Designation	Symbol	Unit	Motor type MDD . . .				
			112 A-N-040	112 B-N-040	112 C-N-040	112 D-N-040	112 C-N-060
Nominal motor speed [1]	n	min^{-1}	4000	4000	4000	4000	6000
Continuous torque at standstill [2]	M_{dN}	Nm	10.5(13.0)[5]	17.5(29.0)[5]	28.0(44.0)[5]	38.0(44.2)[5]	28.0(32.9)[5]
Continuous current at standstill	I_{dN}	A	23.0(28.4)[5]	41.5(68.8)[5]	58.1(91.3)[5]	88.4(102.9)[5]	87.5(102.9)[5]
Theor. maximum torque [3]	M_{max}	Nm	31.3	65.5	100.1	132.2	77.0
Peak current	I_{max}	A	72.9	166.4	222.2	329.1	257.4
Rotor moment of inertia [4]	J_M	kgm^2	61 x 10^{-4}	120 x 10^{-4}	170 x 10^{-4}	230 x 10^{-4}	170 x 10^{-4}
Torque constant at 20 °C	K_m	Nm/A	0.46	0.42	0.48	0.43	0.32
Windings resistance at 20 °C	R_A	Ohm	0.38	0.11	0.08	0.05	0.04
Windings inductance	L_A	mH	4.0	1.5	0.9	0.7	0.5
Thermal time constant	T_{th}	min	100 (75)[5]	90 (60)[5]	100 (75)[5]	120 (90)[5]	100 (75)[5]
Mass [4]	m_M	kg	25	36	48	59	48

[1] Usable motor speed is determined by the torque requirements of the application. The usable speed n_{max} found in the selection lists of the motor-drive combinations are binding for **standard applications**. The usable speed for other applications can be found using the required torque in the torque-speed charcteristics curves

[2] With 60 K overtemperature at the motor housing.

[3] Achievable maximum torque is dependent upon the drive used. **Only** those maximum torques M_{max} found in the selection list of the motor-drive combinations are binding.

[4] Without blocking brake, without blower

[5] Parenthetical values apply to motors with surface cooling.

Fig 10.1: Type dependent motor data

Designation	Symbol	Unit	Data
Permissible ambient temperture	T_{um}	°C	0 ... + 45
Permissible storage and transport temperature	T_L	°C	-20 ... + 80
Maximum installation elevation		m	1000 meters above sea level
Protection category			IP 65
Insulation classification			F
Housing coat			Black prime coat (RAL 9005)

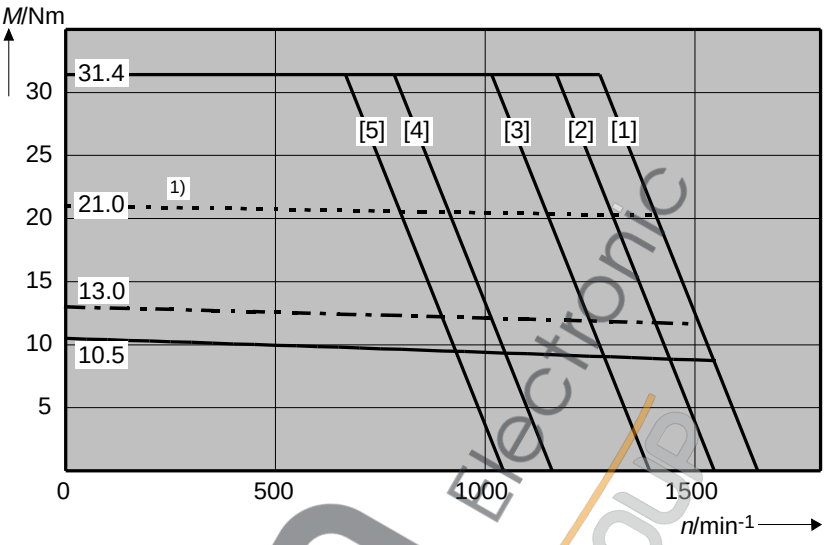
Fig 10.2: General data - MDD 112

Designation	Symbol	Unit	Data Blocking Brake		
Principle of action			electrically actuated release		
Blocking brake	M_H	Nm	144,060		
Nominal voltage	U_N	V	DC 24 ± 10%	DC 24 ± 10%	DC 24 ± 10%
Nominal current	I_N	A	0.75	1.35	1.35
Moment of inertia	J_B	kgm^2	3.6 x 10^{-4}	32 x 10^{-4}	32 x 10^{-4}
Release delay	t_L	ms	70	150	150
Clamping delay	t_K	ms	30	30	30
Mass	m_B	kg	1.1	3.5	3.5

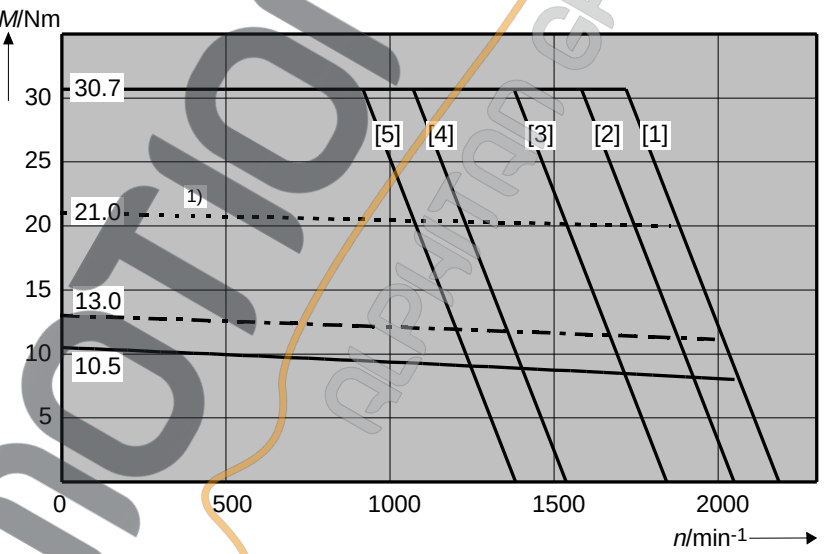
Fig 10.3: Technical data - blocking brake

10.2. Torque-Speed Characteristics

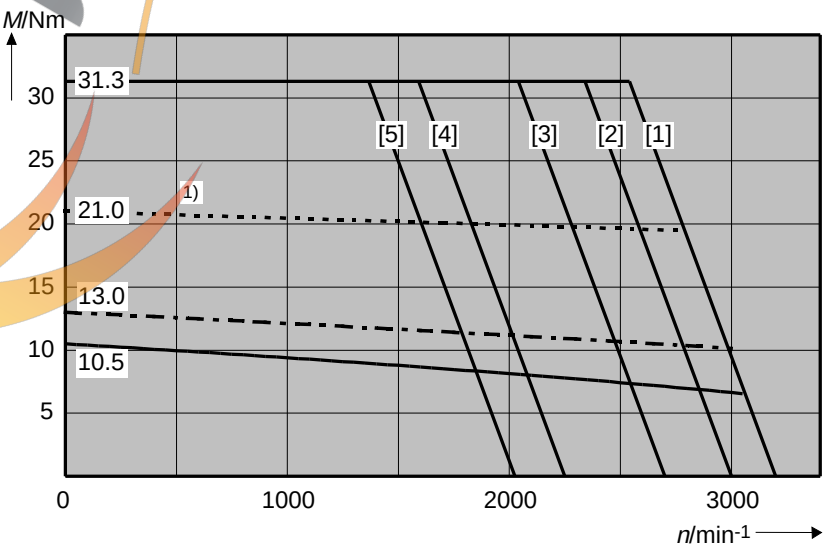
MDD 112 A-N at 1500 min^{-1}



MDD 112 A-N at 2000 min^{-1}



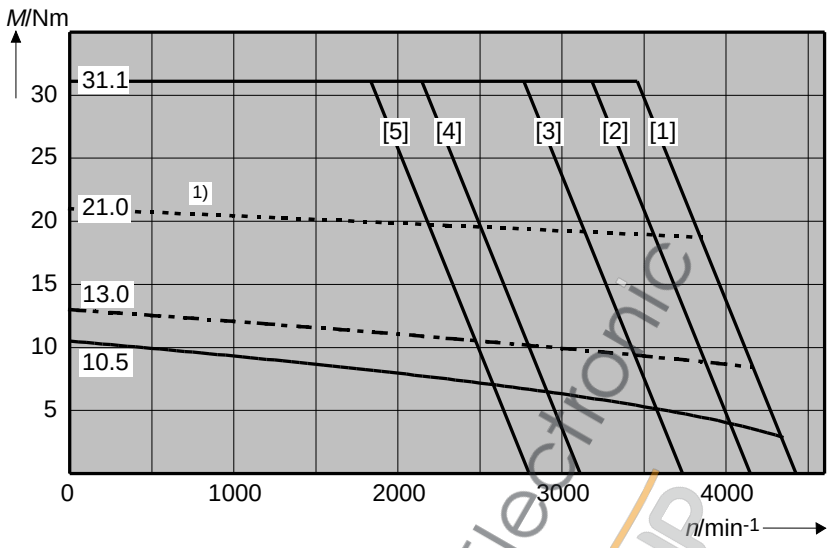
MDD 112 A-N at 3000 min^{-1}



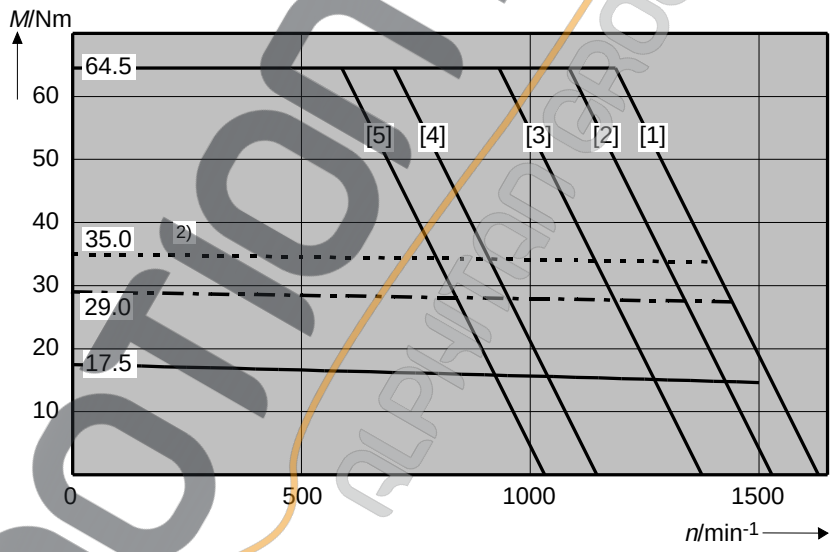
1) Shown: ON time of surface-cooled motor equals 38%.

Fig 10.4: Torque-speed characteristics curve MDD 112

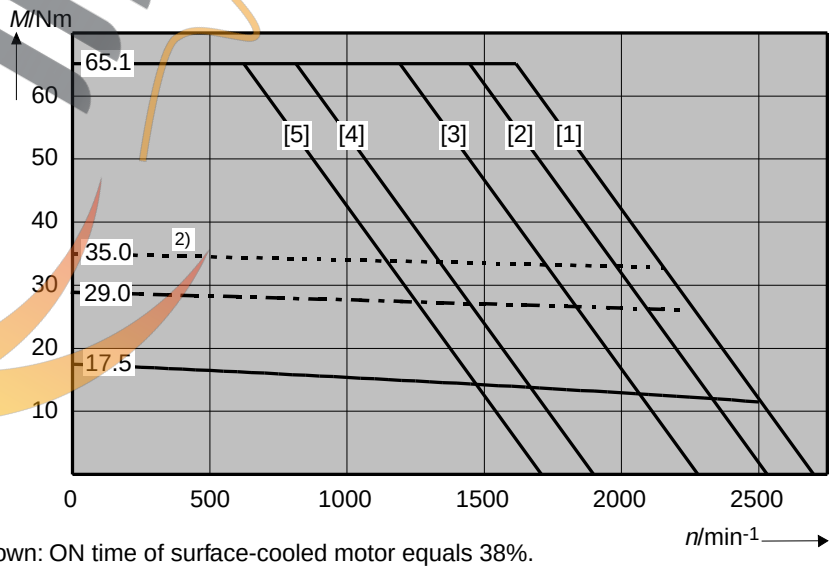
MDD 112 A-N at 4000 min^{-1}



MDD 112 B-N at 1500 min^{-1}



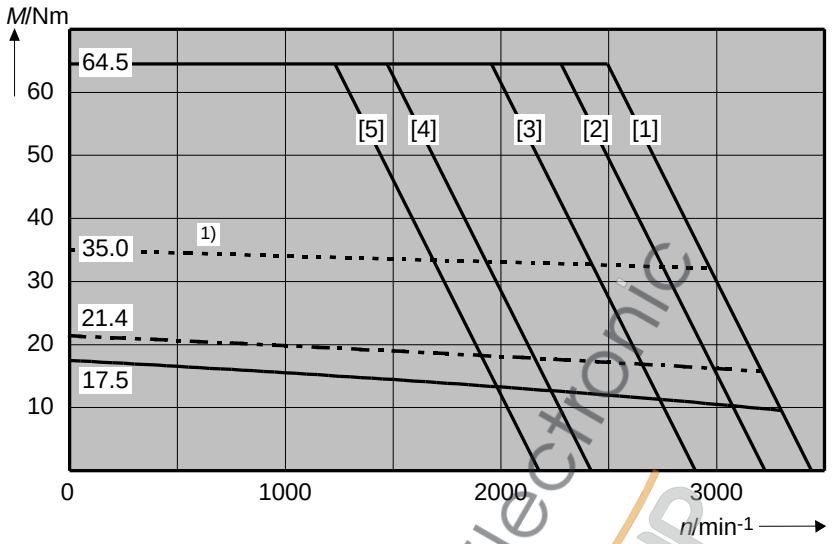
MDD 112 B-N at 2000 min^{-1}



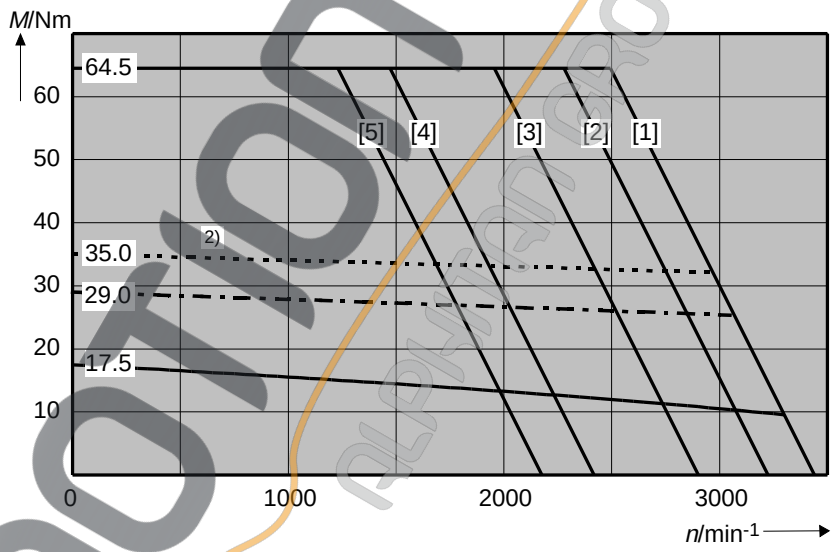
1) Shown: ON time of surface-cooled motor equals 38%.
2) Shown: ON time of surface-cooled motor equals 68%.

Fig 10.5: Torque-speed characteristics curve MDD 112

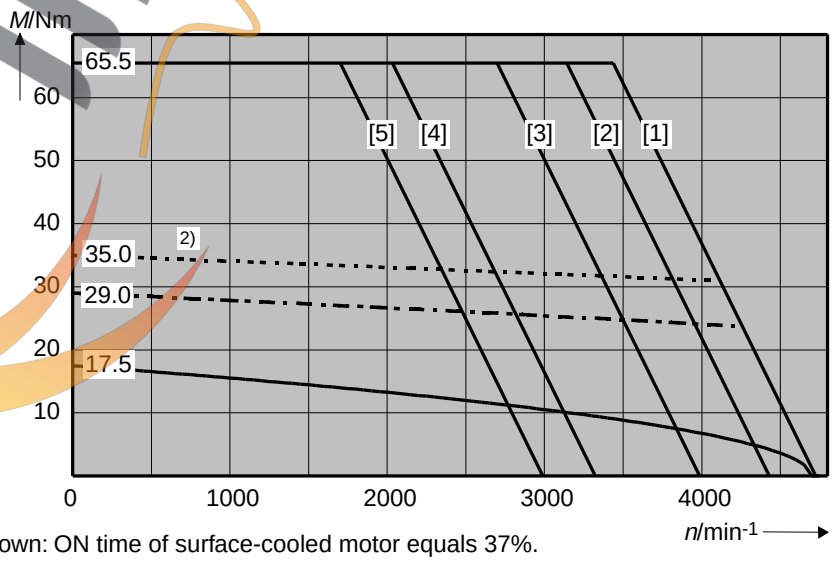
MDD 112 B-N at 3000 min^{-1}



MDD 112 B-L at 3000 min^{-1}



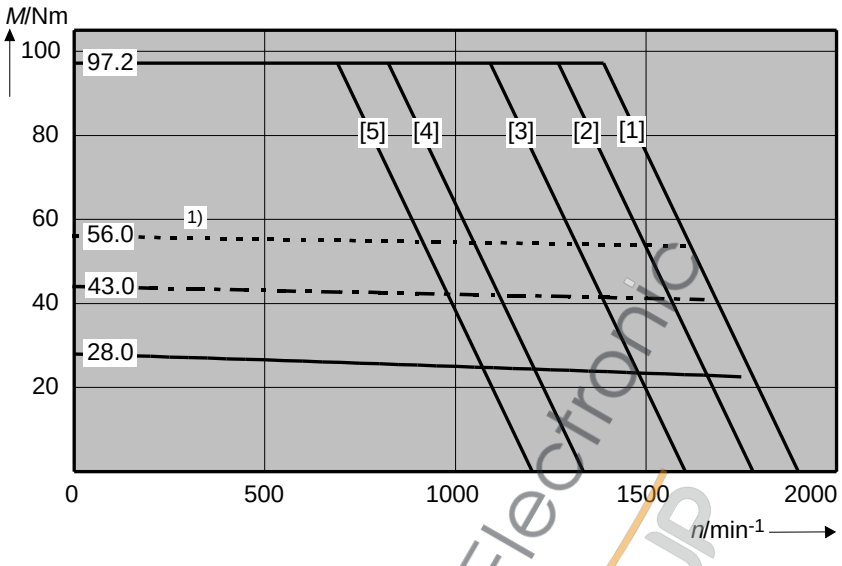
MDD 112 B-N at 4000 min^{-1}



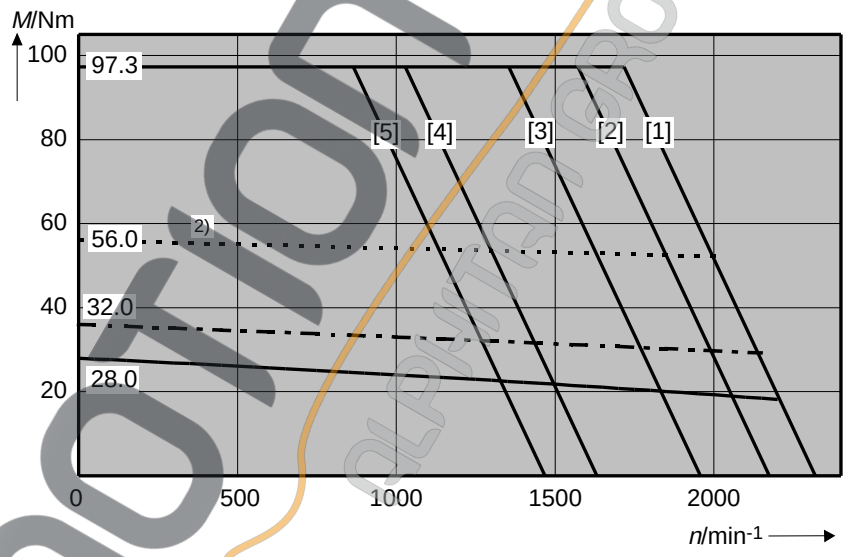
1) Shown: ON time of surface-cooled motor equals 37%.
2) Shown: ON time of surface-cooled motor equals 69%.

Fig 10.6: Torque-speed characteristics curve MDD 112

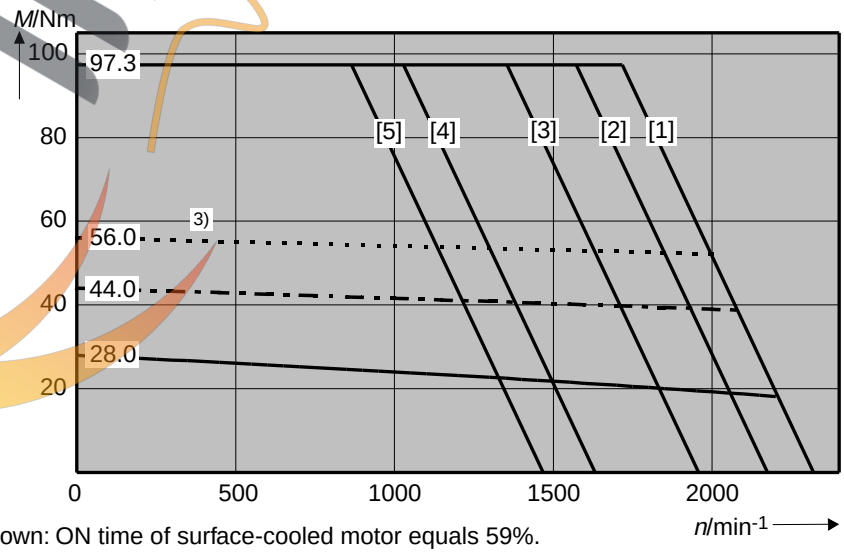
MDD 112 C-N at 1500 min-1



MDD 112 C-N at 2000 min-1



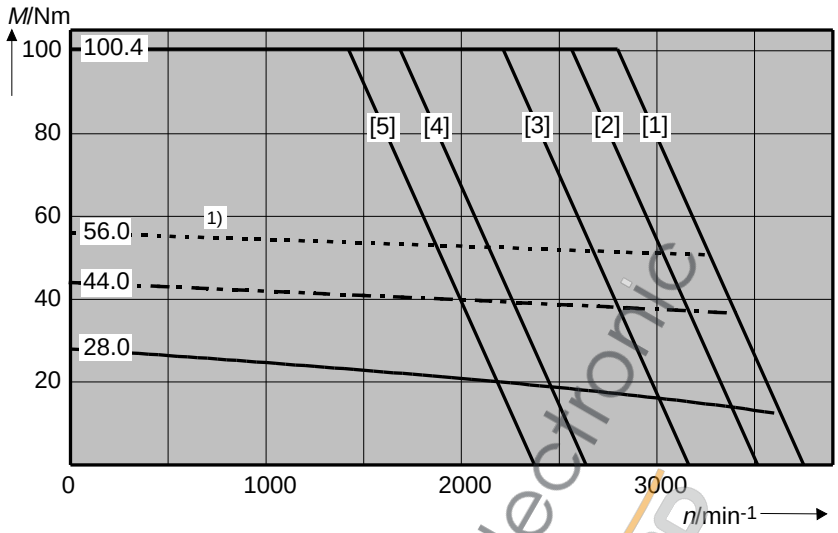
MDD 112 C-L at 2000 min-1



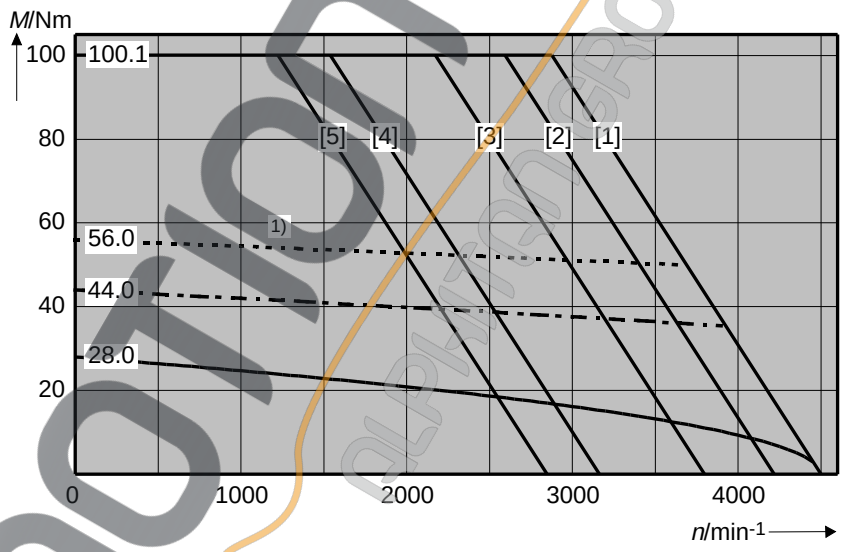
1) Shown: ON time of surface-cooled motor equals 59%.
2) Shown: ON time of surface-cooled motor equals 33%.
3) Shown: ON time of surface-cooled motor equals 62%.

Fig 10.7: Torque-speed characteristics curve MDD 112

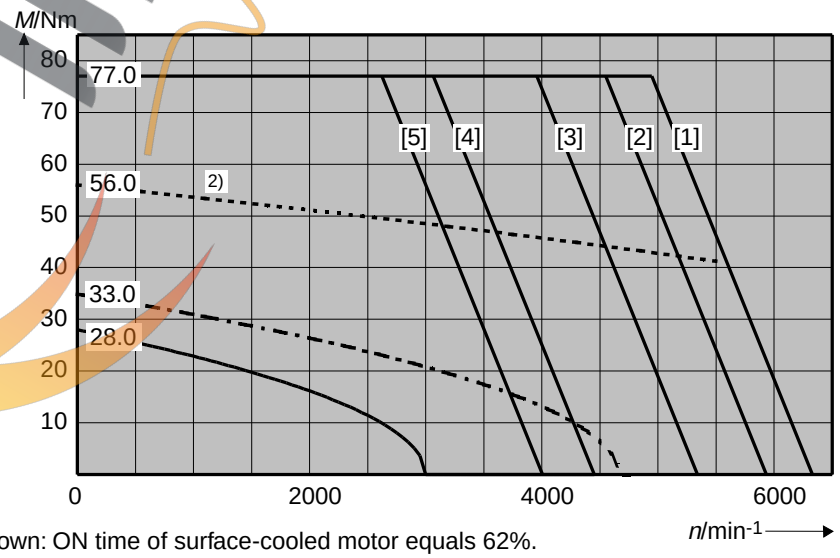
MDD 112 C-N at 3000 min^{-1}



MDD 112 C-N at 4000 min^{-1}



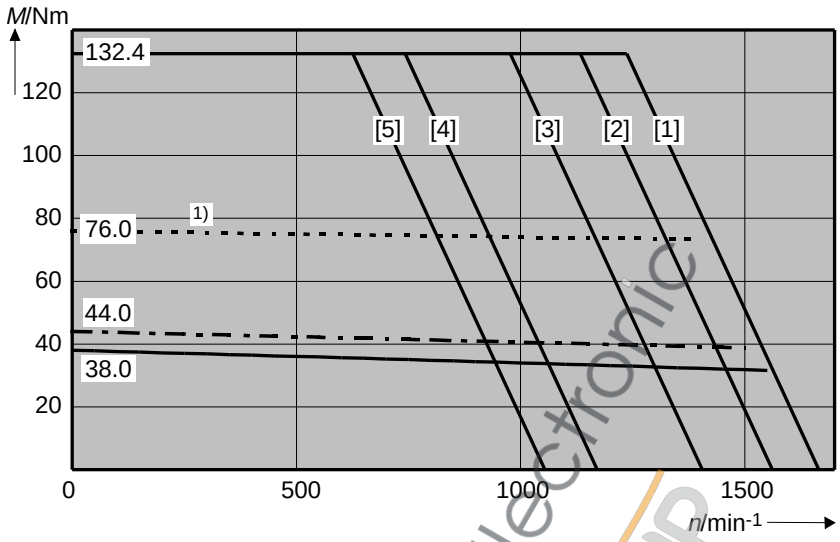
MDD 112 C-N at 6000 min^{-1}



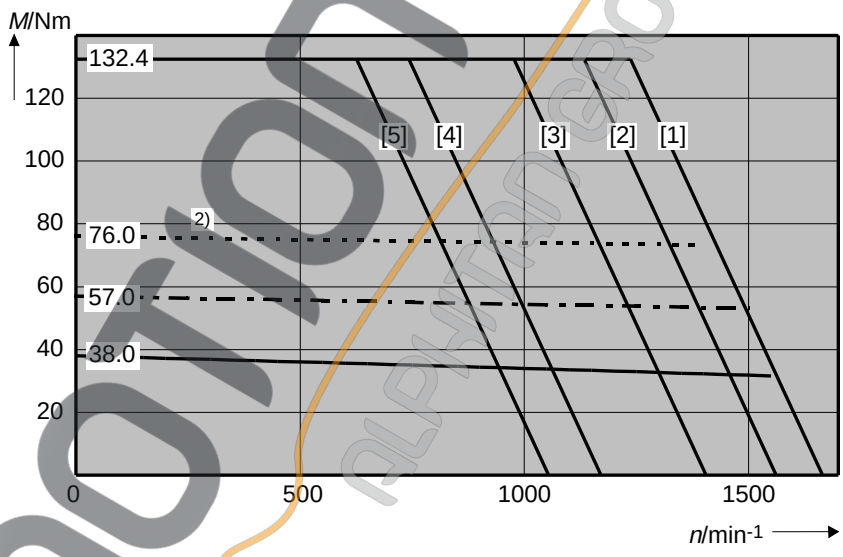
1) Shown: ON time of surface-cooled motor equals 62%.
2) Shown: ON time of surface-cooled motor equals 35%.

Fig 10.8: Torque-speed characteristics curve MDD 112

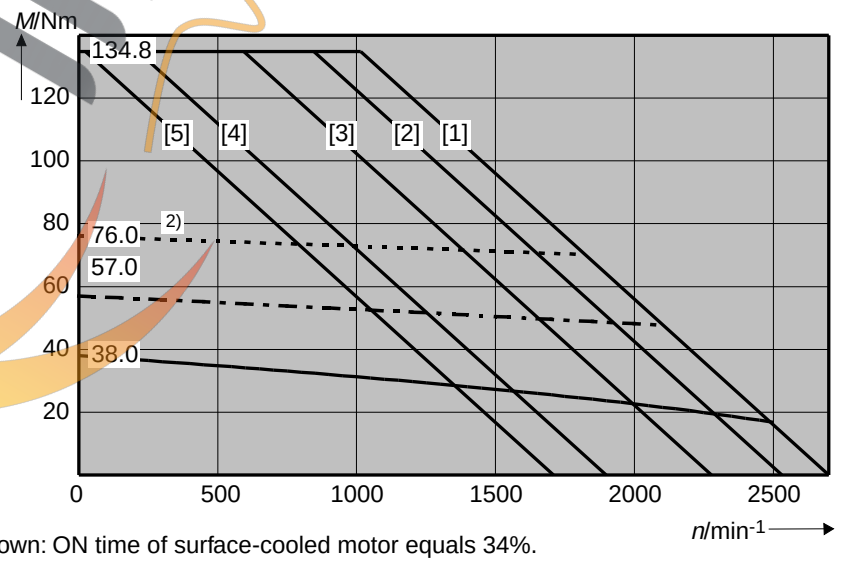
MDD 112 D-N at 1500 min^{-1}



MDD 112 D-L at 1500 min^{-1}



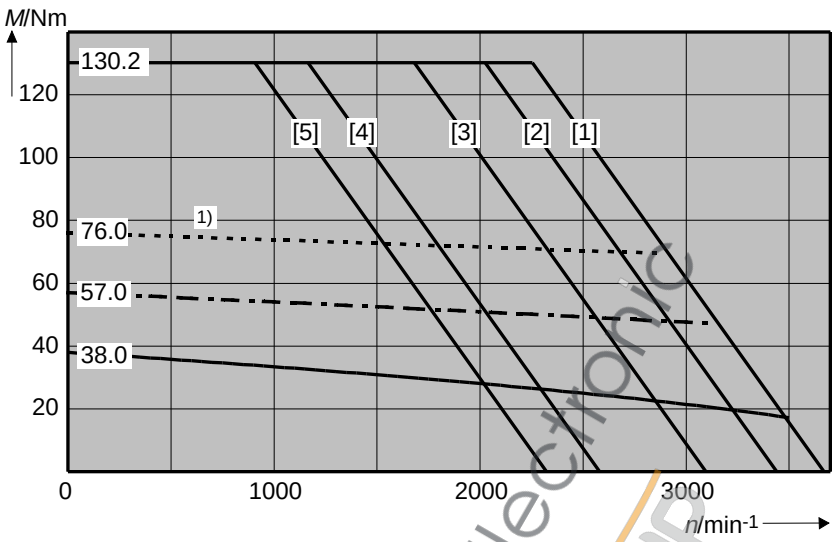
MDD 112 D-N at 2000 min^{-1}



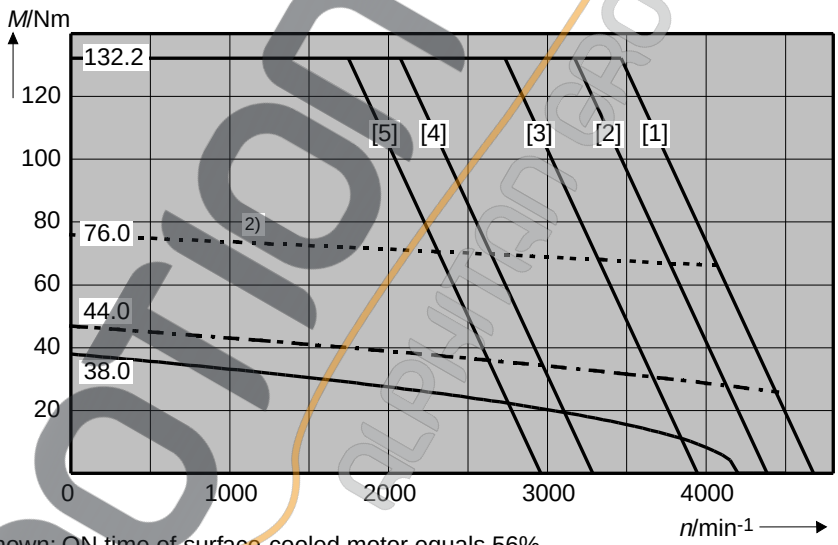
1) Shown: ON time of surface-cooled motor equals 34%.
2) Shown: ON time of surface-cooled motor equals 56%.

Fig 10.9: Torque-speed characteristics curve MDD 112

MDD 112 D-N at 3000 min^{-1}



MDD 112 D-N at 4000 min^{-1}



1) Shown: ON time of surface-cooled motor equals 56%.
2) Shown: ON time of surface-cooled motor equals 34%.

Fig 10.10: Torque-speed characteristics curve MDD 112

10.3. Shaft Load Capacity

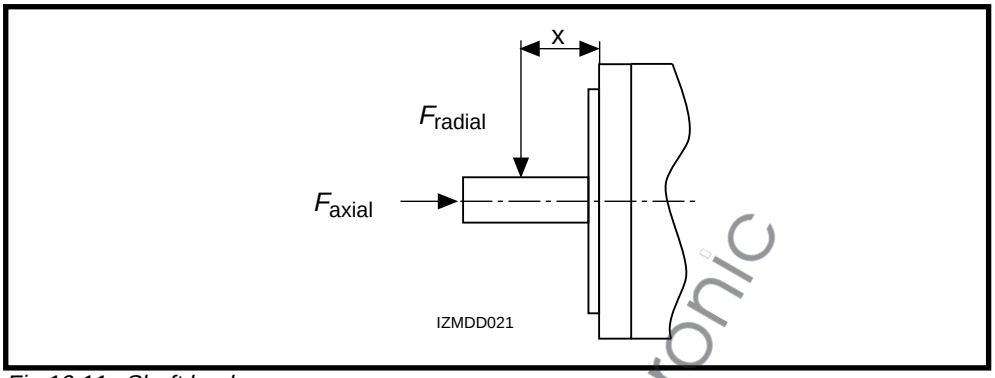


Fig 10.11: Shaft load

Permissible radial force
F_{radial}

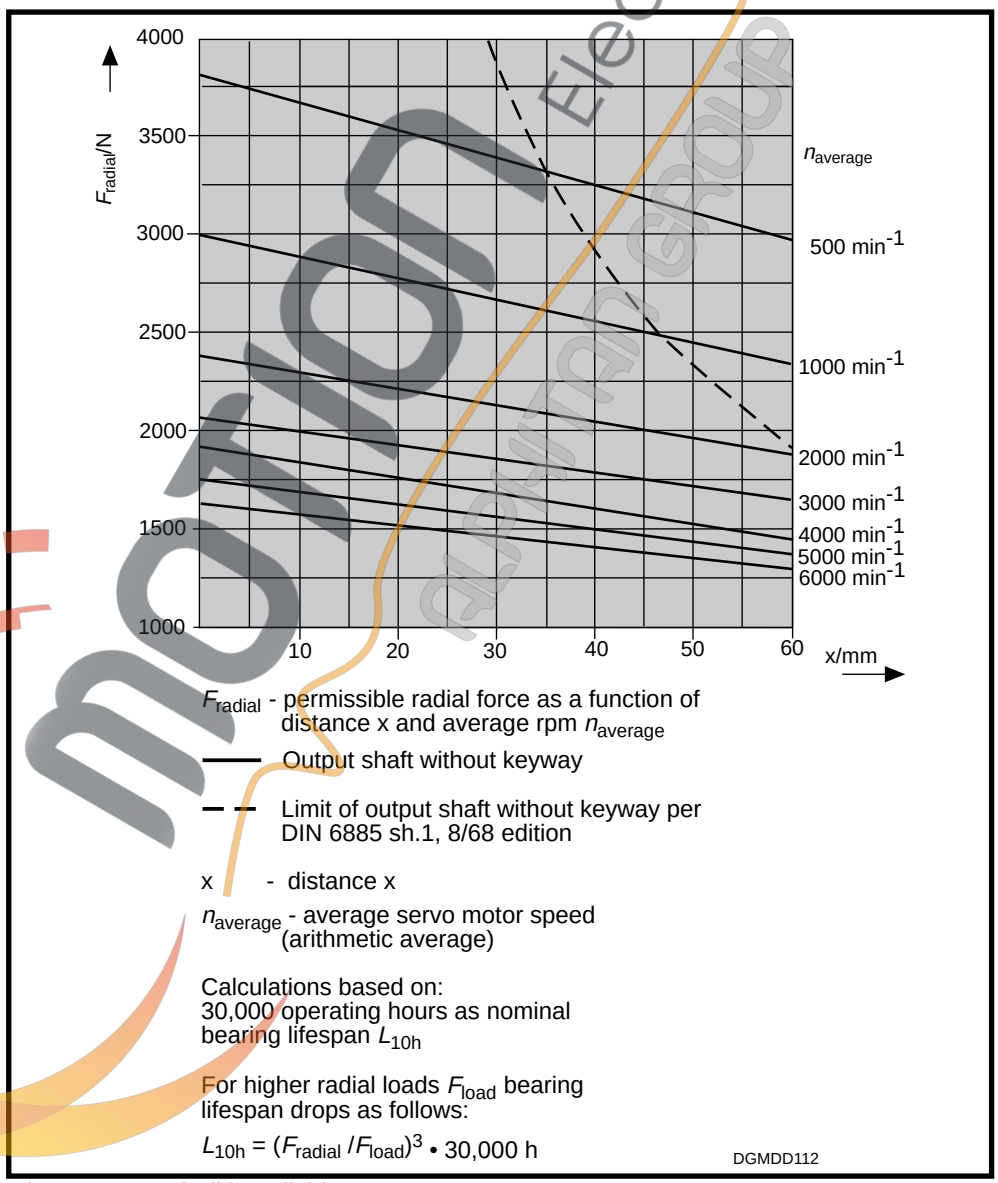


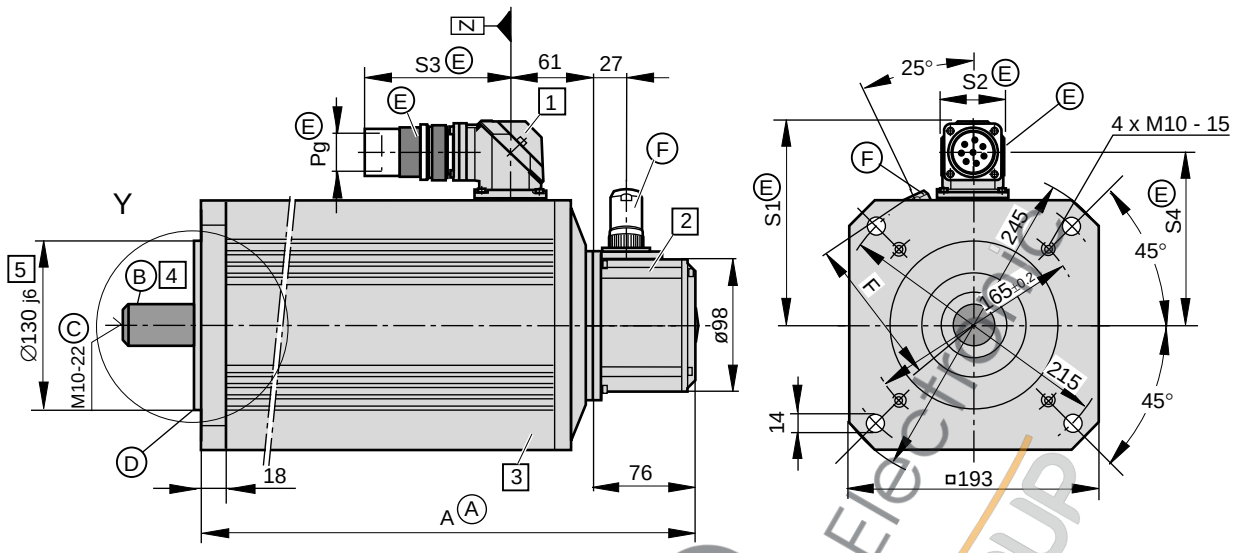
Fig 10.12: Permissible radial force

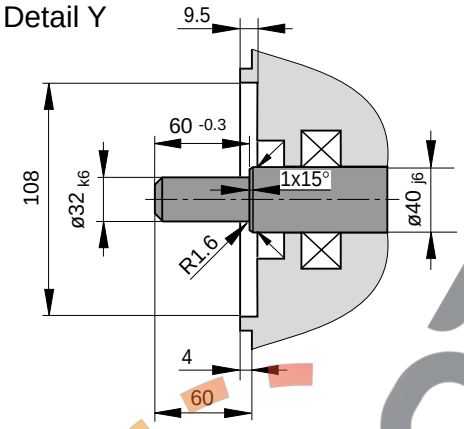
Permissible axial force
F_{axial}

$$F_{axial} = 0.35 \cdot F_{radial}$$

F_{axial} - permissible axial force
F_{radial} - permissible radial force

10.4. Dimensional Data





Ⓒ
- Shaft end per DIN 748 section 3, 7/75 edition, IEC 72, 1971 edition, cylindrical
- Center hole DS M3-8 per DIN 332 section 2, 5/83 edition
- Max. tightening torque M_A for screws in the threads of the center hole: 10 Nm

Ⓓ Flange type per DIN 42948, 11/65 edition, makes mounting possible
- as per design B5 (throughholes in flange)
- as per design B14 (threads in flange)

Ⓔ **Motor power connector**
Depends on motor, must be ordered separately.

Table of dimensions

type \ dim.	S1	S2	S3	S4	Pg
INS 108 3)	151	45	110	133	21
INS 172 2)	163	53	145	138	36

2) withMDD 112 B-N-040, MDD 112 C-N-030, MDD 112 C-N-040, MDD 112 C-N-060, MDD 112 D-N-020, MDD 112 D-N-030, MDD 112 D-N-040, MDD 112 B-L-030, MDD 112 C-L-020, MDD 112 D-L-015

3) other MDD 112

Ⓐ **Dimensional table Dim. A**

Size	Dim. A 1)
MDD 112 A	312
MDD 112 B	387
MDD 112 C	462
MDD 112 D	537

1) Bigger with some options. The then valid dimensions is indicated with the respective feature.

Ⓑ Concentricity, excentricity and coaxiality to the shaft per DIN 42955, tolerance class R, 12/81 edition.

Ⓕ **Feedback connector**
Must be ordered separately.

Table of dimensions

Name	Connector type	Dim. F
straight conn.	INS 513 INS 512	110 112
angle conn. 4)	INS 511 INS 510	108

4) Do not use with axially surface-cooled motor.

MBMDD112_1

Fig 10.13: Dimensional data MDD 112

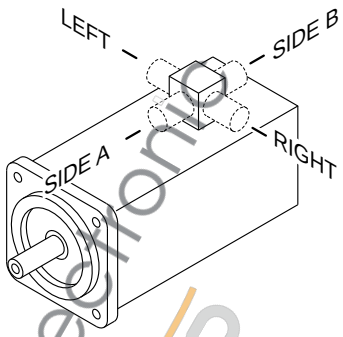
Available Options

1 **Power connection**

The output direction of the electrical power connector is selected at the time the order is placed. Possible output direction is either:

- side A or
- side B
- to the right
- to the left

The drawing depicts side A as output direction. The dimensions of any other output direction are obtained by virtually turning the connector housing around the Z axis.



2 **Motor feedback**

- Digital servo feedback (DSF)
- Digital servo feedback (DSF) with integrated multiturn absolute encoder

The dimensions are identical.

3 **Blocking brake**

- without blocking brake
- with blocking brake: 14 Nm

} The dimensions are identical.

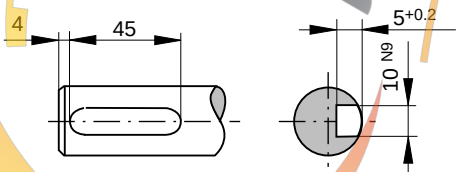
- with blocking brake: 40 Nm (not available with MDD 112 A)
- with blocking brake: 60 Nm (not available with MDD 112)

Dimensional table for motor with holding brake of 40 Nm and 60 Nm

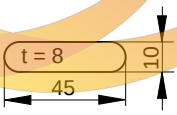
Size	Dim. A
MDD 112 B	437
MDD 112 C	512
MDD 112 D	587

4 **Output shaft**

- plain shaft (preferred type)
- with keyway per DIN 6885 sheet 1, 8/68 edition (Note: balanced with entire key!)



Matching key: DIN 6885-A 10 x 8 x 45



5 **Special centering diameter**

- ø180 j6

MBMDD112_2

Fig 10.14: Dimensional data MDD 112 - available options

10.5. Available Versions

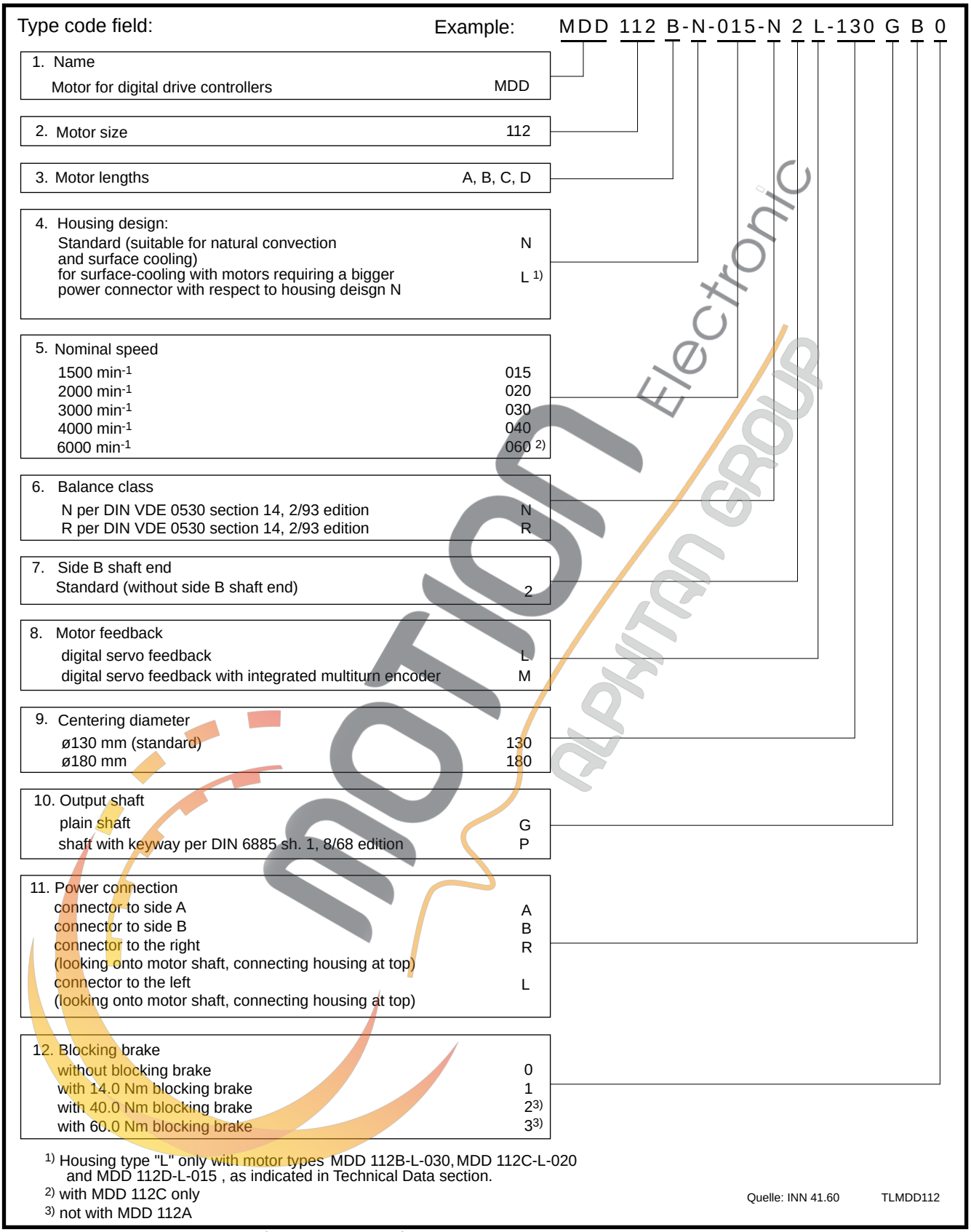


Fig 10.15: Type codes - MDD 112