



ÜV Überlastschutz u. Verbindungssysteme GmbH

Technical Information - ÜV Safety couplings

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1.0 Description

ÜV safety couplings can be used to separate the force curve in drives in case of trouble and to prevent further damage to your machines or systems. The movement of the ring can be detected with proximity switches and be used as a switch-off-signal for controllers.

At all our types, the safety-moment can be changed sensitively and continuously over the setting-range - even at mounted coupling.

Low masses and disc springs with degressive scale spring rate allow an optimal function of the coupling.

The coupling resets after a full turn automatically, and is immediately ready for use. This can also be done by slowly starting the drive.

For free slipping safety clutches, we ask you to tell us their application.

The fit on shafts and couplings should be determined so that a motion allows seat (between running and sliding), a quick and easy installation. A light film of oil makes this installation.

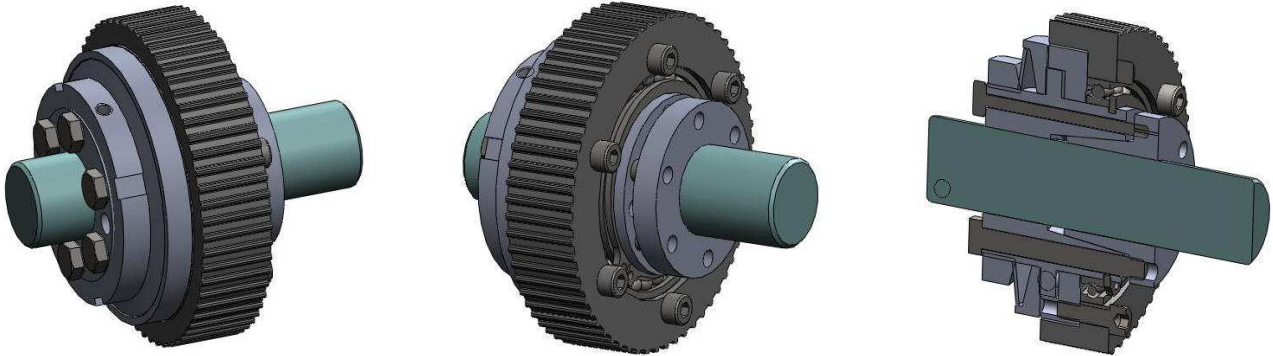
Example of the fit: Shaft diameter 20h7 / 20H7 coupling hole

The movement between the shaft and the cone system or clamping hub should be at maximum 0.05 mm.

2.0 Possibilities for assembly (for indirect drives - Type 2001, 2003, 2005)

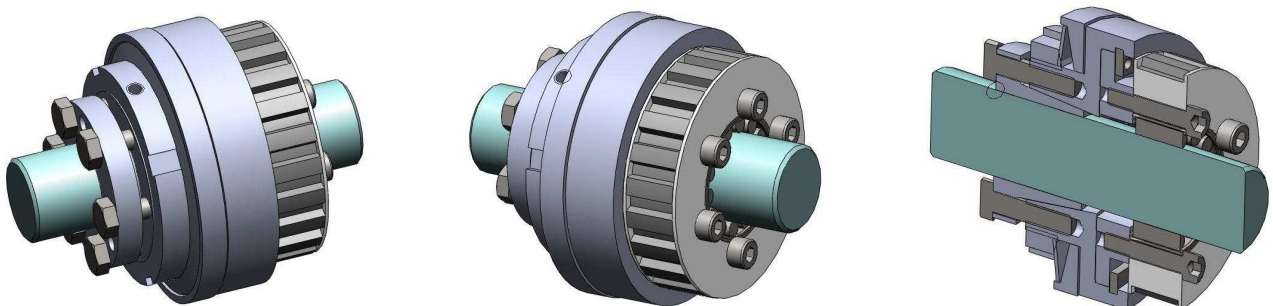
Type 2001

The safety coupling type 2001 is specially for integrating it in toothed pulleys. The toothed pulley is centered on the integrated bearing. This type of coupling can even be mounted on very short shafts.



Type 2003

The safety coupling type 2003 is specially made for using it with very small toothed pulley. The pulley is centered by the shaft. In case of high speeds a bearing should be added between the toothed pulley and the shaft.



Type 2005

The safety coupling type 2005 is specially made for using it with large toothed pulleys. The pulley is centered by the shaft. In case of high speeds a bearing should be added between the toothed pulley and the shaft.





3.0 Calculations

Accelerating torque

$$M_b = \frac{F_1 * J_{Mot} * \Delta n}{9,55 * T_A * \eta}$$

$$F_1 = \frac{J_{Mot} + J_{Mach}}{J_{Mot}}$$

Cutting torque

$$M_s = \frac{F_A * S * L}{\eta * 628}$$

$$M_d = \frac{9550 * P}{n}$$

$$M_{Ad} = F * L$$

Drive side acceleration torque

$$M_{Ab} = \frac{J_{AK} * A_n}{9,55 * T_a * \eta}$$

$$J_{AK} = J_y * \left[\frac{n_y}{n_x} \right]^2$$

- F₁ = Inertia factor
- J_{Mot} = Motor moment of inertia (kg m²)
- J_{Mach} = Machine moment of inertia (kg m²)
- n = RPM (min⁻¹)
- Δn = RPM (difference) (min⁻¹)
- T_A = Start time (s)
- η = Degree of efficiency
- F_A = Cutting force (axel vector in N)
- S = Spindle pitch (cm)
- L = Withstanding ratio (app. 3)
- P = Power (kW)
- M_d = Driving torque in Nm
- M_{Ad} = Output torque in Nm
- M_{Ab} = Output acceleration torque in Nm
- F = Circumferential force of Pulley acting on safety coupling (in N)
- L = Length of drive arm (m)
- N_y = Input speed (min⁻¹)
- N_x = Input speed (min⁻¹)
- J_{AK} = Mass moment of inertia on load point reduced to output shaft (kgm²)
- A_n = Speed difference (RPM)
- T_a = Acceleration time (s)
- J_y = Mass moment of inertia of drive shaft

4.0 Assembly

4.1 Important points for Assembly and Disassembly

Assembly:

Types for indirect drives (TYPE 20.):	Types for direct drives (TYPE 13./15.):																								
<ol style="list-style-type: none"> Clean shafts and bores (a thin film of oil is recommended) Tighten bolts on taper clamping bush diagonally 	<ol style="list-style-type: none"> Clean shafts and bores (a thin film of oil is recommended) Align the shafts: <table border="1" style="margin-top: 10px;"> <thead> <tr> <th colspan="3">Shaft misalignment (TYPE 13.):</th> </tr> <tr> <th>Allowed</th> <th>Lateral</th> <th>Axial</th> </tr> </thead> <tbody> <tr> <td>Assembly</td> <td>0,8 mm</td> <td>1,5 mm</td> </tr> <tr> <td>Operating</td> <td>0,25 mm</td> <td>0,4 mm</td> </tr> </tbody> </table> <table border="1" style="margin-top: 10px;"> <thead> <tr> <th colspan="3">Shaft misalignment (TYPE 15.):</th> </tr> <tr> <th>Allowed</th> <th>Lateral</th> <th>Axial</th> </tr> </thead> <tbody> <tr> <td>Assembly</td> <td>0,8 mm</td> <td>2 mm</td> </tr> <tr> <td>Operating</td> <td>0,2 mm</td> <td>0,5 mm</td> </tr> </tbody> </table> Connect both shafts with coupling Tighten bolts on taper clamping bush diagonally 	Shaft misalignment (TYPE 13.):			Allowed	Lateral	Axial	Assembly	0,8 mm	1,5 mm	Operating	0,25 mm	0,4 mm	Shaft misalignment (TYPE 15.):			Allowed	Lateral	Axial	Assembly	0,8 mm	2 mm	Operating	0,2 mm	0,5 mm
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Disassembly:

- Loosen the retaining bolts
- Force taper off against bellows holder (3 threads per taper bushing provided)

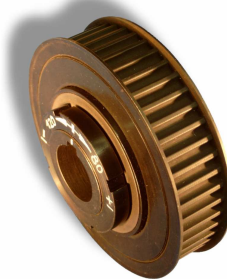
4.2 Tighten torque of bolts:

Size	Tighten torque in Nm
M 2,5	1
M 3	1,5
M 4	3,5
M 5	7
M 6	12
M 8	25
M 10	50
M 12	85
M 14	135
M 16	220
M 20	430

5.0 Special couplings

Do you have a special requirement? We also can help you with this. Our product range includes not all possibilities of applications, but we are able to produce special couplings for your uses. Due to our system some standard parts, can be used to its modular design. Advice us of your requirements and you will get, together with our offer, a drawing with dimensions and details you will need.

Picture: Type 2001 integrated ind toothed pulley.



6.0 Ordering Details

TYPE 1340 – 170	50...120	Ø 30H7	Ø 28H7
Type	Size	Setting range	D1
			D2 (for direct couplings)



ÜV Überlastschutz u. Verbindungssysteme GmbH
 Sudetenstraße 27
 63853 Mömlingen
 Germany
 Tel: +49(0)6022/681700
 Fax: +49(0)6022/681701

E-Mail: info@uev-gmbh.de
 Internet: www.uev-gmbh.de