

## 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

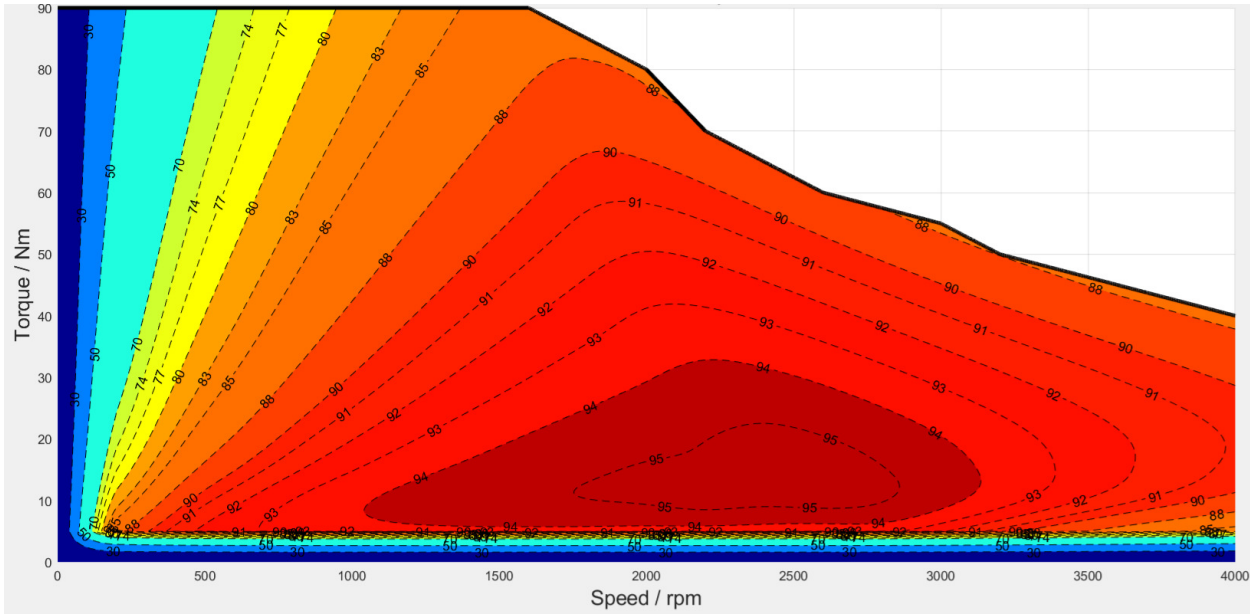
## SPECIFICATIONS

General	
Rated voltage	48 V <sub>DC</sub>
Voltage range	33-66 V <sub>DC</sub>
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 <sub>DC</sub> )
Duty type	S2 (60 min)
Insulation class	H
Temperature sensor type	PT1000

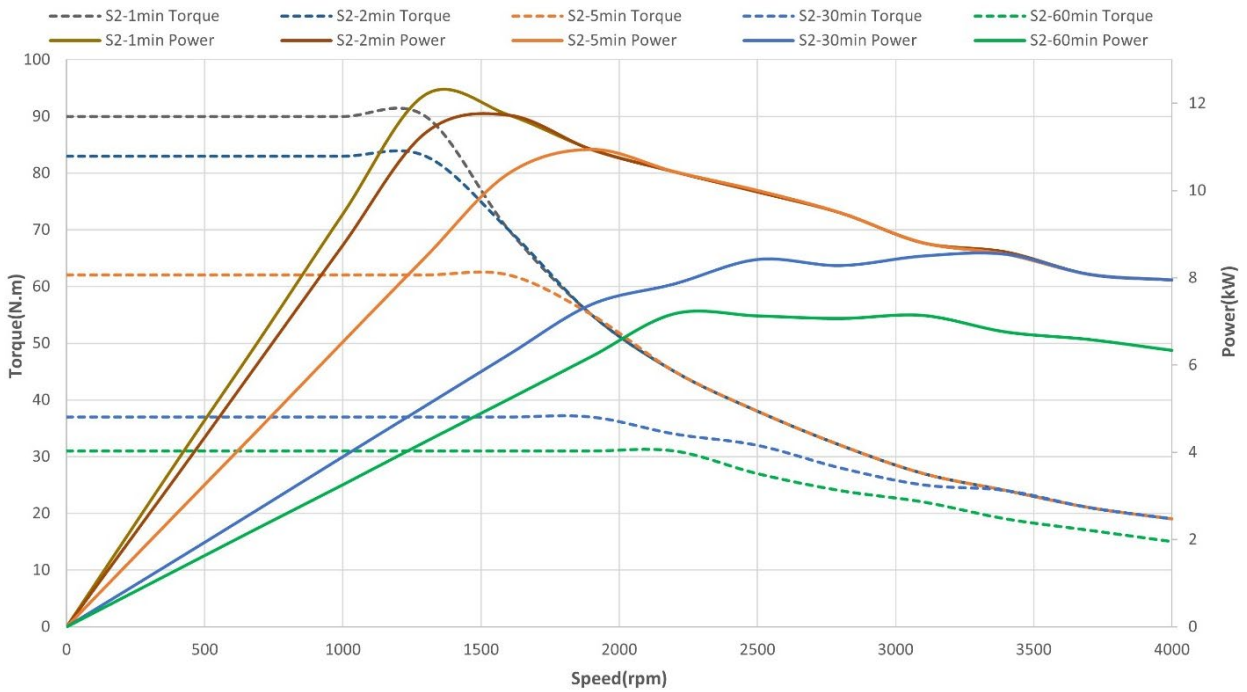
Mechanical	
Dimensions (W x H x L)	212 x 253 x184 mm
Weight	18.2 ±1 kg

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

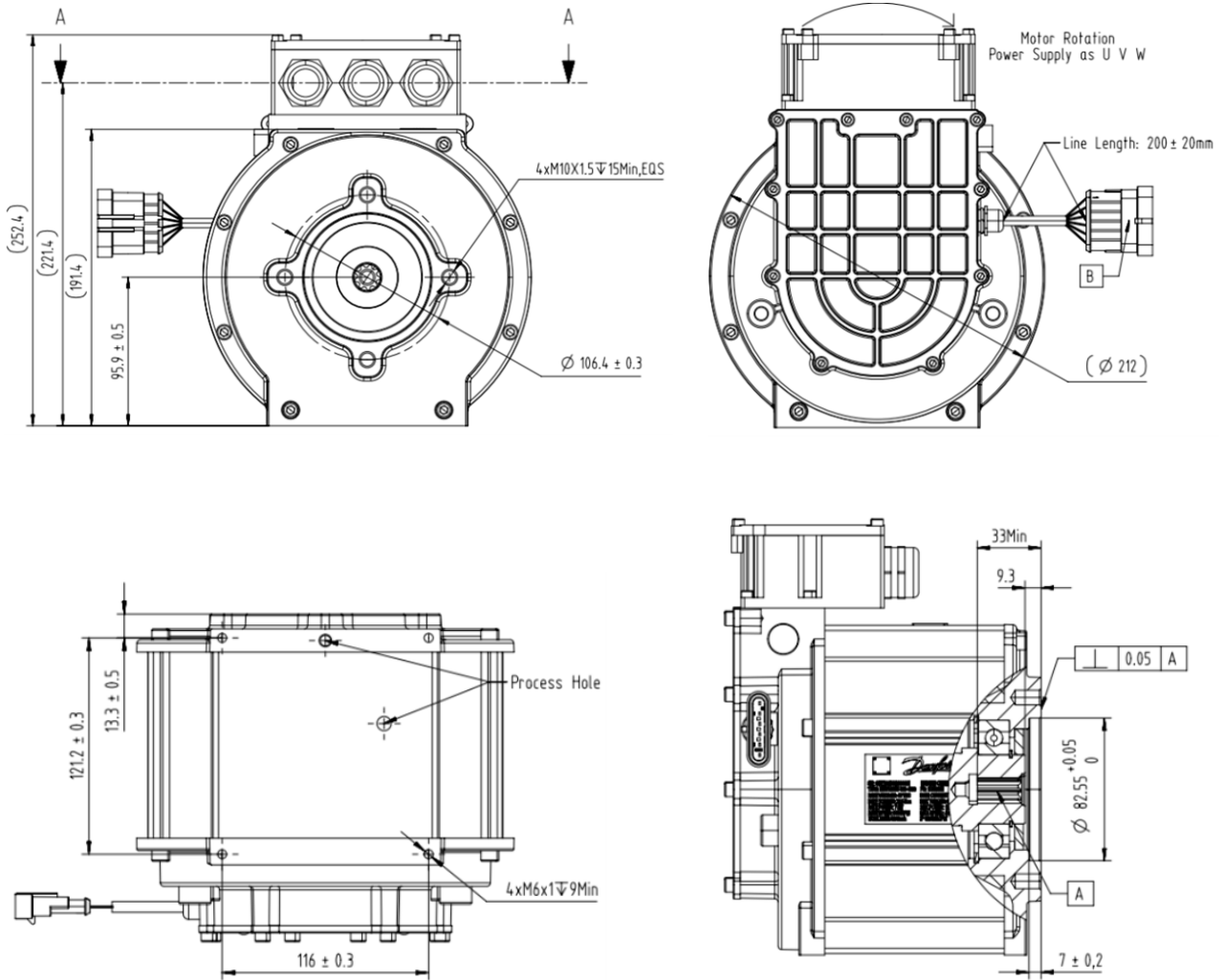


Picture 1 EM-PMI180-T90-4000 efficiency map at 48 V<sub>DC</sub>



Picture 2 EM-PMI180-T90-4000 S2 mode work curve at 48 V<sub>DC</sub>

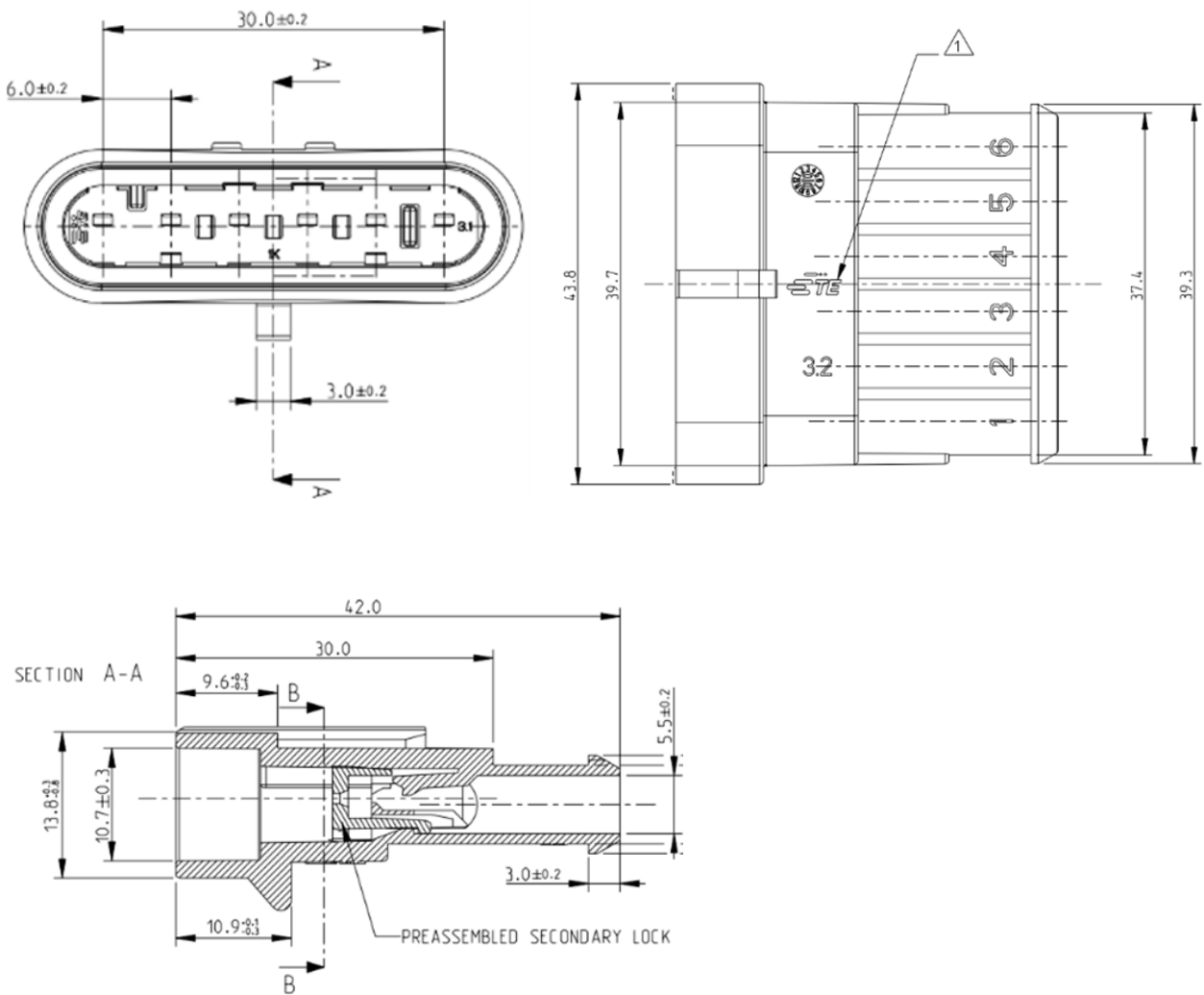
**DIMENSIONS**



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

<b>Gear Pump Mounting Dimensions</b>			
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	
<b>Motor Shaft Spline Parameters</b>			
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

<b>Product code</b>	<b>Description</b>
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)

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