Comfort 150 / 160

D Einbau- und Bedienungsanleitung
Garagentor-Antrieb

GB Installation and Operating Instructions
Garage Door Operator

Bitte sorgfältig aufbewahren.
Keep these instructions for later reference.

1 => GND
2 => Impulz
3 => 24 V

Tipka = 1-2

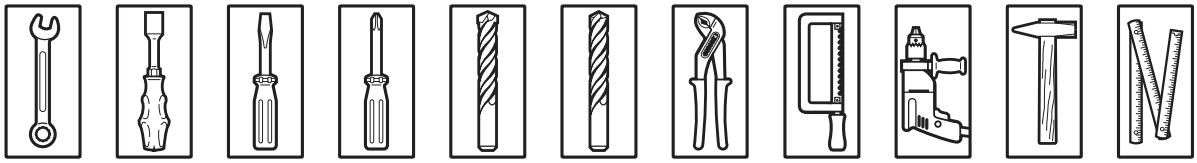
Marantec

Please follow the installation and fitting instructions carefully to avoid wrong installation or damage to the door and door operator. Keep these instructions for later reference.

1 Unpack the boom, motor housing and accessories ready for installation.

2 **The following tools are required:**

Combination wrench SW 10	Masonry drill 10 mm dia.
Combination wrench SW 13	Masonry drill 6 mm dia.
Socket wrench SW 10	Metal drill 5 mm dia.
Socket wrench SW 13	Metal drill 7 mm dia.
Screwdriver, size 8	Pliers
Screwdriver, size 5	Hack saw
Phillips screwdriver, size 2	Electric drill
Phillips screwdriver, size 3	Hammer
	Folding rule



Attention:
Before drilling, cover over the motor with foil, film or cardboard.
Drilling dust and chippings can lead to malfunctions.

3
- Slide the boom into the motor housing.
- Screw supplied centering screws (A) through the boom into the motor housing.
- Screw on the 2 setscrews (B) tightly.

4
- Grease the carriage bearers on all sides.
- Push lever (A) forward and slide the carriage into the boom before moving lever (A) back to normal.
- Remove locking pin (B).

5 Screw wall bracket (A) onto the boom.

6 Up-and-over doors:

- Screw wall bracket (A) with boom to the top door frame, lintel or ceiling, so that the upper door edge lies approx. 10 mm below the horizontal downward boom edge - measured from the highest point of the opening course. (see picture 6 and 10).
- Put the motor unit on a trestle or another suitable object until it is fixed later on to the ceiling.
- Join two door link brackets (B) to the door connector (C) and screw them with 4 screws to the centre of the upper door edge (see picture 6). Drill bit Ø 5mm.
- Join door link (D) to the carriage (E) and door link brackets (B).
- Use extended door link in case the min. distance of 165 mm cannot be kept due to the given situation on building.

Remove door locks or put them out of operation.

7 Sectional doors:

- Screw the wall bracket (A) with boom to the top door frame, lintel or ceiling, so that the upper lamella of the door lies approx. 10 mm below the horizontal downward boom edge - measured from the highest point of the opening course (see pictures 7.1 and 10).
- Put the motor unit on a trestle or another suitable object until it is fixed later on to the ceiling.
- Join two door link brackets (B) to the door connector (C) and screw them with 4 screws to the upper door lamella (see picture 7.1). Drill bit Ø 5mm.

    - If necessary, the motor unit can be installed 200 mm off-centre.
    - For wooden sectional doors please use wood-screws Ø 5x35mm. Drill bit Ø: 3 mm.

- Screw two self-tapping screws (D) into the door connector until the points of the screws are situated in front of the lamella.
- Join door link (E) with carriage (F) and door link brackets (B).
- Use extended door link in case the min. distance of 165 mm cannot be kept due to the given situation on building.

Remove the door locks or put them out of operation.

Attention:
For big and heavy sectional doors please use additionally door connector attachment Spezial 111, Art.-No. 47 574 (see picture 7.2)
(This is not part of the supply package).

8 Retractable up-and-over doors:

Special 102 adapter arm, item no. 564 865, and Special 601 photocell, item no. 564 266, are required (not included in the supply package). Until the ceiling mounts are subsequently fitted, support the motor housing using a trestle or other suitable object.
Before installing the operator, put the door locks out of operation.
Screw wall bracket (A) with boom to the top of the door surround or lintel centrally above the door ensuring that the top edge of the door at its highest point of opening clears the bottom edge of the boom by at least 10 mm (see pt. 10).

Fitting the adapter arm:

Screw support bracket (B) with 6 self-tapping screws to the centre of the top edge of the door leaf (5 mm dia. drill). The support bracket and boom meet centre to centre.

Slot adapter arm (C) into support bracket (B) and using two angle plates (D), screw to door cross strut (E).

Drill 5 mm dia. hole in the door cross strut (4x)
Drill 7 mm dia. hole in the adapter arm (2x)

Angle plates (D) are screwed to the adapter arm using two M6 x 10 screws and hexagon nuts.

Open the door fully, connect carriage (F) and linking bar (G) to adapter arm (C) observing the given dimensions. By lowering the carriage and extending the linking bar, the door opening is enlarged. The linking bar may only be pulled out to the extent that the internally located pressure rollers (H) do not abut against check screws (I).

Close the door and check that the minimum distance of 165 mm has not been exceeded.

To ensure optimum operation of the operator and door, the door travel speed should be altered to 8 cm/s.

See point 11 of the Installation Instructions.

9

Bolt on 2 support straps (A) to the motor housing. Bend them according to site requirements and saw off the projecting lengths (see pt. 10).

Attach one support strap to the centre of the boom.

10

Suspend the motor housing with boom from the ceiling, making sure that the top edge of the door at its highest point of opening clears the bottom edge of the boom by 10 mm (see pts. 6, 7 and 8). Install the ceiling mounts as constructional features of the garage allow (note drill depth for wall plugs).

11 Altering the door travel speed for large doors and for retractable up-and-over doors. Only to be carried out by a specialist!

The operator is supplied set for the faster door travel speed of approx. 14 cm/s.
By relocating the drive belt, the door travel speed can be reduced to approx. 8 cm/s.

Attention:
Before opening the housing, always disconnect the operator from the mains!

Remove the motor cover's central fixing screw (A).
Press all four locking hooks (B) inwards and pull the motor cover down and off.

Slide belt cover (C) approx. 5 mm in the direction of the arrow, press together at the bottom and pull away upwards.

Slip the drive belt first over the small lower motor pulley (D) and then over the large upper spindle pulley (E).

Do not use any sharp-edged tools.

Re-assemble in reverse sequence.

12

Screw in the light bulb (max. 40 Watt, E 14) and push retention ribs (A) on the lamp cover underneath the two locating slots (B) on the motor housing.
Swivel the lamp cover downwards and screw in place as shown.

After an impulse has been given, the light stays on for approx. 3 mins.

Light bulbs are not covered by the guarantee.

13 Quick release:

Pull cord (A) to disengage the door from the electric operator.
When an impulse is given whilst the door is released, the carriage will automatically re-engage.
To permanently disengage the door from the operator, push lever (B) fully forward.

Attention:
In the disengaged state, the door may only be moved with moderate speed.

In order to prevent the carriage from colliding with the operator housing on manual operation of the door, the travel path of the door in the OPEN direction must be limited on site.

14 Electronic controls:

B OPEN indicator
- glows when opening travel limit reached

D CLOSE indicator
- glows when closing travel limit reached

E Glows on passing the reference point

F Malfunction indicator
- flashes when fault message received

G Impulse indicator
- glows when button pressed
- flashes on valid signal from hand transmitter

H Power supply indicator
- glows when voltage o.k.
- goes out for 1 second when motor stops

I "OPEN" test button, + programming button

J "CLOSE" test button, - programming button

K Programming button P

L Mains fuse 4 A MT max.

N Connecting terminals for external impulse buttons

P Plug socket for "external control elements"

Q Plug socket for "electronic aerial",
"external photocell"

When mains ON, all the control lamps glow and the operator lighting comes on for approx. 2 seconds.

After pulling out the mains plug and removing the control unit, fuse (L) can be changed.

Symbols	Explanation
	External photocell
	OPEN
	Automatic timer
	CLOSE
	Operator lighting
	Malfunction
	Impulse
	On, mains voltage
	Programming button + OPEN test button
	Programming button - CLOSE test button
	Programming button
	External connecting terminals
	STOP button
	External control elements
	Electronic aerial

15 Hand transmitter:

A Flashing battery control

B Operating buttons

C Battery compartment cover

D Battery 12V A 23

E Programming contacts

F Battery 3V CR 1025

To change and insert the battery, open the cover.
When changing the battery, be sure to pole correctly.

Batteries are not covered by the guarantee.

Attention:
Only operate the hand transmitter when certain that neither persons nor objects are located within the door's range of travel.

Keep hand transmitters well out of the reach of children!

16 Learning the code:

It is necessary to programme the two hand transmitters with the same code.

Step 1:
Connect both hand transmitters using the enclosed programming cable.

Step 2:
Operate the left hand transmitter and keep the button depressed.

Step 3:
Operate the right hand transmitter while keeping the button on the left transmitter depressed. Programming is completed after approx. 2 secs. Remove the programming cable.

Altering the code:

In the event that a hand transmitter gets lost, it is possible to reprogramme the system with a new code.

To do this, connect the programming cable to the hand transmitter to be reprogrammed.

Step 4:
Short-circuit one of the two outer wires of the programming cable using the middle wire. Operate the hand transmitter for at least 5 secs. A new code is established via random programming whereby the LED flashes rapidly. For multi-channel transmitters this procedure must be carried out individually for every single button.
Once the LED on the hand transmitter constantly glows, the transmitter button can be released and the cable removed. The recoding procedure is now completed.

Attention:
After recoding the hand transmitter, the garage door operator must also be reprogrammed for the new code, since the old code has been irretrievably lost.

17 Electronic aerial:

Protection category: for dry buildings only.

A Connection cable to control unit with plug

B Aerial cordon

C Aerial box with adhesive surface

D Motor housing

E Front panel

Open the front panel. Plug the connection plug into the electronic control unit (see pt. 18/Q).
Place the aerial box into the corresponding recess of the motor housing or stick to the side of the motor housing.
On closing the front panel, lay the connection cable into the guide channel. If the range is poor, place the aerial on the other side or, if necessary, extend the connection cable (A) (not included in the supply package).

18 Connecting external control elements

N Connection of site control elements may only be made to the connecting terminals
- 1 GND
- 2 IMPULSE
- 3 24 V DC max. 50 mA

Attention:
The connections must be potential-free.
External voltage will destroy the electronics.

R Connection cable for control elements (Marantec system cabling).
To connect, remove short-circuit plug (T)
(button inside or key switch outside; not included in the supply package).

S Connection for electronic aerial.

Attention:
Do not insert short-circuit plug (T) into plug socket (Q).

T Short-circuit plug

19 Programming options

Overview of the indicator functions and programming options

Indicator functions

After plugging in at the mains, indicators 1 - 8 glow and the operator lighting comes on for approx. 2 seconds. The indicators and the operator lighting then go out.
The control unit is in the operating state. Indicator 8 glows.
(If an OPEN or CLOSE travel limit is reached, the corresponding LED glows as well).

Error messages

If the MALFUNCTION indicator flashes, after briefly pressing button P the corresponding error number is displayed (indicators flash erratically).
The error number is arrived at by adding together the flashing numbers.
See pt. 26 "Error numbers".

Programming the basic functions of the operator

Press button P for longer than 2 seconds. The control unit then changes from the operating state to the programming state of the basic functions. Indicator 1 flashes, all other indicators glow. Now release button P.

Using the ⊕ or ⊖ buttons, changes can be made in the programming menu and then stored by pressing button P. (If button P is pressed without any change having been made via the ⊕ or ⊖ buttons, the programming menu is skipped and the settings remain unchanged.) After the last programming menu, programming of the basic functions of the operator is completed; recognizable by all the indicators going out in the sequence 8 - 1.

Programming menus

1. Photocell, operation with or without external photocell
2. OPEN travel limit
3. CLOSE travel limit
4. OPEN automatic cut-out } (power limit)
5. CLOSE automatic cut-out } (power limit)
6. Coding the remote control

Programming the extended operator functions

Press button P for longer than 10 seconds. The control unit than changes from the operating state to the programming level for extended operator functions.
Indicator 3 flashes rapidly, all other indicators glow. Whilst continuing to press button P, use buttons ⊕ or ⊖ to select the desired programming level (indicator of the level flashes rapidly, all other indicators glow).
Now release button P.

The first programming menu of the chosen level is selected (indicator 1 flashes, all other indicators glow). Using the ⊕ or ⊖ buttons changes can be made in the programming menu and then stored by pressing button P. (If button P is pressed without any change having been made via the ⊕ or ⊖ buttons, the programming menu is skipped and the settings remain unchanged.)
After the last programming menu, programming of the extended operator functions is completed; recognizable by all the indicators going out in the sequence 8 - 1.

Notes on programming

The programmed in data cannot be deleted but only overwritten.
If the control unit is in the programming mode and none of the programming buttons (⊕, ⊖ or P) are pressed within 30 seconds, the programming procedure is aborted. The control unit changes to the operating state.
The MALFUNCTION indicator flashes.
By briefly pressing button P, the error number is displayed (7 = programming aborted).

Explanation of the extended operator functions (see table for details)

Programming level 3: Automatic timer

Functions	**Explanation**
- Open phase	The length of time during which the door remains open before it automatically closes again.
- Warning phase	The length of time the signal light flashes before the door automatically closes again.
- Start-up warning	The length of time the signal light flashes before the door starts to move.
- Early closing after passing the through-traffic photocell	The door neither closes after the set open phase nor early after the through-traffic photocell has been passed.

Programming level 5: Operator lighting / Signal lights

Functions	**Explanation**
- Lighting phase	The length of time the operator lighting stays on after the door has started to move
- Signal lights	The signal lights flash or glow on power operation of the door.
- Lighting	The operator lighting flashes or glows during the warning phase.

(20) Programming the electronic control unit:

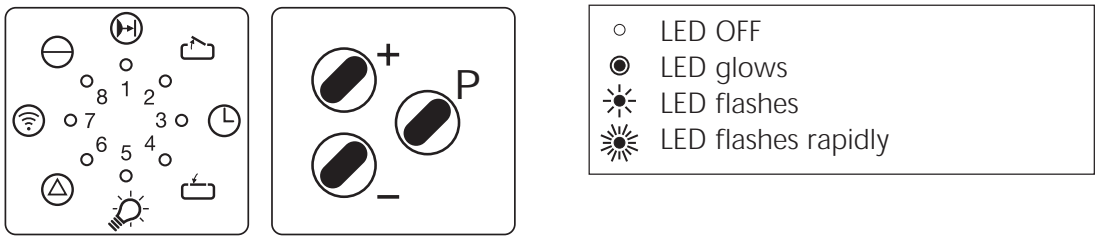
A Indicator programme external photocell
B Indicator programme 'OPEN' travel limit
C Indicator programme automatic timer
D Indicator programme 'CLOSE' travel limit
E Indicator programme light phase
F Indicator programme power limit
(indicators 6 and 2 flashing: 'OPEN' power limit)
(indicators 6 and 4 flashing: 'CLOSE' power limit)
G Indicator programme remote control
I Programming button ⊕
J Programming button ⊖
K Programming button P (programming mode, menu selection/store programming)

To display the electronic control unit fault message:

In the case of a fault message, the cause of the fault can be displayed, see pt. 26.

K	Programming button P	to display fault (press briefly)
1 - 8	Display of fault numbers (flash erratically)	
	for example:	numbers 8 and 2 flash together:
		8 + 2 = fault number 10 (see pt. 26)

(21)



○ LED OFF
◉ LED glows
☀ LED flashes
✺ LED flashes rapidly

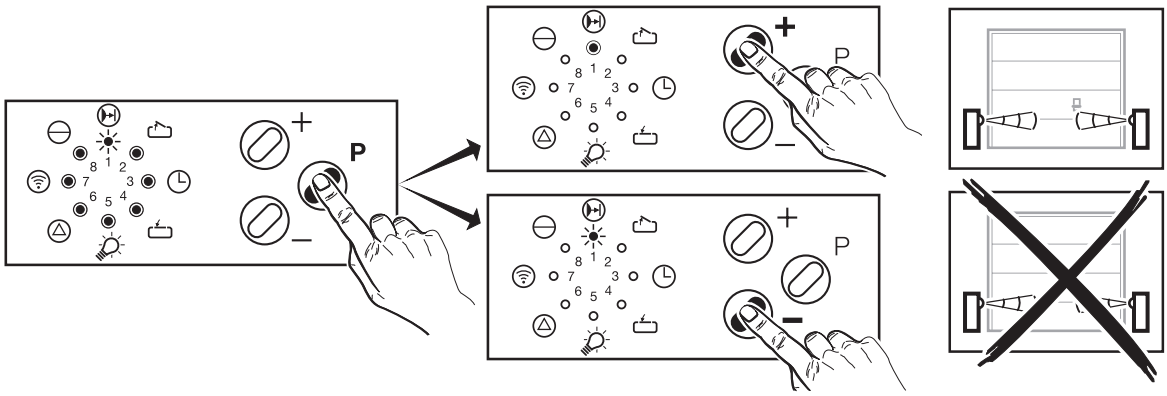
Programming the control unit

- As soon as the control unit is switched on, it runs a self-test, recognizable through the indicators 1 - 8 and the operator lighting which glow for approx. 1 second. Afterwards the control unit is in the operating state (indicator 8 glows).
- If button P is pressed for longer than 2 seconds, the control unit changes to the programming mode.
- By repressing button P the programming menus necessary for programming the basic operator settings are selected in turn.
- If a programming menu is skipped, the setting remains unchanged.
- Using the ⊕ or ⊖ buttons, changes can be made in the corresponding programming menu which can then be stored by pressing button P.
- If the control unit is in the programming mode and 30 seconds elapse without any of the 3 programming buttons having been pressed, the programming process is aborted and the control unit returns to its operating state (error message 7, see pt. 26).

- On misprogramming there is no need to reset because all the stored settings can be reprogrammed.

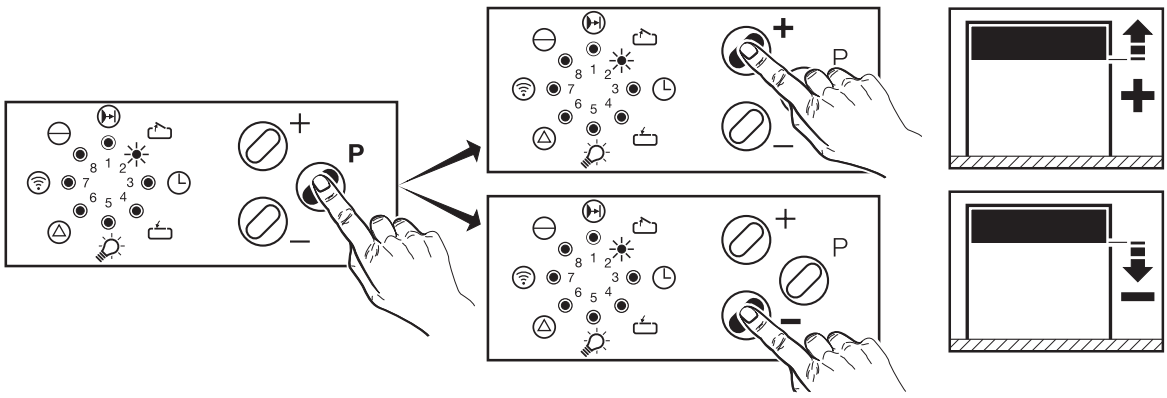
1. Programming an external photocell

(The door operator is preprogrammed for connecting to an external photocell to monitor the through-traffic area. If this photocell is not connected, the operator must be reprogrammed in accordance with pt. 21/1. Otherwise the door can only be closed by press and hold.)



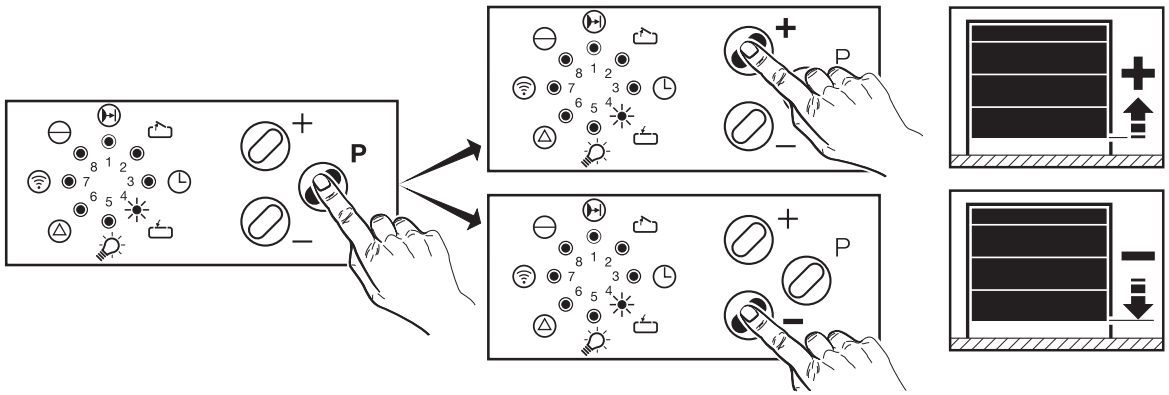
- Press programming button P for approx. 2 seconds until indicator 1 flashes.
- The external photocell can be connected via the ⊕ button.
- Indicator 1 glows.
- **By pressing the ⊖ button, the operator can be operated without an external photocell.**
- **Indicator 1 flashes.**
- Store by pressing programming button P.

2. Programming the 'OPEN' travel limit



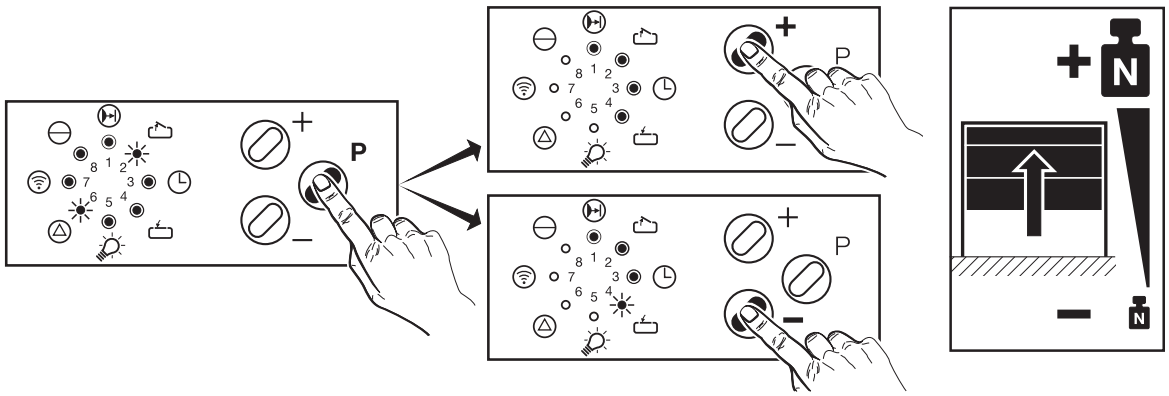
- Indicator 2 flashes.
- Allow the door to reach its end-of-travel 'OPEN' position by operating the ⊕ or ⊖ buttons (operator runs only by press and hold and without the power limit).
- Store by pressing programming button P.

3. Programming the 'CLOSE' travel limit



- Indicator 4 flashes.
- Allow the door to reach its end-of-travel 'CLOSE' position by operating the ⊕ or ⊖ buttons (operator runs only by press and hold and without the power limit).
- Store by pressing programming button P.

4. Programming the 'OPEN' automatic cut-out

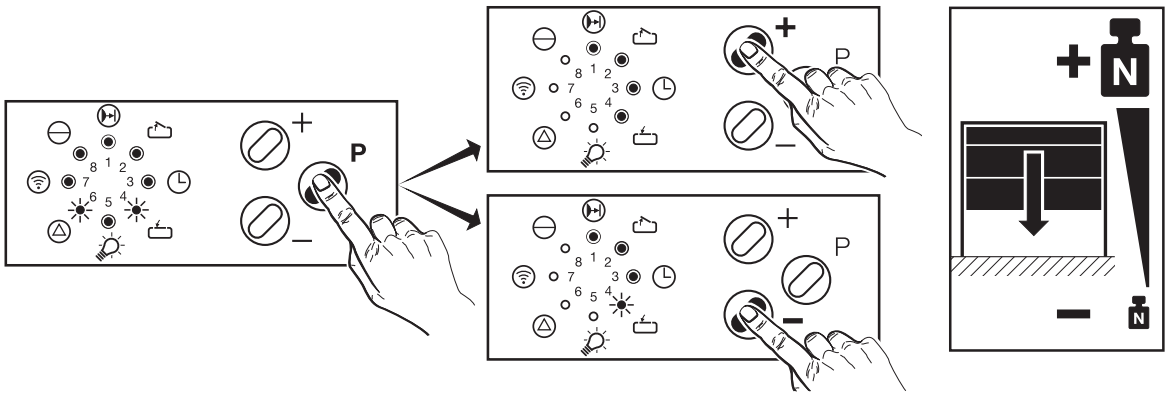


- Indicators 2 and 6 flash.
- By operating the ⊕ or ⊖ buttons, the automatic cut-out can be set in stages from 1 (most sensitive setting) to 16.

Indicator 1 flashes	=	stage 1
Indicator 1 glows	=	stage 2
Indicator 1 glows, indicator 2 flashes	=	stage 3
…		
Indicators 1 to 8 glow	=	stage 16

- Store by pressing programming button P.
  Set the automatic cut-out to be as sensitive as possible (150 N max. at the closing edge).

5. Programming the 'CLOSE' automatic cut-out

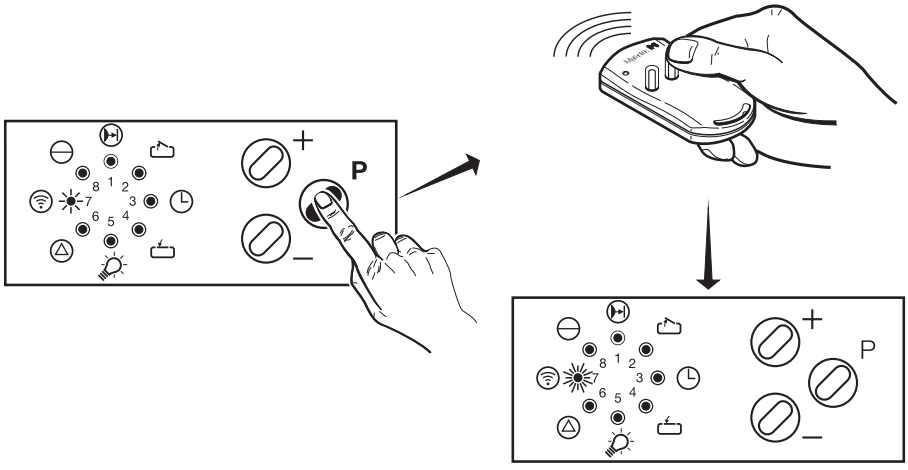


- Indicators 4 and 6 flash.
- By operating the ⊕ or ⊖ buttons, the automatic cut-out can be set in stages from 1 (most sensitive setting) to 16.

Indicator 1 flashes	=	stage 1
Indicator 1 glows	=	stage 2
Indicator 1 glows, indicator 2 flashes	=	stage 3
…		
Indicators 1 to 8 glow	=	stage 16

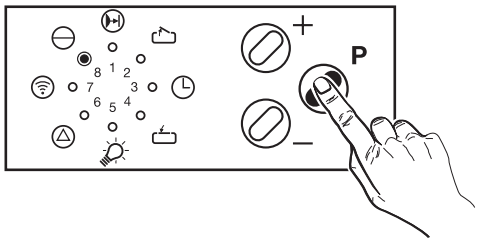
- Store by pressing programming button P.
  Set the automatic cut-out to be as sensitive as possible (150 N max. at the closing edge).

6. Programming the remote control



- Indicator 7 flashes
- The multi-bit hand transmitter is precoded at the factory.
  Operate the corresponding button of the hand transmitter until LED 7 flashes rapidly

P Store programming



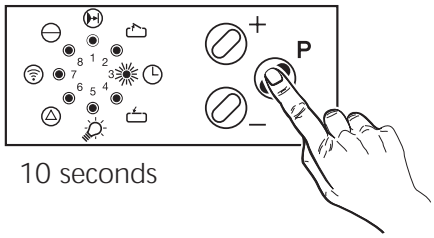
- The code is stored by pressing programming button P and the programming process is completed; recognizable by running light through all the indicators.
- The control unit is now in the operating state (in the event of a power failure all settings are retained).

Programming individual functions e.g. the 'CLOSE' automatic cut-out

- Press programming button P for approx. 2 seconds until indicator 2 flashes.
- Repeatedly press programming button P until indicators 4 and 6 flash.
- Carry out programming (see pt. 21/5).
- Press programming button P again to complete the programming process; recognizable by a running light through all the indicators.

Programming table Level 3

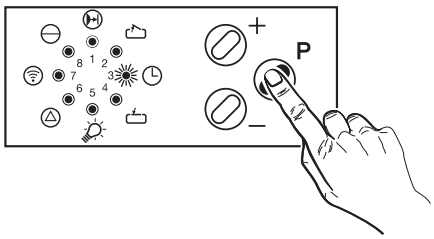
P Level 3: Automatic timer



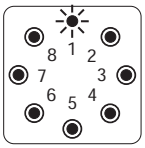
If an automatic timer is used, an external photocell to monitor the through-traffic area must be connected and activated in accordance with pt 21/1 (Earlyclosing after driving past the through-traffic photocell).
Otherwise no automatic timer function is possible.

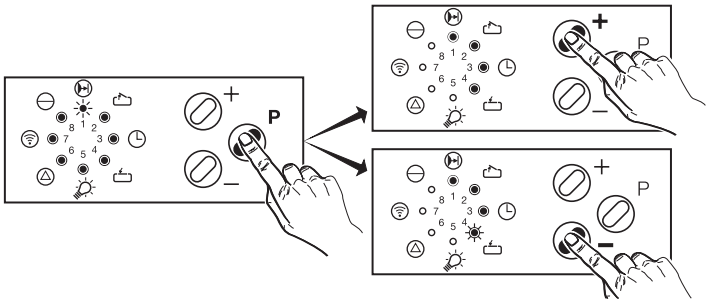
- The control unit is in the operating state.
- If button P is pressed for longer than 10 seconds, the control unit changes to the programming level for extended operator functions **(indicator 3 flashes, all other indicators glow).**
- Release button P. Now indicator 1 flashes.
- The open phase can now be set using the ⊕ or ⊖ buttons (see table of phase settings, pt 22).

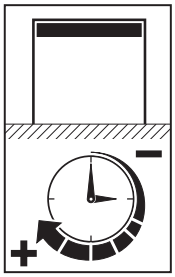
Programming table Level 3
Automatic timer



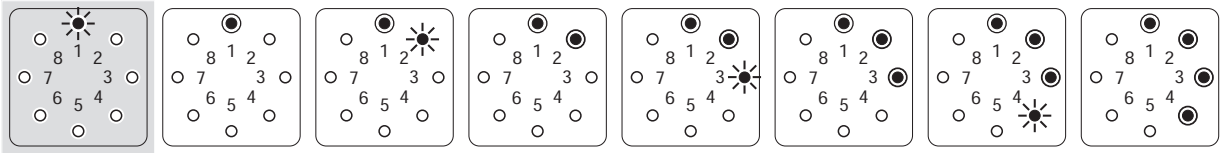
P Menu 1: Open phase





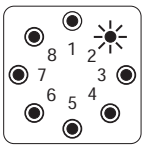


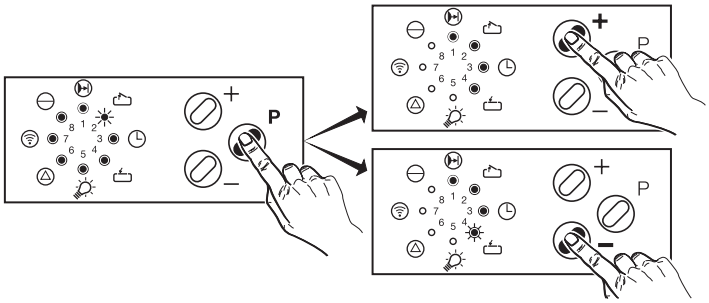
Open phase in seconds:

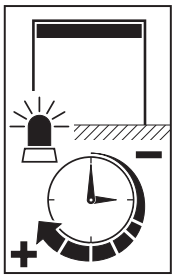


deactivated 5 10 15 20 25 30 35

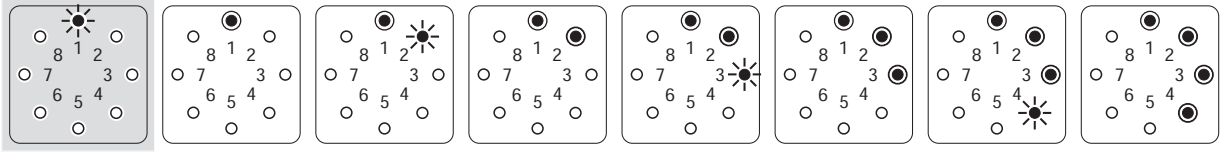
P Menu 2: Warning phase







Warning phase in seconds:



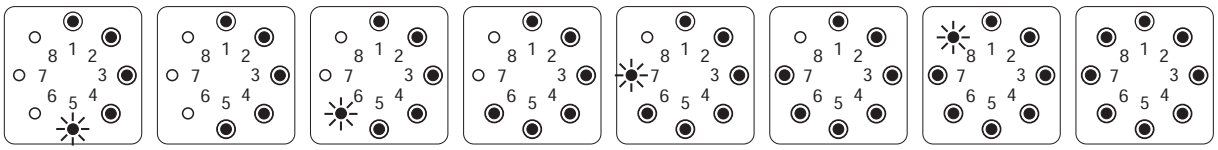
deactivated 2 5 10 15 20 25 30

○	LED OFF
◉	LED glows
☀	LED flashes
✺	LED flashes rapidly
	Factory setting

- Once button P is no longer pressed, indicator 1 **(open phase)** flashes.
- Using the ⊕ or ⊖ buttons, the **open phase** can be set (see table).

Minimum value: 5 seconds
Maximum value: 255 seconds

- Store by pressing programming button P.

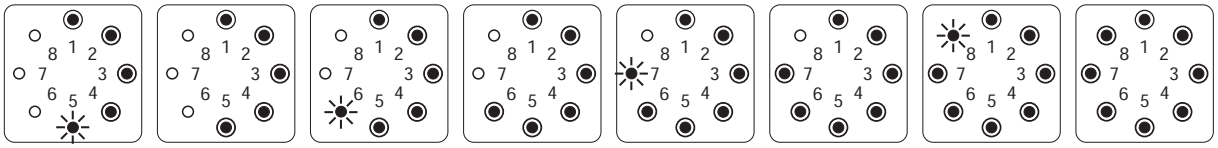


40 50 80 100 120 150 180 255

- Once button P is no longer pressed, indicator 2 **(warning phase)** flashes.
- Using the ⊕ or ⊖ buttons, the **warnimg phase** can be set (see table).

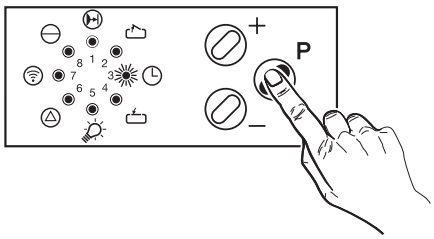
Minimum value: 2 seconds
Maximum value: 70 seconds

- Store by pressing programming button P.

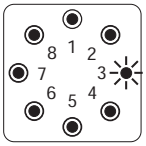


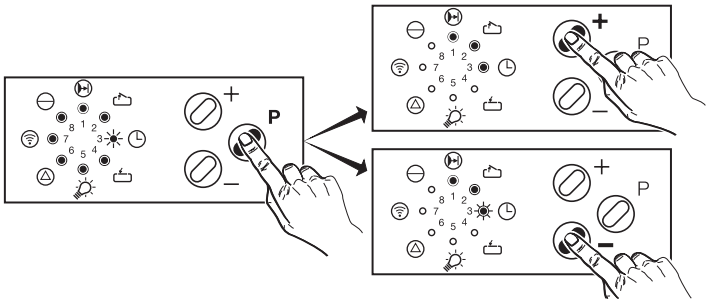
35 40 45 50 55 60 65 70

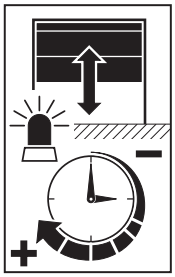
Programming table Level 3
Automatic timer (continued)



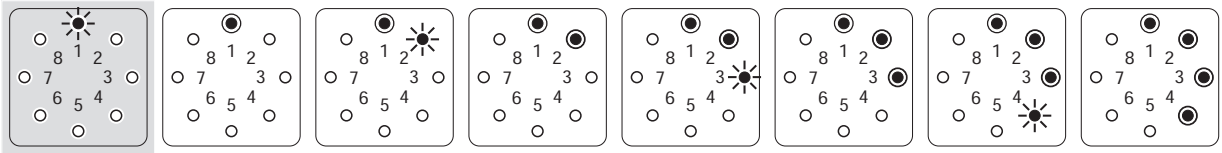
P Menu 3: start-up warning





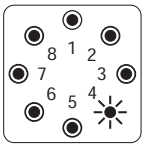


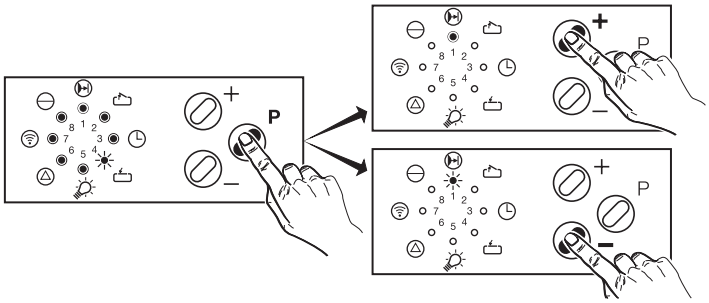
start-up warning in seconds:

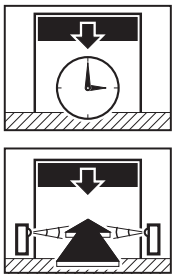


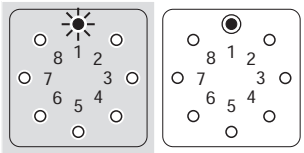
0 1 2 3 4 5 6 7

P Menu 4: Earlyclosing after driving past the through-traffic photocell









No Yes

○	LED OFF
◉	LED glows
☀	LED flashes
✺	LED flashes rapidly
	Factory setting

- Once button P is no longer pressed, indicator 3 **(start-up warning)** flashes.
- Using the buttons, the **start-up warning** can be set (see table).

Minimum value:	0 seconds
Maximum value:	7 seconds

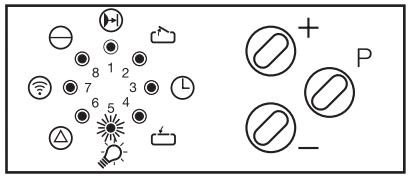
- Store by pressing programming button P.

- Once button P is no longer pressed, indicator 4 **(earlyclosing after driving past the through-traffic photocell)** flashes.
- Using the ⊕ or ⊖ buttons, the function **'early closing after driving past the through-traffic photocell'** or a set time phase can be programmed.

Indicator 1 flashes:	Door closes after the set time phase.
Indicator 1 glows:	Door closes after driving past the through-traffic photocell.

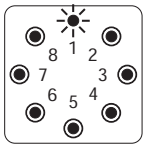
- Complete the programming process by once again pressing programming button P; recognizable by all indicators going out in the sequence 8 - 1.
- Afterwards, the control unit returns to the operating state (indicator 8 glows; if the door is in an open or closed state, the corresponding indicators 2 or 4 also glow).

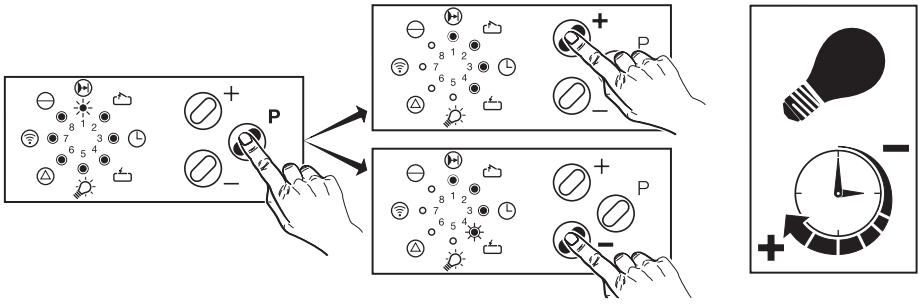
Programming table Level 5
operator lighting/signal lights



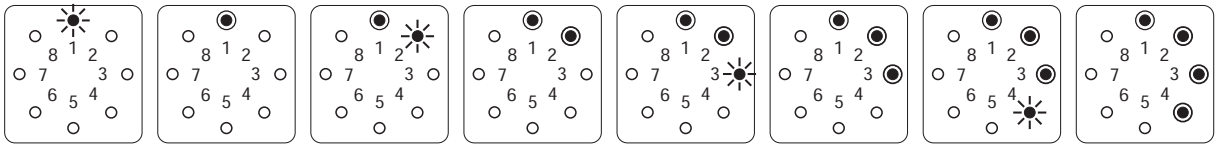
The operator allows connection of an external signal light, provided the relay retrofit kit 'OPEN-CLOSE+light door function' for standard operators in a housing (item no. 152 137) is connected and the automatic timer is activated. The output can be programmed in such a way that the signal lights flash or glow.

P Menu 1: lighting phase



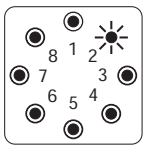


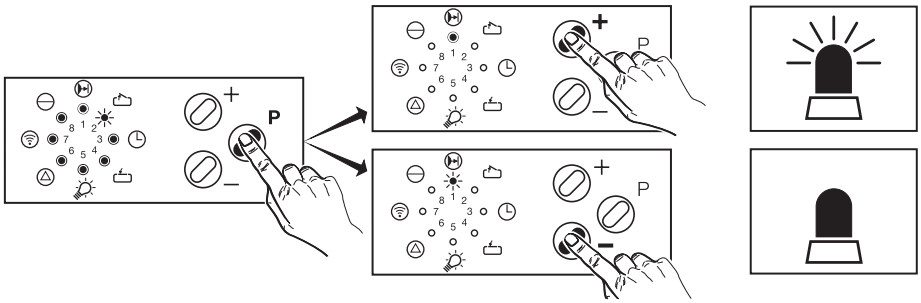
lighting phase in seconds:

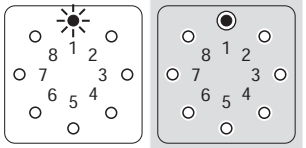


2 95 100 110 120 130 140 150

P Menu 2: signal lights





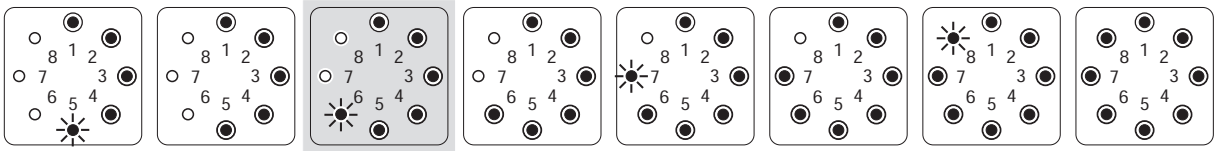


glowing flashing

- The control unit is in the operating state.
- If button P is pressed for longer than 10 seconds, the control unit changes to the programming level for extended operator functions (indicator 3 flashes rapidly).
- Keep button P depressed and using the ⊕ oder ⊖ buttons select programming level 5 **(indicator 5 flashes, all other indicators glow).**
- Release button P.

- Once button P is no longer pressed, indicator 1 **(lighting phase)** flashes.
- Using the ⊕ or ⊖ buttons, the **lighting phase** can be set (see table).

- Store by pressing programming button P.

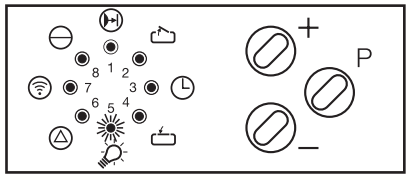


- Once button P is no longer pressed, indicator 2 **(signal lights)** flashes.
- Using the ⊕ or ⊖ buttons, the **signal lights** function can be set.

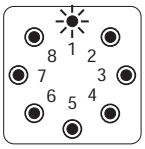
Indicator 1 flashes:	external signal light glows.
Indicator 1 glows:	external signal light flashes.

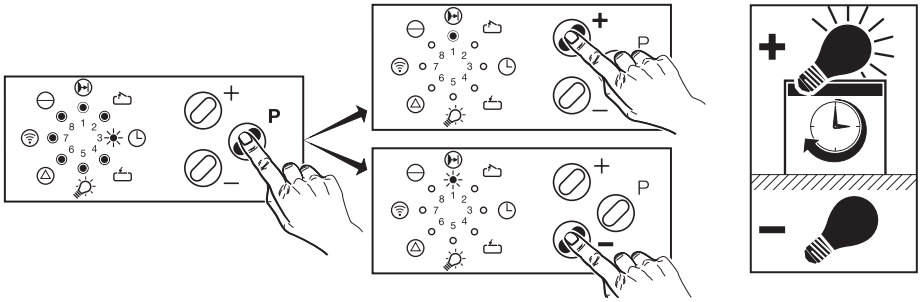
- Store by pressing programming button P.

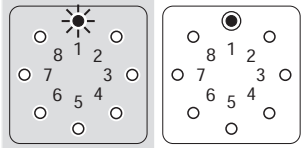
Programming table Level 5
operator lighting/signal lights (continued)



P Menu 3: Lighting







Operator lighting glows during the warning phase

Operator lighting flashes during the warning phase

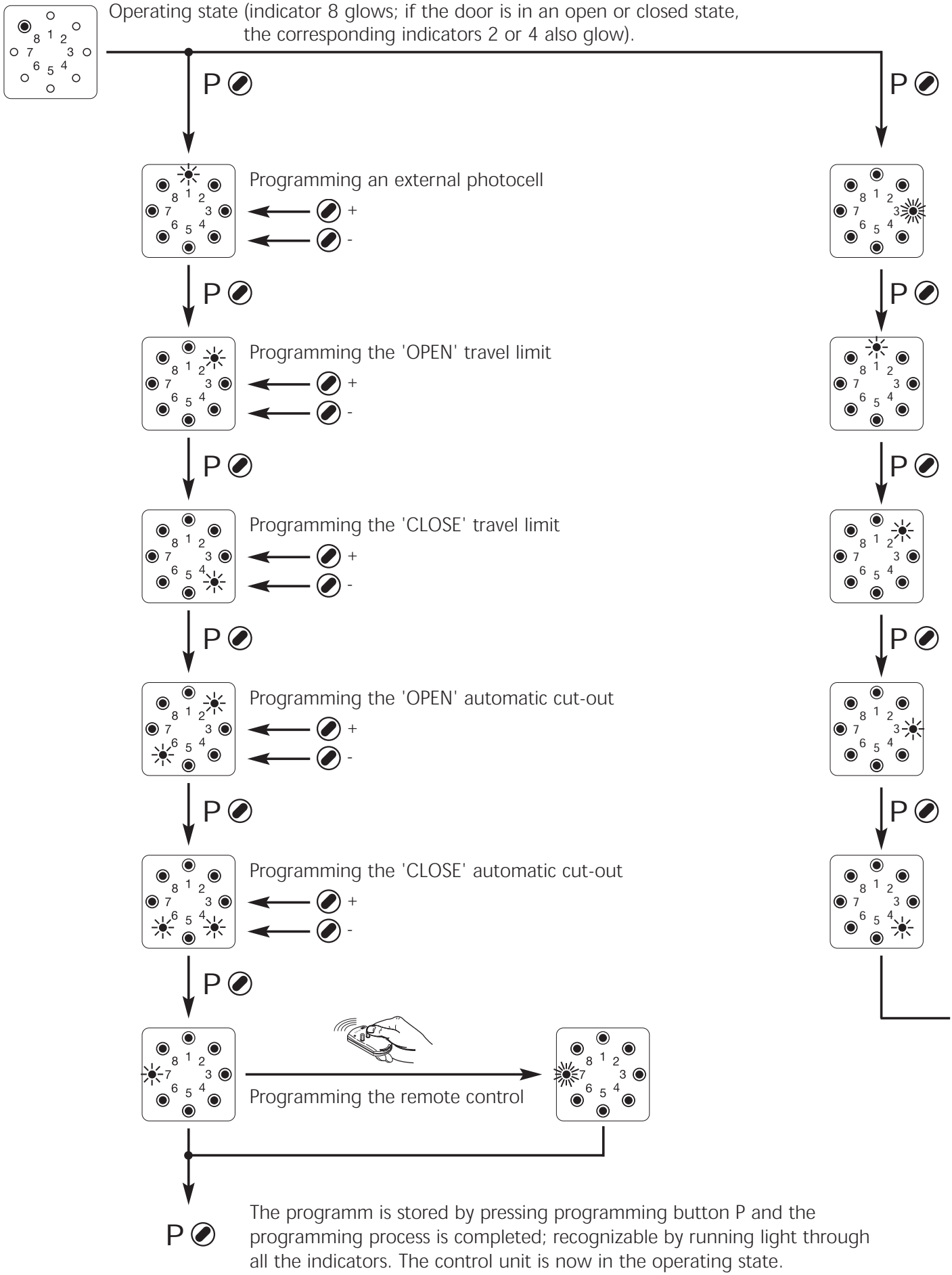
○ LED OFF
◉ LED glows
☀ LED flashes
✺ LED flashes rapidly
Factory setting

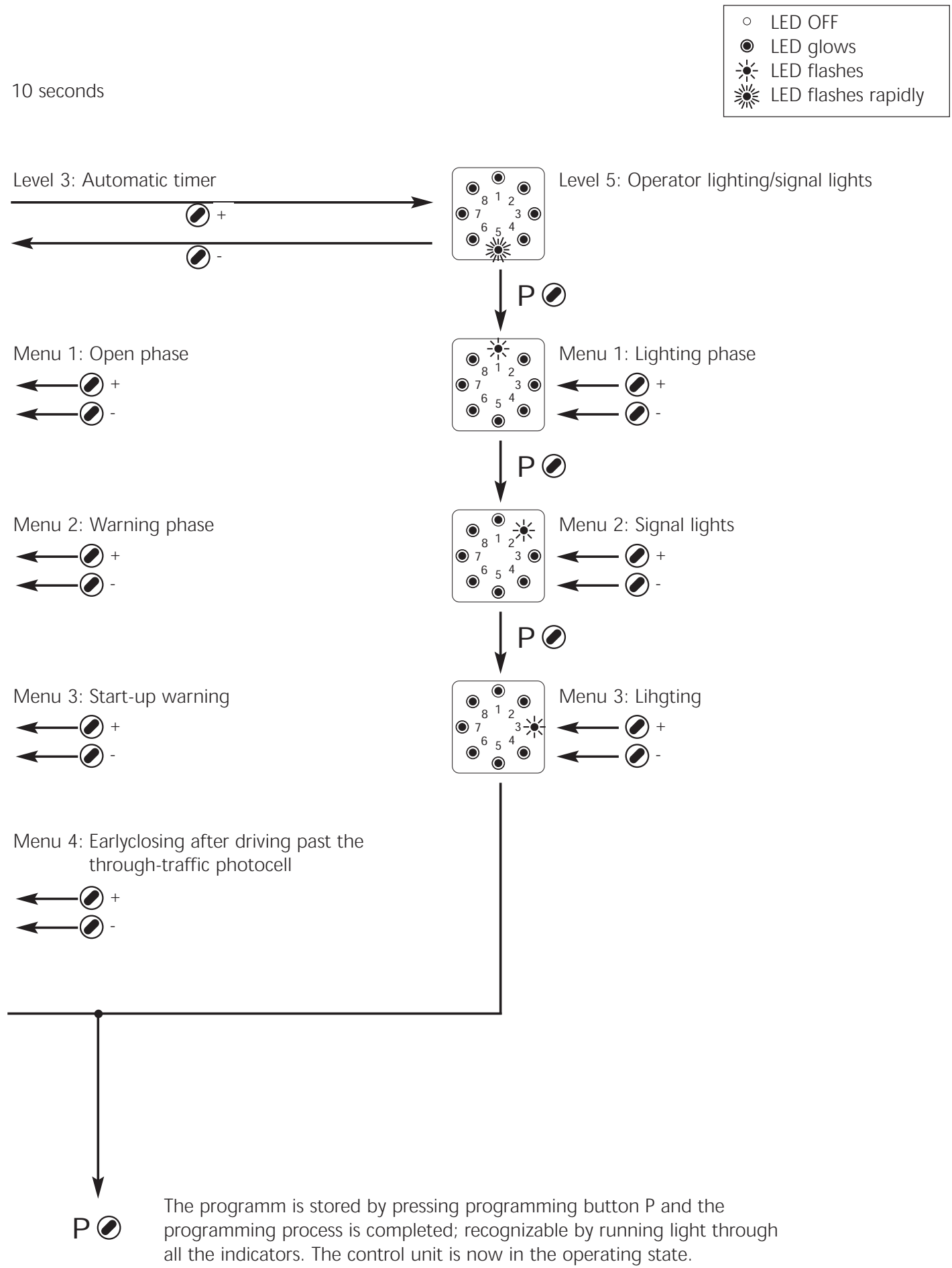
- Once button P is no longer pressed, indicator 3 **(lighting)** flashes.
- Using the ⊕ or ⊖ buttons, the **lighting** function can be set (see table).

Indicator 1 flashes:	operator lighting glows during the warning phase.
Indicator 1 glows:	operator lighting flashes during the warning phase.

- Store by pressing programming button P.

Brief programming instructions for the specialist




LED OFF
LED glows
LED flashes
LED flashes rapidly
10 seconds
Level 3: Automatic timer
+
-
Level 5: Operator lighting/signal lights
P
Menu 1: Open phase
+
-
Menu 1: Lighting phase
+
-
P
Menu 2: Warning phase
+
-
Menu 2: Signal lights
+
-
P
Menu 3: Start-up warning
+
-
Menu 3: Lihgting
+
-
Menu 4: Earlyclosing after driving past the through-traffic photocell
+
-
P
The programm is stored by pressing programming button P and the programming process is completed; recognizable by running light through all the indicators. The control unit is now in the operating state.

22 Comfort 150/160 AC programming table

		Level 3: Automatic timer			Leve 5: operator lighting/signal lights
	LED Indicator	Menu 1: Open phase	Menu 2: Warning phase	Menu 3: Start-up warning	Menu 1: Lighting phase
1	☀ ○ ○ ○ ○ ○ ○ ○	deactivated ■	deactivated ■	deactivated ■	2 sek. □
2	◉ ○ ○ ○ ○ ○ ○ ○	5 sec. □	2 sec. □	1 sec. □	95 sek. □
3	◉ ☀ ○ ○ ○ ○ ○ ○	10 sec. □	5 sec. □	2 sec. □	100 sec. □
4	◉ ◉ ○ ○ ○ ○ ○ ○	15 sec. □	10 sec. □	3 sec. □	110 sec. □
5	◉ ◉ ☀ ○ ○ ○ ○ ○	20 sec. □	15 sec. □	4 sec. □	120 sec. □
6	◉ ◉ ◉ ○ ○ ○ ○ ○	25 sec. □	20 sec. □	5 sec. □	130 sec. □
7	◉ ◉ ◉ ☀ ○ ○ ○ ○	30 sec. □	25 sec. □	6 sec. □	140 sec. □
8	◉ ◉ ◉ ◉ ○ ○ ○ ○	35 sec. □	30 sec. □	7 sec. □	150 sec. □
9	◉ ◉ ◉ ◉ ☀ ○ ○ ○	40 sec. □	35 sec. □	-	160 sec. □
10	◉ ◉ ◉ ◉ ◉ ○ ○ ○	50 sec. □	40 sec. □	-	170 sec. □
11	◉ ◉ ◉ ◉ ◉ ☀ ○ ○	80 sec. □	45 sec. □	-	180 sec. ■
12	◉ ◉ ◉ ◉ ◉ ◉ ○ ○	100 sec. □	50 sec. □	-	190 sec. □
13	◉ ◉ ◉ ◉ ◉ ◉ ☀ ○	120 sec. □	55 sec. □	-	200 sec. □
14	◉ ◉ ◉ ◉ ◉ ◉ ◉ ○	150 sec. □	60 sec □	-	210 sec. □
15	◉ ◉ ◉ ◉ ◉ ◉ ◉ ☀	180 sec. □	65 sec. □	-	220 sec. □
16	◉ ◉ ◉ ◉ ◉ ◉ ◉ ◉	255 sec. □	70 sec. □	-	240 sec. □

Deactivating the automatic timer (both phases without function)
If in accordance with the table either the open phase or the warning phase is set 'without function', then the automatic timer is switched off.

■ = Factory settings

23 Cable connecting plan

A Comfort 150 / 160 Operator

B Electric socket with earth contact 220V - 240V, 50 Hz (on site)

C Electronic aerial

D Comfort 150 / 160 control unit

E Marantec Command Series interior keypad with connection cable

F Marantec Command Series key switch

24 Circuit diagram B-MC 150 / 160

C1		Motor capacitor
F1		Fuse (max. 4A)
H1		Operator lighting
M1		Motor with thermal overload protection
S	x)	Main switch or "emergency-off" button (on site)
S1	x)	"Impulse" button
S21		RPM sensor
S22		Reference point sensor
X0	+)	Mains electric socket
X1		Mains cable with plug

Connecting terminals:

X2c	Command units

Plug connections:

X10	External control elements
X20	Electronic aerial External photocell

Accessories connection:

W20		Electronic aerial
XS10	-)	External control elements Marantec Command Series

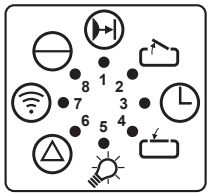
+) on site
x) if fitted
-) For connection, remove short-circuit plug

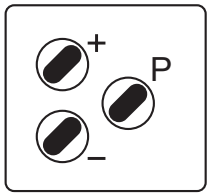
Attention:
Low voltage!
External voltage at the plug sockets X2c, X10 to X20 will completely destroy the electronics.

Attention:
Observe local safety regulations!
Always lay mains cable and control cable separately.

25 Test Instructions - only for the specialist -

Trouble shooting:





Fault	Cause	Remedy
Indicator 8 doesn't glow.	No voltage.	Check mains supply. Check electric socket. Check operator mains fuse (pt. 14/L).
	Thermal overload protection in motor activated.	Allow motor to cool down.
	Defective control unit.	Cut off mains supply to operator. Unscrew control unit, pull slightly forward and withdraw the connecting plug. Remove control unit and have it checked.
Indicator 6 flashes. Fault 10	Automatic cut-out set too sensitively. Door movement too sluggish. Door blocks.	Re-set automatic cut-out to be less sensitive (pt. 21/3 - "OPEN" direction, pt. 21/4 - "CLOSE" direction). Ensure door moves easily.
Indicator 6 flashes. Fault 6 or 15	External photocell defective or interrupted.	Remove obstruction or have photocell checked.
Drive only operates in "OPEN" but not in "CLOSE" direction. Fault 15	Photocell (pt. 21/1) programmed, but not connected.	Reprogramme photocell function or connect photocell.
No response on impulse. Indicator 7 glows	Connecting terminals for "IMPULSE" button bridged, e.g. due to short-circuit or wrong terminal connection.	Temporarily isolate cabled key switches or interior push buttons from control unit. Remove plug (pt. 18/T), insert plug (pt. 18/R) and look for cable fault.
No response on impulse. Fault 36	Short-circuit plug removed (pt. 18/T), but "STOP" button not connected.	Connect "STOP" button.
Indicator 7 doesn't flash rapidly on impulse from hand transmitter	Electronic aerial disconnected.	Connect aerial to control unit (pt. 17).
	Hand transmitter coding is not consistent with receiver coding.	Check coding (pt. 21/6)
	Flat battery.	Insert new 12V battery A 23 (pt. 15). Flashing LED in transmitter indicates battery condition.
	Hand transmitter, control unit electronics or electronic aerial defective.	Have all 3 components checked.
Insufficient range of remote control (less than 5 m).	Flat battery.	Insert new 12V A 23 battery (pt. 15). Flashing LED in transmitter indicates battery condition.
	Wrongly positioned electronic aerial.	Align the aerial cordon and, if possible, let it hang freely.
Indicator 6 flashes. Fault 9	RPM sensor defective.	Have operator checked.
	Door too sluggish.	Check door.

26 Test Instructions - Error numbers -

The error number is displayed on briefly pressing programming button P.

Fault	Error number	Indicator flashes erratically
Photocell actuated	6	Indicator 6
Programming aborted	7	Indicator 7
Reference point switch defective	8	Indicator 8
Defective RPM sensor Anti-lock system actuated	9	Indicator 8 + 1
Power limit	10	Indicator 8 + 2
Excess travel stop	11	Indicator 8 + 3
Photocell self-monitoring unit not o.k.	15	Indicator 8 + 7
Power limit self-monitoring unit	16	Indicator 8 + 7 + 1
Learned power limit	28	Indicator 8 + 7 + 6 + 5 + 2
Response sensitivity of power limit	27	Indicator 8 + 7 + 6 + 5 + 1
Static current circuit broken	36	Indicator 1 - 8

27 Putting into operation

Power-operated windows, doors and gates for industrial or commercial use must be checked by a specialist after initial installation and then regularly at intervals of 1 year minimum.

Maintenance instructions

The Comfort 150 / 160 garage door operator is virtually maintenance-free.
However, all movable parts of the door and operator system should be checked regularly and kept in an easily movable condition. The door must be easy to operate manually.
The separate door counterbalance mechanism must be checked regularly.
The "OPEN" and "CLOSE" settings of the automatic cut-out should be checked regularly.

28 Technical data:

Comfort 150 / 160
Garage Door Operator

Connected loads:
230 V, 50 Hz
260 W

Door travel speed:
0.14 m/s
0.08 m/s

Push and pull force:
Comfort 150: 500 N
Comfort 160: 700 N

Excess travel stop:
88 seconds

Automatic timer device:
with additional relay for signal lights connection and through-traffic photocell (available as accessories). Warning phase adjustable from 2 to 70 seconds. Open phase adjustable from 5 - 255 seconds.

Lighting:
1 x 40 W E 14, goes out automatically after approx. 180 secs.

Control voltage:
Low voltage below 24 V DC.

Automatic cut-out:
Electronic power limit through microprocessor and RPM sensor.

Anti-lock system:
Through microprocessor and RPM sensor.

Protection category:
For dry buildings only.