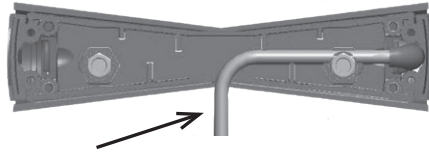


You have to remove the nut before mounting the FS3 on the bed and after mounting the FS3 to the bed, the nut is fastened to secure that the FS3 is fixed to the bed frame.

Please note that the max. torque on the nut should be 2.0 Nm (20 kg f. cm).

When mounting the FS3 bed model, it is important to run the cable through the hole of the FS3 in order to lead the cable through (see picture below).



Location of the notch for the cable of the FS3 bed model.



### Recommendations

- Do not pull the cable or drop the FS3 on the floor.
- Do not play with the FS3.

## 14. HB20 (MEDLINE® CARELINE® HOMELINE®)



The HB20 series combines ergonomic design with a wide range of functionalities such as memory and infrared communication. The handset series is compatible, via the IRO, with the OpenBus™ product assortment.



### Warning

- Inform the customer not to exceed the IP degree and to make regular inspection for correct functionality. Defective and worn out parts must be replaced.
- Inform the customer that due to the soft material of the soft touch buttons, they can remain activated when released after a forced, any activation.
- Inform the customer that there is no indication for low battery. At low battery, the IR range is reduced and it is recommended to replace the batteries. After replacing the batteries, the functionality and IR range must be tested.
- Inform the customer that all IROs that receive the HB2x signal will operate. There is no pairing between a unique HB2x and an IRO.

## 15. HB30 (MEDLINE® CARELINE®)

**Type:** HB320000B006-2002A0F000  
**Item:** J90018  
**Date:** 2013.02.28 IP X6    
  
**P.O:** W-017653-0001 MADE IN CHINA

The HB30 hand control is designed for better user experience and ergonomic fit for the hands of caregivers. The compact size ensures one hand operation. The HB30 is especially suitable for patient lifts and other MEDLINE® and CARELINE® applications like couches, tables and chairs for treatment and examination. The HB30 is available in an analogue version and an OpenBus™ version.

### Usage:

- Usage temperature: 5° C to 40° C
- Storage temperature: -10° C to +50° C
- Compatibility: Analogue JUMBO Systems  
Analogue JUMBO systems with diode and OpenBus  
JUMBO versions  
All OpenBus control boxes
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition approved,  
ANSI / AAMI ES60601-1:2005 3<sup>rd</sup> edition and CAN/CSA-22.2 No 60601-1:2008  
The HB30 is biocompatibility tested and approved according to DS/EN ISO 10993-5:2009, biological evaluation of medical devices - part 5: Tests for in vitro cytotoxicity. It is a demand for hand-held devices for patient lifts.  
The HB30 has a compact design and therefore it cannot be approved according to EN IEC60601-2-52 (Application Environment 4 for care beds used in Domestic areas (or EN1970)).

### How to identify the cables:

Each cable has a label for easy identification of item number and for which control box it is intended.



### How to mount a cable:



Step 1:  
Mount the cable lock and fix it to the slot marked in the picture.

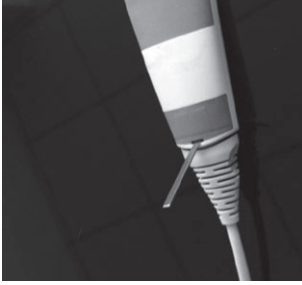


Step 2:  
Fix the cable tab on the hand control's front side first. Push in and twist a bit to fix the tab (see picture fit A into B).



Step 3:  
Fix the tab on the back as well by pushing.

## How to remove a cable:



### Step 1:

Release the cable by pushing e.g. a screwdriver into the hole on the back of the hand control. Twist and release.



## Recommendations

- Please ensure that you use the right cable type to ensure the wished functionality. In case of lack of functionality of your hand control, check that the hand control cable is the right one for the intended control box or contact your local LINAK representative.
- Please note that HB3X0L0 version (analogue with diode) is not supported by the CBJC. The diode will light up at all times if used with the CBJC.
- Do not submerge the hand control under water.
- Unless otherwise specified or agreed with LINAK, the hand control is only intended to be used on LINAK systems.
- Do not sit or lie down on the hand control. It can cause unintended movement of the application.
- When changing hand controls for OpenBus™ systems, the power must be switched off.
- The force of the magnet depends on the thickness and the type of the lacquering, stickers, steel thickness etc. It is the responsibility of the customer to verify that the holding force on the application is acceptable.
- For hand controls with magnets it is the responsibility of the user/operator to evaluate any possible risk caused by use of permanent magnets.
- For hand controls with magnets it is recommended to have a parking place for the hand control on the application, where the customer ensures that the hand control does not fall off.

## 16. HB40 (MEDLINE® CARELINE® TECHLINE®)

Item : HB41000-108142  
 Date : 2016.01.04 IPX4  
 NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
 NE PAS OUVRIER PAR DU PERSONNEL NON AUTORISE  
 W/O #1234567-0001 MADE BY LINAK A/S DENMARK

CE 120690



The HB40 series hand controls are designed for use with LINAK control boxes.

These sturdy compact units are ergonomically designed and ideal for a vast range of applications from patient care beds and office furniture to industrial and agricultural duties.

### Usage:

- Ambient temperature: +5° to +40° C
- HB40 is compatible with CB8-T, CB9..AX(not CH.4) and CB12 (not CH.4)
- HB40A is compatible with CB8-A battery version. Fitted with plug for battery charger CH01.
- HB40E is compatible with CB9Px (except CB9..PM/PN) and CB14
- HB44H is only compatible with CB9..Ax and CB12 (if CH.4) 4 channels
- HB40T is only compatible with CB7 (max. 2 channels)





### Compatibility:

	CB7	CB8	CB8A	CB9..Ax	CB9..Px (not CB9..PM/PN)	CB12	CB14
HB4xO		x		x*		x	
HB4xA			x				
HB4xE					x		x
HB4xH				x (4ch.)		x (4ch.)	
HB4xT	x						

\* only for channels 1, 2 and 3

## 17. HB50 (MEDLINE® CARELINE®)

Item : HB52B00-0011  
Date : 2016.01.04 IPX5  
NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS OUVRIER PAR DU PERSONNEL NON AUTORISE  
W/O #1234567-0001 MADE BY LINAK A/S DENMARK



The HB50 is primarily designed for the LINAK JUMBO system and LINAK control boxes with memory functions.  
The HB50 gives the user access to a range of memory functions, allowing present positions to be stored.  
For use in a wide variety of hospital and patient care.

### Usage:

- Ambient temperature: +5° to +40°
- HB50B is compatible with CBJ2
- HB50E is compatible with CB09P..Px types (except ..PM / PN) and CB14 with memory
- HB50J is compatible with CBJ1
- HB50Y is for Jumbo Home (CBJH)

## 18. HB60 (HOMELINE®)





Item : HB61T00-00009  
Date : 2016.01.04  
NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS OUVRIER PAR DU PERSONNEL NON AUTORISE  
W/O #1234567-0001 MADE BY LINAK A/S DENMARK



The HB60 series is exclusively designed to be used together with the LINAK HOMELINE® system: LA31/LA29 and CB9 with or without memory.

## 19. HB70 (MEDLINE® CARELINE®)

Item : HB75E000-10600  
Date : 2016.01.07 IPX6  
NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS OUVRIER PAR DU PERSONNEL NON AUTORISE  
W/O #1234567-1234 MADE BY LINAK A/S DENMARK



LINAK offers the HB70 with protection class IPX6 as standard and a range of options such as control of up to 5 actuators, memory, and simultaneous drive. The HB70 is designed to operate with most LINAK control boxes.

### Usage:

- Compatible with most LINAK control boxes.
- Approved according to: EN 60601-1, EN 60335-1 and UL 60601-1 as part of a LINAK actuator system



### Recommendation

- It is not possible to combine HB7x with the binary based CB9..PM/PN.
- The IPX6 Washable version has a special adhesive for the front covers.
- The HB75xE0 used together with CB140 will give trend and anti-trend on channel 1 and 2 of the control box when using the last button row.
- All front covers use the codes W0 (not Washable) and WW (Washable) Memory.

### Memory:

- The memory and parallel functions require the control box to have a microprocessor.
- When storing a memory position on the Control Box, the actuators must run to the desired position and the "store" button (S) must be pushed. Then the desired memory position button (1, 2 or 3) must be activated within 2 seconds.



The HB80 hand control has an optimised ergonomic design shaped for the hand. The hand control is suitable for all kinds of MEDLINE and CARELINE applications such as hospital beds, patient lifts, treatment and examination couches etc.

The HB80 hand control is available in versions with up to 10 or 12 activation buttons.

#### Usage:

- Usage temperature: 5° C to 40° C
- Storage temperature: -10° C to +50° C
- Compatibility: Compatible with many LINAK control boxes. For further questions, please ask your local LINAK. IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1:2005 3<sup>rd</sup> edition, and CAN/CSA-22.2 No 60601-1:2008. The HB86 version has a shorter distance between the buttons and cannot be approved according to EN IEC60601-2-52 Application Environment 4 for care beds used in Domestic area (or EN1970).
- Approvals: HB80 is designed and tested in accordance with EN60601-2-52 cl. 201.11.6.6.101 (Machine washable medical beds). The HB80 must hang vertically from it's hook during the washing process. In order to maintain the flexibility of the cables, it is important that a coiled cable is placed in such a way that the cable's own weight does not strain the coil during the washing process.



#### Recommendations

- Clean the hand control regularly to ensure good hygiene standards.
- When a defective HB80 is replaced, check that the new HB80 has exactly the same specification and functionality.
- Do not submerge the hand control under water.
- Unless otherwise specified or agreed by LINAK - the hand control is only intended to be used on LINAK systems.
- When changing hand controls for OpenBus™ systems, the power must be switched off.
- It is recommended to check the hand control and cable for damage and holes made by violent handling before washing the application or at least once a year.
- It is recommended to have a parking place for the hand control on the application, where the customer ensures that the hand control does not fall off.

#### For hand controls with magnets:

- If hand controls with magnet are attached to a smooth surface, a movement or twisting of the cable, for example during transport, can cause the hand control to move and result in damage if the cable is squeezed.
- The force of the magnet depends on the thickness of the lacquering, the lacquering type, stickers, steel thickness etc. It is the responsibility of the customer to verify that the holding force on the application is acceptable.
- It is the responsibility of the user/operator to evaluate any possible risk caused by use of permanent magnets.



#### Warnings

- Do not sit or lie on the hand control. It can cause unintended movement of the application.
- There is a risk that items with internal magnet for mounting instead of hook can disturb function of cardiac pacemaker, implantable cardioverter defibrillators or magnetic implants!

**LINAK®**WE IMPROVE YOUR LIFE.  
DESIGNED IN DENMARK

Type : HD84C1J0550004-200120012D1C000

Item  
J90208Date  
2015.12.14 IPX4

SW.01010189 V.1.2 C1010

NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL

NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISE

MADE BY LINAK A/S DENMARK



W/O #1234567-0001



The HD80 makes it possible to have two hand controls in one unit. The hand control is equipped with a magnet locking function, making it possible to have two levels of operation – one for the patient and relatives and one for the caregiver staff. The HD80 provides a great overview using LED indication of functions being locked or unlocked. The hand control is designed to work with OpenBus™ systems.

**Usage:**

- Usage temperature: 5° C to 40° C
  - Storage temperature: -10° C to +50° C
  - Compatibility: CB6, CB6S, CB60BME, CB16 and CB20 (all OpenBus CBs)
  - Relative humidity: 20% to 90% at 30° C - not condensing
  - Atmospheric pressure: 700 to 1060 hPa
  - Approvals: IEC60601-1-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1:2005 3<sup>rd</sup> edition and CAN/CSA-22.2 No 60601-1:2008
- The HD80 must hang vertically from its hook during the washing process.

**Standard HD80 - HD84C1J0550004-200120012D1C000****Item number J90208**

This hand control can be used as a combination of a hand control and the ACO. It has two levels of operation, where the first is a patient mode with regular operations like hi/lo and trend/anti-trend. Use the magnet key to operate the next level, care mode, where it is possible to lock functions. The LED lights show which functions are locked and which are not.

**Magnet key - article no. 0858008****Warning**

- Do not sit or lie on the hand control. It can cause unintended movement of the bed.
- Inform the customer that after loss of mains power, the lock state is reset to the default setting. Be aware of a special setup for a magnet lock of low power system in case of power down on mains. Also be aware that the lock is reset when running on battery or when powered down.
- Inform the customer that using the magnet key cannot wake up a low power system or a system running on battery. The system will wake up when activating a key and then the magnet key can unlock the system.
- Inform the customer that a powerful magnetic field may change the lock state.
- Always use O-rings on connectors and cable locks.
- There is a risk that items with internal magnet for mounting instead of hook can disturb function of cardiac pacemaker, implantable cardioverter defibrillators or magnetic implants!

**Recommendations**

- Inform the customer to use only the magnet key supplied by LINAK. We also recommend to make a functional test of the application before putting it into operation.
- Clean the hand control regularly to ensure good hygiene standards.
- When replacing a defective HD80, check that the new HD80 has exactly the same specification and functionality.
- Do not submerge the hand control under water.
- Unless otherwise specified or agreed by LINAK, the hand control is only intended to be used on LINAK systems.
- When changing hand controls for OpenBus™, the power must be switched off.
- It is recommended to check the hand control and cable for damage and holes made by violent handling before washing the bed or at least once a year.
- In order to maintain the flexibility of the cables, it is important that a coiled cable is placed in such a way that the cable's own weight does not strain the coil during the washing process.

**For hand controls with magnets:**

- If hand controls with magnets are hooked on a smooth surface, a movement or twisting of the cable, for example during transport, can cause the hand control to move and result in damage if the cable gets squeezed somewhere.
- The force of the magnet depends on the thickness of the lacquering, the lacquering type, stickers, steel thickness etc. It is the responsibility of the customer to verify that the holding force on the application is acceptable.
- It is the responsibility of the user/operator to evaluate any possible risk caused by use of magnets.
- It is recommended to have a parking place for the hand control on the application where the customer ensures that the hand control does not fall off.

## 22. HD80 JUMBO (MEDLINE® CARELINE®)

**LINAK®** 

WE IMPROVE YOUR LIFE  
DESIGNED IN DENMARK

Type : HD82C0F011000W-200230012A0C000

Item : HD8X008-02

Date : 2013.12.19 IPX6 S.O.7654321

NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS A OUVRIR PAR PERSONNEL NONAUTORISE

MADE BY LINAK A/S DENMARK



P.O.1234567-0001



Has an optimised ergonomic design shaped for the hand. The hand control is suitable for all kinds of MEDLINE and CARELINE applications with OpenBus control system such as hospital beds, patient lifts, treatment and examination couches etc.

### Usage:

- Usage temperature: 5° C to 40° C
- Storage temperature: -10° C to +50° C
- Compatibility: CBJ-C
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1:2005 3<sup>rd</sup> edition and CAN/CSA-22.2 No 60601-1:2008.



### Recommendations

- Unless otherwise specified or agreed by LINAK - the hand control is only intended to be used on LINAK systems.
- When changing hand control for OpenBus™ systems the power must be switched off.
- It is recommended to check the hand control and cable for damage and holes made by violent handling before washing the application or at least once a year.
- It is recommended to have a parking place for the hand control on the application, where the customer ensures that the hand control does not fall off.
- Clean the hand control regularly to ensure good hygiene standards.
- When a defective HD80 JUMBO is replaced, check that the new HD80 JUMBO has exactly the same specification and functionality.
- Do not submerge the hand control under water.

### For hand controls with magnets:

- If hand control with magnet are attached to a smooth surface, a movement or twisting of the cable, for example during transport, can cause the handset to move and result in damage if the cable is squeezed.
- The force of the magnet depends on the thickness of the lacquering, the lacquering type, stickers, steel thickness etc. It is the responsibility of the customer to verify that the holding force on the application is acceptable.
- It is the responsibility of the user/operator to evaluate any possible risk caused by use of permanent magnets.



### Warnings

- Do not sit or lie on the hand control. It can cause unintended movement of the application.

## 23. HL70 (MEDLINE® CARELINE®)

Item : HL7240002+20500

Date : 2016.01.07 IPX4

NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISE

W/O #1234567-1234 MADE BY LINAK A/S DENMARK



The HL70 is a handset with integrated locking function, where a selective locking of the different functions is available by use of a special key. The HL70 is an alternative to the HB70 combined with an attendant Control Panel (ACM, ACL, etc.).

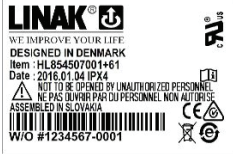
### Usage:

- Exchangeable with HB70
- Compatible with many LINAK control boxes
- Approved according to: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition, and CAN / CSA-22.2 No 60601-1:2008



### Recommendations

- To switch between locked and unlocked position a small knob between the two push buttons has to be turned 20° by use of a special key. The key is for the use of the nursing staff only, there are two types, one is made of plastic the other metal.
- The key has to be ordered separately. Article no. for the plastic key is: 00914516, and the metal key number is: 00914721
- For all types:  
Attention should be given to ensure that the channels shown correspond to the channels available on the chosen control box.



The HL80 handset has an optimised ergonomic design and switch activations.

The HL80 is a lockable handset, which makes it possible to lock or unlock one or several functions.

It is available in several different standard versions with a variation of bed symbols for easy interaction with end-users.

#### Usage:

- Approved according to: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition, and CAN / CSA-22.2 No 60601-1:2008



#### Warnings

- When using the locking function on HL80 check that the handset switches are actually locked.
- Locking function on HL80 only locks the actual handset.
- Do not sit or lie on the handset. It can cause unintended movement of the application.
- Locking of a single channel at HL8x do not necessarily prevent that channel from activation, if the same channel are covered by another handset button (e.g. at simultaneous drive) or another control unit.
- There is a risk that items with internal magnet for mounting instead of hook can disturb function of cardiac pacemaker, implantable cardioverter defibrillators or magnetic implants!



#### Recommendations

- Violent use of the key on HL80 can cause either damage to the keyhole or the key itself.
- If a lock key is missing, then full control over the application could be missing.
- Clean the handset regularly to ensure good hygiene standards.
- When a defective Hx80 is replaced, check that the new Hx80 has exactly the same specification and functionality.
- Do not submerge the handset under water.
- Unless otherwise specified or agreed by LINAK, the handset is only intended to be used on LINAK systems.
- When changing handsets for OpenBus™ systems, the power must be switched off.
- It is recommended to check the handset and cable for damage and holes made by violent handling before washing the application or at least once a year.
- It is recommended to have a parking place for the handset on the application, where the customer ensures that the handset does not fall off.

For handsets with magnet:

- If handsets with magnet are attached to a smooth surface, a movement or twisting of the cable, for example during transport, can cause the handset to move and result in damage if the cable is squeezed.
- The force of the magnet depends on the thickness of the lacquering, the lacquering type, stickers, steel thickness etc. It is the responsibility of the customer to verify that the holding force on the application is acceptable.
- It is the responsibility of the user/operator to evaluate any possible risk caused by use of permanent magnets.



## 25. IRO (MEDLINE® CARELINE®)



The IRO (Infrared Receiver OpenBus™) has been developed as a part of the accessory portfolio to be available for the CB OpenBus™ family. The receiver is fitted to the bed so that the bed movement can be controlled with signals received from a remote control (C-type Transmitter).



### Warnings

- Inform the customer that other handsets/equipment that use a protocol similar to parts of the LINBUS protocol for communication, may have influence on movement of the application
- Inform the customer that:
  - a damaged or a dirty IR window will reduce the receiving sensitivity
  - foreign object must not block the visual line from transmitter to the IRO receiver,
  - the IRO must be mounted for optimal visual receiving ability
- Inform the customer that interference from other light sources (38 KHz +/- 5 %), e.g. neon light, sunlight or toys may cause a temporary stop in a movement
- The customer has to mount the IRO at a protected location in the application
- Inform the customer to use the torque 1.5-2.0 Nm for mounting the IRO on the application

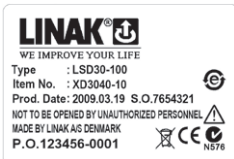
## 26. LS (MEDLINE® CARELINE® TECHLINE®)



There are two types of LINAK limit switches, for actuators type LA22, LA30, LA30S , LS, and LSD.

The LS type gives a signal in two fixed end positions, but requires a control unit to stop the actuator when the microswitches are activated.

## 27. LSD (MEDLINE® CARELINE® TECHLINE®)



The LSD type controls the stroke length of the actuator between two fixed end positions by cutting off the current to the motor.

## 7. Information on specific JUMBO™

### 1. BAJ1 & BAJ2 (MEDLINE® CARELINE®)

**LINAK®**  
WE IMPROVE YOUR LIFE.  
DESIGNED IN DENMARK  
Item : BAJ100000001011  
Date : 2016.01.11  
W/O #1234567-0001  
MADE BY LINAK A/S DENMARK

IPX5



24V 2.9Ah



**LINAK®**  
WE IMPROVE YOUR LIFE.  
DESIGNED IN DENMARK  
Item : BAJ2000000010  
Date : 2016.01.09  
W/O #1234567-0001  
MADE BY LINAK A/S DENMARK

IPX0



120690



These battery packs have been specially developed for use with the JUMBO system.  
The battery packs are easy to exchange through an integrated snap system.  
The battery packs are easily mounted on the JUMBO mounting brackets.

A customised front cover is possible.

BAJ1 has to be charged with a JUMBO charger CHJ2 or a JUMBO control box CBJ1 or CBJ2 with integrated charger.

BAJ2 can be charged as BAJ1, but can also be charged through an integrated DC-plug for use with external charger CH01.

BAJ1 is available in a special edition that can be used in the harsh conditions in the pool environment both outdoor and indoor.

#### Usage:

- Duty cycle: 10% or 2 min. continuous use then 18 min. not in use
- Ambient temperatures: +5° to +40 °C
- This battery pack is a part of the JUMBO system. It is compatible with CBJ1/CBJ2 and CHJ2.
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/ AAMI ES60601-1:2005 3<sup>rd</sup> edition and CAN/CSA-22.2 No 60601-1:2008



#### Warning

Check at regular intervals that the ventilation hole is undamaged and intact. The construction of the ventilation stub permits battery gasses to get out, but it does not permit penetration of water.

### 2. BAJL Li-Ion (MEDLINE® CARELINE®)

**LINAK®**  
Designed in Denmark  
DK - 6430 Nordborg  
Item : BAJL00300000471  
Date : 2017.12.01  
W/O #1234567-0001  
MADE IN DENMARK

U In : Charge Max. 28.8V=  
I In : Max. 2.0A IPX5

S.W.: 0078079 Ver. 1.4 Li-Ion Battery  
S.W.: 0078080 Ver. 1.2 25.9V 2.25Ah 5Wh



71NR 19/66

**LINAK®**  
Designed in Denmark  
DK - 6430 Nordborg  
Item : BAJL00400000481  
Date : 2017.12.01  
W/O #1234567-0001  
MADE IN DENMARK

U In : Charge Max. 28.8V=  
I In : Max. 3.0A IPX5

S.W.: 0078079 Ver. 1.4 Li-Ion Battery  
S.W.: 0078080 Ver. 1.2 25.9V 4.5Ah 117Wh



71NR 19/66-2

The BAJL Li-Ion battery pack has been specially developed for use with the JUMBO system for patient lifts and sit to stand lifts. It is a low-weight battery with reliable and high performance.

#### Usage:

- Compatibility: CBJ Care, COBO, CHJ2 and CH01
- Duty cycle: BAJL003xxxxxxx:  
10 % (2/18 min.) at max. current draw 10 Amp (ambient temperature ≤ 30 °C)  
10 % (2/18 min.) at max. current draw 8 Amp or  
5% (1/19 min.) at max. current draw 10 Amp (ambient temperature > 30 °C)  
BAJL004xxxxxxx:  
10 % (2/18 min.) at max. current draw 10 Amp (standard ambient temperature recommendations)
- Charging: Via JUMBO wall charger CHJ2 or via JUMBO control box with integrated charger
- Charging state: Maximum 30% when shipped from LINAK
- Recharging during storage: Recharge the battery 6 months at the latest after production date stated on the label
- Operating temperature: +5°C to +40°C
- Charging temperature: +10°C to +40°C
- Charging time: Type 3: 3 to 4 hours - Type 4: 6 to 8 hours
- Storage temperature: -10 °C to +40 °C (+10 °C to +25 °C - recommended)  
The batteries must be stored in an applicable storage room without direct sunlight.
- Relative humidity: 20% to 80%
- Atmospheric pressure: 700 to 1060 hPa
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition,  
ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition,  
CAN / CSA-22.2 No 60601-1:2008,  
IEC62133 2<sup>nd</sup> edition,  
UL2054, 2<sup>nd</sup> edition  
PSE (pending)  
UN38.8, 6<sup>th</sup> edition (needed for transport of lithium batteries)

## Mounting

Do not mount the battery upside down.

Please follow the mounting instructions of the control box e.g. CBJ Care or COBO.

## Standby mode

When the BAJL Li-Ion is not being used for a longer period - more than a week - or when it is on stock, it enters into a standby mode to save power and protect the battery from deep discharge.

- Please connect the charger for approx. 15 seconds to exit the standby mode before use.
- There is no audio signal to indicate the standby mode or to indicate exit of standby mode.

## After exit of the standby mode

If there is still no power on, the battery needs to be charged.

After charging, the hand control and/or the control box will indicate the battery capacity level again

## Deep discharge protection

The BAJL Li-Ion has a deep discharge protection to extend the battery lifetime. The deep discharge protection is activated when the battery is discharged.

- Please connect the charger for approx. 15 seconds to exit the deep discharge mode before use.

If the battery is completely discharged, the charging will be started at a very small rate to protect the battery. This small charging rate is not sufficient to turn on the light in the charger, and therefore the user may believe that the system has not yet started. Depending on the battery state, it may take several hours to get to the normal charging state. The orange light of the control box will not be turned on as the operation is analogue. It is therefore not possible to see that the charging has started, however, only at a low level.

If any of the lithium ion batteries built into LINAK products is found to be defective under warranty, LINAK will provide a new product to the OEM. LINAK explicitly disclaims all other remedies. LINAK shall not in any event be liable under any circumstances for any special indirect punitive incidental or consequential damages or losses arising from any incident related to the inherent risk of thermal runaway in the lithium ion cell and any use of LINAK products. Moreover, LINAK explicitly disclaims lost profits, failure to realise expected savings, any claim against our customer by a third party, or any other commercial or economic losses of any kind, even if LINAK has been advised of the possibility of such damages or losses.

## Transportation

The lithium ion batteries must be packed and transported according to applicable regulations. Always ask your local transportation provider how to handle the transportation of lithium ion batteries.



### Recommendations:

- Do not exceed the storage temperature as it will shorten the lifetime and performance.
- Allow the battery to settle to the temperature specified in the user manual before use or charging.
- Only use correct LINAK charger (CHJ2, CH01 or integrated charger in JUMBO control box).
- Do not exceed the duty cycle as it will shorten the life time and performance.
- BAJL Li-ion is not intended for use in outdoor applications and indoor pool environments.
- If the battery is completely discharged, then recharge the battery before storage.
- Unintentional use of the emergency button, e.g. short activation and deactivation of the emergency button after operating the actuators, can lead to an error indication of remaining battery capacity. The battery capacity will however be shown correctly approx. 20 seconds after activation of the emergency button.
- The BAJL goes into sleep mode approximately 20 seconds after the CBJ Care enters into sleep mode. If the CBJ Care is reactivated within this period, it can lead to a wrong remaining battery capacity indication. The remaining battery capacity will however be shown correctly approx. 20 seconds after the reactivation of the CBJ Care.

## Safety feature

BAJL Li-ion contains several mechanisms to protect itself from being damaged due to excessive use.

In case of overheating, the device will activate a thermal protection. No power output will be available until the temperature has returned to normal operating range. Overheating may occur by extensive use at high temperature or by exceeding the duty cycle.

## Battery safety

LINAK Li-ion batteries for medical use are designed and manufactured to be safe through the product lifetime. LINAK has performed various tests of the batteries in normal use, abuse situations and failure situations to verify the design and production methods. These tests have not shown any unacceptable risks.

The batteries are also UL-tested to have an independent organisation verify the safety of the design and to obtain a safety certificate.

This means that UL regularly inspects the factory to check that standards are complied with.

UL has tested in accordance with the following standards:

UN38.3, 6<sup>th</sup> edition - Battery Transportation Safety

IEC62133 Battery Safety

UL2054, 2<sup>nd</sup> edition - Standard for Household and Commercial Batteries



## Warnings

Lithium ion batteries differ from the lead acid technology as they have a built-in deep discharge protection.

- Loss of power might happen due to the battery deep discharge protection. This will only happen in case of continuous battery use despite warnings. In this event, there may be no warning and the application may not be able to move when expected.
- In his risk analysis, the customer must take into consideration how to ensure alternative means to make movement, e.g. quick release or manual lowering.
- Do not open the battery housing as damaging the cell or circuitry may develop excessive heat.
- Lithium ion batteries that are defective, have been damaged or might produce excessive heat or fire are not allowed for transportation.
- The combination of CBJ1 or CBJ2 with BAJL might not be able to complete a full cycle after the audio signal of low battery warning.
- For safety reasons, please adhere to the indicated charging and operation temperature.
- In case the battery turns hot, disconnect it and evacuate the room and wait for 2 hours before taking further steps.
- The mounting instructions must be followed in order to avoid exposing batteries to water.
- Recharge batteries every 6 months at a minimum.
- Dispose of the batteries in accordance with local regulations.

## DO NOT:

- Heat or burn the batteries
- Short circuit the batteries
- Expose the batteries to high impact
- Crush or puncture the batteries
- Use batteries with signs of damage or corrosion
- Charge or store the batteries near combustible material
- Expose the batteries to water or other liquids
- Overcharge or fully discharge the batteries



## Compatibility:

Please be aware that BAJL Li-ion is not compatible with:

- CBJ1, CBJ2 – incl. pool lift versions
- COBO20

## 3. CBJ1/CBJ2 (MEDLINE® CARELINE®)

**CAUTION ! NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL**

**ATTENTION ! NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISE**



WE IMPROVE YOUR LIFE  
DESIGNED IN DENMARK  
 Type: CBJ1002NA111XXX  
 Item: CBJ1008-00  
 Date: 2016.01.09  
 W/O # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 24 V=

IPX4  
 Int. : 10 %, Max. 2 min. / 18 min.



us 120690



The control boxes CBJ1 and CBJ2 are part of the battery driven JUMBO system. JUMBO is a modular system combining an actuator, a control box (CBJ1, CBJ2), a battery (BAJ1) and a charger (CHJ2) in a flexible solution, specially developed for patient lifts.

The complete system is medically approved and contains a series of features which meet the patients need for a safe and comfortable lift, e.g. CBJ1 and CBJ2 are equipped with a soft-start/stop function, emergency lowering function etc.

CBJ1 and CBJ2 are available in a special edition that can be used in the harsh conditions in the pool environment both outdoor and indoor.

**CAUTION ! NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL**

**ATTENTION ! NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISE**



WE IMPROVE YOUR LIFE  
DESIGNED IN DENMARK  
 Type: CBJ2005HD132334  
 Item: CBJ2018-03  
 Date: 2016.01.09  
 W/O # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 100 - 240 V~ - 50-60 Hz

I In : Max. 400 mA  
 IPX4  
 Int. : 10 %, Max. 2 min. / 18 min.



us 120690



## Usage:

- Duty cycle: max. 10% or 2 min. continuous use then 18 min. without use
- Ambient temperature: +5° to +40°
- For one or two actuators (lift and leg spreader actuator)
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1:2005 3<sup>rd</sup> edition, CAN / CSA-22.2 No 60601-1:2008.



## Recommendations

- The mains cable must always be ordered separately when ordering a CBJ1, CBJ2 with an internal charger.
- Use only original LINAK mains cables to ensure proper connection to internal charger.
- When charging, the CBJ1, CBJ2 will not be able to operate any actuators.
- By use of charger CH01 it is possible to activate the actuators when charging. However, this is not recommended as it can damage the control box or the charger CH01.
- When the CBJ1, CBJ2 with LCD display option is combined with the battery BAJ Li-Ion, the LCD display can indicate empty battery even if the battery capacity is not low.


The acoustic alarm will always be activated at low battery capacity independent of display indication.



## Warning

- In order to avoid injury, the emergency-stop should be activated in (all) transport and cleaning situations.
- BAJ Li-Ion batteries differ from BAJ1 lead acid as they have built-in discharge protection.  
If the user continues to use the battery despite warning signals, loss of power might happen due to the battery deep discharge protection. In this event, there may be no warning and the application may not be able to move when expected.
- The combination of CBJ1 or CBJ2 with BAJL might not be able to complete a full cycle after low battery warning.

## Adjustment instructions for the JUMBO application.

	<p>Tool</p> <p>For the adjustment you must use a trimming screwdriver, which can be purchased from LINAK A/S. It is also possible to use other types of trimming screwdrivers for the adjustment.</p> <p><b>Ordinary screwdrivers cannot be used, as they will damage the potentiometer slot.</b></p> <p>When you receive the JUMBO from LINAK A/S it is adjusted to min. current cut-off.</p>
1.	Connect the JUMBO control box to the actuator.
2.	Load the actuator with the required load.
3.	Turn the potentiometer completely clockwise.
4.	Run the actuator in the loaded direction at the same time turn the potentiometer anticlockwise until the actuator stops.
5.	Turn the potentiometer 3 times clockwise.
6.	Check JUMBO can lift the loaded actuator.
7.	Insert the plugs article no. 0009020 (Light grey (RAL7035)) or 0009019 (Dark grey (RAL7016)) to ensure IP protection

## Mounting the CBJ1, CBJ2



### Special care should be taken when mounting the CBJ1, CBJ2.



As long as the CBJ1, CBJ2 is mounted correctly then the CBJ1, CBJ2 complies to IPX5.

If the CBJ1, CBJ2 is mounted incorrectly, then water will gather around the screw holes resulting in non-compliance with IPX5!  
CBJ1, CBJ2 with variable current cut-off: the protection plugs must always be inserted to ensure IP protection after adjustment.



When using the control box with emergency stop, the stop button must be activated in cleaning situations in order to comply with IPX5.  
The battery pack BAJ1 must not be removed in cleaning situations, doing so could result in non-compliance with IPX5.



If the CBJ1, CBJ2 is fitted with option B, D and F (DC power connector), the protection plug ex. 00918174 must always be inserted to ensure IP protection, if the port is not used. IP rating only applies when the battery is connected to the control box.

**CAUTION ! NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL**

**ATTENTION ! NE PAS OUVRIIR PAR DU PERSONNEL NON AUTORISE**



U In : 24 V=  
I In : Max. 500 mA  
IPX4  
Int. : 10 % Max. 2 min. / 18 min.



120690



The control boxes CBJ Care is a part of the JUMBO system. JUMBO is a modular system combining an actuator, a control box (CBJ Care), a battery (BAJ1 / BAJL), and a charger (CHJ2) / internal charger and a hand control in a flexible solution, specially developed for patient lifts.

The complete system contains a series of features which meet the patient's need for a safe and comfortable lift.

CBJ Care is available in 3 versions, one with diodes, one with a display and a third without display and diodes.

It is possible to have control buttons on the front cover to have an easy control option if the hand control is missing. Furthermore it is possible to have 3 channels via a T-cable in channel 1. The 3<sup>rd</sup> channel for tilt function adds value for the patient and the caregiver.

**Usage:**

- Duty cycle: max. 10% or 2 min. continuous use then 18 min. without use
- Ambient temperature: +5° to +40°
- For up to three actuators (lift, leg spreader and tilt of the sling)
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI / AAMI E560601-1:2005 3<sup>rd</sup> edition, CAN/CSA-22.2 No 60601-1:2008 Australia deviation, for one, two or three actuators, (lift, leg spread and tilt actuator), Canadian deviation



**Recommendations**

- Before start-up we recommend to reset the service counters - days and cycles until next service visit. To reset press the up and down button on the control box or the hand control for 5 seconds. An audio signal will confirm the resetting.
- When charging, the CBJ Care will not be able to operate any actuators.
- The battery charger, CH01 and/or CHJ2 must always be ordered separately when ordering CBJ Care.
- It is not possible to use other battery types than BAJ1 or BAJL with the JUMBO Care.
- The mains cable must always be ordered separately when ordering a CBJ Care with internal charger.
- Use only original LINAK mains cables to ensure proper connection to internal charger.
- The green battery indicator (100% to 50% capacity remaining) will light up during charging even though the battery is not fully charged. It is necessary to use the "CHARGE" diode to indicate whether or not the battery is fully charged (when using internal charger). The CHARGE indicator will light up during charging and turn off when the battery is fully charged.
- Using the Learn Mode function means that:
  - The lift will never be able to lift more than 1.5 times the max. load. However, the actuator will not stop exactly at the weight it is adjusted to. This is because the actuator will use less current when its components are run-in. After the max. current value has been registered using the "Learn" function the control box will be able to use max. current +10%. This ensures that the lift is capable of lifting the promised load but cannot lift more than 1.5 times this amount. If the below mentioned conditions are fulfilled:
    - Learn mode is made on the specific pair of actuator and control box which are going to be used in real life afterwards.
    - Ambient temperature should be app. 20 degrees C +/- 5%.
    - Load curve: difference between the highest and lowest load should not be more than approx. max. 10%
- The registration function can only be activated by using a specially produced handset (HB7x235-00). A standard handset cannot activate the function.
- The maximum cut-off value that can be registered (stored) is 11 Amp.
- If an actuator or CBJ Care is exchanged it will be necessary to reset the max. load to ensure the correct cut-off value for the new system as a whole.
- Always use fully charged batteries for learning mode procedures.
- Please note that when you disconnect the service data tool from JUMBO Care it will take 1 hour before the control box will power down. This means that display indicators will keep lighting up 1 hour after disconnection of the service data tool. If you want to avoid this battery consumption the emergency stop button can be activated.
- Ensure that you have the Service data tool version 2.5.0 or newer as only these versions support JUMBO Care 2<sup>nd</sup> generation.
- If the control box is exchanged, the actuator data will be lost. The data is stored in the control box, not the actuator. However, actuator data can be maintained by using the service data tool for saving actuator data in the new control box.
- Note that the control box has to be "awake" in order to connect to the service data tool. Activate the control box before connecting via the emergency lowering buttons or the hand control (via T-cable).
- When using the learn mode function, the lift will never be able to lift more than 1.5 times the max. load. The actuator will not stop exactly at the load it has been adjusted to as the actuator uses less current when its components have been run in. When the max. current value has been registered using the learn mode function, the control box will be able to use max. current +10%. This ensures that the lift is capable of lifting the set load, however it cannot lift more than 1.5 times of the set load.
- When registering current limits, be aware to use a defined set of actuator and control box.
- The ambient temperature must be approx. 20 °C +/- 5 %.
- The difference between the highest and lowest load must not be more than max. 10 %.
- To activate the learn mode function, use the special hand control (HB7x235-00).
- If an actuator or CBJ Care is exchanged, it is necessary to reset the max. load to ensure the correct cut-off value for the new system.
- Always use fully charged batteries for learn mode procedures.
- A max. cut-off value of 11 Amp can be registered (stored).
- The tolerance for preset current cut-off is: +/- 1 Amp.
- The current cut-off value can be reset by means of the learn mode function, however this is not in accordance with EN10535.



## Recommendations

### Hot Plugging:

Removing or adding any OpenBus™ cables is not allowed when the control box is on power via mains supply or battery! If necessary anyway, follow the below procedure:

1. Remove mains or battery and wait 5 sec.
2. Mount or dismount the required cables

If this procedure is NOT followed it may result in a damaged OpenBus™ driver circuit.

The risk of a damaged circuit increases if the accessory has a high start current (in rush current).

### Emergency lowering/lifting:

By use of BAJ1, the lifting arm can be lowered by pressing e.g. a pen in the hole or use the control buttons, if present.

This is a permitted method of lowering/lifting.

The emergency lowering/lifting "buttons" work as normal hand control buttons (you do not get extended functionality by using these when the battery is low).

By use of BAJL, please be aware that loss of power might happen due to the battery deep discharge protection.

This will only happen by continuous use of the battery despite warning.



### Warnings

In order to avoid injury, the emergency-stop should be activated in (all) transport situations.

### Functionality – JUMBO Care with display

Below you find information about what to read-out on the display version of JUMBO Care. Basically the functionality for the display version is the same as the diode version, but more information can be read out on the display.

### Driving information



As long as a hand control button function is activated driving information will be shown on the display. Either lifting arm up, lifting arm down, legs in or legs out or tilt of sling.

The only exception to this is when the battery is flat (stage 3 and 4 – see below). At that point the battery information will be shown instead.

### Battery information

The battery discharging will be shown in four stages:



Battery state 1: The battery is ok, no need for charging (100 - 50 %)



Battery state 2: Battery needs charging. (50 - 25 %)



Battery state 3: Battery needs charging. (Less than 25 %) Buzzer sound is provided when a button is pressed in this battery state.



Battery state 4: The battery needs charging. At this stage some of the functionality of the lift is lost. At this battery stage, it is not possible to drive the lifting arm up or down. Furthermore, an audio signal will sound when a control button is activated (17V or lower). The symbol will switch between the two pictures for 10 seconds. The battery symbol is shown when the box is active until power down (2 minutes after use).



Battery state 4: (BAJL li-ion) When using CBJ Care with display together with a BAJL battery, the display will not show the "Battery state 4" symbol. The BAJL deep discharge protection overrules the "battery state 4". Consequently, the CBJ Care shuts down, and the empty battery symbol is not shown.

- The battery level is measured via voltage level. This means that it is possible to experience e.g. that the battery switches from state 1 to state 2 and back to state 1.

### Charging of battery:



When the mains cable is plugged in and a control button is activated the symbol to the left is shown on the display until power down 2 minutes later. The purpose of the symbol is to tell the user that it is not possible to use the lift when it is plugged in to the mains.

### Short circuit:



If there is a short circuit the control box will show the short circuit symbol with a recommendation to check the connections. The symbol will be shown until the short circuit has been repaired.

### Service:



The control box will show the service symbol when it is time for service. The standard setting is after 12 months / 8000 cycles. After each power down, the first time that the service symbol is shown the control box will provide an audio sound (100 milli seconds) so that the user gets a reminder about checking the display.

The 'SERVICE' text will blink 3 times, then a static service symbol will be shown (10 seconds in total). Even though it is time for service the system will still be functional and work as normal.

### Overload Channel 1 only:



When overload occurs (according to the pre- defined current cut off limit) the overload symbol will be shown on the display. The 'MAX' text will blink 3 times and the overload symbol will be shown for 10 seconds in total.

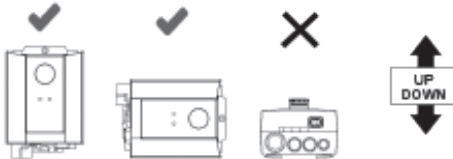
### Service information read-out

Basic service information can be read out on the display. To get the service information on the display please press the lifting arm up button (only 1/2 second press). The information will be shown for 1/2 minute or until other buttons are activated.

	12034	----->	Total cycles done on channel 1
	1257000	----->	Total work done on channel 1
	7	----->	Total number of overloads (channel 1)
	90/360	----->	Days since last service/Days between services

If "No days" are chosen for service interval then the display will show Days since last service /-.

### Mounting of CBJ Care



### Special care should be taken when mounting the CBJ Care.

As long as the the CBJ Care is mounted correctly then the CBJ Care complies to IPX4. If the CBJ Care is mounted incorrectly then water will gather around the screw holes resulting in non-compliance with IPX4!

If the control box is equipped with emergency stop, the stop button must be activated in cleaning situations in order to comply with IPX4.

The battery pack BAJ1 or BAJL must NOT be removed in cleaning situations, doing so could result in non-compliance with IPX4.

If the CBJ Care is fitted with external charger option (DC power connector), the protection plug ex. 00918174 must always be inserted to ensure IP protection, if the port is not used.

IP rating only applies when the battery is connected to the control box.



**CAUTION ! NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL**

**ATTENTION ! NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISÉ**



**LINAK®**  
 WE IMPROVE YOUR LIFE  
 DESIGNED IN DENMARK  
 Item: CBJH13030100004  
 Date: 2916.03.07  
 W/O # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 100 - 240 V~, 50-60 Hz, / I In : Max. 280 mA  
 IPX4  
 Op. : 10 %, Max. 2 min. / 18 min.  
 S.W. P./N.: 0078078 Ver. 1.0








120690



The CBJ-Home is a specially developed solution for patient lifts. The complete system consists of a control box and a battery enclosed in a single elegant module. The system is approved according to medical safety standards and contains a series of features ensuring a safe comfortable lift, e.g. the CBJ-Home is equipped with a soft-start function, electrical emergency lowering, emergency stop etc.

**Usage:**

- Duty cycle: Max. 10% or 2 min. continuous use then 18 min. without use.
- Ambient temperature: +5° to +40°C.
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1:2005 3<sup>rd</sup> edition

**Replacement of battery:**

Only an authorised LINAK service centre should change a battery in a CBJ-Home. If a CBJ-Home is opened and a battery changed by an unauthorised person there is a risk that it may malfunction at a later date.

Mounting of CBJ-Home (only vertically)



**Recommendations**

- If emergency stop is pressed whilst charging, the batteries will not be charged.
- When charging, the CBJ-Home will not be able to operate any actuators.
- For recharging the batteries, use charger CH01 (charger has to be ordered separately).
- Note: Always mount the CBJ-Home with the channel sockets facing downwards
- The CBJ-Home is not intended for use with "buffer" type actuators such as LA28 and LA32.
- The actuator must always be fitted with an exchangeable cable (mini-fit) socket.
- Actuators on channel 1 must always be with spline.
- The mains cables must always be ordered separately when ordering a CBJ with an internal charger.
- Use only original LINAK mains cables to ensure proper connection to internal charger.
- Always use fully charged batteries for learning mode procedures.
- It cannot be guaranteed that the actuator will stop exactly at the weight that is stored as the motors in the actuators will use less current when run in. Though it will never reach the 1.5 times max. load as the norm states.
- Tolerance for current cut off is: +/-10%
- The maximum cut-off value that can be registered (stored) is 8 Amp.
- If an actuator or CBJ-Home is exchanged it will be necessary to reset the max. load to ensure the correct cut-off value for the new system as a whole.
- The registration function can only be activated by using a specially produced handset (HB7X161-00). A standard handset cannot activate the function.
- To operate the "Learn mode" function in External charger versions produced before February 2010 press the "R" button when "learning" (the lifting arm actuator will operate automatically). With all other versions (and future versions with external charger) both the "R" button and the "lifting arm" button need to be pressed.



**Warning**

In order to avoid injury, the emergency stop should be activated in (all) transport situations.

When using the control box with emergency stop button, the stop button must be released before charging batteries or before the application is put into operation.

The mounting screws for the control box and the charger must be tightened with a maximum torque of 1 Nm.

**Mounting information:**

The CBJ-Home is mounted by means of 2 screws:  
 Type ISO4762-M6x90-8.8 ( not supplied by LINAK )

Spares information:

The cable lock kit consists of the following 3 items:

- 2 x screws
- 1 x blind plug for ch. 2 if not in use
- Cable Lock

All the cable lock items are included when ordering the kit, article number: 0898001-B.

## 6. COBO (MEDLINE® CARELINE®)

**LINAK**  
 WE IMPROVE YOUR LIFE  
 DESIGNED IN DENMARK  
 Item : COBO0000EC12011  
 Date : 2015.06.16  
 W/O # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 24 V=  
 I In : Max. 500 mA  
 IPX5  
 Int. : 10 %, Max. 2 min. / 18 min.  
 S.W. P/N : 0070074 Ver. 1.1



The COBO is an interface box specially developed for use together with the JUMBO battery pack (BAJ1/BAJ2 and BAJL Li-Ion) and the CU20 control unit. It is also possible to connect other 24V lead acid customer batteries or fixed power supply.

### Safety:

The COBO has a monitoring circuit for the FET transistor. If the FET is damaged the CU20 will go into fatal error mode. In this case the COBO is defective and must be replaced.

### Usage:

- Compatibility: LINAK Batteries BAJ1, BAJ2 (24 V, 2.9 AH) or other 26 - 28 V power sources via customer battery connection. LINAK Lithium Ion battery (BAJL Li-Ion)
- Duty cycle: 10% 2 minutes running and 18 minutes rest
- Operating temperature: +5°C - +40°C
- Storage temperature: -10°C - +50°C
- Relative humidity: 20% to 80%
- Atmospheric pressure: 700 to 1060 hPa
- Approvals: The COBO is EMC approved and designed in accordance with IEC60601-1:2005 3<sup>rd</sup> edition, ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition and CAN / CSA-22.2 No 60601-1:2008

### Functionality:

COBO with internal charger has a green and a yellow light.

Diode colour	Functionality
Green is on	COBO is connected to mains
Yellow is on	COBO is charging. The yellow LED is constantly on until batteries are fully charged.

The CU20 will shut down after 2 minutes to save power.

Accessories depending on V-permanent when the system is inactive will not work.

The CU20 controls whether or not activation should be allowed during charging.

Please note that the CU20 SW must ensure that there is no movement during charging when using COBO with internal charger.

### Mounting

Special care should be taken when mounting the COBO.

As long as the COBO is mounted correctly then the COBO complies to IPX5 (IPX4 with internal charger).

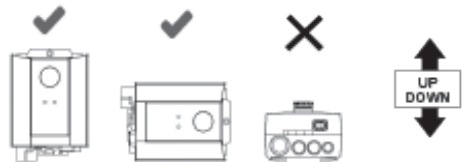
If the COBO is mounted incorrectly then water will gather around the screw holes resulting in non-compliance with IPX5 (IPX4 with internal charger).

When using the control box with emergency stop, the stop button must be activated in cleaning situations in order to comply with IPX5.

The battery pack BAJ1 or BAJL must not be removed in cleaning situations, doing so could result in non-compliance with IPX5.

If the COBO is fitted with option EC (DC posser connector), the protection plug ex. 00918174 must always be inserted to ensure IP protection, if the port is not used.

IP rating only applies when the battery is connected to the control box.



### Recommendations

- Choose CU200XXXXX2XXXX if positioning/memory function is to be used.
- It is recommended that the COBO is serviced according to the relevant national norms for the applications in which it is used, however all electrical parts must be checked at least once a year.
- The COBO should be cleaned regularly, in order to maintain good hygiene. It is not allowed to use chemicals to clean the box.
- Only use COBO together with CU20.



## Warnings

- Pay attention to the polarity of the customer battery cable - red is positive voltage.
- In order to avoid injury, the emergency stop should be activated in (all) transport situations.
- If 24V lead acid customer batteries or fixed power supply is used, the supply source must comply with “Means Of Patient Protection” and “Means Of Operator Protection” in accordance with the Medical Safety Standard.
- If 24V lead acid customer batteries or fixed power supply are used, the customer must ensure that EMC values are kept in accordance with regulations.
- The CU20 power port/channel 7 cannot be used with COBO.
- Max 1 ACT can be connected to the COBO system.
- The COBO is not to be used in agricultural or maritime applications or be connected directly to a vehicle battery.

## 7. COBO20 (MEDLINE® CARELINE®)

**LINAK®**  
 WE IMPROVE YOUR LIFE  
 DESIGNED IN DENMARK  
 Item: COBO2000C11021  
 Date: 2016.01.09  
 WIO # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 90 - 240 V~, 50-60 Hz  
 I In : Max. 450 mA  
 IPX5

Int. :10 % Max. 2 min. / 18 min.



**CAUTION:** NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
 NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISÉ



The COBO20 makes increased battery power available (compared to BA20). It is designed to be used with CU20 together with BAJ1 or BAJ2 (24V, 2.9AH). It is also possible to connect other 24V lead acid or SLA (Sealed Lead Acid) battery types.

COBO20 with internal charger has a green and a yellow light. Green is ON when the COBO20 is connected to mains. Yellow is ON when charging. The yellow light shines constantly until batteries are fully charged.

### Usage:

- The COBO20 is to be used with CU20 (instead of CP20) for applications that need a large battery capacity.
- Ambient temperatures: +5 to 40°C
- Approvals: The COBO20 is EMC approved.  
 The COBO20 is designed in accordance with the following standards: 60601-1/ UL2601 and EN60601-1-4.
- When running on batteries CU20 will shut down after 2 minutes to save power.



## Recommendations

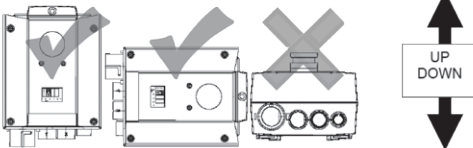
- Choose CU200XXXXX2XXXX if positioning/memory function is to be used.
- After activation of emergency stop it can take up to 10 seconds before the system can be used again.
- If own battery package is used, a10A fuse must be added.
- It is recommended that the COBO20 is serviced according to the relevant national norms for the applications in which it is used, however all electrical parts must be checked at least once a year.
- The COBO20 should be cleaned regularly, in order to maintain good hygiene. It is not allowed to use chemicals to clean the box.
- **Only** use COBO20 together with CU20.



## Warning

In order to avoid injury, the emergency stop should be activated in (all) transport situations.

## Mounting of COBO20



## Special care should be taken when mounting the COBO20:

As long as the COBO is mounted correctly then the COBO20 complies to IPX5. If the COBO is mounted incorrectly then water will gather around the screw holes resulting in non-compliance with IPX5.

## 8. CH01 (MEDLINE® CARELINE®)

For charging the batteries of CB08-XA and all JUMBO control boxes, directly connected to the control box or via the handset HB40A.

For charging of the batteries in battery box BAJ2 (JUMBO system) and CBJH.

## 9. CHJ2 (MEDLINE® CARELINE®)

**CAUTION ! NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL**

**ATTENTION ! NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISÉ**



**LINAK®**  
 WE IMPROVE YOUR LIFE  
 DESIGNED IN DENMARK  
 Item : CHJ20100130J021  
 Date : 2016.01.09  
 W/O # 1234567-0001  
 MADE BY LINAK A/S DENMARK

U In : 100 - 240 V~, 50/60Hz  
 I In : Max. 400 mA Fuse: T1.25A 250V  
 IPX5



120 690



The charger CHJ2 has been specially designed for use as a wall-charger for the JUMBO system.

The CHJ2 charger is a Switch Mode Power Supply (SMPS) version which makes charging of the batteries more efficient.

The charging time for a BAJ1 or BAJL (standard) battery pack is approx. 4 hours.

Mains voltage from 100 V AC – 240 V AC (50/60 Hz) is possible on same charger.

The charger indicates whether the charger is connected to the mains (green LED) or whether the battery is being charged (yellow LED). Medically approved.

### Usage:

- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601:1 2005 3<sup>rd</sup> edition and CAN / CSA-22.2 No 60601-1:2008
- Ambient temperatures: + 5 to + 40 °C

## 10. MBJ1/2/3 (MEDLINE® CARELINE®)

Depending on of what your JUMBO system consists you need to use one of the following three mounting brackets. IP protection is only valid when the JUMBO system is mounted vertically.

All three brackets include matching screws (IPX1, IPXX and IPX5 are delivered with stainless screws). The mounting screws for the control box, charger must be tightened with a maximum torque of 1 Nm.

		<p><b>MBJ1</b>                      For use together with CBJ1 or CBJ2 or CBJC, CHJ2 and BAJ1 or BAJ2. I. e. when combining control box, charger and battery pack MBJ1 has to be used.</p>
		<p><b>MBJ2</b>                      For use together with CBJ1 or CBJ2 or CBJC, and BAJ1 or BAJ2. I. e. when combining control box and battery pack MBJ2 has to be used.</p>
		<p><b>MBJ3</b>                      For use together with CHJ2 and BAJ1 or BAJ2. I. e. when combining charger and battery pack MBJ3 has to be used.</p>

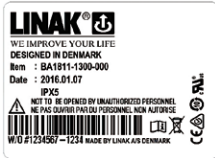
## 8. Information on specific accessories

If the actuator is to be equipped with accessories, these must be specified when ordering the actuator from LINAK. There are the following possibilities:

### 1) TR6/TR7 External transformer

If the TR6 or TR7 fixed cable connection becomes damaged the transformer must be replaced.

### 1. BA18 (MEDLINE® CARELINE®)



The BA18 is exchangeable without opening the CB (BA18 is a separate box).

Ventilation of external batteries, BA18 - see **Figure 1**

Check at regular intervals that the ventilation stub is undamaged and intact. The construction of the ventilation stub permits battery gasses to get out, but it does not permit penetration of water.

#### Usage:

- Compatible with CB6, CB6S, CB7, CB9, CB12 / CB14 BT versions
- Ambient temperature: +5°C to +40°C

### 2. BA19 lead acid (MEDLINE® CARELINE®)



The BA19 lead acid backup battery has been developed specifically for use with the new control boxes CA30/CA40 and CO61. It is a compact and cost-efficient battery with built-in charger and cable management.

#### Usage:

- Compatibility: Battery backup for CA30/CA40 and CO61
  - Duty cycle: 10%, 2 minutes continuous use followed by 18 minutes not in use
  - Charging: Via integrated charger
  - Charging time: Approx. 6 hours
  - Recharging during storage: Battery recharging no later than 6 months after production date stated on the label
  - Operating temperature: +5°C to +40°C
  - Storage temperature: -5°C to +40°C
- The batteries must be stored in an applicable storage room to avoid direct sunlight
- Relative humidity: 20% to 80%, but non-condensing acc. to temp.
  - Atmospheric pressure: 700 to 1060 hPa
  - Service: Battery cells cannot be replaced as the battery cover cannot be closed properly afterwards
  - Approvals (pending): IEC60601-1:2005 3<sup>rd</sup> edition, ANSI/AAMI ES60601-1: 2005, 3<sup>rd</sup> edition CAN/CSA-22.2 No. 60601-1:2008

#### LED functionality:

What does the LED indicate?



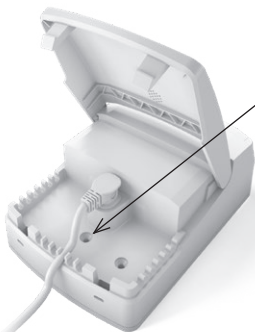
LED	Indication of operation
Solid orange	Charging (battery not ready)
No LED light	Fully charged (battery ready)

#### Buzzer functionality:

The buzzer will make a warning when a button on the hand control is pressed and the battery capacity is low.

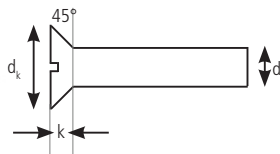
The buzzer can also be activated by the control box to signal other conditions. This must be specified in the control box software.

## Mounting instructions:



BA19 must be mounted with attachment screw and mounting bracket (see below) due to the battery weight.

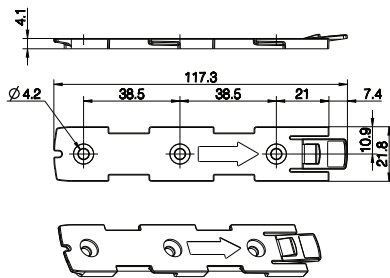
Screw M4 countersunk torque 1.1Nm +/- 0.1Nm.



d	M4
dk	8.4
k	2.7

According to ISO 2009

## Mounting bracket (frame flat) - article no. 1015W1001:



## Recommendations:

- Do not exceed the storage temperature as it will shorten the product life and reduce performance.
- Allow the battery to settle to room temperature before use.
- Do not exceed the duty cycle 2/18 as it will shorten the life, reduce performance, and eventually activate overcurrent protection.
- BA19 is not intended for use in outdoor applications.
- If the battery is completely discharged, then recharge the battery before storage.

## Safety feature

- BA19 contains overcurrent protection for safety and to protect itself from being damaged due to excessive use.
- When current protection is activated no power output will be available



## Warnings

- Loss of power might happen due to activation of overcurrent protection. In this event, there may be no warning and the application may not be able to move when expected.
- Defective or damaged batteries may leak acid and adequate precautions must be taken during handling and transportation.
- Do not open the battery case as damage to the cell or circuitry may develop excessive heat.
- It is important for users to read the guidelines in the "User Manual Linear Actuators and Electronics".
- Do not short circuit the battery.
- Use the specified charger only.
- If disposed to fire, the battery may explode.

If product caution is not clearly visible on the final application at low light intensity, the above mentioned warnings must be integrated in the application manufacturer manual.





The application manufacturer must test the application and ensure that neither intended nor unintended use exceeds the battery specification. The application manufacturer must assure other means of movement, e.g. quick release or manual lowering in case of battery failure.



## Compatibility:

The BA19 has a built-in charger and is therefore not able to operate with control boxes with charger. Be aware that the BA19 is only compatible with CA30, CA40 and CO61.

### 3. BA21 (MEDLINE® CARELINE®)

<b>LINAK</b> Designed in Denmark DK - 6430 Nordborg Type: BA2116X11110 Item: BA21001-00 / 253908 Date: 2016.12.19 W/O #-00001 MADE BY LINAK A/S DENMARK	U In : Charge Max. 50VDC I In : Max. 500mA Li-Ion Battery S.W.: 0078086 Ver. 1.1	IPX6 Washable 25.9V 2.25Ah 58.28Wh Int.: 5 %, Max. 1 min/19 min.	    71NR19/66
	U In : Charge Max. 50VDC I In : Max. 500mA Li-Ion Battery S.W.: 0078086 Ver. 1.1	IPX6 Washable 25.9V 2.25Ah 58.28Wh Int.: 5 %, Max. 1 min/19 min.	

The BA21 Li-Ion back-up battery pack has been specially developed for use with the new w battery with built-in charger and high performance and safety.

#### Features & Options

- Weight: 0.7 kg
- Housing colour: Light grey (RAL 7035)
- Protection class: IPX6 Washable
- Packaging: Every battery is packed individually and is fitted with lithium caution (transportation requirement)
- Classification: Internally powered

#### Usage:

- Compatibility: Battery back-up for CO61
- Duty cycle: 5%, 1 minute continuous use followed by 19 minutes not in use
- Charging: With integrated charger in battery
- Charging time: Approx. 10 hours
- Recharging during storage: Recharge the battery 12 months at the latest after production date stated on the label
- Operating temperature: +5°C to +30°C
- Storage temperature: -10°C to +40°C
- Relative humidity: The batteries must be stored in an applicable storage room avoiding direct sunlight  
20% to 90%, but non-condensing acc. to temperature
- Atmospheric pressure: 700 to 1060 hPa
- Approvals: IEC60601-1:2005 3<sup>rd</sup> edition,  
ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition pending CAN / CSA-22.2 No 60601-1:2008 pending  
IEC62133 2<sup>nd</sup> edition, UL2054, UN38.3 (needed for transport of lithium batteries) pending

#### LED functionality:



LED	Indication of operation
Solid yellow	Charging
No LED light	Fully charged
Error during charging	Flashing yellow

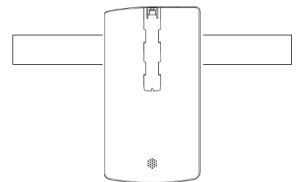
#### Buzzer functionality:

The buzzer will make a warning when a button on the hand control is pressed and the battery capacity is low. The buzzer can also be activated by the control box to signal other conditions. This must be specified in the control box software.

#### Mounting:

The Battery Pack BA21 can be mounted in several ways on the bed/the application, either separately or together with the control box CO61.

It is however not allowed to mount the battery in vertical position with the mounting clip pointing upwards - see illustration below:



#### Deep discharge protection

- The BA21 Li-Ion has a deep discharge protection to protect the battery life. The deep discharge protection is activated when the battery is discharged.
- Charge the battery to exit the deep discharge mode. Ensure that the battery is sufficiently charged before use.



#### Recommendations:

- Do not exceed the storage temperature as it will shorten the product life and performance.
- Allow the battery to settle to room temperature before use.
- Do not exceed the duty cycle 1/19 as it will shorten the life, reduce performance, and eventually activate excess temperature protection.
- BA21 Li-Ion is not intended for use in outdoor applications.
- If the battery is completely discharged, then recharge the battery before storage.

## Safety feature

BA21 Li-Ion contains several mechanisms to protect itself from being damaged due to excessive use.

In case of overheating, the device will activate a thermal protection. No power output will be available until the temperature is back again within normal operating range.

Extensive use at high temperatures or when exceeding the 1/19 duty cycle may lead to overheating.

## Transportation

The lithium ion batteries must be packed and transported according to applicable regulations. Always ask your local transportation provider how to handle the transportation of lithium ion batteries.



### Warnings:

Li-ion batteries differ from the lead acid technology as they have a built-in deep discharge protection.

- Loss of power might happen due to the battery deep discharge protection and will only happen in case of continuous use of the battery despite warnings. In this event, there may be no warning and the application may not be able to move when expected.
- Defective or damaged li-ion batteries or li-ion batteries that may produce excessive heat or fire are not allowed for aircraft transportation.
- Do not open the battery case as damage to the cell or circuitry may develop excessive heat.
- If product caution is not clearly visible at low light intensity, read the product label instructions symbol. A warning must be included in the application manufacturer's manual for the medical device.
- The application manufacturer must test the application and ensure that intended unintended operations do not exceed the battery specification limits. The application manufacturer must assure other means of movement, e.g. quick release or manual lowering.

## 4. Care Communication System (CCS)

The Care Communication System (CCS) is a communication system primarily targeting nursing homes and the home care sector. CCS provides instant intelligent messages and direct voice communication from care bed to caregiver.

The system consists of three parts: a Care Communication Module (CCM) mounted on the bed, a Care Communication Web Portal (CCW) and a Care Communication App (CCA).

### Intended use

The Care Communication System (CCS) is developed as a communication and information system with the purpose of increased efficiency for the health care sector, improved work conditions for caregivers and higher comfort and independency for the people in need of care.

The CCS is not a medical device, nor to be used for any medical purpose, such as diagnostic or therapeutic purposes. CCS is not an emergency call system, nor does the CCS replace the normal monitoring or care routines of patients or people in need of care.

### Care Communication Module (CCM)

The CCM accommodates the transfer of intelligent sensor information from the care bed (i.e. WET detection (WET) or Out Of Bed detection (OOB) to the caregiver by means of the CCW and CCA.

Furthermore, the CCM facilitates voice communication between a caregiver or relative and the person in care.

### Usage and compatibility:

- Compatible: OpenBus control boxes
- Fire classification: UL-94 V2
- IP-classification: IPX4
- Temperature: Operation: +5°C to +40°C  
Storage: -10°C to +50°C
- Relative humidity: 20% to 90% at +30°C
- Atmospheric pressure: 800 to 1060 hPa
- Meters above sea level: Max. 2000 meters
- Approvals: IEC 60601-1: 2005 (3<sup>rd</sup> edition)



The CCM has an identity number called IMEI. The IMEI number is a 15 digit number that is unique for the CCM. The IMEI number is written on the CCM label and is used for registration of the CCM in the CCW.



## Mounting instructions

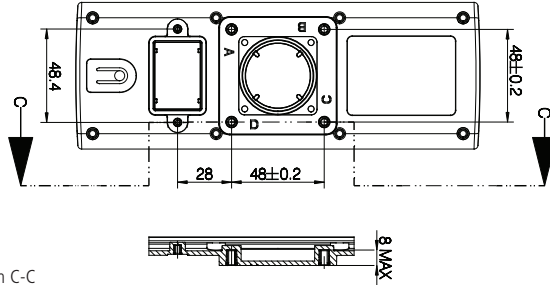
The CCM is intended for fixed mounting to the bed within reach of the person in bed.

There are four cable plug position variants, A, B, C or D (see drawing below), making it possible to define if the CCM is to be mounted on the left or the right side of the bed in either vertical or horizontal position. Please see the design view and combination code for further information.

It is not possible to change the cable outlet after the CCM has been manufactured!

The bed mounting bracket is not supplied by LINAK, but must be designed and made by the bed manufacturer according to the dimensions below.

Maximum screw torque = 1.2 [Nm]



Section C-C

## SIM card

Specifications and requirements:

- SIM card type to be used: Mini SIM also called 2FF (it is possible to use SIM adapter for other SIM types which are not delivered by LINAK).
- The SIM card must support voice communication and minimum 2 MB monthly data.
- The CCM needs to know the SIM card provider's Access Point Name (APN).  
Most providers' APN is known; if, however, the provider is unknown, the APN will be added to the data base.
- The CCM must be unpowered when inserting/removing the SIM card!
- Before inserting the SIM card into the CCM, the PIN code must be deactivated, allowing the CCM to contact the server. Afterwards, the PIN code can be reactivated in the CCW to protect the exchangeable SIM card against misuse.

Handling:

The SIM card is to be inserted on the back of the CCM by opening the SIM card lid, See the illustration below.

Maximum screw torque = 0.35 [Nm]

Be aware to insert the SIM card with the chip downwards.



Ensure that the SIM card lid is screwed on carefully, maintaining the spacing washers on each screw.



### Recommendations:

- The CCM is only intended for indoor use.
- The CCM is only working when connected to mains. There is no battery back-up.  
See the usage section for mains indicator.
- To ensure the IP degree, always use locking rings and cables with O-rings.
- The CCM must be cleaned at regular intervals to remove dust and dirt and to ensure that neither loudspeaker nor microphone is blocked.
- During cleaning, cables must remain plugged in, correctly fitted with O-rings, and the SIM card lid must be closed to prevent water ingress.
- The CCM is resistant to the majority of cleaners and disinfectants used in the care sector. However, the detergents must comply with the following basic requirements:
  - no high alkaline or acid content (pH value 6-8)
  - no caustic content
- Do not spray disinfectants directly on to the microphone or speaker, but use a cloth for disinfection.
- The CCM is a handsfree communication device for fixed mounting and not intended for portable operation.
- We recommend to test the system before use to be sure that the selected SIM card works as expected..



### Warnings

Be aware that the CCS is not intended as a life-supporting or emergency equipment. It is only intended as a communication and comfort system for people in need of care.

## Care Communication Web (CCW)

The Care Communication Web (CCW) is the web user interface to the Care Communication System.



### Recommendations:

- If the CCM is offline the data visible on the web portal will not be updated before the CCM is online.
- If service is needed from LINAK in relation to a specific person in care, the IMEI number found on the web portal is required.  
LINAK does not have access to personal data.
- Your CCW registration implies registration of your contact data, which will be stored as your personal profile.
- The password you have received authorises you, and only you, to use the CCW. You must not make your password available to others.  
All users must request their own password and username.
- You will not disclose confidential information that you may obtain through your use of the CCW to any third party without the prior consent of the person in care.
- Interruptions in the communication service may be caused by events of force majeure, by technical and other measures carried out in the CCS, the suppliers or network operator, or caused by events to improve the services, e.g. maintenance, repairs, system-related updates and expansions.



### Warnings

- Be aware that the CCS is not intended as a life-supporting or emergency equipment. It is only intended as a communication and comfort system for people in need of care.

## Care Communication App (CCA)

The Care Communication App (CCA) provides instant intelligent messages and direct voice communication from the care bed to the caregivers.



### Recommendations:

- Remember that the smart phone data must be enabled in order to use the app.
- The password you have received, authorises you, and only you, to use the CCA. You must not make your password available to others.  
All users must request their own password and username.
- You will not disclose confidential information that you may obtain through your use of the CCA to any third party without the prior consent of the person in care.
- The ability to communicate to the CCS will require the CCA to have internet connection.
- You are required to keep your app updated to the latest version, if you want to keep using the CCA.

## 5. CS16 (TECHLINE®)



The CS16 electronic limit switch is connected between the LINAK® actuator and a non-LINAK power supply, where it cuts out the current to the actuator in end position of if an obstacle is encountered. The PCB contains a variable current limit setting and is available in different versions, depending on the actuator with which it is to be used.

The CS16 should be connected between the linear actuator and the power supply, where it will switch off the power when the actuator reaches end position or if the actuator is overloaded.

As the CS16 are open PCB's, they have to be installed in an encapsulation to prevent damage. (LINAK® offers one type of encapsulation for CS16).

### Adjustment of CS16

The CS16 has a rotary potentiometer for adjusting the value of the cut-off current. To obtain the correct cut-off current, connect the CS16 and turn the potentiometer as far as it will go/anticlock wise to set the maximum cut-off current.

Then subject the actuator to the maximum load it will be exposed to in the application. At the same time turn the potentiometer clockwise, reducing the cut-off current, until the actuator stops (not in end position).

Then turn the potentiometer approx. quarter of a turn anti-clockwise and the system is ready for use.

As the CS16 is a open PCB's, it have to be installed in an encapsulation to prevent damage. (LINAK® offers one type of encapsulation).

## 6. DJB (MEDLINE® CARELINE®)



The DIN Junction Box is designed for use where there is a need for more than 1 or 2 controls to be connected to a control box.

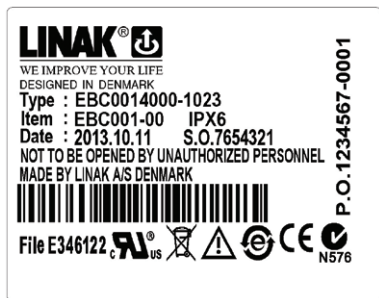
The DIN Junction Box is constructed for connection of up to 4 controls with 8-pin DIN plugs. Furthermore, the box is constructed so that all channels for connection are placed on the same side of the box.

This gives the box a clean design and makes it easy to mount e.g. in a bed frame.

### Usage:

- Possible for connection of LINAK control boxes: CB8, CB9/CB9P, CB12, CB14, CBJ and OpenBus™ control boxes e.g. CB20, CB6S, CB16.

## 7. EBC - Electronic Brake Control System (MEDLINE® CARELINE®)



The EBC - Electronic Brake Control - is designed for use together with 3<sup>rd</sup> party castors and the control systems CB OpenBus™, including JUMBO Care. The EBC can replace traditional (mechanical) central locking systems for castors on healthcare beds or medical applications. This new system offers an increased freedom of application design as there is no need for a mechanical connection between the castors.

### Usage:

- Operating temperature: 5°C to 40°C
- Storage temperature: - 10°C to 50°C
- Compatibility: CBJC, CB6 OBF, CB6 OBME, CB16 or CB20
- Fallshaw EBC system approved according to IEC60601-1:2005 3<sup>rd</sup> edition approved, ANSI / AAMI E560601-1:2005, 3<sup>rd</sup> edition, and CAN / CSA-22.2 No 60601-1:2008 Manner / TENTE approvals are pending



### Recommendations

- The customer shall ensure proper connection between the EBC and the castors. Missing or interrupting some of the individual wires between the EBC and the castor may under some circumstances cause damage to the internal circuitry of the EBC.
- Always use locking mechanism and O-ring on cables.
- If any open sockets, they must be fitted with blind plugs to ensure IP degree.
- Removing or adding any OpenBus™ cables is not allowed when the control box is powered (hot plugging).

Before installation/service

- Stop the application.
- Remove battery power cable and OpenBus™ connection then possible castor connection.
- Service system.





After installation/service

- Reconnect castor connection, then OpenBus™ connection, battery power cable, then control box mains.



LINAK A/S only delivers the OpenBus™ system and is not responsible for any products other than LINAK products (i.e. products from 3<sup>rd</sup> party suppliers or the compliance of such products with the LINAK OpenBus™ system).

## 8. Massage Motor Medical (MEDLINE® CARELINE®)

	Item No. 00MD1000D3-A	  
	Prod. Date : W31 - 2013	
	Power Rate : Max. 24 W / Max. 0.5 A	
	Duty Cycle : 10%, Max. 30 min.	
	NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL	
P.O. 582720-2	MADE IN CHINA	

The massage motor can be added to all kinds of couches and tables, chairs or beds for treatment and examination. It enables comfort, relaxation and tension release for patients and clients. The massage motors are directly connected to the actuator port at the control box – no extra wiring at the application, simple and easy mounting.

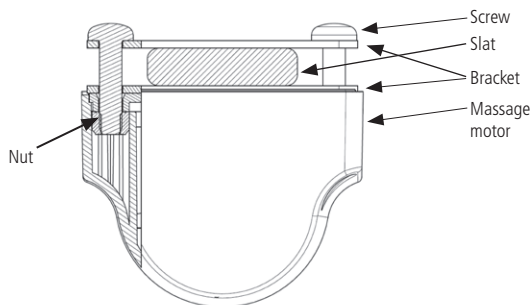
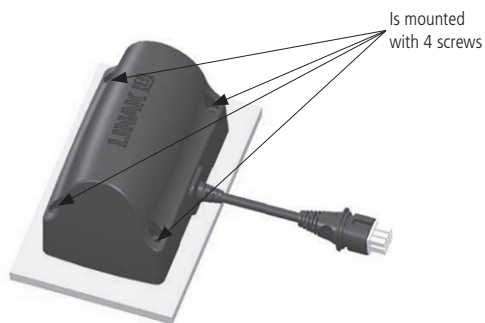
### Usage:

- Compatibility: CB6S OBMe, CB16 OBF, (CB20 pending) MJB006-0x to be used for OpenBus™ impulse drive
- Duty cycle: 10 %, 30 min. max.
- Operating temperature: +5°C to +40°C
- Storage temperature: -10°C to +50°C
- Relative humidity: 20 % to 80 % at +30°C
- Atmospheric pressure: 700 to 1060 hPa
- Approvals: Medical approvals to be determined

### Mounting:

Massage motor on a plate

### Mounting of massage motor by using brackets:



Mounting of the screw with max. torque 2 Nm

The massage unit is mounted with 4 x M6 roundheaded machine screws with flat underside. 15 to 20 mm long + the thickness of the bracket. Torque max. 2-3 Nm.

2 brackets must be used - one on each side of the slat.

## 9. MJB (MEDLINE® CARELINE®)

		
		DESIGNED IN DENMARK
		Item : MJB0005000-1023
		Date : 2016.01.11 IP16
		NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL NE PAS OUVRIER PAR DU PERSONNEL NON AUTORISE
 	 W/O #1234567-0001	

The MJB (Modular Junction Box) is designed for use together with OpenBus™ control boxes.

The MJB makes it possible to connect multiple handsets, attendant controls or it is also possible to use the MJB as a control unit for 3<sup>rd</sup> party products such as Out of Bed Detection, USB charger, Under Bed Light etc.



The MJB8 modular junction box is a central unit in the "Intelligent Care Bed", connecting various intelligent accessories, such as the Out Of Bed and WET detection, and sending notifications via a range of optional gateways to the user (i.e. caregiver)



### Recommendations

- Always use locking mechanism and O-ring.
- Sockets that are not used must be fitted with blind plugs (Item P/N.: 0821008) to ensure IP-degree.
- When using the modular plug cable with an open end, the customer is responsible for maintaining the IP degree.
- When mounting, ensure that a screw torque limit of 1 Nm is not exceeded.
- 3<sup>rd</sup> party products must correspond to all requirements stated in the MJB8 Interface description for 3<sup>rd</sup> party products in order to avoid damage/malfunction.
- The Under Bed Light (Item P/N.: 0964135) must be mounted on the bed with metal screws in order to maintain ESD protection.
- HOT PLUGGING  
Removing or adding any OpenBus™ cables are not allowed when the control box is powered by mains supply!  
Follow the below procedure:
  1. Remove mains and wait 5 seconds
  2. Mount or dismount the required cables
 If this procedure is NOT followed it may result in a damaged OpenBus driver circuit.  
The risk of a damaged circuit increases if the accessory has a high start current.
- Before the final functional production test, it is important that the system is repowered.  
This is to ensure, that all items have been detected on the OpenBus.
- It is important to test the specified notifications in order to ensure that they work correctly before sending the system to the end user.
- The MJB8 is intended for mains operation only. The user must be informed that all MJB8 sensor notifications are disabled when the system is in battery mode.



### Warnings

- LINAK only takes responsibility for LINAK products, not 3<sup>rd</sup> party products.  
Please pay attention to the "Patient Environment" Clause 3.79 – EN60601-1 3<sup>rd</sup> edition. It must be subject to the Risk Analysis.  
It is important to inform the customer about this.
- The MJB8 is not able to detect defective 3<sup>rd</sup> party products.  
We recommend the end user to make a regular test procedure in order to prevent hazardous situations for the user and failures to the system.
- The MJB8 and the attached accessories (i.e. Out Of Bed or WET detection) are not intended as life-supporting or emergency equipment.  
They are only intended to support notifications for communication and comfort purposes of people in need of care.

## 11. Simulator tool (MEDLINE® CARELINE®)



The Simulator Tool is a software that can be used to simulate hand control functions on OpenBus™ and analogue actuator systems. With the Simulator Tool, sequences of actuator movements can be programmed and repeated in order to test actuator systems.

### USB to OpenBus™ gateway:

The gateway acts as an interface between the Simulator Tool Software and the OpenBus control box.

Together with the Simulator Tool Software, it can be used for test and demo purposes only.

It is not allowed to use the product as a control in any commercial application.

It has a USB B-input connection from the computer/laptop.

As output connection it has an RJ45 jack plug for connection to the control box.

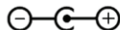
For indication of power supply, the housing has one yellow LED indicator.

Normally, the gateway is powered through the OpenBus connection to the control box. External power supply is only necessary for the control boxes listed below.

For usage with OpenBus systems which have no permanent voltage (40 V) in the OpenBus connection, it is possible to connect the gateway to an external power supply. Therefore, the casing is equipped with a 2.5 x 6.6 mm power jack connector.

Power input: 20 to 40 V DC, minimum requirements 10 mA

Polarity:



Use LINAK battery charger CH01

### Products that require external power:

- Jumbo Care
- COBO

### Limitations:

Note that an OpenBus system that has powered down (8 V missing) cannot be woken up by the USB to Openbus gateway!

Although the USB to Openbus gateway sets a keep power bit, it might be neglected by some control boxes that will power down after a period of time. (Typically 2 minutes).

For cycle testing of such systems (typically battery equipped), that powers down during the cycle, a special control box software that has been stripped for the power down feature is needed.



### Warnings:

- The LINAK Simulator Tool is to be used as a test tool or demo tool only. It is not allowed to use the software and accessories as a control in any commercial application.
- Potentially dangerous situations resulting from automated movement generated by the Simulator Tool Software must be considered and assessed before starting any action.
- Please note that over time the actual movement of an actuator within a fixed activation time may vary due to changed friction inside the actuator or especially when a battery-driven system loses power. Close inspection and required adjustment is necessary to obtain the wanted movement over time and to avoid potentially dangerous situations.
- The generated test report itself is not a legal proof that a system has physically moved the actuators the number of times stated and cannot be used as such.

The time of activation listed in the report generated is not necessarily the same as the time of actuator movement. It just shows how long the function has been activated (equal to the time you have pressed the button on the hand control).

The actuator can be in end-of-stroke position or the function can be locked and therefore the actuator itself doesn't move.

It is recommended to use a physical counter or similar to verify the actual actuator movement.



### Recommendations

- See to it that sufficient pauses are kept between activations, so that the duty cycle of each actuator type is respected.

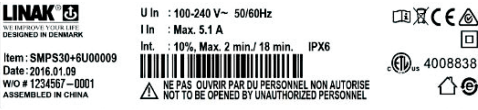


## 12. SLS (MEDLINE® CARELINE® TECHLINE®)



LINAK has designed a switch that can be mounted in connection with the 24V DC actuators: LA12, LA22, LA28, LA28S, LA31, LA32, or LA34 and a control box on e.g. a bed frame. The Safety Limit Switch (SLS). The SLS Switch is primarily used as a Limit Switch in systems consisting of a control box, LA28/28S and/or LA32. As an example the SLS can be installed on the actuator cable where it disconnects the actuator in either inward or outward direction when activated. The SLS can also be used as a signal control directly connected to a control box.

## 13. SMPS30 (MEDLINE® CARELINE®)



The SMPS30 is a very powerful Switch Mode Power Supply typically used for Treatment or Examination Couches. The SMPS30 is an eco-friendly solution due to a low standby power consumption compared to traditional transformer solutions. The universal input voltage makes the SMPS30 adaptable to the worldwide market irrespective of the input voltage.

### Usage:

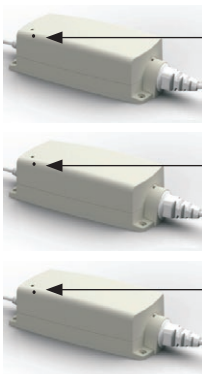
- Compatibility: LA43 IC, LA44 IC
- Duty Cycle\*: 10%, 2 minutes continuous use followed by 18 minutes not in use.
- Operating temperature: 5°C to 40°C
- Storage temperature: -10°C to 50°C
- Relative humidity: 20% to 90% @ 30°C – not condensing
- Atmospheric pressure: 700 to 1060 hPa
- Altitude: max. 2000 metres above sea level
- Approvals: IEC60601-1:2005 3<sup>rd</sup> ed., ANSI / AAMI ES60601-1:2005, 3<sup>rd</sup> edition, CAN / CSA-22.2 No 60601-1:2008

\* AT 10% DUTY CYCLE, MAX. OUTPUT POWER IS POSSIBLE AT AN AMBIENT TEMPERATURE OF 25°C

### Safety concept:

DC power is only on the application when needed – when the hand control is activated.

The user is part of a safety concept with light indications showing:



**Connected to the mains**  
Green light when connected to the mains

**Power request**  
Yellow light at power request when the hand control is activated

**Check of functionality**  
Yellow light is turned off when releasing a hand control button – **otherwise** the hand control or other components in the application are defective. If so, the user must call for service.



The SMPS30 is designed for placing on the floor, but it can also be mounted on the wall / application via the bottom base plate and 4 screws.

If the SMPS30 is mounted on the wall/application, please dismount the SMPS30 to get access to the cable locking mechanism on the mains cable.



## Recommendations

### Please note

The SMPS30 is only compatible with LA43 IC and the LA44 IC.  
The SMPS30 is not suitable for outdoor applications

### Before installation, re-installation or troubleshooting

- Stop the application
- Switch off the power supply and pull out the mains plug
- Relieve the application of any loads, which may be released during the work

### Before start-up

- Make sure that the system has been installed as instructed in the User Manual
- System connection. The individual parts must be connected before the SMPS30 is connected to the mains.

### During operation

- Ensure that the cables are not damaged
- Unplug the SMPS30 before moving the equipment

### Device protection:

The SMPS30 contains several mechanisms to protect itself from being damaged due to excessive use.

- In case of overheating, the device will activate a thermal protection. No power output will be available until the temperature is back again within normal operating range.
- In case of exceeding the current limit / failure in the actuator, the device will activate an overload protection. Immediately after the situation has been remediated the power output will be available again.

### Hot plugging

- It is not allowed to remove or to add the output cable as long as the SMPS is powered by mains.

### Maintenance/cleaning

- The SMPS30 must be cleaned at regular intervals to remove dust and dirt and it must be inspected for mechanical damage, wear and breaks
- It is not allowed to spray directly with a high-pressure cleaner on the device
- Interconnecting cables must remain plugged in, correctly fitted with O-rings, during cleaning to prevent ingress of water
- The SMPS30 is resistant to the majority of cleaners and disinfectants used in the hospital and nursing home sector.  
However, the detergents must comply with the following basic requirements
  - They must not be highly alkaline or acidic (pH value 6-8)
  - They must not contain caustic agents



## 14. Under Bed Light 2 (MEDLINE® CARELINE®)



The Under Bed Light (UBL2) provides a powerful light with a good distribution. The UBL2 is to be used for beds within hospitals, nursing homes and in homecare. The Under Bed Light makes it easier for patients and other people in need of care to find their way at night in the dark to prevent falling accidents and to make them feel safe.

### Usage:

- Operating temperature: +5°C to +40°C
- Storage temperature: -10°C to +50°C
- Relative humidity: 10% to 80% at +30°C not condensing
- Atmospheric pressure: 700 to 1060hPa
- Approvals: EN62471, IEC60601-1:2005, 3<sup>rd</sup> edition (approvals are currently pending)



### Recommendations and Precautions

- If 2 or more UBL2 products with dimming function are connected to the same application, it is recommended to have a factory reset key to be able to synchronize the dimming direction and light intensity if one of the UBL2s is replaced.
- Screw holes in application are needed for mounting. Inform the customer to use M4 Ø12 screws with Ø12 washer, when mounting the UBL2. Max. torque 2.5 Nm.
- Hot-plugging:  
Removing or adding any OpenBus™ cables is not allowed when the CB is powered by mains supply!  
If needed anyway, follow the below procedure:
  1. Remove mains and wait 5 sec.
  2. Mount or dismount the required cablesIf this procedure is NOT followed, it may result in a damaged OpenBus™ driver circuit. The risk of a damaged circuit increases if the accessory has a high start current (in rush current).
- There can be a risk of conflict with other OpenBus™ accessories, like HB, ACP, etc. when using the OpenBus™ UBL2, it is therefore recommended to make a system/bit overview.
- Always use locking mechanism and O-ring
- Sockets not used must be fitted with blind plugs to ensure IP degree
- The UBL2 must be mounted on a plane surface and casing must not be subject to impact or any kind of stress.

## 15. WET Sheet (MEDLINE® CARELINE®)



The WET Sheet is an OpenBus™ product and is a part of the WET Detection solution. The WET Detection solution consists of the WET Sheet, the MJB8 and a WET Sheet cable.



### Recommendations

- The WET Sheet is a wearing part which is not covered by the standard LINAK warranty  
The WET Sheet warranty is valid until the product has been put into use
- The WET Sheet is not a stand-alone article and must be included as part of an application e.g. the MJB8
- The WET Detection will not detect liquid without conductivity e.g. demineralised water
- The WET Sheet is not intended for outdoor use
- The WET Sheet is not a life-supporting unit
- Mechanical pressure on the WET Sheet can destroy the thread and connectors
- It is recommended to change the WET Sheet cable after 500 connections
- The sheet and connector must be placed properly to minimise the risk of bedsores
- The WET Sheet connector is not to be exposed to direct moisture etc. urine or sweat.  
Place the connector away from the user e.g. on the side of the bed
- To ensure the right WET Detection functionality do not use layers on top of the WET Sheet, e.g. a turning sheet
- The recommended temperature for washing is 60 °C. Washing at 85 °C is acceptable, however, this will reduce the lifetime
- Tumble drying at medium heat, however, line drying is recommended
- The typical number of washing cycles is up to 50, but will depend on the washing conditions
- The WET Sheet should be washed before use

## 9. Repair and disposal

### Repair

Only an authorised LINAK service centre should repair the LINAK actuator systems. Systems to be repaired under warranty must be sent to an authorised LINAK service centre.

In order to avoid the risk of malfunction, all actuator repairs must only be carried out by an authorised LINAK Service shop or repairers, as special tools and parts must be used.

If a system is opened by unauthorised personnel there is a risk that it may malfunction at a later date.

### Spare parts

LINAK can supply spindle parts and motor parts as spare parts. Please indicate the designation from the label when ordering spare parts from your nearest authorised LINAK dealer.

### Disposal of LINAK's products

LINAK's products may be disposed of, possibly by dividing them into different waste groups for recycling or combustion.

We recommend that our product is disassembled as much as possible at the disposal and that you try to recycle it. As an example of main groups within sorting of waste we can mention the following.

Metal, plastic, cable scrap, combustible material and collection for recoverable resources.

Some of these main groups can be sub-divided into groups e.g. metal can be divided into steel and aluminum or plastic can be divided into ABS and PP.

At disassembly of batteries, be aware of the chemistry and risk of short-circuiting batteries.

As an example of sorting we show you below, which recycling groups the different components in LINAK's products should be placed into:

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

By now nearly all our moulded plastic units are provided with an internal code for plastic types and fibre content, if any.

## Main groups of disposal

Product main type	Metal scrap	Cable scrap	Electronic scrap	Plastic recycling or combustion	Remark
ACC			X	X	
ACK		X	X	X	
ACL		X	X	X	
ACM		X	X	X	
ACO		X	X	X	
ACOM					
ACP		X	X	X	
BA18				X	Lead battery
BA19				X	Lead acid battery
BA20			X	X	Lead battery
BA21	X	X	X	X	Lithium Ion Battery
BADM			X	X	Lead battery
BAJ1	X	X	X	X	Lead battery
BAJ2	X	X	X	X	Lead battery
BAJL	X	X	X	X	Lithium Ion battery
BB3	X				
BL1	X				
BL4	X				
CA30	X		X	X	
CA40	X		X	X	
CB12	X		X	X	
CB14	X		X	X	
CB16	X		X	X	
CB20	X	X	X	X	
CB6	X		X	X	
CB6P2					
CB6S	X		X	X	
CB7			X	X	
CB8-A			X		
CB8-T			X		
CB9	X	X	X	X	
CBJ1			X		
CBJ2			X		
CBJC			X	X	
CBJH			X		
CBR1			X		
CHJ2			X		

## Main groups of disposal

Product main type	Metal scrap	Cable scrap	Electronic scrap	Plastic recycling or combustion	Remark
CS16		X	X		
COBO			X	X	
COBO20			X	X	
CO61	X		X	X	
CP20	X		X	X	
CU20			X	X	
CUDM			X	X	
DJB		X	X	X	
DPH					
FS	X	X	X	X	Metalscrap because of FSR + FSR
FS2	X	X	X	X	
FS3	X	X	X	X	
HB20			X	X	
HB30		X		X	
HB40		X	X	X	
HB50		X	X	X	
HB60		X	X	X	
HB70		X	X	X	
HB80		X	X	X	
HBDM		X	X	X	
HD80		X	X	X	
HD80 JUMBO		X	X	X	
HL70		X	X	X	
HL80		X	X	X	
IRO			X	X	
LA12	X	X	X	X	
LA22	X	X		X	
LA23					
LA27	X		X	X	
LA28	X	X	X	X	
LA29	X	X	X	X	
LA30	X	X		X	
LA31	X	X	X	X	
LA32	X				
LA34	X	X	X	X	
LA40 HOMELINE					



## Practical information

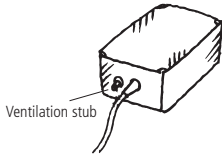
Product main type	Description	Product main type	Description
ACC	Front cover glued together with housing	CBJ1	Glued and screwed together
ACK	No housing. Only foil with cable	CBJ2	Glued and screwed together
ACL	Cannot be opened as it is welded together. When the cable has been cut off it is disposed of as combustible waste	CBJC	Glued and screwed together
ACM	Cannot be opened as it is welded together. When the cable has been cut off it is disposed of as combustible waste	CBJH	Glued and screwed together
ACO	Front cover glued together with housing	CBR1	
ACOM		CH01	Welded together
ACP	Screwed together	CHJ2	Glued and screwed together
BA18		CS16	Screw together, cut off can be adjusted
BA19		COBO	Glued and screwed together
BA20	Welded together	COBO20	Glued and screwed together
BA21	Welded together	CO61	Welded together. Cannot be opened
BADM	Glued and screwed together	CP20	Glued and screwed together
BAJ1	Glued and screwed together, symbol of battery type is marked on the basepart of the housing	CU20	Glued and screwed together
BAJ2	Glued and screwed together, symbol of battery type is marked on the basepart of the housing	CUDM	Glued and screwed together
BAJL	Glued and screwed together, symbol of battery type is marked on basepart of the housing	DJB	Cannot be opened as it is welded together. When the cable has been cut off it is disposed of as combustible waste
BB3	Outer tube (Alu) can be dismantled (screws)	DPH	
BL1		FPP	Foil glued together with housing
BL4	Plastic housing and the BB3 inside can be dismantled (screws)	FS	
CA30	Welded together. Cannot be opened	FS2	
CA40	Welded together. Cannot be opened	FS3	Ultrasonic welded and screwed together
CB12	Screwed together	HB20	
CB14	Screwed together	HB30	Ultrasonic welded
CB20	Glued and welded together. Cannot be opened	HB40	Screwed together
CB6	Glued and screwed together	HB50	Screwed together
CB6P2		HB60	Screwed together
CB6S	Glued and screwed together	HB70	Cannot be opened as it is welded together. When the cable has been cut off it is disposed of as combustible waste
CB7		HL70	Cannot be opened as it is welded together. When the cable has been cut off it is disposed of as combustible waste
CB8-A	Screwed together	HB80	Glued together
CB8-T	Screwed together	HD80	Screwed together
CB9	Has to be unscrewed with a screw driver	HD80 JUMBO	Screwed together
CB16	Glued and screwed together	HL80	Glued together
		HBDM	Glued and screwed together
		IRO	Welded together
		LA12	

## Practical information

Product main type	Description	Product main type	Description
LA22	Cannot be opened as it is glued together. When the cable has been cut off it is disposed of as steel scrap		
LA23			
LA27	Cannot be opened since it is welded together.		
LA28	The outer tube is glued in the motor base, but it can be unscrewed with a pipe wrench in a vice		
LA29			
LA30			
LA31			
LA32	The outer tube is glued in the motor base, but it may be unscrewed with a pipe wrench in a vice		
LA34			
LA40 HOMELINE			
LA43	Screwed together		
LA44	Screwed together		
LC2	<ul style="list-style-type: none"> <li>- LC2-2 uses an LA28 actuator and the LC2-5 uses an LA30 actuator.</li> <li>- LC2 uses its own limit switch end-stop technology not the actuator current cut-off end-stop technology.</li> <li>- LC2 assemblies should not be repeatedly disassembled because the screws are self-tapping and may compromise the fastener integrity.</li> </ul> <p>Lifting columns with gas spring may only be opened when they have run out to full stroke. They can be recognised by the 9<sup>th</sup> figure, which is a "G" and by a warning label on the end plate.</p>		
LP2			
LP3			
LS			
LSD			
MBJ1/2/3			
MJB	Cannot be opened since it is welded together.		
Massage			
Motor			
SLS	Cannot be opened since it is welded together. When the cable has been cut-off it is disposed of as combustible waste		
SMPS30	Screwed together (not a repairable product)		

Figure 1

Ventilation of external batteries, BA18



Check at regular intervals that the ventilation stub is undamaged and intact.  
The construction of the ventilation stub permits battery gasses to get out, but it does not permit penetration of water.

Figure 2

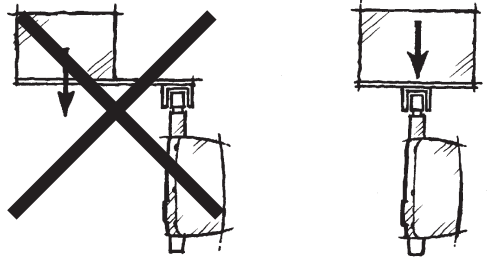


Figure 3

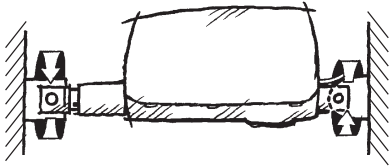


Figure 4

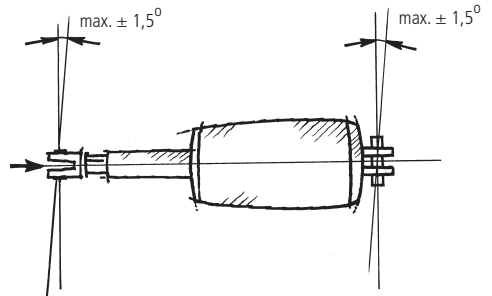
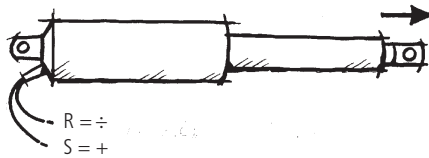
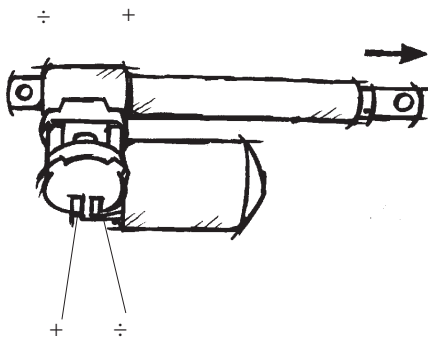


Figure 6

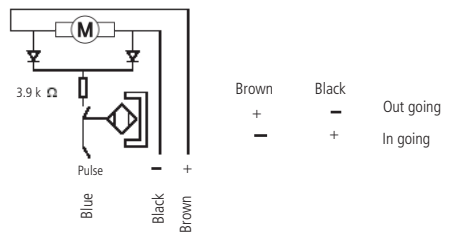
1) LA22



3) LA30 and 30S



LA30 Actuator with reed ( only possible with 24V L-motor )

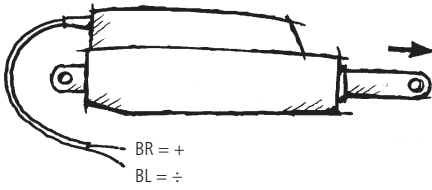


Please note that the voltage level og feedback signal depends on the actuator load.

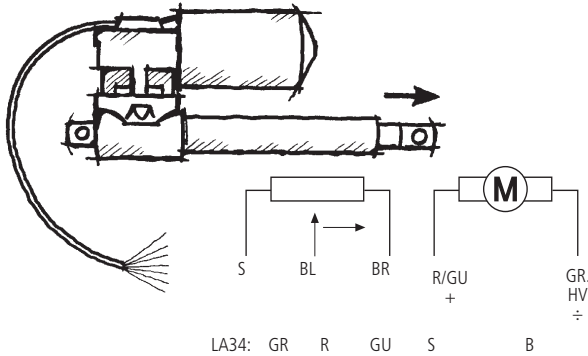


Figure 6

4) LA12



5) LA30, LA30S, LA32 and LA34 with potentiometer



**Colour codes:**

S	Black
BR	Brown
R	Red
O	Orange
GU	Yellow
G	Grey
BL	Blue
V	Purple
GR	Green
HV	White

6) LA30, LA30S and LA32 with optical encoder

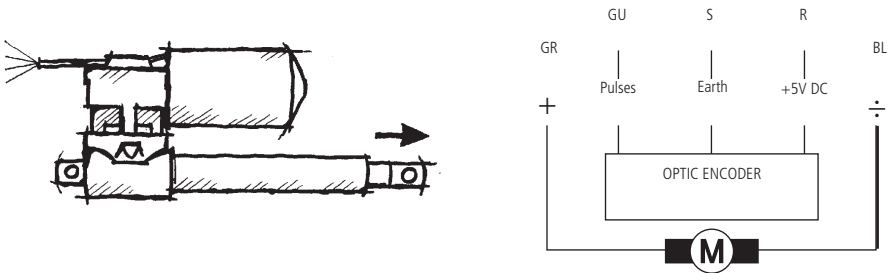


Figure 6

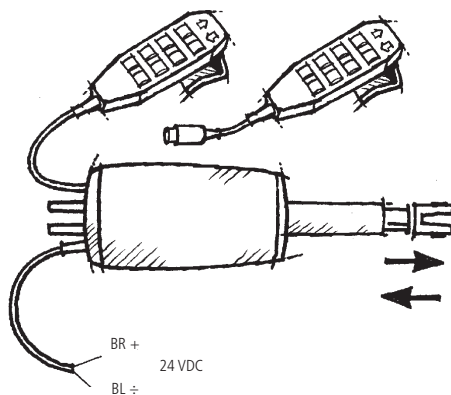
7A-B) LA28/28S/32 with CS28/28S/32 - PC-board version A and B

**Version A**

LINAK handset HB is connected with a telephone plug

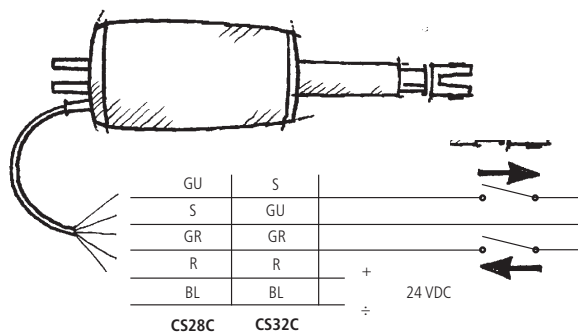
**Version B**

LINAK handset HB is connected with a DIN plug



7C) LA28/28S/32 with CS28/28S/32 - PC-board version C

**Version C**



8) LA28, LA28S, LA32 with reed-switch and LA34 with pulse system

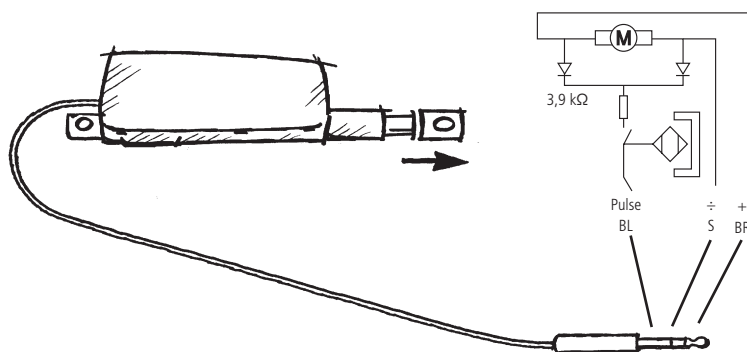
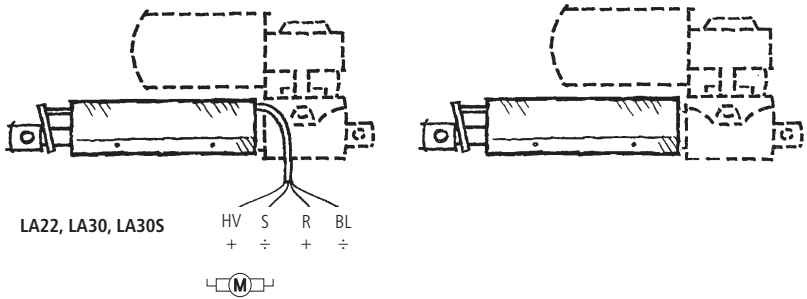
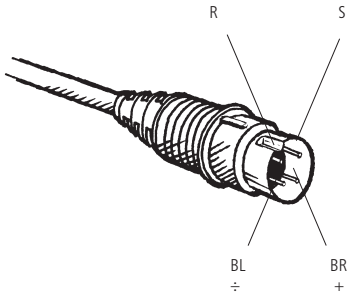


Figure 6

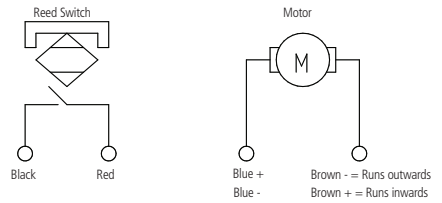
9) LSD



10) LA31, LA34 with electronic pulse coder (reed-switch)



11) LA31 TECHLINE



12) LA12 PLC

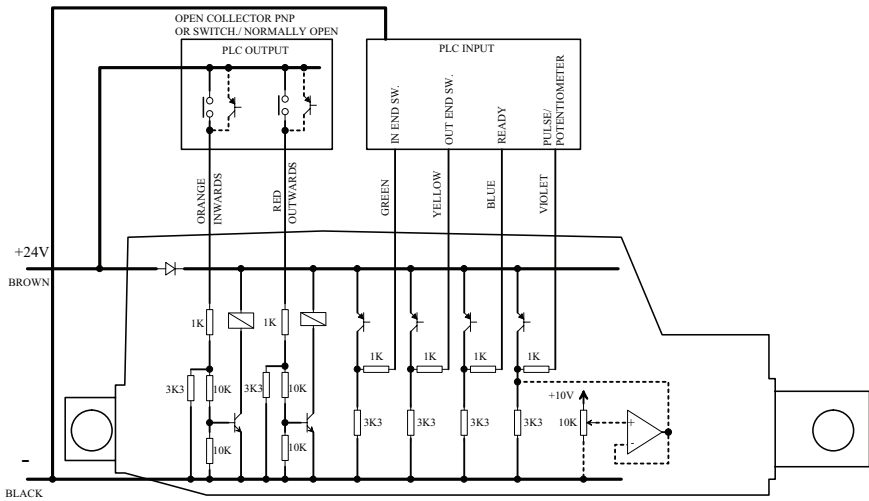
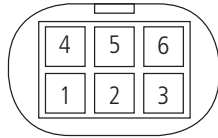


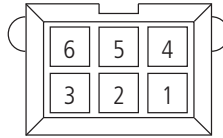
Figure 6

13) Pin-connection for Mini-fit plug (valid for 13 and 14)

Mini-Fit Connector	
Pin 1	
Pin 2	
Pin 3	
Pin 4	
Pin 5	
Pin 6	



Connector front view



PCBA Header top view



0273011 with O-ring

**WITHOUT FEEDBACK**

LA27 Mini-fit plug cable (LA27 standard; Valid for LA27 article numbers = 27xxxxxxxxxx0)

CH1-4 MiniFit:	
When a channel is operated UP (Motor connections)	3: Brown: + 6: Yellow: -
End-of-stroke switches	5: Orange: UP 4: Red: DOWN 2: Black: COMMON
Not Used	1: No Connection

(end of stroke = EOS)

LA23/LA31/LA34/BL1/BL4 Mini-fit plug cable

**without Feedback**

EOS Switch	
Pin 1	Switch com. (GND)
Pin 2	Vbus
Pin 3	M+ (Motor/Power)
Pin 4	EOS wout
Pin 5	EOD in
Pin 6	M- (Motor/Power)

LA27 Mini-fit plug cable (Analog encoded without Hall)

**without Feedback**

Article numbers = 27xxxxxxxxxxB

EOS Switch	
Switch com. (GND)	
Vbus	
M+ (Motor/Power)	
EOS out	
EOD in	
M- (Motor/Power)	

**WITH FEEDBACK**

LA23/LA31/LA34/LA44/BL1 Mini-fit plug cable

**with Feedback**

Hall	
Pin 1	Hall GND
Pin 2	Vbus
Pin 3	M+ (Motor/Power)
Pin 4	Hall A
Pin 5	Hall B
Pin 6	M- (Motor/Power)

LA27 Mini-fit plug cable

**with Feedback**

Article numbers = 27xxxxxxxxxxA

Hall	
Hall com. (GND)	
Vbus	
M+ (Motor/Power)	
EOS (analog)	
Hall	
M- (Motor/Power)	

LA34/LA44 Mini-fit plug cable (potentiometer)

**Potentiometer**

Pin 1	Pot GND
Pin 2	Vbus
Pin 3	M+ (Motor/Power)
Pin 4	Pot Position
Pin 5	Pot + (3V3)
Pin 6	M- (Motor/Power)

BL4 Mini-fit plug cable

**Reed**

Reed com. (GND)
Vbus
M+ (Motor/Power)
NC
Reed
M- (Motor/Power)

Figure 7

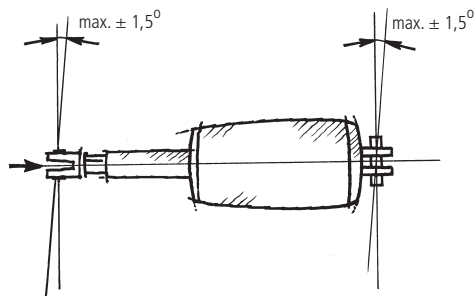


Figure 8

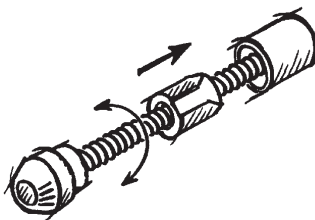


Figure 9

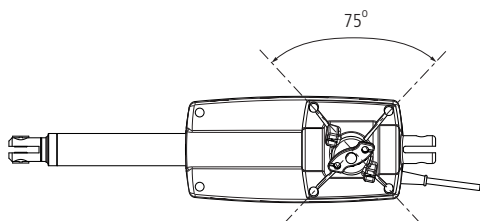
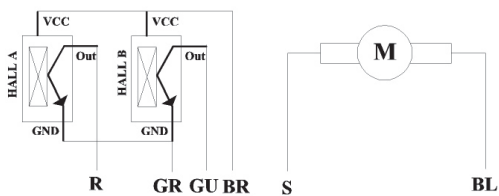


Figure 10





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