

S23C/ S34C

Integrated Closed-Loop Stepper Motors

StepIM - With a superior closed loop control and a cost-effective design, the integrated stepper motors provide an efficient and economical solution for applications that require the performance of a servo at the price level of a stepper.

- **Sophisticated closed loop control enhances motor performance with no step loss**
- **Operates in torque, velocity, and position modes**
- **Efficient torque utilization optimizes motor sizing**
- **Integrated design minimizes component and wiring requirements**
- **Reduced space, installation efforts and system cost**
- **Fieldbus: CANopen DS402**
- **Synchronized control of coordinated motion profiles**
- **The StepIM can function as distributed I/O points - reducing machine complexity**

S23C/ S34C - Closed loop commutation enabling highly dynamic performance

The StepIM significantly enhances the performance of the stepper motors, when compared to conventional open loop control. The integrated electronics control the stepper motor as a two phase BLDC motor, implementing position loop, velocity loop, DQ current control, as well as additional algorithms. Closed loop commutation, by means of an absolute single-turn encoder, ensures optimal torque utilization at any speed.

Optimal cost-performance ratio for applications that require servo-like performance

- High torque/ low speed – eliminating the need for a gear
- High speed in low torque ranges
- The StepIM can function as distributed I/O points - reducing machine complexity

Benefits of closed loop vs. open loop operation

	Closed loop	Open loop
No step loss	Encoder feedback with closed loop control guarantees accurate motion.	Abrupt changes in load may cause lost steps, creating a position error.
High dynamics	Load dependent current control Optimal torque utilization for any speed and any load. Eliminating the effect of midband Resonance.	Constant current control at all speed ranges without considering load variations.
Torque & force control modes of operation	Supported.	Not supported.
Maximum torque utilization	Utilizing 100% of the full range of rated motor torque.	Practical limitation of about 50% of rated motor torque due to risk of synchronization loss.
Low noise & vibration	Silent operation due to reduced stepping vibration and low speed resonance.	Stepping vibration and high speed resonance cause noisy operation.
Energy efficiency	Provides current based on actual load. This reduces heating of the motor and saves energy.	Maximum current is applied irrespective of required torque, leading to high losses and respective heating of the motor and drive.

Integrated components reduce cost, space and machine complexity

In decentralized architectures, wiring and assembly time can be reduced thus enabling significant cost savings for machine builders. Decentralized drives that integrate motor, control and power electronics also free up space and reduce heating in the cabinet. Machine complexity is reduced as fewer components and a smaller cabinet are used.

High resolution magnetic encoder increases system efficiency

With a 12 bit absolute encoder and an update rate of 16 kHz, the StepIM precisely controls the magnetic flux generated based on actual load, ensuring accurate positioning and maximum machine efficiency.

ServoStudio™ for simple commissioning

- Step-by-step guidance through the setup & tuning process
- Plug-and-play motor and feedback wiring
- Real-time data recording and plotting
- Easy integration of servo axes



Application examples

- Tool positioning in wood, textile, and packaging machines
- Blending machines for food and lab automation
- Belt and pulley systems with low stiffness loads
- Coordinated control of a Gantry Robot
- Knitting axes in textile machines
- Actuators on a robot gripper
- Desktop milling machines

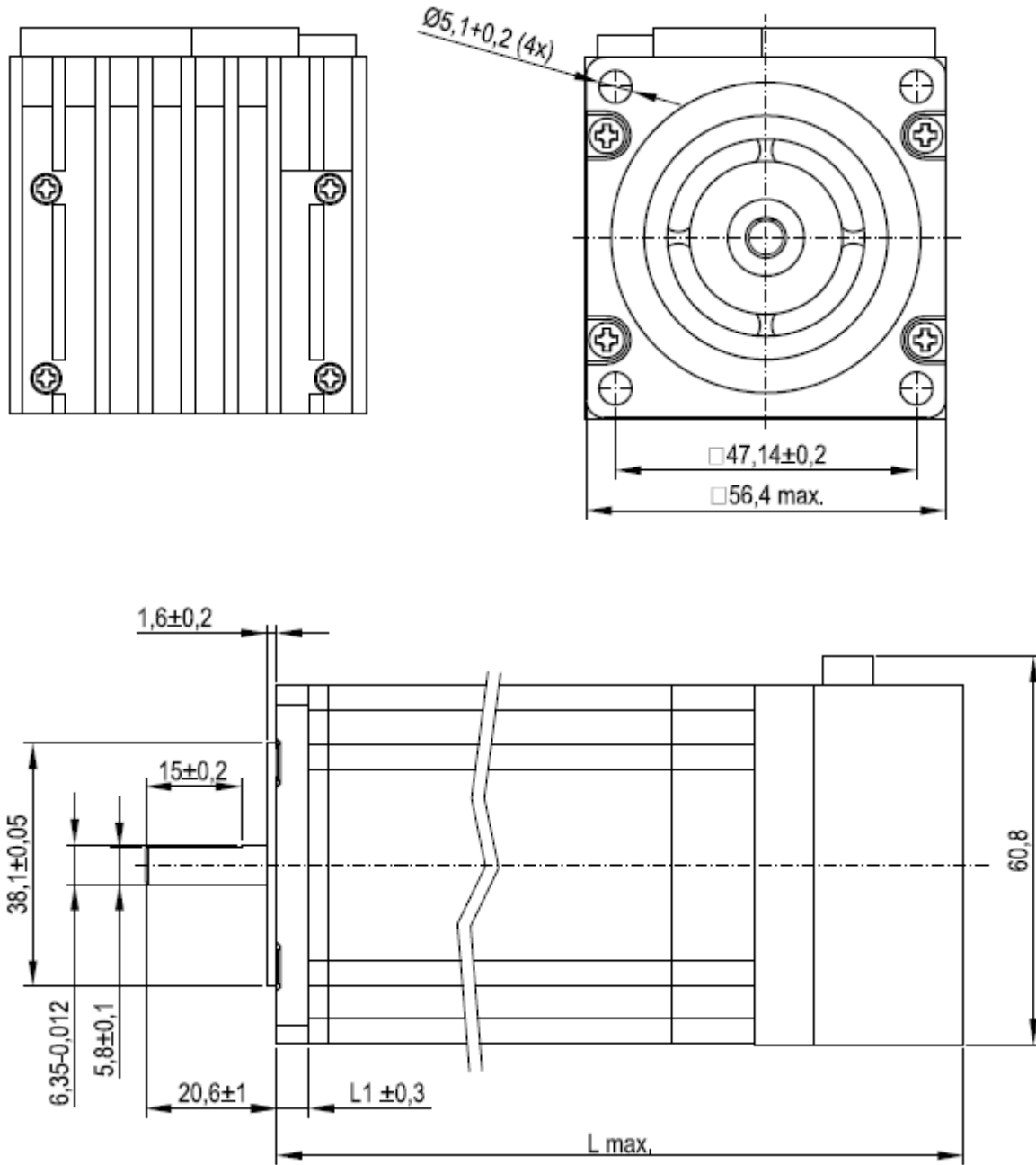
Rating and dimensions

Model	Nema 23 S23C-00-01	Nema 23 S23C-01-01	Nema 23 S23C-02-01	Nema 34* S34C-01-01	Nema 34* S34C-02-01
Input Voltage (VDC)	14 to 48	14 to 48	14 to 48	14 to 48	14 to 48
Torque (Nm)	1.2	1.8	2.6	3.4	5.4**
Inertia (g·cm ²)	260	460	750	1850	2750
Weight (kg)	0.6	1.0	1.5	2.7	3.8
Frame Size (mm)	57	57	57	86	86
Length (mm)	86	108	145	134	163
Communication:	CANopen®; EtherCAT® – future development; RS485 – upon special request				
Motor feedback:	12 bit absolute encoder				
I/Os:	Digital: 4 x Input, 2 x Output Analog: 1 x Differential Input I/Os are software configurable for different functions (e.g. limit switch, remote enable etc.)				

*Supports limited time peak of 50% more torque at 7 amps

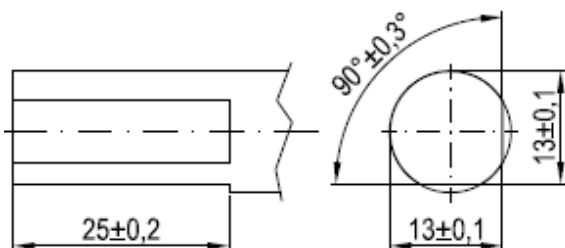
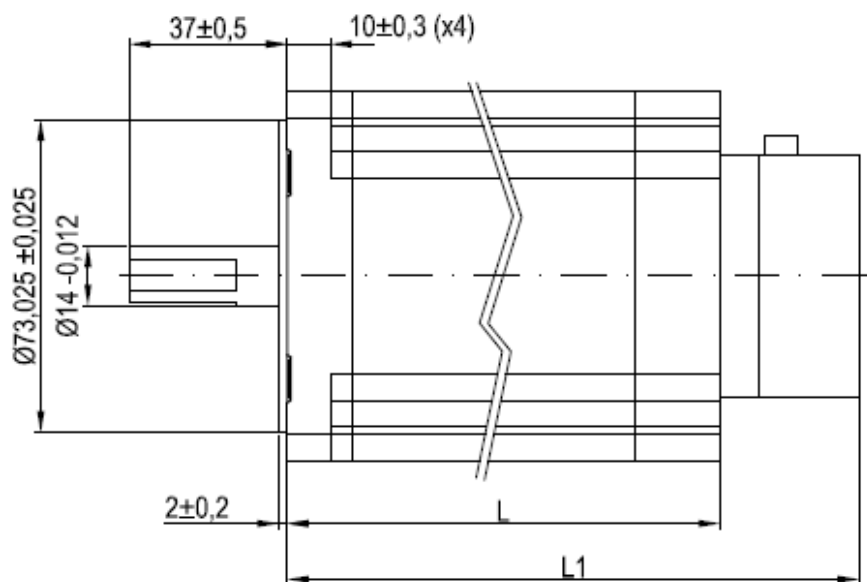
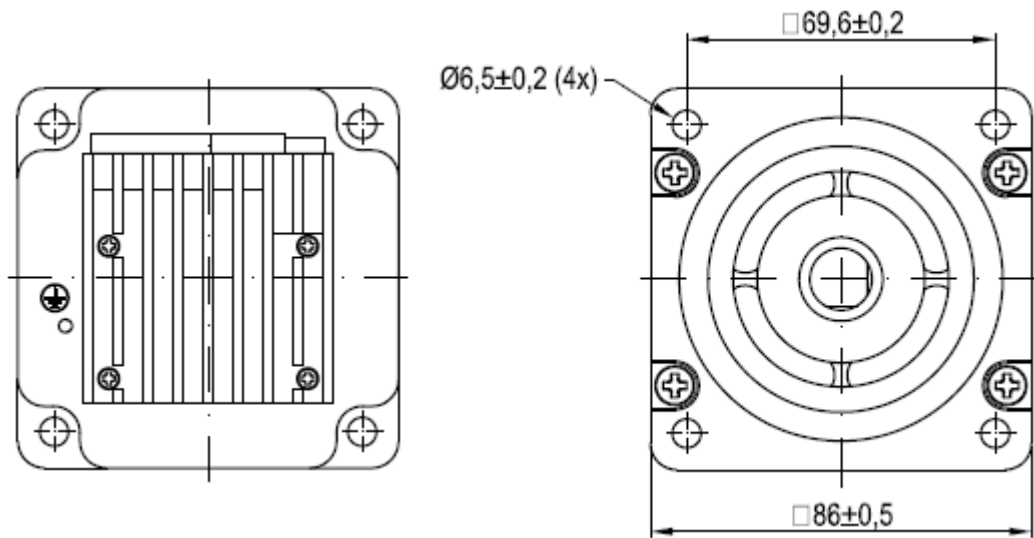
**Under evaluation

StepIM Nema 23 - All dimension in mm



Dimensions S23C		
Motor	L (mm)	L1 (mm)
S23C-00-01	86	5.08
S23C-01-01	108	5.08
S23C-02-01	145	4.80

StepIM Nema 34 - All dimension in mm



Dimensions S34C		
Motor	L (mm)	L1 (mm)
S34C-01-01	101	133.5
S34C-02-01	130.5	163

Type key

