Healthcare applications with solutions from SKF



## SKF... your healthcare partner

While reliability, stability, functionality and safety are absolute essentials, we never loose sight of aesthetics, which enables many of our products to be discretely built into an application.

In cases where a unique solution is required, we can integrate motion into your application seamlessly. This can take many forms including joint development and/or cost sharing. In addition to our full line of linear motion products, we can supply entire "plug and play" assemblies manufactured and tested to meet your specifications.

## Explore the possibilities

Your customers are continually raising their expectations of product performance and reliability – demanding equipment that is safer, consumes less energy, runs quieter, faster and longer, and requires less maintenance. To meet these growing challenges and stay competitive, you need a trusted source of knowledge and application experience to provide you with solutions that work. And for long-term results, you need a working partner that offers one source of responsibility from the design stage right through to delivery. That source is SKF.





## For a day or every day ...



## Knowledgeable solutions

From a position as the world's leading bearing manufacturer, SKF has evolved to being a provider of cost-effective and knowledgeable solutions. You can take advantage of SKF knowledge through our proprietary services and software to shorten the time required to develop and test your solution. SKF knowledge-engineering services, for example, include design verification and testing. SKF product solutions go beyond components and products to include advanced solutions in mechatronics - combining mechanical and electronic elements in a single design.

As an ISO 9001 certified company, SKF engineers will work with you to:

- Review industry standards and design specifications
- Design according to Single Fault Condition (SFC)
- Conduct a Failure Mode and Effect Analysis (FMEA)
- Conduct in-house tests to validate designs
- Provide a report that certifies compliance with medical standards
- Provide continuous product/ design improvements

# Combine motion and comfort with reliability and safety

In the medical community, where motion and comfort are two key operational parameters, beds, lifters, wheelchairs and tables are continuously re-designed to meet the needs of the patient and the caregiver. These types of applications, which integrate state of the art technology with ergonomic design and the latest safety features, must provide maximum reliability and minimum maintenance within a compact, hygienic envelope.

## Innovative & creative solutions

Combine your experience and expertise with our knowledge of linear motion solutions for medical applications and the results may surprise you. At SKF our product and applications engineers have the tools, products and experience to provide you with solutions that are designed for your application. Using a modular approach, we can provide a product or an entire assembly that contains the functionality you require. Nothing more. Nothing less.

## Install with confidence

When you install SKF products, it tells your customers that your resources include the best in state-of-the-art technology, and that your products contain some of the very best components available on the market.















## The SKF solution for adjustable beds

Modern hospital and homecare beds are getting more advanced every day. These adjustable, maintenance-free beds integrate the latest technology, safety features and ergonomics to provide optimum comfort for patients and total functionality for caregivers.

To meet the needs of medical bed manufacturers, patients and caregivers, SKF has developed a complete range of products and bed systems that vary depending on where and how the bed will ultimately be used.

SKF's electric actuation systems offer the following standard functions that can be integrated into any bed and activated with the touch of a button:

- Height adjustment
- Backrest adjustment
- Positioning for a comfortable sitting position
- Leg elevation and knee-fold
- Trendelenburg / reverse Trendelenburg position
- Fully electric controls with handset, bilateral pedals and nurse panel for locking function.

Precise, safe, secure movement and control are key factors in providing patient comfort. This can be achieved mechanically and electrically using any of the following:

- Anti-jamming system with no pulling force
- Back-up nuts
- Overload protection
- Automatic fault detection and locking.
- Built-in limit switches cut power automatically
- Manual quick-release system for Cardio Pulmonary Resuscitation (CPR)

Hospital and homecare beds





Ambulatory chair

Examinating table





To prevent bedsores and provide a comfortable upright position, an "auto contour" function is available with any standard SKF actuation system. Auto contour provides simultaneous medium movement of the back and leg rests via the control box and handset.

For beds that require additional features like a battery back-up or lockable function operated by the caregiver, the CAJC 44/54 is available. This actuator is equipped with a new generation of electronic cards controlled by a micro processor. This actuator, which is equipped with single fault detection capabilities will stop and lock the actuator in the event of a failure.



Physiotherapy table





All SKF actuator systems for beds, couches, stretchers and examination tables are based on well-proven, modular components. These system components were carefully selected to meet the functional and aesthetic requirements of the hospital and homecare environment. The product range consists of linear actuators, telescopic pillars, control units and control panels, which all comply with IEC 60.601.1 and UL 60.601.1

## CAJA 30



The CAJA 30 is a compact and quiet actuator designed for back, leg and knee support and the Hi-Lo (height adjustment) function of beds with head and foot actuators. The standard actuator has built-in limit switches, mechanical end stops, flexible attachment orientation. A back-up nut, antijamming system and the actuator lifetime monitoring system are available as options.

- Max force 3 000 N (dynamic)
- Max force 7 500 N (static)
- Max speed 13,5 mm/s
- Max noise level 47 dB
- Supply voltage 20-40 VDC
- Max amperage 3 A
- Protection class IP54/66

CAJA 35C



The CAJA 35C is a compact and quiet actuator with a mechanical quick release Cardio Pulmonary Resuscitation (CPR) function for the back support. Like the CAJA 30, this actuator has an integrated quick release that can be activated electrically or by a cable for bilateral activation. A back-up nut, anti-jamming system and actuator lifetime monitoring system are available as options.

- Max force 3 500 N (dynamic)
- Max force 8 750 N (static)
- Max speed 11 mm/s
- Max noise level 47 dB
- Supply voltage 20-40 VDC
- Max amperage 4 A
- Protection class IP54/66

CAJA 60



The CAJA 60 is a compact and powerful actuator designed for Hi-Lo support. The standard design includes built-in limit switches, a mechanical endstop and flexible attachment orientation. A back-up nut, anti-jamming system and actuator lifetime monitoring system are available as options.

- Max force 6 000 N (dynamic)
- Max force 15 000 N (static)
- Max speed 8,2 mm/s
- Max noise level 47 dB
- Supply voltage 20-40 VDC
- Max amperage 4,5 A
- Protection class IP54/66

## CAJC 41



CAJC 41 control box can operate up to 4 actuators by a handset. Redundant power switches protect the user in the event of a single fault. This Class I actuator is designed with a ground connection for the equipotential point of the bed.

- Max motor connections 4
- Other connections 1
- Supply voltage 120/230 VAC 50/60 Hz
- Max amperage 5 A
- Protection class IP54/66
- Electrical Class I / II

## CAJC 44/54



NEW



CAJC 44/54 control box is recommended for hospital bed applications. This control box can operate up to 5 actuators by a CAJH 4 handset or a CAJP 4 panel with locking function. A rechargeable battery (CAJH 1) can be used with this control box if power is not available. The battery can be recharged using a dual charging level management system. An external switch can be plug for a customized operating function. A self monitoring of the box and the operating device with redundant power switching prevent the use in case of failure. The micro processor control also the current cut off per channel and per direction and the relay protection for enhanced life time. The Class I is designed with a earth connection for equipotential point of the bed.

CAJB is a battery with a built-in charger.

- Max motor connections 5
- Other connections 4 (handsets, battery and external switches)
- Supply voltage 120/230 VAC 50/60 Hz
- Max amperage 6 A
- Protection class IP54/66
- Electrical Class | / ||

• Capacity 1,2 Ah

Protection class IPx4

(Approximately 15 cycles - double stroke - of actuator under load)



CAJB

## **CAJH 1/4**



CAJH 1 is a high guality ergonomically designed handset that can provide up to 5 pre-programmed positions for 4 actuators connected to a CAJC 41 control box.

CAJH 4 is a high quality ergonomically designed handset that can provide up to 5 pre-programmed positions for 4 or 5 actuators connected to a CAJC 44/54 unit. This handset can also be connected to the CAJP 4 nurse panel.

CAJP 4



CAJP 4 nurse panel for the CAJC 44/54 has dual keys to control the locking function managed by the CAJC 44/54 control box. Extra keys enable the caregiver to provide additional ergonomic functionality.

- Keys: up to 10
- LED Power ON indicator
- Protection class IP54/66
- Keys: up to 10
- Dual LED battery indicator
- Protection class IP54/66
- Two sockets for handset CAJH 4
- Keys: up to 12. whereof 2 are used for the lock/unlock function
- Locking function managed by the CAJC 44/54, controlled by 2 keys lock/unlock and the keys of the function
- Protection class IP54/66
- Dual LED battery indicator

External switch, operating device switch External switches can be connected to the CAJC 44/54 for a customised function such as: lock/unlock all actuators, stop one actuator, stop one actuator in one direction. Other external switches can be connected as an operating device CAJH 4 or CAJP 4.



Protection class IPx4/66

**CRAB 05** 



The CRAB 05 recliner is a new gearbox concept that continues the SKF traditions of innovation and guality. The new gearbox provides an affordable rotary alternative to linear actuators making it possible to develop innovative, attractive solutions that will differentiate your products from competitors.

Subject to customization - can be used with or without motor. Contact your local SKF representative for further details.

## Telemag



Pillars in the TELEMAG series feature the best combination of minimum retracted length and long stroke length. They are used wherever robust and safe guiding systems are needed. The line of Telemag actuators is complimented by the BCU, VCU and SCU control units, which enable a flexible and application focused system control.

- Max load 4000 N
- Max speed 42 mm/s
- Supply voltage 24/120/230 V
- Max amperage 6,5 A
- Protection class IP30/40

## Runner



Look at this! 12000 N

The RUNNER is a very compact, highperformance actuator that combines dynamic load capabilities of 12 000 N with good speed characteristics. The system includes a single fault control unit that accommodate up 3 actuators as well as associated accessories. The RUNNER system is compatible with the DC Telemag series. With a safety factor of 4 based on a static load of 10 000 N, the RUNNER is capable of an incredible 40 000 N breakdown load (without back drive).

- Max load 12000 N
- Max speed 7,5 mm/s
- Supply voltage 24 VDC
- Max amperage 7 A
- Protection class IPx4/X6

Matrix



Actuators in the MATRIX series, which can be installed at virtually any angle, are compact, powerful and quiet and are available for either AC or DC applications. The Matrix can be used with the BCU, VCU or SCU control unit to enable flexibility based on customer needs.

- Max load 8000 N
- Max speed 18 mm/s
- Supply voltage 24/120/230 V
- Max amperage 5,2 A
- Protection class IP66



The Versatile Control Unit (VCU) and Smart Control Unit (SCU) are equipped with a new generation of electronic card controlled by a micro processor. The card provides protection against single faults and initiates an automatic shut-off and lock in the event of a problem. The control unit can operate up to 6 SKF actuators. An external battery can be plugged in under the control unit. Operating devices like the CAJH 4 and CAJP 4 can be plugged into the unit.

- Type micro processor
- Max motor connections up to 5 without encoder (VCU)
- Max motor connections up to 6, with encoder (SCU)
- Supply voltage 120 / 230 VAC
- Max amperage 10 A
- Protection class IPx6/66
- Electrical Class I / II

BCU



The Basic Control Unit (BCU) can operate up to 3 actuators, RUNNER, MATRIX, TELEMAG or CAJA. The BCU can be operated as a stand-alone or mounted directly on the RUNNER. A cover prevents the plugs from becoming disconnected accidently.

- Type standard
- Max motor connections 3
- Supply voltage 120/230 VAC
- Max amperage 7 A
- Protection class IPx4
- Electrical Class I / II

## Actuator lifetime monitoring



Available for most standard SKF actuators, the SKF Actuator lifetime monitoring system displays the actuator's current condition through a simple LED colour change sequence. At the end of the actuators specified life the LED indicator will turn red and a buzzer will sound to indicate it needs replacing.

A more sophisticated version of the system connects to a PC/Laptop or a Pocket PC (PDA), so that the captured data can be downloaded for further analysis.

The SKF Actuator lifetime monitoring system has no special mounting requirements as the external dimensions of the actuator remain unchanged.

- Integrated LED provides a continuous visual indication of the actuator life condition.
- Onboard buzzer provides an audible warning when the actuator reaches its defined sevice life.
- Each actuator's non-volatile memory device records life usage in real time.
- Simple download interface to collect usage data, enables service providers to keep accurate records and propose a proactive maintenance plan.

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## SKF solutions for powered chairs and wheelchairs

People who are temporarily or permanently bound to a wheelchair have very specific, very individual needs. These needs become requirements when the wheelchair is that person's mobility link with the world.

## Mobility - a human right!

The modern wheelchair needs to be as discrete and effective as possible at replacing or augmenting lost patient function. It is an issue of adaptability. A wheelchair must provide an almost infinite number of movements, angles and positions.

At SKF we have a wide range of products and solutions for powered chairs and wheelchairs. Our dedicated products for wheelchairs for example, are designed to accommodate the shock loads, vibrations, water and dirt that might otherwise limit a user's mobility experience.

In addition to our wide range of products, SKF also has the knowledge and expertise in the field of medical mobility to work with you to obtain the functionality that you and your customers need. Our deep understanding of these applications has made us acutely aware of the technical and functional challenges that must be solved in order to create a high-quality, safe and reliable solution that will maximize the user's comfort and mobility.



In addition to chairs and wheelchairs, SKF actuation systems can be designed for elevating applications on vehicles or the front steps of buildings to make them handicap accessible.



Seat elevating



Back-rest reclining



Horizontal position



Seat tilting



Driving and steering

At school









## All SKF actuator systems for 24 V DC powered wheelchairs are based on well-proven, modular components. These system components were carefully selected to meet user requirements for comfort and flexibility.

## CAT modular series

The 33 B is a silent, robust actuator equipped with a highly efficient 12 mm ball screw to prolong battery life.

The 33 TT is a robust and strong actuator equipped with a sliding screw.

The N actuator, designed without a protection tube, has a very short retracted length for cramped spaces. The robust design includes a brass nut for good static load ratings and ultra quiet operation.

The 44 B is an ultra quiet, robust actuator equipped with an extra powerful motor for the most demanding applications. The highly efficient 16 mm ball screw is designed to prolong battery life.

## • CAT series 33 B

- Max load 4 000 N
- Max speed at no load 17 mm/s
- Max speed at full load 13 mm/s
- Max amperage 9 A

## • CAT series 33 TT

- Max load 3 000 N
- Max speed at no load 10 mm/s
- Max speed at full load 8 mm/s
- Max amperage 3,7 A

## • CAT series N

- Max load 3 000 N
- Max speed at no load 9 mm/s
- Max speed at full load 7 mm/s
- Max amperage 9 A

## • CAT series 44 B

- Max load 5 400 N
- Max speed at no load 12 mm/s
- Max speed at full load 10 mm/s
- Max amperage 9 A

CAT D

CAT D series are actuators designed with flat motors. With unique standard of performance, durability and reliability, these actuators are suitable for the most demanding applications.

- Max load 3 000 N
- Max speed at no load 7 mm/s
- Max speed at full load 5 mm/s
- Max amperage 5 A





FD series	FD series is a system of 1 or 2 actuators with a control box and a handset for lift chairs and easy chairs. These actua- tors are compatible with CB200/300/800 control boxes and HS hand sets.	<ul> <li>Max load push 6 000 N / 3 000 N</li> <li>Max speed 4,2 mm/s / 8,2 mm/s</li> <li>Supply voltage 12/24 VDC</li> <li>Max amperage 3 A</li> <li>Protection class IP 52</li> </ul>
CRAB 05	The CRAB 05 recliner is a new type of rotary actuator based on a patented tech- nology suitable for seat, back rest and/or leg movements.	Subject to customization. Contact your local SKF representative for further additional details.
Hub motor	Customised motor solutions.	Subject to customization. Contact your local SKF representative for further additional details.
Felemag	The TELEMAG series features the best combination of minimum retracted length and long stroke length. They are used wherever robust and safe guiding systems are needed. The line of TELEMAG actuators is complimented by the BCU, VCU and SCU control units, which enable a flexible and application focused system control.	<ul> <li>Max load 400 N</li> <li>Max speed at no load 42 mm/s</li> <li>Supply voltage 24/120/230 V</li> <li>Max amperage 6,5 A</li> <li>Protection class IP30/40</li> </ul>
Control units & accessories	The control units facilitate a flexible and application-focused system control. They can connect up to 5 actuators and have several output options for additional func- tionality. In addition to the different control units a variety of accessories like hand and foot switches, locking devices and distribu- tor boxes are available.	<ul> <li>Types standard or microprocessor</li> <li>Motor connections max. 5</li> <li>Supply voltage 120/230 VAC</li> <li>Max amperage up to 10 A</li> </ul>
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## The SKF solution for lifters and mobile care equipment

SKF system components were carefully selected to meet patient and caregiver requirements for ergonomic comfort and safety.

## A complete electromechanical solution

In an application like a patient lifter, where comfort and safety are two key operational parameters for both the patient and the caregiver, there is a real need to integrate state of the art technology with ergonomic design and the latest safety features. In addition these lifters must provide maximum reliability and minimum maintenance within a compact, hygienic envelope.

To meet those objectives, SKF has developed a comprehensive range of products that can be customized to meet the needs of a particular application.

- 12 000 N thrust load capacity
- 40 000 N static load capacity
- Slim in-line solutions
- Stroke up to 700 mm
- Mechanical, anti-pinch protection
- Emergency lowering (mechanical or electrical)
- Vertical rack with control box, charger and battery
- High capacity, replaceable battery
- Wall mounted charging station

## A wide range of solutions.

In addition to our wide range of products, SKF also has the knowledge in the field of medical mobility to work with you to obtain the functionality that you and your customers need. Our deep understanding of these applications has made us acutely aware of the technical and functional challenges that must be solved in order to create a high-quality, safe and reliable solution that will maximize comfort and safety for both the patient and the caregiver. Actuation systems used in elevation and rotation lifter applications to transfer patients.

## Lifetime monitoring improves reliability

The SKF lifetime monitoring system was developed in response to the market need for improved reliability. Patient lifters equipped with this monitoring system not only meet the need for improved reliability but also enable more efficient maintenance.

Lifter to transfer...













All SKF actuator systems for patient lifters are based on well-proven, modular components. These system components were carefully selected to meet user requirements for comfort and flexibility. Each actuator's retracted and extended length can be customized to meet the needs of the application.

RUNNER Look at this! 12 000 N	The RUNNER is a very compact, high- performance actuator that combines dynamic load capabilities of 12 000 N with good speed characteristics. With a safety factor of 4 based on a static load of 10 000 N, the RUNNER is capable of an incredible 40 000 N breakdown load (without back drive). An emergency low- ering option is available up to 12 000 N.	<ul> <li>Max load 12 000 N</li> <li>Max speed 7,5 mm/s</li> <li>Supply voltage 24 VDC</li> <li>Max amperage 7 A</li> <li>Protection class IPx4/x6</li> </ul>
MATRIX	The MATRIX is a compact, powerful and quiet DC actuator that can be installed at virtually any angle. The Matrix can be used with the BCU, VCU, SCU or MBC control unit to enable flexibility based on customer needs. The electrical or mechanical anti- pinch protection system and an emergency lowering option are available up to 8 000 N.	<ul> <li>Max. load 8 000 N</li> <li>Max. speed 18 mm/s</li> <li>Supply voltage 24 VDC</li> <li>Max amperage 5,2 A</li> <li>Protection class IP66</li> </ul>
CAWA	The CAWA is a sturdy, compact and powerful linear drive unit designed for hanging loads. Its smooth operation and clean lines make it especially suitable for use in patient lifters and similar applica- tions. The CAW'A can be mounted easily using the T-slot that runs the full length of its body. There are 54 combinations of stroke length and carriages available as standard.	<ul> <li>Max load 1 650 N</li> <li>Max speed 22 mm/s</li> <li>Supply voltage 24 VDC</li> <li>Max amperage 7 A</li> <li>Protection class IP30</li> </ul>
CAT (R/L)	The CAT (R/L) is a modular actuator that makes it easy to interchange standard components like motors, gears, screws and attachments. CAT actuators are so simple to customize that it makes them suitable for an infinite number of ap- plications.	<ul> <li>Max load 4 000 N</li> <li>Max speed 67 mm/sec</li> <li>Supply voltage 12/24/110/230/380 V</li> <li>Max amperage 4 A</li> <li>Protection class IPx4/66</li> </ul>



## TELEMAG



Pillars in the TELEMAG series feature the best combination of minimum retracted length and long stroke length. They are used wherever robust and safe guiding systems are needed. The line of TELEMAG pillars is complimented by the BCU, VCU and SCU control units, which enable a flexible and application focused system control. Co-designed solutions can be engineered.

- Max load 4 000 N
- Max speed 42 mm/s
- Supply voltage 24/120/230 V
- Max amperage 6,5 A
- Protection class IP30/40

MOBILETTE MCU



## Control units & accessories



The MOBILETTE MBU control unit has been developed for battery powered 24 VDC actuators. The MOBILETTE unit is equipped with a replaceable battery unit and plug-in connections for one or two actuators, a hand or footswitch and a charging adapter. The emergency shut-off function and optional emergency lowering function are features integrated into the control unit. A wall mounted battery charger is available upon request.

Control units provide flexibility to the operator control system. They can accommodate up to 5 actuators and several external options. In addition to the different control units, a wide variety of accessories like hand and foot switches, locking devices and distributor boxes are also available.

- Max motor connections 2
- Supply voltage 24 VDC
- Max amperage 6,3, 7,5 or 9,5 A
- Battery capacity 4,5 Ah
- AC adapter 120/230 V

- Types standard or microprocessor
- Max motor connections 5
- Supply voltage 120/230 VAC
- Max amperage 2 x 6 A

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## Healthcare applications

Sometimes a small change can have a huge impact on performance and reliability. With a full range of advanced engineering services and solution products, SKF engineers can help you to pinpoint areas for improvement and provide solutions that will maximize the performance of your application.

Whether it's analyzing an existing design or implementing new functionality into an application, SKF product and applications engineers can enhance the performance and reliability of your finished product.







Beds & tables: Intensive care beds Maternity beds Accommodations beds Home care beds Ambulatory chairs Examination tables

Standard care beds Nursing beds Rehabilitation beds Stretchers Physiotherapy tables

**Lifters:** Patient lifters Stand up lifters Bath lifters



Wheelchairs and chairs: Power driven wheelchairs Manual wheelchairs with electrical function. Scooters Lift chairs

## Features/Benefits:

Robust design provides a cost-effective solution High-efficiency design provides long battery life Quiet operation provides comfortable use Compact design saves space, simplifies integration Modular design enables customization and design flexibility Fully sealed units require no maintenance High safety factor (2,5 to 4,0) simplifies design and approval process Service life monitoring system improves reliability and reduces maintenance Complete systems decrease development costs and time-to-market



## Contacts

## Linear motion from SKF www.linearmotion.skf.com

## Benelux

## SKF Multitec Benelux B.V.

Nederland +31 030 6029 029 Tel +31 030 6029 028 Fax

België & Luxembourg Tel +32 25 024 270 +32 25 027 336 Fax E-mail multitec\_benelux@skf.com

## Brasil

SKF do Brasil Ltda +55 11 461 991 114 Tel +55 11 461 991 99 Fax E-mail marketing.skf@skf.com.br

## Canada

SKF Canada Limited

Tel +1 416 299 1220 +1 416 299 6548 Fax E-mail www.marketing@skf.ca

### Danmark

## SKF Multitec

+45 65 92 77 77 Tel Fax +45 65 92 74 77 E-mail customerservice.multitec@skf.com

## Deutschland

SKF Linearsysteme GmbH +49 9721 657 232/233 Tel +49 9721 657 111 Fax E-mail lin.sales@skf.com

## Magnetic Elektromotoren GmbH

Tel +49 7622 695 0 +49 7622 695 101 Fax E-mail magnetic.germany@skf.com

## España & Portugal

SKF Productos Industriales S.A. +34 93 377 99 07/-77 Tel Fax +34 93 474 2039/-2156 E-mail prod.ind@skf.com

## Represented by:

## France

SKF Equipements Tel +33 1 30 12 73 00 +33 1 30 12 69 09 Fax E-mail equipements.france@skf.com

## Italia

Tel

SKF Multitec S.p.A. +39 011 22 49 01 Fax +39 011 22 49 233 E-mail multitec.italy@skf.com

## Mexico

SKF de México S.A. de C.V Tel +52 222 229 4900 +52 222 229 4908 Fax Web www.skf.com.mx

### Norge SKF Multitec

+47 22 90 50 00 Tel +47 22 30 28 14 Fax E-mail customerservice.multitec@skf.com

## Schweiz

## Magnetic Elektromotoren AG

+41 52 305 02 02 Tel +41 52 305 02 05 Fax E-mail magnetic.switzerland@skf.com

## SKF LM&PT

+41 44 825 81 81 Tel +41 44 825 82 82 Fax E-mail skf.schweiz@skf.com

## Suomi SKF Multitec

Tel +358 9 615 00 850 +358 9 615 00 851 Fax E-mail multitec.nordic@skf.com

## Sverige

SKF Multitec +46 42 253 500 Tel Fax +46 42 253 545

## U.K.

SKF (UK) Ltd +44 1582 496 735 Tel +44 1582 496 574 Fax E-mail a&mc@skf.com

### **USA**

SKF Motion Technologies Tel +1 610 861 3700 Toll free +1 800 541 3624 +1 610 861 3716 Fax E-mail motiontech.usa@skf.com

## Österreich

SKF Linearsysteme GmbH +49 9721 657 232/233 Tel +49 9721 657 111 Fax E-mail: lin.sales@skf.com

## Other countries

Fax +41 61 921 37 04 E-mail customerservice.multitec@skf.com E-mail actuators@skf.com

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