

# **FLAT Series**

## **SVTM F**

Outrunner Brushless DC Motors

FLAT  
BRUSHLESS

FLAT  
BRUSHLESS

# FLAT Series SVTM F

## Outrunner Brushless DC Motors



Customizable



Compact



High torque



The natural geometry of the outrunner Brushless Flat Motors, as well as the iron core winding, are the perfect fit for applications requiring high-torque in reduced dimensions.

Simplified design, high-end material selection, and automated manufacturing make the Flat Motors a high-performance solution at a competitive price.

Our vocation in listening to the client's requirements has led us to develop a customization-minded offer, focusing on specific application requirements such as integrated feedbacks, special cables and the geometry of shafts and flanges.

## Benefits

High power density

High torque

High efficiency

Cost-effective

Compact

Customizable

## Product code

SVTM F ○○ - ◇◇◇◇◇ - ◇◇ - □ - △◇☆

F Series

○ Diameter  
 ø20mm [01]; ø32mm [02];  
 ø45mm [03]; ø60mm [04];  
 ø90mm [05]

◇ Nominal torque

◇ Nominal voltage

□ Shaft  
 Single (standard) [S];  
 Double [D]\*

△ Connection  
 Wires with connector (standard on SVTM F 04) or  
 flexprint (standard on SVTM F 01, SVTM F 02) [W];  
 PCB with connectors (standard on SVTM F 03, SVTM F 05) [C]

◇ Feedback  
 Hall sensors (standard) [H];  
 Integrated incremental encoder with Hall sensors [E]\*\*

☆ Customization

\*\* Only available for SVTM F 03-0.130, SVTM F 04 and SVTM F 05

## Features

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| Winding               | 3 phases                                        |
| Operating temperature | -20° +55° (other temperature ranges on request) |
| Insulation class      | B, 130°C                                        |
| Magnets               | Neodymium                                       |
| Design technology     | Outer rotor                                     |

## Feedback

Hall Sensor (standard)

Integrated incremental encoder (available on SVTM F 03, SVTM F 04, SVTM F 05)\*

## Customizations

Integrated feedback

Flange shape

Shaft

Connectors

Wires

\* Please contact factory for more details

# Table explanation

## 1 Nominal voltage

It is the applied voltage between two powered phases in block commutation. All nominal data (lines 2 – 9) refer to this voltage. Lower and higher voltages are permissible, provided that limits are not exceeded.

## 2 No load speed

It is the speed at which the unloaded motor runs with the nominal voltage applied. It is proportional to the applied voltage.

## 3 No load current

This is the typical current that the unloaded motor draws when operating at nominal voltage. No load friction depends heavily on temperature. It decreases in extended operation and increases at lower temperatures.

## 4 Nominal speed

It is the speed set for operation at nominal voltage and nominal torque at a motor temperature of 25°C.

## 5 Nominal torque

It is the torque generated for operation at nominal voltage and nominal current at a motor temperature of 25°C. It is at the limit of the motor's continuous operation range. Higher torques heat up the winding too much.

## 6 Nominal current

It is the current in the active phase the nominal torque at the given nominal speed (= max. permissible continuous load current). The maximum winding temperature is reached at 25°C ambient temperature in continuous operation with Nominal current.

## 6 Peak torque

## 7 Peak current

Stall torque is the linearly calculated load torque for motors that causes the shaft to stall at nominal voltage. This torque often cannot be achieved due to saturation effects. Stall current is the quotient from nominal voltage and the motor's terminal resistance. Stall current is equivalent to stall torque. With larger motors, Stall current cannot be reached due to the amplifier's current limits.

## 8 Line to line resistance

It is determined by the resistance at 25 °C between two motor phase.

## 9 Line to line inductance

It is the winding inductance between two motor phase

## 10 Terminal inductance

It is the winding inductance between two motor phase.

## 11 Back EMF constant

It indicates the theoretical no load speed per volt of applied voltage, disregarding friction losses.

## 12 Speed constant

It indicates the theoretical no load speed per volt of applied voltage, disregarding friction losses.

## 13 Speed/torque gradient

The speed/torque gradient is an indicator of the motor's performance. It is based on the quotient of ideal no load speed and ideal stall torque (tolerance  $\pm 20\%$ ).

## 14 Mechanical time constant

It is the time required for the rotor to accelerate from standstill to 63% of its no load speed.

## 15 Shaft radial play

Radial play is the bearing's radial movement.

## 16 Shaft axial play

Axial play is the bearing's radial movement. A spring is utilized to preload the motor's bearings.

## 17 Thermal resistance winding-housing

Characteristic values of thermal contact resistance without additional heat sinking. Lines 17 and 18 combined define the maximum heating at a given power loss (load). Thermal resistance  $R_{th2}$  on motors with metal flanges can decrease by up to 80% if the motor is coupled directly to a good heat-conducting.

## 18 Thermal time constant winding

These are the typical reaction times for a temperature change of winding and motor. It can be seen that the motor reacts much more sluggishly in thermal terms than the winding. The values are calculated from the product of thermal capacity and given heat resistances.

## 19 Operation ambient

Operating temperature range. This derives from the heat reliability of the materials.

## 20 Ambient temperature

Operating temperature range. This derives from the heat reliability of the materials.

## 21 Max. permissible winding temperature

Maximum permissible winding temperature.

## 22 Max. permissible speed

Is the maximum recommended speed based on thermal and mechanical perspectives. A reduced service life can be expected at higher speeds.

## 23 Radial play

Radial play is the bearing's radial movement

## 24 Max. axial load (dynamics)

Dynamic: axial loading permissible in operation. If different values apply for traction and thrust, the smaller value is given.

## 25 Max force for press fits (static)

Maximum axial force applying to the shaft at standstill if the force is not input at the other shaft end. This is not possible for motors with only one shaft end.

## 26 Max. radial load

The value is given for a typical distance from the front flange. As the distance increases, this value decreases.

## 27 Number of pole pairs

Number of north poles of the permanent magnet. The phase streams and commutation signals pass through per revolution p cycles. Servo-controllers require the correct details of the number of pole pairs.

## 28 Number of phases

All motors have three phases.

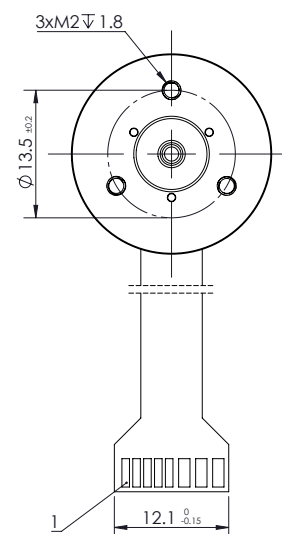
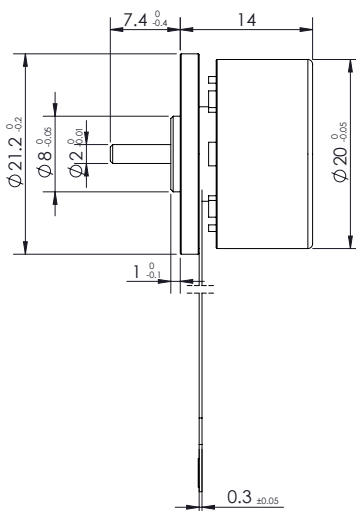
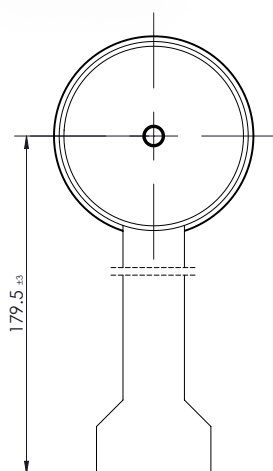
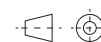
## 29 Weight

[illegible]



# Flat Series SVTM F 01

5 Watt



V 3

## Flying leads

Mating: MOLEX 52207-1133

|      |                  |
|------|------------------|
| PIN1 | Vhall (5-24 VDC) |
| PIN2 | Hall sensor HC   |
| PIN3 | Hall sensor HA   |
| PIN4 | Hall sensor HB   |
| PIN5 | GND              |
| PIN6 | Motor winding MC |
| PIN7 | Motor winding MB |
| PIN8 | Motor winding MA |

## Drive combinations

E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

## Gearbox combinations

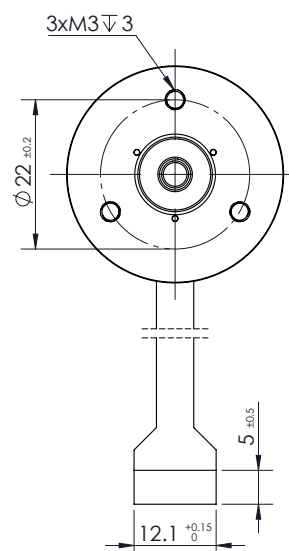
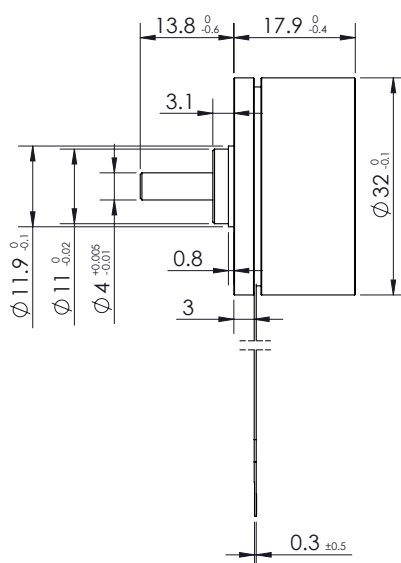
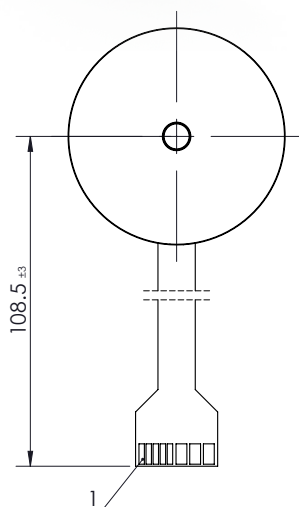
Please contact factory for more details

| Values                                           | Units             | Tolerance | SVTM F 01<br>12 VDC                        | 24 VDC |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|--------|
| <b>Motor data</b>                                |                   |           |                                            |        |
| 1 Nominal voltage                                | VDC               |           | 12                                         | 24     |
| 2 No load speed                                  | rpm               | ±10%      | 9530                                       | 9530   |
| 3 No load current                                | mA                |           | 23                                         | 12     |
| 4 Nominal speed                                  | rpm               | ±10%      | 5170                                       | 5220   |
| 5 Nominal torque                                 | mNm               |           | 7.59                                       | 7.74   |
| 6 Nominal current                                | A                 |           | 0.63                                       | 0.32   |
| 7 Peak torque                                    | mNm               |           | 19                                         | 20     |
| 8 Peak current                                   | A                 | ±10%      | 1.62                                       | 0.85   |
| <b>Characteristics</b>                           |                   |           |                                            |        |
| 9 Line to line resistance                        | ohms@25°C         | ±10%      | 7.2                                        | 26.1   |
| 10 Line to line inductance                       | mH                | ±20%      | 0.62                                       | 2.6    |
| 11 Torque constant                               | mNm/A             | ±10%      | 12                                         | 24     |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 0.89                                       | 1.78   |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           |                                            | 5.1    |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |        |
| 14 Max axial-force                               | N                 |           |                                            | 4.8    |
| 15 Max radial-force*                             | N                 |           |                                            | 14     |
| 16 Shaft radial play                             | mm @4N            |           |                                            | 0.02   |
| 17 Shaft axial play                              | mm @4N            |           |                                            | 0.14   |
| <b>Other specifications</b>                      |                   |           |                                            |        |
| 18 Number of poles                               | #                 |           |                                            | 8      |
| 19 Weight                                        | g                 |           |                                            | 23     |
| 20 Operation ambient                             | °C                |           | -20 +50 Humidity max 85% (no condensation) |        |

\*@ 5mm from the flange



# Flat Series SVTM F 02



V 3

## Flying leads

Mating: MOLEX 52207-1133

|      |                  |
|------|------------------|
| PIN1 | Vhall (5-24 VDC) |
| PIN2 | Hall sensor HC   |
| PIN3 | Hall sensor HA   |
| PIN4 | Hall sensor HB   |
| PIN5 | GND              |
| PIN6 | Motor winding MC |
| PIN7 | Motor winding MB |
| PIN8 | Motor winding MA |

## Drive combinations

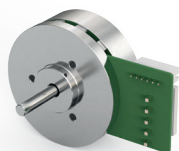
E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

## Gearbox combinations

Please contact factory for more details

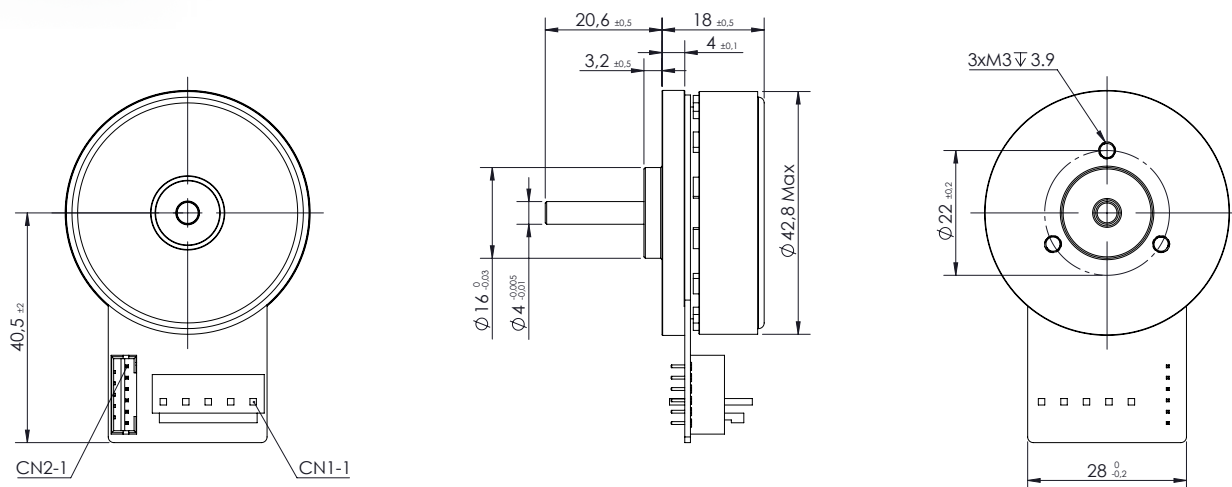
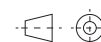
| Values                                           | Units             | Tolerance | SVTM F 02<br>9 VDC                         | 12 VDC | 24 VDC | 48 VDC |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|--------|--------|--------|
| <b>Motor data</b>                                |                   |           |                                            |        |        |        |
| 1 Nominal voltage                                | VDC               |           | 9                                          | 12     | 24     | 48     |
| 2 No load speed                                  | rpm               | ±10%      | 3750                                       | 4650   | 4530   | 4800   |
| 3 No load current                                | mA                |           | < 0.3                                      | < 0.37 | < 0.37 | < 0.37 |
| 4 Nominal speed                                  | rpm               | ±10%      | 2100                                       | 2800   | 2760   | 2950   |
| 5 Nominal torque                                 | mNm               |           | 24.6                                       | 25.1   | 25.5   | 24.7   |
| 6 Nominal current                                | A                 |           | 1.07                                       | 1      | 0.37   | 0.257  |
| 7 Peak torque                                    | mNm               |           | 73.8                                       | 75.3   | 76.5   | 74.1   |
| 8 Peak current                                   | A                 | ±10%      | 3.2                                        | 3      | 1.59   | 0.97   |
| <b>Characteristics</b>                           |                   |           |                                            |        |        |        |
| 9 Line to line resistance                        | ohms@25°C         | ±10%      | 3.2                                        | 3.2    | 13.7   | 53     |
| 10 Line to line inductance                       | mH                | ±20%      | 1.20                                       | 1.21   | 4.86   | 27.8   |
| 11 Torque constant                               | mNm/A             | ±10%      | 23                                         | 24.67  | 48.2   | 96.1   |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 1.7                                        | 1.8    | 3.57   | 7.1    |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           |                                            |        | 35     |        |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |        |        |        |
| 14 Max axial-force                               | N                 |           |                                            |        | 4.8    |        |
| 15 Max radial-force*                             | N                 |           |                                            |        | 14     |        |
| 16 Shaft radial play                             | mm @4N            |           |                                            |        | 0.02   |        |
| 17 Shaft axial play                              | mm @4N            |           |                                            |        | 0.14   |        |
| <b>Other specifications</b>                      |                   |           |                                            |        |        |        |
| 18 Number of poles                               | #                 |           |                                            |        | 8      |        |
| 19 Weight                                        | g                 |           |                                            |        | 50     |        |
| 20 Operation ambient                             | °C                |           | -20 +50 Humidity max 85% (no condensation) |        |        |        |

\*@ 5mm from the flange



## Flat Series SVTM F 03

26 Watt



V 3

| Connector 1                |                  | Connector 2                 |                               |
|----------------------------|------------------|-----------------------------|-------------------------------|
| JST B5P-VH                 |                  | JST B6B-PH-K-S              |                               |
| Mating: JST VHR-5N (power) |                  | Mating: ST PHR-6 (feedback) |                               |
| PIN1                       | GND              | PIN1                        | GND                           |
| PIN2                       | Motor winding MA | PIN2                        | V <sub>hall</sub> (4.5-18VDC) |
| PIN3                       | Motor winding MB | PIN3                        | Hall sensor HC                |
| PIN4                       | Motor winding MC | PIN4                        | Hall sensor HA                |
| PIN5                       | GND              | PIN5                        | Hall sensor HB                |
|                            |                  | PIN6                        | GND                           |

**Drive combinations**  
E50 / E40 (V<sub>out</sub> 90%) or E55 / E45 (V<sub>out</sub> 100%)

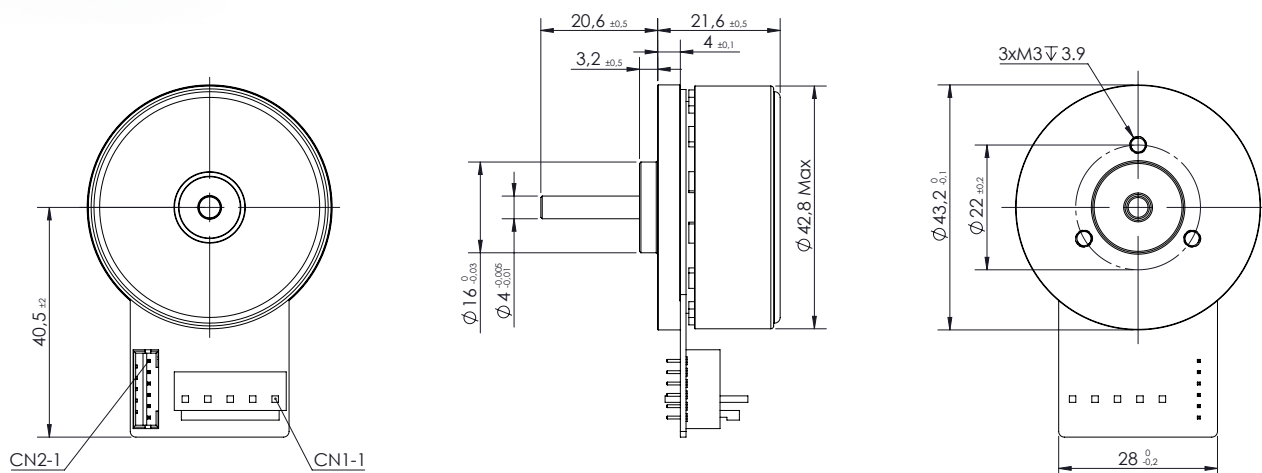
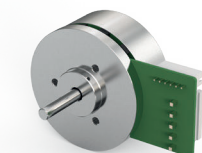
**Gearbox combinations**  
Please contact factory for more details

| Values                                           | Units                  | Tolerance | SVTM F 03-0.050<br>24 VDC                  |
|--------------------------------------------------|------------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                        |           |                                            |
| 1 Nominal voltage                                | VDC                    |           | 24                                         |
| 2 No load speed                                  | rpm                    | ±10%      | 6500                                       |
| 3 No load current                                | mA                     |           | < 0.3                                      |
| 4 Nominal speed                                  | rpm                    | ±10%      | 5000                                       |
| 5 Nominal torque                                 | mNm                    |           | 50                                         |
| 6 Nominal current                                | A                      |           | 1.58                                       |
| 7 Peak torque                                    | mNm                    |           | 150                                        |
| 8 Peak current                                   | A                      | ±10%      | 4.8                                        |
| <b>Characteristics</b>                           |                        |           |                                            |
| 9 Line to line resistance                        | ohms@25°C              | ±10%      | 1.47                                       |
| 10 Line to line inductance                       | mH                     | ±20%      | 0.61                                       |
| 11 Torque constant                               | mNm/A                  | ±10%      | 35.5                                       |
| 12 Back EMF constant                             | V <sub>rms</sub> /kRPM | ±10%      | 2.61                                       |
| 13 Rotor inertia                                 | g cm <sup>2</sup>      |           | 99                                         |
| <b>Mechanical data (preloaded ball bearings)</b> |                        |           |                                            |
| 14 Max axial-force                               | N                      |           | 10                                         |
| 15 Max radial-force*                             | N                      |           | 28                                         |
| 16 Shaft radial play                             | mm @4N                 |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N                 |           | 0.14                                       |
| <b>Other specifications</b>                      |                        |           |                                            |
| 18 Number of poles                               | #                      |           | 16                                         |
| 19 Weight                                        | g                      |           | 80                                         |
| 20 Operation ambient                             | °C                     |           | -25 +55 Humidity max 85% (no condensation) |

\*@ 5mm from the flange



# Flat Series SVTM F 03



V 3

**Connector 1**  
JST B5P-VH  
Mating: JST VHR-5N (power)

|      |                  |      |                   |
|------|------------------|------|-------------------|
| PIN1 | GND              | PIN1 | GND               |
| PIN2 | Motor winding MA | PIN2 | Vhall (4.5-18VDC) |
| PIN3 | Motor winding MB | PIN3 | Hall sensor HA    |
| PIN4 | Motor winding MC | PIN4 | Hall sensor HC    |
| PIN5 | GND              | PIN5 | Hall sensor HB    |
|      |                  | PIN6 | GND               |

**Drive combinations**

E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

**Gearbox combinations**

Please contact factory for more details

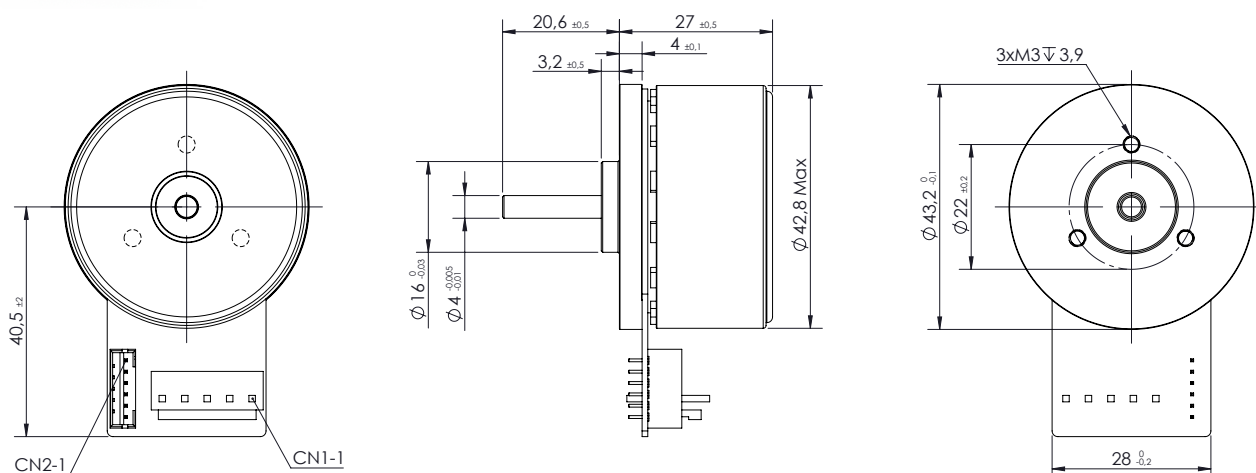
| Values                                           | Units             | Tolerance | SVTM F 03-0.084<br>24 VDC                  |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                   |           |                                            |
| 1 Nominal voltage                                | VDC               |           | 24                                         |
| 2 No load speed                                  | rpm               | ±10%      | 6700                                       |
| 3 No load current                                | mA                |           | < 0.4                                      |
| 4 Nominal speed                                  | rpm               | ±10%      | 5260                                       |
| 5 Nominal torque                                 | mNm               |           | 84                                         |
| 6 Nominal current                                | A                 |           | 2.36                                       |
| 7 Peak torque                                    | mNm               |           | 250                                        |
| 8 Peak current                                   | A                 | ±10%      | 7                                          |
| <b>Characteristics</b>                           |                   |           |                                            |
| 9 Line to line resistance                        | ohms@25°C         | ±10%      | 0.7                                        |
| 10 Line to line inductance                       | mH                | ±20%      | 0.33                                       |
| 11 Torque constant                               | mNm/A             | ±10%      | 33.5                                       |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 2.53                                       |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           | 135                                        |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |
| 14 Max axial-force                               | N                 |           | 10                                         |
| 15 Max radial-force*                             | N                 |           | 28                                         |
| 16 Shaft radial play                             | mm @4N            |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N            |           | 0.14                                       |
| <b>Other specifications</b>                      |                   |           |                                            |
| 18 Number of poles                               | #                 |           | 16                                         |
| 19 Weight                                        | g                 |           | 120                                        |
| 20 Operation ambient                             | °C                |           | -25 +55 Humidity max 85% (no condensation) |

\* @ 5mm from the flange



## Flat Series SVTM F 03

66 Watt



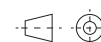
V 3

| Connector 1                |                  | Connector 2                 |                   |
|----------------------------|------------------|-----------------------------|-------------------|
| JST B5P-VH                 |                  | JST B6B-PH-K-S              |                   |
| Mating: JST VHR-5N (power) |                  | Mating: ST PHR-6 (feedback) |                   |
| PIN1                       | GND              | PIN1                        | GND               |
| PIN2                       | Motor winding MA | PIN2                        | Vhall (4.5-18VDC) |
| PIN3                       | Motor winding MB | PIN3                        | Hall sensor HA    |
| PIN4                       | Motor winding MC | PIN4                        | Hall sensor HC    |
| PIN5                       | GND              | PIN5                        | Hall sensor HB    |
|                            |                  | PIN6                        | GND               |

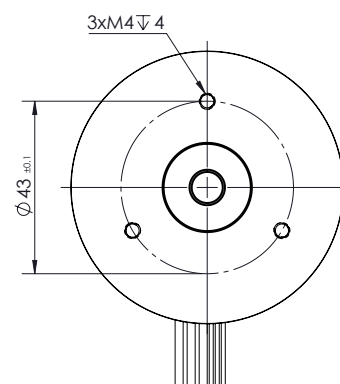
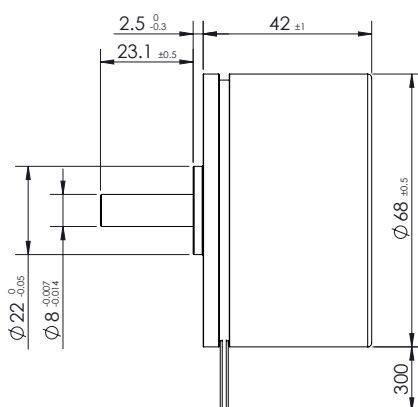
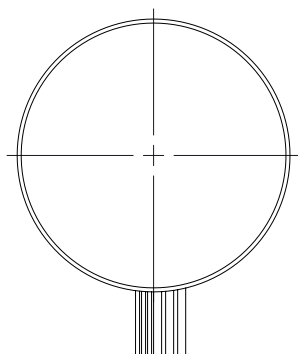
| Drive combinations                               |              |
|--------------------------------------------------|--------------|
| E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)    |              |
| Optional encoder                                 |              |
| Integrated incremental encoder with Hall sensors |              |
| Resolution                                       | 1024ppr, TTL |
| Channels                                         | A,A/,B,B/    |
| Length increase                                  | +2mm         |
| Please contact factory for more details          |              |
| Gearbox combinations                             |              |
| Please contact factory for more details          |              |

| Values                                           | Units             | Tolerance | SVTM F 03-0130<br>24 VDC                   |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                   |           |                                            |
| 1 Nominal voltage                                | VDC               |           | 24                                         |
| 2 No load speed                                  | rpm               | ±10%      | 6100                                       |
| 3 No load current                                | mA                |           | < 0.5                                      |
| 4 Nominal speed                                  | rpm               | ±10%      | 4840                                       |
| 5 Nominal torque                                 | mNm               |           | 130                                        |
| 6 Nominal current                                | A                 |           | 3.26                                       |
| 7 Peak torque                                    | mNm               |           | 390                                        |
| 8 Peak current                                   | A                 | ±10%      | 9.5                                        |
| <b>Characteristics</b>                           |                   |           |                                            |
| 9 Line to line resistance                        | ohms@25°C         | ±10%      | 0.56                                       |
| 10 Line to line inductance                       | mH                | ±20%      | 0.27                                       |
| 11 Torque constant                               | mNm/A             | ±10%      | 36.9                                       |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 2.75                                       |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           | 181                                        |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |
| 14 Max axial-force                               | N                 |           | 10                                         |
| 15 Max radial-force*                             | N                 |           | 28                                         |
| 16 Shaft radial play                             | mm @4N            |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N            |           | 0.14                                       |
| <b>Other specifications</b>                      |                   |           |                                            |
| 18 Number of poles                               | #                 |           | 16                                         |
| 19 Weight                                        | g                 |           | 150                                        |
| 20 Operation ambient                             | °C                |           | -25 +55 Humidity max 85% (no condensation) |

\*@ 5mm from the flange



# Flat Series SVTM F 04



V 3

## Flying leads

|       |        |                  |
|-------|--------|------------------|
| AWG26 | Red    | Vhall (5 VDC)    |
| AWG26 | Green  | Hall sensor HB   |
| AWG26 | Blue   | Hall sensor HA   |
| AWG26 | White  | Hall sensor HC   |
| AWG26 | Black  | GND              |
| AWG18 | Yellow | Motor winding MA |
| AWG18 | Red    | Motor winding MB |
| AWG18 | Black  | Motor winding MC |

## Drive combinations

E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

## Optional encoder

Integrated incremental encoder with Hall sensors

Resolution 4096ppr, TTL

Channels A,A/,B,B/,I,I/

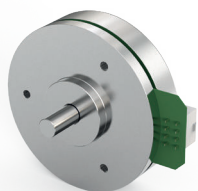
Please contact factory for more details

## Gearbox combinations

Please contact factory for more details

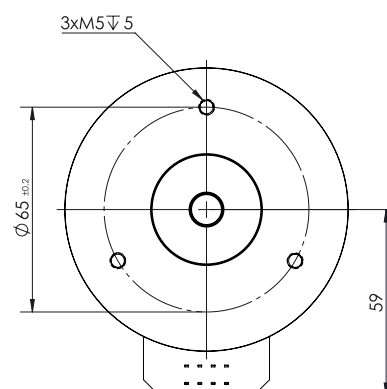
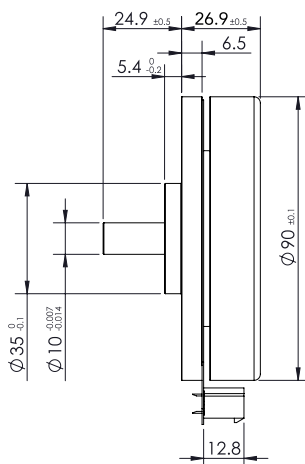
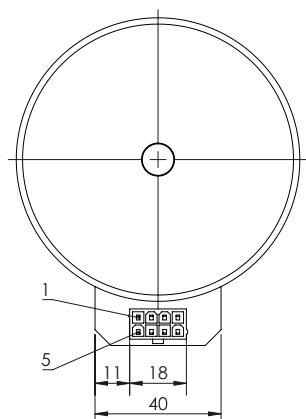
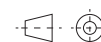
| Values                                           | Units             | Tolerance | SVTM F 04<br>24 VDC                        |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                   |           |                                            |
| 1 Nominal voltage                                | VDC               |           | 24                                         |
| 2 No load speed                                  | rpm               | ±10%      | 4400                                       |
| 3 No load current                                | mA                |           | 0.65                                       |
| 4 Nominal speed                                  | rpm               | ±10%      | 3700                                       |
| 5 Nominal torque                                 | mNm               |           | 290                                        |
| 6 Nominal current                                | A                 |           | 5.6                                        |
| 7 Peak torque                                    | mNm               |           | 870                                        |
| 8 Peak current                                   | A                 | ±10%      | 17                                         |
| <b>Characteristics</b>                           |                   |           |                                            |
| 9 Line to line resistance                        | ohms@25°C         | ±10%      | 0.25                                       |
| 10 Line to line inductance                       | mH                | ±20%      | 0.2                                        |
| 11 Torque constant                               | mNm/A             | ±10%      | 54                                         |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 4.0                                        |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           | 1000                                       |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |
| 14 Max axial-force                               | N                 |           | 10                                         |
| 15 Max radial-force*                             | N                 |           | 28                                         |
| 16 Shaft radial play                             | mm @4N            |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N            |           | 0.08                                       |
| <b>Other specifications</b>                      |                   |           |                                            |
| 18 Number of poles                               | #                 |           | 14                                         |
| 19 Weight                                        | g                 |           | 500                                        |
| 20 Operation ambient                             | °C                |           | -25 +55 Humidity max 85% (no condensation) |

\*@ 10mm from the flange



## Flat Series SVTM F 05

130 Watt



V 3

### Connector

MOLEX 39-28-1083

Mating: Molex 039012080

|      |                  |
|------|------------------|
| PIN1 | Hall sensor HA   |
| PIN2 | Hall sensor HB   |
| PIN3 | Vhall (5-24 VDC) |
| PIN4 | Motor winding MC |
| PIN5 | Hall sensor HC   |
| PIN6 | GND              |
| PIN7 | Motor winding MA |
| PIN8 | Motor winding MB |

### Drive combinations

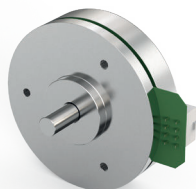
E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

### Gearbox combinations

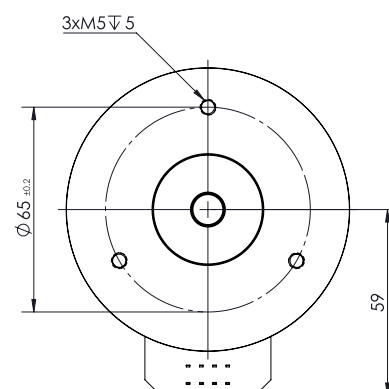
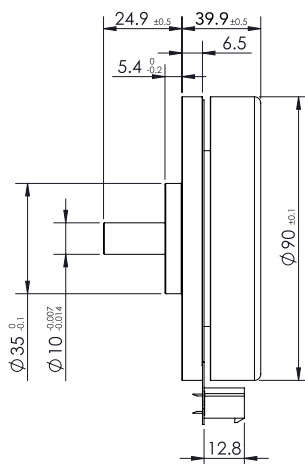
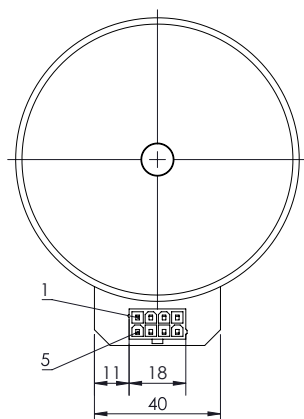
Please contact factory for more details

| Values                                           | Units             | Tolerance | SVTM F 05-0.457<br>24 VDC                  |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                   |           |                                            |
| 1 Nominal voltage                                | VDC               |           | 24                                         |
| 2 No load speed                                  | rpm               | ±10%      | 3300                                       |
| 3 No load current                                | mA                |           | 0.7                                        |
| 4 Nominal speed                                  | rpm               | ±10%      | 2700                                       |
| 5 Nominal torque                                 | mNm               |           | 457                                        |
| 6 Nominal current                                | A                 |           | 6.8                                        |
| 7 Peak torque                                    | mNm               |           | 1600                                       |
| 8 Peak current                                   | A                 | ±10%      | 23                                         |
| <b>Characteristics</b>                           |                   |           |                                            |
| 9 Line to line resistance                        | ohms@20°C         | ±10%      | 0.21                                       |
| 10 Line to line inductance                       | mH                | ±20%      | 0.19                                       |
| 11 Torque constant                               | mNm/A             | ±10%      | 63                                         |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 5.2                                        |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           | 3000                                       |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |
| 14 Max axial-force                               | N                 |           | 45                                         |
| 15 Max radial-force*                             | N                 |           | 110                                        |
| 16 Shaft radial play                             | mm @4N            |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N            |           | 0.08                                       |
| 18 Length (L)                                    | mm                |           | 26.9±05                                    |
| <b>Other specifications</b>                      |                   |           |                                            |
| 19 Number of poles                               | #                 |           | 22                                         |
| 20 Weight                                        | g                 |           | 600                                        |
| 21 Operation ambient                             | °C                |           | -25 +55 Humidity max 85% (no condensation) |

\*@ 10mm from the flange



# Flat Series SVTM F 05



## Connector

MOLEX 39-28-1083

Mating: Molex 039012080

|      |                  |
|------|------------------|
| PIN1 | Hall sensor HA   |
| PIN2 | Hall sensor HB   |
| PIN3 | Vhall (5-24 VDC) |
| PIN4 | Motor winding MC |
| PIN5 | Hall sensor HC   |
| PIN6 | GND              |
| PIN7 | Motor winding MA |
| PIN8 | Motor winding MB |

## Drive combinations

E50 / E40 (Vout 90%) or E55 / E45 (Vout 100%)

## Optional encoder

Integrated incremental encoder with Hall sensors

Resolution 4096ppr, TTL

Channels A,A/,B,B/,I,I/

Length increase +2mm

Please contact factory for more details

## Gearbox combinations

Please contact factory for more details

| Values                                           | Units             | Tolerance | SVTM F 05-0.964<br>48 VDC                  |
|--------------------------------------------------|-------------------|-----------|--------------------------------------------|
| <b>Motor data</b>                                |                   |           |                                            |
| 1 Nominal voltage                                | VDC               |           | 48                                         |
| 2 No load speed                                  | rpm               | ±10%      | 1900                                       |
| 3 No load current                                | mA                |           | 0.35                                       |
| 4 Nominal speed                                  | rpm               | ±10%      | 1670                                       |
| 5 Nominal torque                                 | mNm               |           | 964                                        |
| 6 Nominal current                                | A                 |           | 4.3                                        |
| 7 Peak torque                                    | mNm               |           | 3000                                       |
| 8 Peak current                                   | A                 | ±10%      | 13                                         |
| <b>Characteristics</b>                           |                   |           |                                            |
| 9 Line to line resistance                        | ohms@20°C         | ±10%      | 0.6                                        |
| 10 Line to line inductance                       | mH                | ±20%      | 0.7                                        |
| 11 Torque constant                               | mNm/A             | ±10%      | 241                                        |
| 12 Back EMF constant                             | Vrms/kRPM         | ±10%      | 17.9                                       |
| 13 Rotor inertia                                 | g cm <sup>2</sup> |           | 5000                                       |
| <b>Mechanical data (preloaded ball bearings)</b> |                   |           |                                            |
| 14 Max axial-force                               | N                 |           | 45                                         |
| 15 Max radial-force*                             | N                 |           | 110                                        |
| 16 Shaft radial play                             | mm @4N            |           | 0.02                                       |
| 17 Shaft axial play                              | mm @4N            |           | 0.08                                       |
| 18 Length (L)                                    | mm                |           | 39.9±05                                    |
| <b>Other specifications</b>                      |                   |           |                                            |
| 19 Number of poles                               | #                 |           | 22                                         |
| 20 Weight                                        | g                 |           | 1000                                       |
| 21 Operation ambient                             | °C                |           | -25 +55 Humidity max 85% (no condensation) |

\*@ 10mm from the flange