ELECTRIFIED VEHICLE MOTOR SERIES

Permanent Magnet (PMAC) Motor for Mobile Systems

Parker

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WARNING

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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 voltage, 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:

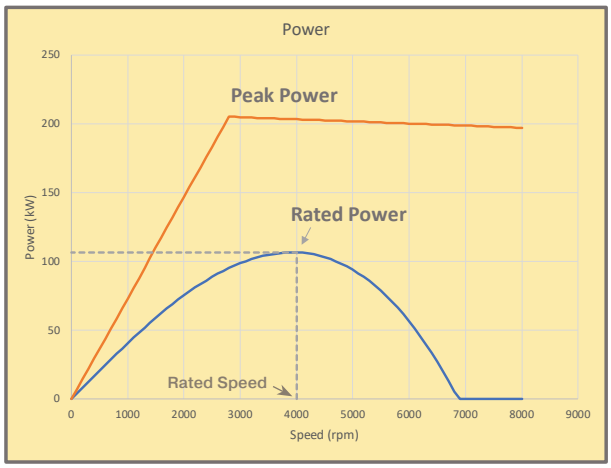
- Construction
- Mining
- Material Handling
- Trucks
- Bus
- Agriculture
- Military

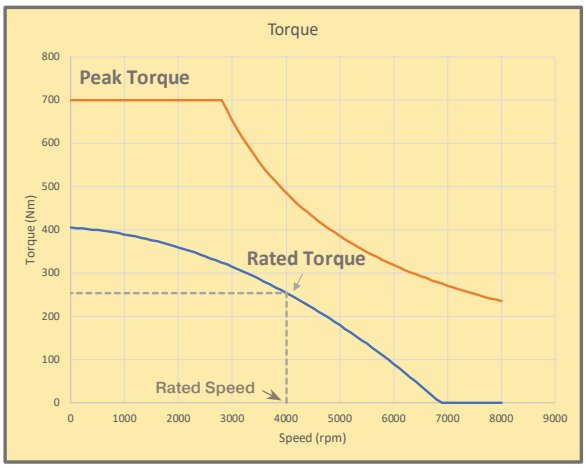
And other off-highway vehicle, autonomous vehicle, and E-Mobility markets

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

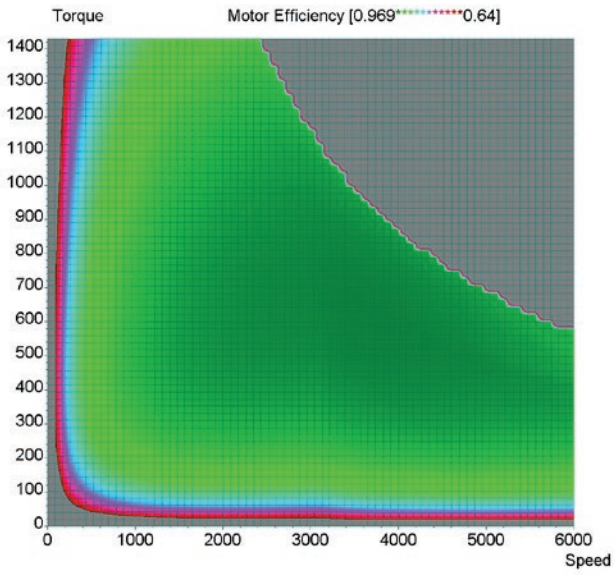




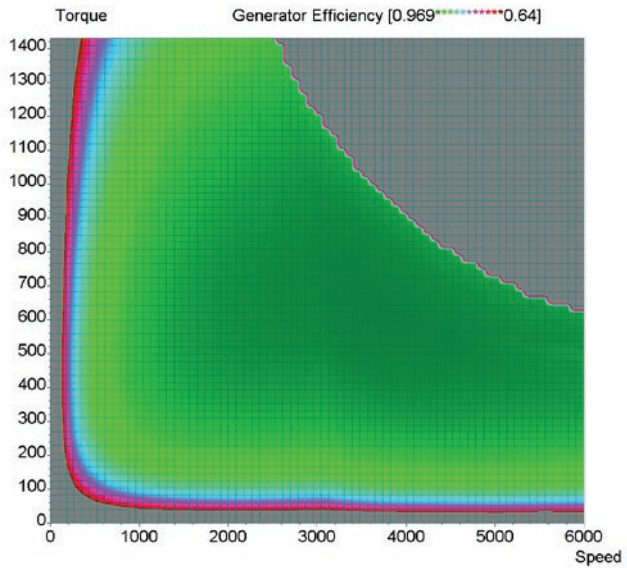
Efficiency

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 Voltage Motor - NX8M

- Easy mechanical mounting with fixing locations on all 4 sides
- Membrane breather vent to minimise internal condensation
- Direct SAE A, ISO 3019/2 pump mounting interface (SAE B shaft available on request)
- Wet spline coupling option for maintenance free Electro Hydraulic Pumps (EHP)
- Natural convection cooling; cold plates in option
- Oil immersion capability
- Easy combination with Parker Global Vehicle Inverter (GVI)
- IP67
- Available as kit version 'easy integration)

Testing and Validation Details

Random vibration
- ISO 16750-3 test VII (2023)

Sinusoidal vibration
- ISO 16750- 3 test IX table 15 (2023)

Shock test
- ISO 16750- 3 - 10 sh***ocks on e***ach axis both direction at 50G duration 6 msec. (2023)

Technical characteristics - overview

Model	NX8M
Motor type	Permanent magnet synchronous motor
Battery voltage	24 - 96 Vdc
Max. speed	8000 rpm
Peak power	99 kW
Operating temperature range	-20°C to +60°C
Protection	IP67
Feedback	Sin/Cos encoder
Thermal protection	PT1000
Cooling	Natural convection or cold plates
Marking	CE




Technical Specifications

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

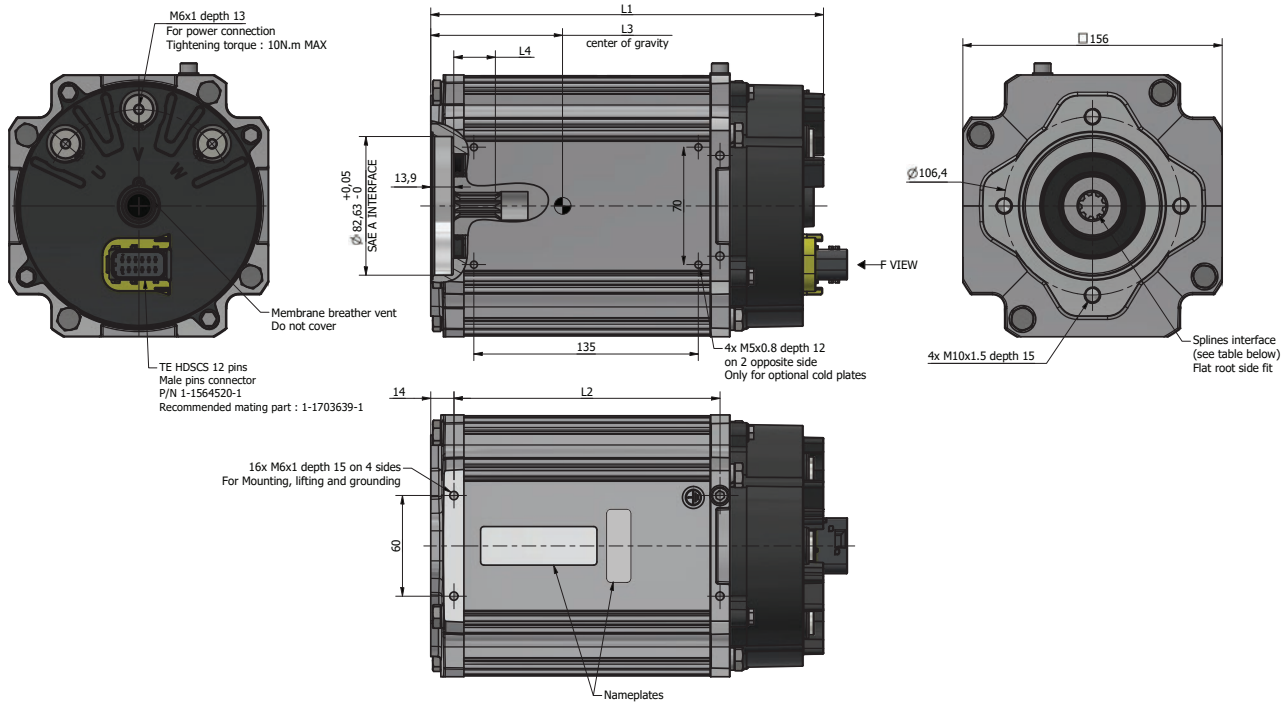
Inverter input voltage	Motor Type	Max speed rpm	Rated torque N.m	Rated power kW	Peak Power kW
24Vdc	NX82LMSB	6000	17.9	7.9	22.3
	NX84LMSB	3000	36.8	7.8	21.4
	NX86LMSB	2000	54.3	7.7	20.4
48Vdc	NX82LMSD	6000	17	8.5	23.4
	NX84LMSC	4000	32.6	10.6	31.1
	NX84LMSB	5000	25,5	11,3	48,1
	NX86LMSB	3500	43.9	13.3	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

Dimensions

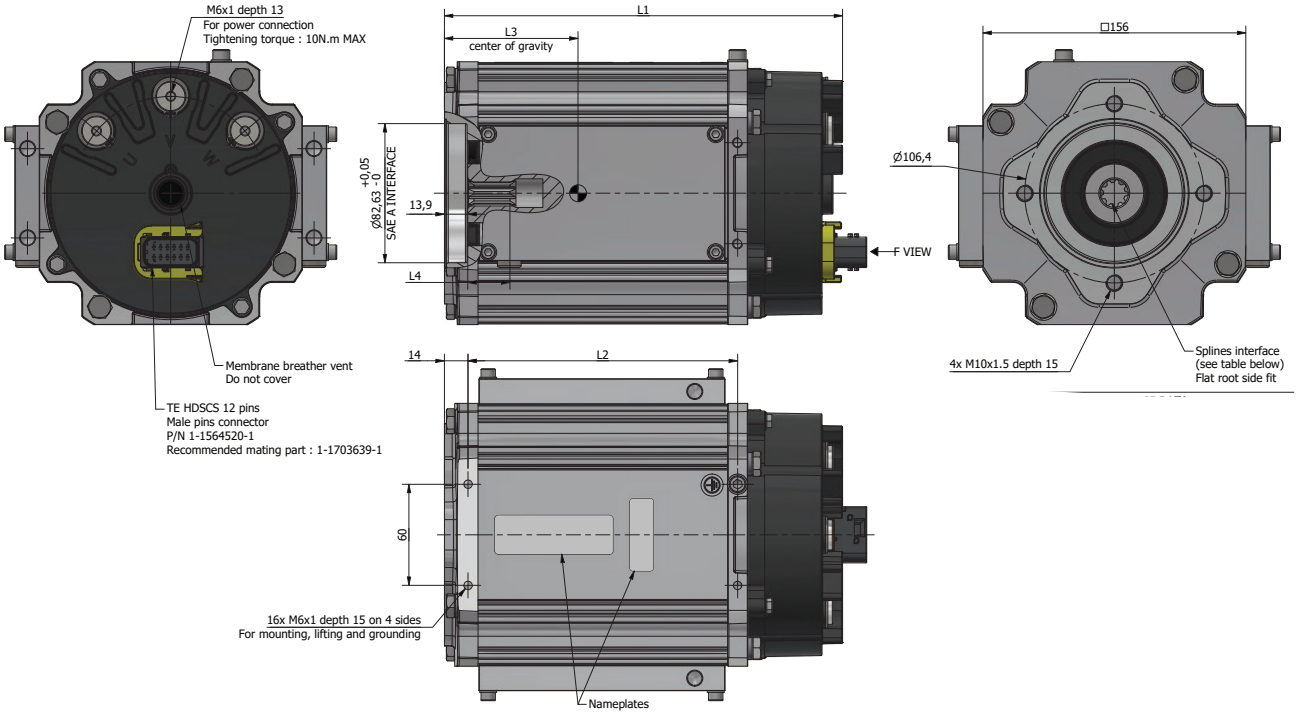
Standard SAE A interface

Dimensions [mm]

Natural Convection



With cold plates (for oil and water cooling)



Motor size	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]		Shaft		Weight [kg]	
				SAE A	SAE B	SAE A	SAE B	Motor only	With cold plates
NX82xM	236	160	93	25	35	X	X	12.5	13
NX84xM	296	220	123	25	35	X	X	20	20.5
NX86xM	356	280	153	25	35	X	X	27.5	28

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

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**

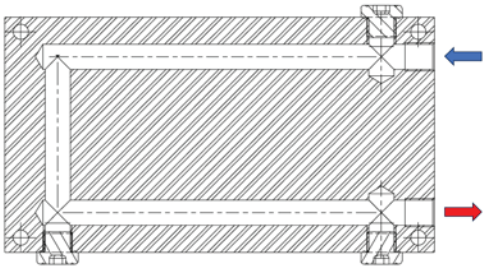
1	**Motor range**	
	NX	Standard version
	NK	Kit version
2	**Motor frame size**	
	8	
3	**Stack length module**	
	2 / 4 / 6	
4	**Cooling type**	
	H	Natural convection
	L	External cooling (oil cooling) - NX version only
	W	External cooling (water cooling) - NX version only
5	**Internal connection type**	
	M	Mobile low voltage
6	**Encoder**	
	S	SinCos
	Y	For kit version
7	**Winding**	
	A...G	see tables page 6
8	**Mechanical configuration**	
	A	SAE A 9T spline shaft
	B	SAE B 13T spline shaft
	I	ISO 3019/2
	O	SAE A 9T spline shaft - motor immersed in oil (IP54)
	P	SAE B 13T spline shaft - motor immersed in oil (IP54)
	R	ISO 3019/2 - motor immersed in oil (IP54)
	S*	SAE A 9T wet spline coupling
	T*	SAE B 13T wet spline coupling
	U*	ISO3019/2 wet spline coupling
	X	Special Interface
9	**Connection**	
	6	Terminal + feedback connector
10	**Thermal sensor**	
	G	PT1000 on feedback connector
11	**Mechanical Interface**	
	00	Standard
	05	SAE B front flange (available only with SAE B shaft)

* On request (please contact Parker)

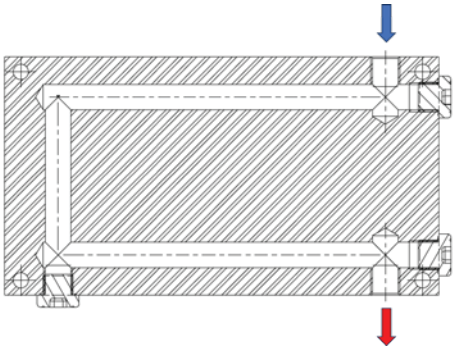
Cooling

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

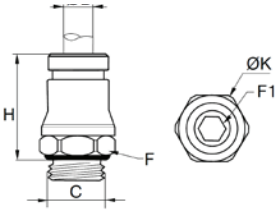
Don't forget that when you use hexagonal plug and rotate it, it will need more space and probably touch the motor, especially on the back configuration setting

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

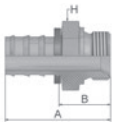
Ø ext. mm	Ø int. mm	R	Incolore							kg
8	6	25	1025P08 00	1025P08 01	1025P08 02	1025P08 03	1025P08 04	1025P08 05	1025P08 06	0.790

Please consult catalogue for more information: Parker Legris General Catalogue

Hoses and Fittings

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

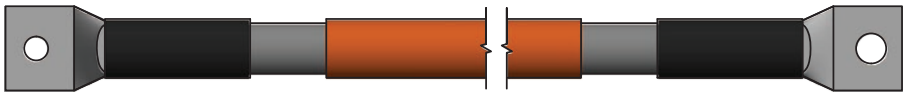
* The vacuum values listed in the table are vacuum pressure values in kPa. For an absolute value subtract the table value from 101 kPa
Note: When ordering, please replace in the part number XXX with the relavant colour code. Example: 801PLUS-4-BLU-RL

Please consult catalogue for more information: Fitting and Hose Catalogue

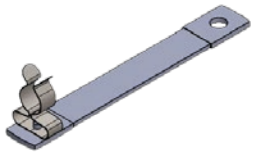
Cables

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



Description	Order code *
Connector + sensor cable / SinCos(1)	GVCF03000x01

* 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
- Compactness (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
- Customisation capability including specific mechanical design

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

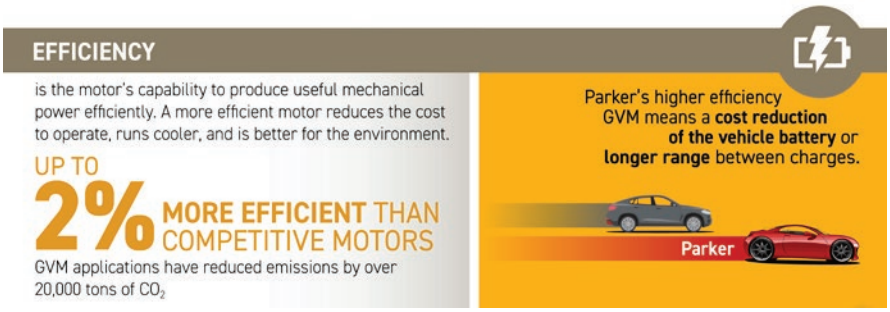
RELIABILITY & DURABILITY

- 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

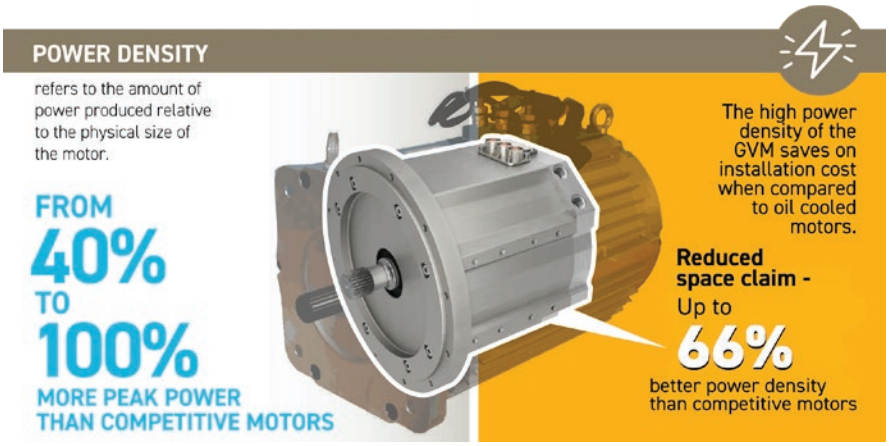
- Lower energy consumption for compliance with emerging energy legislations and green initiatives
- Up to 2% more efficient than comparable PMAC designs
- Operates efficiently as motor or generator for maximum energy recovery during braking and deceleration
- Reduced vehicle emissions for smaller CO_2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

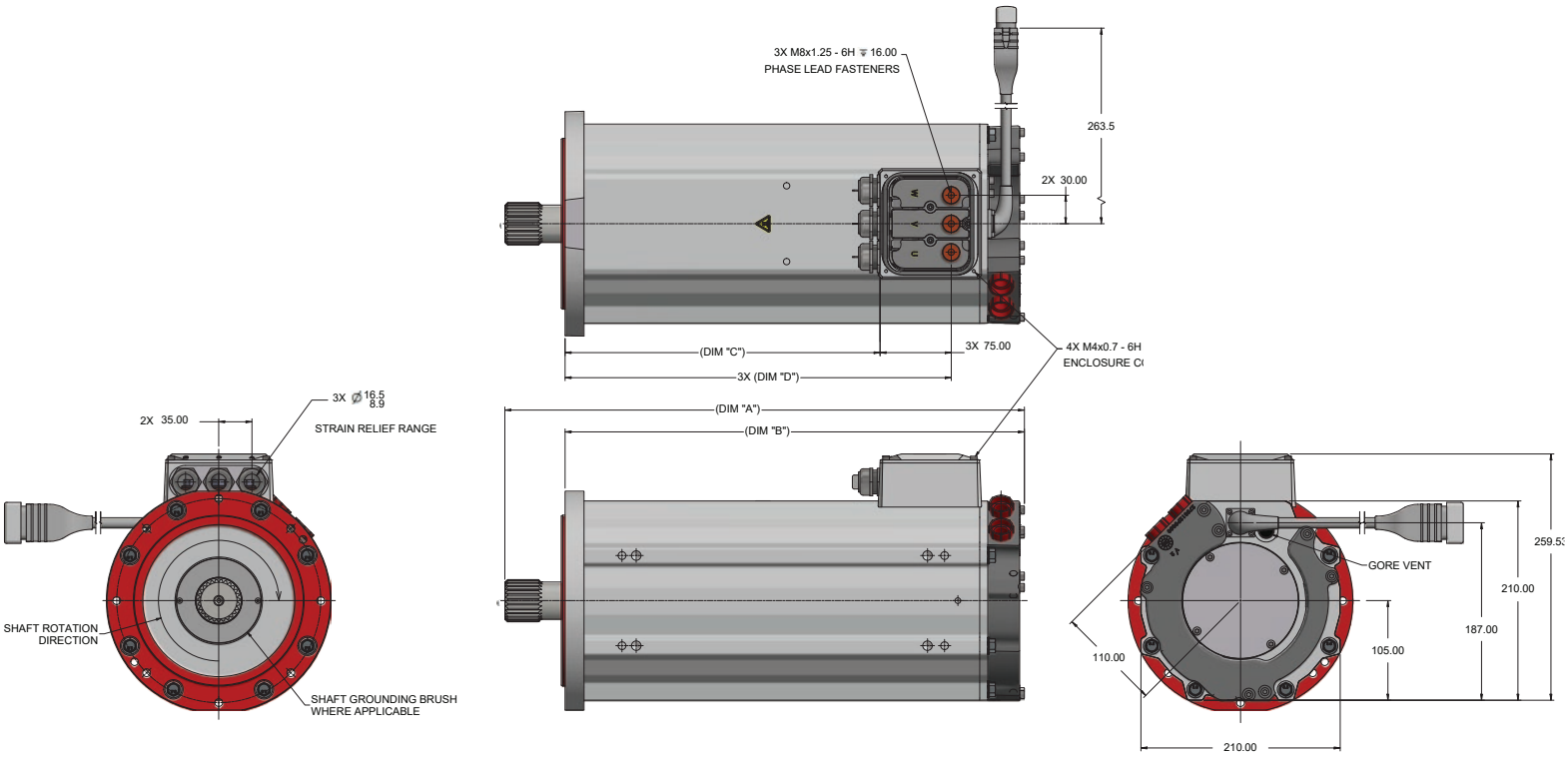
	Battery Voltage [VDC]	Continuous torque at low speed [N.m]	Max. torque [N.m]	Continuous power [kW]	Peak power [kW]	Maximal speed [rpm]	Continuous Power density [kW/kg]	Peak Power density [kW/kg]
Low Flux - Solid Wire								
GVM310300xxx	650	930	1500	233	420	5500	1.29	2.33
GVM310400xxx	650	1250	2010	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

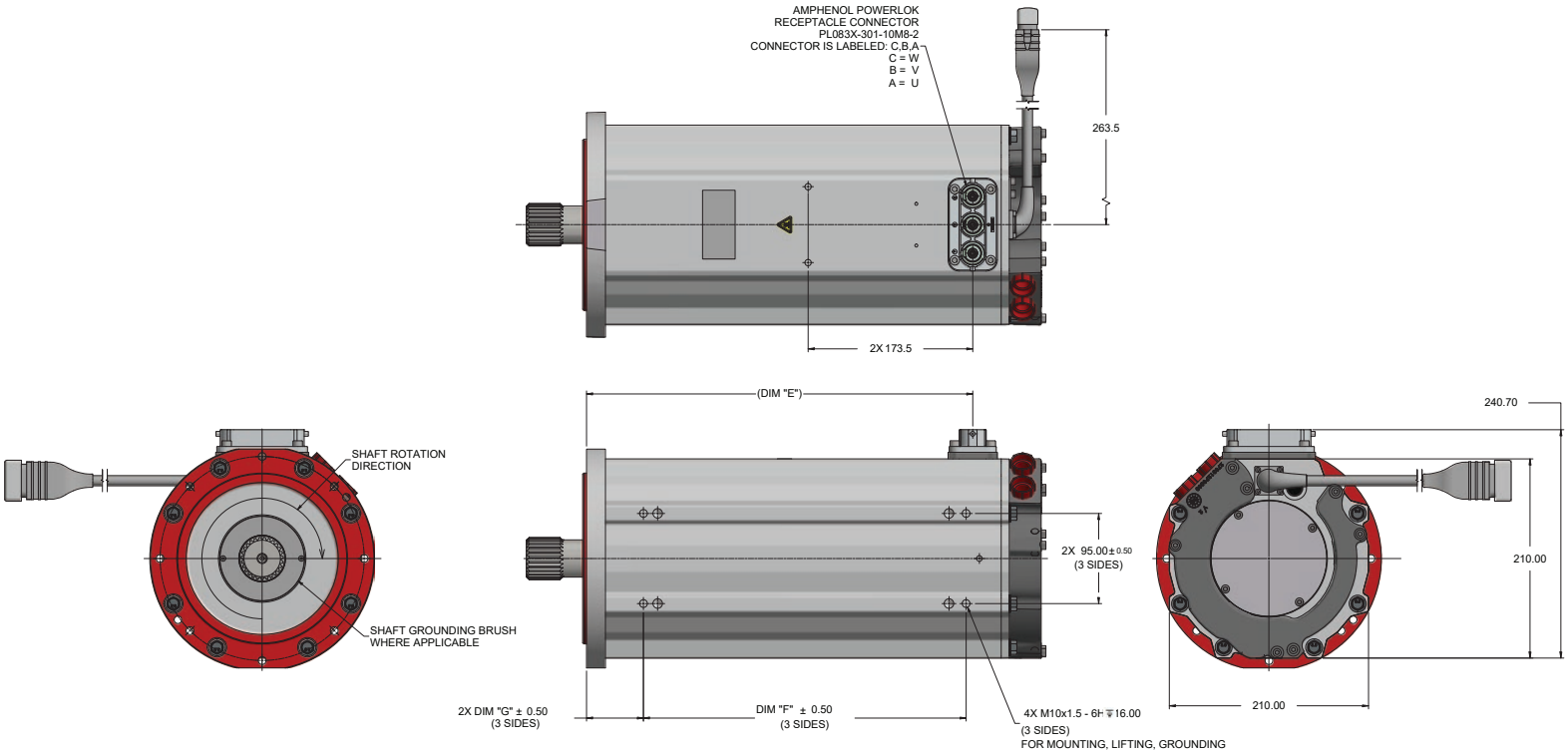


Spline Option	TA				TB			
Stack Length	A	B	C	D	A	B	C	D
GVM210-050	273.6	234.2	82	157	na	na	na	na
GVM210-100	323.6	284.12	132	207	na	na	na	na
GVM210-150	na	na	na	na	397.6	334.1	182.2	257
GVM210-200	na	na	na	na	447.6	384.1	232.2	307
GVM210-300	na	na	na	na	547.6	484.1	332.2	407
GVM210-400	na	na	na	na	647.6	584.1	432.2	507

All dimensions in mm.

Dimensions

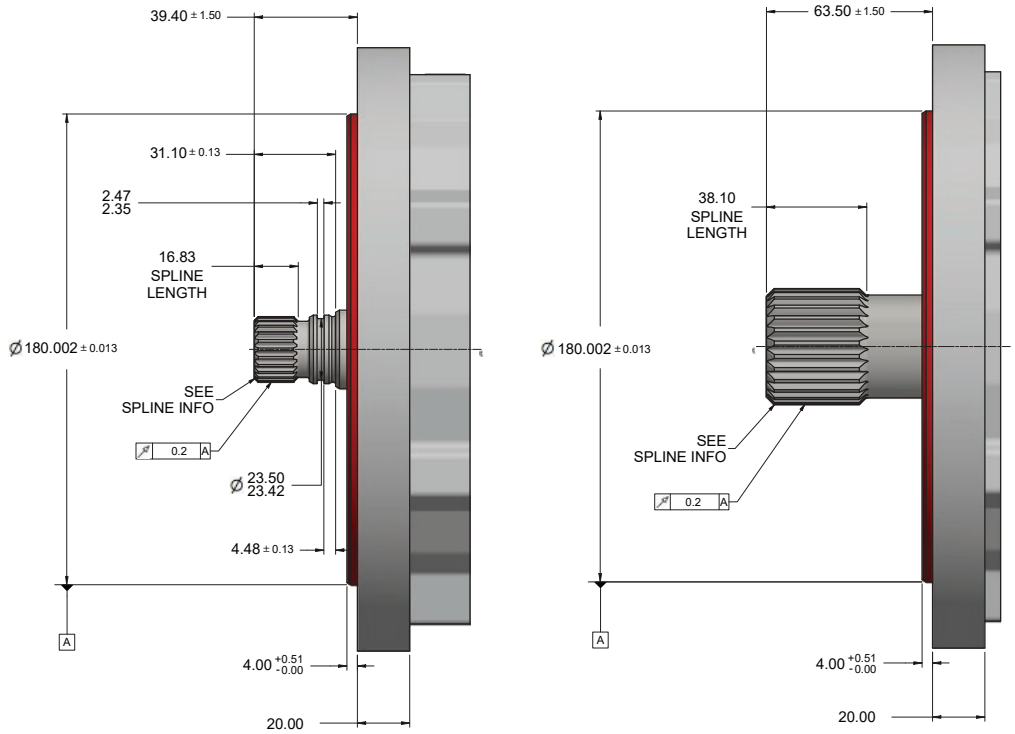
Power connector option 3 - 1 x HV PowerLok™ 300A



	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

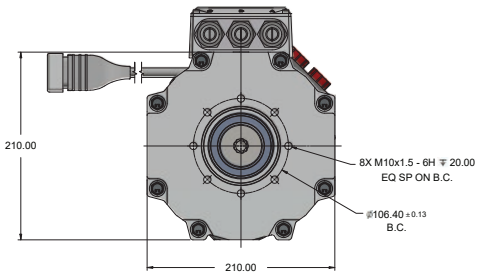
	TA	TB
GVM210 Motor Frame Size	050 - 100	150 - 400
Involute Spline	ANSI B92.2M	ANSI B92.1
Side fit	Flat Root Class 6h	Fillet Root Class 5
Number of teeth	24	27
Module	1.0000	N/A
Spline Pitch	N/A	16/32
Pressure angle	30.0°	30.0°
Pitch diameter (Ref)	24.000	42.863
Base diameter (Ref)	20.785	37.12
Major 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

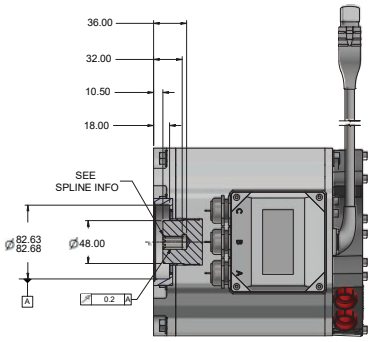
All dimensions in mm.

Consult factory for wet spline option

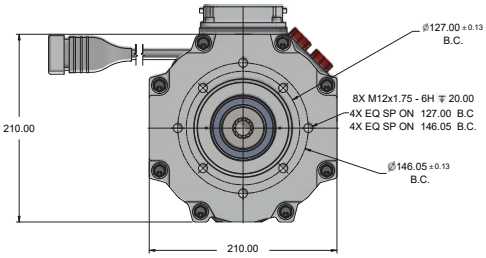
Dimensions

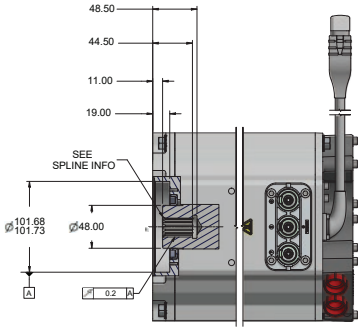
SAE A



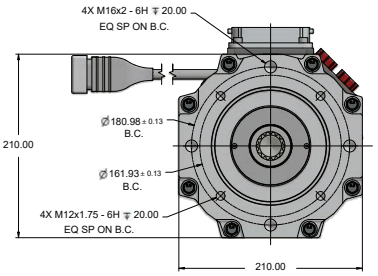


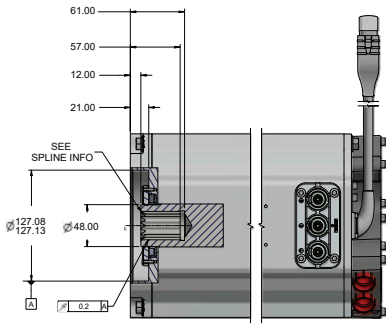
SAE B





SAE C





SAE Interface Data

MODIFIED FROM ANSI B92.1-1972 CLASS 5			
SAE type	SAE A	SAE B	SAE C
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

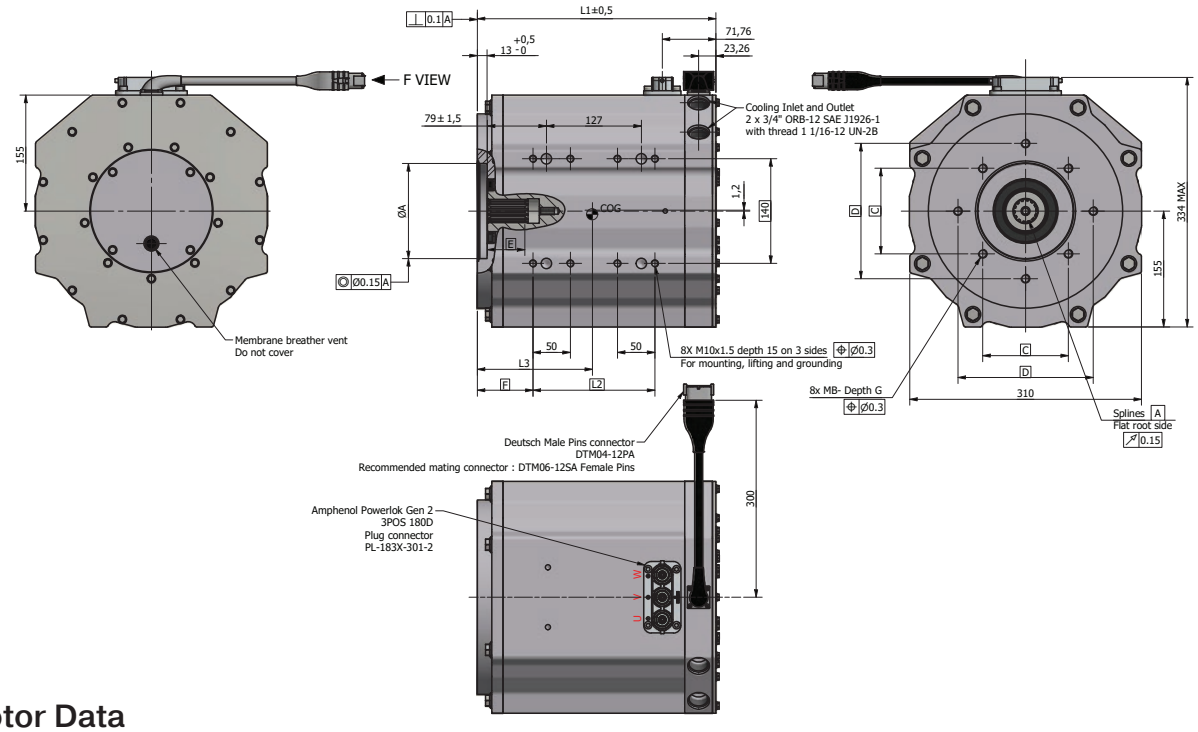
All dimensions in mm.

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

Dimensions - GVM310

GVM310 / SAE Pump Mount Style

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



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

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

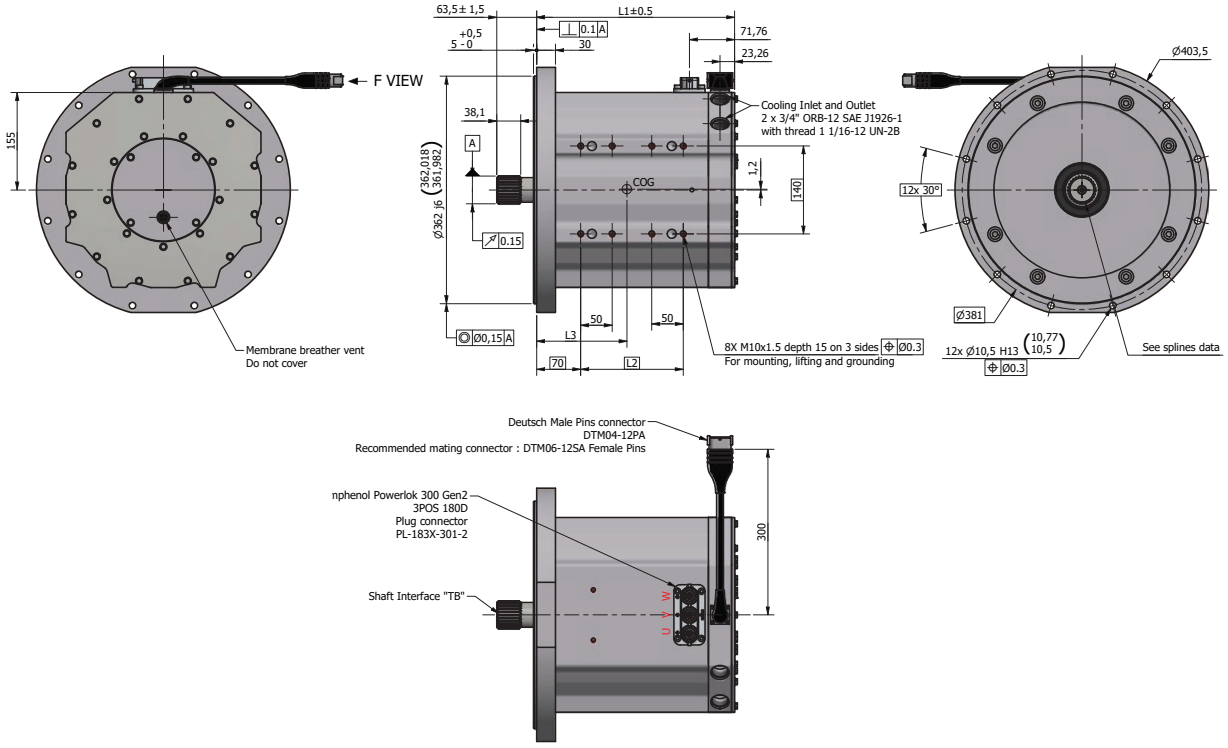
Spline Interface Data

ANSI B92.1	SAE C	SAE D
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

GVM310 / Traction Mount (SAE 4)

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



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

Spline Interface Data

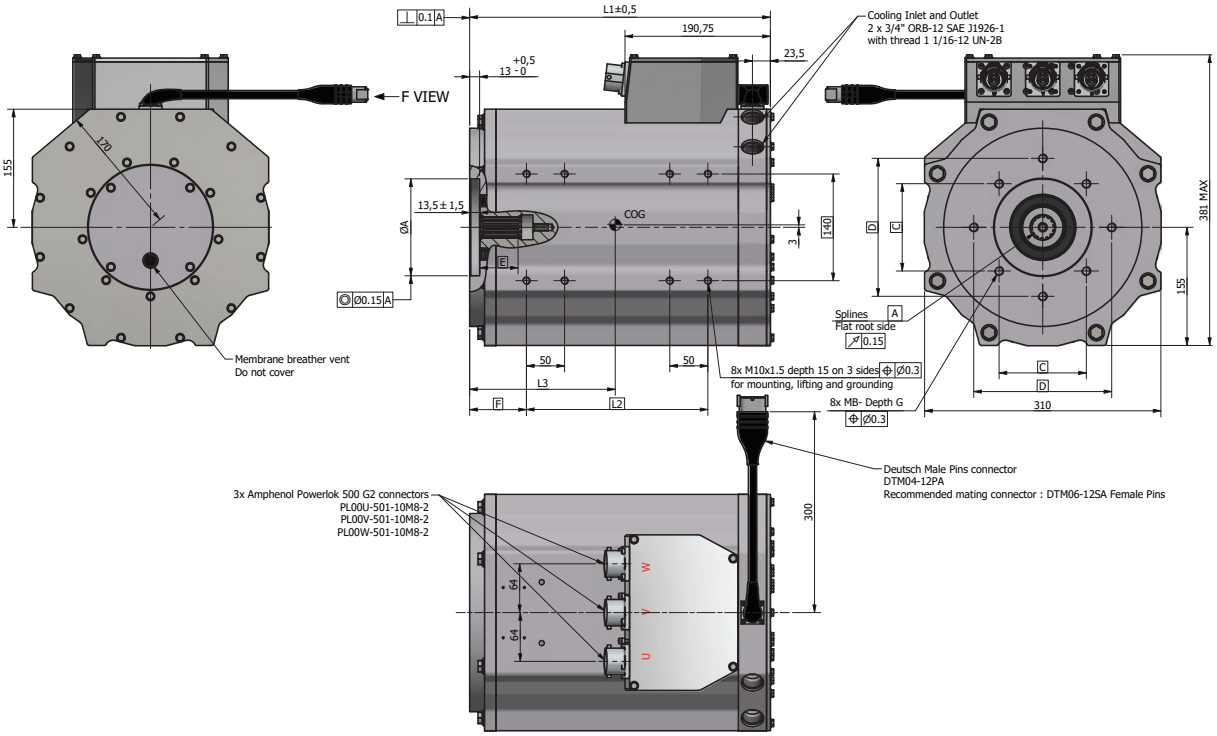
ANSI B92.1	Involute
Side fit	Fillet Root Class 5
Number of teeth	27
Spline Pitch	16/32
Pressure angle	30.0°
Base diameter (Ref)	37.12
Pitch diameter (Ref)	42.863
Major diameter	44.45/44.32
Form diameter (Max)	41.17
Minor diameter	40.36
Circular tooth thickness (Max effective)	2.456
Circular tooth thickness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

All dimensions in mm.

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

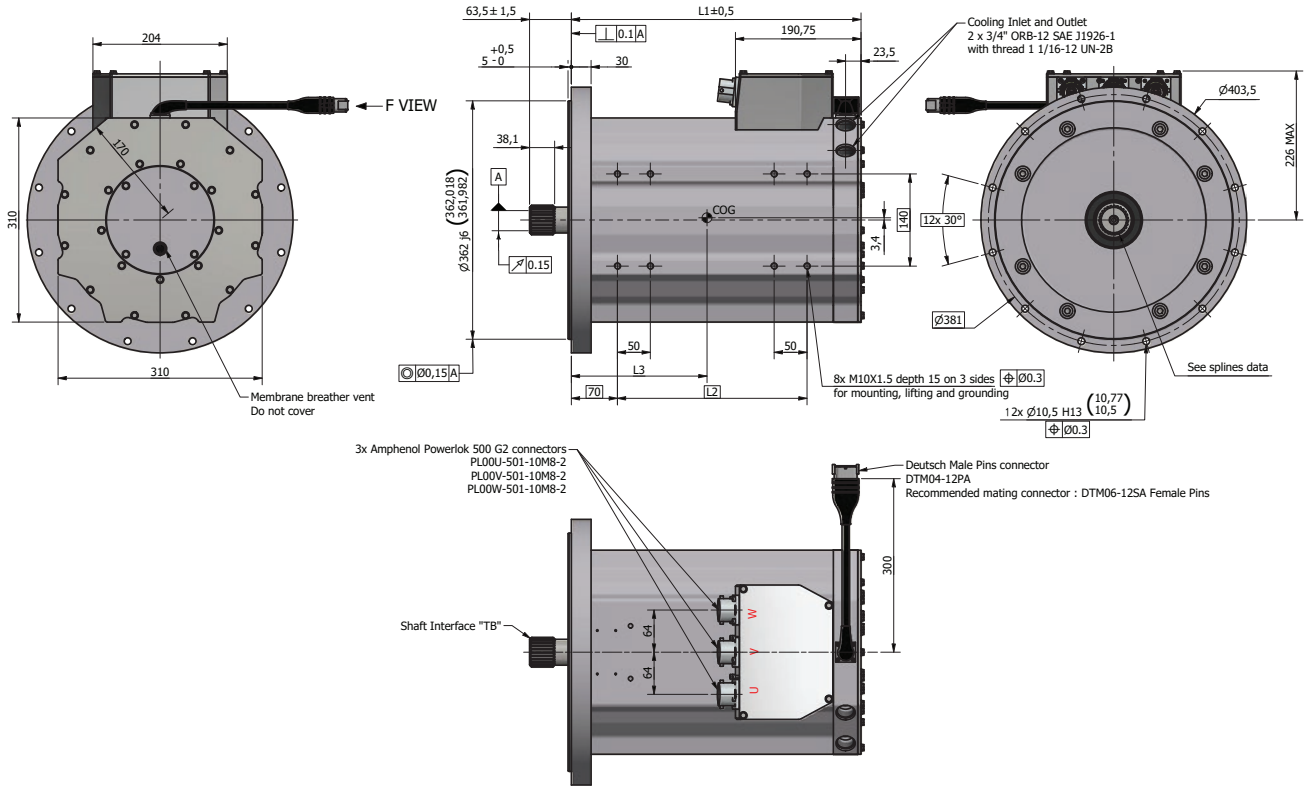
ANSI B92.1	SAE C	SAE D
Flat root side fit	Class 5	Class 6
Number of teeth	14	13
Spline Pitch	12/24	8/16
Pressure angle	30°	30°
Base diameter (Ref)	25.663	35.745
Pitch diameter (Ref)	29.63	41.275
Major diameter (Max)	32.588	45.669
Form diameter (Max)	31.852	44.452
Minor diameter (Min)	27.610	38.252
Circular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

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

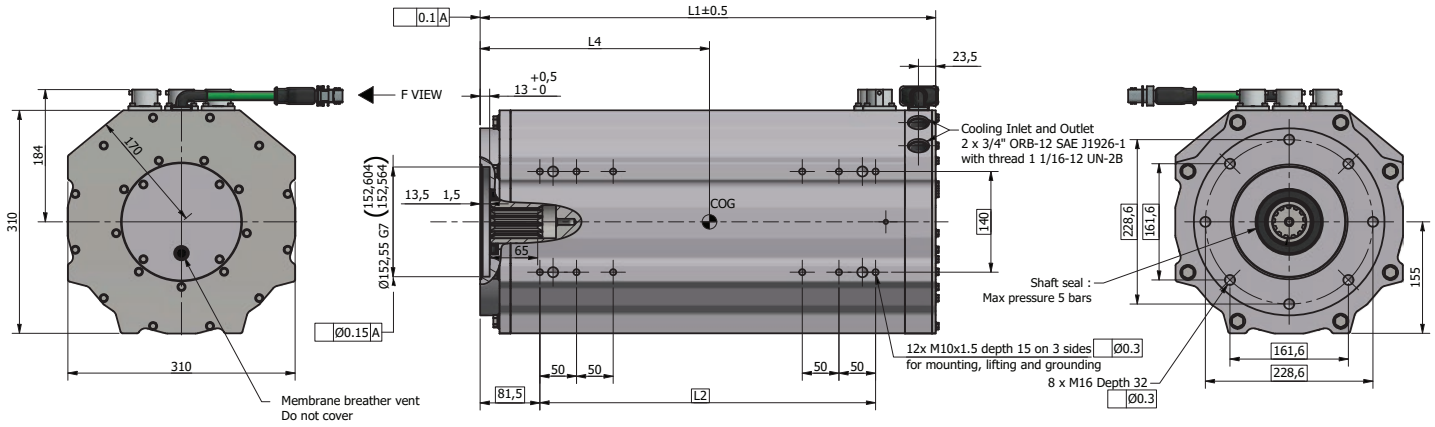
ANSI B92.1	Involute
Side fit	Flat Root Class 5
Number of teeth	27
Spline Pitch	16/32
Pressure angle	30°
Base diameter (Ref)	37.12
Pitch diameter (Ref)	42.863
Major diameter	44.45/44.32
Form diameter (Max)	41.17
Minor diameter	40.36
Circular tooth thickness (Max effective)	2.456
Circular tooth thickness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

All dimensions in mm.

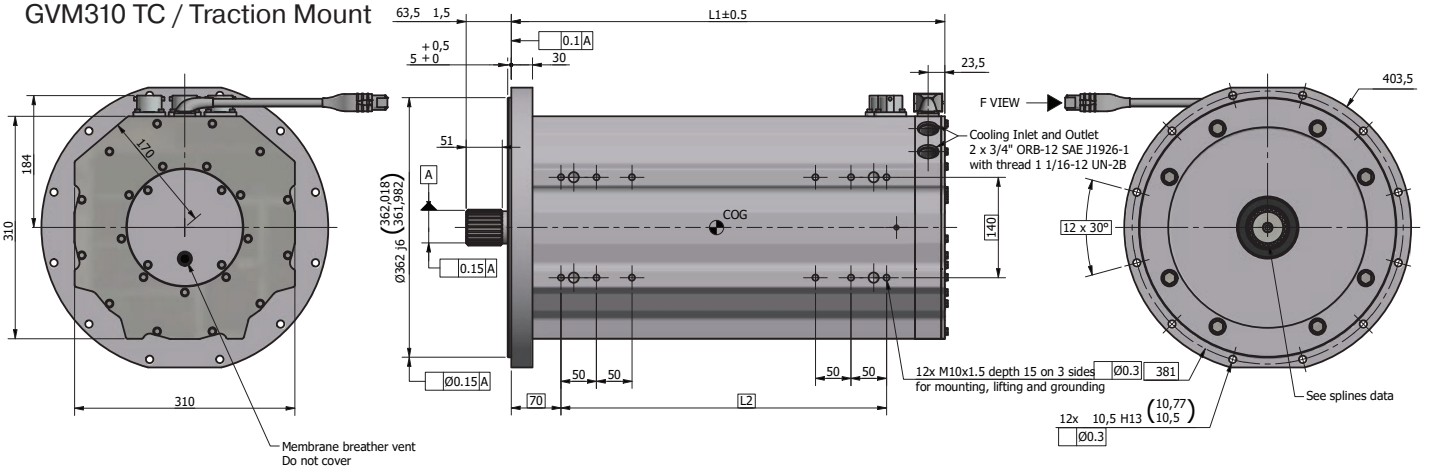
Consult factory for wet spline option

GVM310 / SAE D Pump Mount Style

Power connector - PowerLok™ 500A



GVM310 TC / Traction Mount



Motor size	GVM310-300		GVM310-400	
	SAE D*	TC	SAE D*	TC
L1 [mm]	521	510	621	610
L2 [mm]	358	358	458	458
Weight [kg]	180		230	

Spline Interface Data

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

* For SAE D version, please see page 22

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

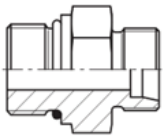
11	**Output Shaft**	GVM210	GVM310
PA	SAE A	page 10-13	
PB	SAE B	page 10-13	
BB	SAE B-B		
PC	SAE C	page 10-13	page 15, 17
PD	SAE D		page 15, 17
TA	Traction	page 10-13	
TB	Traction	page 10-13	page 16, 18
TC	Traction		page 27
IT [1]	ISO7653 - Truck standard (GVM210 only)		
WA [1]	Wet spline SAE A		
WB [1]	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

Cooling

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 summirizing the parts you should use for GVM different sizes

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

Hoses

801TM Push-Lok
Fire retardant cover

Construction
Tube: Synthetic rubber
Reinforcement: High-tensile fibre braid
Cover: Fire retardant synthetic rubber
Temperature Range ..... -40 °C up to +100 °C
Exception: Air ..... max. +70 °C
Water ..... max. +85 °C

Recommended Fluids
Air, water, water-oil-emulsions and
water-glycol-emulsions.
Consult the chemical compatibility section on Parker catalog for more detailed information

- Very flexible
- UL approved:
- Class YDQS2 with VW-1 flame test
- UL 94 V0 for cover compound

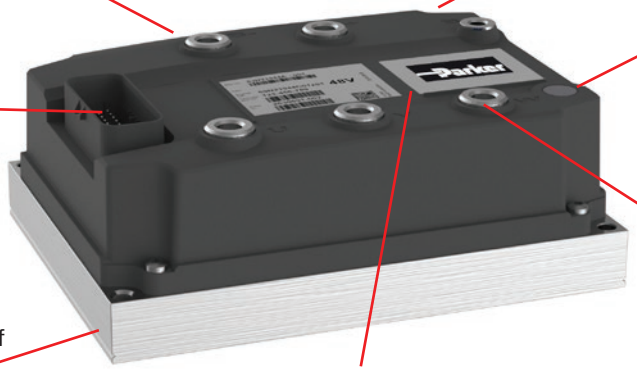
Part Number	Hose I.D.				Hose O.D.	Pressure Rating				Vaccum*	min. bend radius	weight
						max. working pressure		min. burst pressure				
	DN	Inch	Size	mm	mm	MPa	psi	MPa	psi	kPa	mm	kg
801TM-8-RL	12	1/2	-8	12.7	19.4	2.1	350	8.4	1200	95	125	0.27
801TM-10-RL	16	5/8	-10	15.9	23.1	2.1	350	8.4	1200	51	150	0.28

* 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

Low Voltage Global Vehicle Inverter - GVI

Thanks to an IP65 protection class, the drive can be direct vehicle mounted without an enclosure.
(no direct high pressure spray)



Technical Data

Product Code	Frame Size	Output Current [Arms] S2, 2 min(1)	Output Current [Arms] S2, 1 h(2)	Nominal input voltage [Vdc]	Battery Voltage Range [Vdc]	Weight [Kg] (lbs)
GVI-C024-0350S1-S00-G0000	C	350	150	24	16-27	2.3 (5)
GVI-C048-0280S1-S00-G0000	C	280	120	48	33-53	2.3 (5)
GVI-D024-0550S1-S00-G0000	D	550	275	24	16-27	2.5 (5.5)
GVI-D048-0450S1-S00-G0000	D	450	225	48	33-53	2.5 (5.5)
GVI-D048-0550S1-S00-G0000	D	550	275	48	33-53	2.5 (5.5)
GVI-D080-0230S1-S00-G0000	D	230	115	80	50-88	2.5 (5.5)
GVI-D080-0350S1-S00-G0000	D	350	175	80	50-88	2.5 (5.5)
GVI-D080-0400S1-S00-G0000	D	400	200	80	50-88	2.5 (5.5)
GVI-D096-0230S1-S00-G0000	D	230	115	96	56-106	2.5 (5.5)
GVI-D096-0350S1-S00-G0000	D	350	175	96	56-106	2.5 (5.5)
GVI-D096-0400S1-S00-G0000	D	400	180	96	56-106	2.5 (5.5)
GVI-E048-0700S1-S00-G0000	E	700	350	48	33-53	4.8 (10.6)
GVI-E080-0500S1-S00-G0000	E	500	250	80	50-88	4.8 (10.6)
GVI-E080-0700S1-S00-G0000	E	700	350	80	50-88	4.8 (10.6)
GVI-E096-0500S1-S00-G0000	E	500	250	96	56-106	4.8 (10.6)
GVI-E096-0700S1-S00-G0000	E	700	350	96	56-106	4.8 (10.6)

Notes: All current ratings are rms values per motor phase.
(1) 2 minute rating at 8kHz switching frequency and 25°C ambient temperature
(2) 1 hr rating at 8kHz switching frequency and 40°C ambient temperature

Please consult GVI catalogue for more information: GVI Catalogue

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.

Features:

- WEG Cooled IP6K9K Housing
- Front facing, plug in connectors
- Separate vehicle and motor connectors
- CANopen and J1939 ports
- Dual redundant motor temperature inputs
- Full current capability from 200-750V DC
- Safe Torque Off to ISO13849 PLd
- Configurable HVIL
- Active and passive DC bus discharge
- High speed overvoltage protection
- CE and UN ECE R10/R100 compliant
- EMC and DC power filters onboard
- High output frequency capability

Applications:

- Traction and propulsion
- Electrohydraulic Pump (EHP) control
- Hybrid power generation
- Mobile machinery

Model	GVI075	GVI125	GVI250
Supply Voltage	200-750V DC		
Continuous Current (1hr)	108 A	180 A	360 A
Overload	130% for 60 seconds		
Continuous Power	75 kW	125 kW	250 kW
Switching Frequency	1.5 - 8 kHz Variable [1]		
Temperature Range	-40˚C - 65˚C		
Altitude	0-5000m		
Housing	IP67/IP6K9K		
Cooling	WEG 50:50 -20˚C - 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, 61000-6-2, ISO16750		

[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

Electric Power Take Off (ePTO)

- High compactness with one-box-solution for optimal vehicle integration
- Customised plug and run 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

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