Langer & Laumann®
smart door solutions

# SMART MANUAL

Make it easy!

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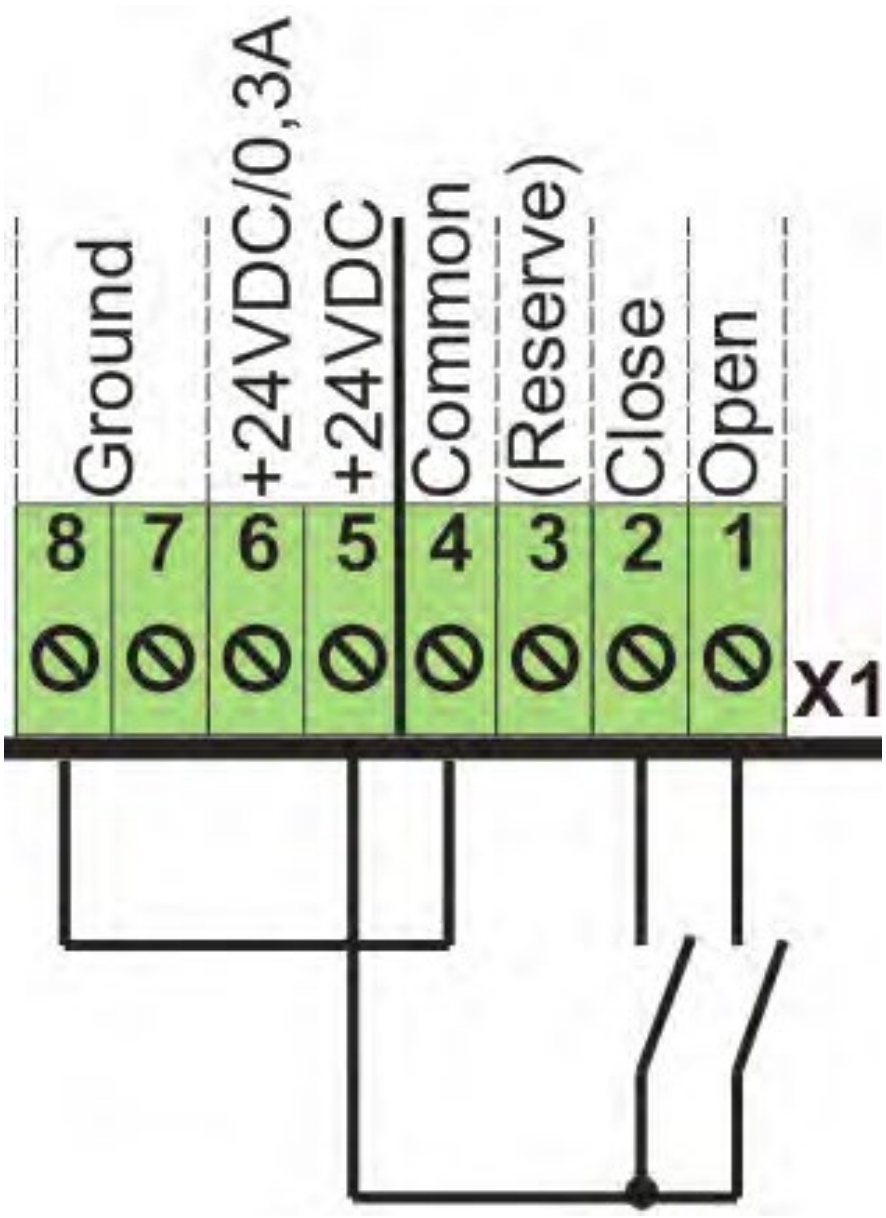
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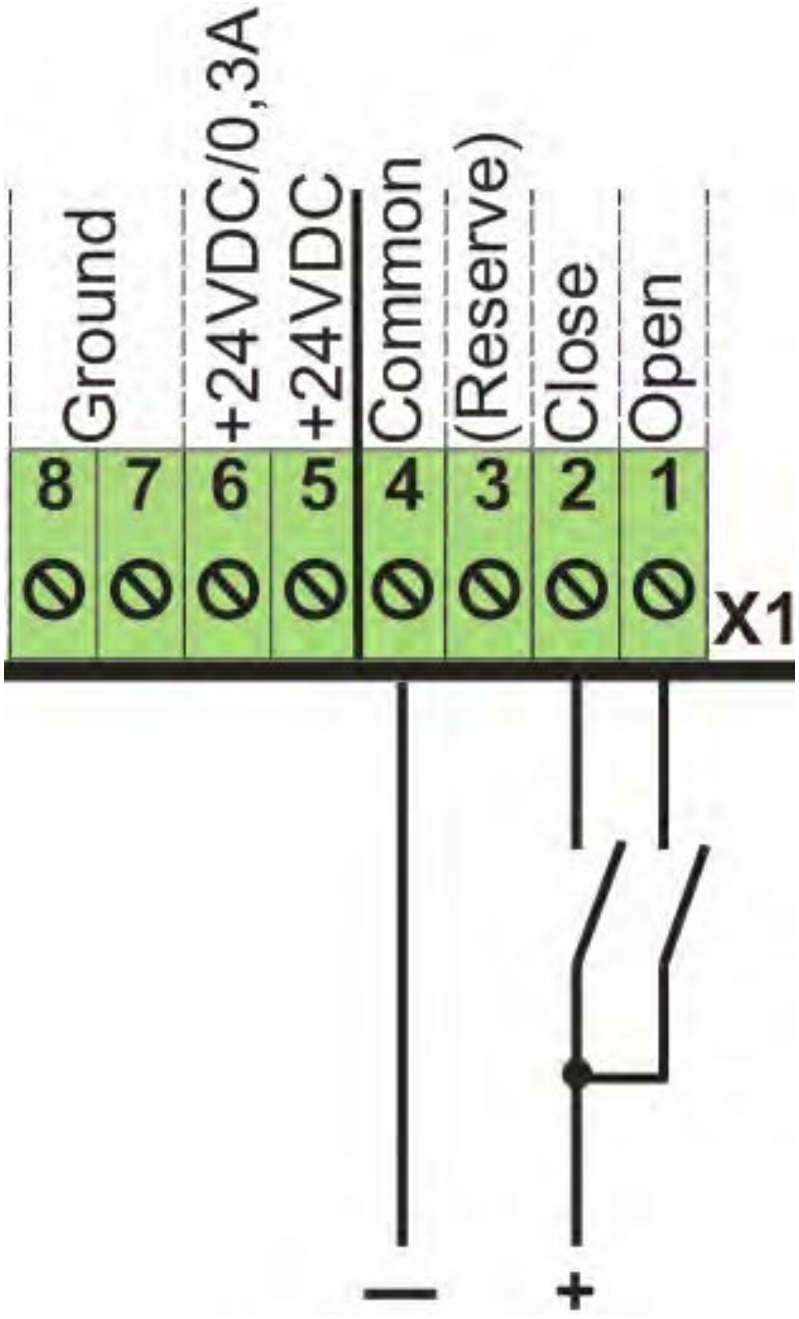
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# 1 Electrical connection

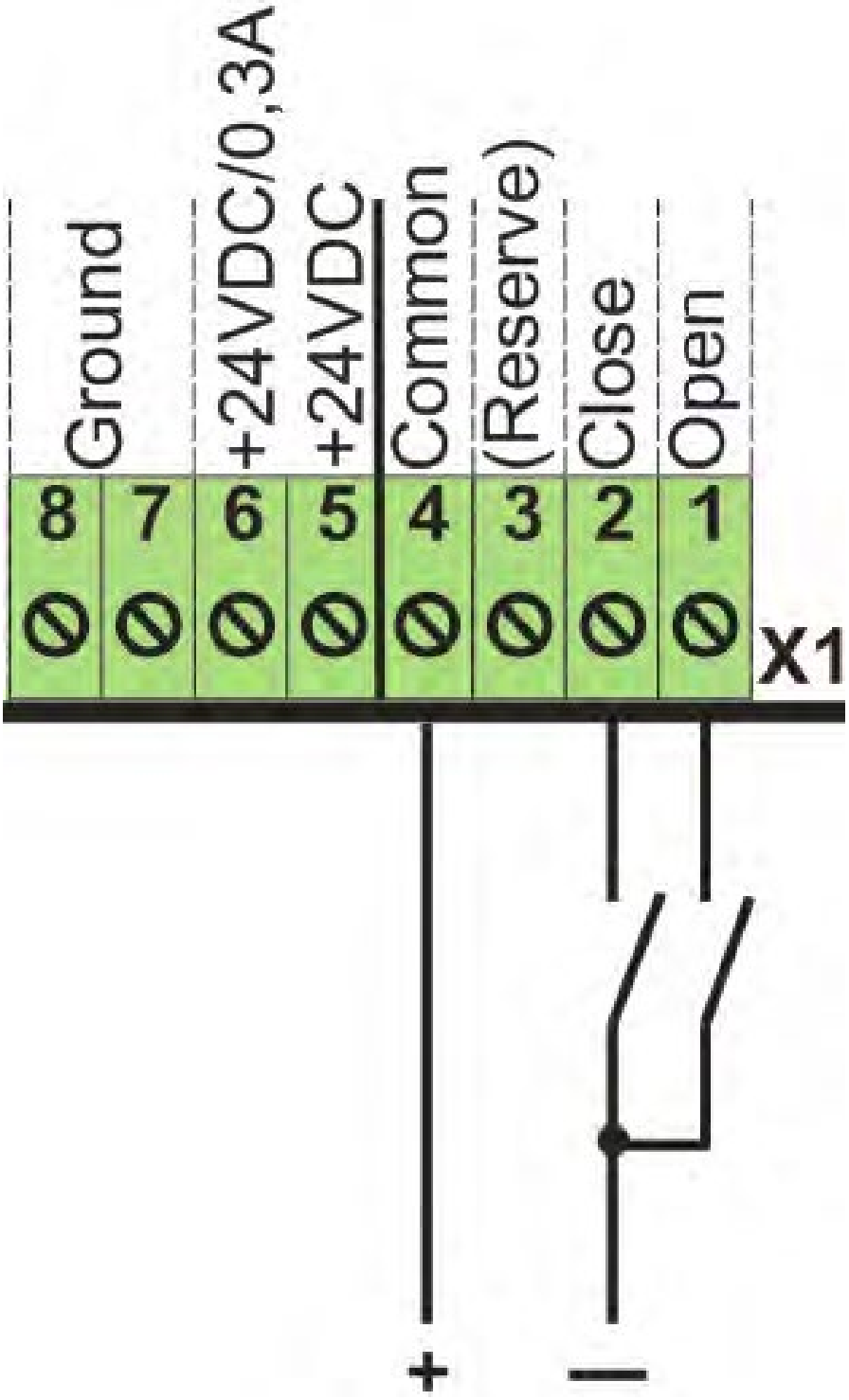
Connection option with internal 24 [VDC] power supply



Connection possibility with external 24 [VDC] + switching



Connection possibility with external 24 [VDC] - switching



# 2 Basics

## The display

| Display | Meaning |
|---|---|
|  | There is no activation. |
|  | The TSG is not calibrated. Manual calibration must be performed.<br><br>If the TSG electronics detects an incorrect motor or an incorrect motor connection, the display flashes and no calibration is possible.<br><br>(see also cap. 7.4 Self-Learn Procedure / page 27). |
|  | Open signal is present (Open). |
|  | Close signal is present (Close). |
|  | Door is opened (Opened). |
|  | Door is closed (Closed). |
|  | Door is obstructed (blocked). |
|  | Intermediate position reached<br>(see also cap. 18.2 Intermediate positions in the travel zone / page 79) |
|  | Reversing range reached<br>(Parameter bd, see also Table 11: b parameters / page 36) |
|  | Triggering light curtain (Light Curtain)<br>(see also section 18.4 Light Curtain Kit / page 81) |
|  | Stop function (see also section 12.3 Stop input / page 54) |

## Operation

By pressing the jog wheel, the TSG switches to the parameter menu.

P0 appears as the first menu item.

Turning the jog dial clockwise increases the parameter menu. Turning the jog dial counter clockwise decreases it.

To see the values of the respective parameter
a short press of the jog wheel is necessary.

## The menu structure

A jog wheel is provided on the TSG electronics for operating and setting the TSG door control unit.

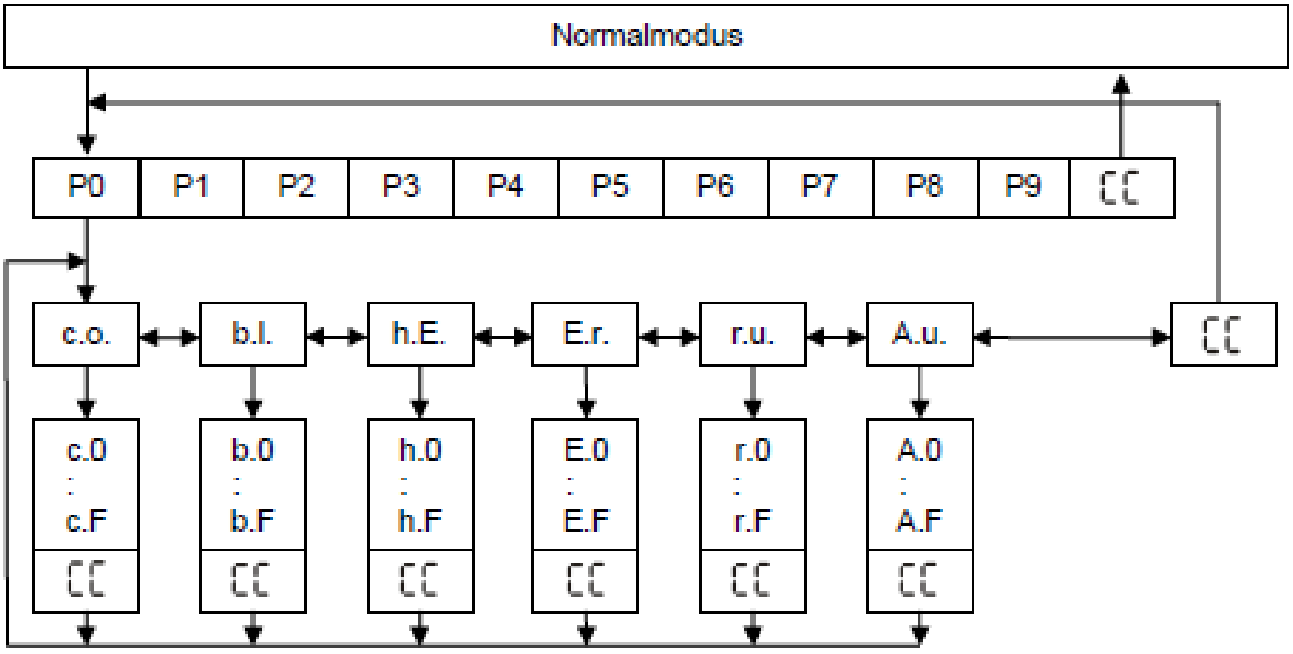
Pressing the jog dial once, from the normal mode, displays the menu starting point P0.

Turning the jog dial clockwise increases the menu items (P1, P2, ...).

Turning the jog dial counter clockwise decreases the menu items.

By pressing the jog wheel, the jump in the respective parameter takes place.

If the jog wheel is turned clockwise until **[CC]** is displayed and the iodine wheel is pressed, the menu is moved back one step or the menu is exited.



# 3 Self-learning procedure

## Preparation

Push the door by hand approximately to the middle of the travel path to start the calibration travel from there.

Disconnect connector X1 (inputs) and connector X2 (relay outputs) or do not connect them to avoid uncontrolled states during and directly after calibration.

Connect the TSG motor cable to terminal strip X4 and the shield clamp of the TSG motor cable to X8 on the TSG electronics. Connect the TSG encoder cable to terminal strip X3 (Sub-D9 connector).

## Calibration process

Switch on the mains voltage on the input side of the TSG door control unit.

Select parameter P9 and hold down the jog wheel for approx. 5 [seconds].

A pre-set value of the total weight of the component to be moved (door leaves, safety guard, ...) appears flashing.

Release the jog wheel. The total weight of the component to be moved (door leaves, safety guard, ...) must be set by turning the jog wheel.

After setting the correct weight, press the jog wheel briefly.

The display **shows**: **[ Ir ]**

By turning the jog wheel in one direction, **the up direction** must be selected **first.**

If the door moves in the closed direction instead of the open direction, the direction of travel of the drive can be changed by turning the jog wheel in the other direction.

Once the door has reached the open position and has been saved, the door automatically moves in the closed direction.

When the closed position is reached and the display shows: **[ cd ].**, the calibration is successfully completed.

The TSG is ready for use, the connectors X1 (inputs) and X2 (relay outputs) can be plugged in.




https://www.youtube.com/watch?v=dC54uQQRR2U

# 4 Manual mode / Manual travel

The manual mode is selected by selecting the parameter **P1.**
The display **[ Hd ]** appears.

By turning the jog dial counter clockwise, the **display [ o ]** appears.
If the jog wheel is pressed and held, the door is moved in the open direction.

By turning the jog dial clockwise, the display **[ C ]...** appears.
If the jog wheel is pressed and held, the door is moved in the CLOSE direction.

Releasing the jog wheel stops the door.

Selecting the **[ Hd ]** display and pressing the jog dial will exit the manual mode.

## NOTICE:

Travel during manual mode corresponds to the same travel behaviour as when control signals are applied to terminals X1.1 or X1.2
(Door Open or Door Closed).

As long as the operator is in manual mode, **no control signals** are accepted at the terminal strip.

# 5 Simple settings P parameters

The P-parameters are for a quick setting of the driving values.

By pressing the jog wheel, the TSG switches to the parameter menu.

P0 appears as the first menu item.

Turning the jog dial clockwise increases the parameter menu. Turning the jog dial counter clockwise decreases it.

To view
the values of the respective parameter, a short press of the jog wheel is necessary.

After setting the value, pressing the jog dial saves the displayed value and exits the parameter.

By selecting **[ CC ]** and pressing the jog dial, the menu jumps back one step.

| | Function | Note | Min | Default | Max | Factor | Unit |
|---|---|---|---|---|---|---|---|
| P0 | Return to special functions | (see also cap.9.2 Advanced menu / page 35) | | | | | |
| P1 | Manual mode | (see also cap. 7.6 Manual mode / manual travel / page 30) | | | | | |
| P2 | Max. Open speed | | 01 | 50 | 99 | 0,01 | [m/s] |
| P3 | Max. Close speed | | 01 | 30 | 99 | 0,01 | [m/s] |
| P4 | Locking and unlocking speed | Creep speed shortly before Door Closed end position | 01 | 05 | P3 | 0,01 | [m/s] |
| P5 | Acceleration and braking in Open direction | | 01 | 07 | 50 | 0,1 | [m/s²] |
| P6 | Acceleration and braking in Close direction | | 01 | 07 | 50 | 0,1 | [m/s²] |
| P7 | Locking and unlocking distance | Creep distance shortly before Door Closed end position | 00 | 03 | 99 | 1 | [cm] |
| P8 | Limit value „Obstructed detection“ in Close direction | | 0.1 | 4.0 | 9.9 | 1 | |
| P9 | Activation of self-learn procedure | (see also cap. 7.4 Self-Learn Procedure / page 27) | | | | | |
| CC | Exit the menu. | Select CC and press the jog wheel to leave the P-parameter menu. | | | | | |

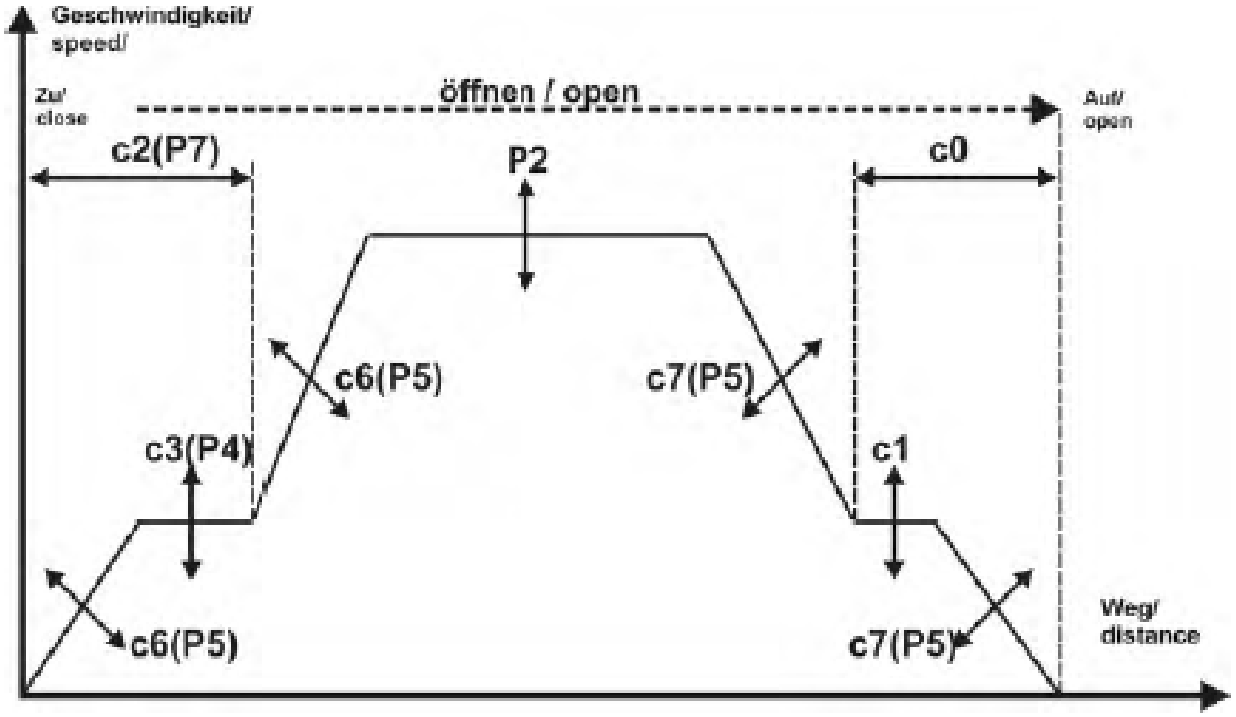
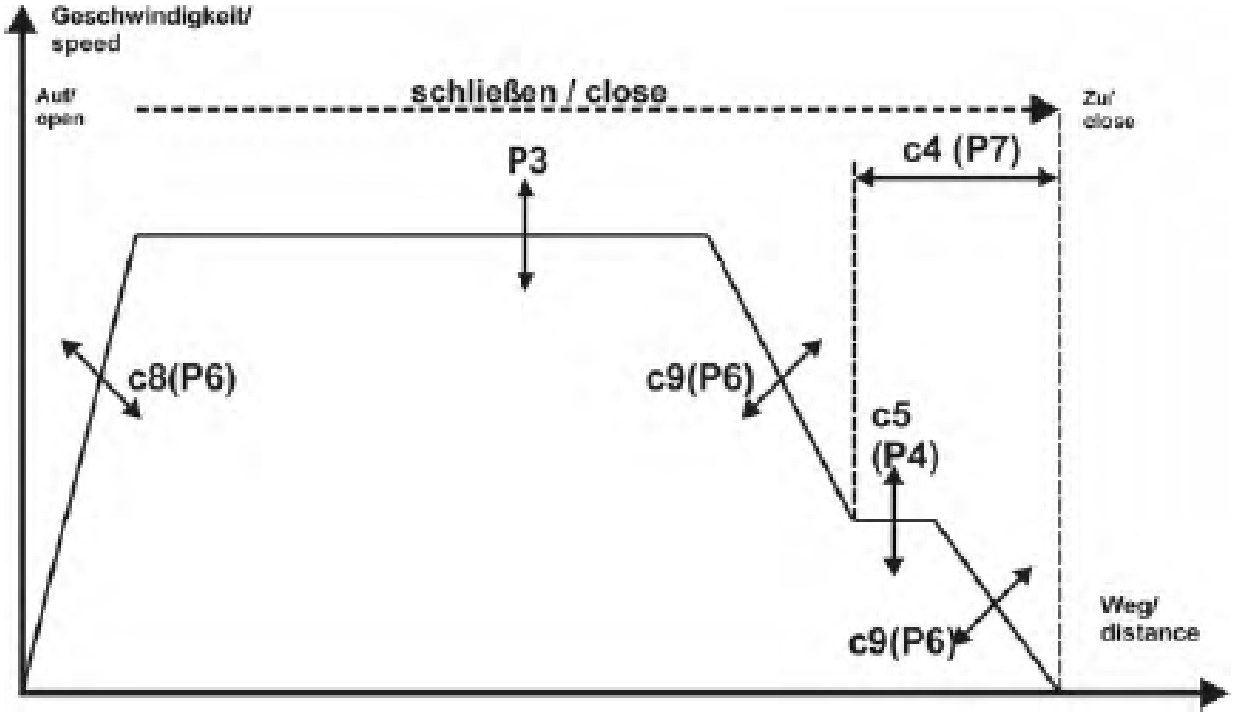



Abb. 25: Fahrkurve "Öffnen" mit c-Parameter

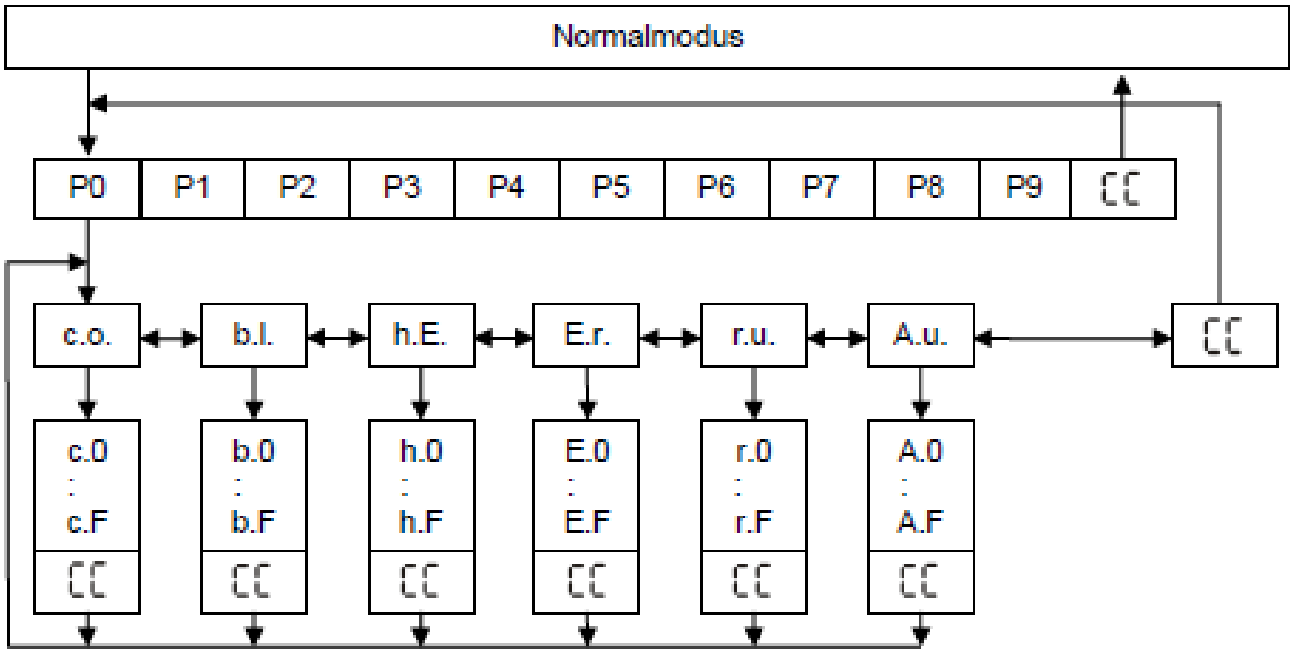


# 6 Advanced parameters

To enter the extended menu mode, the parameter P0 must be selected, and the jog wheel pressed for approx. 5 seconds.

Then, by turning the jog dial, the parameters **c, b, h, E, r**
and Au can be selected

**The complete parameter lists are stored in the manual.**



# 7 Holding torque in the end positions

A holding torque can be set in the end positions. The holding torque causes the door to be held in the respective end position with a force to be set. A distinction is made here as to whether a control signal is applied to the inputs ("Open door" or "Close door") or not.

**cC** Holding torque in open direction without "Open door" input signal

**cd** Holding torque in closing direction without "Close door" input signal

**cE** Holding torque in open direction with "Open door" input signal

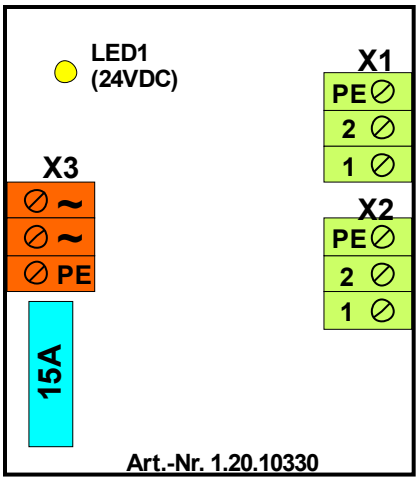
**cF** Holding torque in closing direction with "Close door" input signal

# 8 Auxiliary drive (SinusDrive / Sword)

The TSG extension board can control and move up to two additional TSG sinusoidal drives and is connected to the control section of the TSG main board for this purpose.

In the TSG main board, parameters for activating the function **(hA)**, the opening time (**h7)**, the closing time **(hb)** of the TSG sine drive and the time delay between opening the TSG sine drive and opening the door **(hC)** can be set.

| Parameter | Function | Min. value | Default value | Max. value | Factor | Unit |
|---|---|---|---|---|---|---|
| h7 | Open time of the TSG sine wave drive | 00 | 50 | 80 | | [1/100 second] |
| Hb | Closing time of the TSG sine wave drive | 01 | 50 | 80 | | [1/100 second] |
| hC | Time delay between drive opening and door opening | 01 | 50 | 99 | | [1/100 second] |




X1: Drive 1 connection

X2: Drive 2 connection

X3: AC voltage connection

LED 1: 24[VDC] ok

# 9 Errors (E-parameter)

| Parameter | Function | Min | Standard | Max | Unit | Ready for operation | Reset |
|---|---|---|---|---|---|---|---|
| E0 | Travel not limited | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |
| E1 | Travel path locked | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |
| E2 | EEPROM errors | 00 | 00 | 99 | [Number] | No | power-on reset |
| E3 | Obstructed for reversing | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |
| E4 | Encoder signals are not unique or do not exist | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds]. After a few attempts without changing the drive, stop the Power-On-Reset. |
| E5 | Monitoring for current sensor has been trig-gered | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds]. After a few attempts without changing the drive, stop the Power-On-Reset. |
| E6 | TSG internal monitoring | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds]. After a few attempts without changing the drive, stop the Power-On-Reset. |
| E7 | Obstructed after switch-ing on again | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |
| E8 | Number of starts | 00 | 00 | 99 | [Number] | Yes | -- |
| E9 | Monitoring stop input, amplifier, self-diagnosis | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds]. After a few attempts without changing the drive, stop the Power-On-Reset. |
| EA | Overload current in standstill | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |
| Eb | Error voltage | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds] or power-on reset. |

| Parameter | Function | Min | Standard | Max | Unit | Ready for operation | Reset |
|---|---|---|---|---|---|---|---|
| EC | Motor not ok | 00 | 00 | 99 | [Number] | No | Automatically after 15[seconds]. After a few attempts without changing the drive, stop the Power-On-Reset. |
| Ed | Motor detection faulty | 00 | 00 | 99 | [Number] | No | Restart directly possible if motor is detected. |
| EE | Load Default Settings and clear Error Count | oF | oF | on | oF = Off<br>on = On | -- | -- |
| EF | Clear Error Count | oF | oF | on | oF = Off<br>on = On | -- | -- |
| CC | Exiting the E-parame-ters | Select and press the jog dial to exit the E-parameters and return to c.o. | | | | | |

# 10 Common problems

## 10.1 Engine jerks or is loud

### Cause

Gearbox damage:

Motor is loaded with high currents for a long time.

carbon brushes used up:

The motor is either too old or has been loaded with high currents for a long time.

### Solution

The motor must be replaced.

If available, note the part number of the

motor to be able to perform a 1-to-1 exchange.

### Additional measure

To prevent the error from recurring, check the holding forces of the motor (parameters **Cc,Cd,CE,CF**) and check the mechanics for sluggishness.

## 10.2 Sinus Drive / bolt cam does not open/close completely

### Cause

1. the existing centerboard/transom cam is provided with a spring that acts against the direction of travel of the sine drive.

2. the set travel of the sine drive is not sufficient to completely open the centerboard/transom cam.

### Solution

1. Loosen the spring. If this is not possible, the time during which the sinusoidal actuator is energized can be set via parameters **H7** (to open) and **Hb** (to close).

**CAUTION:** Care must be taken that the

sinusoidal motor does not compress its stop buffers.
Otherwise, in the long run, gearbox damage will occur.

## 10.3 SinusDrive does not move

### Cause

1. plug connection/cable defective
2. car fuse on the additional board is defective
3. gearbox damage

### Solution

1. Check all plugs and cables carefully.
2. Check vehicle fuse and replace if necessary.
3. 3. if the gearbox is damaged, the sine drive must be replaced.

## 10.4 Door pumps in the end positions

### Cause

in OPEN direction:
1. too strong springs in the landing door
2. too big landing door closing weight
3. landing door limits the travel of the car door in CLOSE direction

3. Lock pushes the door open again by a spring

4. Landing door limits the travel of the car door.
5. Mechanical disturbance of the travel path in the end area

### Solution

1. loosen springs if possible
2. increase holding forces in TSG (C parameter)
3. adjust end stops to the narrowest car door and reprogram via P9
Increase catch range ( BB and BE)

Note: For older drives, loosen the belt and turn the motor slightly so that the motor brushes are in a different position.

## 10.5 Door stops while driving

### Cause

1. after a voltage (current) failure, the door moves more slowly. If the elevator controller outputs the signals in a time-controlled manner, the signal may not be present long enough to open the door completely.

### Solution

1. either increase the times in the elevator control or if possible, wire our limit switch X2.

## 10.6 Door blocks sporadically

### Cause

1. Sluggishness of the motor
   2. dirty running rail
   3. if a too long screw was screwed into the mounting of the motor, it may be that the screw presses into the gearbox

### Solution

1. Check the motor carefully. There may be damage to the gearbox
   2. clean the running rail
   3. even if the motor runs again after unscrewing, it should still be replaced, as parts of the mounting are in the gearbox, and this can always lead to further blockages.

## 10.7 Door always blocks in the same place

### Cause

The existing mechanism blocks the door.

### Solution

The mechanics must be changed so that the door can be moved easily. Springs (e.g., from the landing door) or dampers that block the door may also be installed.

## 10.8 Door moves too fast/bangs in the end positions

### Cause

in OPEN direction:
The door has play in the connection from the door leaf to the toothed belt and as a result one door leaf hits the end stop.

in CLOSE direction:
The creep path is too short. The door leaf is closed, and the sword still has a travel distance due to the toothed belt drive.

### Solution

Increase parameter c0 (c0 = creep distance in opening direction)
Increase parameter P7 until the door leaf has a small creep distance before the stop (P8=creep distance shortly before door closed)