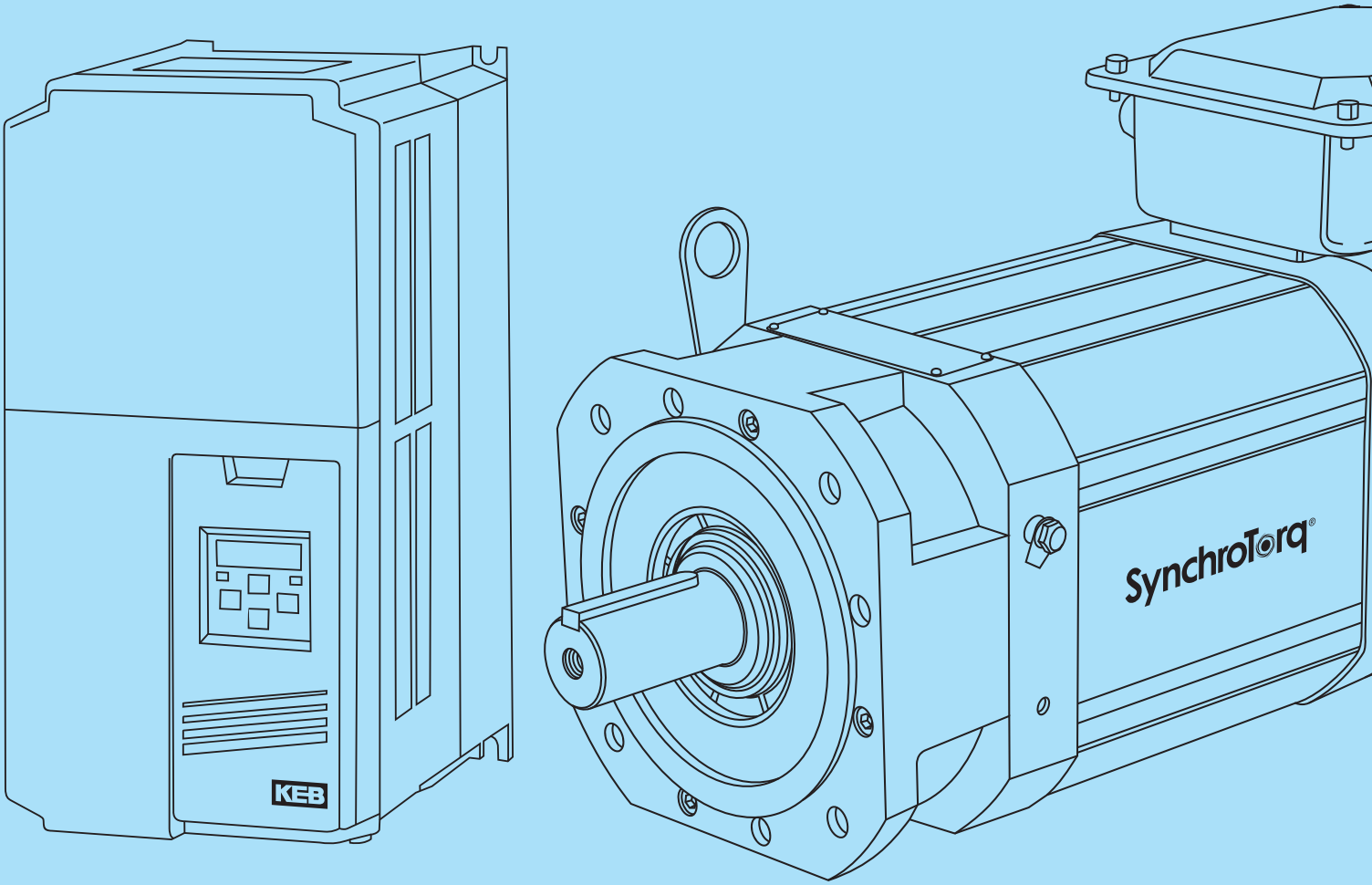
KEB Official Partner

Bharat Bijlee

Compact New 2000 RPM Servo Solution for Plastic Injection Moulding Machines

KEB Drives with Sensorless Closed Loop Technology and SynchroTorq® Servo Motors



Encoder-less | Economical | Low Maintenance

SERVO MOTORS: AN INTRODUCTION

Bharat Bijlee's servo solutions with KEB drives for the plastics industry have a proven record of outstanding torque and speed control. They use resolver feedback for superior positioning accuracy in a highly dynamic operation. However, in some high torque applications like extruders and injection moulders, the costly and vulnerable feedback devices can be eliminated without compromising performance.

When economy is as important as reliability, KEB's Sensorless Closed Loop (SCL) technology becomes an ideal choice. The new SCL servo solution using our SynchroTorq® servo motors fulfils these twin objectives - along with precise torque control and dynamic response.

KEB Servo Drive, SynchroTorq® PM Synchronous Servo Motor, Internal Gear Pump and Accessories

12000+ installations and growing

Flow Ratings: 60 LPM to 150 LPM @ 150 Bar Pressure

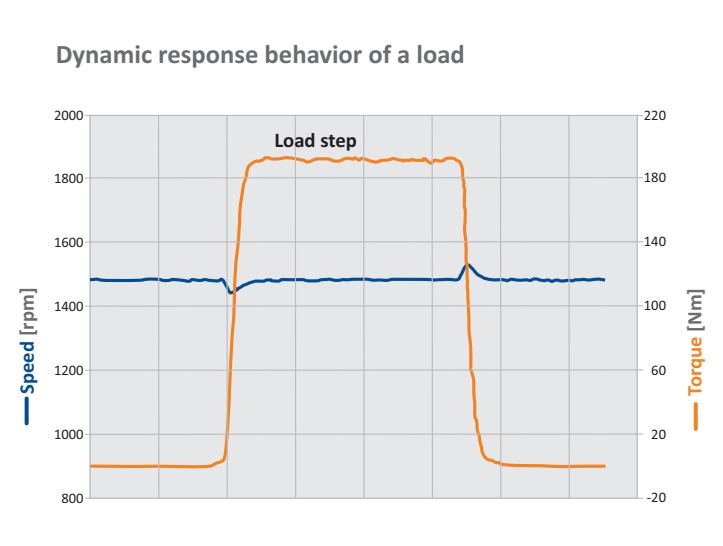
Compact, reliable and point-to-point positioning with KEB SCL encoderless technology for Synchronous Motors

SENSORLESS CLOSED LOOP (SCL) MOTOR CONTROL

KEB's unique SCL motor control technology uses an accurate motor model with a calculated rotor position module. This is achieved without feedback of the motor shaft and enables outstanding decentralized single-axis positioning without an encoder.

What is SCL?

SCL is designed for high performance speed and torque control in processes where the system advantages of Permanent Magnet (PM) motors can be leveraged. It allows field orientated control of PM motors without encoder feedback. The principle of SCL is based on a very precise mathematical model of the motor that builds a virtual rotor position in the control software. During SCL operation, the KEB drive continuously measures the different components of the output current and feeds back this information to the internal motor model. Here the actual flux and torque is compared with the mathematical model. The current can then be regulated to match the required speed and torque. All feedback is handled internally by the drive.

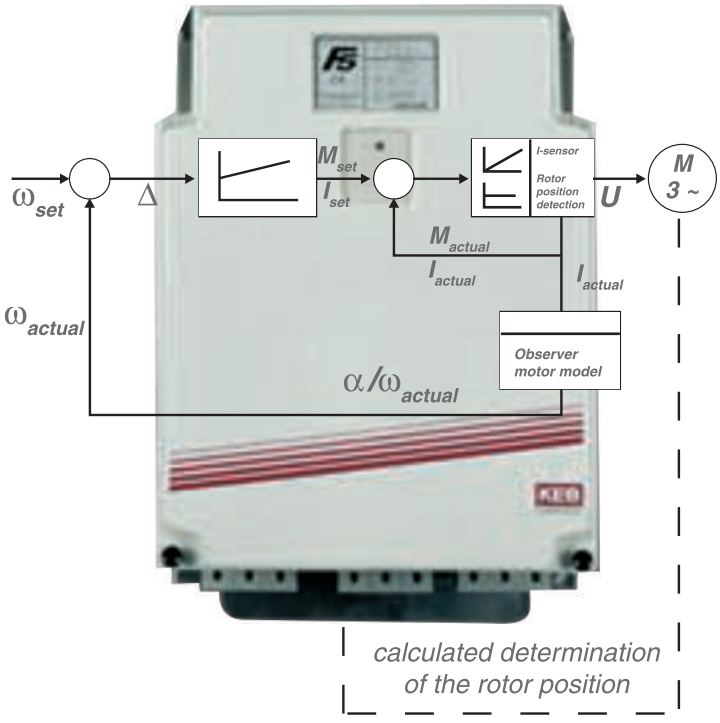


No Feedback Devices

The major benefit of this control method is that no encoder, interface card, or associated cabling is required. This improves both reliability and cost by reducing the number of components and the potential problems of encoder parts, electronics, heat transfer from the motor, and noise from long cable lengths. It becomes especially important in harsh ambient environments, and under shock and vibration.

It also removes the cost of the encoder, interface card and cabling.

SCL uses standard KEB drive hardware, and is software selectable. The drives feature a number of different homing options that can be configured for the application.



Use with Servo Motors

SCL helps machine builders to add value and competitive advantage to their machines. Other than injection moulding/blow moulding machines for plastics, other applications using this algorithm include driven tools, textile machines, extruder drives, hybrid drives, and high frequency pump drives in compressors, screws and vacuum pumps.

Communication Options

The KEB drive product portfolio has communication options for Ethernet/IP, EtherCAT, Powerlink, and ProfiNet.

Features

- Closed Loop (SCL): point-to-point positioning without encoder or resolver feedback
- Accurate speed and torque characteristics
- Excellent performance during sudden load variation: comparable with closed loop drives
- Reduced costs: elimination of encoder, interface card and its cable
- Robust and reliable system solution: potential interference sources from the encoder system are eliminated
- Torque accuracy: < 0.3% of rated torque
- Speed accuracy: < 0.3% of rated speed
- Servo motors are specially designed for maximum speed of 2500 rpm and high Kt: potentially one size lower drive
- Improved pump reliability due to operating speeds < 2500 rpm
- Ambient temperature for the system: 45^{o} C
- Wide operating voltage: 305V to 520V
- Accessories: cradle, coupling, shielded power cables, AC choke, brake resistor
- Compact servo drive reduces cabinet size
- Servo drives have 3c3 class conformal coated electronic boards for protection in harsh environments

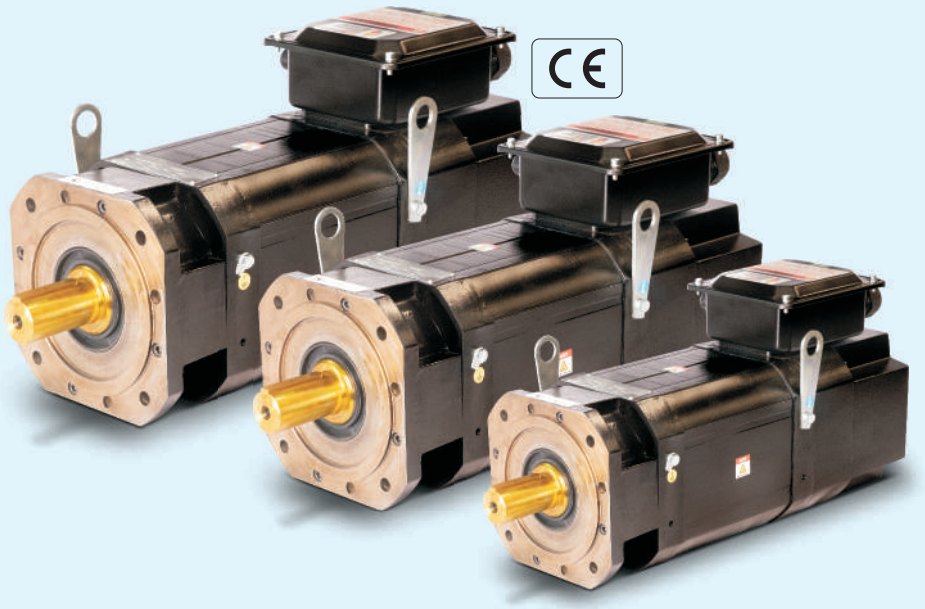
Technical Specifications of Servo Package: SynchroTorq® Servo Motor and KEB Drive

Flow Rating in LPM	Pressure in Bar	Gear Pump Displacement in cc	BBL PM Servo Motor Model nos.	Rated Speed of Servo Motor in RPM	Max speed of Servo Motor in RPM	Servo Motor Ratings in kW	KEB Servo Drive Ratings
62	150	25 cc	STS-50-1700- 215B-F-O	1700	2500	8.89 kW	11 kW
80	150	32 cc	STS-75-1700-215B-F-O	1700	2500	13.34 kW	15 kW
100	150	40 cc	STS-75-1700-215B-F-O	1700	2500	13.34 kW	18.5 kW
125	150	50 cc	STS-95-1700-215B-F-O	1700	2500	16.91 kW	18.5 kW
157	150	63 cc	STS-125-1700-215B-F-O	1700	2500	22.25 kW	22 kW/30 kW

KEY FEATURES OF SynchroTorq® SERVO MOTORS

SynchroTorq® | Servo Series

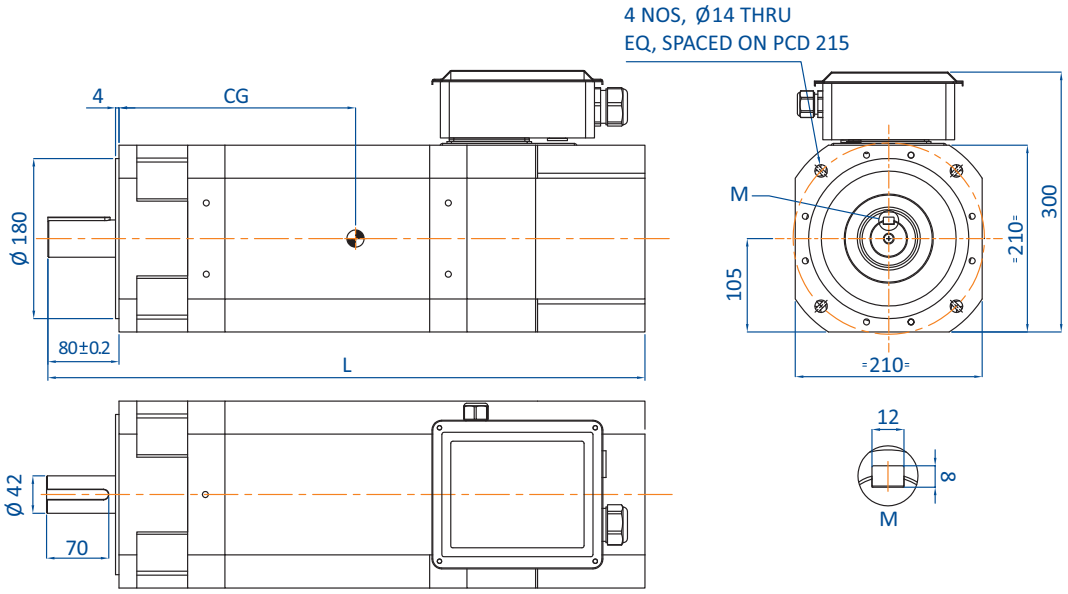
PERMANENT MAGNET SERVO MOTOR



- Servo motor insulation: Class H
- Servo motor bearings: with high temperature grease
- Winding protection: KTY and PTC temperature sensor
- Superior grade permanent magnets with excellent thermal characteristics
- IP rating: IP54 (optional IP55/IP65)
- Single phase cooling fan with high CFM
- Servo motors shaft: with or without key
- Terminal Box: connectors optional

- Pan-India after-sales service support
- Prompt deliveries
- On line technical assistance for drive parameterization support

DIMENSIONS



GA and ODD Dimensions of Servo motor (mm)

Model	STS-50-1700-215B-F-O	STS-75-1700-215B-F-O	STS-95-1700-215B-F-O	STS-125-1700-215B-F-O
L (mm)	545	580	638	673
CG (mm)	160	177	205	222
Wt. (Kg.)	61	71	85	92

Note: Colour: Black RAL9005

TECHNICAL SPECIFICATIONS OF SERVO MOTOR

Parameter	Unit	STS-50-1700-215B-F-O	STS-75-1700-215B-F-O	STS-95-1700-215B-F-O	STS-125-1700-215B-F-O
Rated Speed (n_N)	rpm	1700	1700	1700	1700
Rated Torque (M_N)	Nm	50	75	95	125
Rated Power (P_N)	kW	8.89	13.34	16.91	22.25
Frequency (f)	Hz	85	85	85	85
Rated Current (I_N)	A	20.5	29.5	35.8	51
Rated operating Voltage (V_{rms})	V	345	355	355	344
Torque Constant (Kt_N)	Nm/A	2.44	2.54	2.65	2.45
Back EMF Constant (V_s/1000)	V/rpm	163	170	178	169
Max. Torque (M_{MAX})	Nm	117	149	214	291
Current at Max Torque (I_{MAX})	A	54.4	65.5	87.5	136.8
Max Speed (n_{MAX})	rpm	2500	2500	2500	2500
Moment of Inertia (J)	10^{-3} kgm^2	13.3	16.4	22.3	25.4
Weight	Kg	61	71	85	92

DRIVES PRODUCT RANGE

AC Drives upto 900 kW in partnership with KEB Automation, Germany

F5 Multi
Regenerative Drive R6 &
AFE Solutions

General Purpose AC Drives upto 110kW - BL51/52 VFD

Servo Drives in partnership with KEB Automation, Germany

S6 Intelligent Servo
F5 Multi

KEB H6 Multi Axis Drives for Plastic All Electric IMM

ALL INDIA SERVICE NETWORK

- Regional Offices
- Works
- Service Centre: Drives
- Service Centre: Servo Motors

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