ELECTRIFIED VEHICLE MOTOR SERIES

Permanent Magnet (PMAC) Motor for Mobile Systems

Tel: +45 63 12 83 00 | Email: ps@hymatik.com | www.hymatik.com | Hvidkaervej 27a, DK-5250 Odense SV, Denmark

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Permanent Magnet AC Motor Solutions for Mobile Systems

Parker's motor portfolio features two exceptional series of Permanent Magnet AC (PMAC) motors designed to meet the diverse needs of mobile applications, including electro-hydraulic pump systems and advanced vehicle performance.

NX8M Motor Series

The NX8M Motor Series is a low power motor specifically engineered for electro-hydraulic pump applications. Its easy implementation allows for direct pump assembly without any mounting interface, facilitating seamless integration. Capable of operating immersed in oil, the NX8M enhances pump performance while minimizing noise levels. This cost-effective solution is ideal for both on and off-road vehicles, providing high torque density and efficiency. When paired with a voltage-matched inverter, the NX8M serves as a reliable first step toward full vehicle electrification. Performance can be further optimized through optional water or oil cooling with cold plates as an option.

GVM Global Vehicle Motor Power Series

The GVM Power Series represents the pinnacle of high power PMAC motors, delivering outstanding performance tailored for vehicle duty applications. With a decade-long legacy and thousands of units sold, the GVM series excels in high power density and speed capabilities, making it suitable for traction and electro-hydraulic pumps (EHP) with peak power ratings of up to 850 kW. Notably, the GVM achieves efficiency levels up to 2% higher than comparable PMAC designs, resulting in energy savings of up to 30% compared to traditional induction technologies. Additionally, the GVM functions as a highly efficient generator, providing versatility across various vehicle platforms.

Both motor series feature advanced cooling systems that enhance performance and simplify design, positioning Parker as a leader in providing the building blocks for vehicle electrification. By developing turnkey technologies, Parker reduces time to market and supply chain complexity, ensuring that customers benefit from innovative solutions that drive efficiency and performance in mobile applications.

Applications:

- Electro-hydraulic pumps
- Traction
- Generators
- Auxiliaries
- Diesel Electric
- Hybrid and Full Electric

Markets:

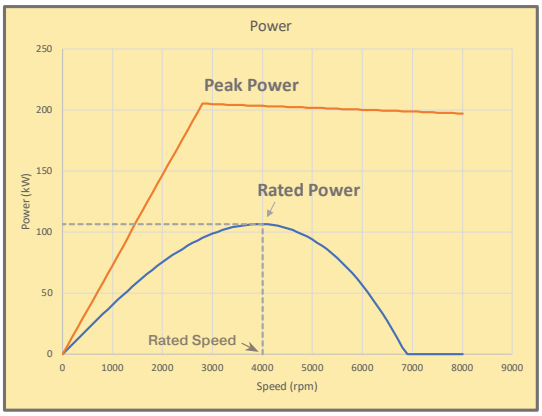
- Construction
- Mining
- Material Handling
- Trucks
- Bus
- Agriculture
- Military

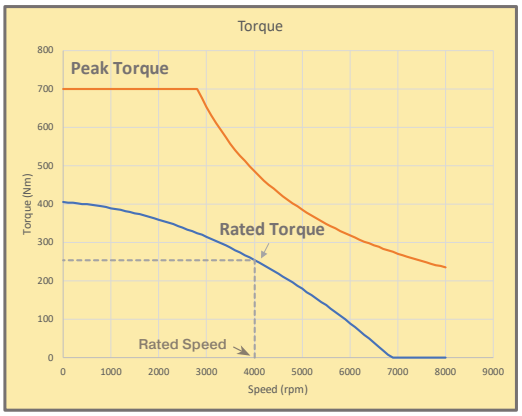
And other off-highway vehicle, autonomous vehicle, and E-Mobility markets

Performance

By selecting the appropriate voltage, rotor length and winding variation, the following parameters can refined to match the vehicle's specific performance requirements:

- Peak torque
- Peak power
- Rated torque
- Rated speed
- Rated power
- Maximum speed

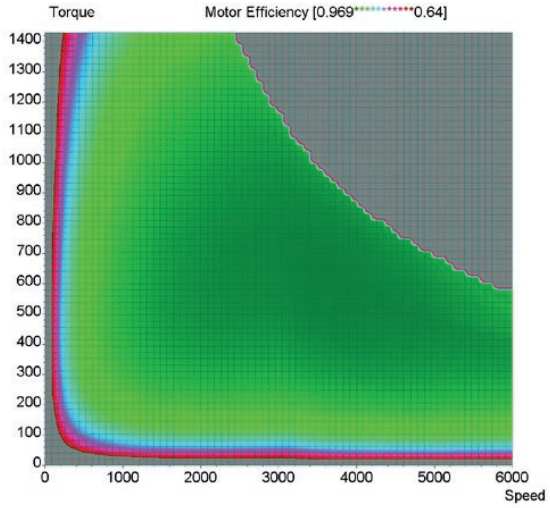




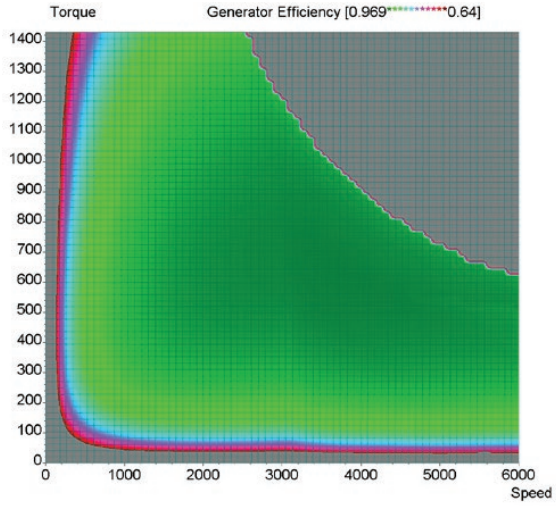
Efficiency

Only when using the best component technology and optimal design characteristics do traction motors/generators and controllers minimize losses both during motoring and power generation (four quadrant mode) increasing vehicle range. Variable speed system allows higher efficiency even at low speed.

Typical Efficiency Maps - Battery Voltage 650 VDC



GVM310-250-BA-2 in motor operation mode



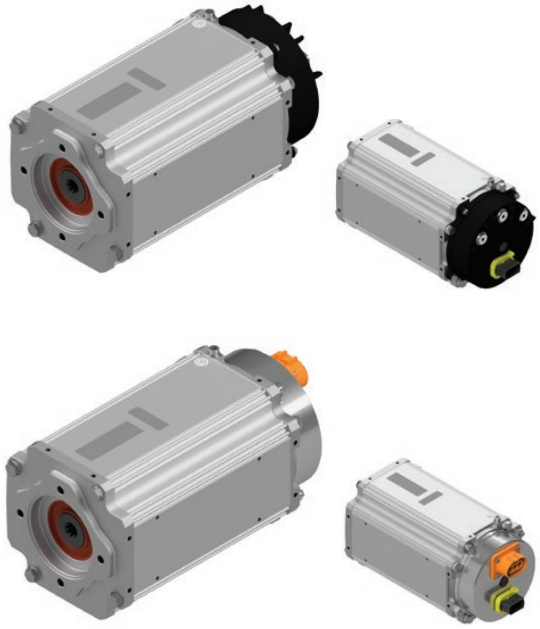
GVM310-250-BA-2 in generator operation mode

Low Power Motor - NX8M

Overview

Available in both low voltage and high voltage versions, the easy to implement NX8M permanent magnet AC motor is the ideal choice for your low power electro hydraulic pump applications, allowing a direct pump assembly without any mounting interface.

It is also capable of working immersed in oil, allowing improved pump performance and lower noise level.
This cost effective solution has been engineered for both on and off-road vehicles.
The high torque density and high efficiency of Parker Permanent Magnet AC (PMAC) motors combined with a voltage matched inverter provide a solution to easily electrify hydraulic pumps , as a first step on the journey to full vehicle electrification.
Performances can be increased through water or oil cooling with optional cold plates.



Product Features

- Easy mechanical mounting with fixing locations on all 4 sides
- For battery voltage up to 800 Vdc
- Membrane breather vent to minimise internal condensation
- Direct SAE A, SAE B, ISO 3019/2 pump mounting interface
- Natural convection cooling; cold plates in option
- Oil immersion capability
- Easy combination with Parker Global Vehicle Inverter (GVI)

Technical characteristics

Model	NX8M
Motor type	Permanent magnet synchronous motor
Battery voltage	24 - 800 Vdc
Max. speed	8000 rpm
Peak power	99 kW
Operating temperature range	-20°C to +60°C
Protection	IP67
Feedback	Resolver, Sin/Cos encoder
Thermal protection	PT1000
Cooling	Natural convection or cold plate
Marking	CE

Applications

- Electro-hydraulic pumps for construction vehicles
- Steering applications
- Hybrid power generation
- Mobile machinery
- Electric Actuators

Technical Specifications - Low voltage Version

Front face cooled 60°C

Inverter input voltage	Motor Type*	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
24Vdc	NX82HMSB	6000	17	7.5	22.3
	NX84HMSB	2700	35.4	7.8	21.4
	NX86HMSB	1750	49.3	7.0	20.4
48Vdc	NX82HMSD	6000	16.7	7.6	23.4
	NX84HMSC	4000	32	9.7	31.1
	NX84HMSB	5000	24.9	10.4	48.1
	NX86HMSB	3500	37	11.2	47.1
96Vdc	NX82HMSG	7000	15.5	8.3	27.6
	NX82HMSE	7500	13	7,6	39
	NX84HMSF	4000	32	9.7	31.7
	NX84HMSC	5000	24.1	9.1	56.5
	NX86HMSD	3700	36.3	11.2	48.1
	NX86HMSC	4000	33.4	10.5	64.5

Motor data for standard air cooled with front flange surface exchange of 60°C
* Other motor performances and oil immersion capability are available on request. Please contact Parker.

Cold plate water cooled 65°C

Inverter input voltage	Motor Type	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
24Vdc	NX82WMSB	6000	22	9.7	22.3
	NX84WMSB	3000	46.1	9.8	21.4
	NX86WMSB	2000	69.2	9.8	20.4
48Vdc	NX82WMSD	6000	21.4	10.7	23.4
	NX84WMSC	4000	43.4	14.1	31.1
	NX84WMSB	6000	38.7	17.6	48
	NX86WMSB	4000	62.6	19.0	47.1
96Vdc	NX82WMSG	7000	20.8	12.0	27.6
	NX82WMSE	8000	17.7	13.3	39.1
	NX84WMSF	4000	43.1	14.0	31.7
	NX84WMSC	7000	30.1	18.7	65.9
	NX86WMSD	4000	60.8	20.1	48.1
	NX86WMSB	6500	44	23,2	99

Cold plate oil cooled 65°C

Inverter input voltage	Motor Type	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
24Vdc	NX82LMSB	6000	17.9	7.9	22.3
	NX84LMSB	3000	36.8	7.8	21.4
	NX86LMSB	2000	54.3	7.7	20.4
48Vdc	NX82LMSD	6000	17	8.5	23.4
	NX84LMSC	4000	32.6	10.6	31.1
	NX84LMSB	5000	25,5	11,3	48,1
	NX86LMSB	3500	43.9	13.3	47.1
96Vdc	NX82LMSG	7000	15.9	9.1	27.6
	NX82LMSE	8000	13.7	8.6	39.1
	NX84LMSF	4000	33.4	10.1	31.7
	NX84LMSC	5000	24.9	10.1	56.5
	NX86LMSD	3700	43.3	13.4	48.1
	NX86LMSC	4500	36.7	13.4	65.6

Technical Specifications - High Voltage Version

NX80KMA Front Face cooled 60°C

Inverter input voltage	Motor	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
350	NX82KMAL	4500	18.8	6.42	17.2
	NX82KMAG	7000	14.5	8.24	29.6
	NX84KMAL	2200	37.6	6.28	16.2
	NX84KMAC	5000	25.8	10.8	44.8
	NX86KMAF	2500	46.3	9.39	31.0
	NX86KMAD	3100	43	10.8	38.8
650	NX82KMAX	2500	20	3.8	8.5
	NX82KMAM	7000	14.3	8.36	30.3
	NX84KMAQ	2600	35.7	7.53	20.8
	NX84KMAJ	4600	27.4	10.9	41.9
	NX86KMAO	2000	48.7	7.9	23.6
	NX86KMAF	4000	33.5	10.9	61.2

NX80GMA Water cooled 65°C

Inverter input voltage	Motor	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
350	NX82GMAL	4600	23,3	8,13	17,2
	NX82GMAG	7400	20,4	11,8	29,5
	NX84GMAL	2400	48	8,15	16,3
	NX84GMAC	5500	40,8	17	44,7
	NX86GMAF	2800	68	14	30,9
	NX86GMAD	3500	67,1	16,6	38,7
650	NX82GMAX	2600	23,9	4,56	8,5
	NX82GMAL	8000	19,8	12,9	33,4
	NX84GMAQ	3000	46,2	9,79	20,8
	NX84GMAE	7000	29,7	18,5	67,9
	NX86GMAO	2200	69,4	11,2	23,6
	NX86GMAD	6000	52,4	24,7	75,1

NX80FMA Oil cooled 65°C

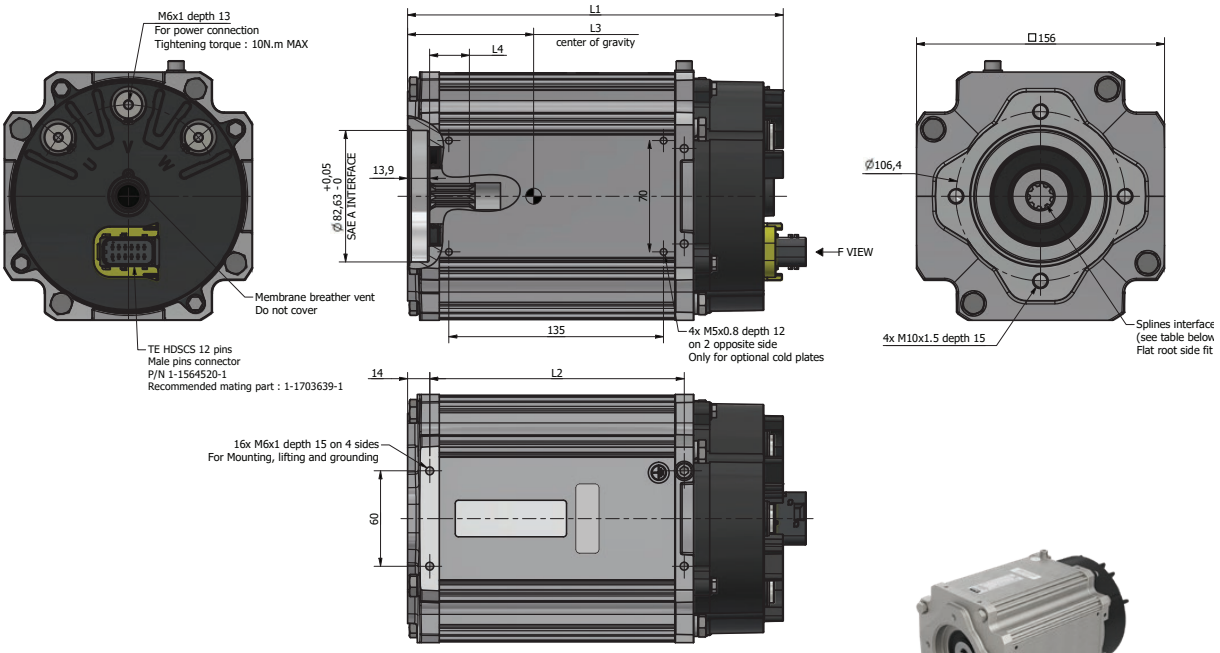
Inverter input voltage	Motor Type	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
350	NX82FMAL	4500	19,6	6,7	17,2
	NX82FMAG	7100	15,5	8,94	29,6
	NX84FMAL	2200	38,9	6,49	16,2
	NX84FMAC	5000	27,9	11,7	44,8
	NX86FMAF	2600	51,6	10,5	30,9
	NX86FMAD	3100	49,2	12,4	38,8
650	NX82FMAX	2500	20,8	3,95	8,5
	NX82FMAL	7800	14	9,18	33,7
	NX84FMAQ	2700	36,8	7,81	20,8
	NX84FMAH	5200	26,5	11,6	48,2
	NX86FMAO	2000	53,6	8,7	23,6
	NX86FMAD	4500	37,1	13,1	73,8

Note: Other motor performances and oil immersion capability are available on request. Please contact Parker.

Dimensions - Low Voltage

Standard SAE A interface

Natural Convection



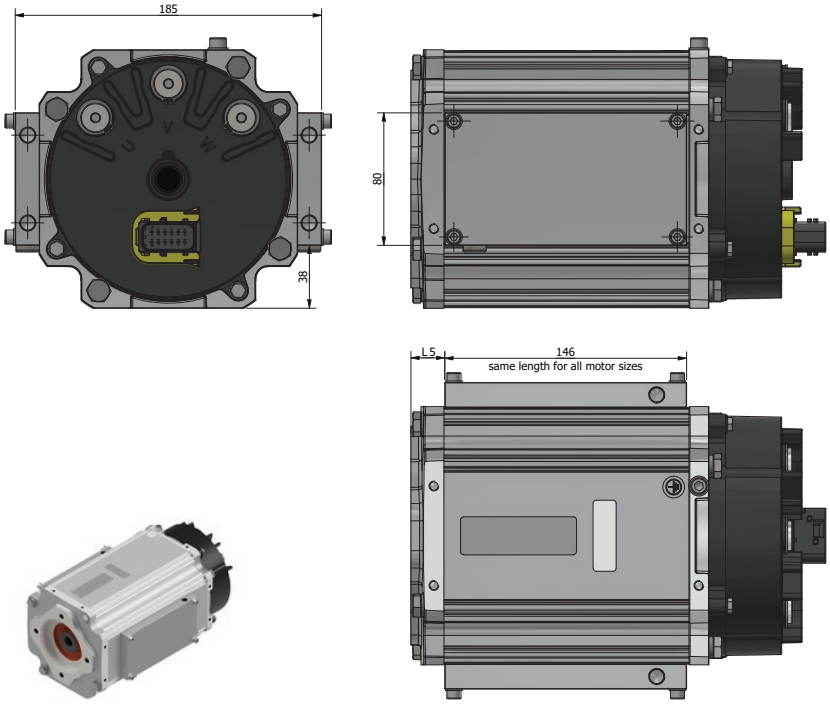
ANSI B92.1	SAE A
Flat root side fit	Class 5
Number of teeth	9
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	12.373
Pitch diameter (Ref) (Runout of 0.08mm at PCD)	14.288
Major diameter (Max)	16.535
Form diameter (Max)	15.977
Minor diameter (Min)	12.929
Circular space width (Max actual)	2.56
Circular space width (Min effective)	2.494

Motor size	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	Weight [kg]
NX82HM	236	160	93	25	12.5
NX84HM	296	220	123	25	20
NX86HM	356	280	153	25	27.5

Note: Also available with ISO 3019/2 interface (please contact Parker)

Standard SAE A interface

With cold plates (for oil and water cooling)

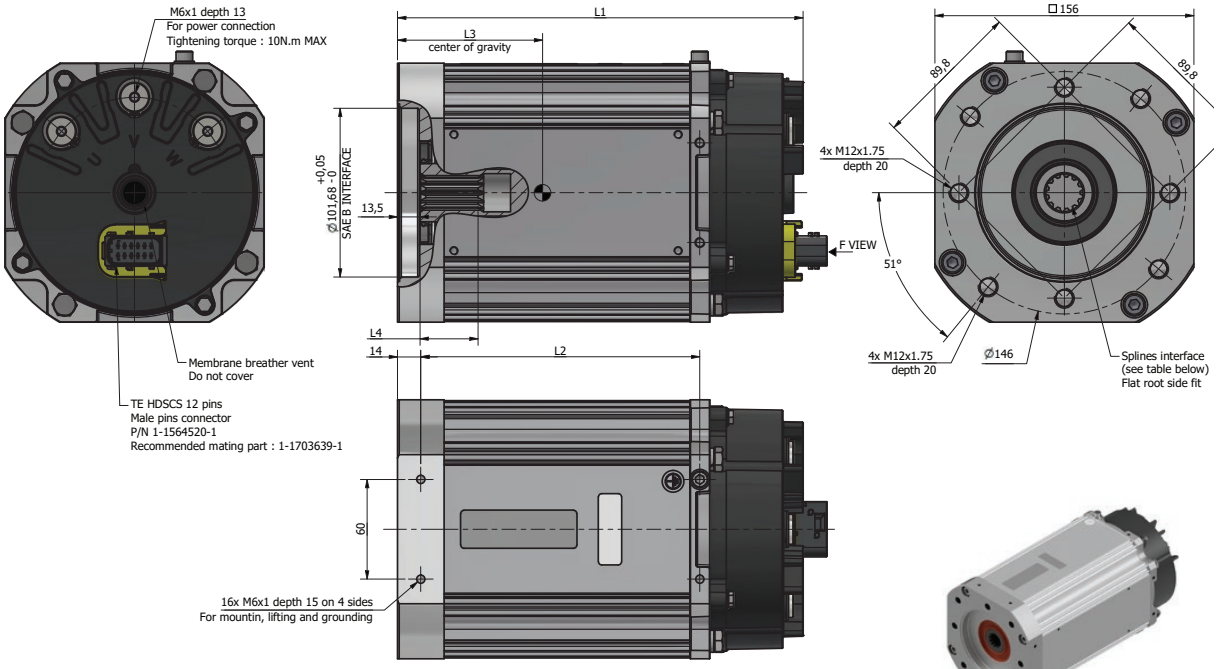


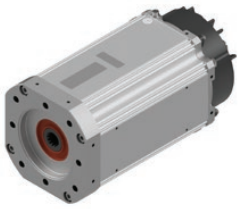
Motor size	L4 [mm]	Threads	Threads depth	Weight [kg]
NX82LM / NX82WM	20	BSP G1/8	10	13
NX84LM / NX84WM	45.5	BSP G1/8	10	20.5
NX86LM / NX86WM	75.5	BSP G1/8	10	28

Dimensions - Low Voltage

Standard SAE B interface

Natural Convection





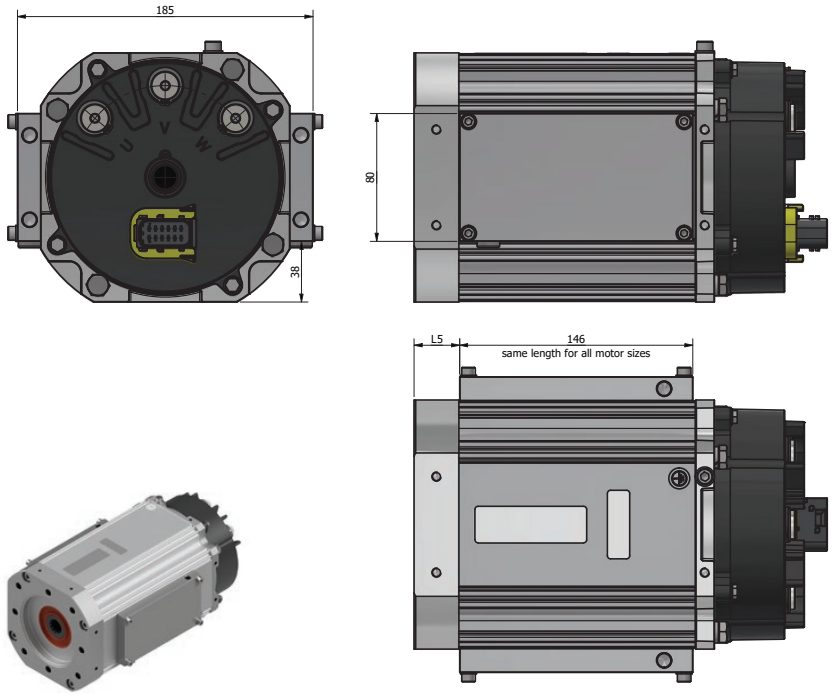
ANSI B92.1	SAE B
Flat root side fit	Class 5
Number of teeth	13
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	17.873
Pitch diameter (Ref) (Runout of 0.08mm at PCD)	20.638
Major diameter (Max)	22.885
Form diameter (Max)	22.327
Minor diameter (Min)	19.151
Circular space width (Max actual)	2.56
Circular space width (Min effective)	2.494

Motor size	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	Weight [kg]
NX82HM	244	168	90	35	13
NX84HM	304	228	120	35	20.5
NX86HM	364	288	150	35	28

Note: Also available with ISO 3019/2 interface (please contact Parker)

Standard SAE B interface

With cold plates (for oil and water cooling)

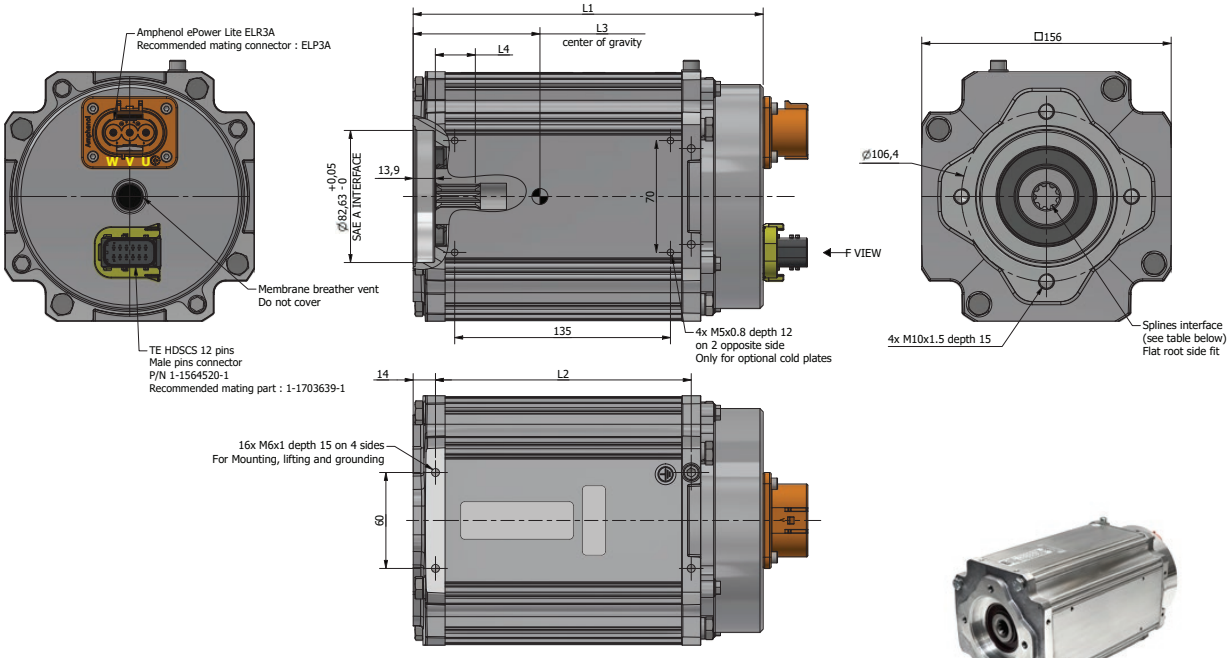


Motor size	L5 [mm]	Threads	Threads depth	Weight [kg]
NX82LM / NX82WM	28.5	BSP G1/8	10	13.5
NX84LM / NX84WM	54	BSP G1/8	10	21
NX86LM / NX86WM	84	BSP G1/8	10	28.5

Dimensions - High Voltage

Standard SAE A interface

Natural Convection



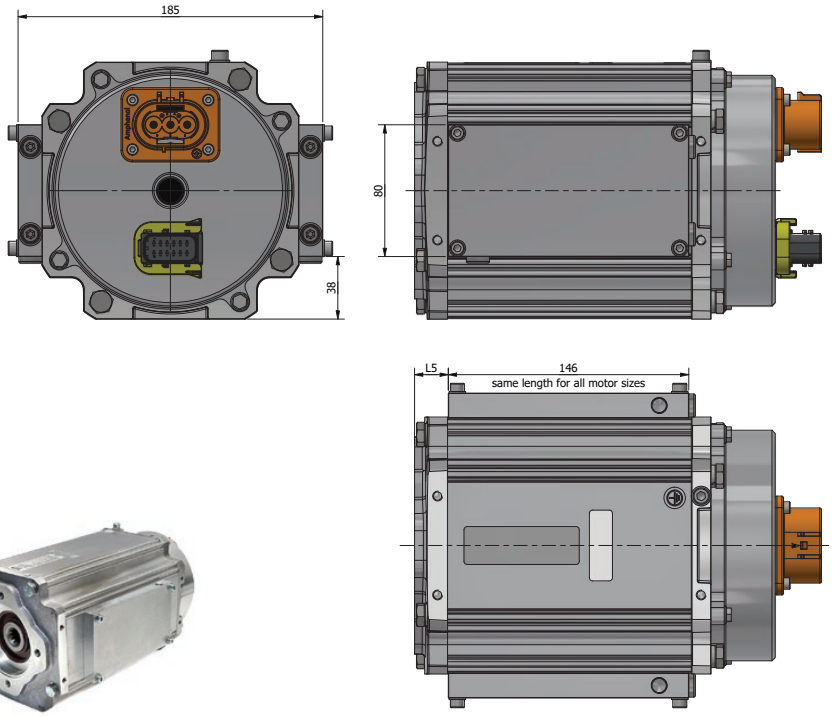
ANSI B92.1	SAE A
Flat root side fit	Class 5
Number of teeth	9
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	12.373
Pitch diameter (Ref) (Runout of 0.08mm at PCD)	14.288
Major diameter (Max)	16.535
Form diameter (Max)	15.977
Minor diameter (Min)	12.929
Circular space width (Max actual)	2.56
Circular space width (Min effective)	2.494

Motor size	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	Weight [kg]
NX82KM	219	160	93	25	12.9
NX84KM	279	220	123	25	20.4
NX86KM	339	280	153	25	27.9

Note: Also available with ISO 3019/2 interface (please contact Parker)

Standard SAE A interface

With cold plates (for oil and water cooling)

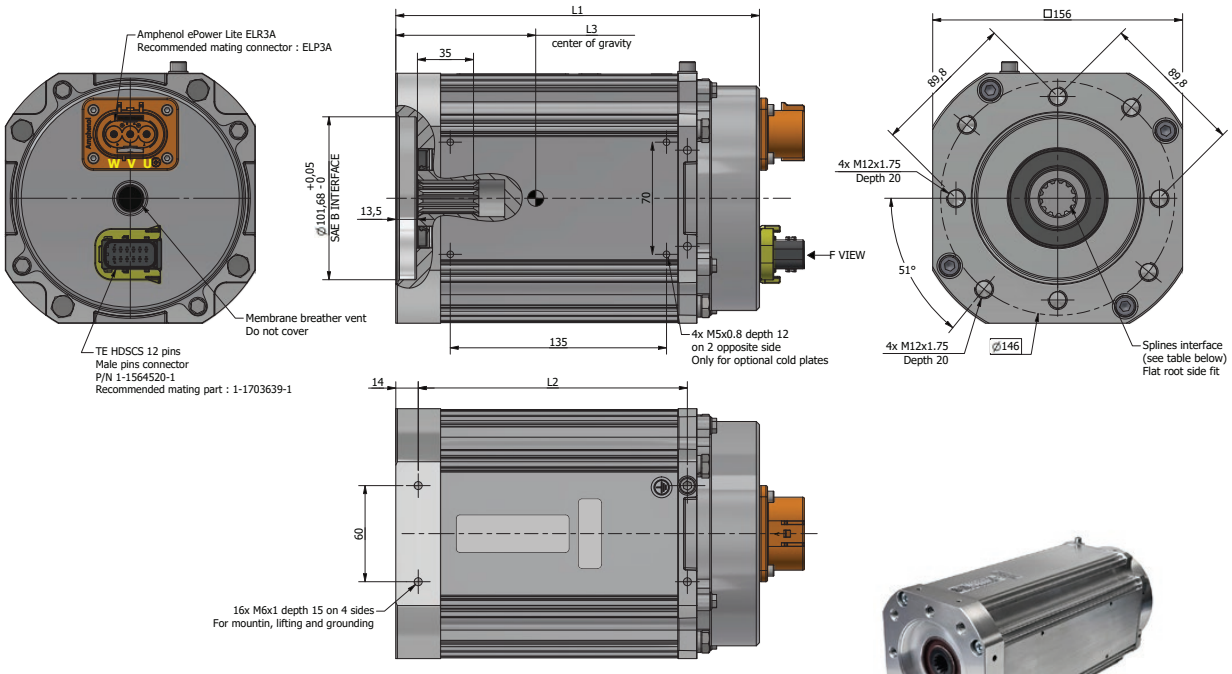


Motor size	L4 [mm]	Threads	Threads depth	Weight [kg]
NX82LM / NX82WM	20	BSP G1/8	10	14
NX84LM / NX84WM	45.5	BSP G1/8	10	22
NX86LM / NX86WM	75.5	BSP G1/8	10	30

Dimensions - High Voltage

Standard SAE B interface

Natural Convection



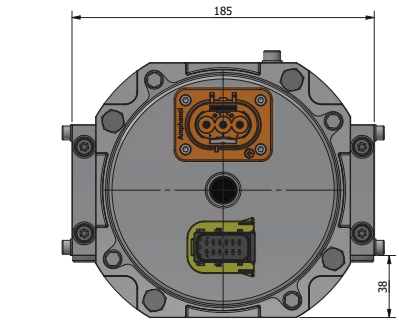
ANSI B92.1	SAE B
Flat root side fit	Class 5
Number of teeth	13
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	17.873
Pitch diameter (Ref) (Runout of 0.08mm at PCD)	20.638
Major diameter (Max)	22.885
Form diameter (Max)	22.327
Minor diameter (Min)	19.151
Circular space width (Max actual)	2.56
Circular space width (Min effective)	2.494

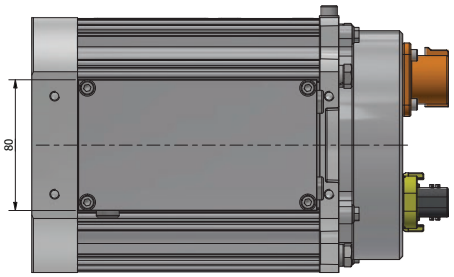
Motor size	L1 [mm]	L2 [mm]	L3 [mm]	Weight [kg]
NX82HM	227	168	90	14
NX84HM	287	228	120	21
NX86HM	347	288	150	29

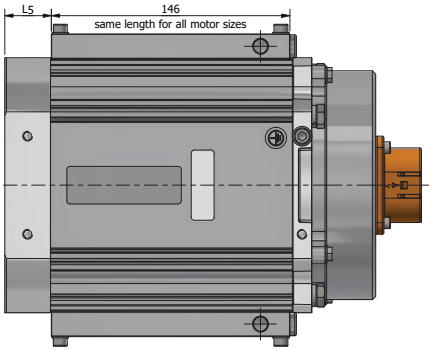
Note: Also available with ISO 3019/2 interface (please contact Parker)

Standard SAE B interface

With cold plates (for oil and water cooling)







Motor size	L5 [mm]	Threads	Threads depth	Weight [kg]
NX82LM / NX82WM	28.5	BSP G1/8	10	15
NX84LM / NX84WM	54	BSP G1/8	10	22
NX86LM / NX86WM	84	BSP G1/8	10	30

Available Interfaces

Pilot

Especially for direct coupled shafts it is extremely important to align both of them as good as possible to prevent forces due to misalignments.

Interface size	Pilot diameter in mm
SAE-A	82.63 - 82.68
SAE-B	101.68 - 101.73
ISO 3019/2	80.01 - 80.04

Female pilot centering dimensions and tolerances per ANSI B92.1/ DIN ISO-3019/2

When using a third party pump, make sure the male pilot dimensions fall in between these limits, to guarantee a fretting free operation.

Flange pattern

Interface size	Flange pattern
SAE-A	2-bolt M10 - depth 15 mm
SAE-B	2-bolt or 4-bolt M12 - depth 20 mm
ISO 3019/2	4-bolt M8 - depth 15 mm

Mounting bolt pattern and bolt size per ANSI B92.1/ DIN ISO-3019/2

NX8M Immersed in Oil

Benefits

- Improved motor/pump performances
- Lower noise level

Oil Inside ISO46 60°C

Inverter input voltage	Motor Type	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
24Vdc	NX82LMSC	4000	17.5	5.1	14.1
	NX84LMSB	2700	38.7	8.4	21.4
	NX86LMSB	2000	62.9	8.8	20.4
48Vdc	NX82LMSC	4000	15	6.1	22.4
	NX84LMSC	3500	32.2	9.7	31
	NX86LMSB	3000	46.1	13	46.6
96Vdc	NX82LMSG	4000	15.6	6.3	22.4
	NX84LMSD	3500	30	9.3	39.4
	NX86LMSC	3200	45.8	12.6	59.1

Order Code

	1	2	3	4	5	6	7	8	9	10	11
Order example	**NX**	**8**	**6**	**H**	**M**	**S**	**C**	**A**	**6**	**G**	**00**

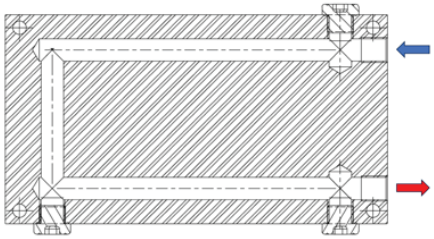
1	**Motor range**		
	NX	Standard version	
	NK*	Kit version	
2	**Motor frame size**		
	8		
3	**Stack length module**		
	2 / 4 / 6		
4	**Cooling type**		
	H	Low Voltage	Natural convection
	L		External cooling (oil cooling) - NX version only
	W		External cooling (water cooling) - NX version only
	K	High Voltage	Natural convection
	F		External cooling (oil cooling) - NX version only
	G		External cooling (water cooling) - NX version only
5	**Market**		
	M	Mobile	
6	**Encoder**		
	A	Resolver	
	S	SinCos	
7	**Winding**		
	A...G	see tables page 6 & 8	
8	**Mechanical configuration**		
	A	SAE A 9T spline shaft, 2 bolts flange	
	B	SAE B 13T spline shaft (to be combined with SAE B front flange)	
	I	ISO3019/2 flange - DIN5480 18T spline shaft	
	O*	SAE A 9T spline shaft, 2 bolts flange - motor immersed in oil (IP54)	
	P*	SAE B 13T spline shaft - motor immersed in oil (IP54) - (to be combined with SAE B front flange)	
	R*	IISO3019/2 flange - DIN5480 18T spline shaft - motor immersed in oil (IP54)	
	S*	SAE A 9T spline shaft, 2 bolts, wet spline coupling	
	T*	SAE B 13T spline shaft, wet spline coupling - (to be combined with SAE B front flange)	
	U*	ISO3019/2 flange - DIN5480 18T spline shaft wet spline coupling	
9	**Connection**		
	6	Low voltage	Terminal + feedback connector
	7	High voltage	Power connector + feedback connector
10	**Thermal sensor**		
	G	PT1000 on feedback connector	
11	**Mechanical Interface**		
	00	Standard (with SAE A or ISO 3019/2)	
	02	Kit version*	
	05	SAE B front flange, 2 or 4 bolts (only in combination with SAE B shafts)	

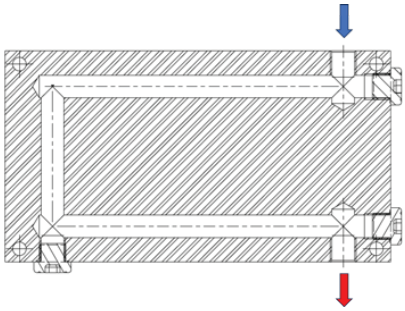
* On request (please contact Parker)

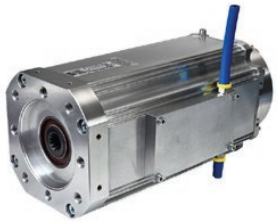
Cooling

Cold Plates

The proposed cold plates can be used in two different ways in accordance with the two pictures hereunder. The flow direction can be reversed if requested in order to facilitate the cooling connection.







Back configuration cooling Inlets/Outlets

Up/Down configuration cooling Inlets/Outlets

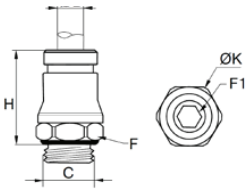
Don't forget that when you use hexagonal plug and rotate it, it will need more space and probably touch the motor, especially on the back configuration setting

As example, the cold plate are 15mm thick but a 14mm hexagonal will touch the motor with the back configuration

Hoses and Fittings

Version for protected environment

3801 Connector



Part Number	C	D mm	F mm	F1 mm	H mm	K mm
3801 08 10	G1/8	8	15	5	19	16.5

Hoses

1025P Semi-rigid polyamide (PA) tubing

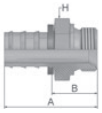
Tubepack 25 m

Ø ext. mm	Ø int. mm	R	Incolore							kg
8	6	25	1025P08 00	1025P08 01	1025P08 02	1025P08 03	1025P08 04	1025P08 05	1025P08 06	0.790

Please consult catalogue for more information: Parker Legris General Catalogue

Version for harsh environment

Connector



Part number	A	B	H
3D982-2-4C	36mm	17mm	14mm

Hoses

Part Number	Hose I.D.				Hose O.D.	Pressure Rating: max. working pressure		Pressure Rating: min. burst pressure		Vaccum*	min. bend radius	weight
	DN	Inch	Size	mm	mm	MPa	psi	MPa	psi	kPa	mm	kg
801PLUS-4-XXX-RL	6	1/4	-4	6.4	12.7	2.4	350	9.7	1400	95	65	0.13

Colour codes / BLK = black / BLU = blue / RED = red / BRN = green / GRA = grey / YEL = yellow / RL = only available on reels

* The vacuum values listed in the table are vacuum pressure values in kPa. For an absolute value subtract the table value from 101 kPa
Note: When ordering, please replace in the part number XXX with the relavant colour code. Example: 801PLUS-4-BLU-RL

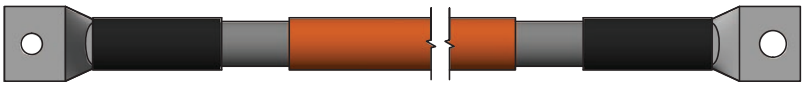
Please consult catalogue for more information: Fitting and Hose Catalogue

Power Cables

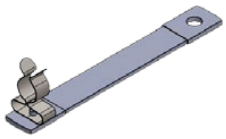
Low Voltage Version

Description	Inverter Compatibility	Order code *
Power cable 35 mm²	GVI-C	GVCP01035x01
Power cable 50 mm²	GVI-D / E	GVCP01050x02
Power cable 70 mm²	GVI-D / E	GVCP01070x02

* x indicates cable length in meters : A=1m B=2m C=3m D=4m



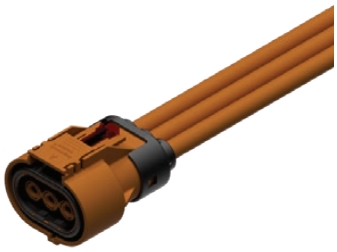
2 Shield connectors to be used with each power cable
Ref : MB 100/10/M6+M4/MSKL 8-18



High Voltage Version

Description	Order code *
Power cable 20-00 Epower lite 3 x 10 mm²	GVCP20010x00

* x indicates cable length in meters : B=2m D=4m



Feedback Cable

Description	Order code *
Connector + sensor cable / SinCos(1) + Resolver	GVCF03000x00

* x indicates cable length in meters : B=2m D=4m

(1) In case of SinCos encoder, take care to connect the cable shield to the vehicle chassis.
The motor housing must be at the same potential than the drive body.

Global Vehicle Motor - GVM

Overview

Features

- High efficiency
- High power density
- Can be used either as motor or generator
- Operating voltages available from 24 to 800 VDC
- Rare earth magnets allow high temperature operation
- Patent pending cooling
- Custom mounting and electrical connection solutions available for high volume applications

Typical Applications

- Electric motors/generators for hybrid applications
- Electric motors for motorbikes, scooters...
- Traction applications
- Electro-hydraulic pumps for high power cylinders
- Electric power steering
- Auxiliary applications as fan/compressors for air conditionning

Technical Characteristics - Overview

Motor type	**Permanent Magnet synchronous motor**
Magnet materials	Rare earth magnets
Number of poles	12
Batterry voltage	24 to 800 VDC
Power range	up to 350 kW (continuous)
Torque range	up to 2300 Nm (peak)
Speed range	up to 9800 min^{-1}
Ambient temperature[1)]	liquid cooled: -40...+120 °C natural convection: -40...+65 °C
Storage temperature[1)]	-40...+120 °C
Sensor	Resolver or SinCos encoder
Insulation of the stator winding	Class H with potting
Protection	IP67 as standard IP6K9K on request
Random vibration*	0,1 g^2/Hz in frequency range 5...2000 Hz (12 g rms – 3x8h)
Operational shock*	25 g, 11 ms, 3x6 (with 2 directions per axis)
Thermal protection	1 PTC probes and 1 KTY84-130 sensor
Shaft end	Spline shaft (male or female), other possibilities on request
Connections	Terminal box (flying cables for kits); connector for feedback
Marking	UL and CE

[1)] With resolver as feedback

Note: the motors are designed for horizontal operation. In case of vertical installation, please contact us.

In case of axial or radial load on the shaft, please consult the acceptable limits on the GVM technical manual.

Testing and Validation Details*:

Mechanical

- Random and swept sine vibration testing to simulate worst case fatigue exposure to SAE J1455
- Shock and vibration levels exceeding SAE J1455 for unsprung mass applications.

Environmental

- Dust and sand, and gravel bombardment to SAE J1455
- Salt Spray - Fog and Immersion to SAE J1455

Electrical

- HiPot insulation test to IEC 34-1 at 2 x V_{RMS} + 1000 V_{RMS}
- Insulation resistance to ISO 6469-3
- EMC emission and immunity to IEC 34-1 (motor only)

* These tests are valid for GVM210 and GVM310 motors up to GVM310-250. (for bigger sizes please contact us)

A smaller size of GVM142 motor is available, you can check the catalog here :

GVM142 catalogue - North America

GVM142 catalogue - Europe

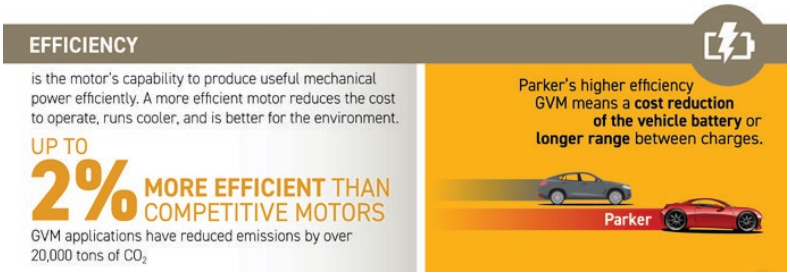
RELIABILITY & DURABILITY

- Long lifetime
- Reduced downtime
- Less maintenance
- Subjected to rigorous environmental testing
- High ingress protection level available
- Ceramic bearings*

*All GVM310 sizes and GVM210 over 150 mm lamination stack length.

EFFICIENCY

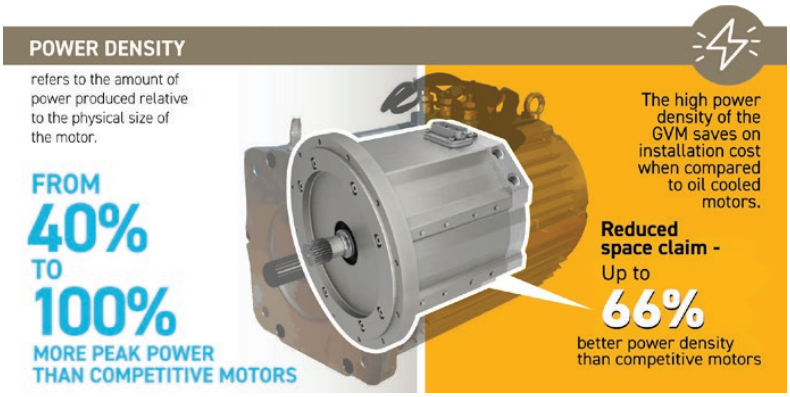
- Lower energy consumption for compliance with emerging energy legislations and green initiatives
- Up to 2% more efficient than comparable PMAC designs
- Operates efficiently as motor or generator for maximum energy recovery during braking and deceleration
- Reduced vehicle emissions for smaller CO_2 footprint



- Reduced battery size
- Extended vehicle range
- Lower cost of ownership over life of vehicle
- Reduced thermal losses allow for smaller, less expensive vehicle cooling system

POWER DENSITY

- Reduced space claim
- Less weight for better performance
- Lighter motor can provide larger payload capacity
- Helps vehicle designers meet packaging and performance goals
- Patented cooling helps achieve vehicle performance objectives
- Enhanced productivity in the form of higher vehicle capacity



Technical Characteristics - GVM210

GVM210 Motor Model Number	Battery Voltage	Rated Torque Mn	Rated Power Pn	Rated Current In	Rated Speed Nn	Peak Torque Mp	Peak Power Pp	Peak Current Ip	Max Speed Nmax*	Ke 25°C 77°F
	[VDC]	[Nm]	[kW]	[Arms]	[rpm]	[Nm]	[kW]	[Arms]	[rpm]	[Vrms/Krpm]
GVM210050PBB1W	96	33.2	18.8	183	5400	82.5	26.2	412	8000	15.4
GVM210050PGF1W	350	28.6	12.6	33.8	4200	82.5	16.7	73.7	8000	85.9
GVM210050PEH1W		30.4	17.8	47.7	5600	82.5	24.4	104.9	8000	60.4
GVM210050PJH1W	650	30.8	17.1	24.4	5290	82.5	23.9	55.4	7300	114
GVM210100PAN1W	96	68.9	33.2	324	4600	172	43.8	683	8000	19.4
GVM210100PEH1W	350	61.2	19.3	52.2	3020	172	23.9	106	6700	125
GVM210100PGF1W	650	60.7	25.4	36.1	4000	172	32	74.5	4700	178
GVM210100PEH1W		63.7	35.8	50.5	5360	172	46.8	106	6700	125
GVM210150PAN1W	96	98.3	34.7	340	3380	261	43.3	684	5000	29.5
GVM210150PDD1W	350	80.5	27.8	73.3	3300	261	33.5	146.3	6000	138
GVM210150PGF1W	650	89.8	25.5	37.3	2710	261	31.6	74.7	3100	270
GVM210150PCB1W		95.9	72.3	101	7200	262	99.3	222	8000	90.8
GVM210200PAR1W	96	126	29.7	296	2250	351	36	591	3000	45.8
GVM210200PAM1W	350	129	103	266	7600	351	177.3	745	8000	36.4
GVM210200PEH1W	650	135	37.3	53.6	2640	351	45.5	106.4	3300	254
GVM210200PBG1W		134	101	142	7200	351	149.9	336	8000	80.6
GVM210300PAR1W	96	185	29	299	1500	530	34,3	591	2000	69.2
GVM210300PAK1W	350	209	123	329	5600	530	195.2	817	8000	50.1
GVM210300PAR1W	650	193	150	207	7400	530	264.5	591	8000	69.2
GVM210400PAR1W	96	202	28.5	306	1350	709	32.7	592	1500	92.5
GVM210400PAK1W	350	257	129	340	4800	709	194	817	8000	67
GVM210400PAK1W	650	232	180	259	7400	709	366.6	817	8000	67

*The maximum operating speed depends on maximum BEMF accepted by the drive (values given for a Peak Voltage of 1200V)
Max. mechanical speed is 8 000 rpm.
Values in table represent GVM ratings with input cooling liquid at **65°C** (Characteristics are given for an optimal drive/motor association without any limitation coming from the drive). For alternative cooling temperatures please contact us.

Technical Characteristics - GVM310

GVM310 Motor Model Number	Battery Voltage	Rated Torque Mn	Rated Power Pn	Rated Current In	Rated Speed Nn	Peak Torque Mp	Peak Power Pp	Peak Current Ip	Max Speed Nmax*	Ke
	[VDC]	[Nm]	[kW]	[Arms]	[rpm]	[Nm]	[kW]	[Arms]	[rpm]	[Vrms/ Krpm]
GVM310125PBG2W	350	302	92	241	2910	700	147	685	8000	96
GVM310125PBA1W		222	100	266	4280	610	165	902	8000	64
GVM310125PMW1W		198	114	300	5500	610	185	1015	8000	58
GVM310125PCE2W	650	292	104	145	3390	700	170	424	5500	154
GVM310125PBT2W		256	108	151	4040	700	205	514	6600	128
GVM310125PNP1W		204	117	166	5500	610	192	559	8000	106
GVM310200PMP1W	350	315	165	437	5010	990	241	1323	8000	73
GVM310200PMW2W		442	124	325	2670	1140	216	984	8000	105
GVM310200PMP2W		419	145	378	3310	1140	281	1287	8000	81
GVM310200PBG2W	650	463	161	225	3310	1140	280	694	5500	153
GVM310200PNH1W		308	159	225	4930	990	229	678	6300	134
GVM310200PNC1W		334	178	253	5090	990	283	828	7300	116
GVM310250PBA1W	350	542	138	370	2420	1240	166	906	6400	132
GVM310250PMW1W		404	147	390	3480	1240	185	987	7100	119
GVM310250PMP1W		432	179	475	3960	1240	241	1320	8000	90
GVM310250PMW1W	650	434	228	323	5010	1240	350	1022	7100	119
GVM310250PNC2W		537	177	246	3150	1430	331	814	5200	162
GVM310250PMW2W		479	199	278	3960	1430	409	1001	6400	132

*The maximum operating speed depends on maximum BEMF accepted by the drive (values given for a Peak Voltage of 1200V)
Max. mechanical speed is 8 000 rpm.
Values in table represent GVM ratings with input cooling liquid at **65°C** (Characteristics are given for an optimal drive/motor association without any limitation coming from the drive). For alternative cooling temperatures please contact us.

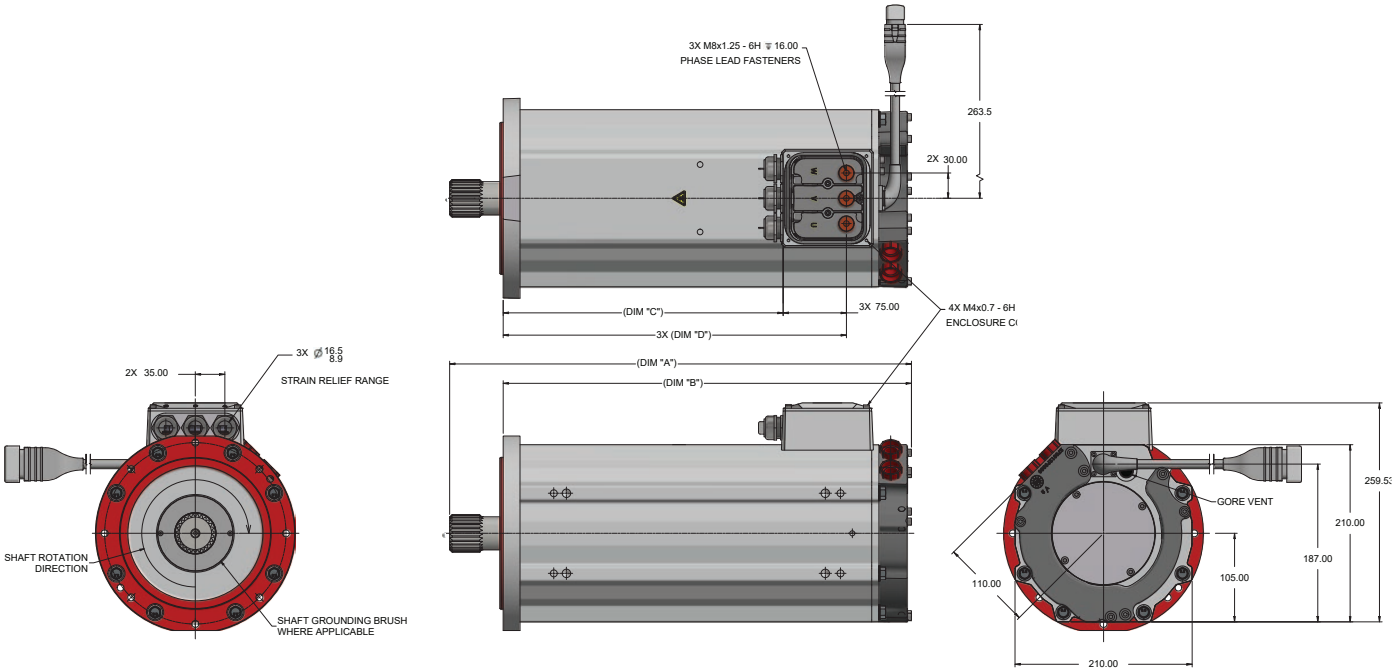
	Battery Voltage [VDC]	Continuous torque at low speed [N.m]	Max. torque [N.m]	Continuous power [kW]	Peak power [kW]	Maximal speed [rpm]	Continuous Power density [kW/kg]	Peak Power density [kW/kg]
Low Flux - Solid Wire								
GVM310300xxx	650	930	1500	233	420	5500	1.29	2.33
GVM310400xxx	650	1250	2010	296	420	5500	1.29	1.83
Low Flux - Litz Wire								
GVM310300xxx	650	840	1500	274	720	5500	1.52	4.00
GVM310400xxx	650	1140	2010	325	720	5500	1.41	3.13
High Flux - Solid Wire								
GVM310300xxx	650	1050	1720	228	500	5500	1.27	2.78
GVM310400xxx	650	1400	2300	303	500	5500	1.32	2.17
High Flux - Litz Wire								
GVM310300xxx	650	970	1720	264	850	5500	1.47	4.72
GVM310400xxx	650	1250	2300	351	850	5500	1.53	3.70

Motor data with water cooling @65°C.

For more details on the winding definition, please contact us.

Dimensions - GVM210

Power connector option 6 - Terminal Box

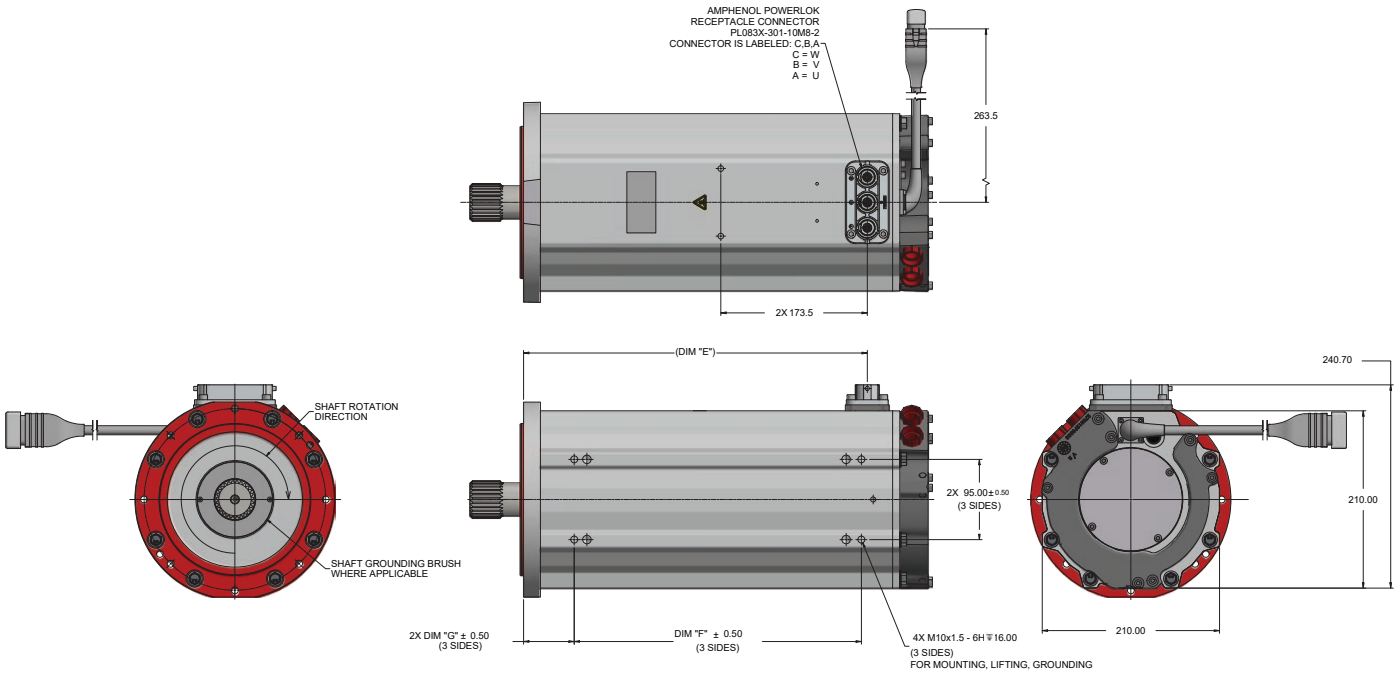


Spline Option	TA				TB			
Stack Length	A	B	C	D	A	B	C	D
GVM210-050	273.6	234.2	82	157	na	na	na	na
GVM210-100	323.6	284.2	132	207	na	na	na	na
GVM210-150	na	na	na	na	397.6	334.1	182.2	257
GVM210-200	na	na	na	na	447.6	384.1	232.2	307
GVM210-300	na	na	na	na	547.6	484.1	332.2	407
GVM210-400	na	na	na	na	647.6	584.1	432.2	507

All dimensions in mm.

Dimensions

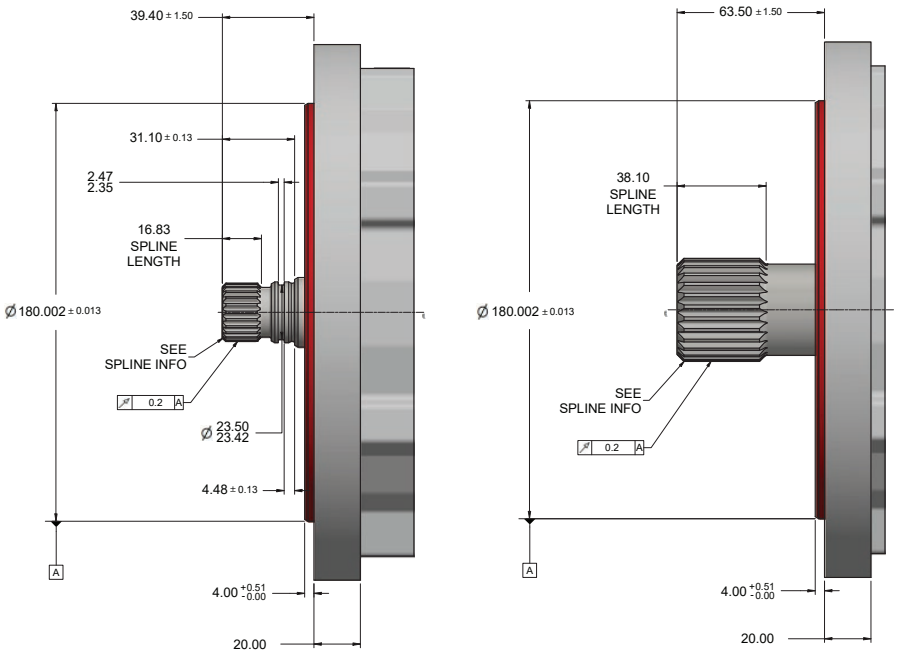
Power connector option 3 - 1 x HV PowerLok™ 300A



	TRACTION			Weight
Stack Length	E	F	G	[kg]
GVM210-050	157	90	60	25
GVM210-100	207	140		36
GVM210-150	257	190		47
GVM210-200	307	240		59
GVM210-300	407	340		77
GVM210-400	507	440		98

All dimensions in mm.

Dimensions



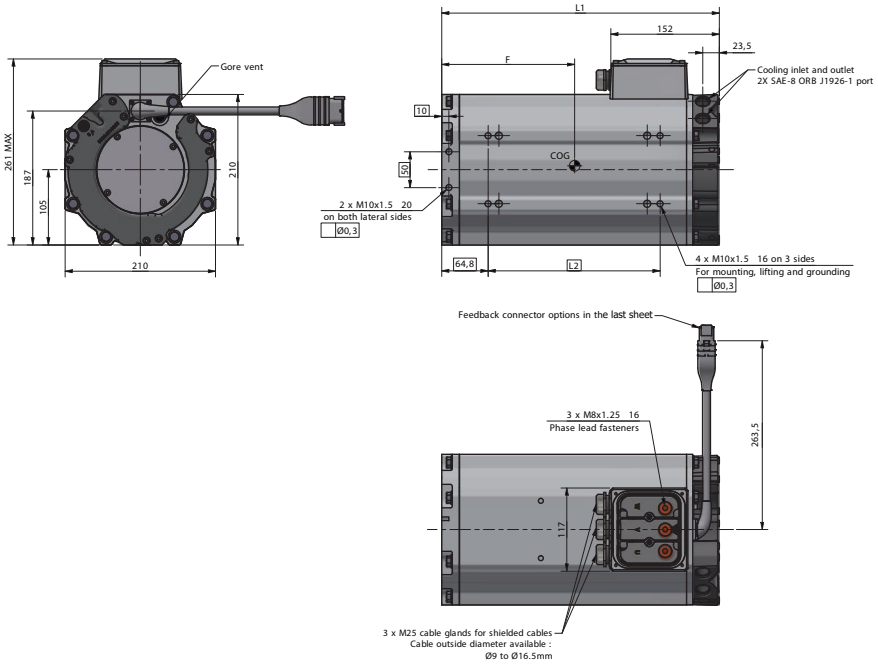
Spline Interface Data

	TA	TB
GVM210 Motor Frame Size	050 - 100	150 - 400
Involute Spline	ANSI B92.2M	ANSI B92.1
Side fit	Flat Root Class 6h	Fillet Root Class 5
Number of teeth	24	27
Module	1.0000	N/A
Spline Pitch	N/A	16/32
Pressure angle	30.0°	30.0°
Pitch diameter (Ref)	24.000	42.863
Base diameter (Ref)	20.785	37.12
Major diameter (Ref)	24.75-25.00	44.32-44.45
Minor diameter (Max)	22.26-22.5	39.27
Form diameter (Max)	22.89	41.17
Circular tooth thickness (Max effective)	1.571	2.456
Circular tooth thickness (Min actual)	1.485	2.421
Pin diameter	2.120	3.048
Measurement over pins (Ref)	27.399-27.479	47.406-47.459

All dimensions in mm.

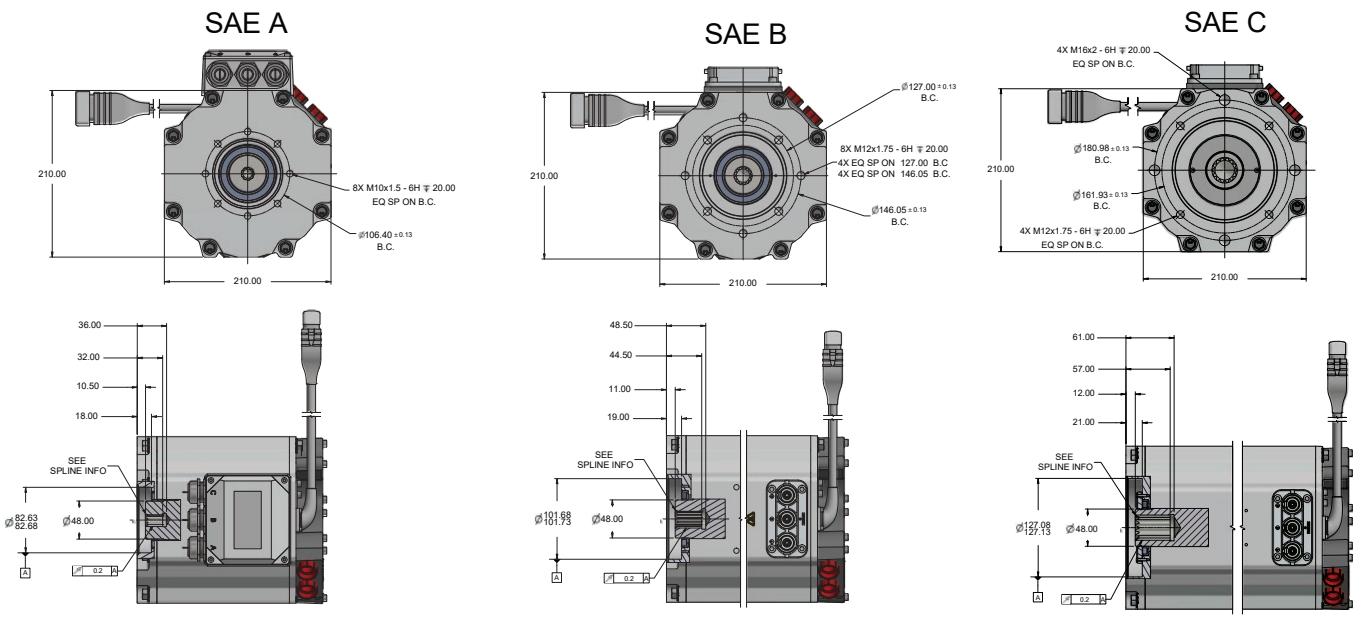
Consult factory for wet spline option

Dimensions GVM210 EHP



Motor size	L1 max.	L2	Weight [kg]	F
GVM210-050	239	90	27	108
GVM210-100	289	140	38	133
GVM210-150	339	190	48	158
GVM210-200	389	240	59	183
GVM210-300	489	340	79	233
GVM210-400	589	440	99	283

Dimensions



SAE Interface Data

MODIFIED FROM ANSI B92.1-1972 CLASS 5			
SAE type	SAE A	SAE B	SAE C
Number of bolt holes	2	2 / 4	2 / 4
GVM210 Motor Frame Size	050	050 - 150	150 - 400
Number of teeth	9	13	14
Pitch	16/32	16/32	12/24
Pressure angle	30°	30°	30°
Base diameter (Ref)	12.372	17.871	25.664
Pitch diameter (Ref)	14.287	20.637	29.634
Major diameter (Min/Max)	16.484/16.586	22.606/22.86	32.334/32.588
Form diameter (Min)	15.976	22.326	31.851
Minor diameter (Min/Max)	12.928/13.055	19.151/19.278	27.686/28.067
Circular space width max actual	2.567		3.398
Circular space width min effective	2.494		3.324
Circular space width min actual			3.362
Measurement between pins (max)	10.010/10.109	16.527/16.603	24.33/24.406
Pin diameter	2.743		3.657

All dimensions in mm.

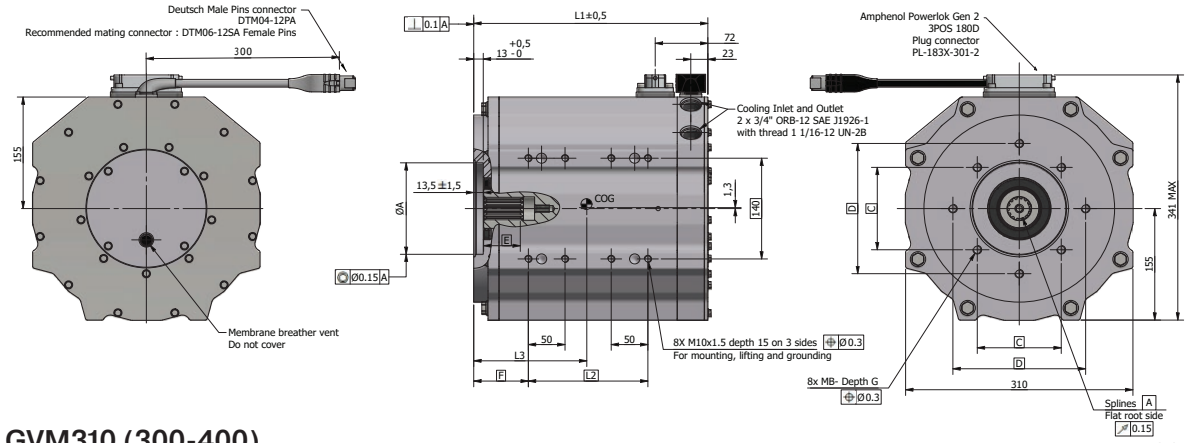
Note: Terminal box and Amphenol Powerlok options are available for all motors sizes.

Dimensions - GVM310 / SAE Pump Mount Style

GVM310 (125-250)

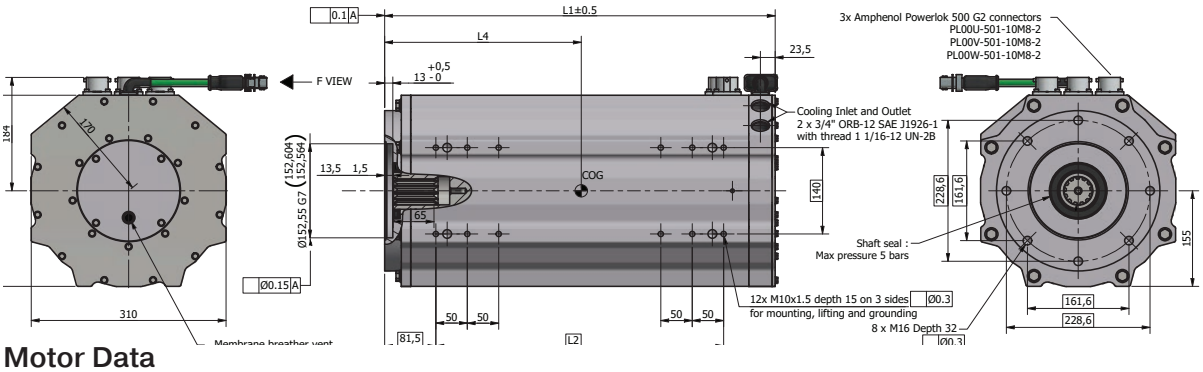
All dimensions in mm.

Power connector option 3 - 1 x HV PowerLok™ 300A



GVM310 (300-400)

Power connector - PowerLok™ 500A



Motor Data

Motor size	L1	L2	L3	SAE C	SAE D	Weight
GVM310-125	320	163	154	X	na	97
GVM310-200	395	238	191	X	na	132
GVM310-200	402	238	197	na	X	132
GVM310-250	452	288	222	na	X	157
GVM310-300	521	358	-	na	X	180
GVM310-400	621	458	-	na	X	230

SAE Interface Data

SAE Type	A	B	C	D	E	F	G
SAE C	Ø127.15G7	12	114.5	181	50	74.5	25
SAE D	Ø152.55G7	16	161.6	228.6	65	81.5	32

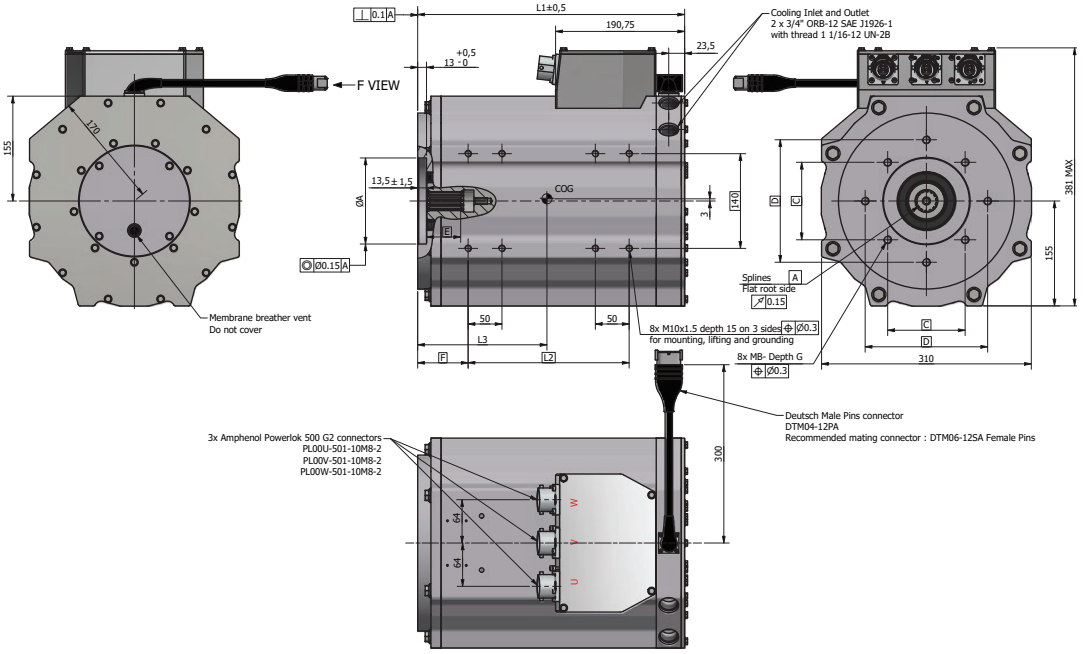
Spline Interface Data

ANSI B92.1	SAE C	SAE D
Number of bolt holes	2 / 4	4
Flat root side fit	Class 5	Class 6
Number of teeth	14	13
Spline Pitch	12/24	8/16
Pressure angle	30°	30°
Base diameter (Ref)	25.663	35.745
Pitch diameter (Ref)	29.63	41.275
Major diameter (Max)	32.588	45.669
Form diameter (Max)	31.852	44.452
Minor diameter (Min)	27.610	38.252
Circular space width (Max actual)	3.426	5.095
Circular space width (Min effective)	3.325	4.986

Consult factory for wet spline option

GVM310 / SAE Pump Mount Style

Power connector option 4 - 3 x HV PowerLok™ 500A



Motor Data

Motor size	L1	L2	L3	SAE C	SAE D	Weight
GVM310-125	320	163	153	X	na	99
GVM310-200	395	238	190	X	na	134
GVM310-200	402	238	196	na	X	134
GVM310-250	452	288	223	na	X	159

SAE Interface Data

SAE Type	A	B	C	D	E	F	G
SAE C	Ø127.15 G7	12	114.5	181	50	74.5	25
SAE D	Ø152.55 G7	16	161.6	228.6	65	81.5	32

Spline Interface Data

ANSI B92.1	SAE C	SAE D
Number of bolt holes	2 / 4	4
Flat root side fit	Class 5	Class 6
Number of teeth	14	13
Spline Pitch	12/24	8/16
Pressure angle	30°	30°
Base diameter (Ref)	25.663	35.745
Pitch diameter (Ref)	29.63	41.275
Major diameter (Max)	32.588	45.669
Form diameter (Max)	31.852	44.452
Minor diameter (Min)	27.610	38.252
Circular space width (Max actual)	3.426	5.095
Circular space width (Min effective)	3.325	4.986

All dimensions in mm.

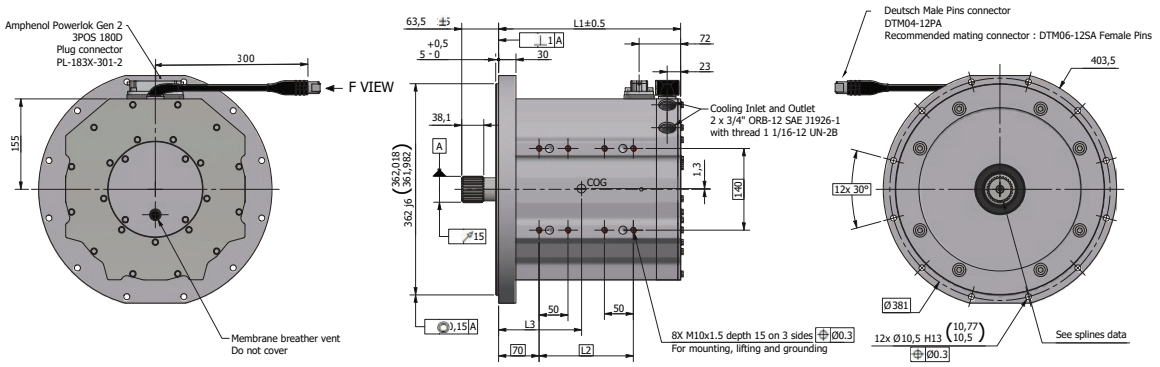
Consult factory for wet spline option

Dimensions - GVM310 / Traction Mount (SAE4)

GVM310 (125 - 250)

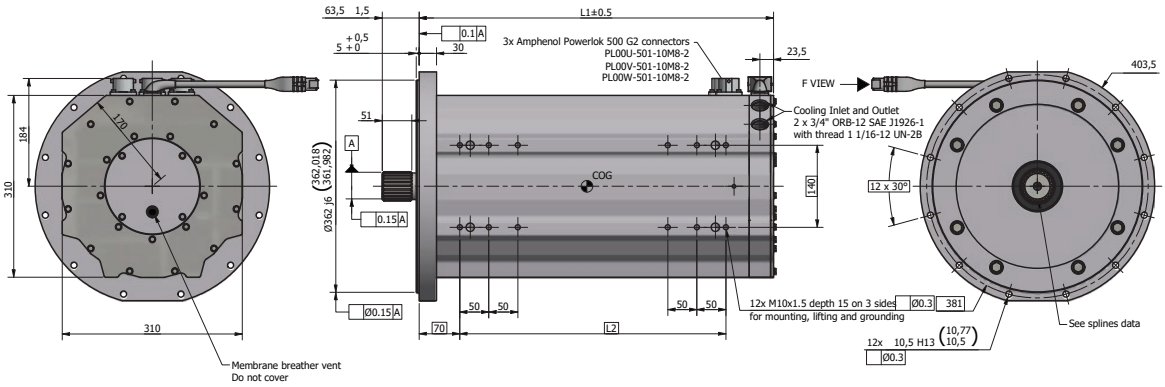
All dimensions in mm.

Power connector option 3 - 1 x HV PowerLok™ 300A



GVM310 (300-400)

GVM310 TC / Traction Mount



Motor Data

Motor size	L1	L2	L3	Shaft Interface	Weight
GVM310-125	315	163	143.5	TB	100
GVM310-200	390	238	180	TB	134
GVM310-250	440	288	204.5	TB	157
GVM310-300	510	358	-	TC	180
GVM310-400	610	458	-	TC	230

Spline Interface Data

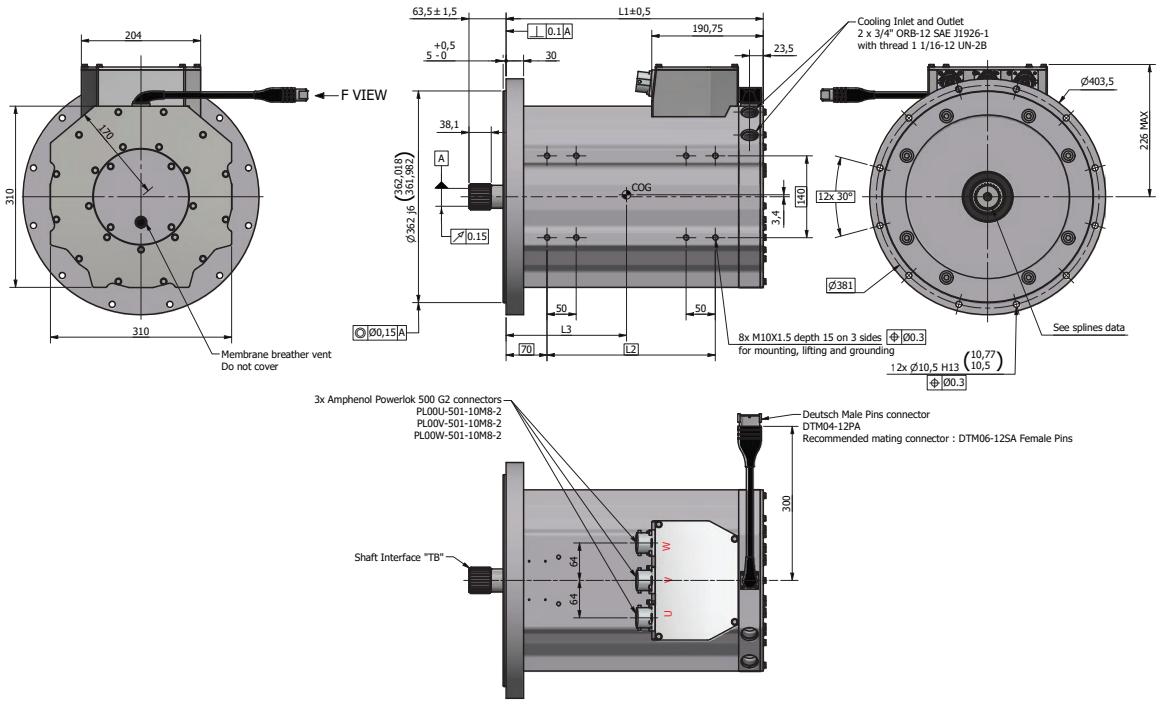
ANSI B92.1	TB Involute Spline
Side fit	Fillet Root Class 5
Number of teeth	27
Spline Pitch	16/32
Pressure angle	30.0°
Base diameter (Ref)	37.12
Pitch diameter (Ref)	42.863
Major diameter	44.45/44.32
Form diameter (Max)	41.17
Minor diameter	40.36
Circular tooth thickness (Max effective)	2.456
Circular tooth thickness (Min actual)	2.421
Pin diameter	3.048
Measurement over pins (Ref)	47.460/47.407

DIN 5480	TC
Number of teeth	26
Module	2
Pressure angle	30°
Tip circle diameter	54.6
Root form circle diameter	50.92
Root circle diameter, coldrolled	50.2
Tooth thickness (Max effective)	3.478
Actual maximum reference tooth thickness	3.348
Actual minimum reference tooth thickness	3.398
Measuring circle diameter	3
Max ref dimension over measuring circles	56.063
Min dimension over measuring circles	55.98

Consult factory for wet spline option

GVM310 / Traction Mount (SAE 4)

Power connector option 4 - 3 x HV PowerLok™ 500A



Motor Data

Motor size	L1	L2	L3	Shaft Interface	Weight
GVM310-125	315	163	131	TB	100
GVM310-200	390	238	181	TB	135
GVM310-250	440	288	206	TB	158

Spline Interface Data

ANSI B92.1	Involute
Side fit	Flat Root Class 5
Number of teeth	27
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	37.12
Pitch diameter (Ref)	42.863
Major diameter	44.45/44.32
Form diameter (Max)	41.17
Minor diameter	40.36
Circular tooth thickness (Max effective)	2.456
Circular tooth thickness (Min actual)	2.421
Pin diameter	3.048
Measurement over pins (Ref)	47.460/47.407

All dimensions in mm.

Consult factory for wet spline option

Order Code

	1	2	3	4	5	6	7	8	9	10	11
Order example	**GVM**	**310**	**200**	**P**	**BA1**	**W**	**R**	**B**	**3**	**1**	**PD**

1	**Motor series**	
	GVM	Global Vehicle Motor
2	**Frame size (outer width)**	
	210	210 mm
	310	310 mm
3	**Stack length**	
		GVM210 / **GVM310**
	050	x /
	100	x /
	125	/ x
	150	x /
	200	x / x
	250	/ x
	300	x / x
	400	x / x
4	**Type of Motor Series**	
	P	Power Series
5	**Magnetics option**	
	....	See motor tables
6	**Cooling system**	
	W	Liquid cooling (please contact us for flow & cooling temperature data)
7	**Feedback**	
	R	Brushless resolver
	S	Sincos encoder (GVM210 only)

8	**Thermal switch**	
	B	2 x PT1000 (all sizes)
9	**Power Termination**	
	3	1 x HV PowerLok™ 300A PL083X-301
	4 [2]	3 x HV PowerLok™ 500A PL00x-500 [3]
	5 [1,2]	2 x HV PowerLok™ 300A PL083X-301
	6	Terminal Box (GVM210 only)
10	**Feedback Termination**	
	1	12 male pin pigtail Deutsch DTM04-12PA
	2 [1]	16 male pin pigtail TE HDSCS 16
11	**Output Shaft**	
		GVM210 / GVM310
	PA	SAE A page 16-19 /
	PB	SAE B page 16-19 /
	BB	SAE B-B /
	PC	SAE C page 16-19 / page 20-24
	PD	SAE D / page 20-24
	TA	Traction page 16-18 /
	TB	Traction page 16-18 / page 21-23
	TC	Traction / page 24
	IT [1]	ISO7653 - Truck standard (GVM210 only)
	WA [1]	Wet spline SAE A
	WB [1]	Wet spline SAE B
	WC [1]	Wet spline SAE C
	WD [1]	Wet spline SAE D

[1] Please consult us
[2] GVM310 only
[3] x = U / V / W for the 3 motor phases

VDA fittings solution

Two parts are requested:
MVDA to be directly fixed in the Manifold (imperial thread) and FVDA to connect the MVDA to the cooling hose.
The FVDA can be easily disconnected from the MVDA.
(VDA fittings are also used with high voltage GVI inverter)

For hoses, please contact your Parker representative.

For GVM210

MVDA1205-08

FVDA121400

FVDA121445 (45°)

FVDA121490 (90°)

For GVM310

MVDA2005-12

FVDA202200

FVDA202245 (45°)

FVDA202290 (90°)

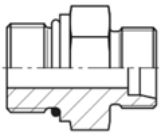
Push-Lok connector solution

For particularly demanding applications, you can use the aluminum fittings as follows:

For hoses, please contact your Parker representative.

Adapter

GE-UNF/UN you need this adapter. It's screwed directly on the GVM manifold and allow you to use the Push-Lok connector.



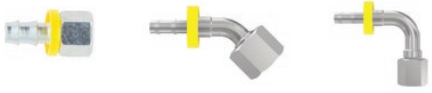
Please consult catalogue for more information: Tube Fitting Catalogue

Connector

Push-Lock connector.
Available in 3 orientations, straight, 45° and 90°
On this connector, the hoses are simply insert on it.

Corresponding Table

Here is a table summarizing the parts to use for the different sizes of GVM.



Size	GVM 210 adapter	GVM310 Adapter	Straight push-lock	45° push-lok	90° push-lok	Hoses
13mm	GE15L3/4UNFOMDCF	Not available on GVM310	3CA82-15-8	3CE82-15-8	3CF82-15-8	801TM-8-RL
16mm	GE18L3/4UNFOMDCF	GE18L11/16UNOMDCF	3CA82-18-10	3CE82-18-10	3CF82-18-10	801TM-10-RL

Please consult catalogue for more information: Fitting and Hose Catalogue

Low Voltage Parker-Curtis Motor Controllers

The F-**Series** low voltage motor controllers from Parker-Curtis are designed specifically for mobile applications requiring precise motor control, integrated vehicle logic, and robust safety features. Supporting battery systems typically ranging from 12 to 144VDC, these controllers combine power electronics with advanced control software to manage traction, pumps, steering, and auxiliary functions.

With compact designs, high efficiency, and proven reliability in harsh environments, Parker-Curtis motor controllers enable OEMs to simplify system architecture, reduce installed cost, and deliver smooth, responsive machine performance.

Technical Data

	Single Drive					Dual Drive	
Model(s)	**AC F2-A**	**AC F4-A**	**AC F6-A**	**AC F10-A**	**AC F16-R**	**AC F2-D**	**AC F5-DE**
Nominal Voltage Range [1]	12-48V	24-96V	24-96V	24-96V	72-144V	24-48V	36-96V
Peak Current Range [1] **(S2, 2 min.)**	120-280Arms	150-500Arms	375-650Arms	550-1000Arms	700-900Arms	2x 120-240Arms	2x 275-450Arms
Operating Temperature	–40°C to 50°C						
Weight	1.1 kg	1.9 kg	3.1 kg	5.0 kg	7.0 kg	1.5 kg	4.5 kg
Dimensions (mm)	120x155x55	1180x140x75	212x155x78	230x200x94	275x232x85	206x150x70	230x200x90
Ingress Protection	IP65/IP67						
EMC	EN12895						
Safety	EN 1175 EN ISO 13849-1 EN IEC 60204-1					EN 1175 EN 280-1 EN ISO 13849-1 EN IEC 60204-1	EN 1175 EN ISO 13849-1 EN IEC 60204-1
UL	UL583/cUL583[2]						

[1] See product datasheet for full model range and voltage/current configurations
[2] Pending on F16-R

High Voltage Parker-Curtis Motor Controllers

The **GMI Series** delivers advanced high-voltage motor control solutions designed for next-generation electric and hybrid mobile machines. Engineered for demanding off-highway and industrial environments, GMI controllers provide precise traction and work-function control while enabling scalable electrification across vehicle platforms.

Supporting battery systems up to 750V class, the GMI family combines high-efficiency power electronics, integrated functional safety architecture, and flexible vehicle system control in compact, rugged packages optimized for mobile applications.

From compact auxiliary electrification to high-power traction systems exceeding 150 kW peak power, GMI controllers allow OEMs to standardize on a common control platform across multiple machine types—reducing integration complexity while improving performance, efficiency, and reliability.

Technical Data

Model		GMI 070	GMI 100	GMI 020
Operating Voltage Range (without derating)		150–500VDC[1]	150–800 VDC[1]	150–800 VDC[1]
Operating Voltage Range (with derating)		500–525VDC	800-825 VDC	800-825VDC
LV Supply Voltage Range		12–24 VDC	12–24 VDC	12–24 VDC
Current Range[2]	Continuous, 60 min.	100-150Arms	75-125Arms	27Arms
	S2, 2 min.	200-300Arms	140-200Arms	45Arms
Operating Temperature		–40°C to 50°C	–40°C to 50°C	–40°C to 50°C
Weight		7.2 kg	6.5 kg	4.1 kg
Dimensions (mm)		315 x 290 x 98	309 x 278 x 92	223 x 158 x 90.5
Ingress Protection		IP6K9K/IP67		
EMC		EN 12895, ISO 13766-1 and ISO 13766-2		
Safety		EN 1175-1:2025 and EN ISO 13849-1:2023		
Environmental & Chemical		ISO 16750-3 & -4 and ISO 19014-3		
UL		UL583		

[1] Overvoltage protection cuts back the regenerative braking (regen) current when the voltage is above 525/825 VDC.
[2] See product datasheet for full model range and voltage/current configurations

High Voltage Global Vehicle Inverter - GVI

Safe, Smart and Scalable, the second generation of GVI mobile inverters provide a single-family solution for both traction and work function applications, on and off-road. The robust WEG cooled housing is rated up to IP6K9K and altitudes of up to 5000m.

Plug and socket connections on the front face simplify installation, and the comprehensive configuration software tool combined with both CANopen and J1939 interfaces gives system design flexibility.

Designed for pairing with the Parker GVM range of PMAC mobile motors, the series has the perfect balance of efficiency, performance and reliability. GVI integrates seamlessly with Parker's IQAN range of products, and with Electro-Hydraulic Pump (EHP) applications in mind, the GVI features onboard I/O tailored to hydraulic work functions.

Technical Data

Model	GVI125	GVI250
Supply Voltage	200-750V DC	
Continuous Current (1hr)	180 A	360 A
Overload	130% for 60 seconds	
Continuous Power	125 kW	250 kW
Switching Frequency	1.5 - 8 kHz Variable [1]	
Temperature Range	-40˚C to 65˚C	
Altitude	0-5000m	
Housing	IP67/IP6K9K	
Cooling	WEG 50:50 -20˚C to 65˚C	
Output Frequency	0-1333Hz [2]	
Auxiliary Supply	8-32V DC	
CAN Interfaces	CANopen, J1939, DM1, UDS [3]	
Compliance	EN61800-5, IEC61800-3, ISO13849, ISO6469, R10, R100, CISPR25 Edition 4, Class 3, ISO11452, ISO7637, 61000	

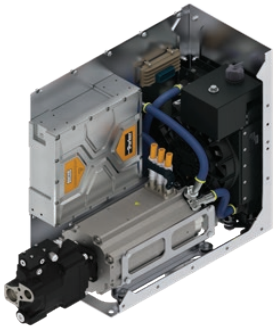
[1] Higher switching frequencies may require current derating
[2] Software limited to 590Hz
[3] 125 baud – 1M baud, with/without termination

Configured ePump

Configured ePumps are designed and optimized for hybrid electric and all electric mobile applications. Configured ePumps consist of a GVM motor, directly coupled to an hydraulic pump and controlled by a high performance mobile hardened GVI inverter.
Parker's configured ePumps provide the lowest possible installed cost and highest efficiency while still maintaining superior reliability in the most demanding applications.

Please consult ePump catalogue for more information:
Catalogue ePumps North America
Catalogue ePumps Europe

Modular Electric Power Take Off (ePTO)



- Compact enclosed assembly for optimal vehicle integration
- Customised plug and play system
- Multiple control modes
  - Pressure / Flow
  - Electric load sensing
- Reduce complexity with "one-stop shop" supplier
- Low energy consumption with efficient solution - operation on demand

Please consult ePTO brochure for more information: Brochure ePTO

Thermal Management

The QDC cooler range, whether 24 VDC or 600 VDC ties in perfectly with Parker inverters and motors ensuring greatest efficiency for all electrified applications.

- 20-30% more efficient cooling matrix
- Low noise fan and fan housing
- High performance fan drive with integrated inverter
- Fan speed control from 1200 RPM to 4750 RPM
- Air free fluid
- 50-60% less space and power consumption
- Silent operation
- Compact design - low space claim

Please consult Thermal Cooling catalogue for more information: Thermal Management catalogue

www.parker.com

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