Mönninghoff electromagnetic tooth clutches

High torque without slip in compact size

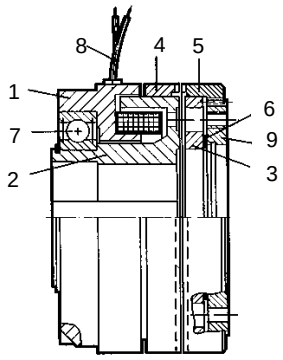
Angular synchronisation of input to output possible

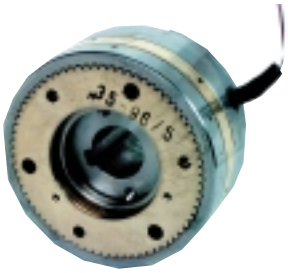
Torque limiting and other special tooth options readily available

Oil or dry running

Applications – disconnection at output of worm drives and lineshafts, connection of auxiliary drives, synchronisation for packaging machinery and machine tools.

1	Stator	4	Toothed ring	7	Ball bearing (2RS)
2	Rotor	5	Armature toothed ring	8	Flying leads
3	Armature	6	Spring	9	Adaptor plate





Model 546.3

Bearing mounted stationary field clutch, good general purpose selection and easy to mount.

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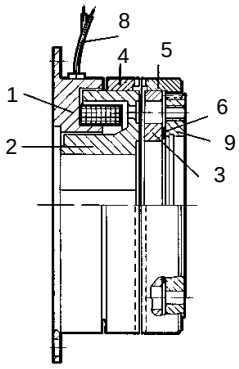

Model 546.1

Flange mounted stationary field clutch, requires precise mounting of stator, axially shorter, suits higher speeds.

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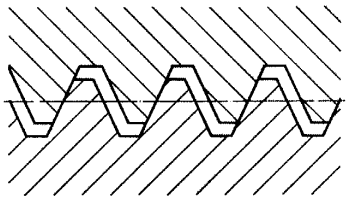
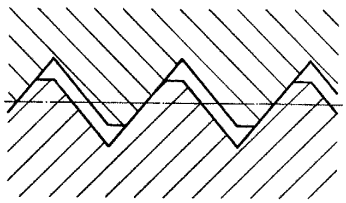
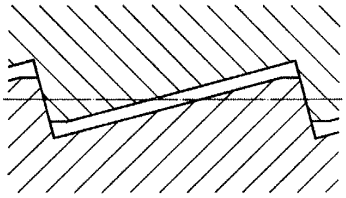
Tooth forms



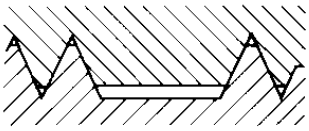
Standard toothform for torque transmission in both directions with minimal backlash



Torque limiting toothform with 45° tip angle for high consistency of release torque



Saw toothform allows engagement at higher speeds up to 100 r/min. Full torque is transmitted in specified direction only.



Fixed position toothform. Single position for synchronisation of input to output. Multi engagement positions also possible.

Ask for tooth clutch Design Guide No. 306 for further details.

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Other models

Model 550 slip ring clutch

Compact design with increased torque capacity and lower prices.
20 – 16000 Nm
Ask for details

Radial or caliper brush gear available
Ask for data sheet 236

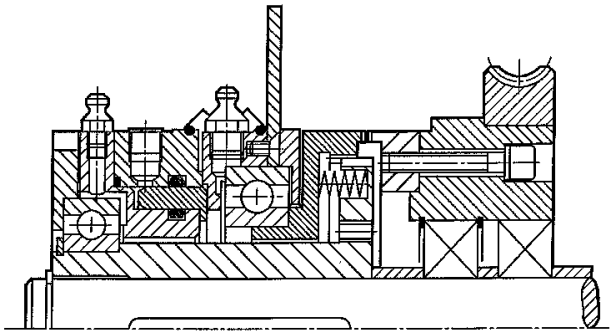
Model 560 tooth brake

High torque brakes for static engagement, energise to engage
20 – 2200 Nm
See page 6.26

Also spring applied tooth brakes available,
10 – 350 Nm, details on request

Model 675 pneumatic clutch

Long life pneumatic tooth clutches for 5 bar operation. Allows adjustable torque limiting and suitable for explosion hazard areas
100 – 2200 Nm
Ask for details



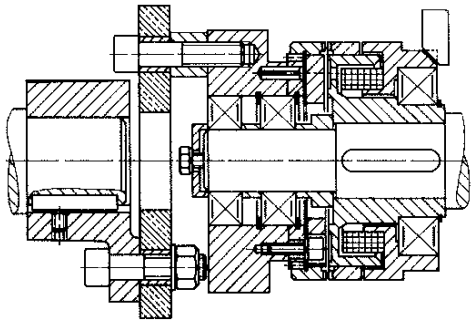
Model 548 spring applied clutch

Normally engaged energise to release clutches of slip ring design
10 – 350 Nm
Ask for brochure MMB41998

Also stationary field spring applied clutches on request
100 – 1600 Nm

Clutch couplings

Model 546/313 with torsionally soft coupling
Model 546/314 with torsionally rigid metal disc coupling
Mönninghoff clutch couplings accommodate the misalignment of in-line connections
Ask for brochure MMB41998 and Publication No. 276



Ask for tooth clutch Design Guide No. 306

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Mönninghoff bearing mounted toothed clutches

0–2200 Nm

Type 546.□□.3.4/5/6/7

Simple to mount 2 part clutch with stator bearing mounted to rotor

High torque, no slip

Maintenance-free in oil or dry running

Optional switch ring on armatures 6 and 7 for microswitch monitoring

Available with standard multi-position teeth, single position, multi-position, torque limiting and other special designs

Mönninghoff tooth clutches series 546.□□.3 consist of a stator/rotor with finished bore and keyway for shaft mounting, plus an armature assembly. There are four armature options. Type 4 features tapped holes d_{11} for bolt connection. Type 5 uses clearance holes d_{12} for the connecting bolts to pass through. Armatures 6 and 7 are the corresponding types with the switch ring for monitoring clutch state by proximity or microswitch.

Type No.	Torque Nm	Maximum* speed r/min	Standard bores d (H7)	Inertia (10^{-3} kgm^2) rotor	Inertia (10^{-3} kgm^2) armature	Coil power P_{20} W	Stockline No. (standard tooth form) Armature 4	Stockline No. (standard tooth form) Armature 5
546.**12**.3.□	17.5	1500	10 12	0.066	0.06	13	C2-525 572/8 wks C2-120 562/8 wks	C2-525 580/8 wks C2-120 570/8 wks
546.**13**.3.□	25	1500	15 18	0.15	0.12	19	C2-189 321/8 wks **C2-65 989**	C2-189 33X/8 wks C2-139 310/8 wks
546.**15**.3.□	50	1500	20 25	0.37	0.37	21	C2-93 937/8 wks C2-139 223/8 wks	**C2-37 056** **C2-71 724**
546.**21**.3.□	100	1500	25 30 35	0.87	0.52	27	**C2-94 496** C2-139 231/8 wks C2-139 24X/8 wks	C2-180 858/8 wks **C2-103 628** C2-139 337/8 wks
546.**23**.3.□	250	1500	35 40	2.06	1.85	36	C2-189 348/8 wks C2-115 398/8 wks	**C2-77 334** **C2-139 345**
546.**25**.3.□	500	1500	40 50	4.88	4.51	57	C2-189 356/8 wks C2-139 258/8 wks	C2-144 682/8 wks **C2-67 506**
546.**31**.3.□	1000	1500	50 60 65	11.2	12.8	80	C2-139 266/8 wks C2-139 274/8 wks C2-139 282/8 wks	C2-139 353/8 wks **C2-114 260** C2-139 361/8 wks
546.**32**.3.□	2200	1500	65 80	28.7	29.2	114	C2-189 364/8 wks C2-139 290/8 wks	C2-181 540/8 wks C2-139 37X/8 wks

* Higher speeds possible, ask for details

Stockline numbers for other toothforms, also for armatures 6 and 7 available on request

Non-stock models normally 8 weeks – small quantities may be available sooner.

Electrical supply

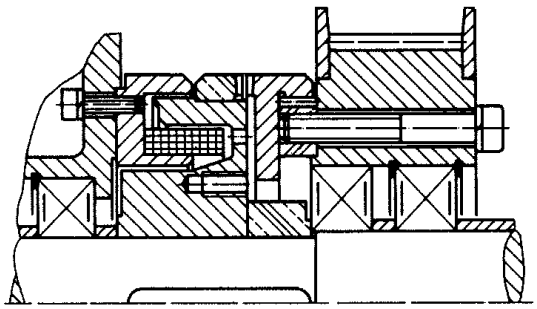
Standard supply voltage for these clutches is 24V d.c. and the Simplavolt power supply units can be used.

Ordering example

(5) off Mönninghoff toothed clutches model 546.15.3.5, standard toothform, bore 25mm H7 with keyway to BS4235, 24V d.c.

Stockline No. C2-71 724

Mounting example



Large stationary field clutches up to 10000 Nm

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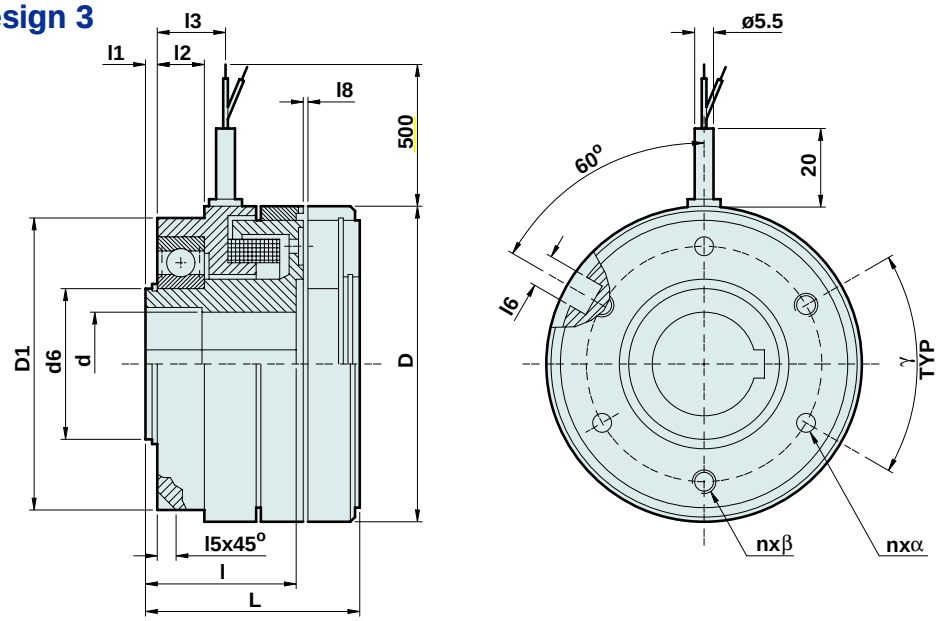
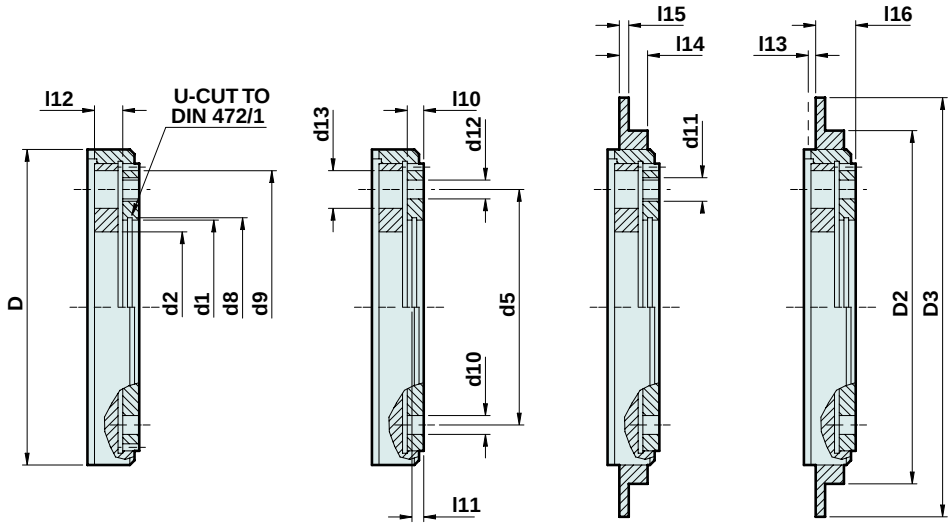
Mönninghoff bearing mounted toothed clutches

Stator Design 3



Armature



Design 4 | Design 5 | Design 6 | Design 7

Size	Bores d min	Bores d max	D	D_1	D_2	D_3	d_1 H7	d_2	d_5	d_6	d_8 DIN 472	d_9	d_{10} dowels	nxβ dowels	d_{11} armatures	d_{12} armatures	nxα armatures	d_{13}	γ
12	10	14	57	52	–	–	26	22	36	20	27.2	45	–	–	M4	4.8	3x120°	8.5	–
13	10	17	67	58	74	90	32	31	46	25	33.7	54	4.5	3x120°	M5	4.8	3x120°	8.5	60°
15	15	25	82	75	90	115	42	36	60	36	44.5	69	4.5	3x120°	M6	5.8	3x120°	10	60°
21	20	35	95	88	107	130	52	46	70	45	55	80	5.5	3x120°	M8	6.8	3x120°	12	60°
23	25	42	114	105	126	165	62	55	80	55	65	93	7.8	3x120°	M8	6.8	3x120°	12	60°
25	30	55	134	127	146	185	72	68	95	70	75	110	9.5	3x120°	M12	8.5	3x120°	15	60°
31	40	70	166	152	178	218	90	80	120	85	93.5	140	9.5	3x120°	M12	8.5	6x60°	15	30°
32	50	85	195	175	215	250	100	95	150	100	103.5	170	11.5	3x120°	M12	10.5	6x60°	19	30°

Size	L	l -0.1	l_1	l_2	l_3	l_5	l_6	l_8 ±0.1	l_{10}	l_{11}	l_{12}	l_{13} movement	l_{14}	l_{15}	l_{16}	Weight kg Arm 4/5	Weight kg Arm 6/7
12	43	34	2	10	15	4.5	5	0.2	3	2.6	4.3	0.75	–	–	–	0.51	–
13	49	39	2.5	11	16.7	5	6	0.3	3.5	2.7	4.8	1.0	6	2	7.5	0.87	0.88
15	55	42	3.5	12	18	6	8	0.3	4.8	4.05	6.1	1.1	8.5	2.5	10.8	1.5	1.6
21	63	45	3	14	20	6	10	0.4	6	5	8.7	1.3	10	3	13.5	2.4	2.6
23	69	50	3	18	24	6	10	0.4	6.5	5.5	9	1.4	10	3	14	3.9	4.2
25	83	61	3	20	27	8	10	0.4	8.4	7	11	1.65	11.5	3	18	6.8	7.2
31	93.5	66	3.5	22	31	10	12	0.5	11.4	8.5	13.1	2.1	11.5	3	23	11.1	11.7
32	110	80	4	24	38.5	10	12	0.5	11.7	9.5	14	2.4	16	6	23.5	15.3	16.7

Mounting information? Ask for tooth clutch Design Guide No. 306

Mönninghoff flange mounted toothed clutches

20–2200 Nm

Type 546.□□.1.4/5/6/7

Three part tooth clutches with flange mounted stator

Short axial length

Available with standard multi-position teeth or single position to synchronise input to output

Other special toothforms including torque limiting readily available

Fast response time

Maintenance-free

Mönninghoff tooth clutches series 546.□□.1 feature a flange mounted coil giving a shorter build length and cost advantages for volume production compared with the bearing mounted models. The stator must be accurately centred and the rotor fixed to the correct axial position as running clearances between these two parts are small. Armature options type 4, 5, 6 and 7 are possible as for the bearing mounting clutches.

Clutches are generally maintenance free with tooth wear only occurring after a long life.

Type No.	Torque Nm	Maximum speed r/min	Standard bores d (H7)	Inertia (10^{-3} kgm^2) rotor	Inertia (10^{-3} kgm^2) armature	Coil power P_{20} W	Stockline No. (standard tooth form) Armature 4	Stockline No. (standard tooth form) Armature 5
546.**12**.1.□	17.5	4800	15	0.065	0.06	13	*C2-138 975/8 wks*	*C2-139 09X/8 wks*
546.**13**.1.□	25	4500	18	0.14	0.12	19	*C2-138 983/8 wks*	*C2-115 714/8 wks*
546.**15**.1.□	50	4500	22 25 max	0.35	0.37	21	*C2-138 991/8 wks* ***C2-137 994***	*C2-139 101/8 wks* *C2-139 11X/8 wks*
546.**21**.1.□	100	4000	30 35 max	0.81	0.52	27	***C2-139 014*** *C2-139 022/8 wks*	*C2-139 128/8 wks* *C2-139 136/8 wks*
546.**23**.1.□	250	3500	40	1.92	1.85	36	*C2-139 030/8 wks*	*C2-139 144/8 wks*
546.**25**.1.□	500	3500	50 max	4.46	4.51	57	*C2-139 049/8 wks*	*C2-139 152/8 wks*
546.**31**.1.□	1000	3000	50 60 70 max	10.3	12.8	80	*C2-139 057/8 wks* *C2-139 065/8 wks* *C2-139 073/8 wks*	*C2-139 160/8 wks* *C2-139 179/8 wks* *C2-139 187/8 wks*
546.**32**.1.□	2200	3000	80 max	25.7	29.2	114	*C2-539 182/8 wks*	*C2-139 195/8 wks*

Stockline numbers for other toothforms, also for armatures 6 and 7 available on request.

Non-stock models normally 8 weeks – small quantities may be available sooner.

Engagement speeds

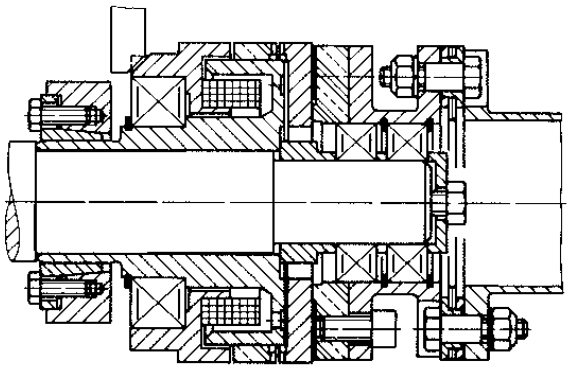
The limiting engagement speed for a clutch is difficult to predict as it depends on speed, inertia and the stiffness of the drive. With standard toothform typical limits are between 10 and 50 r/min. Special toothforms can permit engagement up to 200 r/min. Disengagement can be done at any speed up to the clutch limit.

Ordering example

(2) off Mönninghoff tooth clutches model 546.21.1.4, standard toothform, bore 30mm H7 with keyway to BS4235, 24V d.c.

Stockline No. C2-139 014

Other models



Torsionally rigid clutch coupling combining tooth clutch with Arcoflex coupling

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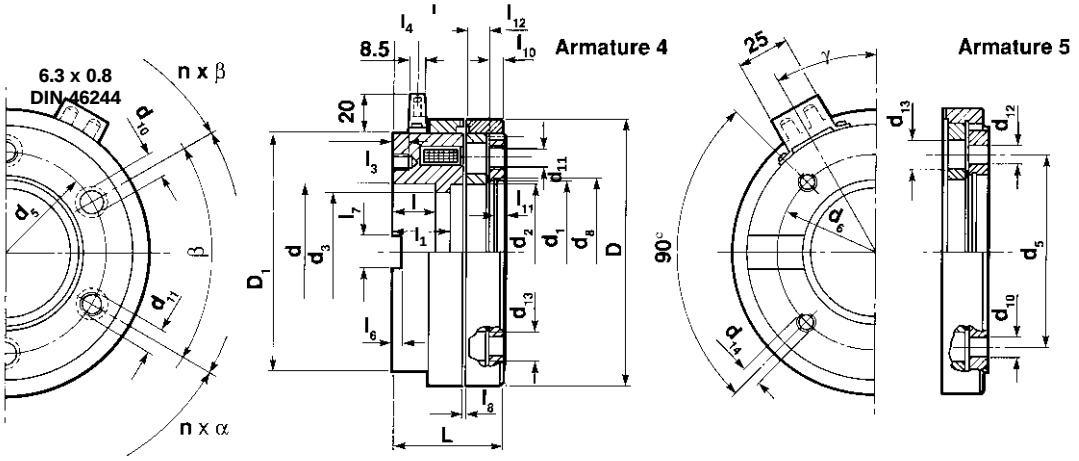
Mönninghoff toothed brakes 20–2200 Nm

Type 560.□□.4.4/5

- **High torque and small dimensions**
- **Suitable for static or very low speed engagement**
- **Energise to engage – spring applied models available on request**
- **Standard multi position toothform, alternatively single position and other specials**
- **Maintenance-free**



Size	Nominal torque Nm	Coil power W	D	D_1	d K6	d_1 H7	d_2	d_3	d_8	L	l +0.2	l_1	l_3	l_4	l_6	l_7 H7	l_8 ±0.1	Weight kg
12	20	10.5	57	50	26	26	22.5	20	27.2	27	14	17	4	6.5	2.5	10	0.2	0.3
13	40	14.5	67	60	32	32	31	27	33.7	31	14	19	5	7	2.5	10	0.3	0.5
15	100	22	82	74	35	42	36.5	31	44.5	34.5	17	19	5	6	2.5	12	0.3	1.0
21	200	29	95	85.5	42	52	46	37	55	43	20	22	5	6	2.5	12	0.4	1.6
23	350	46	114	95	55	62	55	45	65	50	22	27	8	11.5	5	14	0.4	2.6
25	600	56	134	120	68	72	68	60	75	57	22	29	8	12.5	5	16	0.4	3.9
31	1200	79	166	150	75	90	80	65	93.5	63.5	25	30	10	10	6	20	0.5	7.0
32	2200	82	195	178	90	100	95	80	103.5	68.5	28	34	12	12.5	6	20	0.5	12.3

For armature dimensions see type 546 clutches

Size	Stockline No. Armature 4	Armature 5
12	*C2-295 662/8 wks*	*C2-295 670/8 wks*
13	*C2-10 659/8 wks*	*C2-295 689/8 wks*
15	*C2-10 683/8 wks*	*C2-295 697/8 wks*
21	*C2-295 768/8 wks*	*C2-295 776/8 wks*
23	*C2-295 784/8 wks*	*C2-285 475/8 wks*
25	*C2-127 425/8 wks*	*C2-157 051/8 wks*
31	*C2-295 792/8 wks*	*C2-295 804/8 wks*
32	*C2-64 981/8 wks*	*C2-295 812/8 wks*

Mounting

Fix the stator accurately concentric to the shaft by the tapped holes d_{14} in the back face. The key slot l_7 can be used for additional security.
Adapt the armature in either design 4 (tapped holes) or design 5 (through holes) to the shaft ensuring it is concentric.

Ordering example

(6) off Mönninghoff tooth brakes, type 560.25.4.5, standard toothform, 24V d.c.

Stockline No. C2-157 051

Non-stock models normally 8 weeks – small quantities may be available sooner.

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