B&P Elektromotoren

ENGINEERING TOMORROW

Data Sheet

EM-PME375-T150

Electric machine, permanent magnet external

FEATURES

- Synchronous Reluctance assisted Permanent Magnet (SRPM) technology
- Extremely compact and robust structure
- Highest efficiency throughout the operation range on the market (~96 %)
- Liquid cooled with plain water or water/glycol mixture
- Low coolant flow required
- Allowed coolant temperature up to +65°C
- Up to IP65 enclosure class to maximize reliability
- Multiple mounting possibilities

GENERATOR SPECIFIC FEATURES

- Standard SAE flange mounting to match the diesel engine connection
- Wide selection of speed ratings allowing the generator to be selected to customer specific applications with various voltage requirements
- Can be also used as starter motor for the ICE

MOTOR SPECIFIC FEATURES

- Extended speed and torque capabilities compared to standard PM motors from Danfoss reluctance assisted permanent magnet motor technology
- Motor structure is designed to be able to produce high starting torque: EM-PME motor can produce instantly full torque to a non-rotating shaft
- Optimized speed range to meet the most common gear ratios used in heavy mobile machinery

GENERAL

The machine is developed especially for demanding applications. The design of these machines makes them smaller, lighter and more efficient than conventional products on the market.

The machine is designed to be shorter than normal motors for applications where axial length is crucial parameter. The machine is designed to be connected directly to the ICE flywheel housing with part of the motor being inside the flywheel housing further shortening the length of the motor.

TYPICAL APPLICATIONS

- Generator for diesel-electric/serial hybrid applications
- Traction/propulsion motor
- Generator/Motor for parallel hybrid applications

SPECIFICATIONS

General electrical properties

Nominal voltage (line to line)	500 V_{AC}
Voltage stress	IEC 60034-25, Curve A: Without filters for motors up to 500 V_{AC}
Nominal efficiency	96 %
Pole pair number	10
Power supply	Inverter fed.
Minimum inverter switching frequency	8 kHz

Basic information

Machine type	Synchronous reluctance assisted permanent magnet
Mounting direction	Can be used in any direction, see user guide for details.
Mounting (IEC 60034-7)	IM 3001 (Flange)
Standard Flange D-end (SAE J617)	SAE 3, transmission housing
Standard Flange N-end	SAE 3, flywheel housing
Standard rotation direction	Clockwise (both directions possible)
Protection class (IEC 60034-5)	Up to IP65
Duty type (IEC 60034-1)	S9
Standard color	Dark grey RAL7024 powder coating

Mechanical

Total weight	75 kg (no options)
Moment of inertia	0.63 kgm^2
Rotating mass	23 kg

Dimensions

Length (frame)	66 mm
Diameter (frame)	451 mm
Total length (frame + shaft)	195.6 mm

Cooling

Cooling liquid	Plain water with appropriate corrosive inhibitor (max. 50 % corrosive inhibitor)
Cooling liquid corrosive inhibitor type	Ethylene glycol Glysantin G48 recommended
Cooling method (IEC 60034-6)	IC 71 W
Minimum cooling liquid flow	20 l/min
Pressure loss	0.3 bar with 20 l/min (+25°C coolant)
Cooling liquid temperature max	+65°C (Derating required if exceeded)

Temperature rating

Insulation class (IEC 60034-1)	H (180°C)
Temperature rise (IEC 60034-1)	85°C
Maximum winding temperature	150°C
Nominal ambient temperature (IEC 60034-1)	65°C
Min. ambient temperature	-40°C
Nominal altitude (IEC 60034-1)	1000 m

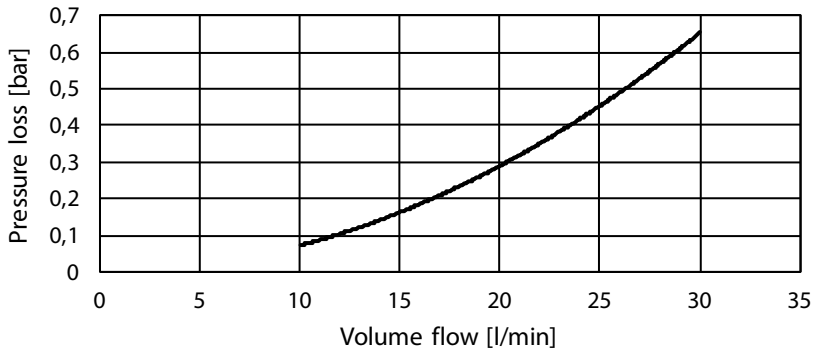
Connections

Coolant connection	2 x G1/2 bores
HV cables	3 x 50 mm^2 max.
Cable direction	Cable direction radial with straight connector and towards N-end with standard angle connector
HV cable connector	3x AMPHENOL HVBI005R10AMHARD
HV cable mating connector	3 x AMPHENOL HVBI-7-05R10-XFC-XXXX-FG/PC (straight plug) 3x AMPHENOL HVBI-9-05R10-XFC-XXXX-FG/PC (right angle plug) (check the exact codes form connector manufacturer)
HV cable	Recommended H+S Radox screened cable
LV connector	12 pin TE HDSCS
LV connector type	TE 1-1564520-1
LV connector pin type	Gold plated
LV mating connector type	TE 1-1703639-1
LV mating connector pin type	TE 1241380-2 (Gold plated)
LV connector pin configuration	See Table below

PIN	Description
1	Resolver, RES_COSN
2	Resolver, RES_SINN
3	Resolver, EXCN
4	Temperature, PT100, windings
5	Temperature, PT100, windings
6	Temperature, PT100, windings
7	Resolver, RES_COSP
8	Resolver, RES_SINP
9	Resolver, EXCP
10	Temperature, PT100, windings GND
11	Temperature, PT100, windings GND
12	Temperature, PT100, windings GND

Table 1 Pin configuration of LV-connector

PRESSURE LOSS VS COOLANT FLOW



Picture 1 Pressure loss vs coolant flow

MOTORS

Type	Coolant temperature +65°C			Coolant temperature +40°C			Coolant temperature +40 / +65°C		
	Cont. Torque [Nm]	Cont. Power [kW]	Nom. Current [A]	Cont. Torque [Nm]	Cont. Power [kW]	Nom. Current [A]	Nom. speed [rpm]	Max. speed [rpm]	Peak torque [Nm]
EM-PME375-T150-1500	160	25	33	191	30	40	1500	3000	600
EM-PME375-T150-1800	167	31	40	179	33	45	1800	3600	600
EM-PME375-T150-2600	147	40	50	164	45	60	2600	4000	600

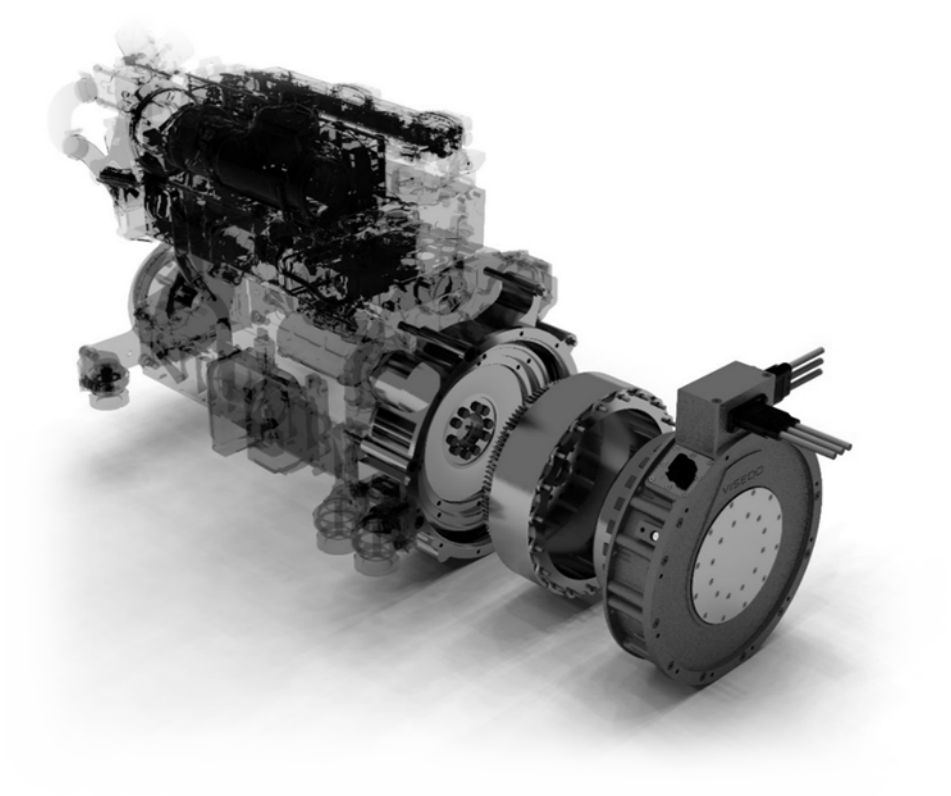
(Peak torque achieved with one (350A) inverter*
*(** Peak torque achieved with two (350A) inverter*

GENERATORS

Type	Coolant temperature +65°C			Coolant temperature +40°C			Coolant temperature +40 / +65°C			
	Apparent power [kVA]	Cont. power [kW]	Nom. Current [A]	Apparent power [kVA]	Cont. Power [kW]	Nom. Current [A]	Nom. speed [rpm]	Nom. Freq. [Hz]	Power factor	Volt/ speed ratio [V/rpm]
EM-PME375-T150-1500	27	26	32	33	32	39	1575	263	0.99	0.319
EM-PME375-T150-1800	34	33	39	38	36	44	1890	315	0.97	0.273
EM-PME375-T150-2600	42	41	49	50	48	59	2730	455	0.99	0.182

*(*** Back EMF for cold (20°C) generator*

Integrated machine is commonly connected directly to the diesel engine flywheel housing. In such application, part of the motor is inside the diesel engine. Exploded view of this kind of application is shown below.



Picture 2 Integrated machine connected to diesel engine flywheel housing

PRODUCT CODE AND OPTIONS

Use product code including all needed options for ordering. Standard options do not need to be listed in the code as they are selected by default if a non-standard option is not selected. Standard options are indicated by a star (*).

Product code	Description
EM-PME375-T150-1500	Standard unit with standard options
EM-PME375-T150-1500+RES1	Standard unit otherwise but with resolver angle sensor

Table 2 Product code examples

Variant	Code	Description	Additional information
High voltage connector	*	High voltage plug-in connectors for 50 mm^2 cables	One plug-in connector per phase for 50 mm^2 cable
	+HVC1	High voltage plug-in connectors for 35 mm^2 cables	One plug-in connector per phase for 35 mm^2 cable
Rotation sensor	*	None	No resolver
	+RES1	Resolver	In-built non contacting resolver, 5-pole pair

*Standard option

Table 3 Option list

B&P ELEKTROMOTOREN BV

Ampèrestraat 8F
4004 KB Tiel

info@bnpelektromotoren.nl

+31 (0)344 616 267

BTW nr. **NL819113918B01**

KvK nr. **30237800**

ING Bank **NL60 INGB 0675 304 792**

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