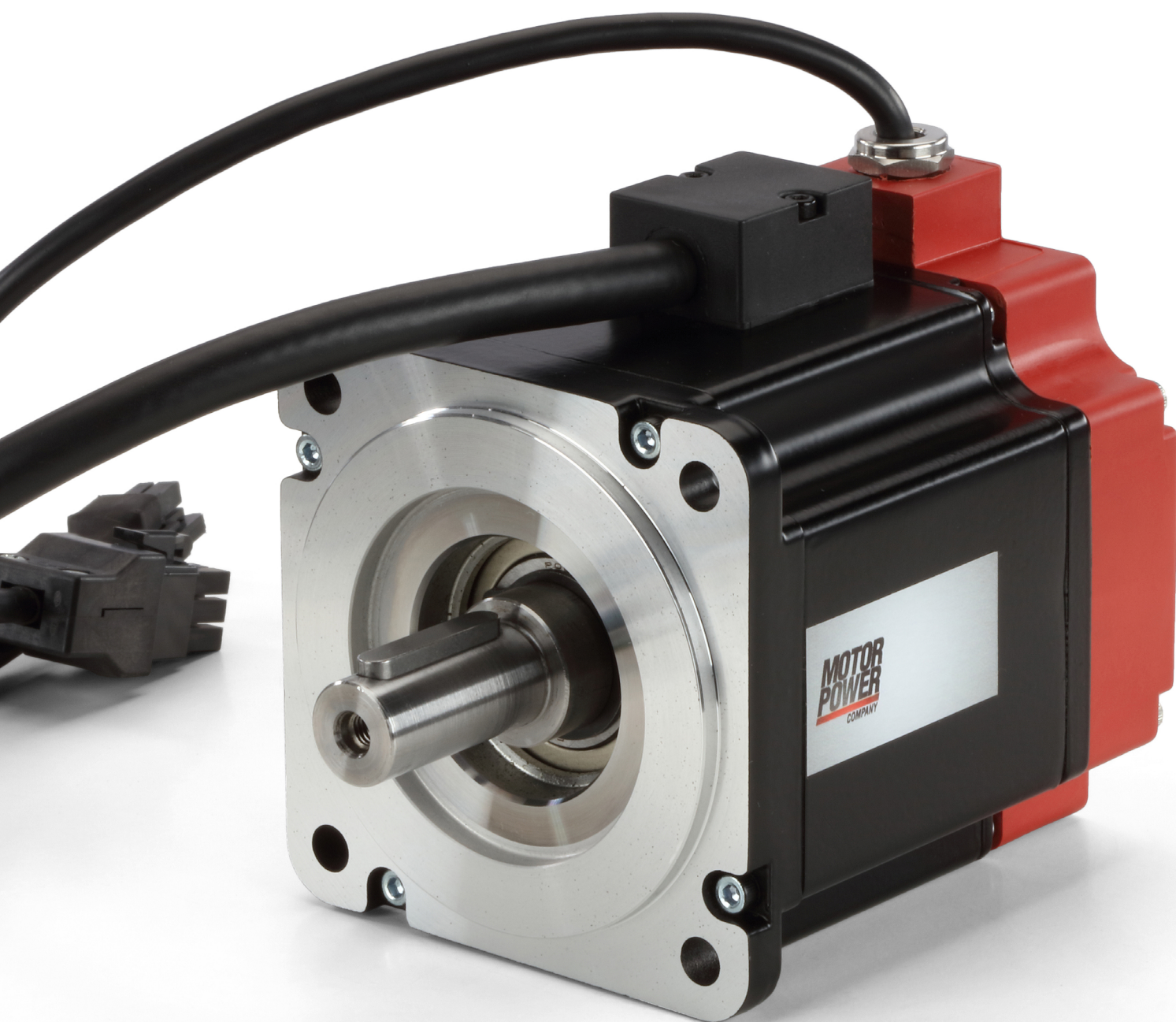


TC4

TETRA COMPACT⁴



SEE IT BEFORE IT HAPPENS

**MOTOR
POWER**
COMPANY

TETRA COMPACT 4

NEXT-LEVEL SERVO MOTORS

Introducing the TETRA COMPACT 4 series from Motor Power Company a breakthrough in high-performance brushless servo motors. Born from years of hands-on experience, these motors redefine the standards in the brushless servomotors category.

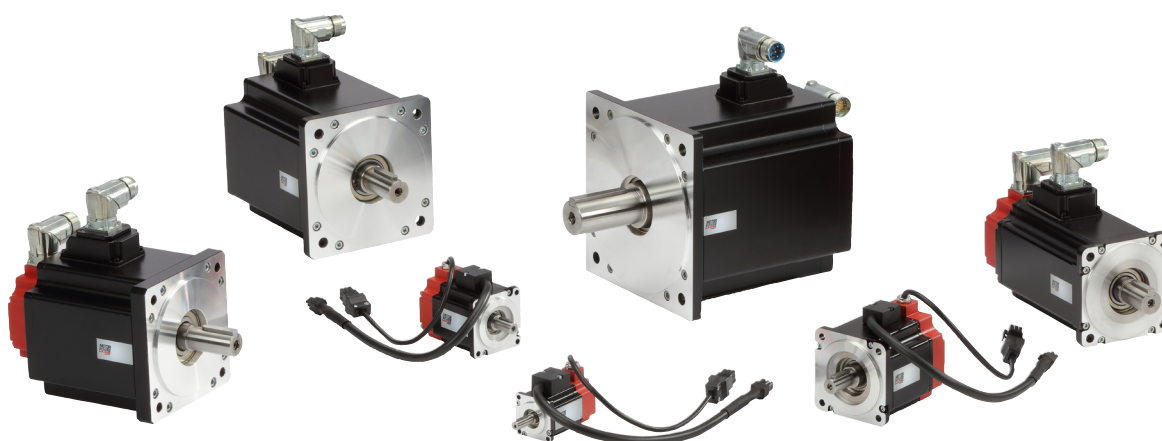
With a unique design that is 30% shorter than its predecessors, the TETRA COMPACT 4 series maintains exceptional power density, efficiency, and speed, setting a new benchmark for AC synchronous motors.

This series features 10-pole servomotors with a variety of feedback options, offering unmatched quality and a broad range of power ratings. Perfectly suited for modern machine performance requirements, Motor Power Company doesn't just provide individual components but complete motion solutions. Pairing these high-performance servomotors with versatile drives of the series BL servo, the TETRA COMPACT 4 series excels across a diverse array of applications. Welcome to a new era of innovation and efficiency in motion technology.



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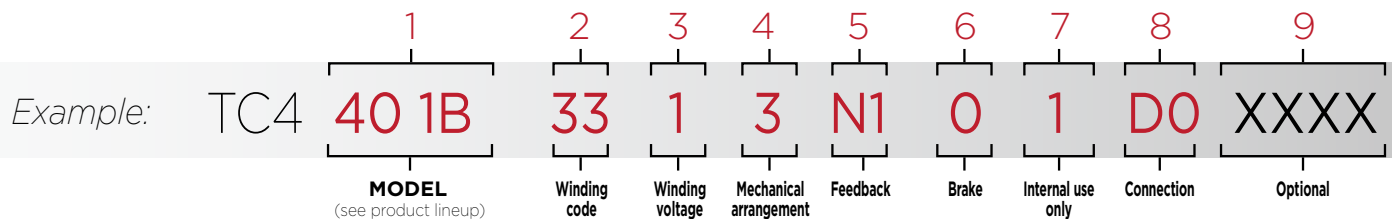


FEATURES

Motor type	Three-phase BPM synchronous servo motor
POLES Number	10 (5 poles pair)
Available frame sizes	40 - 60 - 80 - 100 - 130 - 150 - 180 mm
Rated output torque	From 0.16 to 47.75 Nm
Rated output power	From 50 to 7500 W
Rated servomotor speed	Up to 6000 rpm
Maximum servomotor speed	Up to 8000 rpm
Insulation class	F (155 °C)
Protection class	IP 65 (with oil seal)
Ambient operating temperature	-20 ÷ +40 °C
Ambient storage temperature	-40 ÷ +70 °C
Relative humidity	5 ÷ 85 %, non-condensing
Cooling type	Natural convective
Maximum operating altitude	Up to 3000 m above sea level (derating 1%/100m from 1000m onwards)
Temperature sensor	PT1000 (no sensor for size 40)
Shaft end	Smooth or keyed
Feedback	Resolver, TTL Encoder, Absolute Encoder (Hiperface, EnDat, RS-485)*
Bearing life	20.000 h under rated operation condition
Balancing quality grade	G 6.3 according to ISO 1940
Magnet material	NdFeB with epoxy coating
External coating	RAL 9005 black powder
Approvals	CE, Rohs, Reach, UL file: E468964

*Available also in single cable configuration

TC4 SERVOMOTOR TYPE DESIGNATION



1	MODEL	See PRODUCT LINEUP (p.8)
2	TYPE OF WINDING	See WINDING TABLE CODE (p.7)
3	WINDING VOLTAGE	0 → 24 Vdc 1 → 48 Vdc 6 → 60 Vdc 2 → 230 Vac 4 → 400 Vac
4	MECHANICAL ARRANGEMENT	0 Smooth shaft 1 Smooth shaft + oil seal 2 Keyed shaft 3 Keyed shaft + oil seal
5	FEEDBACK	A1* Hiperface absolute multi-turn encoder A3* Hiperface DSL absolute single-turn 20 bit encoder A4* Hiperface DSL absolute multi-turn 20 bit encoder A5* Hiperface safety DSL single-turn 20 bit encoder A6* Hiperface safety DSL multi-turn 20 bit encoder A15* Hiperface safety DSL single-turn 24 bit encoder A16* Hiperface safety DSL multi-turn 24 bit encoder A22* Safety EnDat 3 single-turn 19 bit encoder A23* Safety EnDat 3 multi-turn 19 bit encoder M1 TTL 2000 ppr encoder M2 Absolute single-turn 17-bit RS-485 encoder N1 A-format 24-bit absolute multi-turn with external battery (not included). Encoder N1 available for models 40-60-80 R1* Resolver

*Not available for TC4 40 models

6	BRAKE	0 Without brake 1 With brake
7	Stator connection (Internal use only)	0 Stator wire connection 1 Stator PWB connection
8	CONNECTION	D0 300mm cable lenght with 6 pins power AMP connector and 9 pins signal AMP connector, only for sizes 40-60-80 D2 300mm cable lenght with 6 pins power AMP connector and 15 pins signal AMP connector. This connection is available only for sizes 40-60-80 with M1 encoder. G2 90° M23 turnable connectors - PT 1000 on power connector H2 90° M23 turnable connectors - PT 1000 on signal connector G3 90° M40 turnable connectors - PT 1000 on power connector H3 90° M40 turnable connectors - PT 1000 on signal connector G11 90° 915 YTEC turnable connector - PT 1000 on power connector H11 90° 915 YTEC turnable connector - PT 1000 on signal connector C21 One cable solution 90° M23 turnable connector



WINDING TABLE CODE

	TYPE OF WINDING										
	41	77	33	78	09	13	21	20	15	16	17
TC4 40 1A	0	0	1	1	2						
TC4 40 1B	0	0	1	1		2					
TC4 60 2A							2	2	4	4	
TC4 60 2B							2	2	4	4	
TC4 80 3A							2	2	4	4	
TC4 80 3B							2	2	4	4	
TC4 80 3C							2	2	4	4	
TC4 100 4A									2/4		4
TC4 100 4B									2/4		4
TC4 130 5F									2/4		4
TC4 130 5G									2/4		4
TC4 130 5H									2/4		4
TC4 150 6A									2/4		4
TC4 150 6B									2/4		4
TC4 150 6C									2/4		4
TC4 180 7A									2/4		4
TC4 180 7C									2/4		4
TC4 180 7D									2/4		4
TC4 180 7E									2/4		4
TC4 180 7F									2/4		4

SERVOMOTOR TYPE

TC4 PRODUCT LINEUP



Servomotor Type	Stall torque M ₀ [Nm]	Nominal Torque M _n @3000 rpm	Nominal Torque M _n @6000 rpm	Peak Torque M _{max}	Nominal Power @3000 rpm	Nominal Power @6000 rpm	Continuous Working Speed n _M	Maximum Working Speed n _{Max}	Moment of Inertia w/o brake	24 Vdc	48 Vdc	230 Vac	400 Vac
[/]	[Nm]	[Nm]	[Nm]	[Nm]	[W]	[W]	[rpm]	[rpm]	[kg cm ²]	[/]	[/]	[/]	[/]
TC4 40 1A	0.215	0.210	0.200	0.75	65	125	3000/6000	8000	0.0305	✓	✓	✓	✓
TC4 40 1B	0.409	0.395	0.370	1.38	125	230	3000/6000	8000	0.0561	✓	✓	✓	✓
TC4 60 2A	0.87	0.85	0.82	3.05	265	515	3000/6000	8000	0.223			✓	✓
TC4 60 2B	1.62	1.52	1.35	5.60	475	850	3000/6000	8000	0.414			✓	✓
TC4 80 3A	1.80	1.78	1.56	6.30	555	980	3000/6000	8000	0.79			✓	✓
TC4 80 3B	3.80	3.45	2.60	13.30	1080	1630	3000/6000	8000	1.42			✓	✓
TC4 80 3C	4.60	3.91	2.88	16.10	1230	1800	3000/6000	8000	2.03			✓	✓
TC4 100 4A	6.45	5.80	4.00	16.50	1820	2510	3000/6000	6000	2.53			✓	✓
TC4 100 4B	10.16	8.36	6.08	33.00	2625	3820	3000/6000	6000	4.61			✓	✓
TC4 130 5F	4.77	3.18	-	14.30	1000	-	3000	4000	6.70			✓	✓
TC4 130 5G	7.16	4.77	-	21.48	1500	-	3000	4000	9.72			✓	✓
TC4 130 5H	9.55	6.36	-	28.65	2000	-	3000	4000	12.77			✓	✓

Servomotor Type	Stall torque M ₀ [Nm]	Nominal Torque M _n @3000 rpm	Nominal Torque M _n @4000 rpm	Peak Torque M _{max}	Nominal Power @3000 rpm	Nominal Power @4000 rpm	Continuous Working Speed n _M	Maximum Working Speed n _{Max}	Moment of Inertia w/o brake	24 Vdc	48 Vdc	230 Vac	400 Vac
[/]	[Nm]	[Nm]	[Nm]	[Nm]	[W]	[W]	[rpm]	[rpm]	[kg cm ²]	[/]	[/]	[/]	[/]
TC4 150 6A	15.00	11.80	9.32	33.50	3715	3900	3000/4000	4000	15.18			✓	✓
TC4 150 6B	29.40	20.00	15.00	68.50	6280	6280	3000/4000	4000	27.68			✓	✓
TC4 150 6C	41.77	20.96	12.66	100.00	6580	5300	3000/4000	4000	40.17			✓	✓

Servomotor Type	Stall torque M ₀ [Nm]	Nominal Torque M _n @2000 rpm	Nominal Torque M _n @3000 rpm	Peak Torque M _{max}	Nominal Power @2000 rpm	Nominal Power @3000 rpm	Continuous Working Speed n _M	Maximum Working Speed n _{Max}	Moment of Inertia w/o brake	24 Vdc	48 Vdc	230 Vac	400 Vac
[/]	[Nm]	[Nm]	[Nm]	[Nm]	[W]	[W]	[rpm]	[rpm]	[kg cm ²]	[/]	[/]	[/]	[/]
TC4 180 7A	9.55	9.55	6.37	28.65	2000	2000	2000/3000	4000	25.22			✓	✓
TC4 180 7C	16.70	16.70	11.15	50.30	3500	3500	2000/3000	4000	44.81			✓	✓

Servomotor Type	Stall torque M ₀ [Nm]	Nominal Torque M _n @1500 rpm	Nominal Torque M _n @2500 rpm	Peak Torque M _{max}	Nominal Power @1500 rpm	Nominal Power @2500 rpm	Continuous Working Speed n _M	Maximum Working Speed n _{Max}	Moment of Inertia w/o brake	24 Vdc	48 Vdc	230 Vac	400 Vac
[/]	[Nm]	[Nm]	[Nm]	[Nm]	[W]	[W]	[rpm]	[rpm]	[kg cm ²]	[/]	[/]	[/]	[/]
TC4 180 7D	28.65	28.65	17.20	71.62	4500	4500	1500/2500	4000	64.99			✓	✓
TC4 180 7E	35.00	35.00	21.00	87.53	5500	5500	1500/2500	4000	102.46			✓	✓
TC4 180 7F	47.75	47.75	28.65	119.37	7500	7500	1500/2500	4000	140.62			✓	✓

The background features large, stylized, semi-transparent letters 'W' and 'P' in shades of gray. The 'W' is positioned above the 'P'.

TETRA
COMPACT

40

RATINGS and SPECIFICATION

			24 Vdc	48 Vdc		230 Vac	
TYPE OF WINDING			77	78	33	09	09
ELECTRICAL DATA							
Continuous stall torque (*)	M_o	[Nm]	0.215				
			0.70	0.75			
Nominal torque	M_n	[Nm]	0.21	0.21	0.20	0.21	0.20
Nominal power	P_n	[W]	65	65	125	65	125
Continuous stall current	I_o	[Arms]	5.20	2.60	3.25	0.72	0.72
Maximum current	I_{Max}	[Arms]	20.00	11.11	13.89	3.09	3.09
Nominal current	I_n	[Arms]	5.08	2.54	3.02	0.78	0.67
Nominal working speed	n_N	[rpm]	3000	3000	6000	3000	6000
Maximum working speed	n_{Max}	[rpm]	6175	6175	7800	8000	8000
Torque constant	K_t	[Nm/Arms]	0.041	0.083	0.066	0.298	0.298
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	2.5	5.0	4.0	18.0	18.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	0.73	2.93	1.85	36.06	36.06
Winding inductance	$L_{q\ u-v}$	[mH]	0.31	1.24	0.77	15.62	15.62
Electrical time constant	T_e	[ms]	0.42	0.42	0.42	0.43	0.43
Thermal resistance	R_{th}	[°C/W]	2.36				
Mechanical time constant (a)	T_m	[ms]	1.30	1.31	1.29	1.24	1.24
Rotor inertia without holding brake	J	[kg·cm²]	0.0305				
Rotor inertia with holding brake	J	[kg·cm²]	0.0326				
Mass without holding brake	m	[kg]	0.40				
Mass with holding brake	m	[kg]	0.56				
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	45 / 35				
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	120 / 95				

Rated output with 185 x 185 x 8 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

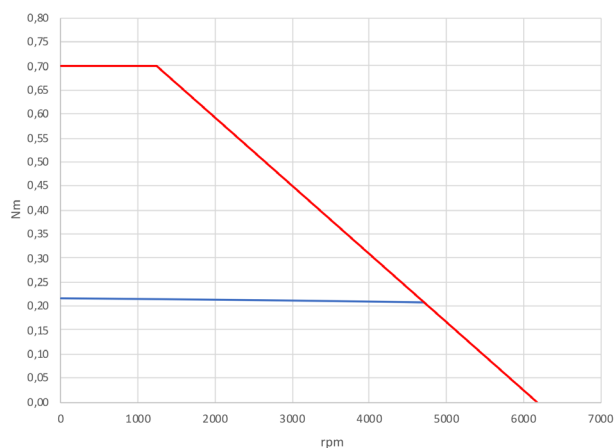
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

401A 77

Operative curves at 24 Vdc

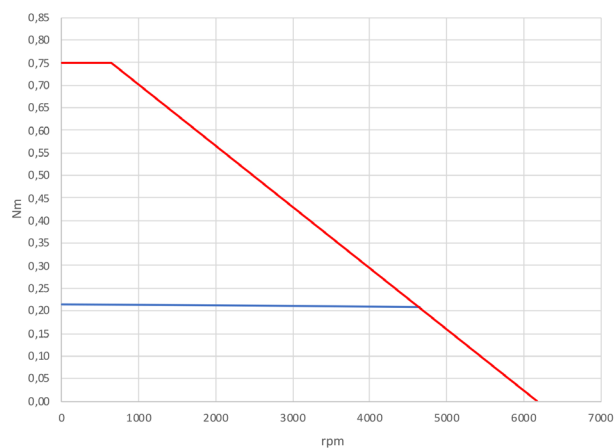
— Cn — Cmax



401A 78

Operative curves at 48 Vdc

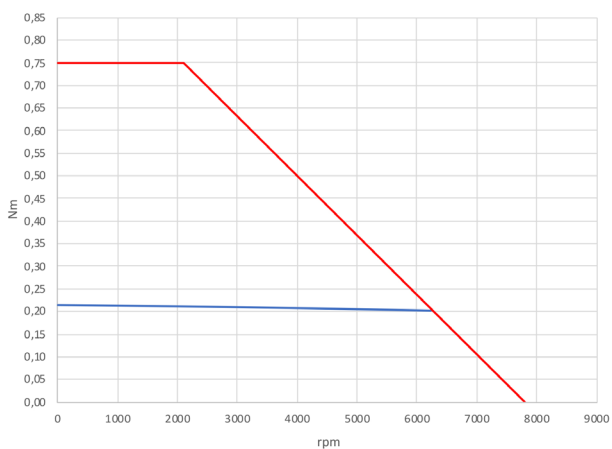
— Cn — Cmax



401A 33

Operative curves at 48 Vdc

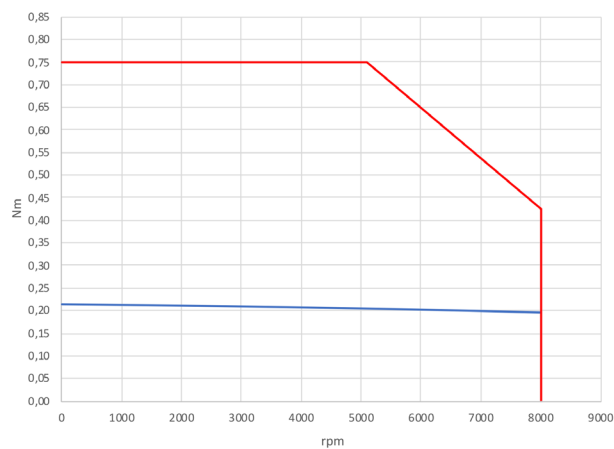
— Cn — Cmax



401A 09

Operative curves at 230 Vac

— Cn — Cmax



Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.
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RATINGS and SPECIFICATION

			24 Vdc	48 Vdc		230 Vac	
TYPE OF WINDING			77	78	33	13	13
ELECTRICAL DATA							
Continuous stall torque (*)	M_o	[Nm]	0.37	0.409			
Peak torque	M_{Max}	[Nm]	0.785	1.38	1.18	1.38	
Nominal torque	M_n	[Nm]	0.360	0.395	0.37	0.395	0.37
Nominal power	P_n	[W]	125	125	230	125	230
Continuous stall current	I_o	[Arms]	8.95	4.95	6.18	0.90	0.90
Maximum current	I_{Max}	[Arms]	20.00	19.40	20.00	3.53	3.53
Nominal current	I_n	[Arms]	8.71	4.78	5.59	0.87	0.81
Nominal working speed	n_N	[rpm]	3000	3000	6000	3000	6000
Maximum working speed	n_{Max}	[rpm]	6250	6250	8000	7890	7800
Torque constant	K_t	[Nm/Arms]	0.041	0.083	0.066	0.455	0.455
Voltage constant	$K_{e \text{ u-v}}$	[Vrms/krpm]	2.5	5.0	4.0	27.5	27.5
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	0.253	1.019	0.632	30.85	30.85
Winding inductance	$L_{q \text{ u-v}}$	[mH]	0.149	0.596	0.361	17.68	17.68
Electrical time constant	T_e	[ms]	0.59	0.59	0.57	0.57	0.57
Thermal resistance	R_{th}	[°C/W]	1.85				
Mechanical time constant (a)	T_m	[ms]	0.83	0.83	0.81	0.83	0.83
Rotor inertia without holding brake	J	[kg·cm ²]	0.0561				
Rotor inertia with holding brake	J	[kg·cm ²]	0.0580				
Mass without holding brake	m	[kg]	0.49				
Mass with holding brake	m	[kg]	0.68				
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	45 / 35				
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	120 / 95				

Rated output with 185 x 185 x 8 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

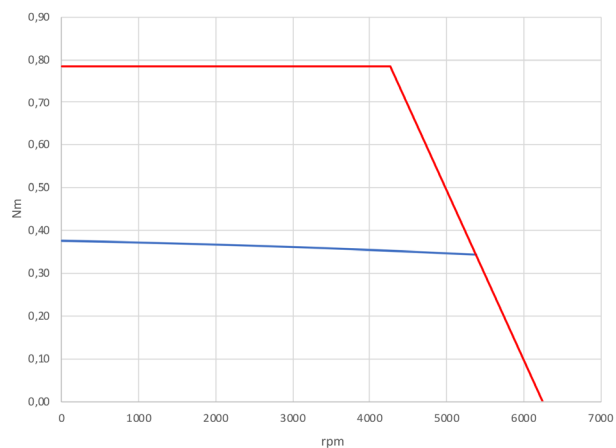
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

401B 77

Operative curves at 24 Vdc

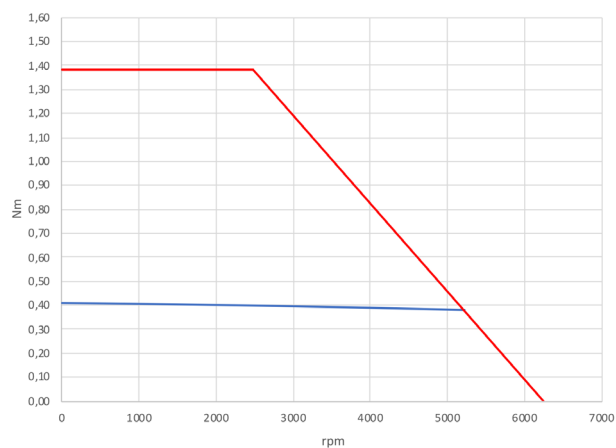
— Cn — Cmax



401B 78

Operative curves at 48 Vdc

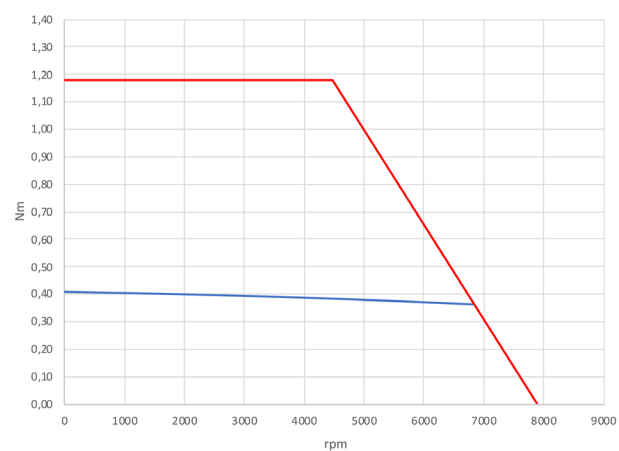
— Cn — Cmax



401B 33

Operative curves at 48 Vdc

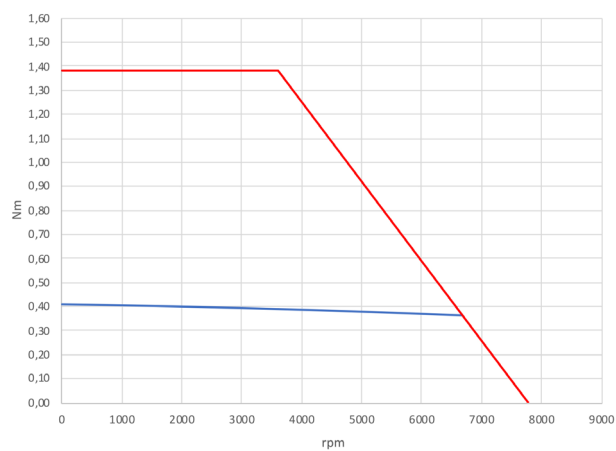
— Cn — Cmax



401B 13

Operative curves at 230 Vac

— Cn — Cmax



Operative temperature -20 ÷ +40 °C

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Model	Feedback tipe	L [mm]	L with brake [mm]	Z [mm]	Z with brake [mm]
1A	N1-M1-M2	66.0	89.0	40.0	40.0
1B	N1-M1-M2	82.0	105.0	56.0	56.0



The background features large, stylized, semi-transparent letters 'W' and 'P' in shades of gray, positioned diagonally across the page.

TETRA
COMPACT4 60

			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_o	[Nm]	0.87			
Peak torque	M_{Max}	[Nm]	3.05			
Nominal torque	M_n	[Nm]	0.85	0.82	0.85	0.82
Nominal power	P_n	[W]	265	490	265	490
Continuous stall current	I_o	[Arms]	1.20	1.65	0.73	0.96
Maximum current	I_{Max}	[Arms]	5.23	7.24	3.18	4.19
Nominal current	I_n	[Arms]	1.17	1.56	0.71	0.90
Nominal working speed	n_N	[rpm]	3000	5700	3000	5700
Maximum working speed	n_{Max}	[rpm]	4850	6760	5140	6800
Torque constant	K_t	[Nm/Arms]	0.728	0.526	1.20	0.91
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	20.19	10.24	51.62	31.75
Winding inductance	$L_{q\ u-v}$	[mH]	28.32	14.93	77.18	44.50
Electrical time constant	T_e	[ms]	1.40	1.46	1.50	1.40
Thermal resistance	R_{th}	[°C/W]	1.60			
Mechanical time constant (a)	T_m	[ms]	0.85	0.83	0.80	0.86
Rotor inertia without holding brake	J	[kg·cm ²]	0.223			
Rotor inertia with holding brake	J	[kg·cm ²]	0.236			
Mass without holding brake	m	[kg]	0.92			
Mass with holding brake	m	[kg]	1.44			
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	42 / 32			
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	260 / 200			

Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

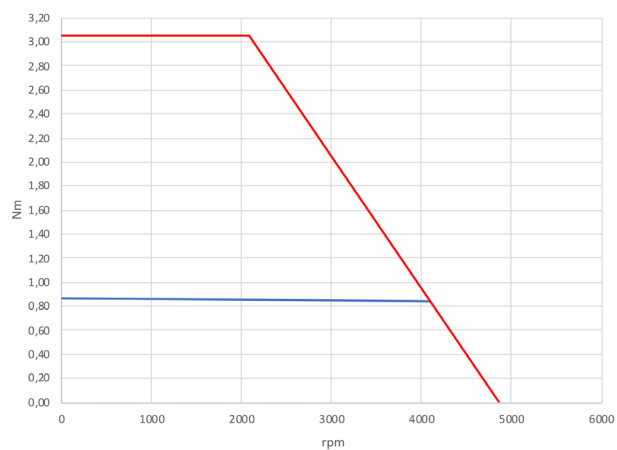
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

602A 20

Operative curves at 230 Vac

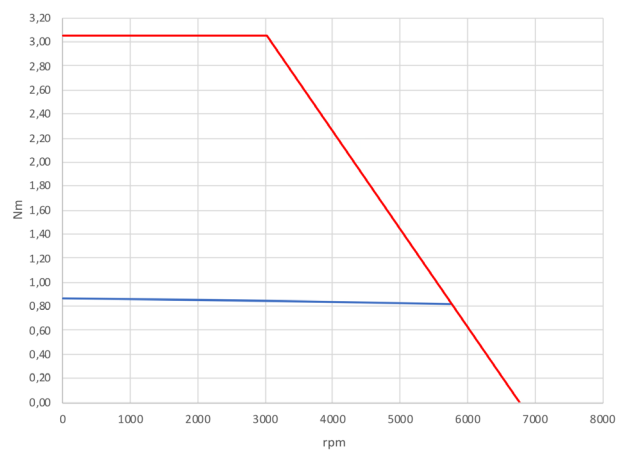
— Cn — Cmax



602A 21

Operative curves at 230 Vac

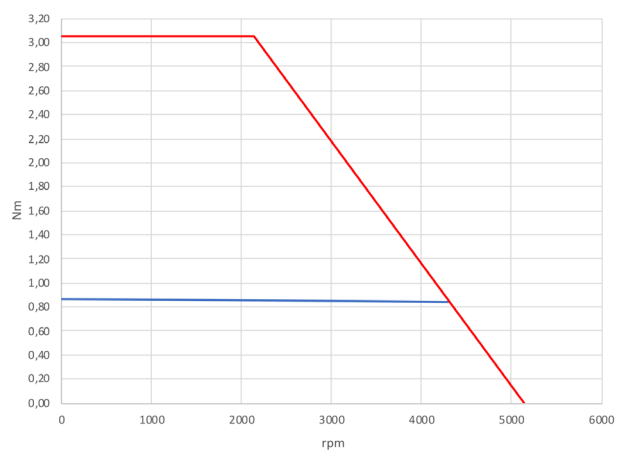
— Cn — Cmax



602A 16

Operative curves at 400 Vac

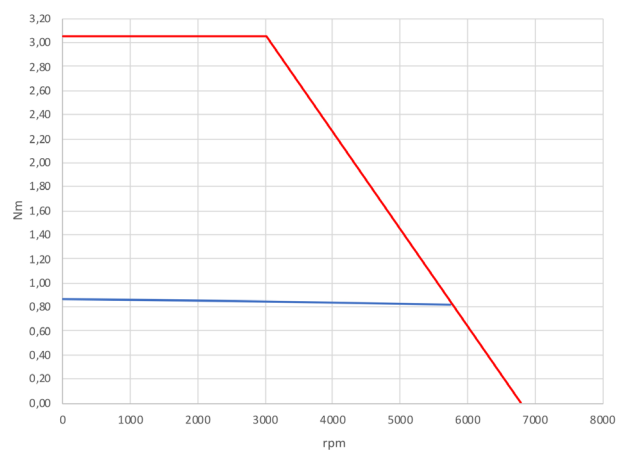
— Cn — Cmax



602A 15

Operative curves at 400 Vac

— Cn — Cmax



Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.
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			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_o	[Nm]	1.62			
Peak torque	M_{Max}	[Nm]	5.60			
Nominal torque	M_n	[Nm]	1.52	1.35	1.52	1.35
Nominal power	P_n	[W]	475	850	475	850
Continuous stall current	I_o	[Arms]	2.23	3.08	1.35	1.78
Maximum current	I_{Max}	[Arms]	8.92	12.34	5.41	7.13
Nominal current	I_n	[Arms]	2.09	2.57	1.27	1.48
Nominal working speed	n_N	[rpm]	3000	6000	3000	6000
Maximum working speed	n_{Max}	[rpm]	4890	6800	5170	6840
Torque constant	K_t	[Nm/Arms]	0.728	0.526	1.20	0.91
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	7.35	3.85	19.55	11.77
Winding inductance	$L_{q\ u-v}$	[mH]	14.76	7.75	40.29	22.93
Electrical time constant	T_e	[ms]	2.02	2.02	2.07	1.96
Thermal resistance	R_{th}	[°C/W]	1.24			
Mechanical time constant (a)	T_m	[ms]	0.57	0.57	0.56	0.59
Rotor inertia without holding brake	J	[kg·cm ²]	0.414			
Rotor inertia with holding brake	J	[kg·cm ²]	0.427			
Mass without holding brake	m	[kg]	1.33			
Mass with holding brake	m	[kg]	1.85			
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	42 / 32			
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	260 / 200			

Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

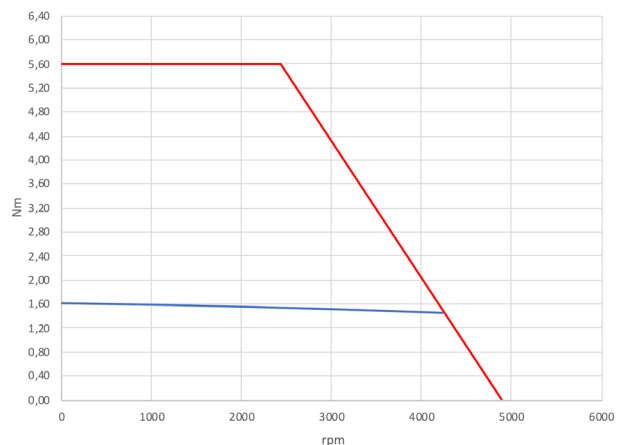
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

602B 20

Operative curves at 230 Vac

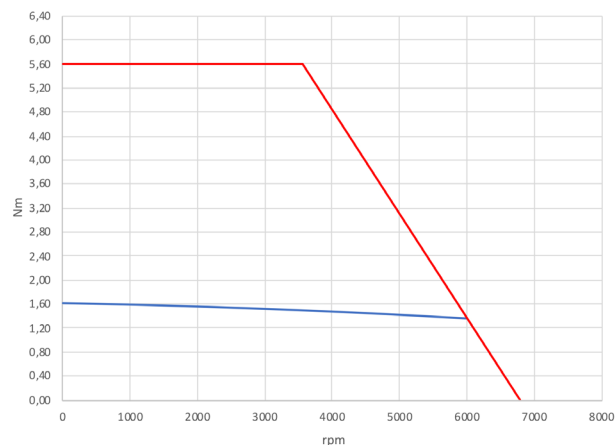
— Cn — Cmax



602B 21

Operative curves at 230 Vac

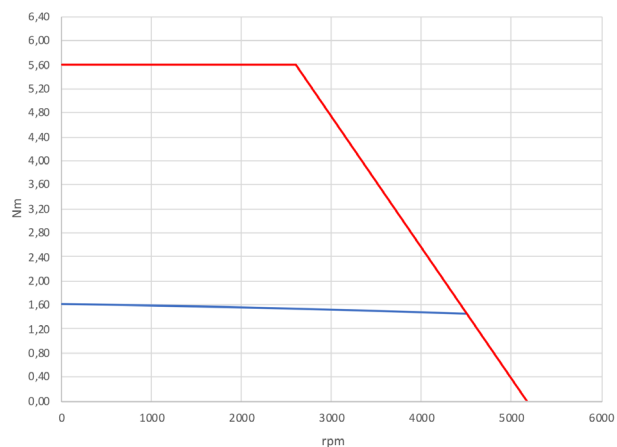
— Cn — Cmax



602B 16

Operative curves at 400 Vac

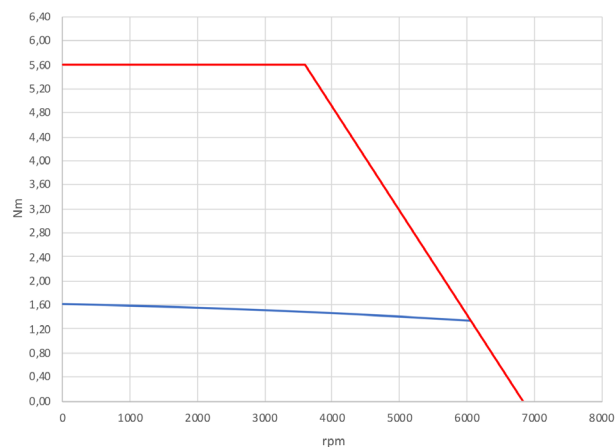
— Cn — Cmax



602B 15

Operative curves at 400 Vac

— Cn — Cmax



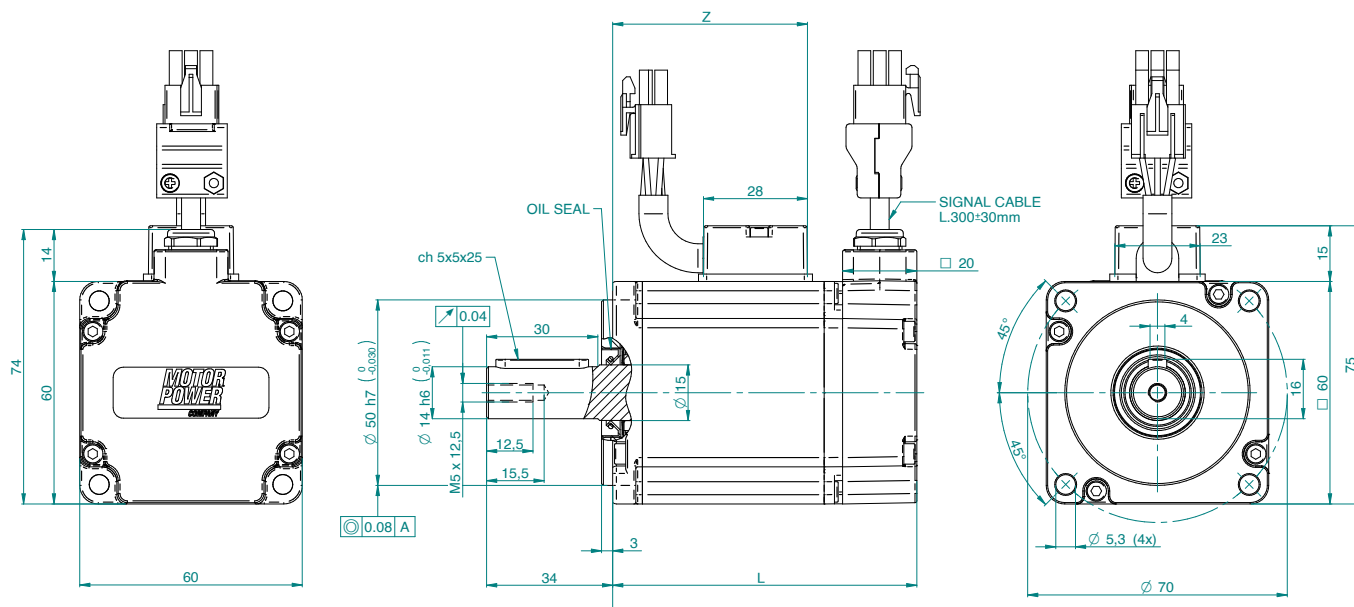
Operative temperature -20 ÷ +40 °C

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60 EXTERNAL DIMENSIONS

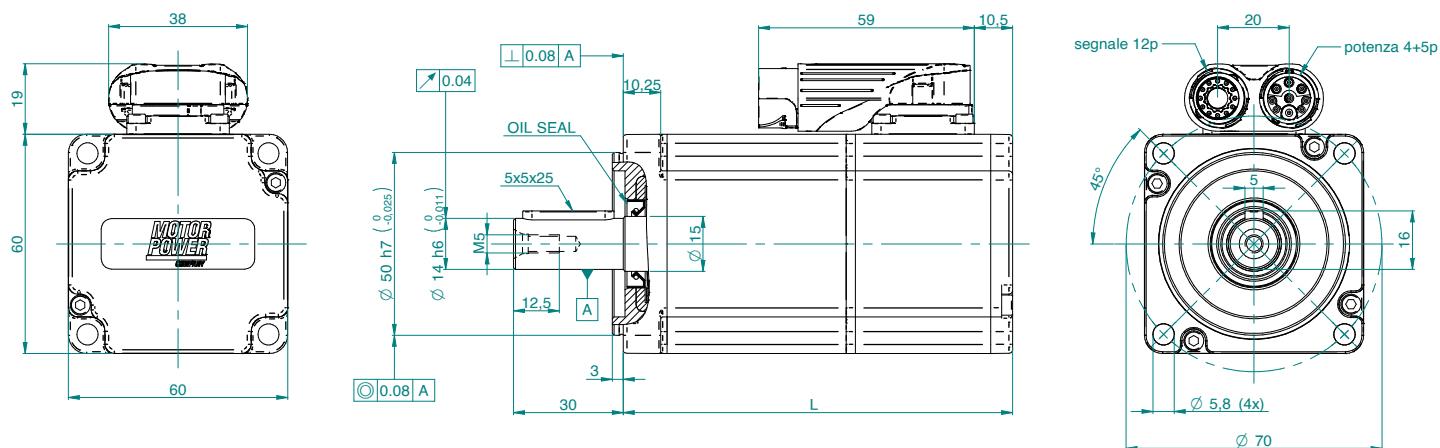
D0/D2 connection

Model	Feedback tipe	L [mm]	L with brake [mm]	Z [mm]	Z with brake [mm]
2A	N1-M1-M2	82.0	112.0	52.5	52.5
2B	N1-M1-M2	105.0	135.0	75.5	75.5



G11/H11 connection

Model	Feedback tipe	L [mm]	L with brake [mm]
2A	A22-A23-M1-M2-N1-R1	106.5	136.0
2B	A22-A23-M1-M2-N1-R1	129.5	159.0
2A	A1-A15-A16	116.5	146.0
2B	A1-A15-A16	139.5	169.0



The background features large, stylized, semi-transparent letters 'W' and 'P' in a light gray color, positioned diagonally across the page. A solid red vertical bar runs along the right edge of the image.

TETRA COMPACT480

			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_o	[Nm]	1.80			
Peak torque	M_{Max}	[Nm]	6.30			
Nominal torque	M_n	[Nm]	1.78	1.59	1.78	1.59
Nominal power	P_n	[W]	555	950	555	950
Continuous stall current	I_o	[Arms]	2.47	3.42	1.50	1.98
Maximum current	I_{Max}	[Arms]	12.53	17.33	7.60	10.02
Nominal current	I_n	[Arms]	2.45	3.02	1.48	1.75
Nominal working speed	n_N	[rpm]	3000	5700	3000	5700
Maximum working speed	n_{Max}	[rpm]	4875	6780	5150	6820
Torque constant	K_t	[Nm/Arms]	0.728	0.526	1.20	0.91
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	6.84	3.43	17.60	10.35
Winding inductance	$L_{q\ u-v}$	[mH]	18.50	9.66	50.18	29.00
Electrical time constant	T_e	[ms]	2.71	2.81	2.84	2.80
Thermal resistance	R_{th}	[°C/W]	1.09			
Mechanical time constant (a)	T_m	[ms]	1.02	0.98	0.97	1.03
Rotor inertia without holding brake	J	[kg·cm²]	0.79			
Rotor inertia with holding brake	J	[kg·cm²]	0.86			
Mass without holding brake	m	[kg]	1.83			
Mass with holding brake	m	[kg]	2.62			
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	115 / 90			
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	440 / 350			

Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

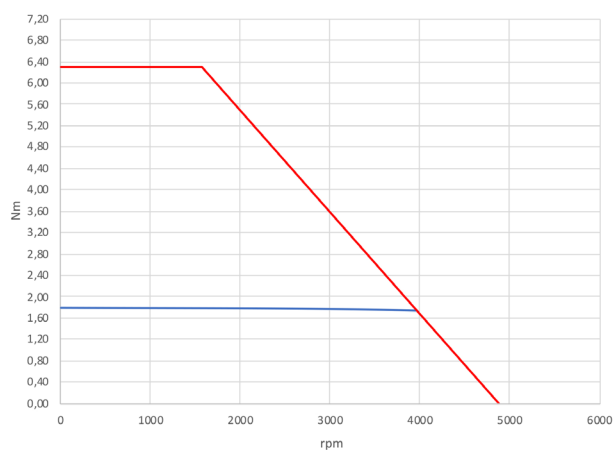
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

803A 20

Operative curves at 230 Vac

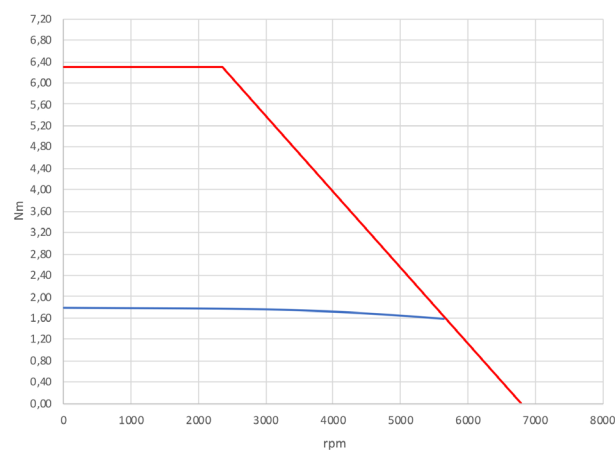
— Cn — Cmax



803A 21

Operative curves at 230 Vac

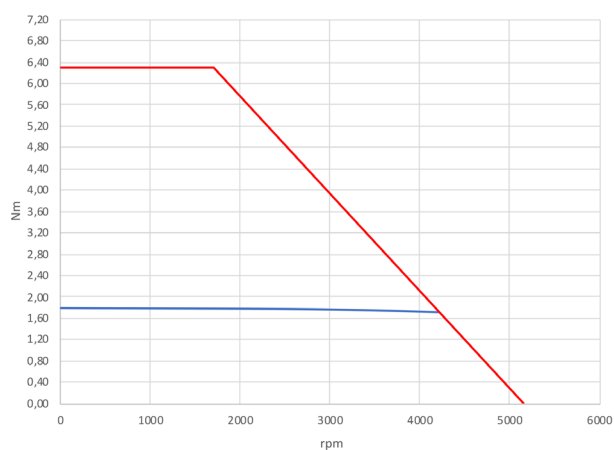
— Cn — Cmax



803A 16

Operative curves at 400 Vac

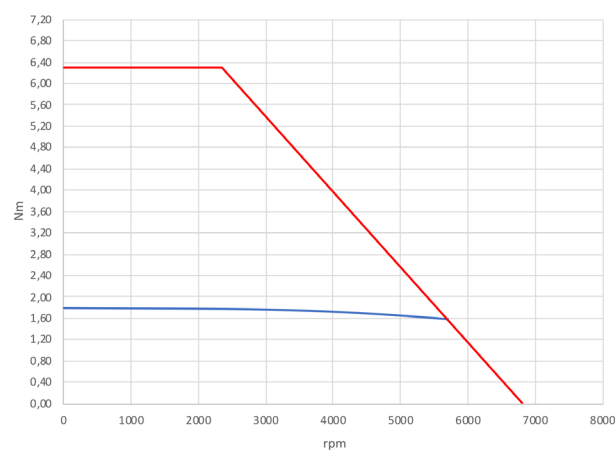
— Cn — Cmax



803A 15

Operative curves at 400 Vac

— Cn — Cmax



Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.
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			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_o	[Nm]	3.80			
Peak torque	M_{Max}	[Nm]	13.30			
Nominal torque	M_n	[Nm]	3.45	2.60	3.45	2.60
Nominal power	P_n	[W]	1080	1630	1080	1630
Continuous stall current	I_o	[Arms]	5.22	7.22	3.17	4.18
Maximum current	I_{Max}	[Arms]	23.83	32.97	14.46	19.06
Nominal current	I_n	[Arms]	4.74	4.94	2.88	2.86
Nominal working speed	n_N	[rpm]	3000	6000	3000	6000
Maximum working speed	n_{Max}	[rpm]	4915	6830	5190	6870
Torque constant	K_t	[Nm/Arms]	0.728	0.526	1.20	0.91
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	1.62	0.88	4.29	2.60
Winding inductance	$L_{q\ u-v}$	[mH]	7.76	4.02	20.86	12.31
Electrical time constant	T_e	[ms]	4.87	4.63	4.95	4.70
Thermal resistance	R_{th}	[°C/W]	0.90			
Mechanical time constant (a)	T_m	[ms]	0.43	0.45	0.42	0.44
Rotor inertia without holding brake	J	[kg·cm ²]	1.42			
Rotor inertia with holding brake	J	[kg·cm ²]	1.50			
Mass without holding brake	m	[kg]	2.76			
Mass with holding brake	m	[kg]	3.37			
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	115 / 90			
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	440 / 350			

Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

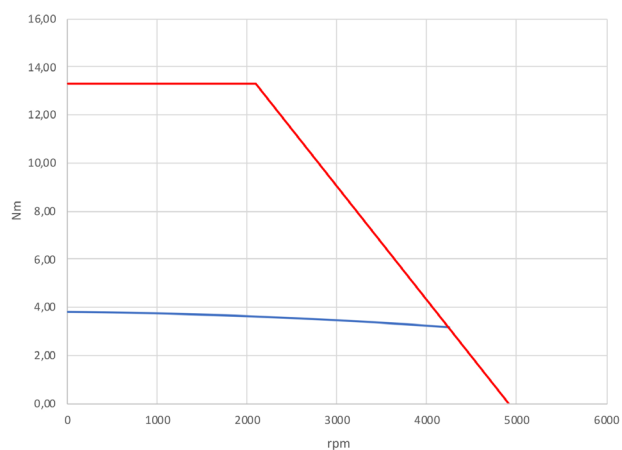
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

803B 20

Operative curves at 230 Vac

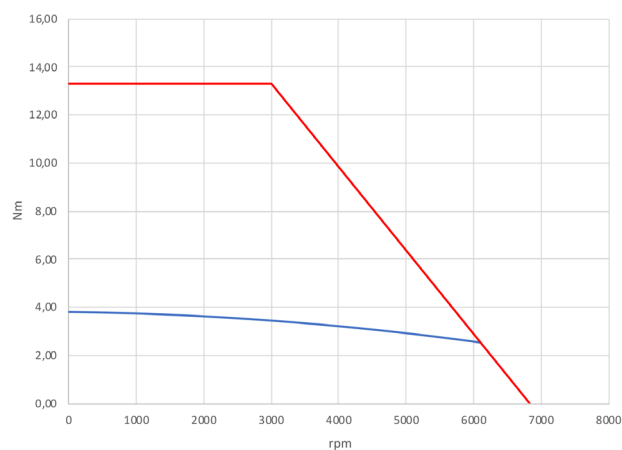
— Cn — Cmax



803B 21

Operative curves at 230 Vac

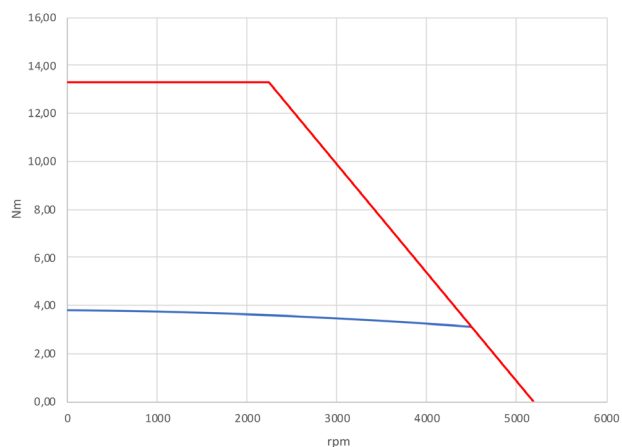
— Cn — Cmax



803B 16

Operative curves at 400 Vac

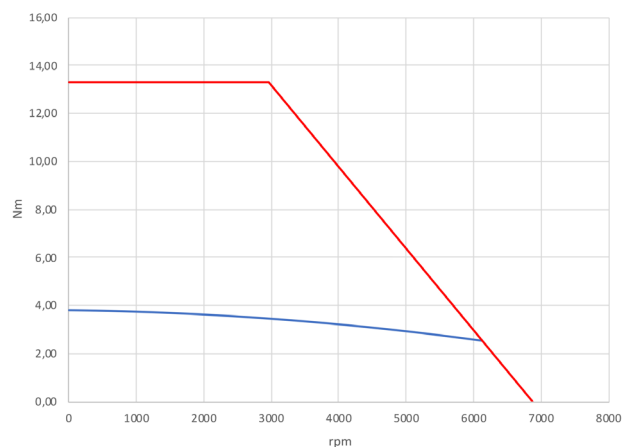
— Cn — Cmax



803B 15

Operative curves at 400 Vac

— Cn — Cmax



Operative temperature -20 ÷ +40 °C

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			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_o	[Nm]	4.60			
Peak torque	M_{Max}	[Nm]	16.10			
Nominal torque	M_n	[Nm]	3.91	2.88	3.91	2.88
Nominal power	P_n	[W]	1230	1800	1230	1800
Continuous stall current	I_o	[Arms]	6.32	8.75	3.84	5.06
Maximum current	I_{Max}	[Arms]	27.31	37.79	16.58	21.85
Nominal current	I_n	[Arms]	5.37	5.48	3.26	3.17
Nominal working speed	n_N	[rpm]	3000	6000	3000	6000
Maximum working speed	n_{Max}	[rpm]	4920	6840	5200	6880
Torque constant	K_t	[Nm/Arms]	0.728	0.526	1.20	0.91
Voltage constant	$K_{e\ u-v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	R_{u-v}	[Ohm]	1.28	0.68	3.41	2.05
Winding inductance	$L_{q\ u-v}$	[mH]	5.89	3.20	16.20	9.40
Electrical time constant	Te	[ms]	4.61	4.72	4.76	4.60
Thermal resistance	R_{th}	[°C/W]	0.88			
Mechanical time constant (a)	T_m	[ms]	0.49	0.50	0.48	0.50
Rotor inertia without holding brake	J	[kg·cm ²]	2.03			
Rotor inertia with holding brake	J	[kg·cm ²]	2.11			
Mass without holding brake	m	[kg]	3.25			
Mass with holding brake	m	[kg]	3.87			
Max. axial shaft load 3000 / 6000 rpm	SL_a	[N]	115 / 90			
Max. radial shaft load 3000 / 6000 rpm	SL_r	[N]	440 / 350			

Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.

(*) without brake.

(a) without brake and without feedback.

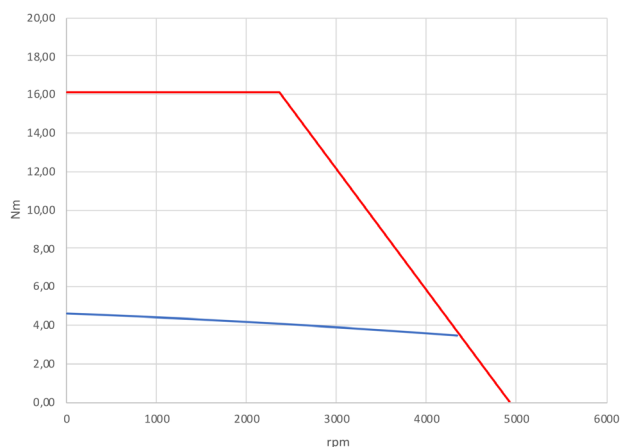
Current values rated @ 20°C.

TORQUE/SPEED CHARTS

803C 20

Operative curves at 230 Vac

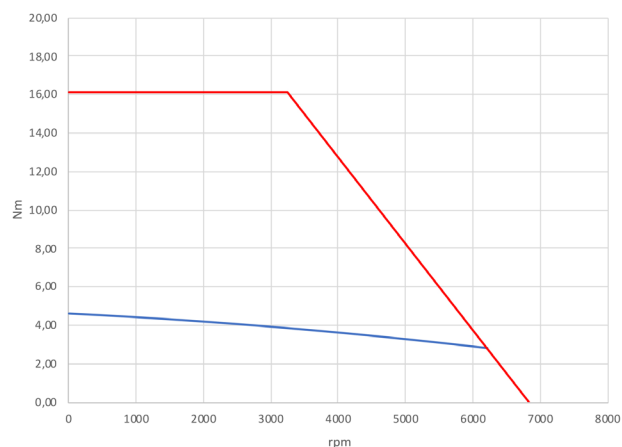
— Cn — Cmax



803C 21

Operative curves at 230 Vac

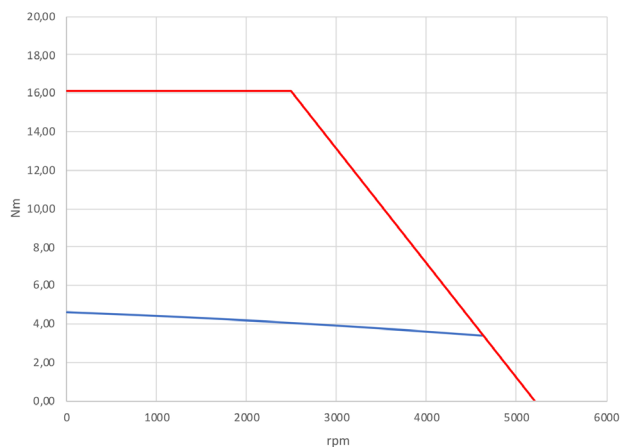
— Cn — Cmax



803C 16

Operative curves at 400 Vac

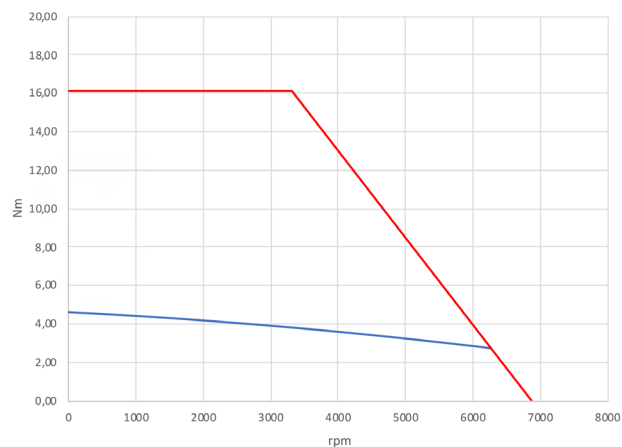
— Cn — Cmax



803C 15

Operative curves at 400 Vac

— Cn — Cmax

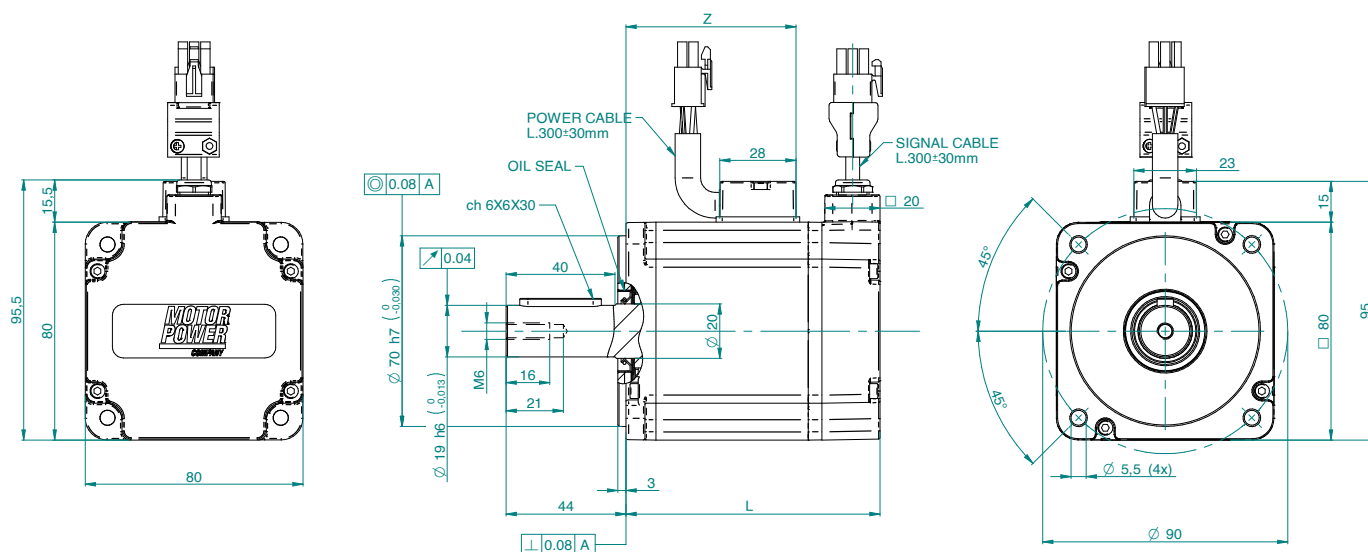


Operative temperature -20 ÷ +40 °C

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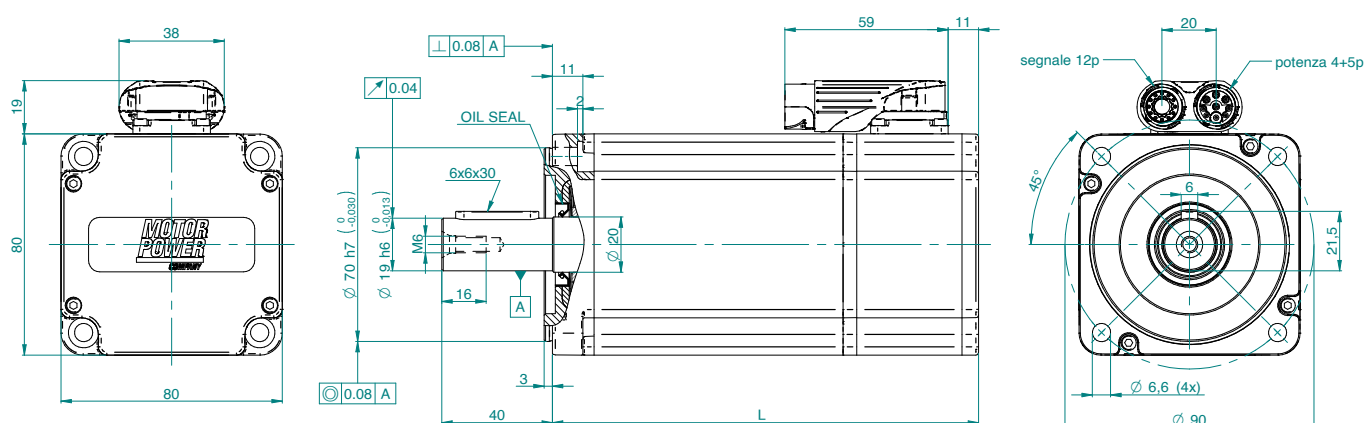
D0/D2 connection

Model	Feedback tipe	L [mm]	L with brake [mm]	Z [mm]	Z with brake [mm]
3A	N1-M1-M2-R1	93.0	125.0	62.5	62.5
3B	N1-M1-M2-R1	115.0	147.0	84.5	84.5
3C	N1-M1-M2-R1	127.0	159.0	96.0	96.0
3A	A1	120.0	152.0	62.5	62.5
3B	A1	142.0	174.0	84.5	84.5
3C	A1	154.0	186.0	96.0	96.0



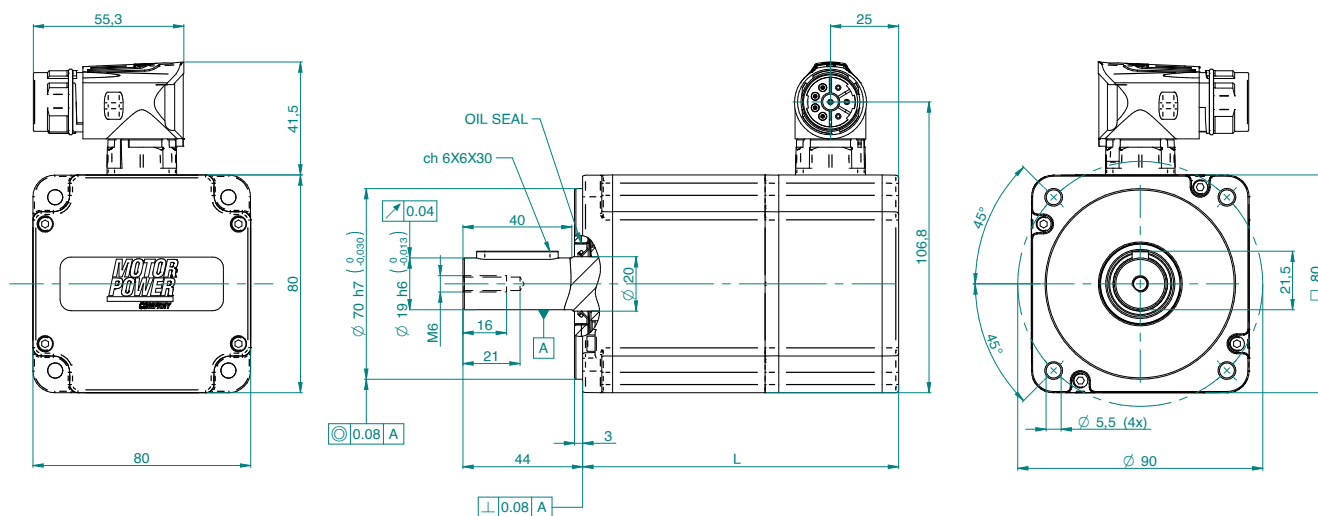
G11/H11 connection

Model	Feedback tipe	L [mm]	L with brake [mm]
3A	A22-A23-M1-M2-N1-R1	120.0	149.0
3B	A22-A23-M1-M2-N1-R1	142.0	171.0
3C	A22-A23-M1-M2-N1-R1	154.0	183.0
3A	A1-A15-A16	130.0	159.0
3B	A1-A15-A16	152.0	181.0
3C	A1-A15-A16	164.0	193.0



C21 connection

Model	Feedback tipe	L [mm]	L with brake [mm]
3A	A22-A23	116.0	145.0
3B	A22-A23	138.0	167.0
3C	A22-A23	150.0	179.0
3A	A3-A4-A5-A6-A15-A16	126.0	155.0
3B	A3-A4-A5-A6-A15-A16	148.0	177.0
3C	A3-A4-A5-A6-A15-A16	160.0	189.0



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TETRA
COMPACT

4 100

100 4A RATINGS and SPECIFICATION

			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	6.45		
Peak torque	M _{Max}	[Nm]	16.5		
Nominal torque	M _n	[Nm]	5.8	4.38	5.8
Nominal power	P _n	[W]	1820	2520	1820
Continuous stall current	I ₀	[Arms]	7.09	7.09	4.03
Maximum current	I _{Max}	[Arms]	25.12	25.12	14.29
Nominal current	I _n	[Arms]	6.38	4.81	3.63
Nominal working speed	n _N	[rpm]	3000	5500	3000
Maximum working speed	n _{Max}	[rpm]	3880	6000	3850
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	1.50	1.50	4.20
Winding inductance	L _{q u-v}	[mH]	14.28	14.28	44.43
Electrical time constant	Te	[ms]	9.54	9.54	10.58
Thermal resistance	Rth	[°C/W]	0.63		
Mechanical time constant (a)	Tm	[ms]	0.46	0.46	0.41
Rotor inertia without holding brake	J	[kg·cm²]	2.53		
Rotor inertia with holding brake	J	[kg·cm²]	2.65		
Mass without holding brake	m	[kg]	5.55		
Mass with holding brake	m	[kg]	6.60		
Max. axial shaft load 3000 / 6000 rpm	SL _a	[N]	245 / 140		
Max. radial shaft load 3000 / 6000 rpm	SL _r	[N]	690 / 540		

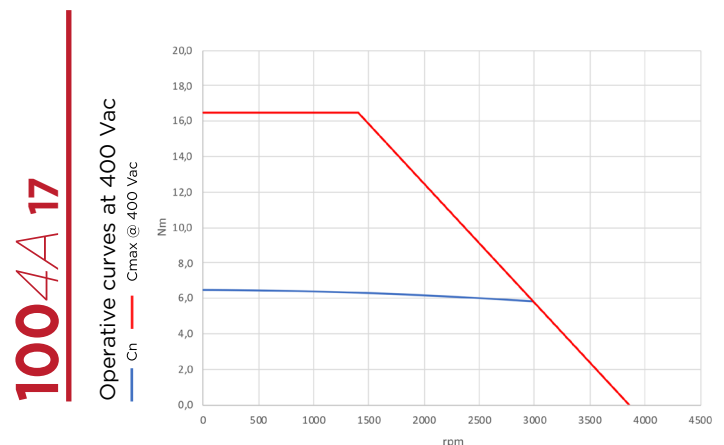
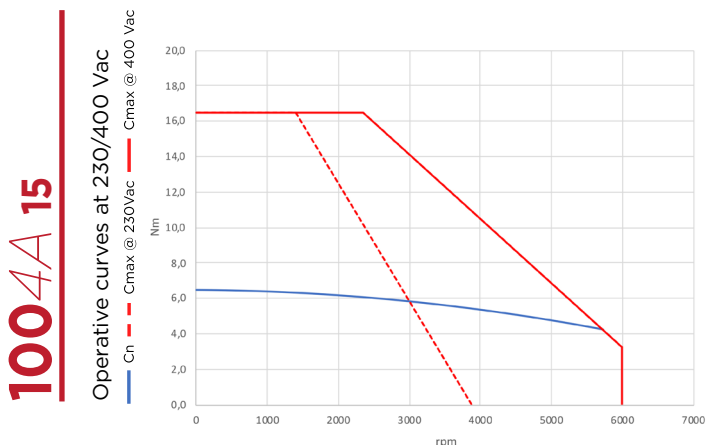
Rated output with 300 x 300 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake.

(a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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100 4B RATINGS and SPECIFICATION

			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	10.16		
Peak torque	M _{Max}	[Nm]	33.00		
Nominal torque	M _n	[Nm]	8.36	6.08	8.36
Nominal power	P _n	[W]	2620	3820	2620
Continuous stall current	I ₀	[Arms]	11.17	11.17	6.35
Maximum current	I _{Max}	[Arms]	50.66	50.66	28.82
Nominal current	I _n	[Arms]	9.19	6.68	5.23
Nominal working speed	n _N	[rpm]	3000	6000	3000
Maximum working speed	n _{Max}	[rpm]	3900	6000	3860
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.61	0.61	1.94
Winding inductance	L _{q u-v}	[mH]	7.14	7.14	22.22
Electrical time constant	Te	[ms]	11.63	11.63	11.46
Thermal resistance	Rth	[°C/W]	0.48		
Mechanical time constant (a)	Tm	[ms]	0.34	0.34	0.35
Rotor inertia without holding brake	J	[kg·cm ²]	4.61		
Rotor inertia with holding brake	J	[kg·cm ²]	4.73		
Mass without holding brake	m	[kg]	8.09		
Mass with holding brake	m	[kg]	9.14		
Max. axial shaft load 3000 / 6000 rpm	SL _a	[N]	245 / 140		
Max. radial shaft load 3000 / 6000 rpm	SL _r	[N]	690 / 540		

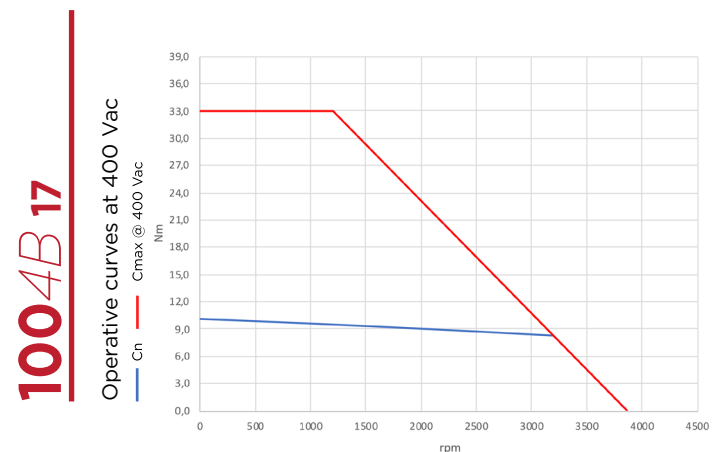
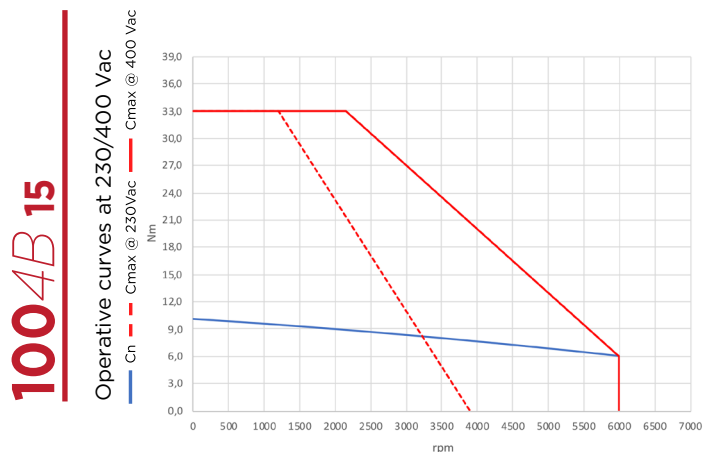
Rated output with 300 x 300 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake.

(a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.
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The background features large, semi-transparent, grey letters 'W' and 'P' that are slightly tilted. The 'W' is positioned above the 'P'.

TETRA
COMPACT

4

130

130 5F RATINGS and SPECIFICATION

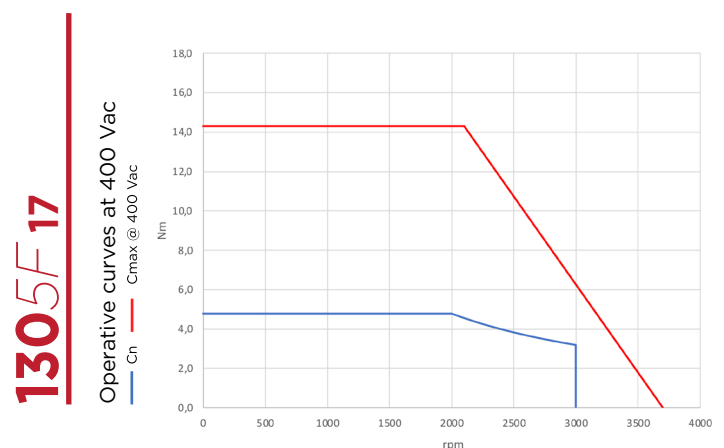
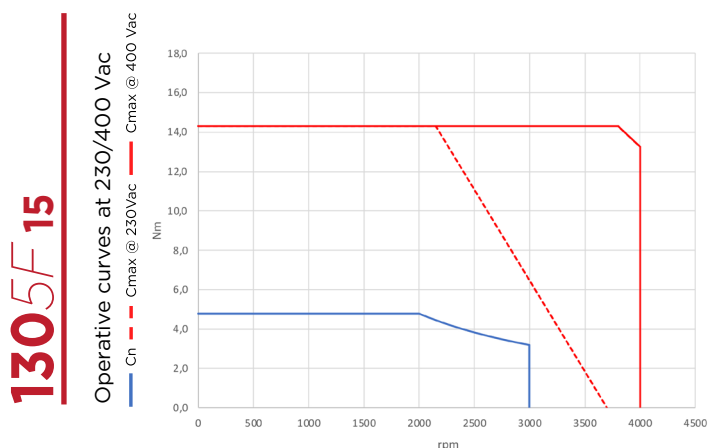
		230 Vac		400 Vac	
TYPE OF WINDING		15		15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	4.77		
Peak torque	M _{Max}	[Nm]	14.3		
Nominal torque	M _n	[Nm]	3.18		
Nominal power	P _n	[W]	1000		
Continuous stall current	I ₀	[Arms]	5.24	5.24	2.98
Maximum current	I _{Max}	[Arms]	18.28	18.28	10.40
Nominal current	I _n	[Arms]	3.50	3.50	1.99
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.81	0.81	2.46
Winding inductance	L _{q u-v}	[mH]	9.37	9.37	29.20
Electrical time constant	Te	[ms]	11.53	11.53	11.85
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.66	0.66	0.65
Rotor inertia without holding brake	J	[kg·cm²]	6.70		
Rotor inertia with holding brake	J	[kg·cm²]	7.95		
Mass without holding brake	m	[kg]	7.35		
Mass with holding brake	m	[kg]	8.87		
Max. axial shaft load 3000 rpm	SL _a	[N]	230		
Max. radial shaft load 3000 rpm	SL _r	[N]	1200		

Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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130 5G RATINGS and SPECIFICATION

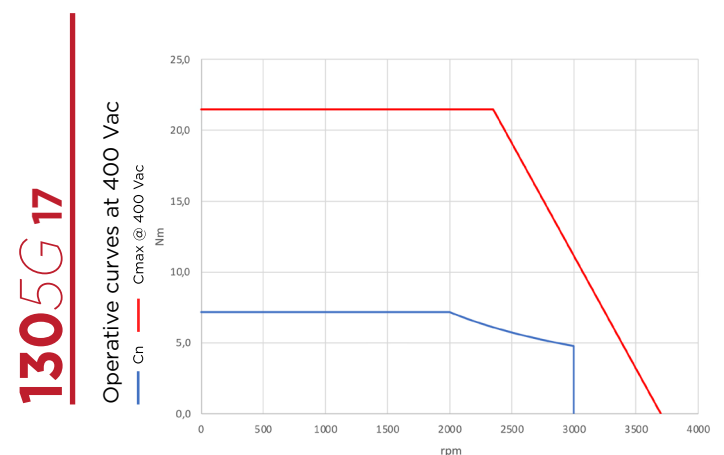
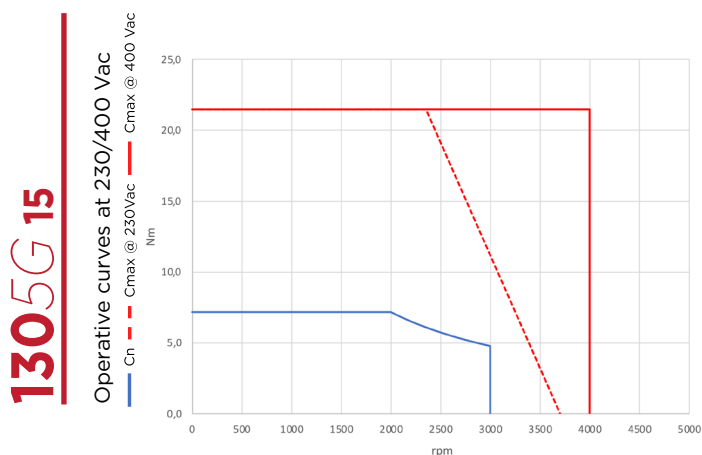
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	7.16		
Peak torque	M _{Max}	[Nm]	21.48		
Nominal torque	M _n	[Nm]	4.78		
Nominal power	P _n	[W]	1500		
Continuous stall current	I ₀	[Arms]	7.87	7.87	4.48
Maximum current	I _{Max}	[Arms]	26.83	26.83	15.26
Nominal current	I _n	[Arms]	5.24	5.24	2.98
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.51	0.51	1.54
Winding inductance	L _{q u-v}	[mH]	5.69	5.69	17.42
Electrical time constant	Te	[ms]	11.29	11.29	11.32
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.59	0.59	0.58
Rotor inertia without holding brake	J	[kg·cm ²]	9.72		
Rotor inertia with holding brake	J	[kg·cm ²]	10.98		
Mass without holding brake	m	[kg]	8.80		
Mass with holding brake	m	[kg]	10.32		
Max. axial shaft load 2000 rpm	SL _a	[N]	230		
Max. radial shaft load 2000 rpm	SL _r	[N]	1200		

Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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130 5H RATINGS and SPECIFICATION

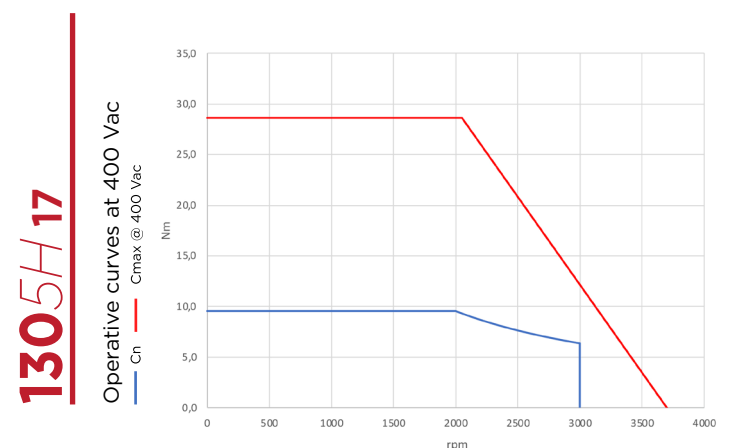
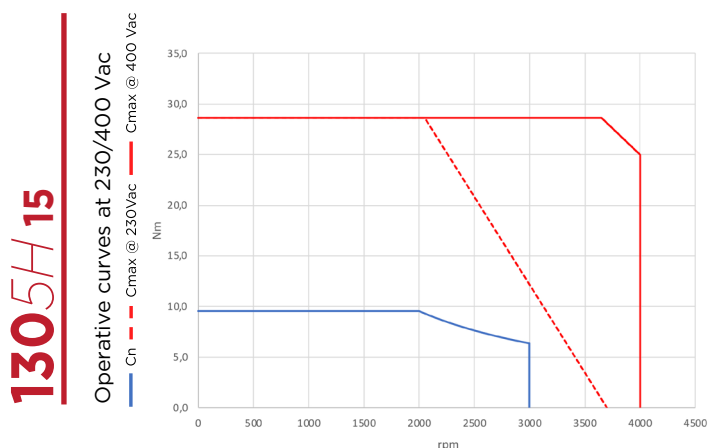
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	9.55		
Peak torque	M _{Max}	[Nm]	28.65		
Nominal torque	M _n	[Nm]	6.37		
Nominal power	P _n	[W]	2000		
Continuous stall current	I ₀	[Arms]	10.50	10.50	5.97
Maximum current	I _{Max}	[Arms]	35.00	35.00	19.90
Nominal current	I _n	[Arms]	7.00	7.00	3.98
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.35	0.35	1.02
Winding inductance	L _{q u-v}	[mH]	4.33	4.33	13.27
Electrical time constant	Te	[ms]	12.19	12.19	13.02
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.55	0.55	0.51
Rotor inertia without holding brake	J	[kg·cm ²]	12.77		
Rotor inertia with holding brake	J	[kg·cm ²]	14.04		
Mass without holding brake	m	[kg]	10.54		
Mass with holding brake	m	[kg]	12.68		
Max. axial shaft load 2000 rpm	SL _a	[N]	230		
Max. radial shaft load 2000 rpm	SL _r	[N]	1200		

Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

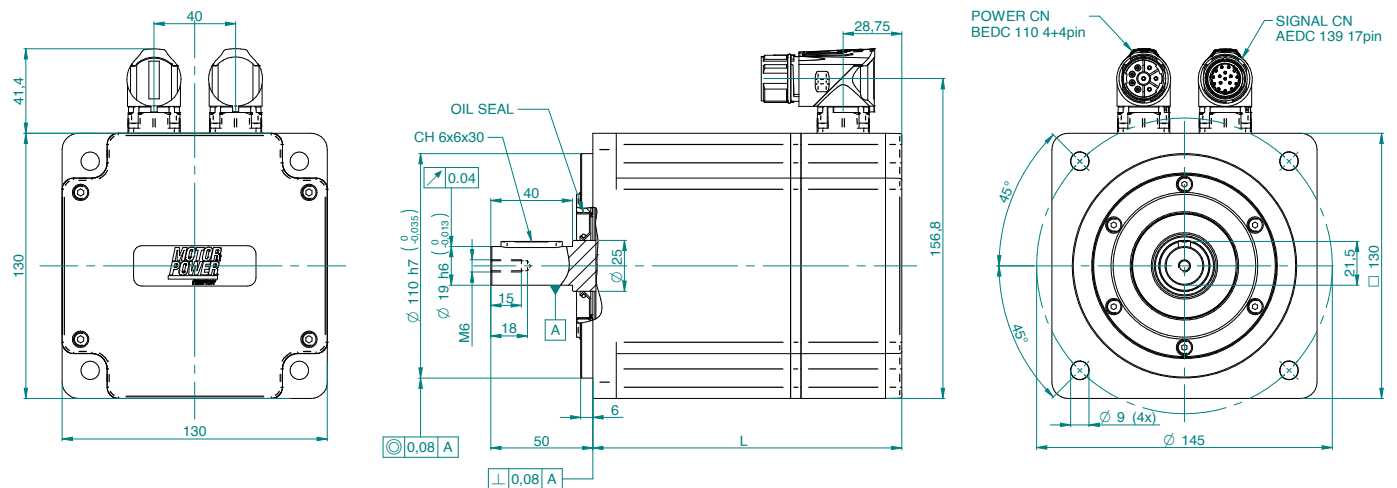
TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

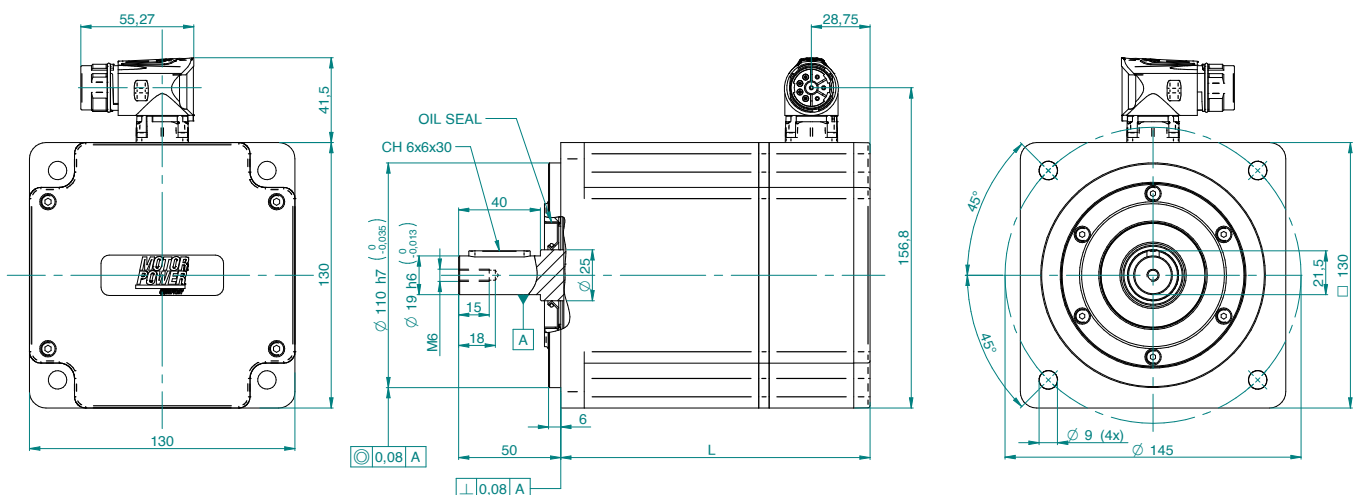
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Model	Feedback tipe	L [mm]	L with brake [mm]
5F	A22-A23-M1-M2	151.5	180.0
5G	A22-A23-M1-M2	167.5	196.0
5H	A22-A23-M1-M2	184.5	210.0
5F	A1-A15-A16-R1	167.5	196.0
5G	A1-A15-A16-R1	183.5	212.0
5H	A1-A15-A16-R1	200.5	226.0



Model		Feedback tipe	L [mm]	L with brake [mm]
5F		A22-A23	151.5	180.0
5G		A22-A23	167.5	196.0
5H		A22-A23	184.5	205.0



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150 6A RATINGS and SPECIFICATION

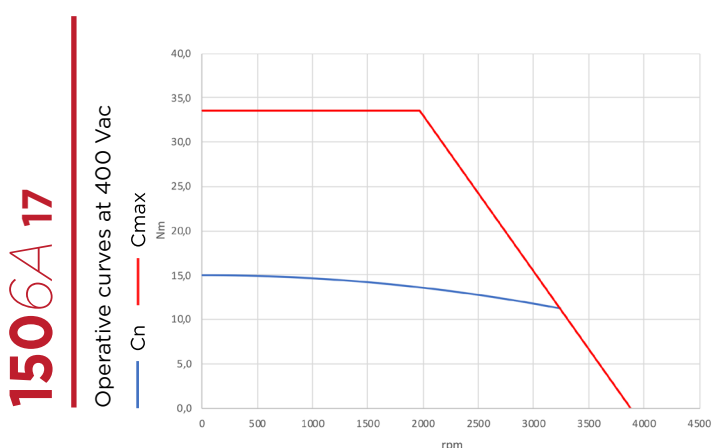
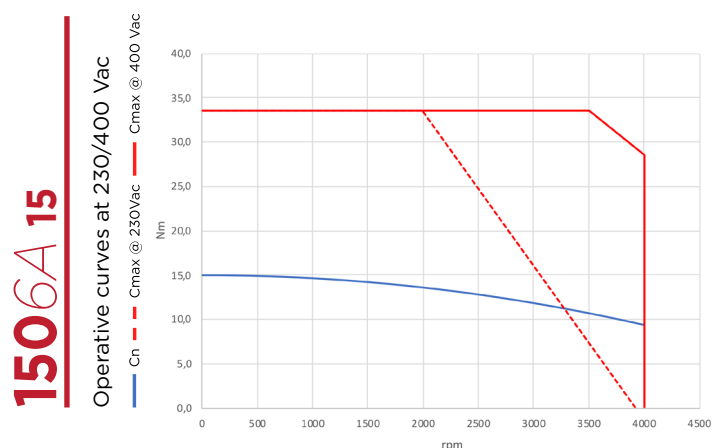
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M _o	[Nm]	15.0		
Peak torque	M _{Max}	[Nm]	33.5		
Nominal torque	M _n	[Nm]	11.8		
Nominal power	P _n	[W]	3715		
Continuous stall current	I _o	[Arms]	16.49	16.49	9.38
Maximum current	I _{Max}	[Arms]	44.91	44.91	25.54
Nominal current	I _n	[Arms]	12.97	12.97	7.38
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3920	4000	3880
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.31	0.31	0.95
Winding inductance	L _{q u-v}	[mH]	4.47	4.47	13.82
Electrical time constant	Te	[ms]	14.28	14.28	14.49
Thermal resistance	Rth	[°C/W]	0.53		
Mechanical time constant (a)	Tm	[ms]	0.57	0.57	0.57
Rotor inertia without holding brake	J	[kg·cm²]	15.18		
Rotor inertia with holding brake	J	[kg·cm²]	16.55		
Mass without holding brake	m	[kg]	13.68		
Mass with holding brake	m	[kg]	17.20		
Max. axial shaft load 3000 rpm	SL _a	[N]	420		
Max. radial shaft load 3000 rpm	SL _r	[N]	1750		

Rated output with 475 x 475 x 20 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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150 6B RATINGS and SPECIFICATION

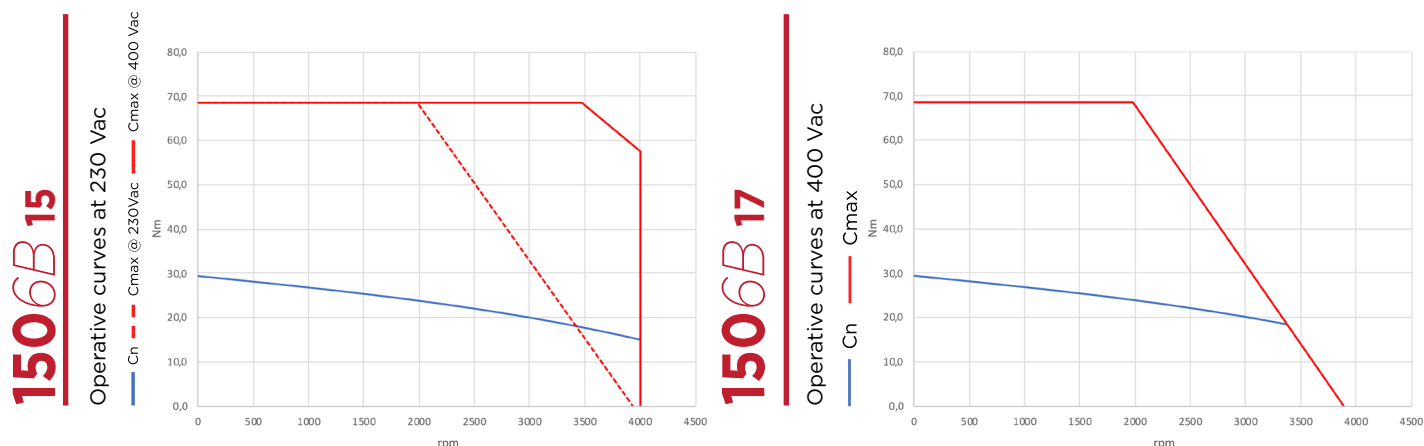
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M _o	[Nm]	29.4		
Peak torque	M _{Max}	[Nm]	68.5		
Nominal torque	M _n	[Nm]	20.0		
Nominal power	P _n	[W]	6280		
Continuous stall current	I _o	[Arms]	32.32	32.32	18.38
Maximum current	I _{Max}	[Arms]	91.94	91.94	52.29
Nominal current	I _n	[Arms]	21.99	21.99	12.50
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3930	4000	3890
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.11	0.11	0.36
Winding inductance	L _{q u-v}	[mH]	2.23	2.23	6.78
Electrical time constant	Te	[ms]	20.01	20.01	18.78
Thermal resistance	Rth	[°C/W]	0.38		
Mechanical time constant (°)	Tm	[ms]	0.37	0.37	0.39
Rotor inertia without holding brake	J	[kg·cm²]	27.68		
Rotor inertia with holding brake	J	[kg·cm²]	28.76		
Mass without holding brake	m	[kg]	18.00		
Mass with holding brake	m	[kg]	22.40		
Max. axial shaft load 3000 rpm	SL _a	[N]	420		
Max. radial shaft load 3000 rpm	SL _r	[N]	1750		

Rated output with 475 x 475 x 20 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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150 6C RATINGS and SPECIFICATION

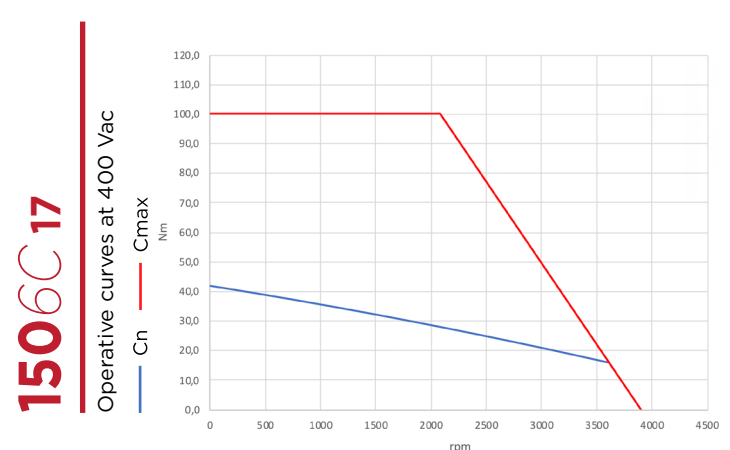
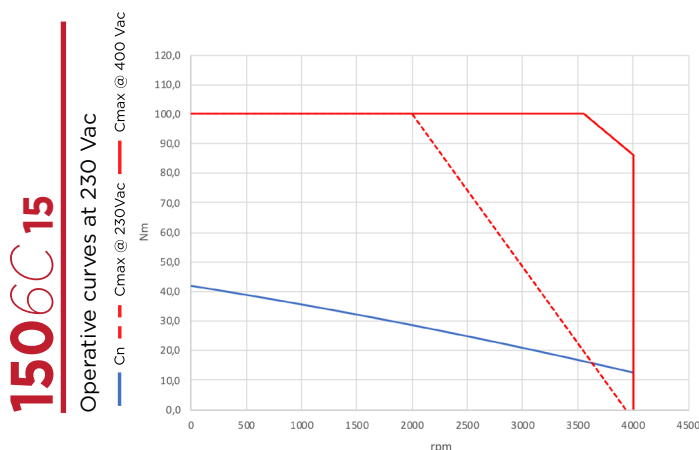
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	41.77		
Peak torque	M _{Max}	[Nm]	100.0		
Nominal torque	M _n	[Nm]	20.96		
Nominal power	P _n	[W]	6580		
Continuous stall current	I ₀	[Arms]	45.92	45.92	26.12
Maximum current	I _{Max}	[Arms]	129.33	129.33	73.56
Nominal current	I _n	[Arms]	23.04	23.04	13.10
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3940	4000	3900
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.072	0.072	0.19
Winding inductance	L _{q u-v}	[mH]	1.54	1.54	4.52
Electrical time constant	Te	[ms]	21.11	21.11	23.24
Thermal resistance	Rth	[°C/W]	0.38		
Mechanical time constant (a)	Tm	[ms]	0.35	0.35	0.31
Rotor inertia without holding brake	J	[kg·cm ²]	40.17		
Rotor inertia with holding brake	J	[kg·cm ²]	41.25		
Mass without holding brake	m	[kg]	23.26		
Mass with holding brake	m	[kg]	27.67		
Max. axial shaft load 3000 rpm	SL _a	[N]	420		
Max. radial shaft load 3000 rpm	SL _r	[N]	1750		

Rated output with 475 x 475 x 20 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

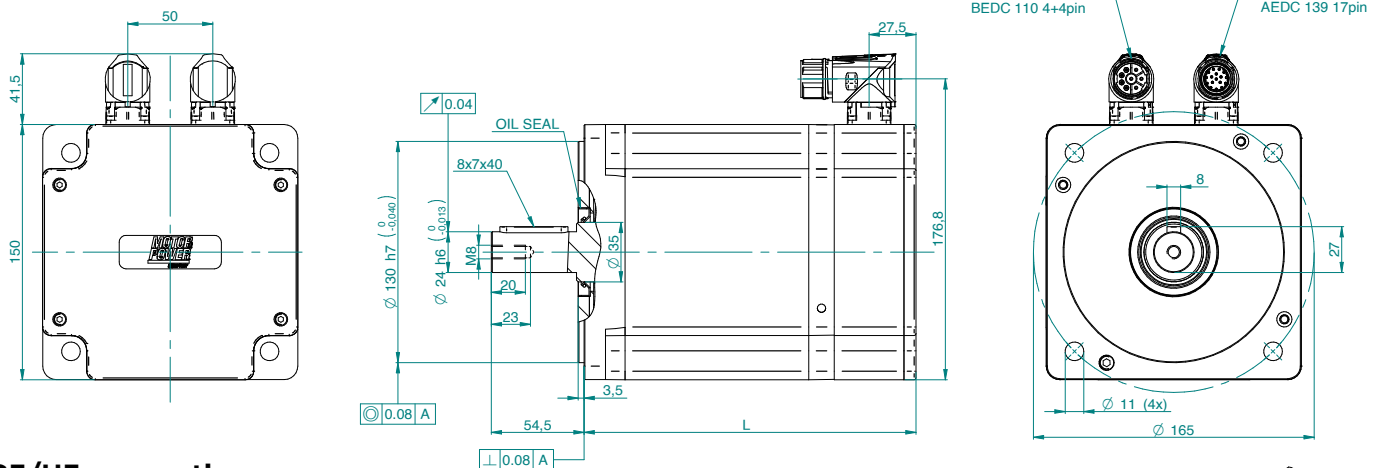
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150 EXTERNAL DIMENSIONS

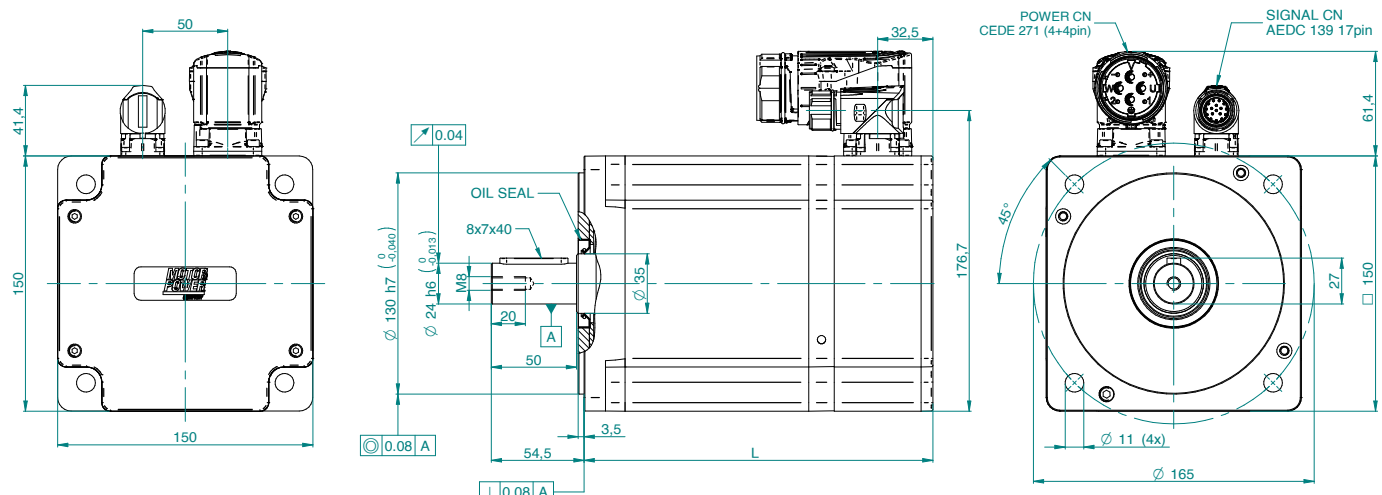
G2/H2 connection

Model	Feedback type	L [mm]	L with brake [mm]
6A	A22-A23-M1-M2	195.0	240.0
6B	A22-A23-M1-M2	240.0	285.0
6C	A22-A23-M1-M2	285.0	330.0
6A	A1-A15-A16-R1	211.0	256.0
6B	A1-A15-A16-R1	256.0	301.0
6C	A1-A15-A16-R1	301.0	346.0



G3/H3 connection

Model	Feedback type	L [mm]	L with brake [mm]
6A	A22-A23-M1-M2	205.0	250.0
6B	A22-A23-M1-M2	250.0	295.0
6C	A22-A23-M1-M2	295.0	340.0
6A	A1-A15-A16-R1	221.0	266.0
6B	A1-A15-A16-R1	266.0	311.0
6C	A1-A15-A16-R1	311.0	356.0



Model	Feedback tipe	L [mm]	L with brake [mm]
6A	A22-A23	195.0	250.0
6B	A22-A23	240.0	295.0
6C	A22-A23	285.0	340.0



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180 7A RATINGS and SPECIFICATION

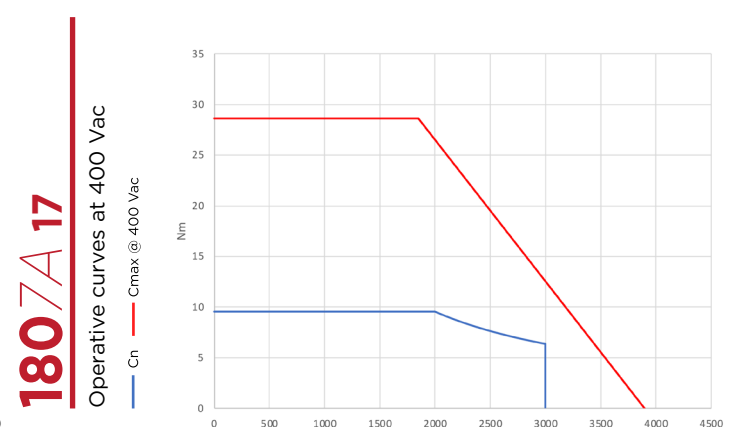
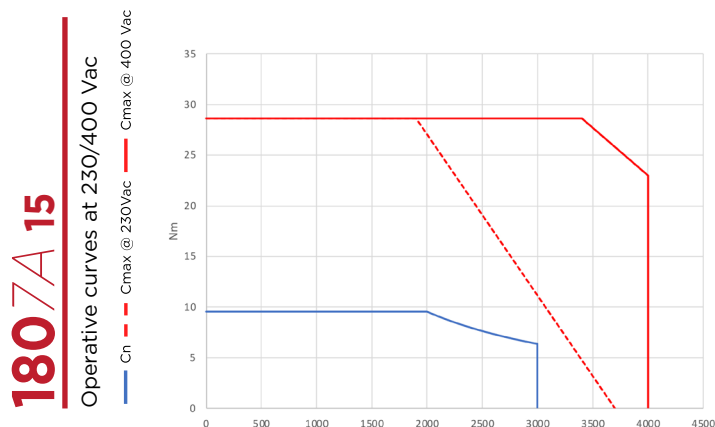
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	9.55		
Peak torque	M _{Max}	[Nm]	28.65		
Nominal torque	M _n	[Nm]	6.37		
Nominal power	P _n	[W]	2000		
Continuous stall current	I ₀	[Arms]	10.50	10.50	5.97
Maximum current	I _{Max}	[Arms]	42.00	42.00	23.88
Nominal current	I _n	[Arms]	7.00	7.00	3.98
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.39	0.39	1.20
Winding inductance	L _{q u-v}	[mH]	4.60	4.60	14.48
Electrical time constant	Te	[ms]	11.79	11.79	12.07
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	1.19	1.19	1.18
Rotor inertia without holding brake	J	[kg·cm²]	25.22		
Rotor inertia with holding brake	J	[kg·cm²]	30.39		
Mass without holding brake	m	[kg]	14.64		
Mass with holding brake	m	[kg]	19.64		
Max. axial shaft load 2000 rpm	SL _a	[N]	500		
Max. radial shaft load 2000 rpm	SL _r	[N]	2300		

Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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180 7C RATINGS and SPECIFICATION

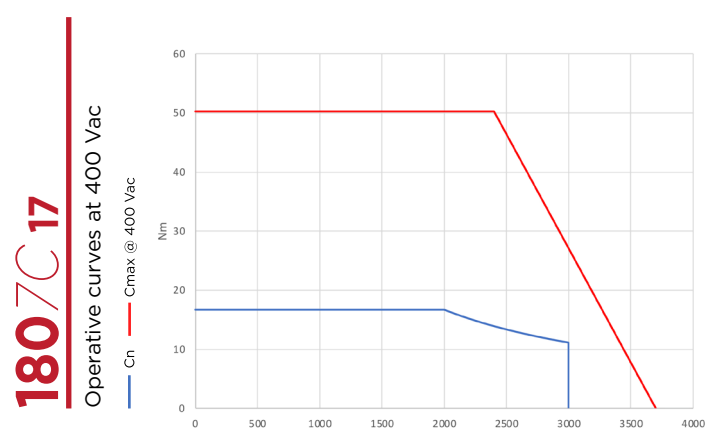
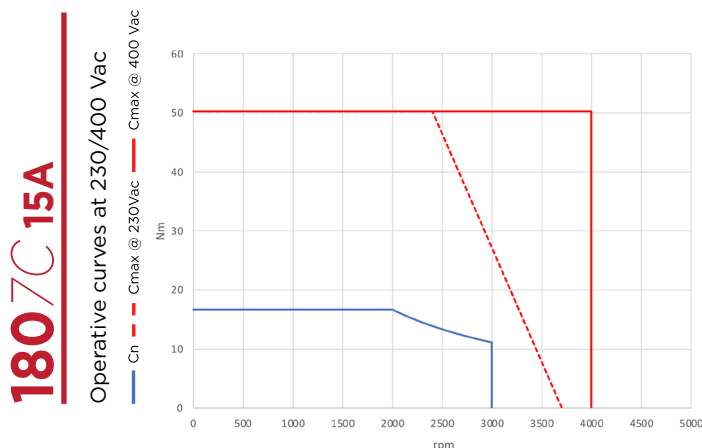
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M _o	[Nm]	16.7		
Peak torque	M _{Max}	[Nm]	50.3		
Nominal torque	M _n	[Nm]	11.14		
Nominal power	P _n	[W]	3500		
Continuous stall current	I _o	[Arms]	18.36	18.36	10.44
Maximum current	I _{Max}	[Arms]	65.05	65.05	37.00
Nominal current	I _n	[Arms]	12.25	12.25	6.97
Nominal working speed	n _N	[rpm]	3000		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.13	0.13	0.37
Winding inductance	L _{q u-v}	[mH]	2.13	2.13	6.62
Electrical time constant	Te	[ms]	16.38	16.38	17.89
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.68	0.68	0.68
Rotor inertia without holding brake	J	[kg·cm²]	44.81		
Rotor inertia with holding brake	J	[kg·cm²]	46.60		
Mass without holding brake	m	[kg]	20.0		
Mass with holding brake	m	[kg]	25.0		
Max. axial shaft load 2000 rpm	SL _a	[N]	500		
Max. radial shaft load 2000 rpm	SL _r	[N]	2300		

Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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180 7D RATINGS and SPECIFICATION

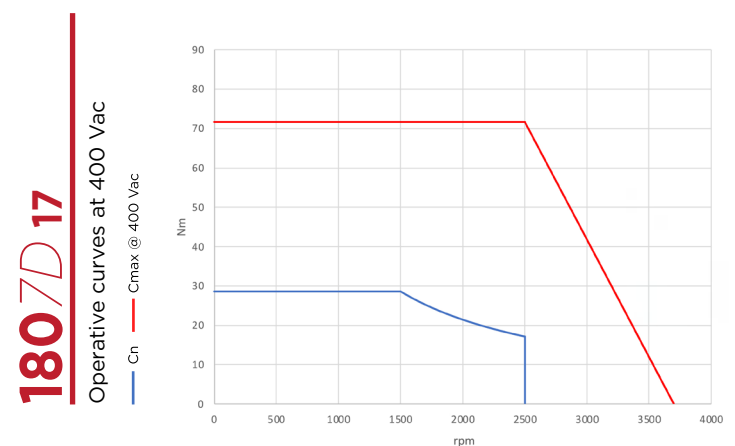
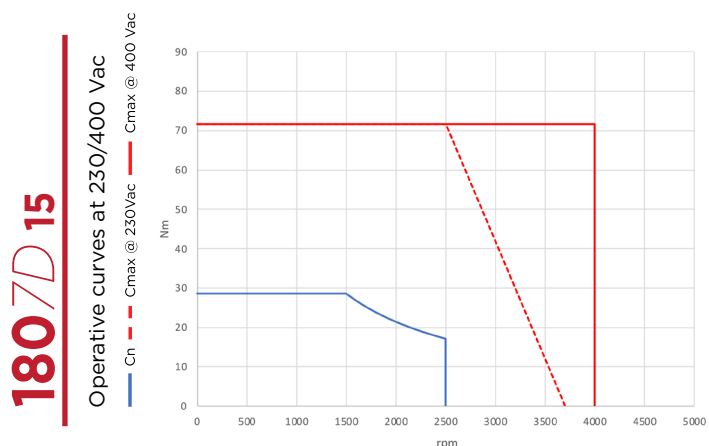
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	28.65		
Peak torque	M _{Max}	[Nm]	71.62		
Nominal torque	M _n	[Nm]	17.20		
Nominal power	P _n	[W]	4500		
Continuous stall current	I ₀	[Arms]	31.50	31.50	17.90
Maximum current	I _{Max}	[Arms]	92.60	92.60	52.68
Nominal current	I _n	[Arms]	18.91	18.91	10.75
Nominal working speed	n _N	[rpm]	2500		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.07	0.07	0.21
Winding inductance	L _{q u-v}	[mH]	1.42	1.42	4.21
Electrical time constant	Te	[ms]	20.29	20.29	20.05
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.55	0.55	0.54
Rotor inertia without holding brake	J	[kg·cm²]	64.99		
Rotor inertia with holding brake	J	[kg·cm²]	66.78		
Mass without holding brake	m	[kg]	25.69		
Mass with holding brake	m	[kg]	31.40		
Max. axial shaft load 2000 rpm	SL _a	[N]	500		
Max. radial shaft load 2000 rpm	SL _r	[N]	2300		

Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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180 7E RATINGS and SPECIFICATION

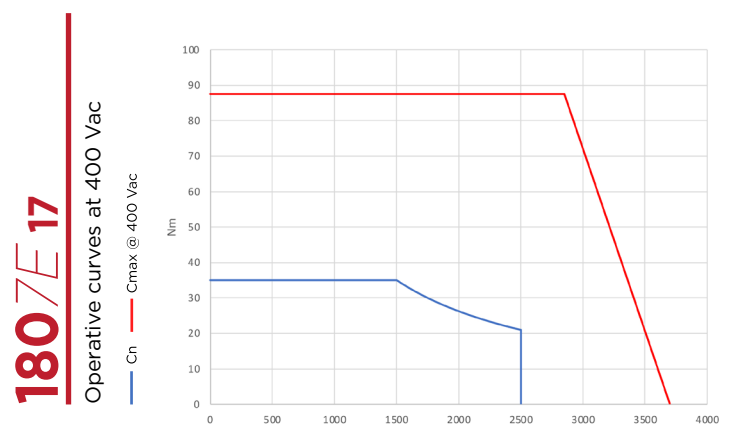
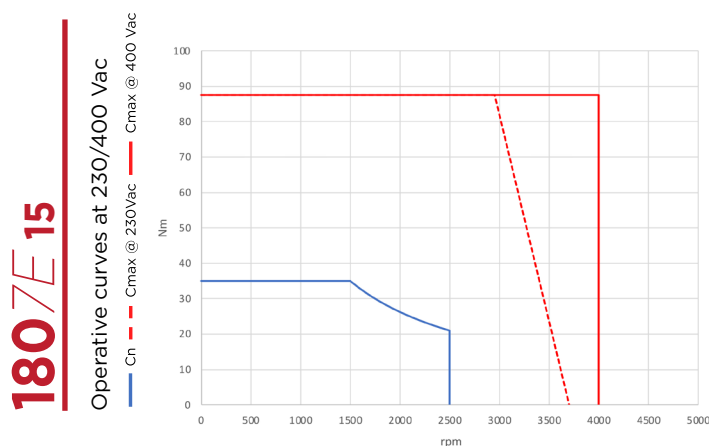
			230 Vac	400 Vac	
TYPE OF WINDING			15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M ₀	[Nm]	35.0		
Peak torque	M _{Max}	[Nm]	87.53		
Nominal torque	M _n	[Nm]	21.0		
Nominal power	P _n	[W]	5500		
Continuous stall current	I ₀	[Arms]	38.47	38.47	21.88
Maximum current	I _{Max}	[Arms]	113.20	113.20	64.38
Nominal current	I _n	[Arms]	23.08	23.08	13.13
Nominal working speed	n _N	[rpm]	2500		
Maximum working speed	n _{Max}	[rpm]	3700	4000	3700
Torque constant	K _t	[Nm/Arms]	0.91	0.91	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.04	0.04	0.12
Winding inductance	L _{q u-v}	[mH]	0.81	0.81	2.64
Electrical time constant	Te	[ms]	21.89	21.89	22.76
Thermal resistance	Rth	[°C/W]	-		
Mechanical time constant (a)	Tm	[ms]	0.46	0.46	0.46
Rotor inertia without holding brake	J	[kg·cm²]	102.46		
Rotor inertia with holding brake	J	[kg·cm²]	104.30		
Mass without holding brake	m	[kg]	34.15		
Mass with holding brake	m	[kg]	39.09		
Max. axial shaft load 2000 rpm	SL _a	[N]	500		
Max. radial shaft load 2000 rpm	SL _r	[N]	2300		

Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

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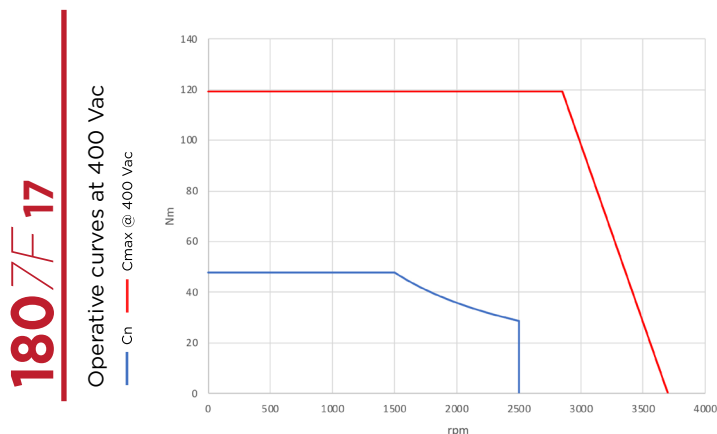
		400 Vac	
TYPE OF WINDING		17	
ELECTRICAL DATA			
Continuous stall torque (*)	M ₀	[Nm]	47.75
Peak torque	M _{Max}	[Nm]	119.37
Nominal torque	M _n	[Nm]	28.65
Nominal power	P _n	[W]	7500 (*1)
Continuous stall current	I ₀	[Arms]	29.85
Maximum current	I _{Max}	[Arms]	87.80
Nominal current	I _n	[Arms]	17.91
Nominal working speed	n _N	[rpm]	2500
Maximum working speed	n _{Max}	[rpm]	4000
Torque constant	K _t	[Nm/Arms]	1.60
Voltage constant	K _{e u-v}	[Vrms/krpm]	96.7
Winding resistance @ 20 °C	R _{u-v}	[Ohm]	0.10
Winding inductance	L _{q u-v}	[mH]	2.30
Electrical time constant	Te	[ms]	23.71
Thermal resistance	Rth	[°C/W]	-
Mechanical time constant (a)	Tm	[ms]	0.38
Rotor inertia without holding brake	J	[kg·cm ²]	140.62
Rotor inertia with holding brake	J	[kg·cm ²]	142.66
Mass without holding brake	m	[kg]	44.52
Mass with holding brake	m	[kg]	49.59
Max. axial shaft load 2000 rpm	SL _a	[N]	500
Max. radial shaft load 2000 rpm	SL _r	[N]	2300

Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
 (*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

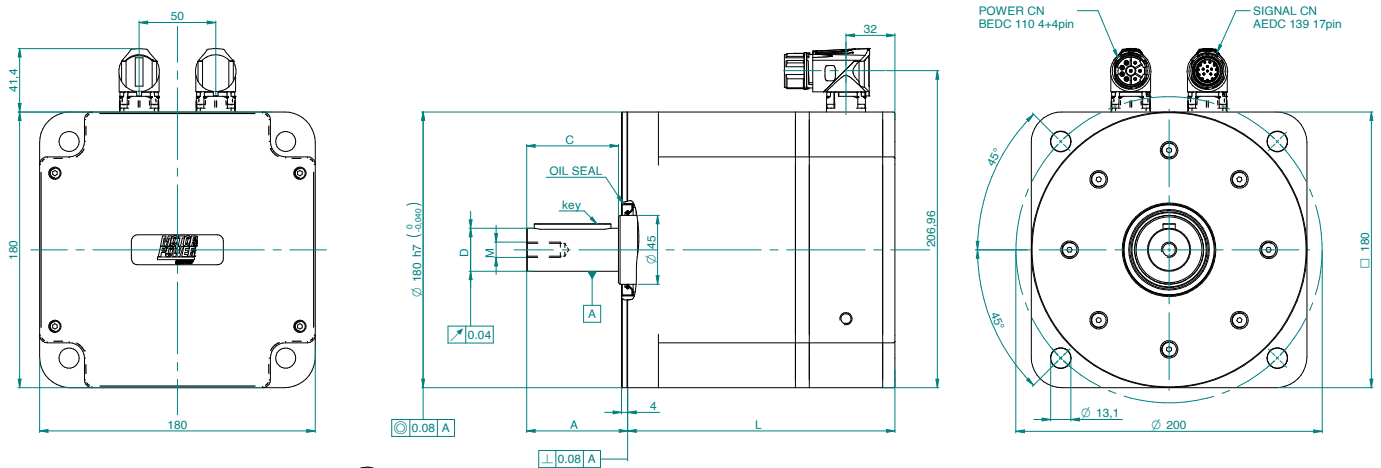
Operative temperature -20 ÷ +40 °C

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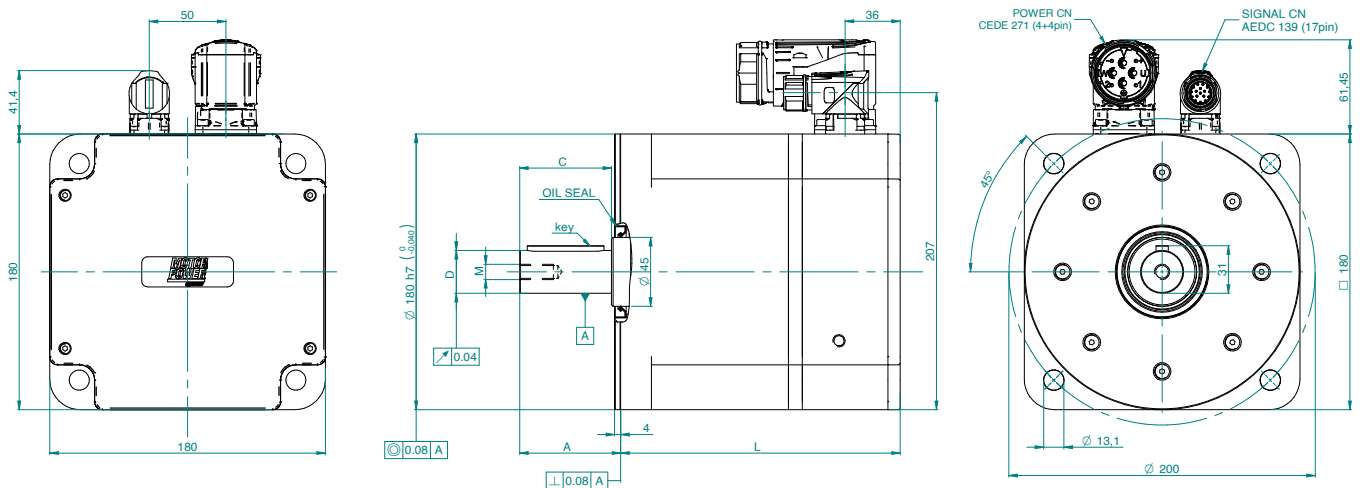
G2/H2 connection

Model	Feedback tipe	L [mm]	L with brake [mm]	D [mm]	A [mm]	C [mm]	M	Key (b x h x l)
7A	A22-A23-M1-M2	174.5	209.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	A22-A23-M1-M2	207.5	242.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	A22-A23-M1-M2	240.5	275.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	A22-A23-M1-M2	284.5	319.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	A22-A23-M1-M2	347.5	382.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7A	A1-A15-A16-R1	190.5	225.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	A1-A15-A16-R1	223.5	258.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	A1-A15-A16-R1	256.5	291.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	A1-A15-A16-R1	300.5	335.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	A1-A15-A16-R1	363.5	398.0	38.0	86.0	80.0	M12x28	10 x 8 x 70



G3/H3 connection

Model	Feedback type	L [mm]	L with brake [mm]	D [mm]	A [mm]	C [mm]	M	Key (b x h x l)
7A	A22-A23-M1-M2	184.5	219	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	A22-A23-M1-M2	217.5	252	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	A22-A23-M1-M2	250.5	285	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	A22-A23-M1-M2	294.5	329	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	A22-A23-M1-M2	357.5	392	38.0	86.0	80.0	M12x28	10 x 8 x 70
7A	A1-A15-A16-R1	200.5	235	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	A1-A15-A16-R1	233.5	268	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	A1-A15-A16-R1	266.5	301	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	A1-A15-A16-R1	310.5	345	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	A1-A15-A16-R1	373.5	408	38.0	86.0	80.0	M12x28	10 x 8 x 70



feedback

TC4 Resolver

		R1	
<i>Motor size</i>		TC4 60 - TC4 80	TC4 100 - TC4 130 - TC4 150 - TC4 180
Nominal voltage	[Vrms]	7±5%	
Nominal current	[mA]	50	
Phase shift	[deg]	+3°	-5°
Minimum sin amplitude	[mVrms]	20	
Frequency	[kHz]	10	
Poles number	[/]	2	
Tranformer ratio	[/]	0.5 ± 5%	
Input impedance	[Ohm]	130 + j280	110+j140
Output impedance	[Ohm]	425 + j755	130+j240
System accuracy	[']	± 10'	
Rotor inertia	[kg cm2]	0.03	0.1

	M1	M2
Type	M-CODER IH INCREMENTAL WITH HALL SENSOR ENCODER	M-CODER ST ABSOLUTE ENCODER
Protocol/Interface	Line Driver A/B/Z - U/V/W	RS 485 2.5 Mbit
Resolution	2-5000 ppr	17-bit
Accuracy	+/- 250"	
Working temperature	-40 °C ÷ +125 °C	
Working speed	< 12.000 rpm	
Max acceleration	100.000 rad/s ²	
Inertia	5.6 x 10-5 kg cm ²	
Weigth	20 g	
Main supply voltage	5 - 12 V	
Current consumption	100 mA (Max)	
External battery voltage	-	
External battery current consumption	-	
Note	Condition monitoring option	

	A1	A3	A4
Type	HIPERFACE ABSOLUTE MULTITURN ENCODER	HIPERFACE DSL ABSOLUTE SINGLETURN ENCODER	HIPERFACE DSL ABSOLUTE MULTITURN ENCODER
Protocol/Interface	HIPERFACE®	HIPERFACE DSL®	
Resolution	128 line	20 bit	
N° absolute multiturn steps	4096 (12 bit)	-	4096 (12 bit)
Accuracy	4096 (12 bit)	+/- 100''	
Working temperature	-20 °C ... +100 °C	-20 °C ... +115 °C	
Working speed	<9000 rpm	<12000 rpm	
Max acceleration	500.000 rad/s²		
Inertia	4,5 gcm²		
Weigth	70 g	100 g	
Main supply voltage	7 - 12 V		
Current consumption	60 mA (withoul Load)	150 mA (max)	
External battery voltage	-		
External battery current consumption	-		
Notes	Mechanical multiturn	-	Mechanical multiturn

	A5	A6	A15
Type	HIPERFACE SAFETY DSL SINGLETURN 20 BIT ENCODER	HIPERFACE SAFETY DSL MULTITURN 20 BIT ENCODER	HIPERFACE SAFETY DSL SINGLETURN 24 BIT ENCODER
Protocol/Interface	HIPERFACE DSL®		
Resolution	20 bit		24 bit
N° absolute multiturn steps	-	4096 (12 bit)	-
Accuracy	+/- 100"		+/- 25"
Working temperature	-20 °C ... +115 °C		-40 °C ... +115 °C
Working speed	<12000 rpm		<9000 rpm
Max acceleration	250.000 rad/s ²		
Inertia	5 gcm ²		
Weight	100 g		
Main supply voltage	7 - 12 V		
Current consumption	150 mA (max)		
External battery voltage	-		
External battery current consumption	-		
Notes	Mechanical multiturn		
Safety function	SIL2 (IEC 61508) PL.d (EN ISO 13849-1:2015)		

	A16	A22	A23
Type	HIPERFACE SAFETY DSL MULTITURN 24 BIT ENCODER	ENCODER SAFETY ENDAT 3 SINGLETURN 19 BIT ENCODER	ENCODER SAFETY ENDAT 3 MULTITURN 19 BIT ENCODER
Protocol/Interface	HIPERFACE DSL®	ENDAT 3®	
Resolution	24 bit	19 bit	
N° absolute multiturn steps	4096 (12 bit)	-	4096 (12 bit)
Accuracy	+/- 25"	+/- 120"	
Working temperature	-40 °C ... +115 °C	-40 °C ... +110 °C	
Working speed	<9000 rpm	<15000 rpm	<12000 rpm
Max acceleration	250.000 rad/s ²	≤ 1 · 10 ⁵ rad/s ²	
Inertia	5 gcm ²	0.2 · 10 ⁻⁶ kgm ²	
Weight	100 g	40 g	40 g
Main supply voltage	7 - 12 V	3,6 - 14 V	
Current consumption	150 mA (Max)	95 mA at 5 V (w/o load)	115 mA at 5 V (w/o load)
External battery voltage	-	-	-
External battery current consumption	-	-	-
Note	Mechanical multiturn	-	Mechanical multiturn
Safety function	SIL2 (IEC 61508) PL.d (EN ISO 13849-1:2015)	SIL3 (IEC 61508) PL.e	

N1

Type A-format 24-bit absolute multi-turn (with battery) and absolute single turn encoder (without battery). Encoder N1 available for models 40-60-80

Protocol/Interface	A-FORMAT RS 485 2,5-16Mbits
Resolution	24 bit
N° absolute multiturn steps	65536 (16 bit)
Accuracy	+/- 90"
Working temperature	-20 °C ... +105 °C
Working speed	<8000 rpm
Max acceleration	$1.0 \times 10^5 \text{ rad/s}^2$
Inertia	$2.6 \times 10^{-9} \text{ kg} \cdot \text{m}^2$
Weigth	13 g
Main supply voltage	5 +/- 10% V
Current consumption	80uA typical 110 uA max
External battery voltage	3,6 +/-10% V
External battery current consumption	55uA typical 110 uA max

Note

Feedback N1 is provided as singleturn device.
With the multiturn usage battery must be applied. Please reach out our application team for assistance with the electric scheme connection.

specifications

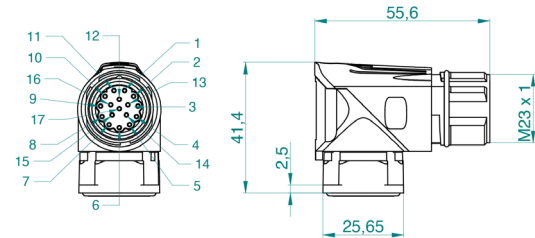
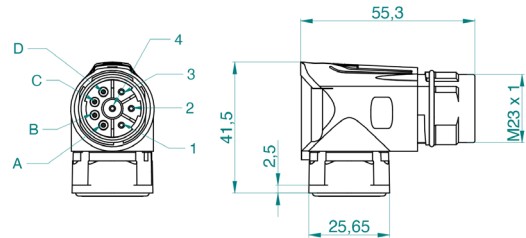
TC4 Brake features

MOTOR SIZE		40	60	80	100	130	150	180
Operating motor temperature	[°C]	-20 ÷ 120						
External ambient temperature	[°C]	-20 ÷ 40						
Standard brake duty	-	Stationary						
Minimum dry static torque (-20 ÷ 120 °C)	[Nm]	0.32	1.3	2.5	6.5	9.6	32	48
Nominal operating voltage (± 10 %)	[Vdc]	24						
Power consumption at 20 °C (± 7 %)	[W]	4.35	11.2	10.2	10.4	19.7	30	49.6
Release time	[ms]	22	58	46	49	71	185	120
Brake release time (pull-in)	[ms]	77	25	58	30	39	66	37
Maximum backlash	[deg]	1.2						

Connectors with G2 connection

Power connector		Feedback connector				
Pin	Function	Pin	A1	M1	N1	R1
1	Phase U	1	-	Hall W	-	-
2	PE	2	-	Hall U	-	-
3	Phase W	3	0 Vdc	0 Vdc	0 Vdc	-
4	Phase V	4	7-12 Vdc	+5 Vdc	+5 Vdc	-
A	Brake + (#)	5	/sin	/ChA	/data	/sin
B	Brake - (#)	6	sin	ChA	data	sin
C	PT 1000 +	7	/data	/ChZ	-	/ref
D	PT 1000 -	8	data	ChZ	-	ref
		9	-	Hall V	-	-
		10	shield	shield	shield	shield
		11	/cos	/ChB	-	/cos
		12	cos	ChB	-	cos
		13	-	Hall /W	-	-
		14	-	Hall /V	-	-
		15	-	Hall /U	-	-
		16	-	-	-	-
		17	-	-	-	-

(#) Optional



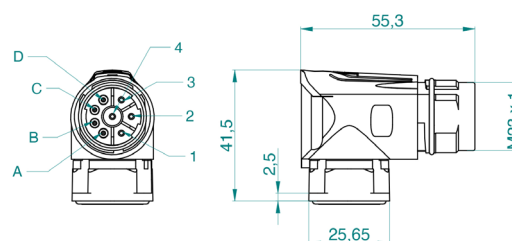
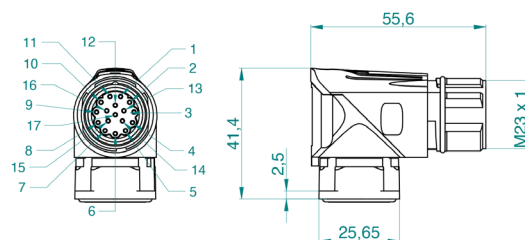
Connectors with H2 connection

Power connector		Feedback connector				
Pin	Function	Pin	A1	M1	N1	R1
1	Phase U	1	-	Hall W	-	-
2	PE	2	-	Hall U	-	-
3	Phase W	3	0 Vdc	0 Vdc	0 Vdc	-
4	Phase V	4	7-12 Vdc	+5 Vdc	+5 Vdc	-
A	brake + (#)	5	/sin	/ChA	/data	/sin
B	brake - (#)	6	sin	ChA	data	sin
C	-	7	/data	/ChZ	-	/ref
D	-	8	data	ChZ	-	ref
		9	-	Hall V	-	-
		10	shield	shield	shield	shield
		11	/cos	/ChB	-	/cos
		12	cos	ChB	-	cos
		13	-	Hall /W	-	-
		14	-	Hall /V	-	-
		15	-	Hall /U	-	-
		16	PT 1000 +	PT 1000 +	PT 1000 +	PT 1000 +
		17	PT 1000 -	PT 1000 -	PT 1000 -	PT 1000 -

(#) Optional

One cable connector with C21 connection

Pin	Function
1	Phase U
2	PE
3	Phase W
4	Phase V
A	Data +
B	Data -
C	Brake +
D	Brake -



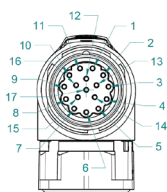
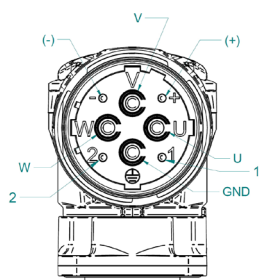
Connectors with G3 connection

Power connector		Feedback connector			
Pin	Function	Pin	A1	M1	R1
U	Phase U	1	-	-	-
	PE	2	-	-	-
W	Phase W	3	0 Vdc	shield	-
V	Phase V	4	7-12 Vdc	S1	-
+	brake + (#)	5	/sin	/S1	/sin
-	brake - (#)	6	sin	S2	sin
1	PT 1000 +	7	/data	/S2	/ref
2	PT 1000 -	8	data	S3	ref
		9	-	/S3	-
		10	shield	ChA	shield
		11	/cos	Index	/cos
		12	cos	/Index	cos
		13	-	/ChA	-
		14	-	ChB	-
		15	-	/ChB	-
		16	-	+5 Vdc	-
		17	-	0 Vdc	-

(#) Optional

Connectors with H3 connection

Power connector		Feedback connector			
Pin	Function	Pin	A1	M1	R1
U	Phase U	1	-	PT 1000 +	-
	PE	2	-	PT 1000 -	-
W	Phase W	3	0 Vdc	shield	-
V	Phase V	4	7-12 Vdc	S1	-
+	brake + (#)	5	/sin	/S1	/sin
-	brake - (#)	6	sin	S2	sin
1	-	7	/data	/S2	/ref
2	-	8	data	S3	ref
		9	-	/S3	-
		10	shield	ChA	shield
		11	/cos	Index	/cos
		12	cos	/Index	cos
		13	-	/ChA	-
		14	-	ChB	-
		15	-	/ChB	-
		16	PT 1000 +	+5 Vdc	PT 1000 +
		17	PT 1000 -	0 Vdc	PT 1000 -



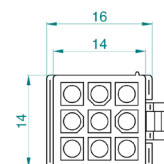
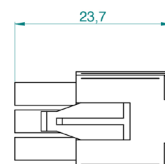
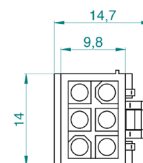
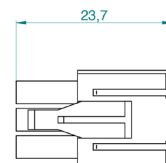
(#) Optional

TC4 Wiring motor connection



Connectors with D0 connection (9 pins, only for models 40-60-80)

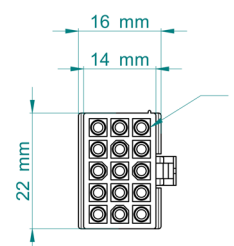
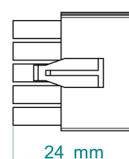
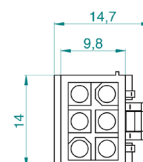
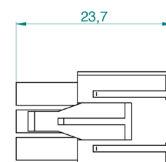
Power connector		Feedback connector			
Pin	Function	Pin	A1	N1	R1
1	Phase U	1	data +	data +	sin
2	Phase V	2	+ sin	-	/sin
3	Phase W	3	Refsin	-	cos
4	PE	4	data -	data -	/cos
5	PT 1000 + / brake + (#)	5	+ cos	-	ref
6	PT 1000 - / brake - (#)	6	Refcos	-	/ref
		7	8V / us	+ 5V	-
		8	0V	0V	-
		9	shield	shield	shield



(#) Optional

Connectors with D2 connection (15 pins, only for models 40-60-80)

Power connector		Feedback connector	
Pin	Function	Pin	M1
1	Phase U	1	Ch A
2	Phase V	2	Ch/A
3	Phase W	3	Ch B
4	PE	4	Ch/B
5	PT 1000 + / brake + (#)	5	Ch Z
6	PT 1000 - / brake - (#)	6	Ch/Z
		7	Hall U
		8	Hall/U
		9	Hall V
		10	Hall/V
		11	Hall W
		12	Hall/W
		13	5 Vdc
		14	0 Vdc
		15	Shield



(#) Optional

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