

Technical Manual

ZePRO1 Control System

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1 Technical description

1.1 General

All lift functions are controlled via the control card. The card has a number of inputs and outputs for connecting the tail lift solenoid (hydraulic pump), valves, sensors and control devices. The card also has LEDs and an alphanumeric display that shows system status.

1.2 Power save mode

If the control card is not used for about 5 mins, it will go into power save mode. Press any control button for approx. 0.5 seconds to "wake" the control card again.

1.3 Operating information

All the lift functions are controlled and monitored through the control card, which is equipped with an alphanumeric display with a flashing light and 2 red LEDs. These display current operating information. In the event of any operational disturbances, fault codes will be displayed to facilitate troubleshooting.

The display indicates:

- Active control device
- Fault display
- Program configuration
- Current status of sensors

Flashing light indicates:

- Off: No supply voltage
- On: Supply voltage available but CS (cabin switch) is not active.
- Flashing: CS (cabin switch) is active, the system is awaiting input signal.

LED 1 indicates:

- Active input, button(s) on control device pressed.

LED 2 indicates:

- Active output (approved input signal from control device and sensors), the lift is operated.

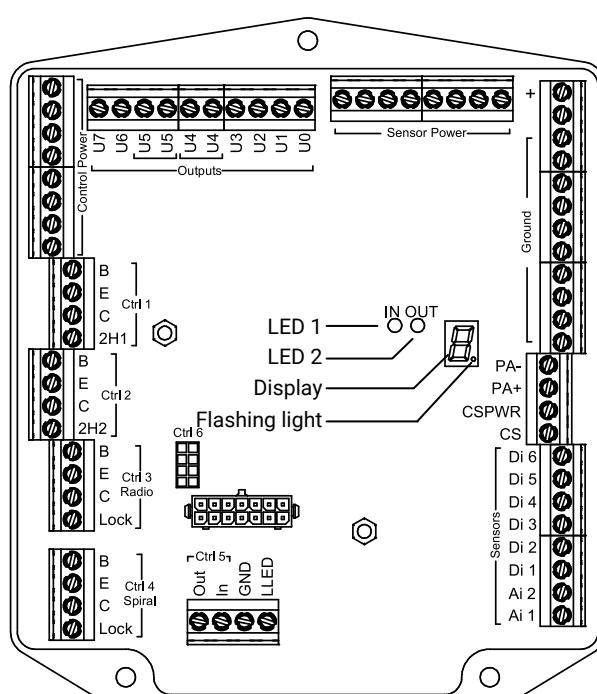


Image 1. The control card is equipped with an alphanumeric display with a flashing light and 2 red LEDs

1.3.1 Information codes

Codes are shown on the display in this sequence. First a letter for identification of information, followed by figures or segments for further information and then ending with a pause. When the CS (cabin switch) is switched on, the current program configuration (P) is displayed first, followed by configuration number. The number of volts detected is then displayed and, after this, the current software version (J), followed by version number.

As long as no control devices are used, a rolling sequence is then displayed, with sensor indication (C), followed by 0-6 segments showing which sensors have a signal.

When a control device is being used, its number (1-7) is displayed, followed by which button has been pressed, segments B, C, E or X (X symbolises the 4th button on the respective control device (2h1 for fixed control device 1, 2h2 for fixed control device 2, lock knob for radio control device and coil control device).

The control devices are symbolised by the numbers 1-7.

1. Fixed control device 1, including two-hand button 2h1
2. Fixed control device 2, including two-hand button 2h2
3. Radio control device, External
4. Coil control device
5. Slider control device
6. Radio control device, internal module
7. CS (cabin switch)

Once a button has been released, the control system for the current control device is locked for a while to ensure that no other person operates the lift from another control device. The current control device number (1-7) will flash on the display while the control system is locked to it. This primarily applies to radio and coil control devices, as other control devices have such a short locking period that there is hardly time to see the indication.

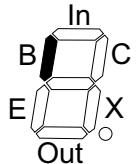
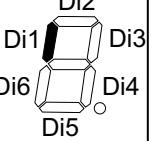
Coil control devices can be equipped with a locking function. Once the control device has been used, the control system is locked for the current control device until it is unlocked manually with the respective control device's deactivation button.

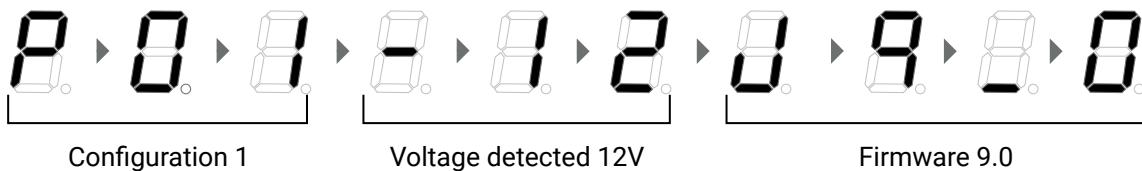
The radio control device is also equipped with a locking function. The control system can then be locked/unlocked by pressing and holding button 5. The lock status is indicated by the lock function LED, which lights up when the lock is activated. In the event of a fault in the remote control, it can be unlocked by turning the control power (CS) Off/On.

If the remote control is in the locked position and the lift has been unlocked by switching the control power (CS) Off/On, the lift will be locked again as soon as any button on the remote control is pressed.

NOTE!

The lift remains locked if it loses power and is then started again, the number 6 will flash on the control card display. It can be unlocked as described above.

Information codes					
Identification	Code 1	Code 2	Code 3	Information	Other
P (Application configuration)	00-99			Configuration setting	
		-		Dividers	
			12/24	Number of volts detected	
J Software version	01-99	-	1-9	Firmware version number	
1-6 (Fixed light) Active control device while operating	1-6			Fixed light (1-6) displays active control device during operation.	
		Segments B, C, E or X.		Segment B, C, E or X lights up depending on which button is pressed	
1-7 (Flashing) The control device to which the control system is locked for a while after completed operation.	1-7			<p>Control device to which the control system is locked. This primarily applies to radio and coil control devices, as other control devices have such a short locking period that there is no time to see the indication. The number will stop flashing when one of the current control device buttons is pressed. If the control card has been without voltage and receives the voltage again when the CS (cabin switch) is switched on, "7" will flash on the display and the control card is locked until the Off/On on the CS is operated. 1-6 = Ctrl 1-6 7 = CS</p>	
C Sensor indication	Segment			<p>1-9.0 segments indicate sensors. On - signal in. Off - no signal in. 0V. (See electrical and hydraulics diagrams for information about the location of the sensors).</p>	

Example of sequence with information codes:**Example of sequence with sensor indication:**

Sensor indication: C, Detected sensor: Di1

**Example of sequence with control device indication:**

Control device: 2, Detected button: B



1.3.2 Fault codes

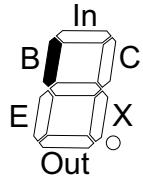
If a fault arises, the fault code will be shown in the display in the form of a letter for identifying the fault, followed by numbers and/or number segments for further information, followed by sensor indication (C) according to the previous page.

The numbers (1-9) in fault codes E and F show which control device/output the fault code refers to.

1. Fixed control device 1, including two-hand button 2h1
2. Fixed control device 2, including two-hand button 2h2
3. Radio control device, External
4. Coil control device
5. Slider control device
6. Radio control device, internal module
7. CS (cabin switch)
8. Control Power
9. Sensor Power

If the system discovers several faults, only the fault code for the fault with the highest priority will be shown automatically. The display is prioritised in the order in the table below, L/H, E, F and A.

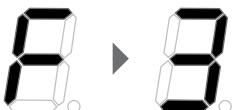
When CS is turned off, the system scrolls through a list of the last five errors detected before the display turns off after approx. 5 minutes, the control card then goes into sleep mode.

Fault codes					
Identification	Code 1	Code 2	Code 3	Information	Other
L Low battery voltage	07-35			Voltage measured	
H High battery voltage	07-35			Voltage measured	
E Control device locked	1			Fixed control device 1 (incl. two-hand button 2h1 if they are monitored)	
	2			Fixed control device 2 (incl. two-hand button 2h2 if they are monitored)	
	3			Radio control device, external	
	4			Coil control device	
	5			Slider control device	
	6			Radio control device, internal module	
	7			CS (cabin switch)	
		Segment		Segments B, C, E or X are illuminated depending on which button signal has locked the control device.	
F Output short-circuited/high current	0-9			The output that has short-circuited/has high current. Fault code is reset automatically if the function in question is running (function verified).	1-7 U0-U7, displayed only after the respective output/function has been active. 8 Control power 9 Sensor power
Output not connected/cable break	0-7			The output that is not connected/has cable break. Fault code is reset automatically if the function in question is running (function verified).	Displayed only after the respective output U0-U7 has been active.
A Internal fault	0-				Contact support if the lift does not function.

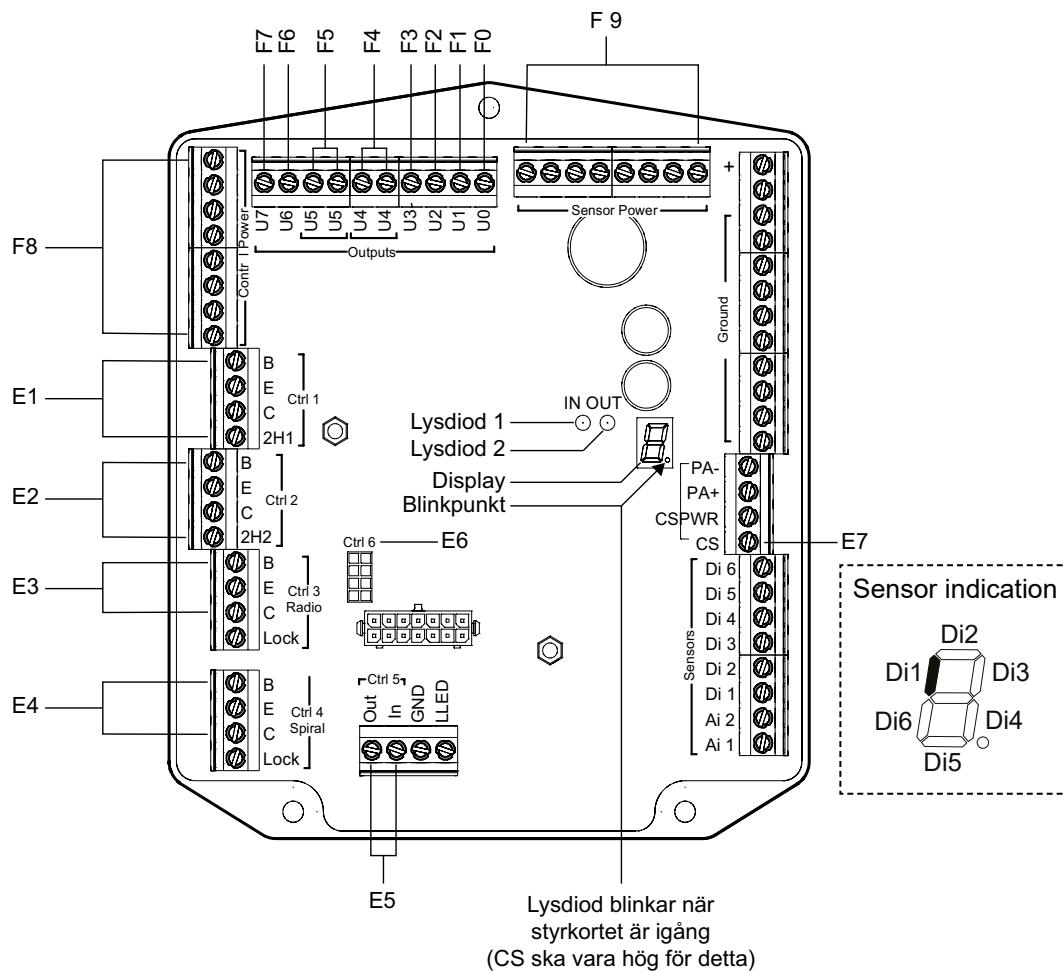
All fault codes can be reset manually by switching the CS (cabin switch) On/Off. Fault codes F0-F7 and U0-U7 are reset automatically if the function in question is running (function verified). Fault codes L and H are reset automatically if the battery voltage becomes correct. Fault code E is reset automatically if the control system does not receive a signal from the relevant control device for 6 minutes.

Example of sequence of fault codes:

Output no. 3 short-circuited.



1.3.3 Fault codes control card



1.3.4 Control device

If a control device button is held down for too long, the control device is blocked and cannot be used for a number of minutes. Fault code E flashes on the display. The fault is also indicated on a non-active coil control device with a lock button, if this is connected to Ctrl 4. The LED on the coil control device then flashes the same number of times as the number on the control device in question, see the list in section "1.3.2 Fault codes" on page 7.

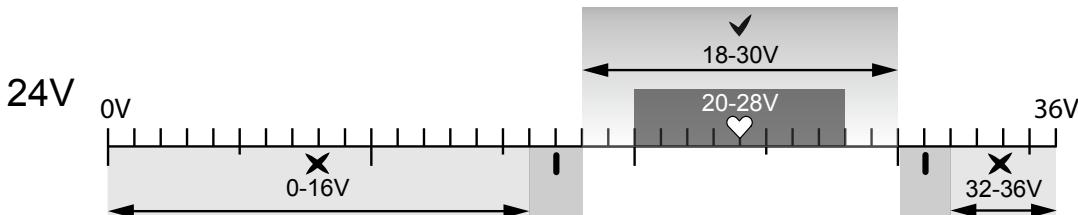
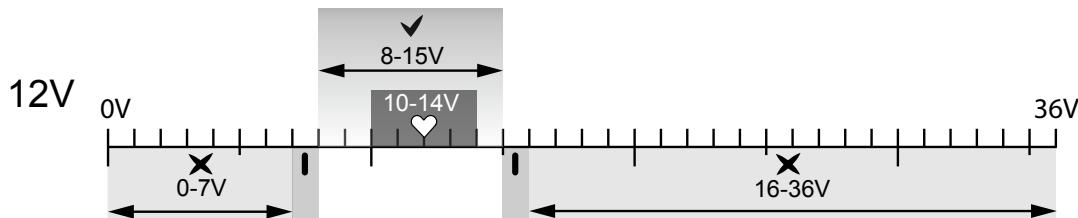
Example: Control device 2 is blocked, the LED on the coil control device then flashes twice, goes out for a moment, flashes twice again, etc.

Coil control device LED	
Fixed light	The coil control device is active
Extinguished (weak glimmer)	The coil control device is not active
Flashing	One of the other control devices is blocked

1.4 Supply voltage

The illustrations below show the desired supply voltage for 12V and 24V systems. Specified voltage refers to voltage when the lift is operated. See also sections "1.6 Minimum recommended conductor cross-sectional area (copper cables, positive and negative cables)" on page 11. and "1.7 Power consumption" on page 12.

- ✗ The lift is not working.
- |- The lift is working but is issuing a warning. This voltage range is only recommended for emergency operation.
- ✓ The lift is working, but the voltage range outside the 'heart-marked' area is only recommended for operation for short periods.
- ♡ The lift is working within the voltage range for optimum function and service life.



1.5 Minimum recommended battery capacity

Minimum recommended battery capacity	
Lifting capacity ≤ 1000 kg.	140 Ah
Lifting capacity ≥ 1500 kg.	180 Ah

NB!

Make sure the lift has access to the minimum recommended current capacity (I_{min}). Some vehicle models have restrictions regarding the amount of power the lift can access from the existing battery.

1.6 Minimum recommended conductor cross-sectional area (copper cables, positive and negative cables)

Minimum recommended conductor cross-sectional area		
	Control cable	1.5 mm ²
Lifting capacity ≤ 1000 kg	Main power cable L < 8m	25 mm ²
	Main power cable L ≥ 8 m	35 mm ²
Lifting capacity ≥ 1500 kg	Main power cable L < 8m	35 mm ²
	Main power cable, L = 8 - 15m	50 mm ² (12 volts) / 35 mm ² (24 volts)
	Main power cable L > 15m	50 mm ² (Only 24 volts)

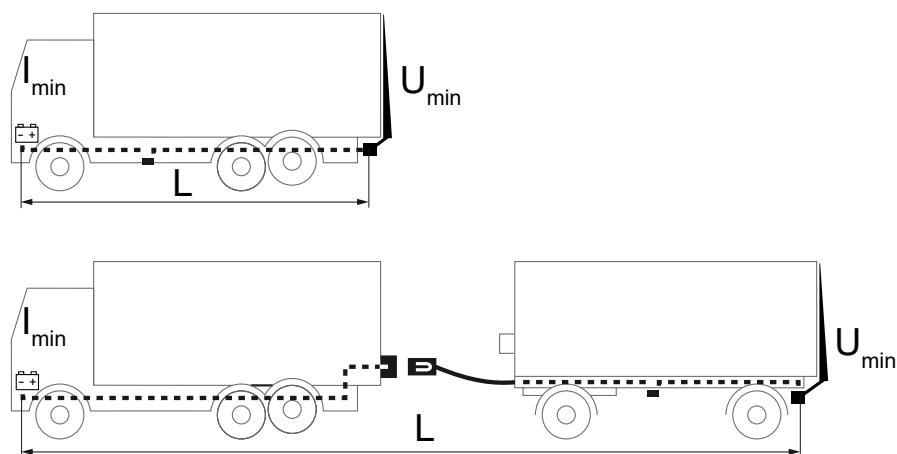


Image 2. Minimum recommended battery capacity - Minimum recommended conductor cross-sectional area

1.7 Power consumption

	Power consumption							
	12 volt				24 volt			
	Pump - Motor unit	Magnet (hyd. unit)	Magnet (elec. shut-off valve)	Solenoid	Pump - Motor unit	Magnet (hyd. unit)	Magnet (elec. shut-off valve)	Solenoid
Z/ZL 1500								
Z/ZL 2000								
ZDK 250								
SZL 1500	245 A	4.2 A	1.5 A	1.8 A	145 A	2.1 A	0.75 A	1.2 A
SZL 2000								
SZN 1500								
SZN 2000								
Z/ZL 2500					200 A	2.1 A	0.75 A	0.85 A
ZS/ZSS/ZD 150	245 A	4.2 A	1.5 A	1.5 A	125 A	2.1 A	0.75 A	0.85 A
ZT/ZTS 150/200								
ZS/ZSS/ZD 200/250	250 A	4.2 A	1.5 A	1.5 A	150 A	2.1 A	0.75 A	0.85 A
ZSSUHD 2000	245 A	4.2 A	1.5 A	1.8 A	145 A	2.1 A	0.75 A	0.9 A
Z100	200 A	1.5 A	1.5 A	1.8 A	90 A	0.75 A	0.75 A	0.9 A
ZHD 1500/2000	245 A	4.2 A	1.5 A	1.8 A	135 A	2.1 A	0.75 A	0.9 A
Z 45	95 A	1.4 A	1.5 A	1.8 A	60 A	0.7 A	0.75 A	0.9 A
Z 75	115 A	1.4 A	1.5 A	1.8 A	75 A	0.7 A	0.75 A	0.9 A
Z3N 75	115 A	1.4 A	1.5 A	1.8 A				

2 Functional description

2.1 Cylinder models

L = Double-acting tilt with limited stroke - Single-acting lift

DL = Double-acting tilt with limited stroke - Double-acting lift

MA = Double-acting adjustable tilt - Single-acting single-speed lift

DA = Double-acting adjustable tilt - Double-acting single-speed lift

S = Double-acting single-speed tilt - Single-acting single-speed lift

SA = Single-acting single-speed adjustable tilt - Single-acting single-speed lift

2.2 Models - Configurations

Model	Configuration	Page
Z/ZL 1500/2000/2500, ZDK 250, Z/ZN 2500 - MA	14	14
Z/ZL 1500/2000/2500 - MA, autotilt (standard)	14	18
Z/ZL 1500/2000/2500 - DA	16	23
Z 45/75 - S, SA	1	27
Z3N(U)/Z3NN(U)/Z3NW(U) - MA	9	30

2.3 Configuration 14 - MA

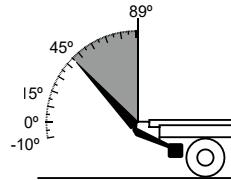
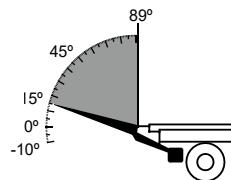
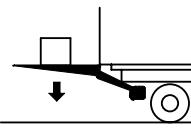
- ["2.3.1 Sensors/Inputs"](#)
- ["2.3.2 Functional diagram"](#)
- ["2.3.3 Restriction in use of control device"](#)
- ["2.3.4 Quick opening - activation zone"](#)

2.3.1 Sensors/Inputs

Designation	Position (standard)	Function	Description
Ai 1			Not used in this configuration
Ai 2			Not used in this configuration
B	Control device	Up button	
E	Control device	Down button	
C	Control device	Tilt button	Used in combination with B and E for tilt-up and tilt-down
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.
Di1			Not used in this configuration
Di2			Not used in this configuration
Di3	Angle sensor		Non-actuated Di3 disables Tilt up with the secondary control device so that the operator must use the two-hand button - 2H along with the primary control device in order to continue to maintain the tilt up function.
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+. 60 Bar (NC).
Di5			Not used in this configuration
Di6			Not used in this configuration
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases when the cabin switch is not used, the (+) signal comes in to Cs jumpered from (CS PWR) on nearby terminal.
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.

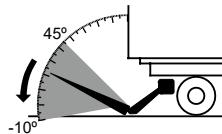
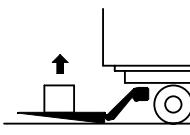
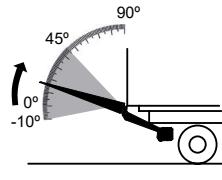
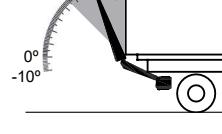
["2.2 Models - Configurations" on page 13](#)

2.3.2 Functional diagram

		Input signal		Output signal	Comment	Control devices	Image
Function		High	Low (0v)				
Opening	1	C E 2H	Di4 ✓ Di2 ✓ Di3* Di4 Di5 Di6 U7	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 ✓ U6** U7	Open from 89° down to approx. 45°. Quick opening is activated.	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
	2	C E	Di4 Di2 ✓ Di3 Di4 Di5 Di6 U7	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7	Opens the body from inside.	Ctrl 1 Ctrl 2 Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Lower		E	U0 Di4 Di2 Di3 Di4 ✓ Di5 ✓ Di6	U1 ✓ U2 U3 ✓ U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** 0.2 second delay of output signal.

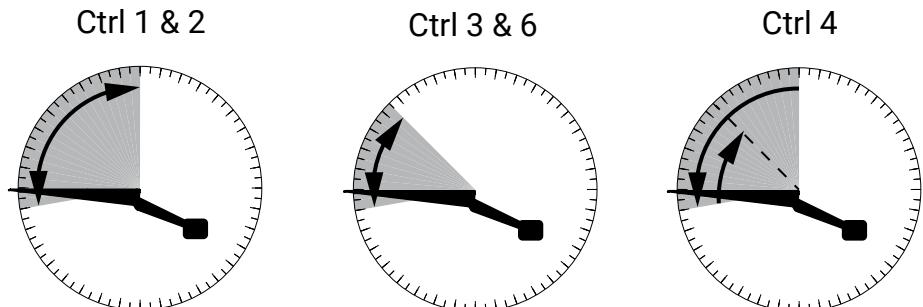
Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Tilt down	C E Di3*	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Raise	B	Di1 ✓ Di2* Di3 Di4 Di5 ✓ Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt up	B C Di3	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Tilting up to approximately 45°	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Closing	B C 2H	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Close against vehicle body	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	

Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

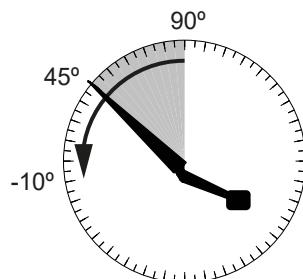
** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

2.3.3 Restriction in use of control device



*Image 3. The use of control devices connected to Ctrl 1 and Ctrl 2 is not limited by the angle of the platform.
The use of control devices connected to Ctrl 3 & 6 is limited by the angle of the platform.
The use of control device connected to Ctrl 4 is limited by the angle of the platform when tilting up.*

2.3.4 Quick opening - activation zone



*Image 4. Quick opening can be activated when the platform angle is 90°-45°.
Provided that the control unit buttons are pressed and held, the quick opening will be active down to -10°.*

"2.2 Models - Configurations" on page 13

"2.3 Configuration 14 - MA" on page 14

2.4 Configuration 14 - MA Autotilt

- "2.4.1 Sensors/Inputs"
- "2.4.2 Functional diagram"
- "2.4.3 Restriction in use of control device"
- "2.4.4 Quick opening zone"
- "2.4.5 Foot controls and warning lights"
- "2.4.6 Inclinometer - voltage"

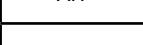
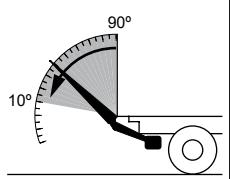
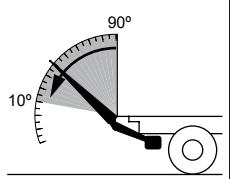
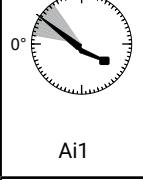
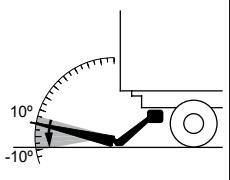
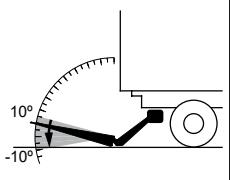
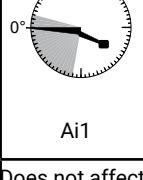
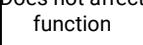
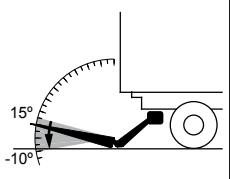
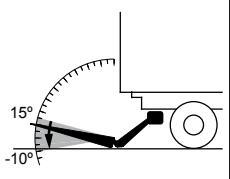
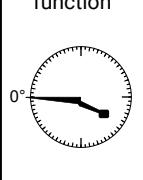
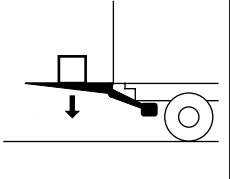
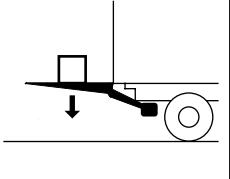
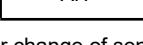
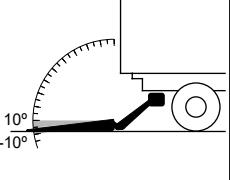
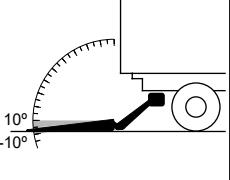
2.4.1 Sensors/Inputs

Designation	Position (standard)	Function	Description
Ai 1	Platform	Inclinometer	Measures the angle of the bridge to Earth's gravity
Ai 2			Not used in this configuration
B	Control device	Up button	
E	Control device	Down button	
C	Control device	Tilt button	Used in combination with B and E for tilt-up and tilt-down
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening. (<i>Does not apply to CE market.</i>)
Di1	Lift arm	Angle sensor	For Autotilt, safety function
Di2			Not used in this configuration
Di3			Not used in this configuration
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+. 60 Bar (NO).
Di5	Lift cylinder	Pressure sensor	For autotilt. 5 Bar (NC).
Di6			Not used in this configuration
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases when the cabin switch is not used, the (+) signal comes in to Cs jumpered from (CS PWR) on nearby terminal.

"2.2 Models - Configurations" on page 13

"2.4 Configuration 14 - MA Autotilt" on page 18

2.4.2 Functional diagram

Function	Input signal		Inclinometer	Output signal	Comment	Control devices	Image
	High	Low (0v)					
Tilt down	1 C E 2H	Di1 ✓ Di2 ✓ Di3*** Di4 Di5 ✓ Di6	0° 	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 ✓ U6** U7 	Quick opening is activated.	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6 	
	2 C E	Di1 ✓ Di2*** ✓ Di3*** Di4 Di5 ✓ Di6	0° 	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 ✓ U6** U7 	Quick opening is activated.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6 	
	3 C E	Di1 Di2 ✓ Di3*** Di4 Di5 ✓ Di6	0° 	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7 		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6 	
Lower	1 E	Di1 Di2 Di3 Di4 ✓ Di5 Di6	Does not affect function 	U0 ✓ U1 ✓ U2 U3 ✓ U4 U5 U6 U7 		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6 	
	2 E Di1 Di5*	Di1 Di2 ✓ Di3** Di4 Di5 Di6	0° 	U0 ✓ U1 ✓ U2 ✓ U3 ✓ U4 ✓ U5 U6 U7 	Autotilt down.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6 	

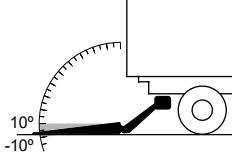
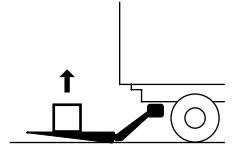
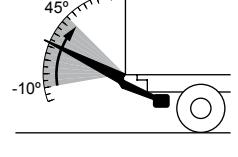
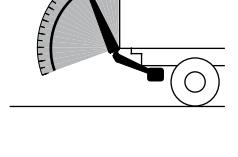
* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** 0.5 second delay of output signal.

*** Unconnected

"2.2 Models - Configurations" on page 13

"2.4 Configuration 14 - MA Autotilt" on page 18

Function	Input signal		Inclinometer	Output signal	Comment	Control devices	Image	
	High	Low (0v)						
Raise	1	B	Di4 ✓ Di2*** Di3 Di4 Di5 Di6	0°  Ai1	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Autotilt up	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
	2	B	Di4 ✓ Di2*** Di3 Di4 Di5 Di6	Does not affect function  Ai1	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt up	B C		Di4 Di2 ✓ Di3*** Di4 Di5 Di6	0°  Ai1	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Closing	B C 2H			Does not affect function  Ai1	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	

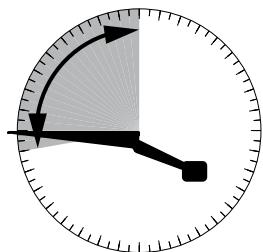
* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** 0.5 second delay of output signal.

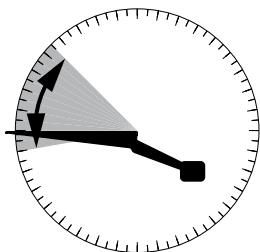
*** Unconnected

2.4.3 **Restriction in use of control device (Tilt up/down and opening/closing)**

Ctrl 1 & 2



Ctrl 3, 4 & 6



*Image 5. The use of control devices connected to Ctrl 1 & 2 is not limited by the angle of the platform.
The use of control devices connected to Ctrl 3, 4 & 6 is limited by the angle of the platform.*

2.4.4 **Quick opening zone**

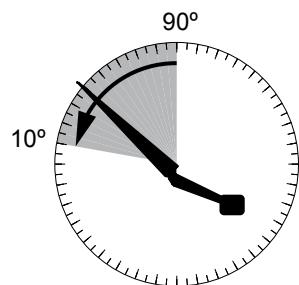


Image 6. Quick opening can be activated when the platform angle is approx. 90°-10°

"2.2 Models - Configurations" on page 13
"2.4 Configuration 14 - MA Autotilt" on page 18

2.4.5 Foot controls and warning lights

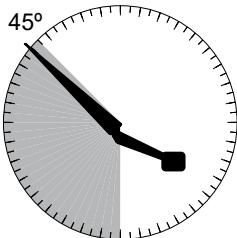


Image 7. When the angle is 45° or less, signal is given on U7 for activating warning lighting and foot controls

2.4.6 Inclinometer - voltage

The voltage of the inclinometer output varies with the inclinometer angle. Below are some examples of different angles and approximate voltage.

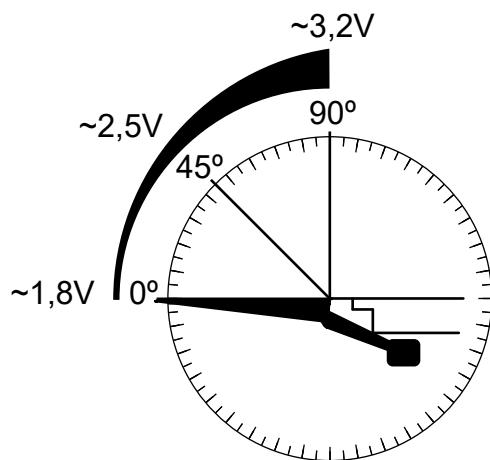


Image 8. Approximate voltage at various angles

"2.2 Models - Configurations" on page 13

"2.4 Configuration 14 - MA Autotilt" on page 18

2.5 Configuration 16 DA

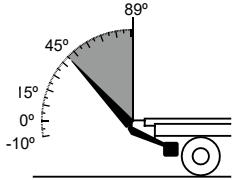
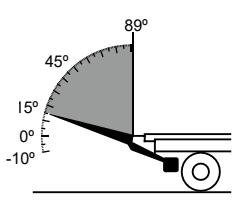
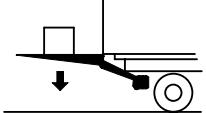
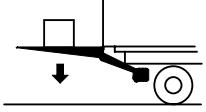
- "2.5.1 Sensors/inputs"
- "2.5.2 Functional diagram"
- "2.5.3 Restriction in use of control device"
- "2.5.4 Quick opening - activation zone"

2.5.1 Sensors/inputs

Designation	Position (standard)	Function	Description
Ai 1			Not used in this configuration
Ai 2			Not used in this configuration
B	Control device	Up button	
E	Control device	Down button	
C	Control device	Tilt button	Used in combination with B and E for tilt-up and tilt-down
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.
Di1			Not used in this configuration
Di2			Not used in this configuration
Di3	Angle sensor		Non-actuated Di3 disables Tilt up with the secondary control device so that the operator must use the two-hand button - 2H along with the primary control device in order to continue to maintain the tilt up function.
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+. 60 Bar (NC).
Di5			Not used in this configuration
Di6			Not used in this configuration
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases when the cabin switch is not used, the (+) signal comes in to Cs jumpered from (CS PWR) on nearby terminal.
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.

"2.2 Models - Configurations" on page 13

2.5.2 Functional diagram

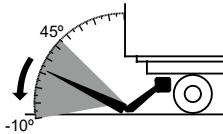
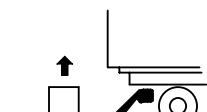
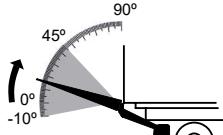
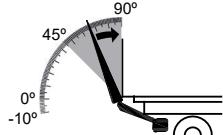
Function	Input signal		Output signal	Comment	Control devices	Image	
	High	Low (0v)					
Opening	1	C E 2H	Di1 ✓ Di2 ✓ Di3* Di4 Di5 Di6 ✓ U6** U7	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 ✓ U6** U7	Open from 89° down to approx. 45°. Quick opening is activated.	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
	2	C E	Di1 ✓ Di2 ✓ Di3 Di4 Di5 Di6 U7	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 ✓ U6** U7	Opens from inside the body.	Ctrl 4 Ctrl 5 Ctrl 6	
Lower	1	E	Di1 Di2 Di3 Di4 ✓ Di5 ✓ Di6	✓ U0 ✓ U1 ✓ U2 U3 ✓ U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
	2	E Di6	Di1 Di2 Di3 Di4 ✓ Di5 Di6 U7	✓ U0 ✓ U1 ✓ U2 U3 ✓ U4 U5 U6 U7	Manual down, replaces lower 1 and 2 at jump- ered Di6.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** 0.2 second delay of output signal.

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"2.5 Configuration 16 DA" on page 23

Function	Input signal		Output signal	Comment	Control de-vices	Image
	High	Low (0v)				
Tilt down	C E Di3*	Di4 Di2 Di3 Di4 Di5 Di6	✓ U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Raise	1	B	Di4 ✓ Di2* Di3 Di4 Di5 ✓ Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
	2	B Di6	Di4 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt up	B C Di3	Di4 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Tilting up to approxi-mately 45°.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Closing	B C 2H	Di4 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Close against vehicle body.	Ctrl 1 ✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** 0.2 second delay of output signal.

2.5.3 Restriction in use of control device

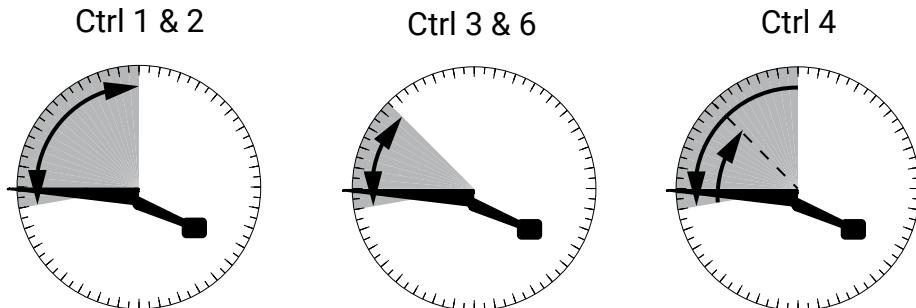


Image 9. The use of control devices connected to Ctrl 1 and Ctrl 2 is not limited by the angle of the platform.

The use of control devices connected to Ctrl 3 & 6 is limited by the angle of the platform.

The use of control device connected to Ctrl 4 is limited by the angle of the platform when tilting up.

2.5.4 Quick opening - activation zone

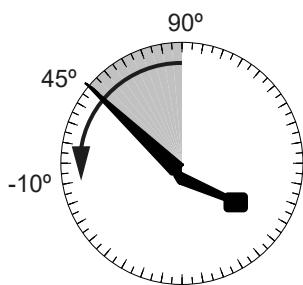


Image 10. Quick opening can be activated when the platform angle is 90°-45°.

Provided that the control unit buttons are pressed and held, the quick opening will be active down to -10°.

"2.2 Models - Configurations" on page 13

"2.5 Configuration 16 DA" on page 23

2.6 Configuration 1

- "2.6.1 Sensors/Inputs"
- "2.6.2 Restriction in use of control device"
- "2.6.3 Functional diagram"

2.6.1 Sensors/Inputs

Designation	Position (standard)	Function	Description
Di1			Not used on this lift model and must not be connected.
Di2	Platform	Angle sensor	Non-actuated Di2 disables Tilt up with the secondary control device so that the operator has to use the two-hand button (2H) along with the primary control device in order to continue to maintain the tilt up function.
Di3	Lift arm	Angle sensor	For Autotilt, safety function.
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+.
Di5			Not used on this lift model and must not be connected.
Di6			Not used on this lift model and must not be connected.
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch.
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.

2.6.2 Restriction in use of control device (Tilt up/down and opening/closing)

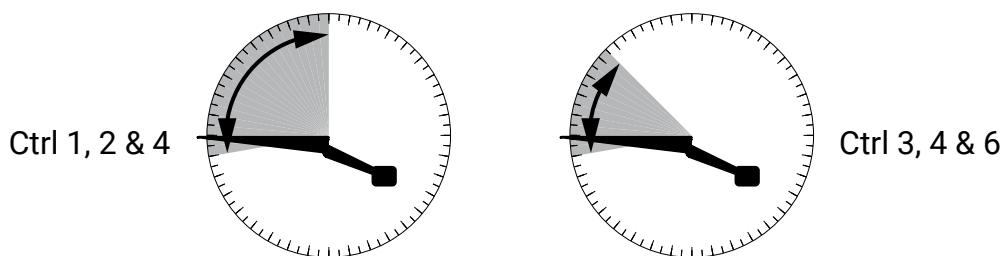
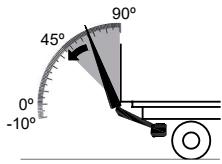
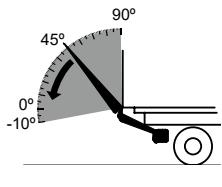
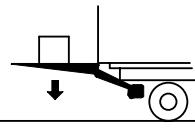
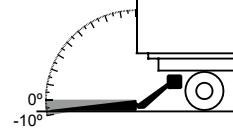
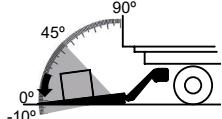


Image 11. The use of control devices connected to Ctrl 1 & 2 is not limited by the angle of the platform. Control devices connected to Ctrl 3, 4 & 6 are limited by the angle of the platform.

["2.2 Models - Configurations" on page 13](#)

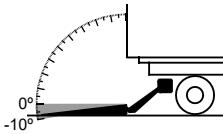
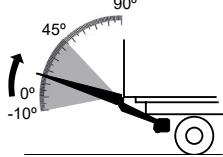
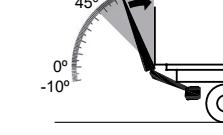
2.6.3 Functional diagram

Function	Input signal		Output signal	Comment	Control devices	Image	
	High	Low (0v)					
Opening	1	C E 2H Di6	Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7	Open from vehicle body down to about 45°	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
	2	D E Di6	Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7		Ctrl 1 Ctrl 2 Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Lower	1	E	✓ Di3	U0 ✓ U1 ✓ U2 U3 ✓ U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
	2	E Di3*	Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 ✓ U2 U3 ✓ U4 ✓ U5 U6 U7	Autotilt down	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt down		C E Di2 Di6	Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 U2 ✓ U3 U4 ✓ U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

"2.2 Models - Configurations" on page 13

"2.6 Configuration 1" on page 27

Function	Input signal		Output signal	Comment	Control de-vices	Image	
	High	Low (0v)					
Raise	B	Di1 Di2 Di3 Di4 ✓ Di5 Di6 Di7	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7	Autotilt up	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6		
			✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7				
Tilt up	1	B C Di2	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Tilting up to approximately 45°	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Closing		B C 2H	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Close against vehicle body	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

2.7 Configuration 9

- "2.7.1 Sensors/Inputs"
- "2.7.2 Restriction in use of control device"
- "2.7.3 Functional diagram - Ctrl 1, 2 & 3"
- "2.7.4 Functional diagram - Ctrl 4"
- "2.7.5 Functional diagram - with auto-levelling"
- "2.7.6 Functional diagram - without autotilt"

2.7.1 Sensors/Inputs

Designation	Position (standard)	Function	Description
Di1	Control card	Jumper	Jumpered = Auto-levelling On
Di2	Platform	Angle sensor	For autotilt
Di3	Platform	Angle sensor	<p>Non-actuated Di3 disables Tilt up with the secondary control device so that the operator must use the two-hand button - 2H1 together with the primary control device in order to continue to maintain the tilt up function.</p> <p>Actuated Di3 enables activation with both the primary and secondary control device.</p> <p>When the two-hand button is actuated along with operation of the primary control device, the signal from Di3 will be ignored.</p> <p>Tilt down using the primary device and active 2H button (C+E+2H) gives quick opening via U6.</p> <p>However, when Di2 and autotilt are actuated, quick opening will be blocked. Secondary device does not have quick opening.</p>
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+.
Di5	Lift cylinder	Pressure sensor	For autotilt.
Di6	Control card	Jumper	For manual operation with no autotilt.
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases when the cabin switch is not used, the (+) signal comes in to Cs jumpered from (+) on nearby terminal.
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.

2.7.2 Restriction in use of control device

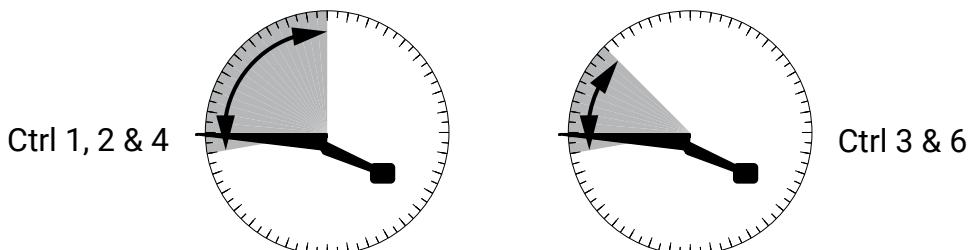
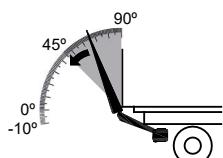
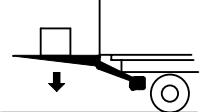
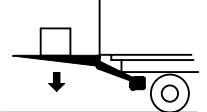
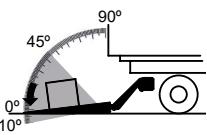
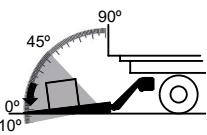
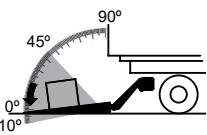


Image 12. The use of control devices connected to Ctrl 1, 2 & 4 is not limited by the angle of the platform. The use of control devices connected to Ctrl 3 & 6 is limited by the angle of the platform.

"2.2 Models - Configurations" on page 13

2.7.3 Functional diagram - Ctrl 1, 2 & 3

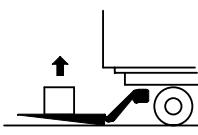
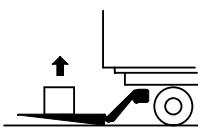
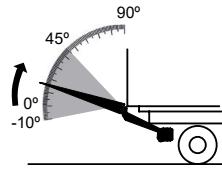
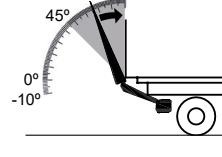
Di1 and Di6 NOT jumpered (without auto-levelling, with autotilt)

Function	Input signal		Output signal	Comment	Control de-vices	Image	
	High	Low (0v)					
Opening	C E 2H	-Di1 ✓ Di2 Di3 Di4 Di5 Di6 U7	✓ U0 ✓ U1 U2 U3 U4 ✓ U5 ✓ U6 U7	Quick opening	✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6		
Lower	1	E	✓ Di1 Di2 Di3 Di4 ✓ Di5 Di6	U0 ✓ U1 U2 U3 ✓ U4 U5 U6 U7	Without auto-levelling Di1 NOT jumpered)	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
Lower (autotilt down)	2	E Di5*	✓ Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
Tilt down	1	C E Di3*	Di1 Di2 Di3 Di4 Di5 Di6 U7	✓ U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
	2	C E 2H1	✓ Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 ✓ U1 U2 U3 U4 ✓ U5 ✓ U6 U7		✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
	3	C E Di2 Di3*	Di1 Di2 Di3 Di4 Di5 Di6	U0 U1 U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	

Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Raise (Autotilt up)	1	B Di2	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
Raise	2	B	Di1 ✓ Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 U3 ✓ U4 U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
Tilt up		B C Di3	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7	Tilting up to approximately 45° ✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	
Closing		B C 2H1	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7	Close against vehicle body ✓ Ctrl 1 ✓ Ctrl 2 Ctrl 3 Ctrl 4 Ctrl 5 Ctrl 6	

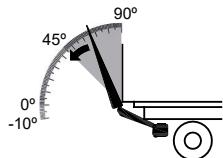
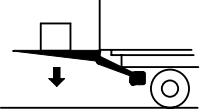
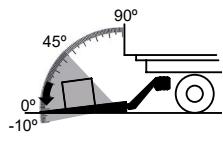
Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

2.7.4 Functional diagram - Ctrl 4

Di1 and Di6 NOT jumpered (without auto-levelling, with autotilt)

Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Opening	C E	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7	Opening from vehicle body	Ctrl 1 Ctrl 2 Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Lower	1	E	✓ Di1 Di2 Di3 Di4 ✓ Di5 Di6	U0 ✓ U1 U2 U3 ✓ U4 U5 U6 U7	Without auto-levelling (Di1 NOT jumpered)	
Lower (Autotilt down)	2	E Di5*	✓ Di1 Di2 Di3 Di4 Di5 Di6	U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7	Ctrl 1 Ctrl 2 Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Tilt down	C E	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7		Ctrl 1 Ctrl 2 Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	

Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

Function	Input signal		Output signal	Comment	Control de-vices	Image
	High	Low (0v)				
Raise (Autotilt up)	1	B Di2	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7		Ctrl-1 Ctrl-2 Ctrl-3 ✓ Ctrl 4 Ctrl-5 Ctrl-6
Raise	2	B	Di1 ✓ Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 U3 ✓ U4 U5 U6 U7		Ctrl-1 Ctrl-2 Ctrl-3 ✓ Ctrl 4 Ctrl-5 Ctrl-6
Tilt up		B C	Di1 Di2 Di3 Di4 Di5 Di6 Di7	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7	Tilting up to approxi-mately 45°	Ctrl-1 Ctrl-2 Ctrl-3 ✓ Ctrl 4 Ctrl-5 Ctrl-6
Tilt up		B C	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7		Ctrl-1 Ctrl-2 Ctrl-3 ✓ Ctrl 4 Ctrl-5 Ctrl-6

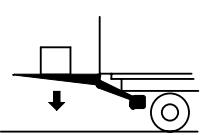
Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

2.7.5 Functional diagram - with auto-levelling

Di1 jumpered

Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Lower (Auto-tilt up)	1	E Di1 Di2*	Di1 Di2 Di3 Di4 ✓ Di5 ✓ Di6	✓ U0 U1 U2 U3 U4 ✓ U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Lower	2	E Di1	Di1 ✓ Di2* Di3 Di4 ✓ Di5 ✓ Di6	U0 ✓ U1 U2 U3 ✓ U4 U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
Lower (Autotilt down)	3	E Di1 Di5*	Di1 Di2 Di3 Di4 Di5 ✓ Di6	U0 ✓ U1 U2 U3 U4 ✓ U5 U6 U7	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	

Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

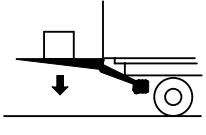
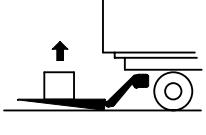
** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

"2.2 Models - Configurations" on page 13

"2.7 Configuration 9" on page 30

2.7.6 Functional diagram - without autotilt

Di1 jumpered

Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Lower (Manual)	E Di6	Di4	U0		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
		Di2	✓ U1			
		Di3	U2			
		Di4	U3			
		Di5	✓ U4			
		Di6	U5			
		Di6	U6			
		Di7	U7			
Raise (Manual)	B Di6	Di4	✓ U0		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 Ctrl 6	
		Di2	U1			
		Di3	U2			
		Di4	U3			
		Di5	✓ U4			
		Di6	U5			
		Di6	U6			
		Di7	U7			

Sensor name with /-symbol in front = 0, i.e., no signal.

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

** Autotilt, lower: Tilt up only until Di2 switches to not actuated, then lower. Di2 is ignored until a re-run takes place.

"2.2 Models - Configurations" on page 13

"2.7 Configuration 9" on page 30

2.8 Configuration 1 ML

- "2.8.1 Sensor/Inputs (Config 1)"
- "2.8.2 Restriction in use of control device"
- "2.8.3 Functional diagram"

2.8.1 Sensor/Inputs (Config 1)

Designation	Position (standard)	Function	Description
Di1			Not used on this lift model and must not be connected.
Di2	Platform	Angle sensor	Non-actuated Di2 disables Tilt up with the secondary control device so that the operator has to use the two-hand button (2H) along with the primary control device in order to continue to maintain the tilt up function.
Di3	Lift arm	Angle sensor	For Autotilt, safety function.
Di4	Tilt cylinder	Open platform alarm	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4, resulting in output signal (-) at Pa-. Also phase (+) signal out on Pa+.
Di5			Not used on this lift model and must not be connected.
Di6			Not used on this lift model and must not be connected.
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases when the cabin switch is not used, the (+) signal comes in to Cs jumpered from (+) on nearby terminal.
2H	Control devices	Two-hand button	Activated in connection with opening and closing of vehicle body. Used for quick opening.

2.8.2 Restriction in use of control device

Tilt up/down

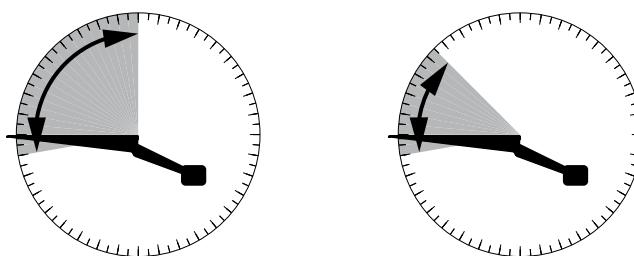
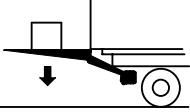
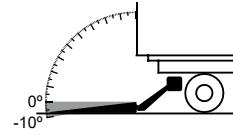
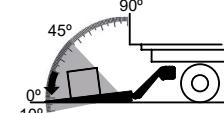
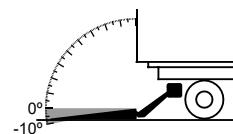
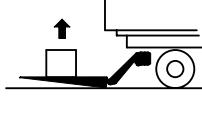
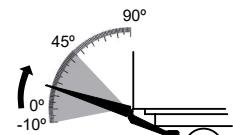
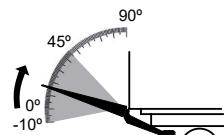


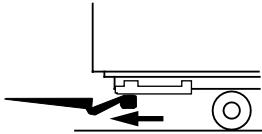
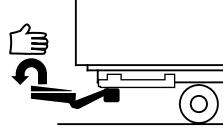
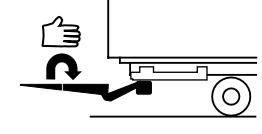
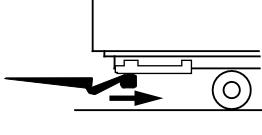
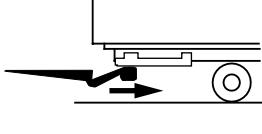
Image 13. All existing control devices can be used throughout the work area

["2.2 Models - Configurations" on page 13](#)

2.8.3 Functional diagram

Function	Input signal		Output signal	Comment	Control devices	Image	
	High	Low (0v)					
Lower	1	E	Di1 Di2 ✓ Di3 Di4 Di5 Di6	U0 ✓ U1 ✓ U2 U3 ✓ U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
			Di4 Di5 Di6	U0 ✓ U1 ✓ U2 U3 ✓ U4 ✓ U5 U6 U7	Autotilt down.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt down	2	C E Di2	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
			Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7	Autotilt up.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Raise		B	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
			Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 ✓ U2 U3 U4 U5 U6 U7		✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	
Tilt up		B C Di2	Di1 Di2 Di3 Di4 Di5 Di6	✓ U0 U1 U2 ✓ U3 U4 U5 U6 U7	Tilting up to approximately 45°.	✓ Ctrl 1 ✓ Ctrl 2 ✓ Ctrl 3 ✓ Ctrl 4 Ctrl 5 ✓ Ctrl 6	

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

Function	Input signal		Output signal	Comment	Control devices	Image
	High	Low (0v)				
Slider out	Out	Di1	✓ U0		Ctrl 1	
		Di2	✓ U1		Ctrl 2	
		Di3	U2	Platform folds out manually	Ctrl 3	
Slider in	In	Di4	U3		Ctrl 4	
		Di5	U4		✓ Ctrl 5	
		Di6	U5	Platform folds in manually	✓ Ctrl 6	
1	In	Di7	✓ U6		Ctrl 1	
		Di8	✓ U7	Normal	Ctrl 2 Ctrl 3 Ctrl 4 ✓ Ctrl 5 ✓ Ctrl 6	
2	C In Di1*	Di9	✓ U0		Ctrl 1	
		Di10	✓ U1		Ctrl 2	
		Di11	U2		Ctrl 3	
		Di12	U3		Ctrl 4	
		Di13	U4		✓ Ctrl 5	
		Di14	U5		✓ Ctrl 6	
		Di15	U6			
		Di16	✓ U7			

* Only required at start of motion; after change of sensor, it is ignored until a re-run takes place.

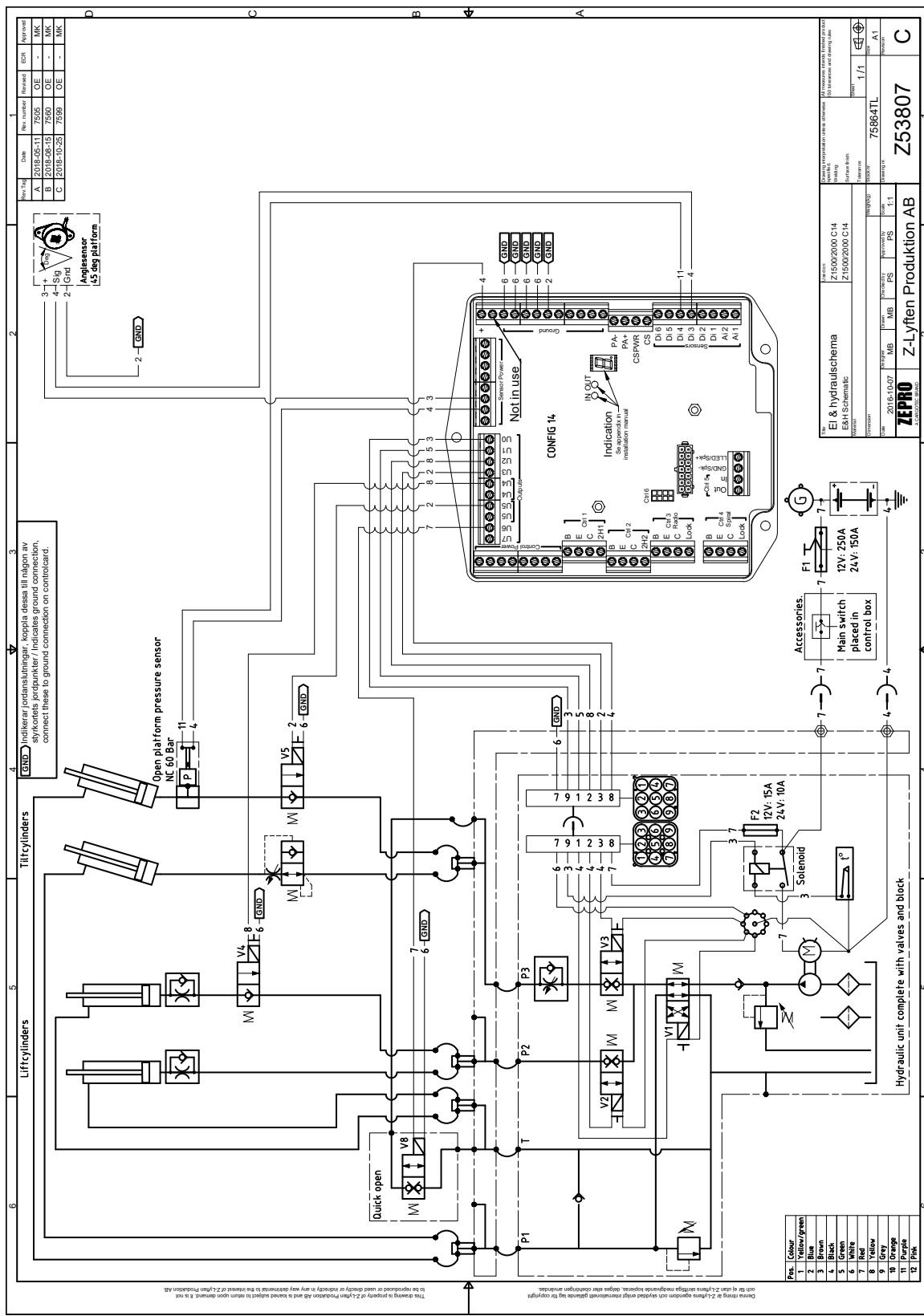
"2.2 Models - Configurations" on page 13

"2.8 Configuration 1 ML" on page 37

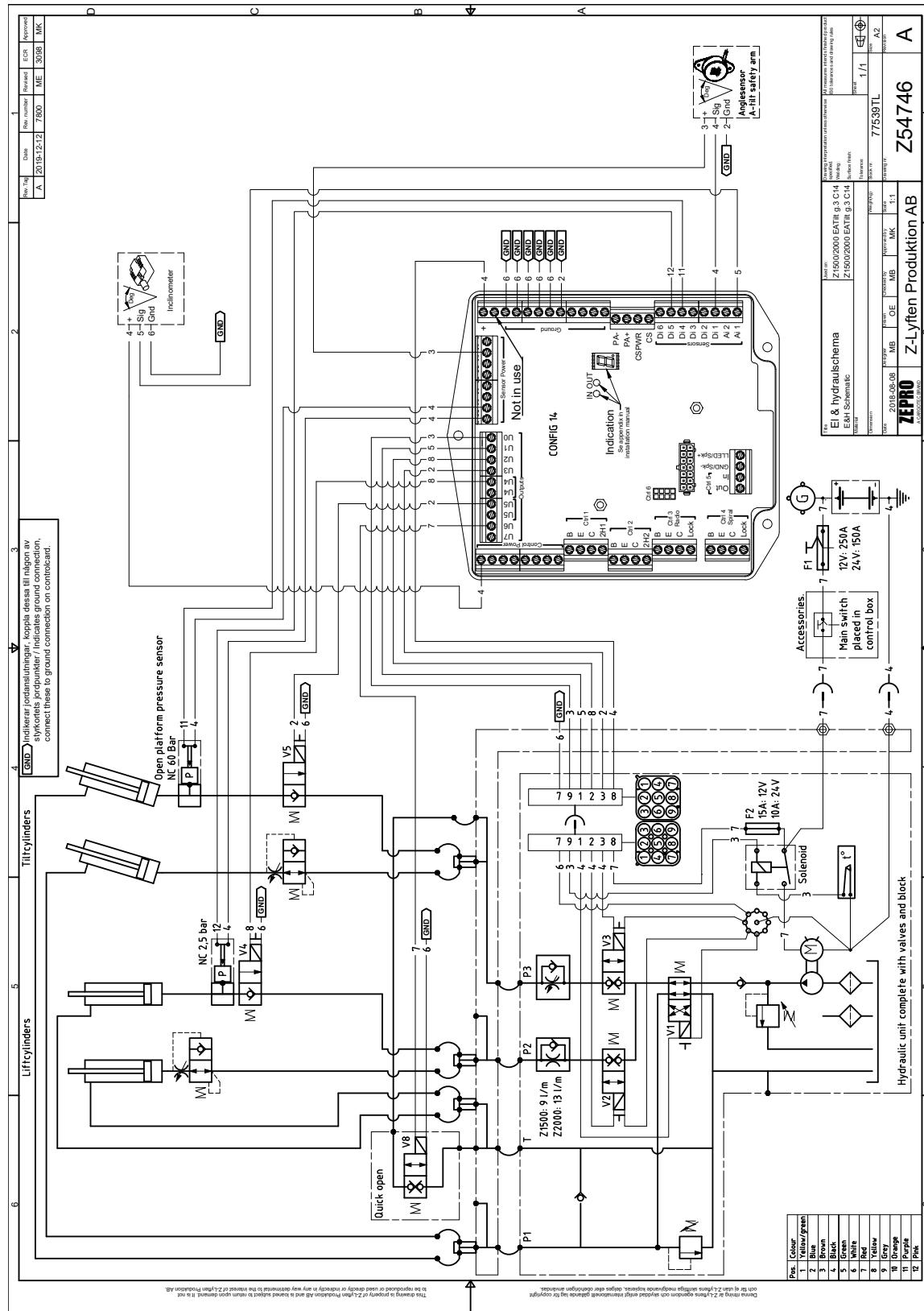
3 Electrical and hydraulic diagrams

3.1 Z/ZL 1500-2000

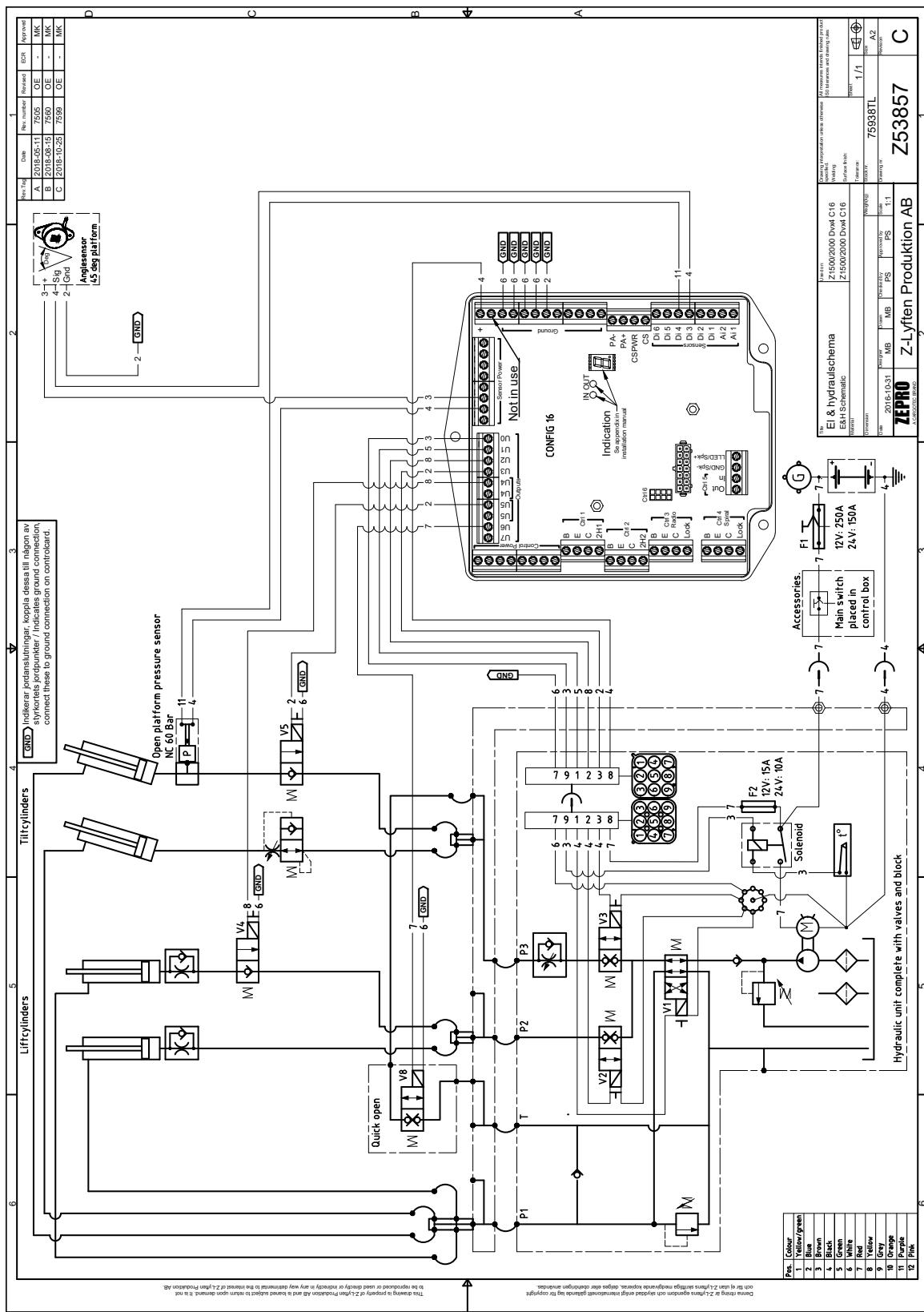
3.1.1 Z/ZL 1500-2000 MA



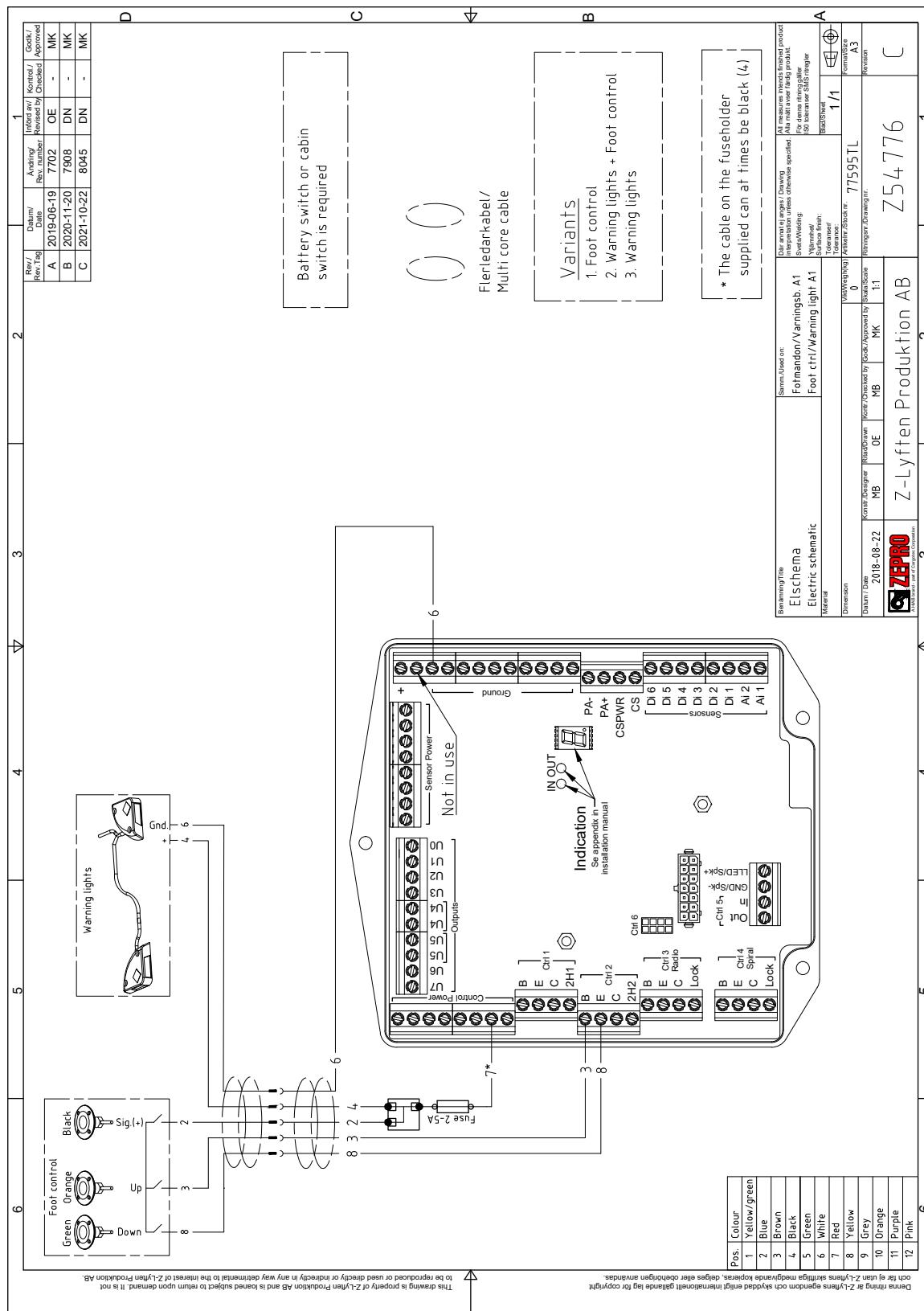
3.1.2 Z/ZL 1500-2000 MA with electric autotilt



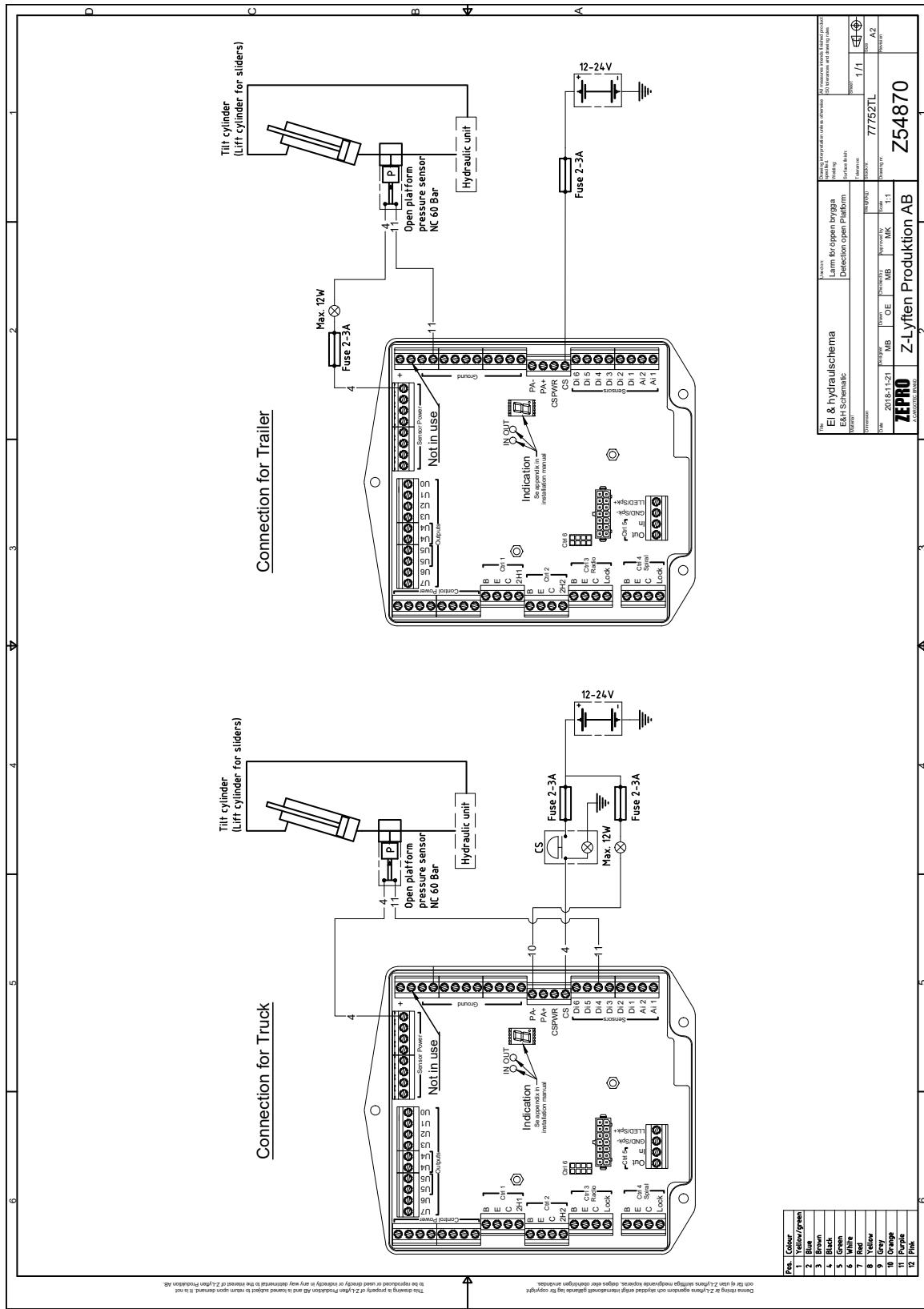
3.1.3 Z/ZL 1500-2000 DA



3.1.4 Warning lighting and foot controls

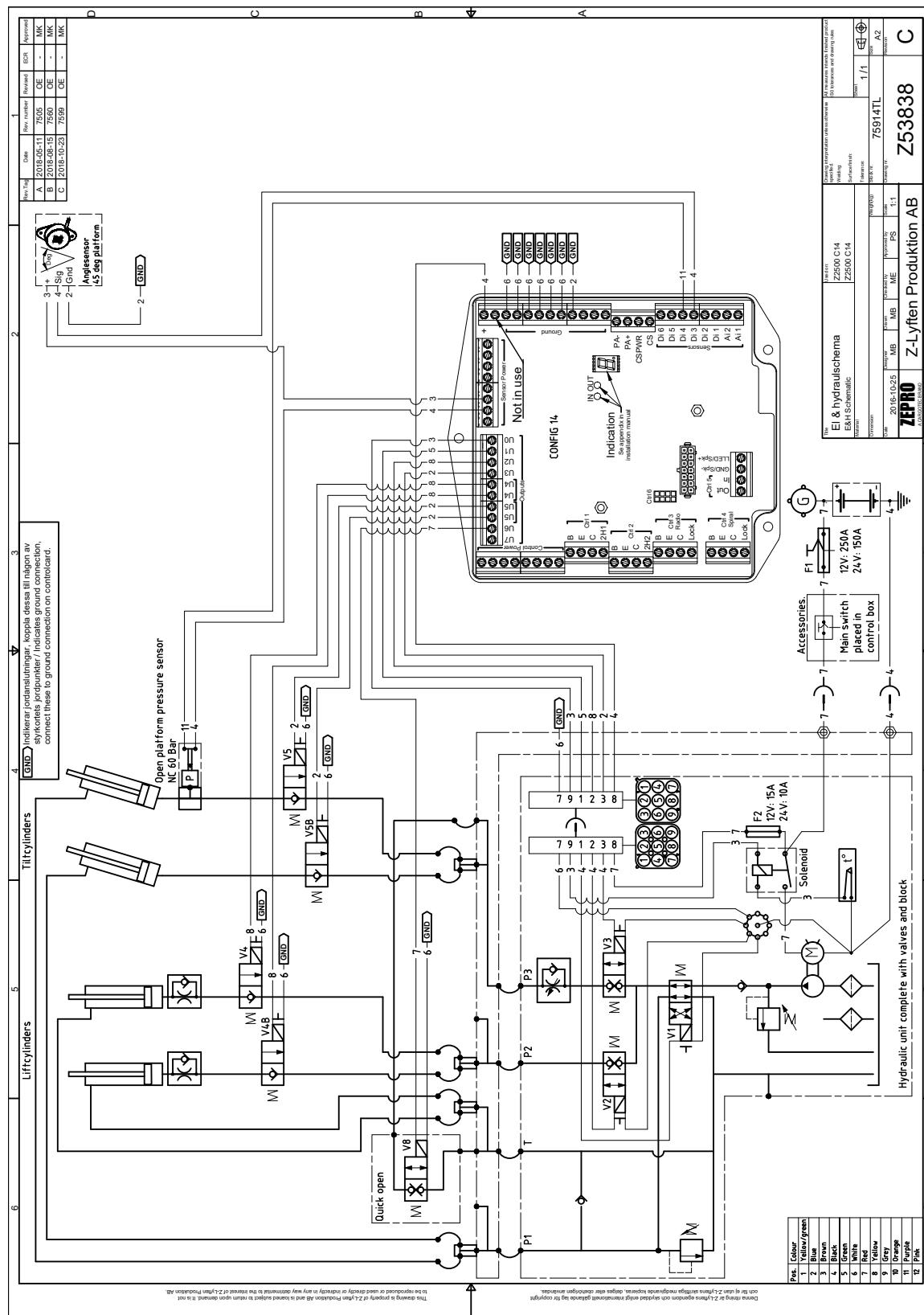


3.1.5 Cabin switch and open platform alarm

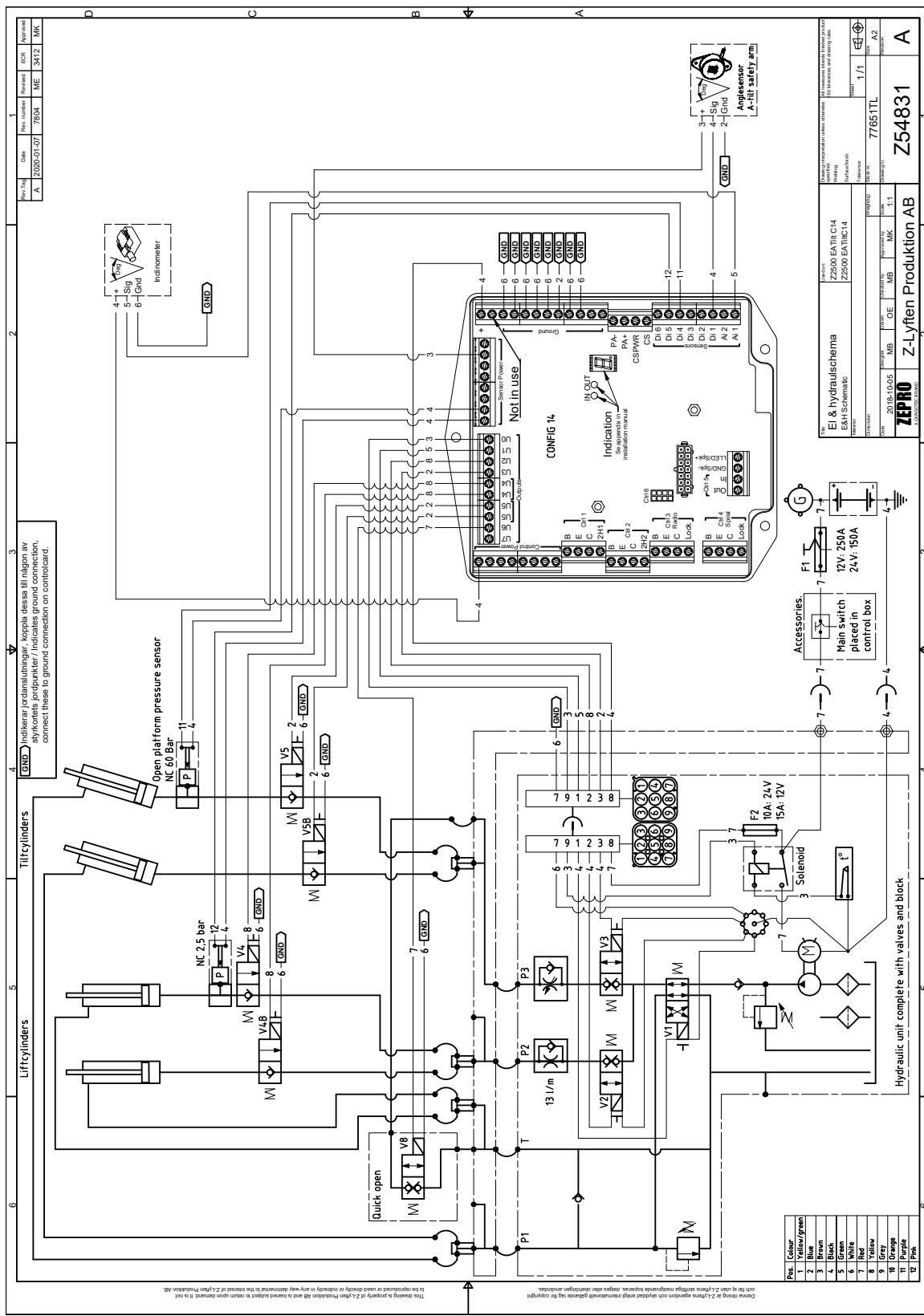


3.2 Z 2500

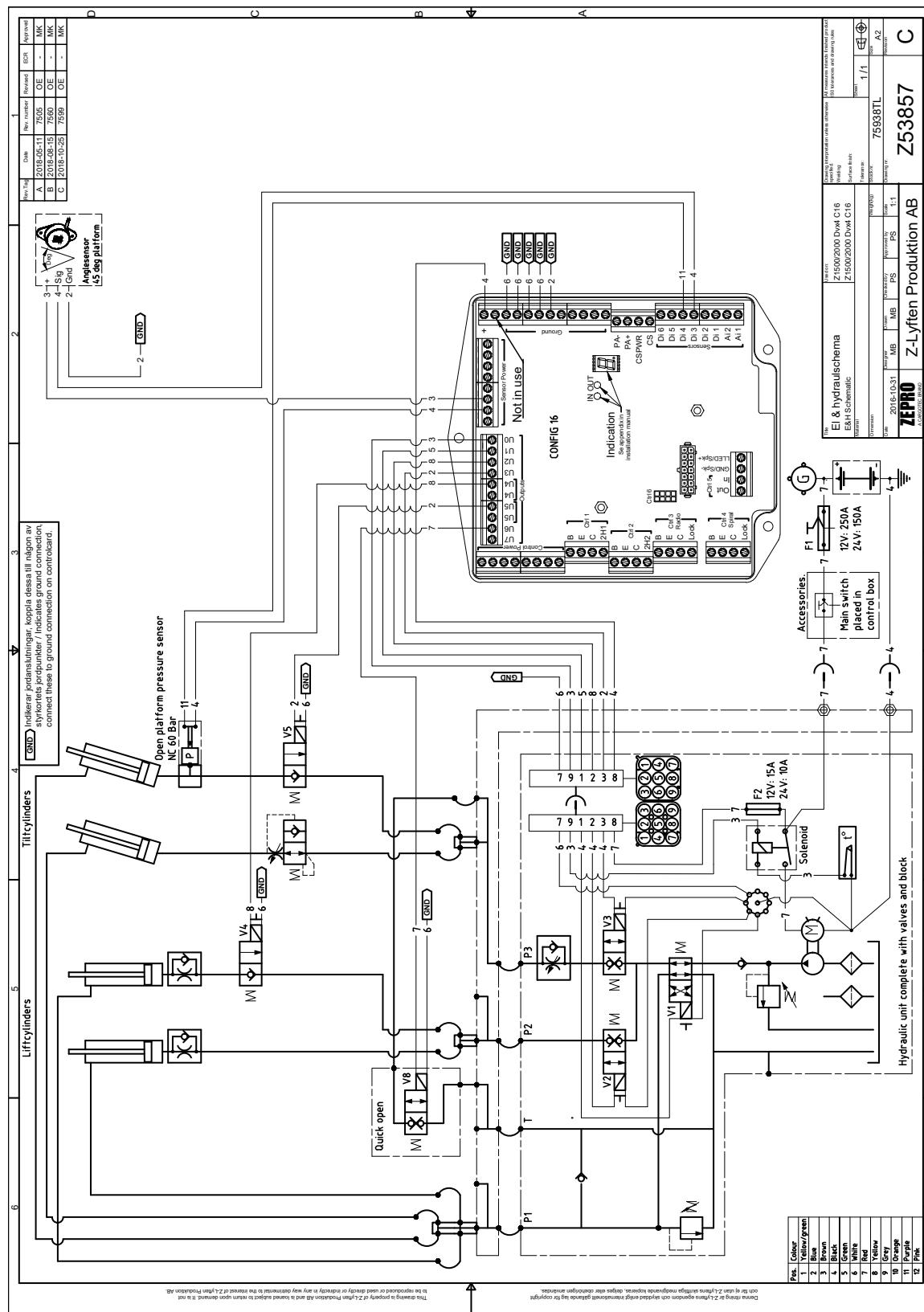
3.2.1 Z 2500 MA



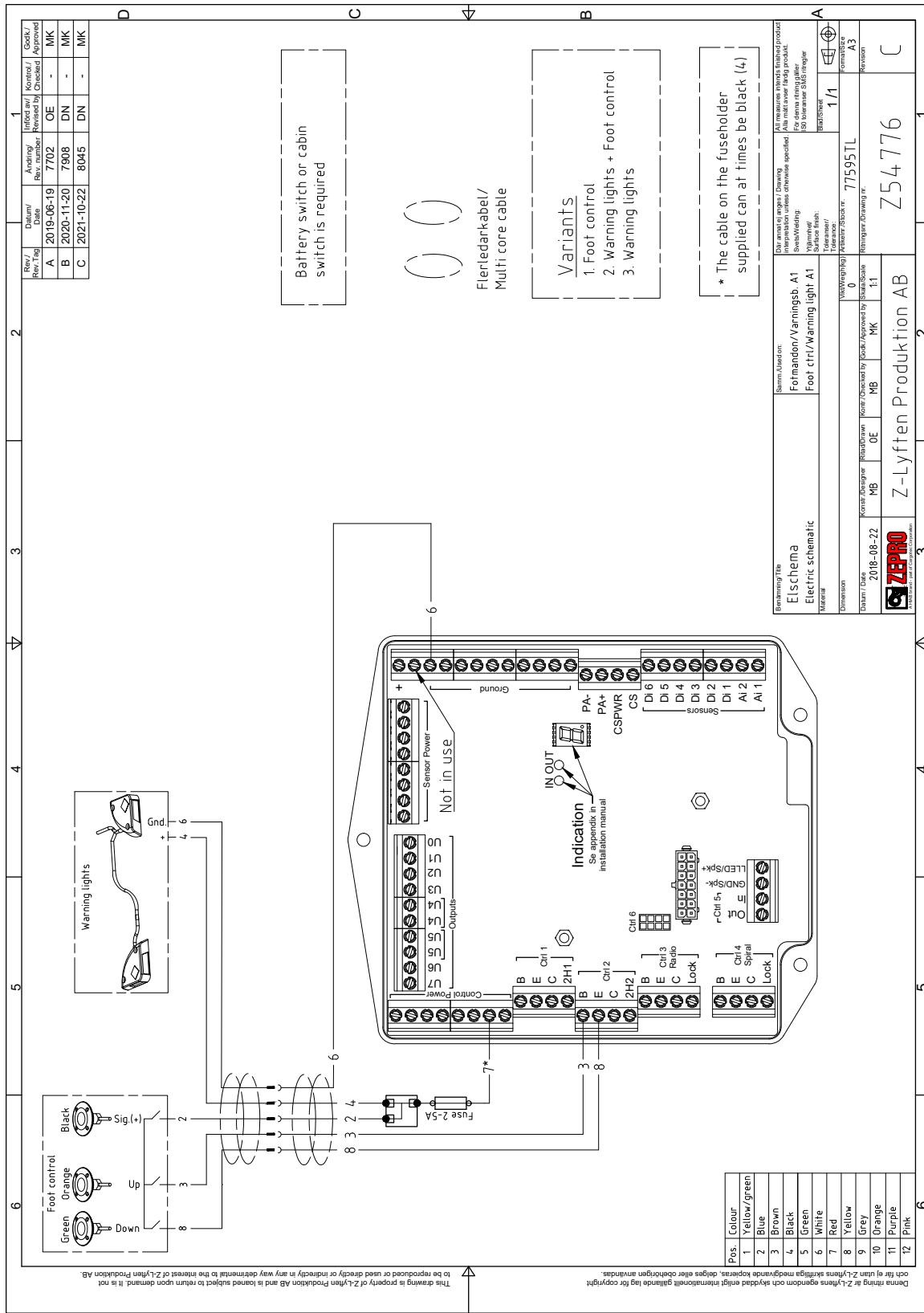
3.2.2 Z 2500 MA with electric autotilt



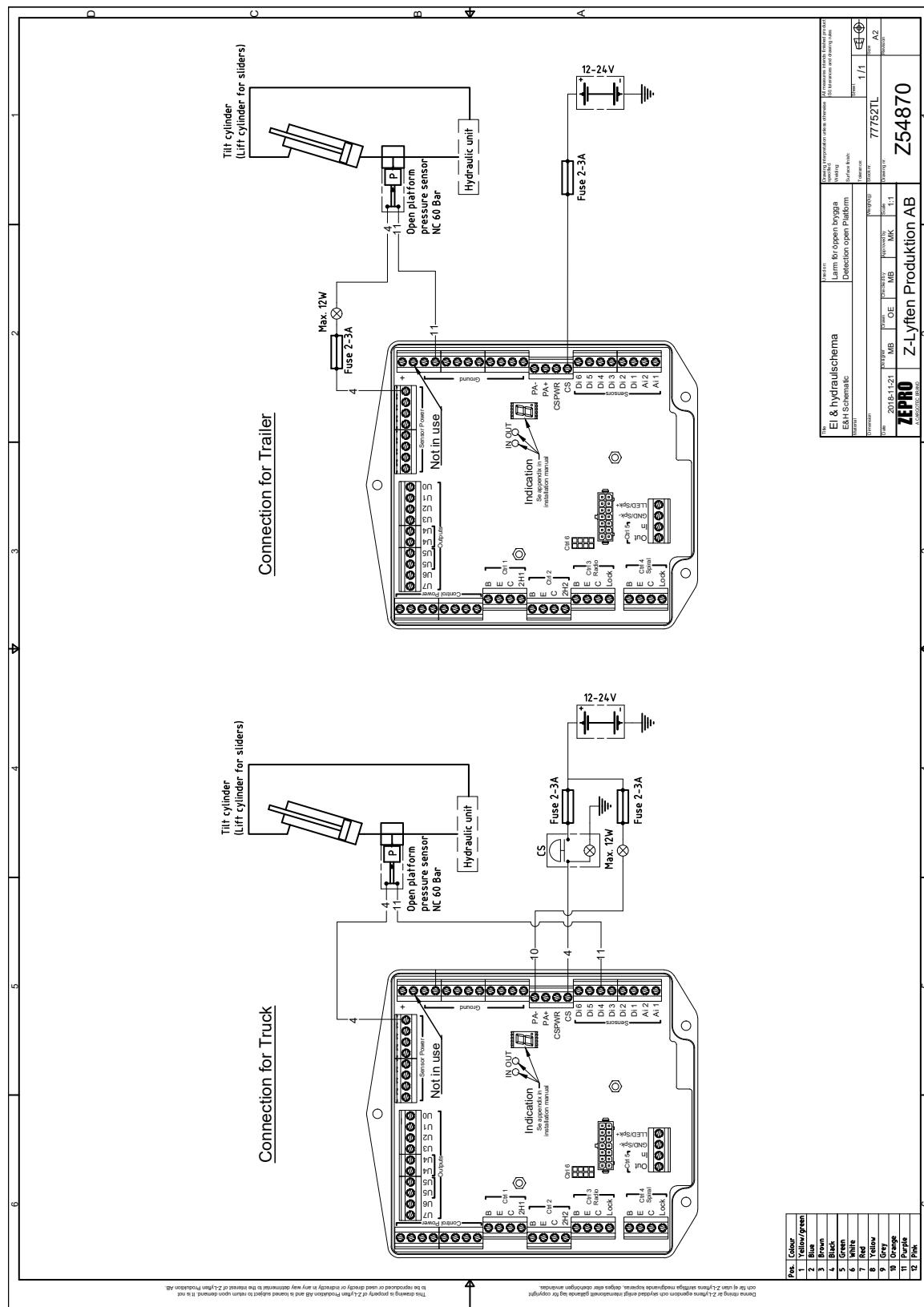
3.2.3 Z 2500 DA



3.2.4 Warning lighting and foot controls

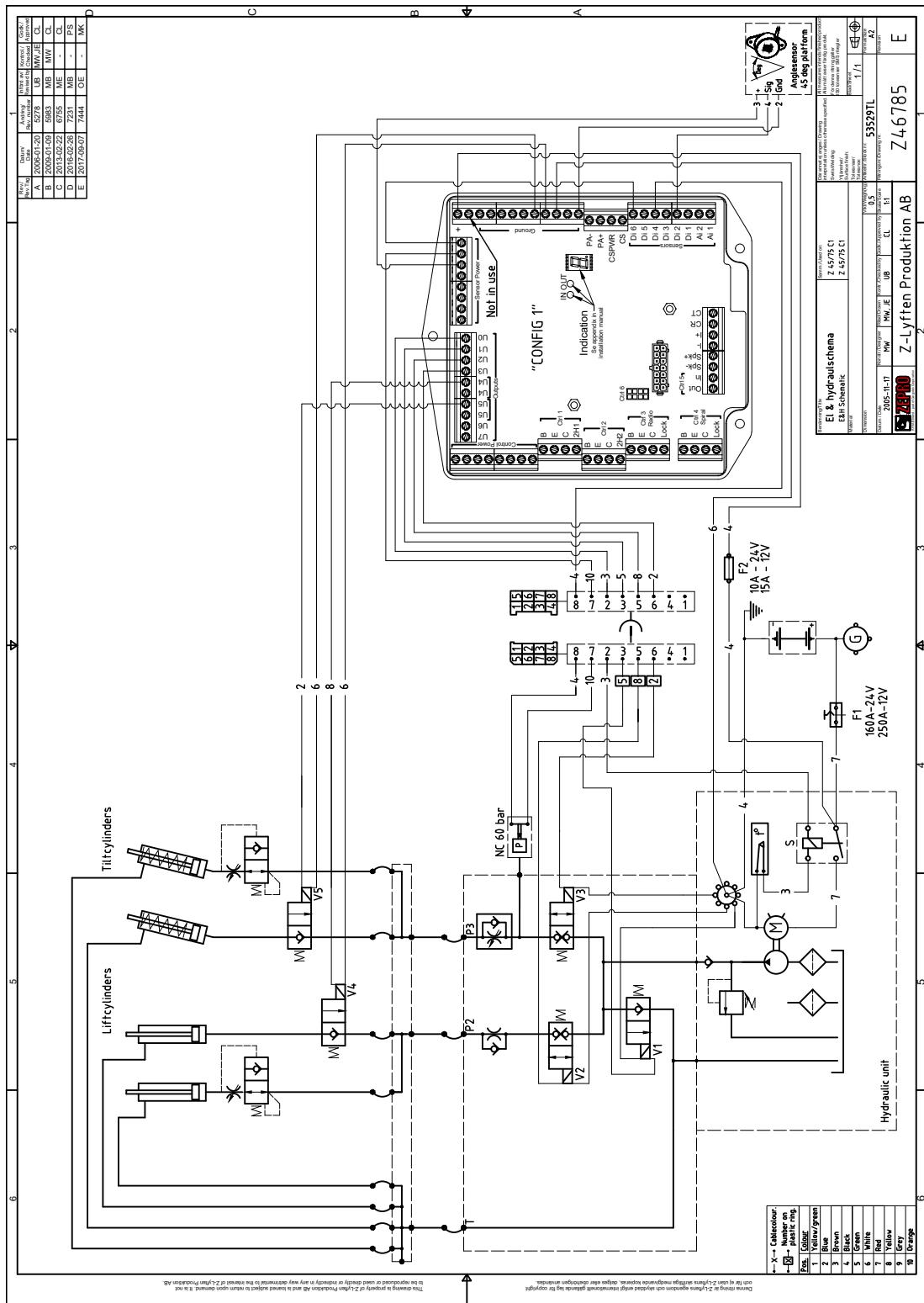


3.2.5 Cabin switch and open platform alarm

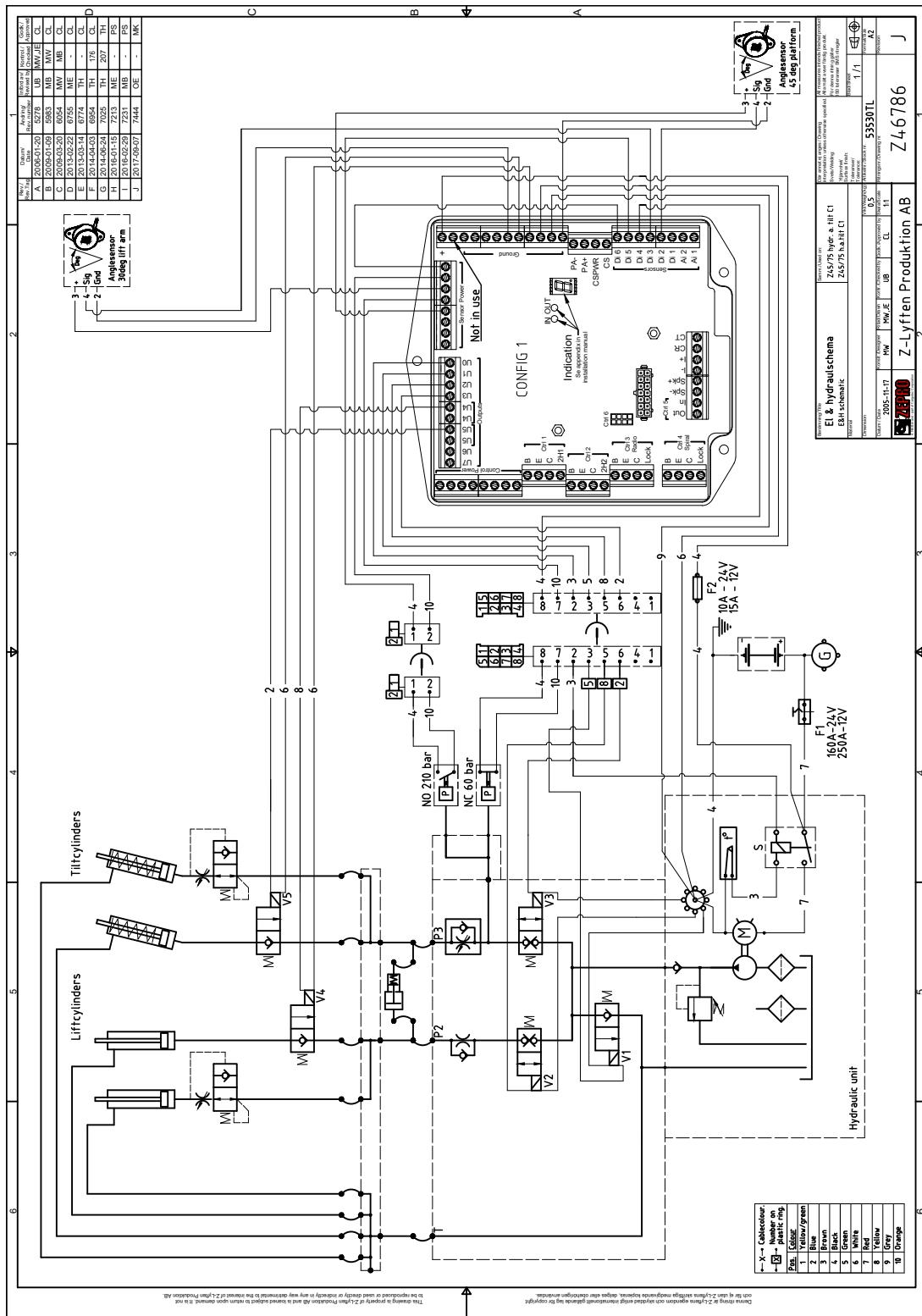


3.3 Z 45/75

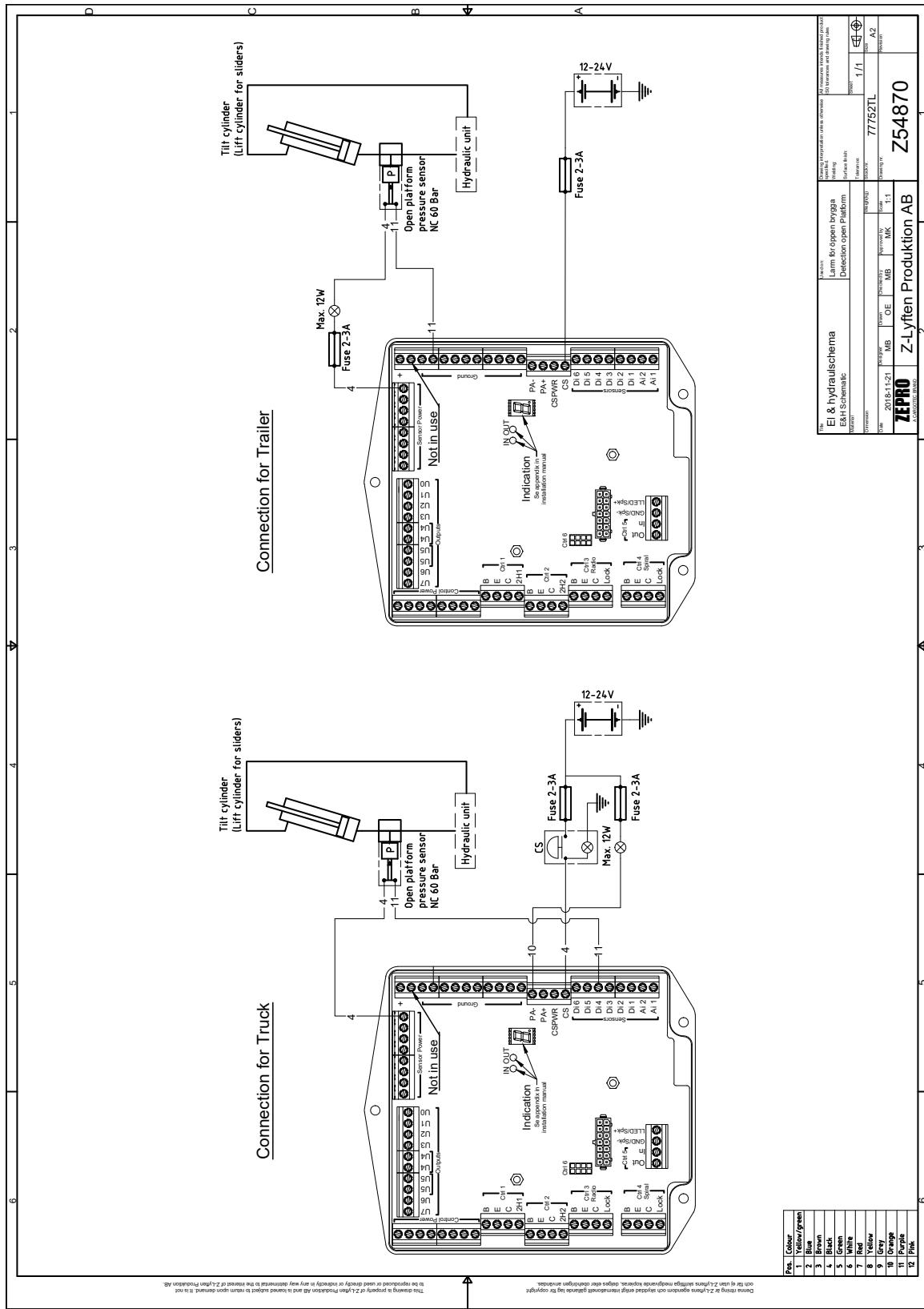
3.3.1 Z 45/75



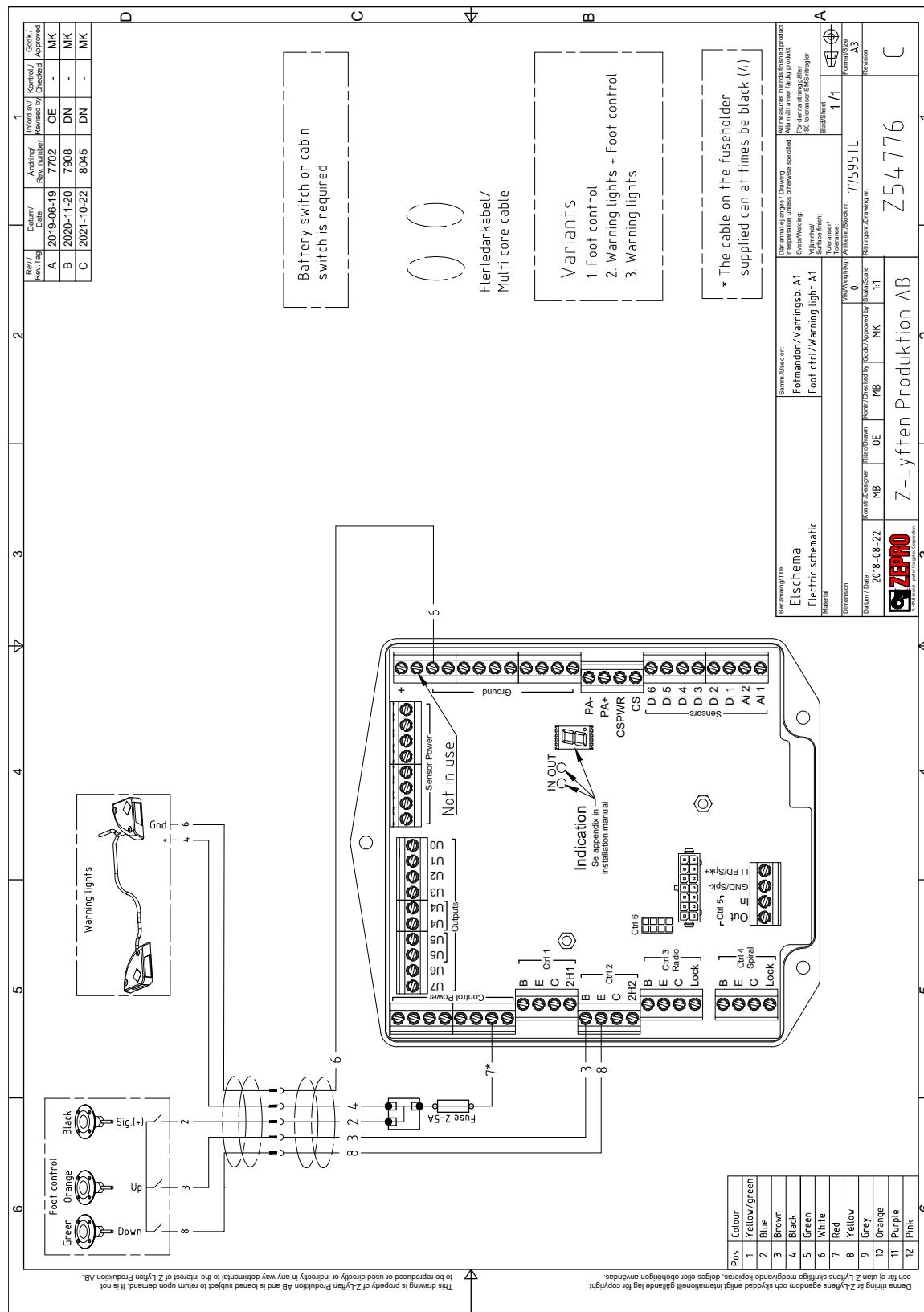
3.3.2 Z 45/75 with hydraulic autotilt



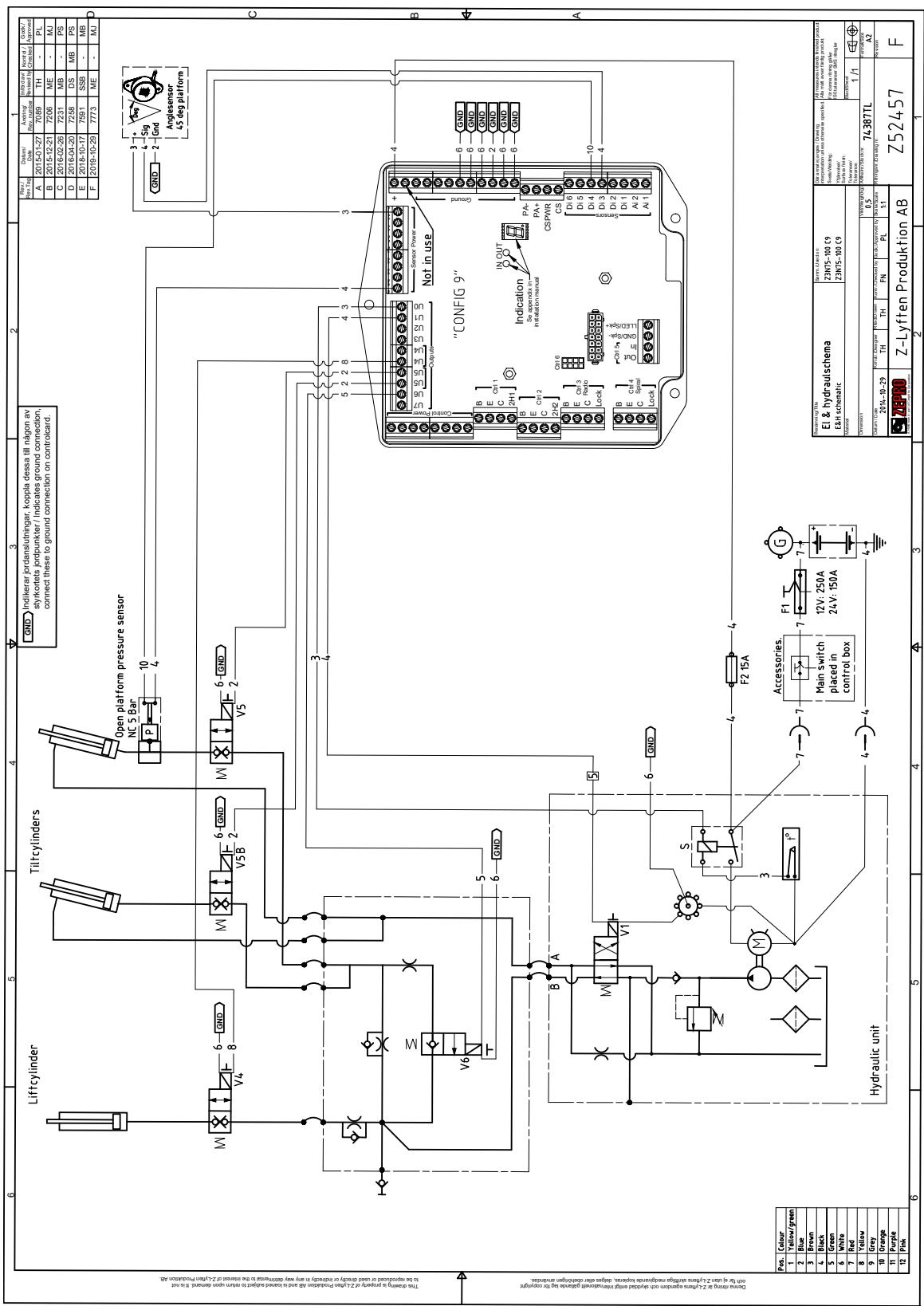
3.3.3 Cabin switch and open platform alarm



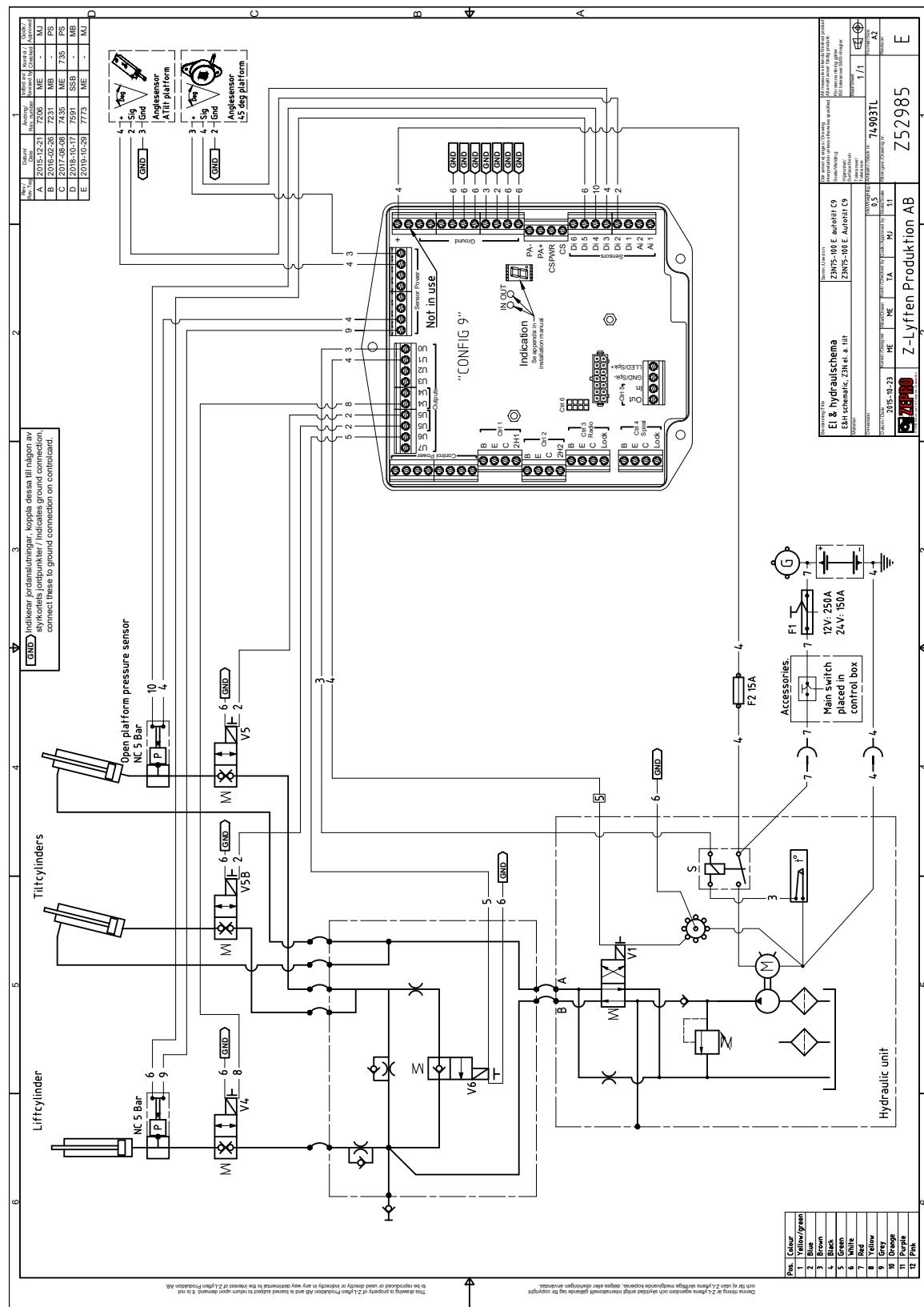
3.3.4 Warning lighting and foot controls



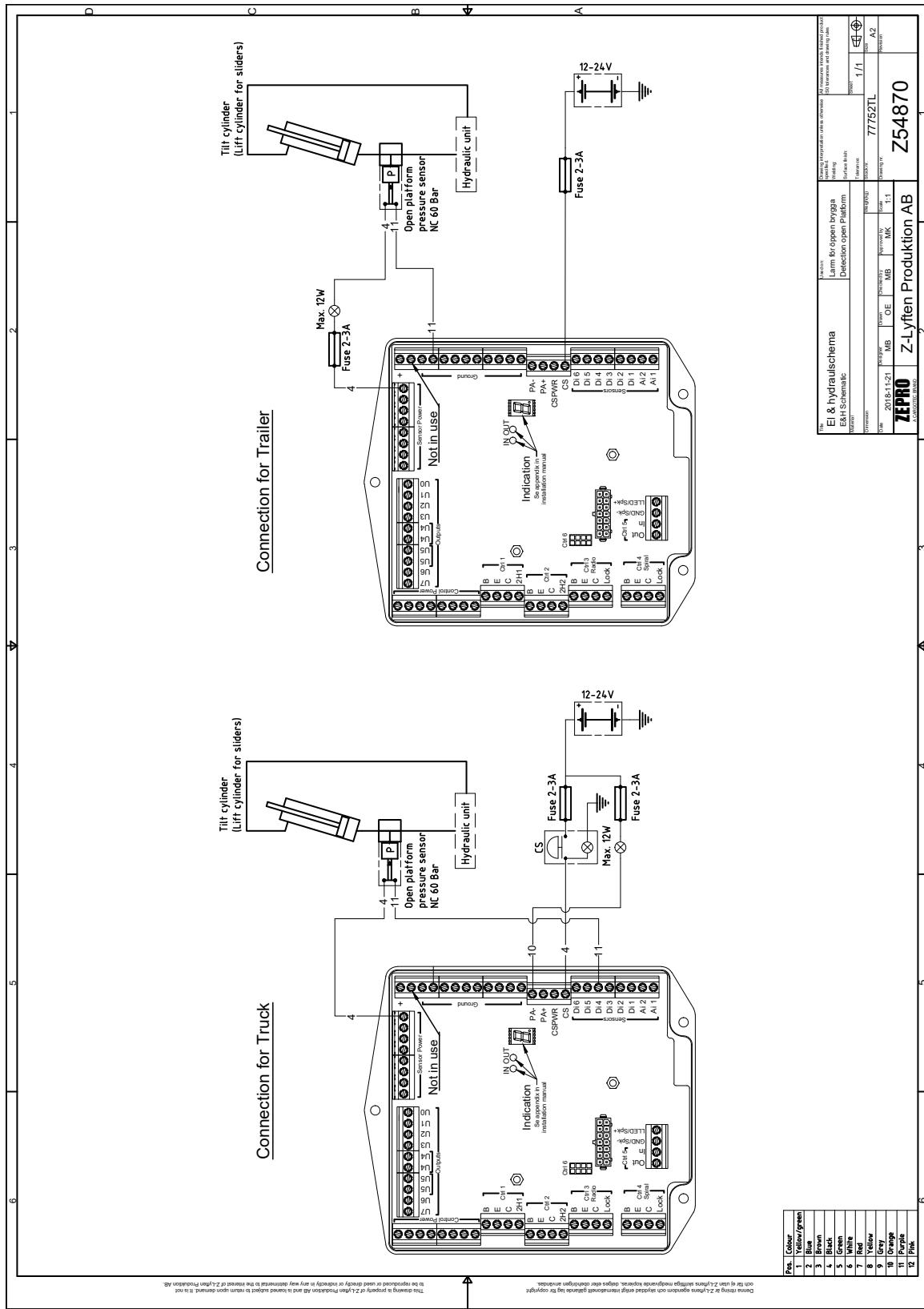
3.4 Z3N, Z3NU, Z3NW, Z3NWU



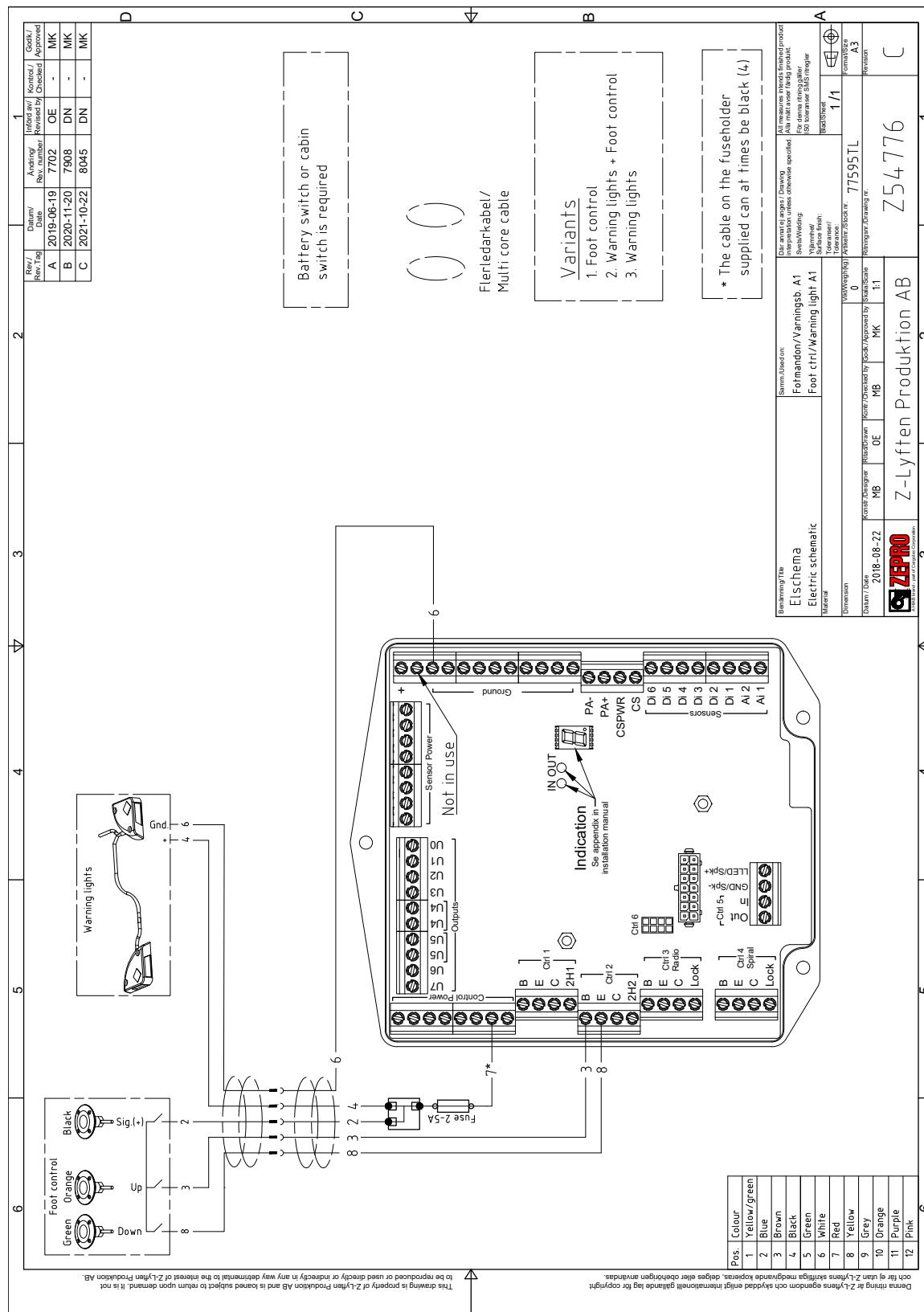
3.4.1 Z3N, Z3NU, Z3NW, Z3NWU with electric autotilt



3.4.2 Cabin switch and open platform alarm



3.4.3 Warning lighting and foot controls



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