

## 9. MDD 093

### 9.1. Technical Data

Designation	Symbol	Unit	Motor type MDD ...				
			093 A-N-020	093 B-N-020	093 C-N-020	093 D-N-020	093 D-N-015
Nominal motor speed <sup>1)</sup>	$n$	min <sup>-1</sup>	2000	2000	2000	2000	1500
Continuous torque at standstill <sup>2)</sup>	$M_{dN}$	Nm	9.2 (12.0) <sup>5)</sup>	14.5(20.0) <sup>5)</sup>	19.5(28.0) <sup>5)</sup>	24.0(35.0) <sup>5)</sup>	24.0(35.0) <sup>5)</sup>
Continuous current at standstill	$I_{dN}$	A	10.2(13.3) <sup>5)</sup>	16.9(23.3) <sup>5)</sup>	21.4(30.8) <sup>5)</sup>	31.2(45.5) <sup>5)</sup>	24.7(36.1) <sup>5)</sup>
Theor. maximum torque <sup>3)</sup>	$M_{max}$	Nm	28.6	45.1	60.6	74.6	74.6
Peak current	$I_{max}$	A	45.8	76.0	96.5	140.4	111.2
Rotor moment of inertia <sup>4)</sup>	$J_M$	kgm <sup>2</sup>	22 x 10 <sup>-4</sup>	29 x 10 <sup>-4</sup>	42 x 10 <sup>-4</sup>	58 x 10 <sup>-4</sup>	58 x 10 <sup>-4</sup>
Torque constant at 20 °C	$K_m$	Nm/A	0.90	0.86	0.91	0.77	0.97
Windings resistance at 20 °C	$R_A$	Ohm	1.86	0.77	0.56	0.42	0.5
Windings inductance	$L_A$	mH	15.3	7.6	6.1	3.9	5.7
Thermal time constant	$T_{th}$	min	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>
Mass <sup>4)</sup>	$m_M$	kg	13.0	16.5	22.0	28.0	28.0
			<b>093 A-N-030</b>	<b>093 B-N-030</b>	<b>093 C-N-030</b>	<b>093 C-L-030</b>	<b>093 D-N-030</b>
Nominal motor speed <sup>1)</sup>	$n$	min <sup>-1</sup>	3000	3000	3000	3000	3000
Continuous torque at standstill <sup>2)</sup>	$M_{dN}$	Nm	9.2 (12.0) <sup>5)</sup>	14.5(20.0) <sup>5)</sup>	19.5(20.8) <sup>5)</sup>	19.5(28.0) <sup>5)</sup>	24.0(35.0) <sup>5)</sup>
Continuous current at standstill	$I_{dN}$	A	17.8(23.2) <sup>5)</sup>	24.1(33.2) <sup>5)</sup>	32.2(34.3) <sup>5)</sup>	32.2(46.2) <sup>5)</sup>	41.4(60.3) <sup>5)</sup>
Theor. maximum torque <sup>3)</sup>	$M_{max}$	Nm	28.6	45.1	60.6	60.6	74.6
Peak current	$I_{max}$	A	79.9	108.2	145.0	145.0	186.0
Rotor moment of inertia <sup>4)</sup>	$J_M$	kgm <sup>2</sup>	22 x 10 <sup>-4</sup>	29 x 10 <sup>-4</sup>	42 x 10 <sup>-4</sup>	42 x 10 <sup>-4</sup>	58 x 10 <sup>-4</sup>
Torque constant at 20 °C	$K_m$	Nm/A	0.52	0.60	0.61	0.61	0.58
Windings resistance at 20 °C	$R_A$	Ohm	0.61	0.43	0.25	0.25	0.18
Windings inductance	$L_A$	mH	4.9	4.4	2.7	2.7	2.1
Thermal time constant	$T_{th}$	min	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>
Mass <sup>4)</sup>	$m_M$	kg	13.0	16.5	22.0	22.0	28.0
			<b>093 A-N-040</b>	<b>093 B-N-040</b>	<b>093 C-N-040</b>	<b>093 D-N-040</b>	
Nominal motor speed <sup>1)</sup>	$n$	min <sup>-1</sup>	4000	4000	4000	4000	
Continuous torque at standstill <sup>2)</sup>	$M_{dN}$	Nm	9.2 (12.0) <sup>5)</sup>	14.5(20.0) <sup>5)</sup>	19.5(28.0) <sup>5)</sup>	24.0(35.0) <sup>5)</sup>	
Continuous current at standstill	$I_{dN}$	A	23.3(30.4) <sup>5)</sup>	36.6(50.5) <sup>5)</sup>	45.3(65.0) <sup>5)</sup>	63.2(92.1) <sup>5)</sup>	
Theor. maximum torque <sup>3)</sup>	$M_{max}$	Nm	28.6	45.1	60.6	74.6	
Peak current	$I_{max}$	A	104.8	164.8	204.0	284.0	
Rotor moment of inertia <sup>4)</sup>	$J_M$	kgm <sup>2</sup>	22 x 10 <sup>-4</sup>	29 x 10 <sup>-4</sup>	42 x 10 <sup>-4</sup>	58 x 10 <sup>-4</sup>	
Torque constant at 20 °C	$K_m$	Nm/A	0.39	0.40	0.43	0.38	
Windings resistance at 20 °C	$R_A$	Ohm	0.36	0.20	0.14	0.09	
Windings inductance	$L_A$	mH	2.8	1.9	1.6	1.3	
Thermal time constant	$T_{th}$	min	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	
Mass <sup>4)</sup>	$m_M$	kg	13.0	16.5	22.0	28.0	

Continued on next page

<sup>1)</sup> 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 characteristics curves

<sup>2)</sup> With 60 K overtemperature at the motor housing.

<sup>3)</sup> 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.

<sup>4)</sup> Without blocking brake, without blower

<sup>5)</sup> Parenthetical values apply to motors with surface cooling.

Designation	Symbol	Unit	Motor type MDD ...		
			093 A-N-060	093 B-N-060	093 C-N-060
Nominal motor speed <sup>1)</sup>	$n$	min <sup>-1</sup>	6000	6000	6000
Continuous torque at standstill <sup>2)</sup>	$M_{dN}$	Nm	9.2 (12.0) <sup>5)</sup>	14.5 (20.0) <sup>5)</sup>	19.5 (28.0) <sup>5)</sup>
Continuous current at standstill	$I_{dN}$	A	36.8 (48.0) <sup>5)</sup>	46.7 (64.5) <sup>5)</sup>	65.2 (93.6) <sup>5)</sup>
Theor. maximum torque <sup>3)</sup>	$M_{max}$	Nm	28.6	45.1	60.6
Peak current	$I_{max}$	A	165.8	210.3	293.3
Rotor moment of inertia <sup>4)</sup>	$J_M$	kgm <sup>2</sup>	22 x 10 <sup>-4</sup>	29 x 10 <sup>-4</sup>	42 x 10 <sup>-4</sup>
Torque constant at 20 °C	$K_m$	Nm/A	0.25	0.31	0.30
Windings resistance at 20 °C	$R_A$	Ohm	0.16	0.11	0.07
Windings inductance	$L_A$	mH	1.3	1.1	0.7
Thermal time constant	$T_{th}$	min	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>	50 (45) <sup>5)</sup>
Mass <sup>4)</sup>	$m_M$	kg	13.0	16.5	22.0

<sup>1)</sup> 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 characteristics curves  
<sup>2)</sup> With 60 K overtemperature at the motor housing.  
<sup>3)</sup> 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.  
<sup>4)</sup> Without blocking brake, without blower  
<sup>5)</sup> Parenthetical values apply to motors with surface cooling.

Fig 9.1: Type dependent motor data

Designation	Symbol	Unit	Data
Permissible ambient temp.	$T_{um}$	°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 9.2: General data - MDD 093

Designation	Symbol	Unit	Data Blocking Brake	
Principle of action			electrically- actuated release	
Holding torque	$M_H$	Nm	11	22
Nominal voltage	$U_N$	V	DC 24 ± 10%	DC 24 ± 10%
Nominal current	$I_N$	A	0.5	0.7
Moment of inertia	$J_B$	kgm <sup>2</sup>	1.06 x 10 <sup>-4</sup>	3.6 x 10 <sup>-4</sup>
Release delay	$t_L$	ms	60	70
Clamping delay	$t_K$	ms	20	30
Mass	$m_B$	kg	0.5	1.1

Fig 9.3: Technical data - blocking brake

### 9.4. Dimensional Data

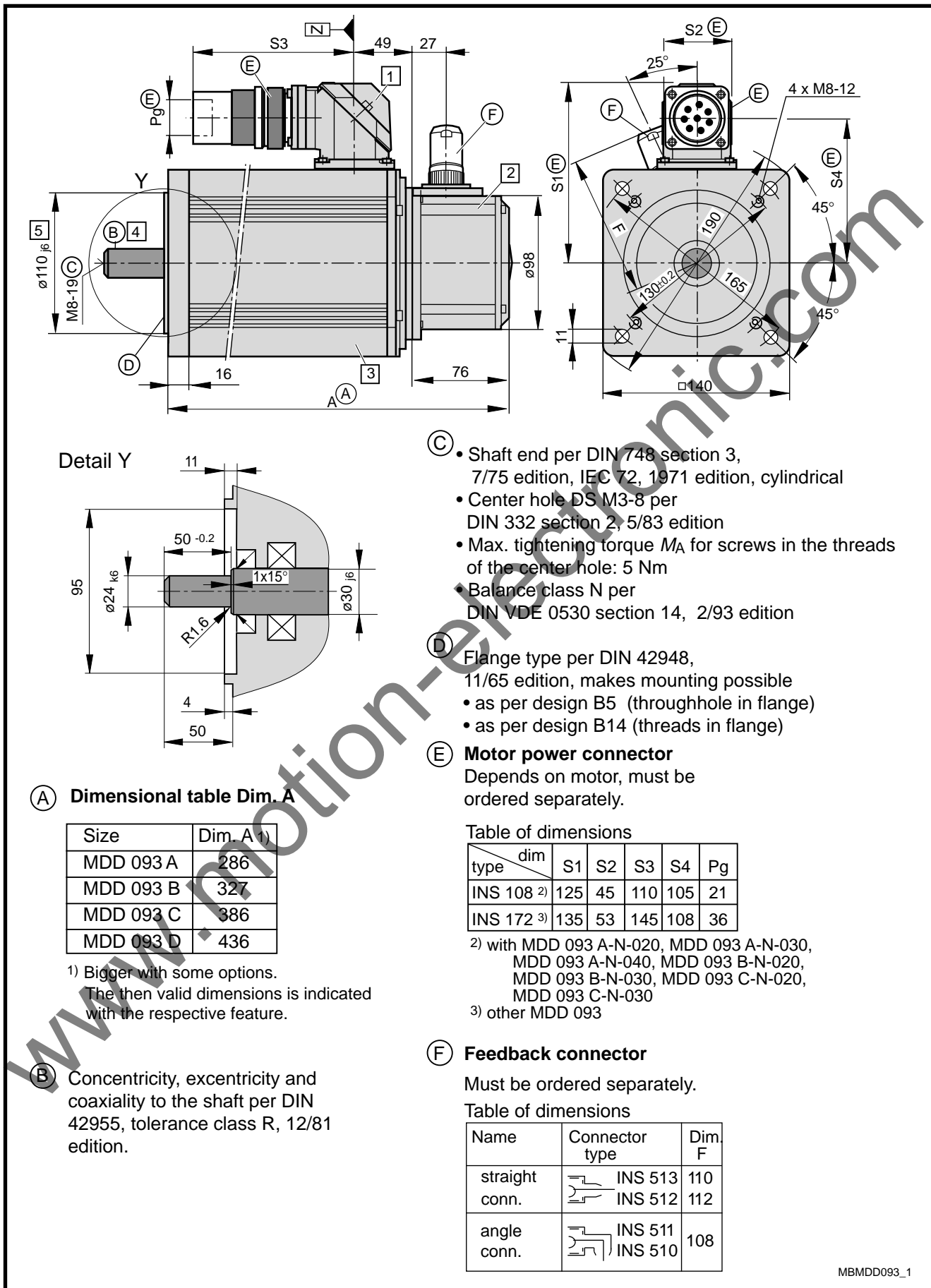


Fig 9.12: Dimensional data MDD 093

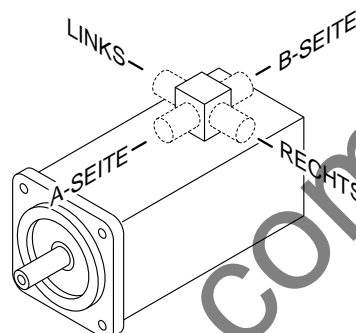
### Available Options

**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**

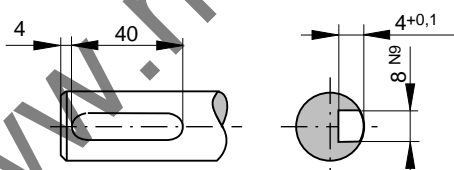
- without blocking brake
- with blocking brake: 11 Nm } The dimensions are identical.
- with blocking brake: 22 Nm

**Dimensional table for motors with blocking brake: 22 Nm**

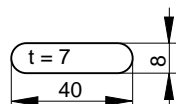
Size	Dim. A
MDD 093 A	316
MDD 093 B	357
MDD 093 C	416
MDD 093 D	466

**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 8 x 7 x 40



**5 Special centering diameter**

- $\varnothing 130_{j6}$

MBMDD093\_2

Fig 9.13: Dimensional data MDD 093 - available options

### 9.5. Available Versions

Type code field:	Example:	MDD 093 B-N-020-N 2 L-110 G B 0
1. Name Motor for digital drive controllers	MDD	MDD
2. Motor size	093	093
3. Motor lengths	A, B, C, D	B
4. Housing design: Standard (suited for natural convection and surface-cooling) for surface cooling with motors requiring a bigger power connector with housing design N	N L 1)	N
5. Nominal speed 1500 min <sup>-1</sup> 2000 min <sup>-1</sup> 3000 min <sup>-1</sup> 4000 min <sup>-1</sup> 6000 min <sup>-1</sup>	015 2) 020 030 040 060 3)	020
6. Balance class Standard (R per DIN VDE 0530 section 14, 2/93 edition)	N	N
7. Side B shaft end Standard (without side B shaft end)	2	2
8. Motor feedback digital servo feedback digital servo feedback with integrated multiturn absolute encoder	L M	L
9. Centering diameter ø110 mm (standard) ø130 mm	110 130	110
10. Output shaft plain shaft shaft with keyway per DIN 6885 sh. 1, 8/68 edition	G P	G
11. Power connection connector to side A connector to side B connector to the right (looking onto motor shaft, connecting housing at top) connector to the left (looking onto motor shaft, connecting housing at top)	A B R L	B
12. Blocking brake Without blocking brake with 11.0 Nm blocking brake with 22.0 Nm blocking brake	0 1 2	0

1) Housing design "L" only with motor types MDD 093C-L-030.  
2) Only with motor length "D"  
3) Only with motor length "D"

Quelle: INN 41.60 TLMD093

Fig 9.14: Type codes - MDD 093