

	Abbr	Unit	P54	P65	P75	P90	P110	P140	P170	
<b>Output torque</b>										
Nominal torque	i=1:1	T <sub>2N</sub>	Nm	15	25	45	78	150	360	585
Maximum acceleration ①		T <sub>2B</sub>	Nm	23	38	68	117	225	540	878
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	30	50	90	156	300	720	1170
Nominal torque	i=1.5:1	T <sub>2N</sub>	Nm	15	25	45	78	150	360	585
Maximum acceleration ①		T <sub>2B</sub>	Nm	23	38	68	117	225	540	878
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	30	50	90	156	300	720	1170
Nominal torque	i=2:1	T <sub>2N</sub>	Nm	12	24	42	68	150	330	544
Maximum acceleration ①		T <sub>2B</sub>	Nm	18	36	63	102	225	495	816
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	24	48	84	136	300	660	1088
Nominal torque	i=3:1	T <sub>2N</sub>	Nm	12	18	33	54	120	270	450
Maximum acceleration ①		T <sub>2B</sub>	Nm	18	27	50	81	180	405	675
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	24	36	66	108	240	540	900
Nominal torque	i=4:1	T <sub>2N</sub>	Nm	–	16	28	52	100	224	376
Maximum acceleration ①		T <sub>2B</sub>	Nm	–	24	42	78	150	336	564
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	–	32	56	104	200	448	752
Nominal torque	i=5:1	T <sub>2N</sub>	Nm	–	14	25	40	85	196	320
Maximum acceleration ①		T <sub>2B</sub>	Nm	–	21	38	60	128	294	480
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	–	28	50	80	170	392	640
Input speed	i= 1:1	n <sub>1nenn</sub>	min <sup>-1</sup>	2500	2150	2000	1700	1400	1100	1000
Applies at 20% of nominal torque at 20° C ambient temperature	i= 1.5:1 ; 2:1	n <sub>1nenn</sub>	min <sup>-1</sup>	3000	2650	2500	2000	1600	1400	1300
	i= 3:1 ; 4:1 ; 5:1	n <sub>1nenn</sub>	min <sup>-1</sup>	3500	3150	3000	2500	2100	2000	1800
		n <sub>1max</sub> ③	min <sup>-1</sup>	7500	7000	6500	5500	4500	3500	3000
Output backlash ④	Standard	j <sub>t</sub>	arcmin	≤ 18	≤ 16	≤ 15	≤ 14	≤ 13	≤ 12	≤ 12
	reduced	j <sub>t</sub>	arcmin	≤ 12	≤ 10	≤ 9	≤ 8	≤ 8	≤ 7	≤ 6
Permissible radial load ⑤		F <sub>1Rmax</sub>	N	300	650	900	1300	2000	3500	5000
		F <sub>2Rmax</sub>	N	400	800	1100	1600	2500	4500	6000
Permissible axial load ⑤		F <sub>1Amax</sub>	N	150	325	450	650	1000	1750	2500
		F <sub>2Amax</sub>	N	200	400	550	800	1250	2250	3000
Efficiency at max load		n	%	> 98	> 98	> 98	> 98	> 98	> 98	> 98
Running noise at 1500 min <sup>-1</sup> , partial load		LpA	db(A)	≤ 70	≤ 70	≤ 70	≤ 74	≤ 76	≤ 77	≤ 78
Weight approx.		m	kg	1.8	3.9	4.5	8.0	13.0	22.0	38.5
Service life		Lh	h	> 15000	> 15000	> 15000	> 15000	> 15000	> 15000	> 15000
Lubrication Synthetic oil, ISO VG 150, up to size P140 inclusive										
Average oil quantity		l		0.05	0.07	0.10	0.20	0.30	0.40	1.00
Operating temperature		°C		up to 80						
Paint				Primary coated RAL 9005 – dull black						
Mass moments of inertia related to input for shaft arrangement WA 13	i=1:1	I <sub>1</sub>	kgcm <sup>2</sup>	0.28	0.90	1.79	4.93	12.5	36.8	85.9
	i=1.5:1	I <sub>1</sub>	kgcm <sup>2</sup>	0.15	0.59	1.22	3.45	9.17	22.4	54.6
	i=2:1	I <sub>1</sub>	kgcm <sup>2</sup>	0.11	0.41	0.95	2.78	7.41	15.6	39.3
	i=3:1	I <sub>1</sub>	kgcm <sup>2</sup>	0.09	0.31	0.78	2.34	6.18	10.9	28.5
	i=4:1	I <sub>1</sub>	kgcm <sup>2</sup>	–	0.28	0.72	2.18	5.71	9.19	24.5
	i=5:1	I <sub>1</sub>	kgcm <sup>2</sup>	–	0.26	0.69	2.10	5.48	8.32	22.6

### Ex-Protection: Explosion-proof gearboxes available on request

#### Type of protection: IP 64

- ① at max 1000 cycles per hour, otherwise please contact us
- ② permissible max 1000 times during the service life of the gearbox
- ③ Follow permissible operating temperatures
- ④ Assuming 2% load at the output or maximum 10 Nm
- ⑤ Point of force application is center of shaft at an output speed of n= 400 min<sup>-1</sup>

Please see gearbox selection and installation on page 18+19 and thermal power limit on page 9!

As a function of the thermal power limit, higher speeds at a reduced torque are possible. For an optimal design of your application, please contact us.

		Kürzel	Einheit	P210	P240	P280	P360	P450
<b>Output torque</b>								
Nominal torque	i=1:1	T <sub>2N</sub>	Nm	1300	2150	3200	3750	6600
Maximum acceleration ①		T <sub>2B</sub>	Nm	1950	3225	4800	5625	9900
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	2600	4300	6400	7500	13200
Nominal torque	i=1.5:1	T <sub>2N</sub>	Nm	1300	2150	3200	3550	7000
Maximum acceleration ①		T <sub>2B</sub>	Nm	1950	3225	4800	5325	10500
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	2600	4300	6400	7100	14000
Nominal torque	i=2:1	T <sub>2N</sub>	Nm	1220	2010	3050	3500	7000
Maximum acceleration ①		T <sub>2B</sub>	Nm	1830	3015	4575	5250	10500
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	2440	4020	6100	7000	14000
Nominal torque	i=3:1	T <sub>2N</sub>	Nm	1020	1650	2850	3350	7000
Maximum acceleration ①		T <sub>2B</sub>	Nm	1530	2475	4275	5025	10500
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	2040	3300	5700	6700	14000
Nominal torque	i=4:1	T <sub>2N</sub>	Nm	860	1410	2300	2900	6600
Maximum acceleration ①		T <sub>2B</sub>	Nm	1290	2115	3450	4350	9900
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	1720	2820	4600	5800	13200
Nominal torque	i=5:1	T <sub>2N</sub>	Nm	740	1210	2000	2600	6000
Maximum acceleration ①		T <sub>2B</sub>	Nm	1110	1815	3000	3900	9000
EMERGENCY STOP torque ②		T <sub>2Not</sub>	Nm	1480	2420	4000	5200	12000
Input speed	i= 1:1	n <sub>1nenn</sub>	min <sup>-1</sup>	800	700	650	650	550
Applies at 20% of nominal torque at 20° C ambient temperature	i= 1.5:1 ; 2:1	n <sub>1nenn</sub>	min <sup>-1</sup>	1050	950	850	850	800
	i= 3:1 ; 4:1 ; 5:1	n <sub>1nenn</sub>	min <sup>-1</sup>	1600	1350	1200	1200	1100
		n <sub>1max</sub> ③	min <sup>-1</sup>	2200	2000	1700	1400	1300
Output backlash ④	Standard	j <sub>t</sub>	arcmin	≤ 11	≤ 11	≤ 11	≤ 11	≤ 10
	reduced	j <sub>t</sub>	arcmin	≤ 6	≤ 6	≤ 6	≤ 6	≤ 5
Permissible radial load ⑤	i=1:1 – 2:1	F <sub>1Rmax</sub>	N	8500	11000	15000	18000	22000
	i=3:1	F <sub>1Rmax</sub>	N	8500	11000	15000	15000	18000
	i=4:1	F <sub>1Rmax</sub>	N	8500	11000	15000	11000	15000
	i=5:1	F <sub>1Rmax</sub>	N	8500	11000	15000	9000	11000
	i=1:1 – 5:1	F <sub>2Rmax</sub>	N	10500	15000	18000	24000	34000
Permissible axial load ⑤	i=1:1 – 2:1	F <sub>1Amax</sub>	N	4250	5500	7500	9000	11000
	i=3:1	F <sub>1Amax</sub>	N	4250	5500	7500	7500	9000
	i=4:1	F <sub>1Amax</sub>	N	4250	5500	7500	5500	7500
	i=5:1	F <sub>1Amax</sub>	N	4250	5500	7500	4500	5500
	i=1:1 – 5:1	F <sub>2Amax</sub>	N	5250	7500	9000	12000	17000
Efficiency at max load		n	%	> 98	> 98	> 98	> 98	> 98
Running noise at 1500 min <sup>-1</sup> , partial load		L <sub>pA</sub>	db(A)	≤ 80	≤ 82	≤ 83	≤ 85	≤ 85
Weight approx.		m	kg	71.0	103.5	155.0	240.0	400.0
Service life		L <sub>h</sub>	h	> 15000	> 15000	> 15000	> 15000	> 15000
Lubrication	Delivery by default without oil							
Average oil quantity		l		2.20	2.60	3.00	9.00	22.00
Operating temperature		°C		bis 80				
Paint	Primary coated RAL 9005 - dull black							
Mass moments of inertia related to input for shaft arrangement WA 13	i=1:1	I <sub>1</sub>	kgcm <sup>2</sup>	287	592	1190	2314	7632
	i=1.5:1	I <sub>1</sub>	kgcm <sup>2</sup>	179	373	762	1270	4152
	i=2:1	I <sub>1</sub>	kgcm <sup>2</sup>	123	253	506	877	2764
	i=3:1	I <sub>1</sub>	kgcm <sup>2</sup>	84.1	167	328	467	1596
	i=4:1	I <sub>1</sub>	kgcm <sup>2</sup>	69.9	136	263	316	1077
	i=5:1	I <sub>1</sub>	kgcm <sup>2</sup>	62.7	120	230	219	750

### Ex-Protection: Explosion-proof gearboxes available on request

#### Type of protection: IP 64

- ① at max 1000 cycles per hour, otherwise please contact us
- ② permissible max 1000 times during the service life of the gearbox
- ③ Follow permissible operating temperatures
- ④ Assuming 2% load at the output or maximum 10 Nm
- ⑤ Point of force application is center of shaft at an output speed of n= 400 min<sup>-1</sup>

Please see gearbox selection and installation on page 18+19 and thermal power limit on page 9!

As a function of the thermal power limit, higher speeds at a reduced torque are possible. For an optimal design of your application, please contact us.