TECHLINE®
IMPROVING FLEXIBILITY

Linear Actuator LA33

User Manual

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Preface

Dear User,

We are delighted that you have chosen a LINAK® product.

LINAK systems are high-tech products based on many years of experience in the manufacture and development of actuators, electric control boxes, controls, batteries, accessories and chargers.

This User Manual does not address the end user. It is intended as a source of information for the equipment or system manufacturer only, and it will tell you how to install, use and maintain your LINAK electronics. The manufacturer of the end product has the responsibility to provide a User Manual, where relevant safety information from this manual is passed on to the end user.

We are convinced that your LINAK product/system will give you many years of problem-free operation.

Before our products leave the factory, they undergo both function and quality testing. Should you, nevertheless, experience problems with your product/system, you are always welcome to contact your supplier.

LINAK subsidiaries and some distributors situated all over the world have authorised service centres, which are always ready to help you. Locate your local contact information on the back page.

LINAK provides a warranty on all products. (See warranty section).

This warranty, however, is subject to correct use in accordance with the specifications, maintenance being done correctly, and any repairs being carried out at a service centre, which is authorised to repair LINAK products.

Changes in installation and use of LINAK systems can affect their operation and durability. The products may only be opened by authorised personnel.

This User Manual has been written based on the present technical knowledge. LINAK reserves the right to carry out technical modifications and keeps the associated information updated.

LINAK A/S

Terms of use

LINAK® takes great care in providing accurate and up-to-date information on its products.
However, the user is responsible for determining the suitability of LINAK products for a specific application.

Due to continual development, LINAK products are subject to frequent modifications and changes. LINAK reserves the rights to conduct modifications, updates, and changes without any prior notice. For the same reason, LINAK cannot guarantee the correctness and actual status of imprinted information on its products.

LINAK uses its best efforts to fulfil orders. However, for the reasons mentioned above, LINAK cannot guarantee availability of any particular product at any given time. LINAK reserves the right to discontinue the sale of any product displayed on its website or listed in its catalogues or in other written material created and produced by LINAK, LINAK subsidiaries, or LINAK affiliates.

All sales are subject to the 'Standard Terms of Sale and Delivery for LINAK A/S' available on LINAK websites.

Introduction

The actuator LA33 combines compact design and high power in a solution fit for use in industrial settings and for demanding applications that require customized interfaces, faster, silent operation or to work in rough and extreme environments.

Features

- 12, 24 or 48 VDC permanent magnetic motor
- Maximum load from 500 N - 5,000 N depending on gear ratio and spindle pitch
- Maximum. speed up to 70 mm/sec. depending on load and spindle pitch
- Stroke length from 100 to 600 mm (1000 mm with maximum 1000 N as special item)
- Heavy duty aluminium housing for harsh conditions
- Highly efficient acme thread spindle
- Protection class: IP66 for outdoor use (dynamic), furthermore the actuator can be washed down by a high pressure cleaner (IP69K – static)
- Hand crank for manual operation
- Integrated brake, high self-lock ability
- Endplay – 2 mm maximum
- Non rotating piston rod eye
- Built-in endstop switches
- Noise level: 73 dB (A) measuring method DS/EN ISO 8746 actuator not loaded
- Self-lock (with shorted power cables)

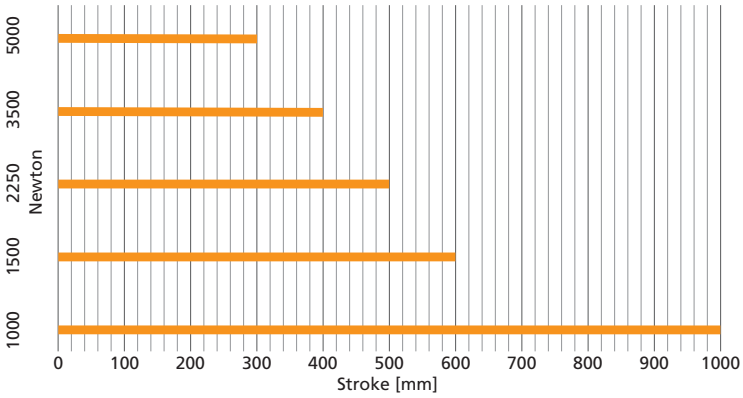
Options in general

- Exchangeable cables in different lengths
- Adjustable magnetic sensors for Endstop Signals (code no. 1017031)
- Hall effect sensor
- IC options including:
  - IC - Integrated Controller
  - IC with I/O
  - Integrated Parallel Controller
  - LIN bus communication and CAN bus communication (see CAN bus user manual)
  - Analogue or digital feedback for precise positioning
  - Proportional control
  - Endstop Signals
  - PC configuration tool

Usage

- Duty cycle at 600 mm stroke is maximum. 20% (4 min. drive and 16 min. rest)
- Duty cycle, with plastic gear, at 400 mm stroke is maximum. 10% (2 min. drive and 18 min. rest)
- Ambient operating temperature -40 °C (reduced load) to +85 °C (reduced duty cycle)
- Ambient operating temperature at full performance from +5 °C to +40 °C
- Storage temperature: -55 °C to +105 °C

Load vs. stroke length



- For applications operating only in pull the limitations are 600 mm stroke and 5,000 N load
- 1000 mm with maximum 1000 N in push and 1500 N in pull available as special item. (For plastic gears there is no difference between push and pull loads).
- Safety factor 2

Technical specifications

12V motor:

Type	Thrust max. Push/ Pull (N)	Self-lock max. Push (N)	Self-lock max. Pull (N)	Spin-dle Pitch (mm) /Gear	*Typical speed (mm/s)		Stroke length (mm) in steps of 50mm			*Typical Amp. (A)		End-play mm +/-
					No load	Full load	Min.		Max.	No load	Full load	
33090xxxxxxxxA...	5000	5000	5000	9 / A	9	6	100	-	300**	2.8	10	1
33150xxxxxxxxA...	3500	3500	3500	15 / A	15	9	100	-	400**	2.8	10	1.25
33150xxxxxxxxA...	2250	2250	2250	15 / B	23	15	100	-	500**	2.8	10	1.25
33200xxxxxxxxA...	1500	1500	1500	20 / B	34	24	100	-	600	2.0	10	2.5
33200xxxxxxxxA...	500	500	500	20 / C	68	52	100	-	600	5.0	12	2.5

24V motor:

Type	Thrust max. Push/ Pull (N)	Self-lock max. Push (N)	Self-lock max. Pull (N)	Spin-dle Pitch (mm) /Gear	*Typical speed (mm/s)		Stroke length (mm) in steps of 50mm			*Typical Amp. (A)		End-play mm +/-
					No load	Full load	Min.		Max.	No load	Full load	
33090xxxxxxxxB...	5000	5000	5000	9 / A	9	7	100	-	300**	1.8	6.5	1
33150xxxxxxxxB...	3500	3500	3500	15 / A	15	13	100	-	400**	1.8	7.0	1.25
33150xxxxxxxxB...	2250	2250	2250	15 / B	25	21	100	-	500**	1.8	6.6	1.25
33200xxxxxxxxB...	1500	1500	1500	20 / B	35	30	100	-	600	1.8	6.5	2.5
33200xxxxxxxxB...	500	500	500	20 / C	80	72	100	-	600	3	7	2.5

48 V Motor:

Type	Thrust max. Push/ Pull (N)	Self-lock max. Push (N)	Self-lock max. Pull (N)	Spin-dle Pitch (mm) /Gear	*Typical speed (mm/s)		Stroke length (mm) in steps of 50mm			*Typical Amp. (A)		End-play mm +/-
					No load	Full load	Min.		Max.	No load	Full load	
33090xxxxxxxxJ...	5000	5000	5000	9 / A	9	7	100	-	300**	0.9	3.2	1
33150xxxxxxxxJ...	3500	3500	3500	15 / A	15	13	100	-	400**	0.9	3.5	1.25
33150xxxxxxxxJ...	2250	2250	2250	15 / B	25	21	100	-	500**	0.9	3.3	1.25
33200xxxxxxxxJ...	1500	1500	1500	20 / B	35	30	100	-	600	0.9	3.2	2.5
33200xxxxxxxxJ...	500	500	500	20 / C	80	72	100	-	600	0.9	3.5	2.5

* The typical values can have a variation of ± 20% on the current values and ± 10% on the speed values. Measurements are made with an actuator in connection with a stable power supply and an ambient temperature at 20 °C.

** There are limitations on the stroke length if you need full load, please see "Load vs. stroke length" on page 5.

Please note that all actuators featuring 'IC Advanced with softstop towards end stop' or 'IC Parallel', 'LINBUS', 'CAN bus', 'MODBUS' will run at a regulated speed, which is typically around 80% of the nominal speed.

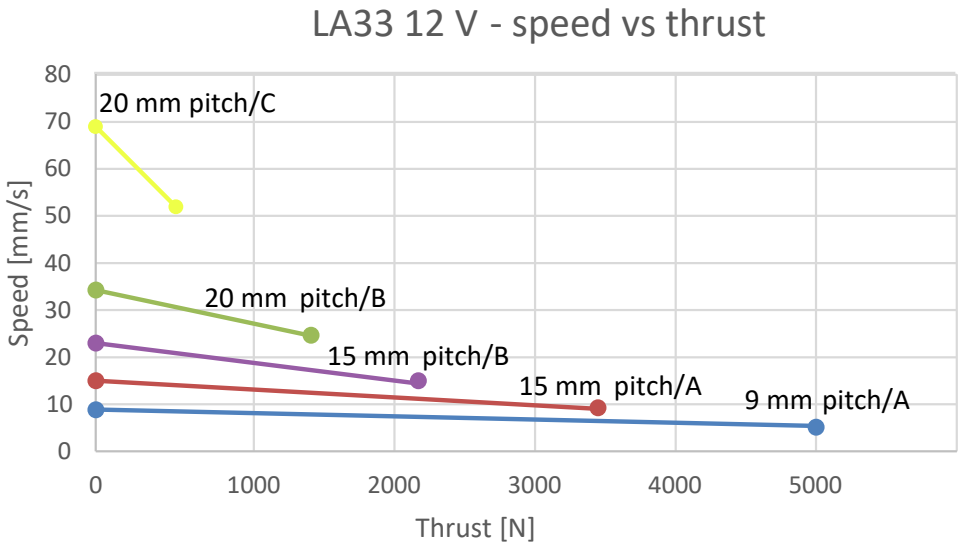
It is possible to maintain an endstop signal, after the actuator has stopped, with other feedback systems than those available with Integrated Controller. -This comes at the cost of the better self-lock and the improved ability to prevent back-drive, which a shorted motor provides. It requires that supply on both brown, blue, red and black wires is maintained.
See Fig. 2 in "Actuator with Endstop Signal output" for connections.

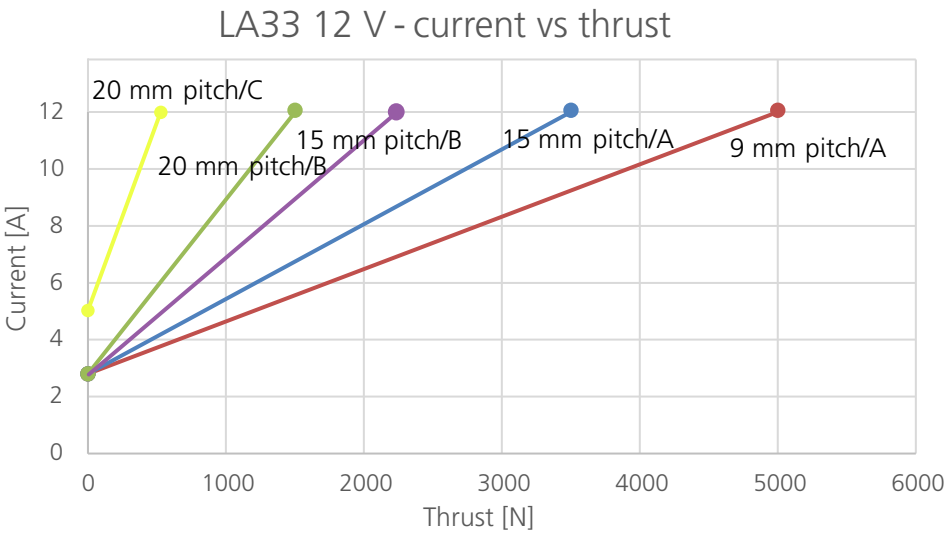
Gear ratios:

	Type	Gear ratio	9mm spindle	15mm spindle	20mm spindle
Gearbox	33xxxxxxxxxxxxxxxxA...	1:67	5000 N	3500 N	-
	33xxxxxxxxxxxxxxxxB...	1:39	-	2250 N	1500 N
	33xxxxxxxxxxxxxxxxC...	1:16	-	-	500 N

Speed and current curves 12 V

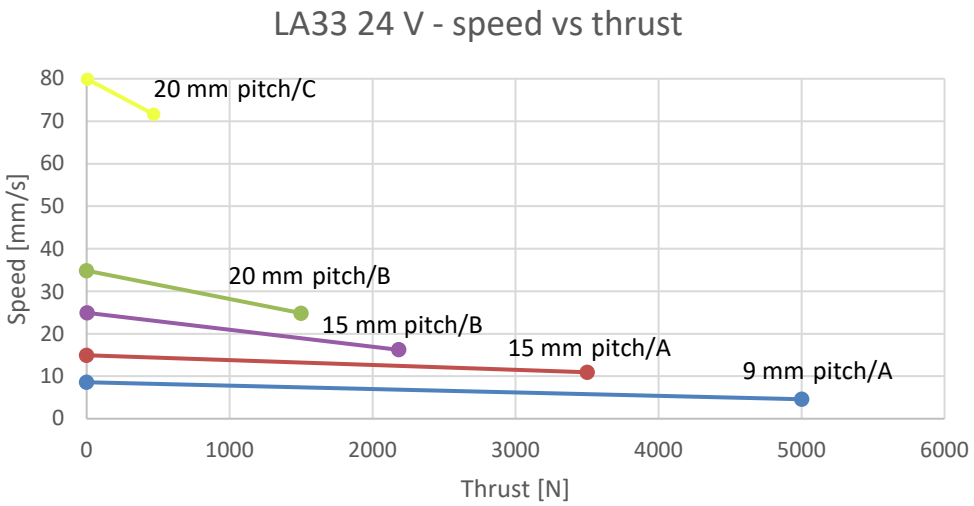
The values below are typical values and made with a stable power supply and an ambient temperature of 20° C.

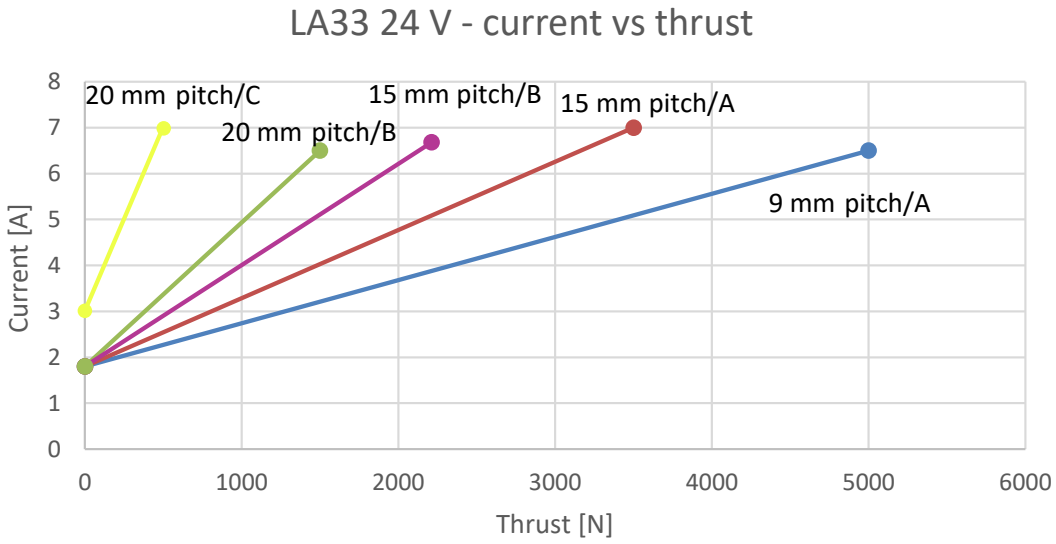


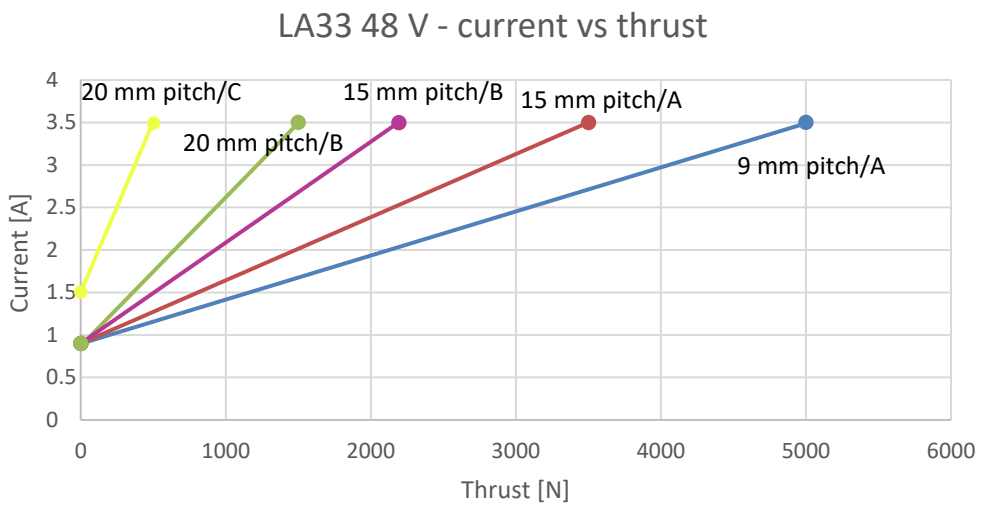


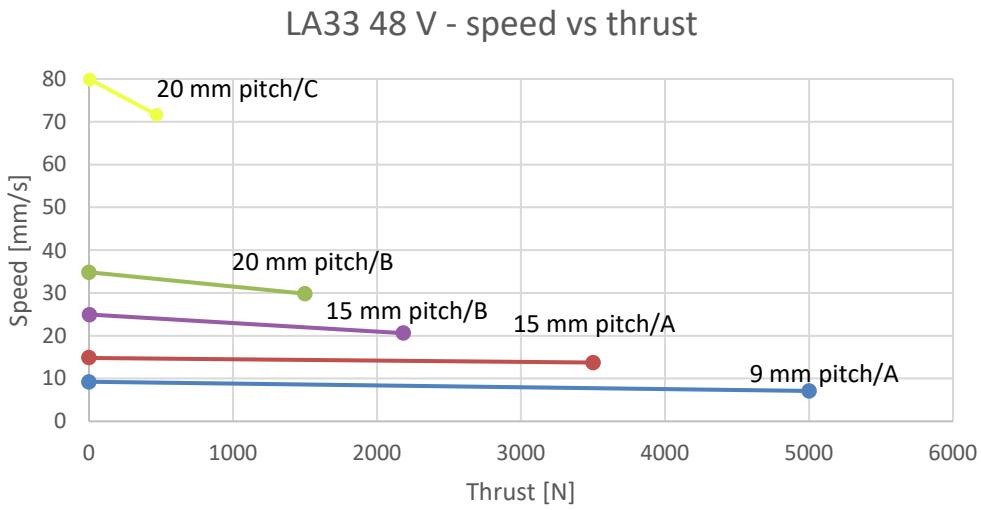
Speed and current curves 24 V

The values below are typical values and made with a stable power supply and an ambient temperature of 20˚ C. The performance is reduced at low temperatures (below -5° C).






LA33 48 V - current vs thrust
Current [A]
Thrust [N]
20 mm pitch/C
20 mm pitch/B
15 mm pitch/B
15 mm pitch/A
9 mm pitch/A
0
0.5
1
1.5
2
2.5
3
3.5
4
0
1000
2000
3000
4000
5000
6000


LA33 48 V - speed vs thrust
Speed [mm/s]
Thrust [N]
20 mm pitch/C
20 mm pitch/B
15 mm pitch/B
15 mm pitch/A
9 mm pitch/A
0
10
20
30
40
50
60
70
80
0
1000
2000
3000
4000
5000
6000

Ordering example

33 090 200 0A 0A 3 B 1 A = 1 1 B C 2 A 4 2 0 0 0 0 0

Actuator Type:	33	=	LA33			
Spindle Type:	**090**	=	9 mm	200	=	20 mm
	150	=	15 mm			
Stroke length:	**200**	=	length in mm			
Safety:	00	=	None	**0A**	=	Safety nut
Feedback:	00	=	None	0F	=	PWM
	0A	=	Hall Potentiometer (Analogue)	0K	=	Single Hall
Platform	0	=	None			
	3	=	IC Integrated Controller)			
Motor Type:	A	=	12 VDC	J	=	48 VDC
	B	=	24 VDC			
Endstop:	0	=	Power switch	2	=	Zero point (Platform - IC)
	1	=	Signal switch (Platform - IC)			
IP:	**A**	=	IP66			
Colour:	**=**	=	Dark Olivish Grey NCS S7000-N			
Back Fixture:	**1**	=	Ø 12.2 hole with slot	A	=	12.2 hole with slot AISI 304
	2	=	Ø 12.2 hole with slot - 90°	B	=	12.2 hole with slot AISI 304 - 90°
	3	=	Ø 12.9 hole with slot	C	=	12.9 hole with slot AISI 304
	4	=	Ø 12.9 hole with slot 90°	D	=	12.9 hole with slot AISI 304 90°
	5	=	M12 X 1.75 male adaptor			
Piston Rod Eye:	**1**	=	Ø 12.2 hole with slot	A	=	Ø 12.2 hole with slot AISI 304
	2	=	Ø 12.9 hole with slot	B	=	Ø 12.9 hole with slot AISI 304
	4	=	M8 female adapter, AISI 303	C	=	Ball eye ø10H7 AISI 304
	5	=	M12 X 1.75 male adaptor	D	=	Ball eye ø12H7 AISI 304
				X	=	Special
Gear:	A	=	Ratio 1:67	1	=	Ratio 1:67 (Plastic gear)
	B	=	Ratio 1:39	2	=	Ratio 1:39 (Plastic gear)
	C	=	Ratio 1:16	3	=	Ratio 1:16 (Plastic gear)

Plug type:	0	=	None
	C	=	Flying leads (Signal cable with FASTIN FASTON AMP)
	J	=	Deutsch (DT4), power 2P
	K	=	Deutsch (DT4), power 2P + signal 4P
	L	=	Deutsch (DT4), power 2P + signal 6P
	M	=	Deutsch (DT4), power and signal 8P
	O	=	AMP Superseal, power 2P
	P	=	AMP Superseal, power 2P + signal 4P
	Q	=	AMP Superseal, power 2P + signal 6P

Cable:	0	=	None	3	=	1.5 m power and 1.5 m signal
	1	=	1.5 m power	4	=	5 m power and 5 m signal
	2	=	5 m power	5	=	Y 1.5 m power and signal in one
				X	=	Special

Endstop Reached output:	**A**	=	A_HIGH / A_HIGH	J	=	A_HIGH / LOW
	B	=	A_LOW / A_HIGH	K	=	A_LOW / LOW
	C	=	A_HIGH / A_LOW	L	=	A_HIGH / HIGH
	D	=	A_LOW / A_LOW	M	=	A_LOW / HIGH
	E	=	LOW / A_HIGH	N	=	LOW / LOW
	F	=	HIGH / A_HIGH	O	=	HIGH / LOW
	G	=	LOW / A_LOW	P	=	LOW / HIGH
	H	=	HIGH / A_LOW	Q	=	HIGH / HIGH
				X	=	Special

Feedback Level:	0	=	None (IC w/o feedback)	**4**	=	4 - 20 mA
	1	=	Single Hall	5	=	PWM 10 - 90 %*
	2	=	0-10 V	6	=	PWM 20 - 80 %*
	3	=	0.5 - 4.5 V	X	=	Special

IC Type:	0	=	None	B	=	I/O Basic (9 Pin)
	1	=	IC Basic	C	=	I/O Customized (9 pin)
	2	=	IC Advanced	F	=	I/O Full (9 pin)
	4	=	IC Parallel	G	=	CANbus J1939 (9 pin) Split supply
	6	=	LIN bus	H	=	CANopen (9 pin) Split supply
	7	=	CAN bus J1939 (6 pin)	I	=	CANbus J1939 (9 pin)
	8	=	CANopen (6 pin)	J	=	CANopen (9 pin)
				X	=	Special

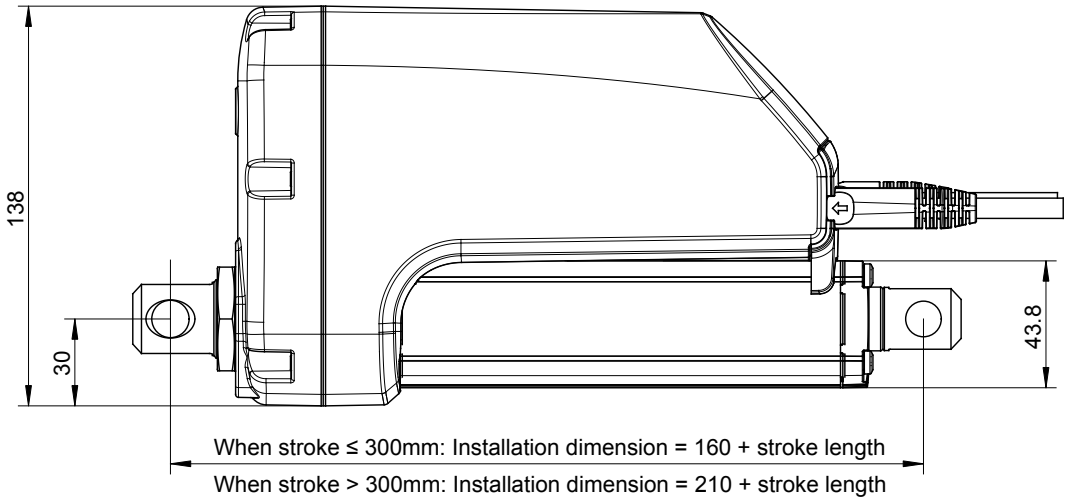
Not used:	**0**	=	N/A

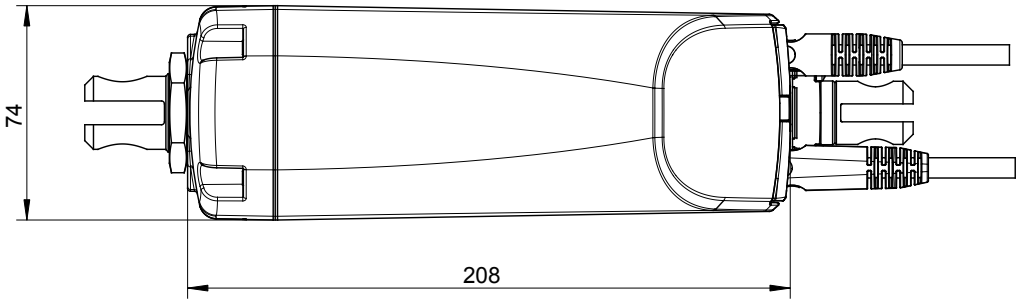
Not used:	**0**	=	N/A

BID:	**xxx**	=	Stroke up to 300 mm = stroke + 160 mm
	xxx	=	Stroke from 301 mm = stroke + 210 mm

*IC Advanced only

Built-in dimensions:





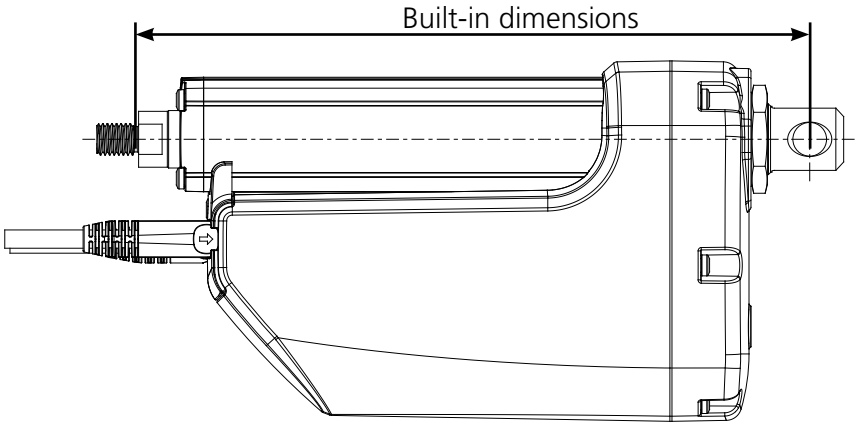
Stroke and built-in tolerances:

Endstop options	Descriptions	Stroke tolerance	Example for 200mm stroke	BID tolerance	Example for 360mm BID
All	With built-in limit switches or Integrated Controller	+/-2mm	198 to 202mm	+/- 4mm	356 to 364mm

Built-in dimensions:

	Piston rod	"1 and A" / to the centre of the hole		"2 and B" / to the centre of the hole		"5" / from the surface		"C and D" / to the centre of the hole	
Back fixture		Stroke < = 300	Stroke > 300	Stroke < = 300	Stroke > 300	Stroke < = 300	Stroke > 300	Stroke < = 300	Stroke > 300
		160	210	160	210	157*	207*	171	221

* These built-in dimensions are measured according to the illustration below.



Cable kit Article numbers

Buslink® cable kits:			
System:	**Article no.**	**Pins:**	**Including:**
IC: Basic, Advanced and Parallel	0367999	6	(Adapter + USB2Lin)
CAN bus / CANopen with 6 pin	0367997	6	(Adapter + USB2Lin)

Actuator Connect® cable kits:			
System:	**Article no.**	**Pins:**	**Including:**
I/O & CAN bus / CanOpen with 9 pins	0367996	9	(Adapter + USB2Lin)

Latest versions of both Buslink® and Actuator Connect® can be downloaded at the LINAK/TECHLINE page.

The power supply for actuators without integrated controller must be monitored externally and cut off in case of current overload.

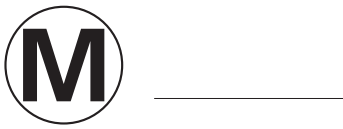
IC actuators has an integrated protection.

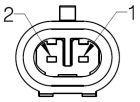
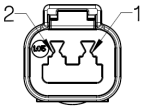
Recommended fuse for actuators without integrated controller:

Type	Spindle Pitch (mm)	Load maximum. Push/Pull (N)	Typical Amp. at full load (A)			Recommended fuse		
			48 V	24 V	12 V	48 V	24 V	12 V
33090xxxxxxxxA...	9	5000	-	-	10	-	-	20
33150xxxxxxxxA...	15	3500	-	-	10	-	-	20
33150xxxxxxxxA...	15	2250	-	-	10	-	-	20
33200xxxxxxxxA...	20	1500	-	-	10	-	-	20
33200xxxxxxxxA...	20	500	-	-	10	-	-	20
33090xxxxxxxxB...	9	5000	-	7.0	-	-	15	-
33150xxxxxxxxB...	15	3500	-	7.0	-	-	15	-
33150xxxxxxxxB...	15	2250	-	7.0	-	-	15	-
33200xxxxxxxxB...	20	1500	-	7.0	-	-	15	-
33200xxxxxxxxB...	20	500	-	7.0	-	-	15	-
33090xxxxxxxxJ...	9	5000	3.5	-	-	7.5	-	-
33150xxxxxxxxJ...	15	3500	3.5	-	-	7.5	-	-
33150xxxxxxxxJ...	15	2250	3.5	-	-	7.5	-	-
33200xxxxxxxxJ...	20	1500	3.5	-	-	7.5	-	-
33200xxxxxxxxJ..	20	500	3.5	-	-	7.5	-	-

Without feedback

33XXXXXX0000XXXX=XXXXXXXXXXXXX



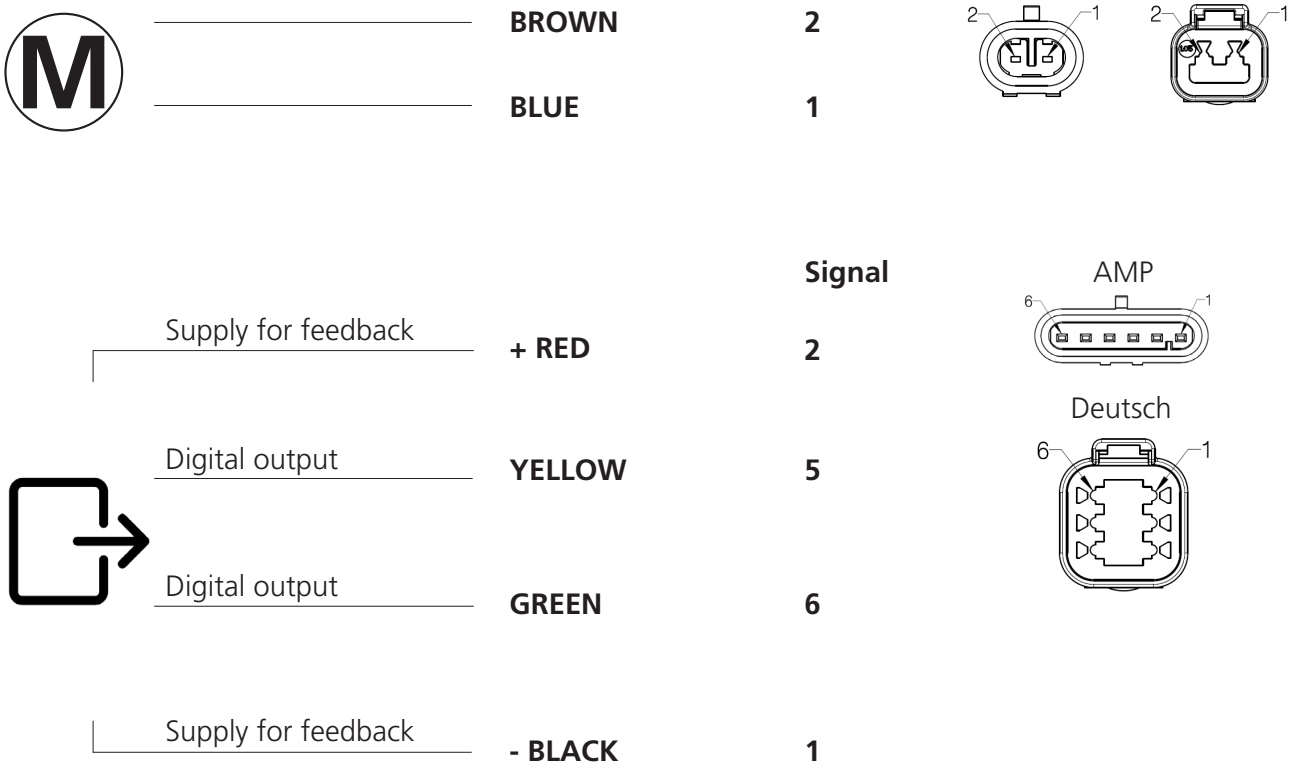
	Power	AMP	Deutsch
BROWN	2		
BLUE	1		

Without feedback

Input/Output	Specification	Comments
Description	Permanent magnetic DC motor.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Not to be connected	
Black	Not to be connected	
Green	Not to be connected	
Yellow	Not to be connected	
Violet	Not to be connected	
White	Not to be connected	

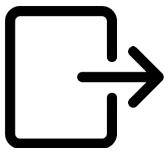
Endstop reached

33XXXXXXXXXXXX0X=XXXXXAXXXXXXX



If you wish to use the endstop reached, you will have to keep power on the Brown, Blue, Red and Black wires, otherwise the signal will be lost.

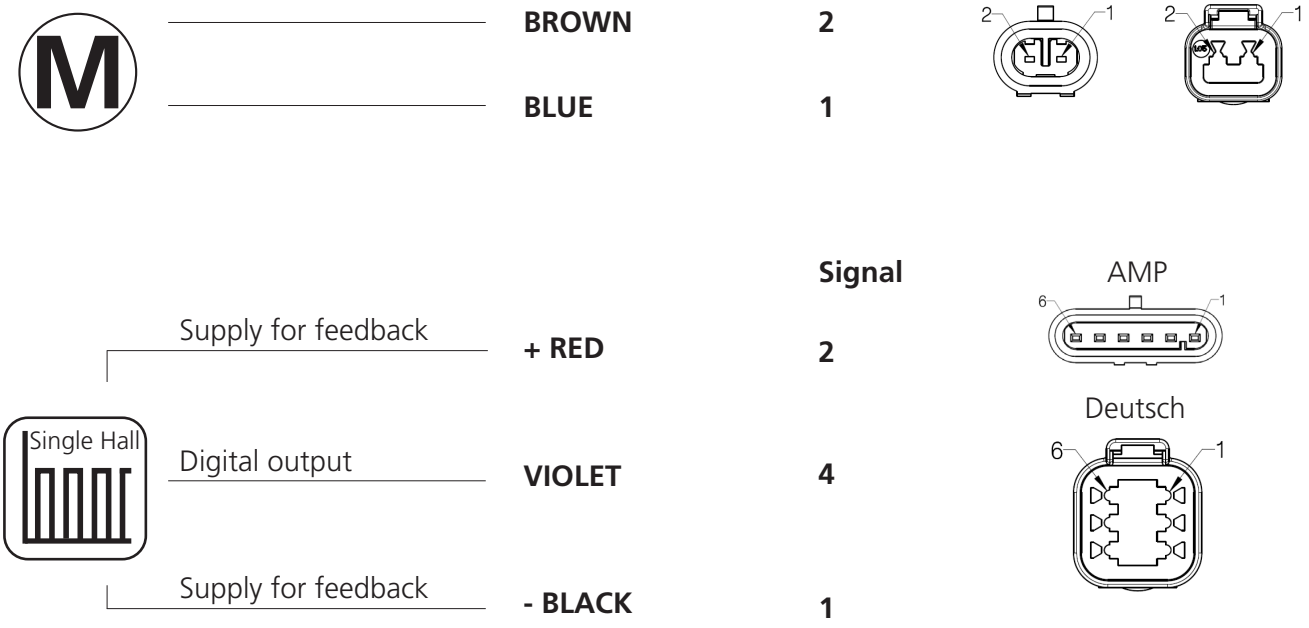
Endstop reached

Input/Output	Specification	Comments
Description	The actuator can be equipped with electronically controlled Endstop reached out.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24 VDC	Current consumption: Max. 40 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Endstop reached out	Output voltage min. VIN - 2 V Source current max. 100 mA NOT potential free
Yellow	Endstop reached in	
Violet	Not to be connected	
White	Not to be connected	

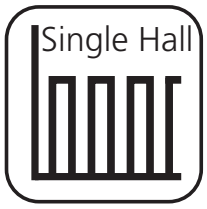
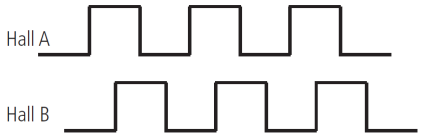
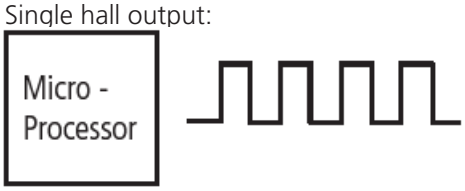
If you wish to use the Endstop reached, you will have to keep power on the brown, blue, red and black wires, otherwise the signal will be lost.

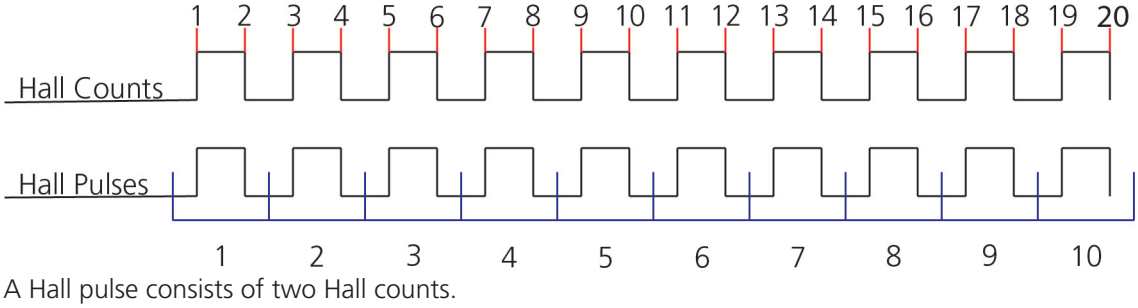
Relative positioning - Single Hall

33XXXXXXXX0KXXXX=XXXXXAXXXXXXX



Relative positioning - Single hall

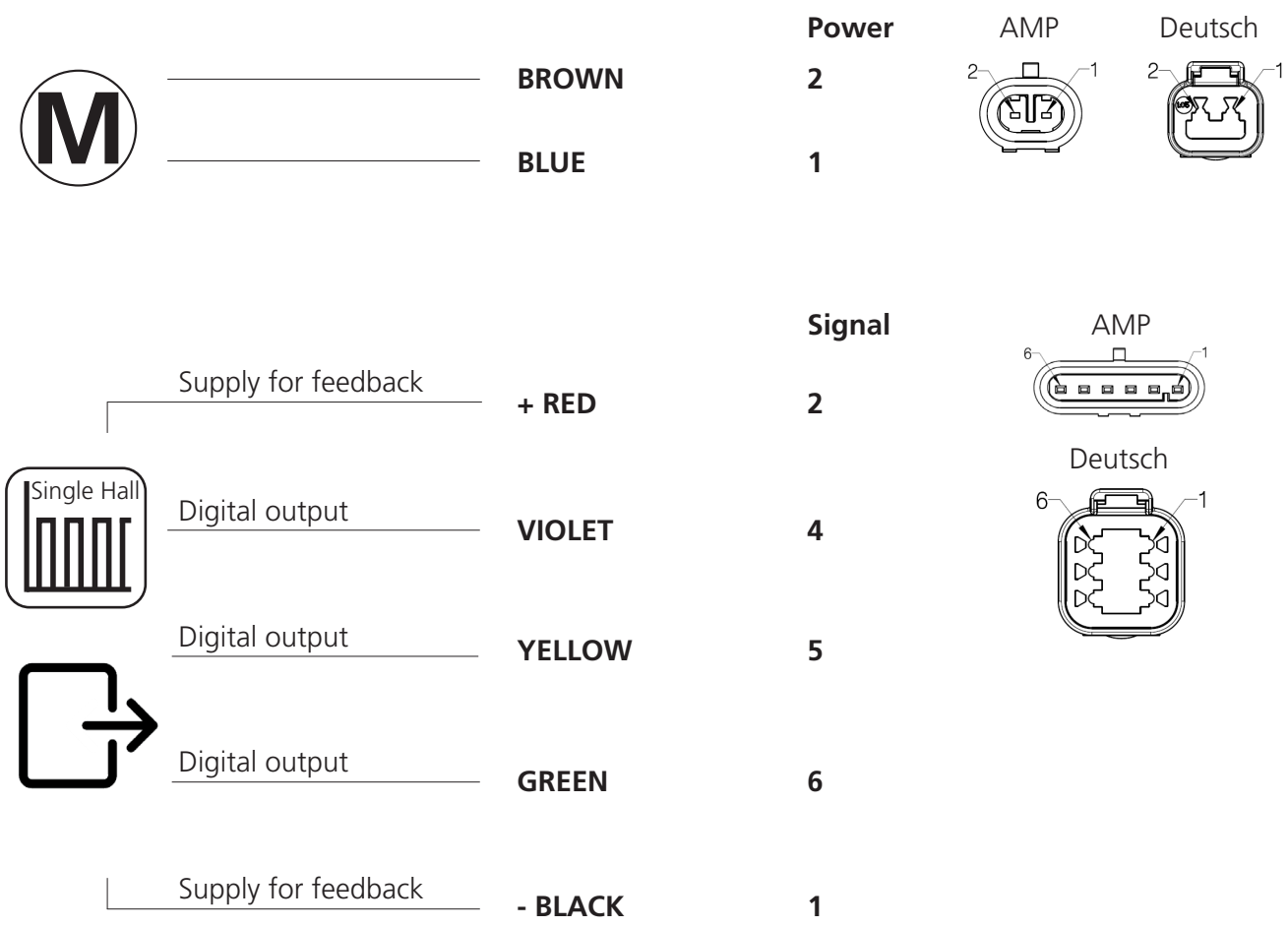
Input/Output	Specification	Comments
Description	The actuator can be equipped with Single hall that gives a relative positioning feedback signal when the actuator moves.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24 VDC	Current consumption: Max. 40 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Not to be connected	
Yellow	Not to be connected	
Violet	Single Hall output (PNP) Movement per Single Hall count: 33090: Actuator = 0.3 mm per count 33150: Actuator = 0.5 mm per count 33200: Actuator = 1.1 mm per count Frequency: Frequency is up to 125 Hz on Single Hall output depending on load and spindle. Overvoltage on the motor can result in shorter pulses.	Output voltage min. V_{IN} - 2 V Max. current output: 12 mA Max. 680 nF N.B. For more precise measurements, please contact LINAK A/S. Low frequency with a high load. Higher frequency with no load.
	Input: 	Single hall output: 
White	Not to be connected	



A Hall pulse consists of two Hall counts.
A Hall count occurs every time the signal changes direction, either upwards or downwards.

Relative positioning - REED 4 wires

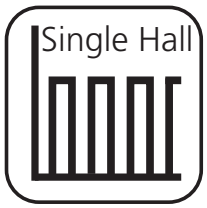
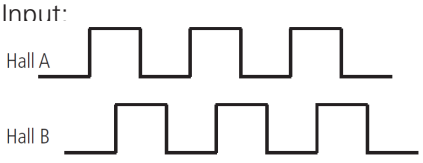
33XXXXXXXX0KXXXX=XXXXXAXXXXXXX

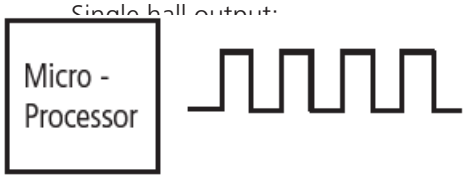


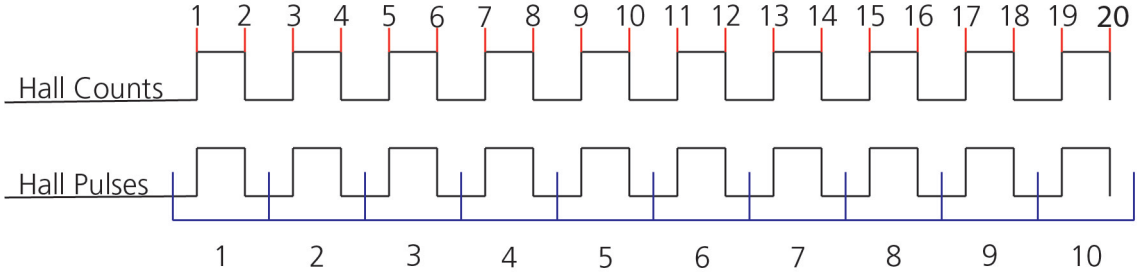
*YELLOW/GREEN: Endstop reached out are NOT potential free (see specifications on next page)

If you wish to use the endstop reached, you will have to keep power on the Brown, Blue, Red and Black wires, otherwise the signal will be lost.

Relative positioning and endstop reached - Single hall

<table>
<tr><th>Input/Output</th><th>Specification</th><th>Comments</th></tr>
<tr><td>Description</td><td>The actuator can be equipped with Single hall that gives a relative
positioning feedback signal when the actuator moves.</td><td> 
</td></tr>
<tr><td>Brown</td><td rowspan="2">12 - 24 VDC (+/-)
12 V ± 20 %
24V ± 10 %
Under normal conditions:
12 V, max. 13 A
24 V, max. 9 A</td><td>To extend actuator:
Connect Brown to positive
To retract actuator:
Connect Brown to negative</td></tr>
<tr><td>Blue</td><td>To extend actuator:
Connect Blue to negative
To retract actuator:
Connect Blue to positive</td></tr>
<tr><td>Red</td><td>Signal power supply (+) 12-24 VDC</td><td rowspan="2">Current consumption:
Max. 40 mA during run and pause
There will accure a higher inrush current</td></tr>
<tr><td>Black</td><td>Signal power supply GND (-)</td></tr>
<tr><td>Green</td><td>Endstop reached out</td><td rowspan="2">Output voltage min. V_{IN} - 2 V
Source current max. 100 mA
NOT potential free</td></tr>
<tr><td>Yellow</td><td>Endstop reached in</td></tr>
<tr><td rowspan="2">Violet</td><td>Single Hall output (PNP)
Movement per Single Hall count:
33090: Actuator = 0.3 mm per count
33150: Actuator = 0.5 mm per count
33200: Actuator = 1.1 mm per count
Frequency:
Frequency is up to 125 Hz on Single Hall output depending on load and spindle.
Overvoltage on the motor can result in shorter pulses.</td><td>Output voltage min. V_{IN} - 2 V
Max. current output: 12 mA
Max. 680 nF
N.B. For more precise measurements, please contact LINAK A/S.
Low frequency with a high load.
Higher frequency with no load.</td></tr>
<tr><td colspan="2">Input:
 

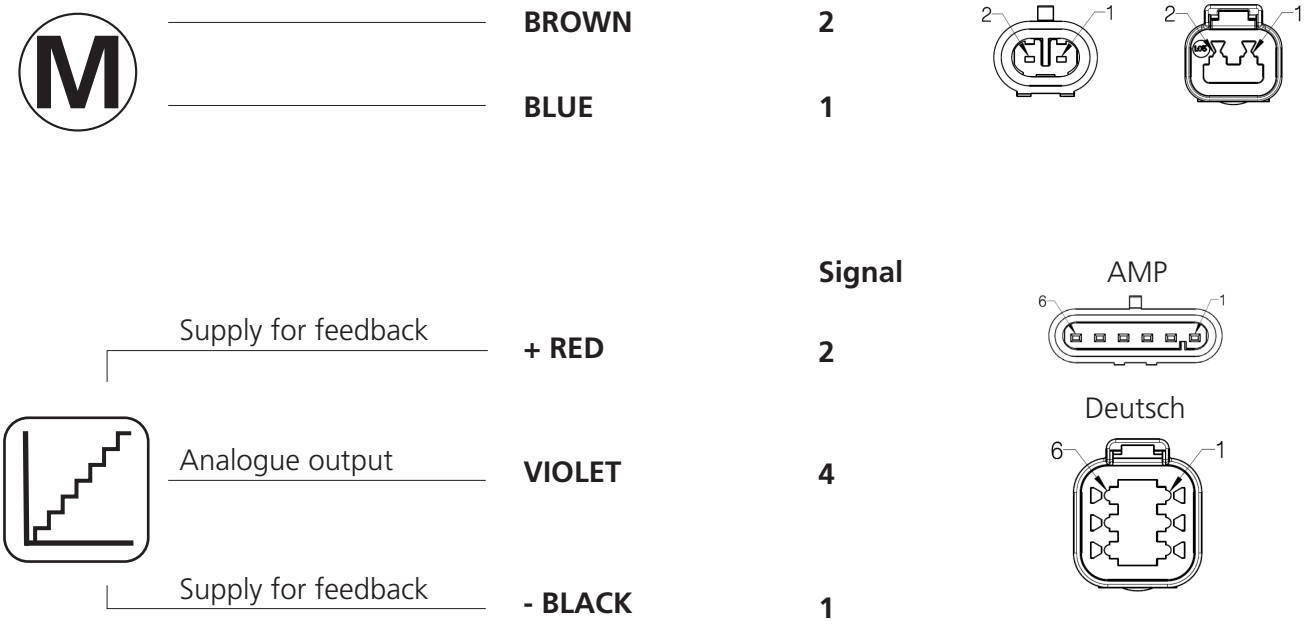

</td></tr>
<tr><td>White</td><td colspan="2">Not to be connected</td></tr>
</table>



A Hall pulse consists of two Hall counts.
A Hall count occurs every time the signal changes direction, either upwards or downwards.

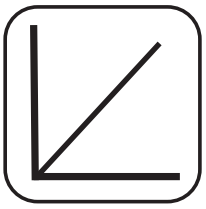
Absolute positioning - Analogue feedback

33XXXXXXXX0AXXXX=XXXXXXXXXXXXX



The signal power must be turned on at all times when the actuator is running, and minimum one second before it starts to run.

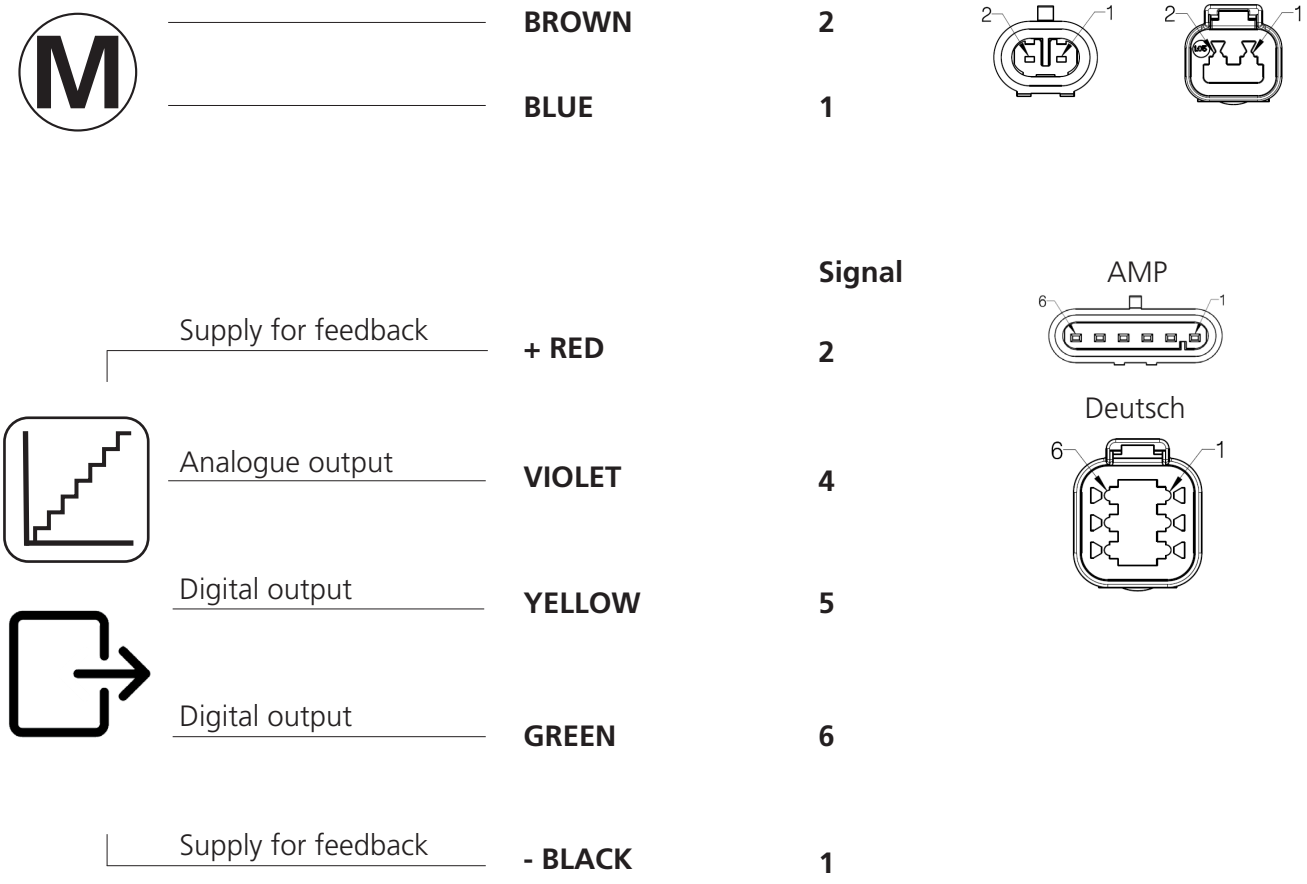
Absolute positioning - Analogue feedback

Input/Output	Specification	Comments
Description	The actuator can be equipped with an electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24VDC	Current consumption: Max. 60 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Not to be connected	
Yellow	Not to be connected	
Violet	Analogue feedback 0-10 V 0.5-4.5 V 4-20 mA	Tolerances +/- 0.2 V or mA Max. current output: 1 mA Ripple max. 200 mV Transaction delay 100 ms Linear feedback 0.5 %
White	Not to be connected	

For actuators with analogue feedback it is recommended to fully extract and retract the actuator on a regular basis
(thereby activating the limit switches) in order to ensure precise positioning.

Absolute positioning - Analogue feedback

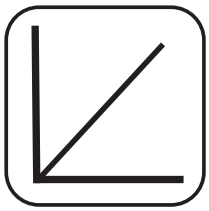
33XXXXXXXX0AXXXX=XXXXXAXXXXXXX



If you wish to use the endstop signals, you will have to keep power on the Brown, Blue, Red and Black wires, otherwise the signal will be lost.

The signal power must be turned on at all times when the actuator is running, and minimum one second before it starts to run.

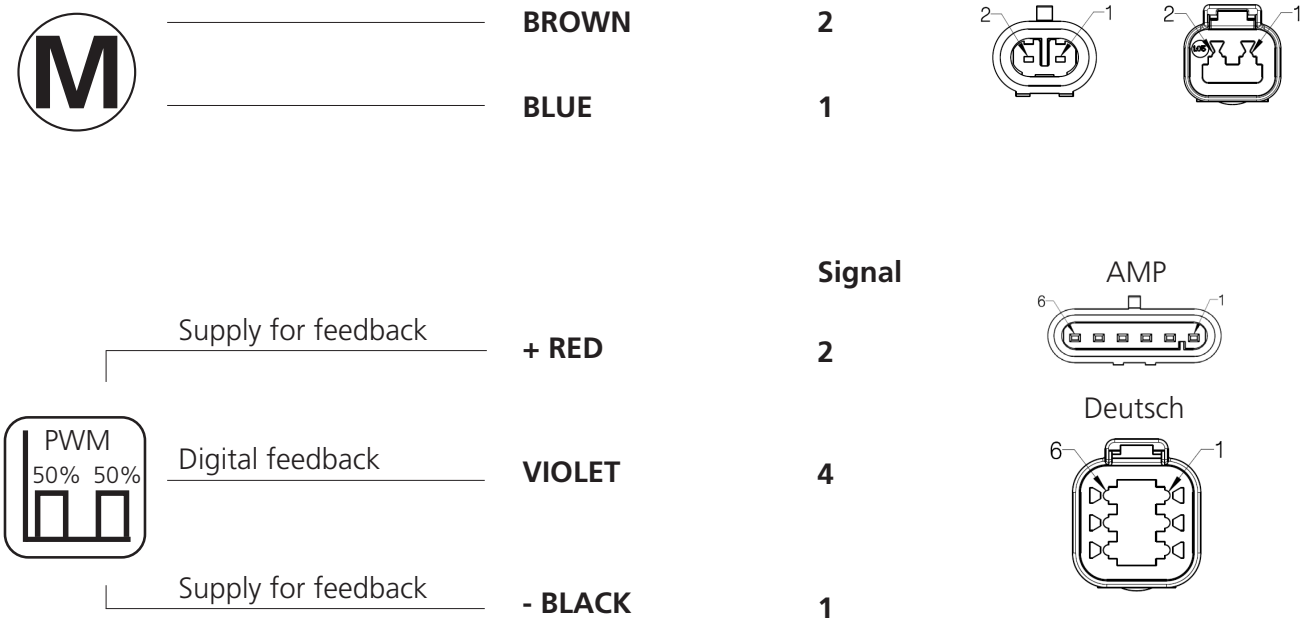
Absolute positioning and endstop reached - Analogue feedback

Input/Output	Specification	Comments
Description	The actuator can be equipped with electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24 VDC	Current consumption: Max. 60 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Endstop reached out	Output voltage min. V_{IN} - 2 V Source current max. 100 mA NOT potential free
Yellow	Endstop reached in	
Violet	Analogue feedback 0-10 V 0.5-4.5 V 4-20 mA	Tolerances +/- 0.2 V or mA Transaction delay 20 ms Linear feedback 0.5 % Output: Source Serial resistance: 12 V max 300 ohm 24 V max 900 ohm
White	Not to be connected	

For actuators with analogue feedback it is recommended to fully extract and retract the actuator on a regular basis
(thereby activating the limit switches) in order to ensure precise positioning.

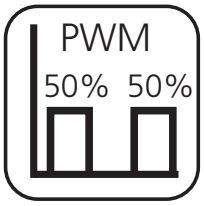
Absolute positioning - PWM

33XXXXXXXX0FXXXX=XXXXXXXXXXXXX



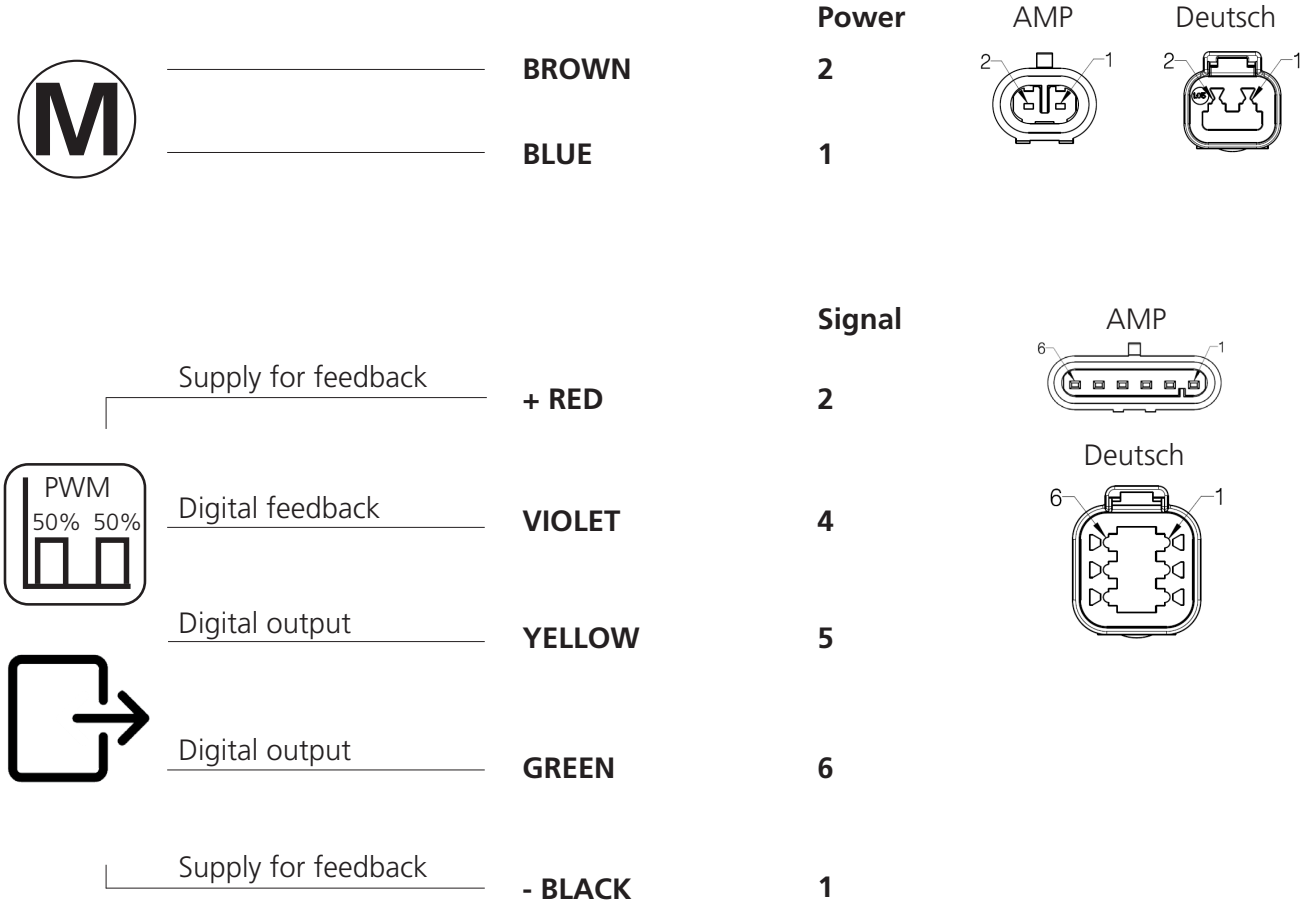
The signal power must be turned on at all times when the actuator is running, and minimum one second before it starts to run.

Absolute positioning - PWM

Input/Output	Specification	Comments
Description	The actuator can be equipped with electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24 VDC	Current consumption: Max. 60 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Not to be connected	
Yellow	Not to be connected	
Violet	Digital output feedback (PNP) 10-90 % (Option 5) 20-80 % (Option 6)	Output voltage min. V_{IN} - 2 V Tolerances +/- 2 % Max. current output: 12 mA Frequency: 75 Hz
White	Not to be connected	

Absolute positioning and endstop reached - PWM

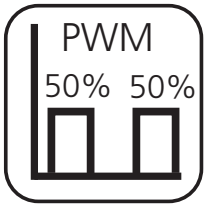
33XXXXXXXX0FXXXX=XXXXXAXXXXXXX



If you wish to use the endstop signals, you will have to keep power on the Brown, Blue, Red and Black wires, otherwise the signal will be lost.

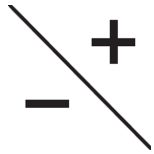
The signal power must be turned on at all times when the actuator is running, and minimum one second before it starts to run.

Absolute positioning and endstop reached - PWM

Input/Output	Specification	Comments
Description	The actuator can be equipped with electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12 - 24 VDC (+/-) 12 V ± 20 % 24V ± 10 % Under normal conditions: 12 V, max. 13 A 24 V, max. 9 A	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24 VDC	Current consumption: Max. 60 mA during run and pause There will accure a higher inrush current
Black	Signal power supply GND (-)	
Green	Endstop reached out	Output voltage min. V_{IN} - 2 V Source current max. 100 mA NOT potential free
Yellow	Endstop reached in	
Violet	Digital output feedback (PNP) 10-90 % (Option 5) 20-80 % (Option 6)	Output voltage min. V_{IN} - 2 V Tolerances +/- 2 % Max. current output: 12 mA Frequency: 75 Hz
White	Not to be connected	

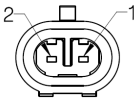
IC

33XXXXXXXXXX3XXX=XXXXXXX1XXXXX

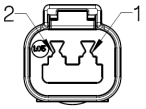


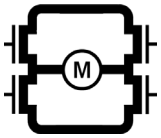
		Power
24/48 VDC +	**BROWN**	**2**
GND -	**BLUE**	**1**

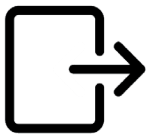
AMP



Deutsch

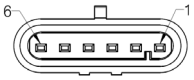




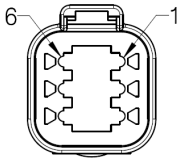


		Signal
Digital input	**RED**	**2**
Digital input	**BLACK**	**1**
Digital output	**YELLOW**	**5**
Digital output	**GREEN**	**6**

AMP

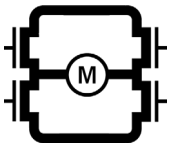


Deutsch



Please be aware that if the power supply is not properly connected, you might damage the actuator!

IC Basic

Input/Output	Specification	Comments
Description	Easy to use interface with integrated power electronics (H-bridge). The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12 - 24 VDC + (VCC) 12 V ± 20 % 24 V ± 10 % 12 V, max. 13 A - current cut off @ 15 A 24 V, max. 9 A - current cut off @10 A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing If the temperature drops below 0 °C, all current limits will automatically increase to 20 A for 12 V and 15 A for 24 V
Blue	12-24 VDC - (GND) Connect Blue to negative	
Red	Extends the actuator	The signal becomes active at: > 67% of V_{IN} The signal becomes inactive at: < 33% of V_{IN} Input current: 10 mA
Black	Retracts the actuator	
Green	Endstop reached out	Output voltage min. V_{IN} - 2 V Source current max. 100 mA Endstop Signals are NOT potential free. Endstop Signals can be configured with BusLink software according to any position needed When configuring virtual endstop, it is not necessary to choose the position feedback Endstop Signal and virtual endstop will work even when feedback is not chosen
Yellow	Endstop reached in	
Violet	Not to be connected	
White	Not to be connected	

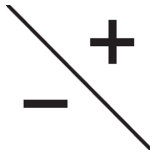
Current cut-offs should not be used as stop function! This might damage the actuator.
Current cut-offs should only be used in emergencies!

Current cut-off limits are not proportional with the load curves of the actuator.
This means that the current cut-offs cannot be used as load indicator.

There are tolerances on the spindle, nut, gear wheels etc. and these tolerances will have an influence on the current consumption for the specific actuator.

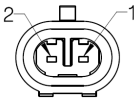
IC with feedback and endstop reached

33XXXXXXXXXX3XXX=XXXXXAX2XXXXX

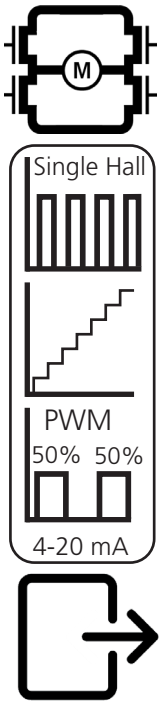


		Power
24/48 VDC +	**BROWN**	**2**
GND -	**BLUE**	**1**

AMP

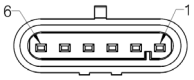


Deutsch

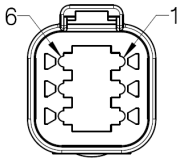


		Signal
Digital input	**RED**	**2**
Digital input	**BLACK**	**1**
Feedback	**VIOLET**	**4**
Signal GND	**WHITE**	**3**
Digital output	**YELLOW**	**5**
Digital output	**GREEN**	**6**

AMP



Deutsch

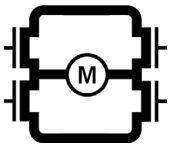


Please be aware that if the power supply is not properly connected, you might damage the actuator!

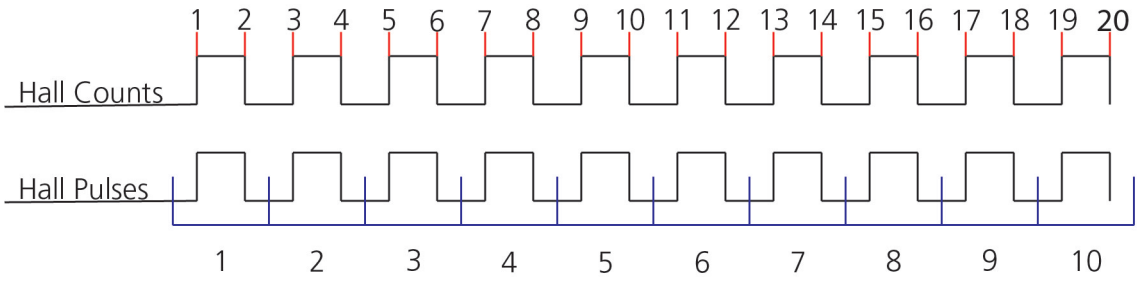
Configuration of IC Advanced is possible with the BusLink software for PC
The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately
Item number for BusLink cable kit: 0367999 (adapter + USB2Lin)

IC Advanced with Feedback and Endstop reached

Input/Output	Specification	Comments
Description	Easy to use interface with integrated power electronics (H-bridge). The actuator can also be equipped with electronic circuit that gives an absolute or relative feedback signal. The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12 - 24 VDC + (VCC) 12 V ± 20 % 24 V ± 10 % 12 V, max. 13 A - current cut off @ 15 A 24 V, max. 9 A - current cut off @10 A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing If the temperature drops below 0 °C, all current limits will automatically increase to: 20 A for 12 V 15 A for 24 V
Blue	12-24 VDC - (GND) Connect Blue to negative	
Red	Extends the actuator	The signal becomes active at: > 67% of V_{IN} The signal becomes inactive at: < 33% of V_{IN} Input current: 10 mA
Black	Retracts the actuator	
Green	Endstop reached out	Output voltage min. V_{IN} - 2 V Source current max. 100 mA Endstop Signals are NOT potential free. Endstop Signals can be configured with BusLink software according to any position needed. When configuring virtual endstop, it is not necessary to choose the position feedback. Endstop Signal and virtual endstop will work even when feedback is not chosen.
Yellow	Endstop reached in (Option 1) Constantly high (Option 2)	

Input/Output	Specification	Comments
Violet	Analogue feedback (0-10 V): Configure any high/low combination between 0-10 V	Ripple max. 200 mV Transaction delay 20 ms Linear feedback 0.5 % Max. current output. 1 mA
	Single Hall output (PNP) Movement per Single Hall count: 0.1372 mm per count Frequency is 14-26 Hz on Single Hall output depending on load. Overvoltage on the motor can result in shorter pulses	Output voltage min. V_{IN} - 2 V Max. current output: 12 mA Max. 680 nF
	Digital output feedback PWM: Configure any high/low combination between 0-100 %	Output voltage min. V_{IN} - 2 V Frequency: 75 Hz ± 10 Hz as standard, but this can be customised. Duty cycle: Any low/high combination between 0 and 100 percent. Open collector source current max. 12 mA
	Analogue feedback (4-20 mA): Configure any high/low combination between 4-20 mA	Tolerances +/- 0.2 mA Transaction delay 20 ms Linear feedback 0.5 % Output: Source Serial resistance: 12 V max. 300 ohm 24 V max. 900 ohm
	All absolute value feedbacks (0-10 V, PWM and 4-20 mA)	Standby power consumption: 12 V, 60 mA 24 V, 45 mA It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning
White	Signal GND	For correct wiring of Power GND and Signal GND - please see figure below

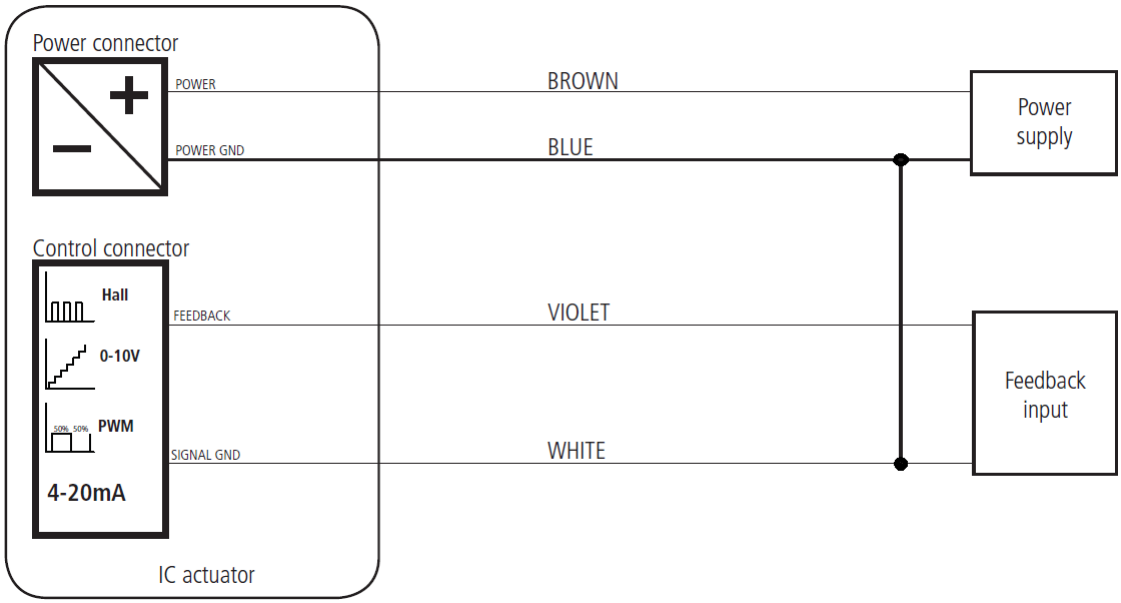


A Hall count occurs every time the signal changes direction, either upwards or downwards

A Hall pulse consists of two Hall counts.

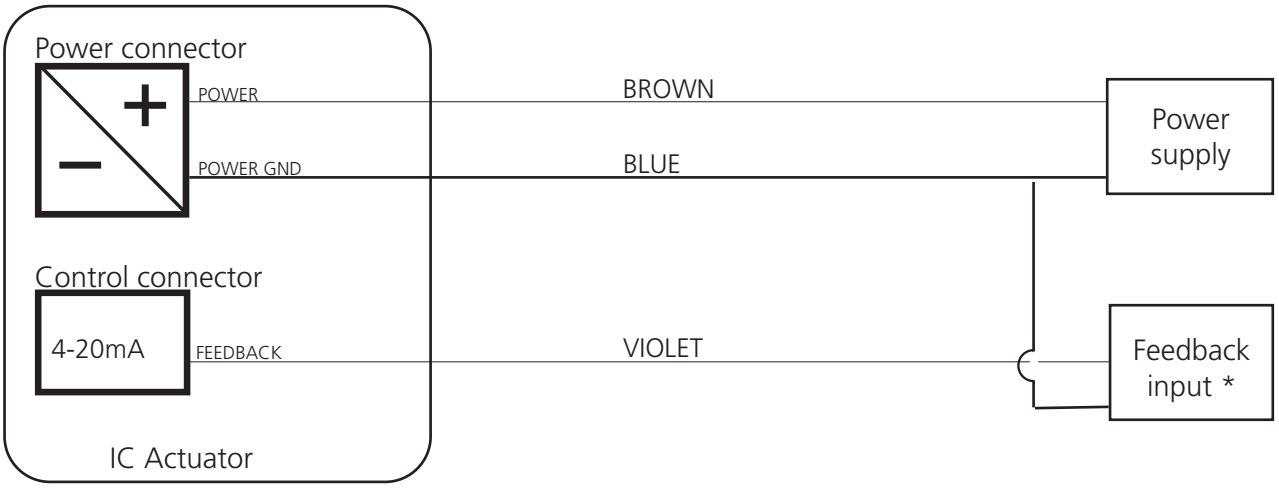
- Current cut-offs should not be used as stop function! This might damage the actuator. Current cut-offs should only be used in emergencies!
- Current cut-off limits are not proportional with the load curves of the actuator. This means that the current cut-offs cannot be used as load indicator.
- There are tolerances on the spindle, nut, gear wheels etc. and these tolerances will have an influence on the current consumption for the specific actuator.

Correct wiring of Power GND and Signal GND for IC Advanced:



Please note: This section only applies for 0-10 V, Hall and PWM feedback options.

The following connection illustration applies for 4-20 mA only:

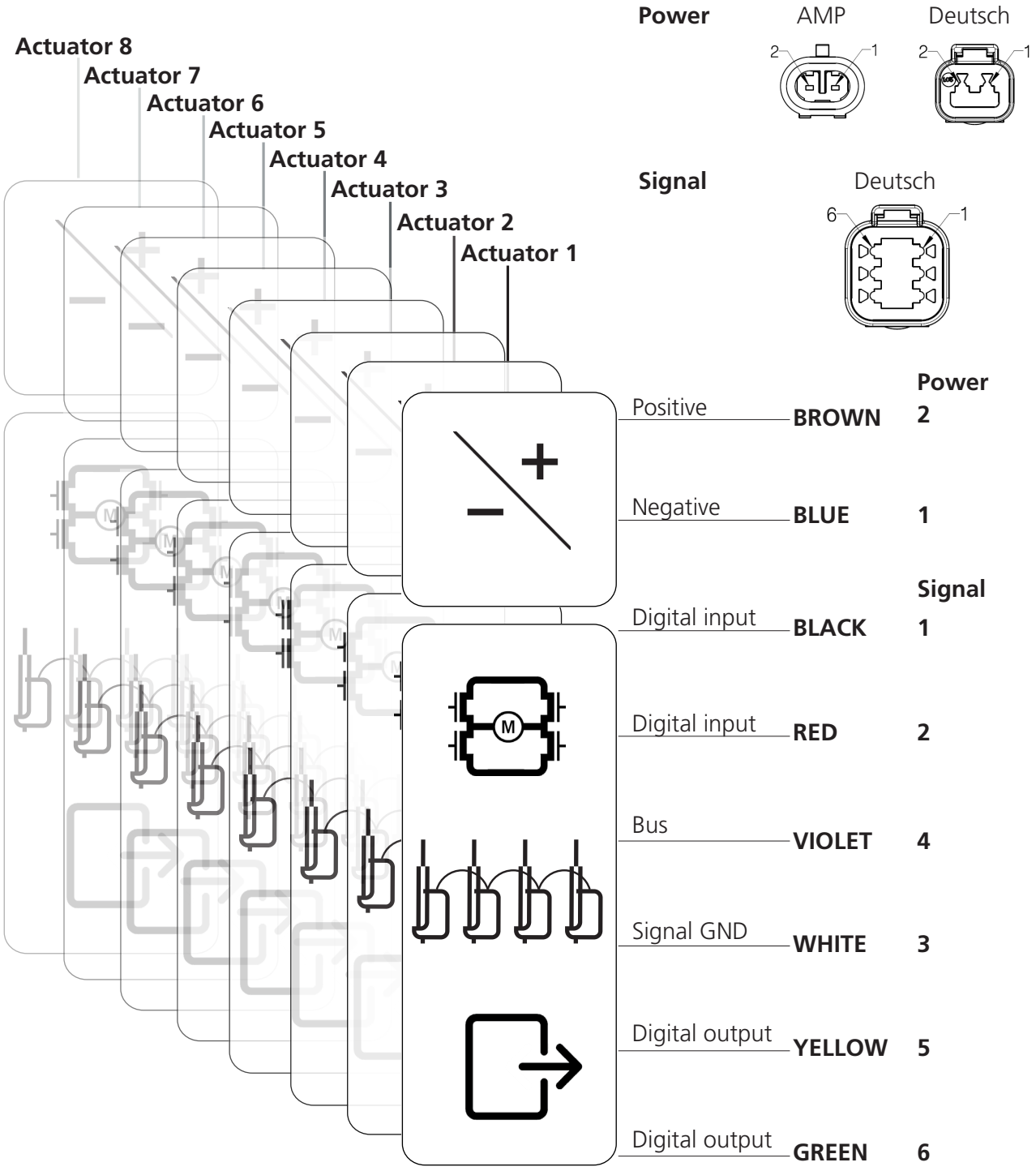


* Only to be used on differential input card. Do not use single ended input card.

Do NOT connect or put the white wire anywhere near GND,
as this will create ground loops, disturbing the mA-signal.

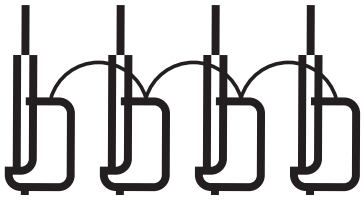
IC Parallel

33XXXXXXXXXX3XXX=XXXXXXX4XXXXX



Please be aware that if the power supply is not properly connected, you might damage the actuator!
The Green and Yellow wires from parallel connected actuators must NOT be interconnected

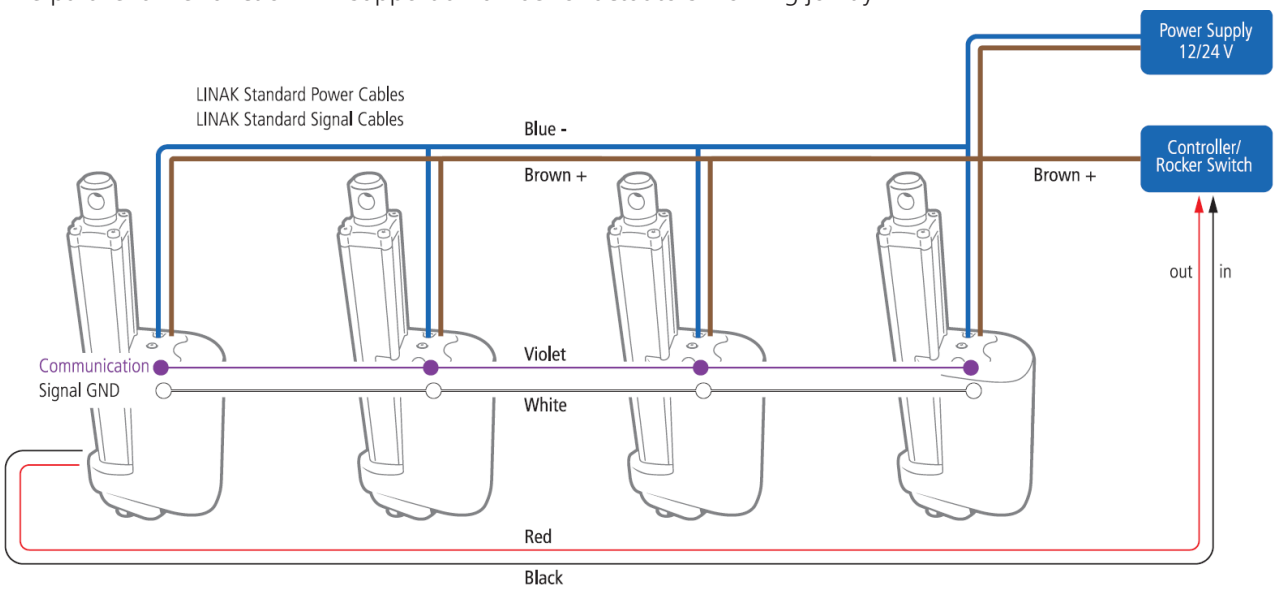
IC Parallel

Input/Output	Specification	Comments
Description	Parallel drive of up to 8 actuators. A Master actuator with an integrated H-bridge controller controls up to 7 slave actuators. The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12 - 24 VDC + (VCC) 12 V ± 20 % 24 V ± 10 % 12 V, max. 13 A - current cut off @ 15 A 24 V, max. 9 A - current cut off @10 A	Note: Do not change the power supply polarity on the brown and blue wires! The parallel actuators can run on one OR separate power supplies. Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through BusLink (only one actuator at a time for parallel). If the temperature drops below 0 °C, all current limits will automatically increase to 20 A for 12 V and 15 A for 24 V
Blue	12-24 VDC - (GND) Connect Blue to negative	
Red	Extends the actuator	The signal becomes active at: > 67% of V_{IN} The signal becomes inactive at: < 33% of V_{IN} Input current: 10 mA It does not matter where the in/out signals are applied. You can either choose to connect the signal cable to one actuator OR you can choose to connect the signal cable to each actuator on the line. Either way this will ensure parallel drive
Black	Retracts the actuator	
Green	Endstop reached out	Output voltage min. V_{IN} - 2 V Source current max. 100 mA Endstop reached are NOT potential free. Endstop reached can be configured with BusLink software according to any position needed.
Yellow	Endstop reached in	
Violet	Parallel communication: Violet cords must be connected together	Standby power consumption: 12 V, 85 mA, 24 V, 50 mA No feedback available during parallel drive
White	Signal GND: White cords must be connected together	For correct wiring of power GND and Signal GND see next page

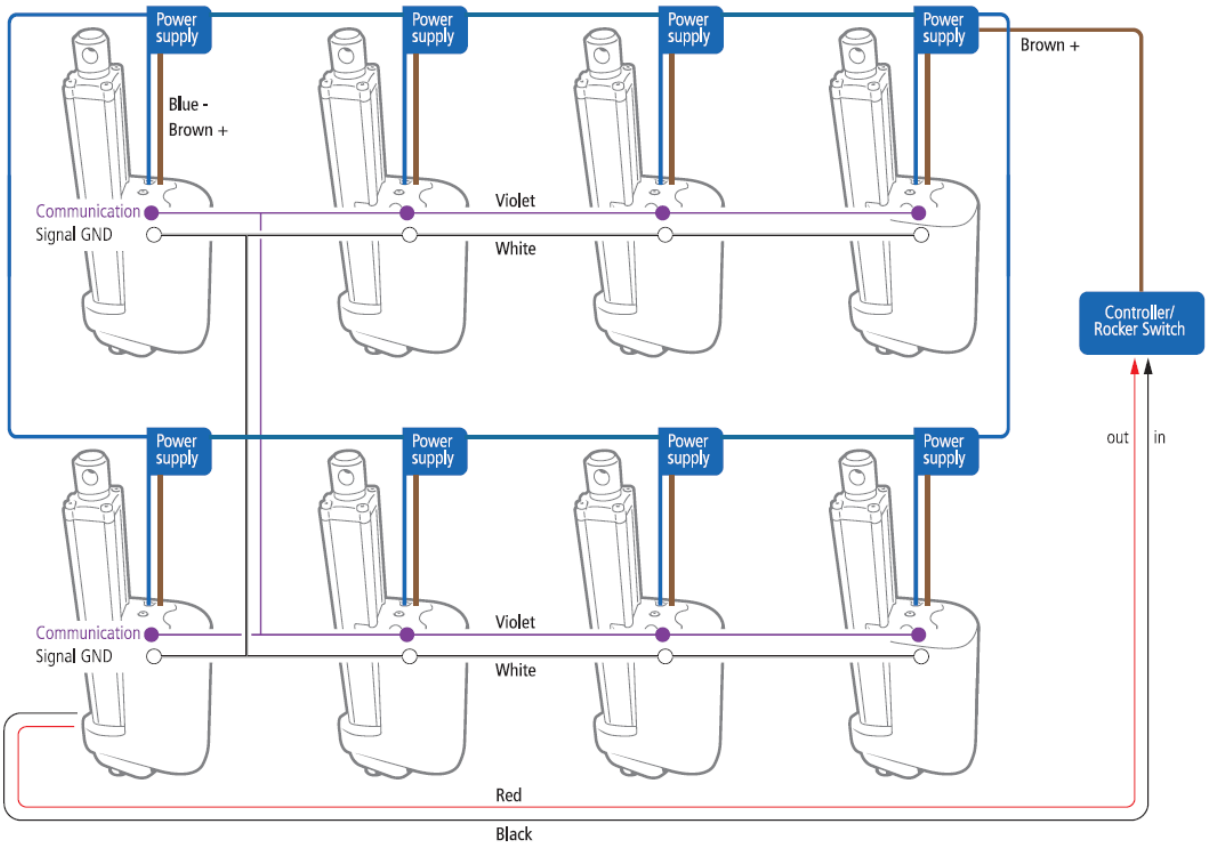
- Current cut-offs should not be used as stop function! This might damage the actuator. Current cut-offs should only be used in emergencies!
- Current cut-off limits are not proportional with the load curves of the actuator. This means that the current cut-offs cannot be used as load indicator.
- There are tolerances on the spindle, nut, gear wheels etc. and these tolerances will have an influence on the current consumption for the specific actuator.

The parallel system

The parallel drive function will support a number of actuators working jointly:



It is both possible to run parallel with a single power supply, or to run each actuator with separate power supplies:



Only standard power and signal cables are available for parallel.

If separate power supplies are used, they must have the same potential, and the power supply GND (blue wires) must be connected in a common ground.

- The signal cables may be 40 meters in total

BusLink software tool and the parallel system:

The BusLink software tool is available for parallel and can be used for:

Configuration, Manual run and Diagnostics (service counter)

The BusLink software can be downloaded on: https://www.linak.com/segments/techline/tech-trends/ic-and-bus-actuators/

For more information and easy set-up of BusLink, please follow this link to view the Quick Guide for BusLink: https://cdn.linak.com/-/media/files/user-manual-source/en/techline-buslink-quick-guide-brochure-eng.ashx?la=en

Please note that the BusLink cables must be purchased separately from the actuator!

Item number for BusLink cable kit: 0367999 (adaptor + USB2Lin)

Only through the BusLink software tool is it possible to state if the system is Parallel or Non-critical Parallel. Via this tool it is also possible to reconfigure the whole system from one system to the other.

The parallel system:

- The system does not have to run on one main power supply only – it can be supplied by individual supplies corresponding to the number of actuators in the system. Please respect the actuator specifications regarding voltage level and current consumption!
- It does not matter where the IN/OUT signal is applied.
- When all actuators are connected, a Controler will automatically be chosen. E.g. with 5 actuators in one system there will be 1 Controler and 4 Companions. The Controler can control up to 7 companions
- If an overload occurs, the running of the actuators will be stopped and blocked in that direction until an activation in the opposite direction has been made, or the system has been re-powered
- Before entering BusLink mode, all actuators must be disconnected. It is only possible to configure one actuator at a time through BusLink
- When changing the actuator configuration, it is important that all actuators in the system have the same configuration before the system starts running. Otherwise, the actuators will not run
- Actuators will be pre-programmed from our production as 2, 3, 4, 5.. etc. parallel systems. Through BusLink it will be possible to add or remove actuators to/from the system

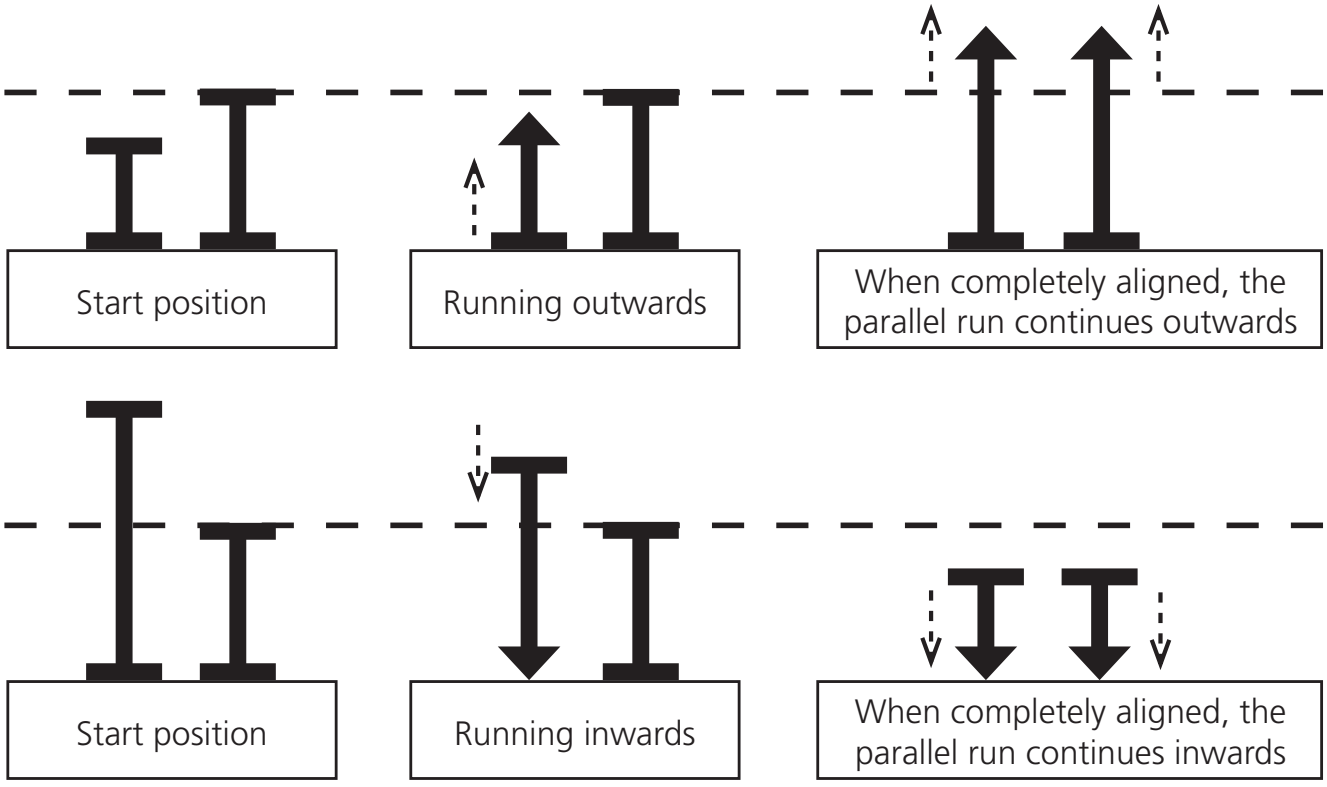
- In case an actuator drops off the line due to e.g. a damaged signal cable, the parallel system will stop immediately
- In case one of the actuators are broken, the system will not move; not even after re-powering. The broken actuator needs to be replaced, before the system can runagain. The system will only run, when it is complete or configured to a Non-critical Parallel system via the Buslink software tool
- Only for non-critical parallel systems
- The Non-critical Parallel system offers auto-detection for every single power up if a new actuator is added to the line (system)
- To add or remove actuators from the system, the system needs to be shut down and powered up again. Please be aware, that after re-powering, the system will not detect if an actuator is missing!
- If adding a new actuator to the system, be aware that the actuator needs to have the same configuration (Non-critical Parallel) as the existing ones; this can be done via the BusLink software tool.

System Monitoring for Parallel:

- If one of the actuators have one of the following error conditions, the actuator will immediately STOP:
- H-Bridge fault
- Out of the temperature range (High duty cycle protection)
- Overcurrent (Current cut-off if one or all actuators go in mechanical block)
- SMPS fault
- Endstop Sisgnal fault switch
- Hall sensor failure
- Position lost
- Overvoltage (39.5V DC)

Alignment of the parallel actuator system:

If the actuators are not in parallel when starting up, the next movement will run in the following manner:

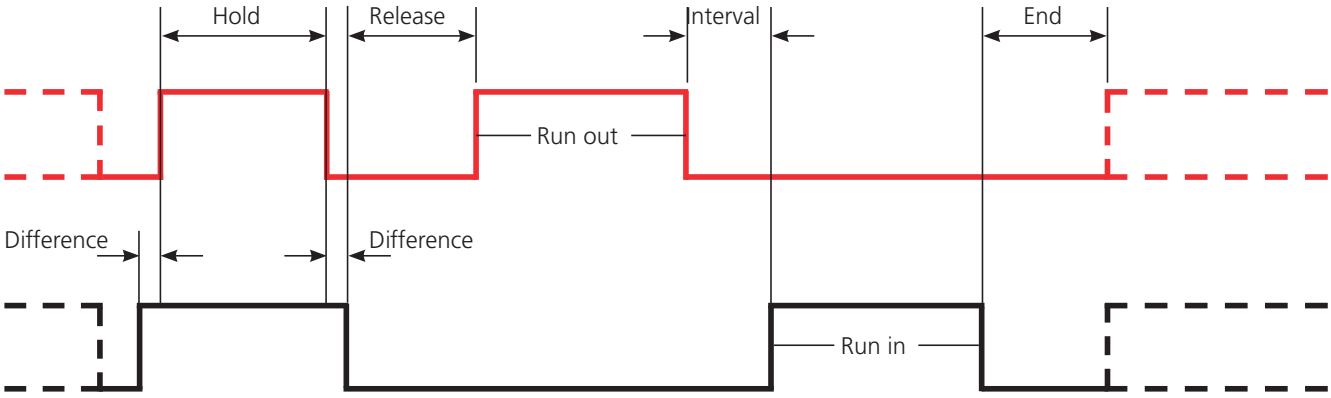


Parallel manual service mode:

With the parallel manual service mode it is possible to drive one or more parallel actuators separately, using the red and black wire from each actuator.

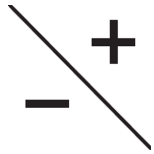
Please follow this procedure to manually extend/retract the parallel actuator(s):

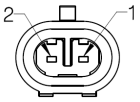
Step	Procedure	Min.	Max.
1. Hold	Put power on the Red and Black wires for 10-30 seconds. Hold with a maximum of difference between the two wires.	10 sec.	30 sec.
2. Release	Disconnect all wires and wait 0.5-2 seconds before the next step. Hold with a maximum of difference between the two wires.	0.5 sec.	2 sec.
3. Extend/Retract	Now choose either to extend or retract the actuator: To extend the actuator: Connect only the Red wire(s) to the power supply To retract the actuator: Connect only the Black wire(s) to the power supply	-	-
4. Interval	Switch between running in/out as much as needed, without exceeding the 2.0 seconds interval between disconnecting/connecting the Red and Black wires	-	2 sec.
5. End	To exit the parallel manual mode, diconnect the Red and Black wires for more than 2.0 seconds	2 sec.	-

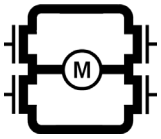


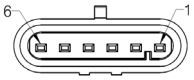
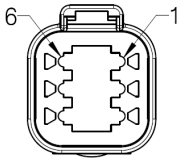
I/O Basic

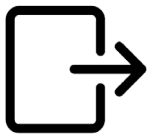
33XXXXXXXXXX3X2X=XXXXXXXBXXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		



		Signal	AMP	Deutsch
Digital input	**RED**	**1**		
Digital input	**BLACK**	**2**		



Digital output	**YELLOW**	**3**
Digital output	**GREEN**	**4**

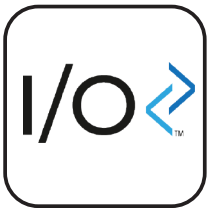
Analog output + or Digital input	**ORANGE** Not used	**0**
Analog output - or Digital input	**LIGHT BLUE** Not used	**0**

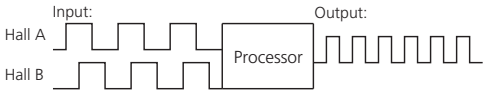
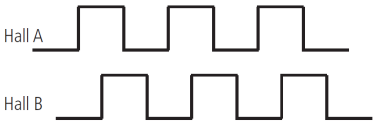
Parallel	**VIOLET** Not used	**0**
Parallel GND	**WHITE** Not used	**0**

Bluetooth® Antenna	**GREY**	**0**

Not used*: The I/O Basic actuator can be upgraded to I/O Full, if more functionality is needed - even after purchase. Connect the actuator to Actuator Connect™ via Bluetooth® or a USB adapter cable (must be purchased separately), and request an unlock key from your local LINAK office.

I/O Customised or Full

Input/Output	Specification	Comments
Description	IC - I/O is a universal industrial interface developed by LINAK©. I/O is a common term used, to describe inputs and outputs As part of the IC (Integrated Controller) range, the IC - I/O interface it is offering a range of flexible digital and analogue in- and outputs. It can be deployed through all industries.	
Brown	24-48 VDC + (VCC) 24V, current limit 13 A 48V, current limit 8 A	Note: Do not swap the power supply polarity on the brown and blue wires! The PCB is coupled to the housing through a capacitor. Current limit levels can be adjusted through Actuator Connect®. If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.
Blue	- (GND) Connect Blue to negative	
Red	Extends the actuator features*: -Standard run (Default for Full version) -Impulse run -Servo (+) -Proportional (+)	The signal becomes active at: ≥ 67% of V_{IN} = ON The signal becomes inactive at: ≤ 33% of V_{IN} = OFF Input current: 10 mA
Black	Retracts the actuator features*: -Standard run (Default for Full version) -Impulse run -Servo (-) -Proportional (-)	

Input/Output	Specification	Comments
Yellow	Digital position output features*: - Endstop reached (inwards) (Default for Full version) - Endstop zone reached (inwards) - Actuator running - Constantly low - Constantly high - Single hall XOR - Dual hall (A)	Digital outputs: The digital outputs are either active high or active low, depending on the preferred signal type. - Output voltage min. VIN - 2 V - Source current max. 100 mA Single hall XOR:  Dual hall: 
Green	Digital position output features*: - Endstop reached (outwards) (Default for Full version) - Endstop zone reached (outwards) - Actuator running - Constantly low - Constantly high - Single hall XOR - Dual hall (B)	
Orange	Analogue output or Digital input feature*: -Analogue feedback (+) -Predefined position 1 -Run condition	Customisable or not used (Default for Full version)
Light Blue	Analogue output or Digital input features*: -Analogue feedback (-) -Predefined position 2	Customisable or not used (Default for Full version)
Violet	Parallel communication*	Customisable or not used (Default for Full version) The Parallel drive function will support up to 8 actuators running simultaneously. It is possible to run parallel with a main power supply or separate power supplies
White	Parallel common GND	Only to be connected to other Parallel GND and only in parallel systems
Grey	Antenna for Bluetooth®	The grey wire is used to strengthen the Bluetooth signal, allowing a stable wireless connection and has no functionality during operation.

* Customisable: The I/O Customised actuator is configured based on customer needs - for detailed information about wire functionality, please see the auto-generated data sheet (type in J-number from product label in the 'Tools' roll down menu).

The I/O Full actuator is configured like an I/O Basic from factory, but with full access to all features. Connect the actuator to Actuator Connect™ via Bluetooth® or a USB adapter cable (must be purchased separately), to enable and configure various features.

I/O Customised or Full

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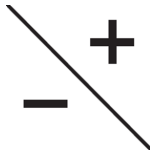
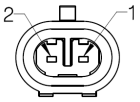
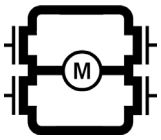
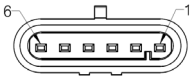
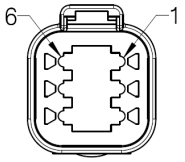
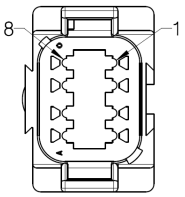
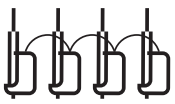


		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		



		Signal	AMP
Digital input	**RED**	**1**	
Digital input	**BLACK**	**2**	Deutsch 
Digital output	**YELLOW**	**3**	
Digital output	**GREEN**	**4**	Deutsch 
Analog output + or Digital input	**ORANGE** Not used or customisable*	**5**	
Analog output - or Digital input	**LIGHT BLUE** Not used or customisable*	**6**	



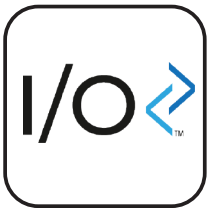
Parallel	**VIOLET** Not used or customisable*	**7** Alt. 5**
Parallel GND	**WHITE** Not used or customisable*	**8** Alt. 6**

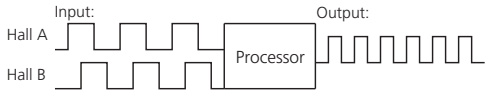
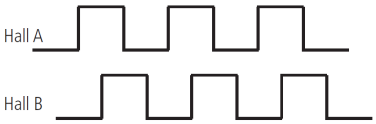
Bluetooth® Antenna	**GREY**	**0**

*Customisable: The I/O Customised actuator is configured based on customer needs - for detailed information about wire functionality, please see the auto-generated data sheet (type in J-number from product label)
The I/O Full actuator is configured like an I/O Basic from factory, but with full access to all features. Connect the actuator to Actuator Connect™ via Bluetooth® or a USB adapter cable (must be purchased separately), to enable and configure various features.

**If 'endstop reached' is not used, a 6-pin connector can be chosen, where the alternative pins are used.

I/O Customised or Full

Input/Output	Specification	Comments
Description	IC - I/O is a universal industrial interface developed by LINAK©. I/O is a common term used, to describe inputs and outputs As part of the IC (Integrated Controller) range, the IC - I/O interface it is offering a range of flexible digital and analogue in- and outputs. It can be deployed through all industries.	
Brown	24-48 VDC + (VCC) 24V, current limit 13 A 48V, current limit 8 A	Note: Do not swap the power supply polarity on the brown and blue wires! The PCB is coupled to the housing through a capacitor. Current limit levels can be adjusted through Actuator Connect®. If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.
Blue	- (GND) Connect Blue to negative	
Red	Extends the actuator features*: -Standard run (Default for Full version) -Impulse run -Servo (+) -Proportional (+)	The signal becomes active at: ≥ 67% of V_{IN} = ON The signal becomes inactive at: ≤ 33% of V_{IN} = OFF Input current: 10 mA
Black	Retracts the actuator features*: -Standard run (Default for Full version) -Impulse run -Servo (-) -Proportional (-)	

Input/Output	Specification	Comments
Yellow	Digital position output features*: - Endstop reached (inwards) (Default for Full version) - Endstop zone reached (inwards) - Actuator running - Constantly low - Constantly high - Single hall XOR - Dual hall (A)	Digital outputs: The digital outputs are either active high or active low, depending on the preferred signal type. - Output voltage min. VIN - 2 V - Source current max. 100 mA Single hall XOR:  Dual hall: 
Green	Digital position output features*: - Endstop reached (outwards) (Default for Full version) - Endstop zone reached (outwards) - Actuator running - Constantly low - Constantly high - Single hall XOR - Dual hall (B)	
Orange	Analogue output or Digital input feature*: -Analogue feedback (+) -Predefined position 1 -Run condition	Customisable or not used (Default for Full version)
Light Blue	Analogue output or Digital input features*: -Analogue feedback (-) -Predefined position 2	Customisable or not used (Default for Full version)
Violet	Parallel communication*	Customisable or not used (Default for Full version) The Parallel drive function will support up to 8 actuators running simultaneously. It is possible to run parallel with a main power supply or separate power supplies
White	Parallel common GND	Only to be connected to other Parallel GND and only in parallel systems
Grey	Antenna for Bluetooth®	The grey wire is used to strengthen the Bluetooth signal, allowing a stable wireless connection and has no functionality during operation.

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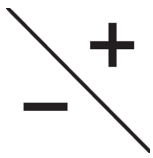
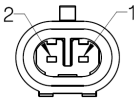
CAN bus (J1939)

33XXXXXXXX003XXX=XXXXXX07XXXXX

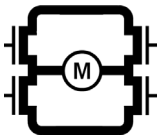


		Power
24/48 VDC +	**BROWN**	**2**
GND -	**BLUE**	**1**

AMP

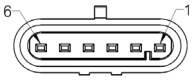


Deutsch

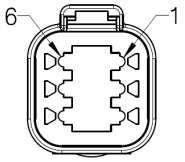


		Signal
Digital input HW Addressing pin 2	**RED**	**2**
Digital input HW Addressing pin 1	**BLACK**	**1**

AMP



Deutsch



Bus	**GREEN**	**6**
Bus	**YELLOW**	**5**

Service-Interface

Data	**VIOLET**	**4**
Data GND HW Addressing pin 3	**WHITE**	**3**

The BusLink software tool is available for CAN bus actuators and can be used for:

Diagnostics, manual run and configuration

The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately

Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

CANbus (J1939)

Input/Output	Specification	Comments
Description	Compatible with the SAE J1939 standard. Uses CAN messages to command movement, setting parameters and to deliver feedback from the actuator. Actuator identification is provided using standard J1939 address claim or fixed addresses.	
Brown Connect to positive	12 - 24 VDC + (VCC) 12 V ± 20 % 24 V ± 10 % 12 V, max. 13 A - current cut off @ 15 A 24 V, max. 9 A - current cut off @10 A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing. Current limit levels can be adjusted through BusLink. If the temperature drops below 0 °C, all current limits will automatically increase to: 20 A for 12 V 15 A for 24 V
Blue	12-24 VDC - (GND) Connect Blue to negative	
Red	Extends the actuator	The signal becomes active at: > 67% of V_{IN} The signal becomes inactive at: < 33% of V_{IN} Input current: 10 mA
Black	Retracts the actuator	
Green	CAN_L	Actuators with CAN bus does not contain the 120 Ω terminal resistor. The physical layer is in accordance with J1939-15.* Speed: Autobaud up to 500 kbps (CAN bus prior to version 3.0 up to 250 kbps) Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair Cable impedance: 120 Ω (±10 %)
Yellow	CAN_H	
Violet	Service interface	Only BusLink can be used as service interface. Use the green adapter cable
White	Service interface GND	

* J1939-15 refers to Twisted Pair and Shielded cables.

The standard/default cables delivered with CAN actuators do not comply with this.

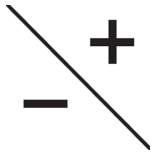
BusLink cables must be purchased separately from the actuator!

Find more information about the CAN bus actuators in the CAN bus user manual.

The newest version is available online at LINAK.COM/TECHLINE

CAN bus 0-Point Hardware Addressing

33XXXXXXXX003XXX=XXXXXX0GXXXXX



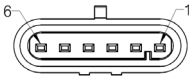
		Power
24/48 VDC +	BROWN	2
GND -	BLUE	1

AMP

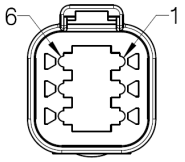
Deutsch

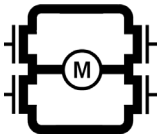
		Signal
Not to be connected	ORANGE	5
Digital input Hardware addressing 1	BLACK	2
Digital input Hardware addressing 2	RED	1
Hardware addressing 3	LIGHT BLUE	6
Bus	YELLOW	3
Bus	GREEN	4
Not to be connected	GREY	0
Data	VIOLET	7
Data GND	WHITE	8

AMP



Deutsch





Service-Interface

The BusLink software tool is available for CAN bus actuators and can be used for:

Diagnostics, manual run and configuration

The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately

Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

CAN bus (J1939) 0-Point with Hardware Addressing

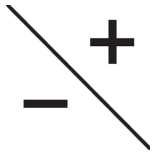
<table>
<tr><th>Input/Output</th><th colspan="4">Specification</th><th colspan="2">Comments</th></tr>
<tr><td>Description</td><td colspan="4">Compatible with the SAE J1939 standard. Uses CAN messages to command movement, setting parameters and to deliver feedback from the actuator.
Actuator identification is provided,using standard J1939 address claim or fixed addresses.</td><td colspan="2">  </td></tr>
<tr><td rowspan="7">Brown
Connect to positive</td><td colspan="4">24-48 VDC + (VCC)
Connect Brown to positive</td><td colspan="2" rowspan="7">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Vsup</td><td>Vmin</td><td>Vmax</td><td></td></tr>
<tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr>
<tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr>
<tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td colspan="4">24 V, current limit 13 A
48 V, current limit 8 A</td></tr>
<tr><td>Blue
Connect to negative</td><td colspan="4">- (GND)</td></tr>
<tr><td>Red</td><td colspan="4">Extends the actuator/
Hardware addressing (2)</td><td rowspan="2">Manual run
If not connected to VCC at startup:</td><td rowspan="2">HW addressing
When used for Hardware addressing connect to VCC or negative (GND)</td></tr>
<tr><td>Black</td><td colspan="4">Retracts the actuator/
Hardware addressing (1)
The signal becomes:
active at: > 67% of V_{IN}
inactive at: < 33% of V_{IN}
Input current: 10 mA</td></tr>
</table>

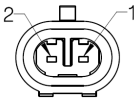
Input/Output	Specification	Comments
Green	Can_L	Actuators with CAN bus does not contain the 120 Ω terminal resistor. The physical layer is in accordance with J1939-15.* Speed: Autobaud up to 500 kbps (CAN bus prior to version 3.0 up to 250 kbps) Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair Cable impedance: 120 Ω (±10 %)
Yellow	Can_H	
Orange	Not to be used	
Light Blue	HW addressing (3)	When used for Hardware addressing connect to VCC or negative (GND)
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

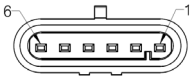
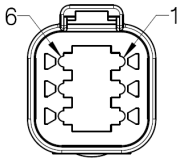
* J1939-15 refers to Twisted Pair and Shielded cables.
The standard/default cables delivered with CAN actuators do not comply with this.

CAN bus 0-Point Hardware Addressing with Split Supply

33XXXXXXXX003X2X=XXXXXX0GXXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		

		Signal	AMP	Deutsch
Split power supply	**ORANGE**	**5**		
Digital input Hardware addressing 2	**RED**	**1**		
Digital input Hardware addressing 1	**BLACK**	**2**		
Hardware addressing 3	**LIGHT BLUE**	**6**		
Bus	**YELLOW**	**3**		
Bus	**GREEN**	**4**		
Not to be connected	**GREY**	**0**		
Data	**VIOLET**	**7**		
Data GND	**WHITE**	**8**		

Service-Interface

The BusLink software tool is available for CAN bus actuators and can be used for:

Diagnostics, manual run and configuration

The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately

Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

CAN bus (J1939) 0-Point with Hardware Addressing and Split supply

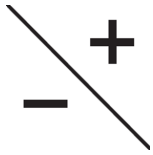
<table>
<tr><th>Input/Output</th><th colspan="4">Specification</th><th colspan="2">Comments</th></tr>
<tr><td>Description</td><td colspan="4">Compatible with the SAE J1939 standard. Uses CAN messages to command movement, setting parameters and to deliver feedback from the actuator.
Actuator identification is provided,using standard J1939 address claim or fixed addresses.</td><td colspan="2">CAN SAE J1939</td></tr>
<tr><td rowspan="7">Brown
Connect to positive</td><td colspan="4">24-48 VDC + (VCC)
Connect Brown to positive</td><td colspan="2" rowspan="7">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Vsup</td><td>Vmin</td><td>Vmax</td><td></td></tr>
<tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr>
<tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr>
<tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td colspan="4">24 V, current limit 13 A
48 V, current limit 8 A</td></tr>
<tr><td>Blue
Connect to negative</td><td colspan="4">- (GND)</td></tr>
<tr><td>Red</td><td colspan="4">Extends the actuator/
Hardware addressing (2)</td><td rowspan="2">Manual run
If not connected to VCC at startup:</td><td rowspan="2">HW addressing
When used for Hardware addressing connect to VCC or negative (GND)</td></tr>
<tr><td>Black</td><td colspan="4">Retracts the actuator/
Hardware addressing (1)
The signal becomes:
active at: > 67% of V_{IN}
inactive at: < 33% of V_{IN}
Input current: 10 mA</td></tr>
</table>

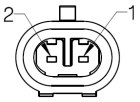
Input/Output	Specification	Comments
Green	Can_L	Actuators with CAN bus does not contain the 120 Ω terminal resistor. The physical layer is in accordance with J1939-15.* Speed: Autobaud up to 500 kbps (CAN bus prior to version 3.0 up to 250 kbps) Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair Cable impedance: 120 Ω (±10 %)
Yellow	Can_H	
Orange	Split supply: 24 VDC with ≈28mA current consumption 48 VDC with ≈16mA current consumption Connect to positive. The split supply uses the common GND from the power supply	Split supply is for operational power only.
Light Blue	HW addressing (3)	When used for Hardware addressing connect to VCC or negative (GND)
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

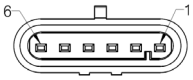
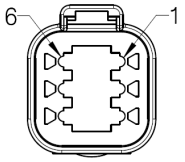
* J1939-15 refers to Twisted Pair and Shielded cables.
The standard/default cables delivered with CAN actuators do not comply with this.

CAN bus 0-Point Software Addressing

33XXXXXXXX003X2X=XXXXXX0GXXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		

		Signal	AMP	Deutsch
Not to be connected	**ORANGE**	**5**		
Digital input	**RED**	**1**		
Digital input	**BLACK**	**2**		
Not to be connected	**LIGHT BLUE**	**6**		
Bus	**YELLOW**	**3**		
Bus	**GREEN**	**4**		
Not to be connected	**GREY**	**0**		
Data	**VIOLET**	**7**		
Data GND	**WHITE**	**8**		

Service-Interface

The BusLink software tool is available for CAN bus actuators and can be used for:

Diagnostics, manual run and configuration

The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately

Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

CAN bus (J1939) 0-Point with Software Addressing

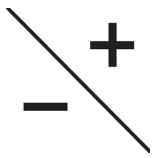
<table>
<tr><th>Input/Output</th><th>Specification</th><th>Comments</th></tr>
<tr><td>Description</td><td>Compatible with the SAE J1939 standard. Uses CAN messages to command move¬ment, setting parameters and to deliver feedback from the actuator. See the LINAK CAN bus user manual.
Actuator identification is provided, using standard J1939 SW addressing.</td><td>CAN SAE J1939</td></tr>
<tr><td>Brown
Connect to positive</td><td>24-48 VDC + (VCC)
Connect Brown to positive
<table>
<tr><td>Vsup</td><td>Vmin</td><td>Vmax</td><td></td></tr>
<tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr>
<tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr>
<tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
</table>
24 V, current limit 13 A
48 V, current limit 8 A</td><td rowspan="2">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Blue
Connect to negative</td><td>- (GND)</td></tr>
<tr><td>Orange</td><td>Not to be used</td><td></td></tr>
<tr><td>Red</td><td>Extends the actuator</td><td rowspan="2">The signal becomes active at:
> 67% of V_{IN} = ON
The signal becomes inactive at:
< 33% of V_{IN} = OFF</td></tr>
<tr><td>Black</td><td>Retracts the actuator</td></tr>
<tr><td>Light Blue</td><td>Not to be used</td><td>Not to be used</td></tr>
</table>

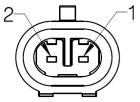
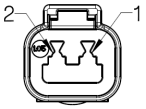
Input/Output	Specification	Comments
Green	CAN_L	Actuators with CAN bus does not contain the 120 Ω terminal resistor. The physical layer is in accordance with J1939-15. * Speed: Autobaud up to 500 kbps Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair
Yellow	CAN_H	
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

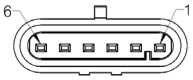
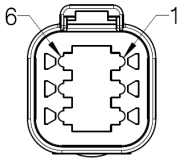
* J1939-15 refers to Twisted Pair and Shielded cables. The standard/default cables delivered with CAN bus actuators do not comply with this. Find more information about the CAN bus in the CAN bus user manual -The newest version is available online at LINAK.COM/TECHLINE

CAN bus 0-Point Software Addressing with Split Supply

33XXXXXXXX003X2X=XXXXXX0GXXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		

		Signal	AMP	Deutsch
Split power supply	**ORANGE**	**5**		
Digital input	**RED**	**1**		
Digital input	**BLACK**	**2**		
Not to be connected	**LIGHT BLUE**	**6**		
Bus	**YELLOW**	**3**		
Bus	**GREEN**	**4**		
Not to be connected	**GREY**	**0**		
Data	**VIOLET**	**7**		
Data GND	**WHITE**	**8**		

Service-Interface

The BusLink software tool is available for CAN bus actuators and can be used for:

Diagnostics, manual run and configuration

The newest version is available online at LINAK.COM/TECHLINE

Please note: The BusLink configuration cable must be purchased separately

Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

CAN bus (J1939) 0-Point with Software Addressing and Split supply

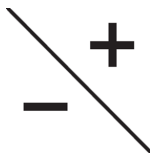
<table>
<tr><th>Input/Output</th><th colspan="4">Specification</th><th>Comments</th></tr>
<tr><td>Description</td><td colspan="4">Compatible with the SAE J1939 standard. Uses CAN messages to command movement, setting parameters and to deliver feedback from the actuator. See the LINAK CAN bus user manual.
Actuator identification is provided, using standard J1939 SW addressing.</td><td rowspan="2">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Brown
Connect to positive</td><td colspan="4">24-48 VDC + (VCC)
Connect Brown to positive
<table><tr><th>Vsup</th><th>Vmin</th><th>Vmax</th><th></th></tr><tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr><tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr><tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr><tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr></table>24 V, current limit 13 A
48 V, current limit 8 A</td></tr>
<tr><td>Blue</td><td colspan="4">- (GND)
Connect Blue to negative</td></tr>
<tr><td>Orange</td><td colspan="4">Split supply:
24 VDC with ≈28 mA current consumption
48 VDC with ≈16 mA current consumption
Connect to positive. The split supply uses the common GND from the power supply</td><td>Split supply is for operational power only.</td></tr>
<tr><td>Red</td><td colspan="4">Extends the actuator</td><td rowspan="2">The signal becomes active at:
> 67% of V_{IN} = ON
The signal becomes inactive at:
< 33% of V_{IN} = OFF</td></tr>
<tr><td>Black</td><td colspan="4">Retracts the actuator</td></tr>
<tr><td>Light Blue</td><td colspan="4">Not to be used</td><td>Not to be used</td></tr>
</table>

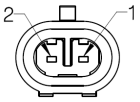
Input/Output	Specification	Comments
Green	CAN_L	Actuators with CAN bus does not contain the 120 Ω terminal resistor. The physical layer is in accordance with J1939-15. * Speed: Autobaud up to 500 kbps Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair
Yellow	CAN_H	
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

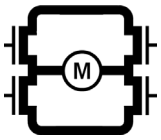
* J1939-15 refers to Twisted Pair and Shielded cables. The standard/default cables delivered with CAN bus actuators do not comply with this. Find more information about the CAN bus in the CAN bus user manual -The newest version is available online at LINAK.COM/TECHLINE

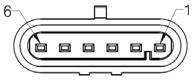
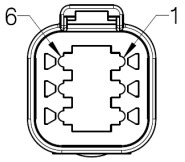
CANopen

33XXXXXXXX003XXX=XXXXXX08XXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		



		Signal	AMP	Deutsch
Digital input	**RED**	**2**		
Digital input	**BLACK**	**1**		

Bus	**YELLOW**	**5**
Bus	**GREEN**	**6**

Data	**VIOLET**	**4**
Data GND	**WHITE**	**3**

Please be aware that if the power supply is not properly connected, you might damage the actuator!

The BusLink software tool is available for CAN bus actuators and can be used for:
Diagnostics, manual run and configuration

The newest version is available online at **LINAK.COM**/TECHLINE

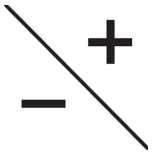
Please note: The BusLink configuration cable must be purchased separately
Item number for BusLink cable kit: 0367997 (adapter + USB2Lin)

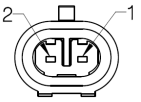
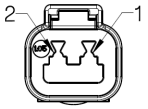
CANopen

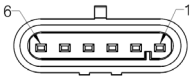
Input/Output	Specification	Comments
Description	Compatible with the CiA 301 standard. Using CANopen messages to command movement, setting parameters and to deliver feedback from the actuator. Actuator identification is provided, using standard CiA 301 address claim or fixed addresses	CANopen
Brown -Connect to positive	12 - 24 VDC + (VCC) 12 V ± 20 % 24 V ± 10 % 12 V, max. 13 A - current cut off @ 15 A 24 V, max. 9 A - current cut off @10 A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through BusLink If the temperature drops below 0 °C, all current limits will automatically increase to 20 A for 12 V and 15 A for 24 V
Blue -Connect to negative	12-24 VDC - (GND)	
Red	Extends the actuator	The signal becomes active at: > 67% of V_{IN} The signal becomes inactive at: < 33% of V_{IN} Input current: 10 mA
Black	Retracts the actuator	
Green	CAN_L	CANopen assumes a physical layer according to ISO 11898-2. Speed: Autobaud up to 250 kbps (Prototypes: 125 kbps) Max bus length @ 125 kbps: 500 m Max bus length @ 250 kbps: 250 m Max bus length @ 500 kbps: 100 m Max stub length @ 125 kbps: 22 m Max stub length @ 250 kbps: 11 m Max stub length @ 500 kbps: 5,5 m Max node count: 127 Wiring: Unshielded twisted pair Cable impedance: 120 Ω (±10%)
Yellow	CAN_H	
Violet	Service interface	Only BusLink can be used as service interface. Use the green adapter cable
White	Service interface GND	

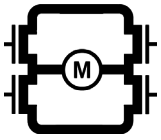
CANopen 0-Point

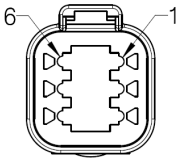
33XXXXXXXX003X2X=XXXXXX0HXXXXX



		Power	AMP	Deutsch
24/48 VDC +	**BROWN**	**2**		
GND -	**BLUE**	**1**		

		Signal	AMP
Not to be connected	**ORANGE**	**5**	



			Deutsch
Digital input	**RED**	**1**	
Digital input	**BLACK**	**2**	
Not to be connected	**LIGHT BLUE**	**6**	
Bus	**YELLOW**	**3**	
Bus	**GREEN**	**4**	
Not to be connected	**GREY**	**0**	
Data	**VIOLET**	**7**	
Data GND	**WHITE**	**8**	

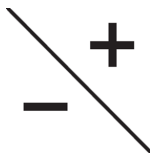
CANopen 0-Point

<table>
<tr><th>Input/Output</th><th colspan="4">Specification</th><th>Comments</th></tr>
<tr><td>Description</td><td colspan="4">Compatible with the CiA 301 standard.
Using CANopen messages to
command movement, setting parameters and to deliver feedback from the actuator.
Actuator support LSS</td><td>CANopen</td></tr>
<tr><td rowspan="7">Brown
Connect to positive</td><td colspan="4">24-48 VDC + (VCC)
Connect Brown to positive</td><td rowspan="7">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Vsup</td><td>Vmin</td><td>Vmax</td><td></td></tr>
<tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr>
<tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr>
<tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td colspan="4">24 V, current limit 13 A
48 V, current limit 8 A</td></tr>
<tr><td>Blue
Connect to negative</td><td colspan="4">- (GND)</td></tr>
<tr><td>Orange</td><td colspan="4">Not to be used</td><td></td></tr>
<tr><td>Red</td><td colspan="4">Extends the actuator</td><td rowspan="2">The signal becomes active at:
> 67% of V_{IN} = ON
The signal becomes inactive at:
< 33% of V_{IN} = OFF
Input current: 10 mA</td></tr>
<tr><td>Black</td><td colspan="4">Retracts the actuator</td></tr>
<tr><td>Light Blue</td><td colspan="4">Not to be used</td><td>Not to be used</td></tr>
</table>

Input/Output	Specification	Comments
Green	CAN_L	CANopen assumes a physical layer according to ISO 11898-2. Speed: Autobaud up to 500 kbps Max bus length @ 125 kbps: 500 meters Max bus length @ 250 kbps: 250 meters Max bus length @ 500 kbps: 100 meters Max stub length @ 125 kbps: 22 meters Max stub length @ 250 kbps: 11 meters Max stub length @ 500 kbps: 5,5 meters Max node count: 127 Wiring: Unshielded twisted pair
Yellow	CAN_H	
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

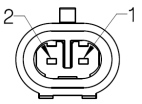
CANopen 0-Point with Split Supply

33XXXXXXX003X2X=XXXXXX0HXXXXX



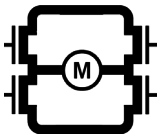
		Power
24/48 VDC +	**BROWN**	**2**
GND -	**BLUE**	**1**

AMP



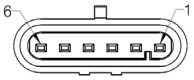
Deutsch

		Signal
Split power supply	**ORANGE**	**5**
Digital input	**RED**	**1**
Digital input	**BLACK**	**2**
Not to be connected	**LIGHT BLUE**	**6**
Bus	**YELLOW**	**3**
Bus	**GREEN**	**4**
Not to be connected	**GREY**	**0**
Data	**VIOLET**	**7**
Data GND	**WHITE**	**8**

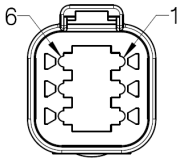


Service-Interface

AMP



Deutsch



CANopen 0-Point with Spilt supply

<table>
<tr><th>Input/Output</th><th>Specification</th><th>Comments</th></tr>
<tr><td>Description</td><td>Compatible with the CiA 301 standard.
Using CANopen messages to
command movement, setting parameters and to deliver feedback from the actuator.
Actuator support LSS</td><td>CANopen</td></tr>
<tr><td>Brown
Connect to positive</td><td>24-48 VDC + (VCC)
Connect Brown to positive
<table>
<tr><td>Vsup</td><td>Vmin</td><td>Vmax</td><td></td></tr>
<tr><td rowspan="2">24 V</td><td>16 V</td><td>36 V</td><td>Motor running</td></tr>
<tr><td>10 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
<tr><td rowspan="2">48 V</td><td>36 V</td><td>58 V</td><td>Motor running</td></tr>
<tr><td>24 V</td><td>60 V</td><td>Motor not running
CAN communication possible</td></tr>
</table>
24 V, current limit 13 A
48 V, current limit 8 A</td><td rowspan="2">Note: Do not swap the power supply polarity on the brown and blue wires!
The PCB is coupled to the housing through a capacitor.
Current limit levels can be adjusted through Actuator Connect®.
If the temperature drops below 0 °C, all current limits will automatically increase with a factor 2.</td></tr>
<tr><td>Blue
Connect to negative</td><td>- (GND)</td></tr>
<tr><td>Orange</td><td>Split supply:
24 VDC with ≈28 mA current consumption
48 VDC with ≈16 mA current consumption
Connect to positive. The split supply uses the common GND from the power supply</td><td>Split supply is for operational power only.</td></tr>
<tr><td>Red</td><td>Extends the actuator</td><td rowspan="2">The signal becomes active at:
> 67% of V_{IN} = ON
The signal becomes inactive at:
< 33% of V_{IN} = OFF
Input current: 10 mA</td></tr>
<tr><td>Black</td><td>Retracts the actuator</td></tr>
<tr><td>Light Blue</td><td>Not to be used</td><td>Not to be used</td></tr>
</table>

Input/Output	Specification	Comments
Green	CAN_L	CANopen assumes a physical layer according to ISO 11898-2. Speed: Autobaud up to 500 kbps Max bus length @ 125 kbps: 500 meters Max bus length @ 250 kbps: 250 meters Max bus length @ 500 kbps: 100 meters Max stub length @ 125 kbps: 22 meters Max stub length @ 250 kbps: 11 meters Max stub length @ 500 kbps: 5,5 meters Max node count: 127 Wiring: Unshielded twisted pair
Yellow	CAN_H	
Violet	Service interface	Only Actuator Connect® can be used as service interface. Use grey adapter cable
White	Service interface GND	

Manual Hand Crank

The manual Hand Crank can be used in the case of power failure.

The cover over the Allen Key socket must be unscrewed before the Allen Key can be inserted and the Hand Crank operated.

Hand Crank Torque: 6-8 Nm

Hand Crank rpm: Maximum. 65

- The power supply has to be disconnected during manual operation.
- If the actuator is operated as a Hand crank, it must only be operated by hand, otherwise there is a potential risk of overloading and hereby damaging the actuator
- Actuators with absolute positioning must be initialised after use of the manual hand-crank, because their positioning will be displaced when the power is disconnected
- After using the hand crank the ingress protection will be lower - even if the cover is properly mounted

DECLARATION OF CONFORMITY

LINAK A/S
Smedevænget 8

DK - 6430 Nordborg

hereby declares that

Actuator (LA33 std.) 33**********0**********

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the EMC Directive 2014/30/EU according to following harmonised standards:
EN 61000-6-1:2019, EN 61000-6-2:2019, EN 61000-6-3:2021, EN 61000-6-4:2019

complies with the RoHS2 Directive 2011/65/EU according to the harmonised standard:
EN 63000:2018

Nordborg, 2023-06-27

LINAK A/S
John Kling, B.Sc.E.E.
Regulatory Affairs Manager
Authorized to compile the relevant technical documentation

This declaration of conformity is issued under the sole responsibility of the manufacturer
Original Declaration

DECLARATION OF CONFORMITY

Imported by
LINAK UK Limited
Smethwick, B66 1RJ

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Actuator (LA33 std.) 33**********0**********

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complies with the Statutory Instrument 2016/1091, Electromagnetic Compatibility Regulations 2016 according to following standards:
BS EN 61000-6-1:2019, BS EN 61000-6-2:2019, BS EN 61000-6-3:2021, BS EN 61000-6-4:2019

complies with the Statutory Instrument 2012/3032 Restriction of the User of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 according to the standard:
BS EN IEC 63000:2018

Nordborg, 2023-06-27

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hereby declares that

Actuator (LA33 IC) 33**********3**********

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the EMC Directive 2014/30/EU according to following harmonised standards:
EN 61000-6-1:2019, EN 61000-6-2:2019, EN 61000-6-3:2021, EN 61000-6-4:2019

complies with the RoHS2 Directive 2011/65/EU according to the harmonised standard:
EN 63000:2018

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Actuator (LA33 IC) 33**********3**********

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complies with the Statutory Instrument 2016/1091, Electromagnetic Compatibility Regulations 2016 according to following standards:
BS EN 61000-6-1:2019, BS EN 61000-6-2:2019, BS EN 61000-6-3:2021, BS EN 61000-6-4:2019

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BS EN IEC 63000:2018

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Smedevænget 8

DK - 6430 Nordborg

hereby declares that:

Actuator 33xxxxxxxxxxxx=xxxxxxxxBxxxxx, 33xxxxxxxxxxxx=xxxxxxxxCxxxxx, 33xxxxxxxxxxxx=xxxxxxxxFxxxxx

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the Radio Equipment Directive (RED) 2014/53/EU according to following standards:
EN 300 328 V2.2.2. (2019-07)
EN 301 489-1 V2.2.3 (2019-11), EN 301 489-17 V3.2.4 (2020-09)
EN IEC 62368-1:2020
EN 62479:2010
EN 50663:2017

complies with the RoHS2 Directive 2011/65/EU according to the standard:
EN 63000:2018

Additional information:
The system does comply with the selected parts of the standards:
EN 61000-6-2:2019, Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4:2019: Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

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Smethwick, B66 1RJ

hereby declares that:

Actuator 33xxxxxxxxxxxx=xxxxxxxxBxxxxx, 33xxxxxxxxxxxx=xxxxxxxxCxxxxx, 33xxxxxxxxxxxx=xxxxxxxxFxxxxx

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the Radio Equipment Directive (RED) 2014/53/EU according to following standards:
EN 300 328 V2.2.2.
EN 301 489-1 V2.2.3, EN 301 489-17 V3.2.4
BS EN IEC 62368-1:2020
BS EN 62479:2010
BS EN 50663:2017

complies with the RoHS2 Directive 2011/65/EU according to the standard:
BS EN 63000:2018

Additional information:
The system does comply with the selected parts of the standards:
BS EN 61000-6-2:2019, Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
BS EN 61000-6-4:2019: Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

Nordborg, 2023-06-27

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DECLARATION OF CONFORMITY

LINAK A/S
Smedevænget 8

DK - 6430 Nordborg

hereby declares that

Actuator (LA33 CAN)
33**********3A**********6*****, 33**********3B**********6*****
33**********3A**********7*****, 33**********3B**********7*****
33**********3A**********8*****, 33**********3B**********8*****

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the EMC Directive 2014/30/EU according to following harmonised standards:
EN 61000-6-1:2019, EN 61000-6-2:2019, EN 61000-6-3:2021, EN 61000-6-4:2019

complies with the RoHS2 Directive 2011/65/EU according to the harmonised standard:
EN 63000:2018

Nordborg, 2023-06-27

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Smethwick, B66 1RJ

hereby declares that

Actuator (LA33 CAN)
33**********3A**********6*****, 33**********3B**********6*****
33**********3A**********7*****, 33**********3B**********7*****
33**********3A**********8*****, 33**********3B**********8*****

(The '*' in the product description can either be a character or a number, thereby defining the variation of the product)

complies with the Statutory Instrument 2016/1091, Electromagnetic Compatibility Regulations 2016 according to following standards:
BS EN 61000-6-1:2019, BS EN 61000-6-2:2019, BS EN 61000-6-3:2021, BS EN 61000-6-4:2019

complies with the Statutory Instrument 2012/3032 Restriction of the User of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 according to the standard:
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