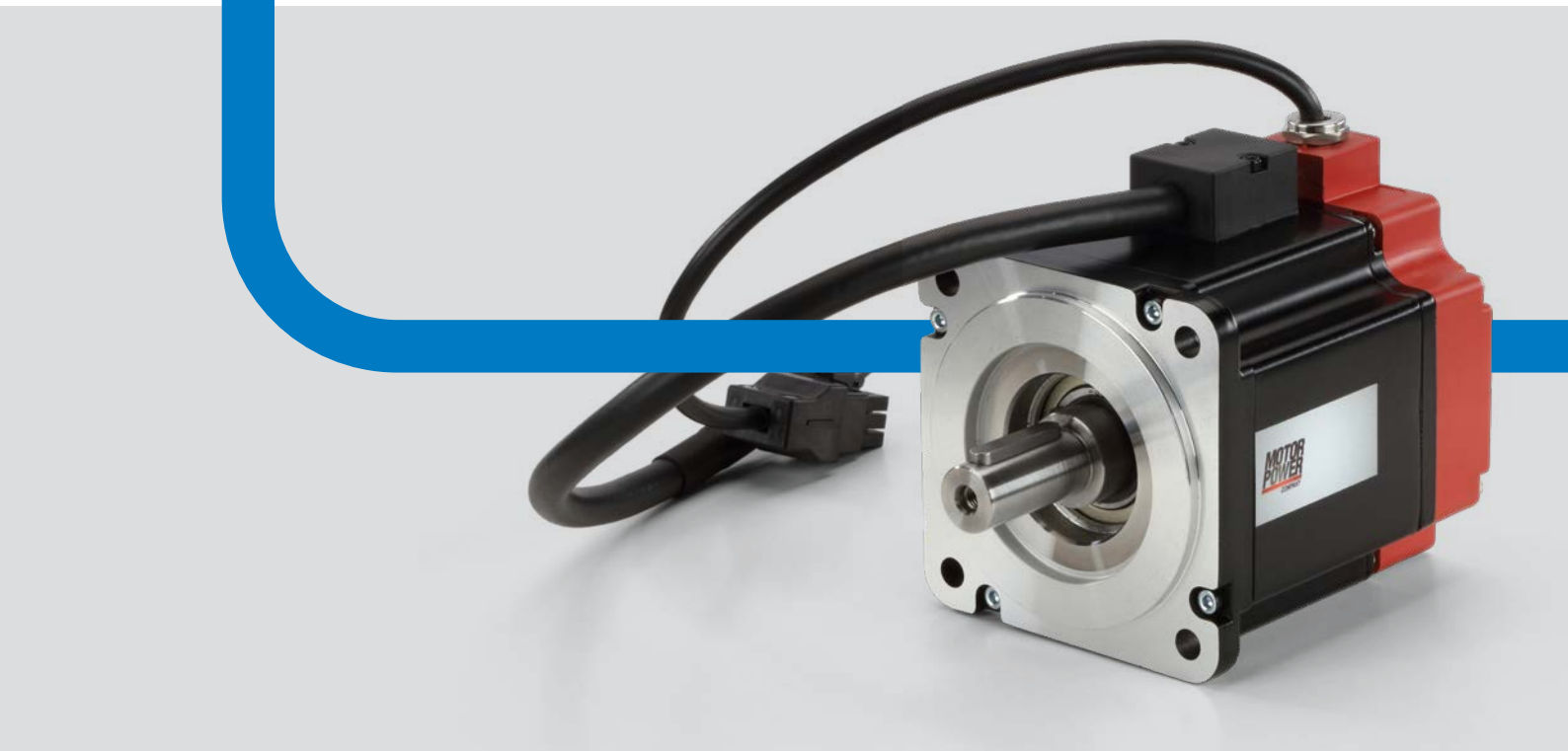
the other side of motion control

MPC TETRA COMPACT TC4



Hardware
Software
Service

MADE IN ITALY

CODESYS

in sinergy with

CMZ

MOTOR POWER COMPANY

MOTION CONTROL ENGINEERING & PRODUCTION

CMZ SISTEMI ELETTRONICI engineers, produces in Italy and distributes worldwide electronic systems for industrial motion control.

We target to machine builders and systems integrators for the co-development of automatic machines and equipment with customized and specific configurations in multi-axis motion.

Established in 1976 focusing on the production of controllers & drives, today the company offers customizable motion & control solutions including the systems design, the electronics programming, the development of ready-to-use motion & application libraries and ad-hoc softwares, alongside with a wide selection of controllers IEC61131 up to 99 axis, servo drives, brushless and stepper servo motors up to 120 Nm strictly compact and Made in Italy, peripherals and I/O modules both digital and analogic, HMI operator panels.

Our high technological and safety standing is based on a team of 70 technicians and engineers.
The systems realized to date in our factory count over 150,000 units.

CMZ is a Research Laboratory recognized by the Italian Ministry for Scientific Research.

The company is part of Soga Energy Team industrial group operating in power generation, motion and control and established in 1966.

soga energyteam

CMZ Video

TC4

CONTENTS

TC4

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 0.215 to 47.75 Nm
Rated output power	From 65 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 Recognized TC4 40 24 Vdc and 48 Vdc models UL file: E216686 - MPC IF 155 Insulation File Marking

*Available also in single cable configuration

TC4 SERVOMOTOR TYPE DESIGNATION

	1	2	3	4	5	6	7	8	9
Example: TC4	40 1B	33	1	3	N1	0	1	D0	XXXX
	MODEL (see product lineup)	Winding code	Winding voltage	Mechanical arrangement	Feedback	Brake	Internal use only	Connection	Optional

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
		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

TC4

WINDING TABLE CODE

TYPE OF WINDING

SERVOMOTOR TYPE	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

TC4 PRODUCT LINEUP

Servomotor Type	Stall torque M0 [Nm]	Nominal Torque Mn @3000 rpm	Nominal Torque Mn @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 cm²]	[/]	[/]	[/]	[/]
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 M0 [Nm]	Nominal Torque Mn @3000 rpm	Nominal Torque Mn @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 cm²]	[/]	[/]	[/]	[/]
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 M0 [Nm]	Nominal Torque Mn @2000 rpm	Nominal Torque Mn @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 cm²]	[/]	[/]	[/]	[/]
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 M0 [Nm]	Nominal Torque Mn @1500 rpm	Nominal Torque Mn @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 cm²]	[/]	[/]	[/]	[/]
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			√	√

TETRA COMPACT 4

40

RATINGS and SPECIFICATION

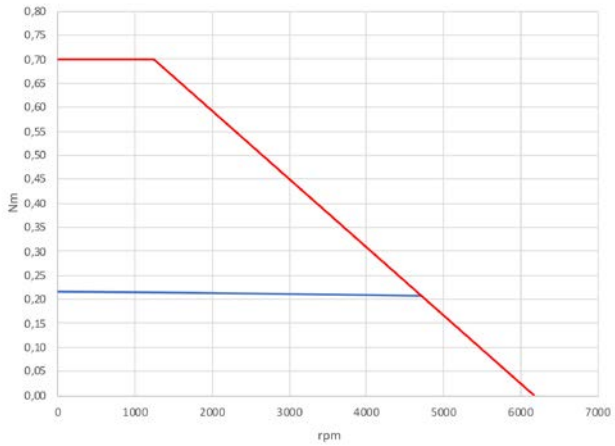
			24 Vdc	48 Vdc		230 Vac	
TYPE OF WINDING			77	78	33	09	09
ELECTRICAL DATA							
Continuous stall torque (*)	M_0	[Nm]			0.215		
			0.70		0.75		
Nominal torque	M_n	[Nm]	0.21	0.21	0.20	0.21	0.20
Nominal power	P_n	[W]	65	65	125	65	125
Continuous stall current	I_o	[Arms]	5.20	2.60	3.25	0.72	0.72
Maximum current	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	Te	[ms]	0.42	0.42	0.42	0.43	0.43
Thermal resistance	Rth	[°C/W]			2.36		
Mechanical time constant (a)	Tm	[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

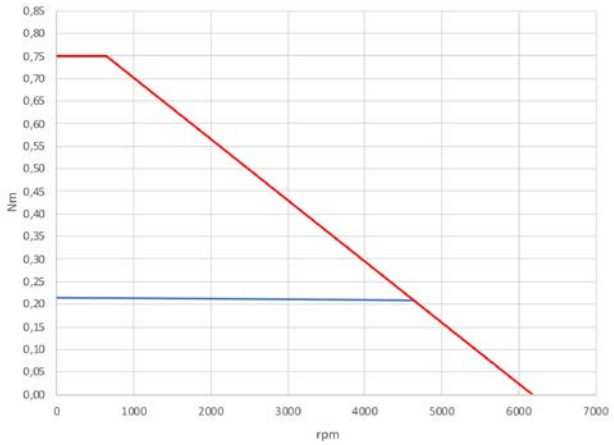
401A 77

Operative curves at 24 Vdc — Cn — Cmax



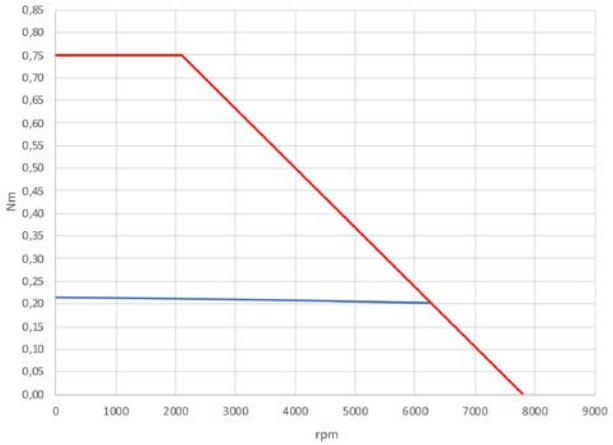
401A 78

Operative curves at 48 Vdc — Cn — Cmax



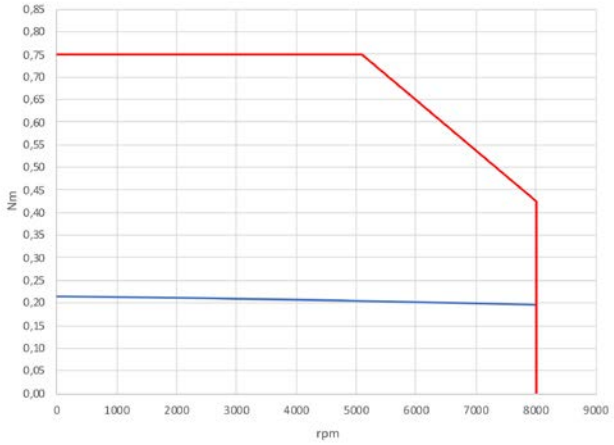
401A 33

Operative curves at 48 Vdc — Cn — Cmax



401A 09

Operative curves at 230 Vac — Cn — Cmax



Operative temperature -20 ÷ +40 °C

RATINGS and SPECIFICATION

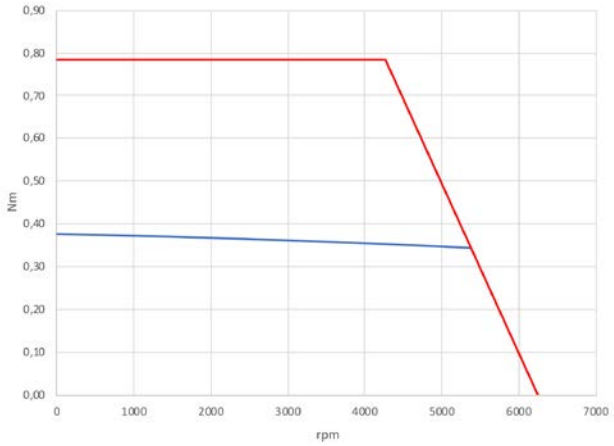
			24 Vdc	48 Vdc		230 Vac	
	TYPE OF WINDING		77	78	33	13	13
ELECTRICAL DATA							
Continuous stall torque (*)	M_0	[Nm]	0.37		0.409		
Peak torque	M_{Max}	[Nm]	0.785	1.38	1.18	1.38	
Nominal torque	M_n	[Nm]	0.360	0.395	0.37	0.395	0.37
Nominal power	P_n	[W]	115	125	230	125	230
Continuous stall current	I_0	[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	$K_{e\ u-v}$	[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	$L_{q\ u-v}$	[mH]	0.149	0.596	0.361	17.68	17.68
Electrical time constant	Te	[ms]	0.59	0.59	0.57	0.57	0.57
Thermal resistance	Rth	[°C/W]			1.85		
Mechanical time constant (a)	Tm	[ms]	0.83	0.83	0.81	0.83	0.83
Rotor inertia without holding brake	J	[kg·cm²]			0.0561		
Rotor inertia with holding brake	J	[kg·cm²]			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

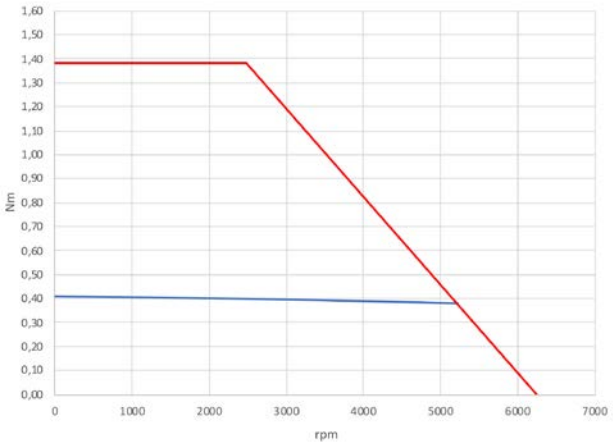
401B 77

Operative curves at 24 Vdc — Cn — Cmax



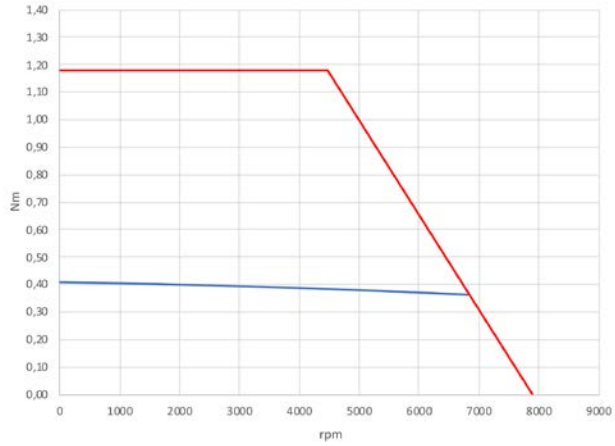
401B 78

Operative curves at 48 Vdc — Cn — Cmax



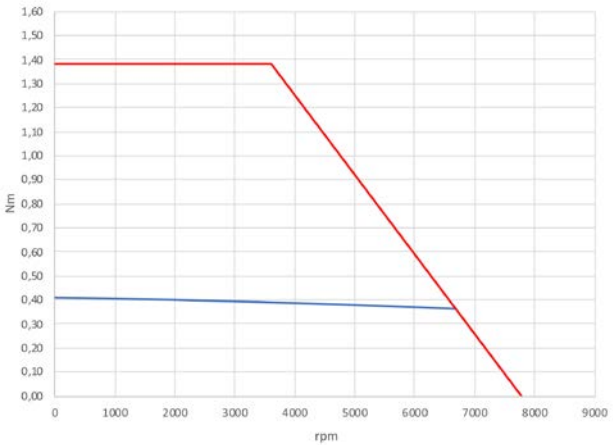
401B 33

Operative curves at 48 Vdc — Cn — Cmax



401B 13

Operative curves at 230 Vac — Cn — Cmax

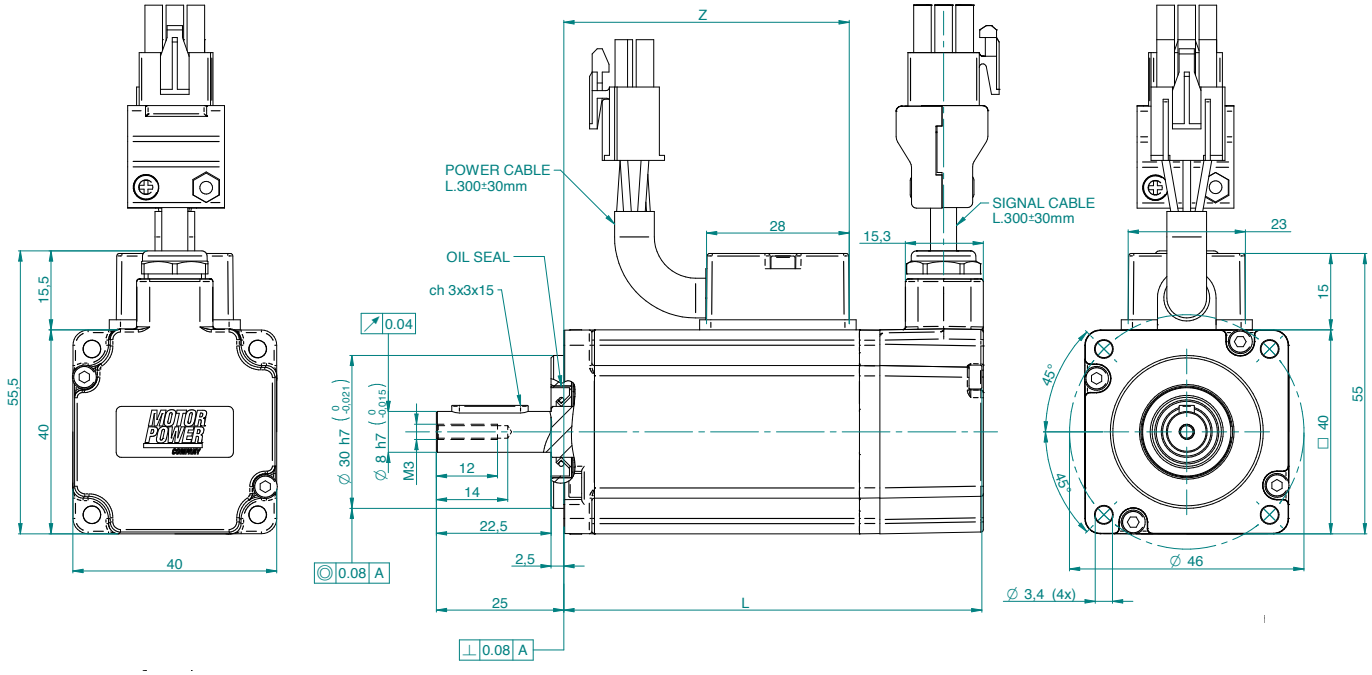


Operative temperature -20 ÷ +40 °C

40 EXTERNAL DIMENSIONS

DO/D2 connection (up to 9 Arms continuous)

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



TETRA COMPACT 4 60

602A RATINGS and SPECIFICATION

			230 Vac		400 Vac	
	TYPE OF WINDING		20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_0	[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_0	[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	Te	[ms]	1.40	1.46	1.50	1.40
Thermal resistance	Rth	[°C/W]	1.60			
Mechanical time constant (a)	Tm	[ms]	0.85	0.83	0.80	0.86
Rotor inertia without holding brake	J	[kg·cm²]	0.223			
Rotor inertia with holding brake	J	[kg·cm²]	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			

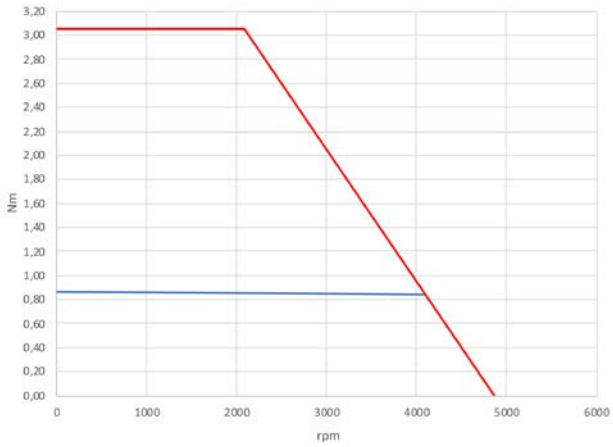
Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake.
(a) without brake and without feedback.
Current values rated @ 20°C.

TC4

TORQUE/SPEED CHARTS

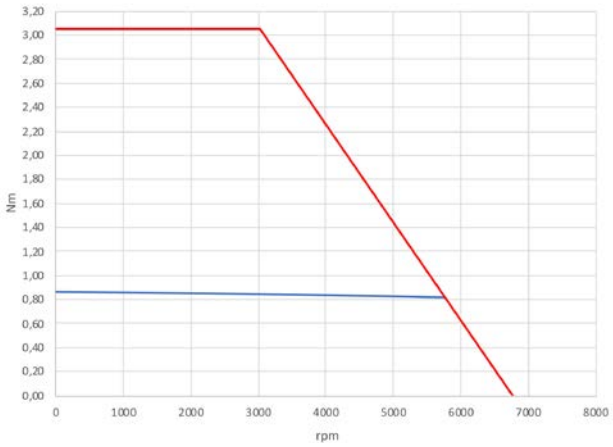
602A 20

Operative curves at 230 Vac — Cn — Cmax



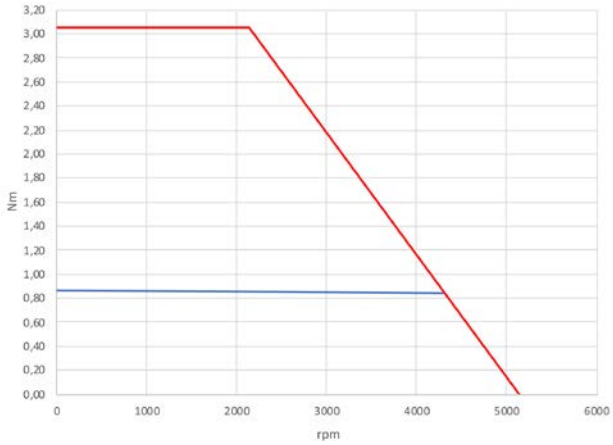
602A 21

Operative curves at 230 Vac — Cn — Cmax



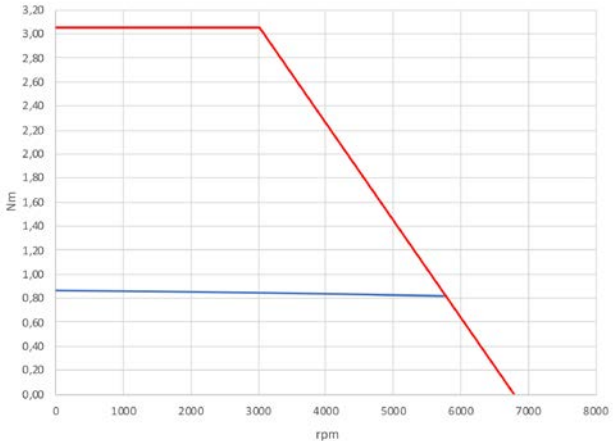
602A 16

Operative curves at 400 Vac — Cn — Cmax



602A 15

Operative curves at 400 Vac — Cn — Cmax



Operative temperature -20 ÷ +40 °C

602B RATINGS and SPECIFICATION

			230 Vac		400 Vac	
TYPE OF WINDING			20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_0	[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_0	[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	Te	[ms]	2.02	2.02	2.07	1.96
Thermal resistance	Rth	[°C/W]	1.24			
Mechanical time constant (a)	Tm	[ms]	0.57	0.57	0.56	0.59
Rotor inertia without holding brake	J	[kg·cm²]	0.414			
Rotor inertia with holding brake	J	[kg·cm²]	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			

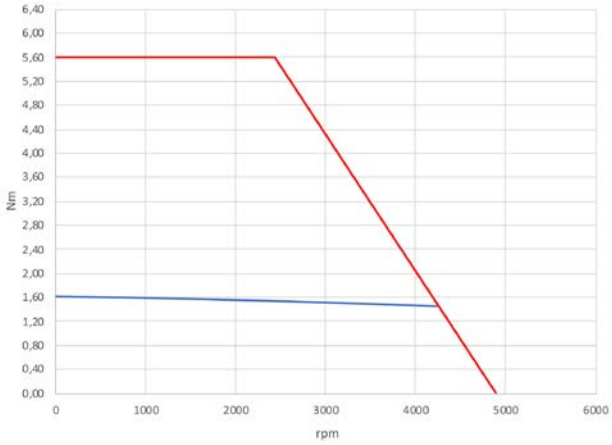
Rated output with 250 x 250 x 12 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake.
(a) without brake and without feedback.
Current values rated @ 20°C.

TC4

TORQUE/SPEED CHARTS

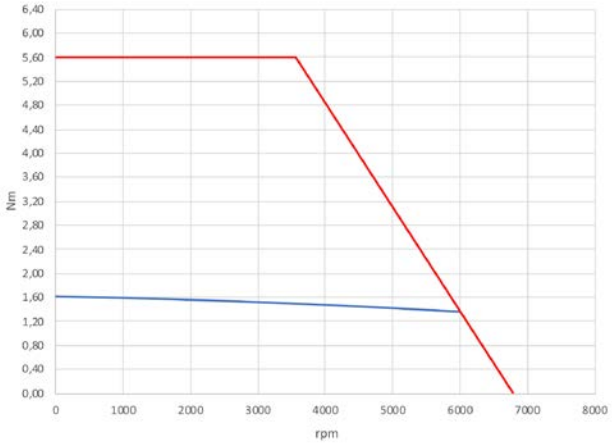
602B 20

Operative curves at 230 Vac — Cn — Cmax



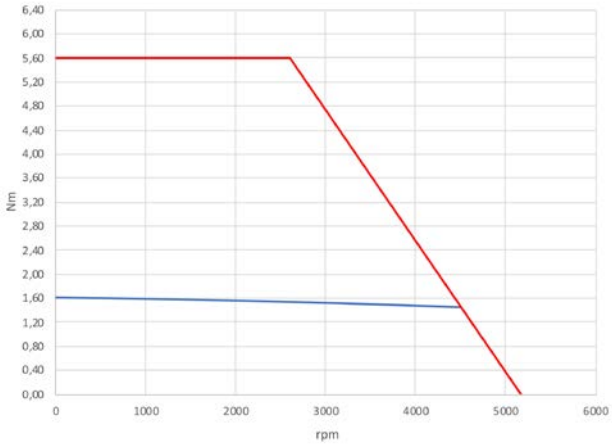
602B 21

Operative curves at 230 Vac — Cn — Cmax



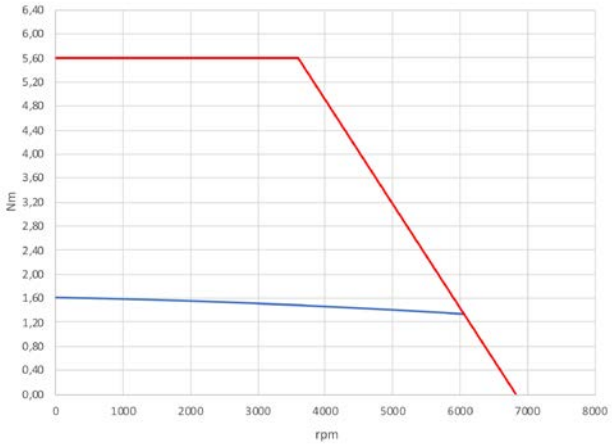
602B 16

Operative curves at 400 Vac — Cn — Cmax



602B 15

Operative curves at 400 Vac — Cn — Cmax

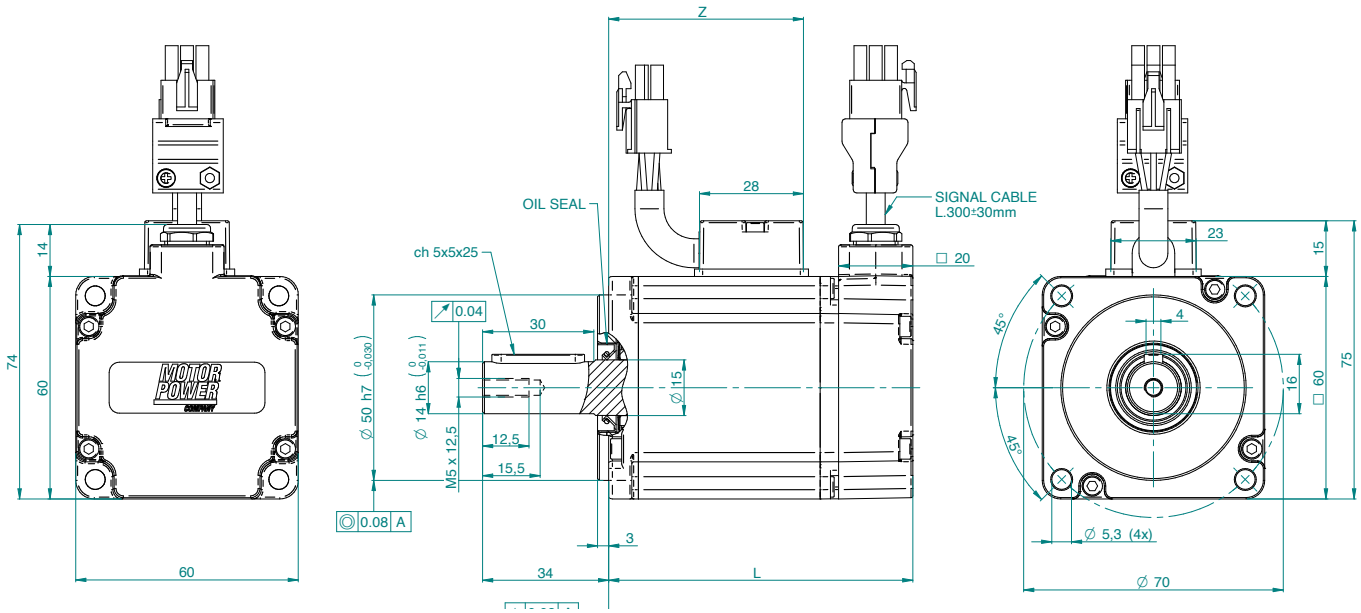


Operative temperature -20 ÷ +40 °C

60 EXTERNAL DIMENSIONS

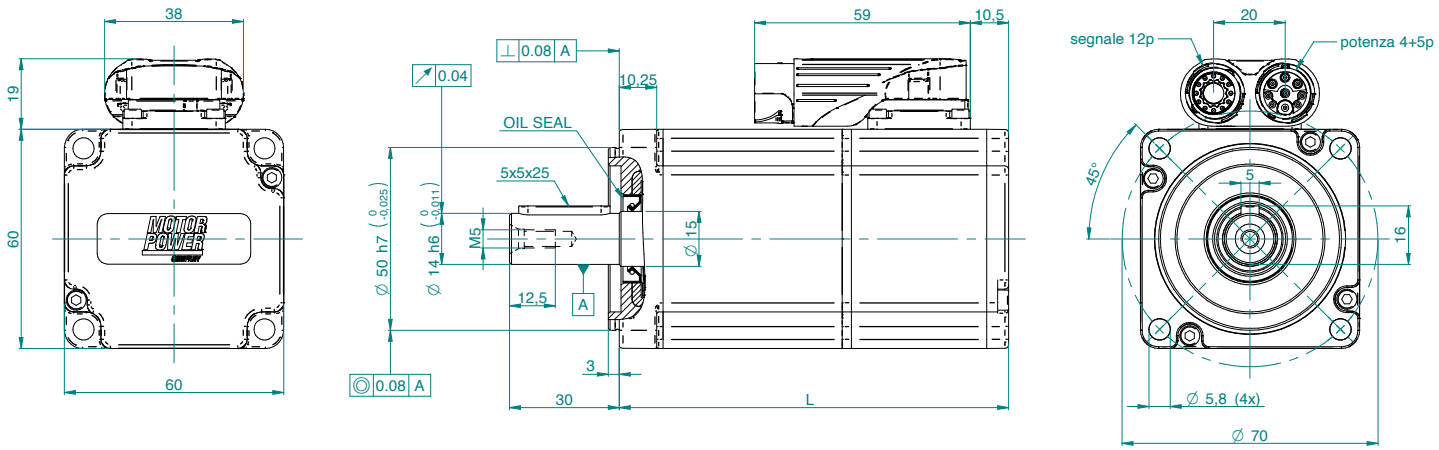
D0/D2 connection (up to 9 Arms continuous)

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



G11/H11 connection (up to 14 Arms continuous)

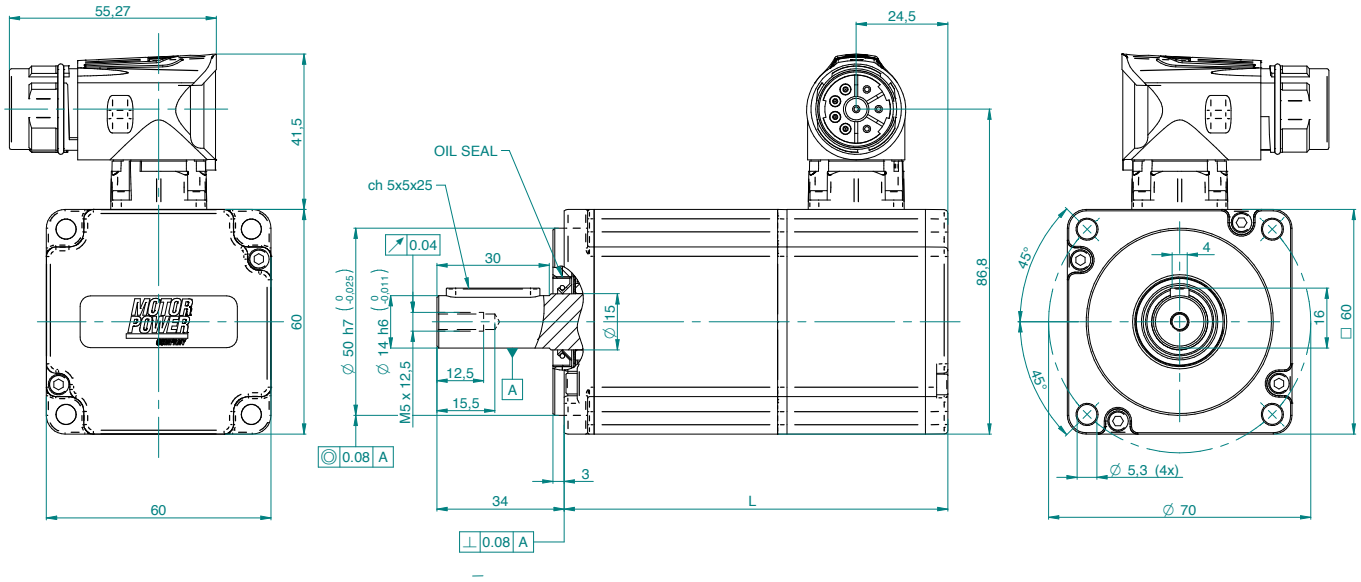
Model	Feedback tipe	L [mm]	L with brake [mm]
2A	A22-A23-M1-M2-R1	106.5	136.0
2B	A22-A23-M1-M2-R1	129.5	159.0
2A	A1-A15-A16	116.5	146.0
2B	A1-A15-A16	139.5	169.0



60 EXTERNAL DIMENSIONS

C21 connection (up to 30 Arms continuous)

Model	Feedback tipe	L [mm]	L with brake [mm]
2A	A22-A23	102.5	132.0
2B	A22-A23	125.5	155.0
2A	A3-A4-A5-A6-A15-A16	112.5	142.0
2B	A3-A4-A5-A6-A15-A16	135.5	165.0



TETRA COMPACT 4 80

803A RATINGS and SPECIFICATION

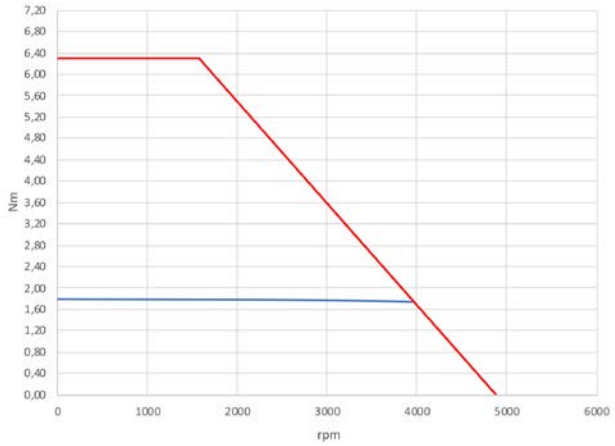
			230 Vac		400 Vac	
	TYPE OF WINDING		20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_0	[Nm]		1.80		
Peak torque	M_{Max}	[Nm]		6.30		
Nominal torque	M_n	[Nm]	1.78	1.59	1.78	1.59
Nominal power	P_n	[W]	555	950	555	950
Continuous stall current	I_0	[Arms]	2.47	3.42	1.50	1.98
Maximum current	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	$K_{e\ u\text{-}v}$	[Vrms/krpm]	44.0	31.8	72.5	55.0
Winding resistance @ 20 °C	$R_{u\text{-}v}$	[Ohm]	6.84	3.43	17.60	10.35
Winding inductance	$L_{q\ u\text{-}v}$	[mH]	18.50	9.66	50.18	29.00
Electrical time constant	Te	[ms]	2.71	2.81	2.84	2.80
Thermal resistance	Rth	[°C/W]		1.09		
Mechanical time constant (a)	Tm	[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

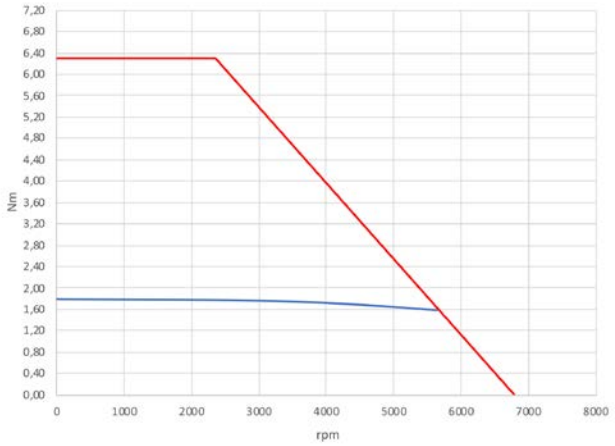
803A 20

Operative curves at 230 Vac — Cn — Cmax



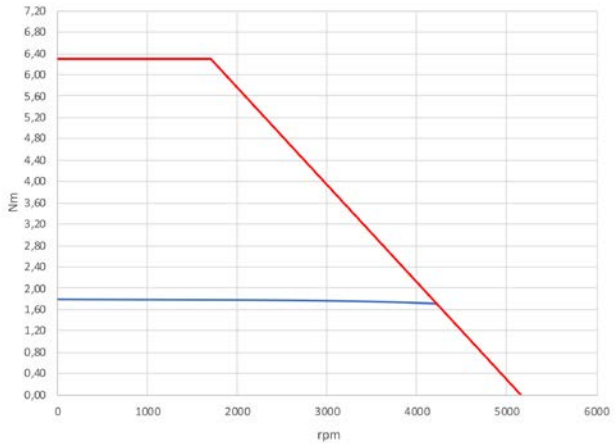
803A 21

Operative curves at 230 Vac — Cn — Cmax



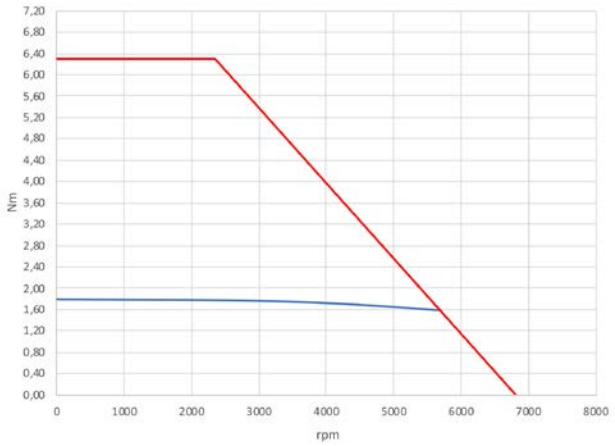
803A 16

Operative curves at 400 Vac — Cn — Cmax



803A 15

Operative curves at 400 Vac — Cn — Cmax



Operative temperature -20 ÷ +40 °C

803B RATINGS and SPECIFICATION

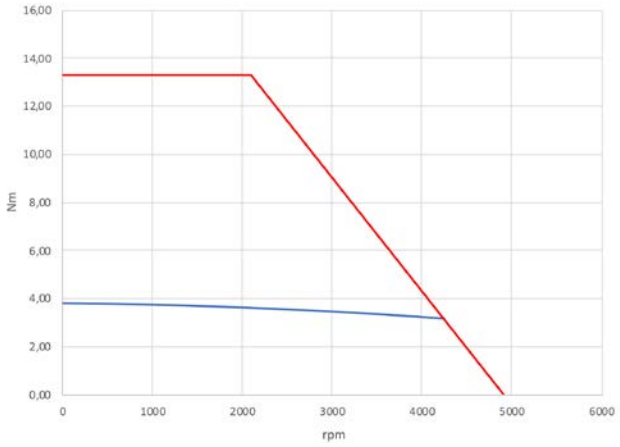
			230 Vac		400 Vac	
	TYPE OF WINDING		20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_0	[Nm]		3.80		
Peak torque	M_{Max}	[Nm]		13.30		
Nominal torque	M_n	[Nm]	3.45	2.60	3.45	2.60
Nominal power	P_n	[W]	1080	1630	1080	1630
Continuous stall current	I_0	[Arms]	5.22	7.22	3.17	4.18
Maximum current	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	Te	[ms]	4.87	4.63	4.95	4.70
Thermal resistance	Rth	[°C/W]		0.90		
Mechanical time constant (a)	Tm	[ms]	0.43	0.45	0.42	0.44
Rotor inertia without holding brake	J	[kg·cm²]		1.42		
Rotor inertia with holding brake	J	[kg·cm²]		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

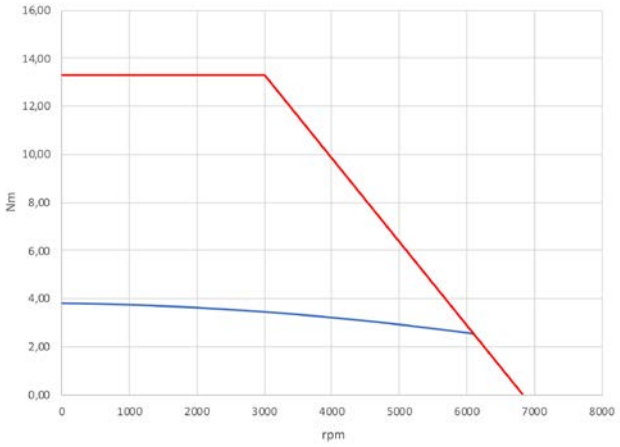
803B 20

Operative curves at 230 Vac — Cn — Cmax



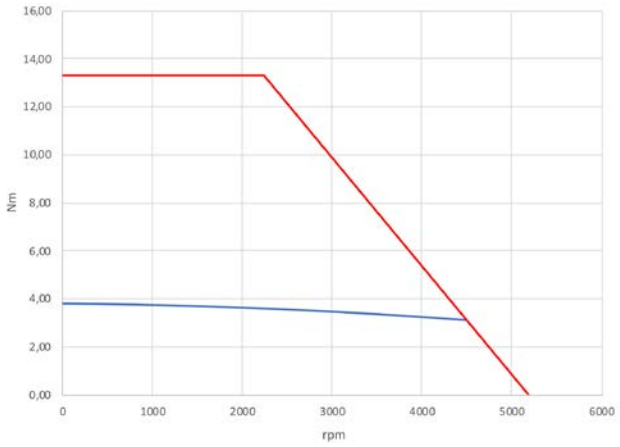
803B 21

Operative curves at 230 Vac — Cn — Cmax



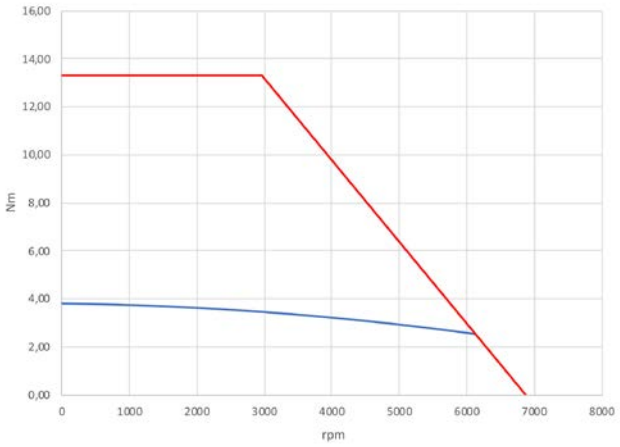
803B 16

Operative curves at 400 Vac — Cn — Cmax



803B 15

Operative curves at 400 Vac — Cn — Cmax



Operative temperature -20 ÷ +40 °C

803C RATINGS and SPECIFICATION

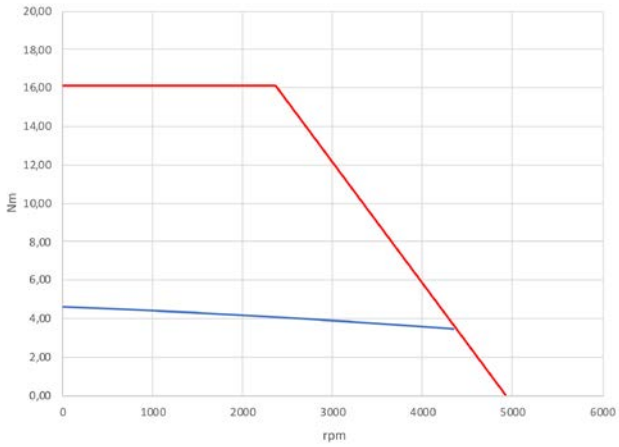
			230 Vac		400 Vac	
	TYPE OF WINDING		20	21	16	15
ELECTRICAL DATA						
Continuous stall torque (*)	M_0	[Nm]		4.60		
Peak torque	M_{Max}	[Nm]		16.10		
Nominal torque	M_n	[Nm]	3.91	2.88	3.91	2.88
Nominal power	P_n	[W]	1230	1800	1230	1800
Continuous stall current	I_0	[Arms]	6.32	8.75	3.84	5.06
Maximum current	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	Rth	[°C/W]		0.88		
Mechanical time constant (a)	Tm	[ms]	0.49	0.50	0.48	0.50
Rotor inertia without holding brake	J	[kg·cm²]		2.03		
Rotor inertia with holding brake	J	[kg·cm²]		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

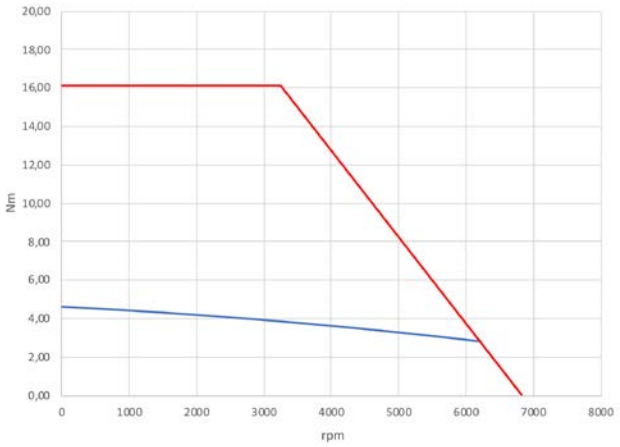
803C 20

Operative curves at 230 Vac — Cn — Cmax



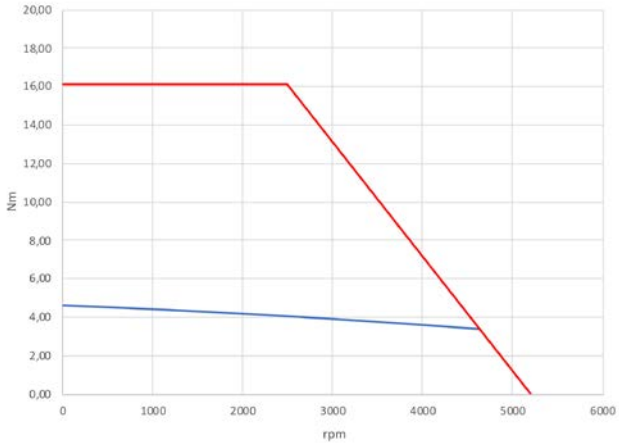
803C 21

Operative curves at 230 Vac — Cn — Cmax



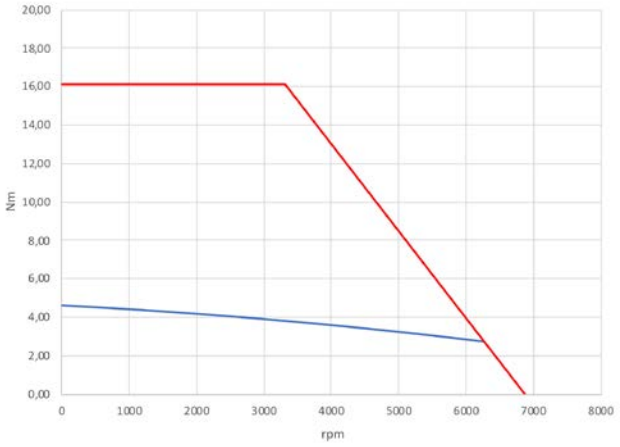
803C 16

Operative curves at 400 Vac — Cn — Cmax



803C 15

Operative curves at 400 Vac — Cn — Cmax

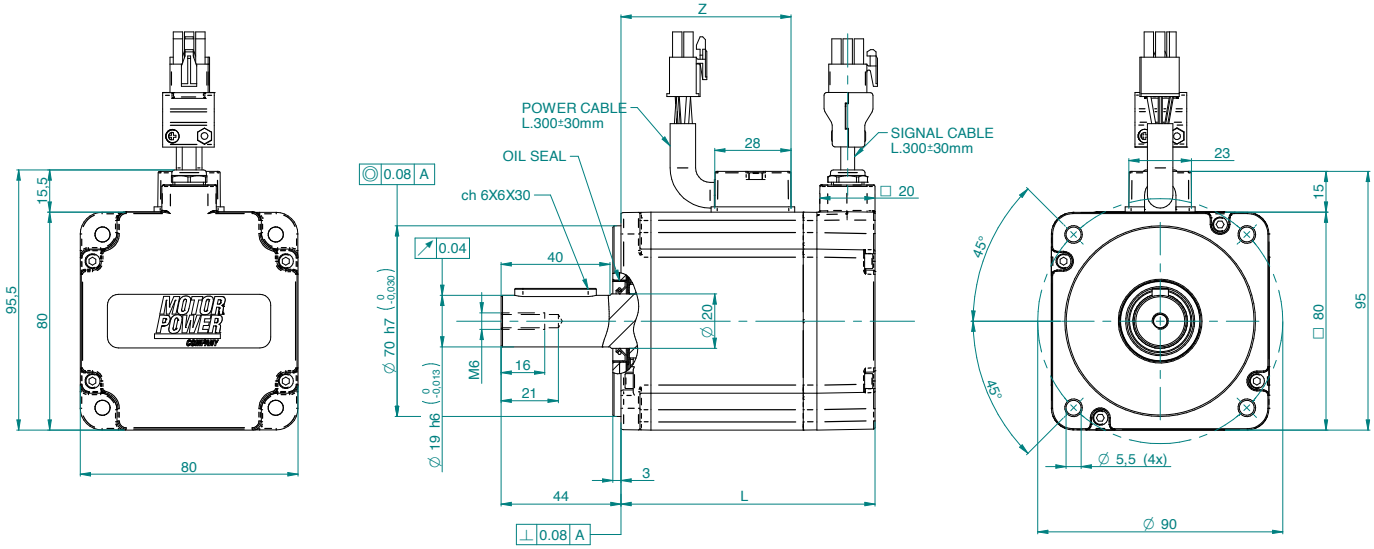


Operative temperature -20 ÷ +40 °C

TC4 80 EXTERNAL DIMENSIONS

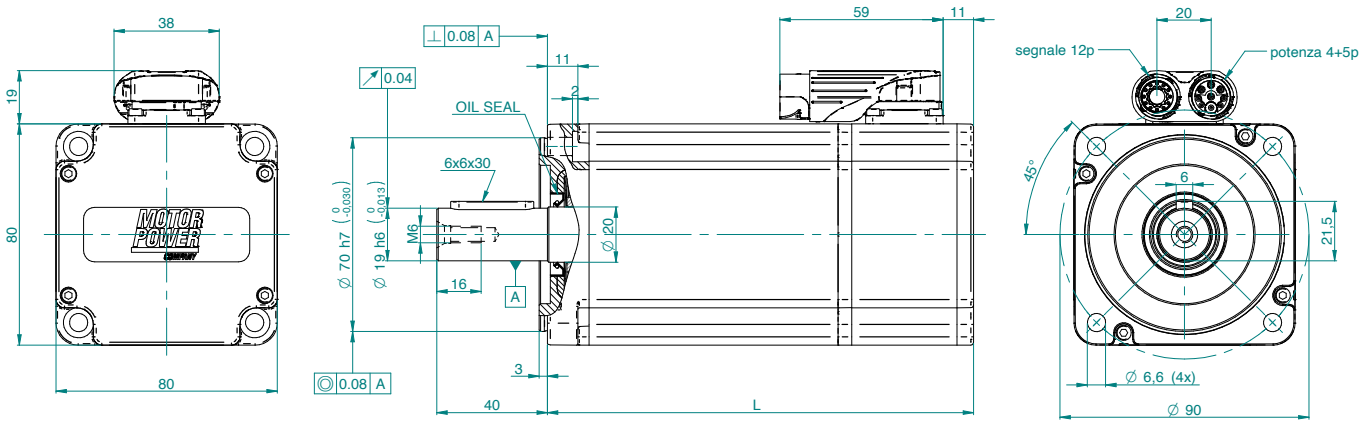
D0/D2 connection (up to 9 Arms continuous)

Model	Feedback tipe	L [mm]	L with brake [mm]	Z [mm]	Z with brake [mm]
3A	M1-M2-R1	93.0	125.0	62.5	62.5
3B	M1-M2-R1	115.0	147.0	84.5	84.5
3C	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 (up to 14 Arms continuous)

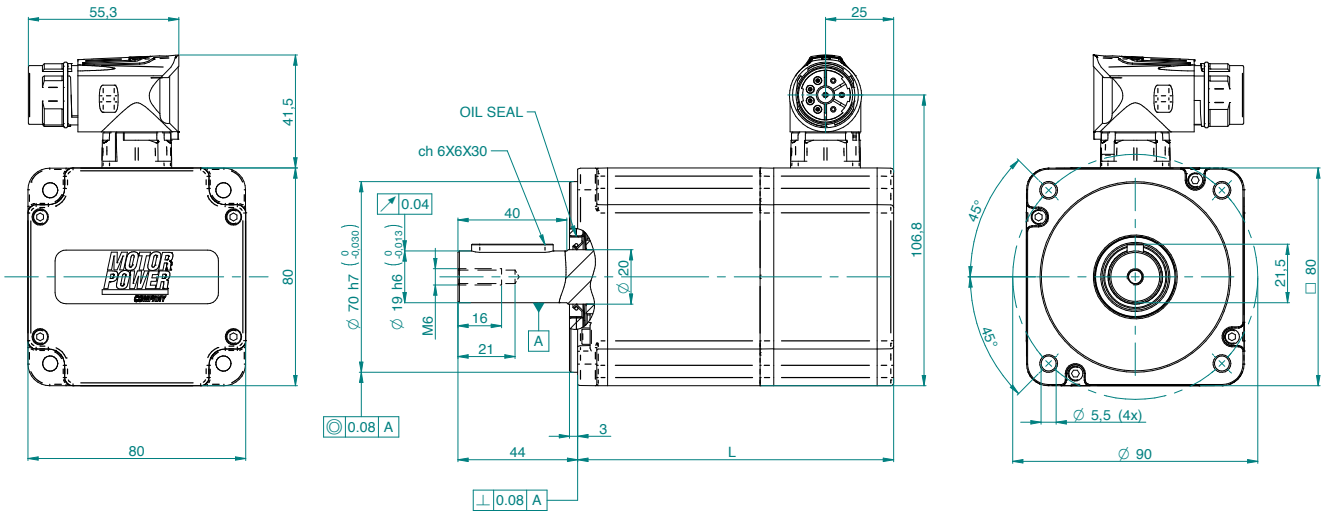
Model	Feedback tipe	L [mm]	L with brake [mm]
3A	A22-A23-M1-M2-R1	120.0	149.0
3B	A22-A23-M1-M2-R1	142.0	171.0
3C	A22-A23-M1-M2-R1	154.0	183.0
3A	A1-A15-A16	130.0	159.0
3B	A1-A15-A16	152.0	181.0
3C	A1-A15-A16	164.0	193.0



TC4 80 EXTERNAL DIMENSIONS

C21 connection (up to 30 Arms continuous)

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



NOTE

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.

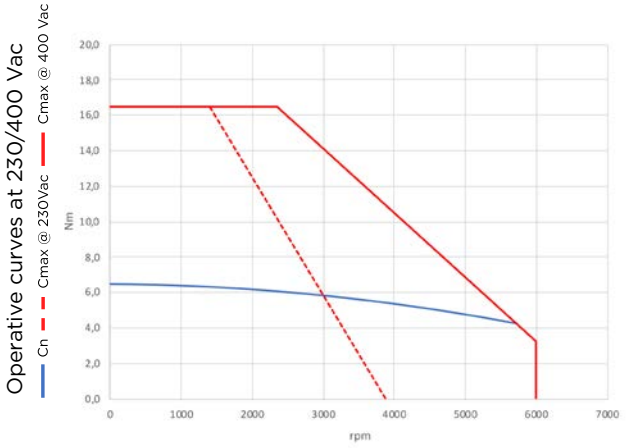
TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

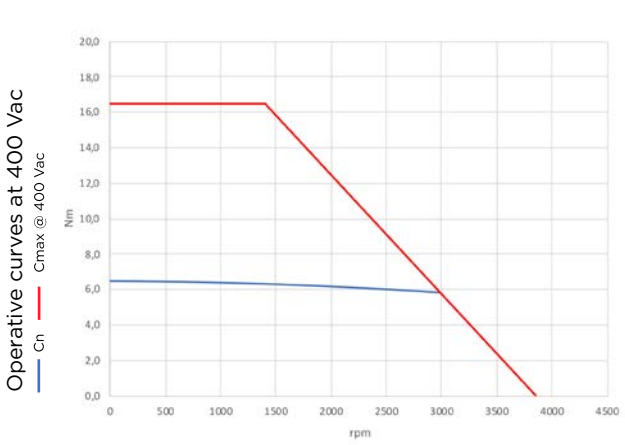
100*4A* 15

Operative curves at 230/400 Vac



100*4A* 17

Operative curves at 400 Vac



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]		0.61	
Mechanical time constant (a)	Tm	[ms]	0.34	0.34	0.35
Rotor inertia without holding brake	J	[kg·cm²]		4.61	
Rotor inertia with holding brake	J	[kg·cm²]		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	

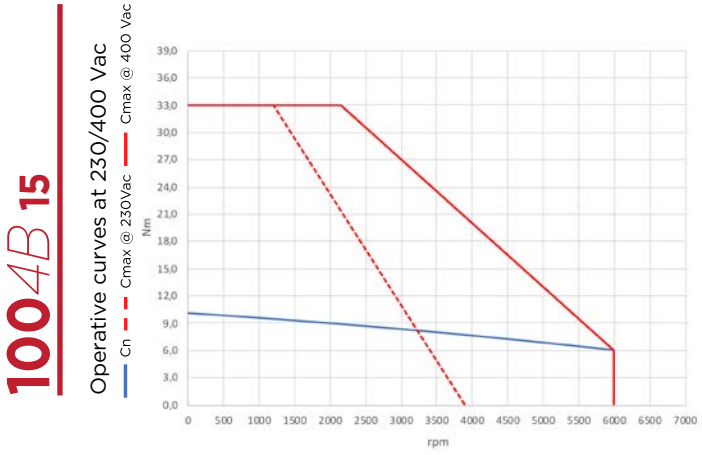
Rated output with 300 x 300 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake.
(a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

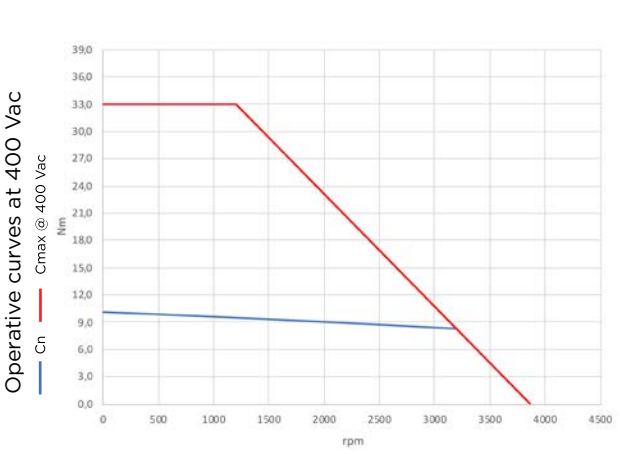
Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

100*4B* 15



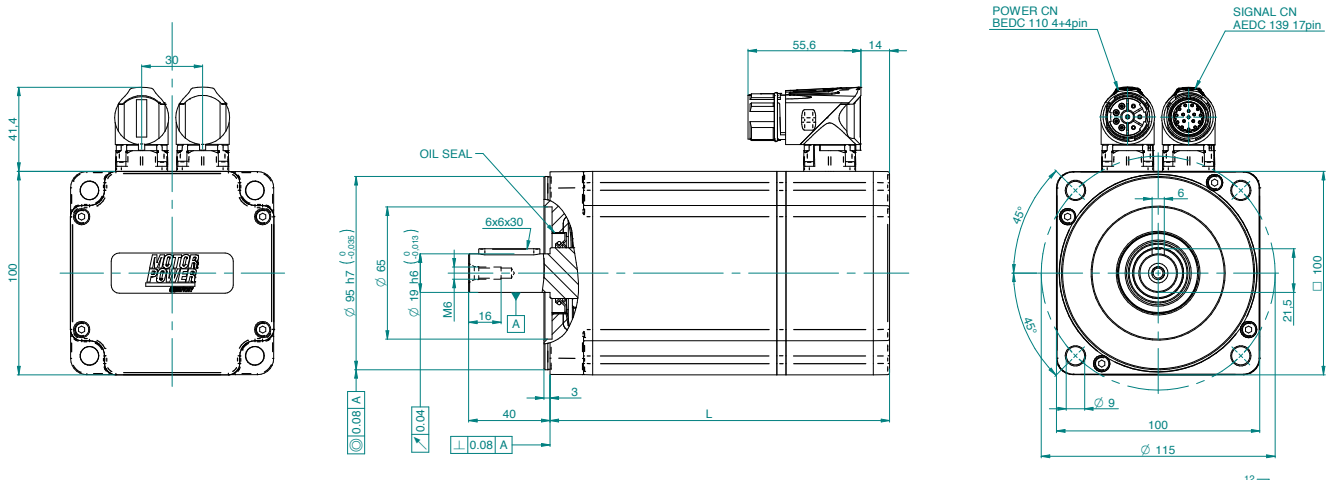
100*4B* 17



EXTERNAL DIMENSIONS

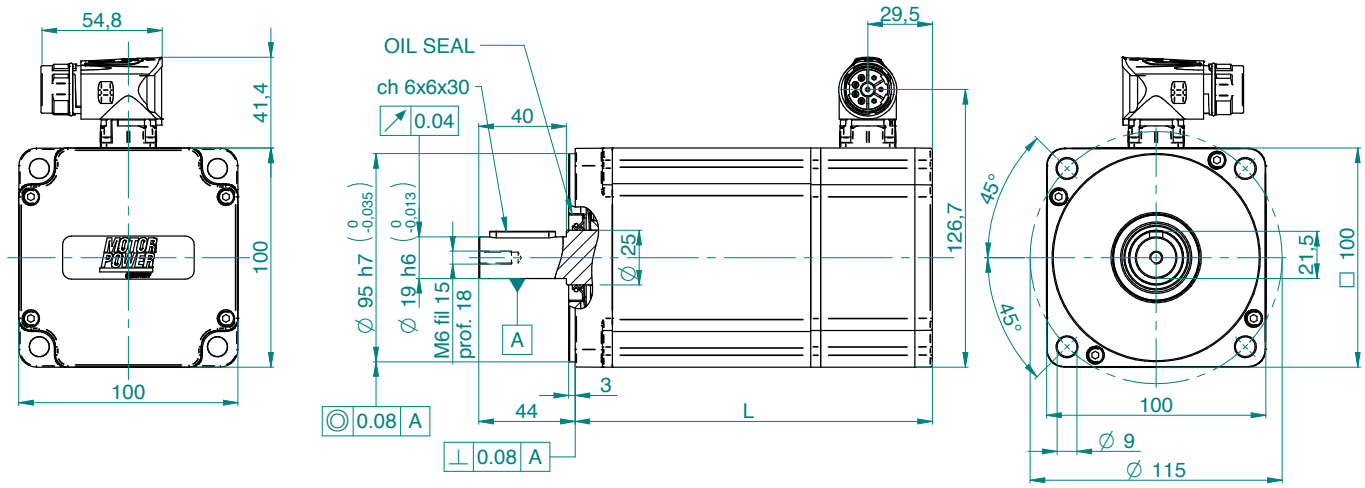
G2/H2 connection (up to 30 Arms continuous)

Model	Feedback tipe	L [mm]	L with brake [mm]
4A	A22-A23-M1-M2	167.0	197.0
4B	A22-A23-M1-M2	212.0	242.0
4A	A1-A15-A16-R1	183.0	213.0
4B	A1-A15-A16-R1	228.0	258.0



C21 connection (up to 30 Arms continuous)

Model	Feedback tipe	L [mm]	L with brake [mm]
4A	A22-A23	163.0	193.0
4B	A22-A23	208.0	238.0
4A	A3-A4-A5-A6-A15-A16	179.0	209.0
4B	A3-A4-A5-A6-A15-A16	224.0	254.0



TETRA COMPACT 4

130

130 5F RATINGS and SPECIFICATION

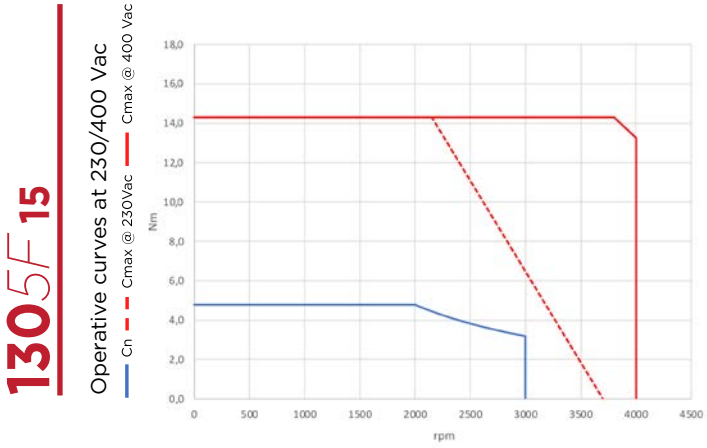
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		4.77	
Peak torque	M_{Max}	[Nm]		14.3	
Nominal torque	M_n	[Nm]		3.18	
Nominal power	P_n	[W]		1000	
Continuous stall current	I_0	[Arms]	5.24	5.24	2.98
Maximum current	I_{Max}	[Arms]	18.28	18.28	10.40
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	

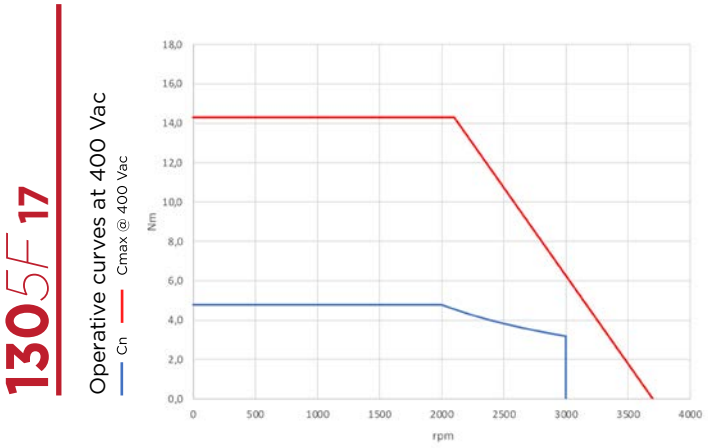
Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.





130 5G RATINGS and SPECIFICATION

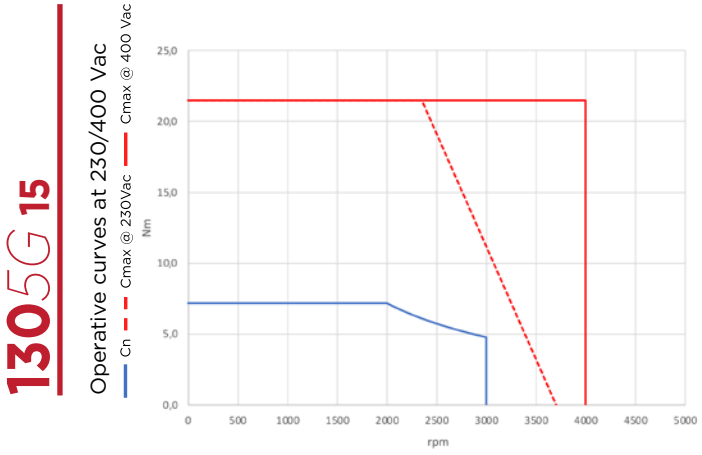
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		7.16	
Peak torque	M_{Max}	[Nm]		21.48	
Nominal torque	M_n	[Nm]		4.78	
Nominal power	P_n	[W]		1500	
Continuous stall current	I_0	[Arms]	7.87	7.87	4.48
Maximum current	I_{Max}	[Arms]	26.83	26.83	15.26
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·cm²]		9.72	
Rotor inertia with holding brake	J	[kg·cm²]		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	

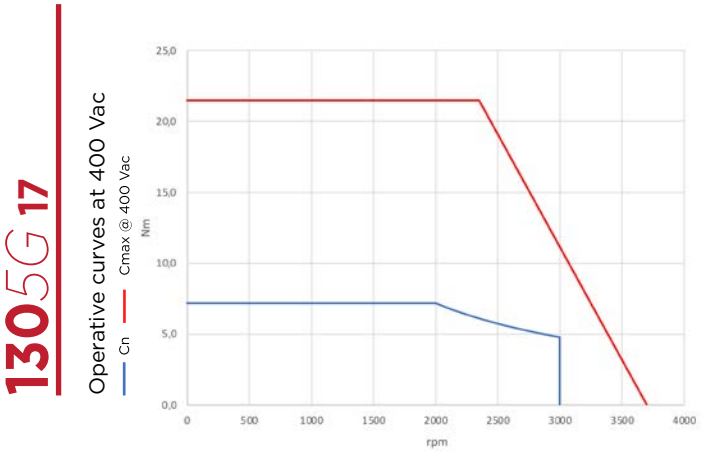
Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.





130 5H RATINGS and SPECIFICATION

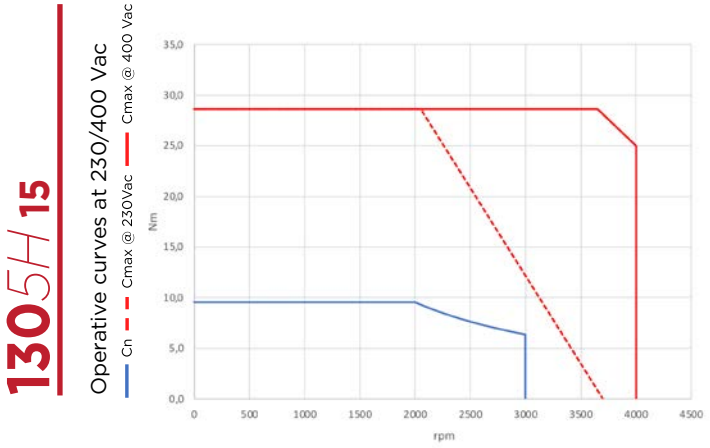
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		9.55	
Peak torque	M_{Max}	[Nm]		28.65	
Nominal torque	M_n	[Nm]		6.37	
Nominal power	P_n	[W]		2000	
Continuous stall current	I_0	[Arms]	10.50	10.50	5.97
Maximum current	I_{Max}	[Arms]	35.00	35.00	19.90
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·cm²]		12.77	
Rotor inertia with holding brake	J	[kg·cm²]		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	

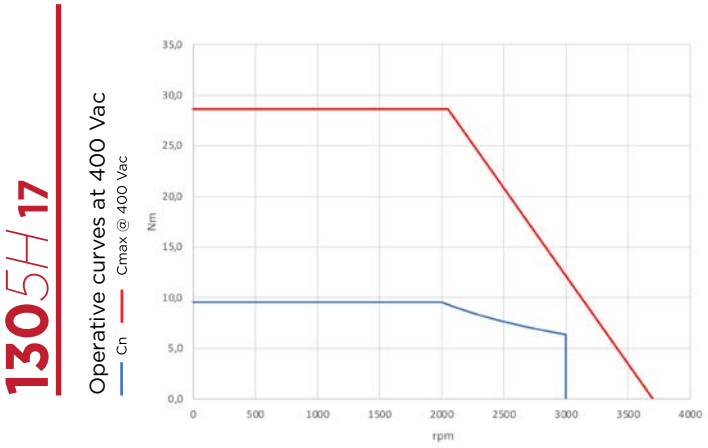
Rated output with 400 x 400 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

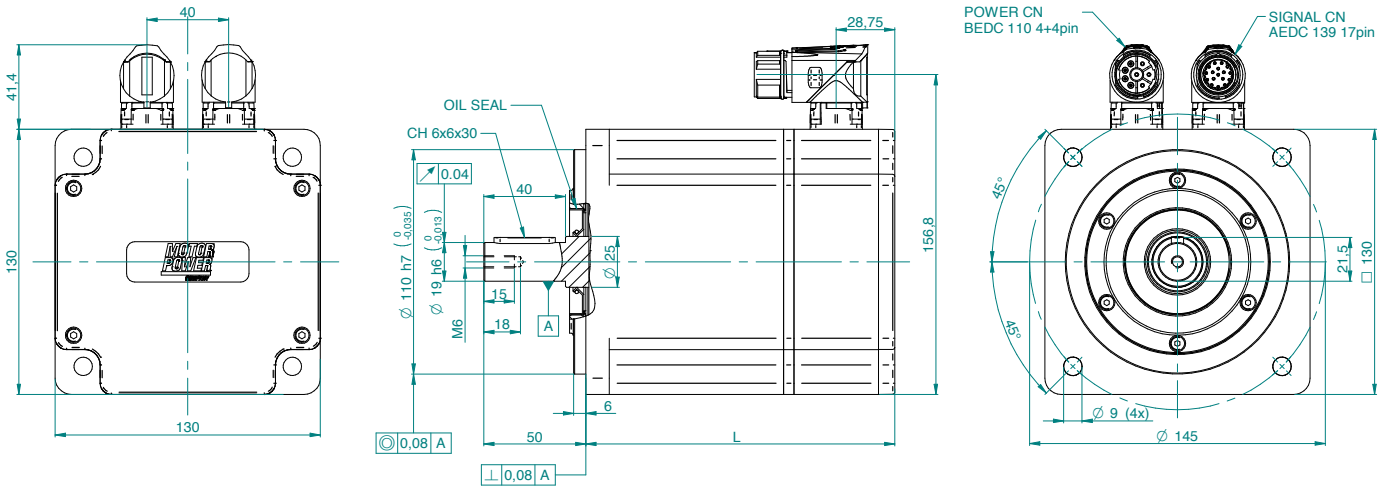




130 EXTERNAL DIMENSIONS

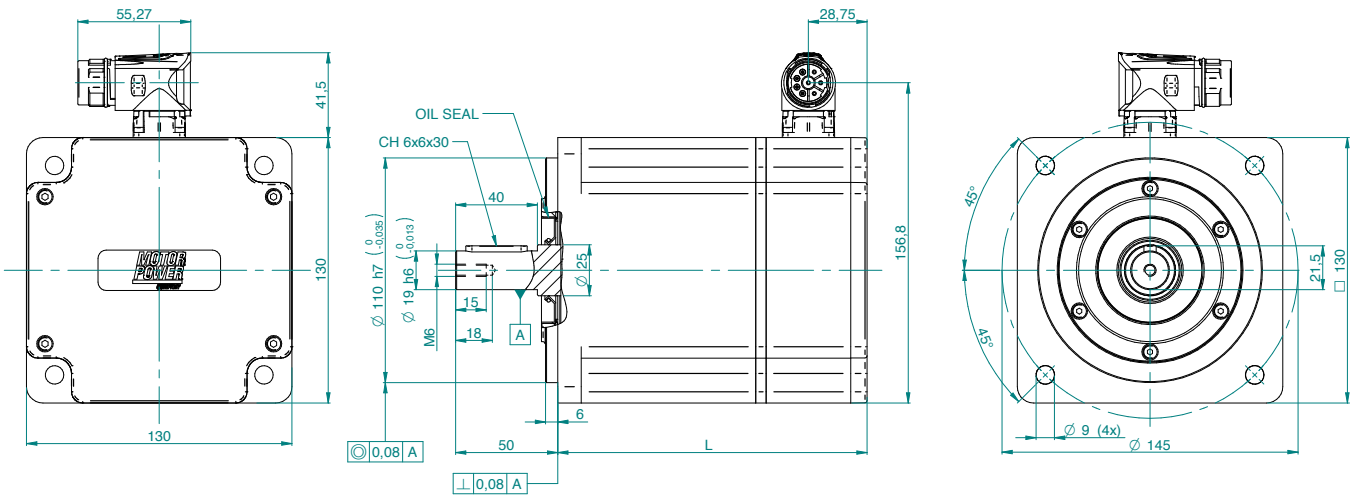
G2/H2 connection (up to 30 Arms continuous)

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	220.0
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	236.0



C21 connection (up to 30 Arms continuous)

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	220.0



150

TETRA COMPACT 4

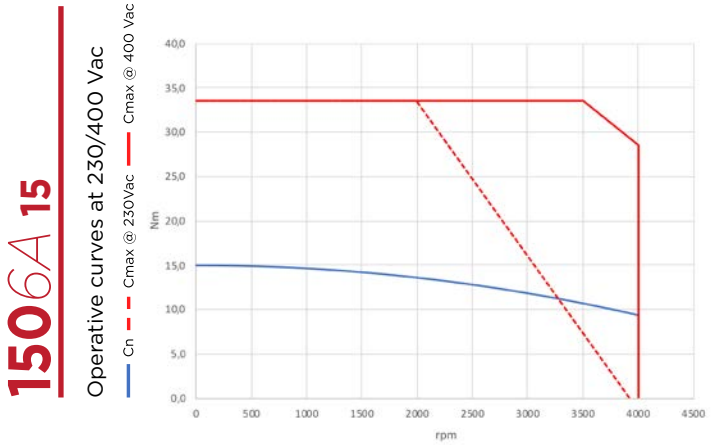
150 6A RATINGS and SPECIFICATION

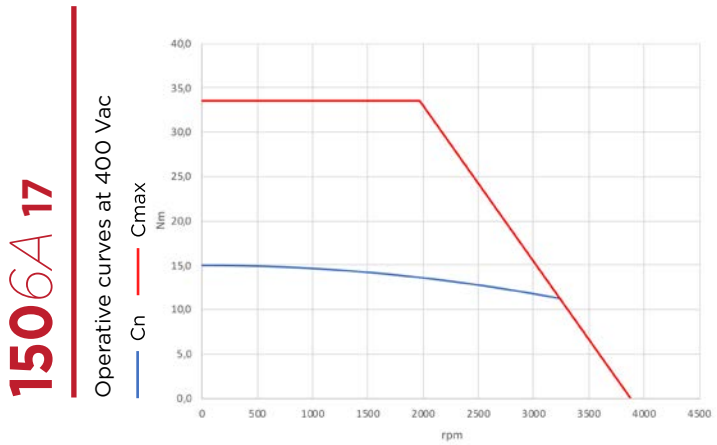
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		15.0	
Peak torque	M_{Max}	[Nm]		33.5	
Nominal torque	M_n	[Nm]		11.8	
Nominal power	P_n	[W]		3715	
Continuous stall current	I_0	[Arms]	16.49	16.49	9.38
Maximum current	I_{Max}	[Arms]	44.91	44.91	25.54
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





150 *6B* RATINGS and SPECIFICATION

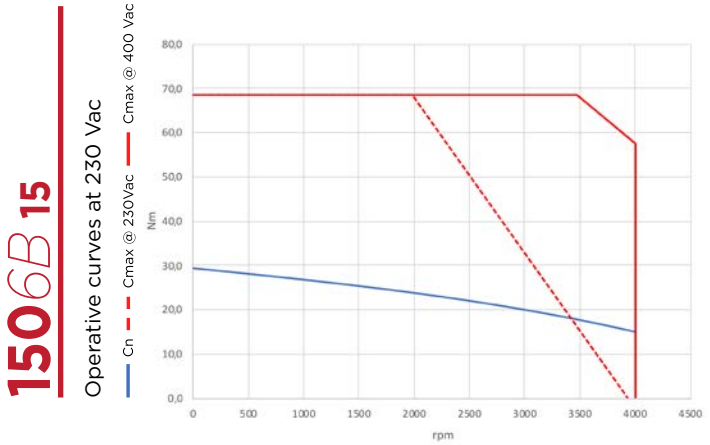
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		29.4	
Peak torque	M_{Max}	[Nm]		68.5	
Nominal torque	M_n	[Nm]		20.0	
Nominal power	P_n	[W]		6280	
Continuous stall current	I_0	[Arms]	32.32	32.32	18.38
Maximum current	I_{Max}	[Arms]	91.94	91.94	52.29
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 (a)	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	

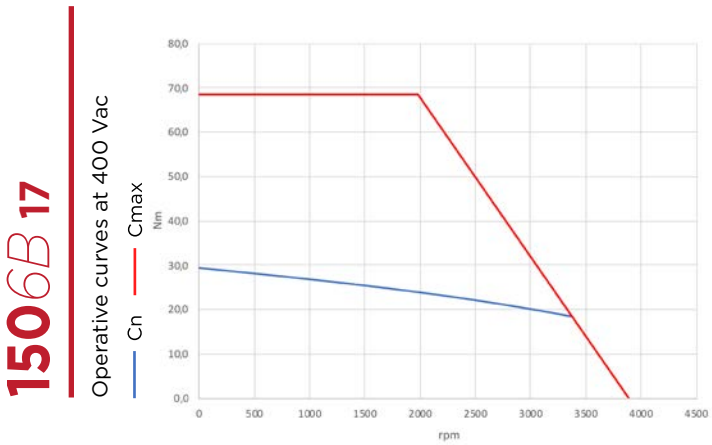
Rated output with 475 x 475 x 20 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.





150 6C RATINGS and SPECIFICATION

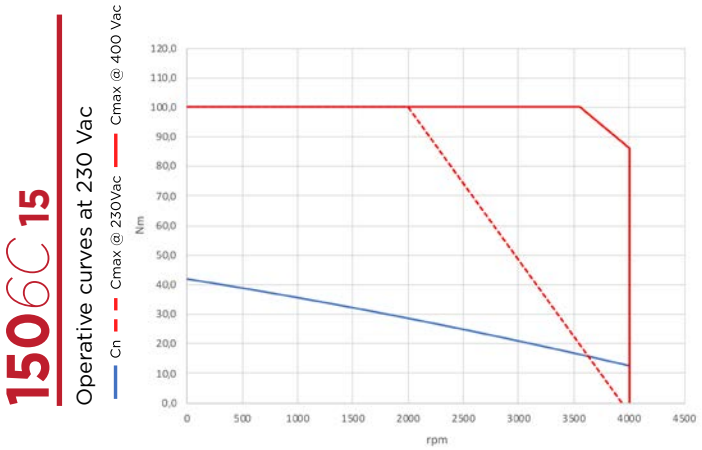
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		41.77	
Peak torque	M_{Max}	[Nm]		100.0	
Nominal torque	M_n	[Nm]		20.96	
Nominal power	P_n	[W]		6580	
Continuous stall current	I_0	[Arms]	45.92	45.92	26.12
Maximum current	I_{Max}	[Arms]	129.33	129.33	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·cm²]		40.17	
Rotor inertia with holding brake	J	[kg·cm²]		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	

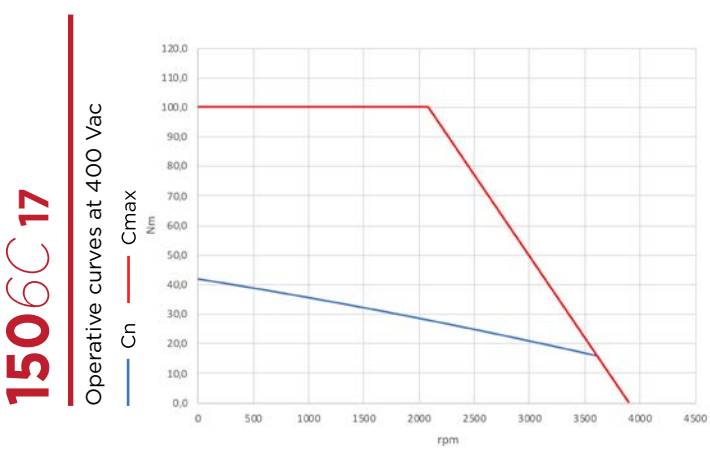
Rated output with 475 x 475 x 20 mm aluminium heat sink flange coupling. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

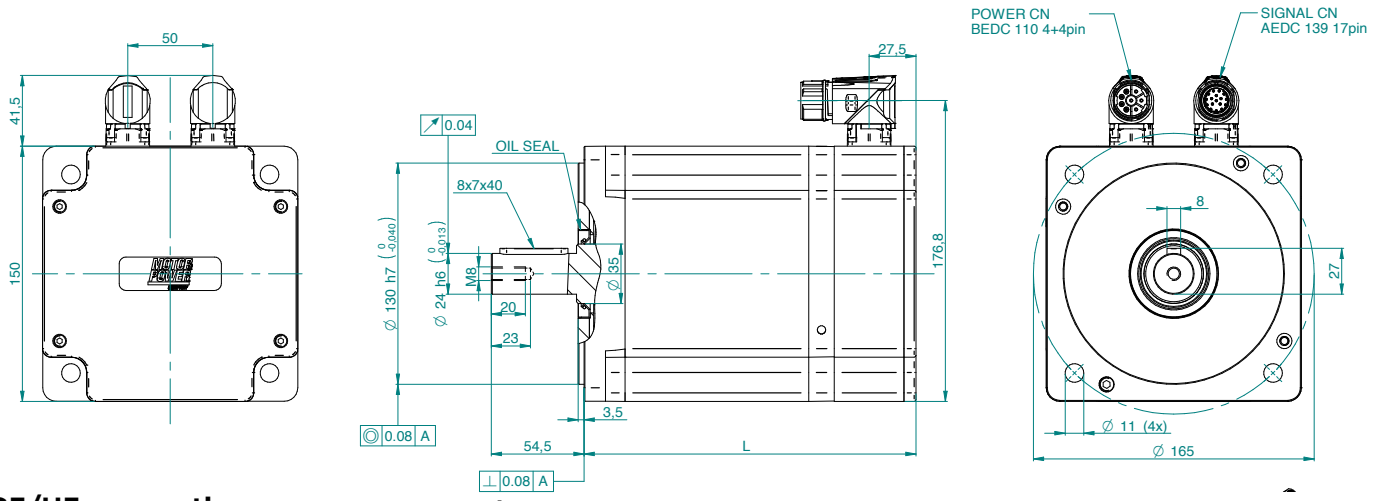




150 EXTERNAL DIMENSIONS

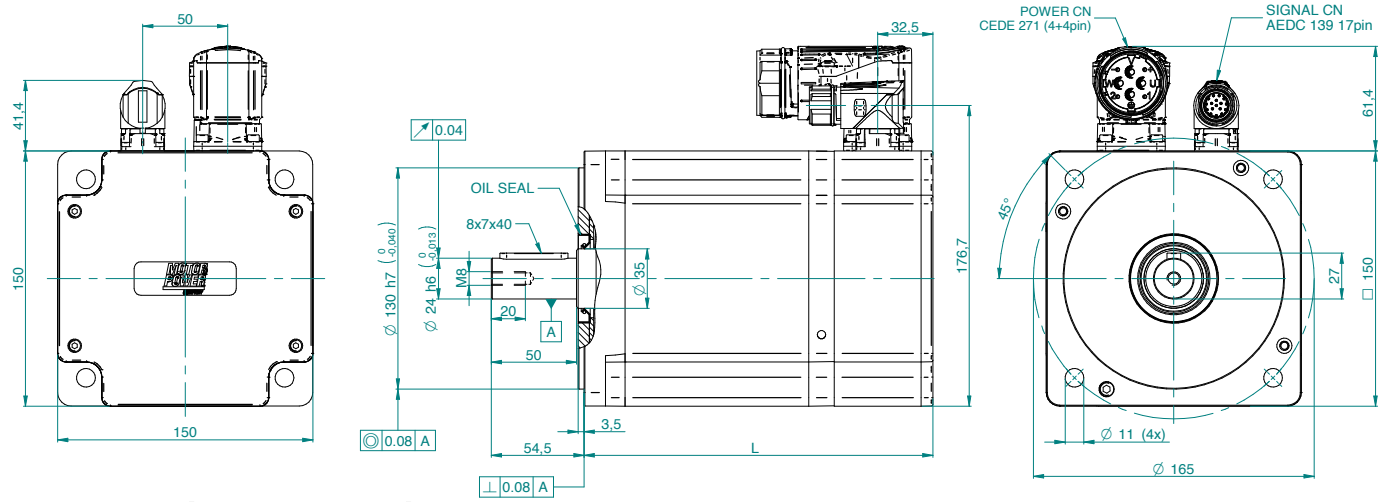
G2/H2 connection (up to 30 Arms continuous)

Model	Feedback tipe	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 (up to 75 Arms continuous)

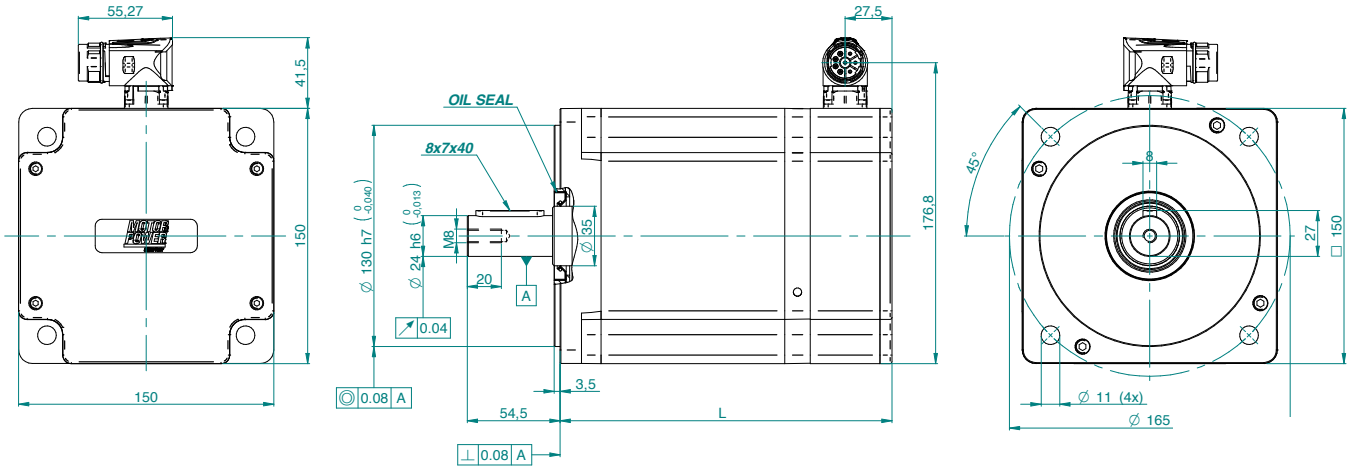
Model	Feedback tipe	L [mm]	L with brake [mm]
6A	A22-A23-M1-M2	205.0	250.0
6B	A22-A23-M1-M2	250.0	295.0
6C	A22-A23-M1-M2	295.0	340.0
6A	A1-A15-A16-R1	221.0	266.0
6B	A1-A15-A16-R1	266.0	311.0
6C	A1-A15-A16-R1	311.0	356.0



150 EXTERNAL DIMENSIONS

C21 connection (up to 30 Arms continuous)

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



NOTE

TETRA COMPACT 4 180

180 7A RATINGS and SPECIFICATION

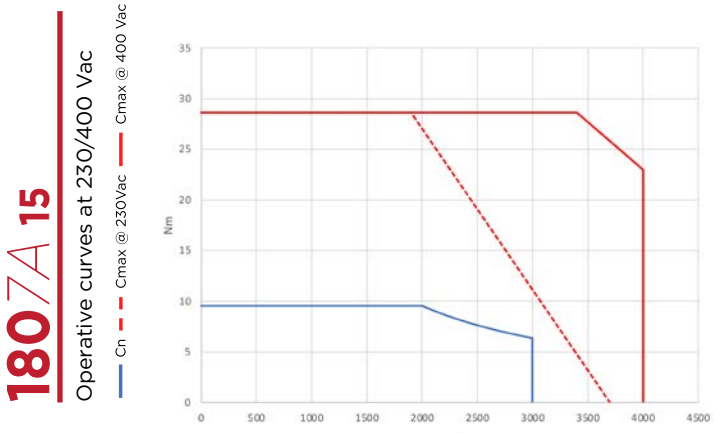
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		9.55	
Peak torque	M_{Max}	[Nm]		28.65	
Nominal torque	M_n	[Nm]		6.37	
Nominal power	P_n	[W]		2000	
Continuous stall current	I_0	[Arms]	10.50	10.50	5.97
Maximum current	I_{Max}	[Arms]	42.00	42.00	23.88
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	$K_{e\ u\text{-}v}$	[Vrms/krpm]	55.0	55.0	96.7
Winding resistance @ 20 °C	$R_{u\text{-}v}$	[Ohm]	0.39	0.39	1.20
Winding inductance	$L_{q\ u\text{-}v}$	[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	

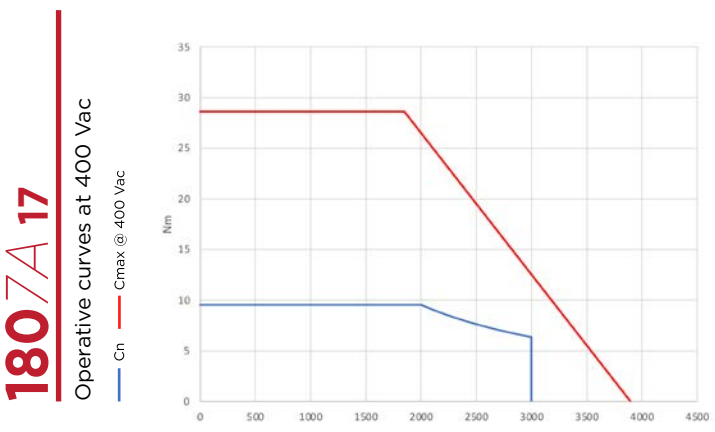
Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.





180 7C RATINGS and SPECIFICATION

			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[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_0	[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.

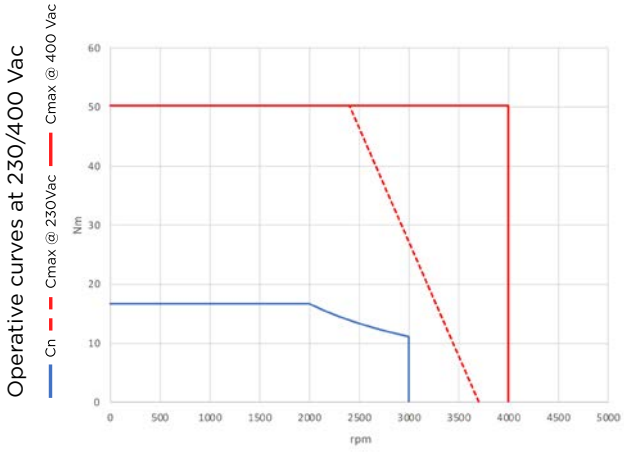
TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

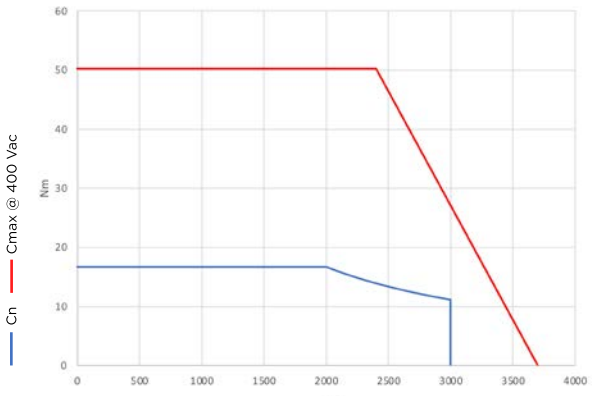
180 7C 15A

Operative curves at 230/400 Vac



180 7C 17

Operative curves at 400 Vac



180 7D RATINGS and SPECIFICATION

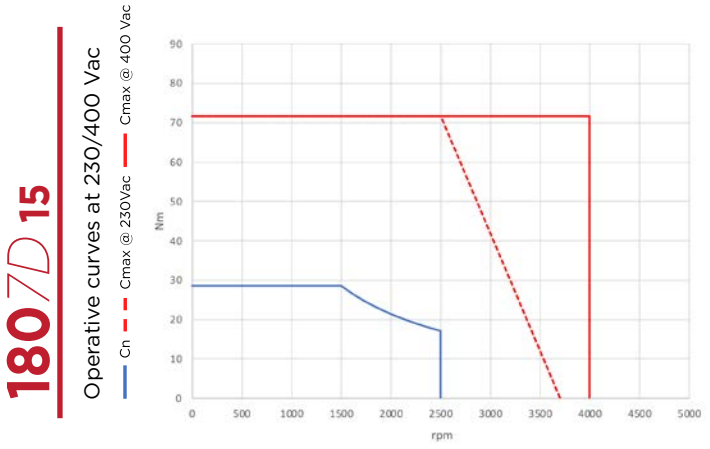
			230 Vac	400 Vac	
	TYPE OF WINDING		15	15	17
ELECTRICAL DATA					
Continuous stall torque (*)	M_0	[Nm]		28.65	
Peak torque	M_{Max}	[Nm]		71.62	
Nominal torque	M_n	[Nm]		17.20	
Nominal power	P_n	[W]		4500	
Continuous stall current	I_0	[Arms]	31.50	31.50	17.90
Maximum current	I_{Max}	[Arms]	92.60	92.60	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	

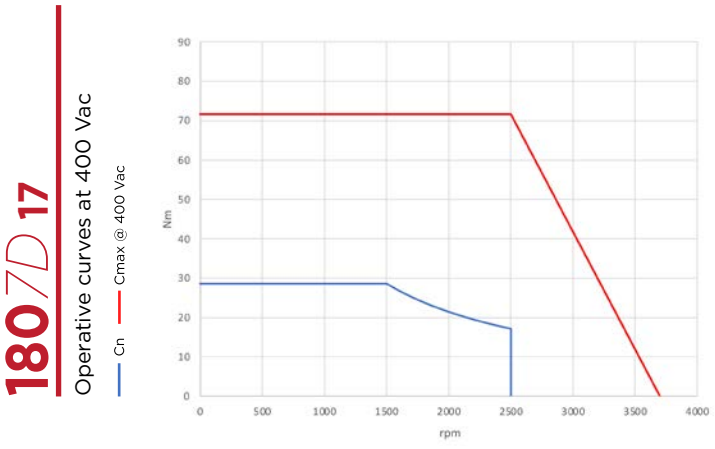
Rated output with 550 x 550 x 20 mm aluminium heat sink flange. Derating must be considered if the oil seal is applied - IP 54 standard shaft bushing.
(*) without brake. (a) without brake and without feedback. Current values rated @ 20°C.

TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.





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.

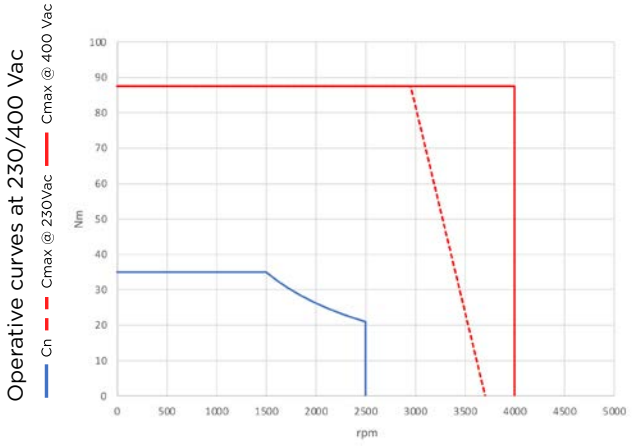
TORQUE/SPEED CHARTS

Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

180 7E 15

Operative curves at 230/400 Vac



180 7E 17

Operative curves at 400 Vac

180 7F RATINGS and SPECIFICATION

			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]	3700
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]	0.095
Winding inductance	$L_{q\ u-v}$	[mH]	1.98
Electrical time constant	Te	[ms]	23.71
Thermal resistance	Rth	[°C/W]	-
Mechanical time constant (a)	Tm	[ms]	0.46
Rotor inertia without holding brake	J	[kg·cm²]	140.62
Rotor inertia with holding brake	J	[kg·cm²]	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

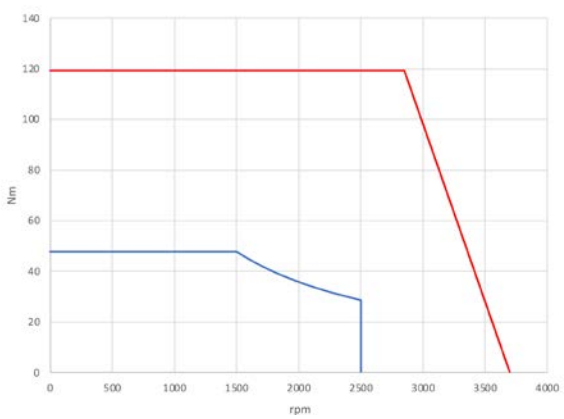
Operative temperature -20 ÷ +40 °C

Any specifications are subjected to change without notice.

180 7F 17

Operative curves at 400 Vac

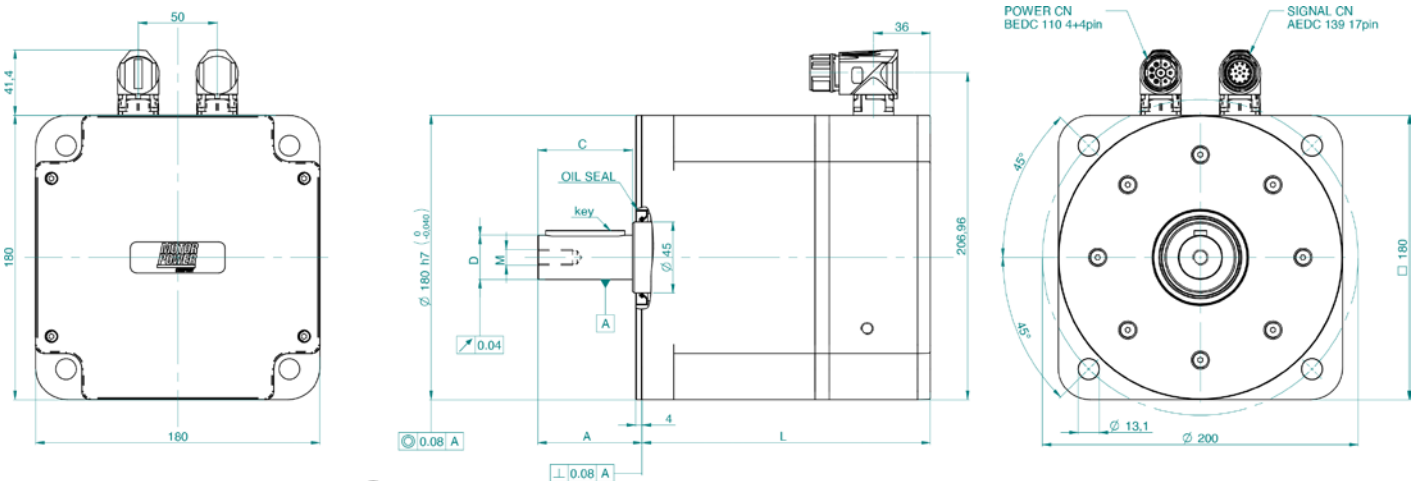
Cn — Cmax @ 400 Vac



TC4 180 EXTERNAL DIMENSIONS

G2/H2 connection (up to 30 Arms continuous)

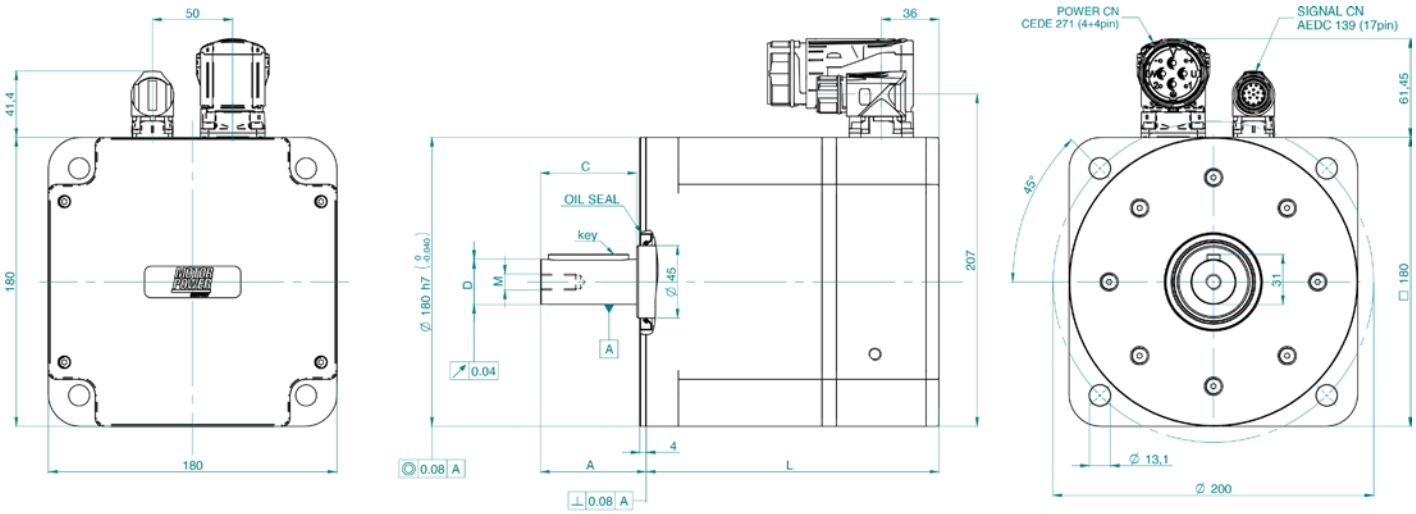
Model	Feedback tipe	L [mm]	L with brake [mm]	D [mm]	A [mm]	C [mm]	M	Key (b x h x l)
7A	All types	182.5	217.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	All types	215.5	250.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	All types	248.5	283.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	All types	292.5	327.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	All types	355.5	390.0	38.0	86.0	80.0	M12x28	10 x 8 x 70



TC4 180 EXTERNAL DIMENSIONS

G3/H3 connection (up to 75 Arms continuous)

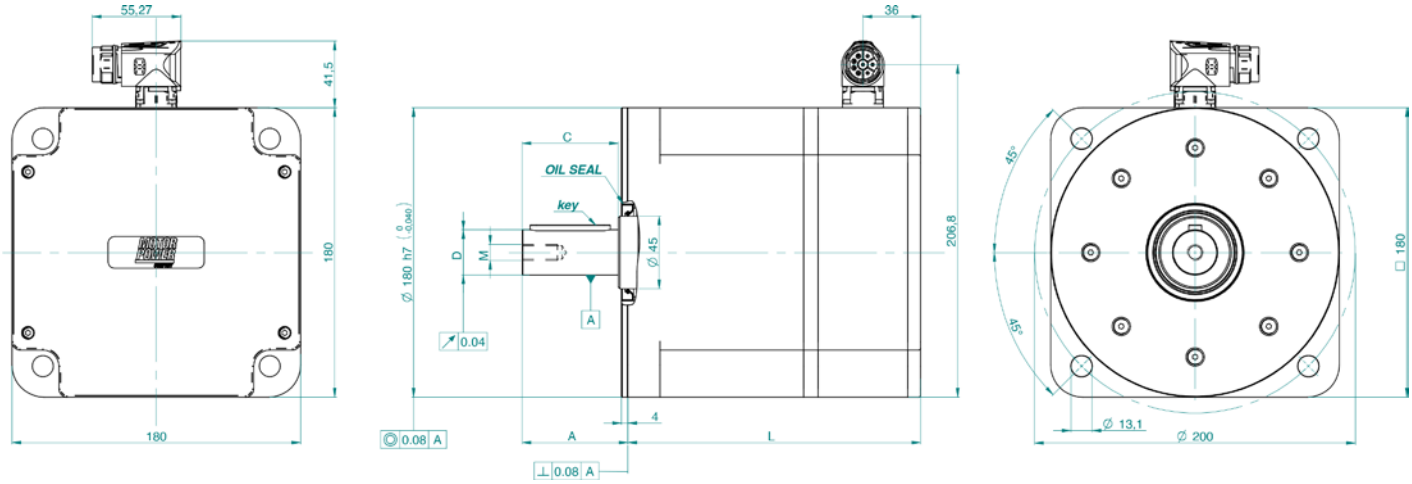
Model	Feedback tipe	L [mm]	L with brake [mm]	D [mm]	A [mm]	C [mm]	M	Key (b x h x l)
7A	All types	182.5	217.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	All types	215.5	250.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	All types	248.5	283.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	All types	292.5	327.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	All types	355.5	390.0	38.0	86.0	80.0	M12x28	10 x 8 x 70



TC4 180 EXTERNAL DIMENSIONS

C21 connection (up to 30 Arms continuous)

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	182.5	217.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7C	A22-A23	215.5	250.0	28.0	66.0	60.0	M10x22	8 x 7 x 50
7D	A22-A23	248.5	283.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7E	A22-A23	292.5	327.0	38.0	86.0	80.0	M12x28	10 x 8 x 70
7F	A22-A23	355.5	390.0	38.0	86.0	80.0	M12x28	10 x 8 x 70



feedback

TC4 Resolver

		R1	
Motor size		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

TC4 Encoder

Type	M1 M-CODER IH INCREMENTAL WITH HALL SENSOR ENCODER	M2 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/s²	
Inertia	5.6 x 10-5 kg cm²	
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	

Type	A1 HIPERFACE ABSOLUTE MULTITURN ENCODER	A3 HIPERFACE DSL ABSOLUTE SINGLETURN ENCODER	A4 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

TC4 Encoder

Type	A5 HIPERFACE SAFETY DSL SINGLETURN 20 BIT ENCODER	A6 HIPERFACE SAFETY DSL MULTITURN 20 BIT ENCODER	A15 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/s²		
Inertia	5 gcm²		
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)		

Type	A16 HIPERFACE SAFETY DSL MULTITURN 24 BIT ENCODER	A22 ENCODER SAFETY ENDAT 3 SINGLETURN 19 BIT ENCODER	A23 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/s²	≤ 1 · 10⁵ rad/s²	
Inertia	5 gcm²	0.2 · 10⁻⁶ kgm²	
Weigth	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	

TC4 NOTE

specifications

TC4 Brake features

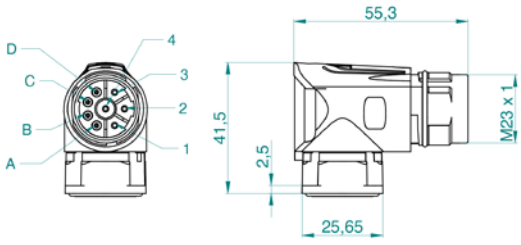
MOTOR SIZE		40	60	80	100	130	150	180
Operating motor temperature	[°C]	-20 ÷ 120						
External ambient temperature	[°C]	-20 ÷ 40						
Standard brake duty	-	Stationary						
Minimum dry static torque (-20 ÷ 120 °C)	[Nm]	0.32	1.3	2.5	6.5	9.6	32	48
Nominal operating voltage (± 10 %)	[Vdc]	24						
Power 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						

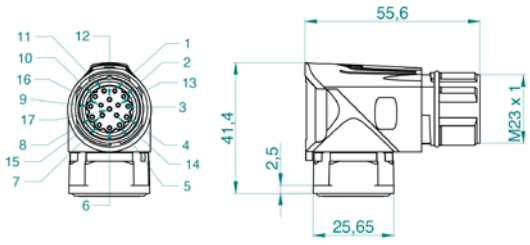
TC4 Wiring motor connection

Connectors with G2 connection

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

(#) Optional





TC4 Wiring motor connection

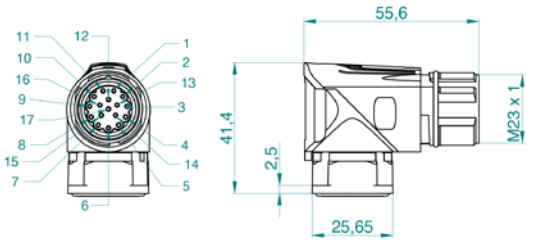
Connectors with H2 connection

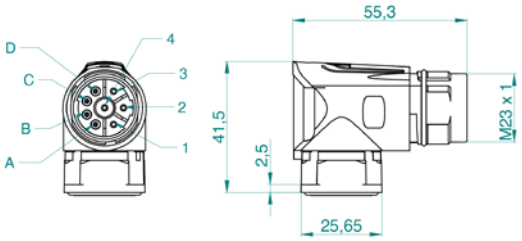
Power connector		Feedback connector			
Pin	Function	**Pin**	**A1**	**M1**	**R1**
1	Phase U	**1**	-	Hall W	-
2	PE	**2**	-	Hall U	-
3	Phase W	**3**	0 Vdc	0 Vdc	-
4	Phase V	**4**	7-12 Vdc	+5 Vdc	-
A	brake + (#)	**5**	/sin	/ChA	/sin
B	brake - (#)	**6**	sin	ChA	sin
C	-	**7**	/data	/ChZ	/ref
D	-	**8**	data	ChZ	ref
		9	-	Hall V	-
		10	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 +
		17	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 -





TC4 Wiring motor connection

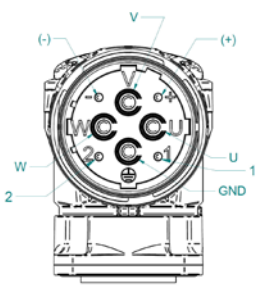
Connectors with G3 connection

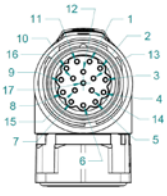
Power connector		Feedback connector			
Pin	Function	**Pin**	**A1**	**M1**	**R1**
U	Phase U	**1**	-	-	-
⏚	PE	**2**	-	-	-
W	Phase W	**3**	0 Vdc	shield	-
V	Phase V	**4**	7-12 Vdc	S1	-
+	brake + (#)	**5**	/sin	/S1	/sin
-	brake - (#)	**6**	sin	S2	sin
1	PT 1000 +	**7**	/data	/S2	/ref
2	PT 1000 -	**8**	data	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 -





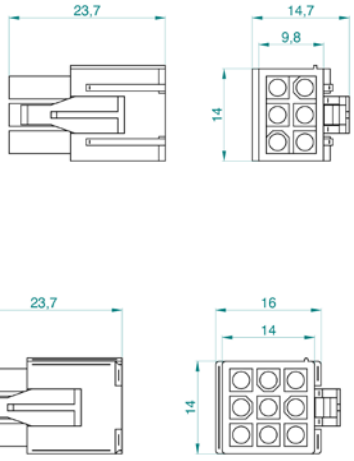
(#) Optional

TC4 Wiring motor connection

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

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

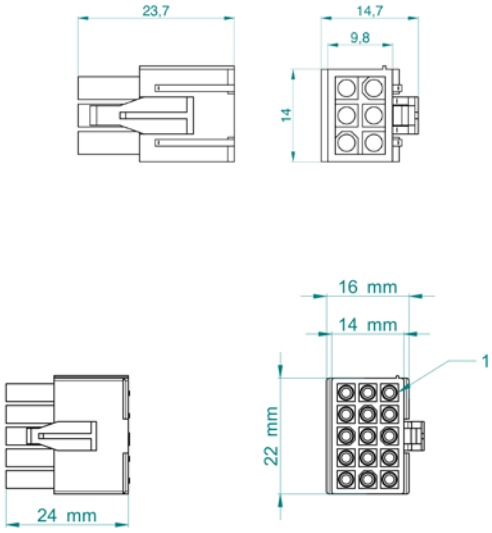
(#) Optional



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



N. 324838

N. 324839

soga energyteam

CMZ SISTEMI ELETTRONICI SRL

Via dell'Artigianato 21
31050 Vascon di Carbonera (TV)
Italy
+39 0422 447411
cmz@cmz.it

cmz.it

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