



BPM SERIES

Permanent Magnet Motors designed for
Electric Off-Highway Vehicles

 **Bonfiglioli**



PERMANENT MAGNET MOTORS FOR MOBILE APPLICATIONS

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Engineering Sustainability



Selection Policy:

All data could vary depending upon the specific application.

Selection approvals must be obtained from Bonfiglioli Customer Application Engineer Office. Contact your reference for application approval. We reserve the right to modify our product specifications, configurations and dimensions at any time without notice.

BPM SERIES

PERMANENT MAGNET MOTORS DESIGNED FOR ELECTRIC OFF-HIGHWAY VEHICLES

With over 40 years of engineering excellence and a proven track record in custom powertrain solutions, Bonfiglioli is a leading provider of permanent magnet motors for the off-highway electric vehicle market. Our deep understanding of the industry and close collaboration with customers enable us to deliver tailored solutions that optimize performance, efficiency, and durability.

As emission regulations tighten across the off-highway sector, Bonfiglioli is committed to helping manufacturers meet these challenges while improving productivity and reducing operating costs. Our motors are specifically designed for demanding applications in agriculture, construction, mining and material handling, delivering increased power, reduced energy consumption and lower total cost of ownership.

Let Bonfiglioli be your partner in driving the future of off-highway electromobility.



PERMANENT MAGNET MOTORS

P	E1	T10	S1	44	6
					BRAKE HOLDING VOLTAGE 6 6Vdc 24 24Vdc 12 12Vdc 48 48Vdc
				BRAKE TORQUE 44 44Nm 175 175Nm 60 60Nm 250 250Nm	
				FEEDBACK AND BRAKE CONNECTIONS S1 Two straight receptacles Hummel M16 size (3-pin / 10-pin) S2 Straight and rotatable receptacles Hummel M16 size (3-pin / 10-pin) S3 Single rotatable receptacle Hummel M16 size (10-pin) S4 Single straight receptacle TE M23 size (12-pin) F1 1m flying cables with cap housings TE AMP Superseal 1.5 (2-pin / 6-pin) F1A 0.35m flying cables with cap housings TE AMP Superseal 1.5 (2-pin / 6-pin) F2 1m flying cables with cap housings TE AMP Superseal 1.5 (2-pin / 2pin & 4-pin) F2A 0.35m flying cables with cap housings TE AMP Superseal 1.5 (2-pin / 2pin & 4-pin) F3 1m flying cables with receptacle TE DEUTSCH DTM (2-pin / 6-pin) F3A 0.35m flying cables with receptacle TE DEUTSCH DTM (2-pin / 6-pin)	
				POWER CONNECTIONS T10 Terminal board with M10 male studs T8 Terminal board with M8 male studs W8 Terminal board with M8 female threads P1 Three straight receptacles Amphenol Powerlock size 1 P2 Three straight receptacles Amphenol Powerlock size 3 P3 Three straight receptacles Amphenol Surlock size 1 P4 Single rotatable receptacle TE M23 size 6-pin P5 Single straight receptacle Amphenol 3-pin	
				FEEDBACK DEVICE E1 SinCos 5Vdc – 2.2Vpp 1ppr R1 Resolver 2p – 7Vrms 10kHz – i=0.5 S Sensorless (no feedback device)	
				THERMAL PROTECTION P Thermistor PTC 150 K Silicon sensor type KTY 84-130 T Platinum sensor PT1000	

For variants combinations availability see sections dedicated to each motor size.
Custom design upon request.



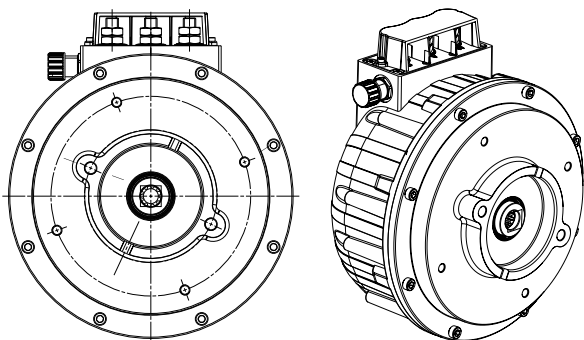
VERSIONS

DEGREE OF PROTECTION

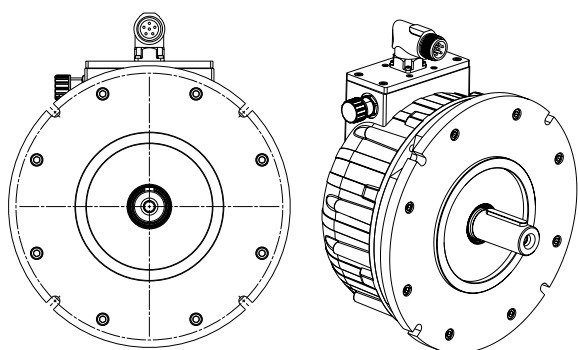
BPM motors are manufactured with protection class IP65 or IP67 according to IEC 60034-5. The IP protection class evaluation refers to the motor enclosure.

MOUNTING INTERFACE

Different mounting interfaces are available according to motor size and stack length.

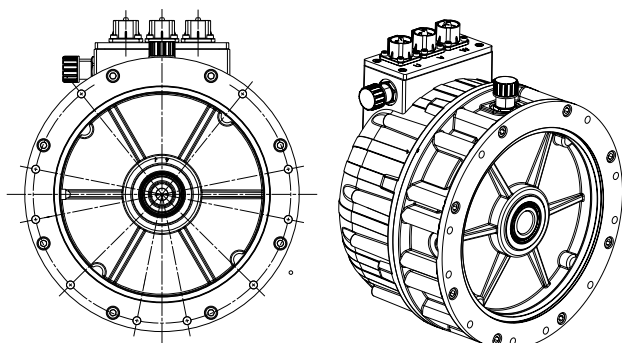


Pump motors have flange and shaft design according to SAE J 744-2021 / ISO 3019-1:2001 or ISO 3019-2:2005.



Motors with through hole flange interface have a general-purpose design.

Brake option is not available for flange-mounted motors.



Motor for gearbox integration are designed to maximize compactness in combination with gearbox series 7T, 7C, 6W.

Brake option is available.



BPM 200



MATERIALS
HANDLING



AERIAL
PLATFORMS



CONSTRUCTION
EQUIPMENTS



AGRICULTURE
EQUIPMENTS

KEY FEATURES

- High efficiency electric motor
- High torque density
- Increased control precision
- Modular design ranging in 4 different sizes
- EM failsafe parking brake upon request
- Pump and application coupling upon request

HIGHLIGHTS

- Surface permanent magnet motors
- 48-650 Vdc voltage range
- 5,3-13,5 kW nominal power
- 60-190 Nm peak torque
- Max mechanical speed 6000rpm
- TENV cooling

BPM 200 L1 | RATINGS

		BPM 200 L1 ... S ... N	
	M_0 [Nm]	20	
	M_{max} [Nm]	60	
	2p [-]	8	
	J_M [kg cm ²]	40	
	m_M [kg]	13	
	m_{MB} [kg]	18	
	V_{bt} [Vdc]	48	425
	n [min ⁻¹]	2250	2250
	f_n [Hz]	150	150
S1	P_n [kW]	3,65	3,65
	M_n [Nm]	15,5	15,5
	I_n [A]	90	10,4
	V_n [V _{AC}]	28	235
S2 60 min.	P_n [kW]	5,17	5,17
	M_n [Nm]	21,9	21,9
	I_n [A]	125	14,4
	V_n [V _{AC}]	29	245
S2 30 min.	P_n [kW]	6,78	6,78
	M_n [Nm]	28,8	28,8
	I_n [A]	163	18,9
	V_n [V _{AC}]	30	255

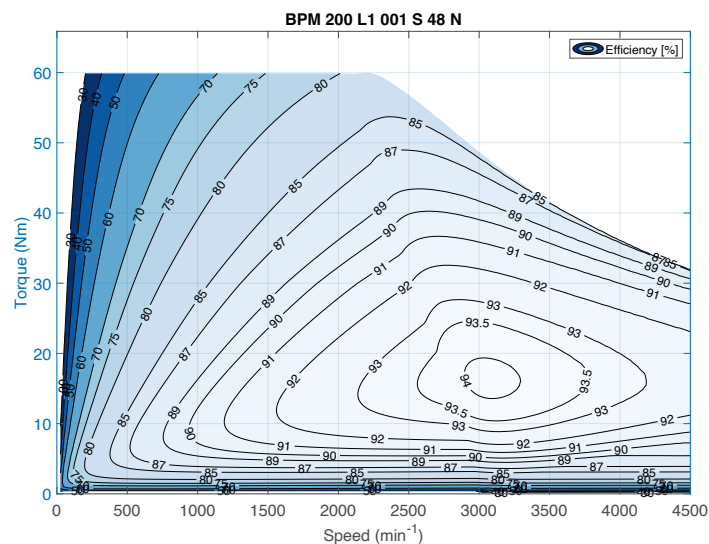
Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

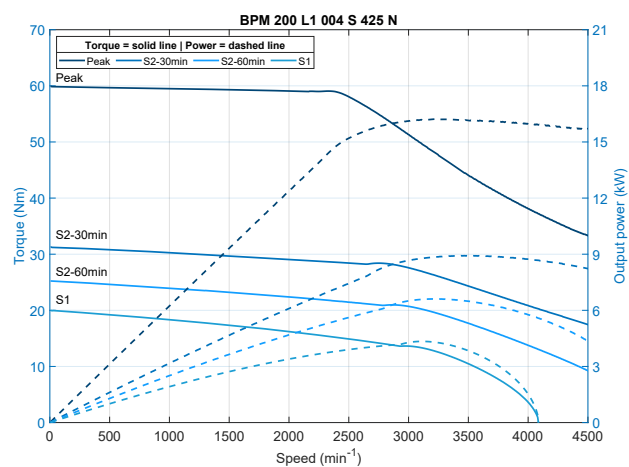
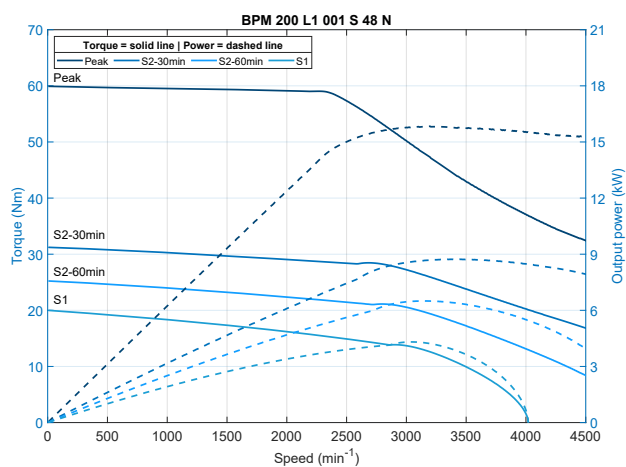
Motor curves are computed assuming zero-d-current control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

BPM 200 L1 | EFFICIENCY MAPS



BPM 200 L1 | POWER AND TORQUE TO SPEED CURVES



BPM 200 L2 | RATINGS

		BPM 200 L2 ... S ... N	
	M_0 [Nm]	35	
	M_{max} [Nm]	100	
	2p [-]	8	
	J_M [kg cm ²]	82	
	m_M [kg]	19,5	
	m_{MB} [kg]	24,5	
	V_{bt} [Vdc]	48	400
	n [min ⁻¹]	2250	2250
	f_n [Hz]	150	150
S1	P_n [kW]	4,60	4,60
	M_n [Nm]	19,5	19,5
	I_n [A]	105	13,0
	V_n [V _{AC}]	27	207
S2 60 min.	P_n [kW]	8,00	8,00
	M_n [Nm]	34,0	34,0
	I_n [A]	192	25,0
	V_n [V _{AC}]	28	214
S2 30 min.	P_n [kW]	11,5	11,5
	M_n [Nm]	48,8	48,8
	I_n [A]	250	36,0
	V_n [V _{AC}]	29	228

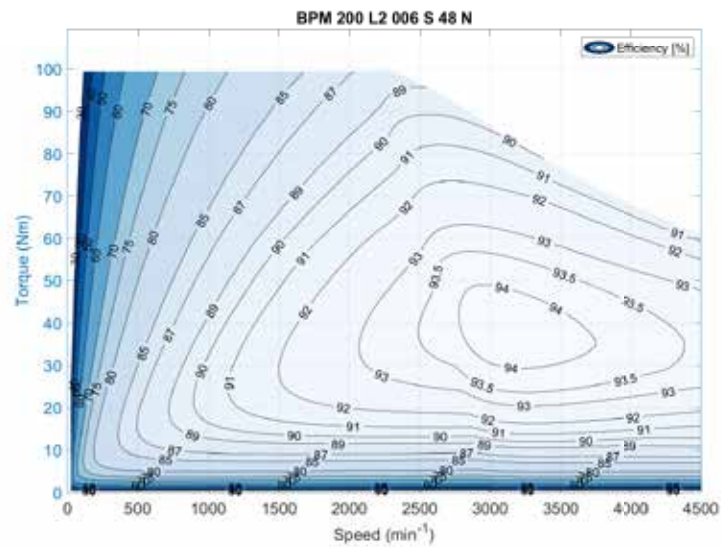
Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

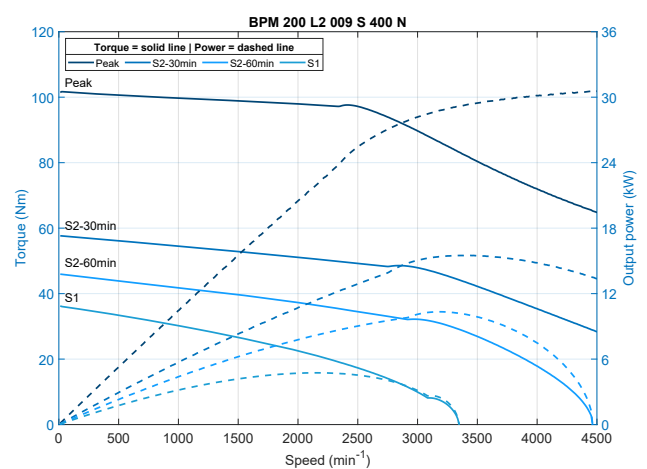
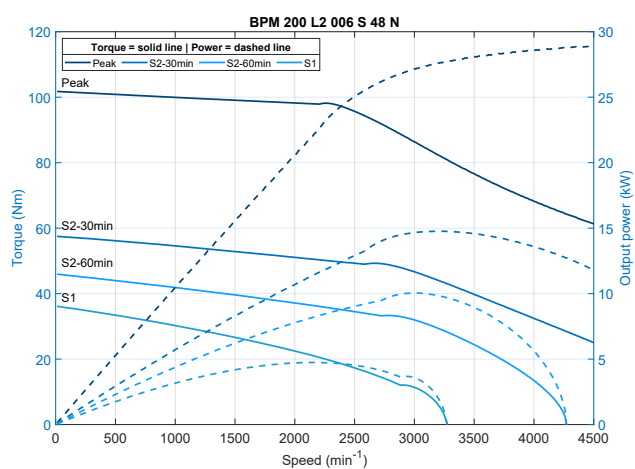
Motor curves are computed assuming zero-d-current control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

BPM 200 L2 | EFFICIENCY MAPS



BPM 200 L2 | POWER AND TORQUE TO SPEED CURVES



BPM 200 L3 | RATINGS

		BPM 200 L3 ... S ... N	
	M_0 [Nm]	55	
	M_{max} [Nm]	150	
	2p [-]	8	
	J_M [kg cm ²]	122	
	m_M [kg]	33	
	m_{MB} [kg]	-	
	V_{bt} [Vdc]	96	400
	n [min ⁻¹]	2250	1500
	f_n [Hz]	150	100
S1	P_n [kW]	7,20	6,44
	M_n [Nm]	30,6	41,0
	I_n [A]	98	22
	V_n [V _{AC}]	50	202
S2 60 min.	P_n [kW]	14,4	10,6
	M_n [Nm]	61,1	67,5
	I_n [A]	197	36
	V_n [V _{AC}]	53	220
S2 30 min.	P_n [kW]	20,5	14,3
	M_n [Nm]	87,0	91,0
	I_n [A]	284	50
	V_n [V _{AC}]	57	230

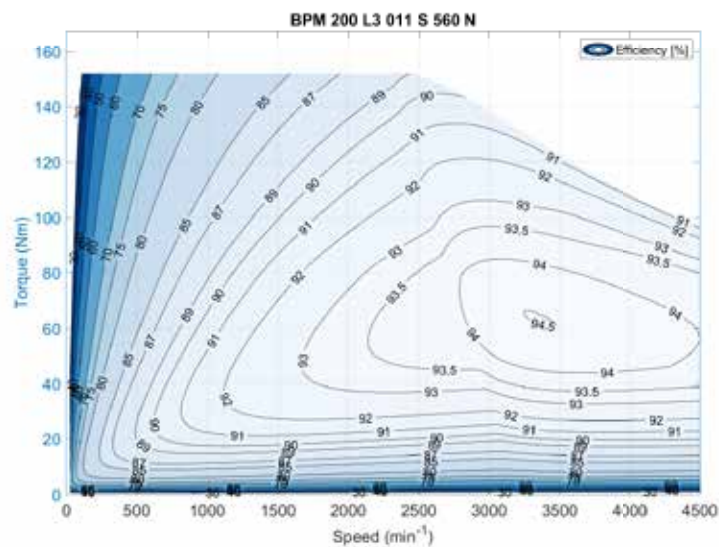
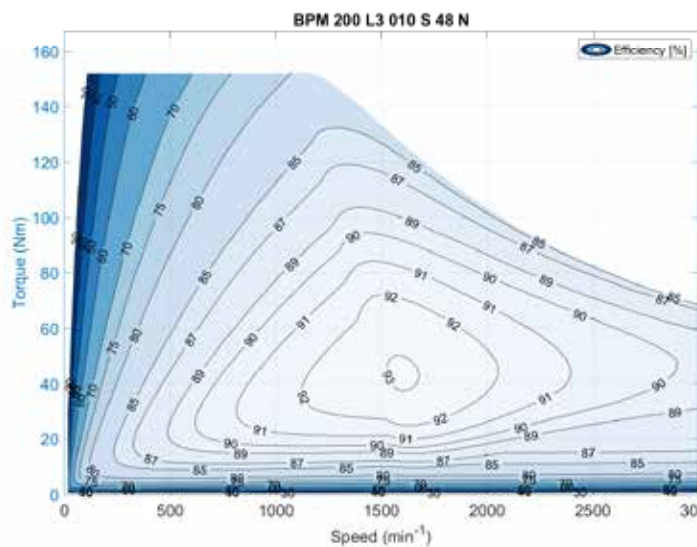
Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

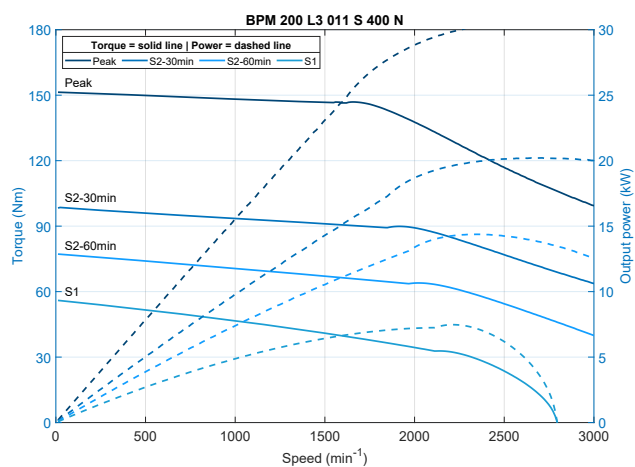
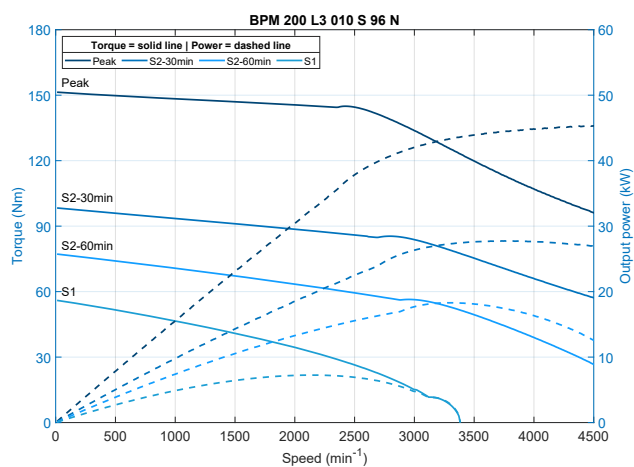
Motor curves are computed assuming zero-d-current control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

BPM 200 L3 | EFFICIENCY MAPS



BPM 200 L3 | POWER AND TORQUE TO SPEED CURVES



BPM 200 L4 | RATINGS

		BPM 200 L4 ... S ... N	
	M_0 [Nm]	70	
	M_{max} [Nm]	190	
	2p [-]	8	
	J_M [kg cm ²]	151	
	m_M [kg]	38	
	m_{MB} [kg]	-	
	V_{bt} [Vdc]	96	400
	n [min ⁻¹]	2250	2250
	f_n [Hz]	150	150
S1	P_n [kW]	8,20	8,20
	M_n [Nm]	34,8	34,8
	I_n [A]	104	27
	V_n [V _{AC}]	53	204
S2 60 min.	P_n [kW]	17,50	17,50
	M_n [Nm]	74,3	74,3
	I_n [A]	222	57,4
	V_n [V _{AC}]	57	219
S2 30 min.	P_n [kW]	25,4	25,4
	M_n [Nm]	108	108
	I_n [A]	325	84
	V_n [V _{AC}]	60	232

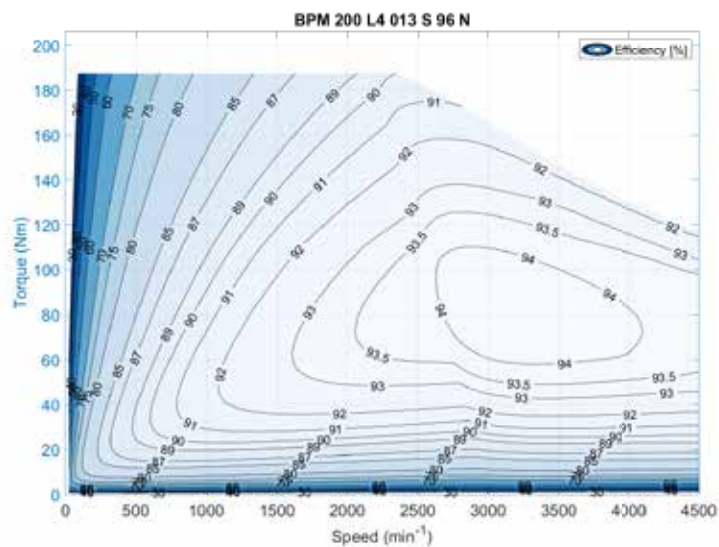
Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

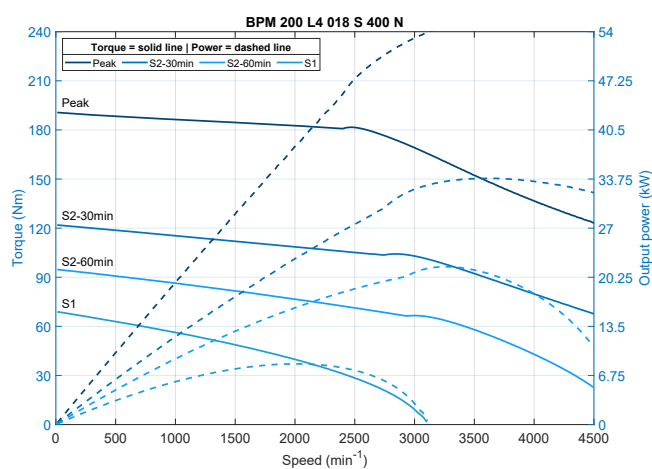
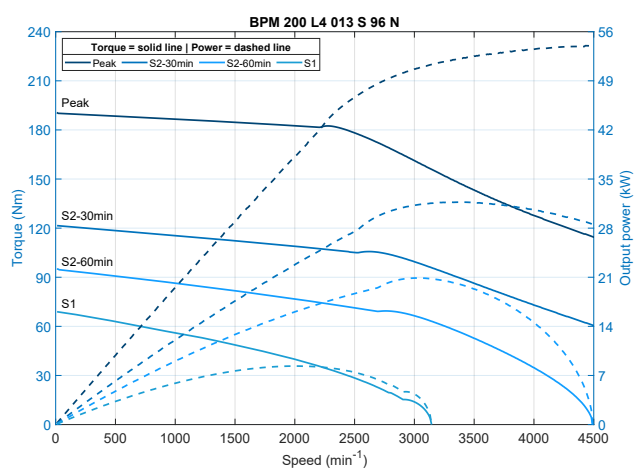
Motor curves are computed assuming zero-d-current control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

BPM 200 L4 | EFFICIENCY MAPS



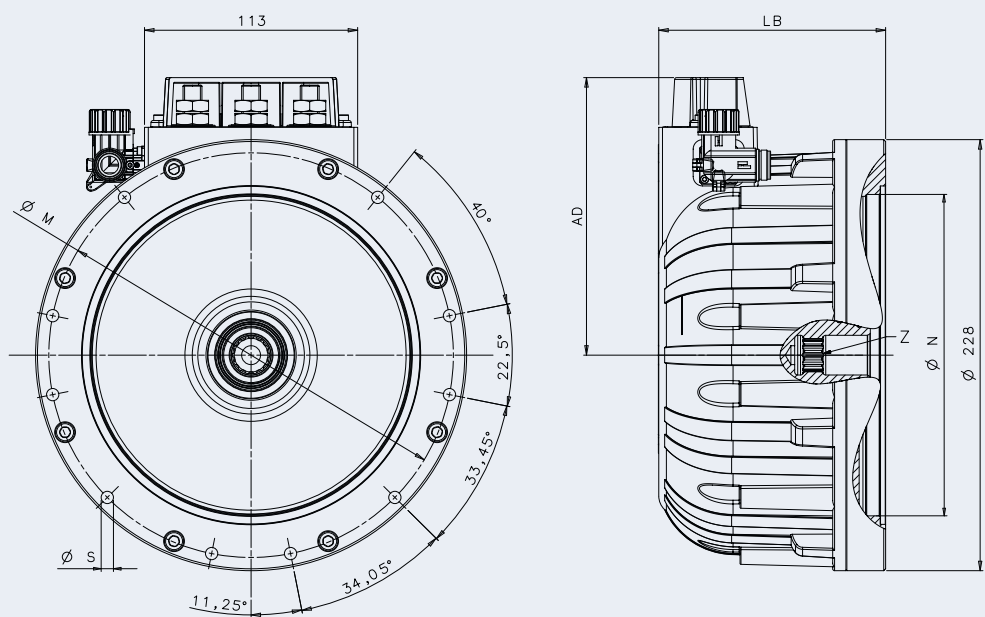
BPM 200 L4 | POWER AND TORQUE TO SPEED CURVES



BPM 200 | DIMENSIONS

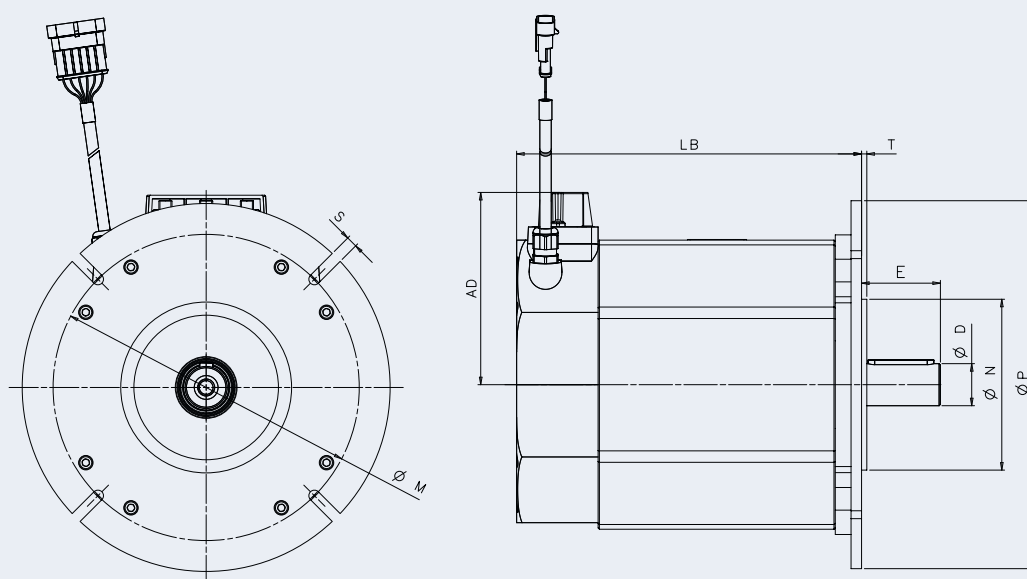
The following tables provide key dimensional data for selected motor variations.
Measurements in millimeters.

MOTOR WITHOUT BRAKE



L1-L2 SIZE





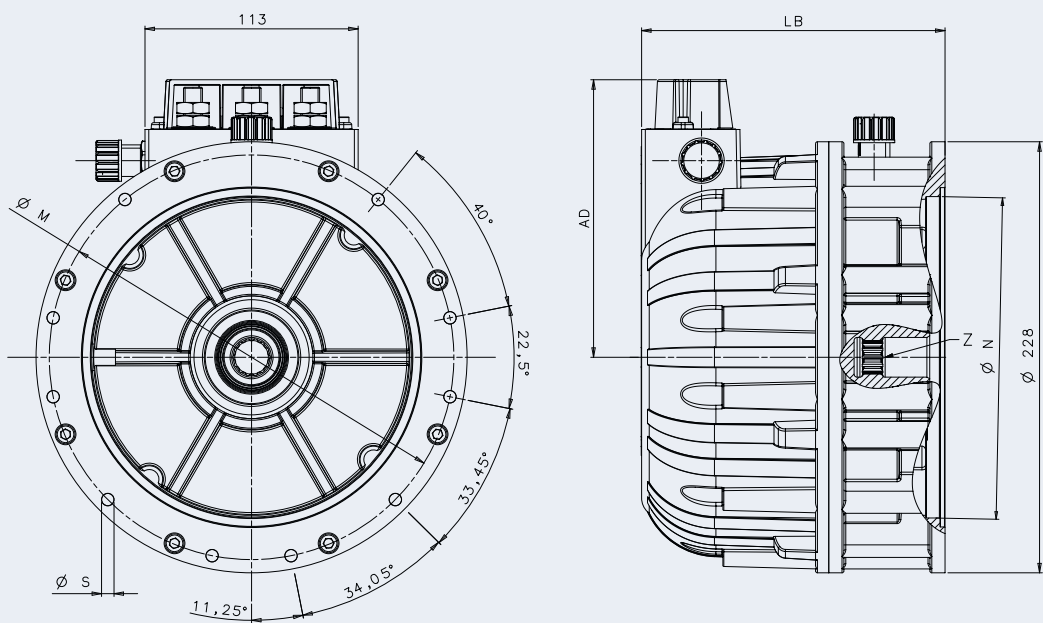
L3-L4 SIZE

Motor variants Size	LB	AD	M	S	N	MP	SP	T	P	D	E	Z
L1	120	147	214	6.6	170	-	-	-	-	-	-	Z14
	129	147	233-238	8.5	130	-	-	4	246	28	60	-
L2	155	147	214	6.6	200	-	-	9	-	-	56	Z16
	173	147	233-238	8.5	130	-	-	4	246	28	60	-
L3 L4	263	147	233-272	8.5	130	-	-	4	280	32	60	-

BPM 200 | DIMENSIONS

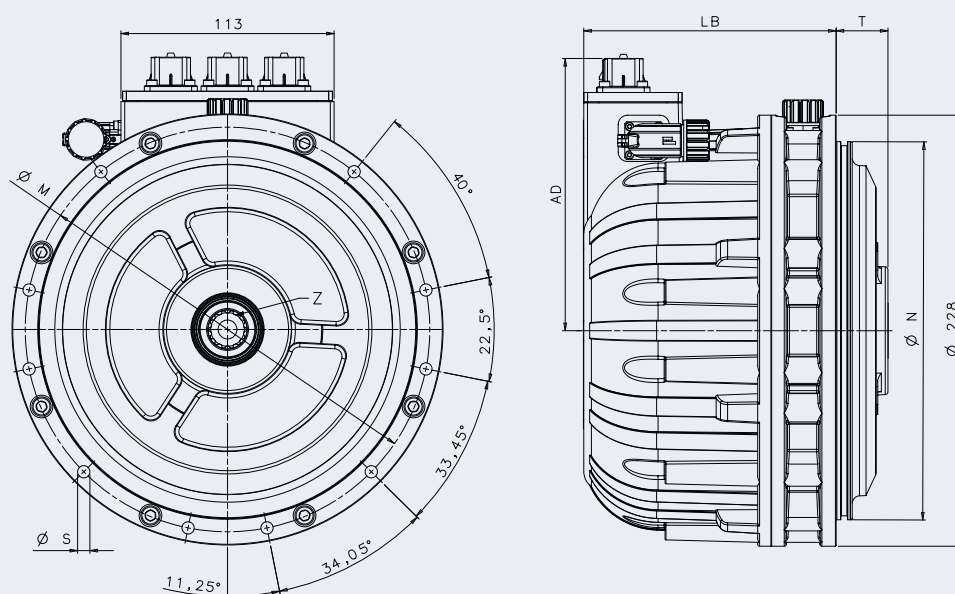
The following tables provide key dimensional data for selected motor variations.
Measurements in millimeters.

MOTOR WITH BRAKE



L1 SIZE





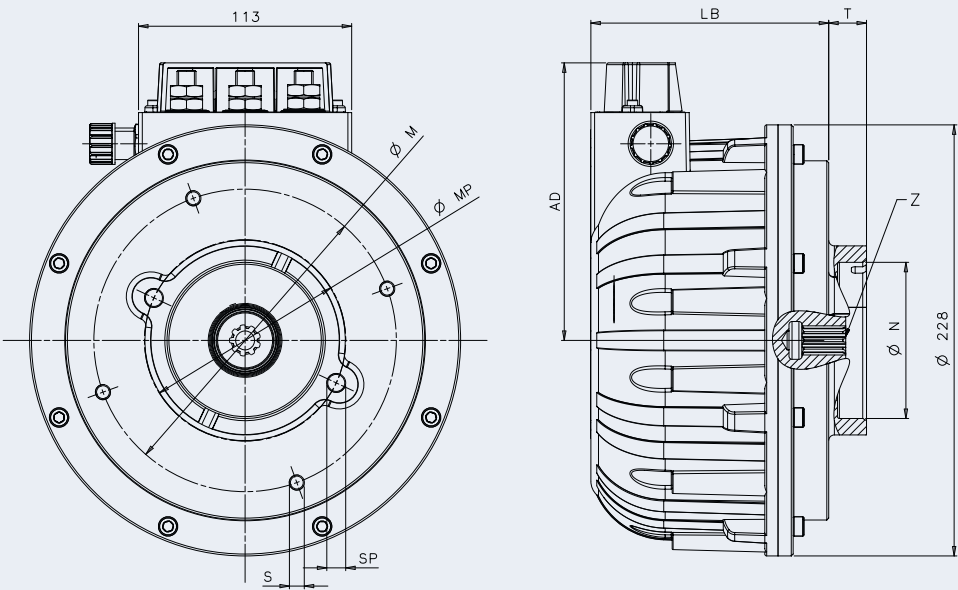
L2 SIZE

Motor variants Size	LB	AD	M	S	N	MP	SP	T	P	D	E	Z
L1	161	147	214	6.6	170	-	-	-	-	-	-	Z14
	134	147	214	6.6	200	-	-	28	-	-	-	Z14
	134	147	214	6.6	200	-	-	28	-	-	-	Z20
L2	178	147	214	6.6	200	-	-	28	-	-	-	Z14

BPM 200 | DIMENSIONS

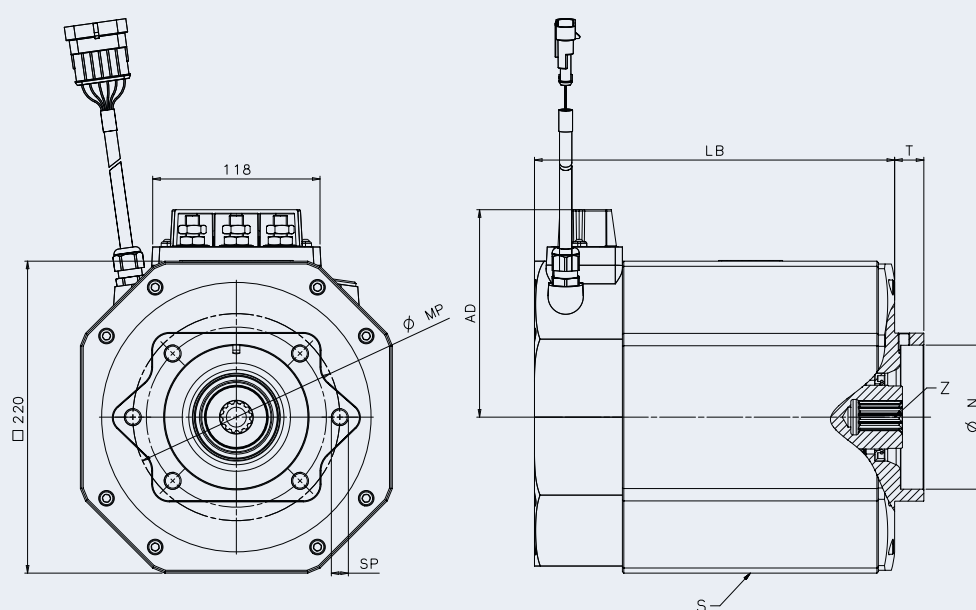
The following tables provide key dimensional data for selected motor variations.
Measurements in millimeters.

PUMP MOTOR



L1-L2 SIZE





L3-L4 SIZE

Motor variants Size	LB	AD	M	S	N	MP	SP	T	P	D	E	Z
L1	126	147	160	M8	82.55	106.4	M10	20	-	-	-	Z9
	126	147	160	M8	82.55	106.4	M10	20	-	-	-	Z11
L2	170	147	160	M8	82.55	106.4	M10	20	-	-	-	Z9
	170	147	160	M8	82.55	106.4	M10	20	-	-	-	Z11
	170	147	180	M10	101.6	146	M12	23	-	-	-	Z13
	170	147	180	M10	101.6	146	M12	23	-	-	-	Z15
L3 L4	255	147	-	M8	82.55	106.4	M10	14	-	-	-	Z9
	255	147	-	M8	82.55	106.4	M10	14	-	-	-	Z11
	255	147	-	M8	101.6	146	M12	20	-	-	-	Z13
	255	147	-	M8	101.6	146	M12	20	-	-	-	Z15

BPM 240



EXCAVATORS

MATERIALS
HANDLINGCONSTRUCTION
EQUIPMENTSAGRICULTURE
EQUIPMENTS

KEY FEATURES

- High efficiency electric motor
- High torque density
- Increased control precision
- Modular design ranging in 2 different sizes
- EM failsafe parking brake upon request
- Pump and application coupling upon request

HIGHLIGHTS

- Internal permanent magnet motors
- 400-800 Vdc voltage range
- 35-63 kW nominal power
- 343-370 Nm peak torque
- Max mechanical speed 6000rpm
- Liquid cooling design

BPM 240 L4 | RATINGS

		BPM 240 L4 ... V ... N	
	M_0 [Nm]	152	
	$M_{\max}$ [Nm]	343	
	2p [-]	10	
	J_M [kg cm ²]	323	
	m_M [kg]	90	
	m_{MB} [kg]	98	
	V_{bt} [Vdc]	400	700
	n [min ⁻¹]	2600	3200
	f_n [Hz]	217	267
S1	P_n [kW]	30,30	35,40
	M_n [Nm]	111,0	105,0
	I_n [A]	87	80
	V_n [V _{AC}]	270	380

Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

Motor curves are computed assuming MTPA control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

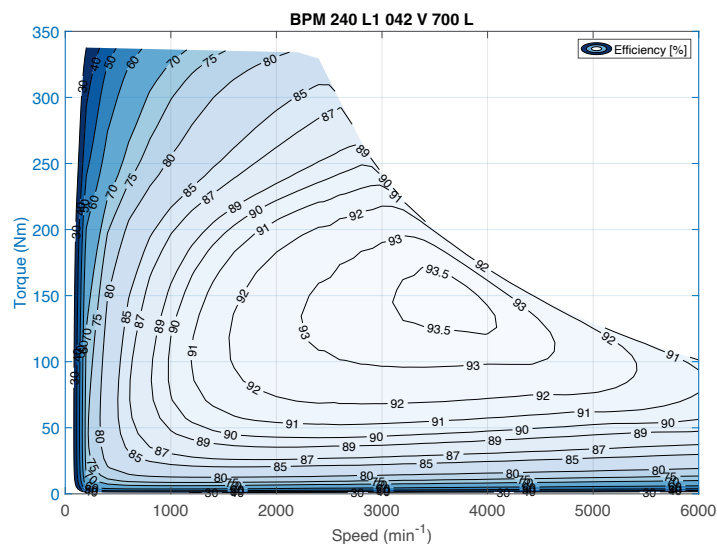
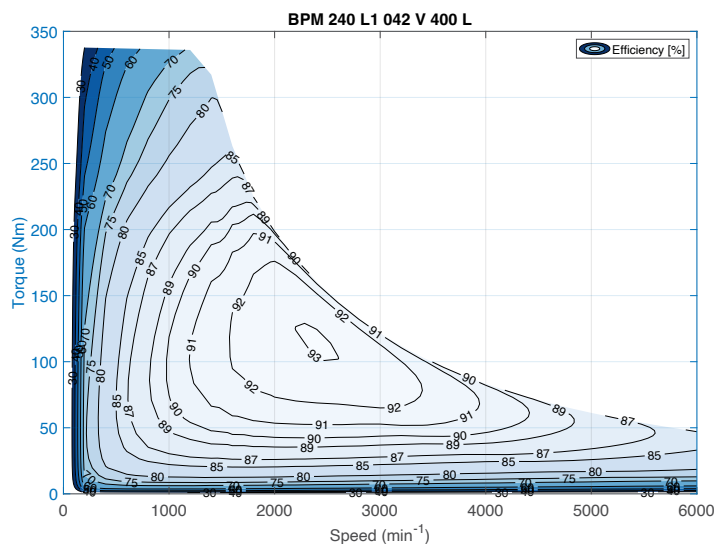
Liquid cooling data:

- type of coolant: WEG 50/50

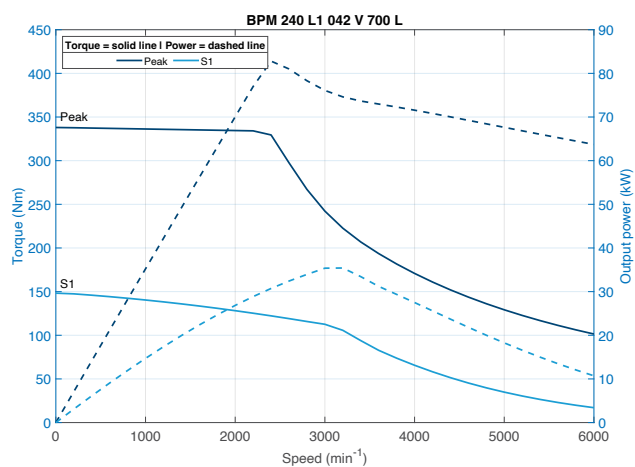
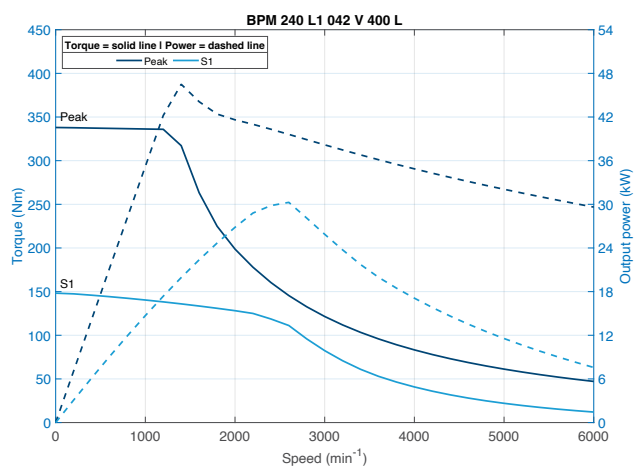
- flow rate: 15l/min

- inlet temperature: 65°C

BPM 240 L4 | EFFICIENCY MAPS



BPM 240 L4 | POWER AND TORQUE TO SPEED CURVES



BPM 240 L7 | RATINGS

		BPM 240 L7 ... V ... N	
	M ₀	[Nm]	239
	M _{max}	[Nm]	370
	2p	[-]	10
	J _M	[kg cm²]	546
	m _M	[kg]	140
	m _{MB}	[kg]	150
	V _{bt}	[Vdc]	400
	n	[min ⁻¹]	2600
	f _n	[Hz]	217
S1	P _n	[kW]	46,00
	M _n	[Nm]	168,0
	I _n	[A]	160
	V _n	[V _{AC}]	258

Data valid for ambient temperature according to IEC 60034-1 (-15°C - 40°C). Duty definition according IEC to 60034-1.

Power and torque to speed curves refer to nominal battery voltage. Nominal curves shift according to operating battery voltage.

Motor curves are computed assuming MTPA control and then field weakening control beyond voltage limit.

Motor curves and efficiency maps are computed assuming ambient temperature of 20°C and motor temperature as steady state condition under S1 duty cycle.

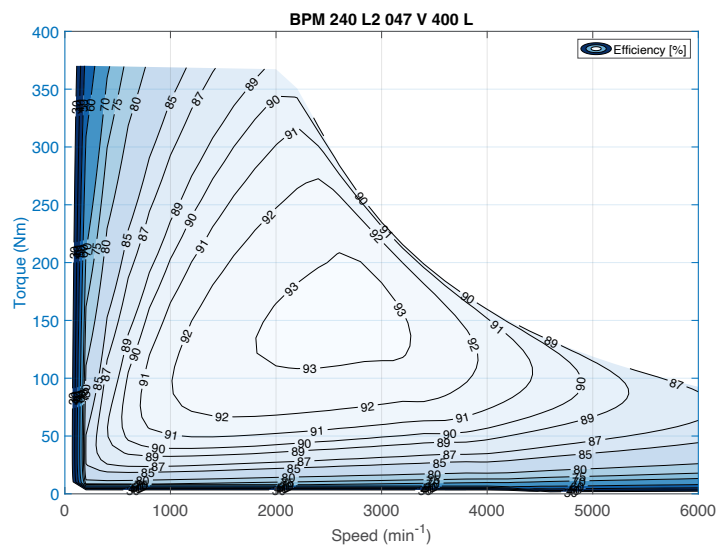
Liquid cooling data:

- type of coolant: WEG 50/50

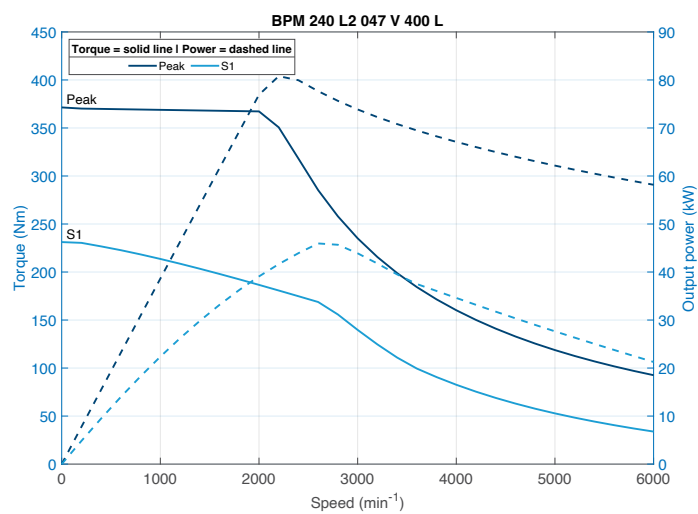
- flow rate: 15l/min

- inlet temperature: 65°C

BPM 240 L7 | EFFICIENCY MAPS



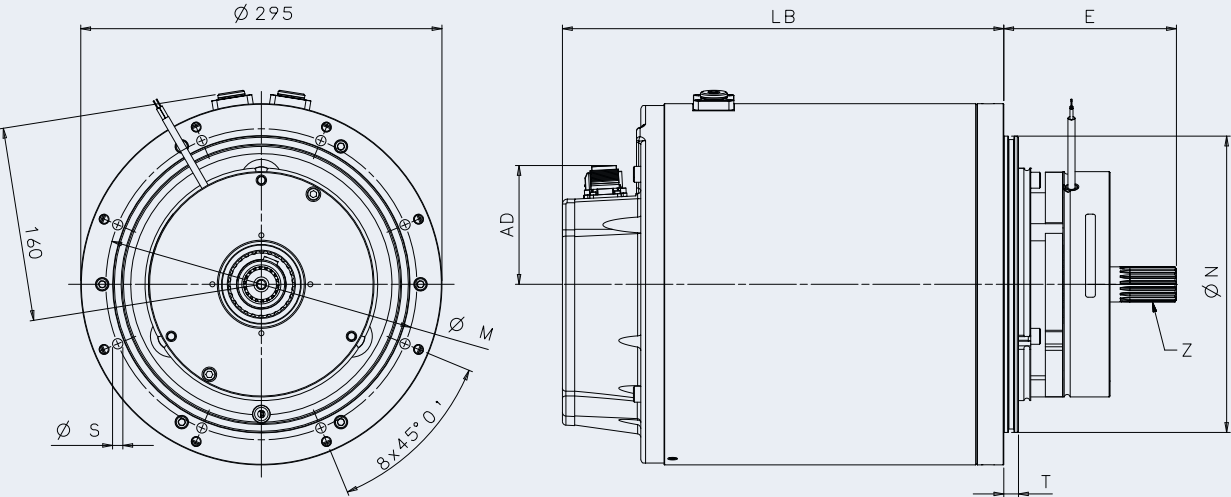
BPM 240 L7 | POWER AND TORQUE TO SPEED CURVES



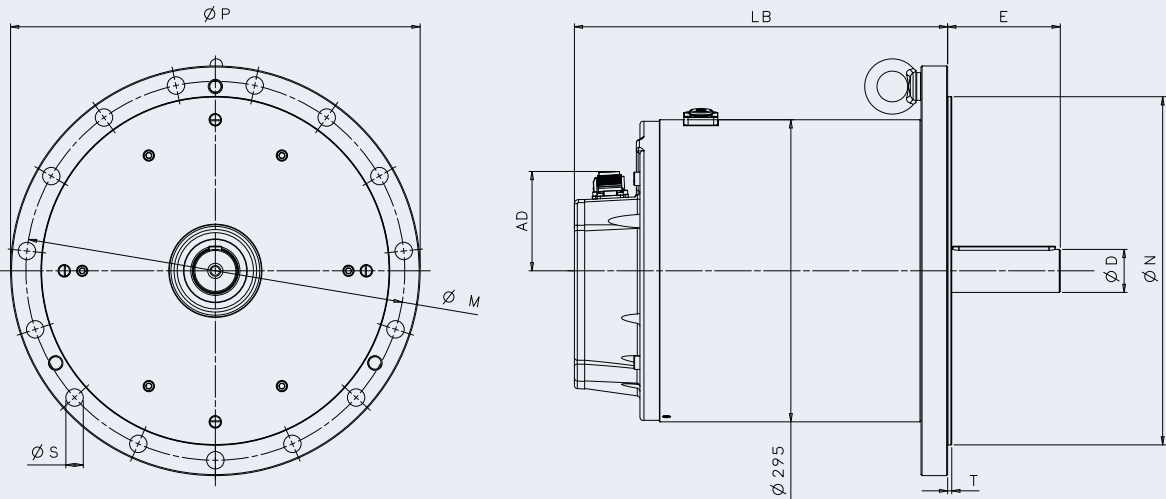
BPM 240 | DIMENSIONS

Following table reports main geometrical dimensions considering a limited extract of all available motor variants.
Measurements in millimeters.

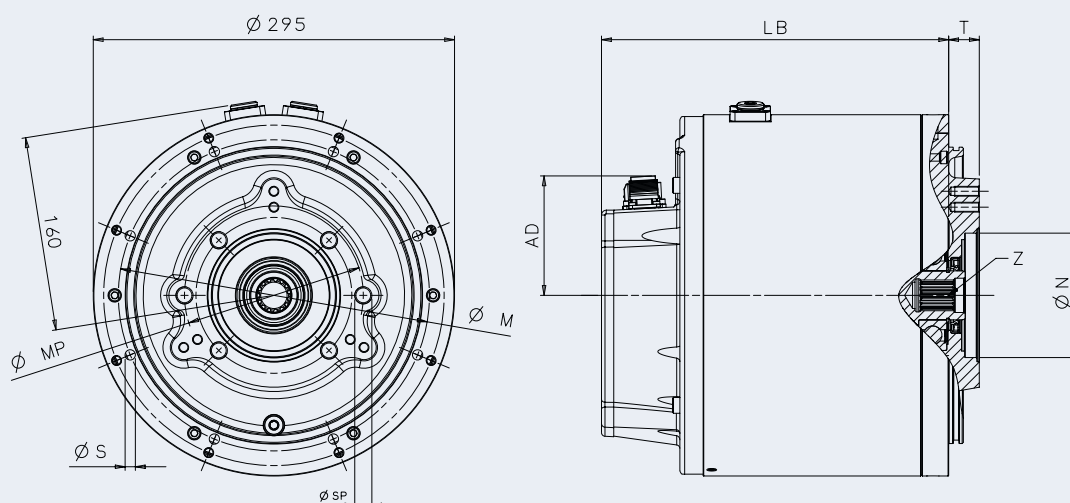
MOTOR WITH BRAKE



MOTOR WITHOUT BRAKE



PUMP MOTOR



Motor variants		LB	AD	M	S	N	MP	SP	T	P	D	E	Z
Size													
L4		283	98	254	8.5	242	-	-	12	-	-	141	Z18
		288	98	370	17	340	-	-	4	400	42	110	-
		284	98	254	8.5	101.6	146	M12	25	-	-	-	Z15
L7		361	98	254	8.5	242	-	-	12	-	-	141	Z18
		365	98	370	17	340	-	-	4	400	42	110	-
		362	98	254	8.5	101.6	146	M12	25	-	-	-	Z15

OUR GLOBAL PRESENCE

Thanks to an international network of closely interconnected commercial and production sites, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. We know that our direct presence in local markets is the key to long-lasting success, so our family includes 18 production sites, 23 commercial sites and more than 550 distributors around the world.

Our organization is always close by, offering complete and efficient solutions and supporting our customers with dedicated services, co-engineering and after-sales assistance.


18

PRODUCTION SITES


23

COMMERCIAL SITES


80

COUNTRIES


550

DISTRIBUTORS


~4,700

PEOPLE

AUSTRALIA

Bonfiglioli Transmission (Aust.) Pty Ltd
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