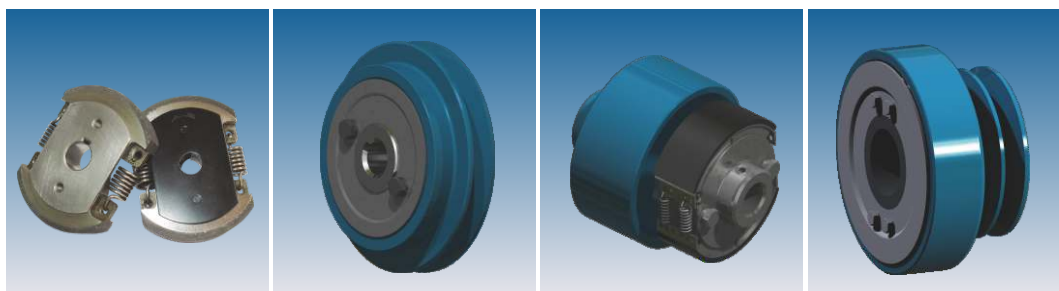


CENTRIFUGAL CLUTCH

离心离合器



公司简介

无锡市第五机械制造有限公司地处被誉为“太湖明珠”的无锡市锡北镇，位于长江三角洲平原腹地，江苏南部，太湖流域的交通中枢，京杭大运河从中穿过。北倚长江，南濒太湖，东接苏州，西连常州，构成苏锡常都市圈。海陆空交通都十分便利。

公司所在位置距离上海浦东机场约2小时车程。公司占地面积8000平方米，公司员工约100人，公司通过了ISO9001:2015质量体系认证。公司拥有先进的机加工和检测设备。

目前公司的产品有气动离合器和离心离合器，离心离合器主要应用于通用机械的动力传递，大量使用在工程机械、建筑机械、园林机械、特种汽车等行业。为国内外很多知名企业做配套服务。



Company Info

Wuxi No.5 Machinery Manufacturing Co., Ltd. is located in Xibei Town, Wuxi City, which is known as "the Pearl of Taihu Lake". It is located in the hinterland of Yangtze River delta plain, in the south of Jiangsu Province, and the transportation center of Taihu Lake Basin. The Beijing Hangzhou Grand Canal runs through it. It is adjacent to the Yangtze River in the north, Taihu Lake in the south, Suzhou in the East and Changzhou in the west, forming the Suzhou Wuxi Changzhou metropolitan area. Sea, land and air transportation are very convenient.

The company is located about 2 hours' drive from Shanghai Pudong airport. The company covers an area of 8000 square meters and has about 100 employees. The company has passed the iso9001:2015 quality system certification. The company has advanced machining and testing equipment.

At present, the company's products are pneumatic clutch and centrifugal clutch. Centrifugal clutch is mainly used for power transmission of general machinery, and is widely used in engineering machinery, construction machinery, garden machinery, special automobile and other industries. For many well-known enterprises at home and abroad to do supporting services.

产品应用 Product Application

离心离合器的配套功率范围从2.5HP到200HP，目前已经应用到很多的行业。

- 工程机械：冲击夯、平板夯、手扶式压路机等
- 建筑机械：座骑式抹平机、砂浆喷涂机等
- 园林机械：树枝粉碎机、锯木机、割草机、大型喷雾设备等、
- 铁道工务机械：液压螺栓扳手、振动捣固镐、钢轨切割机等
- 特种汽车：扫地车等
- 其它：空压机，发电机，无人飞机等

The matching power range of centrifugal clutch is from 2.5hp to 200HP, which has been applied to many industries.

- Construction machinery: impact rammer, plate rammer, walking roller, etc
- Construction machinery: riding leveling machine, mortar spraying machine, etc
- Garden machinery: branch grinder, sawing machine, lawn mower, large spray equipment, etc.
- Railway maintenance machinery: hydraulic bolt wrench, vibration tamping pick, rail cutting machine, etc
- Special vehicles: sweepers, etc
- Other: air compressor, generator, unmanned aircraft, etc



园林机械
Garden machinery



小型工程机械
small-size engineering machinery



园林机械
Garden machinery



小型工程机械
small-size engineering machinery



无人机
UAV



铁路养护机械
Railway maintenance machinery

产品特点

离心离合器是靠原动机本身的转速实现主从动部分的接合和分离的离合器，它具有以下特点：

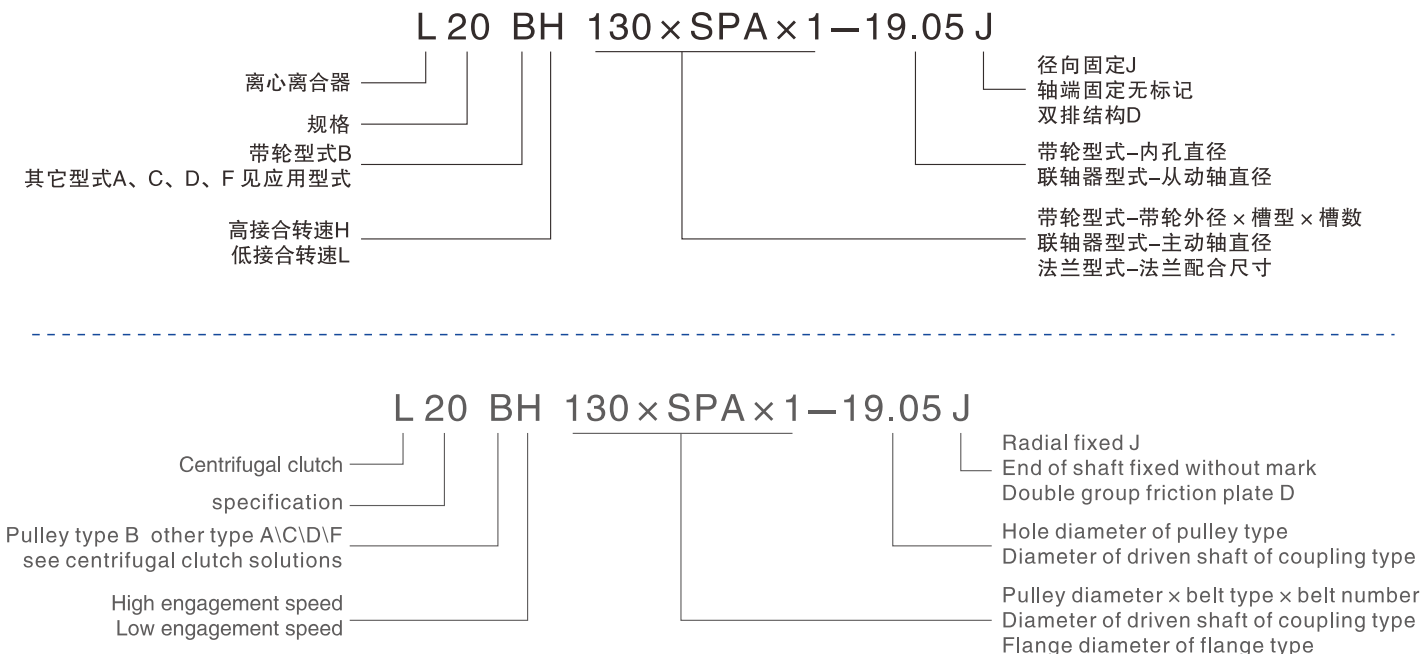
1. 离合器的扭矩取决于离心力，因此不能传递大于额定扭矩的负荷。如果从动端超载，离合器会出现打滑。也不宜装在低速轴上使用，在低速时为了达到足够的离心力，就要增大结构尺寸，将增加成本。
2. 由于离心离合器的离心力正比于转速的平方，而输出功率则随工作转速的立方而变化，因此不宜在变速系统中使用。也不适用于频繁启动或启动过程太久的场合。
3. 对于直接启动的工作机械，运用离心离合器可降低启动载荷，获得平稳的起动效果，用于电机时，可显著地减小启动电流。

Product Features

The centrifugal clutch is motivated by prime motor's own rotating speed to achieve the engagement and separation of the clutch between active part and driven part and it has following features:

1. The torque of clutch depends on centrifugal force, so it can not transmit the load bigger than the rated torque. If the driven side is overloaded, the clutch will be slipping. It should not be installed in the low speed shaft to use, because at the low speed, in order to reach the enough centrifugal force, the structure size should be enlarged, which will increase its cost.
2. Due to the centrifugal force of centrifugal clutch is proportional to the square of the rotating speed, while the output power changes with the cube of the working speed, it should not be used in the transmission system and apply to the occasions of frequent start-up or starting up with too long time.
3. For the working machinery which is directly started up, using centrifugal clutch can reduce the start-up load and get the stable start-up effect, and when it is used in the motor, it can significantly reduce the start-up current.

离心离合器型号标示 Centrifugal clutch type label



离合器性能参数

Clutch performance parameters

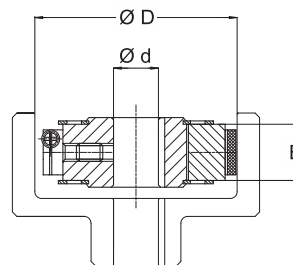
specification	D [mm]	B [mm] 1)	d max. [mm]	Standard bore diameter d [mm] (inch) 2)	Md at nE 750 and nB 1500 [Nm]	Recommended motor power 3) [kW]	Md at nE 1250 and nB 2500 [Nm]	Recommended motor power 3) [kW]	Md at nE 1500 and nB 3000 [Nm]	Recommended motor power 3) [kW]
L05	60	20	18	15	2.3	0.19	6.6	0.85	9.5	1.5
L07	81	20	15	15	3.8	0.4	10.6	1.89	15.3	2.4
L15	80.5	15	28	14-25 (3/4)	4.2	0.33	11.6	1.5	16.7	2.6
L20	90	15	30	18;20;25 (3/4;1)	6.4	0.5	18	2.3	25.9	4
L30	100	20	35	20;25;28(3/4;1)	13.8	1.1	38.5	5	55.5	8.7
L41	107.5	26	30	20;25;28(3/4;1)	13.3	1.05	37	4.86	53.4	8.4
L65	114.5	25.4	26	18;20;25 (3/4;1)	22.8	1.79	63	8.2	92	14.3
L80	125	20	50	25;38;49;(3/4;1;1 1/8)	35.7	2.8	99	13	143	22.5
L90	138	25	55	25-40;(1;1 1/8)	62.8	4.9	174.6	22.9	252	40
L100	150	30	60	25-50(1;1 1/8)	109	8.5	303	39.7	436	69
L110	165	30	65	42;50;55(1 7/16)	176	14	490	64.3	706	111
L120	180	40	75	50;60(2 3/8)	376.9	29.6	1046	137	1507	237

d max. = 最大孔径 max. bore dia.

Md = 扭矩 torque

nE = 接合转速 engagement speed

nB = 工作转速 operating speed



d = 孔径 bore dia.

D = 轮毂内径 inside dia. of drum

B = 离心块宽度 flyweight width

1) 离合器传递功率随B增大而增加。The transmitted power increases as the width B is increased.

2) 内孔尺寸可以根据用户要求制作。Tapered bores and special dimensions can be manufactured on request.

3) 配套功率计算选用安全系数2，最终型号选择由公司技术部确定。Motor power is calculated using a safety factor of 2. Final selection of the clutch should be carried out by TENGWU!

接合速度：

离心离合器的接合速度表示离心块在离心力的作用下克服弹簧施加的力，离心块被迫向外移动，摩擦片和离合器的轮毂内表面开始摩擦时的转速。在更高的转速下，摩擦表面和离合器轮毂完全接触才能传递扭矩。

快速通过啮合速度区可以将摩擦片的磨损降至最低。接合速度受离心块重量和弹簧的强度影响，弹簧力越大，离合器接合转速越高。接合速度的选择要与发动机的运行速度和要传输的功率相适应。因为离心式离合器可以传递的功率随着转速的增加而增加。

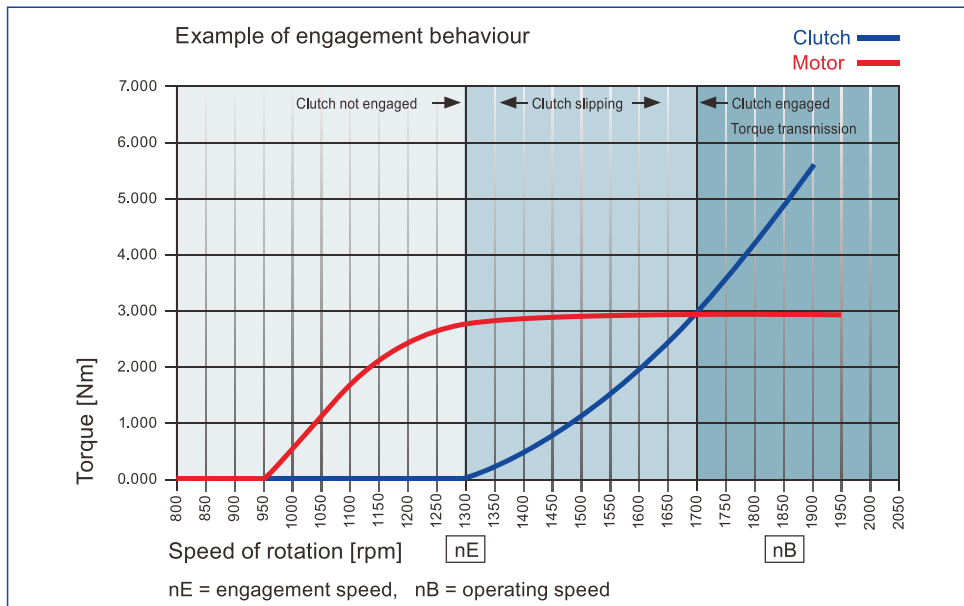
我们会根据我们积累的经验来选择接合速度和所需的弹簧力。选择合适的接合转速，使离合器工作转速下传递的扭矩高于理论上所需的扭矩。通过合理的安全系数防止发动机转速在运行过程中出现短时间下降导致离合器打滑。

Engagement speed:

The engagement speed of a centrifugal clutch indicates the speed at which centrifugal force acting on the mass of the flyweights overcomes the force exerted by the tension springs that restrain them. The flyweights are forced outwards and the friction surfaces start to rub on the inner surface of the clutch drum. The full torque is only transmitted at a higher speed at which the friction surfaces of the flyweights are fully in contact with the clutch drum.

Wear of the friction linings can be minimised by passing quickly through the engagement speed band. The engagement speed is influenced by the strength of the springs that restrain the flyweights the stronger the spring the longer the flyweights are held back. The engagement speed is chosen to suit the operating speed of the drive motor and the power that is to be transmitted. Because the power a centrifugal clutch can transmit rises as the speed of rotation increase.

The engagement speed and the springs required are determined individually using the knowledge and experience we have built up at TENGWU. The engagement speed is selected so that the transmissible torque at operating speed is higher than theoretically necessary. This safety factor protects the clutch from slipping if the speed drops for a short period.



离心离合器和制动器多种应用形式

Centrifugal clutches and brakes different solutions, driven-side

所有型号离心离合器只能与合适的轮毂或皮带轮一起使用。禁止离合器或制动器在没有合适的轮毂或皮带轮的场合使用。违规使用会导致人身伤害。

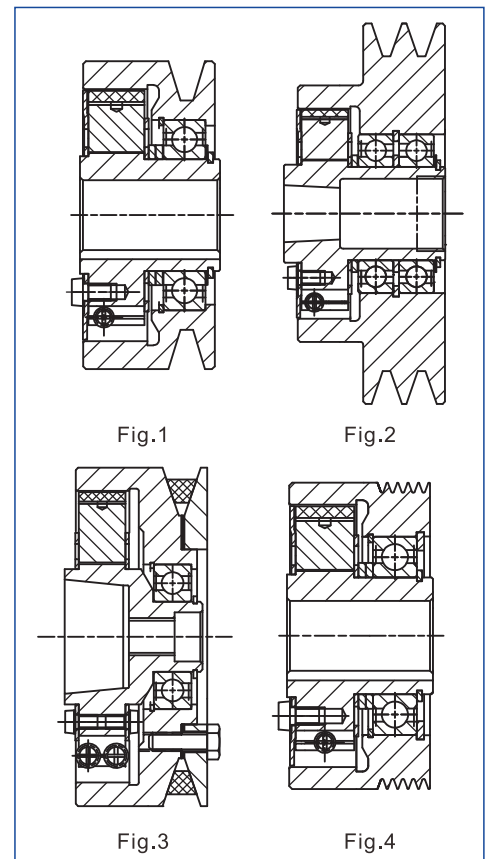
All versions can only be used in conjunction with a suitable drum or belt pulley. The operation of a clutch or brake without a suitable drum or belt pulley is forbidden. Non-compliance can result in injury to persons

带轮结构型式-B

Belt-pulley version -B

带轮型式离合器通过皮带来传递扭矩，皮带轮和从动轮做成一体，可以加工单槽，双槽或多槽，槽轮外径尺寸从72-270之间，槽型包括：SPZ,SPA,SPB和多楔带。图1到图4示意了不同的带轮型式，其中图3采用分体式皮带轮，可以不用张紧轮。通过更换调整垫片来调整皮带轮之间的中心距，起到张紧的作用。

Where torque is transmitted through a V-belt, the belt groove or grooves can be machined in the drum. Single, duplex or multiple groove pulleys can be produced in this way. Depending on the clutch size, effective pulley diameters from ca. 80 to 270 mm can be incorporated. Common groove forms are: SPA, SPB, SPZ, and Poly-V to DIN/EN. Figures 1 to 4 show different belt-drive clutch versions. The clutch shown in Fig. 3 with a split pulley allows elimination of a tensioning pulley. The V-belt is tensioned by changing the spacer shims between the two pulley halves.



无轮毂结构型式A

Core version - A

这个型式的离合器轮毂或制动轮毂由客户自制，轮毂必须安装在从动侧，和主动部分同轴并安装牢固，如果需要大扭矩传递的场合，可以采用双排或多排的离合组件，轴的尺寸可以是直轴或锥轴等按客户要求制作。

This version without a drum is supplied when a clutch or brake drum already exists in the customer's set up, or a suitable component for this purpose is available on the output side. The drum must be accurately centred and securely mounted. For higher torque transmission, a clutch can be equipped with several rows of flyweights. The shaft diameter can be varied and tapered mountings are possible.

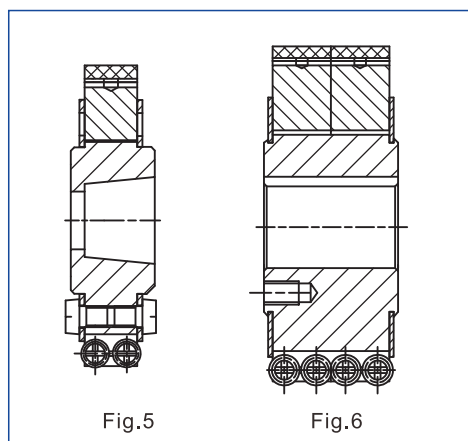


Fig.5

Fig.6

轴对轴结构型式-C

Core version with drum - C

这个型式的结构的离合器主从动部分分别安装在同轴的两个轴端，两轴之间的同轴度误差和角度误差都要求很小，否则会引起摩擦片的过渡磨损或是离合器无法正常工作。

This version can be used to connect two shaft ends. It is important that the installation has the lowest possible misalignment in both radial and angular directions. Excessive misalignment can result in premature wear of the linings or complete failure of the clutch.

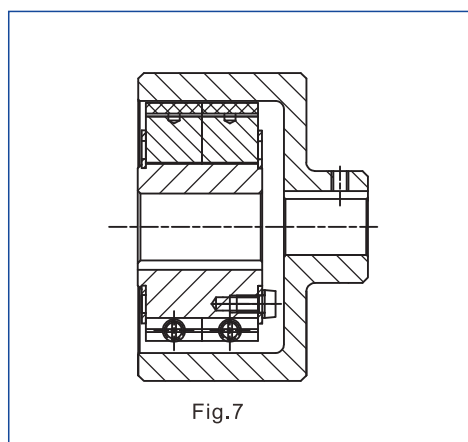


Fig.7

带弹性联轴器的结构型式-D

Unit version with flexible coupling D

补偿两轴之间的径向和角度偏差的最简单方法是在离合器主从动之间增加弹性联轴器。弹性联轴器可以径向或轴向安装和定位。

The easiest way of compensating for radial and angular misalignment between two shafts is to use a flexible shaft coupling. The flexible coupling can be installed and located either radially or axially.

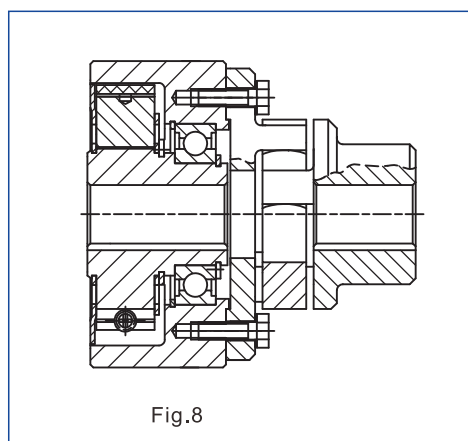


Fig.8

法兰输出结构型式F

Flange Unit version F

如果无法将两个轴端或一个轴端与离合器轮毂定位，则可以在轮毂和芯轴之间使用轴承。如图9所示，通过法兰定位接口输出。输出端可以再安装带轮、链轮等传动部件。

Where it is not practical to locate both shaft ends or one shaft end and the drum, a bearing can be used between hub and drum. As shown in Fig. 9, the output drive can be through a tolerance ring on to which a belt pulley, a timing-belt pulley, or a mounting flange can be pressed.

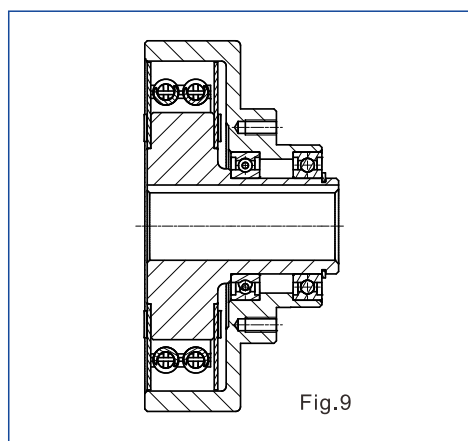


Fig.9

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