

Data Sheet

EM-PMI180-T90-4000

Low voltage eMotor

FEATURES

- Permanent Magnet Synchronous Motor (PMSM) with Hairpin Winding
- EM-PMI180-T90-4000 motor is designed to meet all requirements for pump drive applications
- Developed specifically for demanding applications
- Smaller, lighter and more efficient than conventional products on the market



TYPICAL APPLICATIONS

- 16-20 m RT Scissor lift
- Mini excavator
- Mini wheel loader
- eBoom lift
- Hydraulic power unit

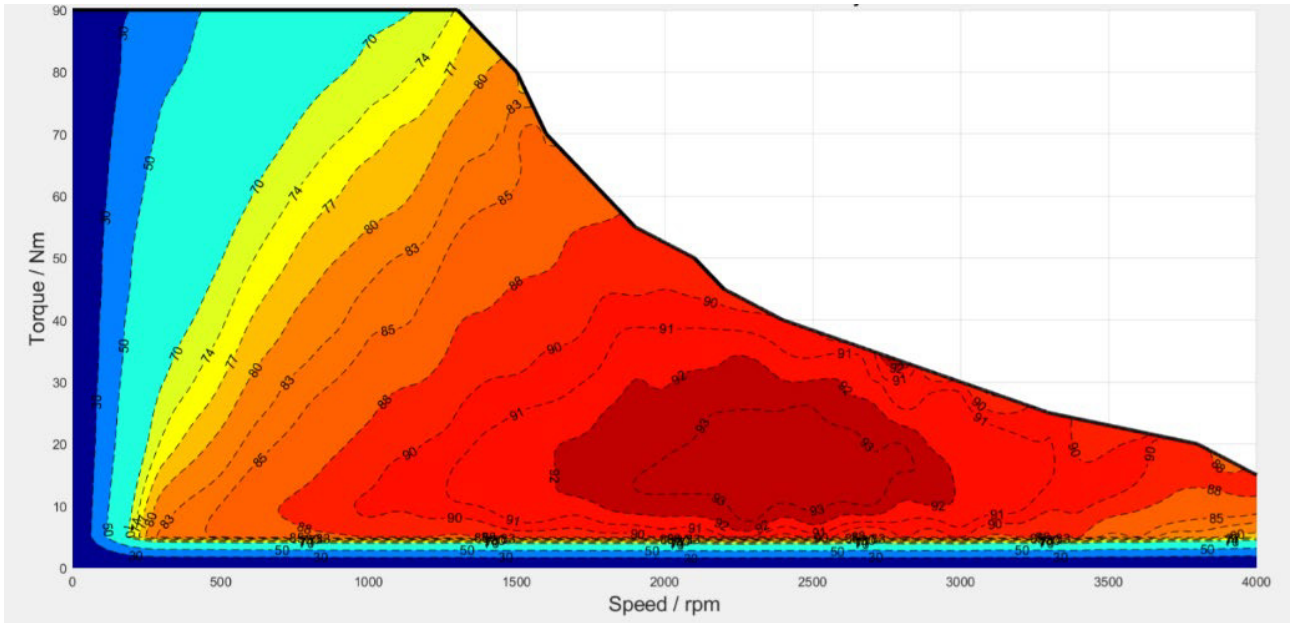
SPECIFICATIONS

General	
Rated voltage	48 V _{DC}
Voltage range	33-66 V _{DC}
Rated output power	7 kW
Maximum output power	12 kW
Rated / Max output speed	3000/4000 rpm
Rated / Max output torque	22.5/90 Nm
Poles of motor	4
Speed sensor type	SIN/COS resolver
Poles of speed sensor	4
SIN/COS (peak-to-peak)	3.2 ±0.4 V
Line back EMF (V/k rpm)	13.5 ±10 % (25°C)
Line resistance (mΩ)	12.3 ±5 %, unbalance ≤ 3 %
Line inductance (uH)	58 ±5 %, unbalance ≤ 3 %
Insulation resistance	>=20 MΩ (500 V _{DC})
Duty type	S2 (60 min)
Insulation class	H
Temperature sensor type	PT1000

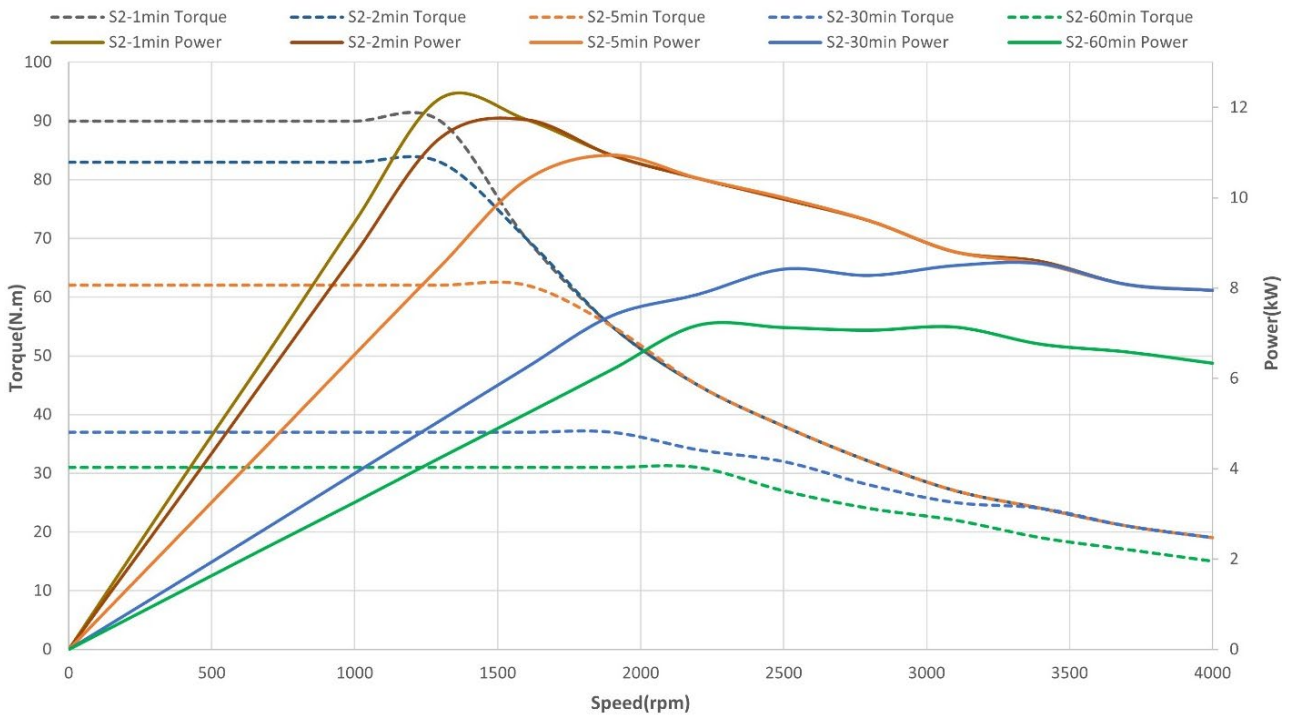
Mechanical	
Dimensions (W x H x L)	212 x 253 x184 mm
Weight	18.2 ±1 kg

Ambient Conditions	
Storage temperature	-40°C - +85°C
Operating temperature	-40°C - +55°C
Altitude	≤2000 m
Enclosure class	IP67

Standards and classifications	
Withstand Voltage Test	EN 1175:2020
Insulation Resistance Test	EN 1175:2020
Low Temperature Storage Test	IEC 60068-2-1:2025 Test A: Cold
Low Temperature Operation Test	IEC 60068-2-1:2025 Test A: Cold
High Temperature Storage Test	IEC 60068-2-2:2025 Test B: Dry heat
High Temperature Operation Test	IEC 60068-2-2:2025 Test B: Dry heat
Salt Spray Test	IEC 60068-2-52:2017 Test Kb: Salt mist, cyclic (sodium chloride solution)
EMC Test	ISO 13766-1:2018; IEC 61000-4-2; IEC 61000-4-8 and IEC 61000-4-5
Over-Speed Test	IEC 60034-1:2017 Part 1 Rating and performance
Constant Damp Heat Test	IEC 60068-2-78:2025 Test Cab Damp heat, steady state
Damp Heat Cycle Test	IEC 60068-2-30:2025 Test Db Damp heat, cyclic (12 h + 12 h cycle)
Temperature Shock Test	IEC 60068-2-14:2023 Test N Change of temperature
Swept-Sine Vibration Test	IEC 60068-2-6:2007 Test Fc Vibration (sinusoidal)
Broadband Random Vibration Test	IEC 60068-2-64:2019 Test Fh Vibration, broadband random and guidance
Shock Vibration Test	IEC 60068-2-27:2008 Test Ea and guidance: Shock
IP Protection Test	IEC 60529:2008 Degrees of protection provided by enclosures (IP Code)
Free Fall Test	IEC 60068-2-31:2008 Test Ec: Rough Handling Shocks

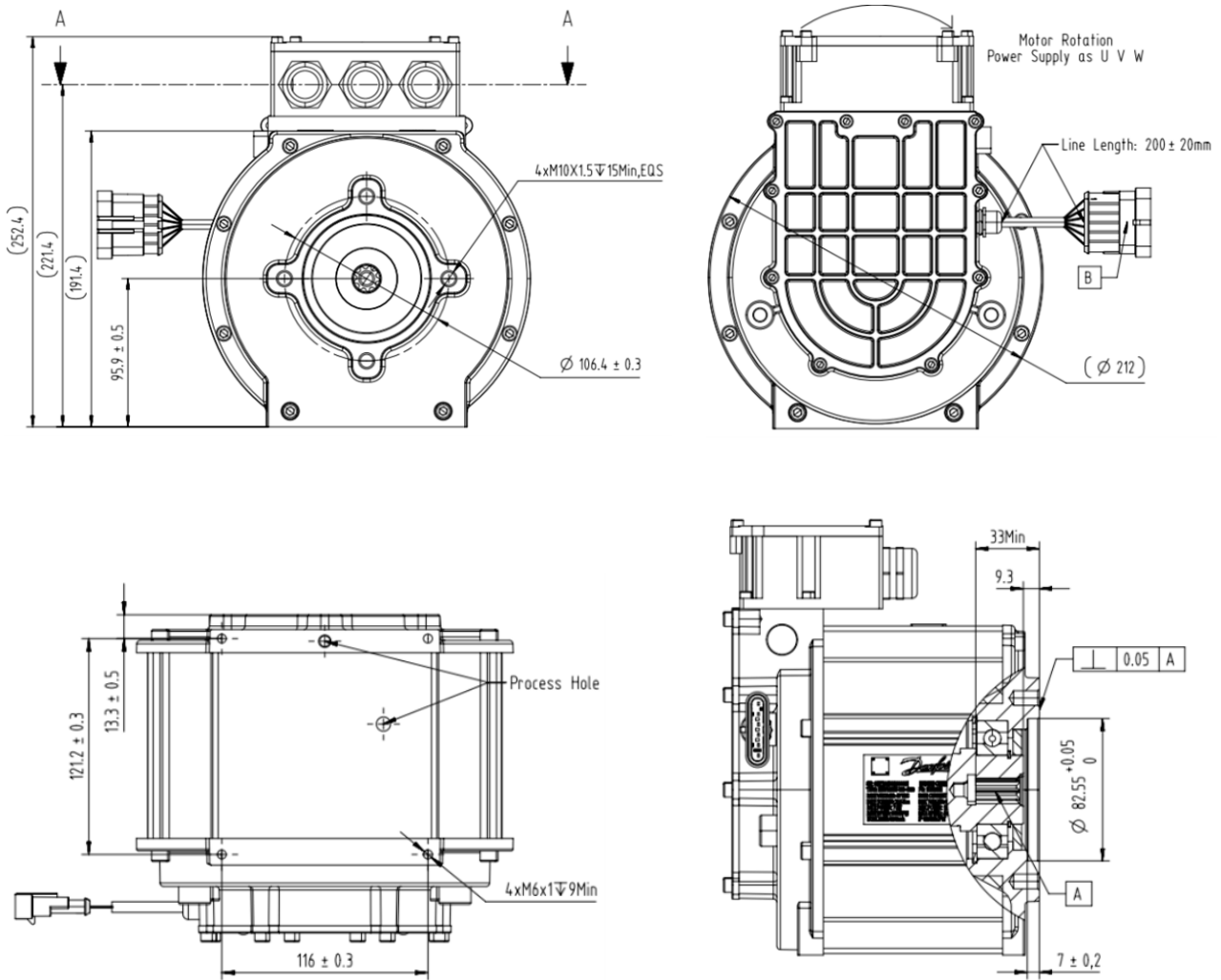


Picture 1 EM-PMI180-T90-4000 efficiency map at 48 V_{DC} (test under the 25°C ambient temperature)



Picture 2 EM-PMI180-T90-4000 S2 mode work curve at 48 V_{DC} (test under the 25°C ambient temperature)

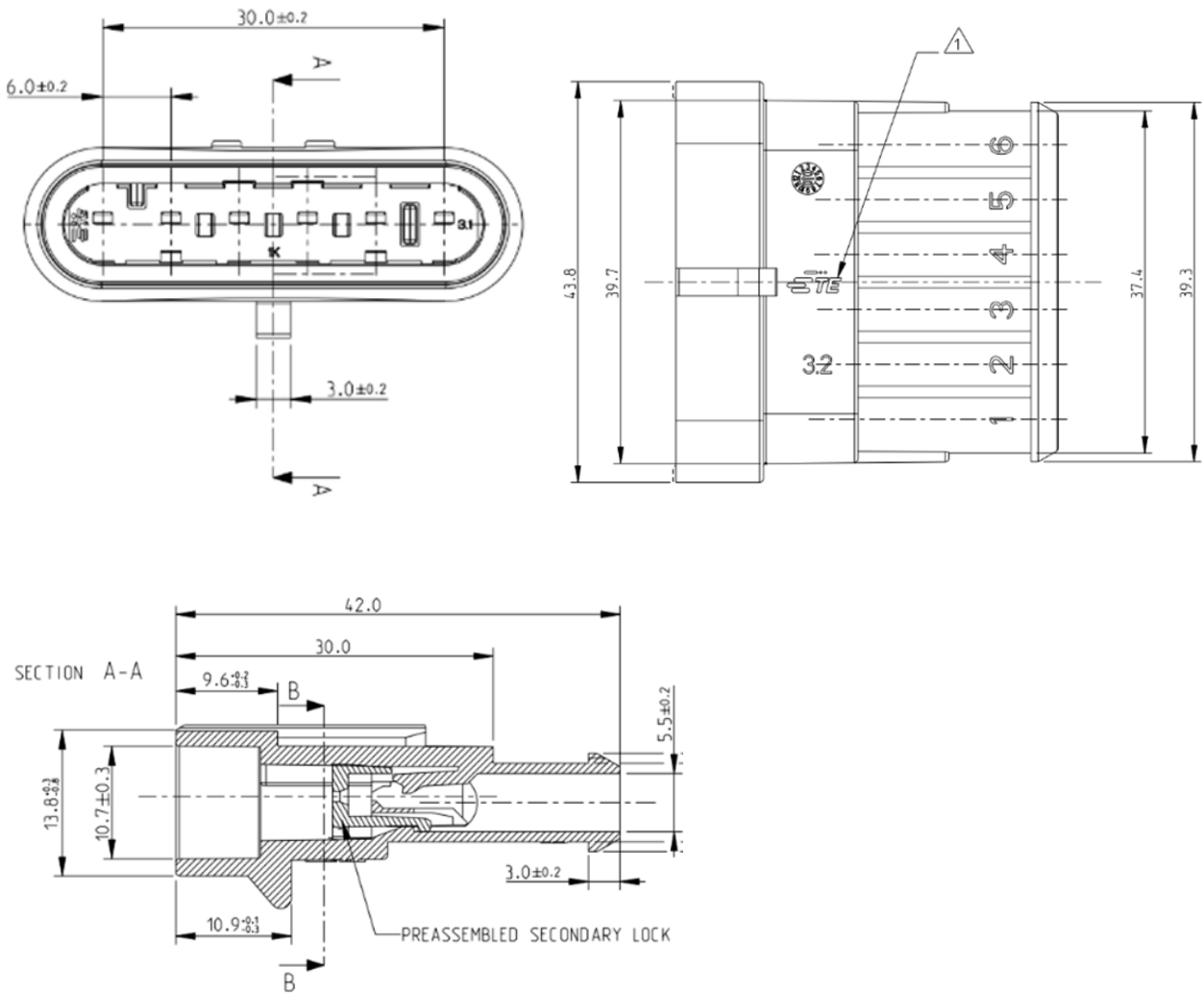
DIMENSIONS



Picture 3 Dimensions for EM-PMI180-T90-4000

Dimension	Length
L	184 mm
W	212 mm
H	253 mm

Table 1 Dimensions for EM-PMI180-T90-4000



Picture 4 Connector information for EM-PMI180-T90-4000

SIGNAL CONNECTOR PINOUT

Connector type: AMP 282108-1		
Pin	Discription	Color
1	VCC +5V	Red
2	Temp Sensor+	Yellow
3	SIN	Green
4	COS	Blue
5	GND	Black
6	Temp Sensor-	White

Gear Pump Mounting Dimensions			
Pump interface		SAE A	
Spigot Diameter		Φ 82.55 (+0.05,0) mm	
Internal Spline Engagement Length		33 (+ 0.5,0) mm	
Mounting Bolt Circle Diameter		Φ 106.4 ±0.3 mm	
Mounting Hole Dimensions		M10 x 1.5, Depth Min 15 mm	
Motor Shaft Spline Parameters			
Internal Spline	ANSI B92.1-9T-16/32	Actual Tooth Space Width	2.5653-2.624 mm
Modulus	1.5875	Pitch Dia.	14.2875 mm
Number Of Teeth	9	Base Diameter	12.373 mm
Pressure Angle	30°	Form Diameter	15.9766 mm
Major Diameter	16.5354 mm	Pin Diameter	2.7432 mm
Minor Diameter	12.9286 (+0.1,0) mm	Measurement Between Pins	10.102-10.253 mm

PRODUCT CODE AND OPTIONS

Product code	Description
EM-PMI180-T90-4000	EM - Electric machine
	PMI180 - Interior Permanent Magnet Synchronous Motor (IPMSM) 180
	T90 - Motor maximum torque (Nm)
	4000 - Motor maximum speed (rpm)

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.