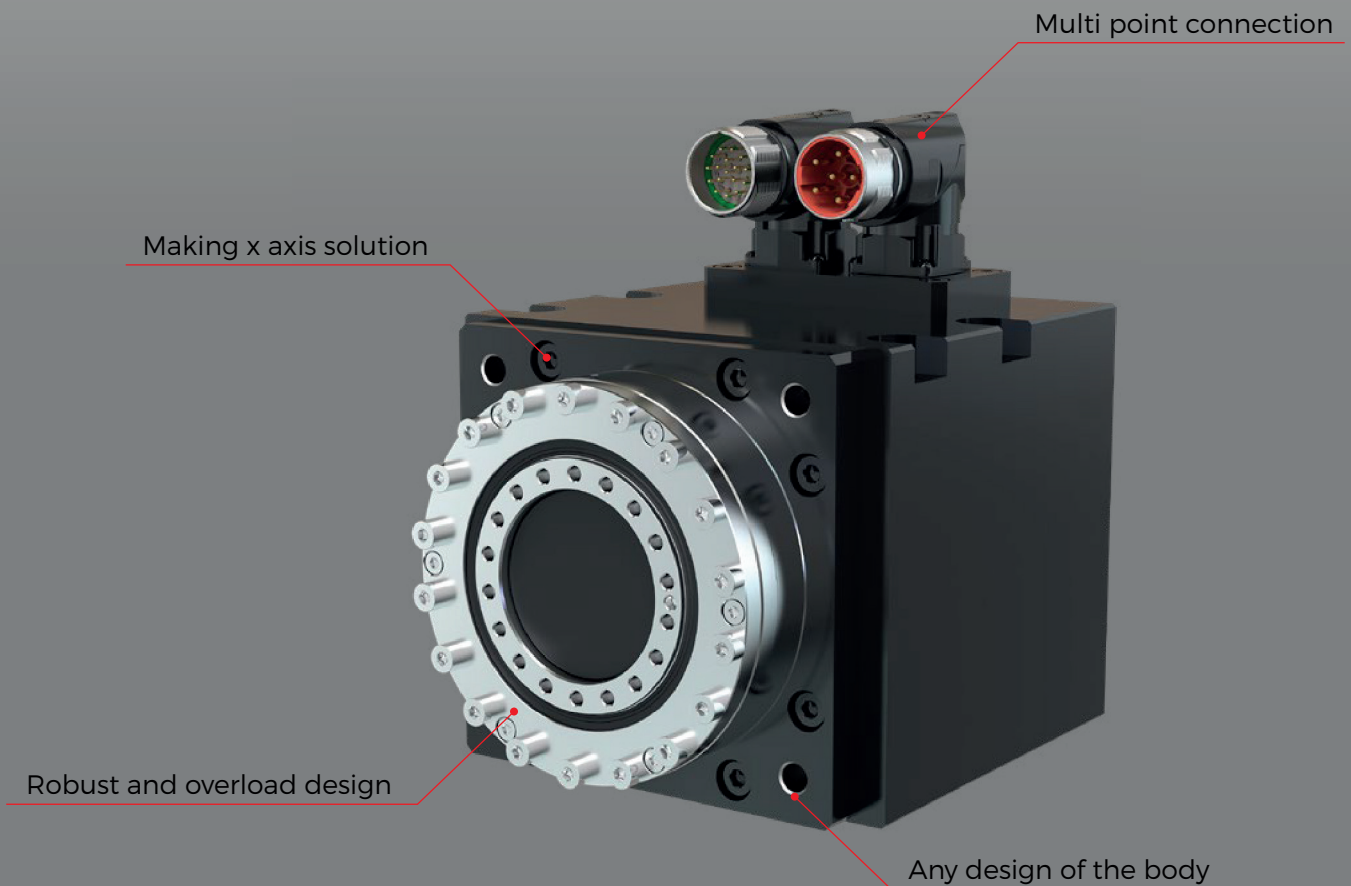




# DSM series



WHEN AIR IS BETTER THAN STEEL

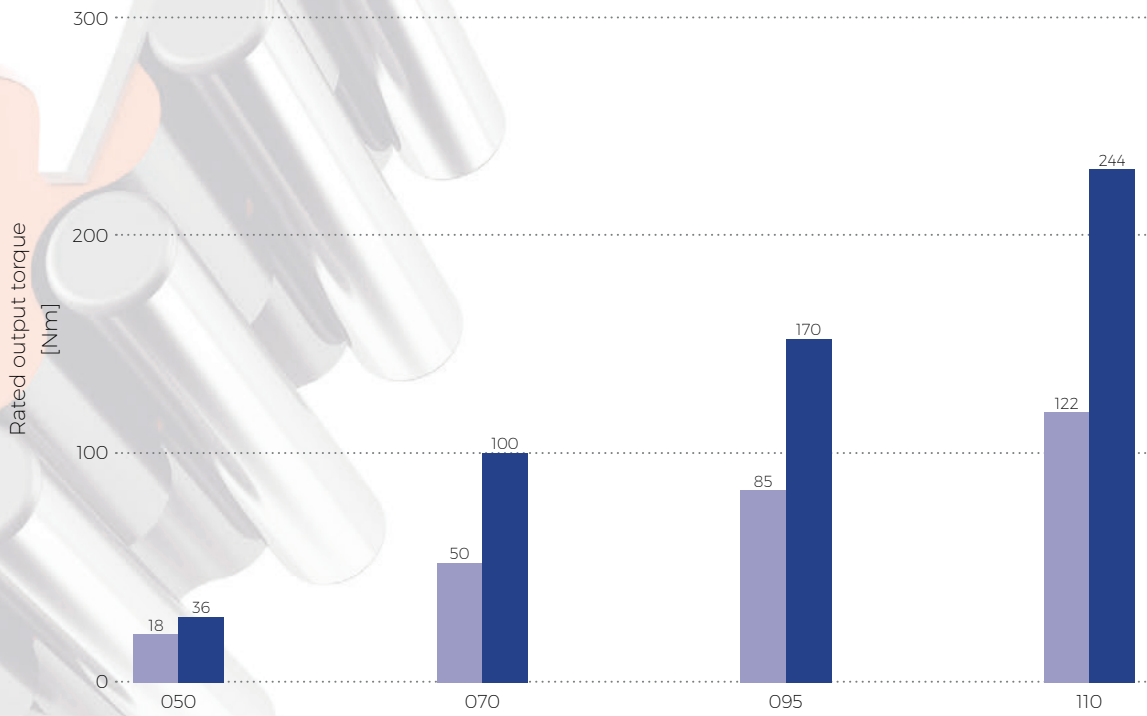
### 8.3 DSM series



#### Advantages

- low lost motion
- low moment of inertia
- high reduction ratio
- high kinematic accuracy
- high moment overload capacity
- high capacity of the integrated radial-axial output bearings
- high dynamic performance

The **DriveSpin® DSM** modular rotary positioning modules provide controlled rotary motion and transfer of torque with a high positioning accuracy and precision. The output flange of the module allows capturing both radial and axial forces. The modules feature a special design, which allows versatile connections, also without additional devices. Actuators can be combined in many ways using the modular system. The simple design integration ability and small dimensions allow creating kinematic assemblies from DSM modules for end effectors, but also for additional devices and positioners. The selection of a module size depends on the required load-carrying capacity and the number of degrees of freedom of the motion axis. The DSM Series is characterized by simple and quick assembly and reduces overall cost. Compact design ensures optimum mounting options and application possibilities, even in confined installation spaces. These actuators are used in applications with request of high torque density, precision and dynamics. Rated output torque is from 18 Nm to 122 Nm.



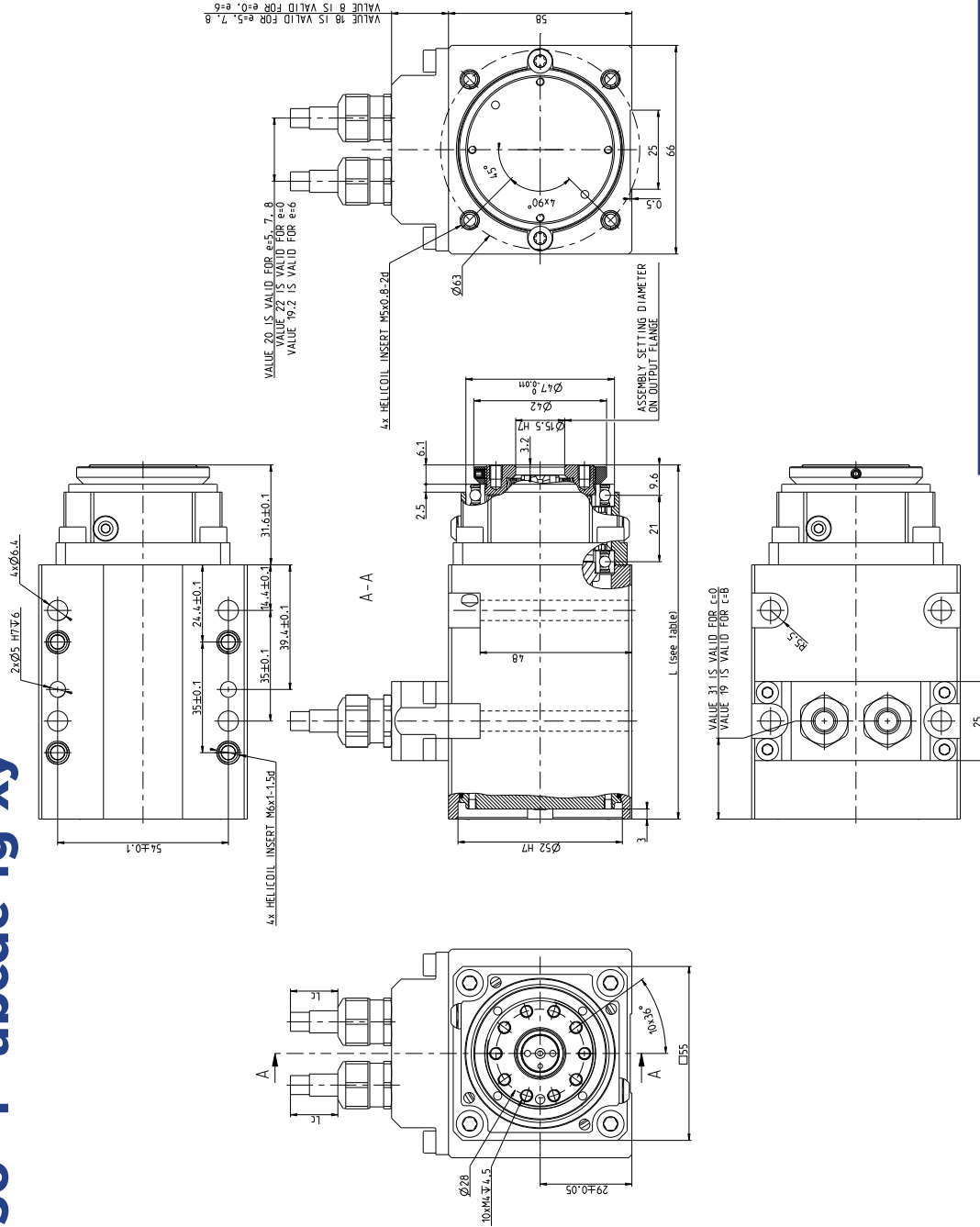
Tab. 8.3a: Rated output torque

Size		050	070	095	110
<b>Rated output torque</b>	$T_R$ [Nm]	18	50	85	122
<b>Acceleration/ braking output torque</b>	$T_{acc}$ [Nm]	36	100	170	244

# DSM 050 - i - abcde-fg-xy



# DSM 050 - i - abcde-fg-xy



Size	Feedback type (d)	Without brake		With brake	
		Dimension L ± 0.5 [mm]	Weight m [kg]	Dimension L ± 0.5 [mm]	Weight m [kg]
<b>DSM 050</b>	OA	112	1.4	142	1.6
	OB,OC	112	1.4	142	1.6
	OD,OE	112	1.4	142	1.6
	OK,OL	119	1.4	152	1.6

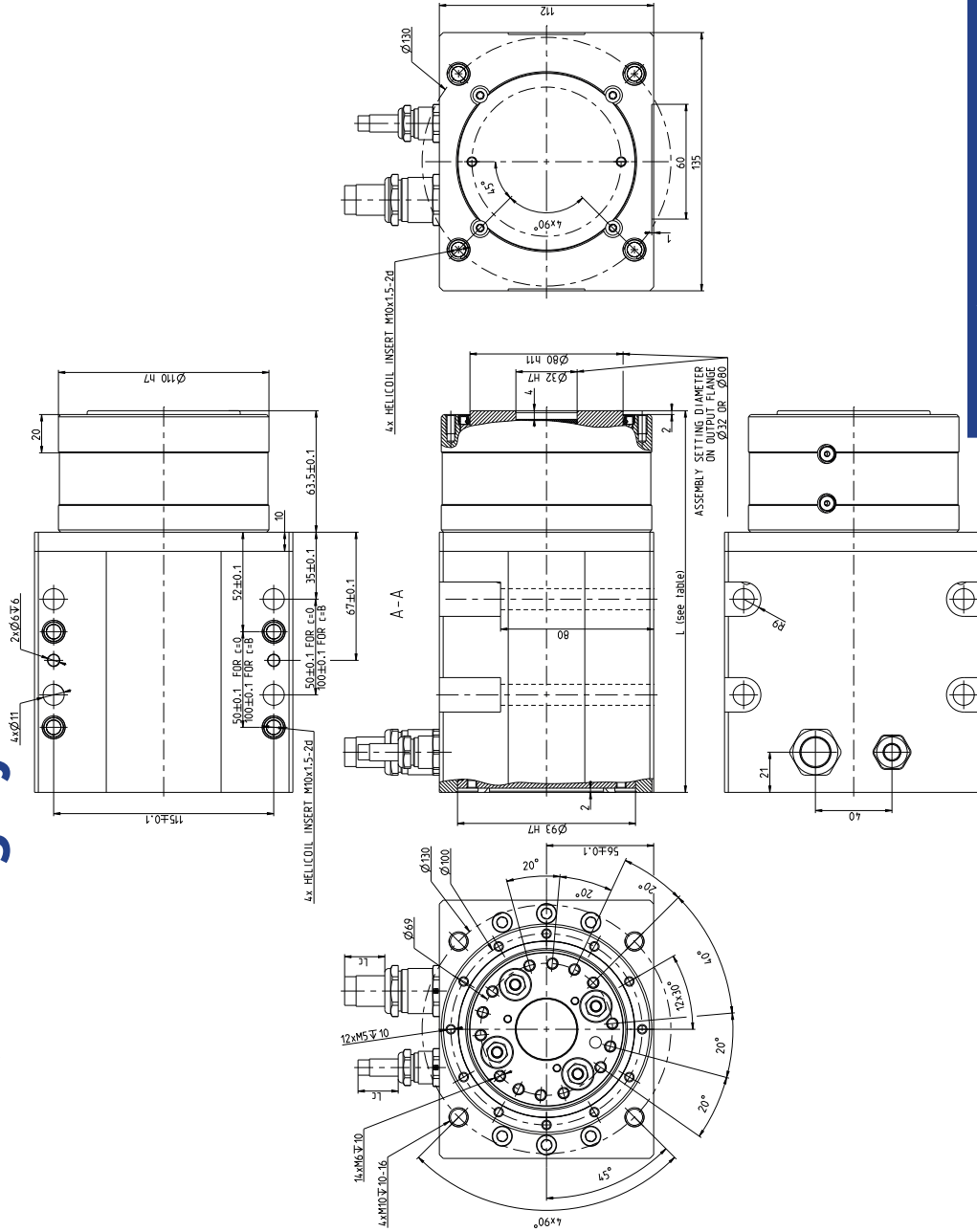




# DSM 110 - i - abcde-fg-xy



## DSM 110 - i - abcde-fg-xy



Size	Feedback type (d)	Without brake		With brake	
		Dimension L ± 0.5 [mm]	Weight m [kg] *	Dimension L ± 0.5 [mm]	Weight m [kg] *
<b>DSM 110</b>	OA	200	10.5	252	12.4
	OB,OC	200	10.5	252	12.4
	OD,OE	200	10.6	252	12.5
	OH	200	10.6	252	12.5

Tab. 8.3b: DSM series technical data table

Reduction Gear parameters	Tolerance			DSM 050		
Reduction ratio	$i$			63		
Rated output torque	$T_R$ [Nm]			18		
Acceleration/braking output torque	$T_{acc}$ [Nm]			36		
Rated input speed	$n_r$ [rpm]			2 000		
Maximum allowable input speed <sup>9)</sup>	$n_{max}$ [rpm]			5 000		
Allowable moment <sup>2)3)</sup>	$M_{cmax}$ [Nm]			44		
Tilting stiffness <sup>1)6)</sup>	$M_t$ [Nm/arcmin]			4		
Torsional stiffness <sup>1)7)</sup>	$k_t$ [Nm/arcmin]			2.5		
Lost motion	LM [arcmin]			< 1.5		
Hysteresis	H [arcmin]			< 1.5		
Rated radial force <sup>2)</sup>	$F_{rR}$ [kN]			1.44 <sup>8)</sup>		
Maximum axial force <sup>2)4)</sup>	$F_{amax}$ [kN]			1.9		
Gear lubrication				Grease Castrol TRIBOL GR TT 1 PD		
Reduction gear limit temperature	[°C]			60 °C		
Standard ambient temperature range	[°C]			-10 °C to +40 °C		
Motor parameters						
DC BUS voltage	$U_{dc}$ [V <sub>dc</sub> ]	+/- 10%	24	320	560	
Motor rated speed	$n_n$ [rpm]		3 500	3 500	3 500	
Motor rated torque	$M_n$ [Nm]	+/- 10%	0.23	0.23	0.23	
Motor rated current	$I_n$ [A <sub>rms</sub> ]		7.1	0.58	0.3	
Motor stall torque	$M_o$ [Nm]	+/- 10%	0.24	0.24	0.24	
Motor stall current	$I_o$ [A <sub>rms</sub> ]		7.4	0.6	0.3	
Motor peak torque	$M_{max}$ [Nm]	+/- 10%	1	1	1	
Motor peak current	$I_{max}$ [A]		30.8	2.5	1.25	
Motor back-EMF constant	$K_E$ [V <sub>peak</sub> /krpm]	+/- 10%	2.7	36	67	
Motor torque constant	$K_T$ [Nm/A <sub>rms</sub> ]	+/- 10%	0.032	0.4	0.8	
Terminal resistance (L-L)	$R_{2ph}$ [Ω]	+/- 10%	0.2	36	122	
Terminal inductance (L-L)	$L_{2ph}$ [mH]	+/- 20%	0.2	36	130	
Number of poles	2p		6	6	6	
Electromagnetic brake DC supply	[V <sub>dc</sub> ]			24. Special		
Electromagnetic brake torque at input	[Nm]			0.4		
Protection class				IP 64		
Motor Insulation class				F		
Paint				RAL 9005		
Motor number of phases				3		
Motor type of connection				Y(star-configuration)		

1) Mean statistical value

2) Load at output speed 32 rpm for size 050, other sizes at 15 rpm

 3) Moment  $M_c$  max at  $F_a=0$ . If  $F_a \neq 0$  see Glossary

 4) Axial force  $F_a$  max for  $M_c=0$  (In case of size 050 also  $F_r=0$  condition has to be fulfilled). If  $M_c \neq 0$  see Glossary

5) 3 900 rpm for ratio 67 : 4 500 rpm for ratios 89, 119

6) The parameter depends on the version of high precision reduction gear.

7) The parameter depends on the version, ratio and lost motion of the high precision reduction gear.

 8) For size 050 this is value of MAXIMUM RADIAL FORCE  $F_{rmax}$  for  $a_2=0$ ;  $F_a=0$  and at 32 rpm output speed. For  $a_2>0$ ;  $F_a=0$  at 32 rpm output speed  $F_{rmax} = 0.044/(a_2+0.0305)$  [kN].  $a_2$  represents the distance of the radial force centre from the front of the output flange in meters see Glossary.

9) Instantaneous speed peak that may occur within the working cycle. Note please the temperature on the gear case that should not exceed significantly 60°C

10) 4 500 rpm for ratio 73 : 4 800 rpm for ratio 95



Tab. 8.3b: DSM series technical data table - continued

DSM 070			DSM 095			DSM 110		
57.75			73.95			67.89.119		
50			85			122		
100			170			244		
2 000			2 000			2 000		
5 000			4 500 / 4 800 <sup>10)</sup>			3 900 / 4 500 <sup>5)</sup>		
142			410			740		
35			120			150		
7			15			22		
< 1.5			< 1			< 1		
< 1.5			< 1			< 1		
2.8			3.5			9.3		
4.1			11.1			13.1		
Grease Castrol TRIBOL GR TT 1 PD			Grease Castrol TRIBOL GR TT 1 PD			Grease Castrol TRIBOL GR TT 1 PD		
60 °C			60 °C			60 °C		
-10 °C to +40 °C			-10 °C to +40 °C			-10 °C to +40 °C		
24	320	560	24	320	560	24	320	560
2 500	4 500	4 500	4 000	4 000	4 000	2 500	3 000	3 000
0.88	0.76	0.76	1.4	1.4	1.4	3.4	3.2	3.2
13	1.2	0.7	27	5.6	3.1	37	4.9	2.8
0.9	0.9	0.9	1.6	1.6	1.6	3.8	3.8	3.8
13.3	1.42	0.83	31	6.4	3.5	41	6	3
3	3	3	5.5	5.5	5.5	11	11	11
44.3	4.7	2.8	106.1	22	12.1	120	17	10
5.7	68.3	105.6	4.4	25	47	8	57	103
0.0677	0.63	1.09	0.052	0.25	0.46	0.09	0.65	1.14
0.13	17	40.5	0.052	1.2	4.36	0.027	1.4	4.5
0.25	34.4	87	0.11	2.84	8.71	0.15	7.4	24
10	10	10	10	10	10	10	10	10
24. Special			24. Special			24. Special		
4.5			2			4.5		
IP 64			IP 64			IP 64		
F			F			F		
RAL 9005			RAL 9005			RAL 9005		
3			3			3		
Y(star-configuration)			Y(star-configuration)			Y(star-configuration)		

**IMPORTANT NOTES:**

- Load values in the table are valid for the nominal life of  $L_{10} = 6\,000$  hours. Service life for average torque  $T_a$  and average speed  $n_a$  other than  $T_p, n_p$  can be calculated. Please contact manufacturer with estimated duty cycle.
- High precision reduction gears are preferred for intermittent duty cycles (S3-S8); the output speed in applications is inverted-variable. The S1 continuous duty cycle needs to be consulted with manufacturer
- Please consult the maximum speed in duty cycle with the manufacturer
- The values in the table refer to the ambient temperature of 20°C to 25°C
- For ambient temperatures lower than -10°C pre-heating might be considered please consult manufacturer

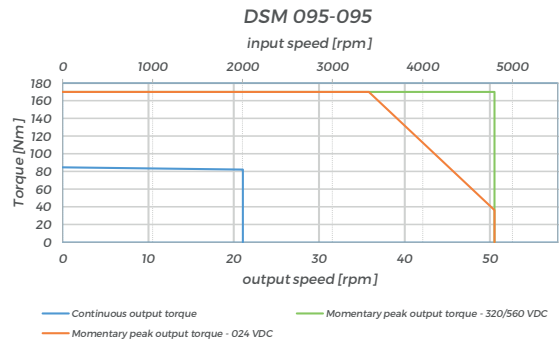
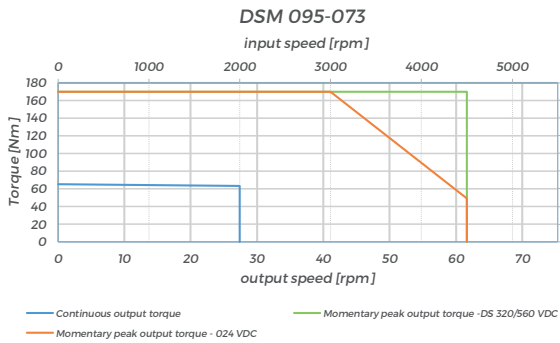
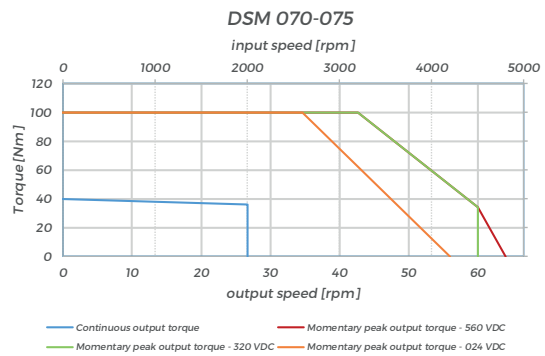
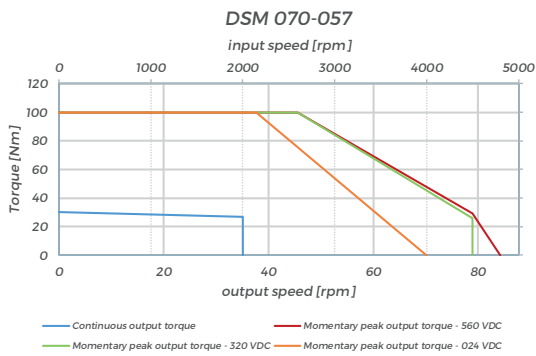
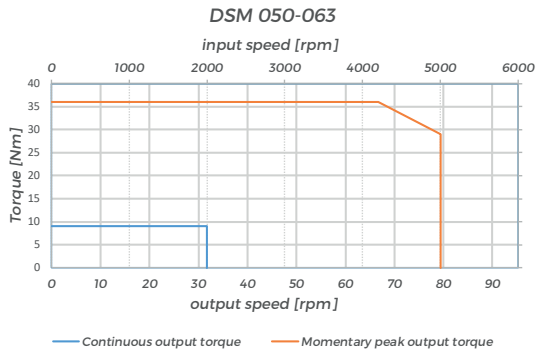


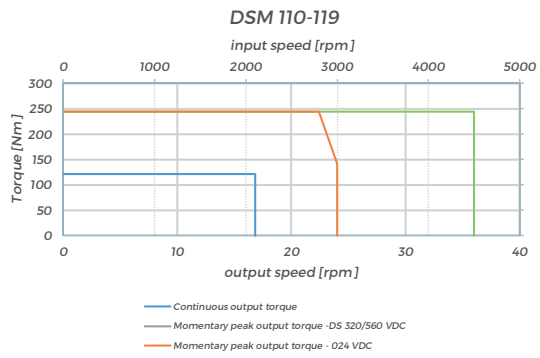
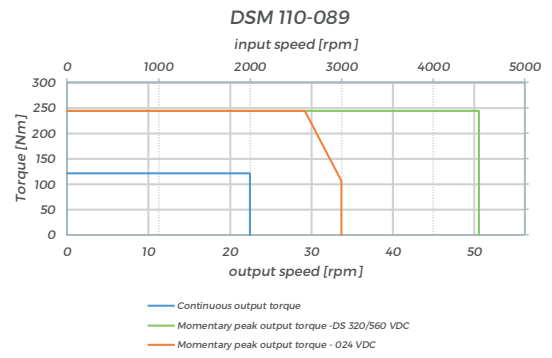
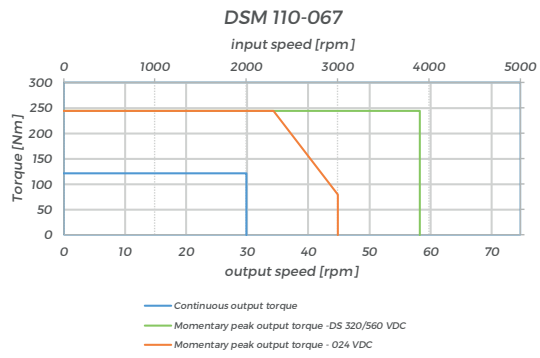
Tab. 8.3c: Inertia at input (DSM actuator without brake)

Feedback type (d)	$J_{w/o\ brake}$	DSM 050	DSM 070	DSM 095	DSM 110
OA	10 <sup>-4</sup> kgm <sup>2</sup>	0.062	0.420	1.657	1.825
OB	10 <sup>-4</sup> kgm <sup>2</sup>	0.061	0.487	1.646	1.814
OC	10 <sup>-4</sup> kgm <sup>2</sup>	0.061	0.487	1.646	1.814
OD	10 <sup>-4</sup> kgm <sup>2</sup>	0.037	0.416	1.640	1.830
OE	10 <sup>-4</sup> kgm <sup>2</sup>	0.037	0.416	1.640	1.830
OF	10 <sup>-4</sup> kgm <sup>2</sup>	-	-	1.661	-
OG	10 <sup>-4</sup> kgm <sup>2</sup>	-	-	1.661	-
OH	10 <sup>-4</sup> kgm <sup>2</sup>	-	0.416	1.661	1.830
OK	10 <sup>-4</sup> kgm <sup>2</sup>	0.060	-	-	-
OL	10 <sup>-4</sup> kgm <sup>2</sup>	0.060	-	-	-

Tab. 8.3d: Inertia at input (DSM actuator with brake)

Feedback type (d)	$J_{w/o\ brake}$	DSM 050	DSM 070	DSM 095	DSM 110
OA	10 <sup>-4</sup> kgm <sup>2</sup>	0.121	0.780	1.707	2.193
OB	10 <sup>-4</sup> kgm <sup>2</sup>	0.101	0.853	1.695	2.182
OC	10 <sup>-4</sup> kgm <sup>2</sup>	0.101	0.853	1.695	2.182
OD	10 <sup>-4</sup> kgm <sup>2</sup>	0.101	0.778	1.689	2.196
OE	10 <sup>-4</sup> kgm <sup>2</sup>	0.101	0.778	1.689	2.196
OF	10 <sup>-4</sup> kgm <sup>2</sup>	-	-	1.711	-
OG	10 <sup>-4</sup> kgm <sup>2</sup>	-	-	1.711	-
OH	10 <sup>-4</sup> kgm <sup>2</sup>	-	0.778	1.711	2.196
OK	10 <sup>-4</sup> kgm <sup>2</sup>	0.100	-	-	-
OL	10 <sup>-4</sup> kgm <sup>2</sup>	0.100	-	-	-





Schweiz

**Nozag AG**

Barzloostrasse 1  
CH-8330 Pfäffikon/ZH

Telefon +41 44 805 17 17

Aussendienst Westschweiz  
Telefon +41 79 886 76 83

[www.nozag.ch](http://www.nozag.ch)  
[info@nozag.ch](mailto:info@nozag.ch)