ENGINEERING TOMORROW

Data Sheet

# ED-DT180-PT7000-48V-1M42

Low voltage eHub

## FEATURES

- Permanent Magnet Synchronous Motor (PMSM) with Hairpin Winding
- Engineered to deliver high-efficiency propulsion for electric vehicles
- Developed specifically for demanding applications
- Smaller, lighter and more efficient than conventional products on the market

## TYPICAL APPLICATIONS

- eHub
- Mini excavator
- Mini wheel loader
- eBoom lift

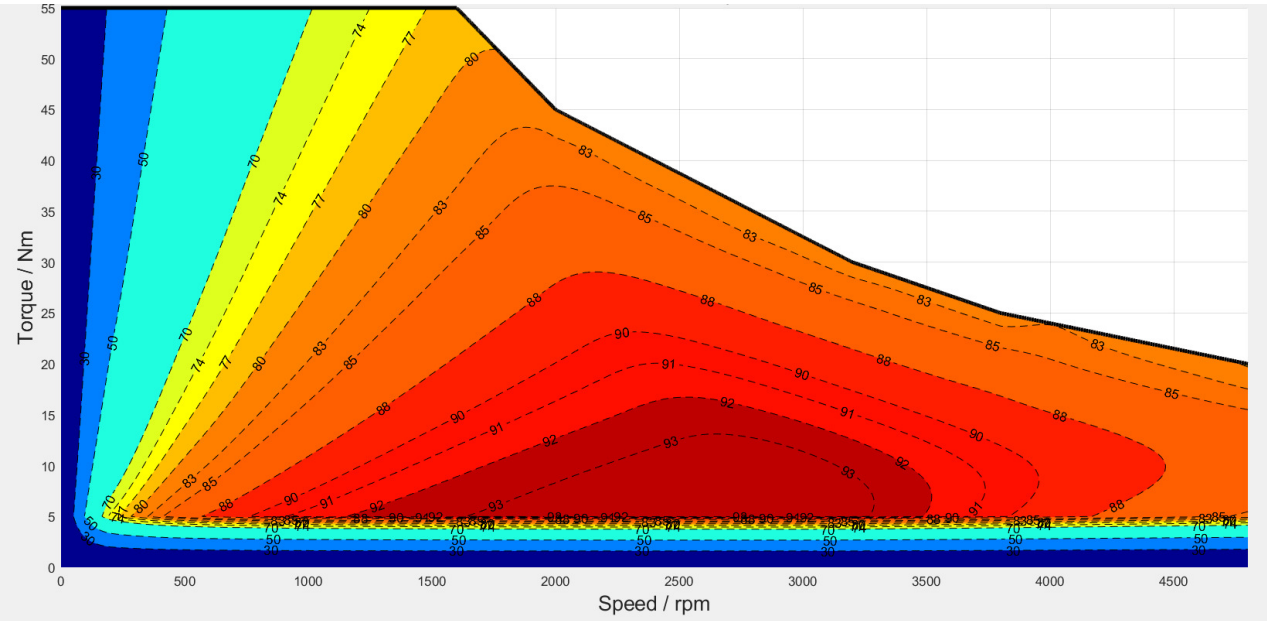
# SPECIFICATIONS

| General | |
|---|---|
| Rated voltage | 48 $V_{DC}$ |
| Voltage range | 33-66 $V_{DC}$ |
| Rated output power | 3.5 kW |
| Maximum output power | 7.5 kW |
| Rated / Max output speed | 21/42 rpm |
| Rated / Max output torque | 1600/6180 Nm |
| Gearbox lubrication | 0.85L/SHC626 |
| Gearbox ratio | 114.5 |
| 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) | 10.3 ±10 % (25°C) |
| Line resistance (mΩ) | 29.5 ±5 %, unbalance <=3 % |
| Line inductance (uH) | 108 ±5 %, unbalance <=3 % |
| Insulation resistance | >=20 MΩ (500 $V_{DC}$) |
| Duty type | S2 (60 min) |
| Insulation class | H |
| Temperature sensor type | PT1000 |
| Rated brake voltage | 48 V |
| Rated brake torque | >=85 Nm |
| Drop-out voltage | <=24 V |
| Pull-in voltage | <=32 V |
| Maintain current | <=2 A |
| Effective braking cycles | >=1000 time |

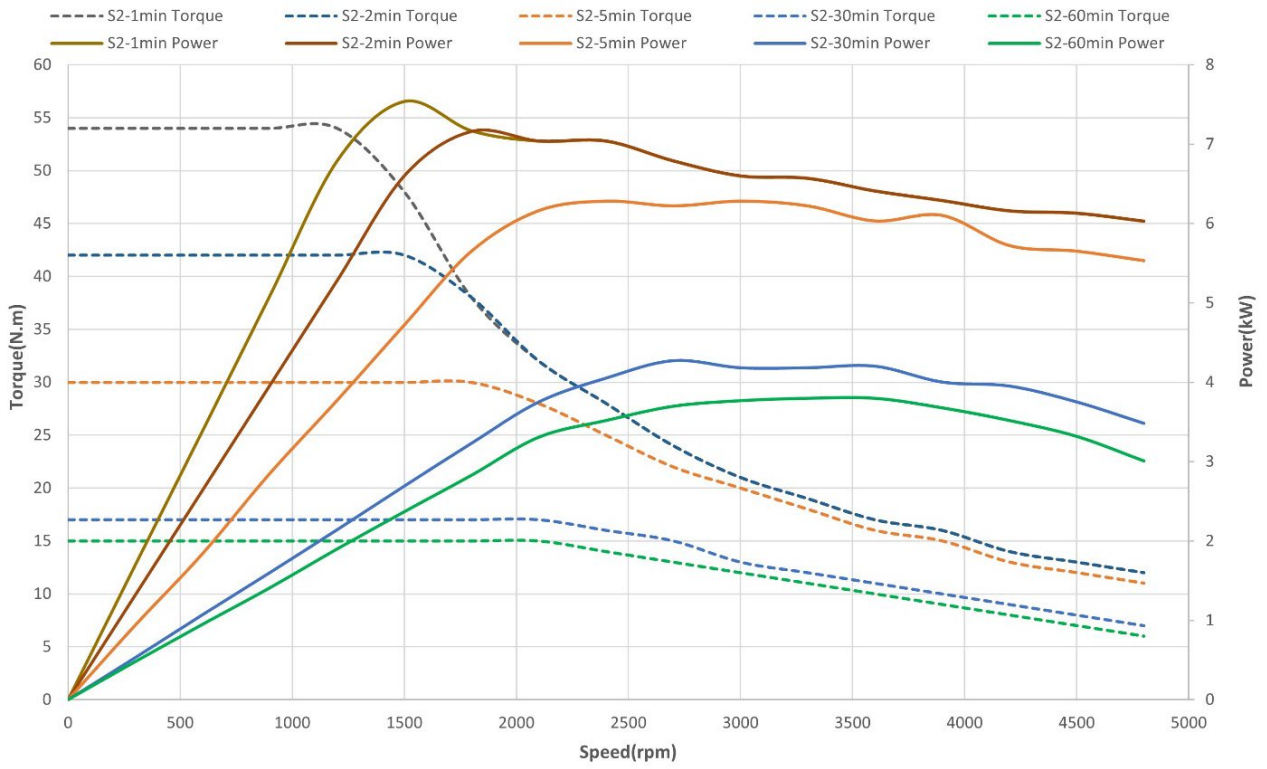
| Mechanical | |
|---|---|
| Dimensions (W x H x L) | 280 x 280 x 418 mm |
| Weight | 66.5 ±1 kg |

| Ambient Conditions | |
|---|---|
| Storage temperature | -30°C - +85°C |
| Operating temperature | -30°C - +55°C |
| Altitude | <=1000 m |
| Enclosure class | IP67 |

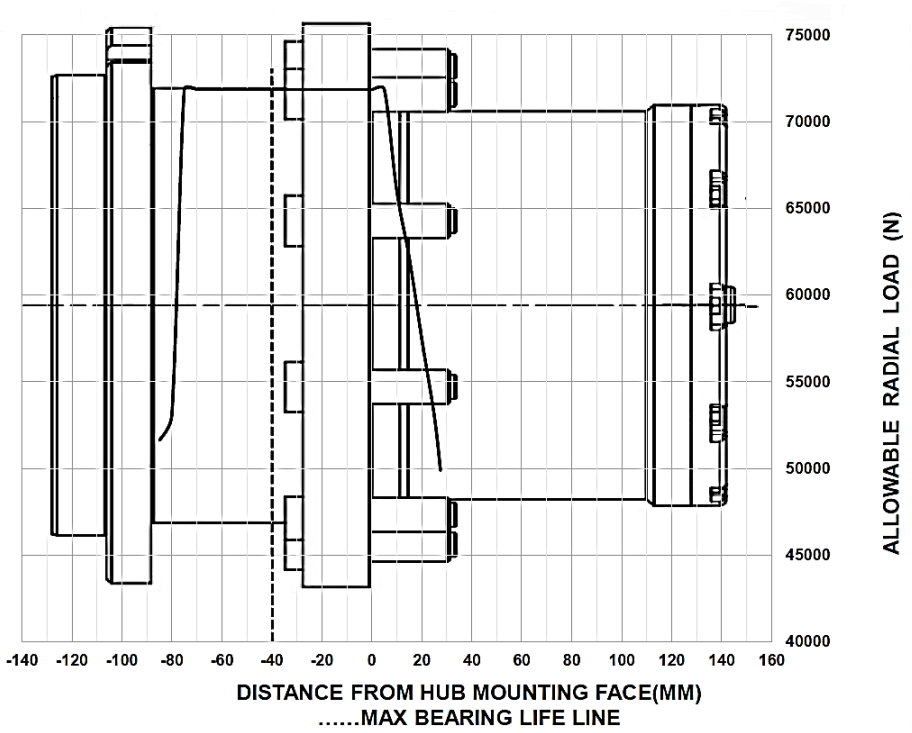
| Standards and classifications | |
|---|---|
| Withstand Voltage Test | EN 1175:2020 |
| Insulation Resistance Test | EN 1175:2020 |
| Low Temperature Storage Test | IEC 60068-2-1:2025 Test A: Cold |
| Low Temperature Operation Test | IEC 60068-2-1:2025 Test A: Cold |
| High Temperature Storage Test | IEC 60068-2-2:2025Test B: Dry heat |
| High Temperature Operation Test | IEC 60068-2-2:2025 Test B: Dry heat |
| Salt Spray Test | IEC 60068-2-52:2017Test 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 | IEC60068-2-78:2025 Test Cab Damp heat, steady state |
| Damp Heat Cycle Test | IEC 60068-2-30:2025Test Db Damp heat, cyclic (12 h + 12 h cycle) |
| Temperature Shock Test | IEC 60068-2-14:2023Test N Change of temperature |
| Swept-Sine Vibration Test | IEC 60068-2-6:2007 Test Fc Vibration (sinusoidal) |
| Broadband Random Vibration Test | IEC 60068-2-64:2019Test 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 60068-2-31:2008Test Ec: Rough Handling Shocks |




Picture 1 EM-PMI180-T54-4800 efficiency map at 48 $V_{DC}$

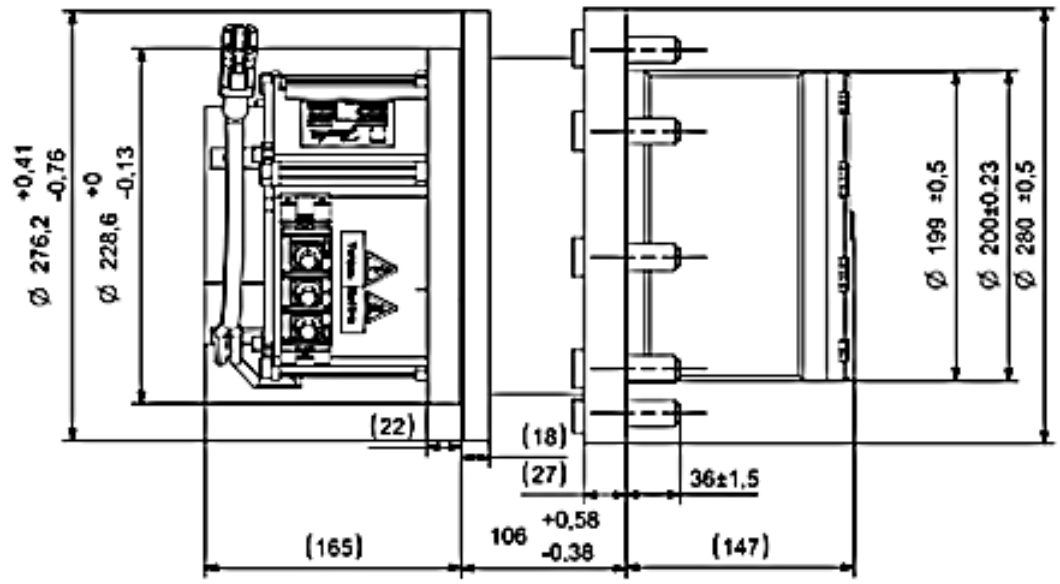



Picture 2 EM-PMI180-T54-4800 S2 mode work curve at 48 $V_{DC}$ (Note: The maximum output torque of eHub equals motor torque multiplied by ratio 114.5)




Picture 3 Bearing life curve: 1000 hrs at 50 rpm

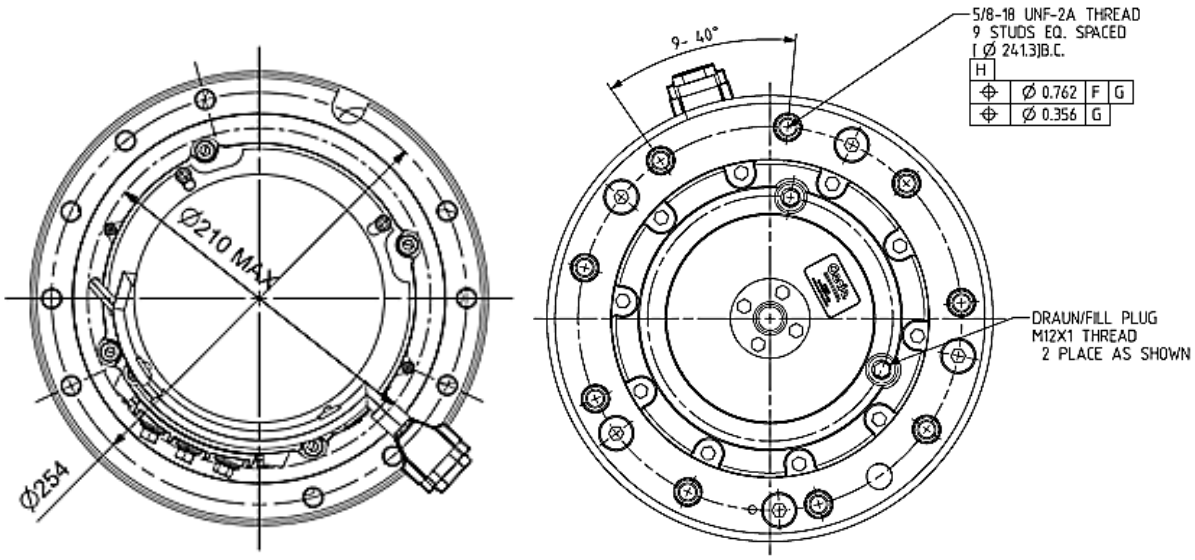
## DIMENSIONS



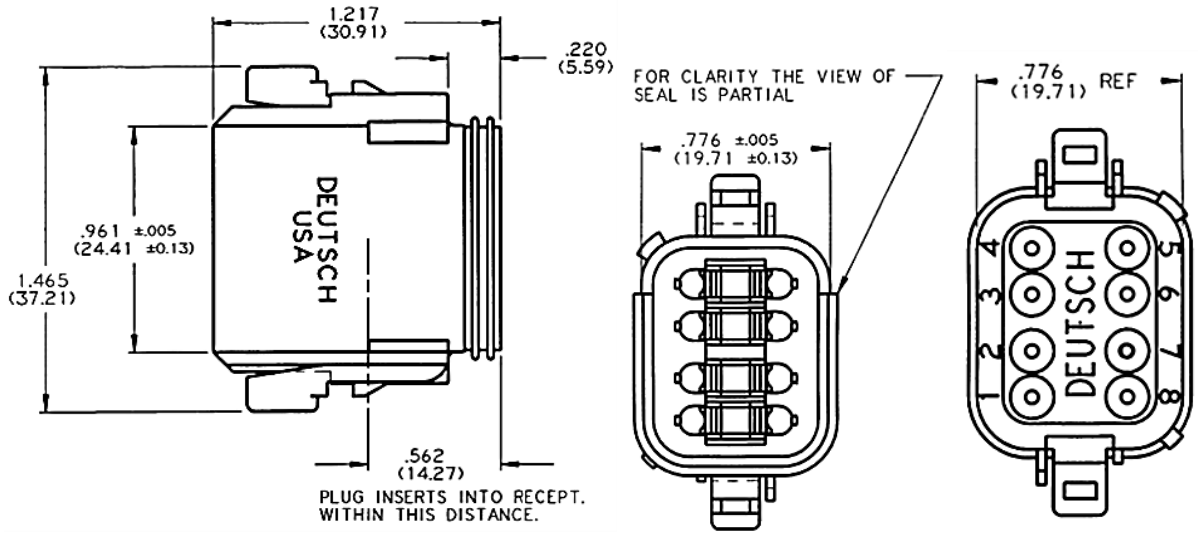

Picture 4 Dimensions for ED-DT180-PT7000-48V-1M42

| Dimension | Length |
|---|---|
| L | 418 mm |
| W | 280 mm |
| H | 280 mm |

Table 1 Dimensions for ED-DT180-PT7000-48V-1M42




Picture 5 Diameters for ED-DT180-PT7000-48V-1M42




Picture 6 Connector information for ED-DT180-PT7000-48V-1M42

## SIGNAL CONNECTOR PINOUT

| **Connector type: DT06-08SA-EP06** | | |
|---|---|---|
| **Pin** | **Discription** | **Color** |
| 1 | VCC +5V | Orange |
| 2 | GND | Grey |
| 3 | Brake+ | Red |
| 4 | Brake- | Black |
| 5 | Temp Sensor- | Yellow |
| 6 | Temp Sensor+ | White |
| 7 | SIN | Green |
| 8 | COS | Blue |

## PRODUCT CODE AND OPTIONS

| Product code | Description |
|---|---|
| ED-DT180-PT7000-48V-1M42 | ED - Electric sub-system |
| | DT180 - Drivetrain system |
| | PT7000 - 7000 Gearbox torque platform |
| | 48 $V_{DC}$ platform voltage |
| | 1M42 - 1M: Gear Ratio 1, 42: Max output speed |