Motors | Automation | Energy | Transmission & Distribution | Coatings

Application:
Elevator Position Control

ADL300 EPC

User Guide

Language: English

Information about this manual

This manual explains the functions and the description of the parameters.

The information about mechanical installation, electrical connection and fast start-up can be found on the ADL300 Quick start guide.

All the manuals, in electronic file format, including manuals for expansions and fieldbuses can be found on the DOWNLOAD CENTER of WEG website:

https://www.weg.net/catalog/weg/IT/en/p/MKT_WDC_GLOBAL_PRODUCT_INVERTER_FOR_ELEVATOR_ADL300

Software version

This manual is updated according the software version V 4.x.8
Variation of the number replacing "X" have no influence on the functionality of the device.
The identification number of the software version is indicated on the identification plate of the drive or can be checked with the **Firmware ver.rel** parameter - **PAR** 490, menu 2.6.

Application version (mode Expert only)

This manual is updated according the application version EPC V 10.x.0
The identification number of the application version can be checked with the **Application ver.rel** parameter - **PAR** 504, menu 2.9; the application type can be checked with the **Application type** parameter **- PAR** 506, menu 2.10 (10 = Application EPC)

General Information

Nota ! In industry, the terms "Inverter", "Regulator" and "Drive" are sometimes interchanged. In this document, the term "Drive" will be used.

Before using the product, read the safety instruction section carefully (on Quick start manual).

Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.

WEG Automation Europe S.r.l. has the right to modify products, data and dimensions without notice. The data can only be used for the product description and they can not be understood as legally stated properties.

Thank you for choosing this WEG product.

We will be glad to receive any possible information which could help us improving this manual.
The e-mail address is the following: techdoc@weg.net.

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INTRODUCTION

This document provides all the information necessary for the design, wiring and configuration of a system based on the EPC (Elevator Position Control) application in the lift industry using a product from the ADL300 series.
It describes the sequences and functions of EPC (Elevator Position Control). The version 2 introduce the enhancement to manage installations up to 32 floors doubling the previous version where the max number of floors was 16.

The EPC function is a position regulator for direct, "one shot" arrival at the floor without having to slow down during the approach.

The control must function on ADL300 drives in all the control modes envisaged (FOC and BRS)

The EPC functions are installed in the ADL300 series of drives as application 2. To enable the function the **558 Application select** parameter must be set to 2 (see ADL300-…-FP manual).

For all information about the ADL300 series of drives reference should be made to the "**Quick start guide and Specifications and connection"** ***(ADL300 QS –EN manual 1S9QSEN).***

1. INSTALL THE APPLICATION

1.1 General Information

This section describes a standard application commissioning procedure.
The preliminary operations for commissioning ADL300 drives are described in chapter 8 of the “ADL300 Quick Start Guide".

1.2 Requirements

The EPC application for ADL300 requires **firmware version 2.00.** or higher (Releases 1.x do not support the EPC application).
To install the application you must have a PC, version 1.6.5 or higher of the WEG_eXpress software with Catalog, the RS-485 serial interface cable (cod 8S864C).
The application set-up file contains an automatic procedure that copies the required files in the specific folders of the Catalog.

1.3 Preliminary operations

The EPC application is preloaded in the drive as Application 2 (refer to the menu parameter 4.5 **PAR** 558 **Application sel**).

Once WEG_eXpress is installed perform the following procedure:

- Select the **ADL300A** (Asynchronous) or ADL300S (Synchronous) Lift drive.

- Selezionare la versione dell’applicazione:
  - ***ADL300S: 4.x.4 EPC 7.x.10.0 (EPC for Synchronous Motors)***
  - ***ADL300A: 4.x.4 EPC 7.x.10.0 (EPC for Asynchronous Motors)***

- At this stage the application is ready to be used.
  Parameters are available in menu 5 “LIFT”.

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2. APPLICATION OVERVIEW

This section contains a general description of the EPC (Elevator Positioning Control) application.

The **EPC** (Elevator Positioning Control) function is a separate application for independent management of direct arrival at the floor with internal position regulator and saving of floor distances (system autotuning).
There are two possible configurations for this application:

- Digital I/O control: in the installations where the number of available I/Os is sufficient, the control can be done via I/Os. **N** Digital Inputs are necessary to manage a system with 2^{N} floors. If the number of I/Os available in the BASIC version (ADL300**B**) is not sufficient, it is possible to use the ADVANCED (ADL300**A**) version with an adequate number of I/Os (e.g. by using the *EXP-IO-D16R4-ADL* expansion card).
- Remote control via CANopen fieldbus: it is possible to control the application via CANopen fieldbus, saving in this way I/Os. To use this mode the ADL300 must be equipped with the CANopen interface. (Order the ADL300 version with CAN interface).
- In case of systems where the number of floors is 16+, the use of CANopen control is suggested.

The main requirements for the EPC function are:

- Maximum operating speed (4m/s)
- Maximum number of floors 32
- Stop at floor without approaching at reduced speed (positioning for direct arrival at floor)
- Automatic management of speed and ramp times according to the floor of call and arrival
- Management of brake and contactor command sequences
- Availability of configurator for complete configuration and monitoring of operating variables.
- Possibility of calling floors directly (floor booked) or of requesting stops at floors during travel.
- Possibility of entering corrections and compensations on floor levels

Advanced controls:

- Inertia Compensation
- Battery run mode with choice of preferred direction
- Over Permissible Speed protection

The following functions are managed externally, by an external PLC or electromechanical unit:

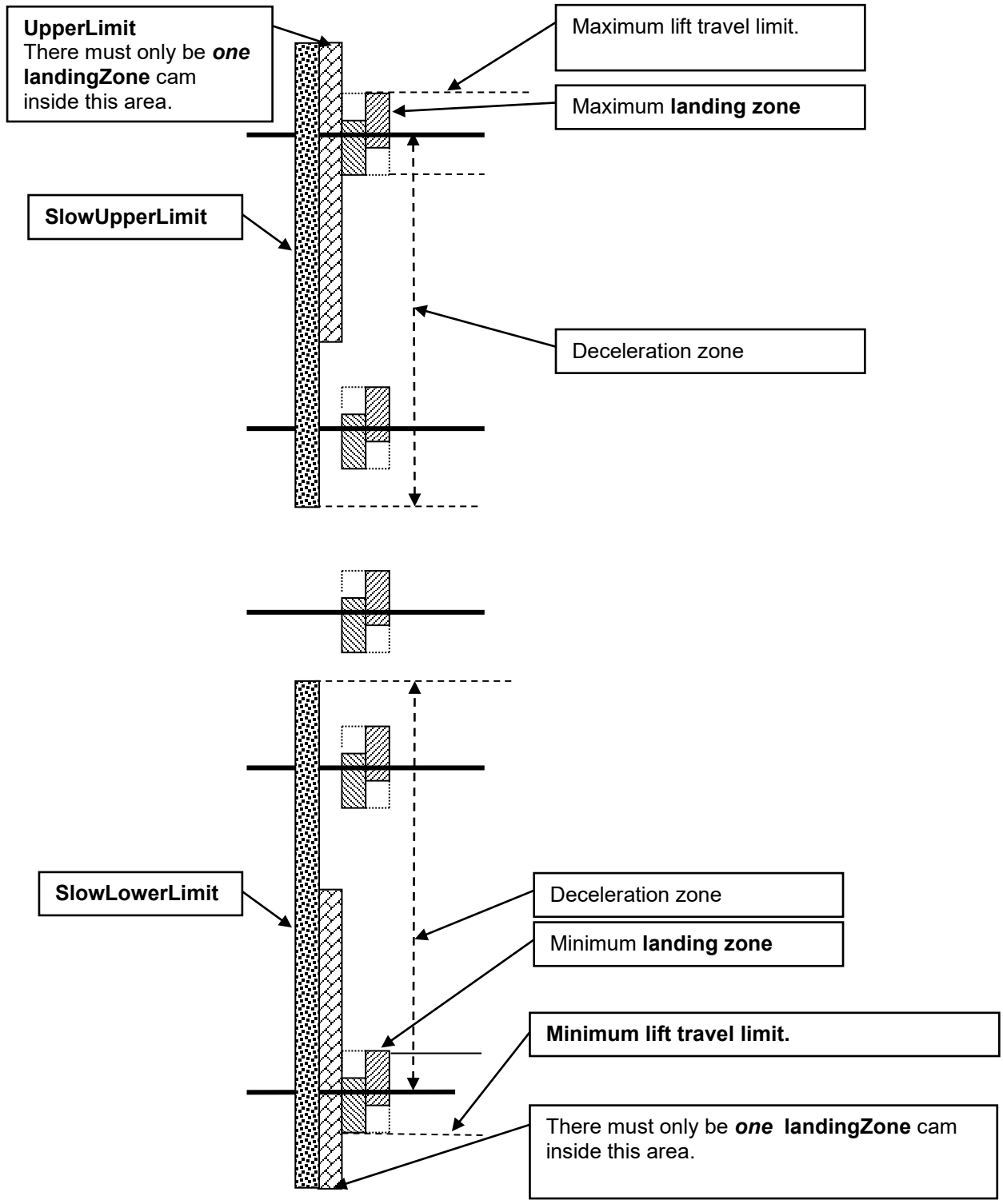
- Floor call logic
- Safety logic

The control system recognises the position of the floors via a series of cams installed along the path of the lift car. It uses a Self Study initialisation sequence to detect the position of these cams, on the basis of which it determines the level of each floor and the number of floors.
The distance between floors may vary from floor to floor, subject to certain restrictions.

3. CONFIGURATION OF THE INTERNAL POSITIONING DEVICE (EPC)

3.1 Layout of cams

The floor management cams must be arranged as illustrated in the figure:



Types of cams

Three types of cams are used in the system:

Deceleration cams

- There are two deceleration cams:
  - Deceleration lower limit (*SlowLowerLimit)* read by the *InputSlowLowerLimit* input;
  - Deceleration upper limit (*SlowUpperLimit)* read by the *InputSlowUpperLimit* input.

- These cams have the following functions:
  - *SlowLowerLimit*: if engaged it may cause the lift to slow down when this is travelling towards the lowest floor at an incorrect speed.
  - *SlowUpperLimit*: if engaged it may cause the lift to slow down when this is travelling towards the highest floor at an incorrect speed.

The length of the deceleration cams must be calculated so that the lift car has time to stop from the moment it engages a cam while travelling at maximum speed before reaching the maximum lift travel limit.

There may be several landing zones in the area covered by the deceleration cams.

In some systems the qualification cams, described below, can be used as deceleration cams. In this case there must only be one landing zone in the area covered by the deceleration cams.

Qualification cams

- There are two qualification cams:
  - The *LowerLimit* cam read by the *InputLowerLimit* input
  - The *UpperLimit* cam read by the *InputUpperLimit* input

These cams are used for the following functions:

- Execution of the *Zero Cycle*, in conjunction with cams A and B.
- The *Self Study* sequence for storing the position of the floors present in the system.

The qualification cams qualify the end landing zones and thus determine the first and top floors. **For this reason there must only be one landing zone in the area covered by the qualification cam.**

Floor counter cams

Each floor in the system is associated with a pair of floor counter cams.

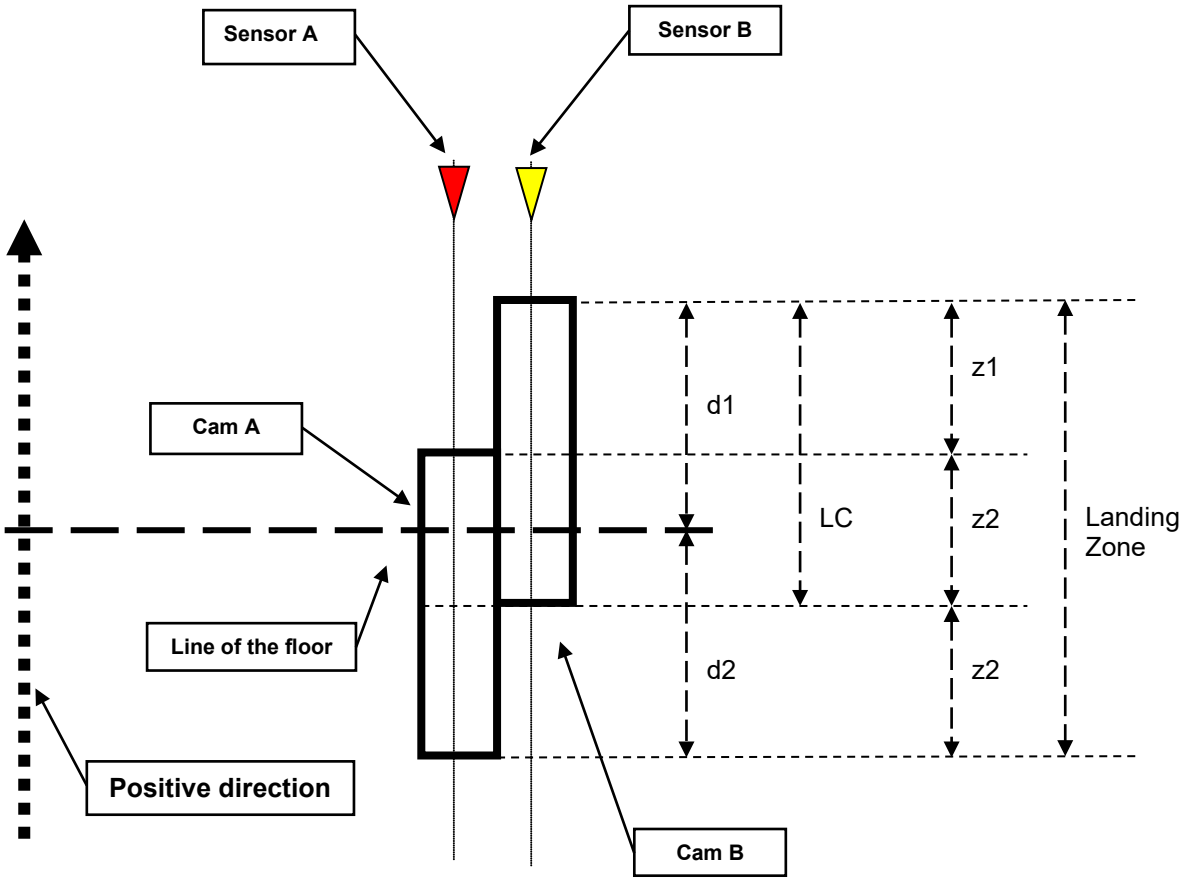
- These cams are called *CAM A* and *CAM B* and are read by the InputCammaA and InputCammaB inputs.
- The landing zone is the area determined by the logical OR of cam A and cam B.

- There is one pair of cams for each floor in the system.

- These cams are used by the following functions:
  - Floor counter.
  - Realignment of the lift car at the floor.
  - Zero cycle at the lowest floor, in conjunction with the*LowerLimit* qualification cam.
  - Zero cycle at the highest floor, in conjunction with the *UpperLimit* qualification cam.
  - The Self Study sequence for storing the position of the floors present in the system.

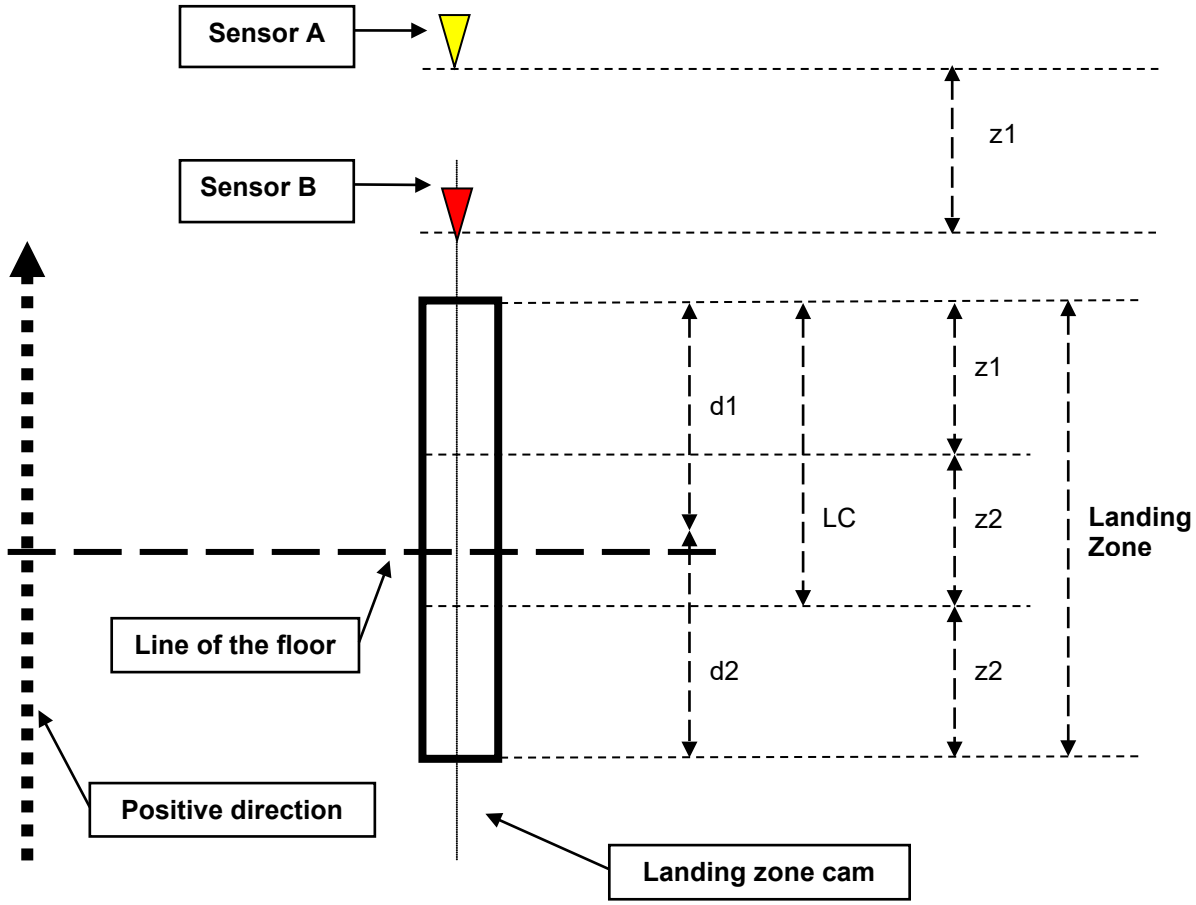
Layout of floor counter cams

The cams must be arranged as follows with respect to the lift floor:



LC	Length of cam A and of cam B.
d1 = d2	Distance between the lower edge of cam A and the line of the floor. Distance between the upper edge of cam B and the line of the floor.
z1, z2, z3 >= LC / 2	Dimension of an acquisition zone. This value **must** be greater than or equal to **LunghezzaMinimaCamma / 2**.
Landing Zone = (LC / 2) * 3	Dimension of the landing zone

The figure below shows a possible alternative cam and sensor layout. This second method is functionally identical to that illustrated on the previous page but simpler to install and service. For further details please see appendix B.



LC => **LunghezzaMinimaCamma**	Length of cam A and of cam B.
d1 = d2	Distance between the upper edge of cam A and the line of the floor. Distance between the lower edge of cam B and the line of the floor.
z1, z2, z3 >= LC / 2	Dimension of an acquisition zone. This value **must** be greater than or equal to **LunghezzaMinimaCamma / 2**.
Landing Zone = (LC / 2) * 3	Dimension of the landing zone

Use of cams to count floors

The floor counter cams are arranged so as to simulate **a hypothetical incremental encoder** "spread" over the lift shaft. In this hypothetical simulation the cams correspond to the notches on the disk and the two sensors, on the lift car, represent the photocells.

The system can detect the absolute position of the lift car, as it is immune to counting errors caused by the lift cables slipping on the pulley or stretching.

Like all incremental encoders, it must first be initialised. This is performed automatically during the initialisation of the motor incremental encoder by executing the zero cycle sequence.

Floor counter check

The progress of the floor counter can be checked by moving the lift car in the shaft.

If the floors are counted in the opposite order to that intended, invert the inputs of cam A and cam B on the terminal board of the drive, in the same way as for a normal incremental encoder.

3.2 Description of Functions (EPC)

The internal positioning device (EPC) offers standard functions, positioning mode functions and special functions.

3.2.1 Standard functions:

Some of the functions are already available in the standard version of the drive (EFC application). These mainly include:

- Signals and sequences for brake and door contactor commands
- Pre-torque function
- Ramping down of current at the end of the sequence
- Weights and estimated inertia.

3.2.2 Floor counter

The application must be able to read the floor counter cams (cam A and cam B), and recognise the current position in the shaft and the direction of travel. The floor counter cams are arranged so as to simulate a hypothetical incremental encoder "spread" over the lift shaft. The position is thus controlled twice, once based on the reading of the motor position sensor and once based on the reading of the cams to check the real position of the lift car in the shaft.

3.2.3 Mechanical constants

Specific parameters used to perform exact calculations of mechanical constants (separation of the ratio into two parameters).

3.2.4 Elevator Shaft Limit

Control functions to prevent shaft limits from being exceeded. The controls regard both position and speed. An alarm must be generated if the control systems intervene.

3.2.5 Floor Self Study function

The Self Study command is used to set a special control system mode in order to detect the height of the cams indicating the position of the floors in the lift shaft. These heights are detected automatically by performing a series of movements. The following positions are stored for each floor: **A Low, B High** This command should only be executed when installing the control system or moving the floor identification cams. No direct floor call or movement commands are possible (except jog and zero cycle) unless a Self Study command has been correctly executed.

3.2.6 Zero cycle function

The zero cycle command is used to move the lift car to a known zero position. A zero cycle must be executed each time the drive is switched on to reset the floor counter and rephase to a known position. **The encoder alarm generates a loss of zero**

3.2.7 Jog function

This command is used to perform manual jog operations in both directions. This is necessary during maintenance operations and commissioning.

3.2.8 “Target floor call” mode

In this mode the PLC sends the command of the floor to be reached directly via digital inputs or CANopen control word (floorSel =..4) and a pulse signal of recognition (floor call).
Thus the application already has a target destination before sending a start command.
A request to change destination may be received during travel, with the application giving a negative response: “Passed Braking Point" or a positive response: “Change target” signal.

3.2.9 Realignment function

The lift car is not mechanically integral with the motor pulley and the lift cables could, for a variety of mechanical reasons, slip on the motor pulley. This would alter the position of the lift car with respect to that calculated by the control system using the encoder on the motor, resulting in misalignments. These can lead to incorrect positioning of the lift car with respect to the floor.
To overcome these problems the control system incorporates the following realignment functions:

- **Static realignment.**
- **Dynamic realignment.**

3.2.10 Emergency Stop function

No operations must be possible during an emergency stop. The external PLC must disable the drive and apply the brake.

3.2.11 Manual brake release function

In emergency operation, manned emergency operations can be activated.
This function allows the cabin to move when there is a power failure in order to bring it to the closest floor by gravity.

- Such manoeuvres are only possible when the drive is in emergency mode, which the control card indicates with the “Emergency Function” digital input.

- When the brake release signal is active, the drive only controls the brake contactor.
- To move the car, the operator must keep the brake release signal activated.
- The Max em speed parameter sets the maximum car (or motor) speed during the manoeuvre.
- If the car reaches the maximum allowable speed, the drive locks the brake for the amount of time set in the Lock Time parameter, disabling the brake release signal (even if pressed, the brake will not be released).
- When this manoeuvre is activated, the display (both optional and built-in) shows the current speed of the car (or motor if the rpm is set) and the direction - i.e. Forward or Reverse.

3.2.12 Battery emergency function

Operation in Battery Run mode is enabled in the event of a power failure, when the emergency power supply module from battery is present; it is intended to enable the car to reach the nearest floor (you can select the running mode that best suits your system) to let passengers off, thus preventing the conventional manual manoeuvre.
It is possible to define the emergency manoeuvring mode using the Emergency Mode switch.

3.2.12.1 Up

The “Up” function commands a Forward run by activating the emergency manoeuvre.

3.2.12.2 Down

The “Down” function commands a Reverse run by activating the emergency manoeuvre.

3.2.12.3 Recommended

The “recommended” function enables the drive to evaluate the best direction through ongoing calculation during floor calls in NON-emergency mode; this calculation is based on the value of current delivered and the DC-Link voltage.
In particular, if the drive was in regenerative mode before the emergency, the same direction will be maintained even in an emergency; if the drive was not in regenerative mode but was supplying current at a value lower than the value set in the Detected Threshold parameter, the drive direction will be maintained, otherwise the drive changes direction as it considers the previous direction as unfavourable.

3.2.12.4 Battery Saving

The “Battery Saving” function makes it possible to manage automatic return to floor in an emergency by exploiting car movement by force of gravity, running the motor only when necessary.
The manoeuvre is activated by configuring “Battery Saving” (**PAR** 11102) as an emergency mode and activating the Emergency Function using the configured input.
The function follows this logic:

- A “manual brake release” manoeuvre is automatically launched, respecting the “manual brake release” function settings (see section 3.2.11)
- If the car moves, the “manual brake release” manoeuvre continues, respecting the conditions set by the function (see section 3.2.11)
- If the car is in the equilibrium position — i.e. the car speed remains below the threshold (**PAR** 11082) for the pre-set amount of time (**PAR** 11096) — then the command is given to close the brake again and start of the emergency electric run.
- The electric run takes place in the recommended direction.

In this way, even in manned imbalance operation, no external circuits are required to reactivate the run contactors and supply the brake.

- The command is given to open the brake, while the short-circuit contactor is kept closed.
- The car starts moving by force of gravity, speed control is enabled: the maximum possible car speed is configured in the parameter “Max em speed”, otherwise the brake is closed again for a time equal to the “Lock Time” after which it is reopened.
- If the car does not move, since it is in the equilibrium position — i.e. the speed threshold “Min em speed” is not not exceeded after the “Min speed time” has elapsed — the brake is closed once more and then the command is given to activate an emergency run in the recommended direction.

3.2.13 Position Reached function

The control system generates this signal (AtFloor) each time the landing position is reached

3.2.14 "Passing braking point" signal

This signal is activated, in floor call mode, if the external PLC attempts to change the floor to be reached while the lift car is moving. In this case the control system evaluates the possibility of stopping at the requested floor on the basis of the current operating conditions. If this is possible, the system automatically changes the floor to be reached. Otherwise the previous request is maintained and the system sends a "passing braking point" signal to the PLC. This is a pulse signal proportional to the length of the call

3.2.14.1 Reverse target safety

This function is used if the PLC generates a call error. This may occur for example if, while the lift car is travelling, a request is received to stop at a floor in the opposite direction of travel. In this case the control system generates a "Passed Braking Point" signal and continues to travel towards the previously requested position.

3.2.15 Door pre-opening function

This function makes it possible to command early door opening if the car speed is below the Door open speed threshold and at least one floor cam has been engaged.
The drive can send the command via WdecompOut status word bit, or directly to a digital drive output by enabling Door preopening and setting the desired digital output to PAD16.

3.3 LIFT CONTROL COMMANDS

The following commands are available:

- Jog Forward (*JogFwd*)
- Jog Reverse (*JogRev*)
- Zero cycle (*Cycle0*)
- Self study (*SelfStudy*)
- Floor call (*FloorCall*)
- Forward (*Forward*)
- Reverse (*Reverse*)
- Stop (*Stop*)
- Maintenance (*Maintenance*)
- Realignment (*Relevelling*)
- Emergency command (*Battery Run*)
- Emergency function *(Battery Sel)*

3.3.1 Maintenance command

The maintenance command acts on forward and reverse. For further details please see the description of the two commands.

3.3.2 JogFwd command

The JogFwd command moves the lift car in the positive direction.
The following operating modes are implemented for this command:

- On the rising edge of the JogFwd command the lift starts moving in the positive direction, which is normally upwards. The following events may occur while the lift car is moving:
- Removal of the JogFwd command: the lift stops in any point after completing the set deceleration ramp.

WARNING!
As per specifications, the JogFwd command has no movement limits, **the user must therefore take care to stop the lift in time.**

3.3.3 JogRev command

The JogRev command moves the lift car in the negative direction.
The following operating modes are implemented for this command:

- On the rising edge of the JogRev command the lift starts moving in the negative direction, which is normally downwards. The following events may occur while the lift car is moving:
- Removal of the JogRev command: the lift stops in any point after completing the set deceleration ramp.

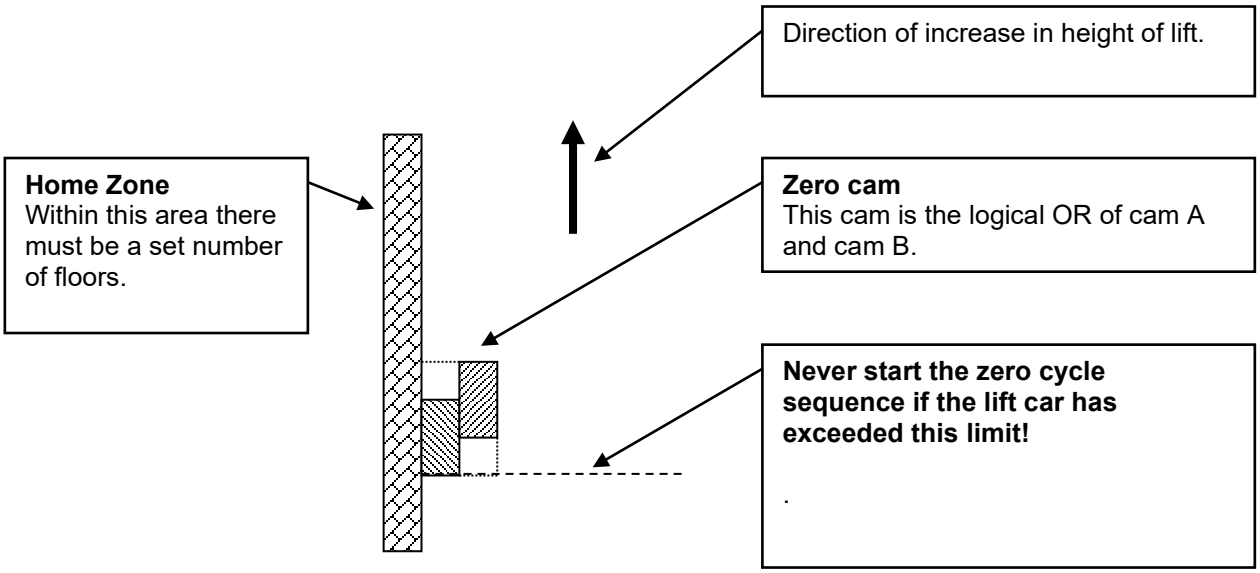
WARNING!
As per specifications, the JogRev command has no movement limits, **the user must therefore take care to stop the lift in time.**

3.3.4 Zero cycle command

The zero cycle command is used to initialise the lift encoder counter and the floor counter. When the initialisation procedure is complete, if the floor levels are operational, it executes a floor 0 positioning operation.

The zero cycle is a sequence used to:

- Initialise the motor incremental encoder.
- Initialise the floor counter function performed by the realignment cams.



The following **conditions** are necessary in order for the zero cycle sequence to function correctly:

1. Set the ZeroSpd parameter, which represents the zero search speed, to a suitably low value.
2. In the area limited by the Lower Limit cam, there may be more than one floor cam indicated in the Lower Cam Limit parameter. The zero cam consists of the “or” for the two cams of the lowest floor.
3. The zero cycle sequence **must never** be started when the position of the lift car is lower than the deceleration cam.

The **zero cycle sequence** is performed as follows:

1. If the zero cam is not engaged:
   - The lift car starts moving in the negative direction.
   - The moment the lift car engages the zero cam, the incremental encoder position and floor counter are initialised.
   - The lift car stops and the system sets ZeroFound = 1 and concludes the zero cycle sequence.

2. If the zero cam is engaged:
   - The lift car starts moving in the positive direction.
   - The movement stops when the lift car releases the zero cam.
   - The lift car starts moving in the negative direction.
   - The moment the lift car engages the zero cam, the incremental encoder position and floor counter are initialised.
   - The lift car stops, the system sets ZeroFound = 1 and concludes the zero cycle sequence.

For a variety of reasons, the zero sequence must be performed at low speed. If the sequence is launched with the lift car a long way from the zero cam, the cycle could take a very long time to be executed.

3.3.4.1 Minimum lift travel limit

The minimum lift travel limit is equal to the minimum limit of the zero cam.
The lift must normally never exceed this limit, although there are some exceptions when special maintenance operations are required.

Due to these exceptions the control system does not perform any checks or take any action if this limit is exceeded. **All control procedures and any alarms are thus managed by the external PLC**.

The external PLC must also prevent activation of the zero cycle sequence if the lift car is below the zero cam. If this rule is not observed the lift car will over-travel into the pit and crash into the floor of the shaft.

3.3.5 Floor Self Study command

The Floor Self Study command is used to detect the height of the cams signalling the position of the floors within the lift shaft. The control system detects these positions automatically, by performing a series of movements.

This command should only be executed when installing the control device or moving the floor identification cams.

WARNING: before running Floor Self Study, check correct arrangement of the cams, particularly the deceleration cams. Also check that the size of the deceleration cam is sufficient to stop the control system. Remember that these sequences start and stop according to the positions of the cams. Cams that are not in their correct position could cause a collision.

The **Self Study sequence** is as follows:

1. For systems with only 2 stops, enter the length of a single floor cam in the “Cam length” parameter (**PAR** 11106)
2. On the rising edge of the Self Study command, the sequence is activated.
3. The Zero variable found is set to Off; therefore, the control must run a zero loop sequence.
4. The control system moves the lift, at the ZeroSpd speed, in the negative direction until engaging the Lower Limit cam.
5. After engaging the Lower Limit cam, continue at the ZeroFound speed until cam B for floor zero is engaged. On the upper margin of cam B the control system initialises the encoder 0 position and floor counter.
6. It continues in the negative direction, at the same speed, until engaging cam A of floor 0. After engaging cam A it stops.
7. Cam positions: A and B are reset to zero; reset the correction parameters
8. The lift moves in the positive direction at the Self Study speed.
9. While moving the system detects the position of the car at the edges of all the cams it meets, including the deceleration and qualification cams.
10. Upon engaging the upper deceleration cam, Slow Upper Limit, it reduces the speed to the value set in Low speed parameter.
11. It continues in the positive direction until engaging cam B of the top floor. Once engaged, it stops.
12. It stores the positions detected.
13. It calculates the position of the lower edge of cams A and B of floor 0. The lift car must not reach these edges, so the control system assumes that the size of cam A at floor zero is identical to that of cam A at floor one, and thus calculates the lower edge of cam A as follows:
    A Low (floor 0) = A High (floor 0) – (A High (floor 1) - A Low (floor 1))
    The same procedure is used to calculate the lower edge of cam B.
14. The lift car is moved into position at the top floor.
15. Set SelfStudyOK = **On**.

3.3.6 FloorCall command

This command is used to request positioning of the lift car at a specific floor.
This command has the following operating mode:

1. On the rising edge of the FloorCall command a request is sent to position the lift car at the requested floor.
2. The lift starts to execute the positioning operation at the requested floor. The following events may occur while the lift car is moving:

    - Removal of the FloorCall command: nothing happens.
    - Resending of the FloorCall command, to a new floor: the following situations are possible:

        - The new floor that has been requested cannot be reached because it has already been passed or because the lift could not stop at the position of the new floor. The lift therefore continues as per the original plan.
        - The new floor that has been requested can be reached and the lift moves towards the new floor.

This command can **ONLY** be executed if the Self Study sequence has been successfully completed, and the **SelfStudyOk** parameter is set to **On**.

3.3.7 Reverse command

The reverse command has four operating modes:

Case	Cause	Action	Description
1	Maintenance input closed (enable)	**JogRev**	Executes the jog reverse command See "Reverse command with Maintenance input = enable" section
2	Maintenance input open (disable) Zero cycle not done (ZeroFound = FALSE) Lift car stopped NOT at top floor		See "Reverse command before zero cycle not from last floor" section
3	Maintenance input open (disable) Zero cycle not done (ZeroFound = FALSE) Lift car stopped at top floor		See "Reverse command before zero cycle from last floor" section
4	Maintenance input open (disable) Zero cycle done (ZeroFound = TRUE)		See "Reverse command after zero cycle" section

Reverse command with Maintenance input = enable
If the Maintenance input is closed (enable) when the reverse command is sent the control system acts as if the JogRev command had been set.

Reverse command before zero cycle
If the reverse command is sent before the incremental encoder and floor counter have been initialised, a zero cycle is executed.

This command can ONLY be executed if the Self Study sequence has been successfully completed, and the SelfStudyOk parameter is set to ON.

Reverse command after zero cycle
The reverse command following execution of the zero cycle, indicated by the ZeroFound= ON output, functions as follows:

- On the rising edge of the command the lift starts moving towards floor 0. The following events may occur during this movement:
    - Nothing happens: the lift reaches floor 0 executing the normal deceleration ramp as set.

- Removal of the reverse command: the lift stops at any point after executing the normal set deceleration ramp.
- The stop command becomes ON causing the lift to stop at the first possible floor.

If on the rising edge of the reverse command the stop command is ON the lift moves to the next floor.

This command can **ONLY** be executed if the Self Study sequence has been successfully completed, and the **SelfStudyOk** parameter is set to **ON**.

3.3.8 Forward command

The forward command has four operating modes:

Case	Cause	Action	Description
1	Maintenance input closed (enable)	JogFwd	Executes the jog forward command See "Forward command with Maintenance input = enable" section
2	Maintenance input open (disable) Zero cycle not done (ZeroFound = OFF) Lift car stopped NOT at floor		See "Forward command before zero cycle not from top floor" section
3	Maintenance input open (disable) Zero cycle not done (ZeroFound = OFF) Lift car stopped at top floor 0		See "Forward command before zero cycle from floor 0" section
4	Maintenance input open (disable) Zero cycle done (ZeroFound = ON)		See "Forward command after zero cycle" section

Forward command with Maintenance input = enable
If the maintenance input is closed (enable) when the forward command is sent the control system acts as if the JogFwd command had been set.

Forward command before zero cycle
If the forward command is sent before the incremental encoder and floor counter have been initialised, a zero cycle is executed.

This command can ONLY be executed if the Self Study sequence has been successfully completed, and the SelfStudyOk parameter is set to ON.

Forward command after zero cycle
The forward command following execution of the zero cycle, indicated by the ZeroFound= ON output, functions as follows:

- On the rising edge of the command the lift starts moving towards the top floor.
  The following events may occur while the lift car is moving:
  - Nothing happens: the lift reaches the top floor executing the normal deceleration ramp as set.
  - Removal of the forward command: the lift stops at any point after executing the normal set deceleration ramp.
  - The stop command becomes ON causing the lift to stop at the first possible floor.

If on the rising edge of the forward command the stop command is ON the lift moves to the next floor.
This command can ONLY be executed if the Self Study sequence has been successfully completed, and the SelfStudyOk parameter is set to ON.

3.3.9 Stop command

The stop command is active after the zero cycle (ZeroFound = ON), and only interacts with the forward and reverse commands.
For more information please read the sections on the forward and reverse commands.

3.3.10 Battery Run Mode function

The battery run mode function is used to manage lift movements with the emergency power supply (power failure)

3.3.11 Battery SEL function

The battery sel function is used to disable alarms (undervoltage and phase loss). Only the jog and battery run commands are enabled. All the others are blocked.

3.3.12 Manual brake release function

Manual emergency manoeuvre. This function allows the cabin to move when there is a power failure in order to bring it to the closest floor by gravity.

- This manoeuvre can be performed only when the drive is in emergency mode, which the control card indicates with the “Emergency Function” digital input. There must be a Brake Open digital input connected to a "Brake Open" button on the control panel that enables cabin movement.
- When the button is pressed, the inverter issues the command according the “Brake release type” parameter setting (**PAR** 11104): brake contactor only or both brake and run contactors.
- The operator has to push the “Brake Open” button to move the cabin.
- The Max em speed parameter sets the maximum car (or motor) speed during the manoeuvre.
- If the car reaches the maximum admissible speed, the drive locks the brake for the time set in
- Lock time, thus disabling use of the button (even when pressed, it does not release the brake).
- When this manoeuvre is activated, the display (both optional and built-in) shows the current speed of the car (or motor if the rpm is set) and the direction - i.e. Forward or Reverse.
- This manoeuvre is disabled in case of inspection.

3.3.13 Realignment function

The lift car is not mechanically integral with the motor pulley and the lift cables could, for a variety of mechanical reasons, slip on the motor pulley. This would alter the position of the lift car with respect to that calculated by the control system using the encoder on the motor, resulting in misalignments. These can result in incorrect positioning of the lift car with respect to the floor. To overcome these problems the control system incorporates the following realignment functions:

- Static realignment.
- Dynamic realignment.

Both functions are enabled by means of an appropriate parameter which allows them to be enabled separately in order to simplify installation.
The functions must not be enabled before executing the Self Study function.

4. COMMISSIONING VIA KEYPAD

4.1 ASYNCHRONOUS MOTOR START-UP WIZARD

From ADL300 quick start guide page 48/80 for asynchronous motor and page 55/80 for brushless motor

The STARTUP WIZARD is a guided procedure used for quick start-up of the drive that helps to set the main parameters.
It consists of a series of questions, relating to the various sequences for entering and calculating the parameters necessary for correct drive and lift application operation. The order of these sequences is as follows:

- **Electrical connections** **See step 1** (see QS manual)
- **Setting motor parameters** **See step 2** (see QS manual)
- **Autotune with motor at stand-still or coupled to the load** **See step 3** (see QS manual)
- **Setting encoder parameters** **See step 4** (see QS manual)
- **Setting the maximum speed reference and maximum system speed** **See step 6** (see QS manual)
- **Setting system weights** **See step 7** (see QS manual)
- **Setting application parameters** **See step 8**
- **Saving parameters** **See step 9**

4.2 SYNCHRONOUS MOTOR START-UP WIZARD

- **Electrical connections** **See step 1** (see QS manual)
- **Setting motor parameters** **See step 2** (see QS manual)
- **Autotune with motor at stand-still or coupled to the load** **See step 3** (see QS manual)
- **Setting encoder parameters** **See step 4** (see QS manual)
- **Encoder phasing** **See step 5** (see QS manual)
- **Setting the maximum speed reference and maximum system speed** **See step 6** (see QS manual)
- **Setting system weights** **See step 7** (see QS manual)
- **Setting application parameters** **See step 8**
- **Saving parameters** **See step 9**

Step 8 Setting application parameters:

for asynchronous and synchronous motors

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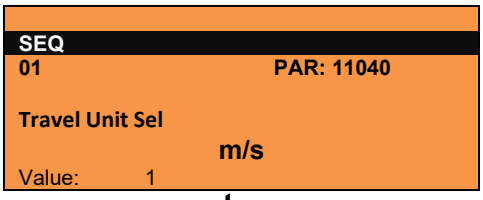

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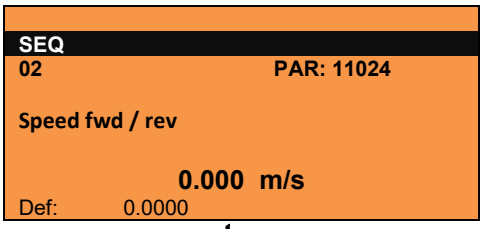

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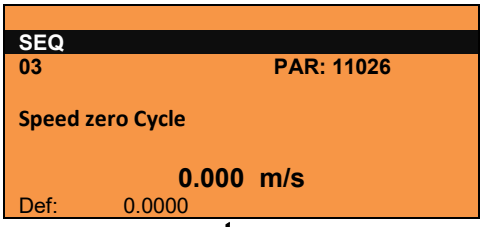

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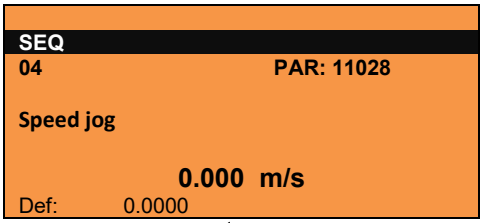

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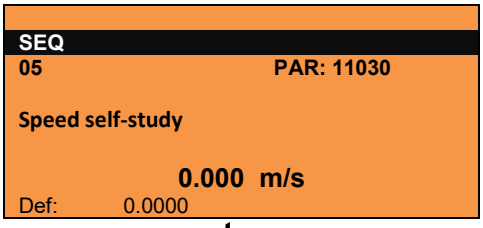

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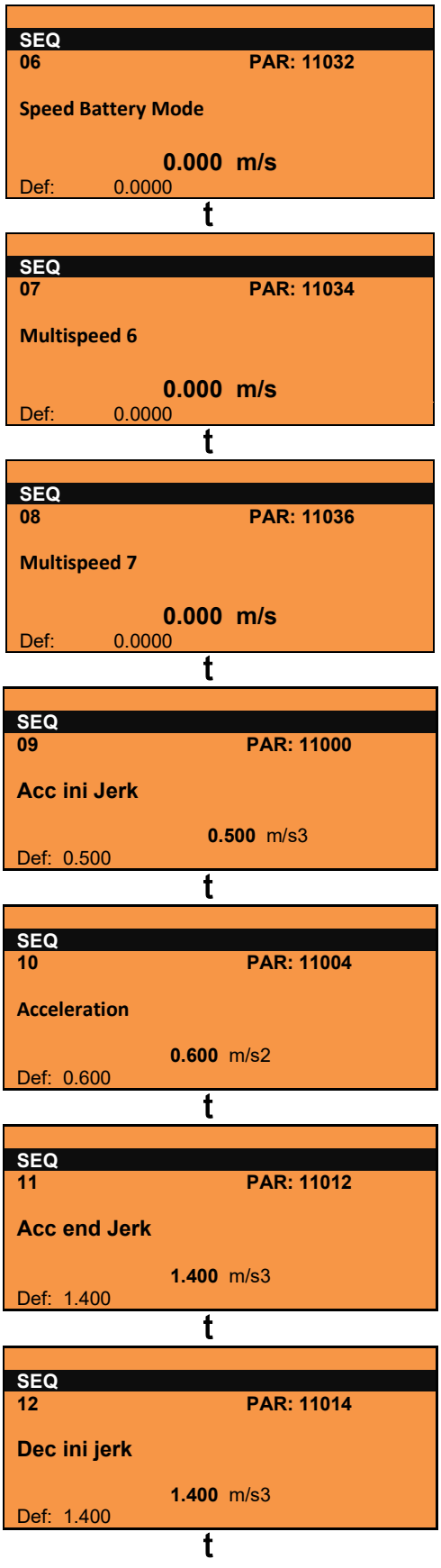
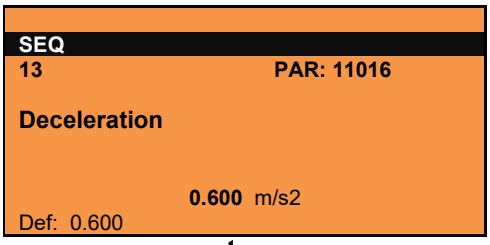

SEQ
06
PAR: 11032
Speed Battery Mode
0.000 m/s
Def: 0.0000
t
SEQ
07
PAR: 11034
Multispeed 6
0.000 m/s
Def: 0.0000
t
SEQ
08
PAR: 11036
Multispeed 7
0.000 m/s
Def: 0.0000
t
SEQ
09
PAR: 11000
Acc ini Jerk
0.500 m/s3
Def: 0.500
t
SEQ
10
PAR: 11004
Acceleration
0.600 m/s2
Def: 0.600
t
SEQ
11
PAR: 11012
Acc end Jerk
1.400 m/s3
Def: 1.400
t
SEQ
12
PAR: 11014
Dec ini jerk
1.400 m/s3
Def: 1.400
t



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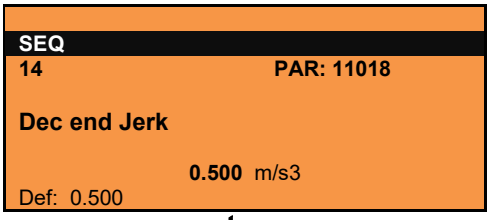

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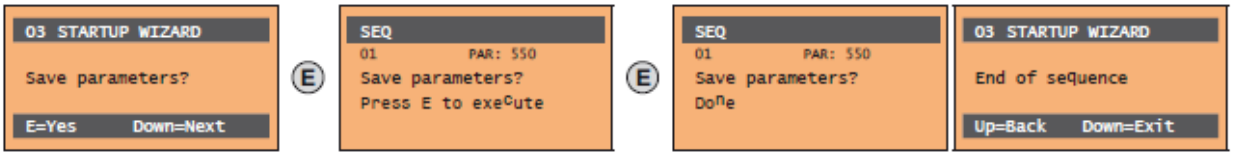
Step - Save parameters

To save the new parameter settings, so that they are maintained also after power-off, proceed as follows:



(1) (2) (3) (4)

(1) Press the E key to start the save parameters procedure.

(2) Press "E" to confirm

(3) End of procedure

(4) When the parameters have been saved correctly the drive displays this screen to show that the startup wizard is complete.

5. DESCRIPTION OF PARAMETERS

This manual only includes the parameters concerning the application (menu 5). For all other parameters reference should be made to the "Description of functions and list of parameters" manual.

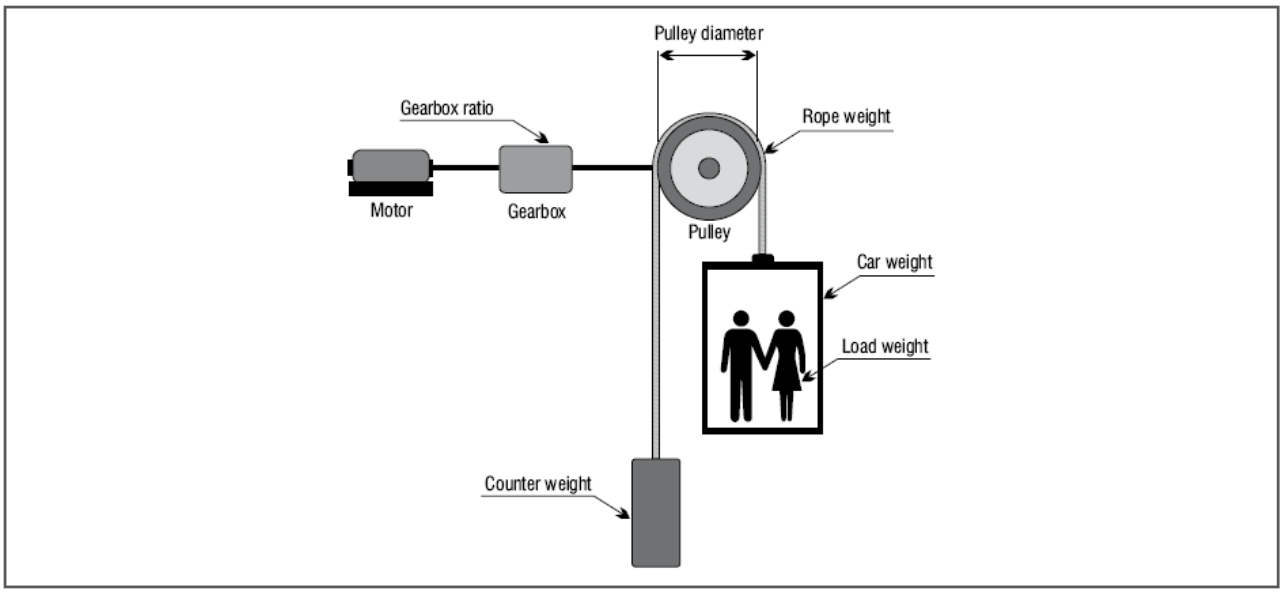
5 – LIFT

The LIFT menu displays the parameters concerning the LIFT function in the configuration with internal positioning device (EPC).
All these functions are installed in the ADL300 series of drives as "Application 2".
To enable the function the **558 Sel Applicazione** parameter must be set to 2 (see ADL300 FP Functional Parameter manual).

05.01 – MECHANICAL DATA

The parameters described in this menu are used to define the mechanical and physical characteristics of the system.

Mechanical constants
The mechanical constant defines the relationship between motor rpm and the distance travelled by the lift car.
There are two ways of calculating the **ConstMech** depending on the method of transformation that is used.
- Direct mode: **Mechanical constant** = System speed /(Full scale speed/60)
- Mechanical data: **Mechanical constant** = (π *Pulley diameter)/ Reduction gear ratio



The mechanical constant is calculated when the drive is switched on and re-calculated whenever changes are made to one of the relative parameters (**Mechanical calc mode, Contract speed, Pulley Diameter, Gearbox ratio**).
The method used to calculate the mechanical constant can be chosen regardless of which control mode has been selected (**Flux vector OL**, **Flux vector CL**) or of the unit of measure to be used.

Weights and inertia
Once the system's mechanical characteristics have been entered the total inertia applied to the motor can be calculated.
When these parameters are changed the calculated inertia value is automatically saved in the **Comp inerzia** parameter in order to perform correct inertia compensation.
The system displays the inertia value that can be entered in the **Inertia** parameter in the SPEED REG GAINS menu to calculate the speed loop parameters more accurately.

This operation is performed automatically when **PAR 11162 Calc spd reg gain** is enabled.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.1	**11006**	Car Max Speed	m/s	FLOAT	16/32BIT	1.0	0.0	10.0	RW	FVS

Lift car speed at base frequency. This represents the system speed. It is also used to calculate the mechanical constant.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.2	**11042**	Gearbox Ratio		FLOAT	16/32BIT	45.0	***	***	RW	FVS

Ratio between the speed of the motor and of the pulley.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.3	**11044**	Pulley Diameter	m	FLOAT		0.6	***	***	RW	FVS

Pulley diameter setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.5	**11100**	Invert direction			BIT	Off			RW	FVS

Reversal of the motor rotation direction.

Off Not reversed
On Reversed

By setting Off, the direction of rotation is not reversed.
Setting On reverses the direction of rotation.
International standards require that a positive reference corresponds to the motor rotating in a clockwise direction as seen from the drive side (shaft).
For correct operation, the control algorithms provide that a positive speed reference corresponds to a positive speed measurement.

ATTENTION!
When the parameter is changed, the zero search and floor self study must be repeated

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.5	**11046**	Calc speed reg gain			BIT	0	0	1	RW	FVS

Enables writing of the inertia calculated in the speed regulator (**PAR** 2240)

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.6	**11150**	Car Weight	kg	FLOAT		0.0	0	10000	RW	FVS

Lift car weight setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.7	**11152**	Counter Weight	kg	FLOAT		0.0	0	100000	R/W	FVS

Counterweight setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.8	**11154**	Load Weight	kg	FLOAT		0.0	0	100000	RW	FVS

Maximum load weight setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.9	**11156**	Rope Weight	kg	FLOAT		0.0	0	100000	RW	FVS

Cable weight setting.

Mechanical reducer inertia setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.10	**11158**	GearboxInertia	Kgm2	FLOAT		0.0050	0	1000	RW	FVS

Mechanical reducer inertia setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.11	**11160**	Motor inertia	Kgm2	FLOAT		0.0060	0	1000	RW	FVS

Motor inertia setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.12	**11420**	Mechanical calc mode		ENUM		0	0	1	ERW	FVS

Setting of the method for calculating the unit of measure, based on the speed of the lift car and of the motor (direct mode) or as a function of the mechanical ratios (mechanical data method).

0 Direct mode
1 Mechanical data

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.13	**12036**	Mechanical const	m/rev	FLOAT					R	FVS

The value of the calculated mechanical constant is displayed.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.14	**12050**	Inertia Calculated	Kgm2	FLOAT					R	FVS

The system inertia with half load relayed to the motor is displayed. This value can be entered in the Inertia parameter in the SPEED REG GAINS menu.

05.02 – SPEED

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.1	**11022**	Multispeed 0	m/s	FLOAT		0.00	0.00	0.00	RW	FVS

Setting of the value of multispeed 0. This can be selected via digital input, fieldbus, etc.
The value selected is the reference for the lift S ramp.

NB: This speed cannot be changed. It must always be zero

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.2	**11024**	Speed fwd / rev	m/s	FLOAT		1.00	0.00	10000	RW	FVS

Setting of the value of multispeed 1. The selected value is the reference for the lift S ramp.
The value of this parameter is assumed as forward/reverse speed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.3	**11026**	Speed zero Cycle	m/s	FLOAT		0.40	0.00	10000	RW	FVS

Setting of the value of multispeed 2. The selected value is the reference for the lift S ramp.
The value of this parameter is assumed as zero cycle speed.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.4	**11028**	Speed jog	m/s	FLOAT		1.00	0.00	10000	RW	FVS

Setting of the value of multispeed 3. The selected value is the reference for the lift S ramp.
The value of this parameter is assumed as jog speed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.5	**11030**	Speed self-study	m/s	FLOAT		0.40	0.00	10000	RW	FVS

Setting of the value of multispeed 4. The selected value is the reference for the lift S ramp.
The value of this parameter is assumed as Self Study speed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.6	**11032**	Speed Battery Mode	m/s	FLOAT		0.10	0.00	10000	RW	FVS

Setting of the value of multispeed 5. The selected value is the reference for the lift S ramp.
The value of this parameter is assumed as battery mode speed.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.7	**11034**	Multispeed 6	m/s	FLOAT		0.00	0.00	10000	RW	FVS

Setting of the value of multispeed 6. This can be selected via digital input, fieldbus, etc.
The value selected is the reference for the lift S ramp.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.8	**11036**	Multispeed 7	m/s	FLOAT		0.00	0.00	10000	RW	FVS

Setting of the value of multispeed 7. This can be selected via digital input, fieldbus, etc.
The value selected is the reference for the lift S ramp

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.9	**11038**	Slow speed	m/s	ENUM		2	0	8	RW	FVS

Setting of the low speed value.

0 Multispeed 0
1 fwd/rev speed
2 Zero cycle speed
3 Jog speed
4 Self study speed
5 Battery mode speed
6 Multispeed 6
7 Multispeed 7
8 Null

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.10	**11040**	Travel Unit Sel	m/s	INT16		0	1	2	RW	FVS

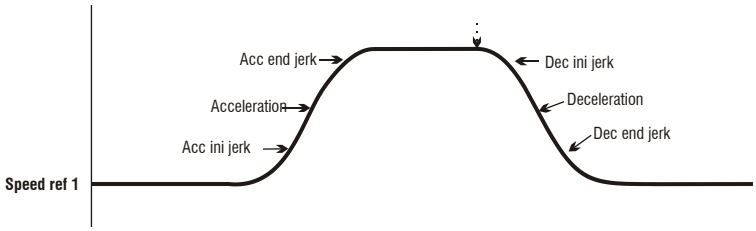
Selection of the unit of measure for the speed references.

0 Hz (motor speed)
1 m/s (speed of the lift car and depends on the mechanical constant)
2 Rpm (speed of the motor shaft)

When the unit of measure is changed the transformation constants are re-calculated, the units of measure in the list of parameters are changed and the multispeed values are converted into the new unit of measure (the result may contain approximations due to conversion calculations).
A variable that represents the lift car speed in m/s (**PAR** 12210) is always available
The units of measure for the acceleration and deceleration parameters (m/s²) and jerks (m/s³) are fixed.

05.03 – RAMPS

The lift functions according to an S-shaped ramp with the possibility of setting 4 independent jerks and linear acceleration and deceleration coefficients, as in the standard profile illustrated in the figure below.



The values for Jerk iniziale acc, Accelerazione and Jerk finale acc on the acceleration ramp are calculated by multiplying the corresponding parameters by the acceleration ramp factor **Percent acc Factor**, **PAR 13184**), while the values for Jerk iniziale dec, Decelerazione and Jerk finale dec on the deceleration ramp are calculated by multiplying the corresponding parameters by the deceleration ramp factor (**Percent dec Factor**, **PAR 13186**).
When the **Start** command is removed, the reference speed goes to zero regardless of the reference selected in the multispeeds.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.1	**11000**	Acc ini Jerk	m/s3	FLOAT		0.500	0.001	20	RW	FVS

Setting of the jerk value for the initial part of acceleration.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.2	**11004**	Acceleration	m/s2	FLOAT		0.600	0.001	10	RW	FVS

Maximum acceleration value setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.3	**11012**	Acc end Jerk	m/s3	FLOAT		1.400	0.001	20	RW	FVS

Setting of the jerk value for the final part of acceleration.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.4	**11014**	Dec ini jerk	m/s3	FLOAT		1.400	0.001	20	RW	FVS

Setting of the jerk value for the initial part of deceleration.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.5	**11016**	Deceleration	m/s2	FLOAT		0.600	0.001	10	RW	FVS

Maximum deceleration value setting.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.6	**11018**	Dec end Jerk	m/s3	FLOAT		0.500	0.001	20	RW	FVS

Setting of the jerk value for the final part of deceleration.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.7	**13184**	PercAccFactor	Perc	FLOAT		100.0	0.0	1000.0	RW	FVS

Setting of the acceleration coefficient multiplier.
If set to 100 the ramp uses the coefficients entered in the parameters.
If set to a value of less than 100 the lift will accelerate over a longer distance.
If set to a value of more than 100 the lift will accelerate over a shorter distance.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.8	**13186**	Perc Dec Factor	Perc	FLOAT		100.0	0.0	1000.0	RW	FVS

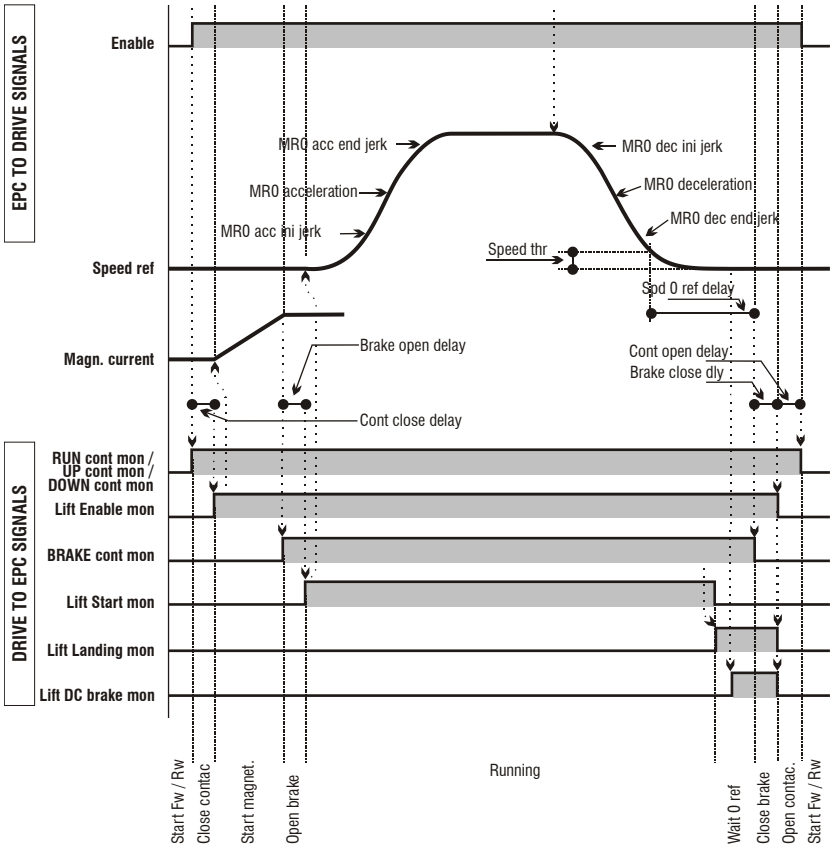
Setting of the deceleration coefficient multiplier.
If set to 100 the ramp uses the coefficients entered in the parameters.
If set to a value of less than 100 the lift will decelerate over a longer distance.
If set to a value of more than 100 the lift will decelerate over a shorter distance.

05.04 – SEQUENCES

This menu contains the parameters used to manage and define the travel of the lift according to the status of the inputs and alarms. The structure of the lift sequences in case of a floor call command is summarised below. Once the command has been received and the number of the floor to be reached has been saved, the internal positioning device starts and automatically executes the trajectory until reaching the floor with direct arrival.
In case of jog speed the deceleration sequence starts the moment the jog command is removed.

Starting sequence:

1. Reading of the Enable hardware input and alarm check (enabling is interrupted if any alarms are present)
2. Recognition of the **Enable** and **Floor Call** commands as set in **Seq start mode**
3. Upon receiving the **Floor Call** command, the number of the floor to be reached is acquired by reading the binary combination of the Floor0, Floor1, Floor 2… bits as a function of the direction of travel the line and short circuit contactor closing command is given.
4. After the time set **Contactor close delay** the internal **Enable** signal is activated
5. The system waits for the magnetisation signal from the drive (**Drive Ready**)
6. After magnetisation the signal is activated to release the brake
7. The system waits for the brake to be released (**Contactor Open Delay**)
8. After the brake release delay the **Lift Start** command is sent and the movement is enabled.



Sequence of movements:

1. The motor is started with the values shown in the ramp. The movements are performed according to the multispeeds and the S-shaped ramp set in the internal position control.
2. When the set speed has been exceeded it is possible to check the actual opening of the brake using the output signal **Monitor Brake 2**
3. The internal position control executes the set trajectory and starts the deceleration ramp at the appropriate time.

Stop sequence:

1. Upon reaching zero speed the direct current braking command is enabled (**SSC** control mode)
2. The system waits the time necessary to reach zero speed and sends a command to close brakes 1-2
3. The system waits for the brakes to close (**Brake Close delay**), and if the current is to be ramped down, it waits for the current limit to reach zero. The lift internal enable signal (**Enable lift**), arrival zone and direct current braking signals are lowered
4. The system waits for the time set in **Contactor Open Delay** and checks that zero current is delivered, before sending the command to open the contactors.
5. The time delay set in the **SC cont open delay** parameter must elapse and the close motor short circuit phase command is given.

It is absolutely essential to allow for the fact that a drive alarm condition could occur or the drive could be disabled at any time. In that case the drive must be stopped and a command must be sent to open the contactors.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.1	**11060**	Seq start mode		ENUM		0	0	1	RW	FVS

Setting of the contactor command sequence starting mode.

0 Run fwd/back
1 Enable

When set to **0** the contactor sequences can be enabled without sending the Enable command (Enable is only needed for motor operation). The enable signal can be sent by an auxiliary contact of the output contactors.
If set to **1** the contactor sequences can only be enabled if the enable command is active.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.2	**11062**	Cont Close Delay	ms	INT32		200	0	10000	RW	FVS

Setting of the delay for closing the contactor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.3	**11064**	Brake open delay	ms	INT32		200	0	10000	RW	FVS

Setting of the delay for opening the brake.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.4	**11068**	Brake close delay	ms	INT32		200	0	10000	RW	FVS

Setting of the delay for closing the brake.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.5	**11070**	Current Ramp Down Delay	ms	INT32		0	0	10000	RW	FVS

Setting of the time needed to reduce the torque from the threshold value active during travel to 0. It defines the slope of the downward ramp in the “Rampa dimin corrente” function. The purpose of this function is to prevent immediate removal of motor torque upon application of the brake, which would cause undesirable stress on the inside of the lift car.
To avoid this phenomenon, after applying the brake the current limits are brought to the current value in use and then ramped down.
The function is enabled when **Current down delay** is set to a value other than zero.
This is only possible when **Torque curr lim sel (PAR 2354)** has a value other than "OFF", otherwise **Current ramp down delay** is forced to zero.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.6	**11072**	Cont open delay	ms	INT32		200	0	10000	RW	FVS

Setting of the delay for opening the contactor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.7	**11078**	Speed 0 Threshold	rpm	INT16		1			RW	FVS

Setting of the zero speed threshold, below which the zero speed signal is activated

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.8	**11080**	Speed 0 Delay	ms	UINT16		0	0	10000	RW	FVS

Setting of the zero speed delay. After the zero speed signal and after the delay set in this parameter the zero speed signal is enabled. These parameters are used to know the lift car stop.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.9	**11082**	Em min speed	m/s	FLOAT		0.01			RW	FVS

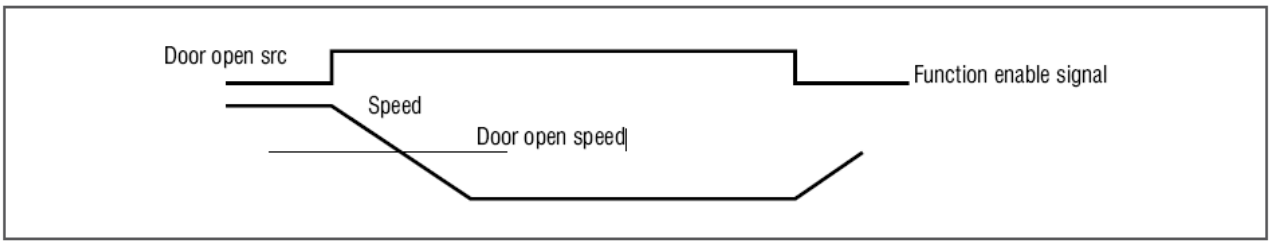
Sets the minimum speed of the car (or motor) during manoeuvring in “Battery saving” mode.
The speed can be expressed in m/s (for the cabin) or in rpm (for the motor).

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.10	**11084**	SC cont open delay	ms	UINT32		500	500	2000	RW	FVS

Sets the delay time for closing the phase short circuit contactor following opening of the motor contactor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.11	**11086**	Door Open Speed	m/s	FLOAT		0.0010			RW	FVS

Setting of the door open speed. This function is used to control door opening in advance before the lift car arrives at the floor. The door open signal can be relayed to a digital output when the speed is below the user-definable threshold. The function must be enabled from the digital input. The state of execution of the speed control command for opening the door can be checked by sending the feedback from the door opening mechanism to the digital input of the drive.
An alarm may be generated if the command and feedback do not coincide.



Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.12	**11090**	Em max speed	m/s	UINT32		200			RW	FVS

Sets maximum cabin (or motor) speed during the manoeuvre. The speed can be expressed in m/s (for the cabin) or in rpm (for the motor).

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.13	**11092**	Brake lock time	s	UINT32		4	1	30	RW	FVS

Sets brake lock time when the cabin reaches maximum allowed speed.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.14	**11096**	Em min speed time	s	UINT16		4	1	30	RW	FVS

Setting of the time required to identify whether the car is in the position of equilibrium - i.e. the car speed does not exceed the set “**Em min speed**” threshold (PAR11082).

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.15	**12024**	Actual Multispeed Sel		ENUM		0	0	8	R	FVS

The currently selected speed is displayed.

0 Multispeed 0
1 fwd/rev speed
2 Zero cycle speed
3 Jog speed
4 Self study speed
5 Battery mode speed
6 Multispeed 6
7 Multispeed 7
8 Null

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.16	**12026**	Actual Multi spd out	m/s	FLOAT			0		R	FVS

The lift car speed is displayed in m/s.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.17	**12038**	Actual Lift State		INT					R	FVS

Lift sequence status display.

05.05 – LIFT COMMANDS

The input commands of the EPC lift application can be connected to a signal via a switch that can be used to select from among a series of options listed in the selection list.
The selection list can be used to select from among the following options for each single command:

- Null or One
- Digital Inputs of the I/O expansion card
- Some internal signals (e.g. “Brake cont mon” ..)
- A selectable “LiftDecomp1” bit (e.g. “Lift decom1 B0”)
- A selectable “LiftDecomp2” bit (e.g. “Lift decom2 B0”)
- PAD15

In I/O configuration the commands are connected to digital inputs
In the CANopen configuration they are connected to the LiftDecomp connected in turn for instance via the variable **Control word 2** to a fieldbus process channel e.g. **PDC FieldBus M->S2.**.

The variable **Control word 2** can generally be connected to another fieldbus process channel or to the drive parameter **Wcomp** or to **PAD16.**

The default configuration is shown in the table below:

Input	Description	Default source
Enable	Enable command	Enable digital input
Floor Call	Floor call command	Dig input 6X
Cycle 0	Zero cycle command	Dig input 4X
Self study	Self study command	Dig input 5X
Jog Fwd	Jog forward command	Dig input 7X
Jog Rev	Jog reverse command	Dig input 8X
Realignment	Realignment command	Dig input 9X
Forward	Forward command	Null
Reverse	Reverse command	Null
Stop	Stop command	Null

Maintenance	Maintenance command	Null
Battery Mode	Battery Mode command	Dig input 3X
Battery Run	Battery Run command	Dig input 3X
Floor 0	Floor command bit 0	Dig input 10X
Floor 1	Floor command bit 1	Dig input 11X
Floor 2	Floor command bit 2	Dig input 12X
Floor 3	Floor command bit 3	Null
Floor 4	Floor command bit 4	Null

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.1	**11002**	Emergency mode		ENUM		0			RW	FVS

The parameter is used to set the type of emergency to be performed.
0 = Up
1 = Down
2 = Autoselect
3 = Recommended
6 = Battery saving

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.2	**11278**	Em DC brk currentt	%	FLOAT		75	0	150	RW	FVS

The parameter is used to set the value of the braking current by injecting DC current into the motor windings. This value can be limited, thus preventing emergency battery overload. Not applicable to synchronous motors
.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.3	**11284**	Detection limit	%	INT		50	0	100	RW	FVS

This is the limit value for current delivered by drive (expressed as a percentage of the rated current) to select the most favourable run direction in “Recommended” (see **PAR** 11002).

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.4	**11400**	Enable cmd sel		ENUM		1110			RW	FVS

Setting of the source for the enable command “**COMMAND SOURCE LIST**”:

1110 Digit input E
1210 Digit input 1X
1212 Digit input 2X
1214 Digit input 3X
1216 Digit input 4X
1218 Digit input 5X
1220 Digit input 6X
1222 Digit input 7X
1224 Digit input 8X
1226 Digit input 9X
1228 Digit input 10X
1230 Digit input 11X
1232 Digit input 12X
3702 Run cont mon
3706 Down cont mon
3708 Brake cont mon
3714 Door open mon
3728 PAD15
6000 Zero
6002 One
20 Lift decom B0
21 Lift decom B1
22 Lift decom B2
23 Lift decom B3
24 Lift decom B4

25 Lift decom B5
26 Lift decom B6
27 Lift decom B7
28 Lift decom B8
29 Lift decom B9
30 Lift decom B10
31 Lift decom B11
32 Lift decom B12
33 Lift decom B13
34 Lift decom B14
35 Lift decom B15
37 Lift decom2 B0
38 Lift decom2 B1
39 Lift decom2 B2
40 Lift decom2 B3
41 Lift decom2 B4
42 Lift decom2 B5
43 Lift decom2 B6
44 Lift decom2 B7
45 Lift decom2 B8
46 Lift decom2 B9
47 Lift decom2 B10
48 Lift decom2 B11
49 Lift decom2 B12
50 Lift decom2 B13
51 Lift decom2 B14
52 Lift decom2 B15

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.5	**11402**	Floor Call cmd sel		ENUM		1220			RW	FVS

Setting of the source for the floor call command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.6	**11404**	Cycle 0 cmd sel		ENUM		1216			RW	FVS

Setting of the source for the zero cycle command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.7	**11406**	Self Study cmd sel		ENUM		1218			RW	FVS

Setting of the source for the Self Study command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.8	**11408**	Jog Fwd cmd sel		ENUM		1222			RW	FVS

Setting of the source for the Jog Forward command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.9	**11410**	Jog Rev cmd sel		ENUM		1224			RW	FVS

Setting of the source for the Jog Reverse command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.10	**11412**	Realignement cmd sel		ENUM		1226			RW	FVS

Setting of the source for the realignment command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.11	**11414**	Fwd cmd sel		ENUM		6000			RW	FVS

Setting of the source for the Forward command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.12	**11416**	Rev cmd sel		ENUM		1220			RW	FVS

Setting of the source for the Reverse command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.13	**11418**	Stop cmd sel		ENUM		6000			RW	FVS

Setting of the source for the Stop command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.14	**11422**	Maintenance cmd sel		ENUM		6000			RW	FVS

Setting of the source for the Maintenance command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.15	**11424**	Battery Mode Sel		ENUM		1214			RW	FVS

Setting of the source for the Battery Mode command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.16	**11426**	Battery run sel		ENUM		1214			RW	FVS

Setting of the source for the emergency activation command::
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.17	**11428**	Floor 0 sel		ENUM		1228			RW	FVS

Setting of the source for the Floor 0 command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.18	**11430**	Floor 1 sel		ENUM		1230			RW	FVS

Setting of the source for the Floor1 command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.19	**11432**	Floor 2 sel		ENUM		1232			RW	FVS

Setting of the source for the Floor2 command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.20	**11434**	Floor 3 sel		ENUM		6000			RW	FVS

Setting of the source for the Floor3 command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.21	**11436**	Floor 4 sel		ENUM		6000			RW	FVS

Setting of the source for the Floor 4 command:
"**COMMAND SOURCE LIST**" see **PAR** 11400.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.22	**11438**	Switch slow down		BOOL		Off			RW	FVS

Enables low rephaser speed during call to the top and bottom floors.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.23	**12382**	Chosen Direction		INT					R	FVS

Indicates the direction selected by the drive during the emergency.
0 No direction selected
1 Forward
2 Reverse
The association of Forward/Reverse and Up/Down depends on how the motor connection is made.

05.06 – INPUTS

The input signals of the EPC lift application can be connected to a signal via a switch that can be used to select from among a series of options listed in the selection list.
The selection list can be used to select from among the following options for each single input:

- Null or One
- Digital Inputs of the I/O expansion card
- Some internal signals (e.g. “Brake cont mon” ..)
- A selectable “LiftDecomp1” bit (e.g. “Lift decom1 B0”)
- A selectable “LiftDecomp2” bit (e.g. “Lift decom2 B0”)
- PAD15

In I/O configuration they are connected to digital inputs
In the CANopen configuration they are connected to the LiftDecomp connected in turn for instance via the variable **Control word 1** to a fieldbus process channel e.g. **PDC FieldBus M->S1.**.

The variable **Control word 1** can generally be connected to another fieldbus process channel or to the drive parameter **Wcomp** or to **PAD16.**

The default configuration is shown in the table below:

Input	Description	Default source
CAM A	Cam A input	Null (*)
CAM B	Cam B input	Null (*)
Input Upper Limit	Upper limit input	Dig input 1X
Input Lower Limit	lower limit input	Dig input 2X
Input Slow Upper Limit	Slow upper limit input	Dig input 1X
Input Slow Lower Limit	Slow lower limit input	Dig input 2X
Input Contactor Feedback	Contactor feedback input	Run Cont Mon
Input Brake Feedback	Brake feedback input	Brake cont mon
Input Door Open	Door open input	Door Open Mon
Input Door Feedback	Door feedback input	Null

(*) ***CAM A and CAM B*** must **always** be selected ***Null*** and must **always** be connected to the **freeze** inputs of the encoder expansion card.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.1	**11054**	Cam Upper Limit		ENUM		1	0	4	RW	FVS

This parameter allow to define how many floors is positioned the sensor before the upper floor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.2	**11056**	Cam Below Limit		ENUM		1	1	4	RW	FVS

This parameter allow to define how many floors is positioned the sensor before the bottom floor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.3	**11094**	Brake release sel		ENUM		Null			RW	FVS

Manual brake release command selection.
Enables source selection list:

6000 Null
6002 One
12250 B0 Lift decomp
12252 B1 Lift decomp
12254 B2 Lift decomp

12256 B3 Lift decomp
12258 B4 Lift decomp
12260 B5 Lift decomp
12262 B6 Lift decomp
12264 B7 Lift decomp
12266 B8 Lift decomp
12268 B9 Lift decomp
12270 B10 Lift decomp
12272 B11 Lift decomp
12274 B12 Lift decomp
12276 B13 Lift decomp
12278 B14 Lift decomp
12280 B15 Lift decomp
1110 Digit input E
1210 Digit input 1X
1212 Digit input 2X
1214 Digit input 3X
1216 Digit input 4X
1218 Digit input 5X
1220 Digit input 6X
1222 Digit input 7X
1224 Digit input 8X
1226 Digit input 9X
1228 Digit input 10X
1230 Digit input 11X
1232 Digit input 12X
3702 Run cont mon
3706 Down cont mon
3708 Brake cont mon
3714 Door open mon
99 Fw + Rev (the function is activated by engaging the Jog Forward and Backward commands at the same time)

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.4	**11104**	Brake release type		ENUM		0			RW	FVS

Selection of contactors to be commanded during the manual brake release manoeuvre.

0: Brake Only the brake contactor is controlled.
1: Brake+Run The brake and run contactors are controlled.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.5	**11252**	Brake fbk A3 sel		ENUM		1	1	4	RW	FVS

Selection of the alarm Brake out of service. The alarm function is disabled by default.
Selection list for the enabling source:

6000 Null
6002 Uno
12250 BO Lift decomp
12252 B1 Lift decomp
12254 B2 Lift decomp
12256 B3 Lift decomp
12258 B4 Lift decomp
12260 B5 Lift decomp
12262 B6 Lift decomp
12264 B7 Lift decomp
12266 B8 Lift decomp
12268 B9 Lift decomp
12270 B10 Lift decomp

12272 B11 Lift decomp
12274 B12 Lift decomp
12276 B13 Lift decomp
12278 B14 Lift decomp
12280 B15 Lift decomp
1110 Digit input E
1210 Digit input 1X
1212 Digit input 2X
1214 Digit input 3X
1216 Digit input 4X
1218 Digit input 5X
1220 Digit input 6X
1222 Digit input 7X
1224 Digit input 8X
1226 Digit input 9X
1228 Digit input 10X
1230 Digit input 11X
1232 Digit input 12X
3702 Run cont mon
3706 Down cont mon
3708 Brake cont mon
3714 Door open mon

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.6	**11272**	Fast Enable sel		ENUM		6002			RW	FVS

This parameter enables the Fast Enable Command at the Digital Input 7. The Digital Input 7 ingress must be driven by the controller. This function must be enabled in case of contactorless operation mode.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.7	**11500**	Cam A sel		ENUM		6000			RW	FVS

Setting of the source for the Cam A input **"EPC INPUT LIST":**

1110 Digit input E
1210 Digit input 1x
1212 Digit input 2x
1214 Digit input 3x
1216 Digit input 4x
1218 Digit input 5x
1220 Digit input 6x
1222 Digit input 7x
1224 Digit input 8x
1226 Digit input 9x
1228 Digit input 10x
1230 Digit input 11x
1232 Digit input 12x
3728 PAD 15
6000 Null
6002 One
15 Mon Digit input 13x
16 Mon com contactor
19 Mon contatt discesa
17 Brake cont mon
18 Mon open door
19 Mon contact down direction
20 B0 Lift decomp
21 Lift decom1 B1
22 Lift decom1 B2

23 Lift decom1 B3
24 Lift decom1 B4
25 Lift decom1 B5
26 Lift decom1 B6
27 Lift decom1 B7
28 Lift decom1 B8
29 Lift decom1 B9
30 Lift decom1 B10
31 Lift decom1 B11
32 Lift decom1 B12
33 Lift decom1 B13
34 Lift decom1 B14
35 Lift decom1 B15
37 Lift decom2 B0
38 Lift decom2 B1
39 Lift decom2 B2
40 Lift decom2 B3
41 Lift decom2 B4
42 Lift decom2 B5
43 Lift decom2 B6
44 Lift decom2 B7
45 Lift decom2 B8
46 Lift decom2 B9
47 Lift decom2 B10
48 Lift decom2 B11
49 Lift decom2 B12
50 Lift decom2 B13
51 Lift decom2 B14
52 Lift decom2 B15

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.8	**11502**	Cam B sel		ENUM		6000			RW	FVS

Setting of the source for the Cam B input:
"EPC INPUT LIST"

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.9	**11504**	Upper Limit sel		ENUM		1210			RW	FVS

Setting of the source for the Upper Limit input:
"EPC INPUT LIST"

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.10	**11506**	Lower Limit sel		ENUM		1212			RW	FVS

Setting of the source for the Lower Limit input:
"EPC INPUT LIST"

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.11	**11508**	Slow upper limit sel		ENUM		1210			RW	FVS

Setting of the source for the Slow Upper Limit input:
"EPC INPUT LIST"

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.12	**11510**	Slow Lower Limit sel		ENUM		1212			RW	FVS

Setting of the source for the Slow Lower Limit input:
"EPC INPUT LIST" see PAR 11500.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.13	**11512**	Contactor Fbk sel		ENUM		16			RW	FVS

Setting of the source for the counter feedback input:
"EPC INPUT LIST" see PAR 11500.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.14	**11514**	Brake Fbk sel		ENUM		17			RW	FVS

Setting of the source for the brake feedback input:
"EPC INPUT LIST" see PAR 11500.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.15	**11516**	Door Open sel		ENUM		18			RW	FVS

Setting of the source for the Door Open input:
"EPC INPUT LIST" see PAR 11500.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.16	**11518**	Door Fbk sel		ENUM		6000			RW	FVS

Setting of the source for the Door Feedback input:
"EPC INPUT LIST" see PAR 11500.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.17	**11530**	Control Word 1		ENUM		0			RW	FVS

Setting of the source for the Control Word 1 input:

0 FieldBus M->S1
1 FieldBus M->S2
2 FieldBus M->S3
3 WComp
4 PAD16

ATTENTION! Enabling parameter 11098 will block selection of PAD16

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.18	**11532**	Control Word 2		ENUM		1			RW	FVS

Setting of the source for the Control Word 2 input:

1 FieldBus M->S1
2 FieldBus M->S2
3 FieldBus M->S3
4 WComp
5 PAD16

ATTENTION! Enabling parameter 11098 will block selection of PAD16

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.19	**11534**	Delay acq time	ms	INT		0	0	1000	RW	FVS

Setting of the delay time for sending the slowdown signal.
The value of this parameter is used to compensate for the distance covered during the delay time between the passage of the cabin on the slowdown sensor and receipt of the decelerate command by the drive. At high speeds this distance can have significant values: e.g. with a cabin travelling at 2 m/s and a delay time of 30 ms, the distance covered and to be taken into consideration during the deceleration phase is 6 cm.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.20	**11538**	Enable freeze		BIT		ON			RW	FVS

Enable encoder freeze

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.21	**11582**	Cam filter		UINT32		0	0	100	RW	FVS

Filter setting for acquisition of cam status.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.22	**12206**	Control Word 1 Mon		UINT32		0			R	FVS

The status of the inputs is displayed as a hexadecimal value, see the description of "Lift control word1" for the meaning of each bit

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.23	**12210**	Control Word 2 Mon		UINT32		0			R	FVS

The status of the inputs is displayed as a hexadecimal value, see the description of "Lift control word2" for the meaning of each bit

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.24	**12216**	Command Input mon1		UINT32		0			R	FVS

The status of the comand1 inputs are displayed as hexadecimal values:

Par.	signal	description
Bit0	EnableCmd	
Bit1	Start FwdCmd	
Bit2	Start RevCmd	
Bit3	JogFwdCmd	
Bit4	JogRevCmd	
Bit5	Null	
Bit6	ContFbk	
Bit7	BrakeFbk	
Bit8	DoorOpen	
Bit9	DoorFbk	
Bit10	EmergencyMode	
Bit11	EPCCycle0Cmd	
Bit12	UpperLimit	
Bit13	LowerLimit	
Bit14	EPCSelfStudyCmd	
Bit15	EPCFloorCallCmd	

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.25	**12218**	Command Input mon2		UINT32		0			R	FVS

The status of the comand2 inputs are displayed as hexadecimal values:

Par.	signal	description
Bit0	EPCForwardCmd	
Bit1	EPCReverseCmd	
Bit2	LandASt	
Bit3	LandBSt	
Bit4	UpperLimitSt	
Bit5	LowerLimitSt	
Bit6	SlowUpperLimitSt	
Bit7	SlowLowerLimitSt	
Bit8	EPCMaintenanceCmd	
Bit9	EPCSelfLevelling	
Bit10	BatterySel	

Bit11	BatteryRun	
Bit12	Null	
Bit13	Null	
Bit14	Null	
Bit15	Null	

05.07 – LIFT OUTPUTS

Lift control output signals are connected directly to the PAD parameters. See table in chapter 6.6 Outputs.
The set of lift output signals is comprised in two LiftStatusWords, see chapter 6.7.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.1	11450	Sel Status Word1		ENUM		0			RW	FVS

Setting of the source for "lift status word 1":
0 Pad11
1 Pad12

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.2	11452	Sel Status Word2		ENUM		1			RW	FVS

Setting of the source for "lift status word 2":
0 Pad11
1 Pad12

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.3	11098	Enable preopen door		BOOL		Off			RW	FVS

Enables the output command to preopen door on digital output, the signal is reported on Pad16.

ATTENTION!
By enabling this parameter, it is no longer possible to select “Pad16” for parameters 11530 and 11532.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.4	12030	Status Word 1		UINT32		500			R	FVS

Status word 1 is displayed as a hexadecimal value, see the description of "lift status word 1" for the meaning of each bit

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.5	12214	Status Word 2		UINT32		0			R	FVS

Status word 2 is displayed as a hexadecimal value, see the description of "lift status word 2" for the meaning of each bit

05.08 – LIFT MONITOR

This menu contains some display parameters that are useful for verifying correct control functioning.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.1	12010	Calculation Mode		INT16		0			R	FVS

The calculation mode is displayed:

0 Direct mode
1 Mechanical data

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.2	12012	Actual spd reference	m/s	FLOAT		0.0000			R	FVS

The current speed reference value is displayed in m/s

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.3	12028	Actual spd reference	rpm	FLOAT		0.0000			R	FVS

The current speed reference value is displayed in rpm

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.4	12084	Rated Torque	Nm	FLOAT		-	-	-	R	FVS

The nominal torque value is displayed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.5	12090	Trip Number		INT32		0.0000			R	FVS

The number of strokes performed by the control device is displayed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8.6	12242	Actual cabin spd	m/s	FLOAT					R	FVS

Display current speed value in m/s

05.09 – LIFT ALARMS

The MdPlc application for ADL300 manages and generates the following alarms:

Alarm	Type of EPC alarm	Description
Plc1 fault	Contactor feedback	Contactor feedback signal error
Plc2 fault	Brake feedback	Brake feedback signal error
Plc3 fault	Door feedback	Door feedback signal error
Plc4 fault	Data Base Alarm	Restricted
Plc5 fault	Calc Alarm	Restricted
Plc6 fault	Speed Limit	Speed limit exceeded
Plc7 fault	Upper down Limit	Rephaser alarm
Plc8 fault	Floor Alarm	Floor not reached in position

All alarms envisage a parameter used to configure the action performed after the alarm has been activated.
Action: used to set the action to be taken after the alarm has been generated as follows.

Action

Ignore The alarm is not inserted in the alarm list, it is not inserted in the alarm log, it is not signalled on the digital outputs, the drive commands are not modified.

Warning The alarm is inserted in the alarm list, it is inserted in the alarm log, it is signalled on the digital outputs, the First alarm data is updated, the Alarm active data is updated, the drive commands are not modified.

Disable The alarm is inserted in the alarm list, it is inserted in the alarm log, it is signalled on the digital outputs, the First alarm data is updated, the Alarm active data is updated, the Stop command is sent and the motor is disabled and stops due to inertia.

Stop The alarm is inserted in the alarm list, it is inserted in the alarm log, it is signalled on the digital outputs, the First alarm data is updated, the Alarm active data is updated, the Stop command is sent. The drive moves to zero speed with the maximum current possible. The drive is disabled when the **Speed 0 delay** signal is enabled.

Fast Stop The alarm is inserted in the alarm list, it is inserted in the alarm log, it is signalled on the digital outputs, the First alarm data is updated, the Alarm active data is updated, the Stop command is sent. The drive moves to zero speed with the maximum current possible. The drive is disabled when the **Speed 0 delay** signal is enabled.

Lift Stop The drive moves to zero speed with the set ramp time. The drive is disabled when zero speed is reached. Once the drive has been disabled the alarm is inserted in the alarm list, it is signalled to the digital outputs.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.1	**11268**	Reset Brake Alarm		Short		0	***	***	RW	FVS

This command is a reset of the **Brake Alarm**.
Procedure to reset:
1. Go to menù 5.9 LIFT ALARMS, check if the **Brake Alarm** is ON.
2. Go to parameter 11268 **Reset Brake Alarm** (default 0).
3. The system requires a code, type the code **5313** to unblock the alarm.
4. Go to menù 5.9 LIFT ALARMS, check if the Brake Alarm is OFF.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.2	**11560**	Floor Alarm Activity		INT16		0	0	5	RW	FVS

Setting of the behaviour of the drive if the "**Floor alarm**" is present. This alarm indicates that the correct sequence for cams A and B cannot be found upon arrival at the floor in case of an internal positioning device.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast Stop
5 Lift Stop

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.3	**11562**	Lim Activity		INT16		1	0	5	RW	FVS

Setting of the behaviour of the drive if the "**Limit**" alarm is present. This alarm indicates that the car has exceeded the upper and lower limits defined by the rephasers (upper/lower limit) or the phaser signal has been lost during a run.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast Stop
5 Lift Stop

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.4	**11564**	Door Activity		INT16		1	0	5	RW	FVS

Setting of the behaviour of the drive if the **Door Feedback** alarm is present. This alarm indicates that feedback has not been received to confirm door opening.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast Stop
5 Lift Stop

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.5	**11566**	Contactor Activity		INT16		1	0	5	RW	FVS

Setting of the behaviour of the drive if the **Contactor Feedback** alarm is present. This alarm indicates that feedback has not been received to confirm contactor closing.

0 Ignore
1 Warning

2 Disable
3 Stop
4 Fast Stop
5 Lift Stop

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.6	**11568**	Brake Activity		INT16		1	0	5	RW	FVS

Setting of the behaviour of the drive if the **Brake Feedback** alarm is present. This alarm indicates that feedback has not been received to confirm brake opening/closing.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast Stop
5 Lift Stop

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.7	**11572**	Brake run hold off		INT16		1	0	1	RW	FVS

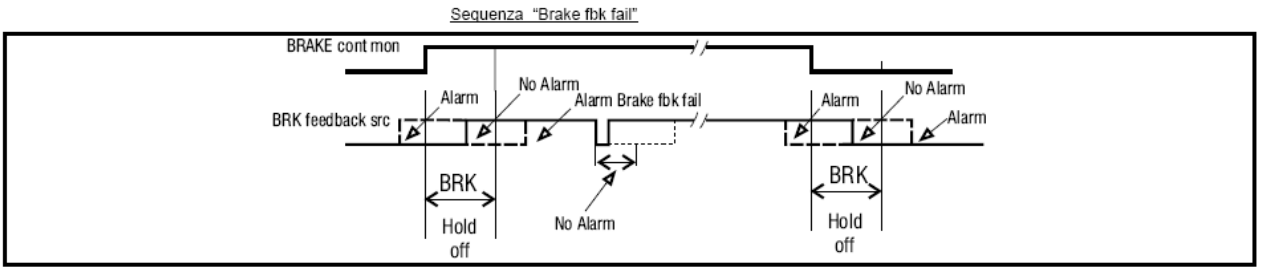
Setting of the behaviour of the drive upon detecting the possible **Brake Feedback** alarm.

0 Ignore
1 Warning

If set to 0 the brake feedback alarm is signalled immediately.
If set to 1 the possible brake feedback alarm is signalled at the end of the travel: this allows the lift car to reach the floor in case of a faulty brake status signal.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.8	**11574**	Brake hold off	ms	INT16		1000			RW	FVS

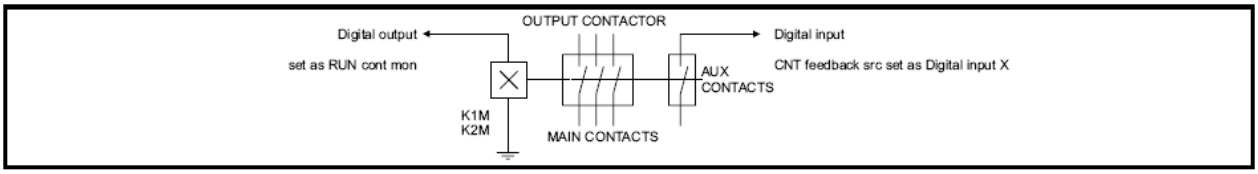
Setting of the delay between the signalling of the **Brake Feedback** alarm condition and activation of the alarm. If an alarm condition occurs, the drive will wait for the set time before activating the alarm. If the alarm is removed within the time set in this parameter, the drive will not activate it.



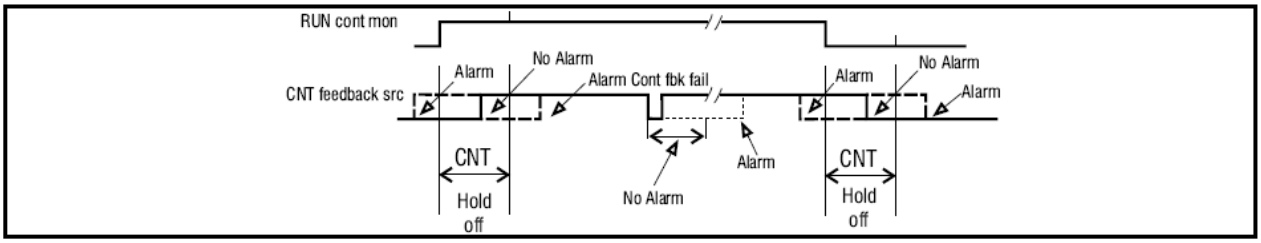
Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.9	**11576**	Cont hold off	ms	INT16		1000			RW	FVS

Setting of the delay between the signalling of the **Contactor Feedback** alarm condition and activation of the alarm. If an alarm condition occurs, the drive will wait for the set time before activating the alarm. If the alarm is removed within the time set in this parameter, the drive will not activate it.

Configurazione tipica contattore

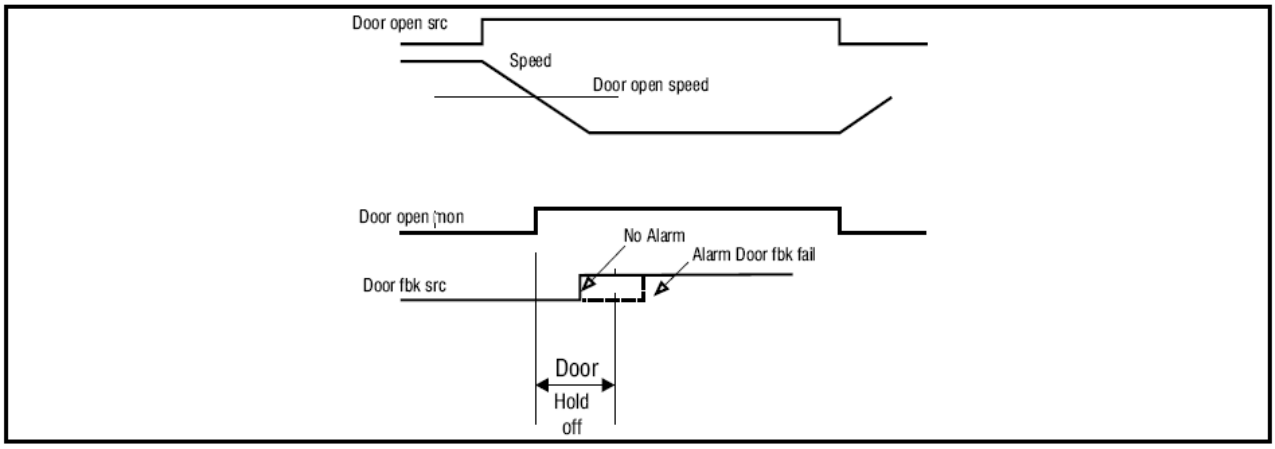


Sequenza "Cont fbk fail"



Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.10	**11578**	Door Hold off	ms	INT16		1000			RW	FVS

Setting of the delay between the signalling of the **Door Feedback** alarm condition and activation of the alarm. If an alarm condition occurs, the drive will wait for the set time before activating the alarm. If the alarm is removed within the time set in this parameter, the drive will not activate it.



Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.11	**12190**	On Speed Limit On		BIT		OFF			R	FVS

Rephaser alarm status.

05.10 – FLOOR COMMANDS

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.1	**11088**	IP Signal Time	ms	INT16		100	50	4000	RW	FVS

A digital signal is sent to the Output 3708 (see menu 5.7 INPUT/OUTPUT Outputs Table) in case of Synchronous motors, and to the bit 11 **Lift Status Word** in case of asynchronous motors, when the elevator go through each floor. In this way is possible to track by a signal the passage of the car through a floor. The duration of this signal is configurable by this parameter.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.2	**11106**	Cam length	m	FLOAT		0.2000	0	2.0	RW	FVS

Length setting for a single floor cam.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.3	**11440**	Number of floors		INT16		7	1	15	RW	FVS

Number of floors

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.4	**11442**	Floor Call Source		ENUM		0	0	3	RW	FVS

Setting of the source for the floor call command:

0 Digital Input
1 Parameter
2 Fieldbus -> MS3

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.5	**11444**	Floor call		UINT16		0	1	15	RW	FVS

Floor call setting parameter. Active if the floor call source is selected as "Parameter"

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.6	**12048**	Floor Destination		UINT16		0			R	FVS

The destination floor value is displayed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.10.7	**12062**	Numero Piano		UINT16		0			R	FVS

The number of floors is displayed.

05.11 – STATUS

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.11.1	**12146**	EPC Status		INT16		0			R	FVS

The EPC status is displayed. The following values are possible:

0	Ready	
1	jog forward	
2	jog Reverse	
3	Zero Cycle	1 of 2
31	Zero Cycle	2 of 2
4	SelfStudy	1 of 2
41	SelfStudy	2 of 2
5	Floor Call	
51	Floor call reverse	
52	Floor call Forward	
6	Forward	
61	Forward command	2 of 3
62	Forward command	3 of 3
7	Reverse	
71	Reverse command	2 of 3
72	Forward command	3 of 3
8	stop normal	
9	Revelling	
91-191	revelling floor call reverse	
92-192	revelling floor call forward	
10	Battery Run	
101	Battery Run Reverse	
102	Battery Run Forward	

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.11.2	**12148**	PosReady		BOOL		OFF			R	FVS

Positioning device ready status is displayed.
On if the following condition is true:

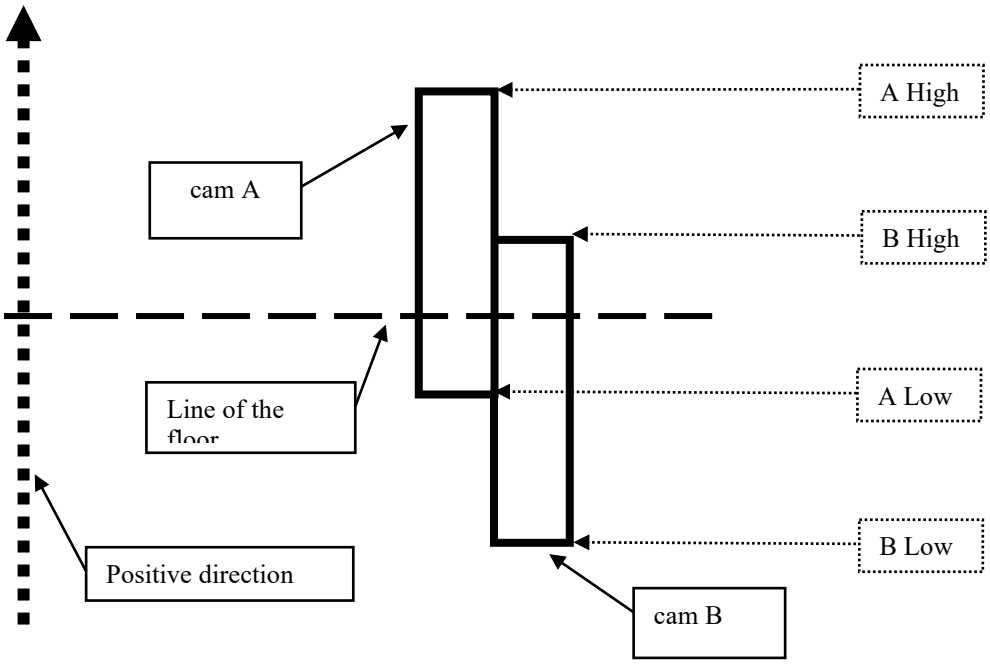
vEPCStatus = 0	*(ready)*
and	
ZeroFound	*(zero cycle executed)*
and	
SelfStudyOk	*(Self study executed)*
and	
sysDriveOk = ON	*(Drive not in alarm condition)*

05.12 – FLOOR ARRAY

The Self Study command is used to detect the position of the cams that indicate the position of the floors in the lift shaft. These positions are detected automatically by performing a series of movements. The following positions are stored for each floor: A Low, B Low, A High, B High, calculated floor line and any corrections to be applied to the floor line.
The values read in this phase are stored in the parameters contained in this menu.
No direct floor call or movement commands are possible (except jog and zero cycle) unless a Self Study command has been correctly executed.

Position of cams floors 0 to 63

n		B Low	A High
Floor number		Position of lower edge of cam B	Position of upper edge of cam A
#		m	m



Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.12.1	**11048**	Correction Fwd	m	FLOAT		0.0000			RW	FVS

When the car moves from the lower floor to the upper floor, this parameter makes it possible to set - for each selected floor (see parameter 11066) - compensation of the difference between the expected car stopping level and the level at which the car actually stops.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.12.2	**11050**	Correction Rev	m	FLOAT		0.0000			RW	FVS

When the car moves from the upper floor to the lower floor, this parameter makes it possible to set - for each selected floor (see parameter 11066) - compensation of the difference between the expected car stopping level and the level at which the car actually stops.

Menu	Par	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Mod
5.12.3	**11066**	Floor Selection		INT		0	0	31	RW	FVS

Used to select the floor for which to set the maximum and minimum cam heights (with parameters 11074 and 11076) and floor level offsets (with parameters 11048 and 11050).

Menu	Par	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Mod
5.12.4	**11074**	Floor Upper Limit	m	FLOAT		0.0000			RW	FVS
5.12.5	**11076**	Floor Lower Limit	m	FLOAT		0.0000			RW	FVS

By these two parameters, for each floor (selected by parameter 11066,) is possible to set the position respectively of the upper edge (A High) of Cam A and lower edge (B Low) of Cam B (see picture at page 47).

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.12.6	**15206**	FloorCallSel		INT16		0			R	FVS

Floor selected with current selection.

05.13– REALIGNMENT

The lift car is not mechanically integral with the motor pulley and the lift cables could, for a variety of mechanical reasons, slip on the motor pulley. This means the position of the car could change with respect to that calculated by the control unit using the encoder on the motor, causing misalignments. These can result in incorrect positioning of the car with respect to the floor. To overcome these problems the control device features the following realignment functions:

- Static realignment.
- Dynamic realignment.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.13.1	**11008**	Realign at floor		BOOL		OFF			RW	FVS

This parameter enables the arrival to the selected destination floor in case the car for some reason stops before. This function enable the drive to lead the car to the selected destination floor.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.13.2	**11116**	Static Enable		BOOL		OFF			RW	FVS

Enabling of static realignment.

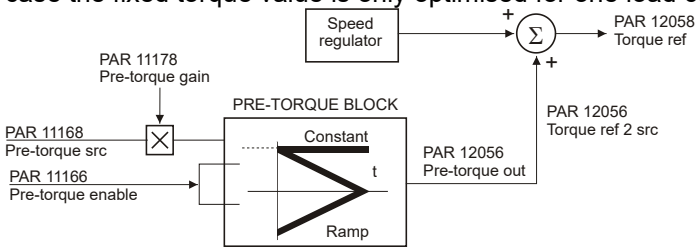
Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.13.3	**11118**	Dynamic Enable		BOOL		OFF			RW	FVS

Enabling of dynamic realignment.

05.14 – PRE-TORQUE

The Pre-torque function is helpful for ensuring smooth starts with no initial acceleration. This is done by setting the torque to a value corresponding to the load before releasing the brake. The initial torque applied to the motor and the direction of the torque that is applied can be supplied by fitting a load cell on the lift car. The signal from the load cell is acquired via an analog input and appropriately scaled if the pre-torque function is used.

If no load cell is available, a fixed torque value can be used, supplying only the direction of torque. In this case the fixed torque value is only optimised for one load condition.



Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.1	**11166**	Pre-torque Enable		BIT		0	0	1	RW	F

Enabling of the pre-torque function
0 Off
1 On

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.2	**11168**	Pre-torque Source		INT16		11170	0	2	RW	F

Selection of the origin (source) of the signal to be used for the pre-torque function.

11170 Init pretorque
1600 AnalogInp1
1650 AnalogInp2
4034 FieldbusM->S2
4044 FieldbusM->S3
4054 FieldbusM->S4
4064 FieldbusM->S5
4074 FieldbusM->S6
4084 FieldbusM->S7
4094 FiledbusM->S8
4104 FieldbusM->S9
4114 FieldbusM->S10
4124 FieldbusM->S11
4134 FieldbusM->S12
4144 FieldbusM->S13
4154 FieldbusM->S14
4164 FieldbusM->S15
4174 FieldbusM->S16

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.3	**11170**	Init pre-torque		INT32		1000			RW	F

Setting of the reference value for the pre-torque function only if the **pre-torque Source** parameter is set to 0. The value set in this parameter only enables the pre-torque function to be optimised for one load condition. By using the fieldbus to modify the setting of this parameter, the pre-torque function can also be optimised for different loads.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.4	**11172**	Pre-torque ramp up	ms	INT32		0	0	10000	RW	F

Setting of the torque value ramping-up time (before the brake is released): if this parameter is set to zero the feed-forward torque value is maintained constant throughout the travel.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.5	**11174**	PreTorque Ramp down	ms	INT32		0	0	60000	RW	F

Setting of the torque value ramping-down time: if this parameter is set to zero the feed-forward torque value is maintained constant throughout the travel.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.6	**11176**	Pre-Torque Offset		FLOAT		0			RW	F

Setting of the offset applied to the pre-torque function input reference.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.7	**11178**	Pre-torque Gain		FLOAT		1			RW	F

Setting of the gain value used to convert the value applied to the analog input into the torque value to be used in the function. This gain value is calculated automatically according to the weights and inertias that are entered. Ideally the reference should be set so that the minimum value corresponds to the empty lift car and the maximum value corresponds to the lift car at full load.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.8	**12034**	Pre-torque Input	perc	INT32		0			ER	F

The reference value sampled at start-up is displayed.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.9	**12058**	Torque reference	perc	INT32		0			ER	F

The torque reference value is displayed, given by the sum of the speed loop output and the torque feed-forward.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14.10	**12078**	Pre-torque out	perc	INT32		0			ER	F

The value of the feed-forward torque output of the pre-torque function is displayed.

05.15 – SELF STUDY

The Self Study command is used to detect the height of the cams indicating the position of the floors in the lift shaft. The control system detects these positions automatically, by performing a series of movements. This command should only be executed when installing the control system or moving the floor identification cams.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.15.1	**12152**	Self Study Cam Stat		INT16		0			R	FVS

Display of the Self Study command
0: Self Study procedure initialization, after the zero search has been performed, the car starts in the positive direction at the Self Study speed.
1: Self Study procedure in progress, waiting to reach cam B on the last floor.
3: An error occurred during the Self Study procedure.
4: If the system has only 2 floors, after running the zero-search, the car starts in the negative direction to search for the cam A lower limit on floor zero.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.15.2	**12168**	Self Study Stat		INT16		0			R	FVS

The Self Study command status is displayed

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.15.3	**12186**	Self Study Ok		Bool		OFF			R	FVS

Indicates whether the Self Study command has been executed correctly.
On = command executed correctly.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.15.4	**12188**	Self Study On		Bool		OFF			R	FVS

The Self Study command execution status is displayed.
On = command being executed.

05.16 – ZERO CYCLE

The zero cycle command is used to initialise the lift encoder counter and the floor counter. When the initialisation procedure is complete, if the floor levels are operational, it executes a floor 0 positioning operation.

The zero cycle is a sequence used to:

- Initialise the motor incremental encoder.
- Initialise the floor counter function performed by the realignment cams.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.16.1	**12154**	Zero Found		Bool		OFF			R	FVS

Indicates whether the Self Study command has been executed correctly.
On = command executed correctly.

Menu	Par	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.16.2	**12170**	Cycle Status 0		INT16		0			R	FVS

The zero cycle command status is displayed. The following values are possible:

0: check whether cams are engaged
1: movement in positive direction
2: movement in negative direction
3: Awaiting entry into cam A
4: entered cam A

05.17 – LIFT SERVICE

This menu is RESERVED TO WEG SERVICE ONLY.
Users are required to avoid any modification.

6. CONFIGURATION OF INPUT/OUTPUT COMMANDS

6.1 Introduction

This section describes the management of signals, input commands (control words) and output commands (status words). These signals can be used to manage the application with a lift control system using a limited number of I/Os and the processing channels of a fieldbus such as CANopen.

6.2 Fixed allocated inputs

The Enable input and inputs for reading the sensors of the floor counter cams A and B are allocated to fixed positions and cannot be reallocated:

Signal name	Card	Terminals		Remarks
En-Hw	I/O Exp	EN-HW	DI-CM	Enable drive hardware input
Cam A	Encoder Exp	2	3	Input F1 (freeze 1) Encoder exp.
Cam B	Encoder Exp	1	3	Input F2 (freeze 2) Encoder exp.

6.3 Reallocatable inputs

The inputs described in the table below can be allocated at will and individually using a selector in the **5.6 LIFT INPUTS** menu.
The selection list can be used to select from among the following options for each single input:

- Null or One
- Digital Inputs of the I/O expansion card
- Some internal signals (e.g. “Brake cont mon” ..)
- A selectable “LiftDecomp1” bit (e.g. “Lift decom1 B0”)
- A selectable “LiftDecomp2” bit (e.g. “Lift decom2 B0”)
- PAD15

In I/O configuration they are connected to digital inputs
In CANopen configuration they are connected to the LiftDecomp connected in turn for instance via the variable **Control word 1** to a fieldbus process channel e.g. **PDC FieldBus M->S1.**.

The variable **Control word 1** can generally be connected to another fieldbus process channel or to the drive parameter **Wcomp** or to **PAD16.**

The default configuration is shown in the table below:

Input	Description	Default source
CAM A	Cam A input	Null
CAM B	Cam B input	Null
Input Upper Limit	Upper Limit input	Dig input 1X
Input Lower Limit	Lower Limit input	Dig input 2X
Input Slow Upper Limit	Slow Upper Limit input	Dig input 1X
Input Slow Lower Limit	Slow Lower Limit input	Dig input 2X
Input Contactor Feedback	Contactor feedback input	Run Cont Mon
Input Brake Feedback	Brake feedback input	Brake cont mon
Input Door Open	Door open input	Door Open Mon
Input Door Feedback	Door feedback input	Null

6.4 Input commands

The input commands described in the table below can be allocated at will and individually using a selector in the **5.5 LIFT COMMANDS** menu.
The selection list can be used to select from among the following options for each single command:

- Null or One
- Digital Inputs of the I/O expansion card
- Some internal signals (e.g. “Brake cont mon” ..)
- A selectable “LiftDecomp1” bit (e.g. “Lift decom1 B0”)
- A selectable “LiftDecomp2” bit (e.g. “Lift decom2 B0”)
- PAD15

In I/O configuration the commands are connected to digital inputs
In CANopen configuration they are connected to the LiftDecomp connected in turn for instance via the variable **Control word 2** to a fieldbus process channel e.g. **PDC FieldBus M->S2.**.

The variable **Control word 2** can generally be connected to another fieldbus process channel or to the drive parameter **Wcomp** or to **PAD16.**

The default configuration is shown in the table below:

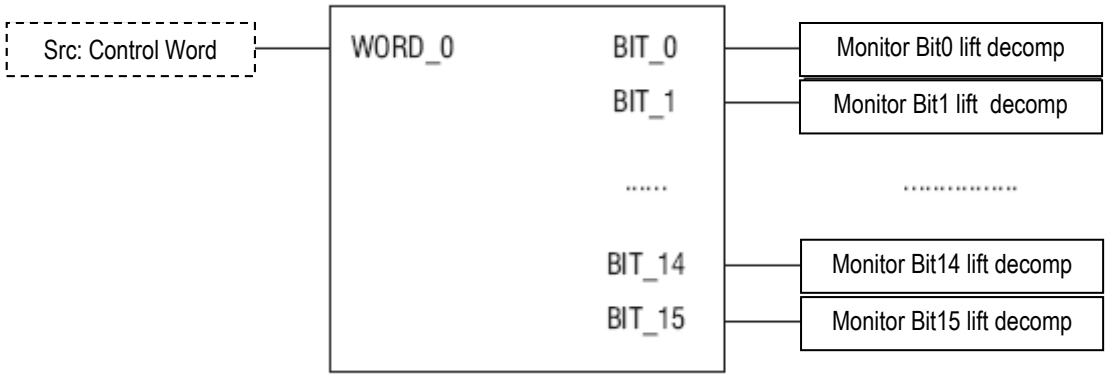
Input	Description	Default source
Enable	Enable command	Enable digital input
Floor Call	Floor call command	Dig input 6X
Cycle 0	Zero cycle command	Dig input 4X
Self study	Self study command	Dig input 5X
Jog Fwd	Jog forward command	Dig input 7X
Jog Rev	Jog reverse command	Dig input 8X
Realignment	Realignment command	Dig input 9X
Forward	Forward command	Null
Reverse	Reverse command	Null
Stop	Stop command	Null
Maintenance	Maintenance command	Null
Battery Mode	Battery Mode command	Dig input 3X
Battery Run	Battery Run command	Dig input 3X
Floor 0	Floor command bit 0	Dig input 10X
Floor 1	Floor command bit 1	Dig input 11X
Floor 2	Floor command bit 2	Dig input 12X
Floor 3	Floor command bit 3	Null

6.5 Example of Control Word Composition

A signal can generally be connected to a normal or expanded digital input, some internal signals and a bit of the Lift Decomp word bit. With the EPC application, two Decomp word bits are used:

- **Control word 1 is the input of decomp lift word bit 1**
- **Control word 2 is the input of decomp lift word bit 2**

Selection of the origin (source) of the word to be used for "**Decomp word**" block decoding. Each bit that is part of the word to be decoded is associated with an 'output channel of the "**Decomp work**" block. The variables that can be used for this function can be selected from among those listed in the "**L_WDECOMP**" selection list.



This control word in the example is connected to a PDC process channel so that:

- **[1530[Control Word 1 = FieldBus M->S1**
- **[1532] Control Word 2 = FieldBus M->S2**

In some specific cases control word 1 or 2 can be connected to the "WComp" drive parameter or to a **PAD parameter** (PAD16).
In this example the single bits of the two control words have the following meaning:

CONTROL WORD1 (SelLiftWdecInp):

Bit	Description	Remarks
0	**CAM A**	Cam A input
1	**CAM B**	Cam B input
2	**Input Upper Limit**	Upper Limit input
3	**Input Lower Limit**	Lower Limit input
4	**Input Slow Upper Limit**	Slow Upper Limit input
5	**Input Slow Lower Limit**	Slow Lower Limit input
6	Free	
7	Free	
8	Free	
9	Free	
10	Free	
11	Free	
12	Free	
13	Free	
14	Free	
15	Free	

The Master Can composes and manages the single bits as appropriate.

CONTROL WORD2 (SelLiftWdecInp1):

Bit	Description	Remarks
0	**Enable**	Enable command
1	**Floor Call**	Floor call command
2	**Cycle 0**	Zero cycle command
3	**Self study**	Self study command
4	**Jog Fwd**	Jog forward command
5	**Jog Rev**	Jog reverse command
6	**Realignment**	Realignment command
7	**Forward**	Forward command
8	**Reverse**	Reverse command
9	**Stop**	Stop command
10	**Maintenance**	Maintenance command
11	**Battery Mode-Run**	Battery Mode-Run command
12	**Floor 0**	Floor command bit 0
13	**Floor 1**	Floor command bit 1
14	**Floor 2**	Floor command bit 2
15	**Floor 3**	Floor command bit 3

	Floor command			
	Bit 3	**Bit 2**	**Bit 1**	**Bit 0**
Floor 0	0	0	0	0
Floor 1	0	0	0	1
Floor 2	0	0	1	0
Floor 3	0	0	1	1
Floor 4	0	1	0	0
Floor 5	0	1	0	1
Floor 6	0	1	1	0
Floor 7	0	1	1	1
Floor 8	1	0	0	0
Floor 9	1	0	0	1
Floor 10	1	0	1	0
Floor 11	1	0	1	1
Floor 12	1	1	0	0
Floor 13	1	1	0	1
Floor 14	1	1	1	0
Floor 15	1	1	1	1

6.6 Outputs

Lift control output signals are connected directly to the PAD parameters according to the table below:

Par.	signal	description
PAD1	LiftEnable	Lift enable command
PAD2	RunCont	Close contactor command
PAD3	UpCont	Up contactor command
PAD4	DownCont	Down contactor command
PAD5	BrakeCont	Brake command
PAD6	LiftDcBrake	DC brake function command
PAD7	Brake2	Brake control signal
PAD8	WdecompOut	Word decomp output
PAD9	LiftStart	Lift start command
PAD10	Floor Number	Floor number
PAD11	Lift status word1	Contains the copy of StatusWord1 (can be selected using *SelLiftStatWord1*)
PAD12	Lift status word2	Contains the copy of StatusWord2 (can be selected using *SelLiftStatWord2*)
PAD13	DestFloor	Destination
PAD14	Ramp Down	Ramp to reduce current to zero
PAD15	SC cont mon	Command to close short circuit contactor
PAD16	*LiftWdecInp*	*Connected to the LifWDecomp selector*

In this mode they can be accessed from the selection lists and thus easily used to configure the relay and digital outputs of the drive. (see the PADS menu for configuration).
The set of lift output signals is comprised in two LiftStatusWords. A selector enables the two status words to be connected to Pad 11 or 12 or to fieldbus S ->M1 or S -> M2.

6.7 Status Word Composition

The set of lift output signals has been composed in two LiftStatusWords, connected respectively to Pad 11 and Pad 12. Possible selections also include the process channels of fieldbus S ->M1 or S -> M2.

Lift Status word 1:

Bit	Description	Remarks
0	LiftEnable	Lift enable command.
1	RunCont	Run command contactor
2	UpCont	Up command contactor
3	DownCont	Down command contactor
4	BrakeCont	Brake command contactor
5	LiftDcBrake	DC brake function command (firmware)
6	Brake2	Brake control signal (See sequences)
7	DoorOpen	Open door command
8	Drive OK	Indicates drive not in alarm condition
9	SpeedIsZero	Indicates speed below the 0 threshold
10	SpeedRefIsZero	Indicates speed reference below the 0 threshold
11	IPOutput	
12	SC cont mon	Short-circuit command contactor
13		
14		
15		

Lift Status word 2:

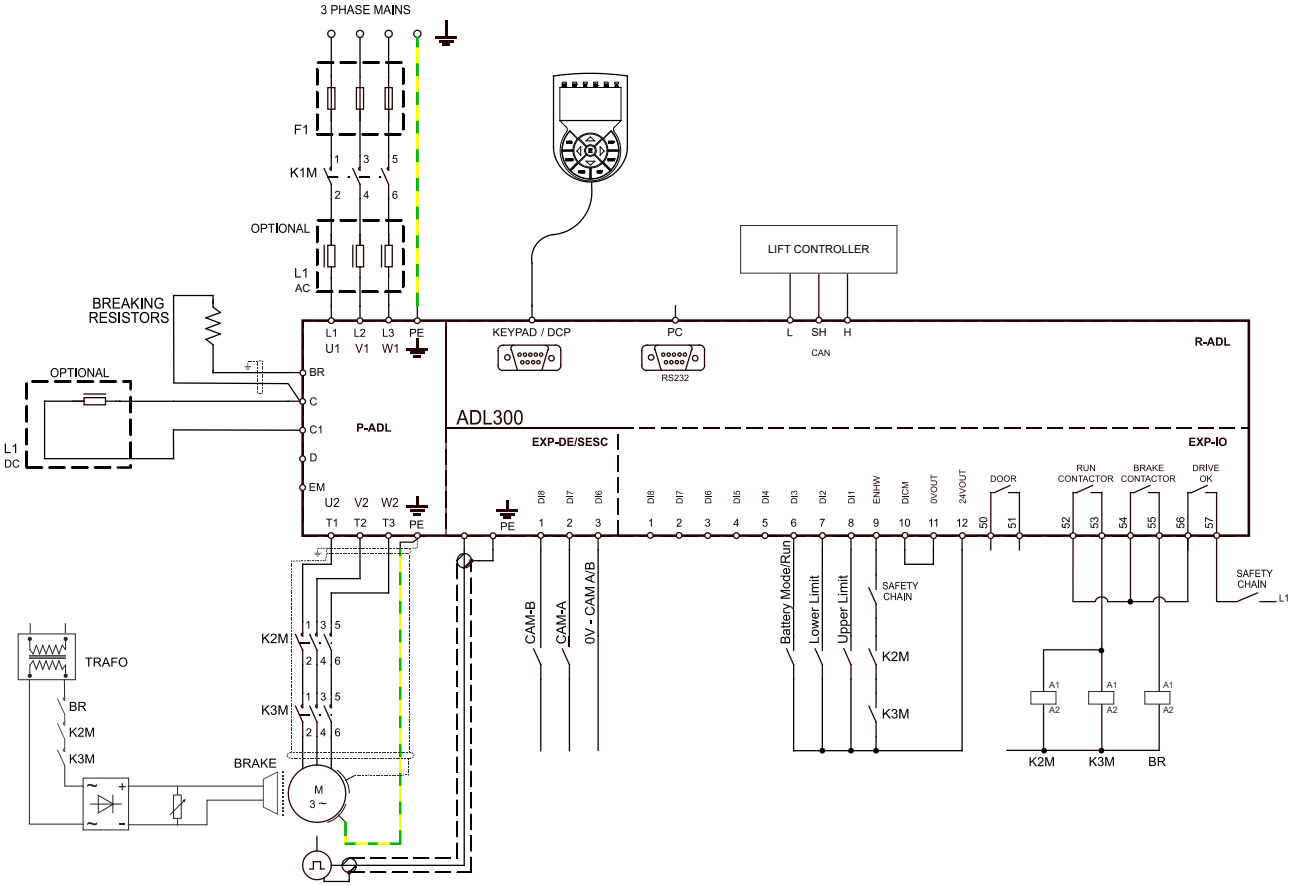
Bit	Description	Remarks
0	Floor Command	Floor call command being executed
1	SelfStudyOn	Self study command being executed
2	SelfStudyOk	Self study command OK
3	StartCycle0	Zero cycle command being executed
4	ZeroFound	Zero cycle command OK
5	PosReady	Positioning device ready
6	Battery Sel	Battery fwd
7	Battery Run	Battery rev
8	RESERVED	Reserved for next stop
9	RESERVED	Reserved for battery mode run
10	AtFloor	Lift at floor
11	PassingBP1	Passing Brake Point
12	PassingBP2	Passing Brake Point
13	UpContMon	
14	DownContMon	
15	DoorOpenMon	

7. REMOTE CONTROL OR VIA I/O

7.1 Introduction

This section describes how to configure the digital inputs and outputs of the ADL300 drive with EPC application. It includes an example of I/O connection and another of how to send command signals via fieldbus.
The source of each signal can, however, always be selected separately using parameters, thus also making different configurations possible (e.g. Menu 05.05 "Lift Command" or 05.06 "Lift Inputs").

7.2 Example of Control via Digital I/Os



The table below shows the factory settings for this example:

Commands:

Input	Description	Default source
Enable	Enable command	Enable digital input
Floor Call	Floor call command	Dig input 6X
Cycle 0	Zero cycle command	Dig input 4X
Self study	Self study command	Dig input 5X
Jog Fwd	Jog forward command	Dig input 7X
Jog Rev	Jog reverse command	Dig input 8X
Realignment	Realignment command	Dig input 9X
Forward	Forward command	Null

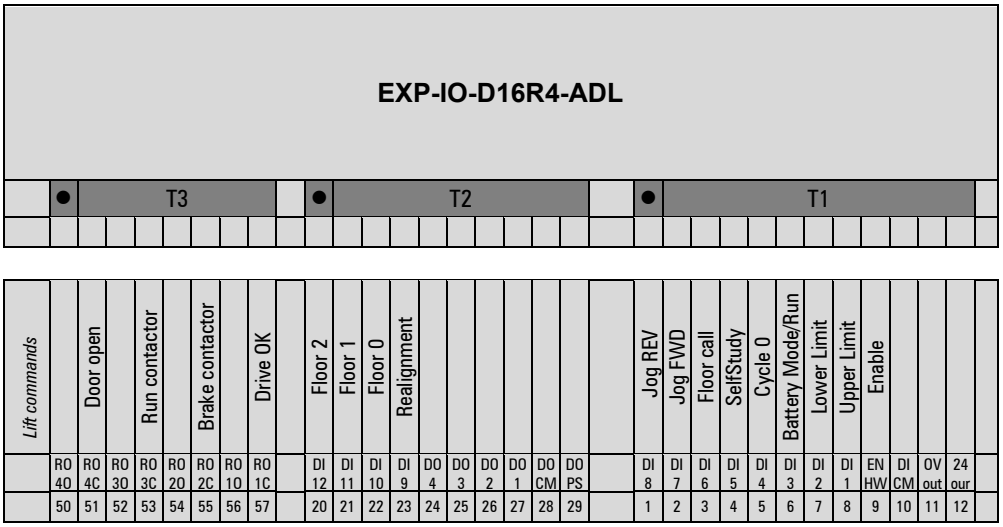
Reverse	Reverse command	Null
Stop	Stop command	Null
Maintenance	Maintenance command	Null
Battery Mode	Battery Mode command	Dig input 3X
Battery Run	Battery Run command	Dig input 3X
Floor 0	Floor 0 command	Dig input 10X
Floor 1	Floor 1 command	Dig input 11X
Floor 2	Floor 2 command	Dig input 12X
Floor 3	Floor 3 command	Null
Floor 4	Floor 4 command	Null

Inputs:

Input	Description	Default source
CAM A	Cam A input	Null
CAM B	Cam B input	Null
Input Upper Limit	Upper Limit input	Dig input 1X
Input Lower Limit	Lower Limit input	Dig input 2X
Input Slow Upper Limit	Slow Upper Limit input	Dig input 1X
Input Slow Lower Limit	Slow Lower Limit input	Dig input 2X
Input Contactor Feedback	Contactor feedback input	Run Cont Mon
Input Brake Feedback	Brake feedback input	Brake cont mon
Input Door Open	Door open input	Door Open Mon
Input Door Feedback	Door feedback input	Null

7.2.1 Connection of card EXP–D16R4-ADL:

This example refers to the factory settings as described above.



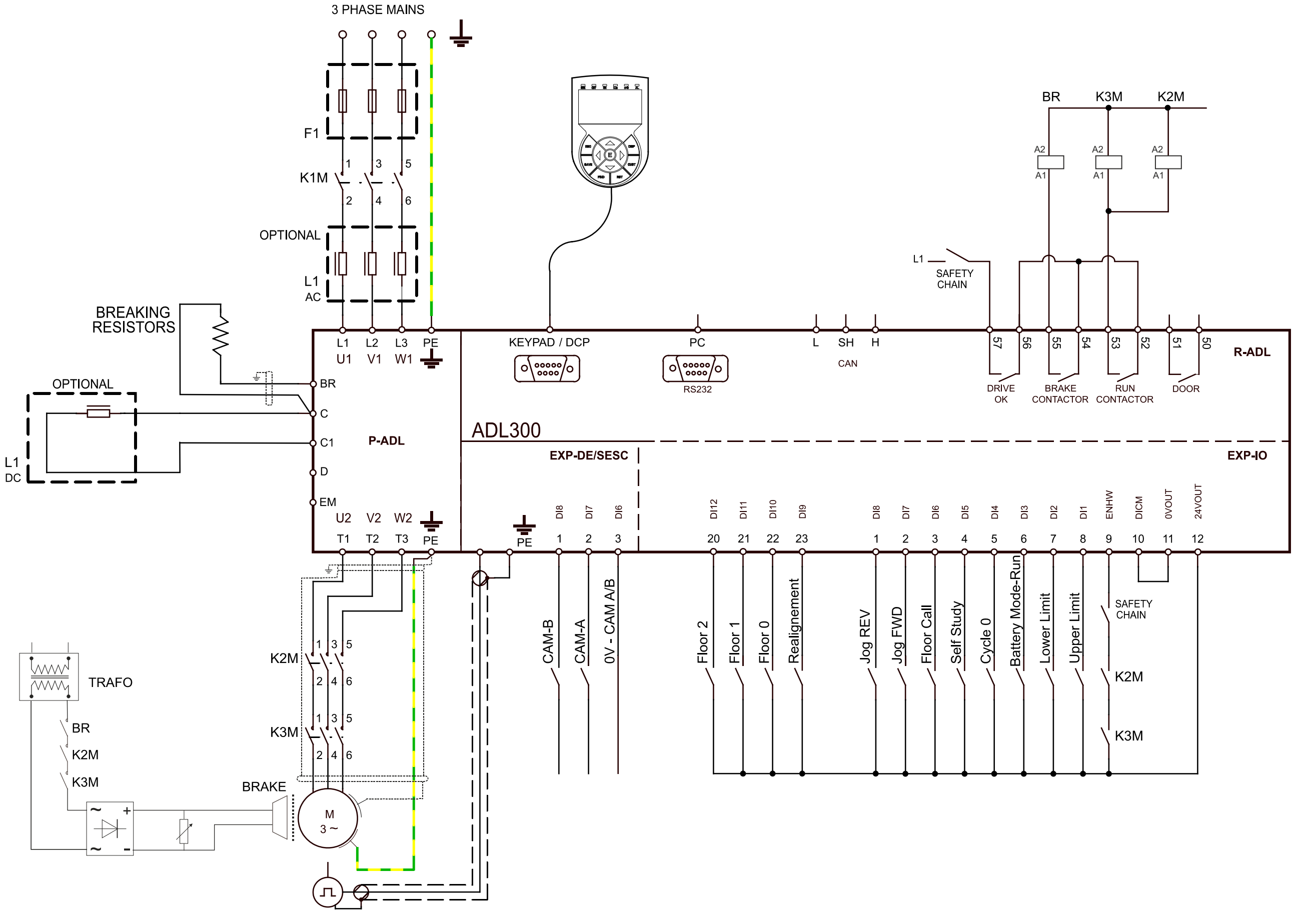
7.2.2 Connection of card EXP–DE-IR1F2-ADL

Connection in case of a digital encoder, normally used in asynchronous mode.
The inputs connected to cam A and B must be allocated to fixed positions!

7.2.3 Connection of card EXP–SESC-IR1F2-ADL

Connection in case of a digital encoder, normally used in synchronous mode.
The inputs connected to cam A and B must be allocated to fixed positions!

7.3 Example of remote control via CANopen



7.3.1 Connection of card EXP–D8R4-ADL:

This example refers to a configuration using four digital inputs.

EXP-IO-D8R4-ADL

T3 | T1

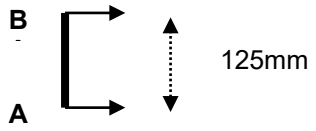
Lift commands		Door open		Run contactor		Brake contactor		Drive OK																			Battery Mode/Run	Lower Limit	Upper Limit	Enable				
	RO 40	RO 4C	RO 30	RO 3C	RO 20	RO 2C	RO 10	RO 1C													DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1	EN HW	DI CM	OV out	24 our	
	50	51	52	53	54	55	56	57													1	2	3	4	5	6	7	8	9	10	11	12	

8. APPENDIX

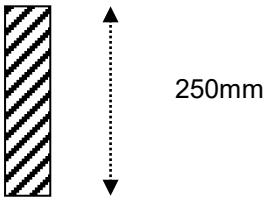
8.1 Appendix A: floor cam

Introduction
Method for obtaining a "spread encoder" using two sensors and a cam.

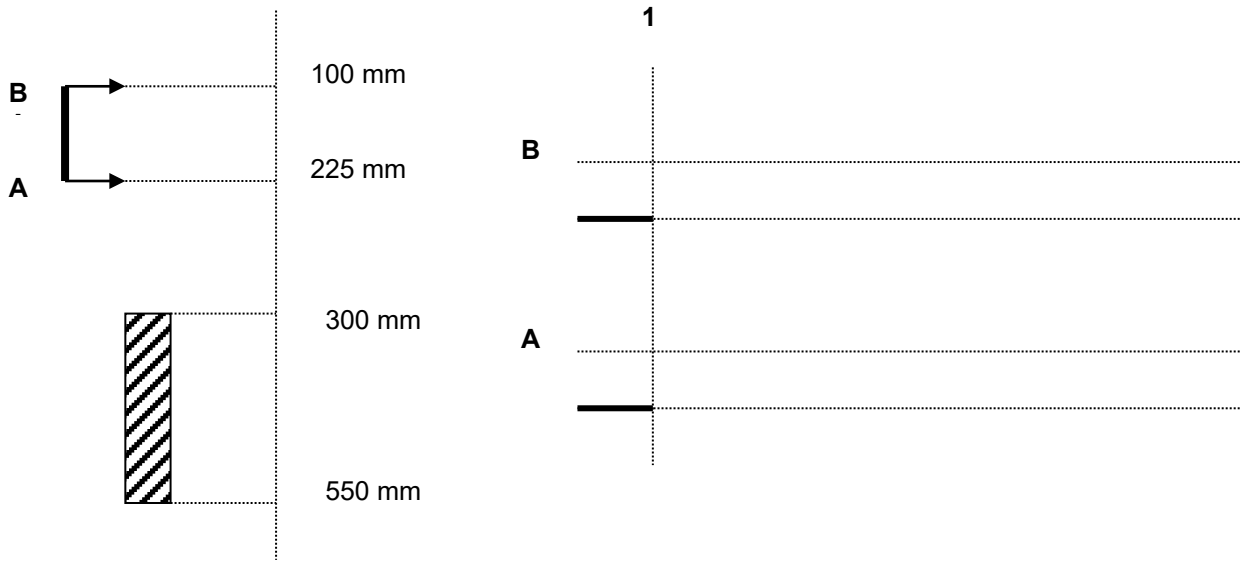
Sensors



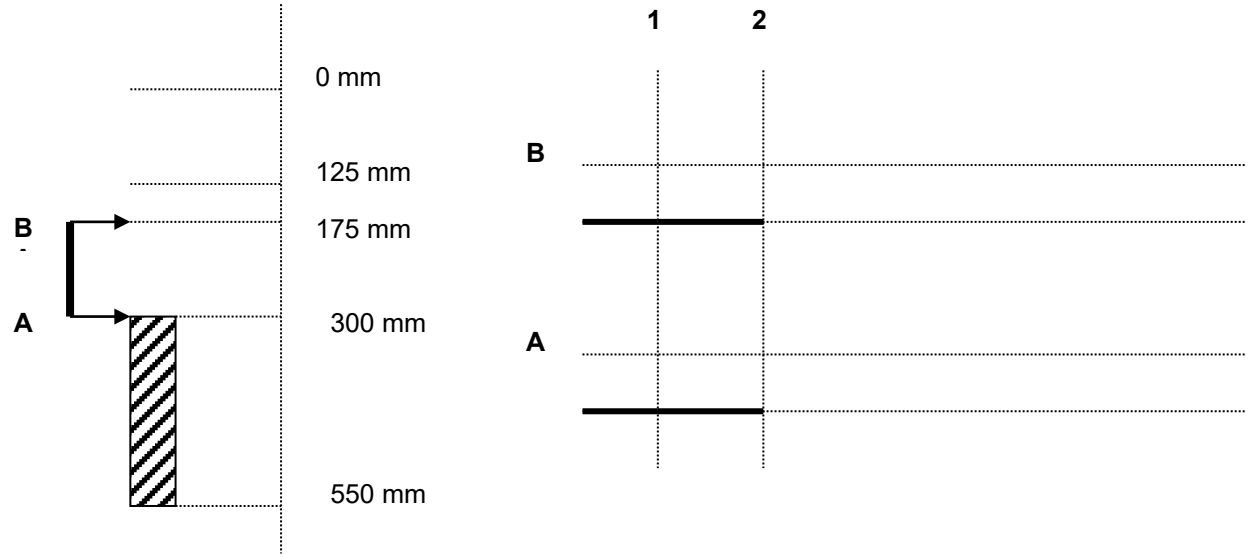
Cam



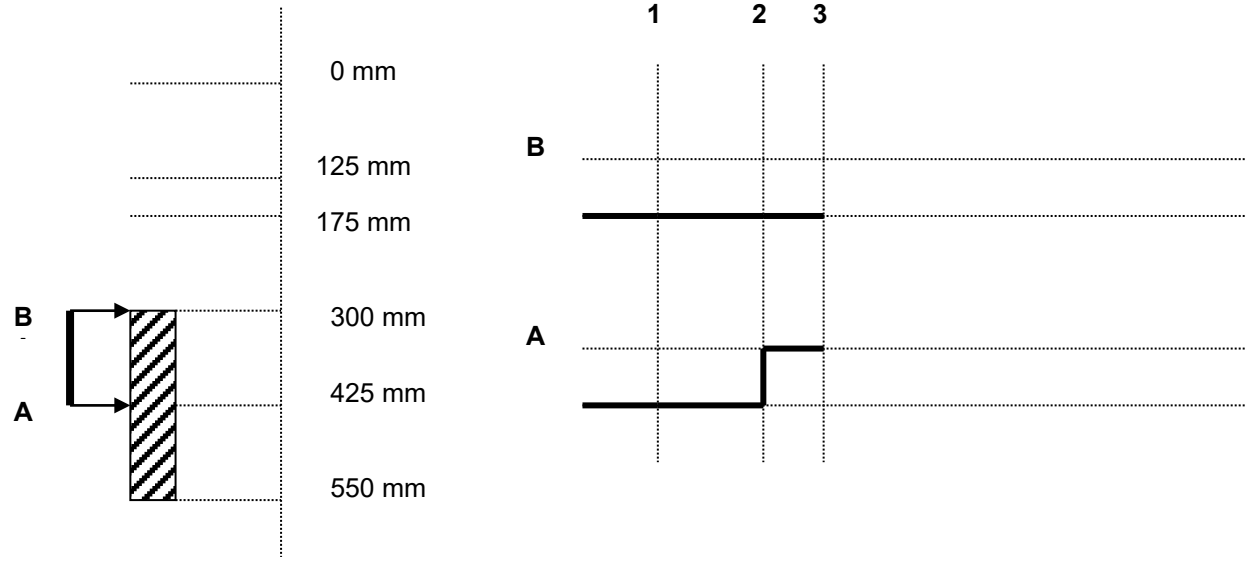
Position 1



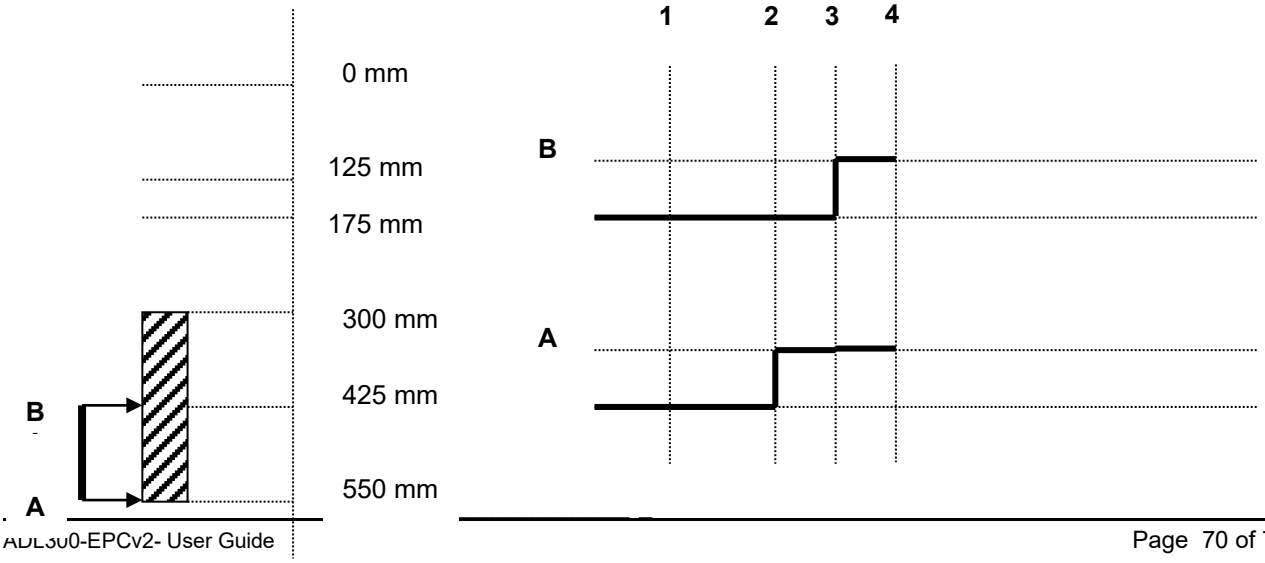
Position 2



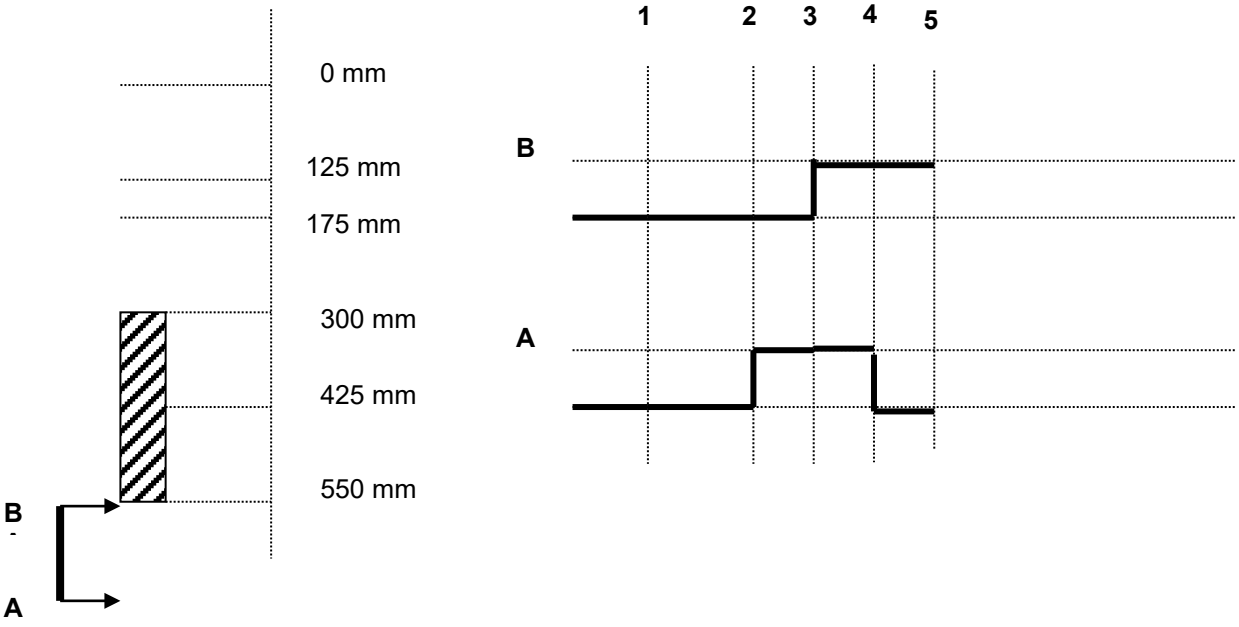
Position 3



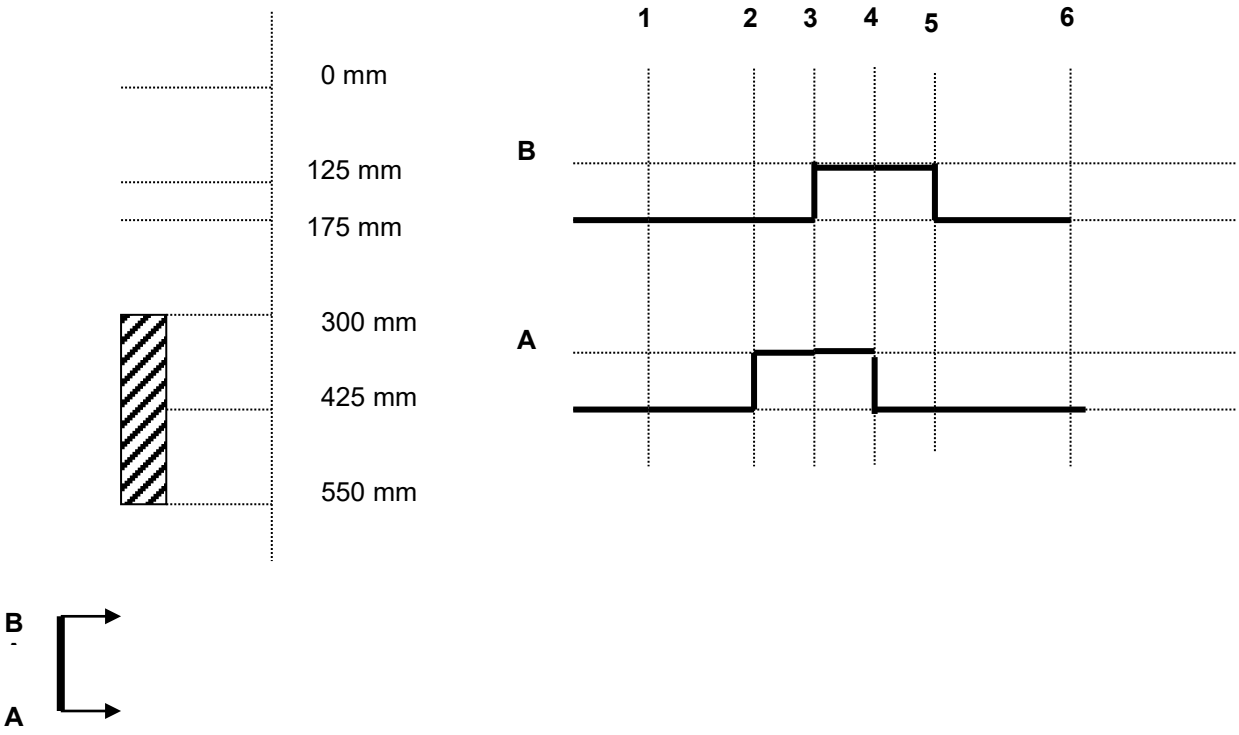
Position 4



Position 5



Position 6



User Guide

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