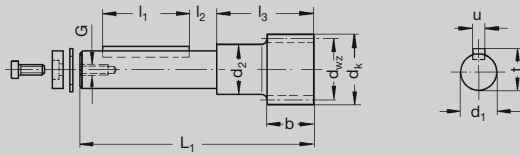




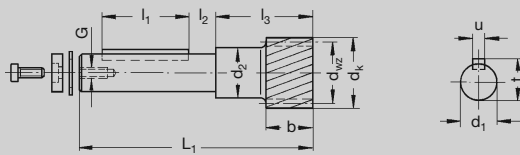
Straight Tooth System, 20° Pressure Angle, teeth are ground and crowned, Tolerances acc. to DIN 3962/63/67



16MnCr5, 1.7131
Case-Hardened
Tooth. Qual. 6 e 25

Order Code	Gearbox ao HP/E/B	Module	No. of Teeth	x	d _{wz}	d _k	b	d _{1h6}	d ₂	L ₁	l ₁	l ₂	l ₃	u	t	G	a	kg
20 28 115	32	2	15	0.375	31.50	35.5	25	20	24	105	28	13.5	50.0	6	22.5	M 5	37.75	0.50
20 28 021	50	2	21	-	42.00	46.0	25	25	35	141	63	13.0	53.0	8	28.0	M 8	43.00	1.21
20 28 332	50	2	32	-	64.00	68.0	25	25	38	141	63	13.0	53.0	8	28.0	M 8	54.00	1.25
20 28 321	50	3	21	-	63.00	69.0	30	25	38	143	63	13.0	55.0	8	28.0	M 8	57.50	1.33
20 28 432	63	2	32	-	64.00	68.0	25	28	42	166	80	14.5	57.5	8	31.0	M 8	54.00	1.50
20 28 421	63	3	21	-	63.00	69.0	30	28	42	168	80	14.5	60.0	8	31.0	M 8	57.50	1.60
20 28 417	63	4	17	-	68.00	76.0	40	28	42	173	80	14.5	65.0	8	31.0	M 8	69.00	2.00
20 28 532	80	2	32	-	64.00	68.0	25	36	48	181	100	12.5	57.0	10	39.0	M12	54.00	2.35
20 28 521	80	3	21	-	63.00	69.0	30	36	48	186	100	12.5	62.0	10	39.0	M12	57.50	2.50
20 28 517	80	4	17	-	68.00	76.0	40	36	48	191	100	12.5	67.0	10	39.0	M12	69.00	2.65
20 28 617	100	4	17	-	68.00	76.0	40	48	57	216	125	9.0	72.0	14	51.5	M12	69.00	4.05
20 28 630	100	4	30	-	120.00	128.0	40	48	57	216	125	9.0	72.0	14	51.5	M12	95.00	6.40
20 28 613	100	5	13	0.500	70.00	80.0	50	48	57	226	125	9.0	82.0	14	51.5	M12	69.00	4.20
20 28 715	125	5	15	0.500	80.00	90.0	50	60	68	272	150	10.0	90.0	18	64.0	M16	74.00	6.94
20 28 713	125	6	13	0.500	84.00	96.0	60	60	68	282	150	10.0	100.0	18	64.0	M16	85.00	7.45

Helical Tooth System, 19°31'42" left, 20° Pressure Angle, teeth are ground and crowned, Tolerances acc. to DIN 3962/63/67



16MnCr5, 1.7131
Case-Hardened
Tooth. Qual. 6 e 25

Order Code	Gearbox ao HP/E/B	Module	No. of Teeth	x	d _{wz}	d _k	b	d _{1h6}	d ₂	L ₁	l ₁	l ₂	l ₃	u	t	G	a	kg
20 29 120	32	1.5	20	-	31.83	34.83	20	20	26	100	40	7.5	45.0	6	22.5	M 5	33.42	0.60
20 29 115	32	2	15	0.4172	33.50	37.50	25	20	24	105	28	13.5	50.0	6	22.5	M 5	39.75	0.50
20 29 020	50	2	20	-	42.44	46.44	25	25	35	141	63	13.0	53.0	8	28.0	M 8	43.22	1.21
20 29 330	50	2	30	-	63.66	67.70	25	25	38	141	63	13.0	53.0	8	28.0	M 8	53.83	1.25
20 29 320	50	3	20	-	63.66	69.70	30	25	38	143	63	13.0	55.0	8	28.0	M 8	57.83	1.33
20 29 430	63	2	30	-	63.66	67.70	25	28	42	166	80	14.5	57.5	8	31.0	M 8	53.83	1.50
20 29 420	63	3	20	-	63.66	69.70	30	28	42	168	80	14.5	60.0	8	31.0	M 8	57.83	1.60
20 29 415	63	4	15	-	63.66	71.70	40	28	42	173	80	14.5	65.0	8	31.0	M 8	66.83	1.85
20 29 530	80	2	30	-	63.66	69.70	25	36	48	181	100	12.5	57.0	10	39.0	M12	53.83	2.40
20 29 520	80	3	20	-	63.66	69.70	30	36	48	186	100	12.5	62.0	10	39.0	M12	57.83	2.40
20 29 515	80	4	15	-	63.66	71.70	40	36	48	191	100	12.5	67.0	10	39.0	M12	66.83	2.50
20 29 615	100	4	15	-	63.66	71.70	40	48	57	216	125	9.0	72.0	14	51.5	M12	66.83	3.90
20 29 630	100	4	30	-	127.32	135.30	40	48	57	216	125	9.0	72.0	14	51.5	M12	98.66	6.90
20 29 612	100	5	12	0.434	68.00	78.00	50	48	57	226	125	9.0	82.0	14	51.5	M12	68.00	4.20
20 29 715	125	5	15	0.500	84.58	94.50	50	60	68	272	150	10.0	90.0	18	64.0	M16	76.29	7.24
20 29 713	125	6	13	0.500	88.76	100.70	60	60	70	282	150	10.0	100.0	18	64.0	M16	87.38	7.89

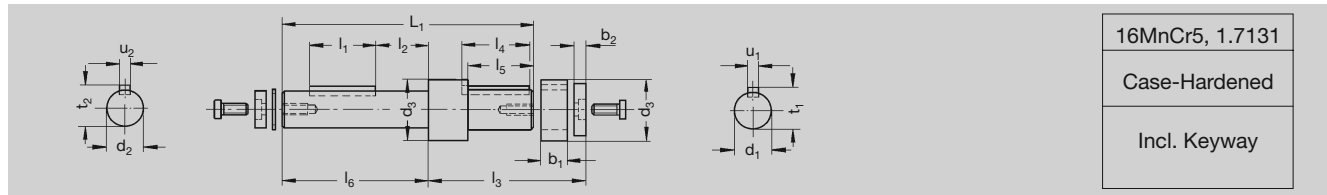
Calculation of center distance a between pinion and rack.





Output Drive Shafts for Key Connection

without Teeth, of 16 MnCr 5, Mat. No.1.7131

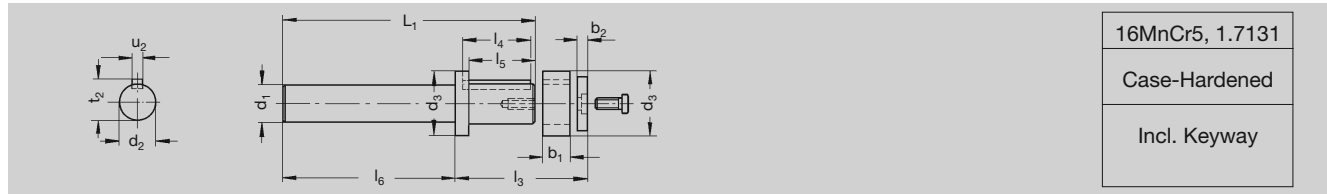


Order Code	Gearbox ao HP/E/B	d _{1h6}	d _{2j6}	d ₃	L ₁	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	u ₁	u ₂	t ₁	t ₂	b ₁	b ₂	kg
65 02 001	32	20	20	-	119.0	40	-	dep. on pairing	40	-	-	6	6	22.5	22.5	-	-	0.6
65 03 040	50	25	25	40	160.0	63	13.0		50	48	87	8	8	28.0	28.0	20	8.0	0.9
65 03 140	50	25	25	40	210.0	63	13.0		50	48	87	8	8	28.0	28.0	20	8.0	1.3
65 04 040	63	28	30	45	185.0	80	14.5		50	48	107	8	8	31.0	33.0	20	8.0	1.1
65 04 140	63	28	30	45	235.0	80	14.5		50	48	107	8	8	31.0	33.0	20	8.0	1.7
65 05 040	80	36	35	48	203.5	100	12.5		50	48	123	10	10	39.0	38.0	20	11.5	2.0
65 05 140	80	36	35	48	253.5	100	12.5		50	48	123	10	10	39.0	38.0	20	11.5	2.7
65 06 040	100	48	45	60	248.5	125	9.0		70	68	143	14	14	51.5	48.5	40	11.5	4.0
65 06 140	100	48	45	60	298.5	125	9.0		70	68	143	14	14	51.5	48.5	40	11.5	5.0
65 07 040	125	60	55	74	316.0	150	10.0		100	99	182	16	18	59.0	64.0	20	16.0	8.6

In the case of hardened gears and shrink-disk mounting of the gears we recommend to recalculate the shaft strength.

Output Drive for Shrink-Disk Connection

without Teeth, of 16 MnCr 5, Mat.No.1.7131



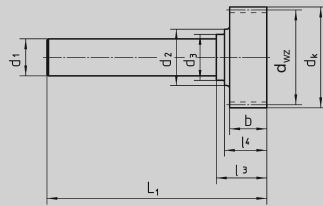
Order Code	Gearbox ao HT/BG HP/E/B	d _{1h6}	d _{2j6}	d ₃	L ₁	l ₃	l ₄	l ₅	l ₆	u ₂	t ₂	b ₁	b ₂	kg
65 03 080	50	25	25	40	168	dep. on pairing	50	48	113.5	8	28	20	8	0.8
65 03 180	50	25	25	40	218		50	48	113.5	8	28	20	8	1.2
65 04 080	50	63	28	30	45	200	50	48	141	8	33	20	8	1.0
65 04 180	50	63	28	30	45	250	50	48	141	8	33	20	8	1.6
65 05 080	63	80	36	35	48	226	50	48	170.5	10	38	20	11.5	1.8
65 05 180	63	80	36	35	48	276	50	48	170.5	10	38	20	11.5	2.5
65 06 080	80	100	48	45	60	273	70	68	196.5	14	48.5	40	11.5	3.8
65 06 180	80	100	48	45	60	323	70	68	196.5	14	48.5	40	11.5	4.8
65 07 080	100	125	60	55	74	329	100	99	220	16	64	20	16	8.0

In the case of hardened gears and shrink-disk mounting of the gears we recommend to recalculate the shaft strength.





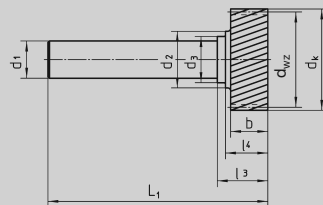
Straight Tooth System, 20° Pressure Angle, teeth are ground and crowned, Tolerances acc. to DIN 3962/63/67



16MnCr5, 1.7131
Case-Hardened
Tooth. Qual. 6 e 25

Order Code	Gearbox Size HT/BG	HP/E/B	Module	No. of Teeth	x	dwz	dk	b	d1h6	d2	d3	L1	l3	l4	a	kg
20 88 115		32	2	15	0.375	31.50	35.5	25	20	24	-	105	31.0	-	37.75	0.50
20 88 021		50	2	21	-	42.00	46.0	25	25	35	31	148	34.0	28.5	43.00	1.21
20 88 332		50	2	32	-	64.00	68.0	25	25	38	31	148	34.0	28.5	54.00	1.25
20 88 321		50	3	21	-	63.00	69.0	30	25	31	-	150	36.5	-	57.50	1.33
20 88 432	50	63	2	32	-	64.00	68.0	25	28	42	36	180	38.5	33.0	54.00	1.50
20 88 421	50	63	3	21	-	63.00	69.0	30	28	42	36	183	41.0	35.5	57.50	1.60
20 88 417	50	63	4	17	-	68.00	76.0	40	28	36	-	188	46.0	-	69.00	2.00
20 88 532	63	80	2	32	-	64.00	68.0	25	36	48	-	203	32.5	-	54.00	2.35
20 88 521	63	80	3	21	-	63.00	69.0	30	36	48	-	208	37.5	-	57.50	2.50
20 88 517	63	80	4	17	-	68.00	76.0	40	36	48	-	213	42.5	-	69.00	2.65
20 88 617	80	100	4	17	-	68.00	76.0	40	48	57	-	240	43.5	-	69.00	4.05
20 88 630	80	100	4	30	-	120.00	128.0	40	48	57	-	240	43.5	-	95.00	6.40
20 88 613	80	100	5	13	0.500	70.00	80.0	50	48	57	-	250	53.5	-	69.00	4.10
20 88 715	100	125	5	15	0.500	80.00	90.0	50	60	68	-	275	55.0	-	74.00	6.30
20 88 713	100	125	6	13	0.500	84.00	96.0	60	60	68	-	285	65.0	-	85.00	6.84

Helical Tooth System, 19°31'42" left, 20° Pressure Angle, teeth are ground and crowned, Qual. 6 e 25 corresp. to DIN 3962/63/67



16MnCr5, 1.7131
Case-Hardened
Tooth. Qual. 6 e 25

Order Code	Gearbox Size HT/BG	HP/E/B	Module	No. of Teeth	x	dwz	dk	b	d1h6	d2	d3	L1	l3	l4	a	kg
20 89 120		32	1.5	20	-	31.83	34.83	20	20	26	-	100.25	26.0	-	33.40	0.50
20 89 115		32	2	15	0.4172	33.50	37.50	25	20	24	-	105	31.0	-	38.75	0.50
20 89 020		50	2	20	-	42.44	46.44	25	25	35	31	148	34.0	28.5	43.22	1.21
20 89 330		50	2	30	-	63.66	67.70	25	25	38	31	148	34.0	28.5	53.83	1.25
20 89 320		50	3	20	-	63.66	69.70	30	25	31	-	150	36.5	-	57.83	1.33
20 89 430	50	63	2	30	-	63.66	67.70	25	28	42	36	180	38.5	33.0	53.83	1.60
20 89 420	50	63	3	20	-	63.66	69.70	30	28	42	36	183	41.0	35.5	57.83	1.60
20 89 415	50	63	4	15	-	63.66	71.70	40	28	36	-	188	46.0	-	66.83	1.85
20 89 530	63	80	2	30	-	63.66	69.70	25	36	48	-	203	32.5	-	53.83	2.35
20 89 520	63	80	3	20	-	63.66	69.70	30	36	48	-	208	37.5	-	57.83	2.40
20 89 515	63	80	4	15	-	63.66	71.70	40	36	48	-	213	42.5	-	66.83	2.50
20 89 615	80	100	4	15	-	63.66	71.70	40	48	57	-	240	43.5	-	66.83	3.90
20 89 630	80	100	4	30	-	127.32	135.30	40	48	57	-	240	43.5	-	98.66	6.90
20 89 612	80	100	5	12	0.434	68.00	78.00	50	48	57	-	250	53.5	-	68.00	4.10
20 89 613	80	100	6	13	0.500	86.76	100.76	60	48	57	-	260	63.5	-	87.38	4.30
20 89 715	100	125	5	15	0.500	84.58	94.50	50	60	70	-	275	55.0	-	76.29	6.57
20 89 713	100	125	6	13	0.500	88.76	100.70	60	60	70	-	285	65.0	-	87.38	7.13
20 48 713*	100	125	6	13	0.500	88.76	100.76	60	60	70	-	285	65.0	-	87.38	7.13
20 48 715*	100	125	6	15	0.500	101.49	113.49	60	60	70	-	285	65.0	-	73.75	7.60

* Gearing quality 4 e 22

Calculation of center distance a between pinion and rack.

