

		Abbr	Unit	P54	P75	P90	P110	P140	P170	P210	P240	P280
Output torque	i=1:1	T _{2N}	Nm	15	45	78	150	360	585	1300	2150	3200
		T _{2B}	Nm	23	68	117	225	540	878	1950	3225	4800
		T _{2Not}	Nm	30	90	156	300	720	1170	2600	4300	6400
	i=1,5:1	T _{2N}	Nm	15	45	78	150	360	585	1300	2150	3200
		T _{2B}	Nm	23	68	117	225	540	878	1950	3225	4800
		T _{2Not}	Nm	30	90	156	300	720	1170	2600	4300	6400
	i=2:1	T _{2N}	Nm	12	42	68	150	330	544	1220	2010	3050
		T _{2B}	Nm	18	63	102	225	495	816	1830	3015	4575
		T _{2Not}	Nm	24	84	136	300	660	1088	2440	4020	6100
	i=3:1	T _{2N}	Nm	12	33	54	120	270	450	1020	1650	2850
		T _{2B}	Nm	18	50	81	180	405	675	1530	2475	4275
		T _{2Not}	Nm	24	66	108	240	540	900	2040	3300	5700
	i=4:1	T _{2N}	Nm	–	28	52	100	224	376	860	1410	2300
		T _{2B}	Nm	–	42	78	150	336	564	1290	2115	3450
		T _{2Not}	Nm	–	56	104	200	448	752	1720	2820	4600
i=5:1	T _{2N}	Nm	–	25	40	85	196	320	740	1210	2000	
	T _{2B}	Nm	–	38	60	128	294	480	1110	1815	3000	
	T _{2Not}	Nm	–	50	80	170	392	640	1480	2420	4000	
Input speed	i= 1:1	n _{1Standard}	min ⁻¹	2500	2000	1700	1400	1100	1000	800	700	650
	i= 1,5:1 ; 2:1	n _{1Standard}	min ⁻¹	3000	2500	2000	1600	1400	1300	1050	950	850
	i= 3:1 ; 4:1 ; 5:1	n _{1Standard}	min ⁻¹	3500	3000	2500	2100	2000	1800	1600	1350	1200
Applies at 20% of nominal torque at 20° C ambient temperature		n _{1max} **	min ⁻¹	7500	6500	5500	4500	3500	3000	2200	2000	1700
				**On request, special measures required								
Output backlash	nenn	arcmin		≤ 18	≤ 15	≤ 14	≤ 13	≤ 12	≤ 12	≤ 11	≤ 11	≤ 11
	vermindert	arcmin		≤ 12	≤ 9	≤ 8	≤ 8	≤ 7	≤ 6	≤ 6	≤ 6	≤ 6
Permissible radial load		F _{1Rmax} *	N	300	900	1300	2000	3500	5000	8500	11000	15000
		F _{2Rmax} *	N	400	1100	1600	2500	4500	6000	10500	15000	18000
Permissible axial load		F _{1Amax}	N	150	450	650	1000	1750	2500	4250	5500	7500
		F _{2Amax}	N	200	550	800	1250	2250	3000	5250	7500	9000
Efficiency at max load	n	%		> 98	> 98	> 98	> 98	> 98	> 98	> 98	> 98	> 98
Running noise at 1500 min ⁻¹	Lpa	db(A)		≤ 70	≤ 70	≤ 74	≤ 76	≤ 77	≤ 78	≤ 80	≤ 82	≤ 83
Weight approx.	m	kg		1,8	4,5	8,0	13,0	22,0	38,5	71,0	103,5	155,0
Service life	Lh	h		> 15000	> 15000	> 15000	> 15000	> 15000	> 15000	> 15000	> 15000	> 15000
Lubrication	Synthetic oil, ISO VG 150, up to size P140 inclusive											
Average oil quantity		litre		0,05	0,10	0,20	0,30	0,40	1,00	2,20	2,60	3,00
Operating temperature		°C		up to 80								
Paint	Primary coated RAL 9005 – black											
Mass moments of inertia related to input for shaft arrangement 13	i=1,0:1	I ₁	kgcm ²	0,28	1,79	4,93	12,5	36,8	85,9	287	592	1190
	i=1,5:1	I ₁	kgcm ²	0,15	1,22	3,45	9,17	22,4	54,6	179	373	762
	i=2,0:1	I ₁	kgcm ²	0,11	0,95	2,78	7,41	15,6	39,3	123	253	506
	i=3,0:1	I ₁	kgcm ²	0,09	0,78	2,34	6,18	10,9	28,5	84,1	167	328
	i=4,0:1	I ₁	kgcm ²	–	0,72	2,18	5,71	9,19	24,5	69,9	136	263
	i=5,0:1	I ₁	kgcm ²	–	0,69	2,10	5,48	8,32	22,6	62,7	120	230

* Centre of shaft

Thermal performance limit

	P54	P75	P90	P110	P140	P170	P210	P240	P280
Thermal performance limit P _{therm} (KW) at 20 °C and duty cycle of 100%	1,6	2,9	4,1	5,7	9,2	13,2	21,2	28,4	38,4

The gearbox performance is limited by the maximum permissible oil bath temperature. The actual effective performance must not exceed the permissible limit when in continuous operation.

For intermittent operation or in the event of increased ambient temperatures, the following factors can be applied as guide values for determining the permissible thermal performance limit.

Duty cycle (dc) in %	100	80	60	40	20
Factor	1,00	1,20	1,40	1,60	1,80

Ambient temperature °C	10	20	30	40	50
Factor	1,20	1,00	0,87	0,75	0,62

Example	Gearbox	dc	Ambient Temperature
P _{therm}	P140	80%	30 °C
Thermal performance limit P _{therm} =	9,2	x 1,20	x 0,87 = 9,6 KW

Applicable is: P_{exist.} ≤ P_{therm}

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.

Please see gearbox selection and installation on page 18+19!

		Abbr.	Unit	P360	P450	
Output torque	i=1:1	T _{2N}	Nm	3750	6600	
		T _{2B}	Nm	5625	9900	
		T _{2Not}	Nm	7500	13200	
	i=1,5:1	T _{2N}	Nm	3550	7000	
		T _{2B}	Nm	5325	10500	
		T _{2Not}	Nm	7100	14000	
	i=2:1	T _{2N}	Nm	3500	7000	
		T _{2B}	Nm	5250	10500	
		T _{2Not}	Nm	7000	14000	
	i=3:1	T _{2N}	Nm	3350	7000	
		T _{2B}	Nm	5025	10500	
		T _{2Not}	Nm	6700	14000	
	i=4:1	T _{2N}	Nm	2900	6600	
		T _{2B}	Nm	4350	9900	
		T _{2Not}	Nm	5800	13200	
i=5:1	T _{2N}	Nm	2600	6000		
	T _{2B}	Nm	3900	9000		
	T _{2Not}	Nm	5200	12000		
Input speed	i= 1:1	n _{1nenn}	min ⁻¹	650	550	
	i= 1,5:1 ; 2:1	n _{1nenn}	min ⁻¹	850	800	
	Applies at 20% of nominal torque at 20° C ambient temperature	i= 3:1 ; 4:1 ; 5:1	n _{1nenn}	min ⁻¹	1200	1100
			n _{1max} **	min ⁻¹	1400	1300
**On request, special measures required						
Output backlash at 2 % max load	nenn		arcmin	≤ 11	≤ 10	
	vermindert		arcmin	≤ 6	≤ 5	
Permissible radial load	i=1:1 – 2:1	F _{1Rmax} *	N	18000	22000	
		F _{1Rmax} *	N	15000	18000	
	i=4:1	F _{1Rmax} *	N	11000	15000	
	i=5:1	F _{1Rmax} *	N	9000	11000	
	i=1:1 – 5:1	F _{2Rmax} *	N	24000	34000	
Permissible axial load	i=1:1 – 2:1	F _{1Amax}	N	9000	11000	
		F _{1Amax}	N	7500	9000	
	i=4:1	F _{1Amax}	N	5500	7500	
	i=5:1	F _{1Amax}	N	4500	5500	
	i=1:1 – 5:1	F _{2Amax}	N	12000	17000	
Efficiency at max load		n	%	> 98	> 98	
Running noise at 1500 min ⁻¹		L _{pa}	db(A)	≤ 85	≤ 85	
Weight approx.		m	kg	240,0	400,0	
Service life		L _h	h	> 15000	> 15000	
Lubrication	Delivery by default without oil					
Average oil quantity			litre	9,00	22,00	
Operating temperature			°C	up to 80	up to 80	
Paint						
Mass moments of inertia related to input for shaft arrangement 13	i=1,0:1	I ₁	kgcm ²	2314	7632	
	i=1,5:1	I ₁	kgcm ²	1270	4152	
	i=2,0:1	I ₁	kgcm ²	877	2764	
	i=3,0:1	I ₁	kgcm ²	467	1596	
	i=4,0:1	I ₁	kgcm ²	316	1077	
	i=5,0:1	I ₁	kgcm ²	219	750	

* Centre of shaft

Thermal performance limit

	P360	P450
Thermal performance limit P _{therm} (KW) at 20 °C and duty cycle of 100 %	60	93,4

The gearbox performance is limited by the maximum permissible oil bath temperature. The actual effective performance must not exceed the permissible limit when in continuous operation.

Duty cycle (dc) in %	100	80	60	40	20
Factor	1,00	1,20	1,40	1,60	1,80

For intermittent operation or in the event of increased ambient temperatures, the following factors can be applied as guide values for determining the permissible thermal performance limit.

Ambient temperature °C	10	20	30	40	50
Factor	1,20	1,00	0,87	0,75	0,62

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.

Example	Gearbox	dc	Ambient Temperature
P _{therm}	P140	80 %	30 °C
Thermal performance limit P _{therm} =	9,2	x 1,20	x 0,87 = 9,6 KW

Please see gearbox selection and installation on page 18+19!

Applicable is: P_{exist} ≤ P_{therm}