



ACTUATOR CONCEPTS



Contents



The objective of this Concens catalogue is to optimise your efforts and resources in order to find the right technical actuator solution for your projects. This catalogue is based on our experience of various markets. The catalogue contains a short introduction to **Concens** followed by a description of products and solutions.

Furthermore, it contains a description of the target market segments where **Concens** solutions will provide a sustainable competitive advantage.



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Elegance - in motion

1. About Concents

During the early 1990s a Danish company required an inline actuator. As this was not available on the market, a new design was developed. For several years it was produced only for this one customer, but in 2002 the design was changed to today's design.

This new design was nominated to receive two design prizes, and therefore a lot of people contacted the design company to find out where this new exciting actuator could be purchased. A market report was produced to investigate the potential for starting a new company to manufacture the inline actuator.

Concents started on this basis in Esbjerg on the west coast of Denmark in March 2003.

From the very start the goal of Concents was to develop and sell state-of-the-art actuators with the following features:

- Smallest actuator available worldwide
- Patented technology
- Unique, award-winning design
- Stainless steel versions
- Waterproof build-in design (IP 66/68)

And ideal for applications:

- Where design matters
- Where size matters
- In hazardous, wet or dusty environment

Vision

"To create new opportunities for people and companies to improve value, quality and competence"

Mission

"We use knowledge, innovation, and design to develop actuators that enable state-of-the-art solutions where small size, attractive design, and high precision are what matters"

Values

Innovation

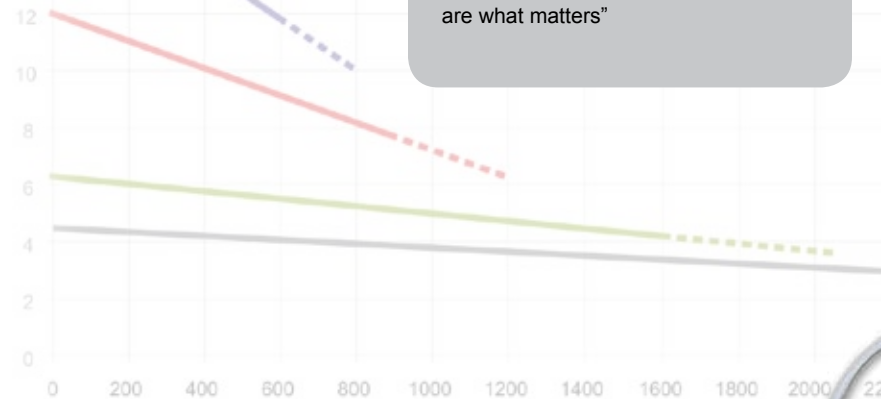
- We aim to be at the forefront of developments within our field in an ever changing market
- We aim to combine design, size and functionality with customers requirements

Perfection

- We are not satisfied until the tiniest detail is perfect whilst maintaining a clear focus on the overall solution
- We ensure that by selecting us that customers get the best products and services available

Dedication

- We are dedicated to know our customers and their needs in order to deliver the best solution
- We provide customers with solutions and services that are required to meet their needs



1.1 Patents

In today's fast moving markets, it is extremely important to protect the high costs of development. This can best be achieved by Patents and Registered Designs and Trademarks.

Concens plans to use patents for strategic important areas of the developed items. This procedure also gives a high degree of security for not spending time and money on inventing something that has already been invented and protected.

Current patents include:

Actuator

- Slide Nut Pat No.: US 6,546,825 – EP 1171726 – EP 00918720.4 – JP 09/958,878
- Noise damped linear actuator - Pat No.: PCT/DK2006/000350 – PA 2005 00883

C3 - Concens control concept

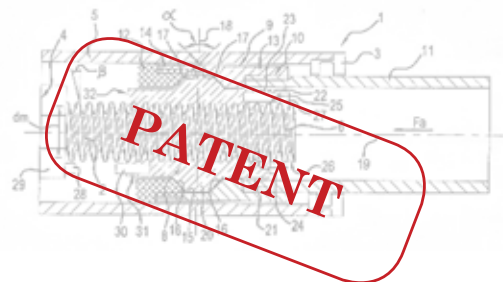
- Combination of a power supply and an electrical appliance with a magnetic holder ("5 patents in one") - Pat No.:PCT/DK2005/000315 – WO 2005/109563 – EP 1 596 461

Design (Europe)

- DR 2001 00020

Trademark & logo

- VR 2003 03471



1.2 Production

All parts are manufactured outside of **Concens** with some parts received as subassemblies.

Most mechanical parts:
Denmark and China

Spindles:
Germany/France/China/Taiwan
Gear motors:

China/Taiwan and Switzerland

Plastic parts:
Taiwan and Denmark

Batteries, Chargers and Magnets:
China

Electronics:

Denmark & Taiwan

All products are 100% tested after final assembly, and traceability is implemented throughout the assembly process.



2. Main industries and applications

The **Concens** actuator is a patented product of registered design that is capable of raising, lowering, lifting, pushing and pulling.

Through innovation and design, the Concens actuator has been created for use in a wide variety of applications. The product can be discreetly integrated into a number of environments into which rival products are unable to fit. The Concens actuator is stable and reliable.





We know that we have created the actuator of the future, and for this reason, we have, of course, patented and registered the design of the individual innovative parts of the tool.

The objective of this part is to point out some of the market segments that **Concens** has chosen to target with its products and solutions thereby enabling the optimisation of the efforts and resources.

We have segmented the actuator market on the basis of our experience and knowledge of

various markets. **Concens** has chosen to target the markets where a significant gap between the customer needs and other available solutions has been identified. **Concens** solutions and products have been developed and positioned for these segments.

These segments have been partitioned in the following areas:

	Application	Features & benefits
Rehab / Medical	 <p>Wheelchairs - Manual Wheelchairs - Automatic Toilet/Shower Chairs Personal Lifts / Hoists Massage Benches and Operation Tables Clinic and Therapeutic Chairs</p>	<ul style="list-style-type: none"> • Design • Small size • Low noise • Low power consumption • Hygienic – easy to clean (IP66/68)
Industry	 <p>Food and Medical Industry Process Industry Kitchens (Hospitals etc.)</p>	<ul style="list-style-type: none"> • Easy interface with PLCs and other controllers • Adaptable to industry speed and load requirements • Compact size and design • Stainless steel models available • Hygienic, waterproof, and easy to clean (IP66, IP68 and IP69K)
Mobile and Maritime	 <p>Handicap Cars Maritime Trains / Buses / Special Vehicles</p>	<ul style="list-style-type: none"> • Small and compact design • Design and RAL colours • Low power consumption • Easy interface with PLCs and other controllers • Adaptable to suit industry speed and load requirements • Stainless steel versions available (IP66, IP68 and IP69K)
Other applications	 <p>Windows SHEV - Smoke & Heat Exhaust ventilation Home Appliances</p>	<ul style="list-style-type: none"> • Design, including all RAL colours • Small, compact design • Low noise • Low power consumption • No cable – battery operated

2.1 Rehab/Medical



Wheelchairs - Manual



Manual wheelchairs are typically of a quite simple design. They are propelled manually using hands and arms to turn the wheels or being pushed by another person. Manual wheelchairs can be equipped with actuators. The actuators can be controlled and driven by a control unit such as the C3 system. The number of C3 boxes and remote controls depends on the electrical functions of the chair.

Other variants of the manual wheel chair use the C3 system for the power supply and control of special motors, which either helps the user to drive the chair or provide complete propulsion without the use of hand and arm. These types of chairs are typically used in nursing homes as well as other small enclosed areas.

Manual wheel chairs are often of a low weight and are compact units with a nice design. The Concens C3 system and actuators suit this requirement. Due to the battery supply the actuators are generally powered by 24 V DC.

Typical applications

- Individual leg support
con35, gearing 1:27
- Central foot pad
Changing angle of foot pad - con35, gearing 1:51, 24 V DC.
Displacement of foot pad - con35, gearing 1:27

- Adjust seat height
1 con50 or 2 con35, as 2 actuators can contribute to very compact dimensions.
- Seat tilt
1 con35 for tilting the seat.
- Reclining back
1 con35 or con50. Requirements regarding speed and load capacity (gearing) are dependent on load specification and structure.
- Head support and arm rest
con35 to adjust angle and height

Control and supply

C3 system with battery remote control and charger.



Wheelchairs - Automatic



Electrical wheelchairs have batteries integrated for propulsion. Simultaneously, the batteries are used as power supply for different actuators mounted in the chair. The chair has typically one central control unit to control both propulsion and actuators.

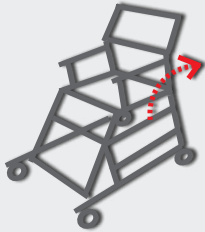
The current consumption of each actuator can be adjusted continuously by the control unit. Concens actuators are due to the design and compact dimensions specially suited for electrical wheelchairs. Due to the battery supply the actuators are powered by 12/24 VDC.

Typical applications

- Individual leg support
con35, gearing 1:27
- Central foot pad
Changing angle of foot pad - con35, gearing 1:51, 24 V DC
Displacement of foot pad - con35, gearing 1:27
- Adjust seat height
1 con50 or 2 con35, as 2 actuators can contribute to very compact dimensions.
- Seat tilt
1 con35 for tilting the seat. Gearing is dependent on construction and specification.
- Reclining back
1 con35 or con50. Requirements to speed and load capacity (gearing) are dependent on load specification and structure.
- Head support and arm rest
con20 or con35 to adjust angle and height.
The specifications are dependent on construction and application.



Toilet / Shower chairs



Toilet/shower chairs are used as auxiliary equipment for shower and toilets assist to support people with their personal hygiene. The basic version of the chairs lacks adjustment or has a gas spring supported adjustment option at the tilt angle.

There are several electrical variations of these chairs. The simplest application is to replace the

gas spring for the tilt angle with an actuator.

In more advanced chairs there can be one or two actuators to lift the seat area by approximately 400 mm lift of the seat area as well as one actuator for the tilt function. To lift the seat area other variations have actuators or built-in spindle systems in columns mounted on each side of the chair. The electrical adjustment is done by the nursing staff.

Today's toilet/shower chairs are engineered structures and considering the conditions of access in private homes also very compact units. Both the C3 system and our actuators are well suited due to their unique design and limited built-in measures.

In general, it is necessary for the toilet/shower chairs to be waterproof systems. Control units and actuators must at least be classified as IP65. Concens solutions fulfil this requirement.

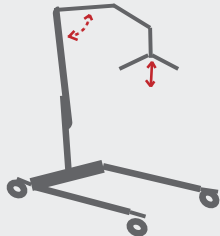
Due to the battery supply the actuators are generally powered by 12/24 V DC.

Typical applications

- Control and supply
C3 system with battery remote control and charger.
- Seat tilt
con35, gearing 1:51 or con50 with gearing dependent on design and load specifications.
- Seat height
One or two con50, or 2 con35 synchronised.



Personal lifts/hoists



Personal lifts are used as auxiliary equipment to lift people in and out of beds, wheelchairs and toilet/shower chairs. Before the lift, the person is arranged in a sling supplied with girths and belts attached to the cradle of the personal hoist. The distance between the legs can be extended to increase stability.

Personal lifts are usually electrically operated. In the simplest version only one actuator is applied to lift the person. The distance between the wheels must be adjusted manually. In the more advanced types of lift the leg moving functions are operated by an actuator.

The Concens actuator is ideal for use in mechanical aids. Its simple design is easy to

integrate and it provides people with a functional tool to take care of heavy lifting. Its rounded ends mean that there are no sharp edges to cause injury.

The design of the C3 system and Concens actuators match the modern design of today's personal lifts.

The C3 system and actuators can be delivered in any RAL colour, emphasising the design of the personal lift. The easy with which a battery can be changed is a competitive advantage. This area often requires waterproof solutions. Control solutions and the actuators must be classified as IP65. The C3 system and Concens actuators fulfil this requirement.

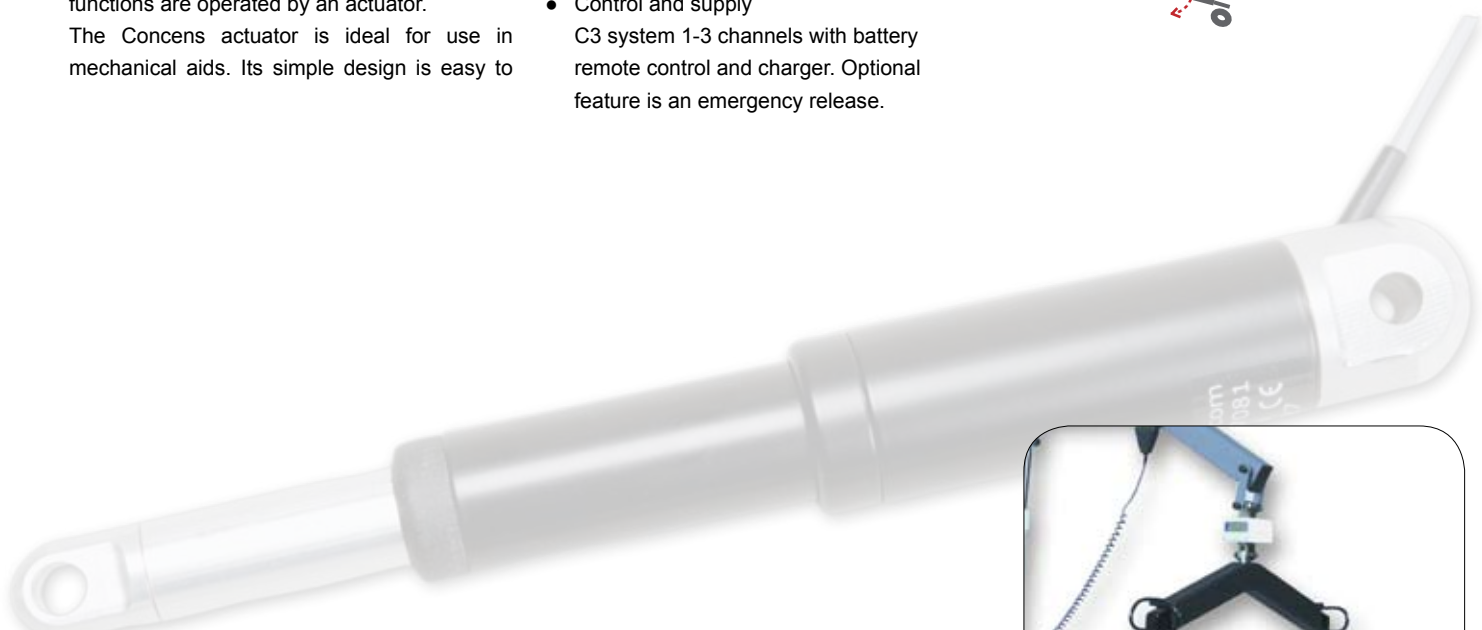
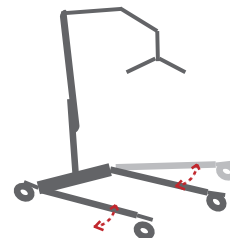
As lifting actuator a con50 with safety nut, spline and mechanical emergency lowering is provided.

Due to the battery supply the actuators are generally powered by 12/24 V DC.

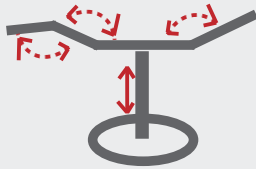
Typical applications

- Control and supply C3 system 1-3 channels with battery remote control and charger. Optional feature is an emergency release.

- Leg angle actuator 1 or 2 con35. Gearing and stroke length are dependent on structural design and load specification.



Massage Benches / Operation Tables



Massage benches are supported by a column at the centre of the bench or a scissors arrangement. The height can be adjusted using an actuator. Furthermore, the different parts such as head, back, thigh and leg can be adjusted either manually, using gas springs or using actuators.

In this area functionality and design are of greater importance. Both our C3 system and our actuators are well suited to this application due to the design and the minimum space requirements.

The user-friendly C3 battery system has an advantage, because charging and supply cables on competing actuator systems will often be a problem in normal applications. This applies especially to the applications such as emergency room level beds when the bench is not stationary.

Most applications require a waterproof system. The control and the actuators must be classified as IP66. The C3 and Concens actuators fulfil this requirement.

Due to the battery supply the actuators are generally powered by 12/24 V DC.

Typical applications

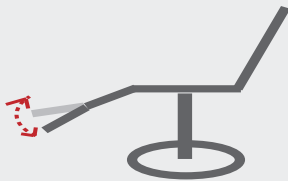
- Adjustment
con35 typically with gearing 1:27, 1:51 or 1:71 in different stroke lengths.
- Side tilt
One con35 with gear 1:51 or 1:71, up to 100 mm stroke length.

Control and supply

C3 system with battery remote control and charger.



Clinic and Therapeutic Chairs



The thing that is common to this area is that they are supported by a central column. The different head, back, thigh and leg areas can

be adjusted individually either manually using gas springs or electrically using actuators. The solutions are often used in combination.

In this application group, there is a tendency for increased functionality to be of greater importance as well as the design.

Typical applications

- Control and supply
C3 system with battery, remote control and charger.

- Adjustment
con35 typically with gearing 1:27, 1:51 or 1:71 in different stroke lengths.
- Adjustment of leg support
con35, gearing 1:27 or 1:51 with approx. 100 mm stroke length.

Control and supply

C3 system with battery, remote control and charger.



2.2 Industry

Food, Medical and Processing Industries

Due to hygiene requirements, resistance to detergents and cleaning methods, there is a distinct need for stainless steel components in the food, medical and processing industries.

The Concens actuator is a precision tool that can be integrated into sterile environments. The actuator design, with its rounded edges and linear shape means it is also easy to clean.

All Concens actuators can all be supplied in stainless steel. We also offer two different quality standards, AISI 304 or AISI 316 (including front and rear brackets). Thus providing a unique opportunity to meet market requirements for in-line electrical actuators.

The combination of high performance and the compact in-line design makes it easy to utilise our actuators in a wide range of food and medical industry applications. Stability, flexible cabling, ease of operation, simple installation



and service are just some of the qualities that make Concens actuators powerful alternatives to hydraulics and pneumatics.

Purchasing an actuator system costs less and has fewer variable costs than similar hydraulic or pneumatic systems. For conditions where hygiene, environmental and energy consumption requirements are paramount and rising, an actuator solution is well worth considering.

Compared to hydraulic and pneumatic systems, the electric actuator is easier to control and thus more precise. It is particularly suited for use in harsh environments where cleaning is carried out using liquids under high pressure. Concens offers a complete system where the actuator and its positioning can be controlled by a standard industry PLC using an interface box between the actuator and the PLC.

Both con35 and con50 can be supplied with optional Hall sensors. It is often the case that these industries demand this kind of solution, because there is a need for systems where the actuator speed, positioning and synchronisation can be controlled. The Concens control unit allows the actuator to have a soft start and stop.

The control unit makes it easy to modify existing pneumatic based applications with actuators from Concens.



Concens actuators are available with 12 / 24 VDC versions.

Hall sensors at the motor axle ensure extremely accurate displacement of the piston rod.

Typical applications

- Automation purposes
- Work environment improvement, e.g. height adjustment
- Applications for functions requiring lifting, turning, adjusting, pulling, etc. con35 or con50. Torque according to need and depending on requirements. con35 and on50 can be supplied in IP66, IP 68 and IP69K and in stainless steel AISI 304 or 316.

Control and supply

Supply from the 12V or 24 VDC systems. Relay control. Concens can supply various power supply system. For accurate positioning a combination of Hall sensors and special OEM control is needed.



Example:

Gearing 50:1 (A), Lead screw pitch 2 mm (B)

Resolution per Hall pulse is: $B/A \text{ mm} = 2/50 \text{ mm} = 0.04 \text{ mm}$

Industrial Kitchens

performance and the compact in-line design allows the actuators to be used in a variety of kitchen applications.

Due to stringent hygiene requirements, resistance to detergents and common cleaning methods in kitchens, the use of stainless steel components is commonplace. With **Concens** actuators, all of which can be made of stainless steel as well as in AISI 304 or AISI 316 (including front and rear brackets), there is a unique opportunity to match the market requirements for in-line electrical actuators.

There is an increasing demand for ergonomic design and optimum workplace layouts. Actuators are excellent for applications such as, the workspace height adjustment or tilting of heavy load equipment. The combination of high

Concens actuators are available in 12 / 24 VDC versions.

Typical applications

- If application is moving around, then a

perfect solution is the unique C3 battery operated system with wireless 24 GHz and wired handset.

- Work environment improvement, e.g. height adjustment.
- Applications for functions requiring lifting, turning, adjusting, pulling, etc. con35, stroke length approx. 350 mm. Torque can be varied to suit application.

Control and supply

Supply from the 12V or 24 VDC systems Relay controlled. **Concens** can supply a number of power supply options.



2.3 Mobile and Maritime

Vehicles for the disabled and auxiliary equipment

Vehicles for the disabled can either be equipped for transporting the disabled, for instance four passengers and their wheelchairs are loaded in the vehicle, while a driver is located in a normal driving seat or they can be equipped so that the handicapped person can drive the car himself, typically from a specially adapted driver seat,.

Many new vehicles for the disabled are built with hidden auxiliary equipment. Users are increasingly demanding that their cars are the focus of attention and not their handicap. Concens actuators allow companies modifying vehicles to meet buyer demands. We offer a wide range of compact and high performance actuators with unique designs. All models can be supplied in 12 or 24 V DC versions.

For the majority of applications, the actuators are powered by the 12 VDC system of the car.

Typical applications

- Parking brake
One con35, stroke length typically 50-100 mm. Torque variable, depending on car type and braking system.
- Gear shift actuator
One con35, stroke length 100 mm. Torque variable, depending on car type and gear system.
- Seat height and adjustment
con50, stroke length up to 300 mm. Torque variable depending on car type and gear system.
- Control of doors and locks, wheelchair console (Located in the bottom of the car for fastening wheelchairs and users). con35, stroke length up to 50-70 mm. Torque variable, according to load and speed requirements. Standard equipment ready for mounting/installation: con50, stroke length typically 300mm. Gearing 1:49, 1:84.
- Swing lifts for wheelchairs and scooters (built-in to activate safety leaf).
1 con35, stroke length approx. 150 mm. Torque dependent on lift construction and load.

- Platform lifts, foot board
con35, stroke length approx. 350 mm. Torque variable, according to load and speed requirements. con35 can be supplied in IP66 and in stainless steel AISI 304 or 316 for external mounting.

Control and supply

Supply from the 12V or 24 VDC system of the vehicle. Relay controlled. Concens can supply a number of different power supply options.



Mobile leisure vehicles

This segment consists of campers, motor homes and other vehicles used for leisure purposes. Many vehicles are constructed with hidden comfort equipment. Concens actuators allow vehicle modification specialists to meet increasing customer demand: Wide range of compact and high performance actuators with unique designs. All models can be supplied in 12 or 24 V DC versions.

For most applications the actuators are powered by the 12 VDC system of the car.

Typical applications

- Platform lifts, foot board
- Raising flat screen TVs
- Raising / lowering of table for further beds
- Kitchen applications, e.g. height adjustment for improved working environment
- Horizontal levelling system
- Roof lifting
- con35, stroke length approx. 350 mm or con50, stroke length approx. 500 mm. Torque variable to suit purpose and requirements. con35 and con50 can be supplied in IP66 and in stainless steel AISI 304 or 316 for external mounting.

Control and supply

Supply from the 12V or 24 VDC system of the vehicle. Concens can supply a range of different power supply systems.



Maritime

For maritime use, the most basic requirements are watertight design and solid stainless steel construction.

Concens actuators are available in a waterproof version that is perfectly suited to harsh maritime environments. Hatches and bulkheads can be opened and closed safely and smoothly.

Concens actuators, all of which can be fabricated out of stainless steel or quality AISI 304 and AISI 316 (including front and rear brackets) offer a unique opportunity to meet market demand for electrical actuators. Concens actuators can be supplied in designs that adhere to IP66, IP68 and IP69K standards.

The combination of high performance and the compact in-line design makes it easy to use the actuators in a series of maritime applications. Concens actuator solution can be a powerful alternative to hydraulic and pneumatic solutions

because of their stability, flexible cables and easy to use controls.

An actuator system is far less expensive to purchase than similar hydraulic systems and the total efficiency is several times greater than hydraulic and pneumatic systems.

The maritime industry often requires optional hall sensors so that actuators speed, positioning and synchronisation can be controlled. Both con35 and con50 can be supplied with optional hall sensors.

The **Concens** control unit allows the actuator is able to make a soft start and stop.

The control unit makes it easy to modify existing pneumatic based applications with stainless steel actuators from Concens.

Concens actuators are available in 12 / 24 VDC versions.

Due to the application of Hall sensors located at the motor axle, the precision of the displacement of the piston rod can be extremely accurate.

Typical applications

- Automatic door, window and hatch closing / opening
- Lifting / lowering of table for additional beds
- Roof lifting

- con35, stroke length approx. 350 mm or con50, stroke length approx. 500 mm. Torque variable according to needs and requirements. con35 and con50 can be supplied in IP66, IP 68 and IP69K and in stainless steel AISI 304 or 316 for external mounting.

Control and supply

Supply from the vehicle's 12 or 24 VDC system and controlled via the **Concens** control unit. For accurate positioning a combination of Hall sensors and special OEM control is needed.



Trains, busses, special vehicles and agricultural machines

Trains, busses, special vehicles such as signpost wagons/carts, salt and sand spreaders and agricultural machines such as harvesters, muck spreader and field sprayers belong to this segment.

The range of applications includes many branches/industries and many manufacturers. Therefore, conditions can vary significantly from case to case. Despite its simple external appearance, the **Concens** actuator is a powerful tool. Thus, it is ideal for use in mobile

applications, where a compact size, added flexibility and strength are required.

Manufacturers require high performance (load and speed) and limited built-in measures. Concens offers a wide range of compact and high performance products with a built-in friendly design, all models are powered by 12 or 24 V DC.

For accurate positioning of the actuator Concens can supply it with Hall sensors.

In most applications, actuators are powered by the vehicles' 12/24V DC system.

Typical applications

- Signpost wagons/carts
Lifting sign into position, two con35 or con50, stroke length ca. 300-500 mm. Gearing according to requirements.
- Salt spreaders
Adjusting the spray direction and angle: Two con35. Stroke length up to

ca. 100 mm. Gearing variable to suit requirement and application. To be used with Hall sensor for positioning.

- Harvesters
For gearshift: Two to three con35, ca. 50 mm stroke length. Torque adjustable to suit requirements and gear system.
- Muck spreader
To regulate manure flow: con50, gear 1:24, stroke length 100 mm, mounted with Hall sensors for positioning. To regulate spray direction: con35, gear 1:27, stroke length 70 mm. For accurate positioning a combination of Hall sensors and special OEM control is needed.

Control and power supply

Power supply from the vehicle's 12 or 24 VDC system. Control through Concens control unit. For accurate positioning a combination of Hall sensors and special OEM control is needed.



2.4 Other applications

Windows, doors, gates, bollards, etc.

The combination of high performance and the compact in-line design makes it easy to implement the actuators in window and opening constructions. Due to its stability, flexible cables and ease of control, a Concens actuator solution can be a wise alternative to pneumatic solutions,

Both the C3 system and our actuators are well suited due to unique design and limited built-in measures.

Both con35 and con50 can be supplied with optional Hall sensors for systems where the actuators speed, positioning and synchronisation can be controlled. Via the Concens control unit the actuator is able to have a soft start and stop.

Typical applications

- Access control
Opening / closing of doors, windows, etc.
con35, stroke length approx. 350 mm or
con50, stroke length approx. 500 mm.
Torque according to need and depending on requirements. con35 and con50 can be supplied in IP66, IP 68 and IP69K and in stainless steel AISI 304 or 316 for external mounting.



Control and supply

C3 system with battery, remote control and charger. Supply from 12 or 24 VDC system. Controlled by **Concens** control unit. For accurate positioning a combination of Hall sensors and special OEM control is needed.



Domestic Applications

its compact in-line design makes actuators highly suitable for use in domestic appliances. Its compact design and wide range of colours make the actuator suitable for use in furniture production.

Both the C3 system and our actuators are well suited due to unique design and limited built-in measures.

Typical applications

- Raise and lower bed heads
- Raise chair seats, leg rests, head rests, back rests and arm rests
- Lifting flat screen TVs

Domestic applications include beds, chairs, TVs and other items where automatic turning, lifting and positioning are required.

The combination of high performance and

- Lifting / lowering of table for further beds
- Kitchen applications, e.g. height adjustment for improved work environment
- con35, stroke length approx. 350 mm. Torque can be varied to suit needs and requirements.

Control and supply

C3 system with battery remote control and charger.





Data Sheet con35 Linear In-line Actuator

Version 3.2 - October 2010



con35

Data

Motor

12/24 VDC power supply, permanent magnet motor

Type (gear ratio)		con35 (5)	con35 (14)	con35 (19)	con35 (27)	con35 (51)	con35 (71)
Maximum load	[N]	120	400	600	900	1600	2200
Speed at maximum load	[mm/s]	33	16	12	7.5	4	3

Recommended max. current: 12 VDC = 3.6 A / 24 VDC = 1.8 A

Self-locking force 17,500 N (Max.)

Temperature

Range -5°C to +70°C
Storage -40°C to +70°C

Protection class IP66

Cable specification 1m, 2×0.25mm² (AWG22), diameter ~ 4mm, black/grey

Materials

Motor and actuator tube Powder coated steel
Piston rod Aluminium
Front and rear brackets PA

Duty cycle Max. 10% or 2 minutes in use followed by 18 min. rest

Colour Black (RAL 9005) is standard

Standard stroke length/weight

Stroke	[mm]	50	100	150	200	250	300	350	400	500	750
Weight	[kg]	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.8	2.3

Max. load limited to 1000 N for stroke lengths ≥ 500 mm.

Options

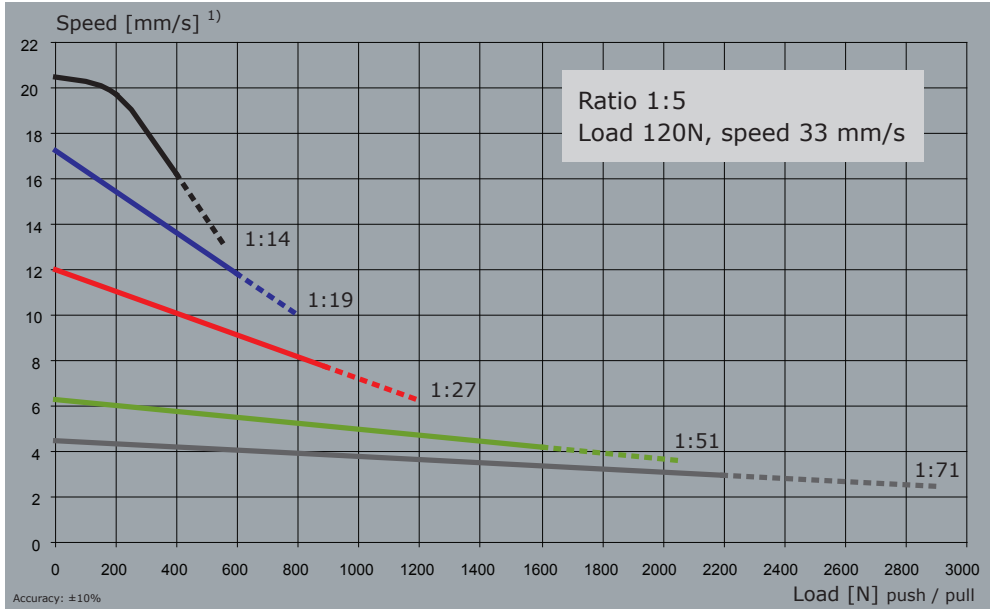
- Stainless steel versions (AISI 304 or AISI 316)
- Front and rear brackets in aluminium or stainless steel
- Front and rear brackets with slash
- Piston rod available in black (equivalent to RAL 9005)
- Hall sensors for positioning and/or synchronization
- IP68/IP69K (additional 11 mm to end-to-end dimensions, gear ratio 1:5 not available)
- Connector types (Molex 5557 / DIN 8 pole / Phono / Others)
- Low Noise
- ATEX zone 22, Class II D
- Certificate EN/UL/CSA 60.601
- Eskimo version (-40°C to +70°C)
- Other cable lengths

On request

- Available in all RAL colours
- Other stroke lengths available
- Customised front, rear brackets and built in measures

Contact Concens for any special requirements.

Speed/force

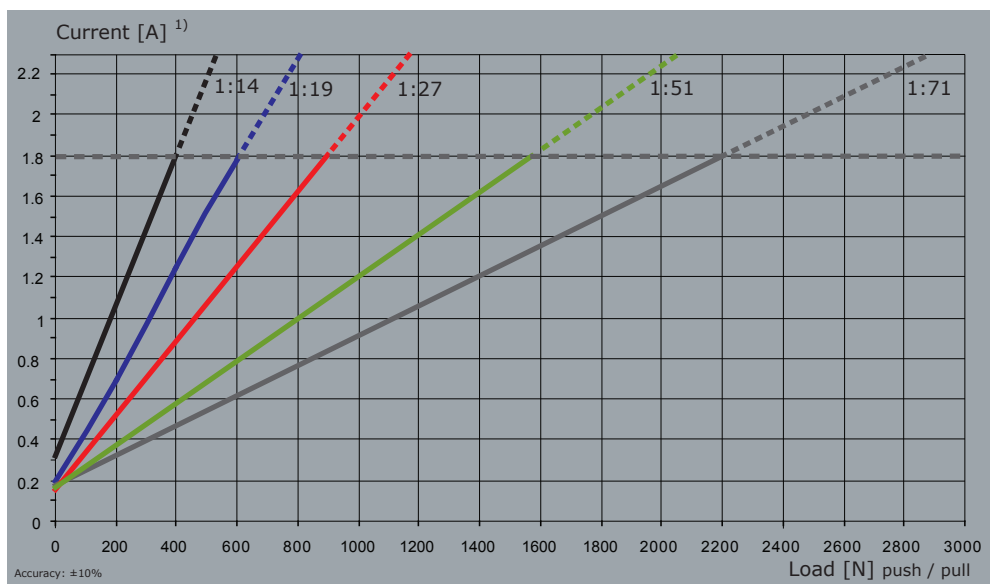


Force/current

For 12 V DC power supply multiply the current values with a factor 2.

In general, applications in the dashed area are not recommended. Please contact Concents for further information.

1) At ambient temperature
T=25 °C



Dimensions

Length A [mm]	Standard	Slash rear	Hall	UL	IP68/IP69K
Gear ratio 5, 14, 19, 27	160+s*	+10	+10	+10	+11
Gear ratio 51, 71	170+s*	+10	+10	+10	+11

* s = stroke length
stroke length > 500 mm: + 7 mm
stroke length > 700 mm: + 42 mm

Precautions

Power supply without over current-relay or other current switch-off devices can cause serious damage to the actuator at mechanical end-stop or if the actuator is overloaded in another way.



Concents A/S
www.concents.com
info@concents.com

Øresundsvej 7
DK-6715 Esbjerg N
Denmark

T +45 70 11 11 31
F +45 76 10 50 10
VAT: DK 10132266

Distributed by:



Data Sheet
con50
Linear In-line Actuator

Version 3.2 - October 2010



con50

Data

Motor

12/24 VDC power supply, permanent magnet motor

Type (gear ratio)		con50 (4)	con50 (14)	con50 (17)	con50 (24)	con50 (49)	con50 (84)
Maximum load	[N]	500	1750	2200	3100	4500	4500
Speed at maximum load	[mm/s]	70	20	17	12	6.0	4.0

Recommended max. current: 12 VDC = 16 A / 24 VDC = 8 A

Self-locking force 22,500 N (Max.)

Temperature

Range -5°C to +70°C
Storage -40°C to +70°C

Protection class IP66

Cable specification 1m, 2×0.75mm² (AWG18), diameter ~ 6mm, black/grey

Materials

Motor and actuator tube Powder coated steel
Piston rod Aluminium
Front and rear brackets PA

Duty cycle Max. 10% or 2 minutes in use followed by 18 min. rest

Colour Black (RAL 9005) is standard

Standard stroke length/weight

Stroke	[mm]	50	100	150	200	250	300	350	400	500	750
Weight	[kg]	2.1	2.3	2.6	2.8	3.1	3.3	3.6	3.8	4.3	5.6

Type con50 max. load limited to 2000 N for stroke lengths ≥ 500 mm.

Options

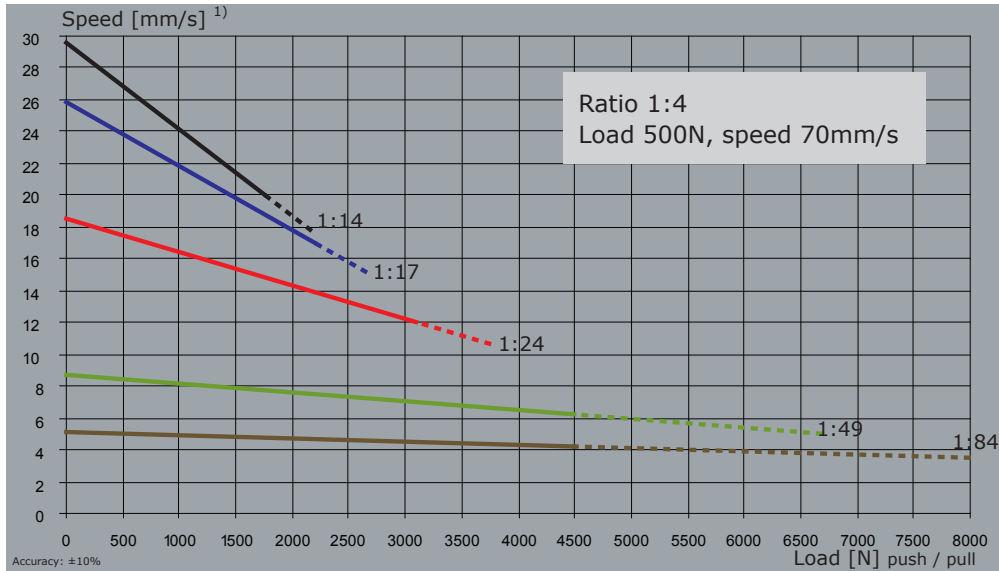
- Stainless steel versions (AISI 304 or AISI 316)
- Front and rear brackets in aluminium or stainless steel
- Front and rear brackets with slash
- Hall sensors for positioning and/or synchronization
- IP68/IP69K (additional 14 mm to end-to-end dimensions)
- Connector types (Molex 5557 / DIN 8 pole / Phono / Others)
- Low Noise
- ATEX zone 22, Class II D
- Certificate EN/UL/CSA 60.601
- Eskimo version (-40°C to +70°C)
- Other cable lengths

On request

- Available in all RAL colours
- Other stroke lengths available
- Customised front, rear brackets and built in measures

Contact Concens for any special requirements.

Speed/force

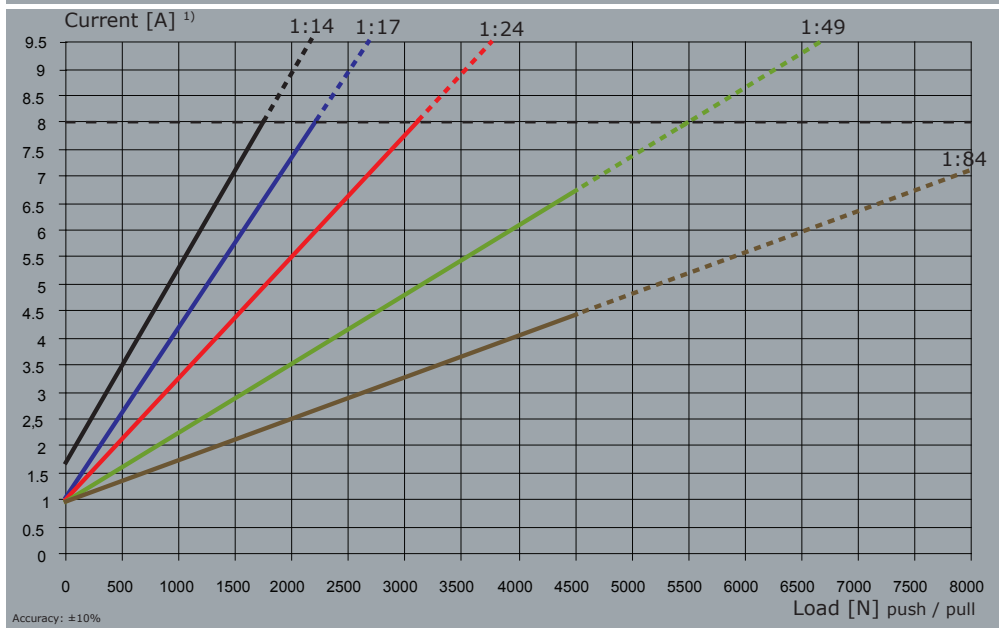


Force/current

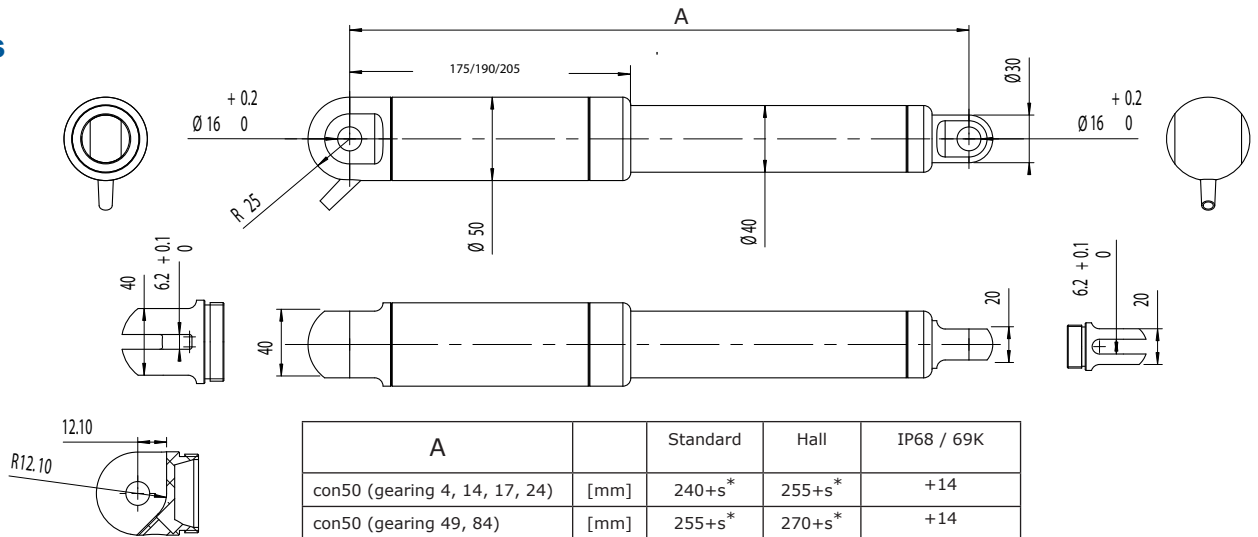
For 12 V DC power supply multiply the current values with a factor 2.

In general, applications in the dashed area are not recommended. Please contact concens for further information.

Max. 7A when used in connection with C3 system.



Dimensions



* s = stroke length
stroke length > 800 mm: + 100 mm
Axial backlash: ±0.5 mm
General dimensional variation: ±1 mm

Precautions

Power supply without over current-relay or other current switch-off devices can cause serious damage to the actuator at mechanical end-stop or if the actuator is overloaded in another way.



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www.concents.com
info@concents.com

Øresundsvej 7
DK-6715 Esbjerg N
Denmark

T +45 70 11 11 31
F +45 76 10 50 10
VAT: DK 10132266

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Data Sheet
C3
Concens Control
Concept

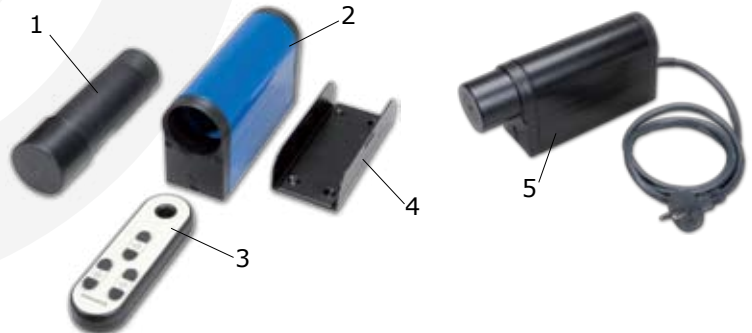
Version 3.0 - May 2010



C3 System

Components

1. Battery (573 g)
2. Control box (491 g)
3. Remote control (93 g)
4. Bracket (318 g)
5. Battery charger box (500 g)



Black (RAL 9005) is standard colour and beige (Pantone 454) foil on remote control

Battery (1)

Type	NiMH
Power supply	24 V DC
Maximum continuous current	7 A (Short-time peak current 10 - 20 A)
Capacity	1400 mAh
Low-capacity warning	Sound signal

Control box (2)

Number of remotes	A C3 control box can recognize ID's from max. 10 remotes
Connector type	Molex Mini-fit 5559
Number of outputs	Up to 5 (4 actuators + 1 wired remote or emergency stop output)
IP code standard	Standard IP50 (remark: IP65 available as option)

Choice of different over-current cut-off level up and down. Adjusted by Concens prior to delivery on customer request. Option for independent actuators or actuators running parallel.

Options for one control box

No. of actuators	Options (Both wired and wireless solutions)		
1	1 Independent		
2	2 Independent	2 Parallel	
3	3 Independent	2 Parallel+ 1 independent	
4	4 Independent	2x2 Parrallel	2 Parallel + 2 Independent

Actuators running in parallel requires Hall (see Hall data sheet)

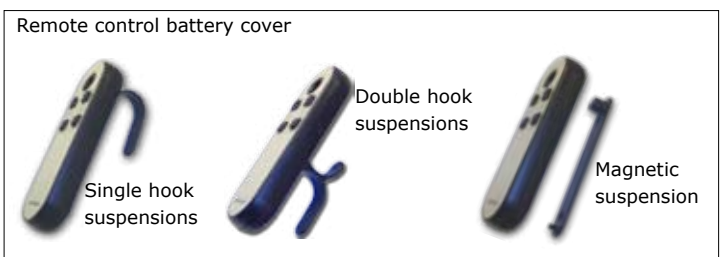
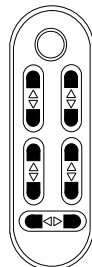
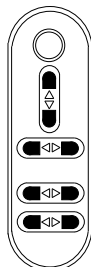
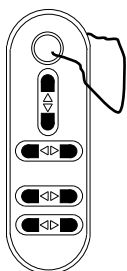
Remote control (3)

Wired solution
Standard cable length 0.55 m



Wireless solution
Frequency 2.4 GHz communication frequency

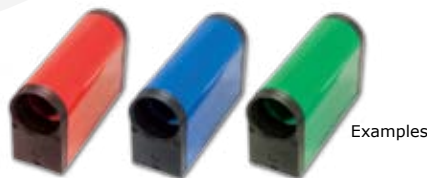
Two basic designs for location of buttons. Customer can select any button location and design from the two standard designs:



Choice of black cord for eye in remote control.

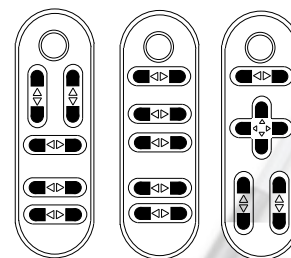
C3 Concens control concept

Bracket (4)	Part of control box delivery	Magnetic coupling with control box (patent application pending)
Battery charger (5)	Power supply Charging time Mains connector Battery change Charging signal Full capacity signal	110 or 240 V AC 5 - 8 hours European / UK / US type Easy revolving fastening (patent application pending) Green light flashing Continuous green light
Patent	Patent application	PCT WO 2005/109563
Options	Customised colour and logo on foil for remote control Protection class IP 65 Precise control of actuator movement and location of end stops. Customised colour of control box and battery charger	Hall sensor in actuator (see Hall data sheet)



Customised remote design

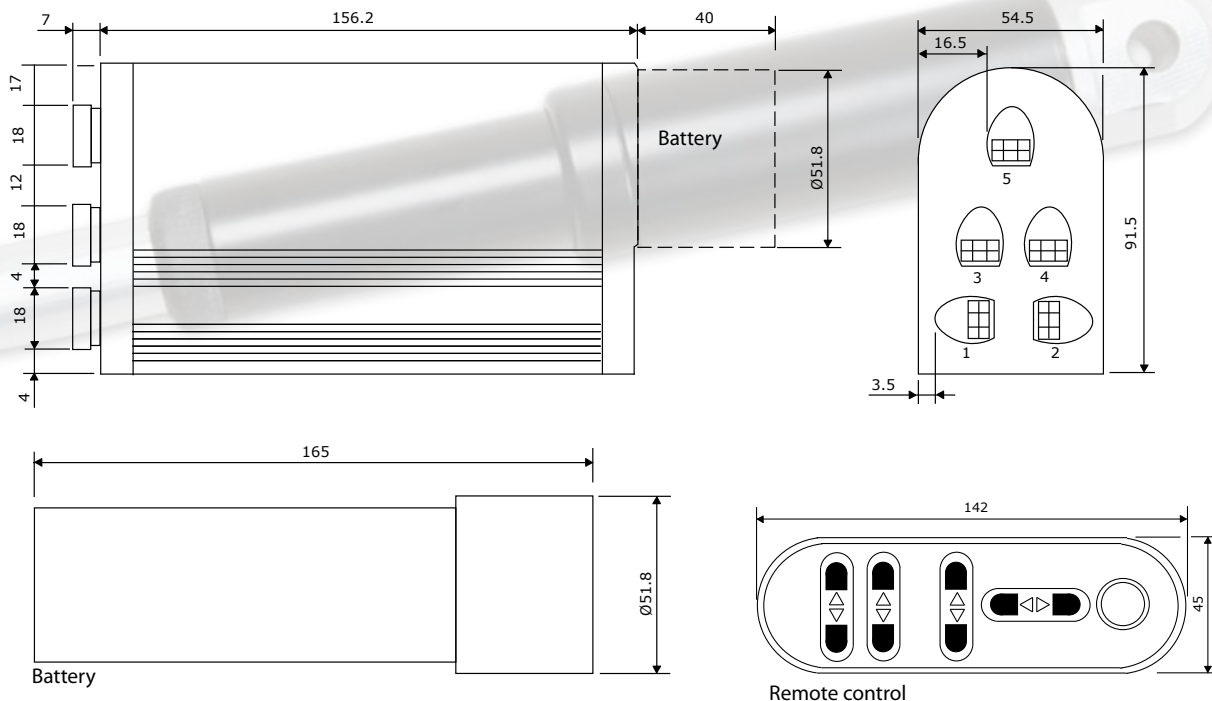
Customer can select any button location and design from three options:



Multiple system design

An unlimited number of control boxes can be setup identically and controlled by one remote control (only wireless).

Dimensions





**Data Sheet
Hall
Option for
con35 and con50**

Version 3.0 - May 2010



Hall

Option for con35 and con50 Control Unit

Possibility to precise control the start and end position of the actuator and the displacement during application. Furthermore, Hall gives the possibility to operate 2 or more actuators in parallel.

Built-in measure

con35 - additional 10 mm (see data sheet for con35)
con50 - additional 15 mm (see data sheet for con50)

Cable

con35 - 1m, 8x0.14mm² (6xAWG26), diameter ~ 5mm, black/grey
con50 - 1m, 8x0.34mm² (8xAWG22), diameter ~ 7mm, black/grey
Maximum recommended cable length is 2.5 m
Contact Concens for other cable lengths in special applications

Concens control units

C3 system (see data sheet for C3)
Logic Data (see data sheet for Logic Data)
C2-20 Concens servosystem







Customer Control Unit







PLC or likewise







Hall Input/
Output

Information for customer's control unit:

Wiring

GREY Cable colour con35 con50	Yellow	Green	Red	Blue	Brown+Pink	White + Grey
						
Function	Hall A output open collector	Hall B output open collector	+5 V dc Hall	0V Hall	Actuator +	Actuator -

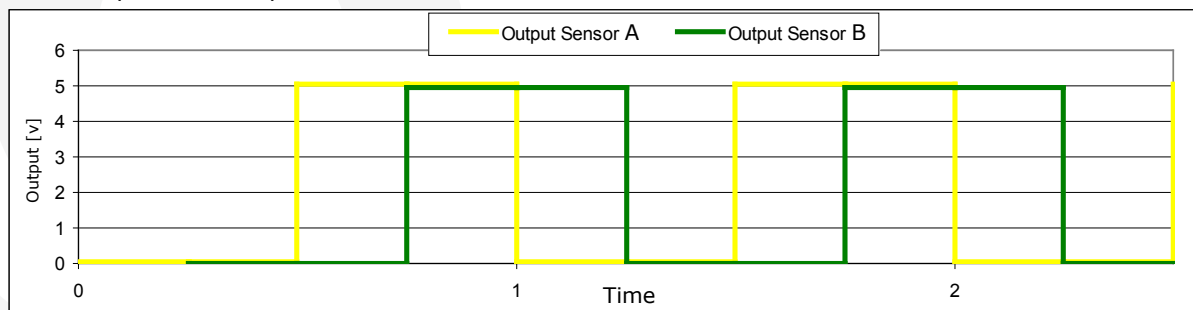
BLACK Cable colour con35	Yellow	Green	Red	Orange	Brown	Black
						
Function	Hall A output open collector	Hall B output open collector	+5 V dc Hall	0V Hall	Actuator +	Actuator -

BLACK Cable colour con50	Yellow	Green	Red	Blue	Brown+Orange	Black + Purple
						
Function	Hall A output open collector	Hall B output open collector	+5 V dc Hall	0V Hall	Actuator +	Actuator -

Warning: Power input in red wire must *never* exceed 5 V dc

Note: In a customer designed control unit external pull-up resistors from Hall signals to +5 V DC are necessary. Resistor values of 1 k Ω are preferred.

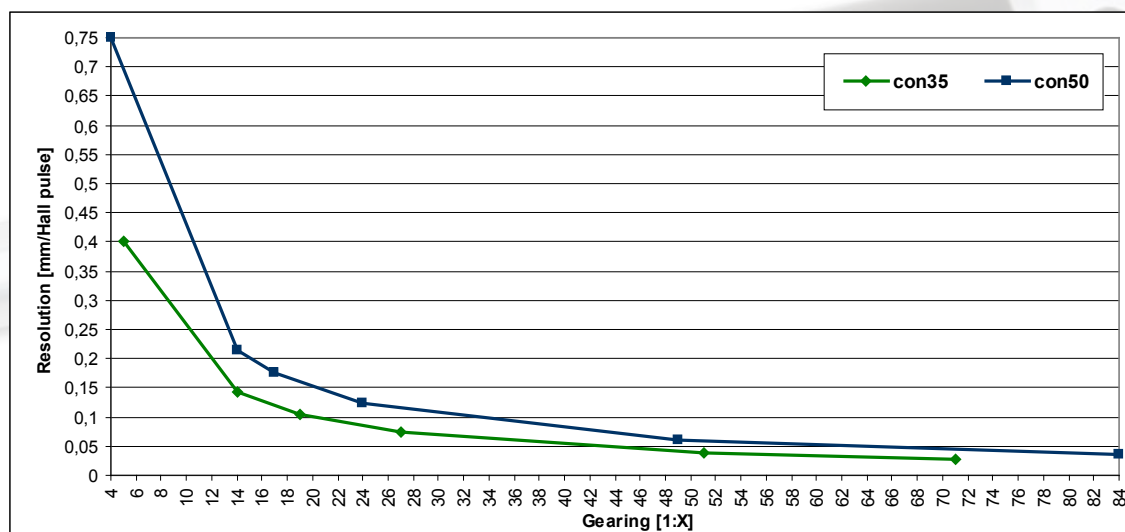
Hall signal output yellow and green wire. $\frac{1}{4}$ cycle delay between output sensor A and B. Order depends on displacement direction of the actuator.



Hall resolution

C3 + con35		C3 + con50	
Gear ratio	mm/pulse	Gear ratio	mm/pulse
5	0.4	4	0.75
14	0.1429	14	0.2143
19	0.1053	17	0.1765
27	0.0741	24	0.1256
51	0.0392	49	0.0612
71	0.0282	84	0.0357

Note: Table shown for C3 controller. Resolution is 4 times better when using C2-20 servo controller.



4. Vocabulary

Actuator

The main actuator components are:

- 1 Motor
- 2 Gear
- 3 Spindle with nut

Concens actuators are available in stainless steel (material quality AISI 304 or 316) for special environments such agricultural machines, food industry and snow moving material, offshore, maritime etc. The load capacity of the actuators ranges up to 6500 N.

Newton (N)

A Newton is the amount of force required to accelerate a mass of one kilogram by one meter per second squared. For example, 1N is the force of Earth's gravity on an apple with a mass of about 102g.

10 N \approx 1 kg

RAL

RAL is a colour space system developed in 1927. RAL started off with only 40 colours, but has since expanded to cover over 1,900. The RAL colour system is mainly used to describe paint and powder colours.

Slide nut

The slide nut allows the motor, gear and spindle to keep running when the actuator has reached one of the end positions. It means that there internally in the slide nut construction allows a slide between the two cone parts in the end positions. The actuator works completely normal on all positions between the outer positions, provided that the actuator has a well-defined and sufficient high load working in one direction. The advantage of the slide nut is that it in some contexts allows avoiding the electronic over-current device (e.g. for example a C3 control box or a overcurrent detecting system).

Safety nut

In some applications with high requirements to personal safety, it is a standard that the actuators are equipped with a safety nut. Its function is to support the piston rod, if the thread of the main nut is worn or destroyed, e.g. to prevent the actuator from collapsing.

The safety nut is built in the main nut in a way so that it will be activated in the moment when the thread of the main nut becomes defected. When the safety nut is activated the actuator can run down/in normally, but subsequently it cannot push up/out. In this way it is indicated that the actuator is defect and needs repair.





Concens – an experienced partner

Concens is represented in several countries via distributors. Outside these countries Concens handles projects directly from the head office in Denmark.

Austria

ELRA Antriebstechnik-Elektronik
Vertriebs Ges.m.b.H
Schönngasse 15-17, A-1020 Wien
www.elra.at

Belgium

ROTERO Belgium bvba
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www.rotero.com

Denmark

Concens A/S
Øresundsvej 7, 6715 Esbjerg N
www.Concens.com

Finland

Seamotion Oy
Tuulensuunkatu 8
FI-21100 Naantali
www.powermotion.fi

France

SNT
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Z.I. De la croix St Nicolas,
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www.snt.tm.fr

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www.admotion.se

United Kingdom

VIPA Ltd.
Bedford i-lab, Priory Business Park,
Stannard Way, Bedford MK44 3RZ
www.vipa.co.uk

Contact

If you require any further information about Concens or our products please have a look at our website. Direct contact can be made to your local distributor or the Concens head office in Denmark.

Concens A/S
www.Concens.com

info@Concens.com
Øresundsvej 7
DK-6715 Esbjerg N

Denmark
T +45 70 11 11 31
F +45 76 10 50 10
VAT: DK 10132266

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