

## **Complementary VLT® LiftDrive documentation**

### **For use of Safe Stop (STO) in Lift systems**

#### **Preface**

This document is an addition to the equipment documentation for VLT® AutomationDrive and VLT® LiftDrive.  
Subject to technical changes.  
All trademarks mentioned are property of the respective companies.

#### **Function**

Safe Stop with VLT® AutomationDrive and VLT® LiftDrive acts as a replacement for the contactors which are usually installed in lifts between the frequency converter and the motor.  
This function is patented.  
Using Safe Stop ensures that no "rotational field" energy is output from the frequency converter to the motor.

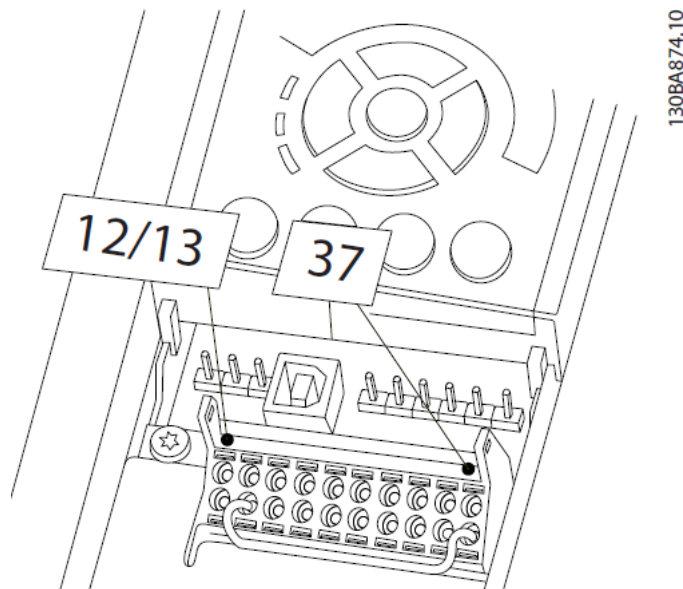


This does not constitute electrical safety. The frequency converter must be disconnected from the supply voltage before working on the cabling or the motor. See the operating instructions for additional waiting times for the discharge of the DC link voltage.

## Preparation



The product is shipped with Safe Stop disabled. The jumper installed between terminals 12 and 37 must be removed to enable this function.



Jumper between Terminals 12/13 (24 V) and Terminal 37

## Environment

Use of Safe Stop requires enclosure rating IP 20 and 5X or higher as the installation environment. Optionally, the unit itself or the control cabinet in which the equipment is installed may have this rating. See the "Type code" section for specific information.

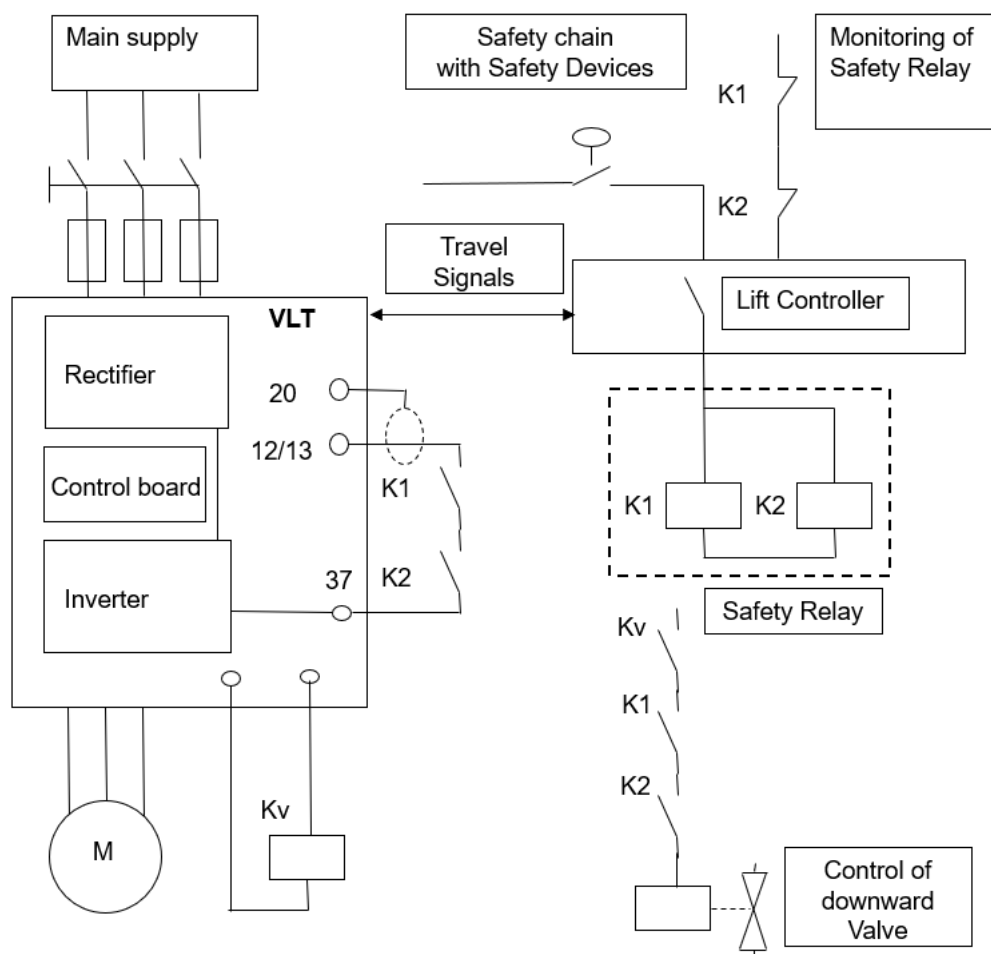
## Installation instructions

Install the device and cabling in accordance with the latest technical standards. Cables which are used for Safe Stop must be protected.

## Components used

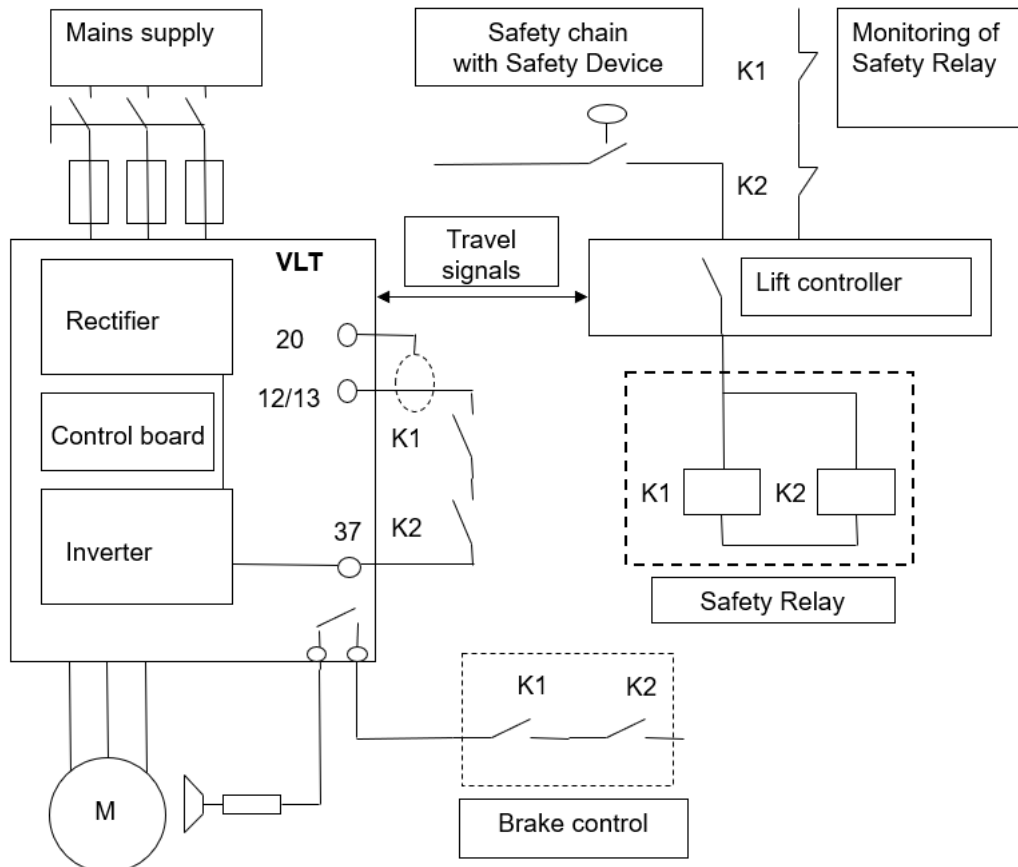
All components related to the use of Safe Stop for lifts must comply with the requirements of EN 81-20 and the specific requirements under "Further information".

## Block diagram valve control



Block diagram valve control of Safe Stop application in lift systems

## Block diagram brake control



Block diagram brake control of Safe Stop application in lift systems

## Further information

### Switching device

Monitoring of the switching device is based on EN81-20 Section 5.9.2.5.4 a. "The voltage on terminal 37 must be interrupted by 2 independent contacts (see block diagram). If the contacts of one of the two relays have not opened, a further start must be prevented no later than the next change of direction."

### Switching element design

In accordance with EN81-20 Section 5.10.3.1.2 b, use category DC-13, Section 5.10.3.1.3 (forcible guidance of the contacts) and section 5.10.3.2.

### Electrical requirements for switching elements

Clearance and creepage distance, IEC 60664-1  
Rated impulse tolerance voltage 4 kV  
Overvoltage category III  
Contamination level 3  
Rated insulation voltage 250 V AV

The cable from terminal 12 to the first switching contact and the return cable from the second switching contact to terminal 37 must be shielded, with the shield connected to terminal 20. The two switching elements must be mounted side by side.

### Electrical requirements for the cable

The requirements of EN 81-20 apply  
Flexible cable, shielded  
Rated voltage  $U_0/U$  300 / 500 V

**Note:** The function of the two independent switching elements can also be implemented with an emergency stop relay in accordance with EN ISO 13849-1 (EN 954-1) Category 4 and EN81-2 Annex H. See the lift control documentation for the functional test procedure.

## **Valve control, Brake control**

The control is based on EN 81-20 Section 5.10.

The supply of power must be interrupted by two independent electrical devices or directly by the safety device. These may be the same device which interrupt the voltage to terminal 37 (Safe Stop). If the contacts of one of the two electrical devices have not opened when the lift is stationary, a further start must be prevented no later than the next change of direction.

## **Device identification, Type code**

Each device is marked with a 39-character type code on the nameplate.

Example: LD-302P5K5T5E20H1BGXXXXSXXXAXBXCXXXXDX

All applicable devices are mentioned in the declaration of conformity and can be used for operation without motor contactors.

## **Functional test**

1. The jumper between the supply voltage terminal 12/13 and terminal 37 must be removed.
2. The switching element (K1, K2) contacts (NO) which are used to drive terminal 37 must be connected in series.
3. If at least one switching element (K1 or K2) is not actuated, the warning LED must light up and the message "Safe Stop" must be displayed.
4. The warning LED is off during travel.



This test is only an aid and does not replace the need for due care when installing and commissioning lift systems.

**History:**

- V 1.00 First version
- V 1.01 Device identification updated
- V 1.02 Functional test paragraph updated; device identification extended
- V 1.03 Change to test instructions
- V 1.04 Changes for new IP 20 frequency converter
- V 1.05 Changes for Frame Size B4, corrections for type code
- V 1.06 Changes for drive identification
- V 1.07 Reference to EN81-20
- V 2.0 Common version for rope- and hydraulic applications