Excellent Electric Actuators

concens

SETEC®

www.setec-group.com

GB

DATA SHEET

con35

Linear In-line Actuator

concens
- excellent electric actuators

Data

Motor/Gear

12/24 VDC power supply, permanent magnet motor

Gear ratio		5	14	19	27	51	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

Max. Static Load*)/ Self-locking force ■ PA Brackets: 2000 N ■ Alu Brackets: 5400 N

*) Depending on stroke length for push-applications

Temperature ■ Operation: -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 minutes rest

Color Black (RAL 9005) is 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. Actual weight may vary depending on model and options selected.

Options

- Stainless steel versions (AISI 304 or AISI 316)
- Front and rear brackets in aluminium or stainless steel
- Front and rear brackets with clevis
- Brackets with spherical bearings
- 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, group II 3 D approval
- Tested according to EN/UL/CSA60.601
- Eskimo version (-40°C to +70°C)
- Other cable lengths

On request

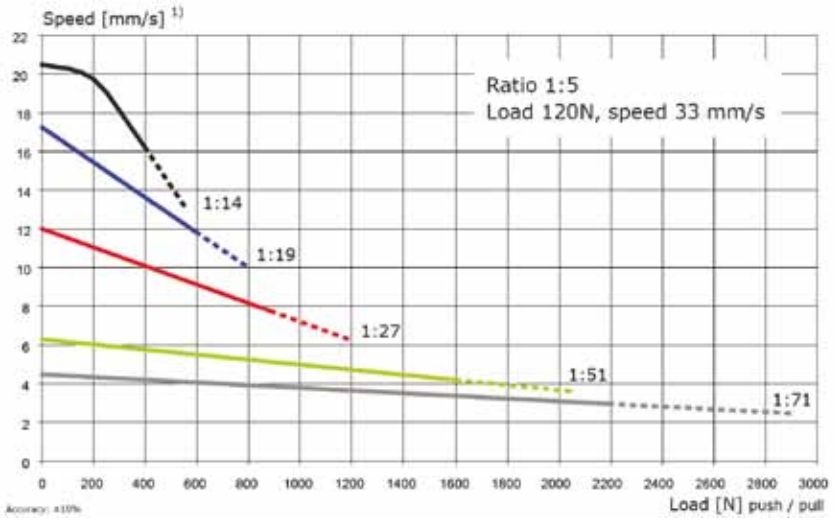
- Available in all RAL colors
- Other stroke lengths available
- Customised front, rear brackets and built in measures

Contact Concens for any special requirements.

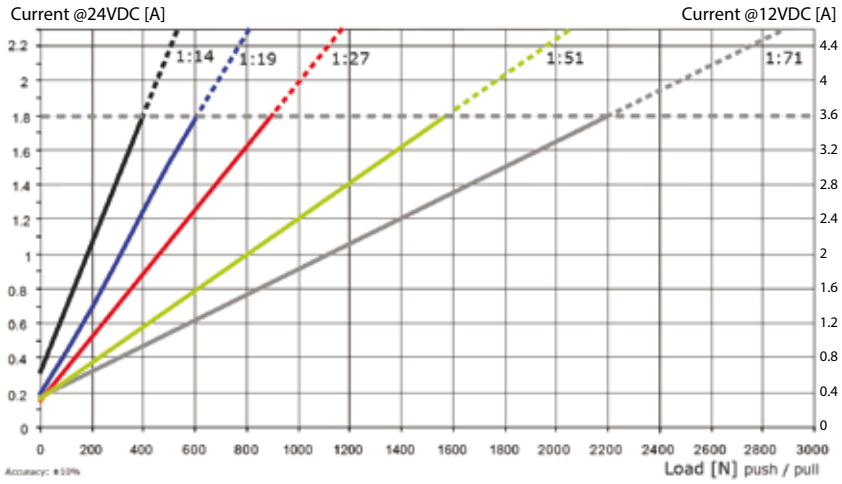
* The dust and water sealing of IP68/69K actuators might affect their performance in lower gear ratios.

con35

Speed/force



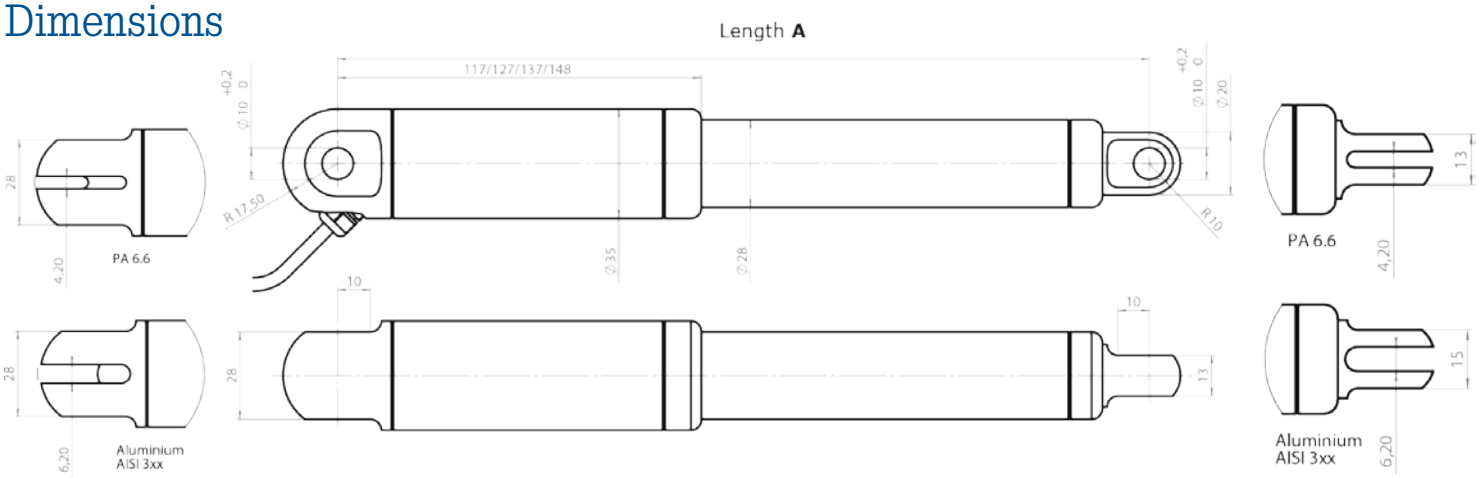
Force/current



Use in the dashed area is not recommended. Please contact Concens for further information.

1) At ambient temperature T=25 °C

Dimensions



Build length **A** [mm]	Standard	Clevis rear	Hall	UL/EN60.601	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 ≥ 500mm: + 7 mm
stroke length ≥ 700mm: + 42 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.
Radial forces might have an adverse effect of the performance of, or lead to damage to the actuator.

GB

DATA SHEET

con50

Linear In-line Actuator

concens
- excellent electric actuators

Data

Motor/Gear

12/24 VDC power supply, permanent magnet motor

Gear ratio		4	14	17	24	49	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

Max. Static Load*)/ Self-locking force ■ PA Brackets: 4700 N ■ Alu Brackets: 16800 N

*) Depending on stroke length for push-applications

Temperature ■ Operation: -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	Stainless steel
Front and rear brackets	PA

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

Color Black (RAL 9005) is 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. Actual weight may vary depending on model and options selected.

Options

- Stainless steel versions (AISI 304 or AISI 316)
- Front and rear brackets in aluminium or stainless steel
- Front and rear brackets with clevis
- Brackets with spherical bearings
- 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, group II 3 D approval
- Tested according to EN/UL/CSA60.601
- Eskimo version (-40°C to +70°C)
- Other cable lengths

On request

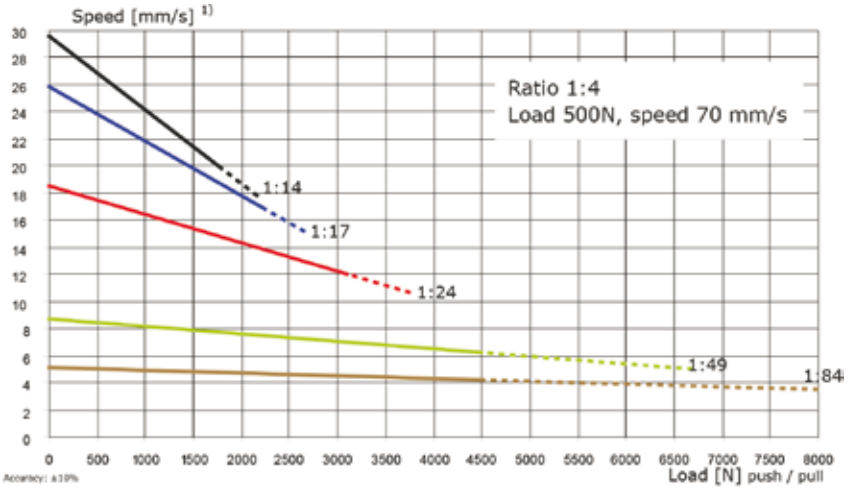
- Available in all RAL colors
- Other stroke lengths available
- Customised front, rear brackets and built in measures

Contact Concens for any special requirements.

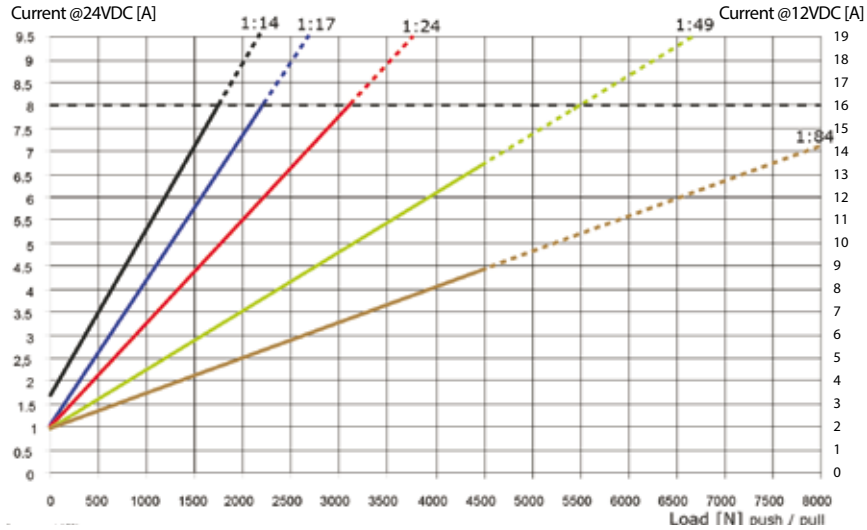
* The dust and water sealing of IP68/69K actuators might affect their performance in lower gear ratios.

con50

Speed/force



Force/current

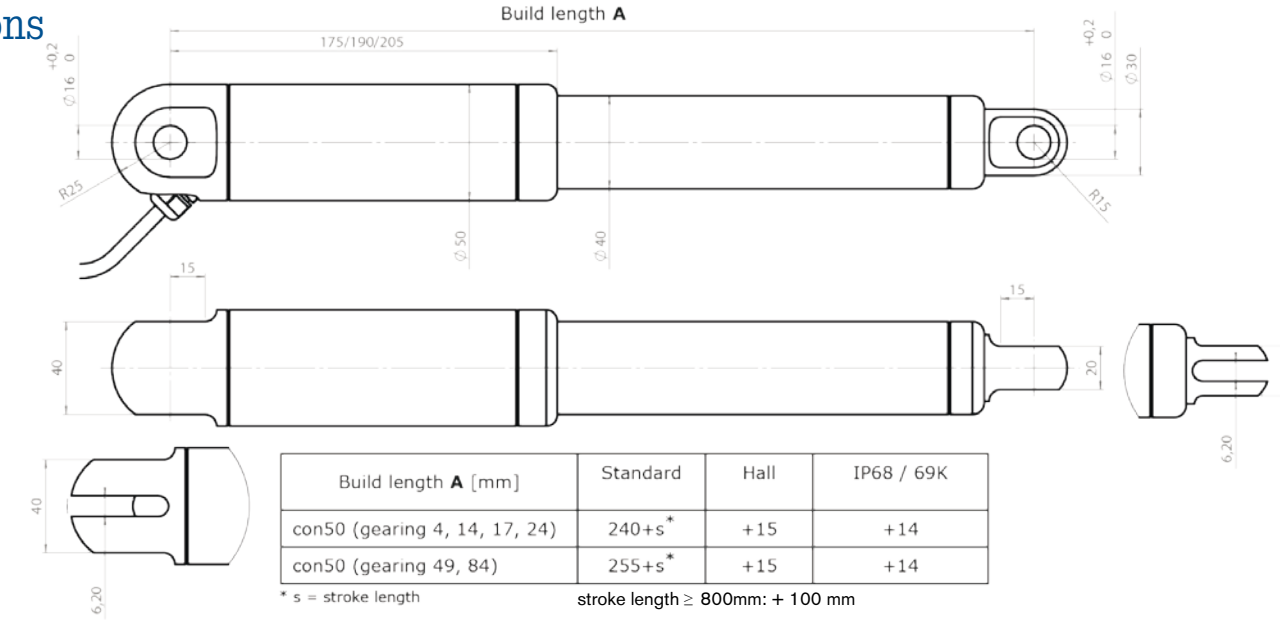


Use in the dashed area is not recommended. Please contact Concens for further information.

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

1) At ambient temperature T=25 °C

Dimensions



Build length **A** [mm]	Standard	Hall	IP68 / 69K
con50 (gearing 4, 14, 17, 24)	240+s*	+15	+14
con50 (gearing 49, 84)	255+s*	+15	+14

* s = stroke length

stroke length ≥ 800mm: + 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.
Radial forces might have an adverse effect of the performance of, or lead to damage to the actuator.

Data Sheet Hall

Option for con35 and con50

Version 3.2 - October 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 -

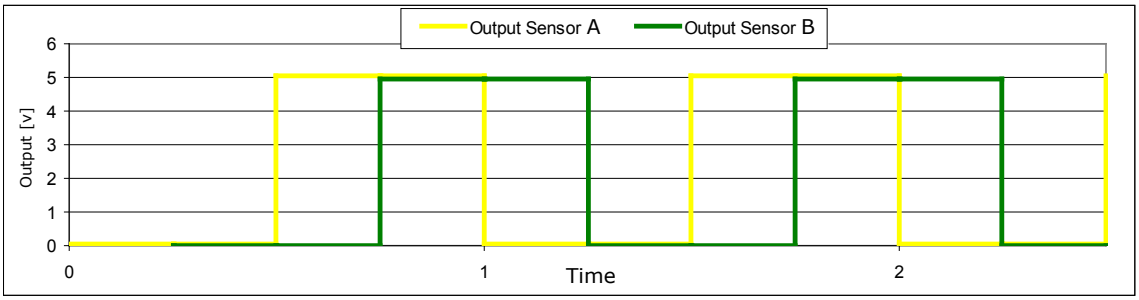
BLACK Cable colour **con35**	Yellow	Green	Red	Orange	Brown	Black
Function	Hall A output open collector	Hall B output open collector	+5 V dc Hall	0V Hall	Actuator +	Actuator -

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 kΩ are preferred.

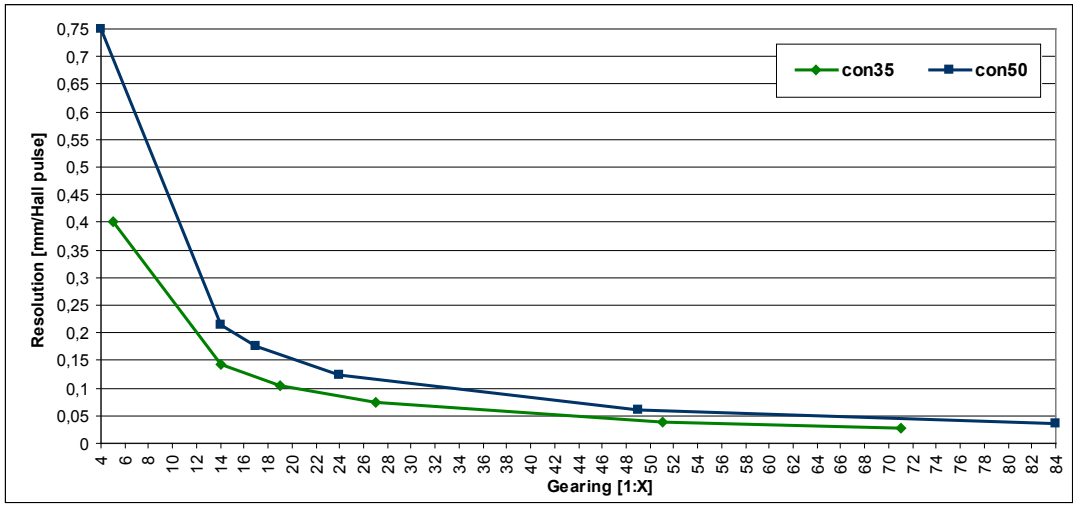
Hall signal output yellow and green wire. $^{1}/_{4}$ cycle delay between output sensor A and B.
Order depends on displacement direction of the actuator.



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.



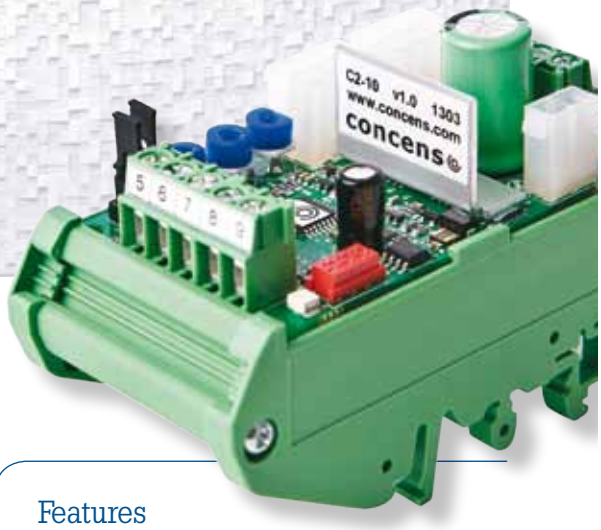
GB

DATA SHEET

C2-10

Control and protection of electric actuators

concens
- excellent electric actuators



C2-10 is developed for controlled ON-OFF driving and direction change of the Concens actuators. C2-10 has advanced current limit features. It limits the actuator current in start-up, braking and jam-situations and in that way protects the motor and the mechanics. C2-10 also has a fault in- and output which indicates error/over-current status and can be used to stop the actuator (for example if an emergency-stop switch is used).

The acceleration and deceleration ramp times are individually adjustable to suit each application. In other words the motor voltage is controlled to give a preferred smooth start and stop. When the C2-10 controller is without power, the motor is dynamically braked with so called short-circuit braking, i.e. the motor poles are connected together. The reverse and forward input can be set to work with negative or positive voltage by moving a jumper.

C2-10 has a 'trip' feature that cuts the motor voltage if the current limit value is exceeded (after trip delay of 2ms). After trip the motor can only be started in the opposite direction. Additionally the C2-10 provides 'kick-start' which means 100ms at full power (100%PWM). Current limit during kick-start is up to 35A.

If the actuator is stopped without going into trip mode, then the C2-10 controller will allow 50% higher current from start and until 500ms after ending acceleration ramp (see timing figure).

Features

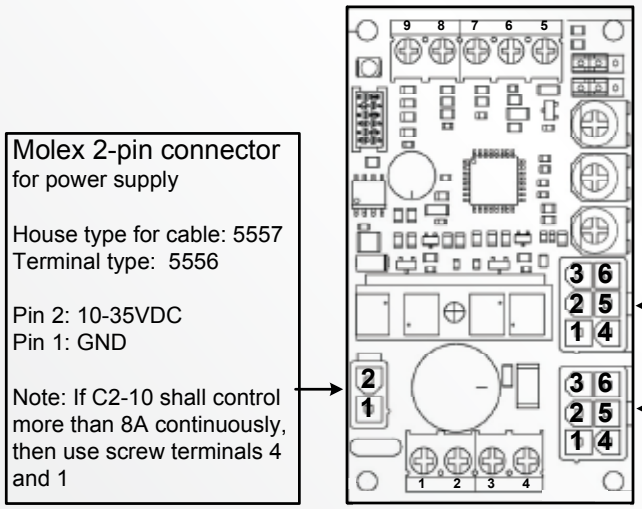
- Adjustable Soft start (acceleration ramp)
- Adjustable Soft stop (deceleration ramp)
- Adjustable current limit
- Two control modes
- High momentary load capacity
- High efficiency
- Easy interfacing to PLC etc.
- Connectors and terminals for actuators, control and power
- DIN-rail fittable
- Status LED

Technical Data

Supply	10-35 VDC (filtered max ripple <30%@full load)
Over voltage protection	40 V
Idle current	Approx. 15 mA
Driving current	10 A continuous, 16 A with duty cycle 50% Max 16 A on duty 2 min
Current limit	0,5... 16 A
Current trip delay	20 ms
Start delay	5 ms
Voltage loss	0,5 V (Im = 4A)
Operating frequency	2000 hz
Ramps	0,1 ... 2,5 s
Digital inputs	'High' @ Uin 4 V → supply voltage, 'Low' @ Uin 0 V → 1 V
Operating temp.	(Ta) -20 ... +70 degC

C2-10

FIG. 1 WIRING FOR C2-10



General

LED signals: Fast blink: Current trip
Four blinks: Overvoltage
Solid light: Overtemp

Current limit during start ramp and 500ms thereafter is current limit plus 50%.

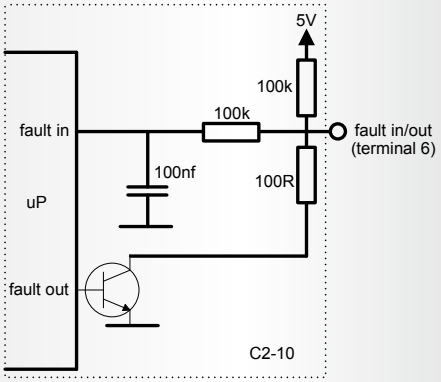
After trip the motor can only be started in the opposite direction. Additionally the C2-10 after trip provides 'kick-start', which means 100ms at full power (100%PWM). Current limit during kick-start is up to 35A.

The fault terminal is both input and output (see fig. 2). During normal operation the signal is pulled high to 5 V on the C2-10 board in series with a 100k resistor. When a fault occurs the fault terminal changes to low voltage (GND via 100R resistor).

Terminals

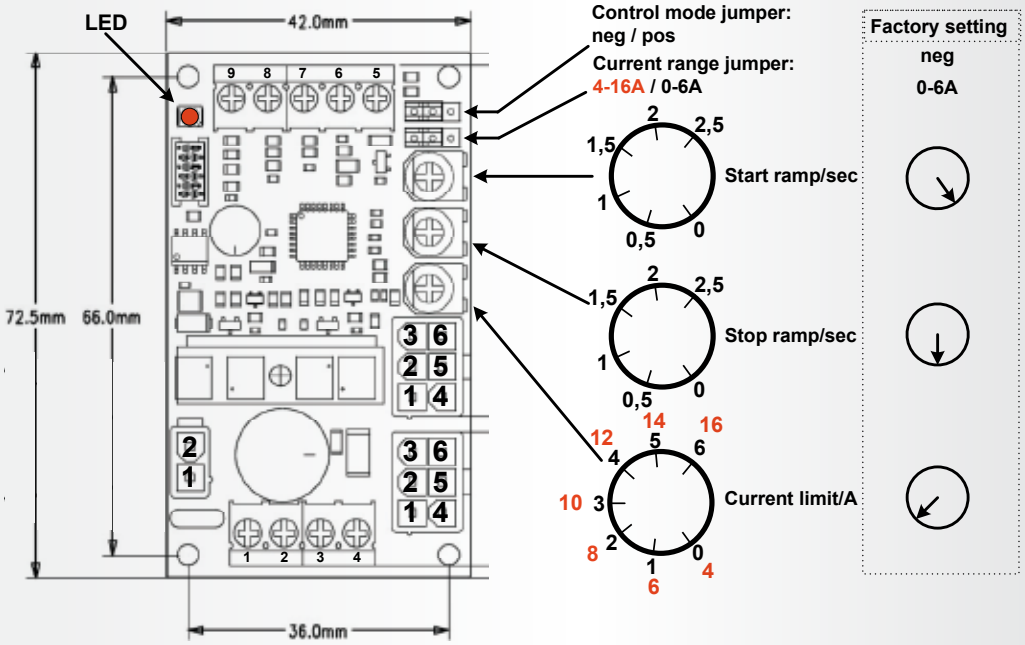
1 Supply GND
2 Supply + (10-35 VDC) fuse required
3 Actuator –
4 Actuator +
5 +5 V output for control-use max. 10 mA load
6 Fault in- and output
7 Reverse (Rev/In) signal input (0,5 mA)
8 Forward (Fwd/Out) signal input (0,5mA)
7+8 Used to activate the actuator back- and forward. Please refer to description of 'Control mode' on page 3
9 GND for control-use (not to be used as supply input)

FIG. 2 CIRCUIT DIAGRAM



C2-10

FIG.3 SETTINGS AND MECHANICAL DIMENSIONS



Control mode

When jumper is put in mode 'neg' (left hand side) then a negative (GND) signal is put on terminal 7 and 8 to run motor.

When using 'neg' mode, then terminal 9 can be used as the negative supply.

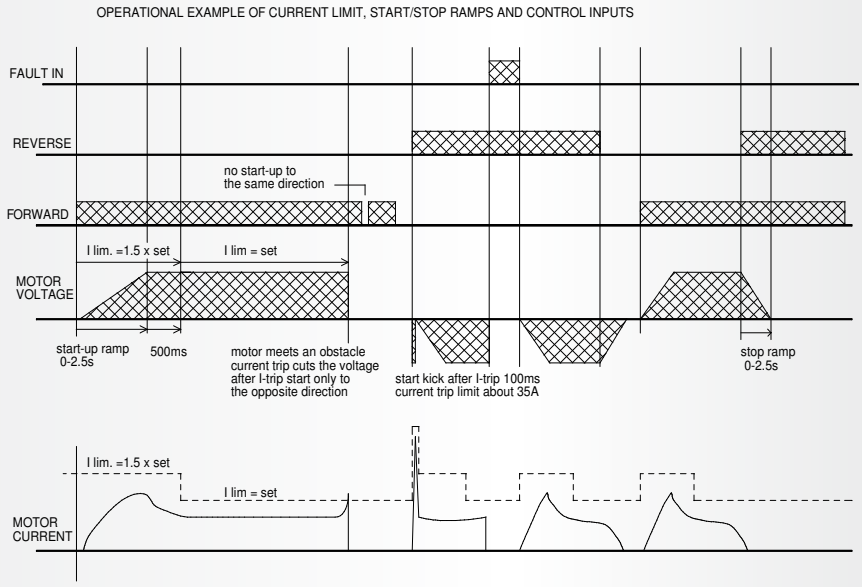
When jumper is put in mode 'pos' (jumper in right side) then a positive (> 4 V) signal is put on terminal 7 and 8 to run motor.

When using 'pos' mode, then terminal 5 can be used as the positive supply.

NOTE: When using the connectors for remote control, then the jumper MUST be in 'neg' mode (left side).

Input current for reverse & forward control is 0.5mA.

FIG. 4 TIMING DIAGRAM



C2-10

C2-10

C2-10 (board alone)
73 x 43 x 25 mm (L x W x H)

C2-10-DIN (DIN rail version)
90 x 46 x 56 mm (L x W x H)

C2-10-BOX (box version)
102 x 73 x 47 mm (L x W x H)

C2-10-BOX-XL (XL box version)
104 x 104 x 46 mm (L x W x H)

Warnings and recommendations

- If C2-10 goes into "trip" (overcurrent), it is only possible to run actuator in opposite direction.
- Please adjust the max. current to be 10% higher than maximum current during running the actuator. This gives the best conditions for long motor and actuator mechanical and electrical lifetime.
- It is very important to ensure that the power supply for the controller is capable of supplying sufficient current – otherwise the controller and the actuator may be damaged.
- Doublecheck correct polarity of power supply. If wrong connected, the C2-10 will be damaged.
- Attention! Driver has no fuse in it. Use external fuse according to application (2 → 16A slow).
- Concens does not have any responsibility over the possible errors in this data sheet.
- Specifications are to be changed without notice.

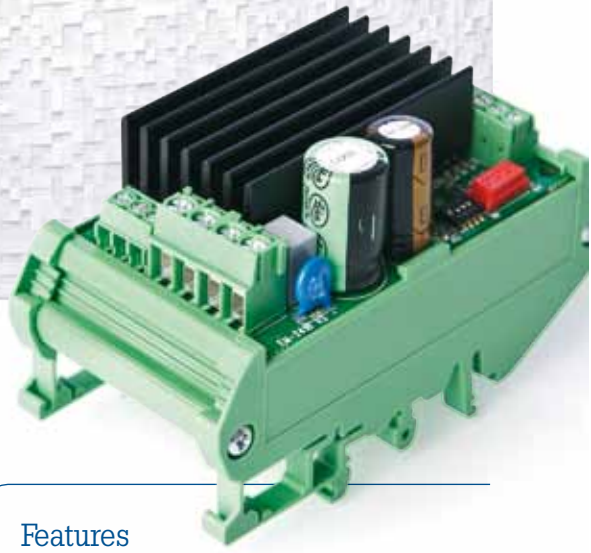
GB

DATA SHEET

C2-20

Advanced Actuator Controller

concens
- excellent electric actuators



The C2-20 actuator controller provides advanced positioning and control of actuators through easy and flexible integration with the application. The controller is designed to work with Concens electrical in-line actuators in applications where positioning is required. C2-20 has adjustable acceleration and deceleration ramps, which make smooth starts and stops possible.

Adjustable current limits in both directions protect the motor against overcurrent. In learning mode the number of hall pulses in a full stroke of the actuator is counted which enables accurate positioning during normal operation.

The position of the actuator is controlled by a DC voltage between 0-5 or 0-10 Volts to the C2-20. Adjustments and parameter settings like current limit value, ramp times, speed etc. are set with C2-PROG interface unit or C2-USB "dongle" connected to a PC.

Features

- Precise position control from analog voltage input
- Soft start and soft stop
- Settable current limit
- High efficiency
- High momentary load capacity
- DIN-rail base fittable
- "Position reached" - signal

Technical Data

Supply voltage	10-35VDC
Ripple	Less than 20%
Actuator current continuous max	15A (Ta<60°C)
Actuator current max	20A (short time)
Current limit adj.	0.1-20A
Overheat limit	100°C
PWM frequency	2kHz
Hall input freq.	Max 1kHz
Input control logic (pos.)	High=4-30V, Low=0-1V or open
Control input impedances typ.	30kohm
Motor and supply connectors	2.5mm wires max
Control connectors	1mm wires max
Dimensions	73x43x25mm (LxWxH)
Weight	75g
Operating temp (Ta)	–20 to +70°C
Idle current	45mA

C2-20

C2-20

FIG. 1 WIRING FOR C2-20

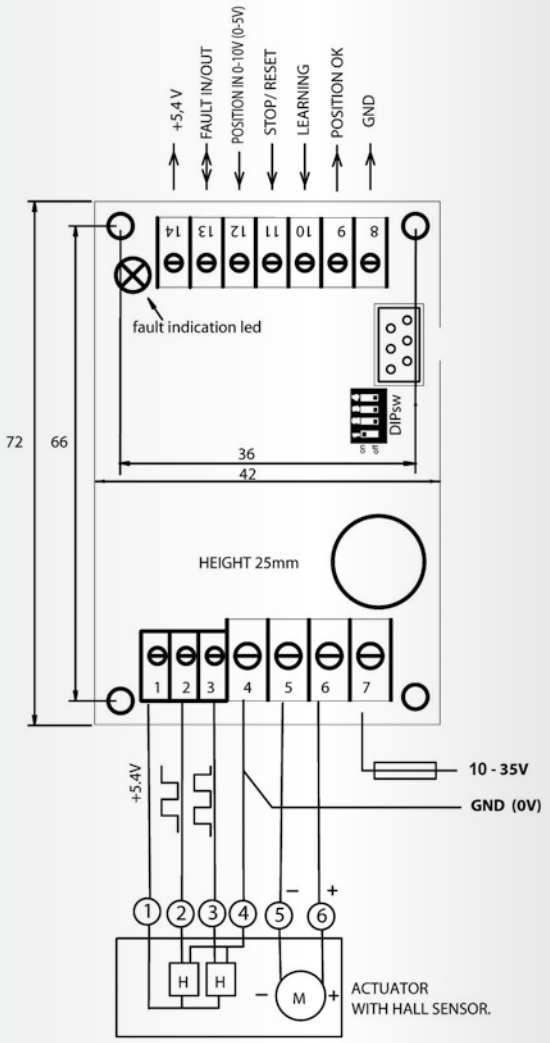
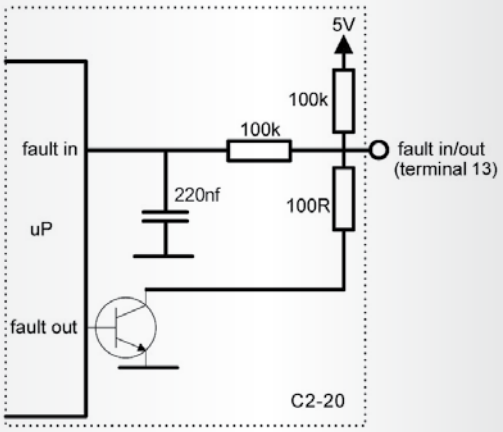


FIG. 2 CIRCUIT DIAGRAM



TERMINALS

1 **Supply for hall sensors** (+5V output)

2 **Hall channel A**

3 **Hall channel B**

4 **GND (0V)**

5 **Actuator –**

6 **Actuator +**

7 **Supply** 10–35 VDC (Use fuse)

8 **GND (0V)**

9 **Position OK**
Digital output 5V through 1kohm when wanted position is reached and low during travel.

Note: If "Brake Zone" is very long, then POSITION OK signal can be difficult to reach, since the motor only gets very low power to reach within the "dead zone"

10 **Learning**
Digital input (>4V and max supply voltage) starts "learning". Rin 47k

11 **Stop/Reset**
Digital input (>4V and max supply voltage) Stops the motor and resets any fault. Rin 47k

12 **Pos. Set**
Analog input 0-10V (0-5V if SW1 on 4 pole SW is OFF), Rin 30k

13 **Fault IN/OUT**
NPN open collector max 100mA can be connected to other C2-20 modules, thereby all modules connected will stop if one module sends a FAULT signal. If wire length is more than 1 meter, a 10kohm pull-up resistor connected to supply is recommended. Diagram in FIG 2

14 **+5,4V** output, max 10mA

WIRING AND SETTINGS

First run the learning cycle and then do the settings with serial interface unit "C2-PROG" or PC. *Default values in* ( )

1/15 Speed: 35 - 100% <=> 35-100 (100)

2/15 Learning speed: 35 - 100% <=> 35-100 (50)

3/15 I-limit "forward": 0,1 - 20,0A <=> 1-200 (20)

4/15 I-limit "reverse": 0,1 - 20,0A <=> 1-200 (20)

Notice! Current limits are 1.5 times higher during **start ramp** and 1 sec. thereafter

5/15 I-trip enable: 0/1 <=> off/on (1)

6/15 I-trip delay: 0 - 255ms <=> 0 - 255 (5)

7/15 Load compensation: 0 -255 <=> 0 - 255 (0)

8/15 Pulse lost timeout: 1 - 5s <=> 1 - 5 (2)

9/15 Start value: 0 - 50% <=> 0 - 50 (30)

10/15 Hour/Start count reset: 0 - 1, reset when set to 1

11/15 Brake area: 0,0 - 20,0% <=> 0 - 200 (50)

12/15 Dead zone: 0,0 - 10,0% <=> 0 - 100 (10)

13/15 Range scale in: + 0,0 - 50,0% <=> 0 - 500 (7)

14/15 Range scale out: - 0,0 - 50,0% <=> 0 - 500 (70)

15/15 Start ramp: 0,1 - 5s <=> 0 - 500 (100)

FIG. 3 POSITIONING WINDOW

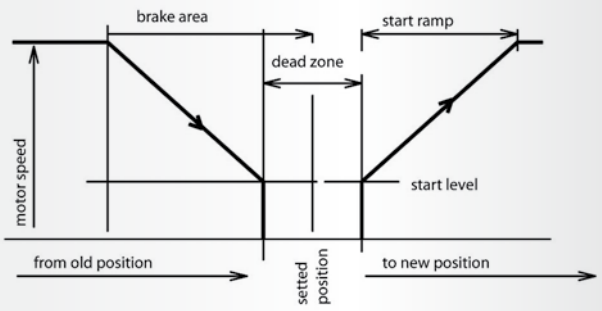
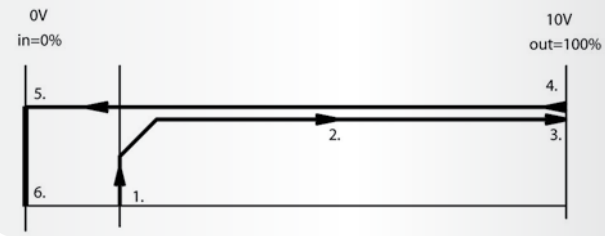
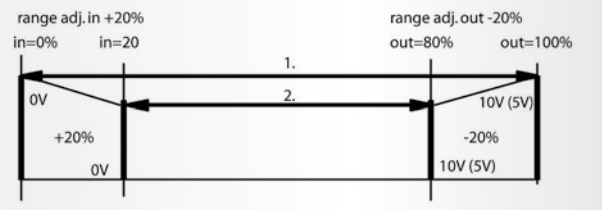


FIG. 4 LEARNING CYCLE



1. Start learning by giving an impulse to learn input (10)
2. Motor starts to run "out" direction with learn speed
3. Current limit stops the motor when mechanical end is reached
4. Motor starts to "in" direction and makes a full stroke. During stroke the pulse counter measures the range.
5. Motor reaches the mechanical end "in", and current limit stops the motor.
6. Device stores full range value and is ready for use

FIG. 5 RANGE SCALING



1. Original learned range = mechanical full range equals the signal range 0-10V (0-5V)
2. Modified range example:
   If range scale in = +20% and
   range scale out = -20%.
   now stroke of actuator is compressed to:
   positioning set value 0V = 20% position
   positioning set value 10V (5V) = 80% position

- **Speed** limits the maximum speed.
- **Learning speed** sets the learning cycle speed. (FIG. 4)
- **I-limits** are individual for reverse and forward directions.
- **I-trip** enables the trip function, so that motor will be shut down when the set I-limit is exceeded. Motor has to be started in opposite direction after trip.
- **I-trip delay** defines the reaction time for trip.
- **Load compensation** increases the torque at low speed. Note that over-compensation will cause oscillation and twiching of the motor.
- **Pulse lost timeout** stops motor after the set time without pulses.
- **Start value** is a voltage level for start (% of full), this ensures that the motor gets an adequate voltage to start properly, but note that too high start level will cause motor vibration (FIG. 3).
- **Brake area** (soft-stop) is proportional value of the full stroke. In low speed application good value is near 1%, and in high speed solution it can be near to 20% (FIG. 3).
- **Dead zone** is steady area, suitable size of this zone depends on the mechanical accuracy of the system, this value is also a ratio of the full stroke (%) (FIG. 3).
- **Hour/Start** count reset makes possible to set the hour/start counter to zero.
- **Range scale** adjustment is for scaling of the stroke, with this the scale can be adjusted after learning. The reverse and forward ends are individually scaleable to get the suitable mechanical stroke for set value from 0-10V (0-5V) (FIG. 5).
- **Start ramp** (soft-start) defines the time before reaching full speed.

STATUS LED SIGNALS

1. Fast blinking = Stopped due to current limiter active
2. Slow blinking = Overtemperature
3. Short, mid, long... = Hall pulse lost
4. 4x fast blinking (burst), pause = Overvoltage
5. 2x short, 1x long = Fault in
6. LED permanent on = Learning not completed, new learning required

C2-20

C2-20

C2-20-PCB-000-000000 (board alone)
73 x 43 x 25 mm (L x W x H)

C2-20-DIN-000-000000 (DIN rail version)
90 x 46 x 56 mm (L x W x H)

C2-20-BOX-000-000000 (box version)
102 x 73 x 47 mm (L x W x H)

C2-USB Programming Cable for PC
and **C2-PROG** Programming Unit

Warnings and recommendations

- If C2-20 goes into "trip" (overcurrent) it is only possible to run actuator in opposite direction.
- Please adjust the max. current to be 10% higher than maximum current during load.
  This ensures the longest actuator lifetime.
- Please ensure that the power supply for the controller is capable of supplying sufficient current – otherwise the controller and the actuator may be damaged.
- Doublecheck correct polarity of power supply. If connected wrong the C2-20 will be damaged.
- Attention! C2-20 has no fuse in it. Use external fuse according to application (2 → 10A slow).
- Concens does not have any responsibility over the possible errors in this data sheet.
- Specifications are to be changed without notice.

GB

DATA SHEET

C2-30

Advanced Actuator Controller

concens
- excellent electric actuators

C2-30

The C2-30 is designed for driving two Concens actuators in parallel. The synchronization is achieved by adjusting actuator speed during drive. If adjustment cannot compensate unbalance between actuators the actuators will be stopped. In this way mechanical stress and breakage can be avoided. Additionally the C2-30 includes current limiter and power stage temperatur protection. The C2-30 has adjustable start and stop ramps for smooth operation.

The basic control is done with Forward, Backward, and Stop commands, either in continous mode or pulse mode.

For help in assembly and in other special situations, the C2-30 controller has Trim inputs for controlling both actuators individually. With these control inputs the user can override most of the limits of normal use and balance the actuators or restore the normal driving position after some unexpected occurrences.

Home-command input is for driving the system to its initial position. This is done with low speed.

A wide range of parameters can be altered to suit to different demands and applications.

The parameters are set with the handy interface C2-PROG or PC with the C2-USB Programming Cable.

Features

- Synchronized parallel driving
- Input for negative or positive pulses
- Current and temperature protection
- Settable drive speed
- Acceleration and deceletation ramps
- Different control modes
- Wide range of parameters
- Easy setting with serial interface
- Good repeatability of settings
- Autobalance feature

Technical Data

Supply Voltage	12VDC/24VDC, filtered max. 20% ripple
Quiescent current	15mA
Actuator current	2x10A cont. 2x20A 25% duty
PWM frequency	2kHz
Current limit	1-20A
Temperature limit	120°C (Power stage)
Ramp times	0-2 sec
Pulse input freq.	max.1kHz
Pulse inputs	pull- up/down 10kohm (Hi/Lo; 4-30V/0-1V)
Control inputs	0-1V=OFF; 4-30V=ON (impedance 10kohm)
Fault output	Active, pull down max. 50mA
Aux. voltage output	5V/20mA
Measures	78 X 73 X 25mm
Operating temp.range	-20 to 60°C
Weight of card	110g
CE	Electromagnetic compatibility Industrial Environment

C2-30

FIG. 1

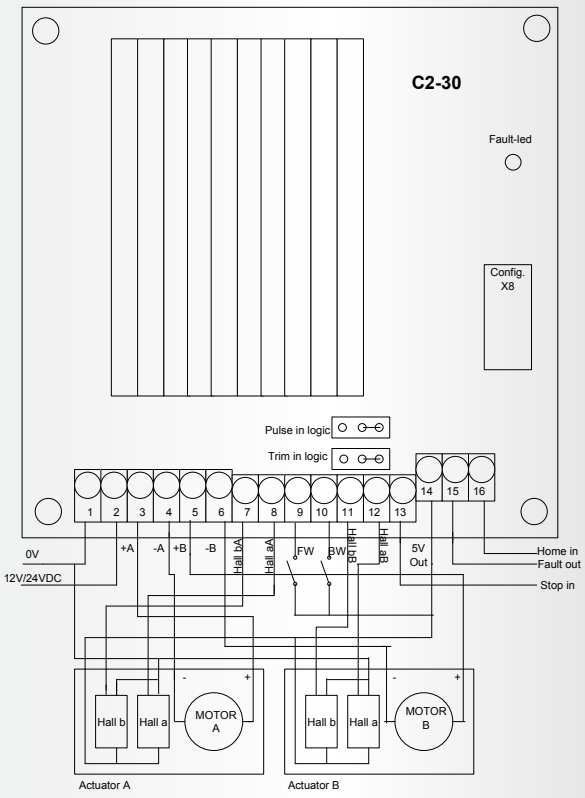
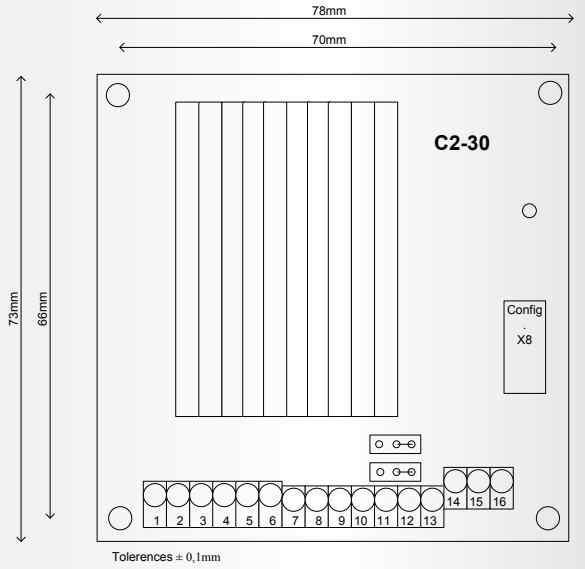


FIG. 2



Terminals

1 **GND (0V)**
2 **Supply 12V/24V DC** (use fuse)
3 **Actuator A +**
4 **Actuator A -**
5 **Actuator B +**
6 **Actuator B -**
7 **Hall channel b actuator A (green)**
8 **Hall channel a actuator A (yellow)**
9 **Forward (out)** pos. command only
10 **Backward (in)** pos. command only
11 **Hall channel b actuator B (green)**
12 **Hall channel a actuator B (yellow)**
13 **Stop,** input for external stop input. Pos. command only.
14 **5V/20mA output** for hall and controls e.g. FW/BW command
15 **Fault output,** pulled down on alarm.
16 **Home,** starting "home-routine". Pos. command only.

Connect actuators and supply as in picture. Supply voltage 12VDC/24VDC must be filtered ripple less than 20%. Pulse inputs work with positive (PNP) or negative (NPN) pulses. Selection is made with "Pulse Logic" selection switch. All other inputs, including "Trim" works with positive commands or signals only.

Inputs/Out

- **Pulse A and B** are for incoming feedback pulse-lines. Parameter 13 also enables the use of two pulse-lines/actuators. If chosen the input pin order is changed and trim-inputs are disabled.
- **FW & BW** are command inputs forward/ backward.
- **Stop** input is for the use of external stop command (eg. end switches).
- **Home** input is for starting the "drive home" routine.
- **Trim** inputs enable driving only one actuator for setting the balance of the system or an emergency over-riding of actuators, one or both. Trim inputs are changed to Pulse B and Pulse B-90° input, if double pulse mode is chosen (par.13).
- **Fault** output is activated in following situations:
  - Difference limit exceeded
  - Pulses have disappeared
  - Temperature too high
  - Current limit exceeded, if enabled
- **Inputs: 4V-30V** as "high" signal level and 0V-1V as "low" signal level
- **Output: NPN** open collector max. 50mA

Parameter Discription

- **Running Speed** is the speed which is used in normal mode.
- **Home Speed** is the low speed used during home-routine.
- **Start- and stop ramps** define the acceleration and deceleration time to 0-100%-0 speed.
- **Current limit** is limit value for current trip. If current value is exceeded the actuators will be stopped. During the period of start ramp + 1 sec the current limit is 1,5 times the current limit set value.
- **Difference limit** is the value for largest allowable difference between A and B pulse counters. If value is exceeded actuators will be stopped.
- **Adjust behavior** defines how fast and intensively the controller will adjust the synchronization between actuators A and B. Smooth 1 Aggressive 10.
- **I-trip-indication** – fault output can be set to "on" also in current trip situation.
- **Start condition** enables the device to re-start the actuator to both or only to opposite direction after a trip or stop situation.
- **Mode** sets the control-mode. In continuous mode the actuator runs as long as command (fw or bw) is "on". In impulse mode a short command starts the actuator and the direction is changed with opposite command. Actuator will stop only with "stop" command. In "Impulse-2 mode actuator starts with short (fw/bw) impulse. Following command stops the actuator, and next command (fw/bw) starts the actuator again. Of course, in all modes the difference limit, current limit and stop-command will stop the actuators.
- **Power-on home** sets device to make drive home routine every time the power comes on.
- **Auto-balance trigger** parameter value sets the starting point for auto balance. Value is the number of pulses counted from mechanical home.
- **Double pulse mode** makes it possible to use two pulse sensors for one actuator and this way the controller can always detect the right direction of movement. This is always recommended when double-pulses are available. NOTICE: the trim function is not possible to use in double pulse mode.
- **End limit fw** is a pulse counter "end stop" for FW direction. The positions is determined in pulse edges from 1-32000. Value 0 means that end stop is not in use.
- **Drive home routine** is a calibration cycle for balancing the system. Home routine can be started by giving FW and BW commands at the same time for 3 sec or with incoming signal to home input. If "power-on home" parameter is enabled the home routine is started every time when power comes on. Drive home routine can be interrupted with new FW or BW command or signal to STOP input. When drive home routine starts, both actuators start to run to same direction and will run until current limit stops the actuator or pulses stop coming. During the drive home routine the fault led is blinking slowly. When blinking stops and both actuators have stopped the device has reset the pulse counters. Now the devise is ready for use. If there is need to change the home drive direction, swap the actuator wires. In double feedback mode the hall signal wires should be swapped too (A to A-90 and B to B-90).
- **Auto balance** starts balancing routine before "real" home. The trigger point is set with parameter 12. If "auto balance" is active it balances the system automatically in the end of stroke. This will prevent the possible pulse error accumulation. Auto balance always works to the home direction.

Fault Situations

Actuator is jammed (current trip), pulses disappear or pulse counter difference is too high (difference limit). The controller will stop the actuators and FAULT output will be pulled down (also in I-trip if indication is enabled). When actuator is restarted the FAULT output is reset. Faults are also indicated with fault-led as follows:

2 blinks = current trip

3 blinks = pulses missing

4 blinks = difference limit

5 blinks = temperature protection

Trim and Override

Trim input allow the balance trimming and emergency use. When one of the TRIM inputs are activated only the corresponding actuator will run. During trim-run the balance adjust and pulse counters are disabled. If both TRIM inputs are activated, it is possible to override actuators and only the current limit is active.

In normal mode both switches SW1/SW2 are set to position "right". When TRIM mode is chosen SW2 is set to position "left". Remove hall-wires from 11+12. Connect 11 to 14 to move actuator A. Connect 12 to 14 to move actuator B.

Monitoring

During normal use it is possible to monitor the function of controller with the C2-PROG. Select the monitor mode in C2-PROG and you can check the following values:

1 current, Actuator A 10-200 = 1-20A

2 current, Actuator B 10-200 = 1-20A

3 pulse count/run cycle, only actuator A

4 pulse count difference

5 position counter A 0-32000

6 position counter B 0-32000

Feedback Pulses

Pulse inputs can work with positive or negative feedback pulses. When pulse logic switch is in negative position, the inputs are internally pulled to 5V with 10kohm resistor. When positive logic is chosen the inputs are pulled to 0V correspondingly. The controller counts pulse edges so counted value is double compared to the actual number of pulses.

Parameter List

Connect C2-PROG or PC to the Config-connector. This can be done with power on. C2-PROG displays the type of the device. Push the select button and you can scan the parameters with arrow buttons. Parameters are changed with +/- buttons. Store new settings with save button (press and hold for more than 5 sec).

Parameter list with:		Quality	Set range	Default
1	Running speed	40-100%	40-100	100%
2	Home speed	20-60%	20-60	60%
3	Start ramp	0-2sec	0-20	0.5sec
4	Stop ramp	0-2sec	0-20	0sec
5	Current limit	1-20A	10-200	5A
6	Difference limit	3-50pulses	3-50	10pulses
7	Behavior	smo->aggr	1-10	5
8	I-trip indication	disa=0; ena=1		0
9	Start condition	both dir=0; only rev if I-trip=1;	only rev if stop=2; only rev=3	1
10	Mode	cont=1; impuls=2; impuls-2=3		1
11	Power on home	disa=0; ena=1		0
12	Auto balance trigger	0-255	0-255; 0=not in use	0
13	Double pulse mode	disa=0; ena=1		1
14	End limit FW	0-32000	0-32000; 0=disabled	0

C2-30

C2-30

C2-30 ITEM NUMBER COMBINATION

C 2 - 3 0 - P C B - 0 0 - 0 0 0 0 - 0 0

Type ID	**00 = All standard** *XX = Special*
Configuration	**0000 = Std. Unconfigured** **xxxx = Special configuration**
For future use	**00 = Std.**
Option	**PCB = Board only**
Type	**30 = C2-30**
Product series	**C2 = C2 system**

If something special is required write an "X"
Bold letters = standard lead time
Italic letters = longer lead time, ask Concens

C2-30-PCB-00-0000-00 (board alone)
73 x 78 x 25mm (L x W x H)

C2-PROG Programming Unit ***and***
C2-USB Programming Cable for PC

Warnings and recommendations

- C2-30 has no fuse in it. Use external fuse according to application.
- Double-check correct polarity of power supply. If connected wrong C2-30 will be damaged.
- Please ensure that the power supply for the controller is capable of supplying sufficient current - otherwise controller and actuator may be damaged.
- Please adjust max current to be 10% higher than maximum current during load to ensure the longest actuator lifetime.
- Concens does not have any responsibility over the possible errors in this data sheet.
- Specifications are to be changed without notice.

C3 concens control concept

The C3 system is a versatile solution for control of concens and other actuators. The unique design, strong power supply system and the option of controlling multiple actuators makes the C3 system attractive in various applications

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)
6. Safety clip

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	Adjusted by concens prior to delivery on customer request.

Options for one control box

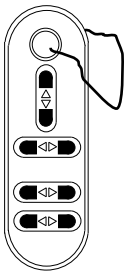
No. of actuators	Options (Both wired and wireless solutions)		
1	1 Independent		
2	2 Independent	2 Parallel	
3	3 Independent	2 Parallel+ 1 independent	
4	4 Independent	2×2 Parrallel	2 Parallel + 2 Independent

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

Remote control (3)

Wired solution

Standard cable length: 0.55 m - 2.30 m (retracted - extracted)

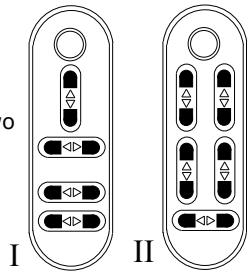


Choice of black cord for eye in remote control.

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:



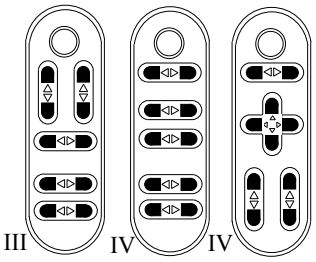
Remote control battery cover

C3 concens control concept

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

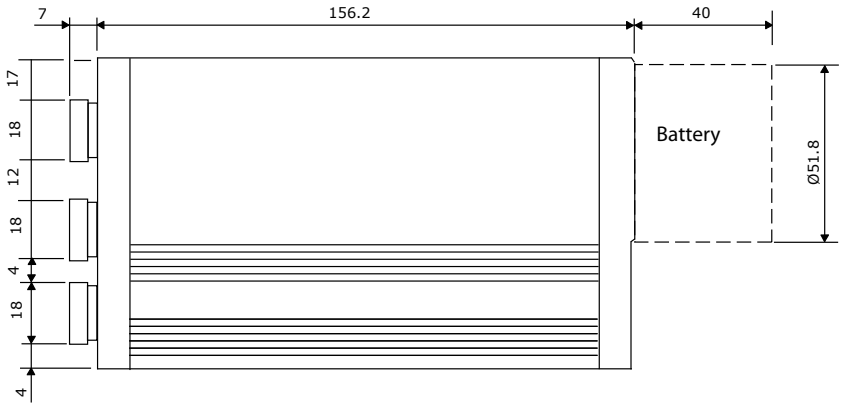
Emergency stop on battery

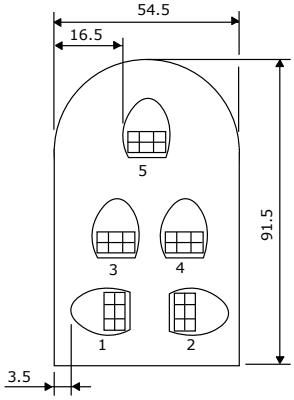
Examples

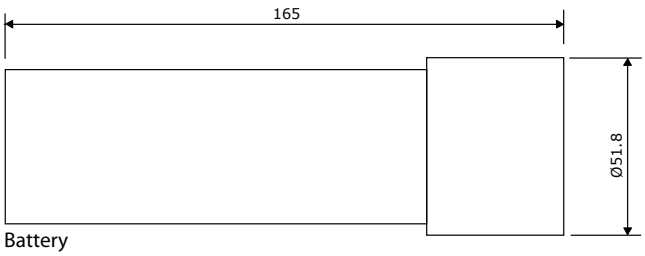


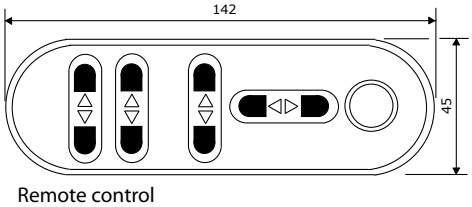
Multiple system design
An unlimited number of control boxes can be setup identically and controlled by one remote control (only wireless).

Dimensions









Actuator Configuration Guide

	Product Series	Stroke Length						Low Noise	Gearing		Voltage	Pitch	Cable length	Connector	Hall	Steel IP	Brackets	Tube Color	Ring Color	Type ID			
"Default" con35 ->	3	5	0	1	0	0	-	2	7	3	2	1	2	-	0	0	0	0	0	0			
"Default" con50 ->	5	0	0	1	0	0	-	2	4	3	3	1	2	-	0	0	0	0	0	0			

'35' = con35
'50' = con50

Standard:
'0050' = 50 mm
'0100' = 100 mm
'0150' = 150 mm
'0200' = 200 mm
'0250´ = 250 mm
'0300' = 300 mm
'0350' = 350 mm
'0400' = 400 mm
Special:
'0500' = 500 mm
'0750' = 750 mm
Custom:
'xxxx' = xxxx mm

'-' = Standard
'+' = Low Noise

Standard:

Con35	con50
14	14
27	**24**
71	84

Special:

con35	con50
05	04
19	17
51	49

Standard:
'1' = 12Vf
'3' = 24Vf
Special:
'4' = 24V
'7' = 24Vf - EN/UL 60.601

Standard:
'2' = 2 mm std. nut (35)
'3' = 3 mm std. nut (50)
'5' = 2 mm std. low temp. grease
'6' = 2 mm std. high temp. Grease
'8' = 3 mm std. low temp. Grease
'9' = 3 mm std. high temp. grease

Standard:
'1' = 1m
'3' = 3m
'6' = 6m

Standard:
'2' = Black cable, Molex Minifit
Special:
'0' = Black cable, no connector

'-' = without hall sensors
'+' = with hall sensors

Standard:
'0' = PA
'1' = PA with clevis
'2' = Alu
'3' = Alu with clevis
'4' = AISI316
'5' = AISI316 with clevis
Special:
'6' = Alu w/spherical bearings

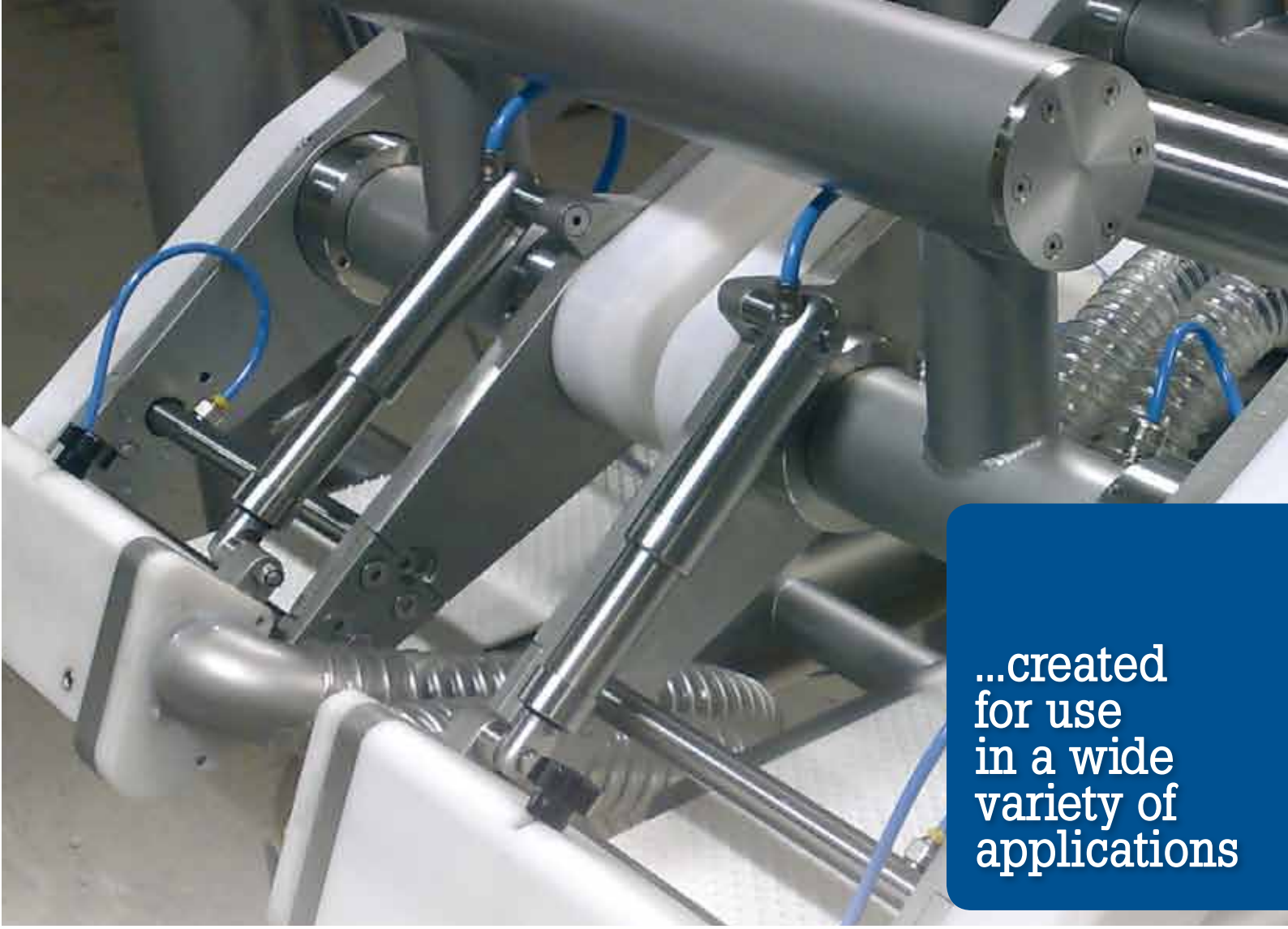
Standard:
'0' = Std. steel, IP66
'2' = AISI316, IP66
'4' = AISI316, IP68
Special:
'1' = AISI304, IP66
'3' = AISI304, IP68
'6' = AISI316, IP69K (no clevis)
'7' = AISI304, IP68, ATEX
'8' = AISI316, IP68, ATEX

Standard:
'0' = Black, RAL9005, shine 25
'9' = AISI
Custom:
'X' = Custom color

Standard:
'0' = Black
'9' = AISI(IP68/69K) only
Special:
'1' = Grey (Con 35 only)

Standard:
'00' = All standard
Special:
'XX' = Special requirement

Notes:
1) Values in **bold** are default values (used if nothing else is specified)
2) Special requirements must be marked as 'x'
3) Type ID equals '00' for 'non-customer' actuators
4) "Special:" means longer delivery time.



...created
for use
in a wide
variety of
applications

Excellent Electric Actuators

concens

SETEC® tecnica cinematica

TORINO

Direzione Generale e Stabilimento di Produzione - Headquarter and Production Plant:

Via Mappano, 17 - 10071 Borgaro T.se (TO)
T +39 011 451 8611 (centr. r.a.) - F +39 011 470 4891
setec.to@setec-group.it

MILANO
Via Meccanica, 5
20026 Novate (MI) - Z. I. Vialba
T +39 02 356 0990 - 382 01 590 (r.a.)
F +39 02 356 0943
setec.mi@setec-group.it

BOLOGNA
Via Del Lavoro, 6/A
40051 Altedo (BO)
T +39 051 871 949 (3 linee r.a.)
F +39 051 870 329
setec.bo@setec-group.it

PADOVA
Via Secchi, 81
35136 Padova
T +39 049 872 5983
F +39 049 856 0965
setec.pd@setec-group.it

FIRENZE
Via Galileo Galilei, 3
50015 Bagno a Ripoli - Grassina (FI)
T +39 055 643 261
F +39 055 646 6614
setec.fi@setec-group.it

www.setec-group.com

EUROPEAN Power Transmission Distributors Association