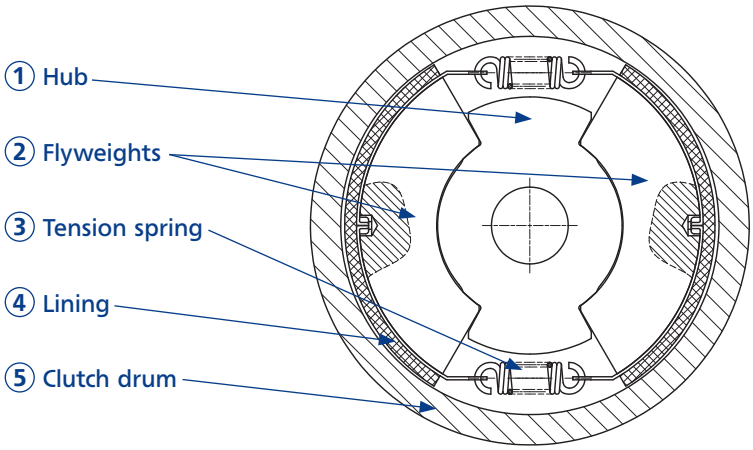
Centrifugal clutches and brakes

F-Type Self-increasing clutch

Construction and mode of operation

The flyweights ② are seated on the profiled hub ① and are held against it by tension springs ③, which are hooked into the linings ④. Discs locate the flyweights axially. Each lining has a crimping on its inner surface to locate it on the flyweight. This prevents the linings from moving sideways.

As the profiled hub rotates, the centrifugal force acting on the flyweights overcomes the spring force. When the speed is high enough, the linings contact the clutch drum ⑤, and friction between the linings and the drum allows torque to be transmitted between the two.

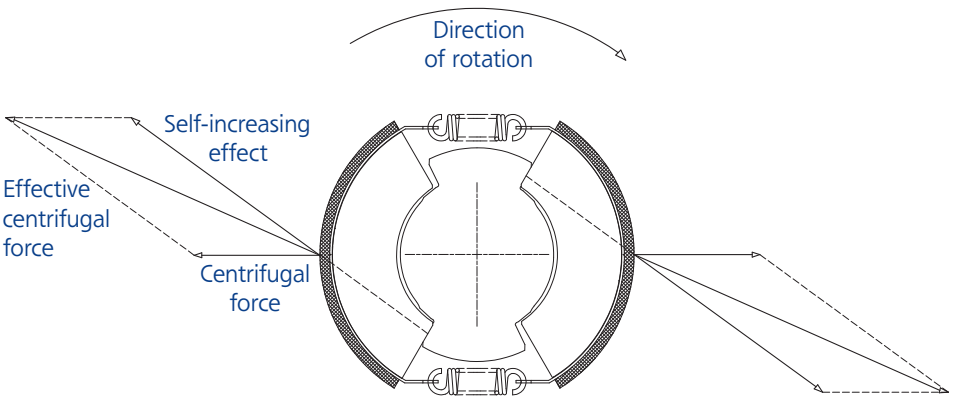


Advantages

The compact design and self-increasing effect allow this clutch to transmit remarkably high torques while needing very little space, resulting in a performance factor of ca. 2.5.

Because the tension springs are easily accessible and the linings removable, the parts subject to wear are easy to replace. Because the linings are not secured to the flyweights, some noise is possible in service, but normally not sufficient to cause a nuisance.

Self-increasing effect: the profiled hub has a special form which causes a wedging effect between the profile and the flyweights when torque is applied to the clutch. This results in an additional force on the linings and allows a higher torque to be transmitted.

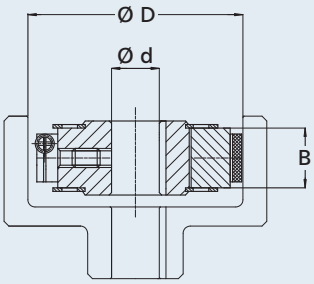


Performance data and dimensions:

Size	D [mm]	B [mm] [1]	d max. [mm]	Standard bore diameter d [mm] (inch) [2]	Md at nE 750 and nB 1500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1250 and nB 2500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1500 and nB 3000 [Nm]	Recommended motor power [3] [kW]
01	50	10	14	12			1.3	0.17	2	0.3
02	60	15	18	15 ($^5/_8$)			4	0.5	5	0.8
03	70	15	22	15; 20 ($^7/_8$)			7	0.9	10	1.6
04	80	15	28	14 - 25 ($^3/_4$; $^7/_8$)	4	0.3	11	1.4	16	2.5
05	90	20	35	18; 20; 25 ($^3/_4$; 1)	10	0.8	26	3.4	40	6.3
06	100	20	35	20; 24; 28 ($^3/_4$; 1)	16	1.3	42	5.5	60	9.4
07	110	20	40	28; 35; 40 (1)	25	2.0	70	9.0	100	15.7
08	125	20	50	25; 38; 49; ($^3/_4$; 1)	40	3.2	120	15.7	180	28.3
09	138	25	55	30; 38; 48 (1)	90	7.0	240	31.0	320	50.0
10	150	25	60	38; 48; 49	125	10.0	340	44.5	470	74.0
11	165	30	65	42; 50; 55 (1 $^7/_{16}$)	220	17.2	620	81.0	870	136.0
12	180	40	75	50; 60 (2 $^3/_8$)	460	36.0	1200	157.0	1700	267.0
13	200	30	75	35; 55; 65 (2 $^3/_8$)	520	41.0	1300	170.0	1850	290.0

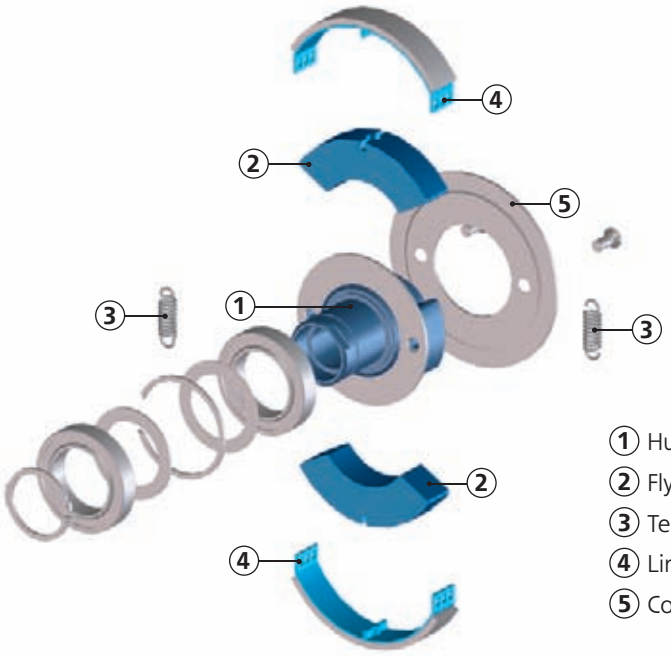
[1] The transmitted power increases as the width B is increased.
[2] Tapered bores and special dimensions can be manufactured on request.
[3] Motor power is calculated using a safety factor of 2.
Final selection of the clutch should be carried out by SUCO!

d max. = max. bore dia.
Md = torque
nE = engagement speed
nB = operating speed



d = bore dia.
D = inside dia. of drum
B = flyweight width

Exploded view of F-Type

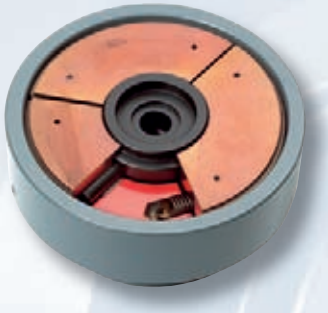


① Hub
② Flyweights
③ Tension spring
④ Lining
⑤ Cover disc

Centrifugal clutches and brakes

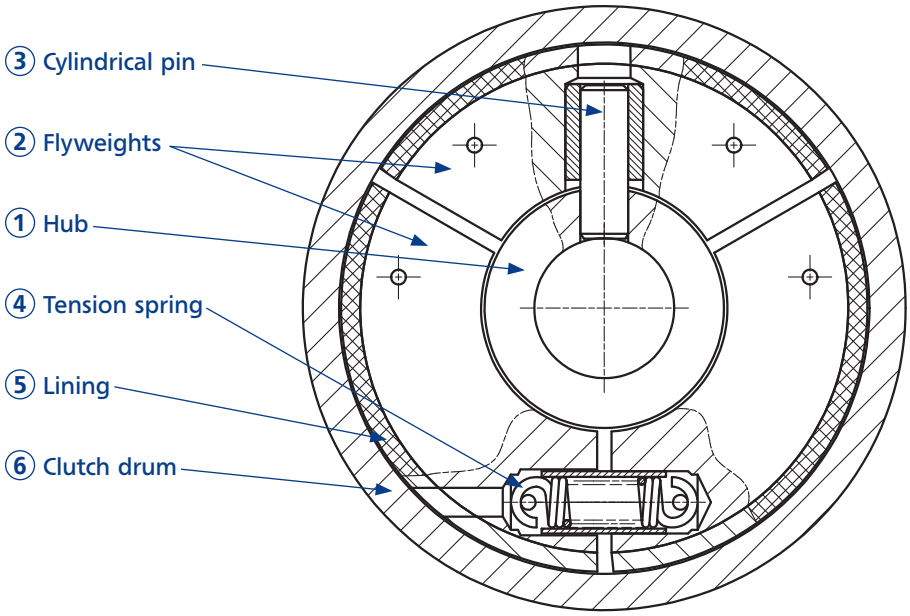
S-Type

Pin-guided clutch with three flyweights



Construction and mode of operation

The cylindrical hub ① carries three flyweights ② which are located by and can slide on cylindrical pins ③. Inside the flyweights, there are tension springs ④ which restrain neighbouring flyweights until centrifugal force overcomes the spring force. Then the flyweights lift from their seats and the linings ⑤ on the flyweights contact the inside diameter of the clutch drum ⑥. Friction between the linings and the clutch drum allows torque to be transmitted.



Advantages

In contrast to F-Type clutches, the linings of pin-guided clutches are permanently bonded to the flyweights instead of being mounted on loose carriers. The guide pins of W-Type clutches provide accurate guidance for the flyweights, which ensures quiet operation of the clutch.

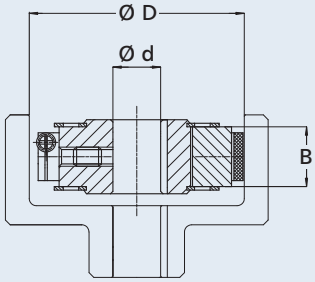
For this type of clutch, the performance factor for torque transmission is ca. 1.5.

Performance data and dimensions:

Size	D [mm]	B [mm] [1]	d max. [mm]	Standard bore diameter d [mm] (inch) [2]	Md at nE 750 and nB 1500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1250 and nB 2500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1500 and nB 3000 [Nm]	Recommended motor power [3] [kW]
04	80	25	24	15 ($^3/_4$; $^5/_8$)	4.3	0.3	12	1.6	17.5	2.8
05	90	25	30	14; 30 ($^5/_8$)	7.5	0.6	21	2.8	31	4.9
06	100	25	24	20; 24; 28 ($^3/_4$; $^7/_8$)	11	0.8	30	4.0	43	7.0
07	110	25	30	28; 30 (1)	15	1.2	45	6.0	64	10.0
08	125	25	40	20; 30 (1 $^1/_2$)	30	2.4	85	11.0	124	20.0
09	138	25	30	17; 30 (1; 1 $^1/_8$)	40	3.0	112	15.0	160	25.0
10	150	35	40	38 (1 $^1/_8$)	78	6.0	216	28.0	310	49.0

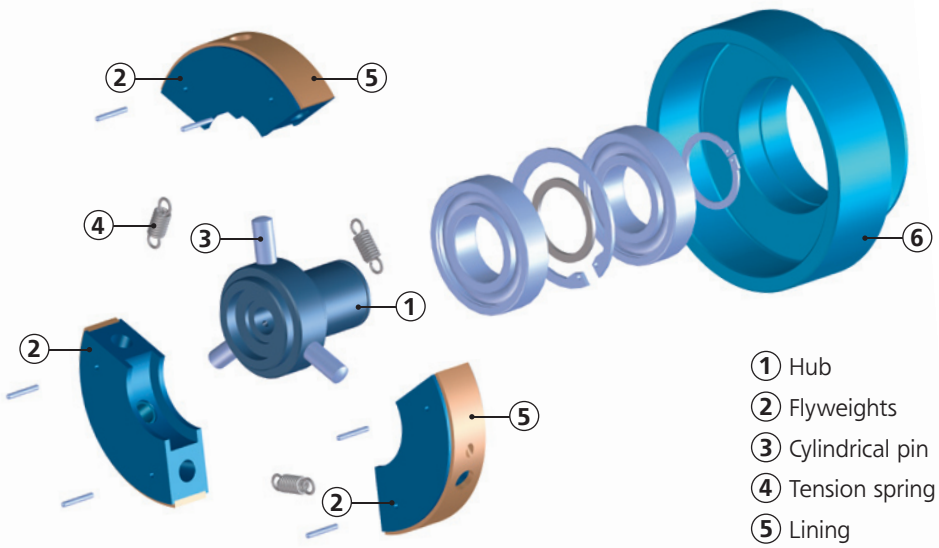
[1] The transmitted power increases as the width B is increased.
[2] Tapered bores and special dimensions can be manufactured on request.
[3] Motor power is calculated using a safety factor of 2.
Final selection of the clutch should be carried out by SUCO!

d max. = max. bore dia.
Md = torque
nE = engagement speed
nB = operating speed



d = bore dia.
D = inside dia. of drum
B = flyweight width

Exploded view of S-Type



1 Hub
2 Flyweights
3 Cylindrical pin
4 Tension spring
5 Lining
6 Clutch drum

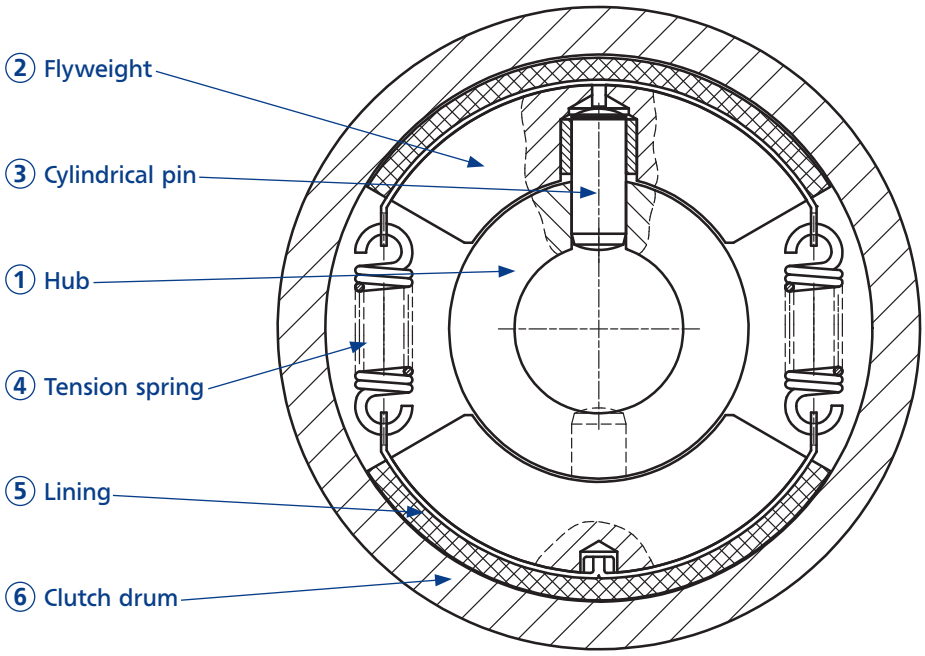
Centrifugal clutches and brakes

W-Type

Pin-guided clutch with two flyweights

Construction and mode of operation

The cylindrical hub ① carries two flyweights ②, which are located by and can slide on cylindrical pins ③. The tension springs ④ are attached outside the flyweights to lining carriers ⑤. The tension springs restrain the flyweights until centrifugal force overcomes the spring force. Then the flyweights lift from their seats and the linings contact the inside diameter of the clutch drum ⑥. Friction between the linings and the clutch drum allows torque to be transmitted.



Advantages:

The W-Type combines the advantages of F-Type and S-Type clutches. Because the tension springs are easily accessible and the linings removable, the parts subject to wear are easy to replace.

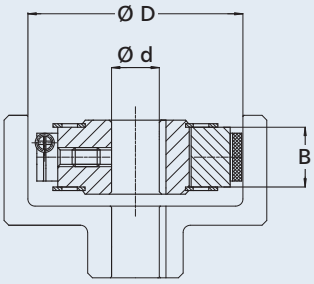
As with the S-Type, the guide pins provide accurate guidance for the flyweights, which ensures quiet operation of the clutch. For this type of clutch, the performance factor for torque transmission is 1.0.

Performance data and dimensions:

Size	D [mm]	B [mm] [1]	d max. [mm]	Standard bore diameter d [mm] (inch) [2]	Md at nE 750 and nB 1500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1250 and nB 2500 [Nm]	Recommended motor power [3] [kW]	Md at nE 1500 and nB 3000 [Nm]	Recommended motor power [3] [kW]
04	80	15	15	15	1.7	0.14	4.6	0.6	6.6	1.0
05	90	20	25	14 ($^5/_8$)	3.7	0.3	10.3	1.4	14.8	2.3
06	100	20	30	30	5.7	0.45	16.0	2.0	23.0	3.6
07	110	20	40	-	8.6	0.7	24.0	3.2	34.5	5.5
08	125	20	40	20; 30 (1 $^1/_2$)	14.0	1.0	38.5	5.0	55	8.5
09	138	25	55	-	27.0	2.2	75.0	9.8	110	17
10	150	25	60	38 (1 $^1/_8$)	36.5	3.0	102	13	145	23

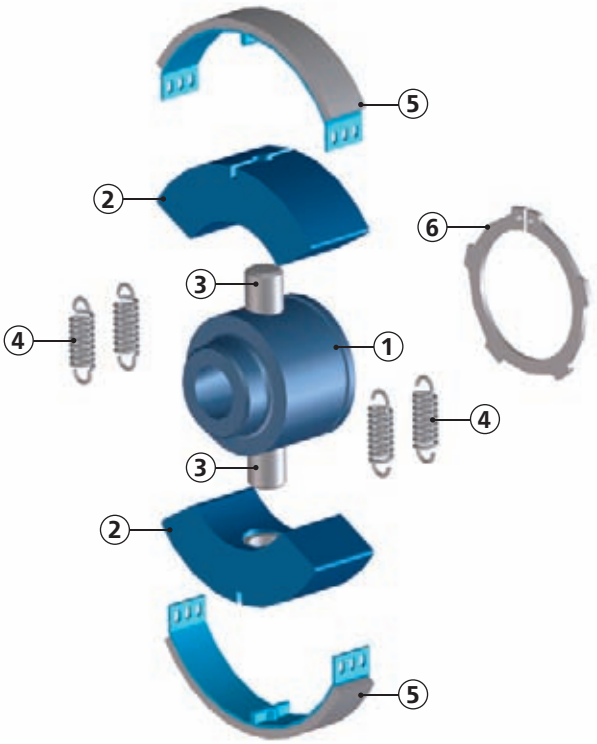
[1] The transmitted power increases as the width B is increased.
[2] Tapered bores and special dimensions can be manufactured on request.
[3] Motor power is calculated using a safety factor of 2.
Final selection of the clutch should be carried out by SUCO!

d max. = max. bore dia.
Md = torque
nE = engagement speed
nB = operating speed



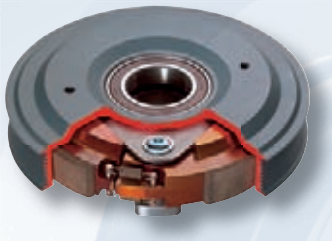
d = bore dia.
D = inside dia. of drum
B = flyweight width

Exploded view of W-Type



① Hub
② Flyweight
③ Cylindrical pin
④ Tension spring
⑤ Lining
⑥ Circlip

P-Type Asymmetric pivot clutch

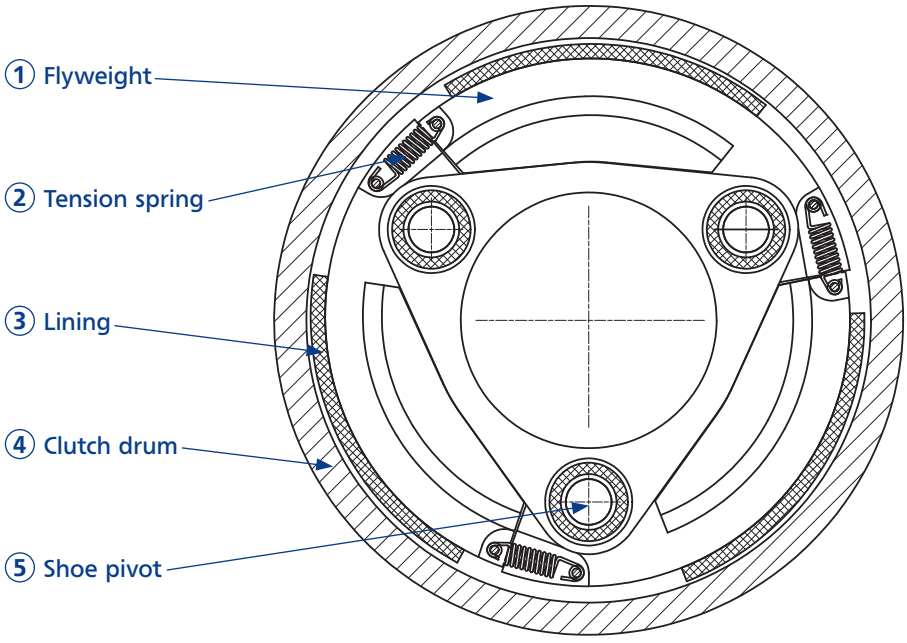


Construction and mode of operation

Flyweights ① are normally mounted so that they can pivot on pins ⑤, which are fitted to a flange.

There are tension springs ② which restrain neighbouring flyweights until centrifugal force overcomes the spring force. Then the flyweights lift from their seats and the bonded linings ③ contact the inside diameter of the clutch drum ④.

Due to the asymmetric arrangement of the flyweights, the torque that can be transmitted by this type of clutch depends on the direction of rotation.



Advantages:

P-Type clutches are extremely narrow.

In addition, the asymmetric pivot clutch is the quietest-running clutch in the SUCO product range. For this type of clutch, the performance factor for torque transmission is ca. 1.75 or ca. 1.25 depending on the direction of rotation.

Performance data and dimensions:

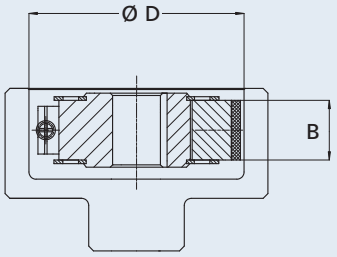
P-Type clutches are flange mounted; for this reason standard bore diameters are not given. Possible bore sizes will be given on request.

Size	D [mm]	B [mm] 1)	Md bei nE 400 and nB 1400 [Nm]	Recommended motor power 2) [kW]	Md at nE 1250 and nB 2500 [Nm]	Recommended motor power 2) [kW]
11	187.5	30	175	13	460	60
12	193	30	180	14	500	70

Other sizes are available on request.

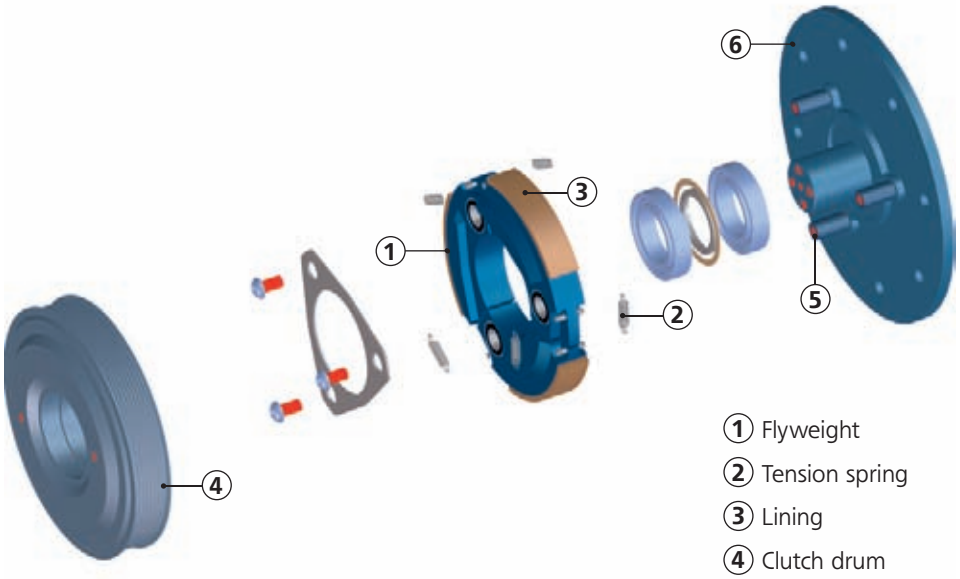
1) The transmitted power increases as the width B is increased.
2) Motor power is calculated using a safety factor of 2.
Final selection of the clutch should be carried out by SUCO!

Md = torque
nE = engagement speed
nB = operating speed



D = inside dia. of drum
B = flyweight width

Exploded view of P-Type



1. Flyweight
2. Tension spring
3. Lining
4. Clutch drum
5. Shoe pivot
6. Flange