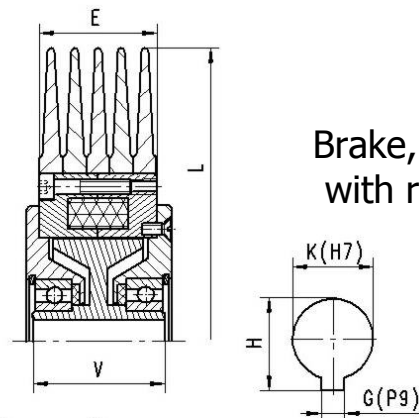


POWDER CLUTCH

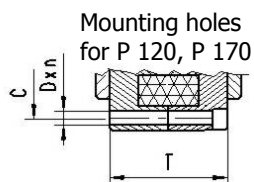
Brake with fan



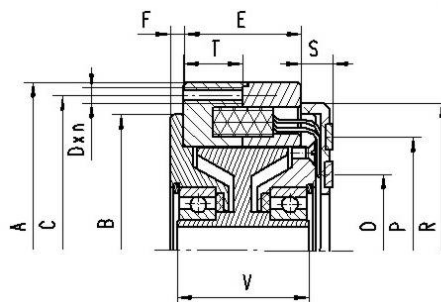
Brake, or clutch with radiator



Brake



Mounting holes for P 120, P 170



Clutch

Technical data	P3 ..	P6 ..	P12 ..	P35 ..	P65 ..	P80 ..	P120 ..	P170 ..
Nominal Torque	3	6	12	35	65	80	120	170
Residual Torque	0,04*	0,06*	0,15*	0,25*	0,4*	0,4*	0,6*	1,5*
Supply voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Current intensity	0,8 A	0,96 A	0,92 A	1 A	1 A	1,1 A	1,2 A	1,2 A
Resistance	30 Ohm	25 Ohm	26 Ohm	24 Ohm	24 Ohm	22 Ohm	21 Ohm	21 Ohm
Engaging time t_{09}	100*	110*	130*	280*	360*	350*	530*	800*
Disengaging time t_{01}	50*	60*	70*	100*	140*	170*	200*	270*
Brake	P 3 H	P 6 H	P 12 H	P 35 H	P 65 H	P 80 H	P 120 H	P 170 H
Heat dissipation P_{max}^{**}	50 W	80 W	100 W	150 W	200 W	250 W	400 W	500 W
Weight	0,75 kg	1,4 kg	2.6 kg	5.0 kg	9.0 kg	12.7 kg	18 kg	24 kg
Brake with radiator	P 3 HR	P 6 HR	P 12 HR	P 35 HR	P 65 HR	P 80 HR	P 120 HR	P 170 HR
Heat dissipation P_{max}^{**}	100 W	160 W	200 W	280 W	400 W	500 W	800 W	1000 W
Weight	1,1 kg	1,9 kg	3.8 kg	7.5 kg	12.9 kg	18.5 kg	23 kg	30 kg
Brake with fan (the fan voltage: 24 VDC, or 115VAC, or 230 VAC)	P 3 HV	P 6 HV	P 12 HV	P 35 HV	P 65 HV	P 80 HV	P 120 HV	P 170 HV
Heat dissipation P_{max}^{**}	150 W	300 W	400 W	600 W	800 W	1050 W	1600 W	2000 W
Weight	1,4 kg	2,2 kg	4.5 kg	8.0 kg	13.0 kg	17.0 kg	24 kg	28kg
Clutch	P 3 S	P 6 S	P 12 S	P 35 S	P 65 S	P 80 S	P 120 S	P 170 S
Heat dissipation P_{max}^{**} (500 rpm)	80 W	100 W	120 W	200 W	280 W	350 W	800 W	1000 W
Heat dissipation P_{max}^{**} (1000 rpm)	100 W	120 W	150 W	250 W	350 W	550 W	1000 W	1250 W
Weight	0,8 kg	1,5 kg	2.8 kg	5.2 kg	9.4 kg	13.3 kg	18,9 kg	24,8 kg
Clutch with radiator	P 3 SR	P 6 SR	P 12 SR	P 35 SR	P 65 SR	P 80 SR	P 120 SR	P 170 SR
Heat dissipation P_{max}^{**} (500 rpm)	250 W	350 W	440 W	640 W	960 W	1200 W	1600 W	2200 W
Heat dissipation P_{max}^{**} (1000 rpm)	300 W	400 W	500 W	800 W	1200 W	1550 W	2000 W	2750 W
Weight	1,2 kg	2,0 kg	4.0 kg	7.7 kg	13.4 kg	19.0 kg	23,7 kg	28,8 kg

* - with controller EZP-51

** - Heat loss power at 100% operation ($T_o = 20^\circ\text{C}$) :

$$P = 0,105 * M_h [\text{Nm}] * (n_w - n_k) [\text{min}^{-1}] < P_{max}$$

n_w - rotor speed $[\text{min}^{-1}]$, n_k - clutch body speed $[\text{min}^{-1}]$,

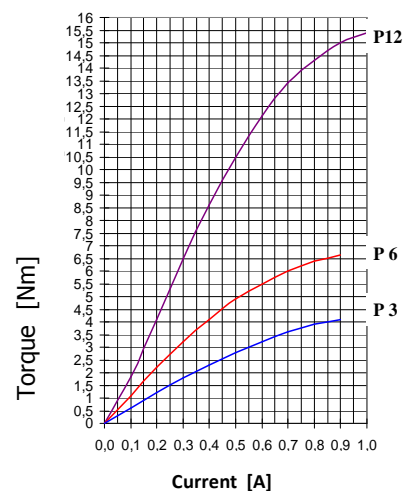
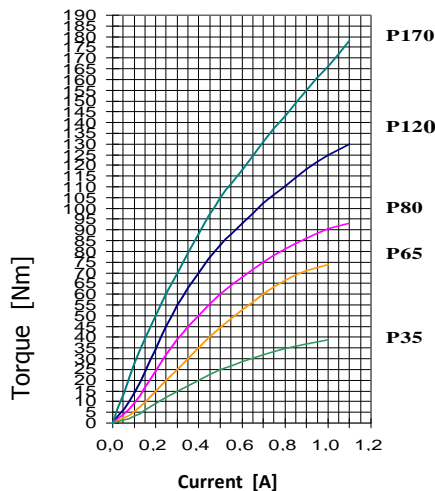
$$\text{lub } P = F [\text{N}] * v [\text{m/s}] < P_{max}$$

t_{09} - the time for reaching 90 % M_n upon engagement ,

t_{01} - the time for reaching 10 % M_n upon disengagement

Dimensions	P 3	P 6	P12	P35	P65	P80	P120 ...	P170 ...
A [h8]	75	91	114	156	188	205	254	254
B [h8]	62	78	92	125	146	149	206	206
C	69	85	105	146	174	188	233	233
D x n	M 3 x 3	M 3 x 3	M 5 x 3	M 5 x 6	M 6 x 6	M 6 x 6	Ø 6,4 x 8	Ø 6,4 x 8
E	25	32	40	48	56	64	70	86
F	5,5	5,5	5	4,5	5	6	6	6
G	3 P 9	4 P 9	4 P 9	5 P 9	8 P 9	8 P 9	8 P 9	8 P 9
H	11 ^{+0,1}	16 ^{+0,1}	16 ^{+0,1}	19.3 ^{+0,1}	28.3 ^{+0,1}	28.3 ^{+0,1}	31.3 ^{+0,2}	31.3 ^{+0,2}
K [H7] (K max)	10 (15)	15 (22)	15 (25)	17 (35)	25 (38)	25 (38)	28 (42)	28 (42)
L	110	140	200	260	330	350	390	390
M	100	120	154	203	236	255	284	284
N	86	93	99	125	137	145	202	218
O	42	52	54	64	70	90	108	108
P	60	70	74	82	90	110	132	132
R	74,5	90,5	114	132	154	184	222	222
S	10	10	10	10	10	10	10	10
T	12,5	16	20	24	28	32	70	86
P-O / 2	9	9	10	10	10	10	12	12
V	31	37	45	50	58	66	74	90

Dimensions	Φ x length	Φ x length	Φ x length	Φ x length	Φ x length	Φ x length	Φ x length	Φ x length
H	Φ 75x36	Φ 91x43	Φ 114x50	Φ 156x58	Φ 188x66	Φ 205x76	Φ 254x82	Φ 254x98
HR	Φ 110x36	Φ 140x43	Φ 200 x 50	Φ 260 x 58	Φ 330 x 66	Φ 350 x 76	Φ 390 x 82	Φ 390 x 98
S	Φ 75x40,5	Φ 91x47,5	Φ 114x55	Φ 156x63	Φ 188x71	Φ 205x80	Φ 254x88	Φ 254x104
SR	Φ 110x40,5	Φ 140x47,5	Φ 200 x 55	Φ 260 x 63	Φ 330 x 71	Φ 350 x 80	Φ 390 x 88	Φ 390x104
HV	Φ 100x91,5	Φ 120x98,5	Φ 154 x104	Φ 203x130	Φ 236x142	Φ 255x151	Φ 284x208	Φ 284x224



Order description :

P

Mechanical size

**3, 6, 12, 35, 65, 80,
120, 170**

Product variant

H	Brake
S	Clutch

Cooling Brake, Or Clutch

	Basic variant	
R	Radiator	
V230	Fan supply	230 V AC
V115	Fan supply	110 V AC
V24	Fan supply	24 V DC

Example of order description:

P 80 HR - Powder brake fitted with radiator, brake supply 24 V DC C

P 80 HV230 - Powder brake fitted with fan of voltage 230 V AC, brake supply 24 V DC

P 120 HV230 K42 G12 H45,3 - special execution K, G, H , brake supply 24 V DC

The producer reserves the right to modify as a result of developing the product. It is possible to realize special versions.