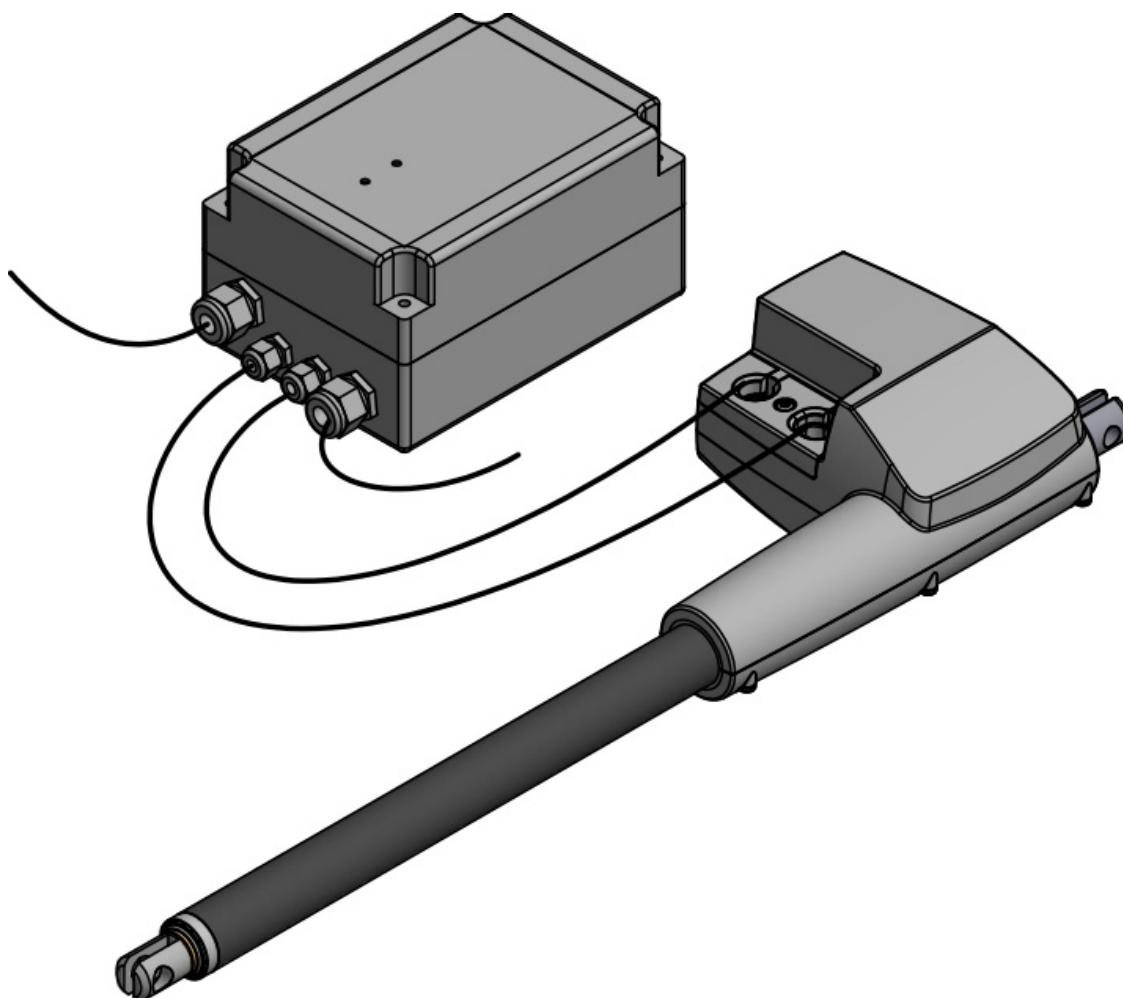


TECH-system Type 322 BASIC

To operate a single actuator in a ventilation system
Instructions for installation and use



Introduction

Dear machine fitter,

Thank you for choosing an actuator system from LINAK®. LINAK systems consist of high-tech products based on many years of experience of the manufacture and development of actuators, electrical control boxes, control systems and chargers.

TECH-systems comprise LINAK actuators and a motor control unit developed and produced by a third-party manufacturer. The function and operational reliability of TECH-systems have been tried and tested in a wide range of applications. In addition, we are continuously improving our products and systems in order to accommodate customers' requirements.

These instructions for installation and use describe how to install, connect and operate a LINAK TECH-system in order to ensure a trouble-free, user-friendly final product.

Before our products leave the factory, they are subjected to a battery of function and quality tests. In the unlikely event that you have difficulties with your systems, please call LINAK Danmark A/S on **(+45) 86 80 36 11**

LINAK provides a warranty on all of its products and systems. However, this warranty is issued on condition that the product is used in accordance with the specifications, that maintenance is performed correctly, and that any repairs are carried out at a workshop that is authorised to repair LINAK products.

Any alterations to the installation and use of LINAK systems may affect their operability and durability. The products may not be opened by unauthorised persons.

LINAK Danmark A/S
Mønstedsvvej 9
DK-8600 Silkeborg

Important information

Important information concerning LINAK products is given under the following headings:



Warning! Failure to comply with these instructions may result in accidents, leading to serious personal injury.



NB! Failure to comply with these instructions may result in damage to or destruction of the product.

Warranty

The LINAK warranty covers manufacturing faults in the products, calculated from the date of production. For additional information about the warranty period, please contact LINAK Danmark A/S. The warranty is limited to the value of the LINAK product.

The LINAK warranty is only valid if the system is unopened and has been used correctly. The control box and control unit must not be subjected to rough handling, as this will void the warranty.

Safety instructions

Please read the following safety information carefully. Everyone who is to connect, install or use the system must have received the necessary information and have access to these instructions.

LINAK recommends that the actuator is used for push applications rather than pull applications.

It is essential that everyone who is to connect, assemble or operate the systems receives the necessary information and has access these instructions.

Before fitting, removal or troubleshooting:

- Stop the actuator.
- Disconnect the power supply or remove the mains plug from the socket.
- Relieve the actuator of any load that can be released during the work.

Before start-up:

- Make sure that the system has been installed as described in these instructions.
- Make sure that the voltage to the motor control unit is correct before connecting the system to the power supply
- System connection. The individual parts must be connected before the motor control unit is connected to the mains.

During operation:

- If the motor control unit emits unusual sounds or smells, disconnect the mains power and any external battery.
- Make sure that the cables are intact.
- Disconnect the mains cable to mobile equipment before it is moved.
- The products are suitable for both indoor and outdoor use. However, you should always check that individual products have the appropriate IP sealing class. (See the product label.)



Warning!

The following applies if the actuator is used to apply pull in a machine that carries a risk of personal injury:

As the manufacturer of the final machine, you are responsible for implementing suitable safety measures to prevent the risk of personal injury in the event of actuator failure.



Warning!

Please note that in all machines in which an actuator is to be involved, steps must be taken to prevent personal injury – such as the risk of crushing fingers.



Warning!

The plastic components in the system cannot withstand the effects of cutting oil.

Classification:

The equipment is *not* suitable for use in the immediate vicinity of a flammable, anaesthetic mixture containing air, oxygen or laughing gas (nitrous oxide).

Environmental conditions

Operating:	
Temperature	+5°C to +40°C
Relative humidity	20% to 90% @ 30°C – not condensing
Atmospheric pressure	700 to 1060 hPa
Storage:	
Temperature	-10°C bis +50°C
Relative humidity	20% to 90% @ 30°C – not condensing
Atmospheric pressure	700 to 1060 hPa

Table of contents.

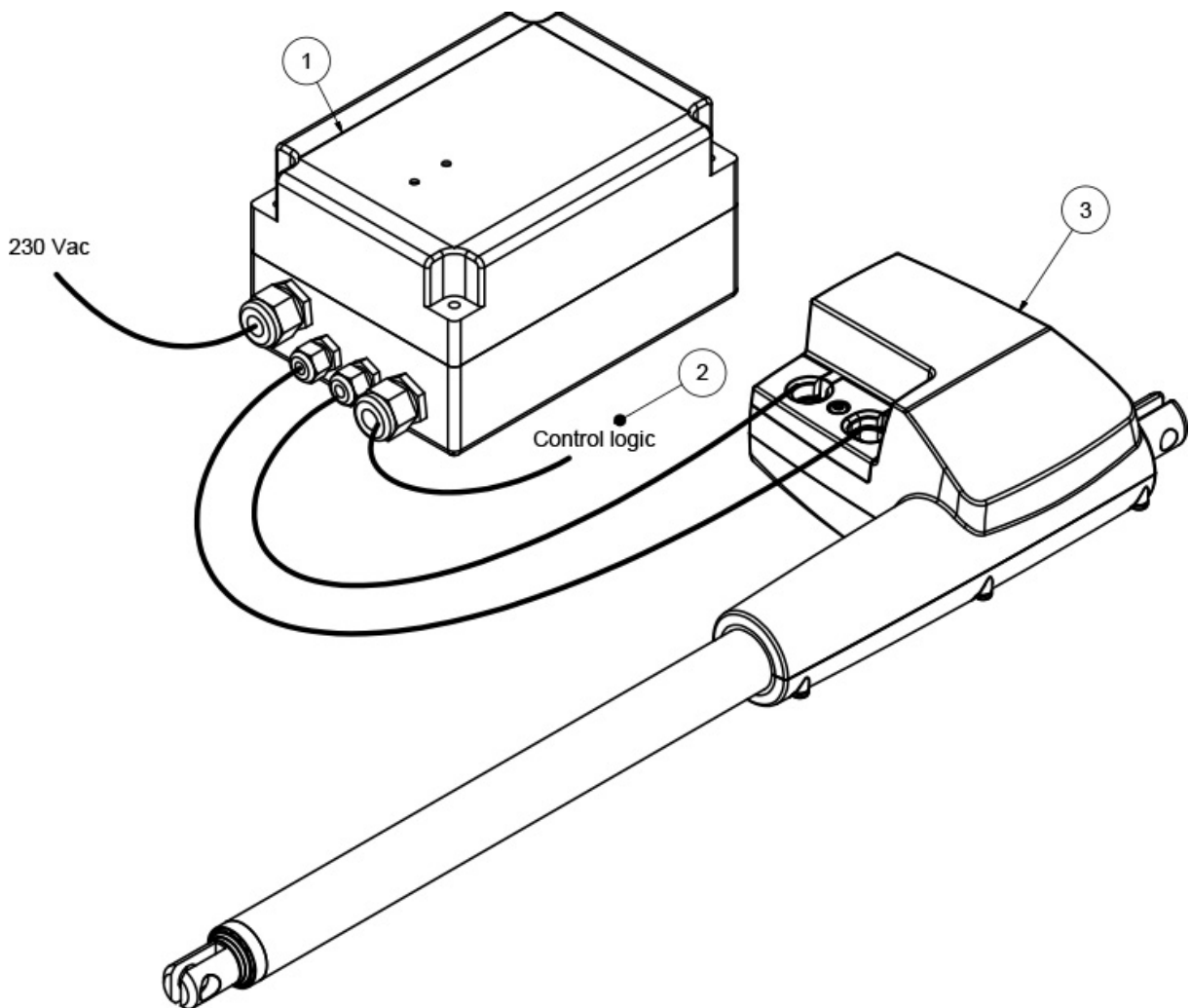
Introduction	3
Important information	4
Warranty	4
Safety instructions	4
Environmental conditions	5
Table of contents	6
Technical data	7
Description of the system.....	7
Dimensions	9
Declaration of Incorporation.....	10
Connection and installation	11
Connection of the motor control unit.....	12
Parameter settings	13
Programming unit TR-EM-236A.....	13
Parameters.....	14
Start/operation	15
Appropriate use:.....	15
Inappropriate use:	15
Operation	16
Maintenance	16
Troubleshooting	16
Error codes.....	16
Key to symbols	17
Disposal of LINAK products	18

Technical data

TECH-system Type 322 is comprised of a motor control unit and an LINAK actuator. You can choose between 3 different types of LINAK actuators.

Description of the system

TECH-system 322 is designed for use in ventilation systems, in which an actuator is required to move the air damper into the desired position. The system uses one actuator with hall/pot. or pot. feedback/response to perform automatic regulation. The position of the actuator spindle (stroke length) is determined by a 0-10V (2-10V) signal emitted by an automatic system. The system is powered during operation by 230 VAC. The current is monitored automatically. In the event of a power failure, the system is powered by an integrated back-up battery, which ensures that the actuator either closes or opens the air damper in the ventilation system. A charge circuit integrated in the system ensures that the battery is fully charged at all times. Battery current is checked automatically at 24-hour intervals. If battery current fails, an acoustic alarm is triggered.



Motor control unit: (pos.1)

Type designation:	EM-322 BASIC
Actuator connection:	1 actuator
Actuator power limit:	7 A duty cycle 20%
Actuator voltage:	24 V DC
Supply voltage to PCB:	10–35 V DC smoothed voltage
Power limit, setting:	0.1-7 A
Ramp times (start/stop):	0-5 seconds
PWM frequency:	2 kHz
Controller input:	0-10 / 2-10V
Operating temperature (Ta):	+5 to +40°C

Operation: (pos.2)

The TECH-322 BASIC's actuator system can be operated as Automatic start-up and positioning via a signal, e.g. from a PLC

Actuator: (pos.3)

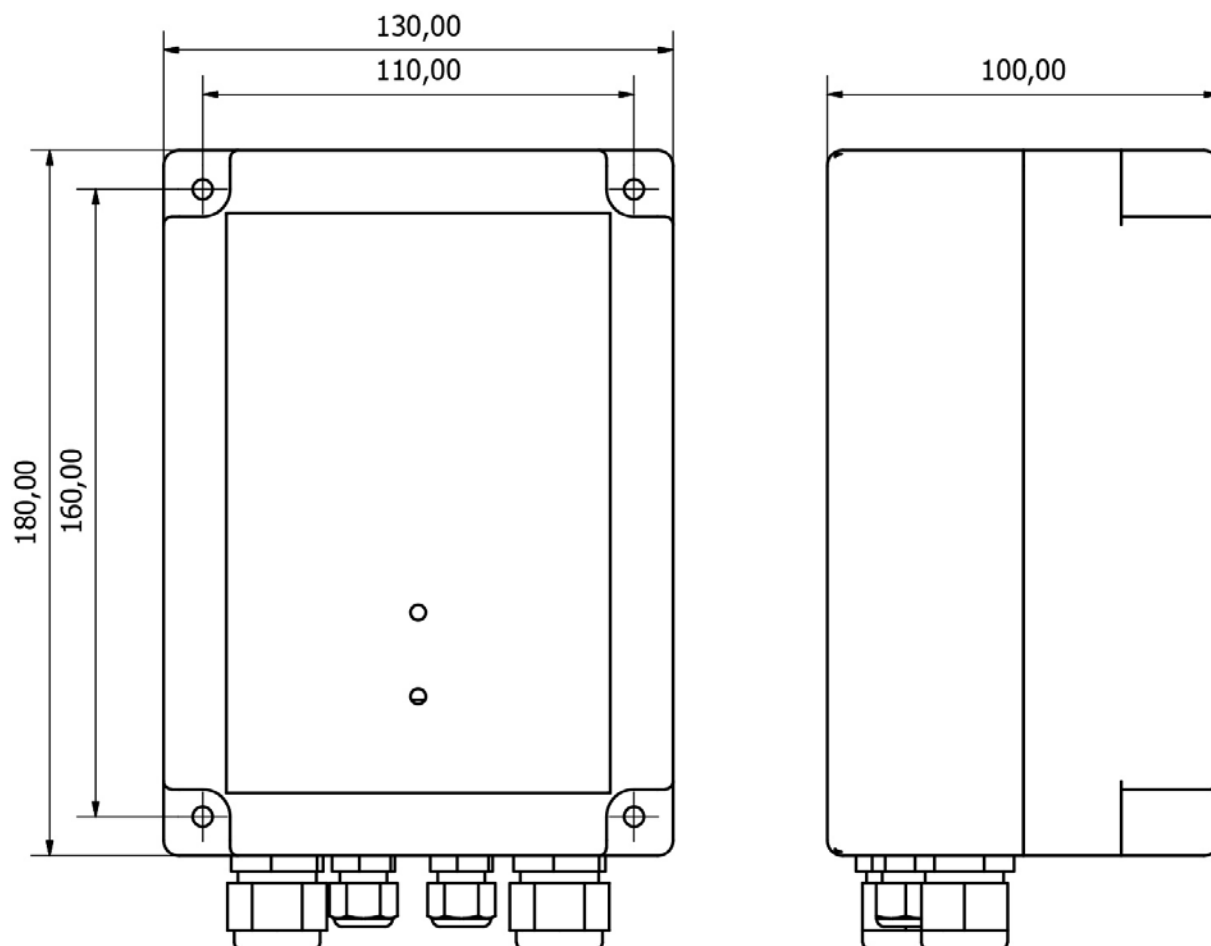
The system is compatible with the following LINAK actuators: All of them with either potentiometer (pot.) feedback/response or Hall potentiometer (Hall/pot.):

- Actuator LA12 w/potentiometer (11 Kohm): Item no.: 12xPxxxxxx24xx
- Actuator LA12 w/Hall potentiometer (0-10 V): Item no.: 12xBxxxxxx24xx
- Actuator LA32 w/potentiometer (1 Kohm): Item no.: 32xxPx-xxxxx0xx
- Actuator LA33 w/Hall potentiometer (0-10 V): Item no.: 33xxxxxxxxoAxxxx=xxxx0xxxxxxxx
- Actuator LA35 w/Hall potentiometer (0-10 V): Item no.: 35xxxxxxAxxxBxx

(see the appropriate product data sheet for additional information)

Dimensions

Motor control unit:



Actuator:

You can find the product data sheet for the appropriate actuator on our website: www.linak.com

Declaration of Incorporation



Declaration of incorporation of partly completed Machinery

Directive 2006/42/EC Annex II B

The signatory Manufacturer and authorised to compile the relevant technical documentation for partly completed Machinery and in response to a reasoned request by the national authorities transmit the relevant information:

**LINAK Danmark A/S
Mønstedsvvej 9
DK-8600 Silkeborg**

Declares that the partly completed machinery:

Discription: Linear Actuator system for single Actuator operating
Name: TECH-system
Type: **322 BASIC**

Consisting of:

LINAK Actuator type: **LA12 or LA32 or LA33 or LA35**

Motor controller unit: **EM-322 BASIC**

Operating unit: **HB40 or PLC**

comply with the following parts of the essential health and safety requirements of the Directive 2006/42/EC Annex I:

1.2.1-safety and reliability of the control system; 1.2.2-control device; 1.2.3-starting; 1.2.4.1-stopping; 1.2.6-failure of the power system

comply with the requirements of the following EN Standards:

EN 13849-1:2008 SRP/CS Cat. B, PL = b og SRESW PL = b

comply with the requirements of the following EU Directives:

- Electromagnetic compability 2014/30/EU

The partly completed Machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Directive 2006/42/EC and other relevant Directives, where appropriate.

Date	Silkeborg	Name and signature
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3/5-2018

Technical chief

Thomas Petersen Skovbjerg



Connection and installation

Install the actuator and motor control as instructed by the supplier of the ventilation system.

Connect the actuator used and set DIP switches and jumper in accordance with the instructions on the following pages.

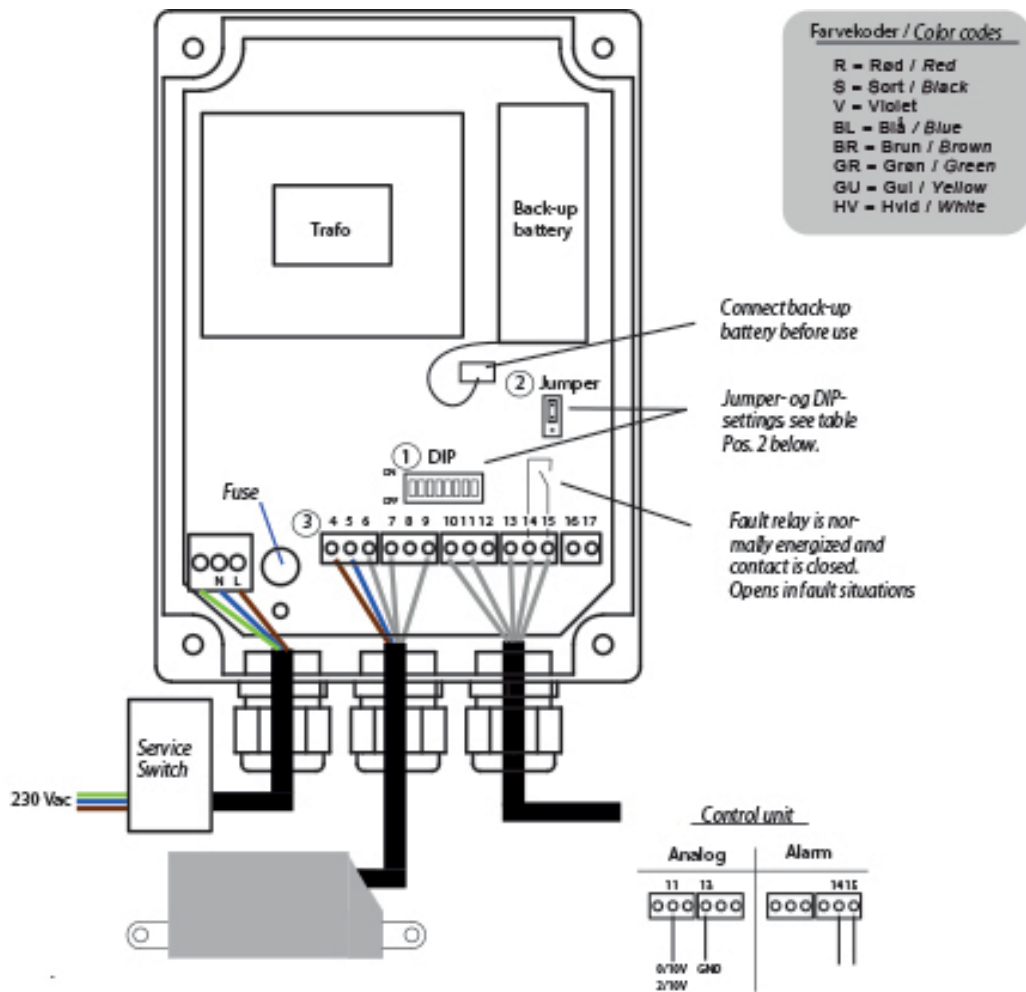
Connect the power supply of 230 VAC +/- 10%. LINAK recommends the installation of an isolator switch before the motor control.



WARNING!

Never turn the actuator's spindle for possible adjustment during assembly. This results in immediate errors on positioning when the actuator is subsequently connected to the control and started up.

Connection of the motor control unit



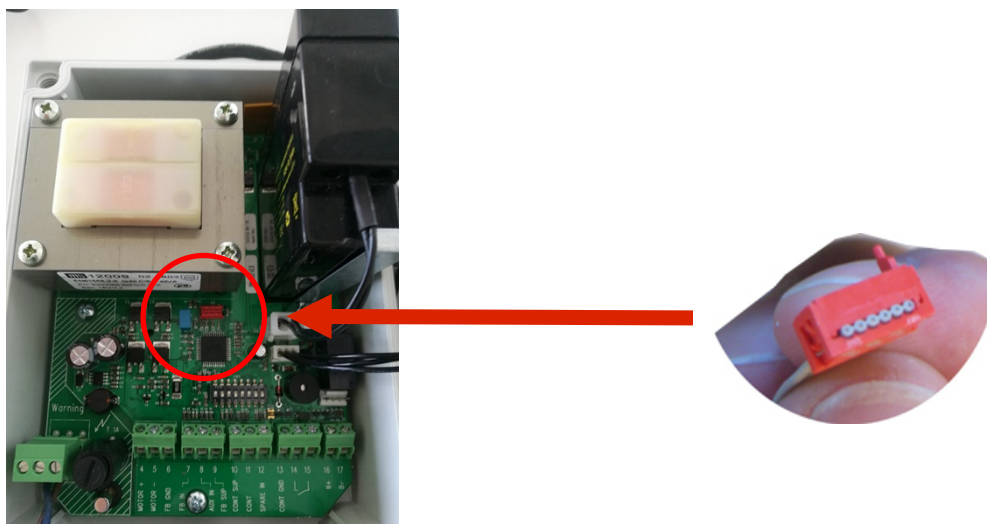
Pos.		12xPxxxxx24x	12xSxxxxx24x	32xPx-xxxxx0x	3SxxxxxxAxxxx	33xxxxxxxAxxxx- xxxxx0xxxxxx	3x 12xPxxxxx24x		
1	DIP								
2	Jumper								
3	Terminal						Act. 1	Act. 2	Act. 3

- DIP 5: ON = 2-10V control signal. OFF = 0-10V control signal.
 DIP 6: OFF = Emergency run position full open.
 DIP 7: ON = inverted control signal (10-0V / 10-2V signal). OFF = Direct control!
 DIP 8: ON = parameters can be modified. OFF = preset default parameter are in use = parameter are fixed.

Parameter settings

Motor control unit EM-322 has 15 parameters, which can be adjusted if the factory-set values fail to produce the desired result. To change these parameters, the Programming unit TR-EM-236 must be connected to the motor control unit.

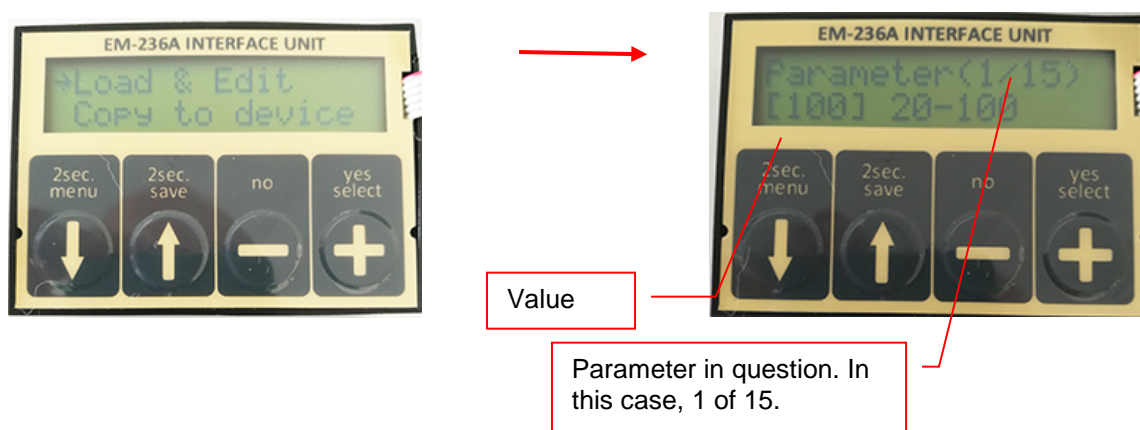
NB! To use the TR-EM-236A programming unit, connect the Motor control to mains.



Programming unit TR-EM-236A

Press ARROW DOWN for 2 seconds to call up the main menu on the Programming unit. In the main menu, use ARROW UP or ARROW DOWN to select the menu item required. To open the menu in question, click the + (plus) button.

To alter the parameter values, select the "Load & Edit" menu item



Use the arrow keys to select the parameter you wish to alter. The parameter selected is shown in the display as <1 / 15>, which means "parameter 1 of 15". The value is presented in square brackets [] and can be changed by pressing the plus or minus buttons

Once you have made the changes you require, save the new configuration by pressing ARROW UP for at least 2 seconds.

Parameters

The following parameters can be adjusted as required or desired:

Speed out:	Speed OUT: Available options: 20-100% (20-100)
Speed in:	Speed IN: Available options: 20-100% (20-100)
Current out:	Setting current limit, OUT Available options: 0.1-20A (1-200)
Current in:	Setting current limit, IN Available options: 0.1-20A (1-200)
Start level:	Setting start level, Available options: 2-100% (5-255)
Dead zone:	Setting dead zone, Available options: 0.1-5% (1-50)
Brake zone:	Setting brake zone, Available options: (1-255)
Start ramp:	Setting start ramp, Available options: 0-5s (0-50)
Stop ramp:	Setting stop ramp, Available options: 0-5s (0-50)
Emergency run:	Direction of automatic emergency run: 0 = OUT, 1 = IN
Feedback:	Select feedback; 0 = 0-5V; 1 = 0-10V
Battery:	Select battery function; 0 = Battery function ON 1 = Battery function OFF
Control value:	Select INPUT voltage, Available options: 0-10V (0-1001) Selection 1001 = control unit selects automatically
Limit out:	Stroke length limit; Available options; 0 –50% (0-500) 0 = 100% stroke length; 500 = 50% stroke length.

Parameter settings (factory settings)

The values stated in the table below correspond to the pre-programmed values the control unit is set to operate with when the DIP setting is selected for the actuator in question.

Par	LA12P	LA12 Hall-pot	LA33	LA35 Hall-pot	3X LA12P	LA32	Text
1	100	100	100	100	100	100	Speed out
2	100	100	100	100	100	100	Speed in
3	20	20	60	50	60	40	Current out
4	20	20	70	55	60	40	Current in
5	20	20	20	20	20	20	Start level
6	30	30	30	30	30	20	Dead zone
7	30	30	50	50	30	50	Brake zone
8	2	2	5	5	2	10	Start ramp
9	2	2	5	5	2	10	Stop ramp
10	0	0	0	0	0	0	Emergency run 0=out 1=in
11	0	1	1	1	0	0	Feedback 0=0-5V 1=0- 10V
12	0	0	0	0	0	0	Battery 0=with, 1=without
13	1000	1000	1000	1000	1000	1000	Control value 1000=10V
14	100	50	50	50	100	50	Limit out 0-500=0-50%
15	20	20	20	20	20	20	Load compaction

Start/operation

Before starting to use the system, it is important that all parameters in the motor control unit have been set correctly according to the specifications for the actuator in question.

The first time that the control is connected to the power supply and battery, the low battery voltage alarm may be activated. The alarm will stop after a time, when the battery has been sufficiently charged by the built-in battery charger.

LA12 and LA35 with Hall/pot feedback starts an automatic reset procedure every time power is connected to the control. This can take up to several minutes, until the actuator is run right in.

Appropriate use:

- The system is *only* intended and designed for use as a component part in machinery or equipment used in an industrial environment.
- After fitting, test the system to check that it functions correctly.
- The machine must be allowed free movement along the full stroke length of the actuator
- Bolts attached to the actuator's piston rod and rear fastening plate must be secure.
- Ensure that the system is connected to the correct voltage.

Inappropriate use:

- The duty cycle must *not* exceed 10%: max. two minutes of operation followed by an 18-minute pause.
- The actuator must *not* bear a load in excess of the max. load stated on the data plate.
- The actuator must *not* bear a transverse load.
- The actuator must *not* be subject to knocks and violent jolts.
- Unevenly distributed loads will exert oblique stress on the actuators.
- The system must *not* be connected to a different voltage than the voltage stated on the data plate.
- The control box and power supply must not be covered.
- The equipment is *not* suitable for use in the vicinity of flammable, anaesthetic mixtures of air, oxygen or nitrous oxide (laughing gas).
- The system is *not* suitable for machines which can be described as:
 - Medical devices
 - Equipment for use in the offshore industry (ATEX)
 - Aircraft
 - Nuclear power plant
- The system must *not* be used until it has been incorporated safely into the end product.

Operation

On normal operation, the GREEN light diode will light up in the cover. When the actuator is running, the YELLOW light diode will light up.

Maintenance

- Clean the surface of the systems at appropriate intervals to remove dust and dirt, and check for signs of damage and breakage.
- Check all connections, cables, housing and connectors, and check that the system functions correctly.
- With the exception of motor control units with PCB or those prepared for mounting in an electrical panel, the control boxes are sealed and maintenance-free.
- Check all connections, cables, housing and connectors.
- For actuators with sealing class IPX6 rating and better: if cleaned using water, these units should only be washed when the piston rod (spindle) is fully extended.

Troubleshooting

Control errors are displayed as different types of flashes of the green light diode:

Error codes

-Continuous green light:	Normal situation
-Short blink, pause:	Main supply disappeared
-Two short blinks, pause:	battery fault
-Three short blinks, pause:	Control signal under 1V
-Four short blinks, pause:	Current limit (I-trip)

Key to symbols



NB! Not all of the symbols described here can be found on the products in question.

	Type B equipment, as per EN 60601-1		Lock function
IPXX	Protection against contact/foreign matter (first character) and water (second character) as per EN60529		Release function
	Class 2 equipment		Charge indicator
	For indoor use		Safety switch/enable button
	Safety isolating		
	Protective earth		
	Alternating Current		
	Direct current		
	Attention, consult accompanying documents		
	Demko approval	File E97199	UL file number
	Fimko approval	File E175209	UL file number
		File E151104	UL file number
			CSA
APPROVAL V94265	Australian approval mark		PSE-Mark
APPROVAL NO.: 97122	Australian approval mark		Product with a thermofuse
	Recognised - Component Mark		For indoor use (House).
	Canadian Recognised - Component Mark		Safety isolating transformer.
	Recognised Component Mark for Canada and the United States		Electronics scrap
	T-Mark		Equipment KI.2 (Double square)
	RW-Tüv approval		Patient part of type B (Mand)
	TÜVRheinland		Patient part of type BF
			Earth protective
		KL.1	Equipment class1.
	TÜV Product Service		Earth
	ETL		CE Mark
	C-ETL		C-TICK
CS95145V			
LGA	LGA		
	UL Listing Mark		
	C-UL Listing Mark		
	C-UL US Listing Mark		
	UL Listing Mark		

Disposal of LINAK products

To dispose of LINAK products, start by sorting them into different categories for recycling or incineration. We recommend that you dismantle your product as fully as possible for disposal, and that the parts are recycled. Sorting categories may include:

- Metal
- Plastic
- Cables
- Flammable material
- Reuse

It is possible to subdivide within some of these categories. For example, “metal” can be subdivided into steel and aluminium, while “plastic” can be divided into ABS and PP. As an example of sorting, the categories in which the various LINAK components must be placed are shown below:

Product	Component	Recycling group
Actuator:	Spindle and motor Plastic housing Cable	Metal scrap Plastic recycling or combustion Cable scrap or combustion
Control box:	PC-board Plastic housing Cable Transformer Batteries	Electronics scrap Plastic recycling or combustion Cable scrap or combustion Metal scrap Recoverable resources
Control:	Plastic housing Cable PC-board	Plastic recycling or combustion Cable scrap or combustion Electronics scrap