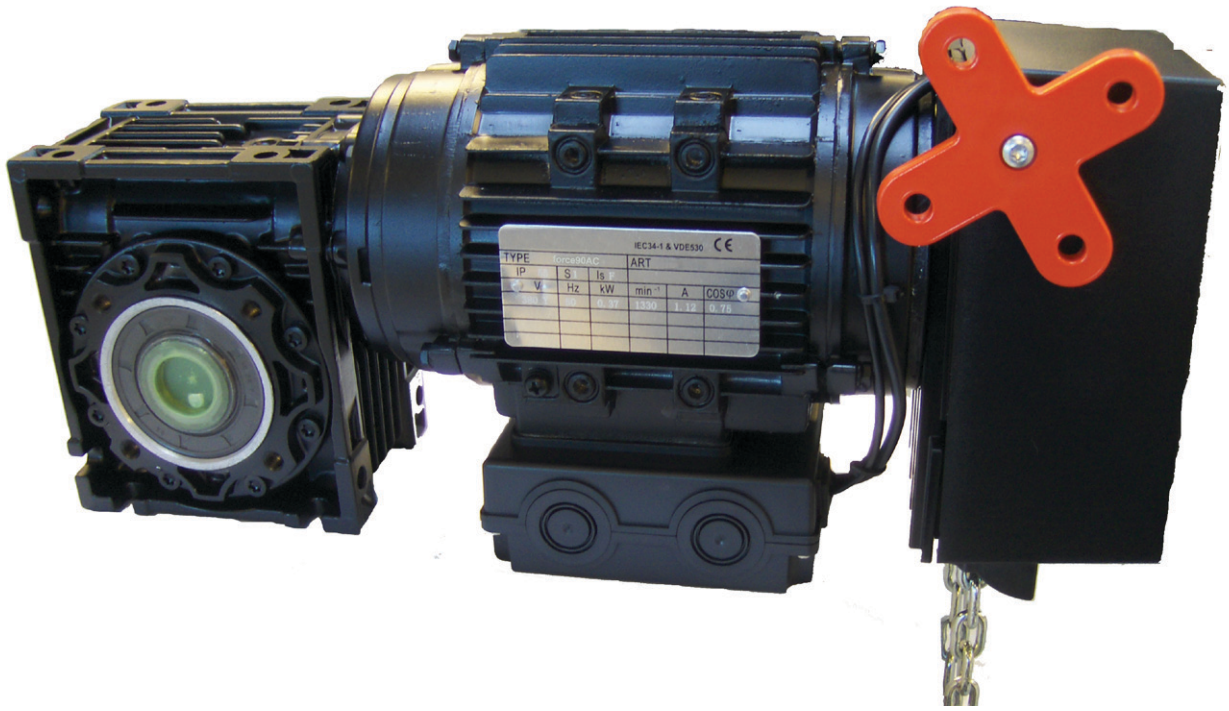
FF manual GB

force140AC

CE

industrial sectional door operator.

INSTALLATION / MAINTENANCE



FF manual GB

INDEX

1 SAFETY INSTRUCTIONS

During the installation it is necessary to observe and follow the safety and accident-prevention regulations valid for the specific application.

In particular the following standards should be noticed (The list may not be sufficiently)

- EN 12453 (Safety in use of power operated doors - Requirements
- EN 12445 (Safety in use of power operated doors – Test methods
- EN 12978 ((Industrial commercial and garage doors and gates- safety devices for power operated doors – Requirements and test methods)

CAUTION – It is important to adjust the electronic force control according to the national regulations to secure the usage of the door and to prevent damage and accidents – Furthermore do not adjust the force control harder than necessary as it can lead to damage or accidents

It is important to follow this installation guide during the installation to insure correct installation.

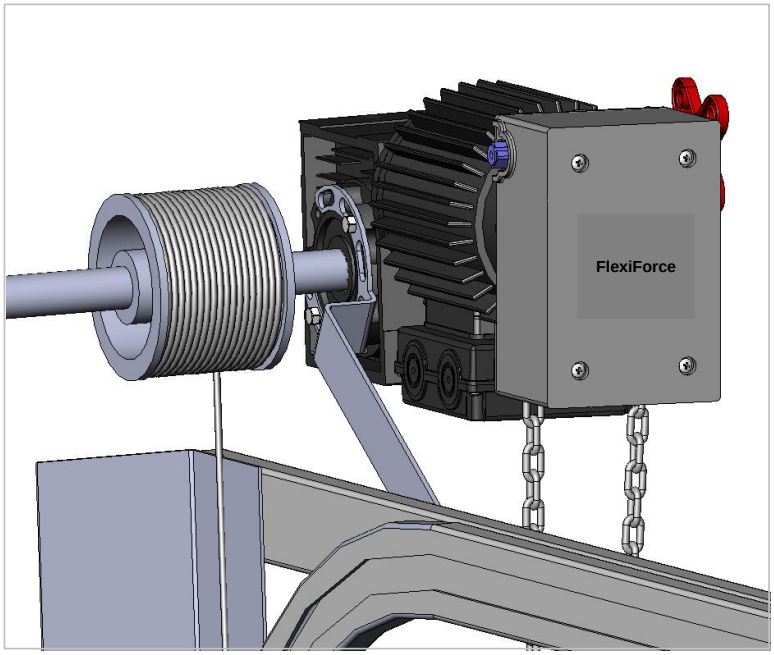
Only trained personal should install electrical equipment according to national security regulations.

1.1 ELECTRICAL INSTALLATION

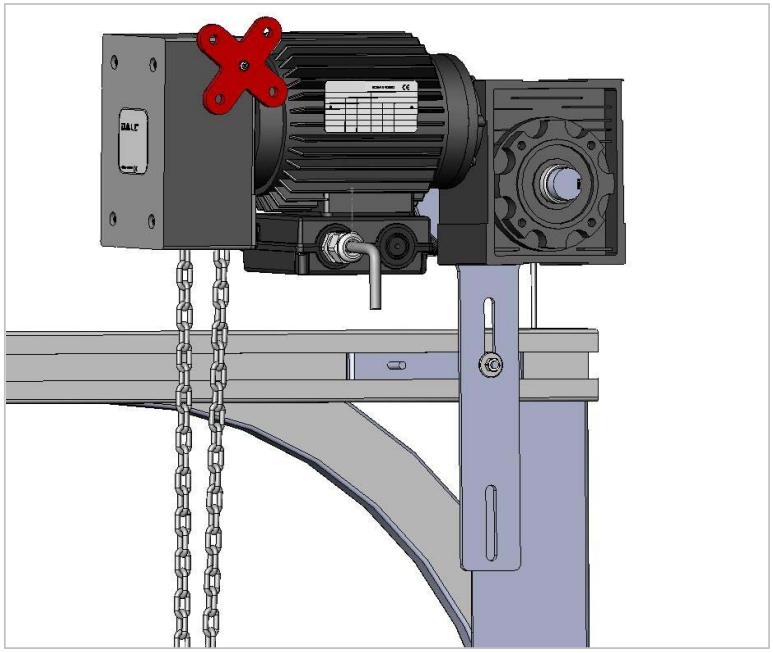
During the electrical installation the installer shall note the following:

- Chect that the control units mains voltage area is equal to the local mains voltage.
- The main power supply must be in the area of max. +/- 10% of the control unit's mains supply.
- Be sure not to overload the gear motor in accordance with the electrical limits on the sign of the gear motor.

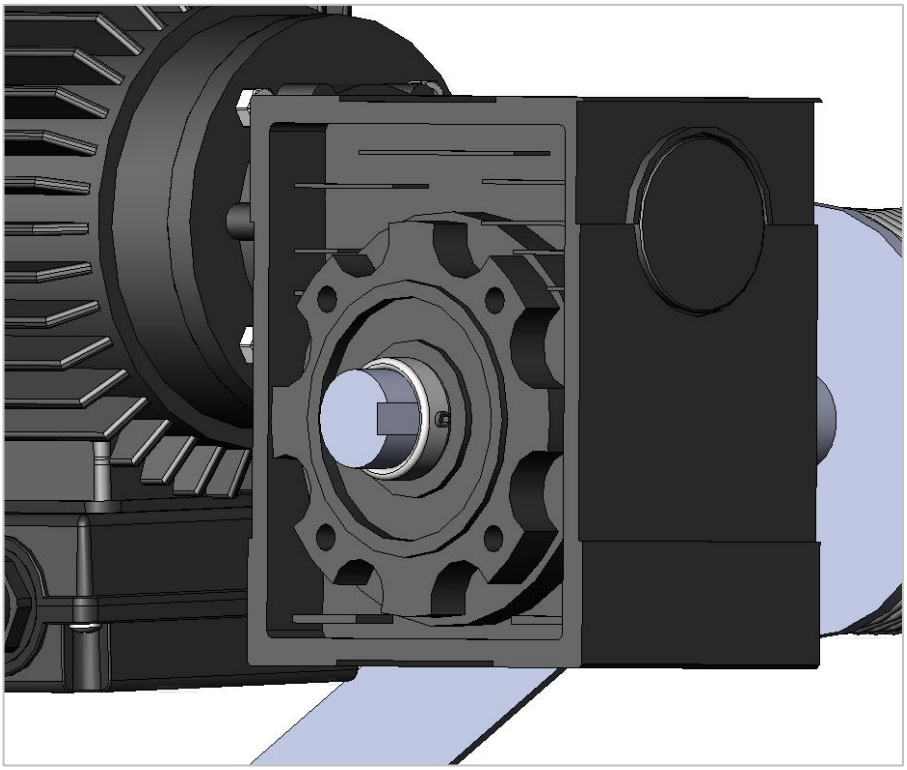
2 INSTALLATION DALL GEARMOTOR ELECTRONIC LIMIT SWITCHES



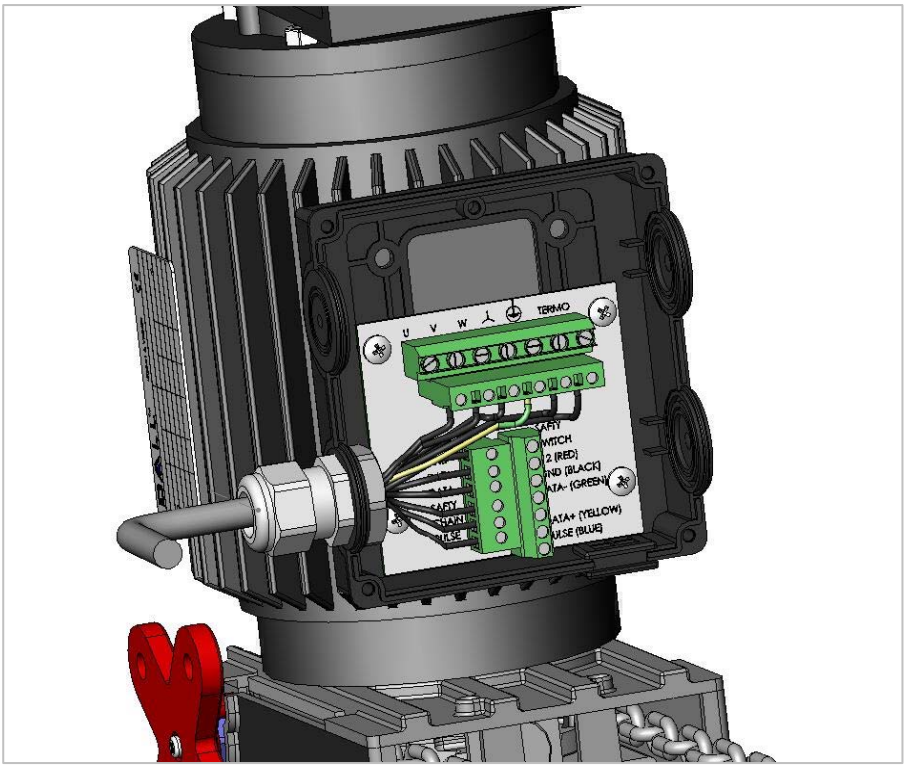
1 Mount the gearmotor on the hollow shaft and fix the mounting bracket with screws to the gearmotor according to the picture.
The gearmotor can be mounted both vertical and horizontal



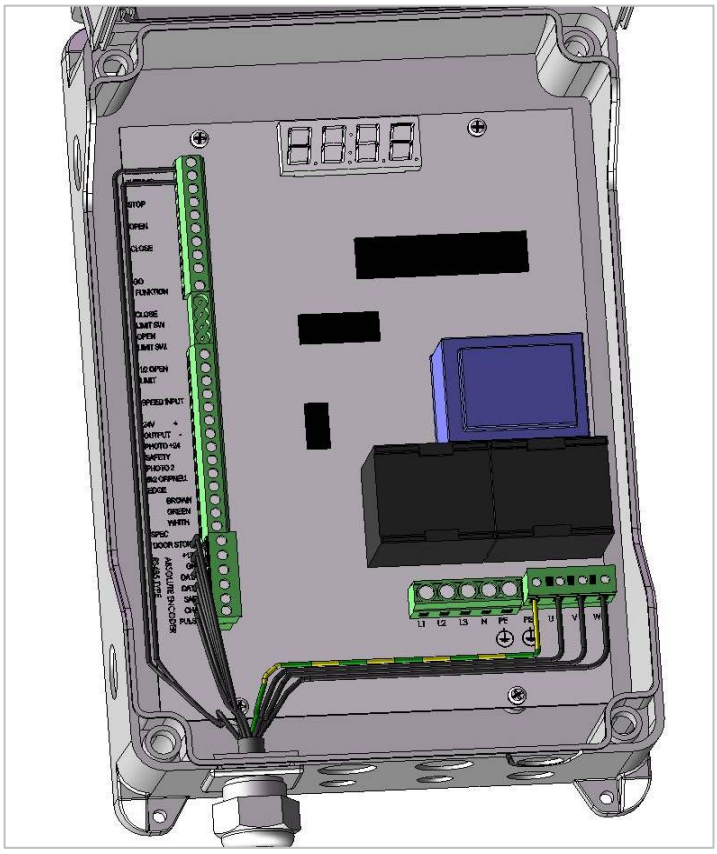
2 The gearmotor can be mounted on the ”C” rail of the door or the door frame vertically



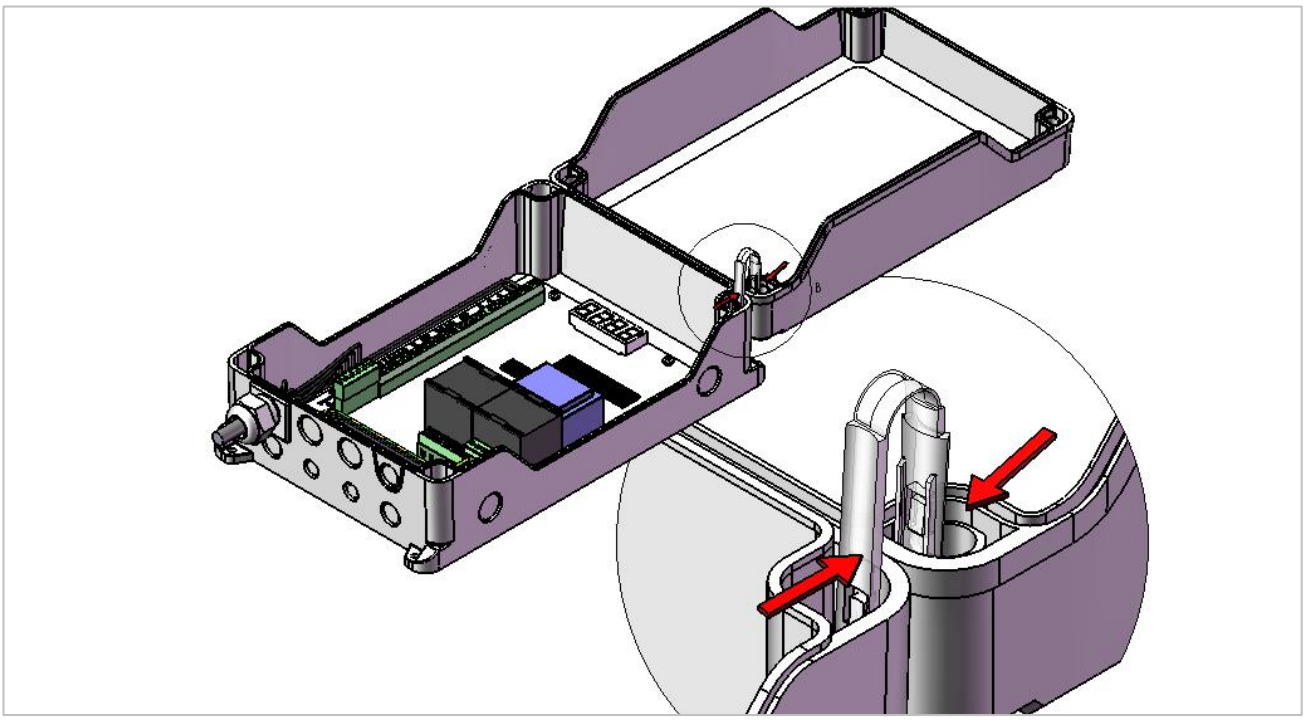
3 Hold the square key steady by using the 1” ring and tighten the hex key.



4 Open the junction box on the gearmotor and remove one of the black blind plugs and fix the plug in terminals as shown.

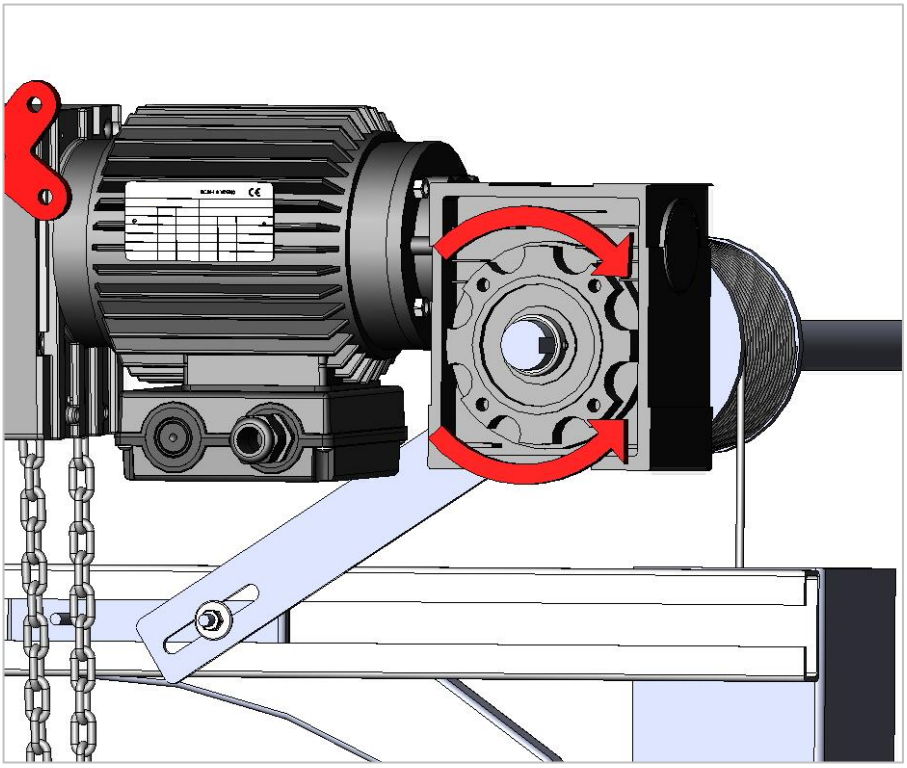


5 Fix the other end of the cable in the control unit as shown. Put the two thermo wires in terminal X3 2-3.



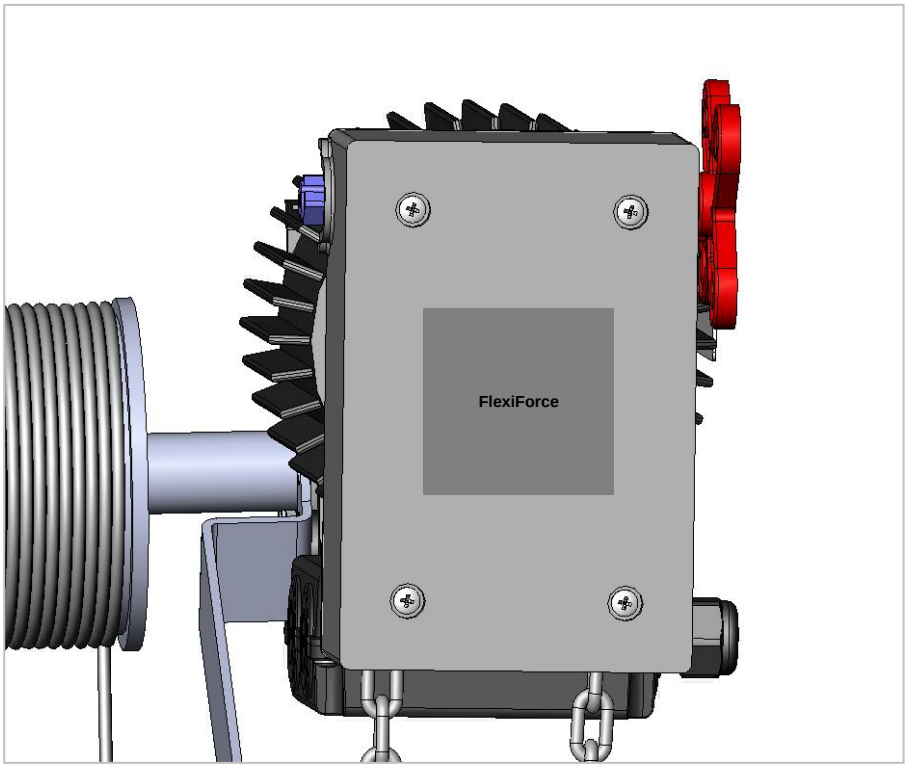
6 The included hinges shall be mounted on top of the box as shown. Important to fix the right ends in the lid and in the base part

7 Fix the mounting bracket for the hand chain on the wall and place the hand chain.

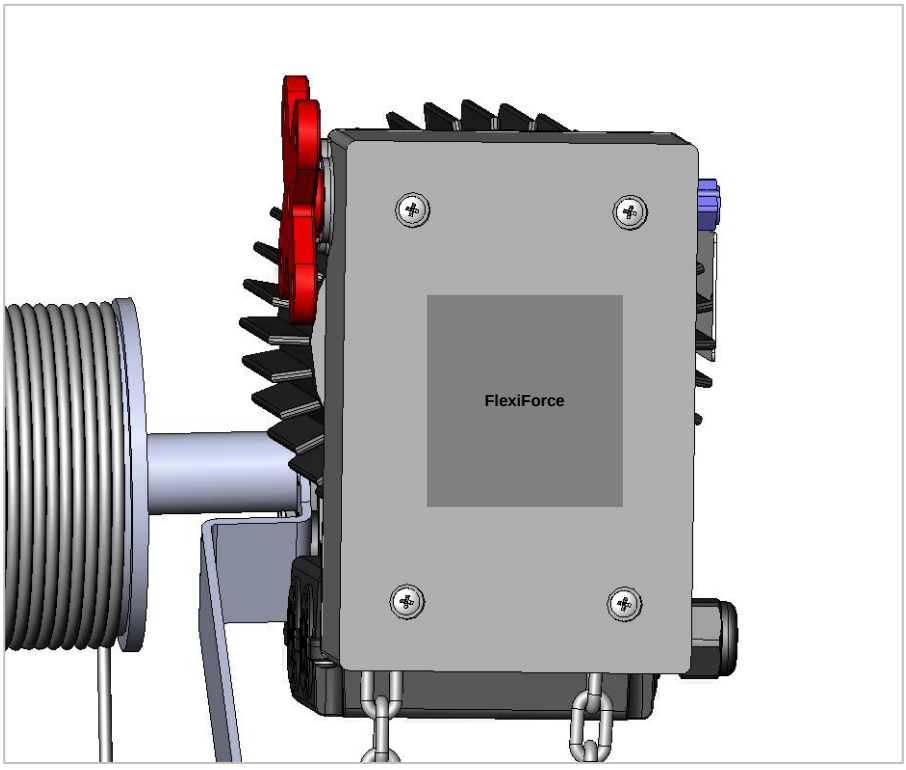


8 Observe the direction of the shaft when the door is opening. Clock wise = left turning and counter clock wise = right turning. Used in programming mode parameter 11.

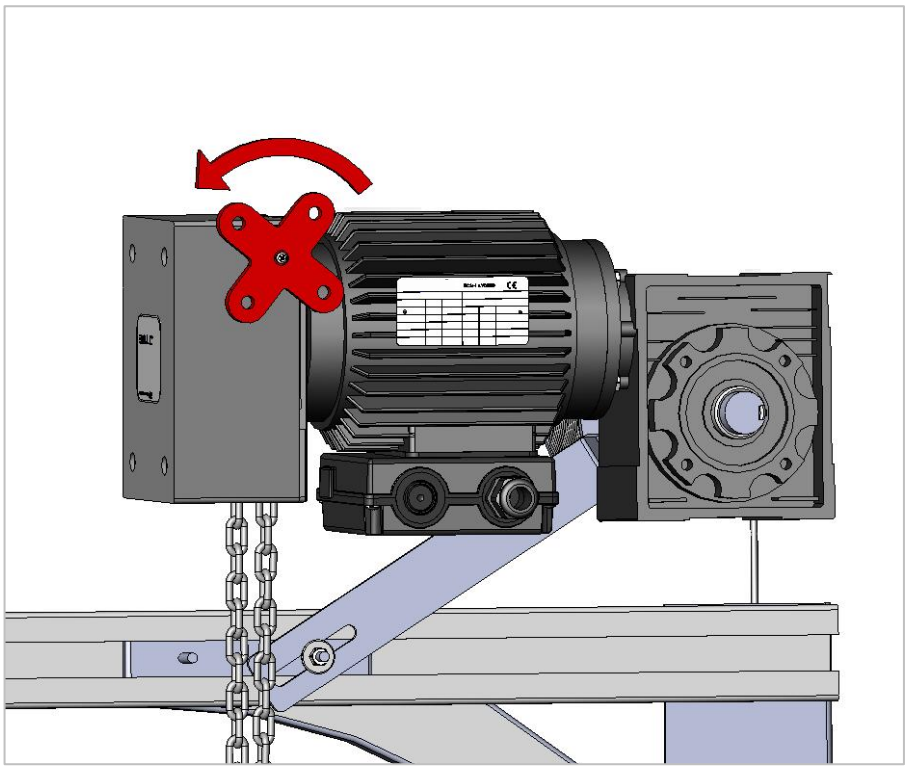
3 MANUAL OPERATION



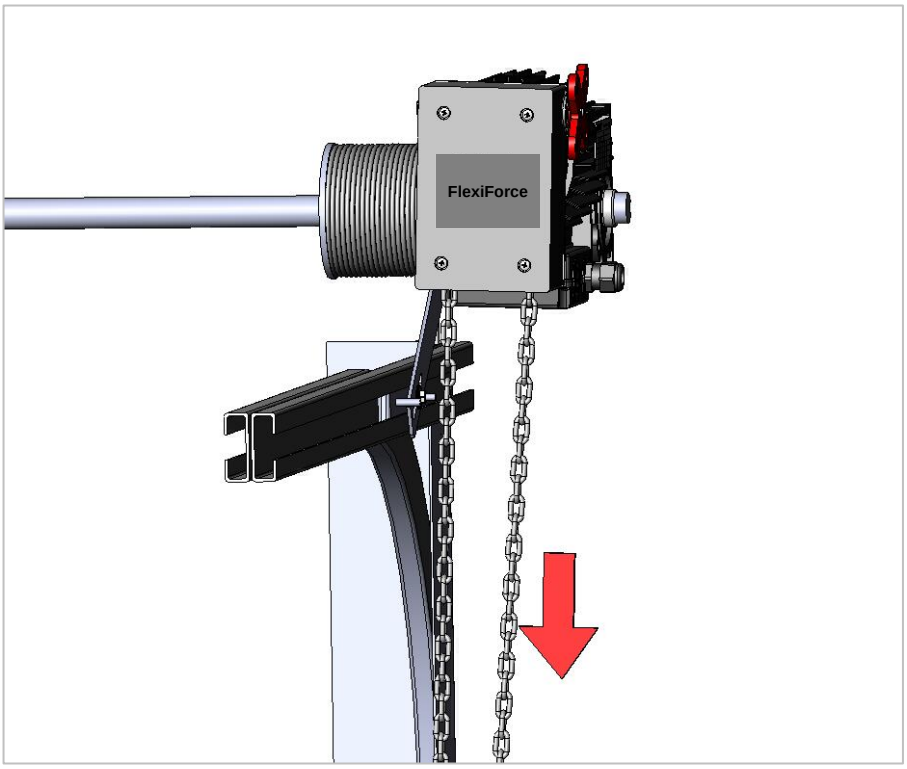
1 Release arm on the right side of the gearmotor. Switch side by releasing the screw in the middle of the release arm



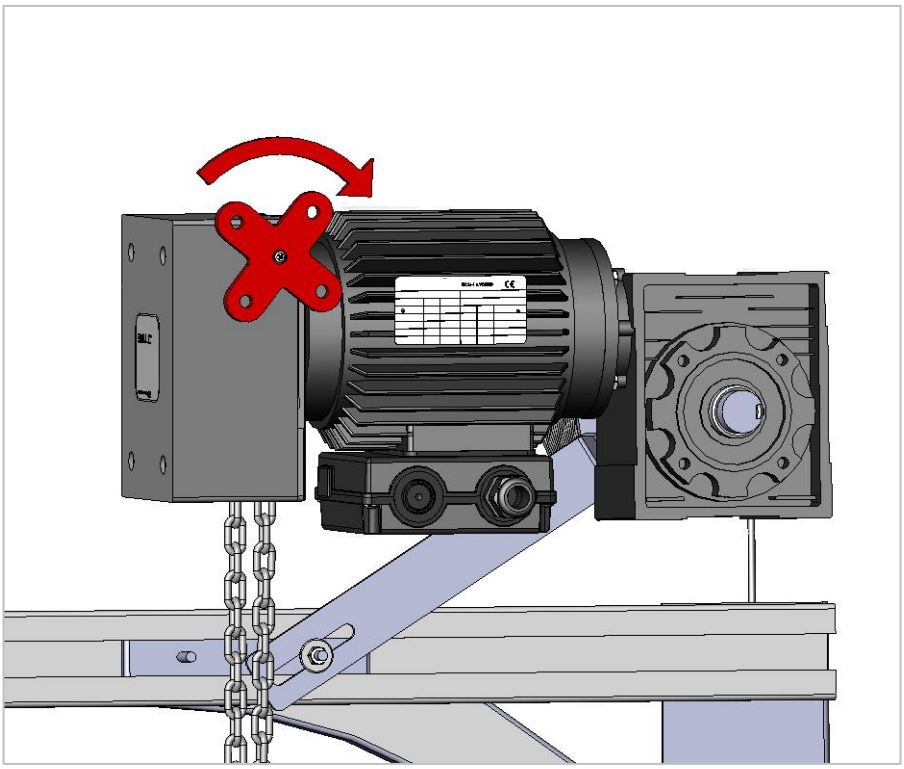
2 Release arm on the left side of the gearmotor



3 Change over to manual operation by switching the arm counter clock wise

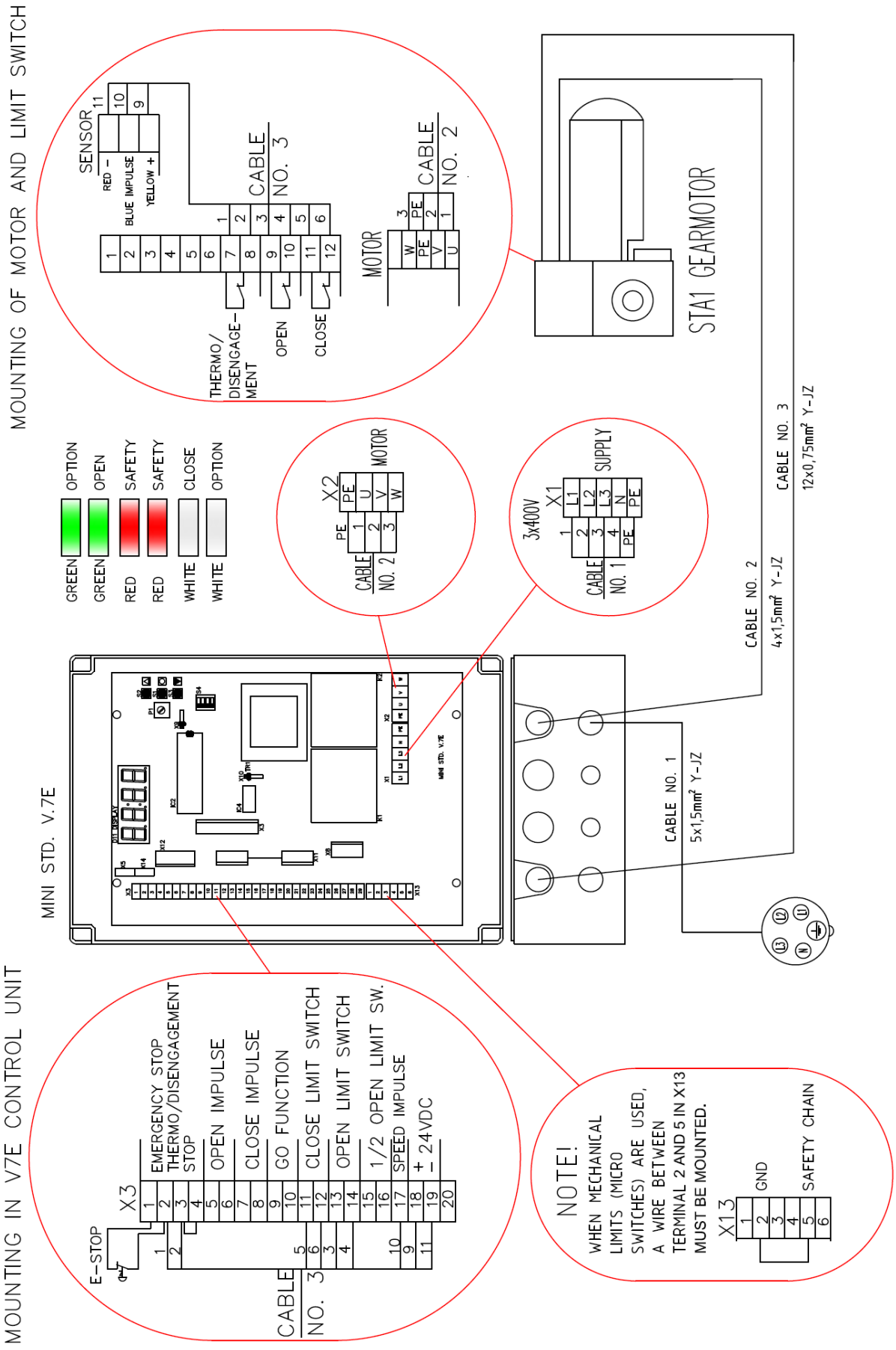


4 Pull the chain part according to the hardware installation to open the door manually. Use opposite chain part to close the door



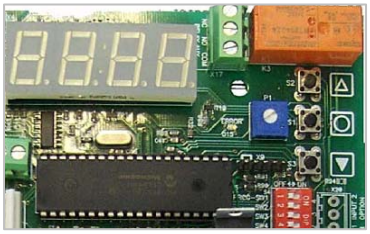
5 Change back to automatic operation by switching the arm clock wise

4 GEARMOTOR WITH MECHANICAL LIMIT SWITCHES



5 HOW TO INSTALL

Programming the control is done by open enclosure. (Without lid)
On the PCB is found OPEN - CLOSE - STOP push-buttons and a 4 pole DIL switch.



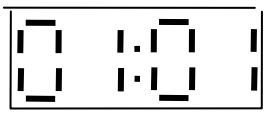
CAUTION! Be sure that no emergency stop or other stop is activated before entering programming mode.

1. ~~**To select programming mode:**~~ **Change DIL switch no. 1 to ON position. The door will always run in deadman mode when programming.**
   (Back to normal mode: Change DIL switch no. 1 to OFF position)

2. Navigating the table:

   STOP push-button is used to toggle between **parameter number** and **parameter value.** Active digits will be flashing.
   Some of the parameters also have an extra step when pressing the stop push-button. This is e.g. when the door need to run for learning process. Display will then shows"RUN".
   OPEN and CLOSE push-buttons is used select the wanted parameter number if this is active or change parameter value if this is active. If display shows "RUN" these button simply runs the door up and down in deadman mode.

3. Parameter explanation

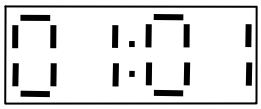


Parameter value. Values shown in this manual is factory setting.

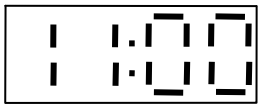
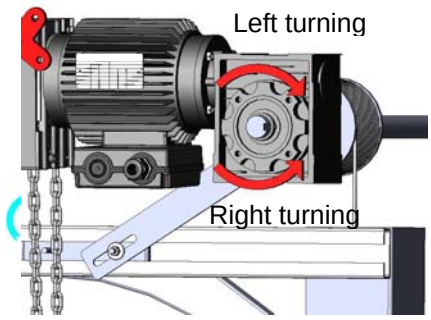
Parameter number

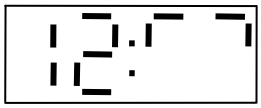
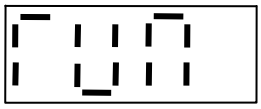
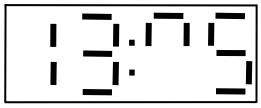
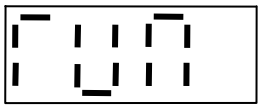
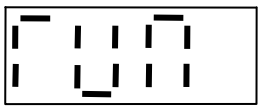
PLEASE FOLLOW THE NEXT PAGES TO INSTALL!!!

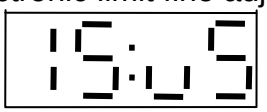
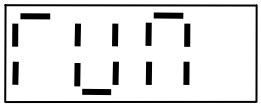
5.1 OPERATION MODE

Parameter 2 digits before colon **Value shown in this column is factory settings**	Value 2 digits after colon
Door type setup 	01 = Dead man OPEN Dead man CLOSE **(Put a bridge in X3 23-24)** 02 = Impulse OPEN. Dead man CLOSE **(Put a bridge in X3 23-24)** 03 = Impulse OPEN. Impulse CLOSE

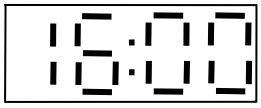
5.2 LIMIT TYPE AND LEARN OPEN AND CLOSING LIMITS

Limits type select 	00 = Mechanical limits (micro switches) 01 = Electronic limits Dalmatic absolute encoder – right turning 02 = Electronic limits Dalmatic absolute encoder – left turning 03 = Electronic limits Feig absolute encoder TST PD – right turning 04 = Electronic limits Feig absolute encoder TST PD – left turning 05 = Electronic limits Kostal encoder type 05.4420.00– right turning 06 = Electronic limits Kostal encoder type 05.4420.00– left turning 07 = Electronic limits Awaco (AEAT-6012-A06)– right turning (option) 08 = Electronic limits Awaco (AEAT-6012-A06)– left turning (option) ***Door operator seen from this side, when the door opens.**  **** After changing to Kostal encoder, a new Power up is needed to start communication.** **! Note that Data+ = Kostal RS485 A.**

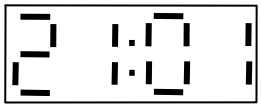
Electronic limit adjust  + 	Learn OPEN limit (electronic limits) Press STOP push-button until the display flashes"RUN". (Note that **no** ½ OPEN limits must be active in learning process. (parameter 16)) Run the door to wanted open position. (By pressing OPEN or DOWN)) Press the STOP push-button to confirm new wanted open limit. (The display will indicate open limit symbol about 2 sec. and the display will automatic switch to back active parameter number)
Electronic limit OPEN fine adjust  + 	Press STOP push-button until the display parameter value is active. Fine adjust OPEN limit 6-9 more open, 1-4 less open. Press OPEN or CLOSE push-button to change value. If the value is changed: Press STOP push-button (Display shows"RUN".) Try the fine adjustment value by running the door up and down. Press the STOP push-button to save and return to parameter value. (adjustment range is maximum +/- 0.8% of the door run range) Pressing STOP without a value change = return to parameter number.
Electronic limit adjust  + 	Learn CLOSE limit (electronic limits) Press STOP push-button until the display flashes"RUN". Run the door to wanted close position. (normally 5 cm from floor) (By pressing OPEN or DOWN) Press the STOP push-button to confirm new wanted open limit. (The display will indicate close limit symbol about 2 sec. and the display will automatic switch to back active parameter number) ***Note that safety edge is disabled in programming stage!!***

Electronic limit fine adjust.  + 	Press STOP push-button until the display parameter value is active. Fine adjust CLOSE limit 6-9 more open, 1-4 less open. Press OPEN or CLOSE push-button to change value. If the value is changed: Press STOP push-button (Display shows" RUN".) Try the fine adjustment value by running the door up and down. Press the STOP push-button to save and return to parameter value. (adjustment range is maximum +/- 0.8% of the door run range) Pressing STOP without a value change = return to parameter number.

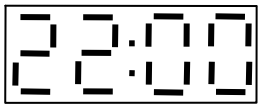
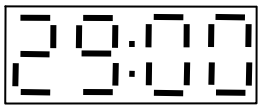
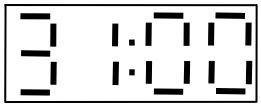
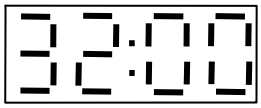
5.3 ½ OPEN SETTINGS

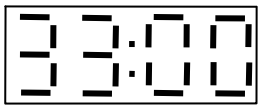
½ OPEN feature 	Possible ½ OPEN stop to save energy. 00 = No ½ open active. 01 = **Mechanical limits used:** (Mechanical limits selected in parameter 11) ½ open stop active. Position controlled by mechanical micro switch (normally closed type) in terminal 15 + 16. Short-circuit then terminal 15,16 by another switch, simply to ON/OFF this function. **Electronic limits used:** (Electronic limits selected in parameter 11) 02 = ½ open stop active. Electronic limit on 4/8 open position. (ON/OFF) controlled by a switch in terminal 15 + 16). 03 = ½ open stop active. Electronic limit on 5/8 open position. (ON/OFF controlled by a switch in terminal 15 + 16). 04 = ½ open stop active. Electronic limit on 6/8 open position. (ON/OFF controlled by a switch in terminal 15 + 16). 05 = ½ open stop active. Electronic limit on 7/8 open position. (ON/OFF controlled by a switch in terminal 15 + 16). 06 = ½ open stop active. Electronic limit on 4/8 open position. (½ OPEN command by a momentary switch (NO) in terminal 15 + 16.) 07 = ½ open stop active. Electronic limit on 5/8 open position. (½ OPEN command by a momentary switch (NO) in terminal 15 + 16.) 08 = ½ open stop active. Electronic limit on 6/8 open position. (½ OPEN command by a momentary switch (NO) in terminal 15 + 16.) 09 = ½ open stop active. Electronic limit on 7/8 open position. (½ OPEN command by a momentary switch (NO) in terminal 15 + 16.)

5.4 SAFETY EDGE SETTINGS

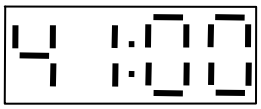
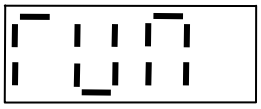
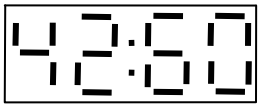
Edge setup 	! Note that actual edge must be connected but not activated before this setup. If the controller has observed a wrong edge select, the display will show ERR. 01 = PNE edge 02 = 8k2 electrical edge 03 = Optical edge 04 = LP-DW edge

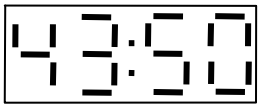
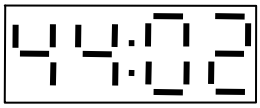
5.5 ADVANCED SETTINGS

Afterrun 	00 = No afterrun and edge monitoring by floor. > 00 Afterrun and edge monitoring by floor - afterruntime 0.01 – 0.30 sec.	
Wire tighten 	00 = No wire tighten function 01 = Wire tighten 5 mS. 02 = Wire tighten 10 mS. 03 = Wire tighten 20 mS. 04 = Wire tighten 30 mS.	
Photo safety functions 	00 = No Photo safety active. 01 = Plug-in Photo module active (Photo module) 02 = External Photo 2 active. (screw terminals) 03 = Plug-in Photo module and external Photo 2 active.	
Auto closing 		. **WARNING** **Automatic closing is normally only allowed if photo safety is used**
	Note that impulse close must be selected in parameter 1. 00 = No auto closing xx = Seconds 1 – 990 (after 99 the changing will be in x10 of seconds and the value is fast flashing. - e.g. 18 is 180 seconds) **Interlock:** If stop or emergency stop is activated more than 5 sec. With door in open position. The auto close is interlocked to prevent closing. Reset of interlock is done by CLOSE push-button or ”GO FUNCTION” close	

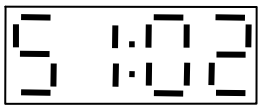
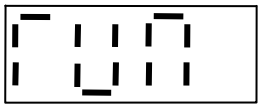
Car wash function 	(Available when auto closing is selected by parameter 32) 00 = No car wash function xx = Photo active time in 0.1 sec. Units (e. g. 15 = 1.5 sec.) (Adjustable 1 – 30 units = 0.1 sec. to 3.0 sec.) Countdown of auto closing time starts, only if photo has been activated more than ”photo active time”. Door shall be complete closed before start of a new cycle.

5.6 FORCE CONTROL

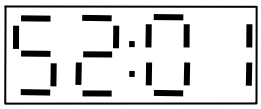
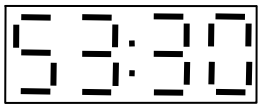
Force control  + 	!All mechanical spring adjustment and door limits must be adjusted before selecting force control. 00 = No force control. 01 = Force control manual adjustment (1300 -1750 rpm) 02 = Force control manual adjustment (2600 -3500 rpm) 03 = Force control by adaptive learning. ”RUN” position is now available by pressing STOP. Run the door 2 complete door cycles from closed position without any stop. (keep pressing OPEN or CLOSE) When learning is finished the ”RUN” will stop flashing 2 sec. and the display will automatic switch back to active parameter number. If new adaptive learning is wanted. Press stop 2 times until”RUN” is flashing again. Hints: If the door stops when learning – check for missing tacho pulses. (setup of torque – look in parameter 44) For solving other errors, look on LED error codes in chapter 8.
Force control Manuel OPEN settings  (not shown if adaptive force control is selected)	Procedure for changing value: Press STOP push-button until the parameter value is active (flashing) 1. If this is the first adjustment - Turn potentiometer P1 clock-wise to maximum. 2. Push CLOSE to reset for new value and run the door to closed position. 3. Press OPEN continuously and turn slowly P1 until the door is stopped, and turn a little back. The display shows approximately P1 percent value. Check the torque and change the value if necessary. **By pressing STOP the value is saved and display is switch to parameter number. The value must be saved before switching away from programming mode.** (if no OPEN or CLOSE have been depressed, no new value is changed)

Force control Manuel CLOSE settings  (not shown if adaptive force control is selected)	Procedure for changing value: Press STOP push-button until the parameter value is active (flashing) 1. If this is the first adjustment - Turn potentiometer P1 clock-wise to maximum. 2. Push OPEN to reset for new value and run the door to open position. 3. Press CLOSE continuously and turn slowly P1 until the door is stopped, and turn a little back. The display shows approximately P1 percent value. Check the torque and change the value if necessary. **By pressing STOP the value is saved and display is switch to parameter number. The value must be saved before switching away from programming mode.** (if no OPEN or CLOSE have been depressed, no new value is changed)
Force control Adaptive settings  (not shown if manual force control is selected)	(Available when parameter 41 = 3) 00 = Force control delay 0.8 sec. Stopped by low speed -0.5 % Wear limit (from initial values) -5 % 01 = Force control delay 0.8 sec. Stopped by low speed -1.0 % Wear limit (from initial values) -5 % 02 = Force control delay 0.8 sec. Stopped by low speed -1.5 % Wear limit (from initial values) -5 % 03 = Force control delay 0.8 sec. Stopped by low speed -2.0 % Wear limit (from initial values) -5 % 04 = Force control delay 0.8 sec. Stopped by low speed -2.5 % Wear limit (from initial values) -6 % 05 = Force control delay 0.8 sec. Stopped by low speed -3.0 % Wear limit (from initial values) -7 % Update of set point 0.3 %/10 door cycles

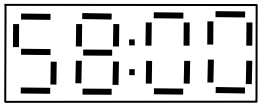
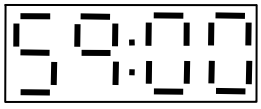
5.7 RUN TIME CONTROL

Run time control  + 	! Both door limits must be adjusted before selecting adaptive run time. 00 = No run time control 01 = Run time 20 sec. 02 = Run time 40 sec. 03 = Adaptive run time. ”RUN” position is now available by pressing STOP. Run the door from closed to open position without any stop. (keep press OPEN) When run time is learned (by open limit) the ”RUN” will stop flashing and the display will automatic switch back to active parameter number) Run time is learned time + 12.5%. Below 10 seconds learned time, fixed 1 second is added.

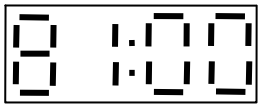
5.8 REVERSE TIME

Reverse time adjustment 	xx = Reverse time of safety edge in 1/100 seconds. 0.00 – 0.99 sec. Example: 01 = 0.01 sec. (If 00 is selected the reverse time is minimum 0.004 sec.)
Reverse time adjustment 	xx = Reverse time of Photo in 1/100 seconds. 0.05 – 0.99 sec. Example: 30 = 0.30 sec. This reverse time is also used as speed reversing time and reverse by open push-button, when the door is closing.

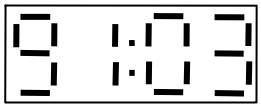
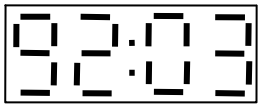
5.9 SERVICE COUNTER

Service countdown setup 	00 = No Service countdown 01 = 15 open cycles before service **(for test only)** 02 = 5000 open cycles before service 03 = 10000 open cycles before service 04 = 20000 open cycles before service Reset for new countdown or selecting value: Press STOP to select parameter value. Press OPEN or CLOSE to select wanted value. Press STOP one time more by **minimum 2 sec**. CLR is shown 2 sec. in display to confirm new countdown.
Service count reaction 	00 = Display shows E:04 01 = Switch to deadman controller and display shows E:04 If LED pad is mounted: Service LED will lights when service countdown reach 0.

5.10 SPECIAL SETTINGS

Encoder positioning failure 	Only available with electronic limits The reaction time for missing positioning changes (E:09 failure) 00 = 1 sec. (failure reset by dead-man operation to find both limits or limit learning again) 01 = 2 sec. (failure reset by dead-man operation to find both limits or limit learning again) 02 = 4 sec. (failure reset by dead-man operation to find both limits or limit learning again) 03 = 4 sec. (failure is shown shortly, resetting automatically)  **No limit monitoring by selecting value 03**

6 INVERTER

Note: This function is only for special variant of V7E, connected with extern inverter.	
Opening Low speed set point 	Only for use with frequency inverter and electronic limits. 00 = 10% before open limit. 01 = 20% before open limit. 02 = 30% before open limit. 03 = 40% before open limit.
Closing Low speed set point 	Only for use with frequency inverter and electronic limits. 00 = 10% before close limit. 01 = 20% before close limit. 02 = 30% before close limit. 03 = 40% before close limit.

6.1 OPTION

Relay K3	Activated when door is running.

7 RESET TO FACTORY SETTINGS

Reset to factory settings can be done by changing DIL switch 4 to ON position and activate STOP push-button in 2 seconds.
The display will flash with"FAC" and program version number will be shown.
Remember to change the DIL switch 4 back to OFF position.

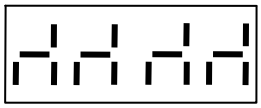
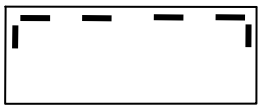
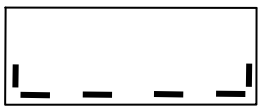
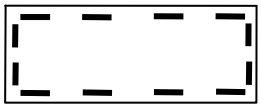
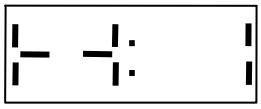
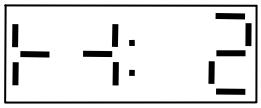
8 LED ERROR CODES (D15) USED WHEN ELECTRONIC LIMITS IS SELECTED

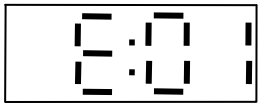
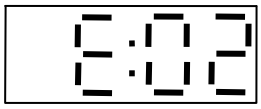
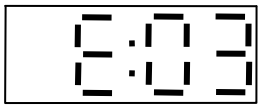
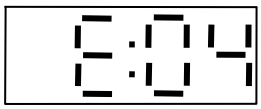
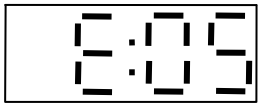
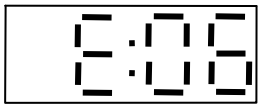
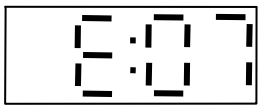
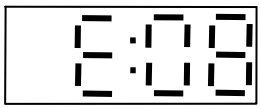
Flashes on error LED	Error explanation	Solving error
1	No answer from encoder	- Check connections. Maybe RS485 A and B are interchanged.
2	Limits not learned	- Learn limits in Prog. Mode.
3	Not in use	
4	Calculation error	- Check that parameter 11 value is correct selected. (Left/right turning select). - Possible user error – both limits are the same. - Encoder error.
5	Not in use	
6	Not in use	
7	Kostal encoder - mechanical failure Dalmatic/Feig encoder = position out of learned range.	- Kostal: Change encoder - Other: Try re-learn
8	Kostal encoder – Failure operating voltage	- Check connection and supply voltage. - Change encoder

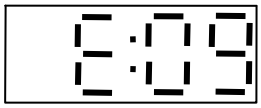
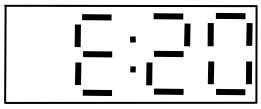
9 DISPLAY IN RUN MODE

The display will in run mode show status of limits, some inputs and error codes if any error occurs.

By power up the software version is showed shortly.

Parameter	Description
Nothing active 	Nothing active. (4 chairs symbol) Door is stopped between limits and no errors are found.
Open limit active 	Normal symbol to help adjustment and fault finding.
Close limit active 	Normal symbol to help adjustment and fault finding.
STOP active 	Normal symbol to help adjustment and fault finding.
OPEN push-button active 	Normal symbol to help adjustment and fault finding.
CLOSE push-button active 	Normal symbol to help adjustment and fault finding.
Photo 1 active 	Normal symbol to help adjustment and fault finding.
Photo 2 active 	Normal symbol to help adjustment and fault finding.
Safety Edge active 	Normal symbol to help adjustment and fault finding.

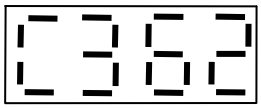
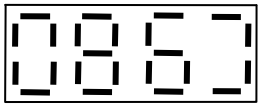
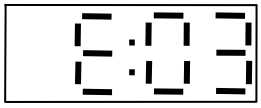
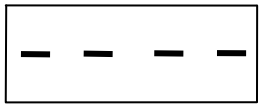
Door running up 	Normal symbol showing Door running up.
Door running down 	Normal symbol showing Door running down.
Edge monitoring 	Error code Monitoring failure of safety edge if this function is activated.
Force control 	Error code Door is stopped by force control if this function is active. Symbol also shown if the adaptive speed is not learned, when returning to run mode.
Run time 	Error code Door is stopped by run time control
Service 	Service counter decremented to 0 Reset for new countdown: Look in parameter 58.
Photo 	Failure in photo circuit. (Test cycle before close fails)
Safety Edge 	Failure in edge circuit. (Test cycle before close fails)
Tacho failure 	Tacho failure when force control is active.
Speed wear 	Speed wear failure.

Encoder failure 	Encoder failure. Door started, but the position is not changing. Stop is stopped after 1 sec. and E:09 failure is shown about 1 sec. Both limits must be relearned or both limits shall be founded again by step by step operation.
EEPROM Fail 	EEPROM counter failure or position failure

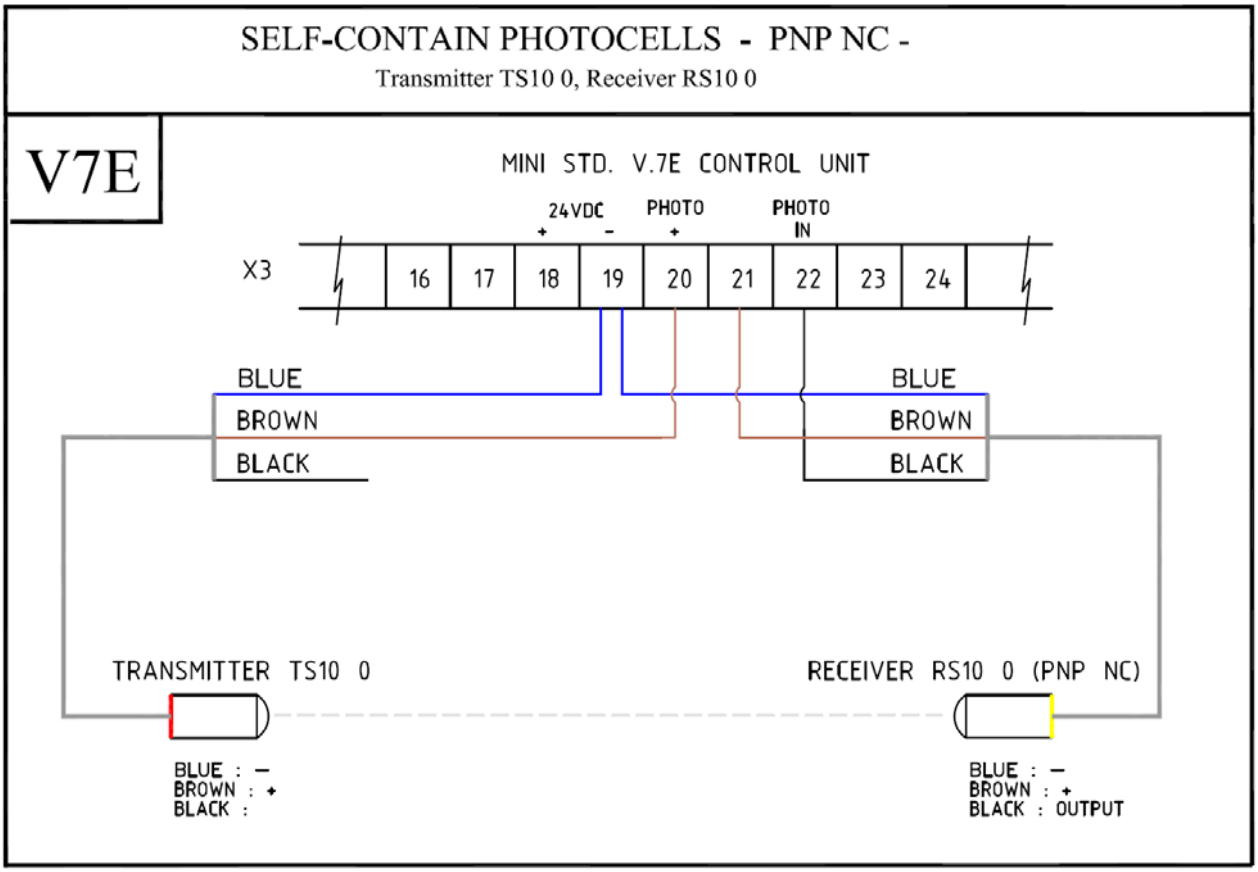
10 DISPLAY STATUS (IN RUN MODE)

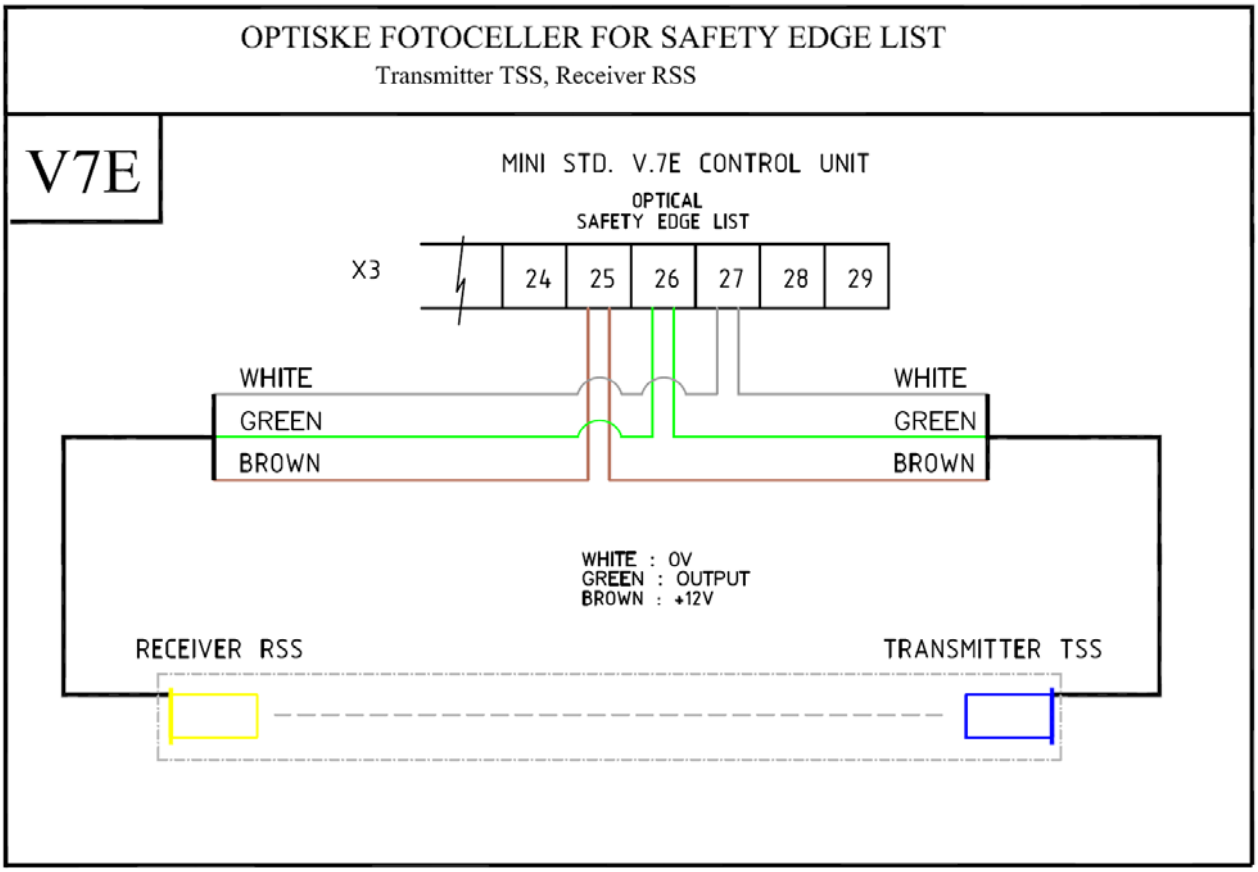
To select DISPLAY STATUS – Close the door and press CLOSE and OPEN push-button (1 sec.)

(The door can't be moved when display status is active)

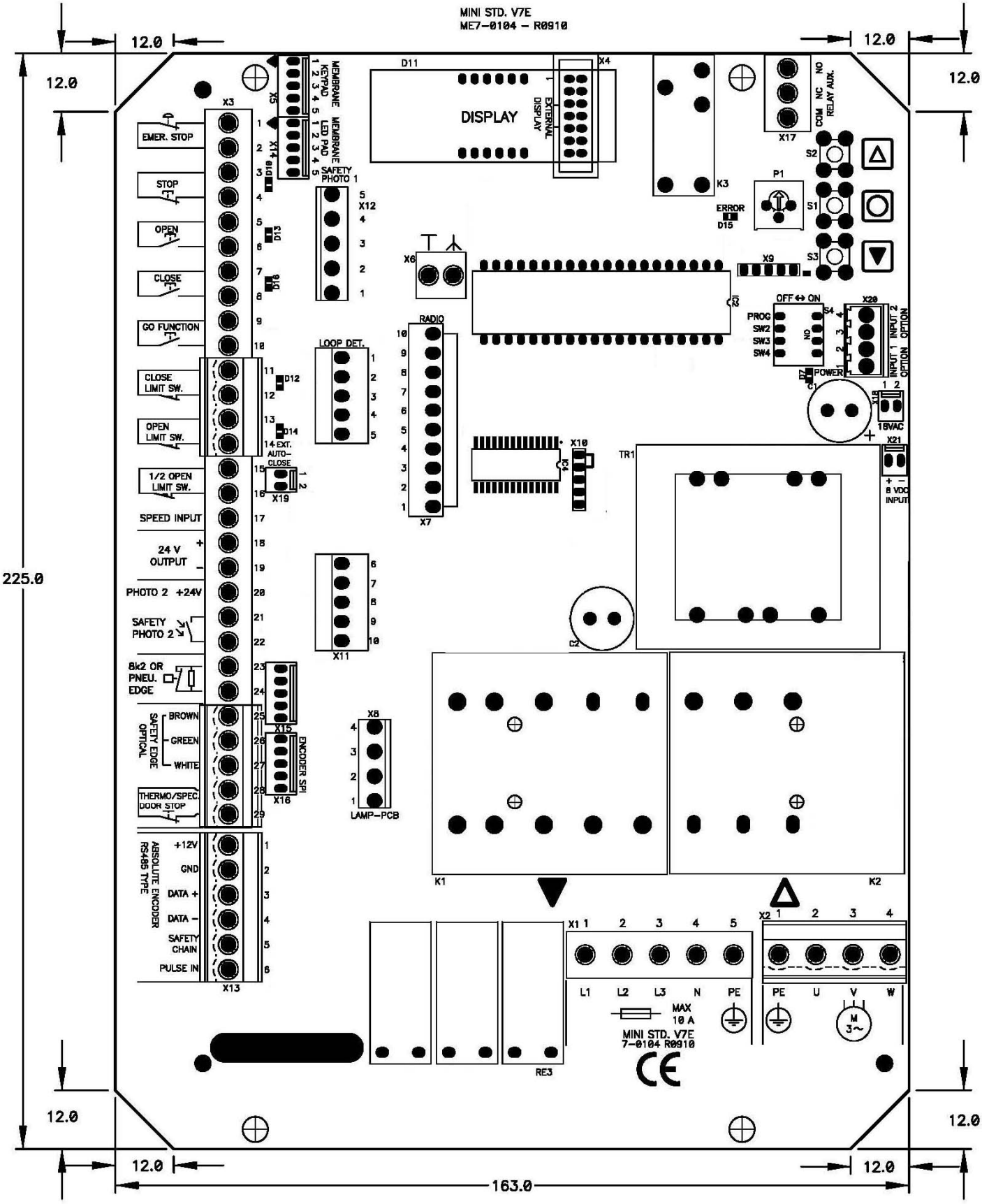
Parameter	Description
Electronic counter status  and 	The display is flashing between least significant digits (000 – 999) and the most significant digits (1000 to 999000). Example shown is (362 and 086) = 362086 door openings Press STOP to select next status available
Last 10 errors 	Press OPEN (up) to select newer error Press CLOSE (down) to select older error At the end where no older error is shown the display will show:  Press OPEN and CLOSE push-button (1 sec.). To exit "display status"

11 PHOTO CONNECTION

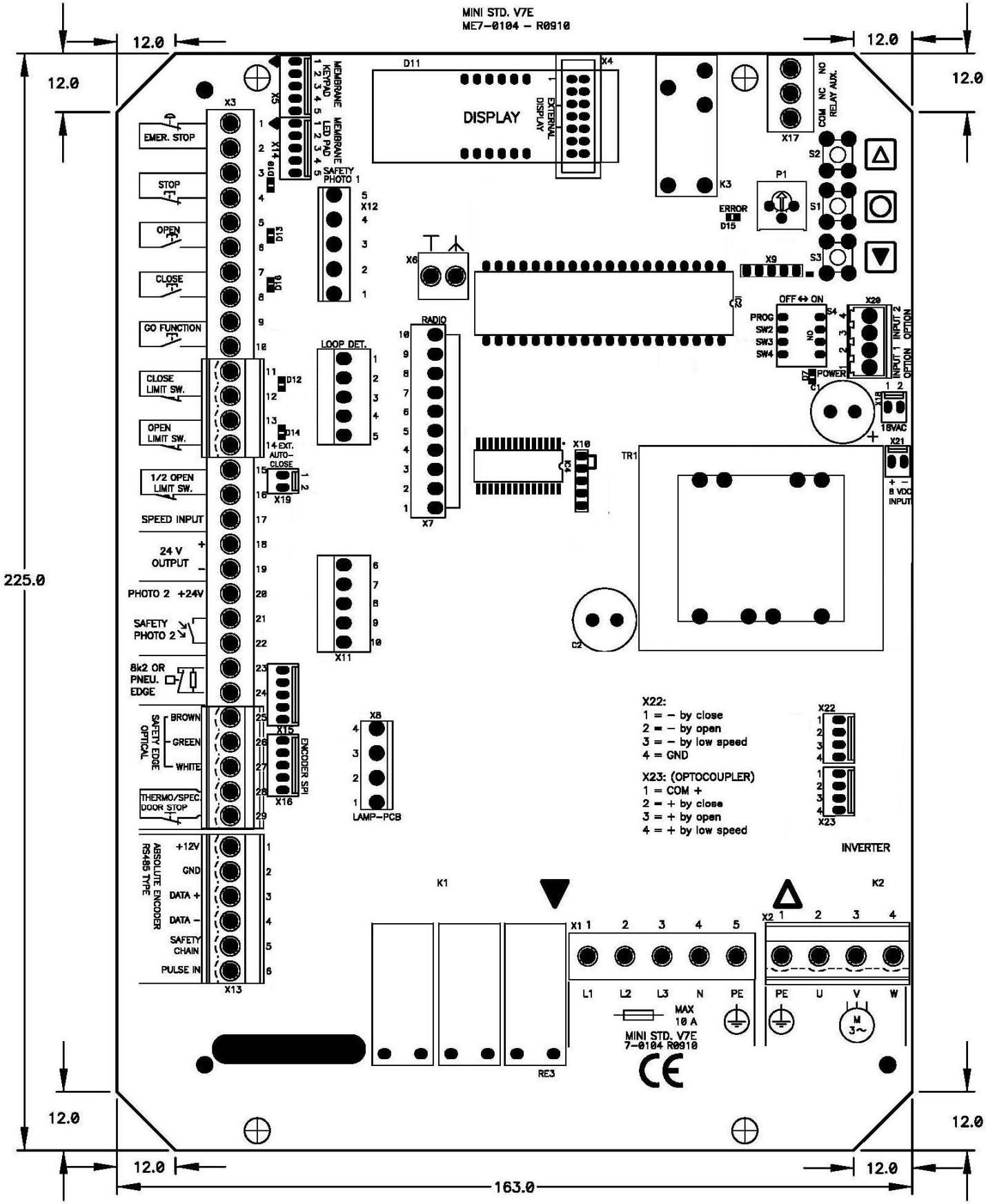




12 PCB LAYOUT



13 PCB LAYOUT – INVERTER



Power is not all that is needed to operate your doors.....

Operators for overhead doors can be bought from anyone at any quality and any price. However, we believe that the key in being successful in selling operators with your doors, is in the ultimate combination of a good product, a good price, from local warehouses, with very good after sales back up. If you add to this combination the "one-stop-shop: operators + hardware", you will agree with us that FlexiForce offers you the best solution for your operator business. Challenge us for becoming your supplier!

I: www.flexiforce.com

E: info@flexiforce.nl

flexiforce FF
innovations for overhead doors