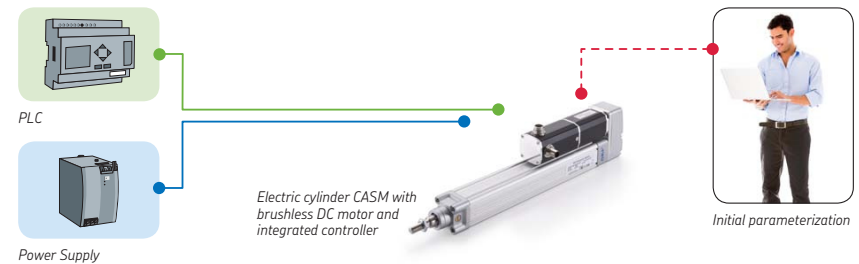# CASM electric cylinders with brushless DC motors

Introduction

CASM electric cylinders powered by brushless DC motors are ideally suited for fast and powerful movements. Replacement of pneumatic cylinders has never been easier. Just parameterize the cylinder by using the SKF Drive Assistant software and benefit from variable speed, high positioning accuracy, high force and long lifetime. The highly efficient electric cylinder will help to increase productivity with less energy consumption and therefore less CO_2 emissions. Due to the tremendous energy savings electric cylinders provide, when compared to pneumatic solutions, the investment cost will be paid back in a short time period.

After the parameterization, the DC powered cylinder can be operated independently by PLC or by switches. The motion controller is already built in.

CASM with Dunkermotoren connecting diagram

PLC

Power Supply

Electric cylinder CASM with brushless DC motor and integrated controller

Initial parameterization

Size comparison

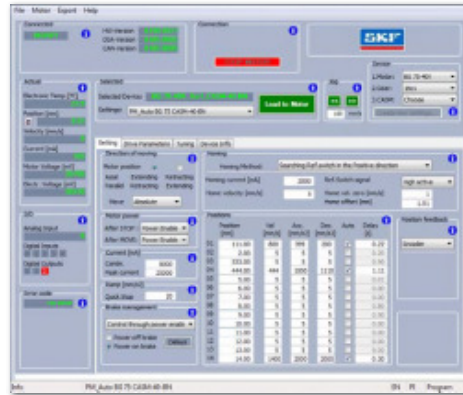| Data overview			BG 45x30 PI			BG 65Sx50 PI			BG 75x75 PI			BG 75x75 PI		
Motor type														
Linear unit			CASM-32			CASM-40			CASM-40			CASM-63		
Screw type			LS	BS	BN	LS	BS	BN	LS	BS	BN	LS	BN	BF
Peak force	F_{peak}	[N]	300	700	462	600	1 170	526	600	2 375	1 484	1 000	1 885	942
Mean load	F_m	[N]	300	327	131	465	440	198	600	1 020	459	692	583	292
Max. linear speed	v_{max}	[mm/s]	60	150	500	70	300	825	70	300	825	70	530	1 060
Max. acceleration	a_{max}	[m/s²]	1	6	6	1	6	6	1	6	6	1	6	6

SKF

SKF Drive Assistant

Parameterize CASM with brushless DC motors with just a few clicks, using the SKF Drive Assistant (requires a Windows PC).

SKF Drive Assistant

- Select your linear unit, gearbox and motor and parameterize up to 14 positions in mm, not in encoder counts
- Choose individual motion profiles (acceleration, speed, deceleration) for each position
- Upload parameters into the motor by using the USB interface cable to get an independent system
- Get real time information about your connected motor

Operation

- Let your powered system move either with standard switches, with PLC binary outputs or with an autonomous positioning loop.
- Get feedback of the motor in case it is moving, has reached its position but also if it hasn't found the home position or if there is an error.

Positioning Modules

Simple
- Move between two positions
- Define one speed, acceleration and deceleration for both positions
- "Move-enable" for safety functions

Standard
- Move between six positions
- Define one speed, acceleration and deceleration for each position
- "Move-enable" for safety functions

Advanced
- Move between 14 positions
- Define individual speed, acceleration and deceleration for each position

Typical Applications

Replacement of pneumatic cylinders
Tilt tray sorters, cutting machines, opening and closing hoods, clamping and fixturing, folding, stopping, labelling, etc …

Typical Applications

Conveyor sorters (diverters) of packaging machines, positioning functions, valve control systems, adjustable filling and portioning systems

Typical Applications

Electric presses, woodworking machines, handling applications, testing equipment, special applications where different speeds or plenty of positions are needed

Automatic Mode

The automatic mode allows the creation of an autonomous positioning loop without any PLC. As soon as the automatic mode is activated (such as by a switch), the actuator moves from one position to the next one with its defined motion profile.

Automatic mode
- Autonomous loop, moving from one position to the next one, as long as the automatic mode is active
- Selection of the positions to be taken in the loop by a mouseclick
- Activation of automatic mode such as by a switch

Typical Applications

Applications with actuators running autonomously, with no need to be coordinated with other actuators, like pumps, cutters, testing equipment etc …

Benefits of using these actuators

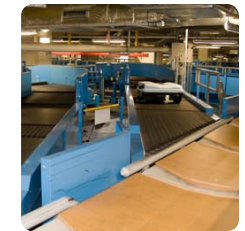| Features	Benefits
Compact size	Saves space in the application and in the switchboard
Integrated motion controller	Less wiring needed as the controller is already built-in
Programming software	Easy to parameterize motion profiles
High efficiency	Cuts energy costs and reduces CO_2 emissions
Fully tested system	Reliable and long lasting
PLC interface	Easy to operate by PLC or switches
Integrated brake	No actuator movement in case of a power loss
Variable speed	Optimizes cycle times
Lubricated for life	Reduces maintenance cost
Built-in encoders	High positioning accuracy
High quality lead- or ball-screws	High force capacity and long lifetime

Applications

Replacement of pneumatic cylinders

Material handling, pick and place

Packaging/ folding/ cutting

Sorting/ positioning/ stopping

For more information, please visit
www.skf.com/casm

Electro Mechanical Systems Limited   tel: 0118 981 7391   info@ems-ltd.com   www.ems-limited.co.uk

CASM-32

Brushless DC motor BG 45 and adapters

CASM-32 linear units with brushless DC motors are perfectly suited to replace pneumatic cylinders in many applications.

It is a very simple system to set up. Connect the motor to a 24 V DC power supply and program up to 14 motion profiles with your computer and the programming accessory kit.

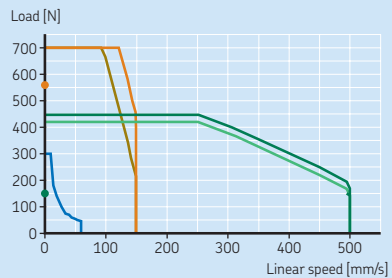After programming the motor, the motion profile can be activated by 2 – 4 binary signals (PLC outputs or switches) and the actuator will run to the defined position.

The brushless, DC motor BG 45x30 PI, comes with an internal encoder with 1 024 counts per turn for high positioning accuracy. The internal brake is activated after each movement to secure the system in case of a power loss and to give the motor time to cool down when not in operation.

The brake also enables an increase in the power performance of a full motion cycle.

For more information, please visit the following site: www.skf.com/casm

Load / linear speed diagram

Load [N]

Linear speed [mm/s]

- CASM-32-BS, a = 1 m/s^2
- CASM-32-BS, a = 6 m/s^2
- CASM-32-BS, brake
- CASM-32-LS
- CASM-32-BN, a = 1 m/s^2
- CASM-32-BN, a = 6 m/s^2
- CASM-32-BN, brake

Load = force acting on the actuator
(gravity force + acceleration force + constant force)

Order numbers for a complete actuator

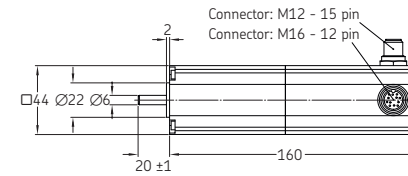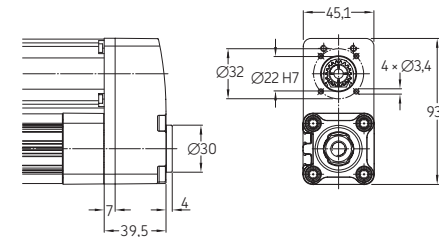|	Order No.
Linear unit according to your needs	See CASM-32 Linear units
Brushless DC motor BG 45x30 PI	BG45X30PI
Adapter kit, parallel or in-line	ZBE-37557x, see below
Accessories according to your needs	See CASM-32 Accessories
Cable kit for BG 45	ZBE-530632-xx, see below

Accessories

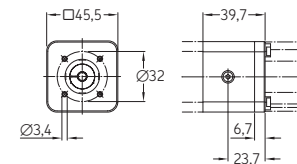|	Order No.
Programming kit for BG motor series	ZBE-530615
Cable kit 3 m for BG 45	ZBE-530632-03
Cable kit 10 m for BG 45	ZBE-530632-10
Replacement belt for parallel adapter	ZBE-375600-32

BLDC motor BG45 x 30
with PI interface and brake

Connector: M12 - 15 pin
Connector: M16 - 12 pin

Order No.:
BG45X30PI

Motor data

	Symbol	Unit	BG 45x30 PI
Nominal torque (100 K)	M	Nm	0.25
Stall torque (20 °C)	M_0	Nm	0.942
Nominal rotational speed	ω	1/min	3 360
Nominal voltage	U	V DC	24
Nominal current (100 K)	I	A	4.87
Peak current (2 s)	I_{peak}	A	15
Max. output power (20 °C)	P_{out}	kW	0.159
Inertia with brake	J	kgm^2	0.0044
Weight with brake	m	kg	0.74

Parallel adapter kit
for CASM-32 and BLDC motor BG 45

Order No.:
ZBE-375573

System capabilities

	F_{peak}	F_m[1]	v_{max}
CASM-32-LS	300 N	300 N	60 mm/s
CASM-32-BS	700 N	327 N	150 mm/s
CASM-32-BN	462 N	131 N	500 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

In-line adapter kit
for CASM-32 and BLDC motor BG 45

Order No.:
ZBE-375570

System capabilities

	F_{peak}	F_m[1]	V_{max}
CASM-32-LS	300 N	300 N	60 mm/s
CASM-32-BS	700 N	327 N	150 mm/s
CASM-32-BN	462 N	131 N	500 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

CASM-40

Brushless DC motor BG 65S and adapters

CASM-40 linear units with brushless DC motors are perfectly suited to replace pneumatic cylinders in many applications.

It is a very simple system to set up. Connect the motor to a 40 V DC power supply and program up to 14 motion profiles with your computer and the programming accessory kit.

After programming the motor, the motion profile can be activated by 2 – 4 binary signals (PLC outputs or switches) and the actuator will run to the defined position.
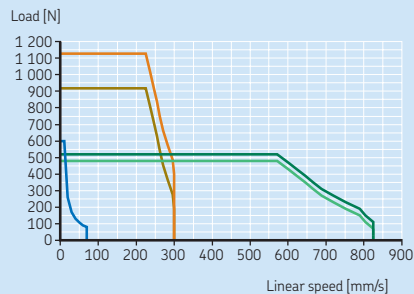
The brushless DC motor, BG 65S × 50 PI, comes with an internal encoder with 4 096 counts per turn for high positioning accuracy. The internal brake is activated after each movement to secure the system in case of a power loss and to give the motor time to cool down when not in operation.

The brake also enables an increase in the power performance of a full motion cycle.

For more information, please visit the following site: www.skf.com/casm

Load / linear speed diagram

Load [N]

Linear speed [mm/s]

— CASM-40-BS, a = 1 m/s²   — CASM-40-BN, a = 1 m/s²
— CASM-40-BS, a = 6 m/s²   — CASM-40-BN, a = 6 m/s²
— CASM-40-LS

Load = force acting on the actuator
(gravity force + acceleration force + constant force)
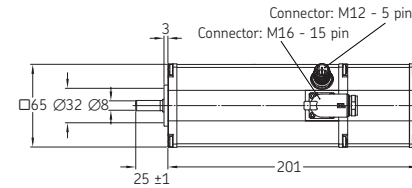
Order numbers for a complete actuator

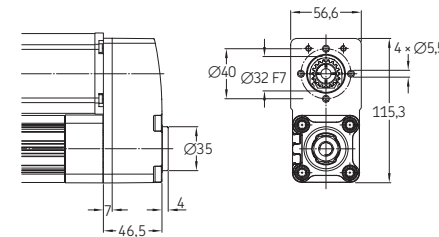|	Order No.
Linear unit according to your needs	See CASM-40 Linear units
Brushless DC motor BG 65S × 50 PI	BG65SX50PI
Adapter kit, parallel or in-line	ZBE-37557x, see below
Accessories according to your needs	See CASM-40 Accessories
Cable kit for BG65S	ZBE-530634-xx, see below

Accessories

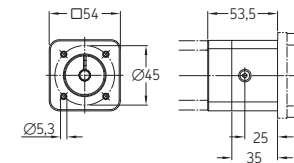|	Order No.
Programming kit for BG motor series	ZBE-530615
Cable kit 3 m for BG 65S	ZBE-530634-03
Cable kit 10 m for BG 65S	ZBE-530634-10
Replacement belt for parallel adapter	ZBE-375600-40

BLDC motor BG 65Sx50 PI

with PI interface and brake

Connector: M12 - 5 pin
Connector: M16 - 15 pin

Motor data

	Symbol	Unit	BG 65Sx50 PI
Nominal torque (100 K)	M	Nm	0.64
Stall torque (20 °C)	M_0	Nm	1.41
Nominal rotational speed	ω	1/min	3 595
Nominal voltage	U	V DC	40
Nominal current (100 K)	I	A	7
Peak current (2 s)	I_{peak}	A	20
Max. output power (20 °C)	P_{out}	kW	0.395
Inertia with brake	J	kgm²	0.0129
Weight with brake	m	kg	1.65

Parallel adapter kit

for CASM-40 and BLDC motor BG 65S

System capabilities

	F_{peak}	F_m[1]	v_{max}
CASM-40-LS	600 N	465 N	70 mm/s
CASM-40-BS	1 170 N	440 N	300 mm/s
CASM-40-BN	526 N	198 N	825 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

In-line adapter kit

for CASM-40 and BLDC motor BG 65S

System capabilities

	F_{peak}	F_m[1]	V_{max}
CASM-40-LS	600 N	465 N	70 mm/s
CASM-40-BS	1 170 N	440 N	300 mm/s
CASM-40-BN	526 N	198 N	825 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

CASM-40

Brushless DC motor BG 75 and adapters

CASM-40 linear units with brushless DC motors are perfectly suited to replace pneumatic cylinders in many applications.

It is a very simple system to set up. Connect the motor to a 40 V DC power supply and program up to 14 motion profiles with your computer and the programming accessory kit.

After programming the motor, the motion profile can be activated by 2 – 4 binary signals (PLC outputs or switches) and the actuator will run to the defined position.
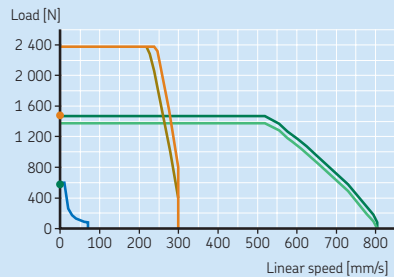
The brushless DC motor, BG 75 × 75 PI, comes with an internal encoder with 4 096 counts per turn for high positioning accuracy. The internal brake is activated after each movement to secure the system in case of a power loss and to give the motor time to cool down when not in operation.

The brake also enables an increase in the power performance of a full motion cycle.

For more information, please visit the following site: www.skf.com/casm

Load / linear speed diagram

Load = force acting on the actuator
(gravity force + acceleration force + constant force)

- CASM-40-BS, a = 1 m/s²
- CASM-40-BS, a = 6 m/s²
- CASM-40-BS, brake
- CASM-40-LS
- CASM-40-BN, a = 1 m/s²
- CASM-40-BN, a = 6 m/s²
- CASM-40-BN, brake

Order numbers for a complete actuator

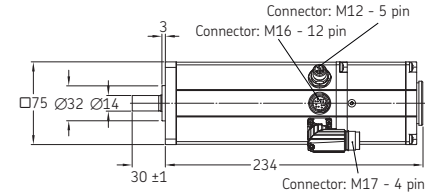|	Order No.
Linear unit according to your needs	See CASM-40 Linear units
Brushless DC motor BG 75 × 75 PI	BG75X75PI
Adapter kit, parallel or in-line	ZBE-37557x, see below
Accessories according to your needs	See CASM-40 Accessories
Cable kit for BG 75	ZBE-530630-xx, see below

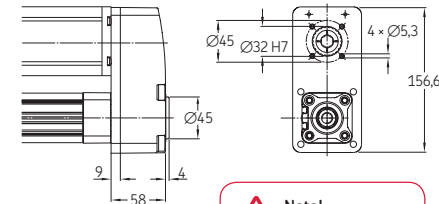### Accessories

	Order No.
Programming kit for BG motor series	ZBE-530615
Cable kit 3 m for BG 75	ZBE-530630-03
Cable kit 10 m for BG 75	ZBE-530630-10
Replacement belt for parallel adapter	ZBE-375600-63

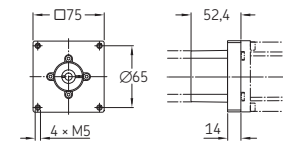## BLDC motor BG 75x75 PI

with PI interface and brake

Connector: M12 - 5 pin
Connector: M16 - 12 pin
Connector: M17 - 4 pin

Order No.:
BG75X75PI

Motor data

	Symbol	Unit	BG 75x75 PI
Nominal torque (100 K)	M	Nm	1.16
Stall torque (20 °C)	M_0	Nm	4.1
Nominal rotational speed	ω	1/min	3 700
Nominal voltage	U	V DC	40
Nominal current (100 K)	I	A	12.7
Peak current (2 s)	I_{peak}	A	50
Max. output power (20 °C)	P_{out}	kW	0.95
Inertia with brake	J	kgm²	0.062
Weight with brake	m	kg	3.08

Parallel adapter kit

for CASM-40 and BLDC motor BG 75

> **Note!**
> For swivel flanges see CASM-63 Accessories.

Order No.:
ZBE-375578

System capabilities

	F_{peak}	F_m[1]	v_{max}
CASM-40-LS	600 N	600 N	70 mm/s
CASM-40-BS	2 375 N	1 020 N	300 mm/s
CASM-40-BN	1 484 N	459 N	825 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

In-line adapter kit

for CASM-40 and BLDC motor BG 75

Order No.:
ZBE-375579

System capabilities

	F_{peak}	F_m[1]	V_{max}
CASM-40-LS	600 N	600 N	70 mm/s
CASM-40-BS	2 375 N	1 020 N	300 mm/s
CASM-40-BN	1 484 N	459 N	825 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

CASM-63

Brushless DC motor BG 75 and adapters

CASM-63 linear units with brushless DC motors are perfectly suited to replace pneumatic cylinders in many applications.

It is a very simple system to set up. Connect the motor to a 40 V DC power supply and program up to 14 motion profiles with your computer and the programming accessory kit.

After programming the motor, the motion profile can be activated by 2 – 4 binary signals (PLC outputs or switches) and the actuator will run to the defined position.
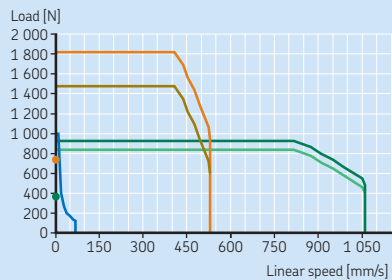
The brushless DC motor, BG 75 × 75 PI, comes with an internal encoder with 4 096 counts per turn for high positioning accuracy. The internal brake is activated after each movement to secure the system in case of a power loss and to give the motor time to cool down when not in operation.

The brake also enables an increase in the power performance of a full motion cycle.

For more information, please visit the following site: www.skf.com/casm

Load / linear speed diagram

Load [N]

Linear speed [mm/s]

- CASM-63-BS, a = 1 m/s^2
- CASM-63-BS, a = 6 m/s^2
- CASM-63-BS, brake
- CASM-63-LS
- CASM-63-BN, a = 1 m/s^2
- CASM-63-BN, a = 6 m/s^2
- CASM-63-BN, brake

Load = force acting on the actuator
(gravity force + acceleration force + constant force)

Order numbers for a complete actuator

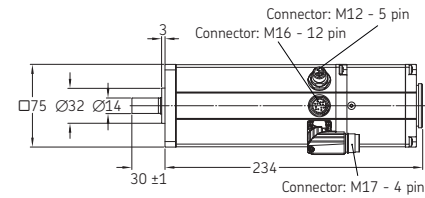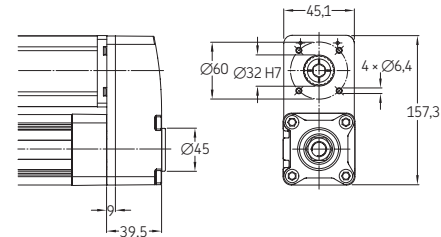|	Order No.
Linear unit according to your needs	See CASM-63 Linear units
Brushless DC motor BG 75 × 75 PI	BG75X75PI
Adapter kit, parallel or in-line	ZBE-37557x, see below
Accessories according to your needs	See CASM-63 Accessories
Cable kit for BG 75	ZBE-530630-xx, see below

Accessories

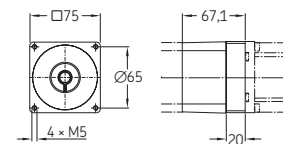|	Order No.
Programming kit for BG motor series	ZBE-530615
Cable kit 3 m for BG 75	ZBE-530630-03
Cable kit 10 m for BG 75	ZBE-530630-10
Replacement belt for parallel adapter	ZBE-375600-63

BLDC motor BG 75x75 PI
with PI interface and brake

Connector: M12 - 5 pin
Connector: M16 - 12 pin
Connector: M17 - 4 pin

Order No.:
BG75X75PI

Motor data

	Symbol	Unit	BG 75x75 PI
Nominal torque (100 K)	M	Nm	1.16
Stall torque (20 °C)	M_0	Nm	4.1
Nominal rotational speed	ω	1/min	3 700
Nominal voltage	U	V DC	40
Nominal current (100 K)	I	A	12.7
Peak current (2 s)	I_{peak}	A	50
Max. output power (20 °C)	P_{out}	kW	0.95
Inertia with brake	J	kgm^2	0.062
Weight with brake	m	kg	3.08

Parallel adapter kit
for CASM-63 and BLDC motor BG 75

Order No.:
ZBE-375575

System capabilities

	F_{peak}	F_m[1]	v_{max}
CASM-63-LS	1 000 N	692 N	70 mm/s
CASM-63-BN	1 885 N	583 N	530 mm/s
CASM-63-BF	942 N	292 N	1 060 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm

In-line adapter kit
for CASM-63 and BLDC motor BG 75

Order No.:
ZBE-375572

System capabilities

	F_{peak}	F_m[1]	V_{max}
CASM-63-LS	1 000 N	692 N	70 mm/s
CASM-63-BN	1 885 N	583 N	530 mm/s
CASM-63-BF	942 N	292 N	1 060 mm/s

[1] Mean load over full cycle. For more information please visit skf.com/casm