Normstahl

INSTALLATION MANUAL
IDO7/C700

K068640/I

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The Normstahl brand has been a reliable partner and producer of premium entrance systems for the private and industrial sector since 1946. In collaboration with its network of distribution partners, Normstahl has become a leading provider of entrance solutions within Europe.

Contents

About this Manual

All installers of the operating system must read, understand and obey the information and instructions in this manual. Failure to do so may result in damage to, or failure of the equipment, and possible injury to individuals.

This manual contains functional descriptions and installation information for an operating system.
- When information or instructions are applicable to all the methods of operation or models, there are no operation types or model numbers in the title.
- When information or instructions are applicable to specific methods of operation or models, the applicable operation type or model numbers appear in the title.
- When instructed to press a button, it is intended as press-and-release. If press-and-hold is required, it will be clearly instructed as press and hold.

Safety Symbols Used in this Manual

The following safety symbol is used in this manual:

Indicates a general warning

Specific useful information concerning the installation.

1 IDO7 operator

1.1 Safety instructions

Follow all instructions since incorrect installation can lead to severe injury.

- Check that the temperature range marked on the operator is suitable for the location.
- Check that the door is moving smoothly and correctly before assembling the operator.
- Check that the door is in good mechanical condition and correctly balanced.
- After installation, ensure that the mechanism is properly adjusted and that the protection system and any manual release function work correctly.
- Ensure that entrapment between the driven part and the surrounding fixed parts due to the opening movement of the driven part is avoided.
- External push button units are to be located within direct sight of the door but away from moving parts. Unless it is key operated, it is to be installed at a minimum height of 1,5 m and not accessible to the public.
- At hold-to-run, all activators must be placed within sight of the door opening and in conformity with EN12453, user type.
- For closing functions out of sight of the door opening, like radio and automatic closing (except for light curtain equipped doors), an additional safety photocell is required.

1.2 Preparation

Before you start make sure that the following preparations are done:
- Approval/communication with customer completed.
- Materials on site are complete.
- All measurements are correct.

1.3 Technical specifications IDO7

The operator is intended to be installed at a height of at least 2.5 m above the floor or other access level.

|	
Dimensions:	340 x 230 x 140 mm (height x width x depth)
Weight:	13.5 kg
Capacity:	IDO7; max. door weight 400 kg, IDO7 HD; from 400 kg up to 800 kg, IDO7 2H; max. door weight 250 kg.
Endurance:	IDO7: Normally 300000 door cycles depending on door weight and temperature. IDO7 HD: Normally 100000 door cycles depending on door weight (max 650 kg) and temperature. For door weights between 650 kg and 800 kg, 50000 door cycles.
Classification:	IP65 mech. unit, IP55 control unit (Excluding the CEE-plug which is IP44)
Supply voltage:	230 VAC ± 10%, single phase, 50/60 Hz, 2 A, fuse 10 A
Temperature range:	-20°C to +55°C
	Normal opening speed down to -8oC. In the temperature interval between -8oC to -20oC the opening speed is reduced in the first cycle to prolong the operator's lifetime. Can be equipped with a heater for a working range down to -30°C.
Operating factor:	ED = 30 %, S3 10 min, non-continuous operation, equals 30 cycles/hour (ED = 15% +51° to +55°C)
Atmospheric humidity:	0-80 % relative, no condensation
Installation area:	Inside/outside location according to the operator's specified temp. range

1.4 Electrical preparations

The manually operated door needs no electrical supply.

For an electrically operated door, the following environment criteria and electrical supplies are required for the operator to function properly:

	IDO7	IDO7 HD	IDO7 2H
Voltage supply: +/- 10%	230V AC 1-phase 50/60Hz	230V AC 1-phase 50/60Hz	230V AC 1-phase 50/60Hz
Power:	0,37 kW	0,6 kW	0,37 kW
Degree of protection:	IP65, with connector IP44	IP65, with connector IP44	IP65, with connector IP44
Allowed door weight, max.:	400 kg	800 kg	250 kg
Temperature working range:	-20 °C to +55 °C*	-20 °C to +55 °C*	-20 °C to +55 °C*
Operating factor:	ED = 30% S3 10 min. intermittent	ED = 30% S3 10 min. intermittent	ED = 30% S3 10 min. intermittent
Mounting preparations:	-	When installing on the wall, an extra attach-ment angle is required with > 500N per fixation point.	-

* At low temperatures the first few cycles may be run with reduced speed to prolong the operator's lifetime. Can be equipped with a heater for a working range down to -30°C.

1.5 Position of the operator

> 150 mm

max. 50 mm

> 200 kg
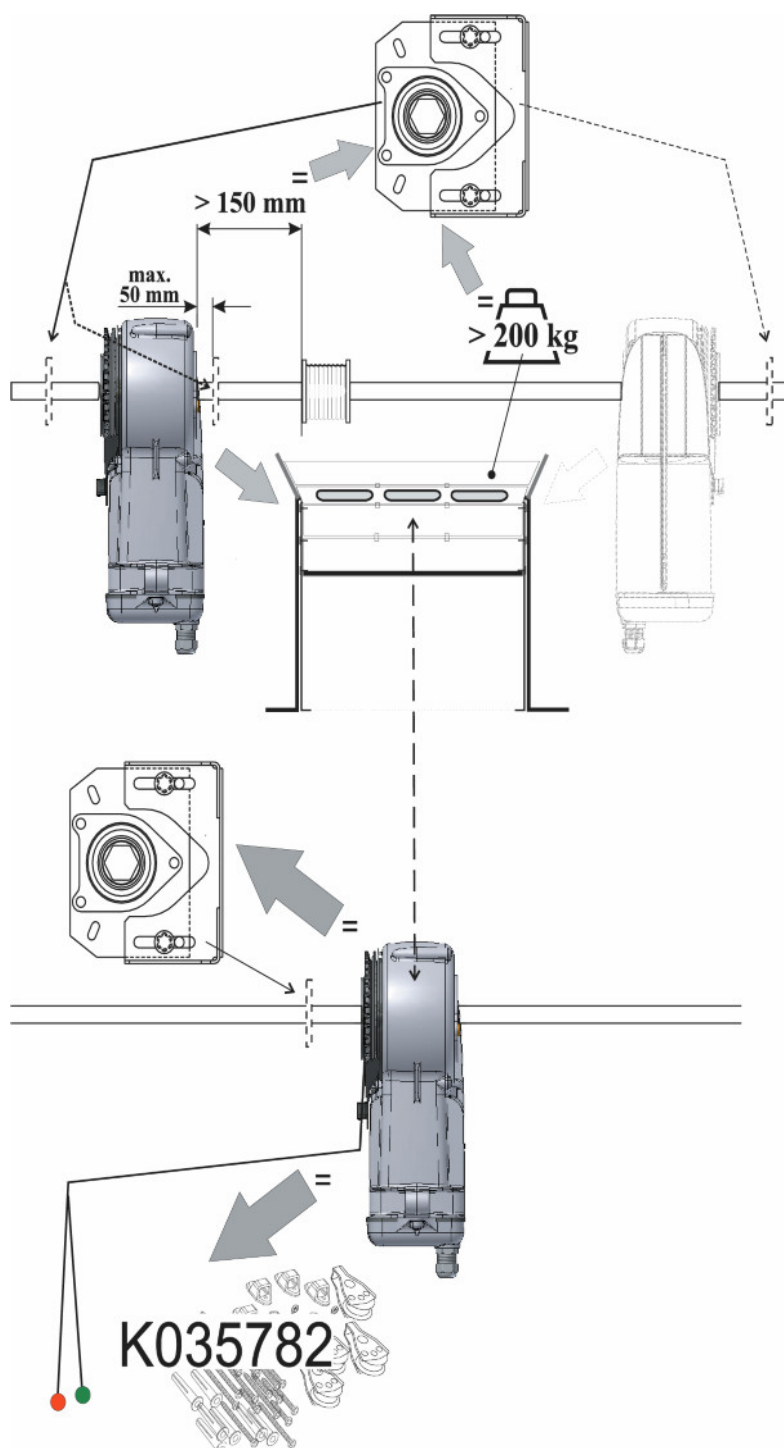
K035782

K035782 – Middle installation kit, 350 mm more height needed with SL and LL hardware

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1.6   Assembling the operator

The door must be correctly installed, balanced and be in a closed position before assembling the operator.

For the IDO7HD operator mounting with a torque of >500N is required.

1. Attach the first stop ring to the shaft.
2. Push the operator completely against the stop ring.
3. Insert the key.
4. Attach the second stop ring.
5. Assemble the torque bar (A or B) onto the mechanical unit with the rubber damper between the torque bar and the console.
6. Adjust the drive unit position.
7. Tighten all screws.
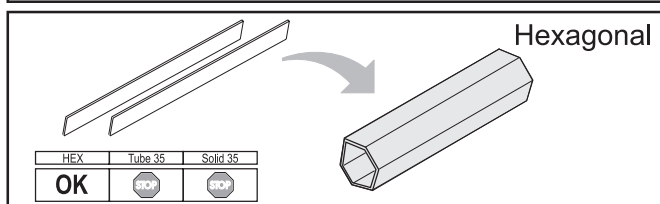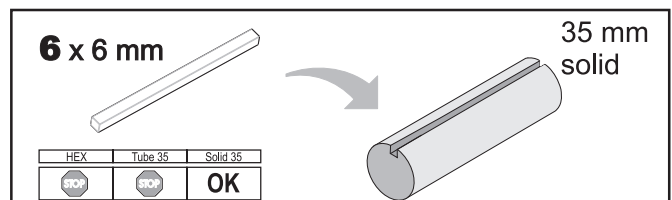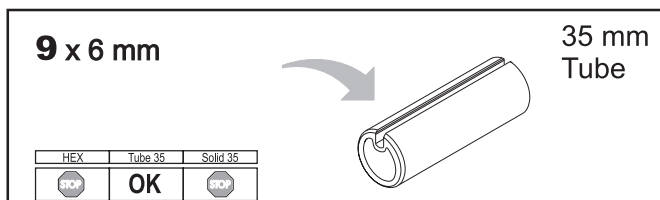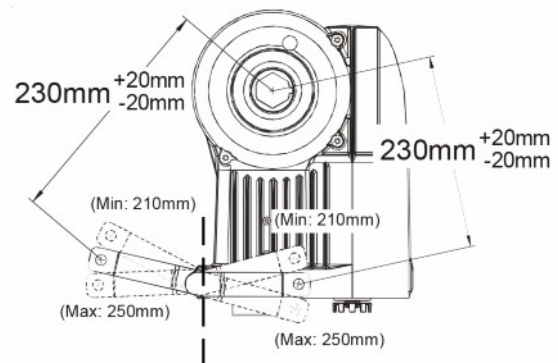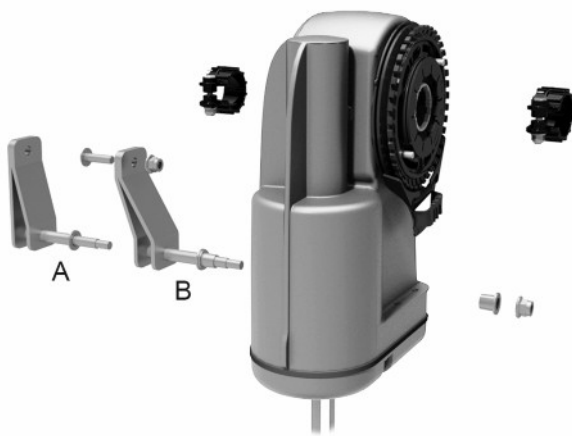
1.7   Assembly of disengaging rope and label

1. Make sure the disengagement is in engaged position, by rotating the disengagement disc counterclockwise until the two pins are in the deepest end of the groove.
2. Rotate the disengagement guide to the desired position (A), the desired exit for the ropes.
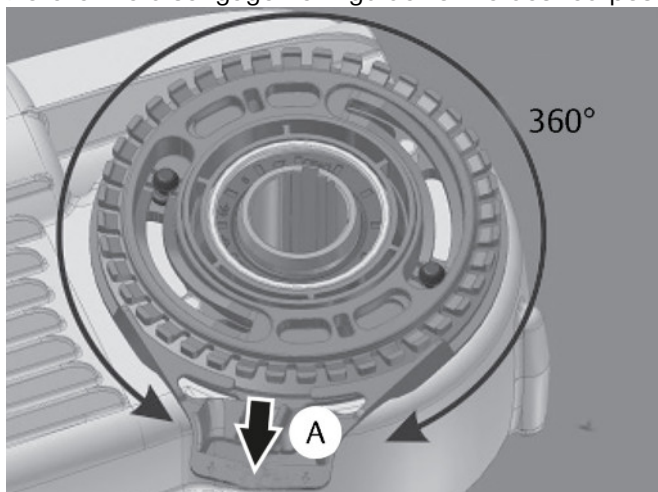
3. Fold the rope in half and push the loop through the disengagement guide.
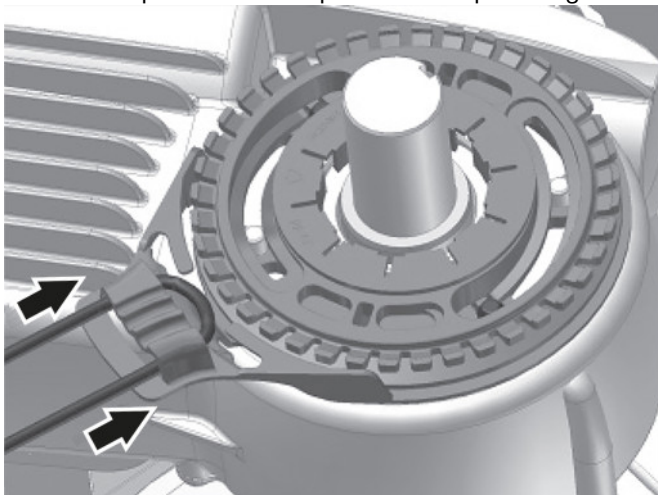
4. Lay the rope loop around and behind the disengagement disc.

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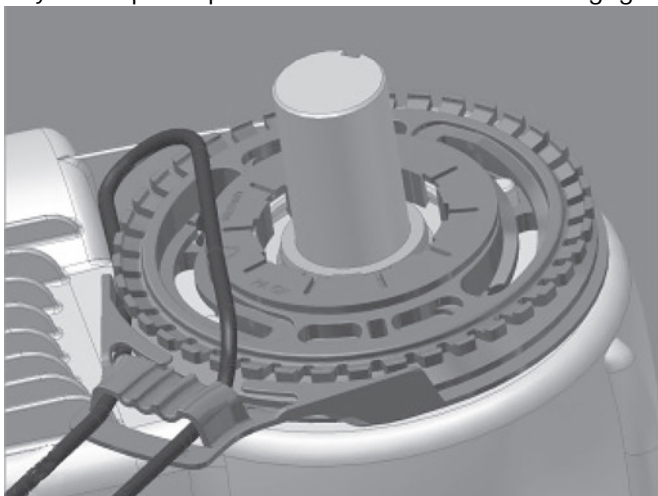
5. Pull both ends of the rope to tighten the rope around the disengagement disc.
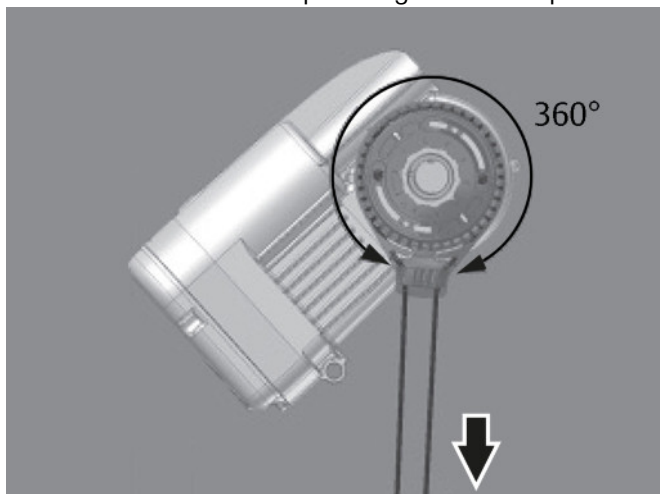
6. Locate a point on the disc straight across from the ropes. To minimize the force needed, make sure that the pull will start on the way down or the top of the disc, not before.
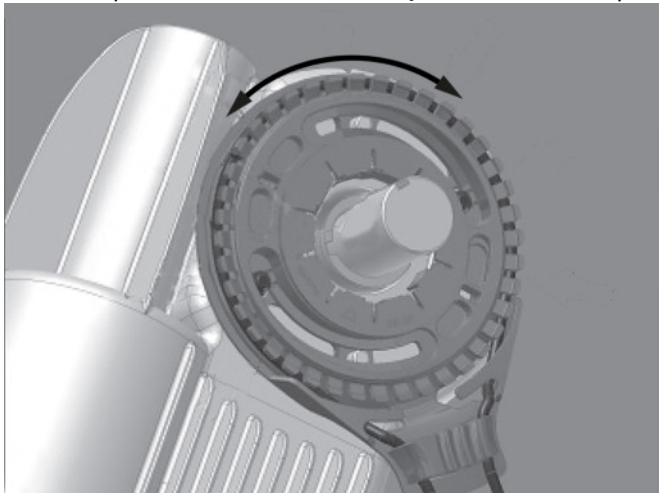
7. Wrap a loop of the rope around the tooth on the disengagement disc to lock it in position.

8. Wrap another loop on another tooth 3-4 teeth from the first loop in the disengaging direction. If the loops ar too far apart the teeth may brake, do not have more than 3-4 teeth apart.
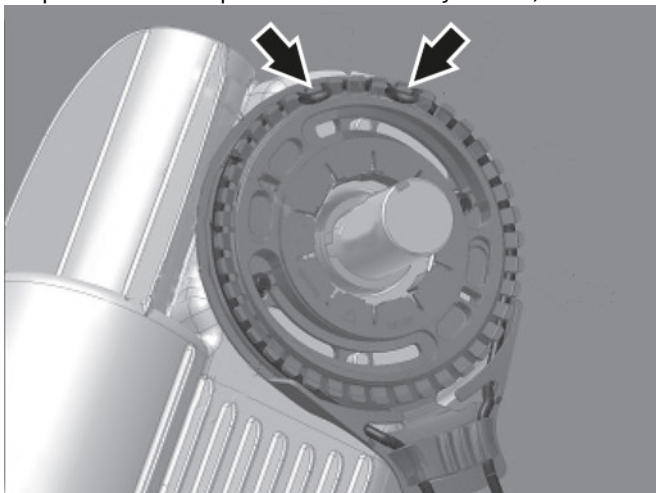
9. Fasten the rope to the track or the wall, using the rope guides. Max allowed angle,<20°.
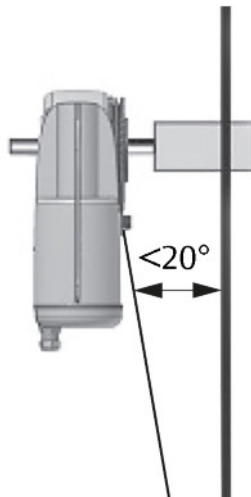
10. Fasten the red and green balls to the rope. Make sure that they follow the instruction on the disengagement label; green to disengage, red to engage.

11. Fasten the disengaging label permanently adjacent to the disengaging balls.

12. Follow the instructions on the disengaging label to test the disengagement.
13. Make sure that the disengagement guide is not operating against the pull in the rope, if so adjust!

2 C700 control unit

2.1 Installation of the control unit

C-Card KO47622
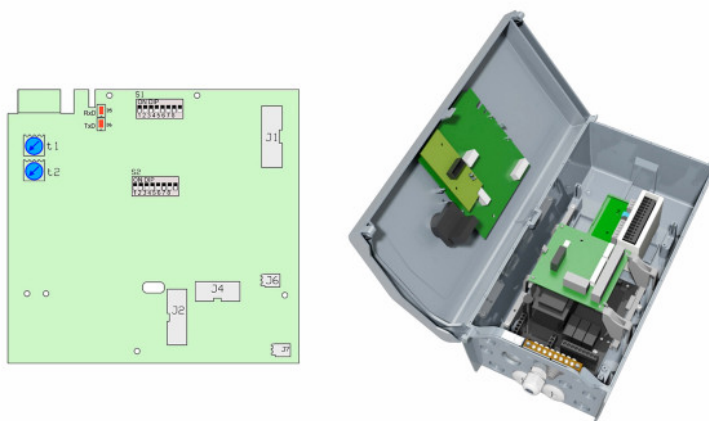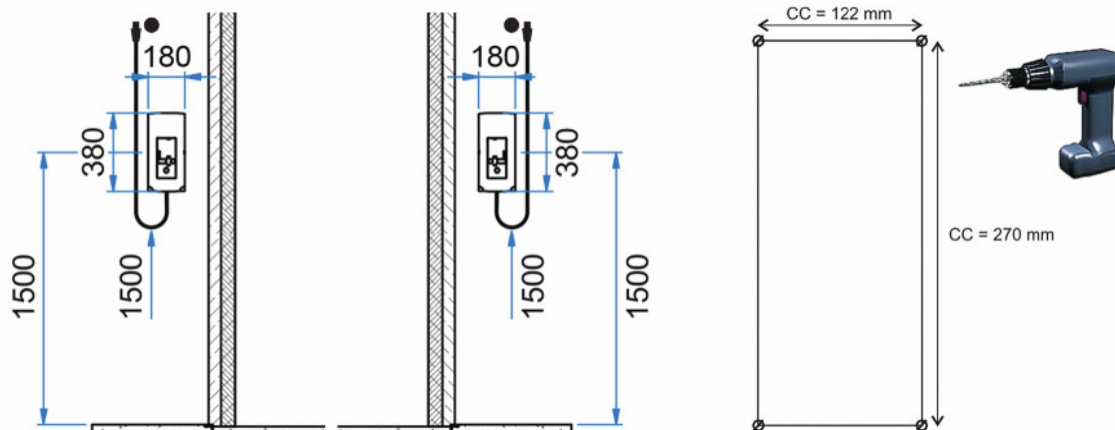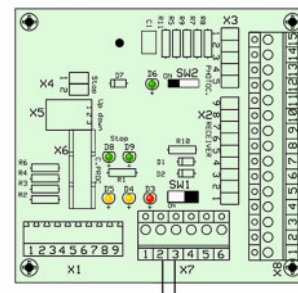
Basic pcb KO47981
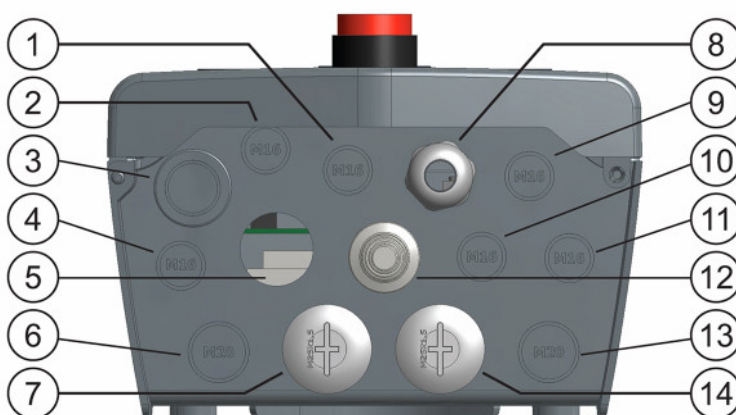
1. Main supply IDO7
2. Radio
3. Photocells
4. Magnetic loop
5. Control IDO7
6. Dir. Traffic light Red
7. External relay box
8. Safety edge
9. External stop buttons
10. Electrical lock
11. Dir. Traffic light Green
12. Supply IDO7
13. Locking
14. Radar

2.2 The C700 Light curtain functionality

2.2.1 Hardware

The light curtain (LG) is connected to the C700 Control unit via an additional card (1) connected to the C-card. The light curtain is separated from the Control unit by opto-couplers.

The G Power module (2) is assembled on the rail in the Control unit.
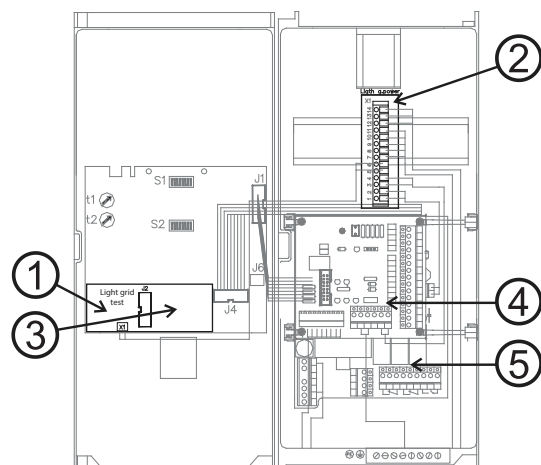
(1) Test-PCB	K043803
(2) G Power module	K043813
(3) C-PCB	K047622
(4) Basic-PCB	K047981
(5) D8-kit/D3-kit	K101548/K043508

2.2.2   Light curtain function

Be careful not to damage to the optical elements.

The light curtain (LG) operates according to the following principle:
- The light curtain blanks out the infra-red beams without de-energizing its output when the door leaf is descending.
- When the door leaf obstructs the final beam, the light curtain de-energizes its output in order to simulate safety edge signal.
- If any beam is obstructed out of this sequence the light curtain output de-energizes and the IDO7 reverses the door leaf immediately.
- Each time the door is fully opened a self-test of the correct functionality of the light curtain is initiated. The C700 does not allow closing of the door leaf unless this test has been successfully performed.
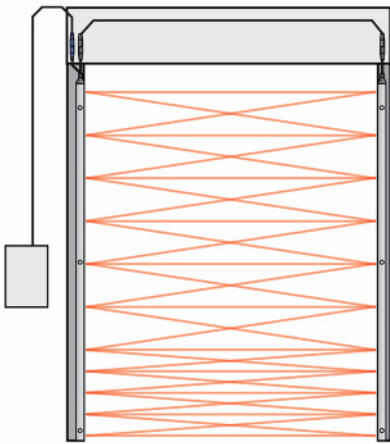
The light curtain optics are located in the door guiding frame.

Although the light curtain does not need regular maintenance, a periodic functional check is strongly recommended:
- Make sure the optical elements are clear of dirt and dust. If necessary, clean the front surface with a soft towel.
- Make sure the edges are securely fastened.
- Check the mounting position, cable routing and connection of the sensor.
- Never use any solvents, cleaners or mechanically abrasive towels or high-pressure water to clean the sensor.
- Avoid scratching the optical elements while cleaning.

2.3   Programming the C700

Make sure the mechanical unit and control unit are assembled as instructed, and connected according to the enclosed connection diagram.

Make sure that the floor is clean and free from cables, packaging.

Before programming the operator, make sure that the buffers have been positioned correctly and that they are properly fixed with the door correctly in balance. Incorrect balancing may lead to unsafe operation and may shorten the life of the product.

Programming must be carried out using the set of buttons in the control box. External devices such as radars, remote controls and push buttons are not allowed.

If an Electrical Door Lock System or similar is installed on connectors X7:2-3, disconnect it and bridge these connectors with a piece of installation wire during the programming procedure. Take care to remove it when ready!

For doors with small drums and without safety features, there may be a risk of unwinding the balancing cables during the programming procedure. Make sure that the balancing cable is positioned correctly on the drum.

The torque setting is available in 15 steps. Default factory setting is step 9. On the C700 control unit the torque setting is displayed on the digital display.

If manual movement of door is tricky:

- Push the door to open position while disengaged and pull the red ball for engagement when it has stopped, clear E11 by pushing the Open or Close button.
- Move the door with motor by switching SW1 ON and push the Open or Close button to move it into position, then toggle SW1 OFF and ON again.

1. Make sure the door is in its closed position.
2. Disconnect the power supply.
3. Toggle dip switches SW1 and SW2 to OFF.
4. Pull the green ball to disengage the operator.
5. Manually pull the door open to either 1.5 m above the floor in cases with PNE or above the light curtain (LG) in cases with light curtain.
   An activated light curtain at the start of/during installation may fool the software that it is a PNE safety edge, giving E04 that can't be reset without restarting the installation.
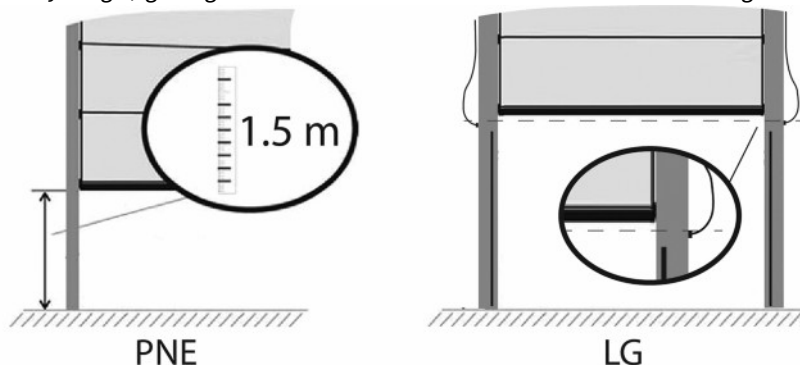
6. Pull the red ball to engage the operator.
7. Mark a "1 m position" above the floor on the door track.
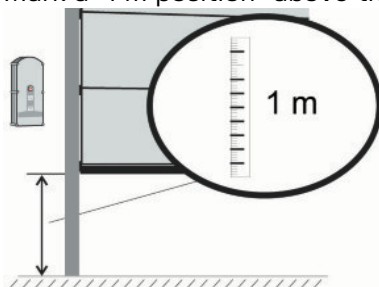
8. Reconnect the power supply.
9. Press the Down button to get the motor into gear and clear E11 or pull the door down manually until you hear a click.

10. Default torque is set to 9. Proceed to the next step and if programming fails going forward start over and include this step to adjust torque.
    The ideal torque setting is as low as possible for safety reasons, so that the door does not forcibly open or close when obstructed by people or objects. Max. excess force is 400 N.
    a. Toggle dip switch SW2 to ON to enter the torque setting modus.
    b. Press and hold the Stop button together with the following options:
        - To increase the torque, press the Open button.
        - To decrease the torque, press the Close button.
    c. Release the Stop button to store the torque setting.
        Note: To reset factory settings: Toggle dip switch SW1 to ON then back to OFF position.
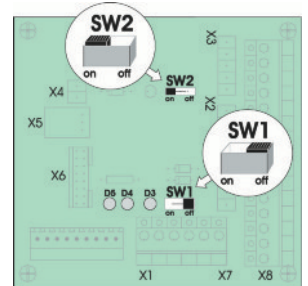   d. Toggle SW2 to OFF to exit the torque setting modus, and continue with the programming procedure.
        Note: Do not switch off the power again!

11. NOTE! Motor type goes together with different settings of the soft ware. One can NOT set a HD mechanical unit for STD or 2H and so on, type of software MUST follow type of mechanical unit!
   **For STD:** Toggle dip switch SW1 to ON to enable the installation mode of the operator.
    For 2H: Press and hold the STOP-button while toggle dip switch SW1 to ON to enable the 2H installation mode of the operator. Release the STOP-button.
    For HD: Press and hold the STOP-button and the CLOSE-button while toggle dip switch SW1 to ON to enable the HD installation mode of the operator. Release the STOP and CLOSE-button.

12. Press the Open or Close button until the rubber sealing edge is in position with the 1m mark. Adjust with the Open or Close buttons if necessary.
    This is necessary to determine the turning direction of the operator according to which way it is installed.
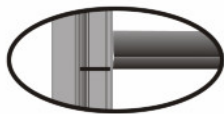
13. Press the Stop button to close the door and:
    - If no photocells in the rails, let the door fully close.
    - If photocells are installed in the rails (connected on X3); Press the Stop button when the door is moving down, from the 1m position, above the photocell installed in the rails. Then press the Down button again to fully close the door. The door will activate the photocells on the way down.
      This will make the system ignore these photocells as a safety pulse below their installed height.
      NOTE! Max activation height 300 mm from the floor!

14. When the door reaches the floor it will automatically revert, open and:
    - In case of vertical lift let the door fully open.
    - In case of all other lifts (with partial horizontal track) immediately press the Stop button when the top roller is in the middle of the track bend. Then press the Open button again to fully open the door.
      This will configure a reduced starting speed that suits the drum types with a non-conical start.
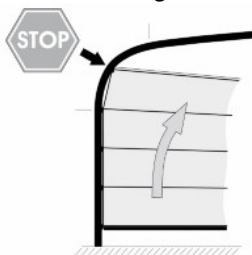
15. If the Stop button in the Control Unit is pressed and kept pressed within 2 seconds after the door has moved to a fully open position it is possible to configure the door to use "hold to run" for both Open and Close.
    NOTE! As of software version A21 "hold to run" for closing is set automatically if the installation is done without a safety edge connected.
    - If the Open button is pressed (without releasing the stop button) then "hold to run" is needed to open the door.
    - If the Close button is pressed (without releasing the stop button) then "hold to run" is needed to close the door.
    - If both Open and Close buttons have been pressed, not necessarily at the same time, then "hold to run" is used in both directions. After the Open and/or Close button have been pressed the stop button is released.
    - It is not possible to revert the choices during this phase but instead a full installation must be done from the start again.
16. **For STD, 2H and HD: Note:** As of software version A22, to avoid the 10-second delay in hold-to-run operation, press the Close button for more than 3 seconds when the door has reached the fully open position. Toggle dip switch SW1 to OFF after 3-4 seconds when the door has reached the top position to end the installation mode of the operator.
    The operator will be ready for daily use after 2 seconds.
    For 2H with LG (optional): To set "full speed down": **Note:** As of software version A22, to avoid the 10-second delay in hold-to-run operation, press the Close button for more than 3 seconds when the door has reached the fully open position. When door has reached its top position hold the STOP-button while switching SW1 to OFF.

The programming procedure is completed. Make sure the correct motor type "Std /Hd/2H" is displayed when setting SW1 to OFF! Proceed to Test and Adjustments.

2.3.1 Reduced opening

1. To set the reduced open height, run the door to the desired half open position.
2. Set the switch S2:2 (DIP-switch on the PCB in the lid) to ON for 2 s and then back to OFF.
3. Push the red open button. The reduced open height has now been set.
4. For automatic closing from reduced opening, an additional safety photocell is needed.
   Note: Will not work in hold-to-run mode before software version A16!

2.3.2 Test and adjustment C700

1. Press the Up button to start opening the door and grab and hang on the step handle to test the overload safety stop.
2. Max. excess force is 400 N.
3. Make sure that all control devices are operational.

Note:
- If LED's D8 and D9 on the maneuvering PCB are lit, the stop circuit is ok.
- If LED D8 is dimmed and D9 is lit, and there is a pass door switch connected, the stop circuit is ok.
- A power cut does not affect the programmed settings.
- If anything is wrong, consult the trouble shooting guide.

2.4 Time settings for automatic closing C700

1. Toggle dip switch SW2 to ON.
2. Turn potentiometer T1 to adjust the delay time before the flashing signal. The scale ranges from 1 to 80 seconds. When turning T1 the delay time is visible in the digital display. Visualization in the display only works with SW C14 and later.
3. Turn potentiometer T2 to adjust the duration of the flashing signal before closing. The scale ranges from 1 to 32 seconds. When turning T2 the signal duration time is visible in the digital display. Visualization in the display only works with SW C14 and later.
   Note: Total automatic closing time = T1+T2.
   Note: If dip switch S2:7 is ON, T1 = 1 - 900 seconds.
4. Toggle dip switch SW2 to OFF.
   Note: Turning SW 2 or SW 1 on will deactivate automatic closing, needs to be activated again! Starting with SW C16 automatic closing will not be deactivated.
5. Proceed to Activation of Automatic closing.

Note: If during the automatic closing countdown a down command is given from the control unit, the door will close immediately.

Note: Automatic closing also works from reduced opening position (Note: Safety photocell necessary).

Note: If stop, open function, open outside, open inside, additional safety, safety edge or the safety photocell are activated during the closing/flashing time countdown, the countdown will restart from the beginning.

2.5 Activating automatic closing C700

1. Press the Open or Close and Stop button to operate the door to an intermediate position.
2. Press and hold the Stop button.
   Press and hold the Open and Close buttons for at least 6 seconds, a small dot shall appear in the lower right corner of the digital display when the buttons are released.
3. Operate the door to the fully open position and make sure that it starts the closing action after the set time.
   Note: Automatic closing will deactivate after five closing attempts without door movement (e.g. activated SBD) or after the the door has reversed on the safety edge five times in a row (NOT valid for LG safety). This indicated by the dot flashing in the lower right corner of the display as of SW A15 and C15.
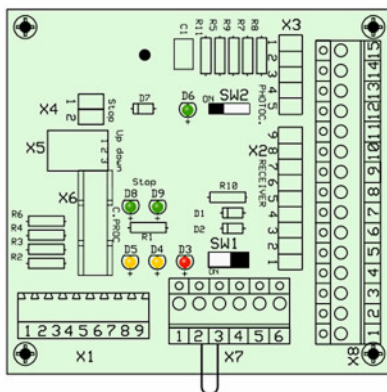
Automatic closing will be reactivated once the Down button is pressed on the control unit.

2.6 Torque adjustment after installation

Make sure that SW1 is in the OFF position!

1. Put the door in an intermediate position
2. Put SW2 in the ON position.

3. Hold the stop button and, at the same time, push:
   - The Up-button once, for a stronger operator.
   - The Down-button once, for a weaker operator.
4. To evaluate the adjusted torque, operate the door within illustrated area.
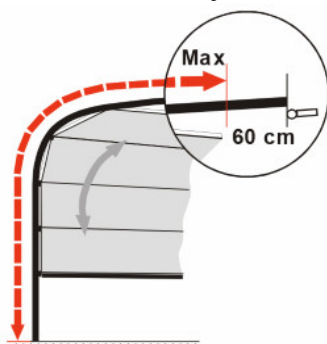
5. When the requested torque is adjusted, run the door by impulse operation to a fully open position.
6. Run the door by impulse operation down.
   The door will now reverse against the floor and run up and stop with low speed against the buffers.

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7. Put SW2 in the OFF position.
8. The door is now ready for operation.

2.7   Functions and DIP-switch settings

For the DIP-switches S1, S2.

| Setting	Function
S1:1 ON	Sets the service countdown counter to 50000 cycles.
S1:1 OFF	No function.
S1:2 ON	Enables that the interlocking relay (X13:7-8-9) indicates all errors except E08.
S1:3 ON	Enables flashing red light between the limit positions. Only at warning lights, not at traffic lights.
S1:3 OFF	Enables steady red light between the limit positions. Only at warning lights, not at traffic lights.
S1:4 ON	Enables red light at fully closed door, both at warning and traffic lights. Green light is, if connected, always on at fully open door, no adjustments.
S1:5 ON	Enables flashing red light before automatic closing (T2).
S1:5 OFF	Enables red light before automatic closing (T2). Only at warning lights, not at traffic lights.
S1:6 ON	Disables "open outside" command at traffic lights for 10 seconds in order to avoid unwanted activation from, for instance, outer magnetic loop on the way out.
S1:7 ON	Enables direction sensing traffic lights. controls opposing traffic by red and green light.
S1:7 OFF	Enables indication (230V) door moves up (X12:3) and door moves down (X12:4) on the SCR-pcb. For the kit D3.
S1:8 ON	Enables FR-function. All commands except safety are delayed 2,5 seconds while red warning lights are flashing. At automatic closing T2 is replaced by the 2,5 seconds. Red traffic lights illuminates steady during T2.
S2:1 ON	Enables DK-function. The operator switches permanently to hold-to-run mode if the safety edge has been activated until reprogrammed.
S2:2	To set reduced opening and fire alarm position, put the door in the required position and turn the switch ON-OFF. Always make a new basic installation before! Photocell is mandatory for automatic closing. NOTE! Reduced opening will not work in hold-to-run mode before software version A16! A new installation erases the position!
S2:3 ON	Enables automatic closing after passing of the safety photocell. Can be combined with S2:5 ON.
S2:3 OFF	Enables automatic closing from fully open door.
S2:4 ON	Doubles the adjusted time on T1 if no acknowledgment has been given. Halves the adjustment time on T1 if acknowledgment has been given. The safety photocell and additional safety systems are able to give acknowledgment.
S2:5 ON	Enables automatic closing if additional safety, connected to X8:5-6, has been activated. Note: Additional safety works with a normally open contact.
S2:6 ON	Enables a memory to an interlocked door. If an interlocked door is given an open command, the command is stored. When interlocking ends, the door will be opened from memory.
S2:7 ON	Enables 1-900 seconds on T1.
S2:8 ON	Enables alternating open-stop-close, instead of one-button function.

2.8 Service indicating and counter

The Service indicating lamp (1) lights up when the pre-set door cycles or time is reached.
Default 365 days / 20000 cycles. This can only be changed with the Service tool.

88:1	Number of cycles ×1000, displayed static. To switch, turn switch 2 on, hold close button activated for 10 s, turn switch 2 off. The display will flash shortly when the change is registered. As of C20.
123	Number of single cycles, displayed alternating between blank - thousands - single cycles.
SEd	Safety edge active (PNE or light curtain (LG)).
PHC	Photocell active.
ESF	Extra safety, X08:5-6, active.
- - -	Flashing: Door is opening to fully open position. Static: Door is fully opened. To switch, turn switch 2 on, hold close button activated for 10 s, turn switch 2 off. The display will flash shortly when the change is registered.
_ _ _	Flashing: Door is closing to fully closed position. Static: Door is fully closed. To switch, turn switch 2 on, hold close button activated for 10 s, turn switch 2 off. The display will flash shortly when the change is registered.
rOP	Door is opening to reduced position.
OPE	Door is opening to fully open.
CLS	Door is closing.
F.IA	Fire alarm is active.
88.1	IoT active.
88.1.	Autoclose dot. Static: Active. Flashing slowly: Paused by stop function. Flashing fast: Blocked (for instance by five activations of the safety edge in a row during automatic closing).
n-0	Magnetic lock unlocking.
d01	Entered service menu.
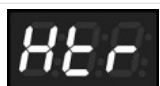
HEr	Hold-to-Run. **Note!** This is not yet for 950D.

2.9   Error codes list

On the C700 door control system error codes appear on the digital display. The following errors can be solved by the user. For any other codes, contact the local Service Centre for assistance.

Error Code	Cause of error	Solution
E04	Safety switch error.	Examine the spiral cable and the conduit for damage. Make sure the conduit is connected to the bottom seal.
E09	Mains voltage too low.	Make sure the correct mains voltage is supplied to the control unit
E11	Operator clutch disengaged	Engage operator clutch as follows: 1. Pull the rope with the green ball to disengage the operator clutch. 2. Pull the rope with the red ball to engage the operator clutch. 3. Press and release the ▱ button and make sure the door moves to the fully open position.
E15	Door has stopped due to over-current while opening.	1. Do the Daily Start Procedure 2. Press and release the ▱ button and make sure the door moves to the fully open position.
E24	Door out of position.	1. Do the Daily Start Procedure 2. Press and release the ▱ button and make sure the door moves to the fully open position.

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