



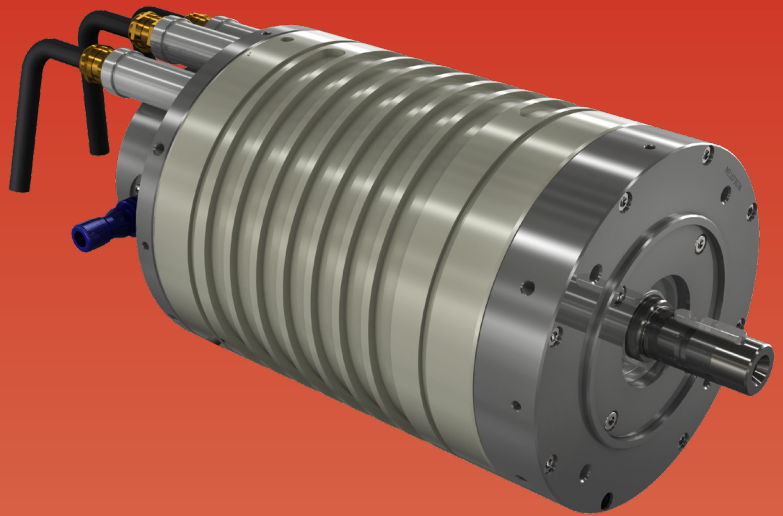
# TRANSFLUID<sup>®</sup>

**industrial & marine**

# TRANSFLUID



**drive with us**



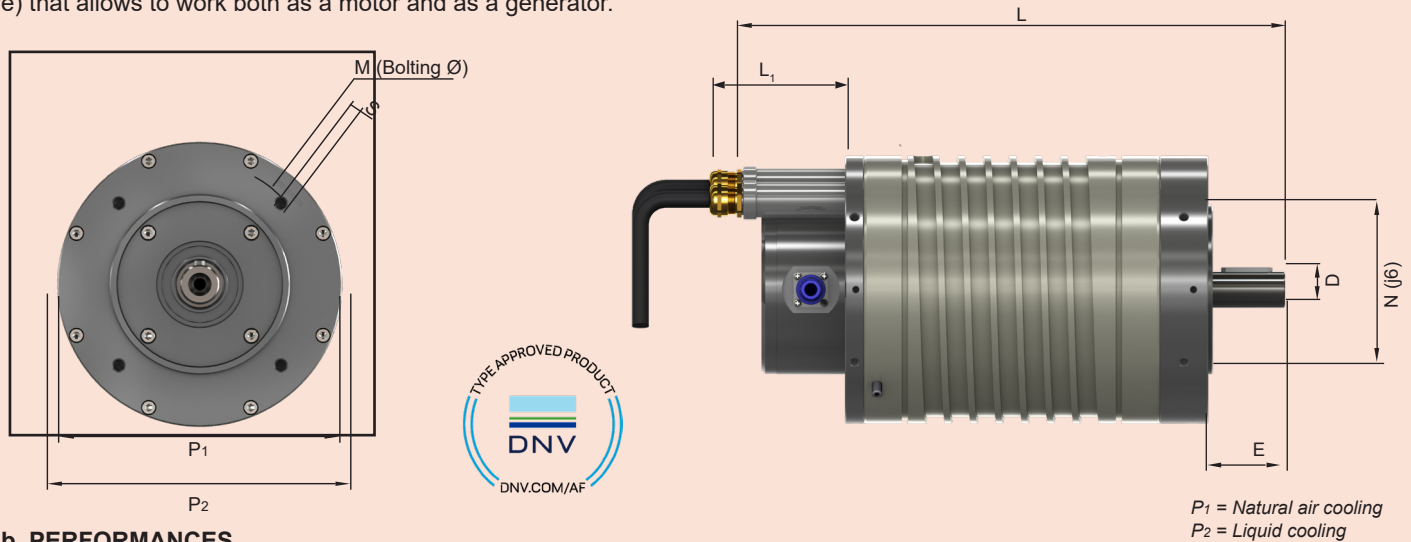
**PERMANENT MAGNETS  
ELECTRIC MACHINES**

# PERMANENT MAGNETS ELECTRIC MACHINES

## 1. DESCRIPTION

TRANSFLUID manufactures three-phase, Permanent Magnet Synchronous Machines (PMSM) with natural convection air cooling. This solution ensures high efficiency with a limited weight and size. The electric machines are controlled by a Motor Controller (Frequency Drive) that allows to work both as a motor and as a generator.

The perfect integration of the range of electric machines with controllers allows for a compact system installation, as well as makes management easy and effective during any operation stage.



**Tab. PERFORMANCES**

| TF - EM      | MOTOR<br>kW (hp) | MOTOR PEAK<br>kW (hp) | GENERATOR<br>kW (hp) | NOMINAL<br>VOLTAGE<br>V <sub>rms</sub> | NOMINAL<br>TORQUE<br>Nm (lb-ft) | NOMINAL<br>CURRENT<br>A ~ | BATTERY<br>Vdc | MOTOR<br>Adc | GENERATOR<br>Adc |
|--------------|------------------|-----------------------|----------------------|--|---------------------------------|---------------------------|----------------|--------------|------------------|
| 180 - 4 *    | 4 (5)            | 5 (7)                 | 4 (5)                | 62                                     | 13 (10)                         | 41                        | 96             | 45           | 40               |
| 180 - 8 *    | 8 (11)           | 10.5 (14)             | 7 (10)               | 60                                     | 25 (18)                         | 85                        | 96             | 89           | 84               |
| 180 - 12 *   | 12 (16)          | 16 (21)               | 10 (14)              | 60                                     | 38 (28)                         | 142                       | 96             | 133          | 124              |
| 220 - 20 *   | 20 (27)          | 25 (34)               | 17 (23)              | 68                                     | 64 (47)                         | 175                       | 96             | 221          | 185              |
| 220 - 35 *   | 35 (48)          | 45 (60)               | 33 (45)              | 159                                    | 111 (82)                        | 137                       | 288            | 128          | 119              |
| 300 - 50 *   | 50 (68)          | 65 (88)               | 49 (67)              | 178                                    | 159 (117)                       | 167                       | 288            | 184          | 177              |
| 300 - 75 *   | 75 (100)         | 100 (134)             | 72 (98)              | 242                                    | 239 (176)                       | 242                       | 288            | 278          | 266              |
| 300 - 100 *  | 100 (136)        | 130 (177)             | 97 (132)             | 252                                    | 318 (235)                       | 322                       | 384            | 273          | 251              |
| 375 - 200 ** | 200 (268)        | 260 (349)             | 190 (255)            | 257                                    | 830 (612)                       | 2x250                     | 384            | 525          | 493              |

\* 3000 rpm

\*\* 2300 rpm (power supply with double inverter)

**Tab. DIMENSIONS**

| TF - EM    | WEIGHT<br>kg (lb) | D<br>mm (inch) | E<br>mm (inch) | L<br>mm (inch) | M<br>mm (inch) | N<br>mm (inch) | P <sub>1</sub><br>mm (inch) | P <sub>2</sub><br>mm (inch) | S     |
|------------|-------------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|-----------------------------|-------|
| 180 - 4    | 19 (42)           | 28 (1.1) j6    | 60 (2.4)       | 328 (12.9)     | ≈165 (6.5)     | 130 (5.1)      | 205 (8.1)                   | 240 (9.4)                   | 4xM10 |
| 180 - 8    | 25 (55)           | 28 (1.1) j6    | 60 (2.4)       | 368 (14.5)     | ≈165 (6.5)     | 130 (5.1)      | 205 (8.1)                   | 240 (9.4)                   | 4xM10 |
| 180 - 12   | 35 (76)           | 28 (1.1) j6    | 60 (2.4)       | 408 (16.1)     | ≈165 (6.5)     | 180 (7.1)      | 205 (8.1)                   | 240 (9.4)                   | 4xM10 |
| 220 - 20   | 58 (128)          | 38 (1.5) k6    | 80 3.1         | 460 (18.1)     | ≈215 (8.5)     | 180 (7.1)      | 243 (9.6)                   | 277 (10.9)                  | 8xM12 |
| 220 - 35   | 80 (175)          | 38 (1.5) k6    | 80 3.1         | 543 (21.4)     | ≈215 (8.5)     | 180 (7.1)      | 243 (9.6)                   | 277 (10.9)                  | 8xM12 |
| 300 - 50   | 135 (295)         | 55 (2.2) m6    | 110 (4.3)      | 602 (23.7)     | ≈265 (10.4)    | 230 (9.1)      | 332 (13.1)                  | 360 (14.2)                  | 8xM12 |
| 300 - 75   | 185 (404)         | 55 (2.2) m6    | 110 (4.3)      | 702 (27.6)     | ≈265 (10.4)    | 230 (9.1)      | 332 (13.1)                  | 360 (14.2)                  | 8xM12 |
| 300 - 100● | 195 (425)         | 55 (2.2) m6    | 110 (4.3)      | 702 (27.6)     | ≈265 (10.4)    | 230 (9.1)      | 332 (13.1)                  | 360 (14.2)                  | 8xM12 |
| 375 - 200● | 410 (1080)        | 75 (2.9) m6    | 140 (5.5)      | 911 (36)       | ≈500 (19.6)    | 450 (17.7)     | -                           | 450 (17.7)                  | 8xØ17 |

● Only water cooled

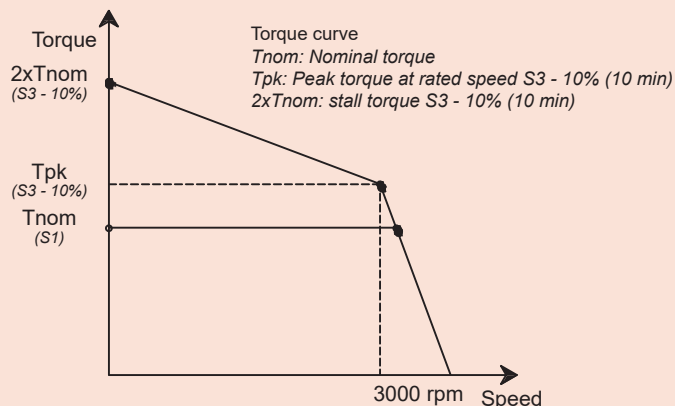
**Special E.Machines on request**

## PERMANENT MAGNETS ELECTRIC MACHINES

### 2. CHARACTERISTICS

The structural characteristics of electric machines are optimized for any use up to 3000 rpm. The systems are convection cooled, making an easy on-board installation. This allows you to use the power in a progressive manner throughout its whole range of speed. The torque curve, which characterizes these types of motors at low speed, can be two times the nominal rating which is extremely useful for vehicle acceleration. In the range of medium speed, up to about 1500 rpm, the torque delivered can be twice as much as the nominal rating for a limited time. In marine applications, this is particularly useful for low vessel speed maneuvering.

All electric machines are equipped with thermal sensor KTY 84-130 and can be equipped with sin/cos magnetic encoder, resolver 2 poles 7V 10kHz and incremental encoders from 500 to 4096 ppr.



(Indicative diagram, for reference only)

### 3. DEFINITION OF POWER RATINGS FOR NATURAL CONVECTION AIR-COOLED MACHINES

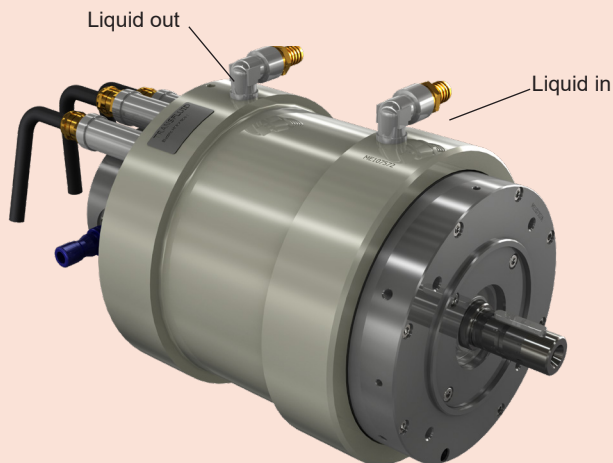
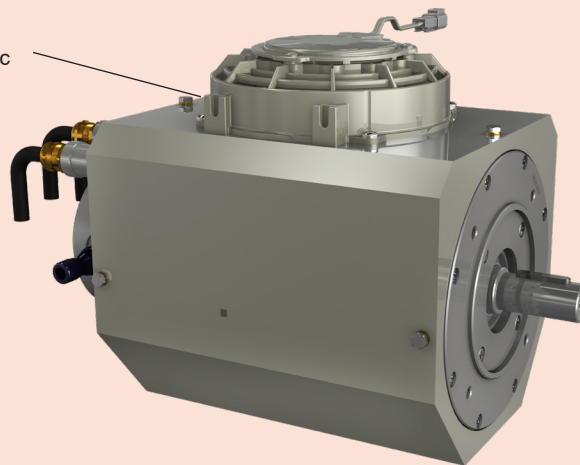
Rating power and torque listed in the performance table, are referred to continuous duty **S1** at rated speed and ambient temperature of 40°C (104°F) at 1000m a.s.l.

If motors work at ambient temperature more than 40°C (104°F) or at altitude above 1000 m a.s.l., then derating coefficients **K<sub>1</sub>** and **K<sub>2</sub>** should be applied (see table below).

| Ambient temperature                    | 40°C (104°F) | 45°C (113°F) | 50°C (122°F) | 55°C (131°F) | 60°C (140°F) |
|--|--------------|--------------|--------------|--------------|--------------|
| Correction factor <b>K<sub>1</sub></b> | 1            | 1.06         | 1.13         | 1.22         | 1.34         |
| Altitude a.m.s.l. up to                | 1000m        | 2000m        | 3000m        | 4000m        | 5000m        |
| Correction factor <b>K<sub>2</sub></b> | 1            | 1.07         | 1.16         | 1.27         | 1.55         |

In case of high ambient temperature and in order to avoid electric machine derating, forced air-cooling kit is also available.

Blowing fan  
12 Vdc or 24 Vdc

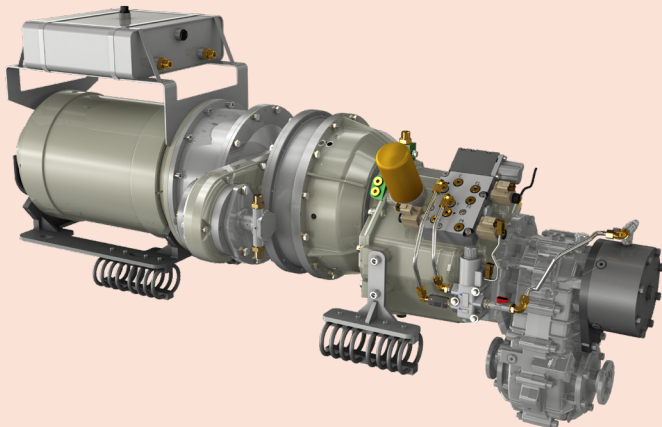


Depending on the installation condition, liquid cooling kit is also available to avoid electric machine derating.

Technical features, dimensions and any other data are not binding. Transfluid S.p.A. reserves the right to change them without notice

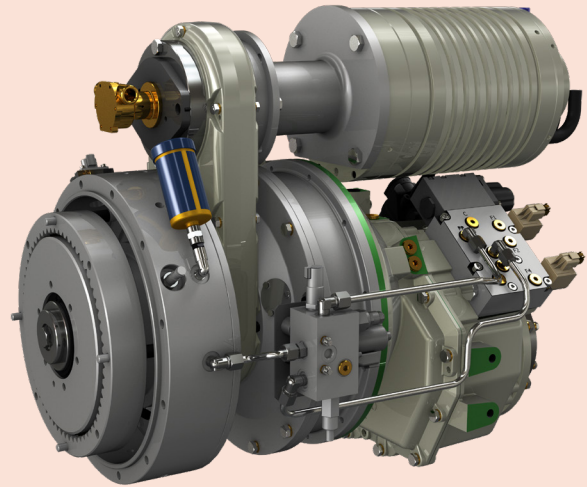
## **ELECTRIC PROPULSION SYSTEM**

Up to 130 kW (174 hp)  
with single, two and three speed transmission.  
Industrial and marine applications



## **HYBRID MODULE**

Combustion engine  
Up to 1230 kW (1649 hp)  
and up to 200 kW (268 hp) electric  
Industrial and marine applications



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