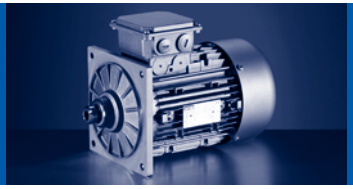


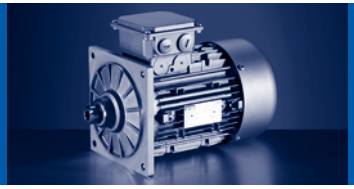
4-pole motors

Rated frequency 50 Hz

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-02	0.060	1425	230	0.42	400	0.24	3.50
MD□□□□□063-22	0.090	1375	230	0.48	400	0.28	2.90
MD□□□□□063-12	0.12	1425	230	0.85	400	0.49	3.10
MD□□□□□063-32	0.18	1365	230	1.00	400	0.58	2.70
MD□□□□□063-42	0.25	1370	230	1.40	400	0.82	2.90
MD□□□□□071-32	0.37	1410	230	1.60	400	0.95	3.30
MD□□□□□071-42	0.55	1405	230	2.40	400	1.40	3.50
MD□□□□□080-32	0.75	1410	230	3.30	400	1.90	4.60
MD□□□□□080-42	1.10	1390	230	4.80	400	2.80	4.40
MD□□□□□090-32	1.50	1410	230	6.60	400	3.80	4.80
MD□□□□□100-12	2.20	1440	230	9.20	400	5.30	6.00
MD□□□□□100-32	3.00	1430	230	12.5	400	7.20	4.60
MD□□□□□112-22	4.00	1450	230	16.1	400	9.30	6.20
MD□□□□□112-32	5.50	1445	230 400 [3]	21.7 12.5	400	12.5	6.10
MD□□□□□132-22	7.50	1455	230 400 [3]	28.6 16.5	400	16.5	5.90
MD□□□□□132-32	9.20	1450	230 400 [3]	34.1 19.7	400	19.7	5.10

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-02	0.40	1.30	1.36	0.57	59.0	63.0	3.30	3.90
MD□□□□□063-22	0.63	1.30	1.39	0.71	63.0	65.0	3.30	3.90
MD□□□□□063-12	0.80	2.50	2.64	0.56	58.0	63.0	3.30	4.10
MD□□□□□063-32	1.26	2.50	2.61	0.70	63.0	64.0	3.30	4.10
MD□□□□□063-42	1.74	3.80	4.10	0.67	65.0	66.0	3.70	4.40
MD□□□□□071-32	2.51	4.76	5.81	0.77	73.0	73.0	10.7	5.80
MD□□□□□071-42	3.74	7.85	9.12	0.77	74.0	74.0	12.8	6.40
MD□□□□□080-32	5.10	11.0	12.1	0.80	73.0	74.0	26.0	11.0
MD□□□□□080-42	7.50	16.5	18.4	0.80	77.0	77.0	26.0	11.0
MD□□□□□090-32	10.1	23.7	27.1	0.76	78.0	79.0	28.4	15.0
MD□□□□□100-12	14.6	38.0	44.0	0.73	83.0	84.0	61.0	24.0
MD□□□□□100-32	20.5	43.0	50.0	0.75	83.0	83.0	61.0	24.0
MD□□□□□112-22	26.3	70.0	95.0	0.73	85.0	86.0	107	31.0
MD□□□□□112-32	36.6	95.0	120	0.77	85.0	86.0	135	38.0
MD□□□□□132-22	49.2	100	150	0.76	87.0	88.0	336	66.0
MD□□□□□132-32	60.6	100	150	0.80	88.0	88.0	336	66.0

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 50 Hz include voltage values of Δ 230 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 400 V possible.

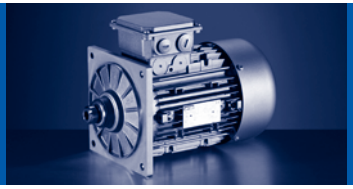


Three-phase AC motors
Rated data of MD type of motor

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□160-22	11.0	1460	230 400 [3]	36.5 21.0	400	21.0	7.00
MD□□□□□160-32	15.0	1460	230 400 [3]	48.4 27.8	400	27.8	7.10
MD□□□□□180-12	18.5	1470	230 400 [3]	57.8 32.8	400	32.8	6.80
MD□□□□□180-32	22.0	1465	230 400 [3]	67.4 38.8	400	38.8	7.30
MD□□□□□180-42	30.0	1465	230 400 [3]	91.1 52.6	400	52.6	7.50
MD□□□□□225-12	37.0	1475	230 400 [3]	114 66.0	400	66.0	6.30
MD□□□□□225-22	45.0	1480	230 400 [3]	137 79.0	400	79.0	7.00

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□160-22	71.9	150	204	0.85	89.2	89.0	610	110
MD□□□□□160-32	98.1	214	288	0.87	89.7	90.0	750	130
MD□□□□□180-12	120	260	313	0.90	90.7	90.5	1350	165
MD□□□□□180-32	144	330	360	0.90	91.2	91.0	1550	175
MD□□□□□180-42	196	548	547	0.90	91.6	91.0	1850	200
MD□□□□□225-12	240	504	528	0.88	93.0	93.0	4400	320
MD□□□□□225-22	291	698	669	0.88	94.0	94.0	5300	345

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 50 Hz include voltage values of Δ 230 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 400 V possible.

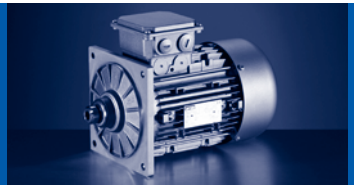


Rated frequency 60 Hz

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-02	0.075	1725	277	0.42	480	0.24	3.50
MD□□□□□063-22	0.11	1675	277	0.48	480	0.28	2.90
MD□□□□□063-12	0.14	1725	277	0.85	480	0.49	3.10
MD□□□□□063-32	0.22	1665	277	1.00	480	0.58	2.70
MD□□□□□063-42	0.31	1670	277	1.40	480	0.82	2.90
MD□□□□□071-32	0.45	1710	277	1.60	480	0.95	3.30
MD□□□□□071-42	0.68	1705	277	2.40	480	1.40	3.50
MD□□□□□080-32	0.92	1710	277	3.30	480	1.90	5.10
MD□□□□□080-42	1.30	1690	277	4.80	480	2.80	5.00
MD□□□□□090-32	1.80	1710	277	6.60	480	3.80	5.30
MD□□□□□100-12	2.60	1740	277	9.20	480	5.30	6.60
MD□□□□□100-32	3.60	1730	277	12.5	480	7.20	5.20
MD□□□□□112-22	4.80	1750	277	16.1	480	9.30	6.40
MD□□□□□112-32	6.60	1745	277 480 [3]	21.7 12.5	480	12.5	6.70
MD□□□□□132-22	9.00	1755	277 480 [3]	28.6 16.5	480	16.5	6.50
MD□□□□□132-32	11.0	1750	277 480 [3]	34.1 19.7	480	19.7	5.60

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-02	0.40	1.30	1.40	0.57	60.0	63.0	3.30	3.90
MD□□□□□063-22	0.63	1.30	1.40	0.71	63.0	65.0	3.30	3.90
MD□□□□□063-12	0.80	2.50	2.60	0.56	58.0	63.0	3.30	4.10
MD□□□□□063-32	1.30	2.50	2.60	0.70	63.0	64.0	3.30	4.10
MD□□□□□063-42	1.80	3.90	4.20	0.67	64.0	66.0	3.70	4.40
MD□□□□□071-32	2.51	4.80	5.80	0.77	74.0	73.0	10.7	5.80
MD□□□□□071-42	3.74	8.00	9.30	0.77	76.0	74.0	12.8	6.40
MD□□□□□080-32	5.10	11.6	13.3	0.80	79.0	79.0	26.0	11.0
MD□□□□□080-42	7.50	17.8	21.0	0.80	79.0	79.0	26.0	11.0
MD□□□□□090-32	10.1	24.7	30.2	0.74	80.0	82.0	28.4	15.0
MD□□□□□100-12	14.6	38.0	47.0	0.73	84.0	85.0	61.0	24.0
MD□□□□□100-32	20.5	43.0	54.0	0.75	87.0	88.0	61.0	24.0
MD□□□□□112-22	26.4	58.0	102	0.73	86.0	87.0	107	31.0
MD□□□□□112-32	36.6	95.0	130	0.76	86.0	87.0	135	38.0
MD□□□□□132-22	49.2	100	160	0.75	88.0	88.0	336	66.0
MD□□□□□132-32	60.6	100	160	0.79	88.0	89.0	336	66.0

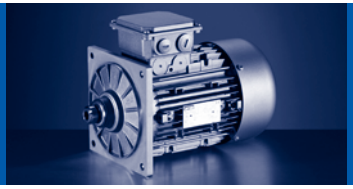
[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 60 Hz include voltage values of Δ 277 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 480 V possible.



	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□160-22	13.2	1760	277 480 [3]	36.5 21.0	480	21.0	7.00
MD□□□□□160-32	18.0	1760	277 480 [3]	48.4 27.8	480	27.8	7.10
MD□□□□□180-12	22.2	1770	277 480 [3]	57.8 32.8	480	32.8	6.80
MD□□□□□180-32	26.4	1765	277 480 [3]	67.4 38.8	480	38.8	7.30
MD□□□□□180-42	36.0	1765	277 480 [3]	90.6 52.3	480	52.3	8.00
MD□□□□□225-12	45.0	1770	277 480 [3]	114 66.0	480	66.0	6.30
MD□□□□□225-22	54.0	1775	277 480 [3]	137 79.0	480	79.0	7.00

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□160-22	71.9	150	204	0.85	90.1	89.0	610	110
MD□□□□□160-32	98.1	214	288	0.87	90.6	90.0	750	130
MD□□□□□180-12	120	260	313	0.90	91.5	90.5	1350	165
MD□□□□□180-32	144	330	360	0.90	92.0	91.0	1550	175
MD□□□□□180-42	196	580	588	0.90	91.8	92.0	1850	200
MD□□□□□225-12	240	504	528	0.88	93.0	93.0	4400	320
MD□□□□□225-22	291	698	669	0.88	94.1	94.1	5300	345

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 60 Hz include voltage values of Δ 277 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 480 V possible.



Rated frequency 87 Hz

	P_N	n_N	M_N	M_{max}	$U_{N,\Delta}$	$I_{N,\Delta}$	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
					± 10 %						
	[kW]	[r/min]	[Nm]	[Nm]	[V]	[A]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-02	0.11	2535	0.40	1.60	400	0.42	0.55	62.0	66.0	3.30	3.90
MD□□□□□063-22	0.16	2485	0.63	2.50	400	0.48	0.67	66.0	68.0	3.30	3.90
MD□□□□□063-12	0.21	2535	0.80	1.60	400	0.85	0.55	61.0	68.0	3.30	4.10
MD□□□□□063-32	0.33	2475	1.26	5.00	400	1.00	0.65	68.0	70.0	3.30	4.10
MD□□□□□063-42	0.45	2480	1.74	7.00	400	1.40	0.63	66.0	69.0	3.70	4.40
MD□□□□□071-32	0.66	2520	2.51	10.0	400	1.60	0.72	76.0	78.0	10.7	5.80
MD□□□□□071-42	1.00	2515	3.74	15.0	400	2.40	0.74	79.0	80.0	12.8	6.40
MD□□□□□080-32	1.35	2520	5.10	20.0	400	3.30	0.80	75.0	77.0	26.0	11.0
MD□□□□□080-42	2.00	2500	7.50	30.0	400	4.80	0.80	81.0	82.0	26.0	11.0
MD□□□□□090-32	2.70	2520	10.1	40.0	400	6.70	0.73	83.0	85.0	28.4	15.0
MD□□□□□100-12	3.90	2550	14.6	60.0	400	9.20	0.71	87.0	88.0	61.0	24.0
MD□□□□□100-32	5.40	2540	20.5	80.0	400	12.5	0.73	87.0	88.0	61.0	24.0
MD□□□□□112-22	7.10	2560	26.3	105	400	16.1	0.71	87.0	88.0	107	31.0
MD□□□□□112-32	9.70	2555	36.6	145	400	21.7	0.75	87.0	88.0	135	38.0
MD□□□□□132-22	13.2	2565	49.2	200	400	28.6	0.75	90.0	90.0	336	66.0
MD□□□□□132-32	16.2	2560	60.6	242	400	34.1	0.79	90.0	91.0	336	66.0
MD□□□□□160-22	19.3	2565	71.9	280	400	36.5	0.85	91.7	90.0	610	110
MD□□□□□160-32	26.4	2565	98.1	390	400	48.4	0.86	91.9	92.0	750	130
MD□□□□□180-12	32.4	2575	120	480	400	57.8	0.89	92.8	92.0	1350	165
MD□□□□□180-32	38.7	2560	144	572	400	67.4	0.89	92.8	92.0	1550	175
MD□□□□□180-42	52.7	2565	196	780	400	91.1	0.89	93.0	93.0	1850	200

[1] Without accessories

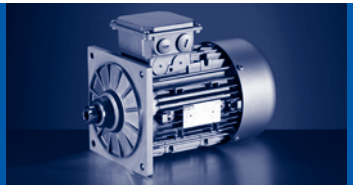
2-pole motors

Rated frequency 50 Hz

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-11	0.18	2740	230	0.80	400	0.40	4.30
MD□□□□□063-31	0.25	2710	230	1.10	400	0.60	3.70
MD□□□□□071-11	0.37	2720	230	1.50	400	0.90	4.40
MD□□□□□071-31	0.55	2630	230	2.40	400	1.40	3.80
MD□□□□□080-11	0.75	2720	230	3.10	400	1.80	4.70
MD□□□□□080-31	1.10	2720	230	4.50	400	2.60	4.70
MD□□□□□090-11	1.50	2710	230	5.50	400	3.20	4.50
MD□□□□□090-31	2.20	2730	230	8.30	400	4.80	3.70
MD□□□□□100-31	3.00	2890	230	10.2	400	5.90	7.00
MD□□□□□100-41	4.00	2840	230	14.2	400	8.30	6.60
MD□□□□□112-31	5.50	2900	400 [2]	11.5			6.00
MD□□□□□112-41	7.50	2890	400 [2]	16.5			6.00
MD□□□□□132-21	9.00	2890	400 [2]	17.0			6.50

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-11	0.63	1.50	1.50	0.88	66.5	66.0	17.0	3.90
MD□□□□□063-31	0.90	1.90	2.00	0.89	67.0	66.0	17.0	3.80
MD□□□□□071-11	1.29	3.10	2.90	0.92	71.0	69.0	51.0	6.00
MD□□□□□071-31	2.00	3.80	4.20	0.93	70.0	63.0	51.0	6.50
MD□□□□□080-11	2.65	5.40	6.50	0.89	70.0	70.0	97.0	10.0
MD□□□□□080-31	3.90	7.50	8.50	0.89	75.0	73.0	97.0	10.0
MD□□□□□090-11	5.20	10.1	10.4	0.95	76.5	75.0	35.0	17.0
MD□□□□□090-31	7.60	16.4	15.5	0.90	77.0	76.0	35.0	17.0
MD□□□□□100-31	9.90	19.0	27.0	0.90	83.0	82.0	32.6	21.0
MD□□□□□100-41	13.6	24.0	29.0	0.91	77.0	78.0	32.6	21.0
MD□□□□□112-31	18.1	46.0	49.0	0.83	86.0	86.0	53.8	28.0
MD□□□□□112-41	24.8	71.0	77.0	0.78	87.0	87.0	70.0	35.0
MD□□□□□132-21	29.8	72.0	72.0	0.92	88.0	88.0	205	68.0

[1] Without accessories
[2] Star/delta start-up at 400 V possible.



Rated frequency 60 Hz

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-11	0.22	3340	277	0.80	480	0.40	4.30
MD□□□□□063-31	0.31	3310	277	1.10	480	0.60	3.70
MD□□□□□071-11	0.45	3320	277	1.50	480	0.90	4.40
MD□□□□□071-31	0.68	3230	277	2.40	480	1.40	3.80
MD□□□□□080-11	0.92	3320	277	3.10	480	1.80	4.70
MD□□□□□080-31	1.30	3320	277	4.50	480	2.60	4.70
MD□□□□□090-11	1.80	3310	277	5.50	480	3.20	4.50
MD□□□□□090-31	2.60	3330	277	8.30	480	4.80	3.70
MD□□□□□100-31	3.60	3490	277	10.2	480	5.90	7.00
MD□□□□□100-41	4.80	3440	277	14.2	480	8.30	6.60
MD□□□□□112-31	6.60	3500	480 [2)]	11.5			6.00
MD□□□□□112-41	9.00	3490	480 [2)]	16.5			6.00
MD□□□□□132-21	11.0	3490	480 [2)]	17.0			6.50

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1)]	m [1)]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-11	0.63	1.50	1.50	0.88	66.5	66.0	17.0	3.90
MD□□□□□063-31	0.90	1.90	2.00	0.89	67.0	66.0	17.0	3.80
MD□□□□□071-11	1.29	3.10	2.90	0.92	71.0	69.0	51.0	6.00
MD□□□□□071-31	2.00	3.80	4.20	0.93	70.0	63.0	51.0	6.50
MD□□□□□080-11	2.65	5.40	6.50	0.89	70.0	70.0	97.0	10.0
MD□□□□□080-31	3.90	7.50	8.50	0.89	75.0	73.0	97.0	10.0
MD□□□□□090-11	5.20	10.1	10.4	0.95	76.5	75.0	35.0	17.0
MD□□□□□090-31	7.60	16.4	15.5	0.90	77.0	76.0	35.0	17.0
MD□□□□□100-31	9.90	19.0	27.0	0.90	83.0	82.0	32.6	21.0
MD□□□□□100-41	13.6	24.0	29.0	0.91	77.0	78.0	32.6	21.0
MD□□□□□112-31	18.1	46.0	49.0	0.83	86.0	86.0	53.8	28.0
MD□□□□□112-41	24.8	71.0	77.0	0.78	87.0	87.0	70.0	35.0
MD□□□□□132-21	29.8	72.0	72.0	0.92	88.0	88.0	205	68.0

[1)] Without accessories
[2)] Star/delta start-up at 480 V possible.

6-pole motors

Rated frequency 50 Hz

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□071-13	0.18	930	230	1.10	400	0.60	3.90
MD□□□□□071-33	0.25	930	230	1.80	400	1.10	2.80
MD□□□□□080-13	0.37	950	230	2.20	400	1.30	4.00
MD□□□□□080-33	0.55	930	230	2.90	400	1.70	3.50

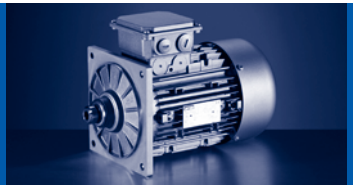
	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□071-13	1.80	5.00	5.00	0.66	67.0	69.0	12.5	6.50
MD□□□□□071-33	2.50	6.60	6.60	0.66	67.0	68.0	12.5	6.50
MD□□□□□080-13	3.70	10.1	10.7	0.63	68.0	69.0	26.0	11.0
MD□□□□□080-33	5.60	12.2	12.8	0.70	68.0	68.0	26.0	11.0

Rated frequency 60 Hz

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□071-13	0.22	1130	277	1.10	480	0.60	3.90
MD□□□□□071-33	0.30	1130	277	1.80	480	1.10	2.80
MD□□□□□080-13	0.45	1150	277	2.20	480	1.30	4.00
MD□□□□□080-33	0.66	1130	277	2.90	480	1.70	3.50

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□071-13	1.80	5.00	5.00	0.66	67.0	69.0	12.5	6.50
MD□□□□□071-33	2.50	6.60	6.60	0.66	66.0	68.0	12.5	6.50
MD□□□□□080-13	3.70	10.1	10.7	0.63	67.0	69.0	26.0	11.0
MD□□□□□080-33	5.60	12.2	12.8	0.70	68.0	68.0	26.0	11.0

[1] Without accessories



4-pole motors

Rated frequency 50 Hz

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1410	230	3.10	400	1.80	5.00
MH□□□□□090-12	1.10	1430	230	4.60	400	2.70	5.40
MH□□□□□090-32	1.50	1435	230	5.80	400	3.30	6.30
MH□□□□□100-12	2.20	1445	230	8.60	400	5.00	6.00
MH□□□□□100-32	3.00	1445	230	12.1	400	7.00	6.50
MH□□□□□112-22	4.00	1455	230	14.5	400	8.40	6.00
MH□□□□□132-12	5.50	1470	230 400 [3]	20.6 11.9	400	11.9	6.10
MH□□□□□132-22	7.50	1460	230 400 [3]	27.0 15.6	400	15.6	8.50
MH□□□□□160-22	11.0	1470	230 400 [3]	37.7 21.8	400	21.8	8.00
MH□□□□□160-32	15.0	1470	230 400 [3]	50.3 29.1	400	29.1	8.20
MH□□□□□180-12	18.5	1475	230 400 [3]	58.8 34.0	400	34.0	8.40
MH□□□□□180-32	22.0	1470	230 400 [3]	68.9 39.8	400	39.8	7.80
MH□□□□□180-42	30.0	1465	230 400 [3]	93.8 53.9	400	53.9	7.00
MH□□□□□225-12	37.0	1483	230 400 [3]	113	400	65.0	7.50
MH□□□□□225-22	45.0	1480	230 400 [3]	137	400	79.0	7.60

	M_N	M_a	M_b	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	5.08	12.0	12.1	0.84	74.9	79.6	79.6	28.0	11.0
MH□□□□□090-12	7.35	20.3	24.2	0.76	77.4	81.6	82.0	32.0	16.0
MH□□□□□090-32	10.0	33.0	34.0	0.76	82.2	83.4	82.8	36.0	18.0
MH□□□□□100-12	14.5	48.0	55.0	0.80	85.4	86.7	86.3	61.0	24.0
MH□□□□□100-32	19.8	67.0	76.0	0.73	83.8	85.6	85.5	66.0	26.5
MH□□□□□112-22	26.3	81.0	100	0.80	86.3	88.2	88.3	135	38.0
MH□□□□□132-12	35.7	90.0	108	0.77	88.2	89.3	89.2	290	59.0
MH□□□□□132-22	49.1	110	175	0.79	87.6	88.9	88.7	336	66.0
MH□□□□□160-22	71.5	164	243	0.82	89.4	90.0	89.8	570	109
MH□□□□□160-32	97.4	224	292	0.82	90.2	90.8	90.6	760	124
MH□□□□□180-12	120	359	371	0.86	90.8	91.4	91.2	1390	175
MH□□□□□180-32	143	400	372	0.87	91.4	92.0	91.6	1440	180
MH□□□□□180-42	196	469	469	0.87	91.9	92.5	92.3	1850	200
MH□□□□□225-12	238	620	620	0.87	94.0	94.6	94.3	4610	395
MH□□□□□225-22	290	698	669	0.88	93.7	94.5	94.3	5300	415

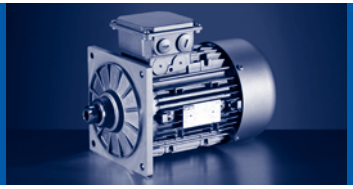
[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 50 Hz include voltage values of Δ 230 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 400 V possible.

Rated frequency 60 Hz

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a / I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.92	1710	277	3.10	480	1.80	5.40
MH□□□□□090-12	1.30	1730	277	4.60	480	2.70	5.80
MH□□□□□090-32	1.80	1735	277	5.80	480	3.30	6.70
MH□□□□□100-12	2.60	1745	277	8.60	480	5.00	6.40
MH□□□□□100-32	3.60	1745	277	12.1	480	7.00	7.00
MH□□□□□112-22	4.80	1755	277	14.5	480	8.40	6.40
MH□□□□□132-12	6.60	1770	277 480 [3]	20.6 11.9	480	11.9	6.50
MH□□□□□132-22	9.00	1760	277 480 [3]	27.0 15.6	480	15.6	9.10
MH□□□□□160-22	13.2	1770	277 480 [3]	37.7 21.8	480	21.8	8.60
MH□□□□□160-32	18.0	1770	277 480 [3]	50.3 29.1	480	29.1	9.10
MH□□□□□180-12	22.2	1775	277 480 [3]	58.8 34.0	480	34.0	8.90
MH□□□□□180-32	26.4	1770	277 480 [3]	68.9 39.8	480	39.8	8.20
MH□□□□□180-42	36.0	1765	277 480 [3]	93.8 53.9	480	53.9	7.40
MH□□□□□225-12	45.0	1783	277 480 [3]	113	480	65.0	7.50
MH□□□□□225-22	54.0	1780	277 480 [3]	137	480	79.0	7.60

	M_N	M_a	M_b	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	5.14	12.6	13.3	0.84	77.3	82.5	82.5	28.0	11.0
MH□□□□□090-12	7.18	22.0	26.0	0.76	80.4	84.0	84.0	32.0	16.0
MH□□□□□090-32	9.91	35.0	37.0	0.76	82.3	84.3	84.0	36.0	18.0
MH□□□□□100-12	14.2	52.0	60.0	0.80	85.7	87.5	87.5	61.0	24.0
MH□□□□□100-32	19.7	73.0	84.0	0.73	84.7	87.8	87.5	66.0	26.5
MH□□□□□112-22	26.1	90.0	110	0.80	87.4	89.5	89.5	135	38.0
MH□□□□□132-12	35.6	97.0	120	0.77	89.0	89.5	90.3	290	59.0
MH□□□□□132-22	48.8	120	192	0.79	88.2	89.5	89.5	336	66.0
MH□□□□□160-22	71.2	171	256	0.81	90.6	91.2	91.0	570	109
MH□□□□□160-32	97.1	243	301	0.82	91.4	92.0	92.4	760	124
MH□□□□□180-12	119	370	382	0.86	92.0	92.6	92.4	1390	175
MH□□□□□180-32	142	413	384	0.87	92.1	93.2	93.0	1440	180
MH□□□□□180-42	195	487	604	0.87	93.1	93.7	93.5	1850	200
MH□□□□□225-12	241	620	620	0.87	94.2	94.8	94.8	4610	395
MH□□□□□225-22	290	698	669	0.88	94.1	94.8	94.7	5300	415

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose ratings at 60 Hz include voltage values of Δ 277 V.
For motor sizes 112-32 to 180-42, the necessary voltage must also be indicated.
[3] Star/delta start-up at 480 V possible.



Rated frequency 87 Hz

	P_N	n_N	M_N	M_{max}	$U_{N,\Delta}$	$I_{N,\Delta}$	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
					± 10 %							
	[kW]	[r/min]	[Nm]	[Nm]	[V]	[A]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	1.35	2520	5.12	20.0	400	3.10	0.84	76.9	81.6	83.5	28.0	11.0
MH□□□□□090-12	2.00	2540	7.52	30.0	400	4.60	0.78	82.0	84.9	86.5	32.0	16.0
MH□□□□□090-32	2.70	2545	10.1	40.0	400	5.80	0.76	82.8	85.5	86.0	36.0	18.0
MH□□□□□100-12	3.90	2555	14.6	60.0	400	8.60	0.83	87.4	89.6	90.0	61.0	24.0
MH□□□□□100-32	5.40	2555	20.2	80.0	400	12.1	0.76	84.3	87.9	88.5	66.0	26.5
MH□□□□□112-22	7.10	2565	26.4	106	400	14.5	0.83	87.9	90.2	90.9	135	38.0
MH□□□□□132-12	9.70	2580	35.9	144	400	20.6	0.82	89.6	91.4	91.8	290	59.0
MH□□□□□132-22	13.2	2570	49.1	196	400	27.0	0.82	88.3	90.1	90.7	336	66.0
MH□□□□□160-22	19.4	2580	71.8	287	400	37.7	0.81	89.4	91.0	91.6	570	109
MH□□□□□160-32	26.4	2580	97.7	391	400	50.3	0.81	89.4	91.0	91.6	760	124
MH□□□□□180-12	32.5	2585	120	480	400	58.8	0.86	90.9	92.2	92.8	1390	175
MH□□□□□180-32	38.7	2580	143	573	400	68.9	0.87	91.7	92.9	93.4	1440	180
MH□□□□□180-42	52.7	2575	196	782	400	93.8	0.87	91.4	92.7	93.2	1850	200
MH□□□□□225-12	64.0	2593	236	920	400	113	0.87	93.1	94.4	94.8	4610	395
MH□□□□□225-22	78.0	2590	288	1150	400	137	0.85	93.0	94.3	94.7	5300	415

[1] Without accessories

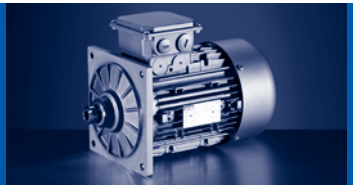
MD/MH three-phase AC motors are designed for operation on a fixed mains and for inverter operation.
For operation at 50 Hz, the motors should be operated in a Δconnection at 230 V or in a star connection at 400 V.
For inverter operation, the base frequency has been set at 87 Hz at a rated voltage of 400 V in a Δconnection.

In the standard version, the motors are connected in the terminal box. As an option, the motors are also available with the plug-in connectors described on the following pages as long as the permissible ratings are not exceeded.

Motor terminal box

Motor terminal box - built-on accessories assignment: 4-pole / 6-pole motors

	M□□MA XX	M□□MA RS M□□MA IG M□□MA AG	M□□MA ZE M□□MA HA	M□□MA LL	M□□MA LZ M□□MA LH
MDSMA□□063-02 MDSMA□□063-22	KK1	KK2			
MD□MA□□063-12 MD□MA□□063-32 MD□MA□□063-42	KK1	KK2			
MD□MA□□071-32 MD□MA□□071-42 MD□MA□□071-13 MD□MA□□071-33	KK1	KK2	KK2	KK1	KK1
MD□MA□□080-13 M□□MA□□080-32 MD□MA□□080-33 M□□MA□□080-42	KK1	KK2	KK2	KK1	KK1
M□□MA□□090-12 M□□MA□□090-32	KK1	KK2	KK2	KK1	KK1
M□□MA□□100-12 M□□MA□□100-32	KK1	KK2	KK2	KK2	KK2
M□□MA□□112-22 M□□MA□□112-32	KK1	KK2	KK2	KK1	KK1
M□□MA□□132-12 M□□MA□□132-22 M□□MA□□132-32	KK1	KK3	KK3	KK1	KK1
M□□MA□□160-22 M□□MA□□160-32	KK3	KK3			
M□□MA□□180-12 M□□MA□□180-32 M□□MA□□180-42 M□□MA□□180-42	KK3	KK3			
M□□MA□□225-12 M□□MA□□225-22	KK3	KK3			

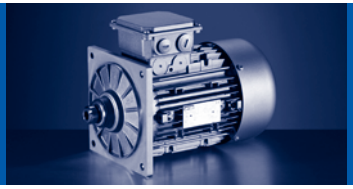


	M□□MA BR	M□□MA BS M□□MA BI M□□MA BA	M□□MA BZ M□□MA BH	M□□MA BL
MDSMA□□063-02 MDSMA□□063-22	KK2	KK3		
MD□MA□□063-12 MD□MA□□063-32 MD□MA□□063-42	KK2	KK3		
MD□MA□□071-32 MD□MA□□071-42 MD□MA□□071-13 MD□MA□□071-33	KK2	KK3	KK2	KK2
MD□MA□□080-13 M□□MA□□080-32 MD□MA□□080-33 M□□MA□□080-42	KK2	KK3	KK2	KK2
M□□MA□□090-12 M□□MA□□090-32	KK2	KK3	KK2	KK2
M□□MA□□100-12 M□□MA□□100-32	KK2	KK3	KK2	KK2
M□□MA□□112-22 M□□MA□□112-32	KK2	KK3	KK2	KK2
M□□MA□□132-12 M□□MA□□132-22 M□□MA□□132-32	KK3	KK3	KK3	KK3
M□□MA□□160-22 M□□MA□□160-32	KK3	KK3		
M□□MA□□180-12 M□□MA□□180-32 M□□MA□□180-42	KK3	KK3		
M□□MA□□225-12 M□□MA□□225-22	KK3	KK3		

Motor terminal box - built-on accessories assignment: 2-pole motors

	M□□MA XX	M□□MA ZE	M□□MA LL	M□□MA LZ
MD□MA□□063-11 MD□MA□□063-31	KK1			
MD□MA□□071-11 MD□MA□□071-31	KK1	KK2	KK1	KK2
MD□MA□□080-11 MD□MA□□080-31	KK1	KK2	KK1	KK2
MD□MA□□090-31 MD□MA□□090-11	KK1	KK2	KK1	KK2
MD□MA□□100-31 MD□MA□□100-41	KK1	KK2	KK1	KK2
MD□MA□□112-31 MD□MA□□112-41	KK1	KK2	KK1	KK2
MD□MA□□132-21	KK1	KK3	KK1	KK3

	M□□MA BR	M□□MA BZ	M□□MA BL
MD□MA□□063-11 MD□MA□□063-31	KK2		
MD□MA□□071-11 MD□MA□□071-31	KK2	KK2	
MD□MA□□080-11 MD□MA□□080-31	KK2	KK2	KK2
MD□MA□□090-31 MD□MA□□090-11	KK2	KK2	KK2
MD□MA□□100-31 MD□MA□□100-41	KK2	KK2	KK2
MD□MA□□112-31 MD□MA□□112-41	KK2	KK2	KK2
MD□MA□□132-21	KK3	KK3	KK3



Motor terminal box with ICN connector

The connectors can be rotated through 270° and fitted with a bayonet fixing. As the connector fixing is also compatible with conventional union nuts, existing mating connectors can continue to be used without difficulty. The motor connection is determined in the terminal box and must be checked before commissioning.

Design			ICN 6-pole	ICN 8-pole
Number of power contacts			3	
Number of earthing contacts			1	
Number of signalling contacts Brake/rectifier supply voltage			2	
TKO thermal contacts supply voltage				2
Max. current	I_{max}	[A]	20.0	
Socket identifier for Lenze system cables Counter plug			M04	M08

Motor terminal box with ICN connectors - built-on accessories assignment: 4-pole / 6-pole motors

	M□□MA XX	M□□MA RS M□□MA IG M□□MA AG	M□□MA ZE M□□MA HA	M□□MA LL	M□□MA LZ M□□MA LH
MDSMA□□063-02 **MDSMA□□063-22**	KK1	KK2			
MD□MA□□063-12 **MD□MA□□063-32** **MD□MA□□063-42**	KK1	KK2			
MD□MA□□071-32 **MD□MA□□071-42** **MD□MA□□071-13** **MD□MA□□071-33**	KK1	KK2	KK2	KK1	KK2
MD□MA□□080-13 **M□□MA□□080-32** **MD□MA□□080-33** **M□□MA□□080-42**	KK1	KK2	KK2	KK1	KK2
M□□MA□□090-12 **M□□MA□□090-32**	KK1	KK2	KK2	KK1	KK2
M□□MA□□100-12 **M□□MA□□100-32**	KK1	KK2	KK2	KK2	KK2
M□□MA□□112-22 **M□□MA□□112-32**	KK1	KK2	KK2	KK1	KK2
M□□MA□□132-12 **M□□MA□□132-22** **M□□MA□□132-32**	KK1	KK3	KK3	KK1	KK3

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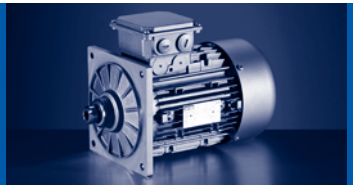
	M□□MA BR	M□□MA BS M□□MA BI M□□MA BA	M□□MA BZ M□□MA BH	M□□MA BL
MDSMA□□063-02 MDSMA□□063-22	KK2	KK2		
MD□MA□□063-12 MD□MA□□063-32 MD□MA□□063-42	KK2	KK2		
MD□MA□□071-32 MD□MA□□071-42 MD□MA□□071-13 MD□MA□□071-33	KK2	KK2	KK2	KK2
MD□MA□□080-13 M□□MA□□080-32 MD□MA□□080-33 M□□MA□□080-42	KK2	KK2	KK2	KK2
M□□MA□□090-12 M□□MA□□090-32	KK2	KK2	KK2	KK2
M□□MA□□100-12 M□□MA□□100-32	KK2	KK2	KK2	KK2
M□□MA□□112-22 M□□MA□□112-32	KK2	KK2	KK2	KK2
M□□MA□□132-12 M□□MA□□132-22 M□□MA□□132-32	KK3	KK3	KK3	KK3



Motor terminal box with ICN connectors - built-on accessories
assignment: 2-pole motors

	M□□MA XX	M□□MA ZE	M□□MA LL	M□□MA LZ
MD□MA□□063-11 **MD□MA□□063-31**	KK1			
MD□MA□□071-11 **MD□MA□□071-31**	KK1	KK2	KK1	KK2
MD□MA□□080-11 **MD□MA□□080-31**	KK1	KK2	KK1	KK2
MD□MA□□090-31 **MD□MA□□090-11**	KK1	KK2	KK1	KK2
MD□MA□□100-31 **MD□MA□□100-41**	KK1	KK2	KK1	KK2
MD□MA□□112-31 **MD□MA□□112-41**	KK1	KK2	KK1	KK2
MD□MA□□132-21	KK1	KK3	KK1	KK3

	M□□MA BR	M□□MA BZ	M□□MA BL
MD□MA□□063-11 **MD□MA□□063-31**	KK2		
MD□MA□□071-11 **MD□MA□□071-31**	KK2	KK2	
MD□MA□□080-11 **MD□MA□□080-31**	KK2	KK2	KK2
MD□MA□□090-31 **MD□MA□□090-11**	KK2	KK2	KK2
MD□MA□□100-31 **MD□MA□□100-41**	KK2	KK2	KK2
MD□MA□□112-31 **MD□MA□□112-41**	KK2	KK2	KK2
MD□MA□□132-21	KK3	KK3	KK3

Motor terminal box with HAN-10 E connector

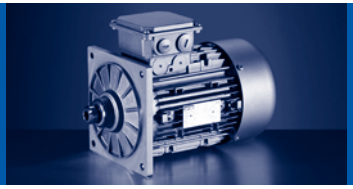
In the case of the rectangular HAN-10E plug-in connectors, all six ends of the three winding phases are taken out to the power contacts. The motor circuit is therefore determined in the mating connector.

Design			HAN-10E
Number of power contacts			6
Number of earthing contacts			1
Number of signalling contacts Brake/rectifier supply voltage TKO thermal contacts supply voltage			 2 2
Max. current	I_{max}	[A]	16.0
Socket identifier for Lenze system cables Counter plug			H10 ... H13

Motor terminal box with HAN modular connector

The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.

Design			HAN modular
Number of power contacts			3
Number of earthing contacts			1
Number of signalling contacts Brake/rectifier supply voltage Rectifier DC switching contacts supply voltage TKO thermal contacts supply voltage			 2 2 2
Max. current	I_{max}	[A]	16.0 40.0
Socket identifier for Lenze system cables Counter plug			H07 ... H15



Motor terminal box with HAN connectors - built-on accessories
assignment: 4-pole / 6-pole motors

	M□□MA XX M□□MA BR	M□□MA ZE M□□MA HA M□□MA BZ M□□MA BH	M□□MA LL M□□MA BL	M□□MA LZ M□□MA LH
MDSMA□□063-02 MDSMA□□063-22	HAN-10E HAN modular			
MD□MA□□063-12 MD□MA□□063-32 MD□MA□□063-42	HAN-10E HAN modular			
MD□MA□□071-32 MD□MA□□071-13 MD□MA□□071-42 MD□MA□□071-33	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□080-13 M□□MA□□080-32 MD□MA□□080-33 M□□MA□□080-42	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
M□□MA□□090-12 M□□MA□□090-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
M□□MA□□100-12 M□□MA□□100-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
M□□MA□□112-22 M□□MA□□112-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
M□□MA□□132-12 M□□MA□□132-22 M□□MA□□132-32	HAN modular	HAN modular	HAN modular	HAN modular
M□□MA□□160-22 M□□MA□□160-32	HAN modular			

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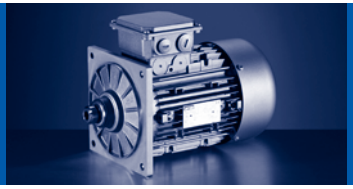
Motor terminal box with HAN connectors - built-on accessories
assignment: 2-pole motors

	M□□MA XX M□□MA BR	M□□MA ZE M□□MA BZ	M□□MA LL M□□MA BL	M□□MA LZ
MD□MA□□063-11 **MD□MA□□063-31**	HAN-10E HAN modular			
MD□MA□□071-11 **MD□MA□□071-31**	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□080-11 **MD□MA□□080-31**	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□090-31 **MD□MA□□090-11**	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□100-31 **MD□MA□□100-41**	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□112-31 **MD□MA□□112-41**	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
MD□MA□□132-21	HAN modular	HAN modular	HAN modular	HAN modular



Connector for feedback

ICN connector

All encoder systems (apart from IG128-24V-H) are also available with an ICN connector fixed to the motor terminal box for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing mating connectors can therefore continue to be used without difficulty.

Design		Resolver	Incremental encoder SinCos absolute value encoder
Number of signalling contacts		12	
Coding	[°]	0	20
Socket identifier for Lenze system cables Counter plug		F05	F06

Connector for IG128-24V-H

As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

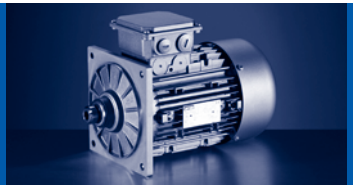
Design		Incremental encoder IG128-24V-H
Number of signalling contacts		4
Coding	[°]	0

ICN connector for blower

ICN connector

The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used without difficulty.

Design	Blower 1-ph	Blower 3-ph
Number of power contacts	6	
Number of earthing contacts	1	
Socket identifier for Lenze system cables Counter plug	L04	L06



Decentralised frequency inverter 8200 motec

Assignment of motor to frequency inverter

Rated frequency 50 Hz

Rated power	Product key		
	Motor		Inverter
P_N			
[kW]			
0.12	MD□□□□□□063-12		E82MV251_2B
0.18	MD□□□□□□063-32		
0.25	MD□□□□□□063-42		
0.37	MD□□□□□□071-32		E82MV371_2B
0.55	MD□□□□□□071-42		E82MV551_4B
0.75	MD□□□□□□080-32	MH□□□□□□080-32	E82MV751_4B
1.10	MD□□□□□□080-42	MH□□□□□□090-12	E82MV152_4B
1.50	MD□□□□□□090-32	MH□□□□□□090-32	
2.20	MD□□□□□□100-12	MH□□□□□□100-12	E82MV222_4B
3.00	MD□□□□□□100-32	MH□□□□□□100-32	E82MV302_4B
4.00	MD□□□□□□112-22	MH□□□□□□112-22	E82MV402_4B
5.50	MD□□□□□□112-32	MH□□□□□□132-12	E82MV552_4B
7.50	MD□□□□□□132-22	MH□□□□□□132-22	E82MV752_4B

Rated frequency 87 Hz

Rated power	Product key		
	Motor		Inverter
P_N			
[kW]			
0.21	MD□□□□□□063-12		E82MV551_4B
0.33	MD□□□□□□063-32		
0.45	MD□□□□□□063-42		
0.66	MD□□□□□□071-32		E82MV751_4B
1.00	MD□□□□□□071-42		E82MV152_4B
1.35	MD□□□□□□080-32	MH□□□□□□080-32	
2.00	MD□□□□□□080-42	MH□□□□□□090-12	E82MV222_4B
2.70	MD□□□□□□090-32	MH□□□□□□090-32	E82MV302_4B
3.90	MD□□□□□□100-12	MH□□□□□□100-12	E82MV402_4B
5.40	MD□□□□□□100-32	MH□□□□□□100-32	E82MV552_4B
7.10	MD□□□□□□112-22	MH□□□□□□112-22	E82MV752_4B

Features and assignments

Three-phase AC motors can be fitted with a spring-applied brake. This is activated after the supply voltage is switched off (closed-circuit principle). For optimum adjustment of the brake motor to the application, a range of braking torques and control versions is available for every motor frame size. For applications with very high operating frequencies the brake is also available in a LongLife version, with reinforced mechanical brake components.

Features

Versions
- **Standard**

1 x 10^6 Repeating switching cycles
1 x 10^6 Reversing switching cycles
- **LongLife**

10 x 10^6 Repeating switching cycles
15 x 10^6 Reversing switching cycles

Control
- DC supply
- AC supply via rectifier in the terminal box

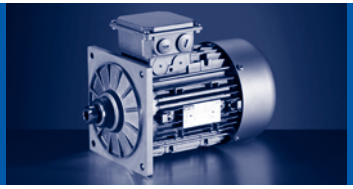
Enclosure
- Without manual release IP55
- With manual release IP54

Friction lining
- Non-asbestos, low wearing

Options
- Manual release
- UL/CSA approval
- Noise-reduced

Motor - brake assignment: 4-pole motors

Design	Standard		LongLife	
	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
MDSMAB□063-02 MDSMAB□063-22 MD□MAB□063-12 MD□MAB□063-32 MD□MAB□063-42	06 06	2.50 4.00	06	4.00
MD□MAB□071-32	06 06 08	2.50 4.00 3.50	06 08	4.00 3.50
MD□MAB□071-42	06 06 08 08	2.50 4.00 3.50 8.00	06 08 08	4.00 3.50 8.00
M□□MAB□080-32	08 08 10	3.50 8.00 7.00	08 10	8.00 7.00
M□□MAB□080-42	08 08 10 10	3.50 8.00 7.00 16.0	08 10 10	8.00 7.00 16.0

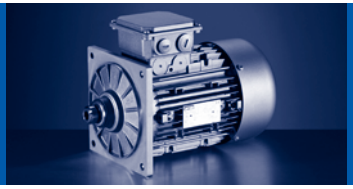


Design	Standard		LongLife	
	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
M□□MAB□090-12 **M□□MAB□090-32**	**08** **08** **10** **10** **10**	3.50 8.00 7.00 16.0 23.0	**08** **10** **10**	8.00 7.00 16.0
M□□MAB□100-12	**10** **10** **12** **12**	7.00 16.0 14.0 32.0	**10** **12** **12**	16.0 14.0 32.0
M□□MAB□100-32	**10** **10** **12** **12** **12**	7.00 16.0 14.0 32.0 46.0		
M□□MAB□112-22 **M□□MAB□112-32**	**12** **12** **14** **14**	14.0 32.0 35.0 60.0		
M□□MAB□132-12	**14** **14** **16** **16**	35.0 60.0 60.0 80.0		
M□□MAB□132-22 **M□□MAB□132-32**	**14** **14** **16** **16** **16**	35.0 60.0 60.0 80.0 100		
M□□MAB□160-22	**16** **16** **18** **18**	60.0 80.0 80.0 150		
M□□MAB□160-32	**18** **18** **18**	80.0 150 200		
M□□MAB□180-12	**18** **18** **20** **20**	80.0 150 145 260		
M□□MAB□180-32	**18** **18** **20** **20** **20**	80.0 150 145 260 315		
M□□MAB□180-42	**18** **18** **20** **20** **20** **20**	80.0 150 145 260 315 400		

Design	Standard		LongLife	
	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
M□□MAB□225-12	25 25 25	265 400 490		
M□□MAB□225-22	25 25 25 25	265 400 490 600		

Motor - brake assignment: 2-pole motors

Design	Standard		LongLife	
	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
MD□MAB□063-11 MD□MAB□063-31	06 06	2.50 4.00	06 06	2.50 4.00
MD□MAB□071-11 MD□MAB□071-31	06 06 08	2.50 4.00 3.50	06 08	4.00 3.50
MD□MAB□080-11 MD□MAB□080-31 MD□MAB□090-11	08 08 10	3.50 8.00 7.00	08 10	8.00 7.00
MD□MAB□090-31	08 08 10 10	3.50 8.00 7.00 16.0	08 10 10	8.00 7.00 16.0
MD□MAB□100-31 MD□MAB□100-41	12 12	14.0 32.0	12 12	14.0 32.0
MD□MAB□112-31 MD□MAB□112-41	12 12 14 14	14.0 32.0 35.0 60.0		
MD□MAB□132-21	14 14 16 16	35.0 60.0 60.0 80.0		



Motor - brake assignment: 6-pole motors

Design	Standard		LongLife	
	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
MD□MAB□071-13	06	2.50	06	4.00
MD□MAB□071-33	06	4.00	08	3.50
	08	3.50		
MD□MAB□080-13	08	3.50	08	8.00
MD□MAB□080-33	08	8.00	10	7.00
	10	7.00		

Brake connection

Direct connection without rectifier

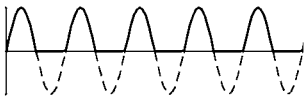
If the brake is activated directly without a rectifier, a freewheeling diode or a spark suppressor is required to protect against induction peaks.

- Supply voltages
  DC 24 V
  DC 180 V
  DC 205 V

Connection via mains voltage with brake rectifier

If the brake is not directly supplied with DC voltage, a rectifier is required. This is included in the scope of supply and is located in the terminal box of the motor. The rectifier converts the AC voltage of the connection into DC voltage. The following rectifiers are available:

Half-wave rectifier, 6-pole

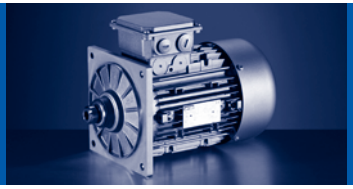


- Ratio of supply voltage to brake coil voltage = 2.22
- Approved by UL/CSA
- Supply voltages
  AC 230 V
  AC 277 V
  AC 400 V
  AC 460 V
  AC 480 V

Bridge rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 1.11
- Supply voltage
  AC 230 V

8



Bridge/half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage
  up to overexcitation time = 1.11
  beyond overexcitation time = 2.22

Supply voltages:

- AC 230 V
- AC 277 V
- AC 400 V

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time $t_{ü}$ and then as a half-wave rectifier. This combination optimises the performance of the brake – depending on the assignment of brake coil voltage and supply voltage:

- **Short-time overexcitation of the brake coil**
  Activating the brake coil for the overexcitation time $t_{ü}$ with twice the rated voltage allows the disengagement time to be reduced. The brake opens more quickly and wear on the friction lining is reduced.
  These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.

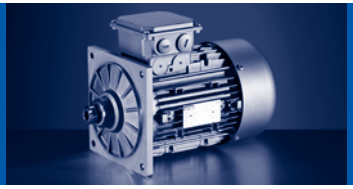
- **Holding current reduction (cold brake)**
  By reducing the holding current, the bridge/half-wave rectifier is able to reduce the power input to the open brake. As the brake heats up less, this type of activation is known as "cold brake".

Brake data, reduced braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Coil power	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	2.50	3.50	7.00	14.0	35.0	60.0	80.0	145	265
1000	M_B	[Nm]	2.30	3.10	6.10	12.0	30.0	50.0	65.0	115	203
1200	M_B	[Nm]	2.30	3.10	6.00	12.0	29.0	48.0	63.0	112	199
1500	M_B	[Nm]	2.20	3.00	5.80	11.0	28.0	47.0	61.0	109 [1)]	193 [1)]
1800	M_B	[Nm]	2.10	2.90	5.70	11.0	28.0	46.0	60.0 [1)]		
3000	M_B	[Nm]	2.00	2.80	5.30	10.0	26.0 [1)]	43.0 [1)]			
3600	M_B	[Nm]	2.00	2.70	5.20	10.0 [1)]					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 [1)]	36.0 [1)]
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 [1)]		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 [1)]	11.0 [1)]			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 [1)]					
Transition operating frequency	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia	J	[kgcm²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

[1)] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.



Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Delay time Engaging	t_{11}	[ms]	11.0	14.0	20.0	21.0	37.0	53.0	32.0	47.0	264
Rise time Braking torque	t_{12}	[ms]	13.0	10.0	17.0	19.0	22.0	30.0	20.0	100	120
Engagement time 230	t_1	[ms]	24.0		37.0	40.0	59.0	83.0	52.0	147	384
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Overexcitation time	$t_{ü}$	[ms]	300				1300				
Min. rest time	t	[ms]	900				3900				
Delay time Engaging	t_{11}	[ms]	12.0	22.0	35.0	49.0	61.0	114	83.0	126	304
Rise time Braking torque	t_{12}	[ms]	14.0	16.0	30.0	45.0	37.0	65.0	52.0	269	138
Engagement time 230	t_1	[ms]	26.0	38.0	66.0	93.0	97.0	180	134	395	443
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

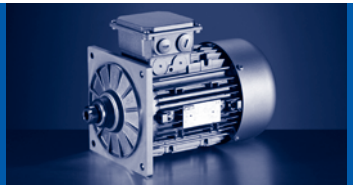
- The brake response and application times are guide values.
  The engagement time is 10 times longer with AC-side switching.
  With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

Brake data, standard braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Coil power	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	4.00	8.00	16.0	32.0	60.0	80.0	150	260	400
1000	M_B	[Nm]	3.70	7.20	14.0	27.0	51.0	66.0	121	206	307
1200	M_B	[Nm]	3.60	7.00	14.0	27.0	50.0	65.0	118	201	300
1500	M_B	[Nm]	3.50	6.80	13.0	26.0	48.0	63.0	115	195 [1)]	291 [1)]
1800	M_B	[Nm]	3.40	6.70	13.0	26.0	47.0	61.0	112 [1)]		
3000	M_B	[Nm]	3.20	6.30	12.0	24.0	44.0 [1)]	57.0 [1)]			
3600	M_B	[Nm]	3.20	6.10	12.0	23.0 [1)]					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 [1)]	36.0 [1)]
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 [1)]		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 [1)]	11.0 [1)]			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 [1)]					
Transition operating frequency	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia	J	[kgcm²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

[1)] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.



Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Delay time Engaging	t_{11}	[ms]	15.0		28.0		17.0	27.0	33.0	65.0	110
Rise time Braking torque	t_{12}	[ms]	13.0	16.0	19.0	25.0		30.0	45.0	100	120
Engagement time 230	t_1	[ms]	28.0	31.0	47.0	53.0	42.0	57.0	78.0	165	230
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Overexcitation time	$t_{ü}$	[ms]	300				1300				
Min. rest time	t	[ms]	900				3900				
Delay time Engaging	t_{11}	[ms]	16.0	25.0	31.0	48.0	33.0	58.0	80.0	102	154
Rise time Braking torque	t_{12}	[ms]	14.0	27.0	21.0	43.0	49.0	64.0	109	157	168
Engagement time 230	t_1	[ms]	30.0	52.0		90.0	82.0	122	189	259	322
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- The brake response and application times are guide values.
  The engagement time is 10 times longer with AC-side switching.
  With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

Brake data, increased braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			10	12	14	16	16	18	20	20	25	25
Coil power	P_{in}	[kW]	0.030	0.040	0.050	0.055	0.055	0.085	0.10	0.10	0.11	0.11
Braking torque												
100	M_B	[Nm]	23.0	46.0	75.0	100	125	200	315	400	490	600
1000	M_B	[Nm]	20.0	39.0	64.0	83.0	103	162	249	317	376	461
1200	M_B	[Nm]	20.0	39.0	62.0	81.0	101	158	244	309	367	449
1500	M_B	[Nm]	19.0	38.0	60.0	78.0	98.0	153	237 [1]	300 [1]	356 [1]	436 [1]
1800	M_B	[Nm]	19.0	37.0	59.0	77.0	96.0	150 [1]				
3000	M_B	[Nm]	17.0	34.0	55.0 [1]	71.0 [1]	89.0 [1]					
3600	M_B	[Nm]	17.0	33.0 [1]								
Maximum switching energy												
100	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1000	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1200	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1500	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	24.0 [1]	24.0 [1]	36.0 [1]	36.0 [1]
1800	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	36.0 [1]				
3000	Q_E	[KJ]	12.0	24.0	18.0 [1]	11.0 [1]	11.0 [1]					
3600	Q_E	[KJ]	12.0	7.00 [1]								
Transition operating frequency	$S_{hü}$	[1/h]	40.0	30.0	28.0	27.0	27.0	20.0	19.0	19.0	15.0	15.0
Moment of inertia	J	[kgcm²]	0.20	0.45	0.63	1.50	1.50	2.90	7.30	7.30	20.0	20.0
Mass	m	[kg]	2.60	4.20	5.80	8.70	8.70	12.6	19.5	19.5	31.0	31.0

[1] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

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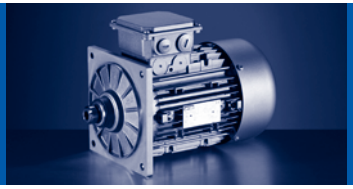
Activation via half-wave or bridge rectifier

Size			10	12	14	16		18	20		25	
Friction energy	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time Engaging	t_{11}	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time Braking torque	t_{12}	[ms]	19.0	25.0		30.0		45.0	100		120	
Engagement time 230	t_1	[ms]	29.0	41.0	36.0	52.0	47.0	69.0	146	117	197	158
Disengagement time	t_2	[ms]	109	193	308	297	435	356	378	470	451	532



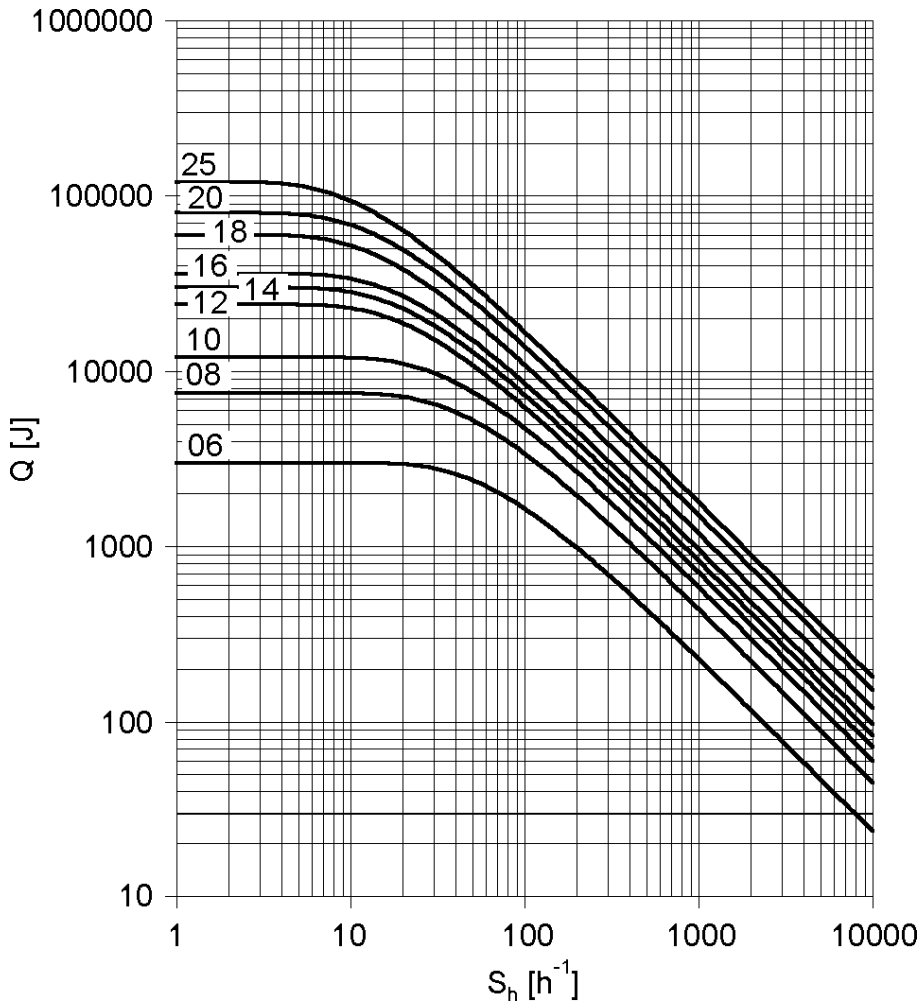
Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)									
Size			**10**	**12**	**14**	**16**		**18**	**20**		**25**	
Friction energy	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time	$t_{ü}$	[ms]	300			1300						
Min. rest time	t	[ms]	900			3900						
Delay time Engaging	t_{11}	[ms]	24.0	27.0	17.0	41.0	21.0	60.0	69.0	17.0	123	85.0
Rise time Braking torque	t_{12}	[ms]	44.0	43.0	37.0	55.0	37.0	113	148	100	190	270
Engagement time 230	t_1	[ms]	68.0	70.0	54.0	97.0	57.0	173	217	334	313	355
Disengagement time	t_2	[ms]	109	193	308	297	435	356	378	470	451	532

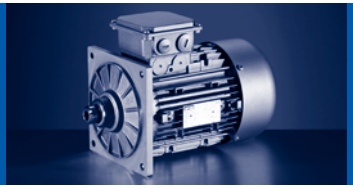
Design			Over-excitation									
Size			**10**	**12**	**14**	**16**		**18**	**20**		**25**	
Friction energy	Q_{BW}	[MJ]	264	706	761	966		1542	2322		3522	
Overexcitation time	$t_{ü}$	[ms]	300			1300						
Min. rest time	t	[ms]	900			3900						
Delay time Engaging	t_{11}	[ms]	29.0	54.0	31.0	70.0	46.0	86.0	103	55.0	171	135
Rise time Braking torque	t_{12}	[ms]	53.0	87.0	68.0	93.0	83.0	160	222	319	266	430
Engagement time 230	t_1	[ms]	82.0	141	99.0	163	129	246	325	374	437	565
Disengagement time	t_2	[ms]	53.0	81.0	117	141	168	151	160	167	184	204

- The brake response and application times are guide values.
  The engagement time is 10 times longer with AC-side switching.
  With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

Permissible friction energy



Q =Switching energy per switching cycle
S_h =Operating frequency
Brake size = 06 ... 25



Rated data

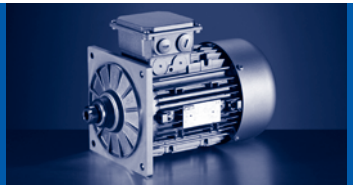
The use of a blower enables operation below 20 Hz without torque derating.

Blower data 50 Hz

	Number of phases	Connection method					
			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
MDFMA□□063	1		230	277	0.027	0.11	2.00
	3	Δ	200	303	0.028	0.12	
		Y	346	525		0.070	
MDFMA□□071	1		230	277	0.027	0.10	2.10
	3	Δ	200	303	0.031	0.11	
		Y	346	525		0.060	
M□FMA□□080	1		230	277	0.029	0.11	2.30
	3	Δ	200	303	0.031		
		Y	346	525		0.060	
M□FMA□□090	1		220	277	0.065	0.29	2.70
	3	Δ	200	303	0.091	0.38	
		Y	346	525		0.22	
M□FMA□□100	1		220	277	0.066	0.28	3.00
	3	Δ	200	303	0.091	0.37	
		Y	346	525		0.22	
M□FMA□□112	1		220	277	0.071	0.28	3.10
	3	Δ	200	303	0.097	0.35	
		Y	346	525		0.20	
M□FMA□□132	1		230	277	0.098	0.40	4.20
	3	Δ	200	303	0.12	0.58	
		Y	346	525		0.33	
M□FMA□□160	1		230	277	0.25	0.97	6.20
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
M□FMA□□180	1		230	277		0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
M□FMA□□225		Δ	200	400	0.28	1.10	15.0
		Y	346	525	0.17	0.35	

Blower data 60 Hz

	Number of phases	Connection method					
			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
MDFMA□□063	1		230	277	0.032	0.12	2.00
	3	Δ	220	332	0.028	0.10	
		Y	380	575		0.060	
MDFMA□□071	1		230	277	0.033	0.12	2.10
	3	Δ	220	332	0.029	0.10	
		Y	380	575		0.060	
M□FMA□□080	1		230	277	0.037	0.14	2.30
	3	Δ	220	332	0.034	0.10	
		Y	380	575		0.060	
M□FMA□□090	1		220	277	0.065	0.25	2.70
	3	Δ		332	0.077	0.33	
		Y	380	575		0.19	
M□FMA□□100	1		220	277	0.075	0.30	3.00
	3	Δ		332	0.087	0.31	
		Y	380	575		0.18	
M□FMA□□112	1		220	277	0.094	0.37	3.10
	3	Δ		332	0.10	0.31	
		Y	380	575		0.18	
M□FMA□□132	1		230	277	0.15	0.57	4.20
	3	Δ	220	332		0.44	
		Y	380	575		0.25	
M□FMA□□160		Δ	220	332	0.36	0.93	6.20
		Y	380	575		0.56	
M□FMA□□180		Δ	220	332		0.93	8.00
		Y	380	575		0.56	
M□FMA□□225		Δ	220	400	0.28	0.76	15.0
		Y	380	575	0.26	0.43	



Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

- The three-phase AC motors with resolver, incremental encoder or SinCos absolute value encoders cannot be used for speed-dependent safety functions in conjunction with the SM 301 safety module.

Resolver

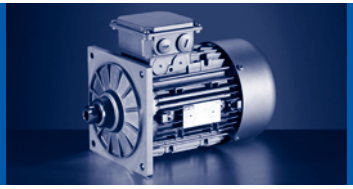
Stator-fed resolver with two stator windings offset by 90° and one rotor winding with transformer winding.

Product key				**RS1**
Accuracy			[']	-10 ... 10
Absolute positioning				1 revolution
Max. input voltage DC	$U_{in,max}$		[V]	10.0
Max. input frequency	$f_{in,max}$		[Hz]	4.00
Ratio Stator / rotor		± 5 %		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance At DC 500 V	**R**		[Ω]	10.0
Number of pole pairs				1

Incremental encoder and SinCos absolute value encoder

Encoder type			HTL incremental				TTL incremental			SinCos absolute value
Product key			**IG128-24V-H**	**IG512-24V-H**	**IG1024-24V-H**	**IG2048-24V-H**	**IG512-5V-T**	**IG1024-5V-T**	**IG2048-5V-T**	**AM1024-8V-H**
Encoder type										**Multi-turn**
Pulses			128	512	1024	2048	512	1024	2048	1024
Output signals			HTL				TTL			1 Vss
Interfaces			A, B track							Hiper-face
Absolute revolutions			0							4096
Accuracy		[']	-22.5 ... 22.5	-2 ... 2						-0.8 ... 0.8
Min. input voltage DC	$U_{in,min}$	[V]	8.00				4.75			7.00
Max. input voltage DC	$U_{in,max}$	[V]	26.0	30.0			5.25			12.0
Max. current consumption	I_{max}	[A]	0.040	0.15						0.080
Limit frequency	f_{max}	[kHz]	30.0	160			300			200

8



The thermal sensors are integrated in the windings. The use of an additional motor protection switch is recommended.

TKO thermal contacts

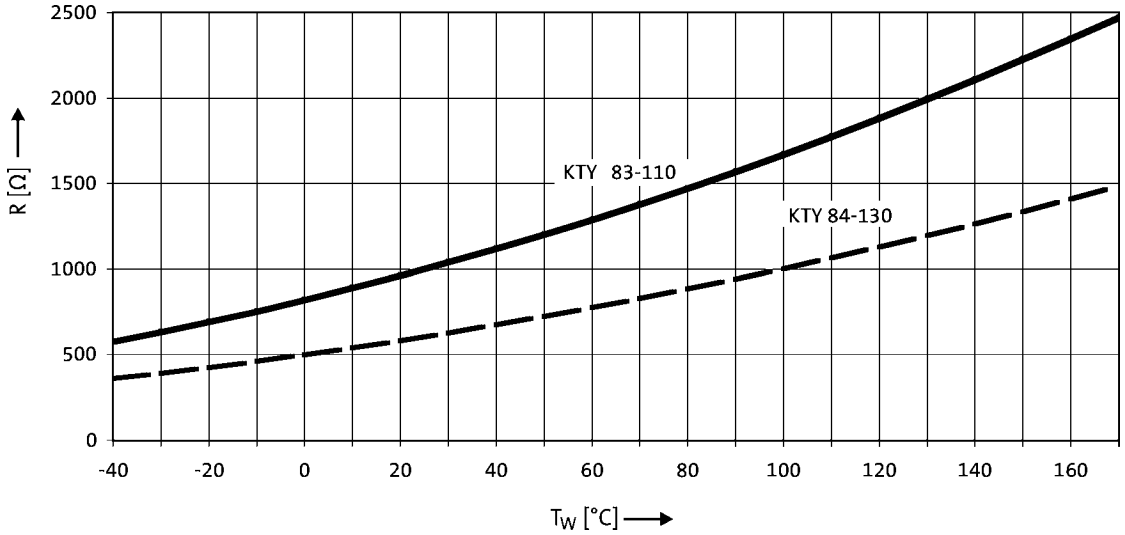
Function	Operating temperature	Min. reset temperature	Max. reset temperature	Max. input current	Max. input voltage
					AC
	T	**T_{min}**	**T_{max}**	**$I_{in,max}$**	**$U_{in,max}$**
	-5 ... 5				
	[°C]	[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

PTC thermistor

Function	Operating temperature	Rated resistance			Standard
		155 °C	**-20 °C**	**140 °C**	**240**
	T	**R_N**	**R_N**	**R_N**	
	-5 ... 5				
	[°C]	[Ω]	[Ω]	[Ω]	
Sudden change in resistance	150	550	30.0	250	DIN 44080 DIN VDE 0660 Part 303

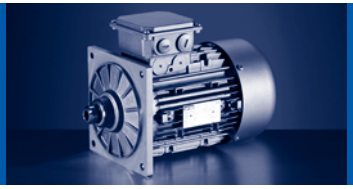
KTY continuous temperature sensor

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R_N	R_N	R_N	$I_{in,max}$	$I_{in,max}$
		[Ω]	[Ω]	[Ω]	[A]	[A]
KTY83-110	Continuous resistance change	1000	2225	2471	0.010	0.002
KTY84-130	Continuous resistance change	603	1334	1482	0.010	0.002



► If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.

8

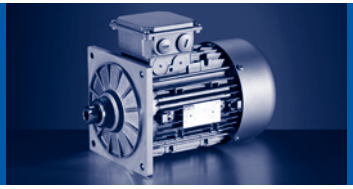


Design	Handwheel made from alloy, smooth wheel surface
Function	Manual operation: ► Emergency operation ► Setting-up operation for machines/systems
Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.

	Moment of inertia	Mass
	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	16.0	0.60
080	16.0	0.60
090	16.0	0.60
100	16.0	0.60
112	16.0	0.60
132	139	1.80

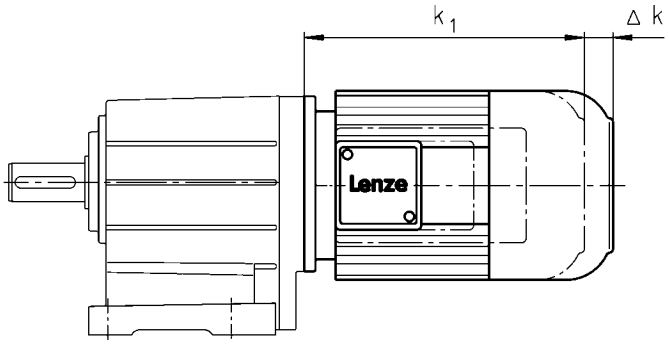
Design	Integral fan made from cast iron
Function	Increased motor centrifugal mass for smooth starting/braking
Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.

	Moment of inertia	Mass
	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	18.0	1.20
080	29.0	1.40
090-□1	83.0	2.80
090-□2	55.0	2.00
100	77.0	2.50
112	153	3.80
132	356	6.00



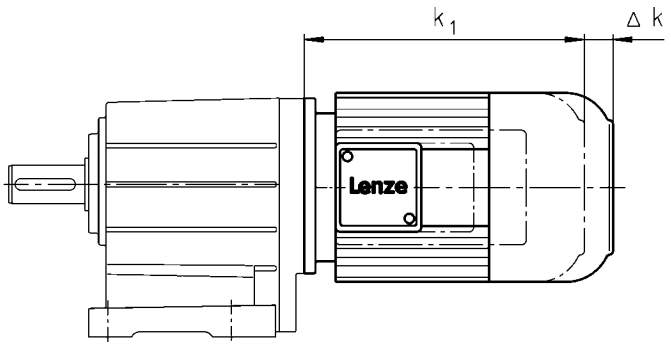
Motors with integral fan

4-pole and 6-pole motors

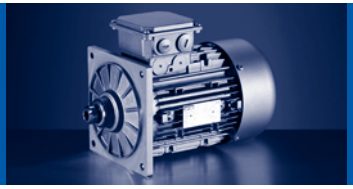


	M□□MA XX	M□□MA BR	M□□MA BS M□□MA BI M□□MA BA	M□□MA BL	M□□MA RS M□□MA IG M□□MA AG	M□□MA LL
	Δ k	Δ k	Δ k	Δ k	Δ k	Δ k
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-02 063-22	0	71	135		71	
063-12 063-32 063-42		40	103		56	
071-32 071-42 071-13 071-33		52	96	52	52	0
080-32 080-42 080-13 080-33		73	111	73	111	4
090-12 090-32		68	105	68	87	0
100-12 100-32		76	101	76	81	76
112-22 112-32		90	120	90	80	0
132-12 132-22 132-32		110	125	110	103	
160-22 160-32		105	191		83	
180-12 180-32		113	192		79	
180-42						
225-12 225-22			193		80	

2-pole motors

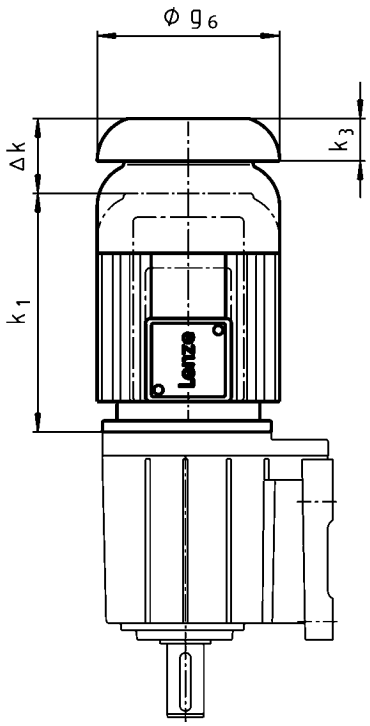


	M□□MA XX	M□□MA BR	M□□MA BL	M□□MA LL
	Δ k	Δ k	Δ k	Δ k
	[mm]	[mm]	[mm]	[mm]
063-11 **063-31**	0	40		
071-11 **071-31**		52	52	0
080-11 **080-31**		73	73	4
090-11 **090-31**		68	68	0
100-31 **100-41**		76	76	76
112-31 **112-41**		90	90	0
132-21		110	110	



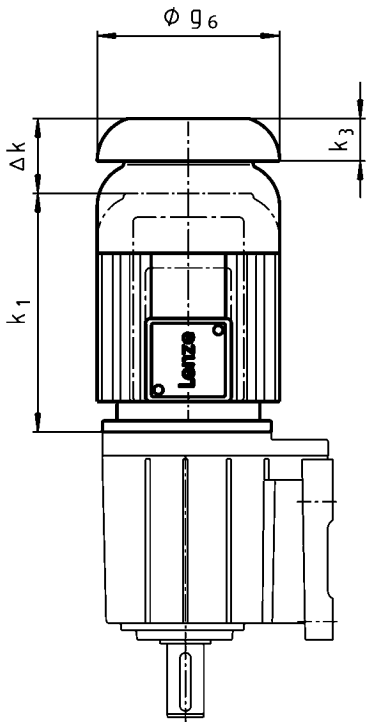
Motors with integral fan and protection cover

4-pole and 6-pole motors

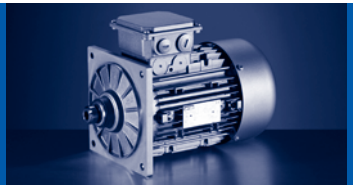


	M□□MA XX	M□□MA BR	M□□MA BS M□□MA BI M□□MA BA	M□□MA BL	M□□MA RS M□□MA IG M□□MA AG	M□□MA LL		
	Δ k	Δ k	Δ k	Δ k	Δ k	Δ k	g_6	k_3
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-02 063-22		97	160		97		123	11
063-12 063-32 063-42	26	66	129		82			
071-32 071-42 071-13 071-33		78	122	78	78	26	138	12
080-32 080-42 080-13 080-33		99	137	99	127	30	156	16
090-12 090-32		94	131	94	113	26	176	15
100-12 100-32	31	107	132	107	112	107	194	17
112-22 112-32		121	151	121	111	31	218	18
132-12 132-22 132-32		141	156	141	134		257	20
160-22 160-32	37	142	228		120		310	25

2-pole motors

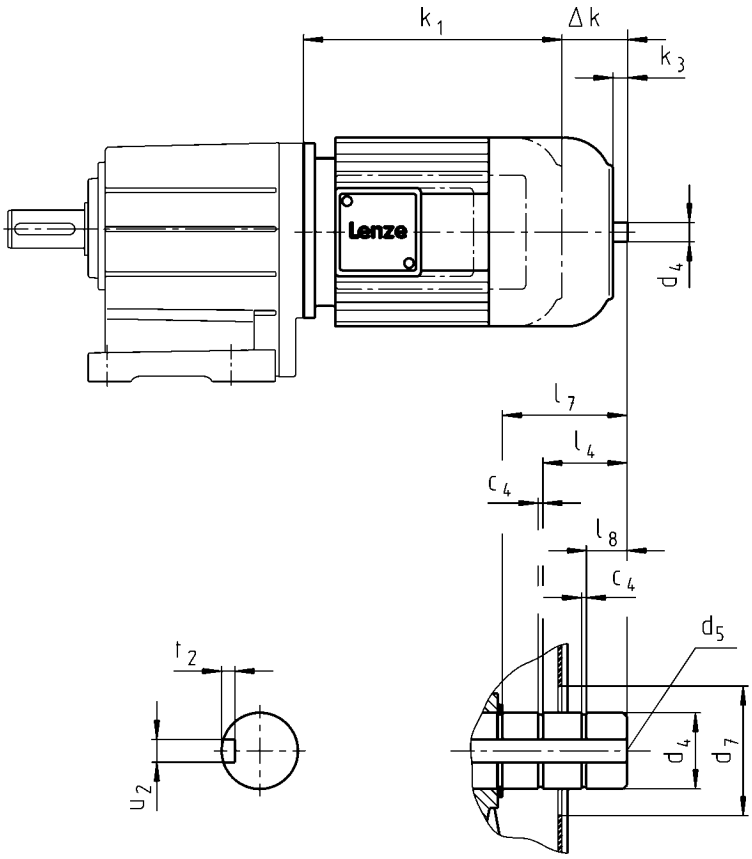


	M□□MA XX	M□□MA BR	M□□MA BL	M□□MA LL		
	Δ k	Δ k	Δ k	Δ k	g_6	k_3
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-11 063-31	26	66			123	11
071-11 071-31		78	78	26	138	12
080-11 080-31		99	99	30	156	16
090-11 090-31		94	94	26	176	15
100-31 100-41	31	107	107	107	194	17
112-31 112-41		121	121	31	218	18
132-21		141	141		257	20



Motors with integral fan and 2nd shaft end

4-pole and 6-pole motors

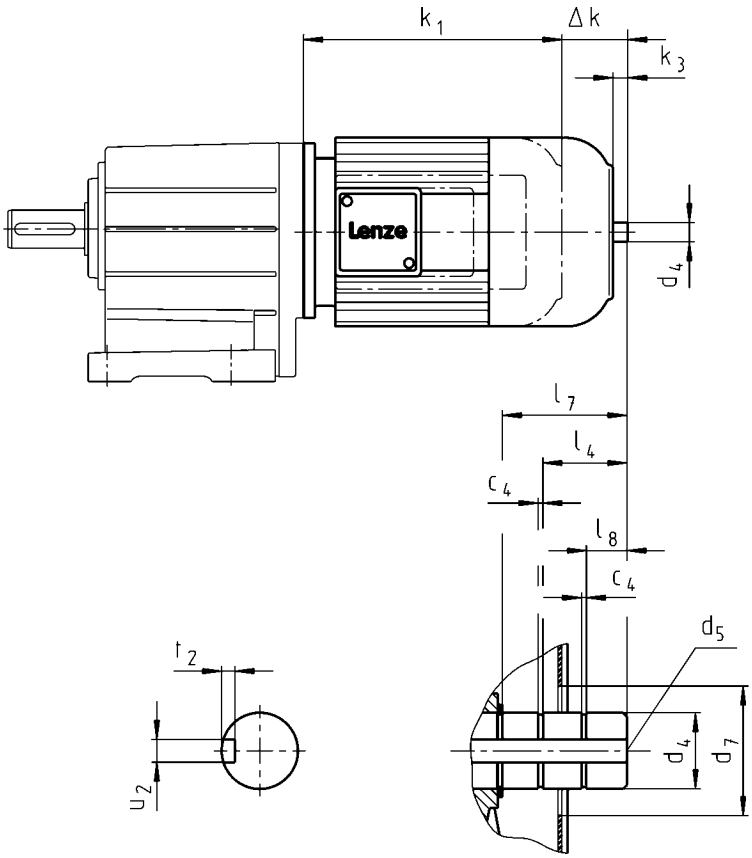


	M□□MA ZE M□□MA BZ M□□MA LZ											
	Δ k	k_3	c_4	d_4	d_4	d_5	d_7 [1]	l_4	l_7	l_8	u_2	t_2
				h6	j6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071-32 071-42 071-13 071-33	47	11	1.1	14		M5	34		19.0	3.0	5.0	3.0
080-32 080-42 080-13 080-33	68	9								4.5		
090-12 090-32	57									5.0		
100-12 100-32	71	19	1.3		20	M6		17	32.5	10.5	6.0	3.5
112-22 112-32	84	16							28.5	7.0		
132-12 132-22 132-32	101	25	1.6		30	M10	46	25	42.0	8.5	8.0	4.0

[1] During operation, appropriate measures must be taken to make fan cover opening safe.

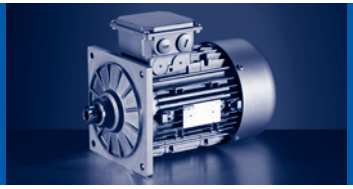
8

2-pole motors



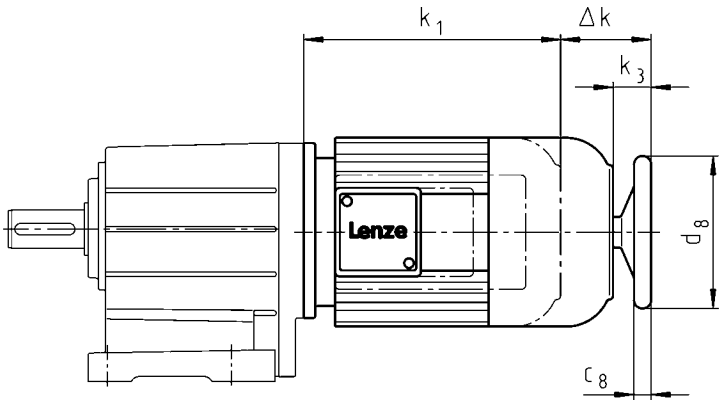
	M□□MA ZE M□□MA BZ M□□MA LZ											
	Δ k	k_3	c_4	d_4	d_4	d_5	d_7 [1]	l_4	l_7	l_8	u_2	t_2
				h6	j6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071-11 071-31	47	11	1.1	14		M5			19.0	3.0	5.0	3.0
080-11 080-31	68	9	1.3	19		M6	34			4.5	6.0	3.2
090-11 090-31	57				20				19.5	5.5		3.5
100-31 100-41	71	19			25	M10		17	32.5	10.5	8.0	4.0
112-31 112-41	84	16							28.5	7.0		
132-21	101	25	1.6		30		48	25	42.0	8.5		

[1] During operation, appropriate measures must be taken to make fan cover opening safe.



Motors with integral fan and handwheel

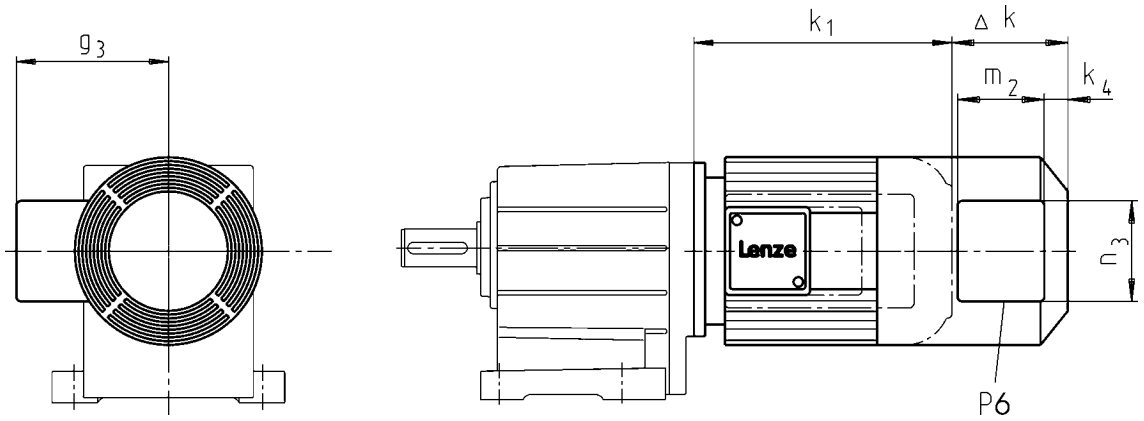
4-pole and 6-pole motors



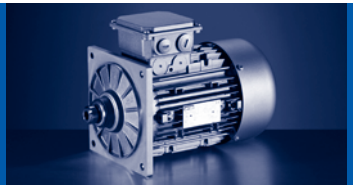
	M□□MA HA M□□MA BH M□□MA LH			
	Δ k	**k_3**	**c_8**	**d_8**
	[mm]	[mm]	[mm]	[mm]
071-32 071-42 071-13 071-33	70	34	18	160
080-32 080-42 080-13 080-33	91			
090-12 090-32	80	32		
100-12 100-32	94	42		
112-22 112-32	107	39		
132-12 132-22 132-32	126	50	26	250

Motors with blower

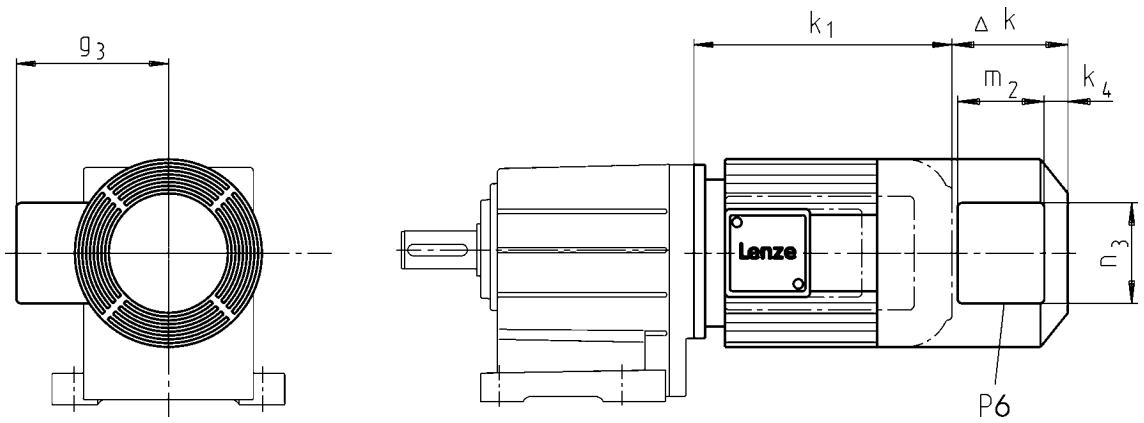
4-pole and 6-pole motors



	M□□MA XX	M□□MA BR	M□□MA BS M□□MA BI M□□MA BA	M□□MA RS M□□MA IG M□□MA AG					
	Δ k	Δ k	Δ k	Δ k	k_4	g_3	m_2	n_3	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-12 063-32 063-42	128	170	170	128	12	115	95	105	1x M16x1.5
071-32 071-42 071-13 071-33		165	165			122			
080-32 080-42 080-13 080-33		183	183		13	132	96	106	
090-12 090-32		181	181		22	141	95	105	
100-12 100-32	109	170	170	109		150			
112-22 112-32	102	183	183	183		162			
132-12 132-22 132-32	115	202	202	202	32	182			
160-22 160-32	149	179	237	224	31	209	96	106	
180-12 180-32		215	275	215					
180-42	155		260						
225-12 225-22	213	213	213	213					



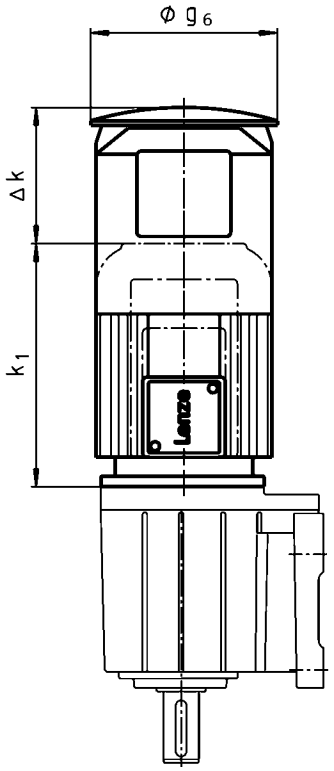
2-pole motors



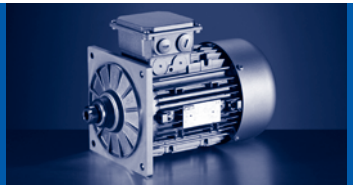
	M□□MA XX	M□□MA BR					
	Δ k	Δ k	k_4	g_3	m_2	n_3	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-11 **063-31**	128	170	12	115	95	105	1x M16x1.5
071-11 **071-31**		165		122			
080-11 **080-31**		183	13	132	96	106	
090-11 **090-31**		181	22	141	95	105	
100-31 **100-41**	109	170		150			
112-31 **112-41**	102	183		162			
132-21	115	202	32	182			

Motors with blower and protection cover

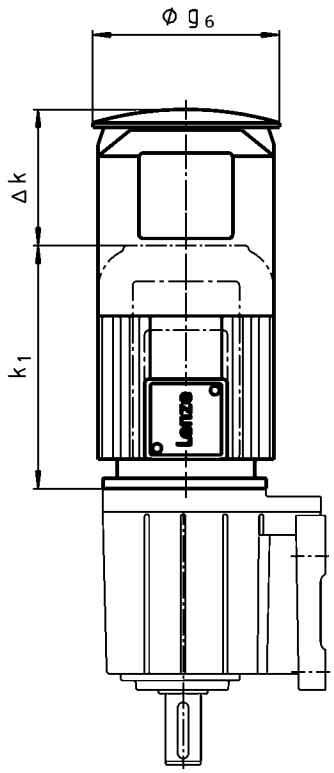
4-pole and 6-pole motors



	M□□MA XX	M□□MA BR M□□MA BS M□□MA BI	M□□MA RS M□□MA IG M□□MA AG	
	Δ k	Δ k	Δ k	g_6
	[mm]	[mm]	[mm]	[mm]
063-12 063-32 063-42	169	209	169	133
071-32 071-42 071-13 071-33	165	202	165	150
080-32 080-42 080-13 080-33	168	224	168	170
090-12 090-32	157	210	157	188
100-12 100-32	137	198	137	210
112-22 112-32	135	216	216	249
132-12 132-22 132-32	140	226	226	300
160-22 160-32	155	267	267	338



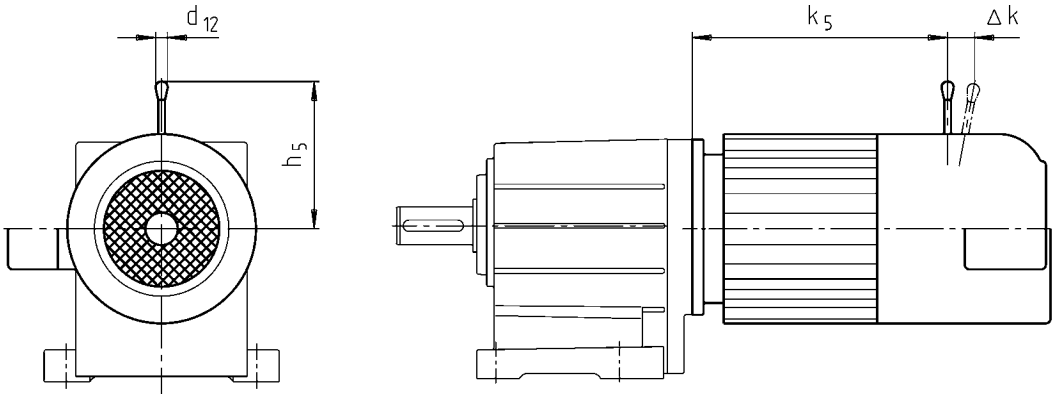
2-pole motors



	M□□MA XX	M□□MA BR	
	Δ k	Δ k	g_6
	[mm]	[mm]	[mm]
063-11 063-31	169	209	133
071-11 071-31	165	202	150
080-11 080-31	168	224	170
090-11 090-31	157	210	188
100-31 100-41	137	198	210
112-31 112-41	135	216	249
132-21	140	226	300

Motors with manual brake release lever

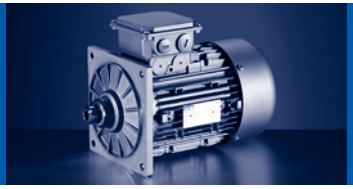
MD□MA (IE1)



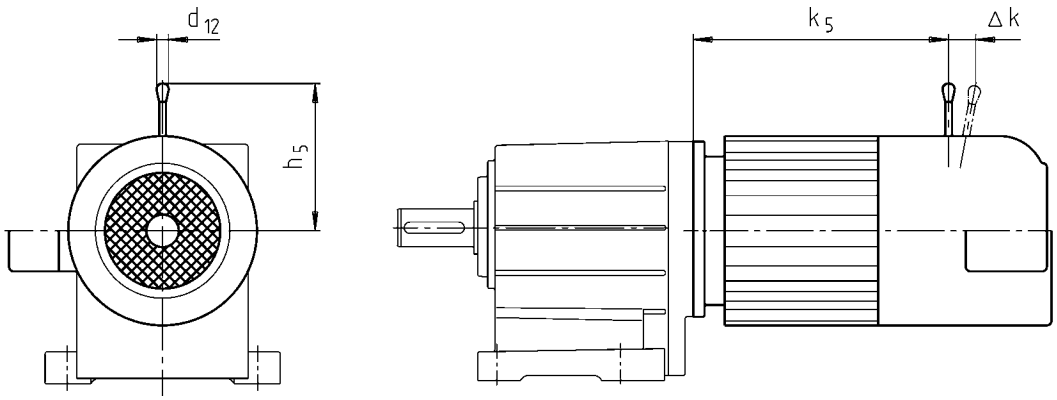
			Brake				
				k_5	Δ k	h_5	d_{12}
				[mm]	[mm]	[mm]	[mm]
	063-02 063-22		06	185	29	107	13.0
063-11 063-31	063-12 063-32 063-42		06	173	29	107	13.0
071-11 071-31	071-32 071-42	071-13 071-33	06 08	186 187	29 27	107 116	13.0 13.0
080-11 080-31	080-32 080-42	080-13 080-33	06 08	207 218	29 27	107 116	13.0 13.0
090-11 090-31	090-32		08 10	245 256	27 28	116 132	13.0 13.0
100-31 100-41	100-12 100-32		10 12	279 281	28 37	132 161	13.0 13.0
112-31	112-22		12 14	292 296	37 41	161 195	13.0 24.0
112-41	112-32		12 14	336 340	37 41	161 195	13.0 24.0
132-21	132-22 132-32		14 16	373 373	41 55	195 240	24.0 24.0
	160-22		16 18	420 423	55 59	240 279	24.0 24.0
	160-32		16 18	464 467	55 59	240 279	24.0 24.0
	180-12 180-32		18 20	539 546	59 74	279 319	24.0 24.0
	180-42		18 20	596 603	59 74	279 319	24.0 24.0
	225-12 225-22		25 25	785 785	103 103	445 445	24.0 24.0

The following combinations with the manual release lever and motor connection in the same position are not possible:

- HAN connector with connection in position 1
- motec inverter
- Terminal boxes for motor sizes 071, 080, 090 for brake and feedback (M□□MA BR/BS/BA/BI)



MH□MA (IE2)



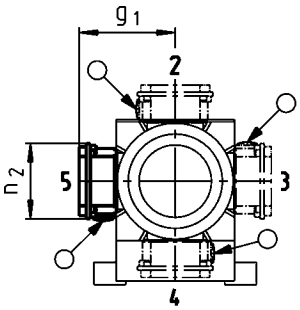
	Brake				
		k_5	Δ k	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
080-32	**06** **08**	207 218	29 27	107 116	13.0 13.0
090-12 **090-32**	**08** **10**	245 256	27 28	116 132	13.0 13.0
100-12	**10** **12**	279 281	28 37	132 161	13.0 13.0
100-32	**10** **12**	294 296	28 37	132 161	13.0 13.0
112-22	**12** **14**	292 296	37 41	161 195	13.0 24.0
132-12 **132-22**	**14** **16**	373 373	41 55	195 240	24.0 24.0
160-22	**16** **18**	420 423	55 59	240 279	24.0 24.0
160-32	**16** **18**	464 467	55 59	240 279	24.0 24.0
180-12 **180-32**	**18** **20**	539 546	59 74	279 319	24.0 24.0
180-42	**18** **20**	596 603	59 74	279 319	24.0 24.0
225-12 **225-22**	**25** **25**	785 785	103 103	445 445	24.0 24.0

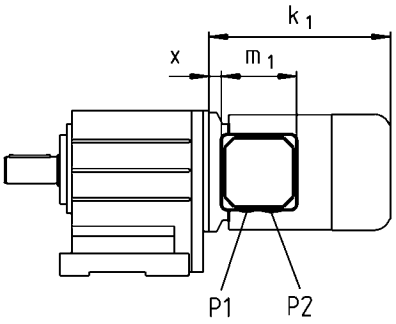
The following combinations with the manual release lever and motor connection in the same position are not possible:

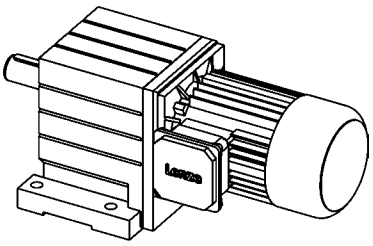
- HAN connector with connection in position 1
- motec inverter
- Terminal boxes for motor sizes 080, 090 for brake and feedback (M□□MA BR/BS/BA/BI)

Motor terminal box KK1

- For motors with motor terminal box KK1, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the cable entry will be positioned as circled on the diagram below.



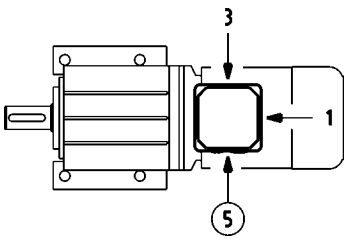
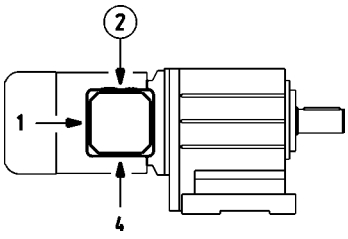
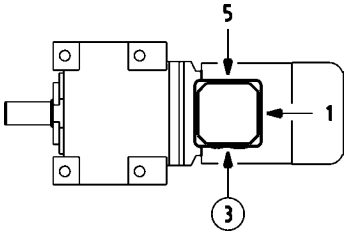
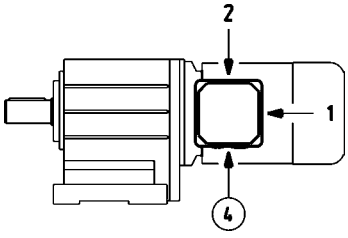


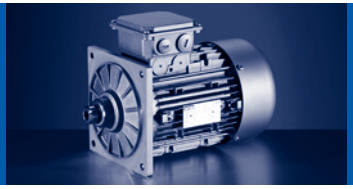


	x	g_1	m_1	n_2	P_1	P_2
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	21 8 [1]	100 114 [1]	75 101 [1]	75 101 [1]	M16x1.5 M20x1.5 [1]	M20x1.5 M20x1.5
071	24 11 [1]	109 123 [1]				
080	14	145	115	115	M20x1.5	M25x1.5
090	19	152				
100	20	161				
112	22	171				
132	33	195	122	122	M32x1.5	M32x1.5

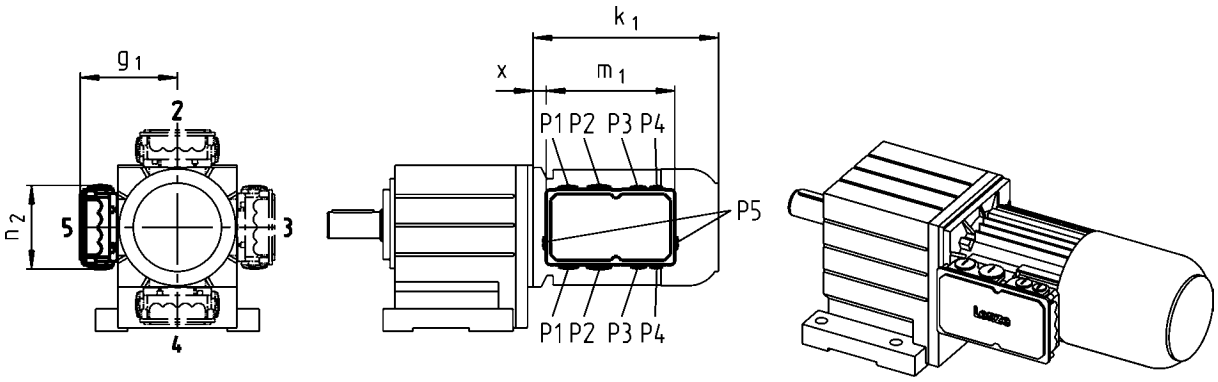
[1] UL/CSA approval: cURus

Position of cable entry

Motor terminal box in position 2	Motor terminal box in position 3
	
Motor terminal box in position 4	**Motor terminal box in position 5**
	

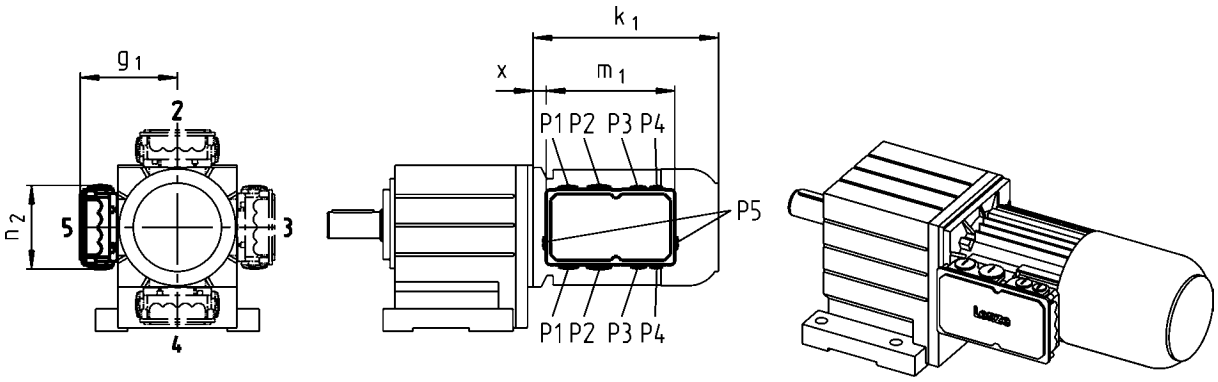


Motor terminal box KK2



	x	g_1	m_1	n_2	P_1	P_2
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	M16x1.5	M20x1.5
071	15	118				
080	17	132	152	121	M20x1.5	M25x1.5
090	22	137				
100	23	147				
112	25	158				

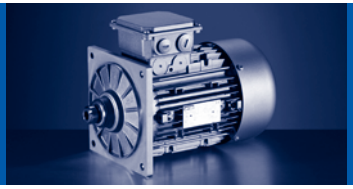
Motor terminal box KK3



	x	g_1	m_1	n_2	P_1	P_2	P_3	P_4	P_5
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	2	124	195	125	M25x1.5	M32x1.5	M20x1.5	M20x1.5	
071	5	133							
080	15	142							
090	20	147							
100	21	158							
112	23	168							
132	38	187							
160	35	210	226	127	M50x1.5	M16x1.5		M16x1.5	
180	73	230							
225	95	346	354	205		M63x1.5 [1]	M50x1.5 [1]		M16x1.5

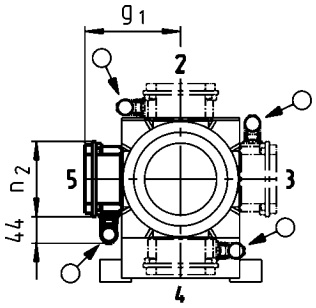
[1] Cable entry only possible at one position.
Terminal box position 2: cable entry at position 5.
Terminal box position 3: cable entry at position 2.
Terminal box position 4: cable entry at position 3.
Terminal box position 5: cable entry at position 4.

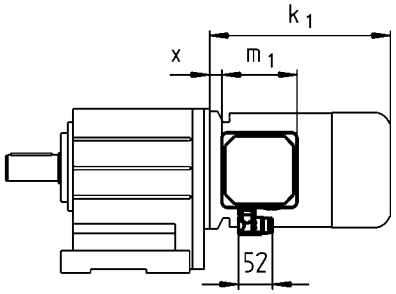
8

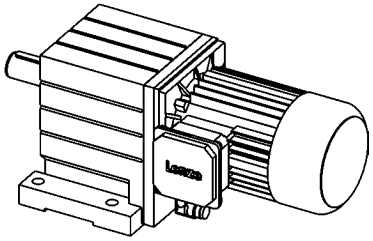


Motor terminal box KK1 with ICN connector

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.

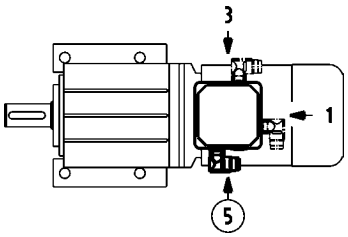
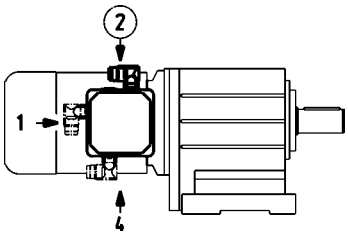
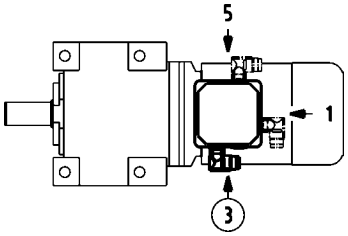
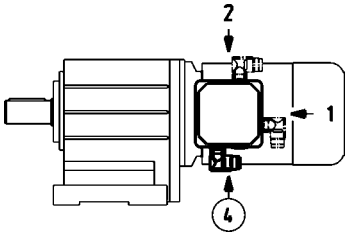






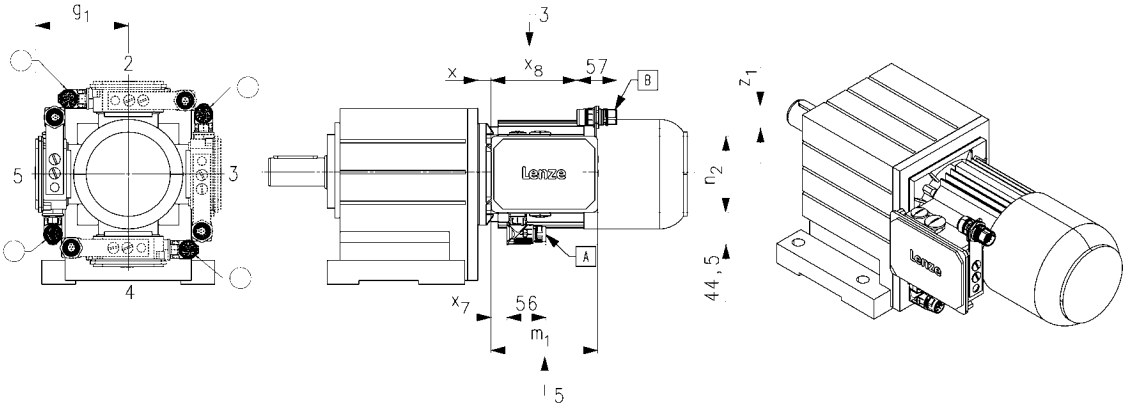
	x	g_1	m_1	n_2
	[mm]	[mm]	[mm]	[mm]
063	8	114	101	101
071	11	123		
080	14	145	115	115
090	19	152		
100	20	161		
112	22	171		
132	33	195	122	122

Position of connector

Motor terminal box with ICN connector in position 2	Motor terminal box with ICN connector in position 3
	
Motor terminal box with ICN connector in position 4	**Motor terminal box with ICN connector in position 5**
	

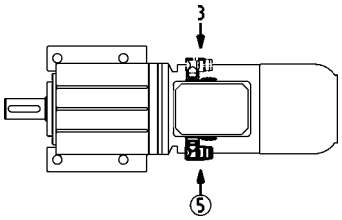
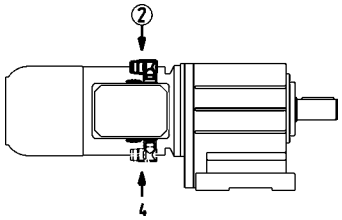
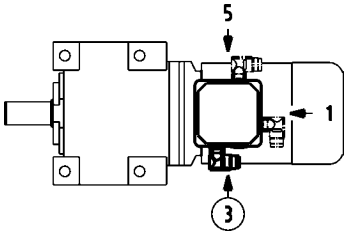
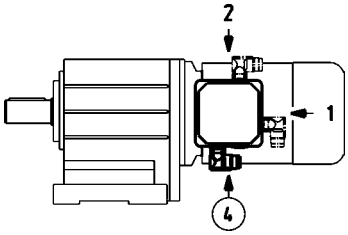
Motor terminal box KK2 / KK3 with ICN connector

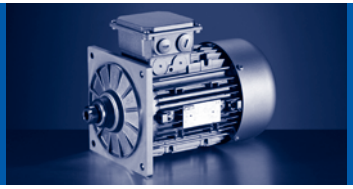
- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.



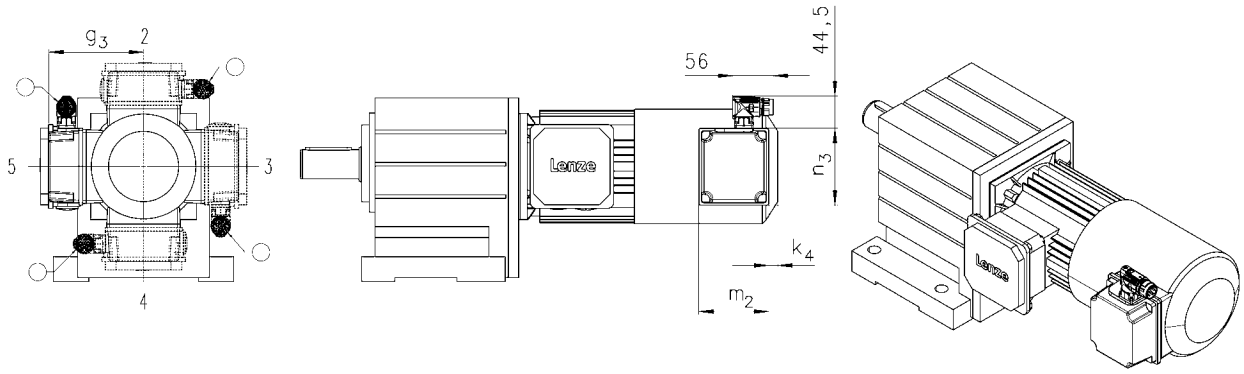
	x	g_1	m_1	n_2	x_7	x_8	$z_{1, max}$
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	16		
071	15	118					
080	17	132	152	121	23		
090	22	137					
100	23	147					
112	25	158					
132	38	187	195	125			

Position of connector

Motor terminal box with ICN connector in position 2	Motor terminal box with ICN connector in position 3
	
Motor terminal box with ICN connector in position 4	**Motor terminal box with ICN connector in position 5**
	



ICN connector for blower

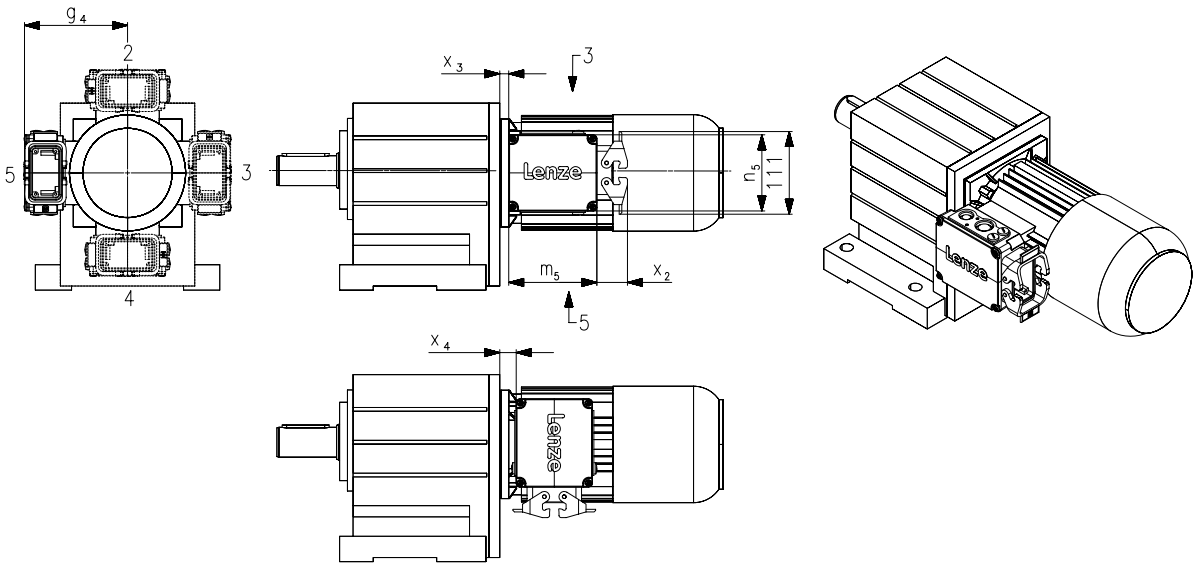


	k_4	g_3	m_2	n_3
	[mm]	[mm]	[mm]	[mm]
063	12	115	**95**	105
071		122		
080	13	132	**96**	106
090	22	141	**95**	105
100		150		
112		162		
132	32	182		
160	31	209	**96**	106
180				
225				

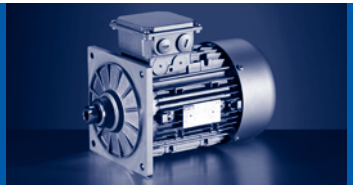
► In addition, the cover of the blower terminal box (including connectors) can be rotated progressively through 90° if necessary.

Motor terminal box with HAN-10E / HAN-Modular connector

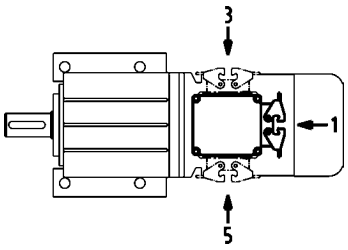
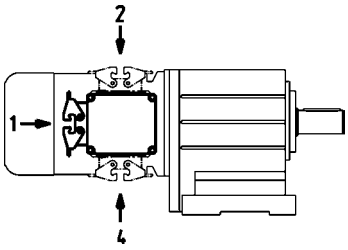
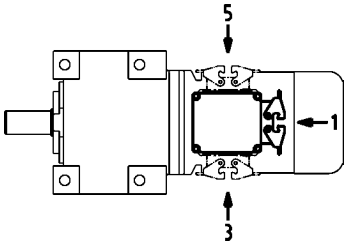
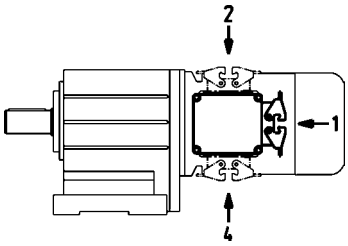
- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- Unless the connector position is specified, it will be supplied in position 1.



	g4	x3	x4
	[mm]	[mm]	[mm]
063	120	5.00	6.00
071	129	7.00	8.00
080	138	11.0	19.0
090	143	15.0	23.0
100	154	16.0	24.0
112	164	13.5	21.5
132	233	34.5	4.50
160	248	39.0	9.00

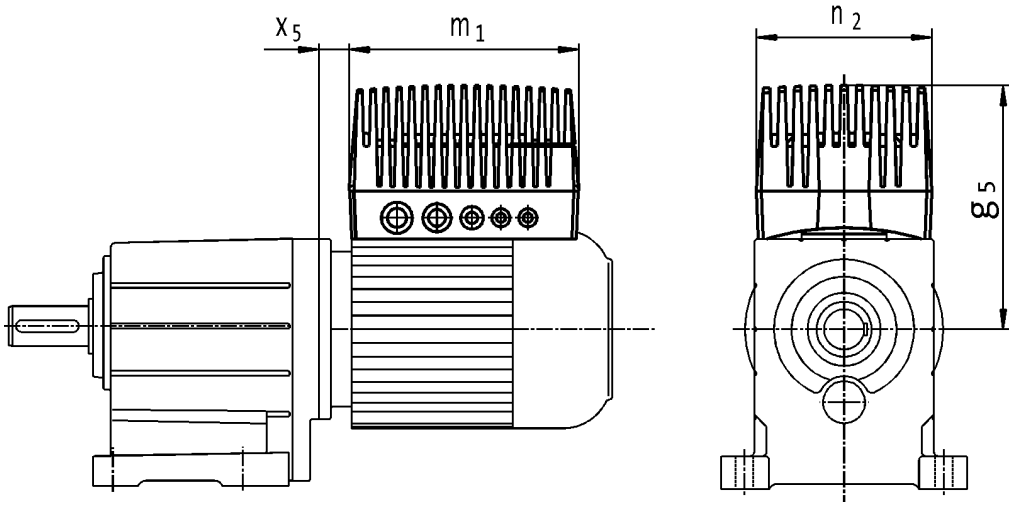


Position of connector

Motor terminal box with HAN connector in position 2	Motor terminal box with HAN connector in position 3
	
Motor terminal box with HAN connector in position 4	**Motor terminal box with HAN connector in position 5**
	

Decentralised frequency inverter 8200 motec

Rated frequency 50 Hz



Product key						
Motor		Inverter				
			g_5	x_5	m_1	n_2
			[mm]	[mm]	[mm]	[mm]
MD□□□□□063-12 MD□□□□□063-32 MD□□□□□063-42		E82MV251_2B	171	20	190	138
MD□□□□□071-32		E82MV371_2B	180	23		
MD□□□□□071-42		E82MV551_4B	228	10	202	156
MD□□□□□080-32	MH□□□□□080-32	E82MV751_4B	223	3		
MD□□□□□080-42		E82MV152_4B	239		230	176
MD□□□□□090-32	MH□□□□□090-12 MH□□□□□090-32		244	9		
MD□□□□□100-12	MH□□□□□100-12	E82MV222_4B	255	10		
MD□□□□□100-32	MH□□□□□100-32	E82MV302_4B	271	0	325	211
MD□□□□□112-22	MH□□□□□112-22	E82MV402_4B	281	2		
MD□□□□□112-32		E82MV552_4B				
	MH□□□□□132-12		300	11		
MD□□□□□132-22	MH□□□□□132-22	E82MV752_4B				

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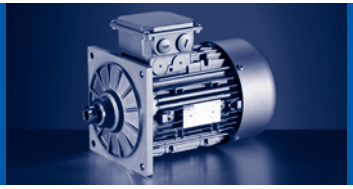
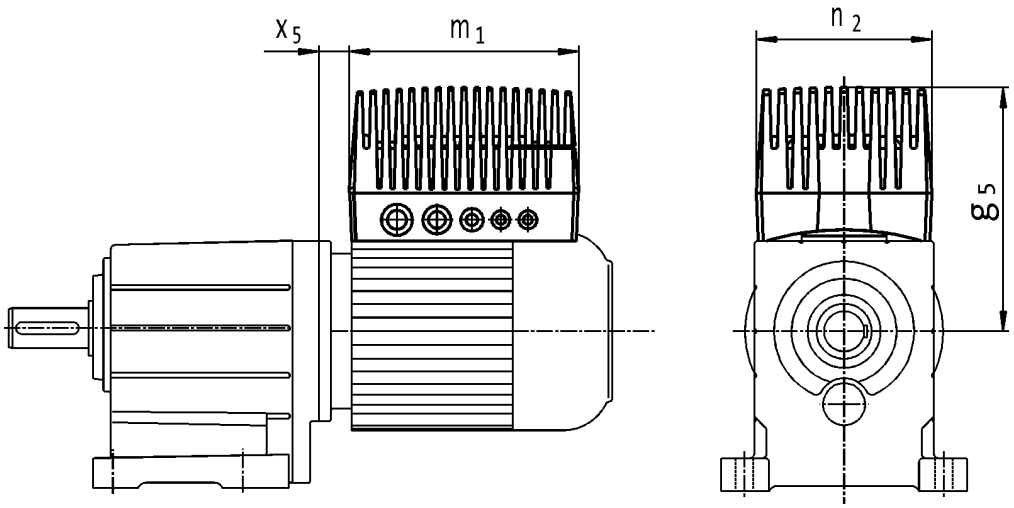


Rated frequency 87 Hz



Product key						
Motor		Inverter				
			g_5	x_5	m_1	n_2
			[mm]	[mm]	[mm]	[mm]
MD□□□□□063-12 MD□□□□□063-32 MD□□□□□063-42		E82MV551_4B	216	7	202	156
MD□□□□□071-32		E82MV751_4B	228	10		
MD□□□□□071-42		E82MV152_4B	244		230	176
MD□□□□□080-32	MH□□□□□080-32		239	3		
MD□□□□□080-42		E82MV222_4B				
	MH□□□□□090-12		244	9		
MD□□□□□090-32	MH□□□□□090-32	E82MV302_4B	260	-1	325	211
MD□□□□□100-12	MH□□□□□100-12	E82MV402_4B	271	0		
MD□□□□□100-32	MH□□□□□100-32	E82MV552_4B				
MD□□□□□112-22	MH□□□□□112-22	E82MV752_4B	281	2		

8

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