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### CHAPTER 4 OPERATORS

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## 1 HISTORICAL OVERVIEW OPERATORS

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## 2 OLD OPERATORS

### 2.1 Overview of delivered Cardo operators

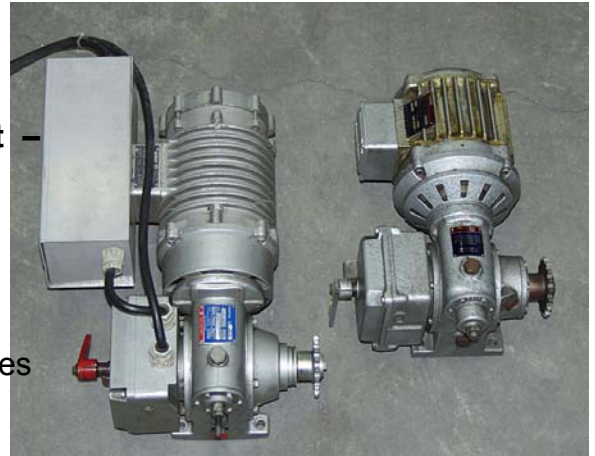
#### 2.1.1 Ovitor operators (Delivered from: Start 1974)

- No spare parts available anymore
- Only small adjustment/repair actions possible.

Note! Only if complete operator is in good condition!

- Possible adjustments : Limit switches
- Possible repairs : Motor-protection switch, Main relays

- If other repairing is needed :  
REPLACE COMPLETE OPERATOR



#### 2.1.2 Operator CDM-1 (Delivered from: 1974 – 1980)

- Most electrical parts for control system not available anymore.
- Some repair/adjustment actions are still possible.

Note ! Only if complete operator is in good condition

- Possible adjustment s : Limit switches / Sliding clutch
- Possible repairs:  
Electro-motor, Sliding clutch,  
Brake, RPM-transmitter,  
Disengagement, Limit switches.  
Motor-protector switch,  
Main relays.

- If other repairing is needed :  
REPLACE COMPLETE OPERATOR



Note! Consult checklist for right type of operator.

#### 2.1.3 Operator CDM-2 (Delivered from 1978 – 1980)

- Most electrical parts (PCB's) are not available anymore.



- Some adjustment/repair actions are still possible.

Note! Only if complete operator is in good condition!

- Possible adjustments: Limit switches / Sliding clutch.
- Possible repairs:
- Electro-motor, Sliding clutch,
- Brake,
- RPM-transmitter,
- Disengagement,
- Limit switches,
- Motor-protector switch,
- Main relays.
- If other repairing is needed :  
REPLACE COMPLETE OPERATOR

**Above mentioned operators are not in accordance with the present state of the art, when it comes to safety and other regulations.**

If upgrading and/or severe repairing is necessary, the customer should be advised to replace the complete operator by one of our present types.

Consult check list for right type of operator!

#### **2.1.4 Operator CDM-5 (Control system in the mechanical unit, 1982 – 1994)**

- Not all spare parts are still available.
- All kind of adjustments/repair actions possible.

**Note!** Only if complete operator is in good condition.

- No safety supervision.
- If upgrading and/or severe repairing is needed,  
Replace the complete operator for  
one of the present types (Consult checklist for  
right type).

### 2.1.5 Operator CDM-5 (HD) (control system in the mechanical unit, 1982 - 1994)

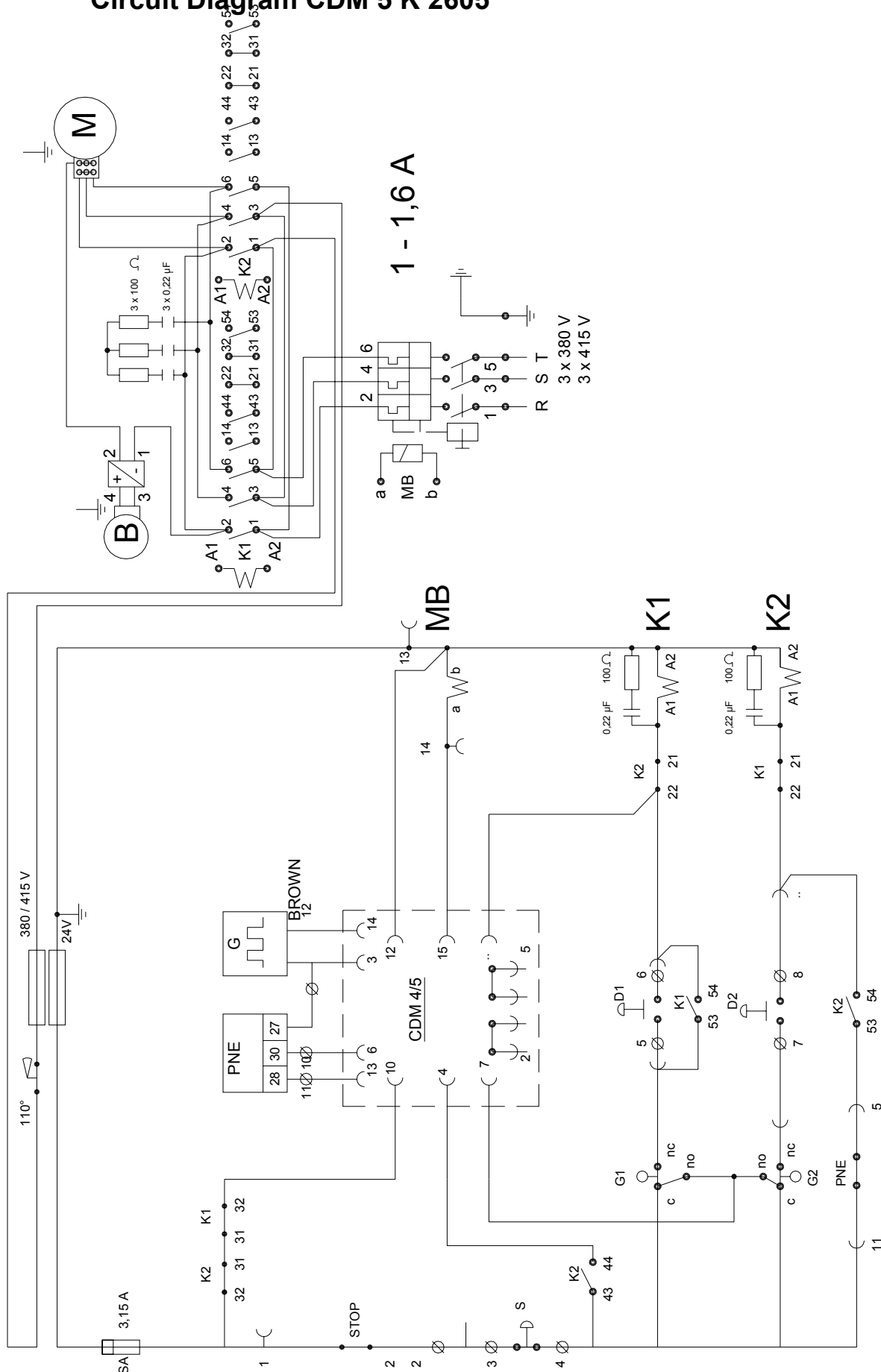


- Not all spare parts are still available.
- All kind of adjustments/repair actions possible.

**Note!** Only if complete operator is in good condition.

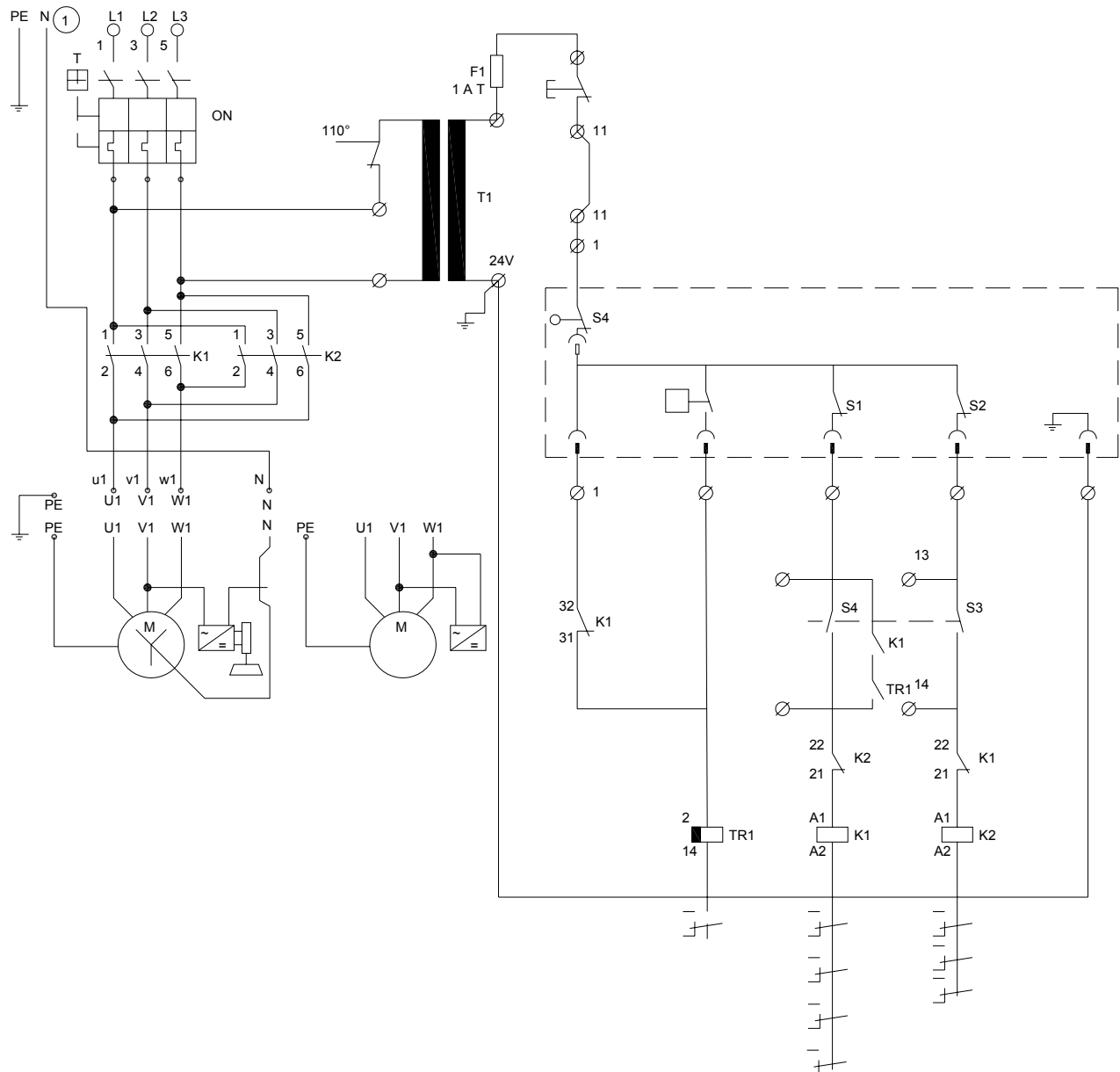
- No safety supervision
- If upgrading and/or severe repairing is needed, replace the complete operator for one of the present types (consult checklist for right type)
- Maximum door weight:
  - CDM 5 = 650 Kg
  - CDM 5 (H) = 1150 Kg

## 2.2 Circuit Diagram CDM 5 K 2605





### 2.2.1 CDM-5 Dead man's grip



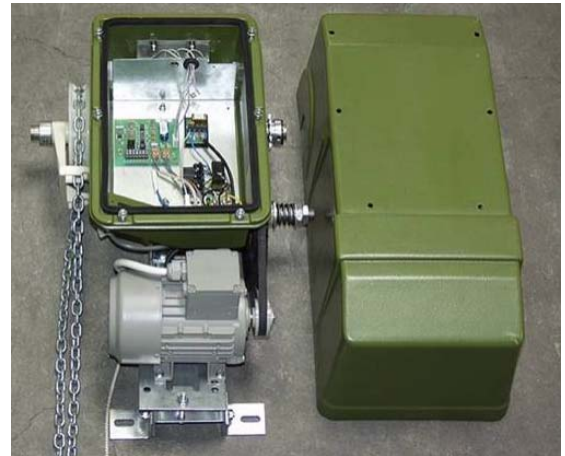
## 2.3 Control unit CDM-5

## 2.4 Mechanical Unit CDM5 (Separate control system, 1984 – present)

- Spare parts still available
- All kind of adjustments/repair actions possible

Note! Only if complete mech. unit is in good condition

- Maximum door weight:  
CDM 5 = 650 Kg  
CDM 5HD = 1150 Kg

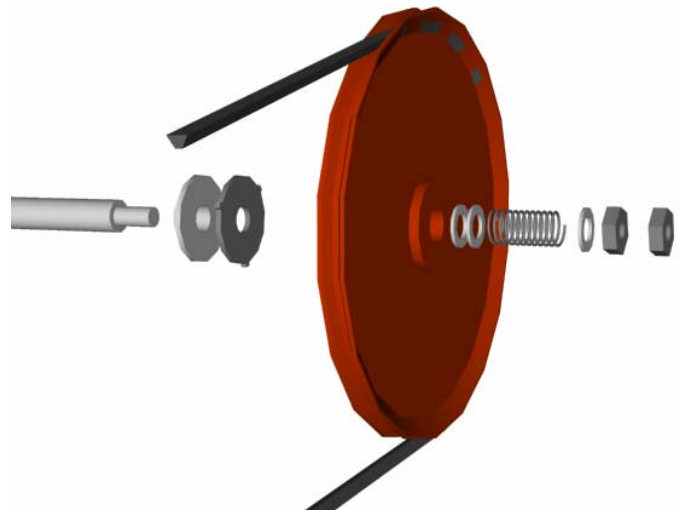


### 2.4.1 Mechanical Unit CDM 5 adjustment of sliding clutch and limit switches

#### Adjustment of sliding clutch:

Increase of the sliding force:

- Unscrew the 2 lock nuts and the thrust washer.
- Take away the necessary rings (One ring increases the force by 10-15kg).
- Fit the thrust washer and the lock nuts again.
- Test the door. (The sliding clutch has to be adjusted so that the operator is strong enough to drive the door from any position, but not too strong. The door could have to be stopped by hand. Too strong adjustment can give a wrong functioning of the SBD).

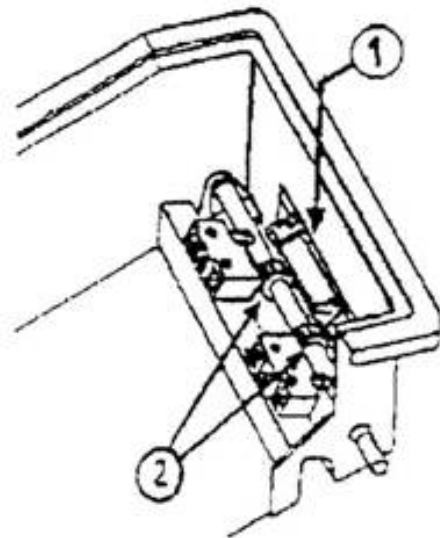


#### Adjustment of the limit switches:

To adjust the limit switches, a control plate can be pressed in and then you can rotate the nuts along the screw-thread. Choose first which limit switch is for OPEN and which one for CLOSED.

- The door will stop at fully opened position by the limit switch. (Adjust the limit switch so, that the buffer is pressed ca. 2 cm)
- On the floor the door stops by the rev. monitor or by the pneumatic safety device. (ECS 430S and 430P) Adjust the lower limit switch, so that it will be activated between 30-70mm from the floor.

For earlier activation, rotate the nut towards the limit switch.



**Replacement and adjustment of the V-belt:**

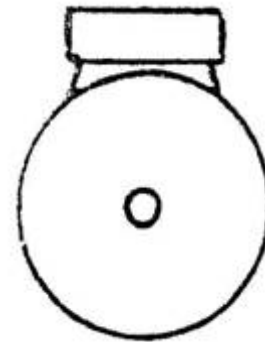
Loosen the brace nut of the motor plate. (Make sure that the motor does not fall off)

- Dismantle the V-belt.
- Install the new V-belt and adjust the tension of the V-belt by tightening the brace nut again. The V-belt is tensioned correctly if you can press it in the middle for  $\pm 6\text{mm}$ .

**Replacement of the brake :**

Symptom: The electro-motor turns but the door does not. (Sliding clutch is working)

- Old type of mechanical units has a brake with the rectifier included.
  - Check that 220VAC reaches the brake while the electro-motor is running.
  - If that is the case: Replace the brake + separate rectifier.
  - If not, check for a fault in the electrical system.
- New type of mechanical units has a brake with a separate rectifier.
  - Check that 220VAC reaches the rectifier while the electro-motor is running.
  - If that is the case: Check if the rectifier gives  $\pm 110\text{VDC}$  at the secondary side.
  - If not, check for a fault in the electrical system.
  - If the rectifier gives  $\pm 110\text{VDC}$ , replace the brake.



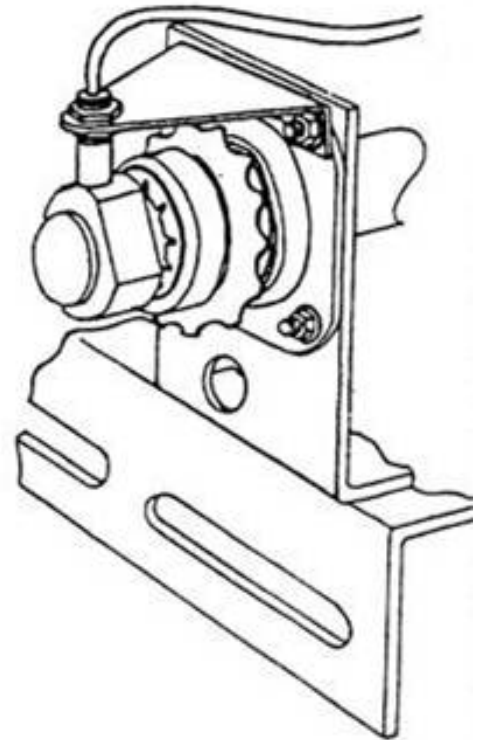
**RPM control:****Symptom:**

Door goes up for  $\pm 10\text{cm}$  and stops.

Or:

Door goes down for  $\pm 10\text{cm}$ , stops, reverses and goes up for  $\pm 10\text{cm}$  again.

- Check the distance between the sensor of the rev. counter and the round surface of the cam on the shaft. (Distance should be  $0,8\text{mm}$  = hack saw blade)
  - If this distance is right, check the sensor! (Use an Ohm-meter)
  - In 1 direction you have to measure  $\pm 3.8 \text{ M}\Omega$ . In the other direction you have to measure an open circuit. If you measure other values, replace the sensor.
  - If the sensor is right, check the electrical part!
- 
- CDM-5 old (Control unit in mech. Unit): Replace the black PCB (K035755)
  - CDM-5 new (Control unit ECS601/602 – 430(S)(P): Replace the adapter PCB in the mech. unit (K033808)

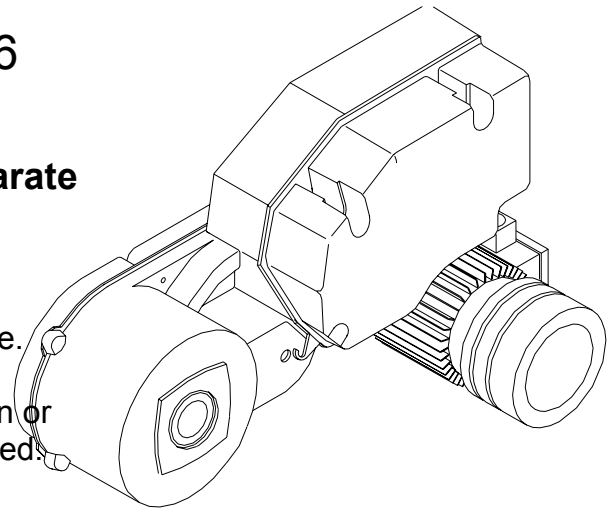


### 3 MECHANICAL UNIT CDM-6

#### 3.1 Mechanical Unit CDM6 (HD)(Separate control system, 1984 – present)

- Spare parts available
- All kinds of adjustments/repair actions possible.

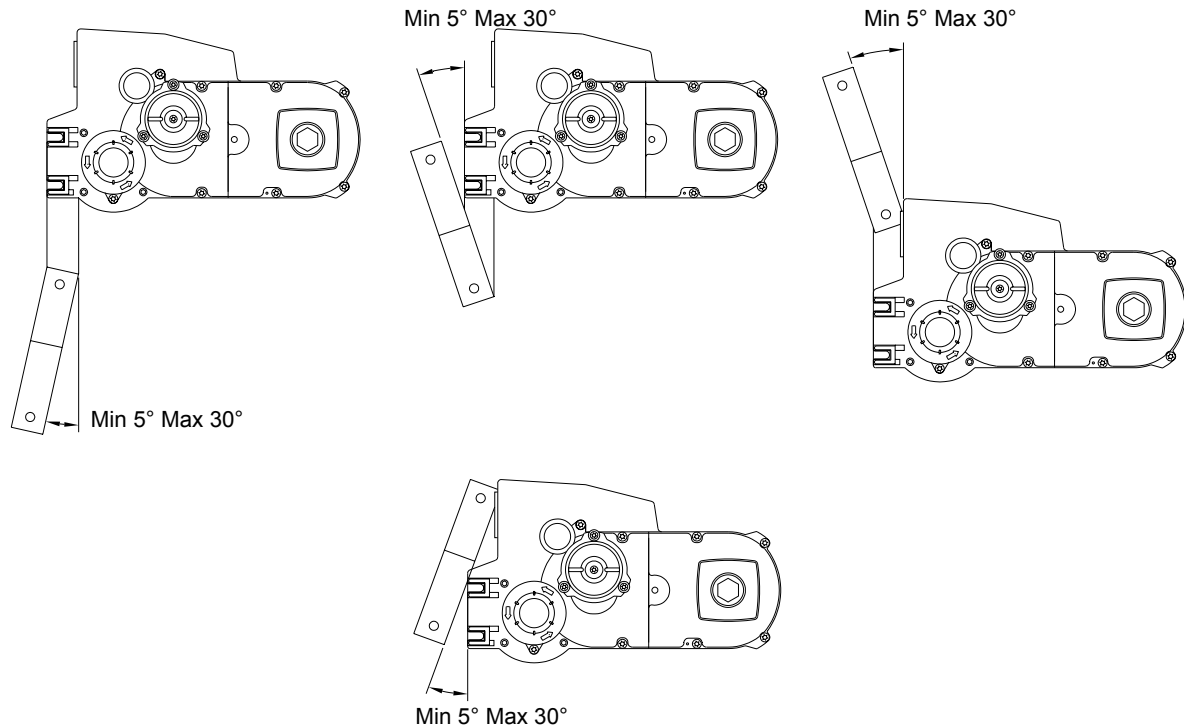
Note! If one of the inside toothed wheels is broken or damaged the complete gear unit has to be replaced.



- Maximum door weight:
- CDM 6 = **275 Kg.**
- CDM 6 HD = **350 Kg.**

### 3.2 Installation of fixing bars CDM 6 (HD)

Installation of fixing bars CDM6-(HD)



The bars should be aligned to each other see fig.

- The bar on the mech. unit can be installed upwards or downwards.
- The other bar can be fitted in Line with or towards the mech. Unit.
- The Z-bar design ensures that the unit can follow the movement of the door shaft without hinder.

Note!

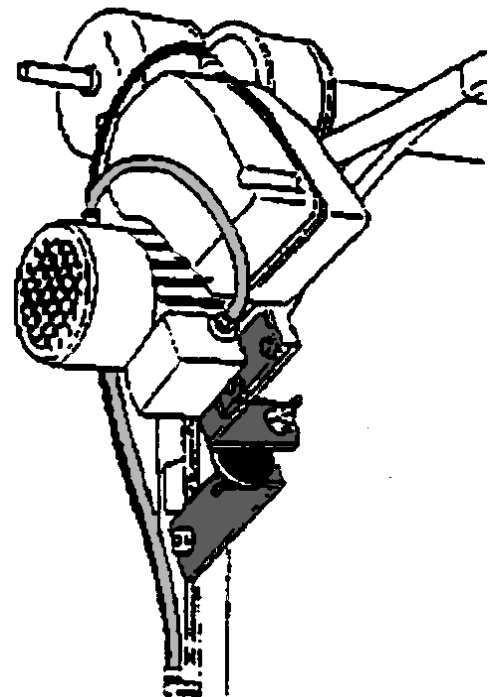
Lock nuts must be used where indicated

#### Installation of fixing bars CDM6-(HD)

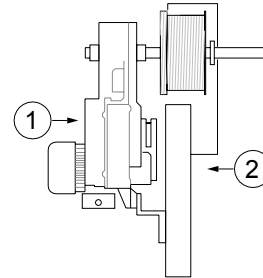
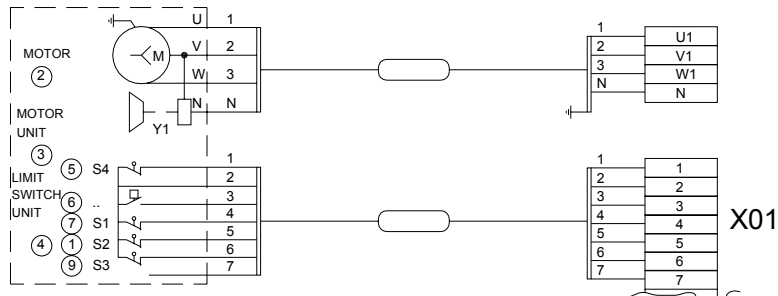
Between both fixing bars should be fitted a vibration damper see fig.

1 vibration damper

2 fixing bar

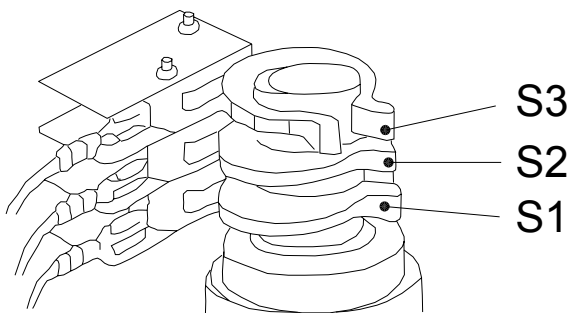


### 3.2.1 CDM6 (HD) adjustment of limit switches and sliding clutch



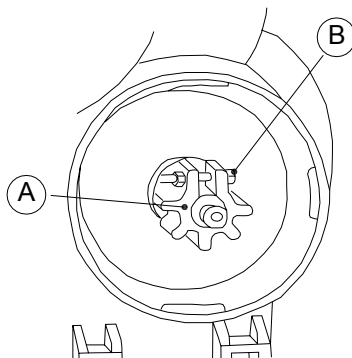
1 LIMIT SWITCH PART  
2. SLIDING CLUTCH

- 2 MOTOR
- 3 OPERATOR
- 4 LIMIT SWITCH UNITS
- 5 RPM CONTROL
- 6 DISENGAGEMENT SWITCH
- 7 LIMIT SWITCH "completely open"
- 8 LIMIT SWITCH "closed"
- 9 LIMIT SWITCH "reduced opening"



#### Adjustment of limit switches

- . Door will stop above by limit switch and on
- . The bottom by the RPM control.
- . The lower limit switch has to be adjusted so
- . That it will be activated approx. 50 mm from
- . Floor level.
- . For earlier switching: turn the switch arm
- . Towards the micro switch roller.
- . For later switching: turn the switch arm away
- . From the micro switch roller.
- S1 = Limit switch "Completely open"
- S2 = Limit switch "Closed"
- S3 = Limit switch "Reduced opening"



#### Adjustment of the sliding clutch

- . Loosen clamping screw B.
- . Screw adjusting nut A inwards to increase
- . Sliding force.
- . One turn of the adjusting nut corresponds
- . To about 10 kg change of the sliding force.



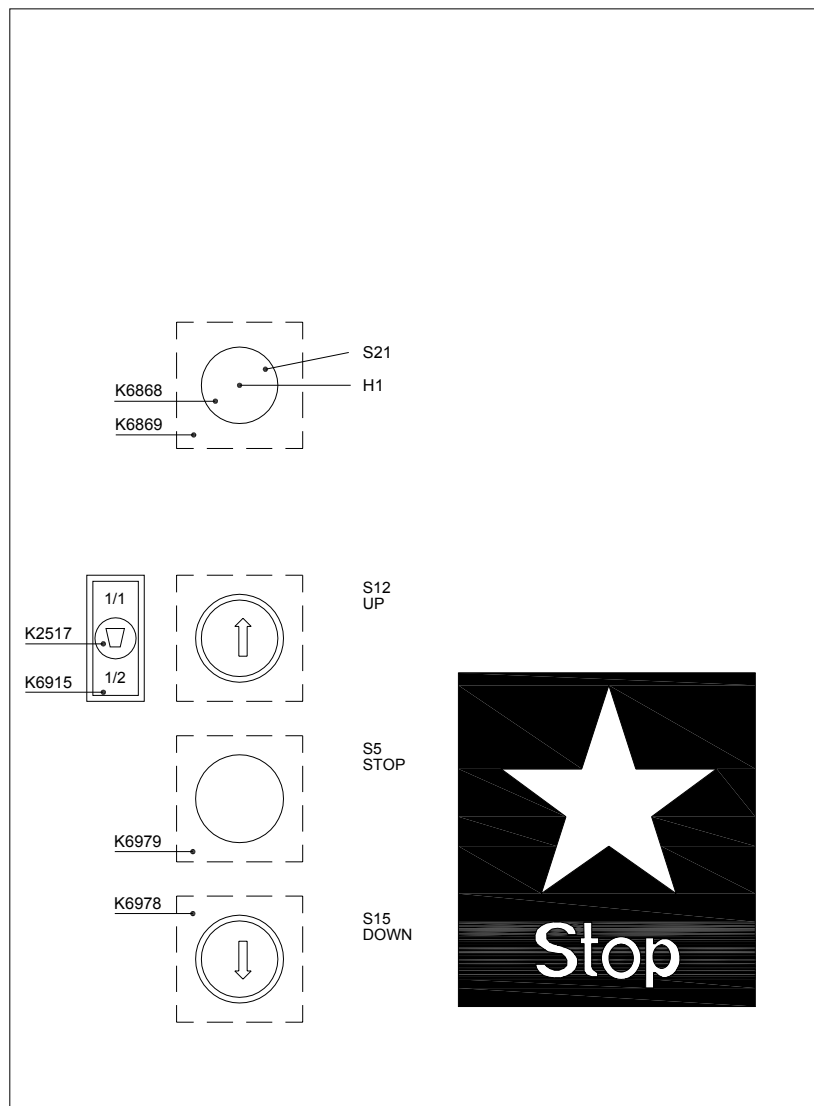
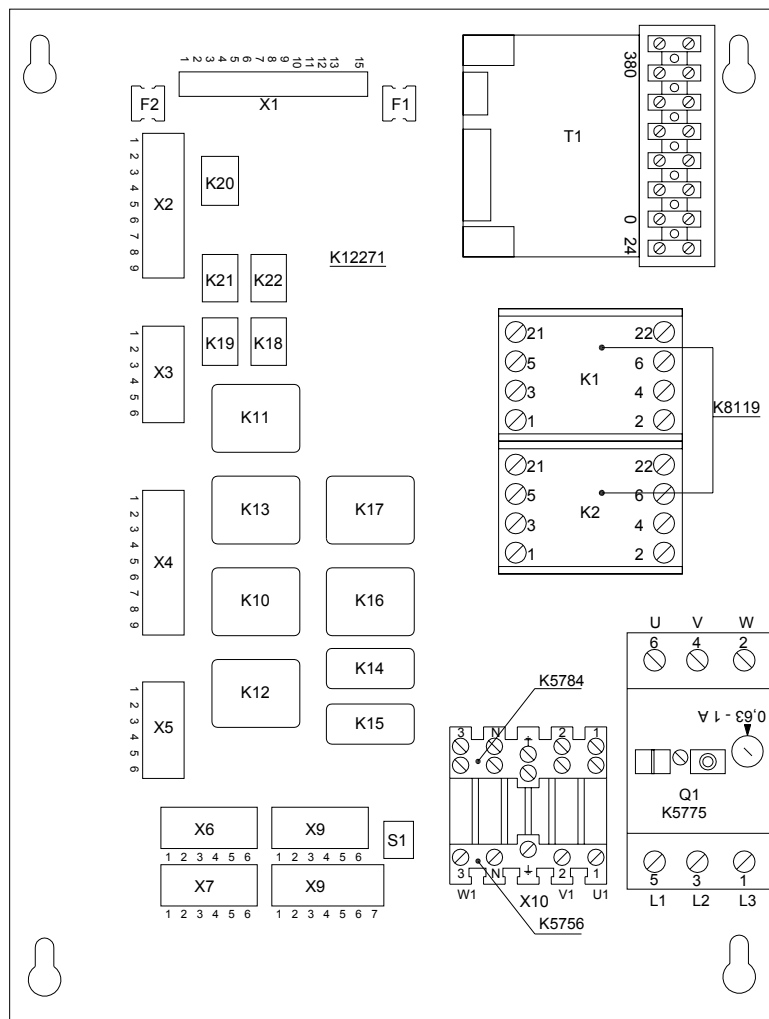
## 4 CONTROL SYSTEM CDM-5/CDM-6 (METAL BOXES)

### **CONTROL SYSTEM CDM5/6 – 01, Steel control box (1984-1988)**

- Not all spare parts are still available.
- Has been delivered with or without safety supervision.
- If upgrading or severe repairing is needed, replace the control unit by one of the present systems (consult check list for right system).

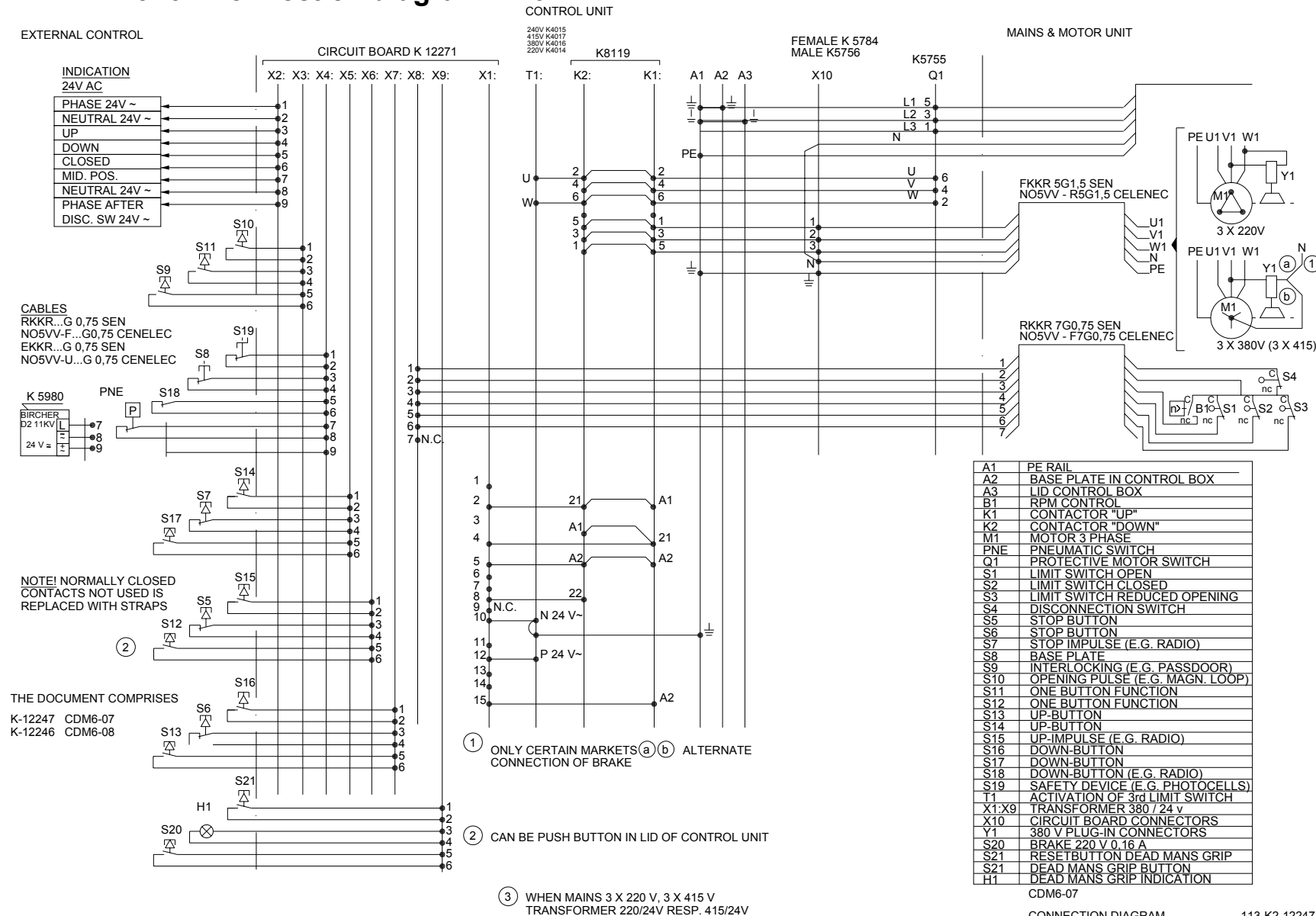


## 4.1 CDM 5/6 - Control unit CDM6-07 K2-12253



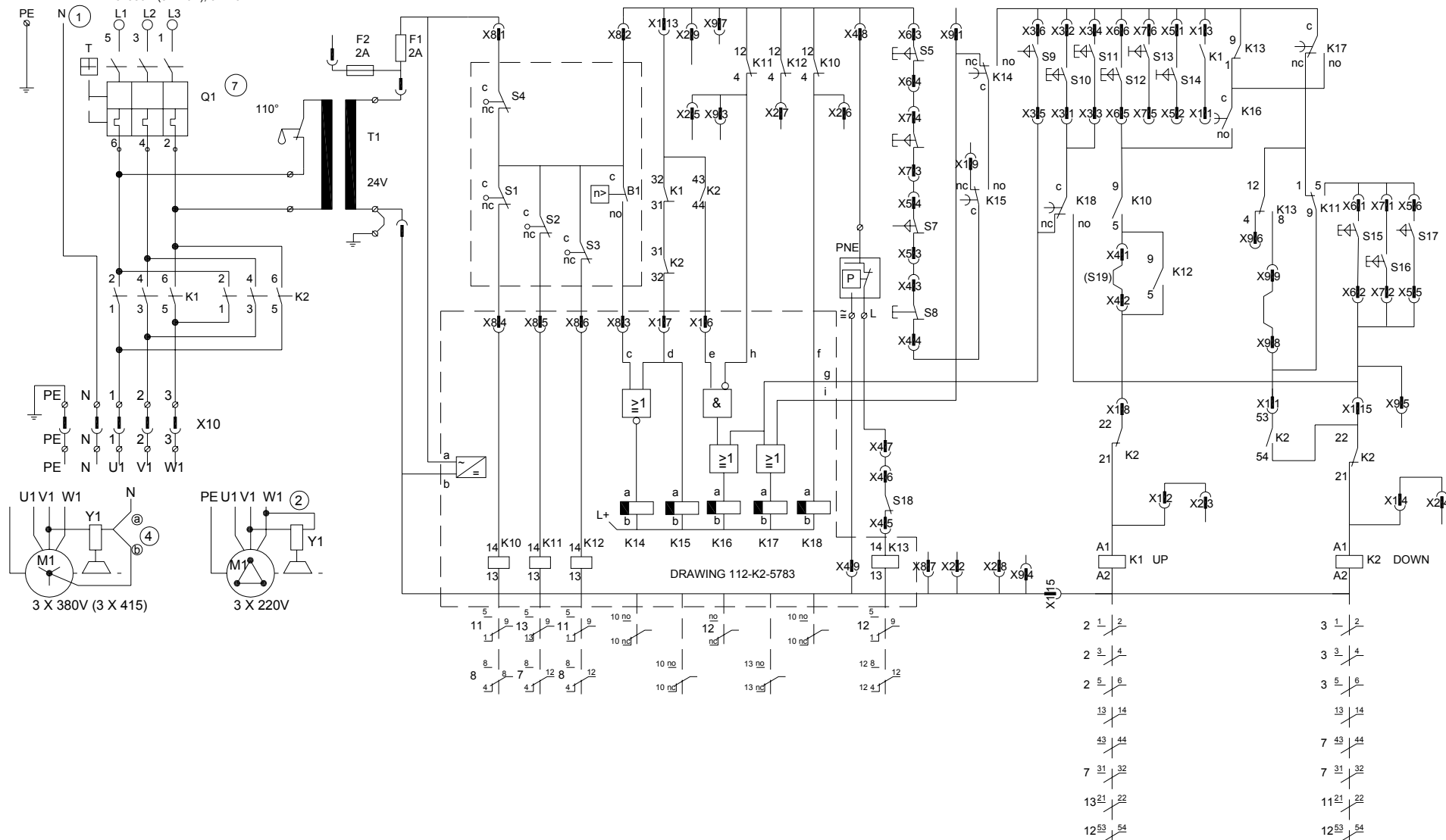
CONTROL UNIT CDM 6-07  
LAYOUT BASEPLATE AND LID

## 4.2 CDM 6 -07 Connection diagram -113-K2-12247



### 4.3 CDM6 Main diagram - 111 K2 - 5640

3x380V (3x220V), 3x415V



CDM 6 MAIN DIAGRAM 111-K2-5640

## 5 AUTOMATIC SYSTEM ECS 600

### 5.1 Additional system ECS 600 (Added to control system CDM5/6 or to CDM5 with control system in mech.unit, 1984-1988)

- Not all spare parts are still available.
- If upgrading or severe repairing is needed, replace the control system and the additional system by one of the present types.
- (Consult check list for right system).
- For automatic systems : see ECS 601.



### 5.1.1 Functional description ECS 600

***ECS 600 is an additional automatic system to be connected to old operators CDM-5 (Control system in the Mech. Unit) and to control systems CDM5/6-01. The basic system consists of 2 circuit boards:***

#### 5.1.2 Interface unit (Obsolete)

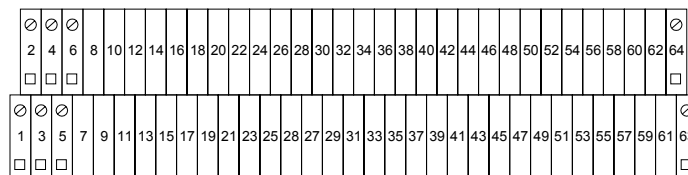
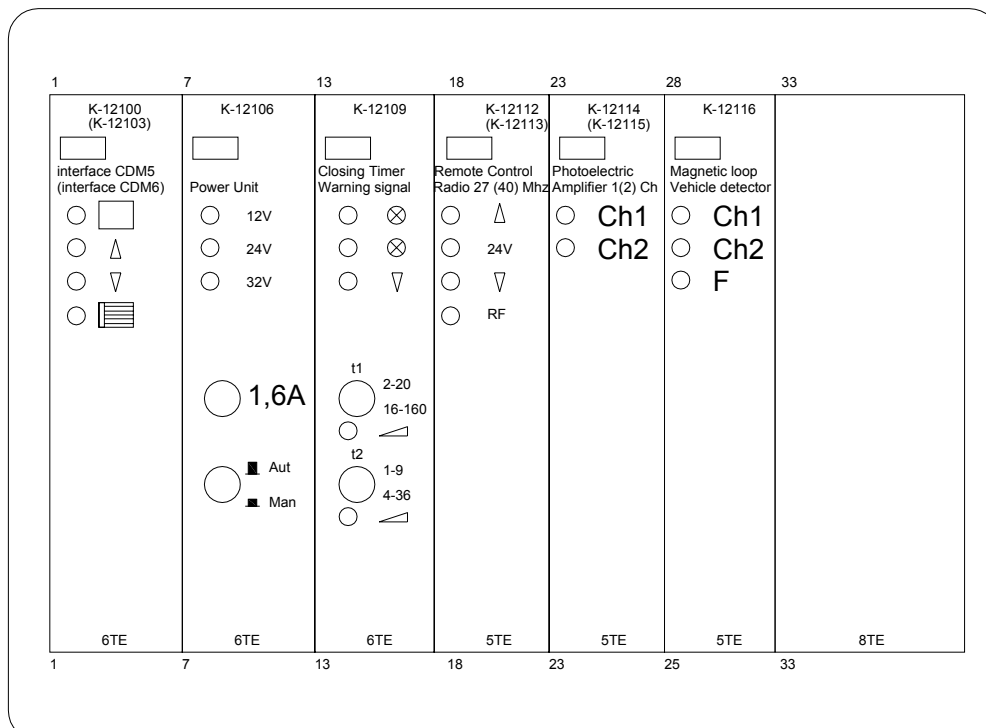
- Different types for CDM5 and CDM6
- Receives signals from the control system and converts them into logic signals (12VDC) to the circuit boards for automatic functions.
- Receives commands from the circuit boards for automatic functions and converts them to the control system.
- In the front panel there are indication LED's for the position of the door.

#### 5.1.3 Power unit (Obsolete)

- Supplies a stabilized, suppressed drive voltage to the other components of the additional system.
- In the front panel there are indication LED's to see if all voltage is present and a switch to switch off the automatic functions.

Note! For more information concerning the automatic functions, see chapter ECS601.

## 5.2 Automatic door operating system ECS 600



### Cable wiring diagrams

Spare for board pos 7  
Pushbutton long vehicle 114-K4-12465

Interlock Unit 114-K4-12117

Sensors for board pos 7

Magnetic loop 114-K4-3084

Photoelectric Optics 114-K4-12447

SCR-switch, warning lights 114-K4-12173

Pullstation for CDM5 114-K4-507

Inhibit key 114-K4-12464

External function 114-K4-867

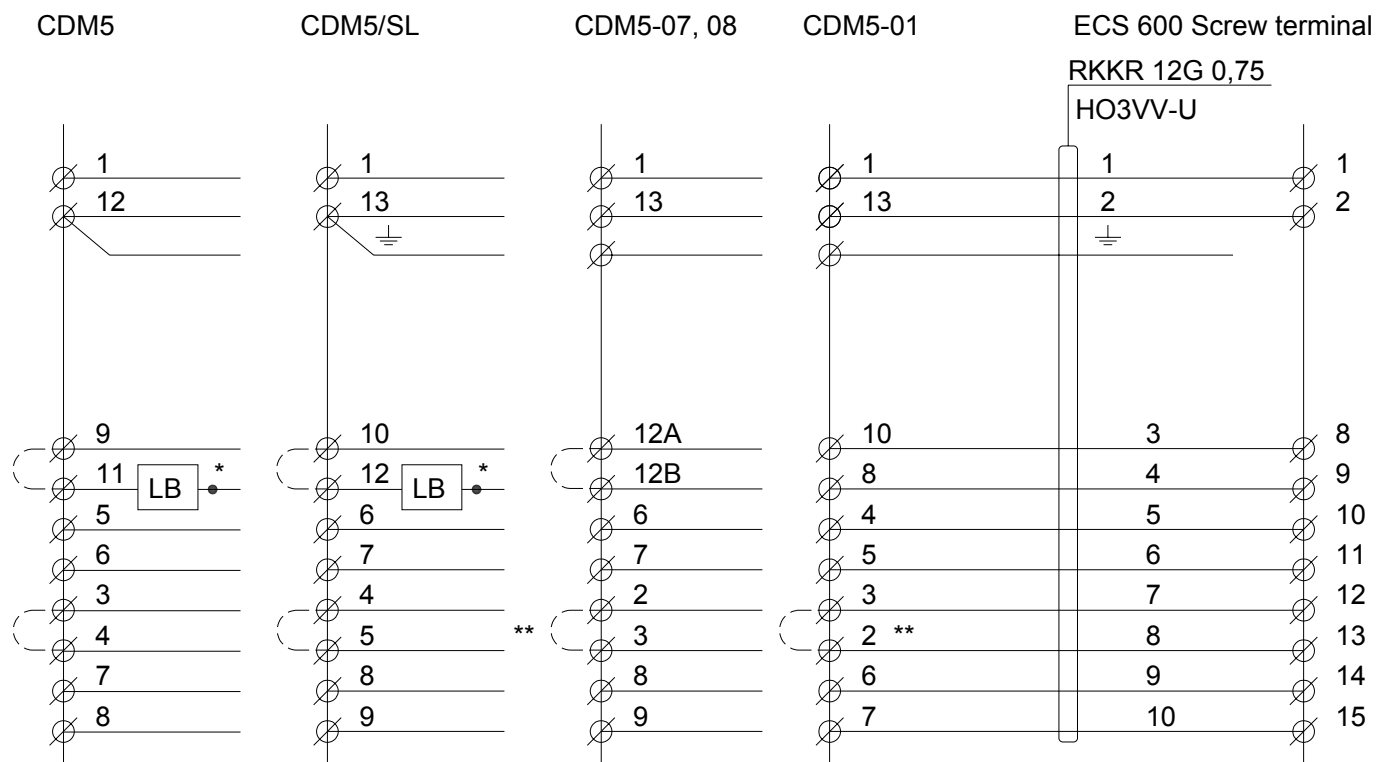
Door Operator  
-CDM5 114-K4-2546  
-CDM6 114-K4-5792

### 5.3 CDM5 - ECS 600 - wiring diagram

## CDM 5 - ECS600

### Wiring diagram

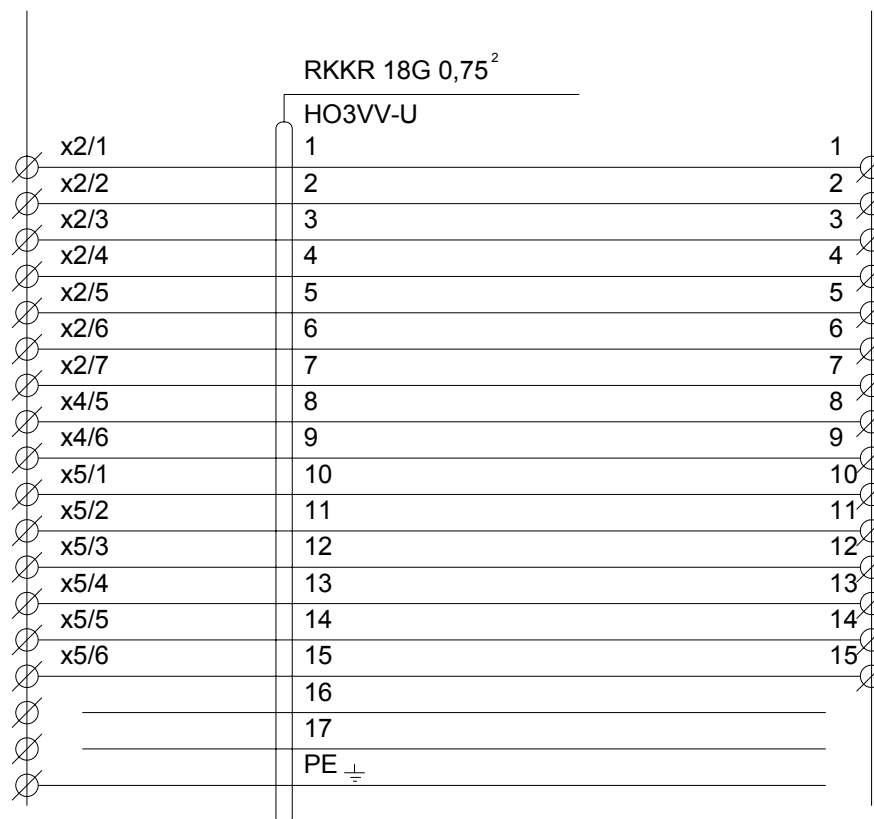
Control units for:



- \*) Wire from pneumatic switch (LB) connected to screw 9 (10 in CDM 5 / SL) to be connected to wire 4 from ECS 600 under flying top joint.
- \*\*) Remove loop if any and connect wires 7 and 8 in series with existing stop devices.

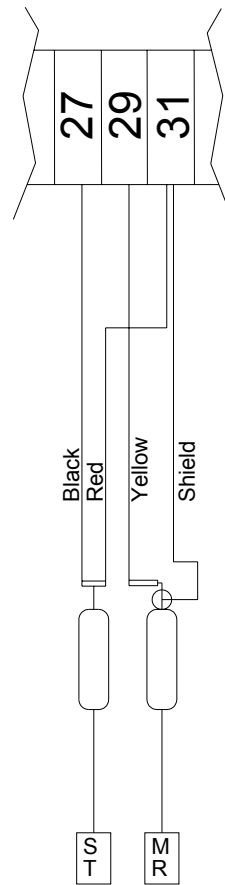


## 5.4 CDM6 - ECS 600 - Wiring diagram

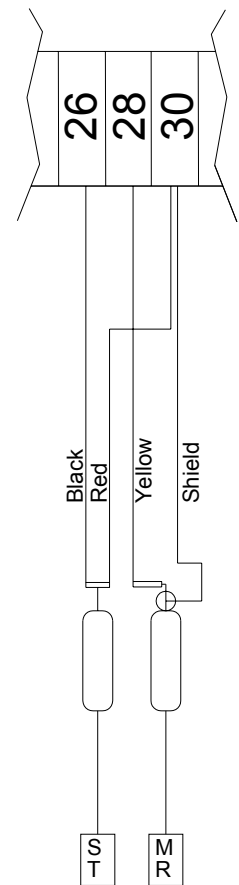


Connect wires 1 and 2 to X2/9 and X2/8 resp. if supply voltage 24VAC is to be disconnected from ECS 600 when the operator is disengaged.

## 5.5 Photocell ECS 600



Photocell optics  
Channel 1



Photocell optics  
Channel 2

## 6 CONTROL SYSTEM ECS 601

### 6.1 Control system ECS 601 (for CDM5 and CDM6, 1988-1993)

- Spare parts are still available
- Has been delivered with or without safety supervision.
- If severe repairing is needed, replace the control unit by one of the present types.  
(consult checklist for the right system).



## **6.2 Functional description**

### **ECS 601/602**

The control systems ECS601/602 can be connected to the mechanical units CDM5 and CDM6. The basic function consists of 3 circuit boards:

#### **6.2.1 Contactor unit**

There are 2 contactors on the circuit board which connect the mains voltage to the motor. The connectors are controlled by signals from the impulse unit. The contactor unit also includes a protective transformer which supplies the 24 VAC for the control voltage.

#### **6.2.2 Impulse unit**

The impulse unit includes all the electronic control functions.

- Gives the needed signals to the contactor unit.
- It senses the function of the safety device.
- It senses the RPM-control. When it indicates that the number of rotations is too low, the door will be stopped and reversed, depending on the position of the door.
- Maximum running device = 45 sec. Power has to be switched off and on again after  $\pm 10$  sec.
- The 1-button function is built into this board.

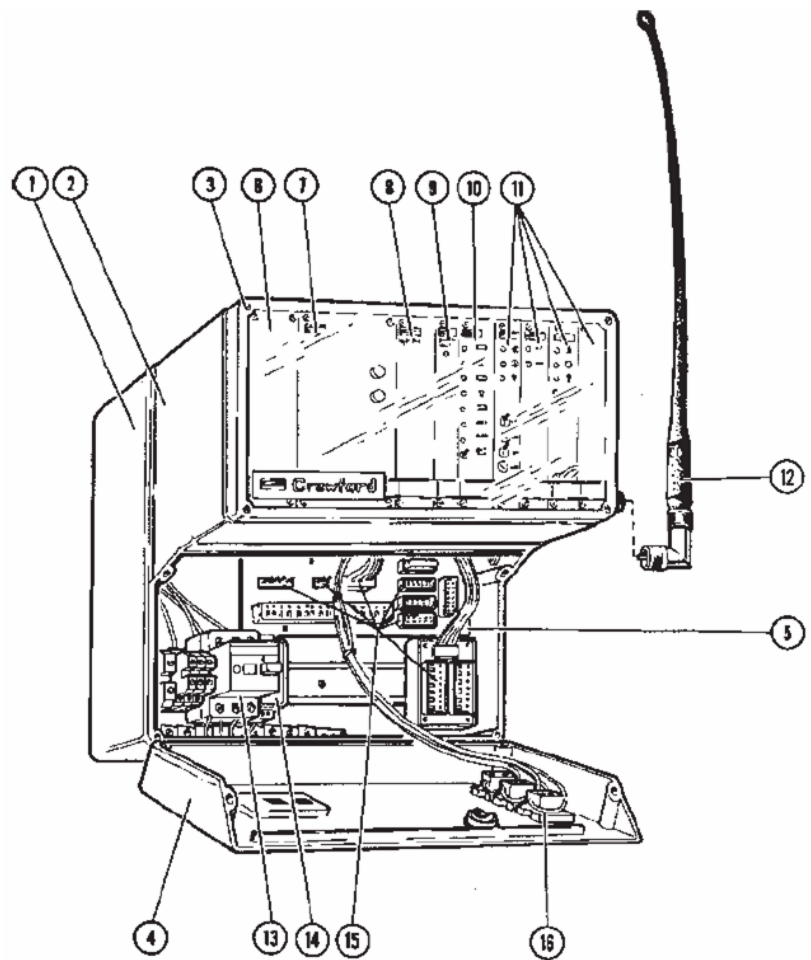
#### **6.2.3 Safety supervision unit (Pinch guard monitoring)**

In most countries it is a regulation that the pneumatic safety edge is tested every time when the door hits the floor. As soon as the limit switch "Door closed" is activated ( $\pm 50$ mm from the floor) the function will be tested and can be seen by the flashing of the LED on the front. If the pulse is too short or not given at all to the supervision unit, the control system switches over to so-called dead man's function. This is indicated by the red LED on the front of the unit. It will stay on constantly.

**SYSTEM DESIGN**

Board 7-9 Basic control

Board 10-11 Optional automation

**Control box in ABS plastic**

1 Bottom part

2 Collar

3 Top lid

4 Lower lid

5 Circuit board

13 Motor protection switch

15 Terminal connections

16 Button control set

**Grundstyrning**

6 Cover plate

7 Contact und

8 Impulse unit

9 Safety supervision unit

**Additional automations**

10 Interface Power unit

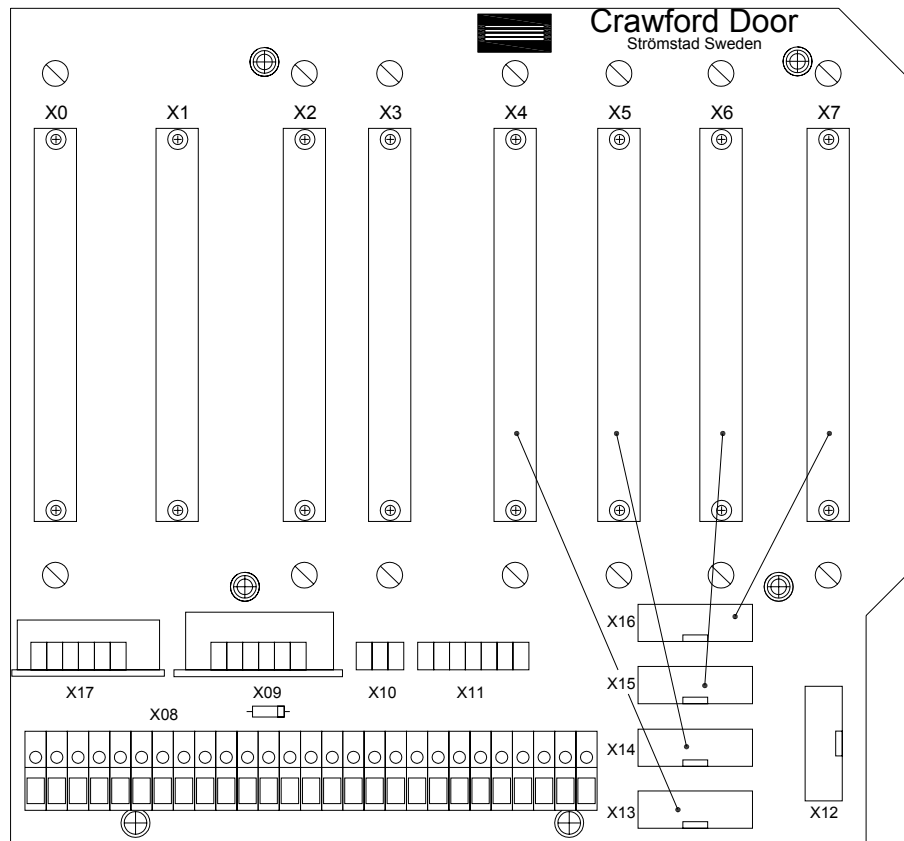
11. 4 board positions for additional automations

12 Antenna for radio receiver

14 Semiconductor for warning light

### Connection of automation circuit boards

The board positions X4-X7 on the circuit board are intended for auxiliary automation circuit boards. The contacts are connected to terminals X13-X16 via lines on the circuit board shown in the diagram below. ie. X4 - X13. X5-X14 etc.



The terminal X12 has a special function. Signals between two interlocking doors are transferred via X12. Bus signals are also transferred through this terminal and a band cable to an extra box for automation boards.

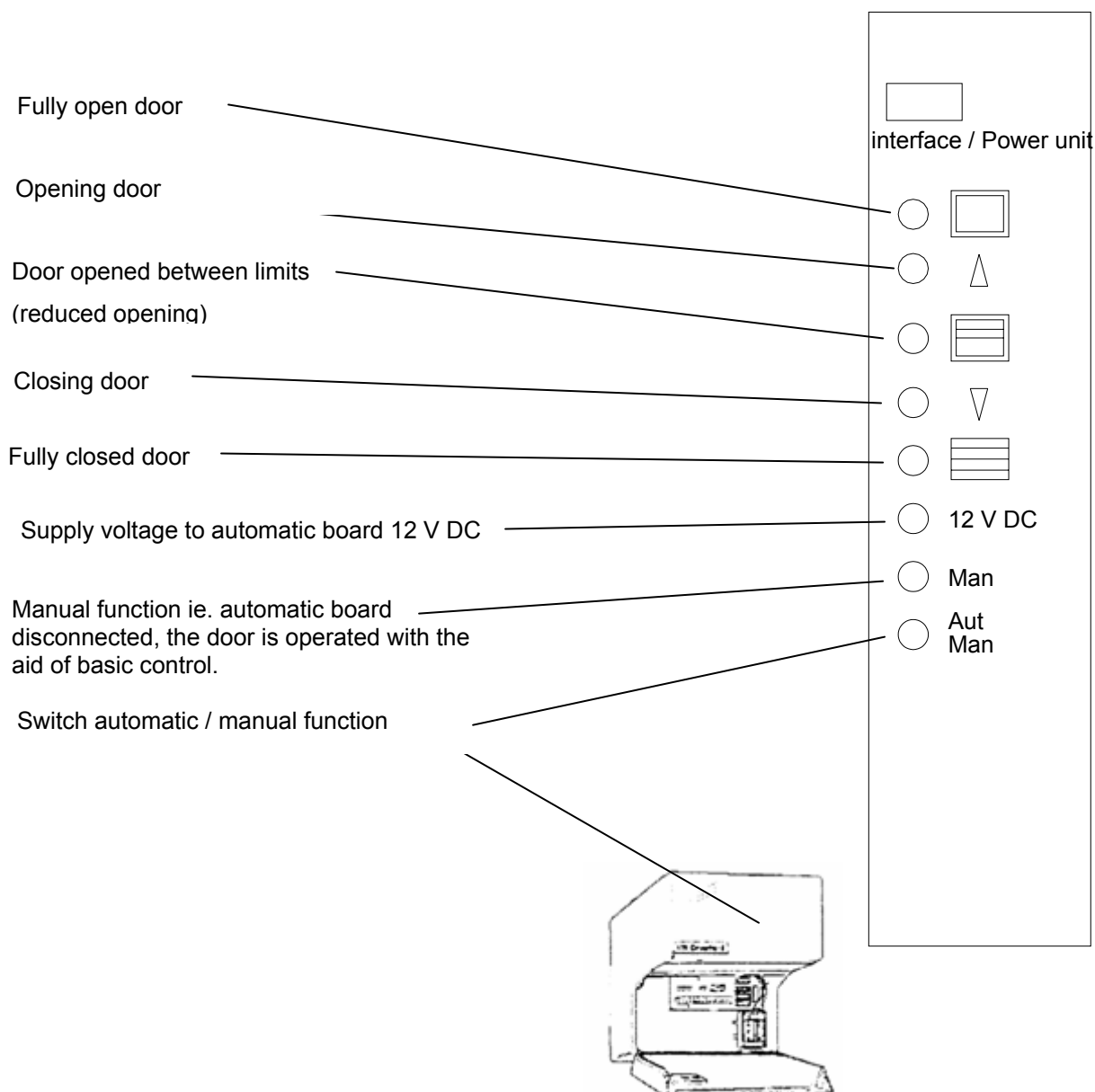
The external units belonging to a specific automation function are connected via a connection terminal installed on the relay track. This is connected to terminal X13-X16 via ribbon cable.

### INTERFACE POWER UNIT

The unit is connected to the 4th board position. X3 (pos 37-42 in the casing). The module contains a neutralized and stabilized 12 V DC drive voltage unit for the supply of voltage to the electronics.

The electronics on the board also function as an interface between basic control and automatic options. This implies that the basic control 24 V AC signals are converted to 12 V DC which the automatic units work with.

The front panel of the board contains diode Lamps which indicate the current door position.



## **AUTO CLOSING / WARNING LIGHT**

The units include two basic functions, automatic closing and warning lights.

### Controlling of warning Lights

The control signals are sent to a semi-conductor relay (thyristor) which in turn connects 110/220V to the lamp fittings.

Control signal to thyristor, red warning signal, (flashing or steady)

Control signal to thyristor, green warning signal (steady light)

When time t2 is running the LED is flashing with 10w intensity The flash frequency depends on the setting of the f2 trimming screw.

Short impulse indicates that the closing signal goes to the interface board. When time t1 is running the LED is blinking with low intensity. The frequency depends on the setting of the t1 trimming screw.

### **Automatic closing**

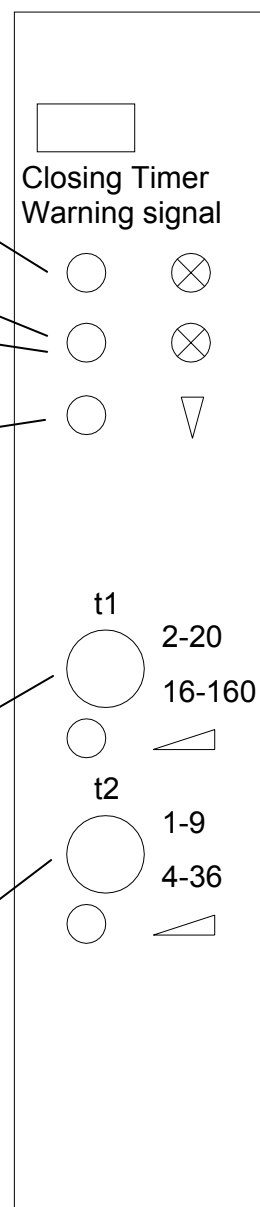
The board contains times circuits which control how long the door is to be open before t is automatically closed. This interval is divided into two time intervals t1 and t2.

Setting of t1

**t1**= the time the door is fully open with the green lamp on. The time range. (2-20 or 16-160 sec.) is selected with the switch and the time is adjusted: with the trimming screw.

Setting of t2

**t2**= the time the door is fully open but warns for closing with a flashing red signal. The time range (1-9 or 2-36 sec.) is selected with the switch and the time is adjusted with the trimmina screw.



The total time when the door is open is  $t1 + t2$ . The times t1 and t2 can be changed with switch S4/3 on the circuit board, see next page.



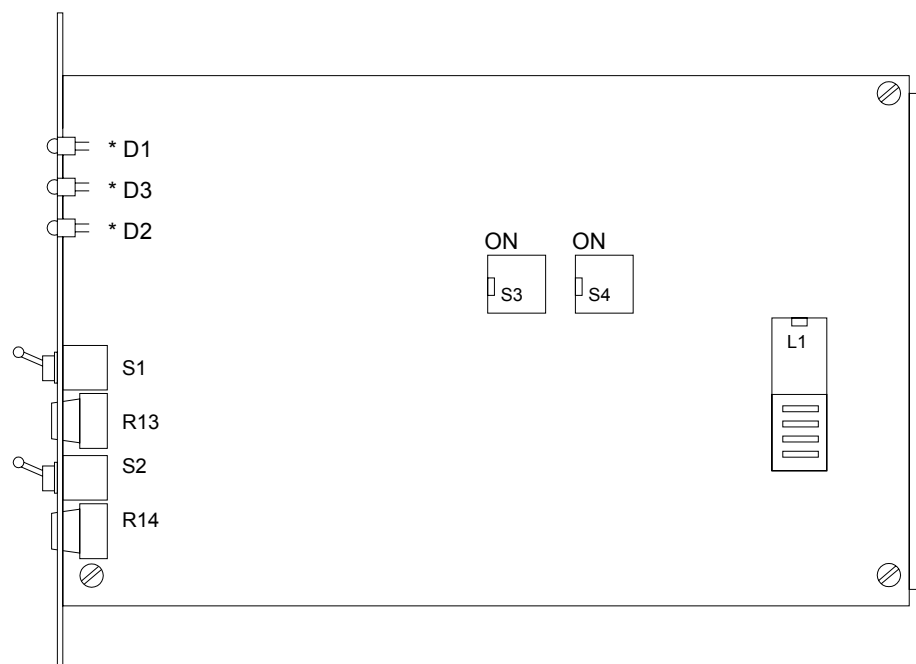
## Optional automation

On the circuit board there are two blocks with DIP switches, S3 and S4 plus a bar block L1.

### Note !!!!

*The bar block shall sit in lower position on L1 for ECS 601.*

*The top position is used for ECS 600.*



S3/1 of Flashing red light before closing.

on Flashing red light before closing and between limit positions.

S3/2 of No red light for closed door.

on Constant red light for closed door.

S3/3 of No green light.

on Constant green light for fully open door.

**Example:**

The time  $t_1 + t_2$  is timed from the first of "fully open door" or "passage of safety photo cell / magnetic loop". The time  $t_1 + t_2$  is timed from "fully open door".



The switches of S3 are set **on** and **off**.

## Optional automation

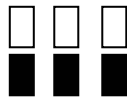
The conditions for automatic closing are selected with **S4**.

**S4/1** off      The time  $t1 + t2$  is timed from the first of "fully open door" or "passage of safety photo cell / magnetic loop". on      The time  $t1 + t2$  is timed from "fully open door".

**S4/2**      off      The closing memory for the safety function is reset when the door moves downwards. on      The closing memory for the safety function is reset when the door is fully closed.

**S4/3** off      The timer works according to the **S4/1** setting. When safety photo cell/magnetic loop is passed, remaining time  $t1$  is divided on by 4. The time interval  $t1$  applies as per setting on front panel.

### Example:



Exit from parking deck  
S4 switches set to:  
**off off off**

Assume that  $t1 = 40$  sec. and  $t2 = 10$  sec. The door opens. When fully open, the time  $t1$  starts to run and when it has run out,  $t2$  starts to run. If no one passes the photo cell, the door will close after  $40 \text{ sec.} + 10 \text{ sec.} = 50 \text{ sec.}$

If someone passes the photo cell after, for example, 12 sec. the remainder of  $t1$  ( $40 \text{ sec.} - 12 \text{ sec.} = 28 \text{ sec.}$ ) is divided by 4:  $28 \text{ sec.} / 4 = 7 \text{ sec.}$  The door starts to close after a total time of  $12 \text{ sec.} + 7 \text{ sec.} + 10 \text{ sec.} = 29 \text{ sec.}$



The consequence of S4/2 being set in off position is: If a closing door is made to reverse, e.g. by the pinch guard monitor or a safety function, it will not close automatically, unless the photo cell is activated.

This is because the closing memory is reset when the door has started to move downwards.

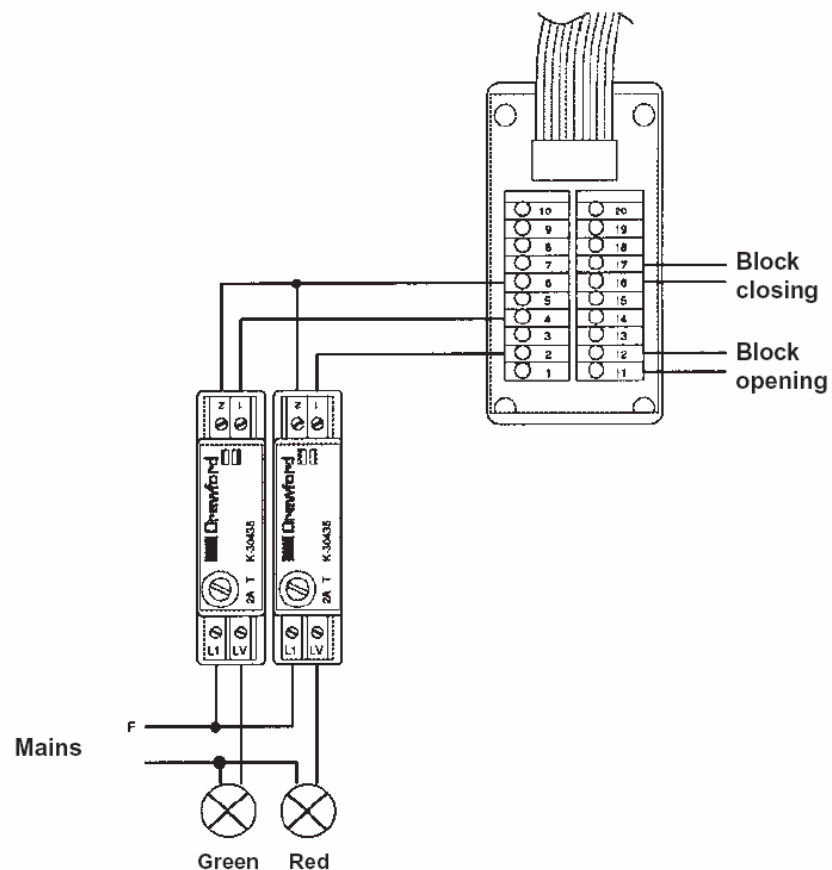
## Optional automation

### SEMI-CONDUCTOR RELAY (THYRISTOR)

The semi-conductor relays for control of mains voltage to the warning light are comprised of separate circuit boards mounted on the relay rail. One board is required for each warning light. Max. effect 250W.

#### Connection of warning light

The semi-conductor relay(s) and lamps are connected to the connection block as per the diagram below. The connection block is linked via ribbon cable to the terminals X13-16 which belong to the board position where the insert circuit is put in.



By using the connections to the in the diagram, the automatic closing function or the opening can be blocked, e.g. by an external timer (closing contact).

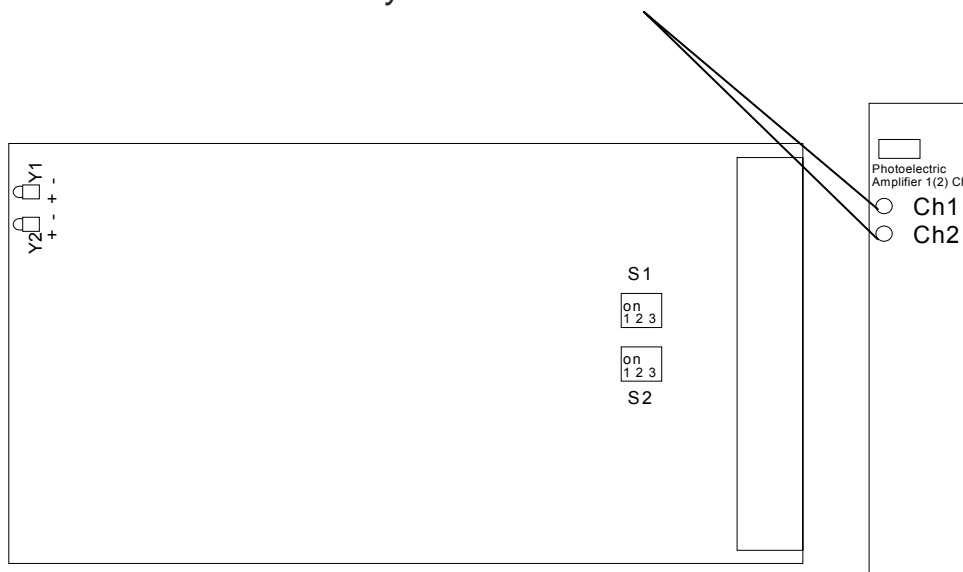
## Optional automation

### PHOTO CELL AMPLIFIER

This unit is available as a single channel and double channel amplifier. A photo cell transmitter and corresponding receiver can be connected to each amplifier channel.

The system works with **IR-light**

*Indicating codes for each channel. Lights when the IP beam is unbroken and received by the receiver.*



On the circuit board there are two switches which can be set according the function of the photo cell.

The following alternatives are available:

- Safety function
- Acknowledgement function (interlock)
- Opening function

Switch S1 is used to select the function for amplifier channel 1;

on off off Safety function

off on off Acknowledge function

off off on Opening function



The corresponding settings are made on switch S2 for channel 2.

## Optional automation

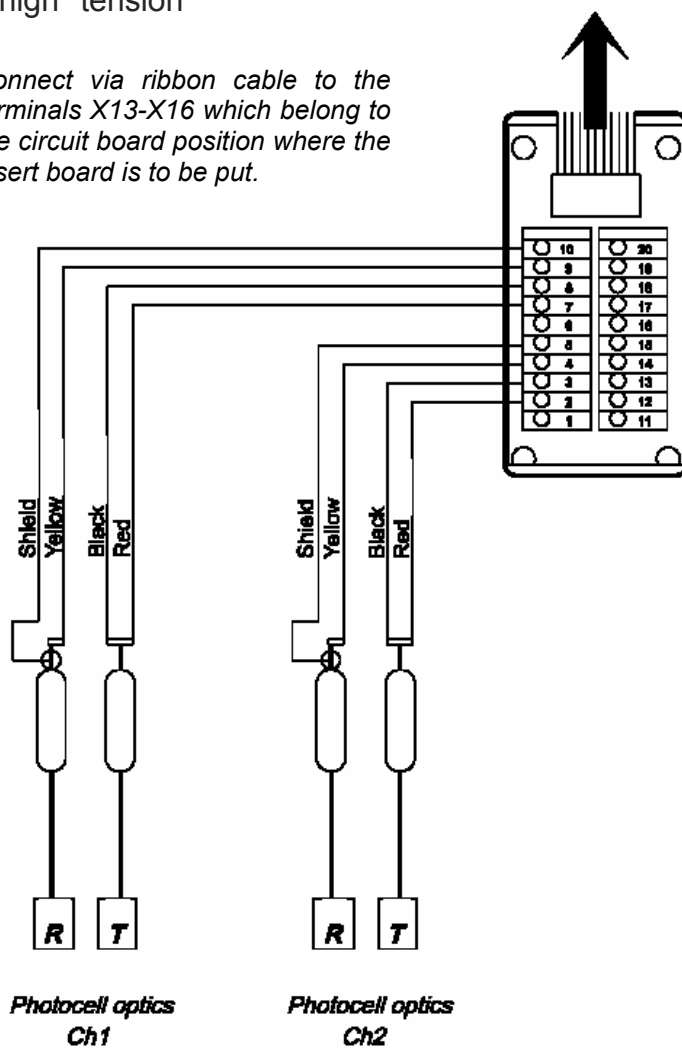
### CONNECTION

The photo cell transmitters and receivers are connected to the connection block as per diagram below. Use shielded cable e.g. EKLK 39 1.5.

#### Note !!!!

The shield must be connected to earth in view of risk for inductive interference from high tension cables.

*Connect via ribbon cable to the terminals X13-X16 which belong to the circuit board position where the insert board is to be put.*



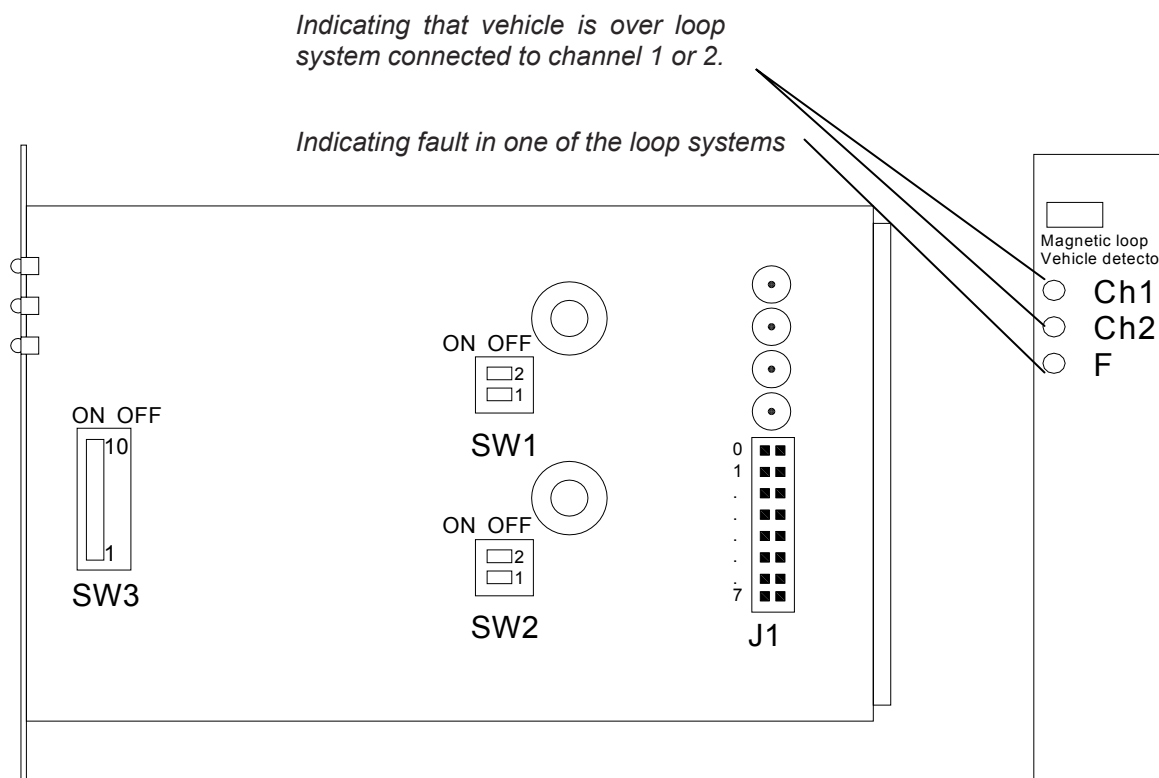


## Optional automation

### MAGNETIC LOOP DETECTOR

The detector can power and sense two separate loop systems each connected to their own channel. Each loop system can in turn comprise two in series or parallel connected loops.

The detector is micro processor controlled and does not require trimming or manual resetting. There is also an automatic fault tracing facility which continuously checks for loop failure/grounded to earth.





There is a jumper field with 8 pairs of pins and three DIP switches for the setting of the detector function on the circuit board.

**Note!!!!**

*If one of the channels is not used, all switches for this channel shall be set in the off position.*

**Jumpers**

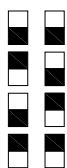
The output signal status is selected by putting jumpers over the pair of pins which are closest to the contact unit J1. The pairs of pins 0-3 are used for the loop system in channel 1 and 4-7 for channel 2.

| Channel 1, jumper in pos. | Channel 2, jumper in pos. | Output signal status        |
|---------------------------|---------------------------|-----------------------------|
| 0                         | 7                         | Acknowledge impulse         |
| 1                         | 4                         | Reversing impulse (safety)  |
| 2                         | 5                         | Opening impulse             |
|                           |                           | Opening impulse to opposite |
| 3                         | 6                         |                             |
|                           |                           | door in interlock           |

## Optional automation

### SETTING OF FREQUENCY

When two loop systems are close to each other there is always a risk for "overlapping" between them. This can be avoided by using different frequencies in the loop systems. The frequency can be set to 4 different values. The DIP switches SW1 is used for channel 1 and SW2 for channel 2.



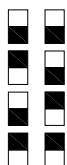
|     |     |
|-----|-----|
| off | off |
| off | on  |
| on  | off |
| on  | on  |

|                        |
|------------------------|
| high frequency         |
| average high frequency |
| average low frequency  |
| low frequency          |

### ADJUSTMENT OF SENSITIVITY AND ATTENDANCE TIME

Detector sensitivity and attendance time are set on the DIP switch SW3. The switches 5-6 are used for sensitivity and 7-8 for attendance time.

### SENSITIVITY



|     |     |
|-----|-----|
| off | off |
| on  | off |
| off | on  |
| on  | on  |





|              |
|--------------|
| low          |
| average low  |
| average high |
| high         |

Sensitivity should be set so that the detector will not respond when the front bumper of a car reaches the edge of the loop but only when the whole loop is covered by the car.

It may be necessary to change the sensitivity if special vehicles are to activate the detector.

### ATTENDANCE

If an object which is detected by the magnetic loop detector remains for a certain time, the attendance time, the detector will readjust automatically. The object will no longer be detected. The attendance time can be set on the switch block SW3/ 7-8 for channel 1 and SW3/3-4 for channel 2.

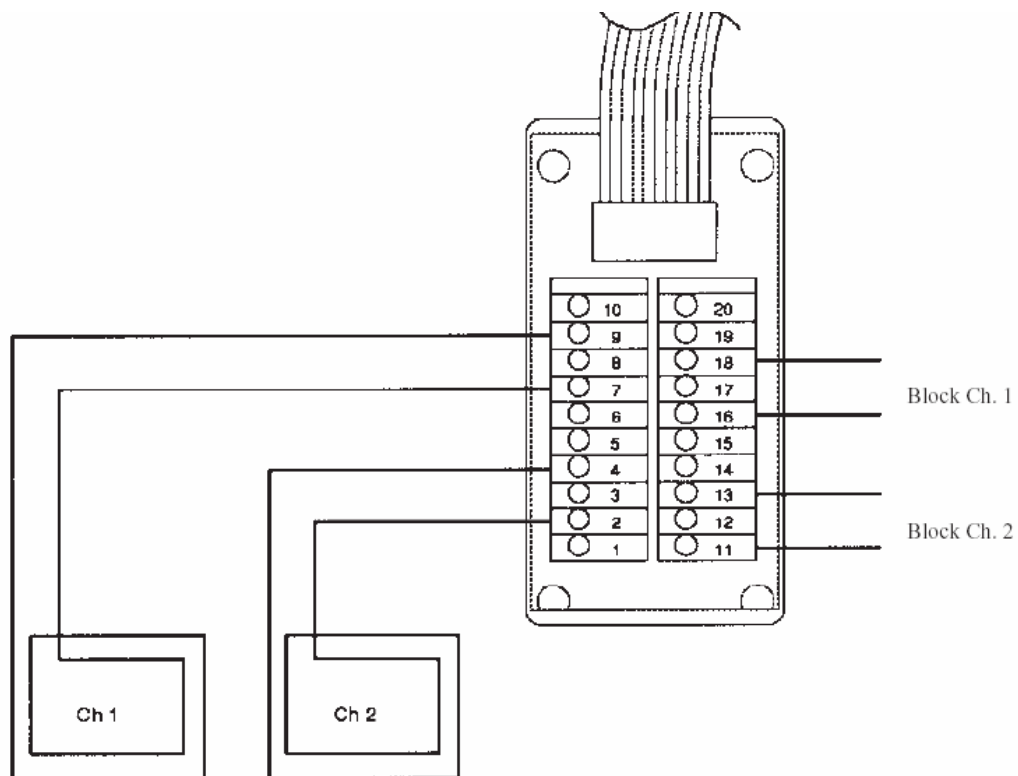
|   |     |     |                   |
|---|-----|-----|-------------------|
|  | off | off | 100 msec. impulse |
|  | on  | off | 3,5 min.          |
|  | off | on  | 7,5 min.          |
|  | on  | on  | 2 hours           |

**Note !!!!**

If one channel is not used all corresponding switches must be set in off position.

## Optional automation

The magnetic loops are connected to ECS 601 via a connection block mounted on the relay rail. The connection block is connected by a ribbon cable to one of the terminals X13-X16, which connects internally to the circuit board position where the insert board is to be put.



The connections "Block Ch1/Block Ch2" on the connection block are used when an external function is to be used to deactivate one of (or both) the loop systems, e.g. timer (closing contacts) can be used for the purpose.

## Optional automation

### INTERLOCKING

Used to achieve an interlocking function i.e. to avoid the exchange of air in the door opening e.g. for reasons of heating economy.

Interlocking normally functions so that one door is blocked in closed position as soon as the other door is opened.

An acknowledging photo cell in the interlock senses that a vehicle has passed the first door and prepares the opening of the second door as soon as the first one has closed.

If the "OPEN" command is given to an interlocked door the command is stored and carried out when the block has been taken away.

*Indicates that door A or B is blocked*  
*Indicated that door A or B receives OPEN signal*

When long vehicles are to pass through the interlock it is possible to cancel temporarily the

*Indicating "long vehicle"*

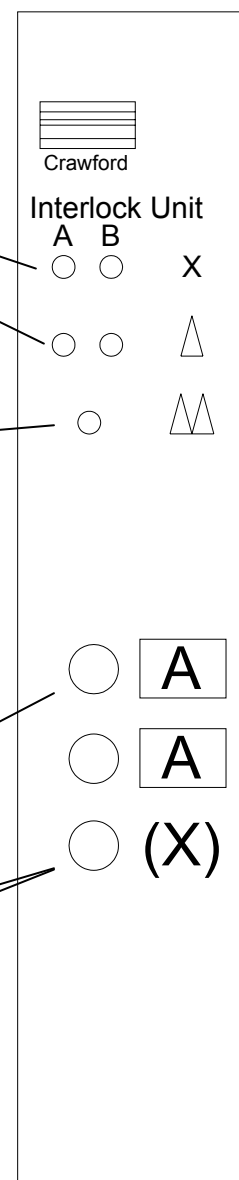
interlocking by pressing a separate push button on the wall. Both doors open then at the same time.

Interlocking can also be cancelled with push buttons in the front panel by blocking of the

*Push buttons for blocking of door A or B in open position. Diode lamp on the button for indicating blocking.*

*Push button which breaks the interlocking function. A diode lamp indicates that interlocking is blocked.*

doors in the open position (summer connection). An open impulse to the outer door will then be transferred to the inner



door and vice versa. There is also a push button which breaks the interlocking function completely.

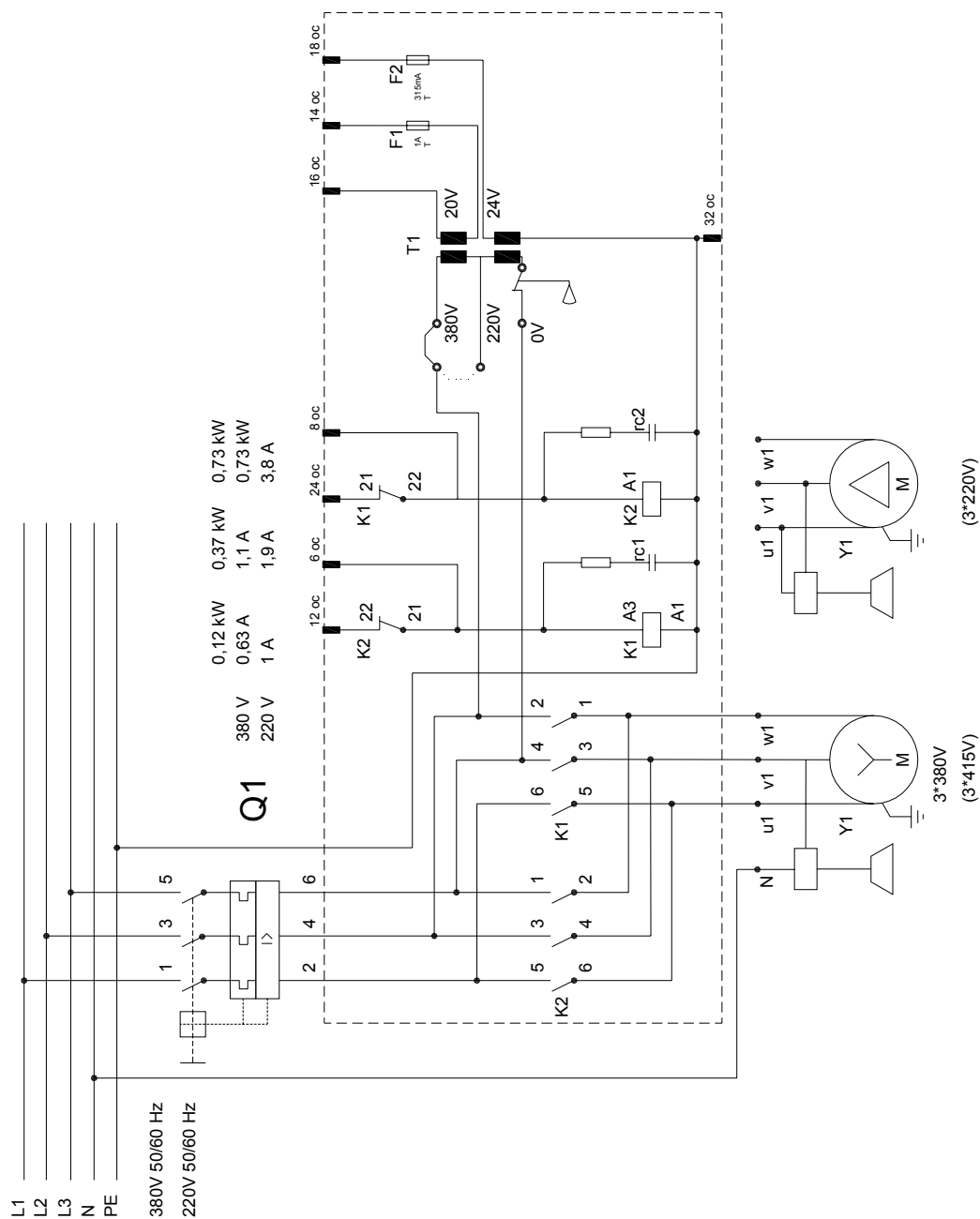
[illegible]

Connect pass door contact on clamp 16 or 17 in series with stop button.



## Automatic ECS 601

## Main current



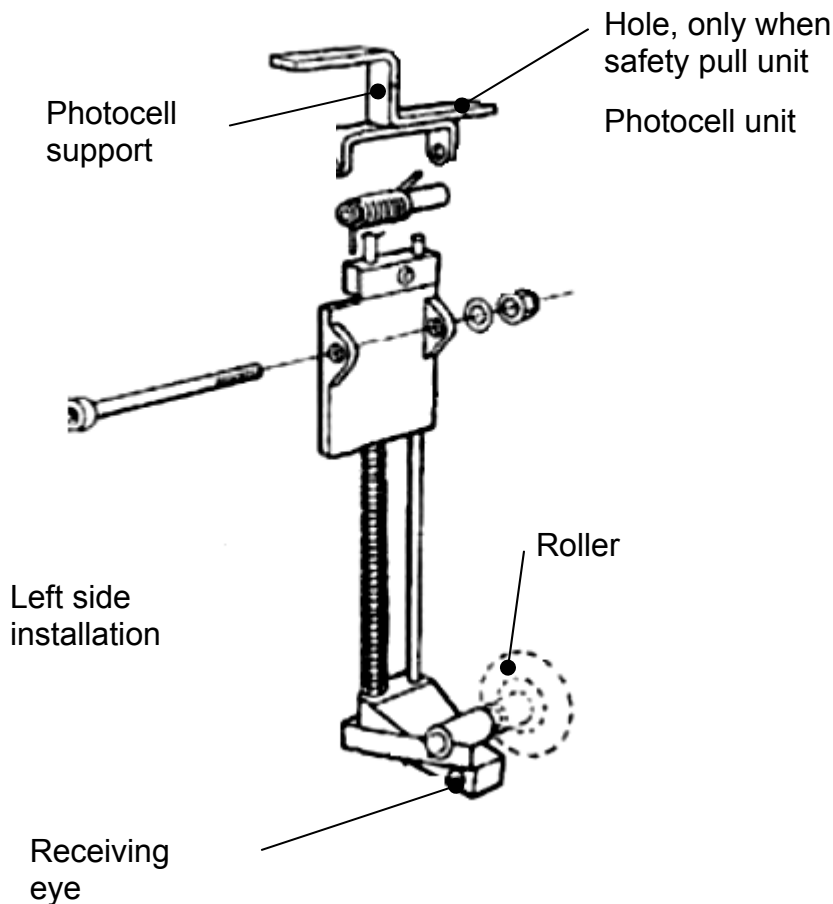
## 7 THERMOSPEED (1988 - 1998)

### 7.1 Thermospeed (1988 - 1998)

- Spare parts are still available
- Adjustments and repair actions are still possible
- Control unit as ECS 601, but with frequency converter
- Special mechanical unit
- For automatic systems : see ECS 601



## 7.2 Automatic ECS 601



Fit the photocell support to the photocell unit, see fig. 1.

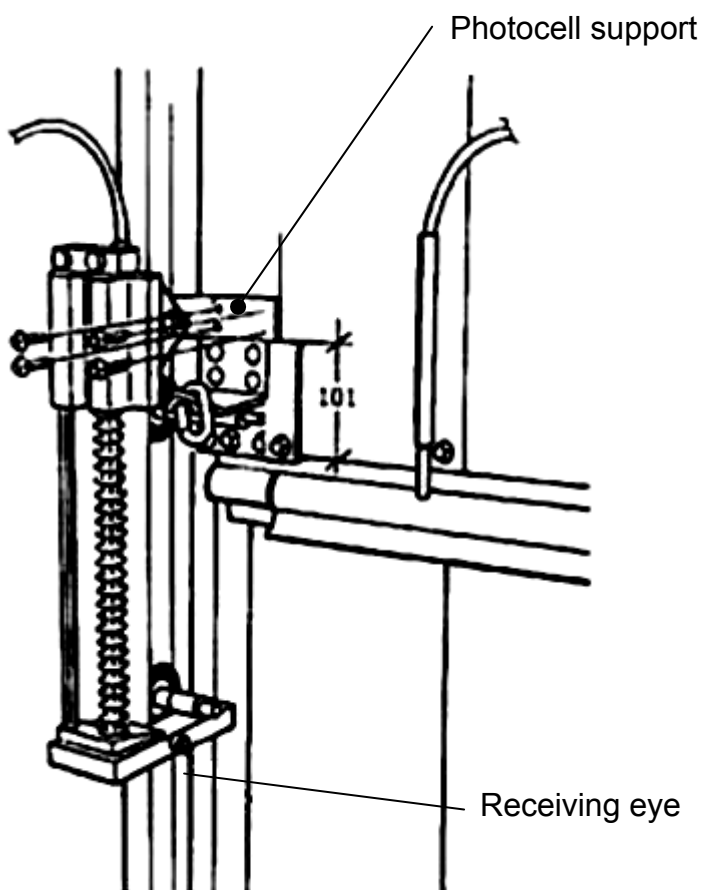
Always fit the photocell receiver on the left side.

Receiving eye = marked "R".

(or in older versions, silver painted eye)

Transmitting eye = marked "F".

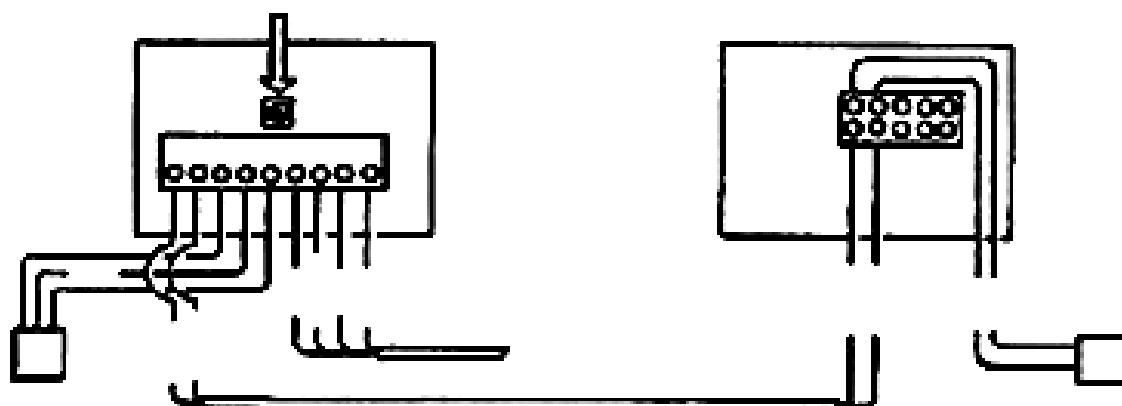
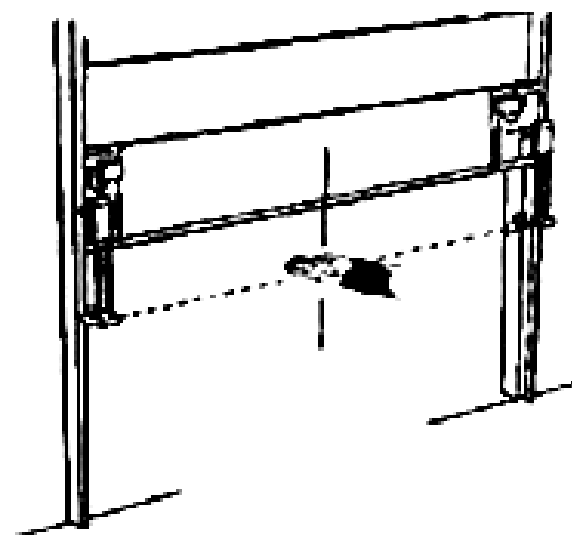
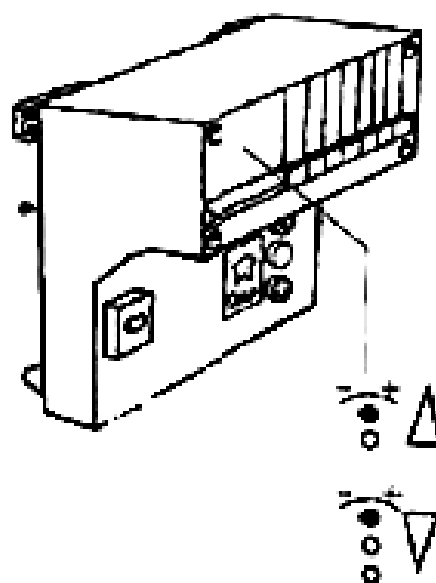
(or in older versions, gold painted eye)



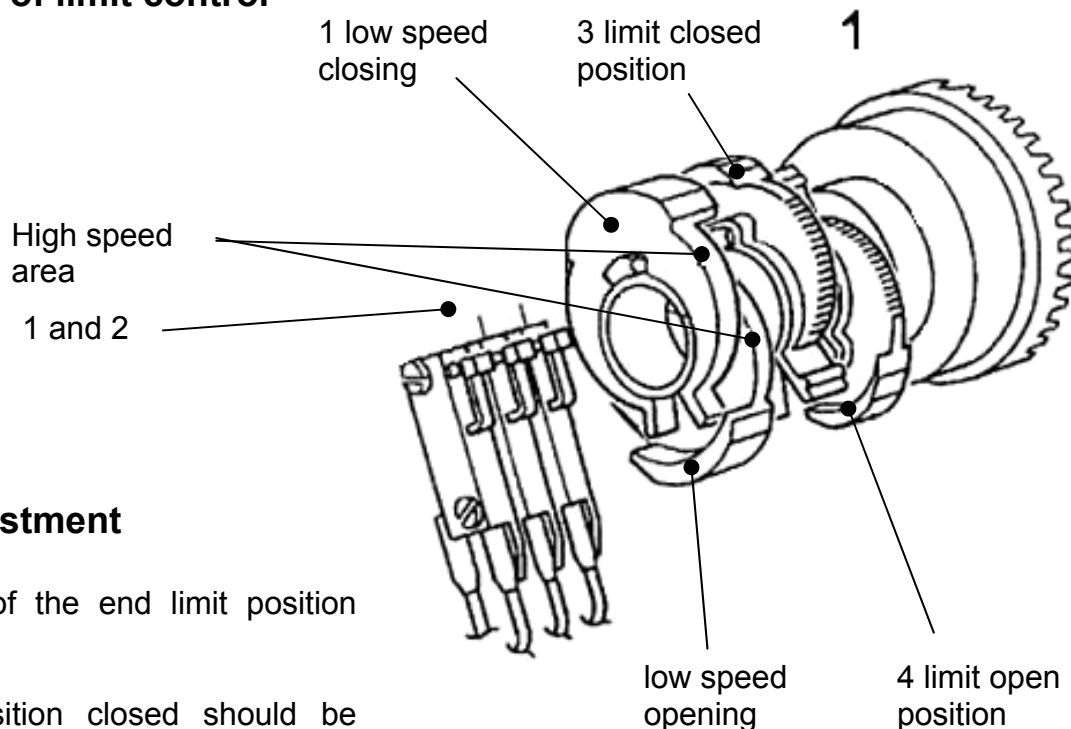
Fit the photocell unit on the left side and the right side. Drill and screw with 20 screws, see fig. 2.

Alternative corner brackets and installation of the photocell support.

Adjust the photocell units so that they are directed towards each other exactly.



## Adjustment of limit control



## Rough adjustment

Adjustments of the end limit position see fig.1

The limit position closed should be activated when the door is approx. 50 mm from being completely closed.

The limit position open should be activated when the door is approx. 50 mm from being completely open.

Check if the door stops with the shock absorbers approx. 20 mm compressed.

Adjustments of the low speed limit position see fig.1

Set the low speed inner cam so that it stops approx. 600 mm before the door reaches its open position.

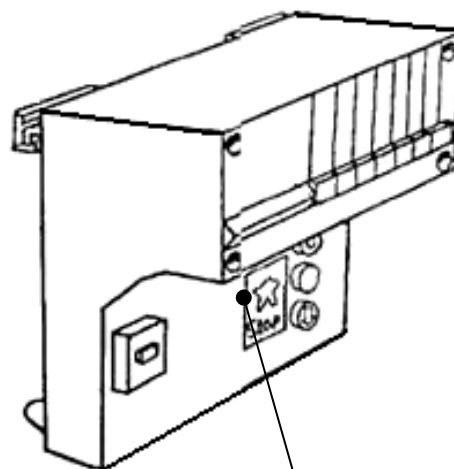
Speed adjustments see fig. 2

Turn the variable speed control up/down to 75% of its adjustment level.

Test the door

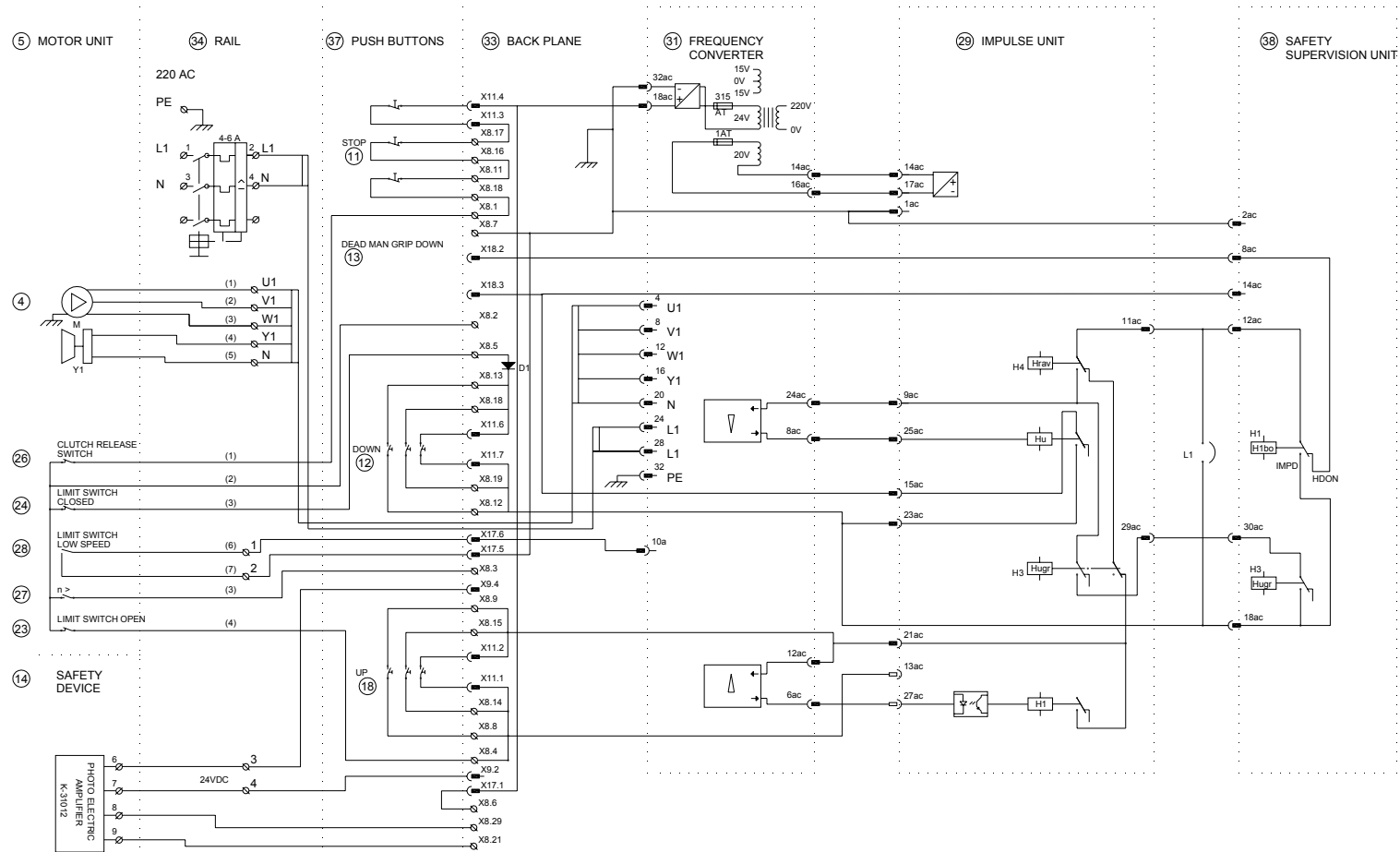
The opening and closing time should be min. 6 sec. for a 4 meters high door, min. 5 sec. for 3.5 meters and 4.5 sec. for a 3 meters high door.

**Note!** The value refers to the average speed 0.7 m/s.



|                             |       |
|-----------------------------|-------|
| Adjust UP speed             | + ● - |
| plastic rivet (don't touch) | ○     |
| Adjust DOWN speed           | + ● - |
| plastic rivet (don't touch) | ○     |
| plastic rivet (don't touch) | ○     |

## 7.3 ECS 601 Thermospeed 111-K3 - 31207



## 7.4 Photocell kits K 35724



K-35746 Set of Emitter

Thermospeed 

| Cable color |           |
|-------------|-----------|
| OLD         | NEW       |
| White (+)   | White (+) |
| Green (-)   | Blue (-)  |



K-35747 Set of Receiver

Thermospeed 

| Cable color                     |                         |
|---------------------------------|-------------------------|
| OLD                             | NEW                     |
| White (+)                       | White (+)               |
| Green <b>and</b> Brown (shield) | Blue <b>and</b> shield. |

## 8 CONTROL SYSTEM ECS 602

### **Control system ECS 602 (for CDM5 and CDM6, 1988 - 1993)**

- Spare parts are still available
- Has been delivered with or without safety supervision.
- If upgrading or severe repairing is needed, replace the control system for one of the present types (consult check list for the right system).





## 8.1 Functional description ECS 601/602

*The control systems ECS601/602 can be connected to the mechanical units CDM5 and CDM6. The basic function consists of 3 circuit boards:*

### 8.1.1 Contactor unit:

There are 2 contactors on the circuit board which connect the mains voltage to the motor. The connectors are controlled by signals from the impulse unit. The contactor unit also includes a protective transformer which supplies the 24 VAC for the control voltage.

### 8.1.2 Impulse unit:

The impulse unit includes all the electronic control functions.

- Gives the needed signals to the contactor unit.
- It senses the function of the safety device.
- It senses the RPM-control. When it indicates that the number of rotations is too low, the door will be stopped and reversed, depending on the position of the door.
- Maximum running device = 45 sec. Power has to be switched off and on again after  $\pm 10$  sec.
- The 1-button function is built into this board.

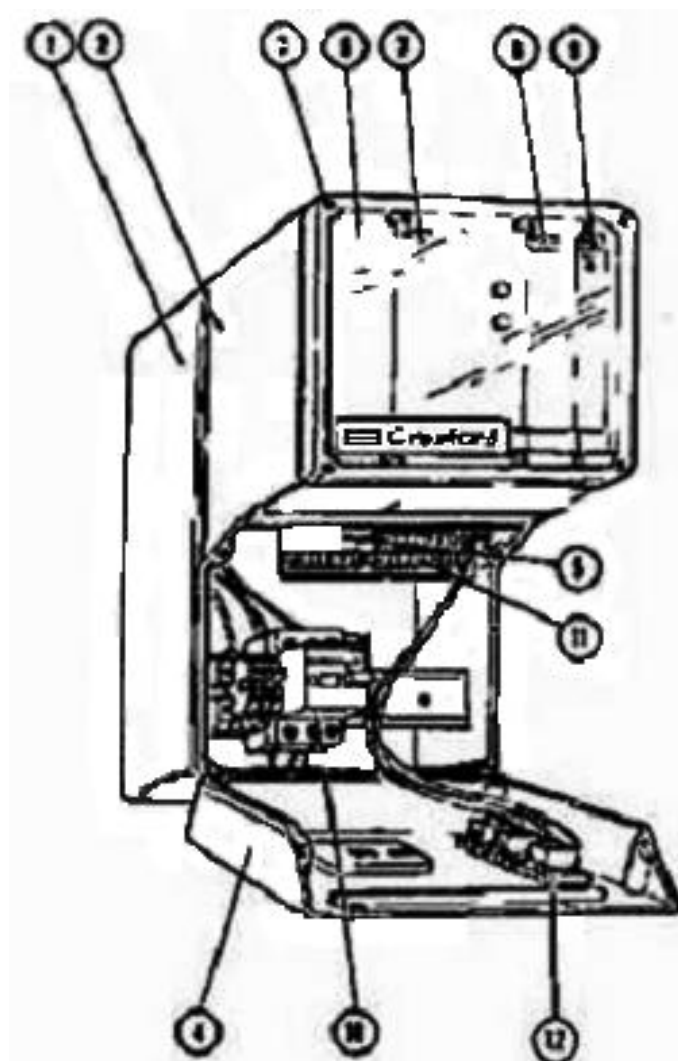
### 8.1.3 Safety supervision unit: (Pinch guard monitoring)

In most countries it is a regulation that the pneumatic safety edge is tested every time when the door hits the floor. As soon as the limit switch "Door closed" is activated ( $\pm 50$ mm from the floor) the function will be tested and can be seen by the flashing of the LED on the front. If the pulse is too short or not given at all to the supervision unit, the control system switches over to so-called dead man's function. This is indicated by the red LED on the front of the unit. It will stay on constantly.

## 8.2 Automatic ECS 602 System design

| Apparatus Box in ABS plastic |              |
|------------------------------|--------------|
| 1                            | Bottom part  |
| 2                            | Collar       |
| 3                            | Top cover    |
| 4                            | Bottom cover |

| Components |                         |
|------------|-------------------------|
| 5          | Circuit plan board      |
| 6          | Cover plate             |
| 7          | Contactor unit          |
| 8          | Impulse unit            |
| 9          | Pinch guard monitoring  |
| 10         | Motor protection switch |
| 11         | Terminal connections    |
| 12         | Operating button unit   |



Material: ABS plastic. The Top cover is transparent. Impact strength and chemical resistance are sufficient for a temperature range from -30° to +60°.

Electrical safety: Complies with IEC specifications for insulation and screen protection for connections to mains supply and control electronics on circuit board.

## 8.3 Automatic ECS 602 Control components

### Circuit plan

This board includes all contacts and line tracks required to connect the insert board and other components included in the basic control together.

X0 - X2 Board contacts for basic control.

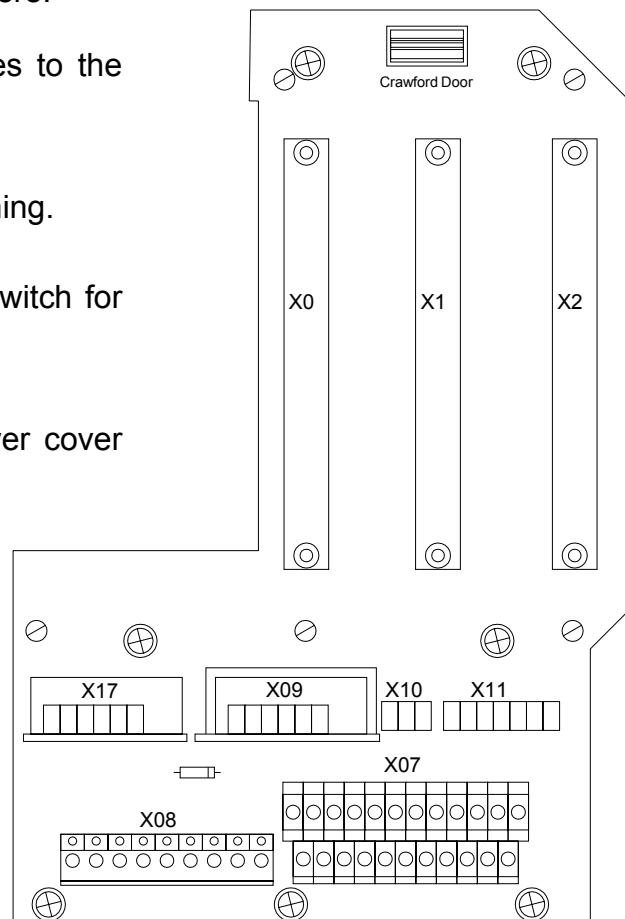
X07 = Screw terminal for connection of external push button boxes and air switches. The push button for the one button operation is also connected here.

X08 Screw terminal for connection of cables to the machinery.

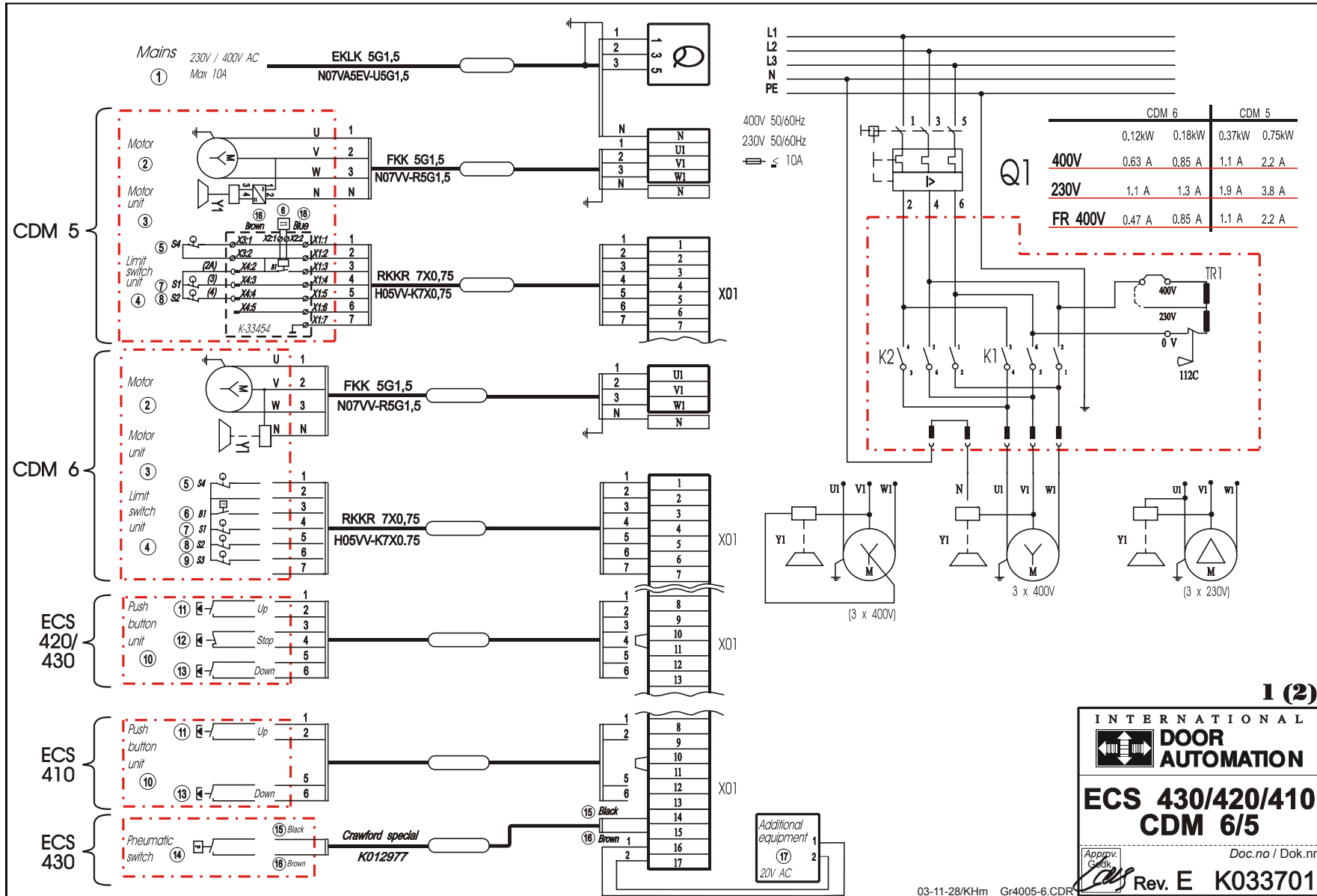
X09 Connection for switch Full/reduced opening.

X 10= connection for push button or key s witch for hold unit operation.

X11 Connection for push buttons in the lower cover for the three button operation.

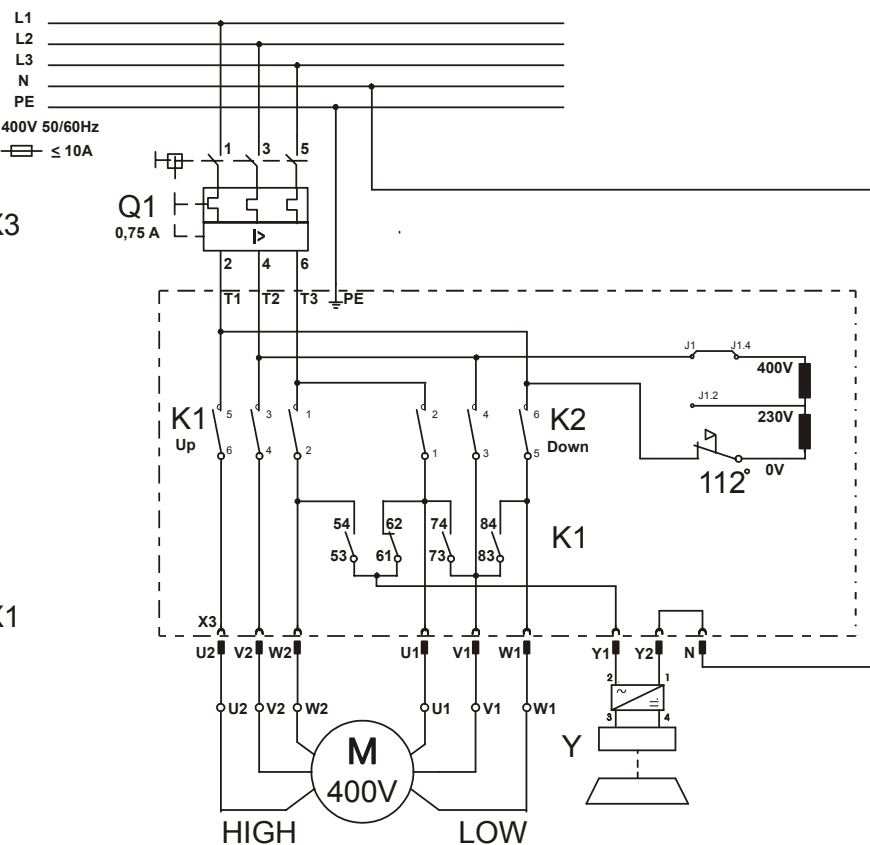
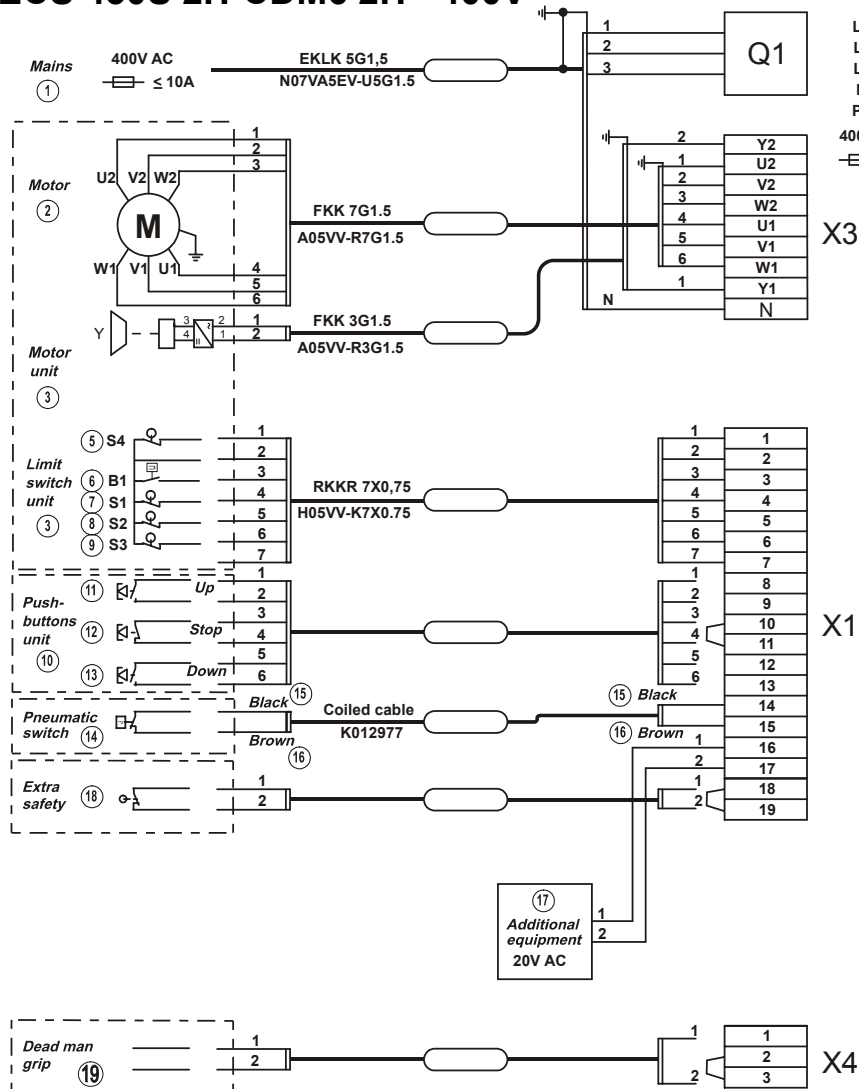


## 9 CONTROL SYSTEM ECS 410/420/430



## 10 CONTROL UNIT ECS 430S – CDM 6/5

## 10.1 ECS 430S 2H-CDM6 2H - 400V



1 (2)



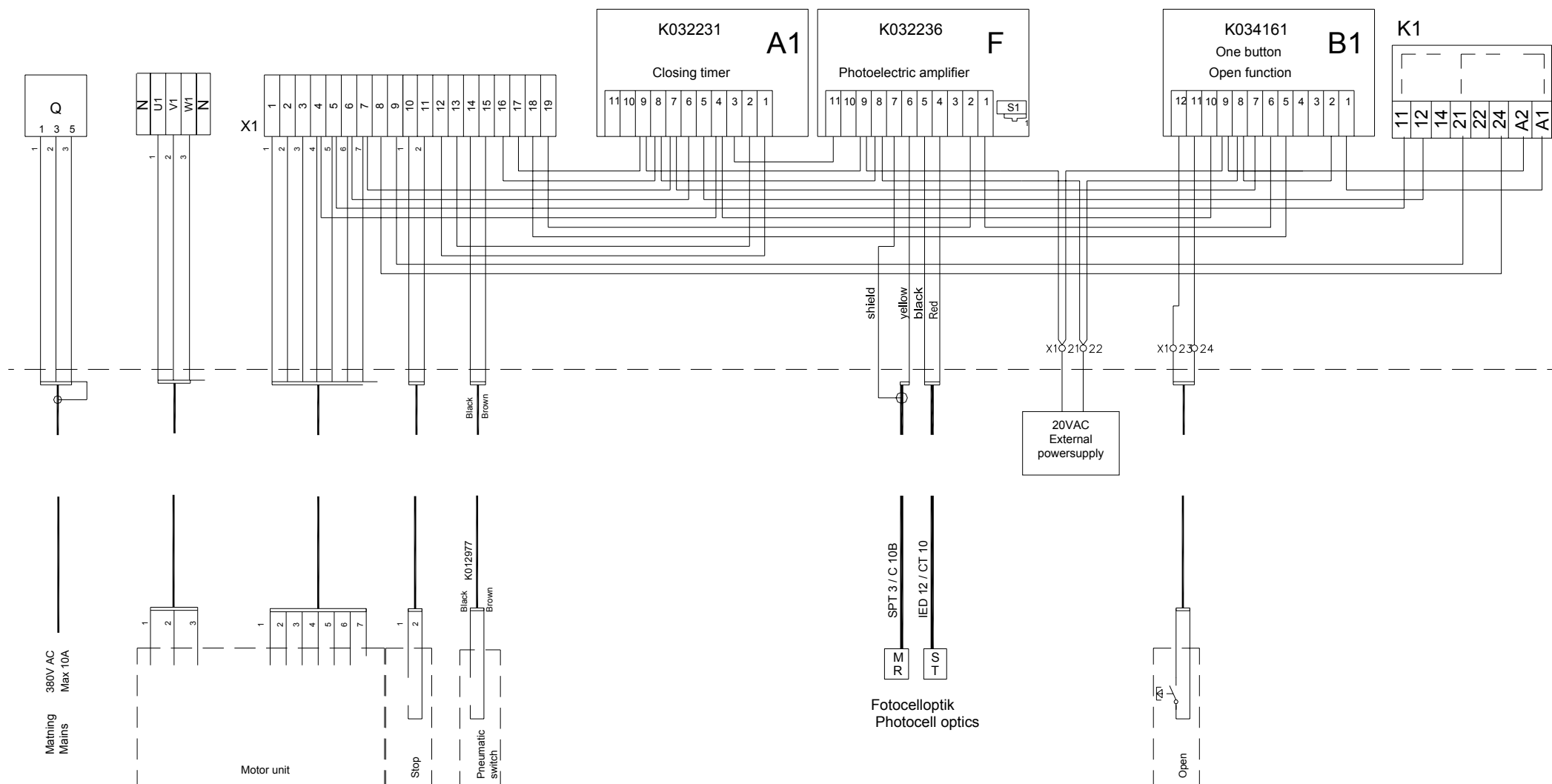
**ECS 430S 2H**  
**CDM 6 2H**  
**400V**

Approv.  
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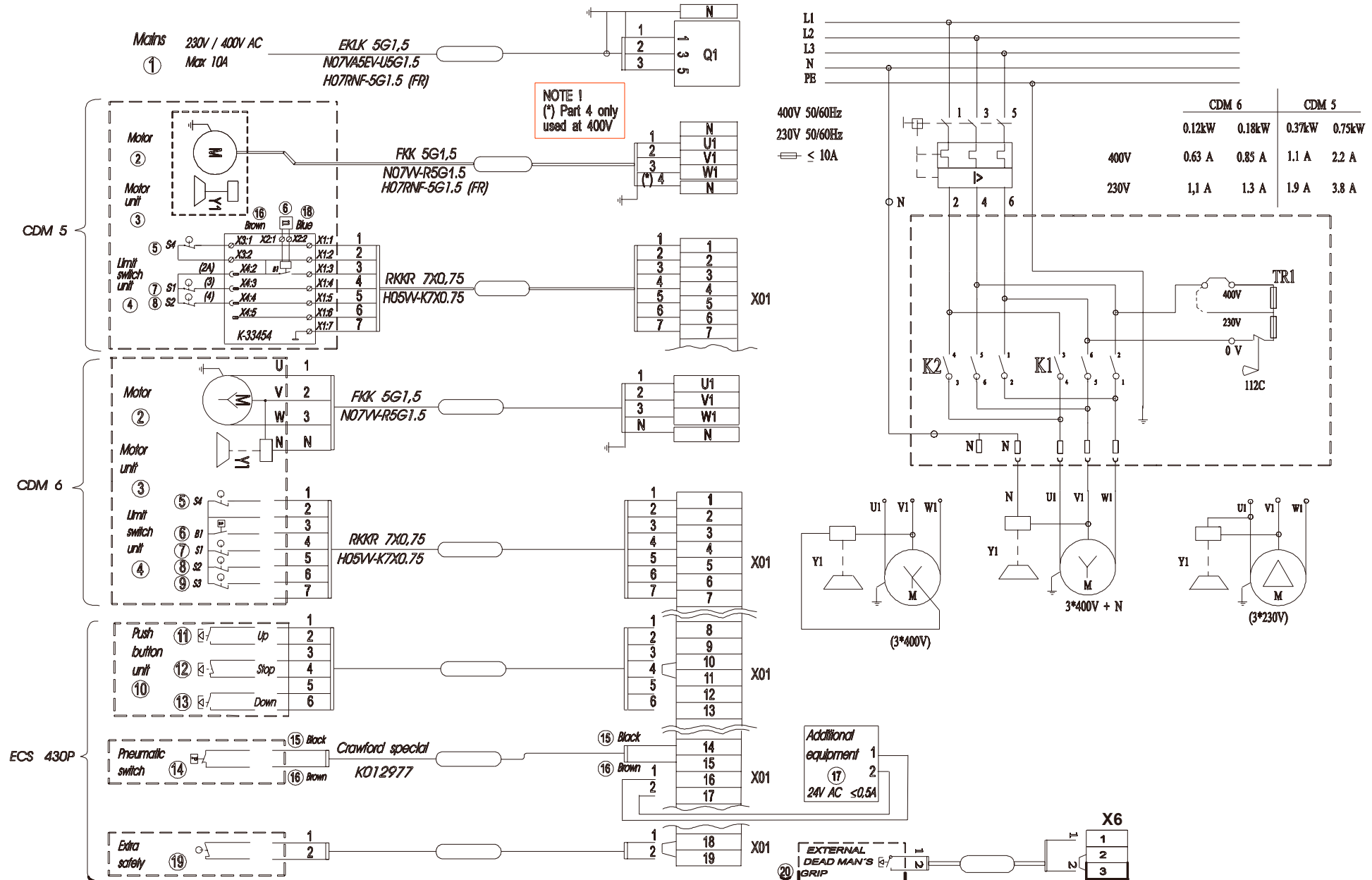
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Rev. A K-38323

## 10.2 B1 System - ECS 430 S

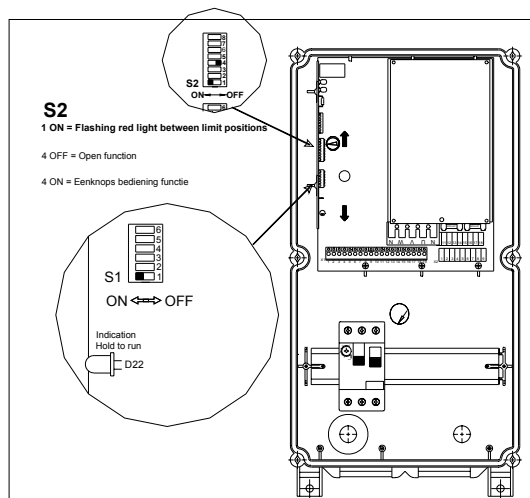


# 11 CONNECTING DIAGRAM ECS 430 P – CDM6/5





## 11.1 Automatic functions ECS 430 P



| S1:1 | ON   |  |      |      |      |         |  |
|------|------|--|------|------|------|---------|--|
| S1:2 | S1:3 | S1:4   | S1:5 | T1   | T2   | CLOSING |  |
| OFF  | OFF  | OFF  | OFF  | 2 s  | 3 s  | 5 s     |  |
| OFF  | ON   | OFF  | OFF  | 2 s  | 8 s  | 10 s    |  |
| OFF  | OFF  | ON   | OFF  | 12 s | 3 s  | 15 s    |  |
| OFF  | OFF  | OFF  | ON   | 8 s  | 12 s | 20 s    |  |
| OFF  | ON   | ON   | OFF  | 12 s | 8 s  | 20 s    |  |
| OFF  | ON   | OFF  | ON   | 8 s  | 32 s | 40 s    |  |
| OFF  | OFF  | ON   | ON   | 48 s | 12 s | 60 s    |  |
| OFF  | ON   | ON   | ON   | 48 s | 32 s | 80 s    |  |
| S1:6 | ON   | The time is counted after "passage of photocell" |      |      |      |         |  |

### S1:

|   |     |  |
|---|-----|--|
| 1 | on  | Automatic closing  |
|   | off | NO automatic closing   |
| 2 | on  | Aut. closing time: X2 when safety acknowledge failed (e.g. photocells). :2 after acknowledge |
|   | off | Aut. closing according S1 : 3,4,5 of 6.  |
| 3 |     | flashing time (see tabel).   |
| 4 |     | closing time (see tabel).  |
| 5 |     | clos. time / flashing time (see tabel).  |
| 6 | on  | Only aut. closing after passing safety acknowledge.  |
|   | off | Always aut. closing after reaching limitswitch open.   |

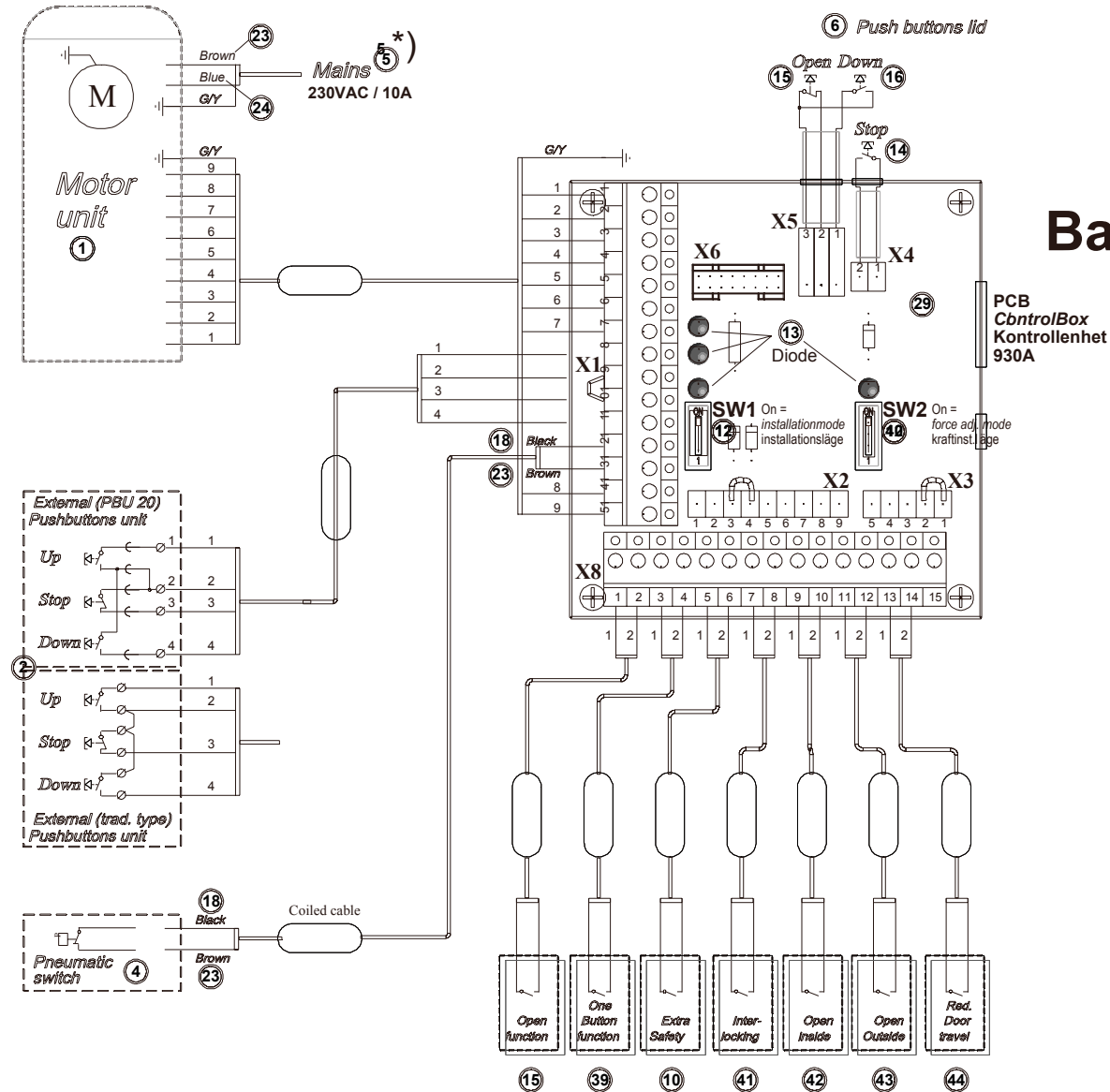
### S2:

|   |     |  |
|---|-----|--|
| 1 | on  | Red light flashing between limit switches.       |
|   | off | No flashing red light.                           |
| 2 | on  | Steady red light at closed door.                 |
|   | off | No steady red light at closed door.              |
| 3 | on  | Steady green light at door opened.               |
|   | off | No steady green light at door opened.            |
| 4 | on  | One button function.                             |
|   | off | Open function.                                   |
| 5 | on  | Delayed door movement / flashing light (France). |
|   | off | Direct movement (all other countries).           |
| 6 | on  | "Interlocking" .                                 |
|   | off | No function.                                     |
| 7 | on  | Option for "Open outside".                       |
|   | off | No function.                                     |
| 8 | on  | Option for "Automatic closing" on/off.           |
|   | off | No function.                                     |

## 11.2 Control system C-kit matrix description

| C-kit      | Description  | In the control unit  | Mounted externally   | Explanation  |
|------------|--|--|--|--|
| <b>C1</b>  | Automatic closing, photocell safety and 2 red warning lights                             | SCR-module, Photocell module, DIP-switch in the control unit.                          | Photocell optics, 2 red warning lights   | Flashing red lights during all door movement (door between limit positions).<br>Flashing red lights before automatic closing.<br>Possible with steady red light for closed door. |
| <b>C2</b>  | Automatic closing and C2 photocell safety  | Photocell module, DIP-switch in the control unit.                                      | Photocell optics.  |  |
| <b>C3</b>  | Automatic closing and 2 red warning lights   | SCR-module, DIP-switch in the control unit.  | 2 red warning lights   | Flashing red lights during all door movement (door between limit positions).<br>Flashing red lights before automatic closing.<br>Possible with steady red light for closed door. |
| <b>C4</b>  | Automatic closing  | DIP-switch in the control unit.  |  |  |
| <b>C5</b>  | Photocell safety   | Photocell module   | Photocell optics.  |  |
| <b>C6</b>  | Magnetic loop  | Magnetic loop detector.  | Magnetic loop kit (40 metre wire, 2 cable conduit 16,0 metal L750mm, 2 tube bends)   |  |
| <b>C7</b>  | Traffic light  | DIP-switch in the control unit.  | SCR-module (external box), 2 red and 2 green signal lights.  | Traffic light is direction sensing.  |
| <b>C8</b>  |  |  |  |  |
| <b>C9</b>  | Interlocking   | DIP-switch in the control unit   | Cable between the doors (3- leaded), not included.   | Function is only obtained between 2 ECS 430P control units, 2 Peroll control units or 1 ECS 430P and 1 Peroll control unit.  |
| <b>C10</b> | Service counter  | Counter  |  | Counts door cycles   |
| <b>C11</b> | One-button / Open function   | DIP-switch in the control unit   |  |  |
| <b>C12</b> | Automatic closing, photocell safety, 2 red warning lights and one-button / open function | SCR-module, Photocell module, DIP-switch in the control unit                           | Photocell optics, 2 red warning lights   | Flashing red lights during all door movement (door between limit positions).<br>Flashing red lights before automatic closing.<br>Possible with steady red light for closed door  |
| <b>C13</b> | Automatic closing, photocell safety and one-button / open function                       | Photocell module, DIP-switch in the control unit                                       | Photocell optics   |  |
| <b>C14</b> | Automatic closing, 2 red warning lights and one-button function                          | SCR-module, DIP-switch in the control unit   | 2 red warning lights   | Flashing red lights during all door movement (door between limit positions).<br>Flashing red lights before automatic closing.<br>Possible with steady red light for closed door  |
| <b>C15</b> | Automatic closing and one-button / open function   | DIP-switch in the control unit   |  |  |
| <b>C16</b> | Photocell safety and one-button / open function  | DIP-switch in the control unit   | Photocell optics   |  |
| <b>C17</b> | Automatic closing and magnetic loop  | Magnetic loop detector, DIP-switch in the control unit                                 | Magnetic loop kit (40 metre wire, 2 cable conduit 16,0 metal L750mm, 2 tube bends)   |  |
| <b>C18</b> |  |  |  |  |
| <b>C19</b> | Automatic closing, photocell safety, 2 red warning lights and magnetic loop              | SCR-module, Photocell module, DIP-switch in the control unit<br>Magnetic loop detector | Photocell optics, 2 red warning lights, Magnetic loop kit (40 metre wire, 2 cable conduit 16,0 metal L750mm, 2 tube bends) | Flashing red lights during all door movement (door between limit positions).<br>Flashing red lights before automatic closing.<br>Possible with steady red light for closed door. |
| <b>C20</b> | Automatic closing, photocell safety and magnetic loop                                    | Photocell module, DIP-switch in the control unit<br>Magnetic loop detector             | Photocell optics, 2 red warning lights, Magnetic loop kit (40 metre wire, 2 cable conduit 16,0 metal L750mm, 2 tube bends) |  |
| <b>C21</b> | Automatic closing, photocell safety and traffic lights                                   | Photocell module, DIP-switch in the control unit                                       | Photocell optics, SCR-module (external box), 2 red and 2 green signal lights   | Traffic light is direction sensing.  |

## 12 DIAGRAM CDM 9



# Basic Wiring Diagram

(The installers documentation)

## CHAPTER 4 OPERATORS



## 12.1 Control system D-kit matrix description

There are 7 base automation kits, the D-systems:

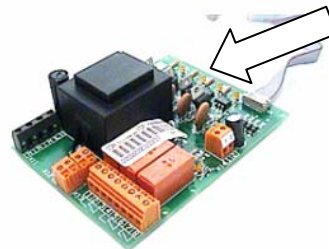
| Kit | Description / content  | part.no. |
|-----|--|----------|
| D1  | Including D7 + red lights  | K043512  |
| D2  | Including D7 + magnetic loop   | K043510  |
| D3  | PCB SCR D3 is always a part of D5 or D6  | K043508  |
| D4  | Including D7 + 2 red lights + magnetic loop  | K043506  |
| D5  | Including D3 + 2 red lights + 2 green lights (traffic lights system)                 | K043504  |
| D6  | Including D3 + 2 red lights + 2 green lights (traffic lights system) + magnetic loop | K043502  |
| D7  | the minimal kit: Interlocking 2 doors  | K043445  |



D1



D2



D3



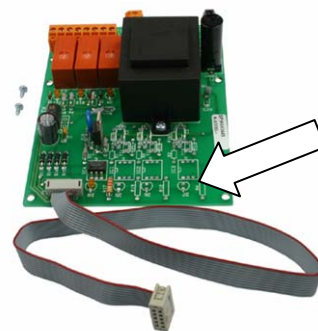
D4



D5



D6



D7

The visual difference between **D3** and **D7** is 1 SCR relay on D7 and 4 SCR relays on D3 (for Red and Green lights (see arrows)).

Also a separate print Indication "Door open" (K043446) is available for the ECS 930A control unit: This PCB card can be used for e.g. interlocking a leveler.



## 13 RADIO EQUIPMENT

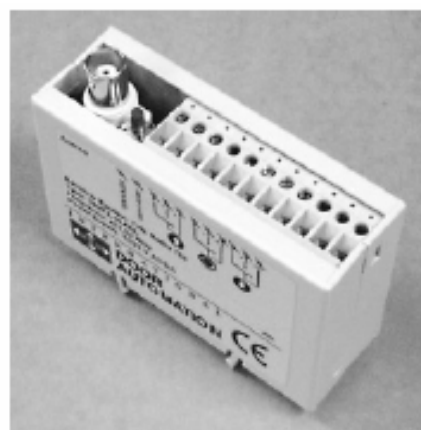
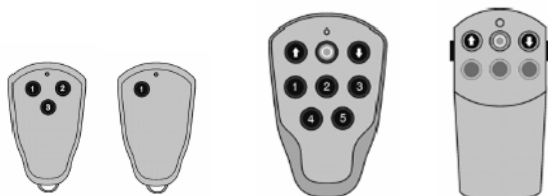


Radio equipment 40 MHz



Radio equipment 433 MHz





Radio equipment 869 MHz



### **13.1 Radio equipment 40 MHz**

The 40 MHz equipment is not available as Spare Part any more.  
These items have become obsolete.





## **13.2 Radio equipment 433 MHz**

The 433 MHz equipment is not available as Spare Parts any more.

All 433 MHz equipment is replaced by the 433-MHz PLUS range.  
Both systems are compatible.

**For programming new equipment on existing installations see next paragraphs.**

### 13.3 Radio equipment 433 MHz PLUS

#### About the transmitter

##### **Shortcut for a door (433-999)**

The \* and # buttons are used to program a shortcut (1 selection per button) for a specific door.

If you hold down the \* or # button when a number is shown on the display for more than three seconds (display flashes) this saves the number as the shortcut.



##### **Switch**

The transmitter must be taken apart to access the **system switch (A)** and **code switches (B)** so that these can be set. The switches are located as shown in the diagram.



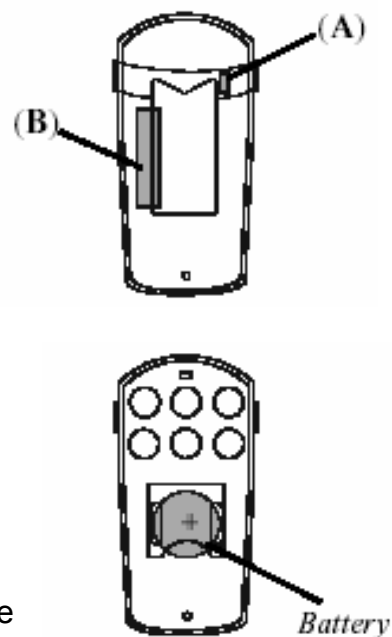
##### **Battery replacement**

The transmitter must be taken apart to access the battery. Note that on transmitters with button batteries the plus character should (+) face the plus character marked on the battery holder.



**K045625**, Battery 3V

**K047196**, Battery for mini-transmitter. (SP) (No picture available)



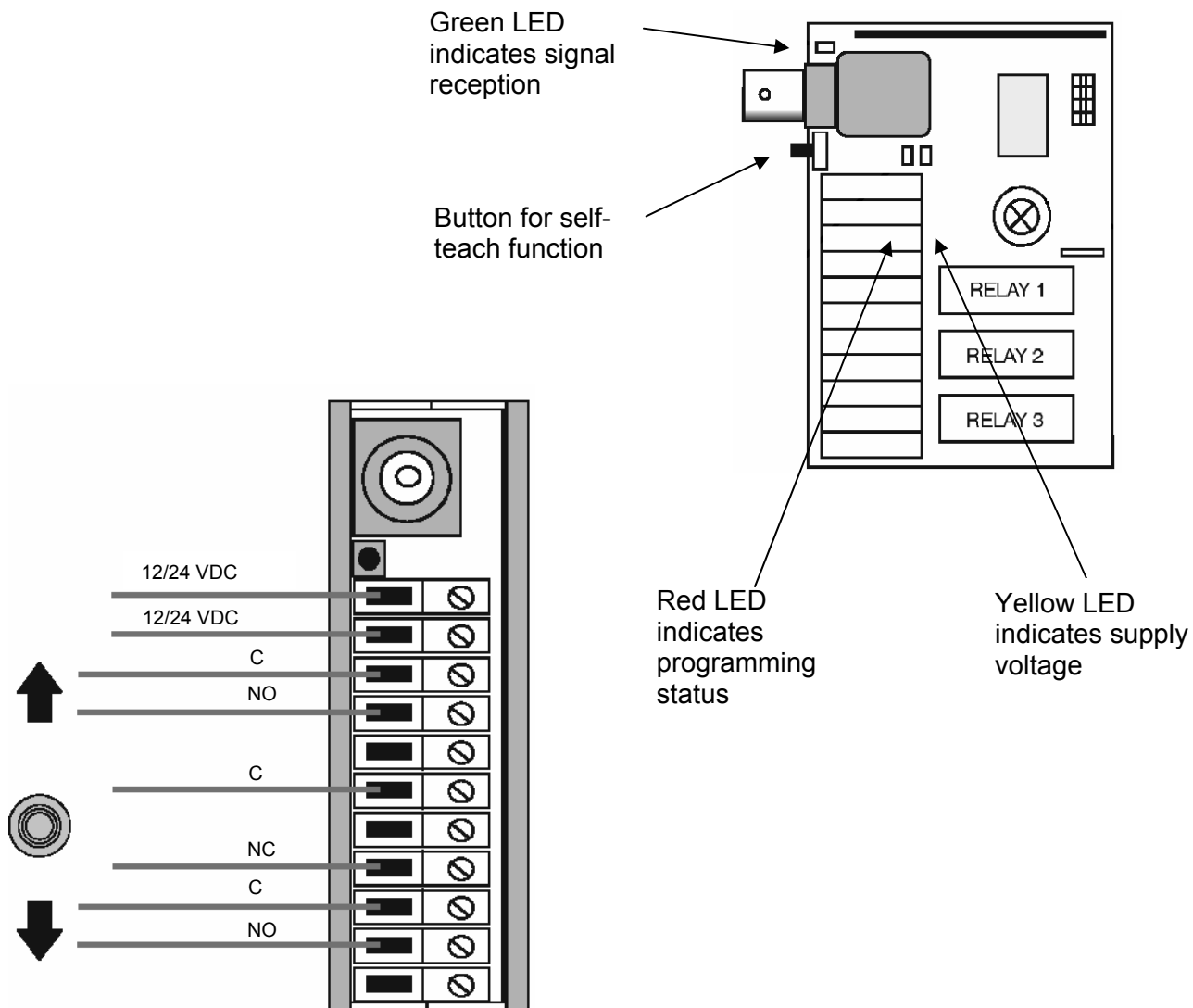
## About the Receiver

### Receiver 433 MHz PLUS

|                   |                                     |
|-------------------|-------------------------------------|
| Frequency         | : 433MHz                            |
| Operating voltage | : 12/24DC                           |
| Dimensions        | : 86 x 30 x 58 mm                   |
| Enclosure         | : IP 23, for internal installation. |



**K039101**, Receiver 433 Plus





## Register a standard code

- Press the self-teach button for at least 300 milliseconds, longest 4 seconds.
- Release the button *Programming mode, red LED comes on*
- Enter the door number, followed by an optional function button (With just the *one-button function* only the door number, with just *up-stop-down function* only the function key) *Red LED flashes*
- The standard code has now been stored *Red LED flashes*

## Register a private code

(= **Standard** and **unique** codes)

- Press the self-teach button for at least 300 milliseconds, longest 4 seconds
- Press the button (*longer than 1 second*)
- *Private program mode, the red LED comes on*
- Enter the door number, followed by an optional function button (With just the *one-button function* only the door number, with just *up-stop-down function* only the function key) *Red LED flashes*
- The private code has now been stored *Red LED double flashes*

## Erase the programmed codes

- Press the self-teach button for more than 6 seconds. (*Red LED goes out*)
- All programmed codes are erased.

*To ensure that the remote control system has a long lasting and reliable operation it is very important that the receiver and antenna are mounted correctly. Correctly installed equipment will provide better range and longer lifetime for the system. It will be worthwhile spending a few minutes reading through these instructions.*



433-DP  
Duopole aerial

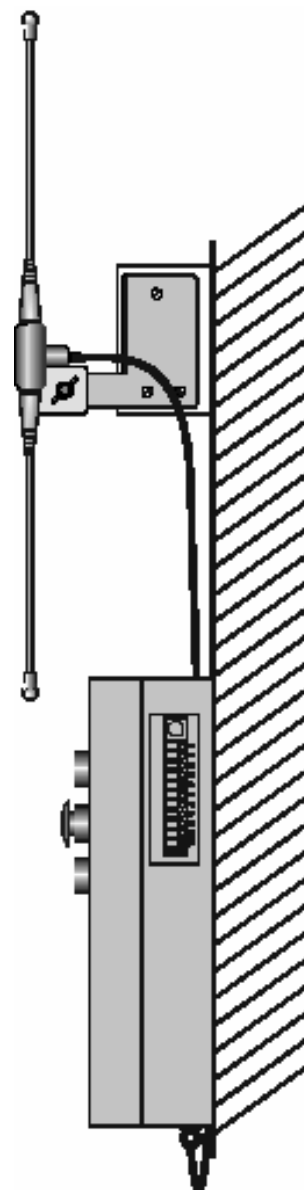
K041765 , Aerial, duopole 433MHz



K045646,  
T-conn.for radio 433 MHz Plus



K039114, Wire, f.aerial 10 m



### 13.4 Programming the transmitters

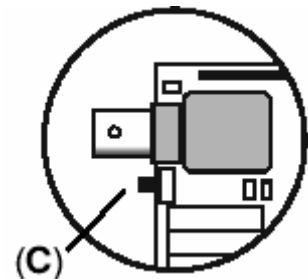
433-1 PLUS (K045613)  
 433-3 PLUS (K045614)  
 433-999 PLUS (K045619)



The transmitter and receiver are coded together so that they then have a common code.

Program as follows:

- Check that the transmitter's system switch (A) is in the ON position.
- Set an own code on the transmitter's code switches (B) 1-10.
- Press the self-teach button (C) on the receiver. The red LED comes on (programming mode 6 seconds)
- Press the required door number button (1-15) on the transmitter.



Check that the relay switches when one of the transmitter's buttons is pressed in.

## Programming the transmitters:

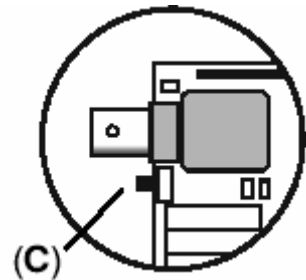
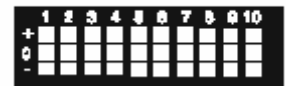
433-01 PLUS (K045612)  
 433-06 PLUS (K045615)  
 433-015 PLUS (K045618)

The transmitter and receiver are coded together so that they then have a common code.



- Check that the transmitter's system switch (A) is in the ON position.
- Set an own code on the transmitter's code switches (B) 1-10.
- Press the self-teach button (C) on the receiver. The red LED comes on (programming mode 6 seconds)
- Press the required door number button (1-999) and an optional function button (up-stop-down) on the transmitter (approx. 3 seconds).

(B)



Check that the relay switches when one of the transmitter's buttons is pressed in.

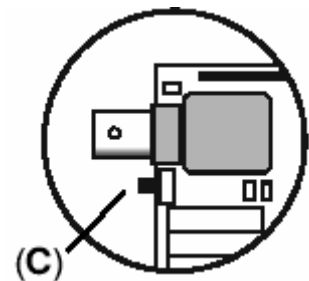
### 13.5 Supplementing old 433 MHz installations 1.

Programming the transmitter 433-999 PLUS to an “old” 433-receiver and a 433-93 (type truck transmitter) in the existing installation.

- Set the transmitter's system switch (A) in the **1** position.
- Check that the code switch (B) 9 is in the + (plus) position.
- Set an identical code on the transmitter's three first switched (code switches 1-3) as set on the receiver. (The transmitter's code switches 4-8 and 10 are not used).
- Check that the relay switches when one of the transmitter's button is pressed.



433-999





### 13.6 Supplementing old 433 MHz installations 2.

Programming the **PLUS** transmitter 433-1, 433-01 and 433-06 to an “old” 433-receiver and small 433-transmitters) in the existing installation. (Not Robust).

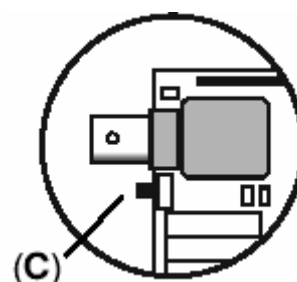


433-01

433-03

433-06

- Set the transmitter's system switch (A) in the **1** position. (off)
- **For 433-1 or 433-01** transmitters proceed as follows:
  - Set an identical code on the transmitter's code switches (B) 1-4) as set on the existing receiver. Set the code switch 10 to the **minus** position (5-9 are not used).
- **For 433-06** transmitter proceed as follows:
  - Set an identical code on the transmitter's code switches (B) 1-4, as set on the existing receiver. Set the code switch 10 to the **minus** position (5-9 are not used).
- Check that the relay switches when one of the transmitter's button is pressed.

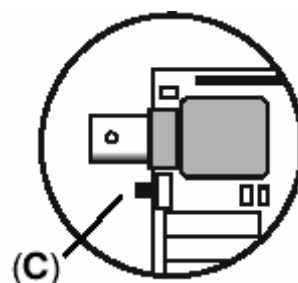


### 13.7 Supplementing old 433 MHz installations 3.

Programming the **PLUS** transmitter 433-1, 433-01 and 433-06 to an “old” 433-receiver and robust transmitters.



- Set the transmitter's system switch (A) in the **1** position. (off)
- **For 433-1 or 433-01** transmitters proceed as follows:
- Set an identical code on the transmitter's code switches (B) 1-8) as set on the existing receiver. (9-10 are not used).
- **For 433-3 and 433-06** transmitter proceed as follows:
- Set an identical code on the transmitter's code switches (B) 1-4, as set on the existing receiver. (9 is not used)
- Set the code switch **10** to the **minus** or **plus** position depending on the code table used on the other Robust transmitters being used





## 13.8 Coding tables

Setting the code on the receiver to operate with the "old" 433-06 / 433-10 transmitter switches 1-4 should have the same setting on both the transmitter and receiver.

### Table for 10 Doors

Plus (+) code

| Button | T5 | T6 | T7 | T8 |
|--------|----|----|----|----|
| 1      | 0  | 0  | 0  | +  |
| 2      | 0  | 0  | +  | 0  |
| 3      | 0  | 0  | +  | +  |
| 4      | 0  | +  | 0  | 0  |
| 5      | 0  | +  | 0  | +  |
| 6      | 0  | +  | +  | 0  |
| 7      | 0  | +  | +  | +  |
| 8      | +  | 0  | 0  | 0  |
| 9      | +  | 0  | 0  | +  |
| 10     | 0  | 0  | 0  | 0  |

Minus (-) code

| Button | T5 | T6 | T7 | T8 |
|--------|----|----|----|----|
| 1      | 0  | 0  | 0  | -  |
| 2      | 0  | 0  | -  | 0  |
| 3      | 0  | 0  | -  | -  |
| 4      | 0  | -  | 0  | 0  |
| 5      | 0  | -  | 0  | -  |
| 6      | 0  | -  | -  | 0  |
| 7      | 0  | -  | -  | -  |
| 8      | -  | 0  | 0  | 0  |
| 9      | -  | 0  | 0  | -  |
| 10     | 0  | 0  | 0  | 0  |

## Service Manual Industrial Doors

## CHAPTER 4 OPERATORS

### Setting the code on the receiver to operate with the “old” 433-93 transmitter



Note that the positions A0=D0, B0=E0, C0=F0

Switches 1-3 should have the same settings on both the transmitter and receiver.

**Table for 93 Doors**

| A     |      |   |   |   |   |   | B     |      |   |   |   |   |   | C     |      |   |   |   |   |   |
|-------|------|---|---|---|---|---|-------|------|---|---|---|---|---|-------|------|---|---|---|---|---|
| "Old" | PLUS | 4 | 5 | 6 | 7 | 8 | "Old" | PLUS | 4 | 5 | 6 | 7 | 8 | "Old" | PLUS | 4 | 5 | 6 | 7 | 8 |
| A1    | 101  | - | 0 | 0 | 0 | - | B1    | 201  | 0 | 0 | 0 | 0 | - | C1    | 301  | + | 0 | 0 | 0 | - |
| A2    | 102  | - | 0 | 0 | - | 0 | B2    | 202  | 0 | 0 | 0 | - | 0 | C2    | 302  | + | 0 | 0 | - | 0 |
| A3    | 103  | - | 0 | 0 | - | - | B3    | 203  | 0 | 0 | 0 | - | - | C3    | 303  | + | 0 | 0 | - | - |
| A4    | 104  | - | 0 | - | 0 | 0 | B4    | 204  | 0 | 0 | - | 0 | 0 | C4    | 304  | + | 0 | - | 0 | 0 |
| A5    | 105  | - | 0 | - | 0 | - | B5    | 205  | 0 | 0 | - | 0 | - | C5    | 305  | + | 0 | - | 0 | - |
| A6    | 106  | - | 0 | - | - | 0 | B6    | 206  | 0 | 0 | - | - | 0 | C6    | 306  | + | 0 | - | - | 0 |
| A7    | 107  | - | 0 | - | - | - | B7    | 207  | 0 | 0 | - | - | - | C7    | 307  | + | 0 | - | - | - |
| A8    | 108  | - | - | 0 | 0 | 0 | B8    | 208  | 0 | - | 0 | 0 | 0 | C8    | 308  | + | - | 0 | 0 | 0 |
| A9    | 109  | - | - | 0 | 0 | - | B9    | 209  | 0 | - | 0 | 0 | - | C9    | 309  | + | - | 0 | 0 | - |
| A10   | 110  | - | - | 0 | - | 0 | B10   | 210  | 0 | - | 0 | - | 0 | C10   | 310  | + | - | 0 | - | 0 |
| A11   | 111  | - | - | 0 | - | - | B11   | 211  | 0 | - | 0 | - | - | C11   | 311  | + | - | 0 | - | - |
| A12   | 112  | - | - | - | 0 | 0 | B12   | 212  | 0 | - | - | 0 | 0 | C12   | 312  | + | - | - | 0 | 0 |
| A13   | 113  | - | - | - | 0 | - | B13   | 213  | 0 | - | - | 0 | - | C13   | 313  | + | - | - | 0 | - |
| A14   | 114  | - | - | - | - | 0 | B14   | 214  | 0 | - | - | - | 0 | C14   | 314  | + | - | - | - | 0 |
| A15   | 115  | - | - | - | - | - | B15   | 215  | 0 | - | - | - | - | C15   | 315  | + | - | - | - | - |
| A0    | 100  | - | 0 | 0 | 0 | 0 | B0    | 200  | 0 | 0 | 0 | 0 | 0 | C0    | 300  | + | 0 | 0 | 0 | 0 |

| D     |      |   |   |   |   |   | E     |      |   |   |   |   |   | F     |      |   |   |   |   |   |
|-------|------|---|---|---|---|---|-------|------|---|---|---|---|---|-------|------|---|---|---|---|---|
| "Old" | PLUS | 4 | 5 | 6 | 7 | 8 | "Old" | PLUS | 4 | 5 | 6 | 7 | 8 | "Old" | PLUS | 4 | 5 | 6 | 7 | 8 |
| D1    | 401  | - | 0 | 0 | 0 | + | E1    | 501  | 0 | 0 | 0 | 0 | + | F1    | 601  | + | 0 | 0 | 0 | + |
| D2    | 402  | - | 0 | 0 | + | + | E2    | 502  | 0 | 0 | 0 | + | 0 | F2    | 602  | + | 0 | 0 | + | 0 |
| D3    | 403  | - | 0 | 0 | + | + | E3    | 503  | 0 | 0 | 0 | + | + | F3    | 603  | + | 0 | 0 | + | + |
| D4    | 404  | - | 0 | + | 0 | 0 | E4    | 504  | 0 | 0 | + | 0 | 0 | F4    | 604  | + | 0 | + | 0 | 0 |
| D5    | 405  | - | 0 | + | 0 | + | E5    | 505  | 0 | 0 | + | 0 | + | F5    | 605  | + | 0 | + | 0 | + |
| D6    | 406  | - | 0 | + | + | 0 | E6    | 506  | 0 | 0 | + | + | 0 | F6    | 606  | + | 0 | + | + | 0 |
| D7    | 407  | - | 0 | + | + | + | E7    | 507  | 0 | 0 | + | + | + | F7    | 607  | + | 0 | + | + | + |
| D8    | 408  | - | + | 0 | 0 | 0 | E8    | 508  | 0 | + | 0 | 0 | 0 | F8    | 608  | + | + | 0 | 0 | 0 |
| D9    | 409  | - | + | 0 | 0 | + | E9    | 509  | 0 | + | 0 | 0 | + | F9    | 609  | + | + | 0 | 0 | + |
| D10   | 410  | - | + | 0 | + | 0 | E10   | 510  | 0 | + | 0 | + | 0 | F10   | 610  | + | + | 0 | + | 0 |
| D11   | 411  | - | + | 0 | + | + | E11   | 511  | 0 | + | 0 | + | + | F11   | 611  | + | + | 0 | + | + |
| D12   | 412  | - | + | + | 0 | 0 | E12   | 512  | 0 | + | + | 0 | 0 | F12   | 612  | + | + | + | 0 | 0 |
| D13   | 413  | - | + | + | 0 | + | E13   | 513  | 0 | + | + | 0 | + | F13   | 613  | + | + | + | 0 | + |
| D14   | 414  | - | + | + | + | 0 | E14   | 514  | 0 | + | + | + | 0 | F14   | 614  | + | + | + | + | 0 |
| D15   | 415  | - | + | + | + | + | E15   | 515  | 0 | + | + | + | + | F15   | 615  | + | + | + | + | + |
| D0    | 400  | - | 0 | 0 | 0 | 0 | E0    | 500  | 0 | 0 | 0 | 0 | 0 | F0    | 600  | + | 0 | 0 | 0 | 0 |

### 13.9 Radio equipment 869 MHz

- New ergonomic design - with high quality
- Easy to install - **easy programming**
- Safe with secure data transmission
- Each transmitter is supplied with a **unique** code
- The receiver can manage **100 unique codes** (AGM: 500 unique codes)
- The receiver is programmed via the handheld transmitter
- Possibility to operate up to 999 doors
- Robust

#### Battery replacement

The transmitter must be taken apart to access the battery.

Note that on transmitters with button batteries the plus character should (+) face the plus character marked on the battery holder.

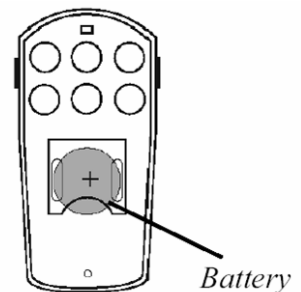
#### About the transmitter

##### **Shortcut for a door (869-999)**

The \* and # buttons are used to program a shortcut (1 selection per button) for a specific door.

If you hold down the \* or # button when a number is shown on the display for more than three

Seconds (display flashes) this saves the number as the shortcut.

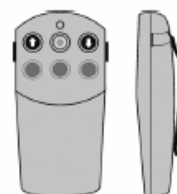


### 13.10 Transmitters in the 869MHz program

**Transmitter 869-1** K047181

with function buttons

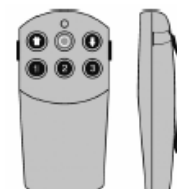
Up - Stop - Down.


**Transmitter 869-3** K047182

with function buttons

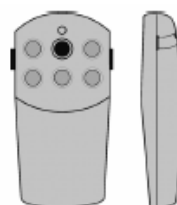
Up - Stop - Down.

For 3 doors.


**Transmitter 869-O1** K047180

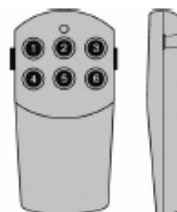
with One button function.

For 1 door.


**Transmitter 869-O6** K047183

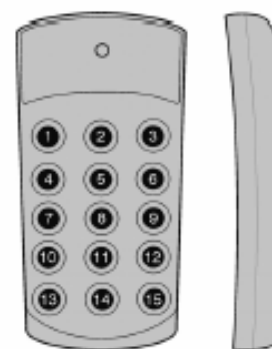
with One button function.

For 6 doors.


**Transmitter 869-O15** K047184

with One button function.

For 15 doors.

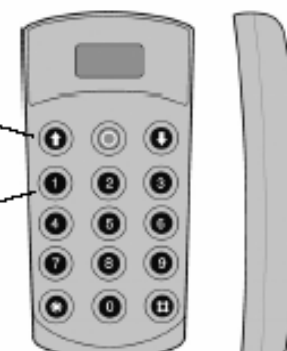

**Transmitter 869-999** K047185

with function buttons

Up - Stop - Down.

For up to 999 doors.

 Function  
buttons

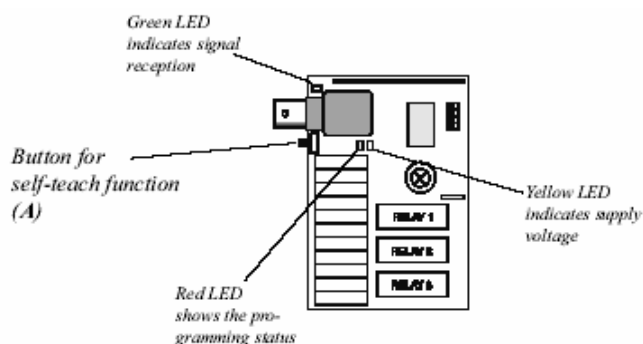
 Door  
number  
buttons


For latest info see Spare Parts Catalogue

## 13.11 Receivers in the 869MHz program

### DIN Receiver 869

Up to 100 unique codes (transmitters)

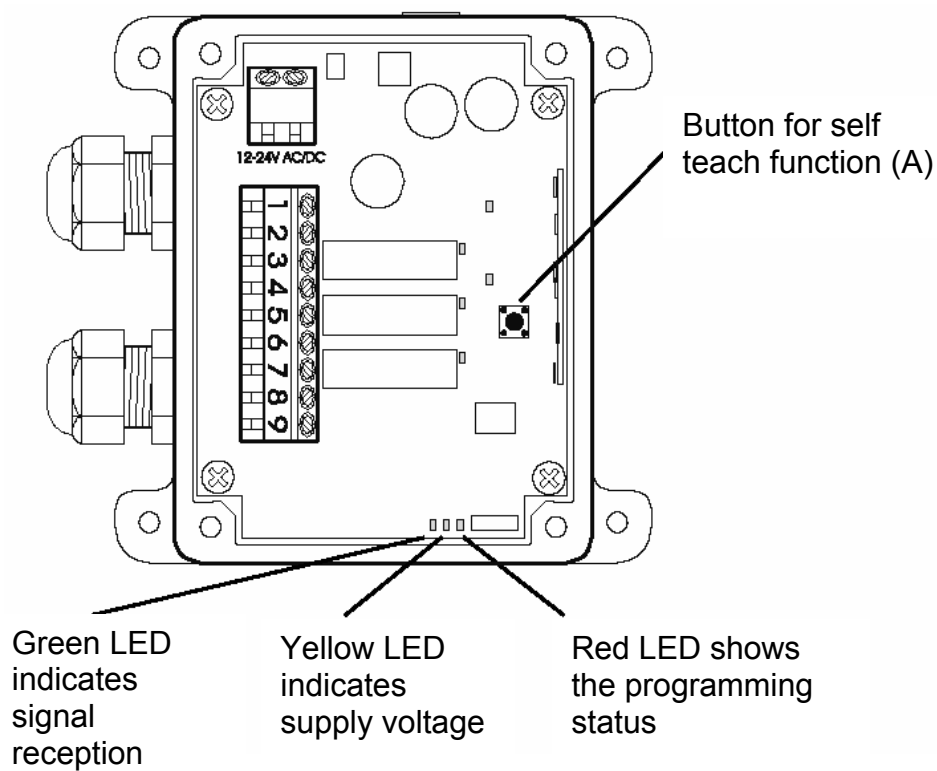
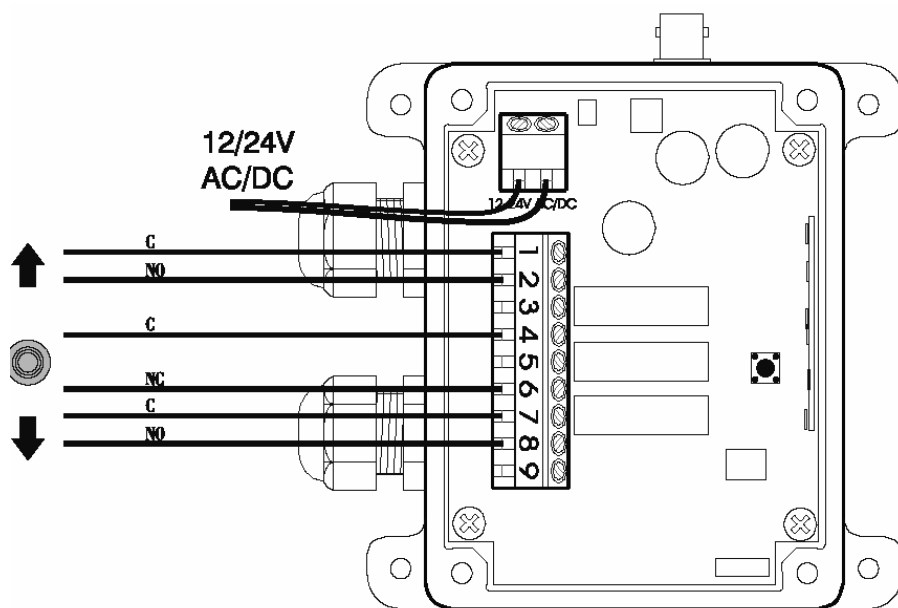


Frequency: 869 MHz  
 Operating voltage: 12/24V AC/DC  
 Dimensions: 86 x 30 x 58 mm  
 Enclosure: IP 23, for internal installation

### WR Receiver 869



Frequency: 869 MHz  
 Operating voltage: 12/24V AC/DC  
 Dimensions: 120 x 103 x 44 mm  
 Enclosure: IP 65, for external installation

**WR Receiver 869****WR 869 / AGM WR 869**



## AGM WR Receiver 869

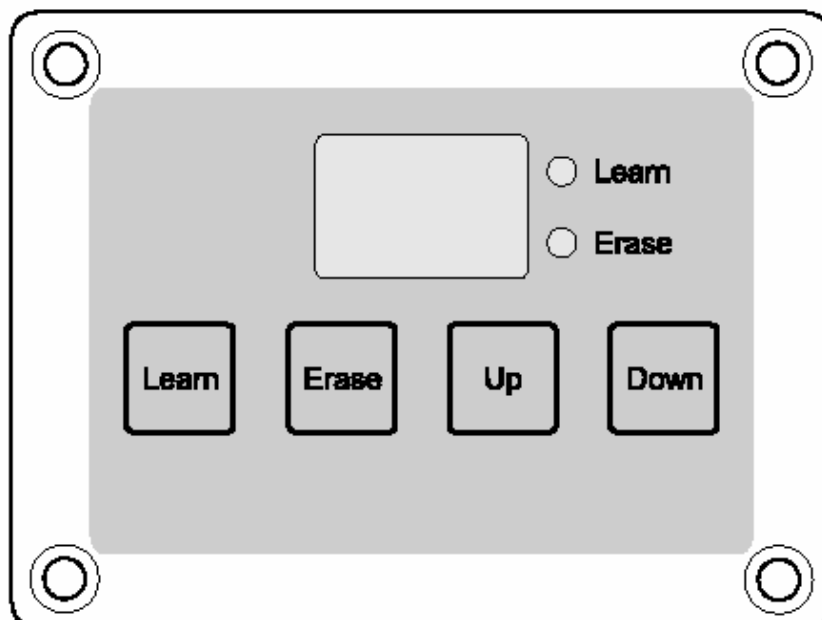
- Frequency: 869 MHz
- Operating voltage: 12/24V AC/DC
- Dimensions: 120 x 103 x 44 mm
- Enclosure: IP 65, for external installation
- AGM WR Receiver 869 is used together with an One-button transmitter and/or with a transmitter with Up-Stop-Down functions.

### Programming the AGM WR Receiver

The receiver can be programmed to accept up to 500 different transmitters, where each transmitter has its own unique ID-code. It is recommended to keep a log of transmitter serial numbers that have been programmed into the receiver and on which position. It could also be useful to log which user has access to which transmitter.



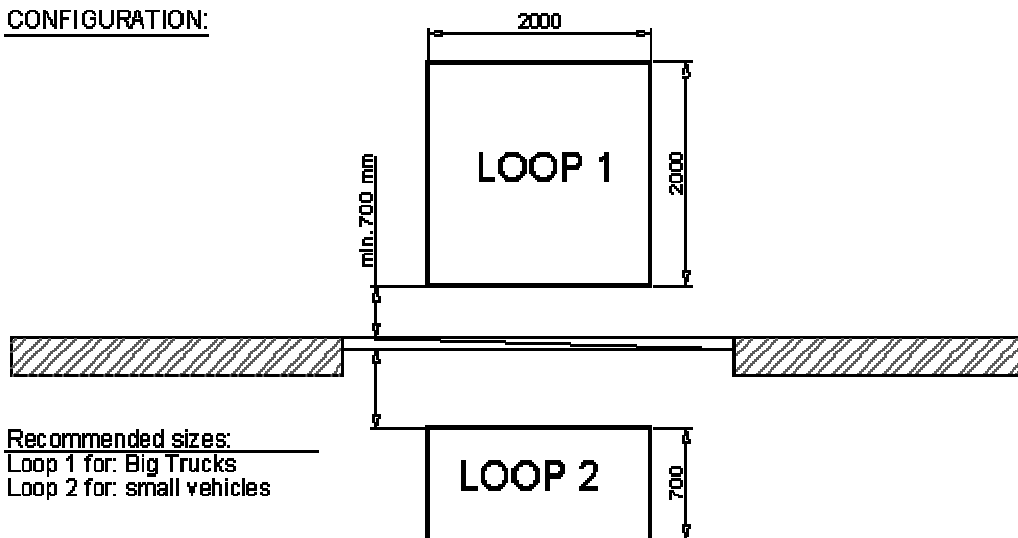
For programming the ID codes see document **K046727**, *RADIO 869MHz Installation & Programming*



## 14 MAGNETIC LOOP SYSTEM

### Induction Loop installation Industrial Doors / EconoRoll Doors

#### CONFIGURATION:

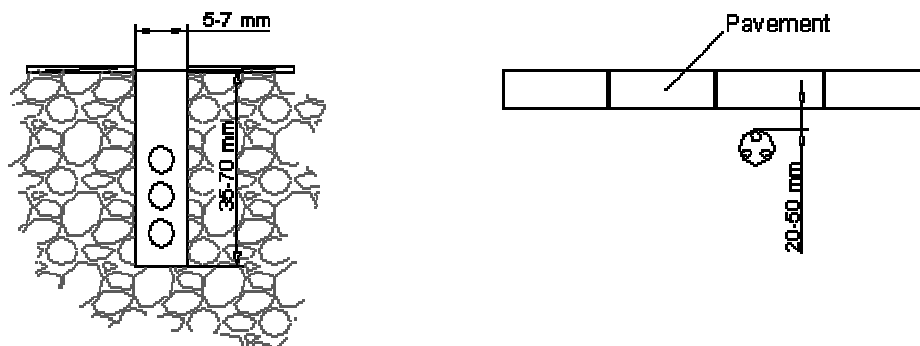


#### Recommended sizes:

Loop 1 for: Big Trucks

Loop 2 for: small vehicles

#### INSTALLATION:



Loopwiring as in C-System (K012451)

Prefabricated Loops:

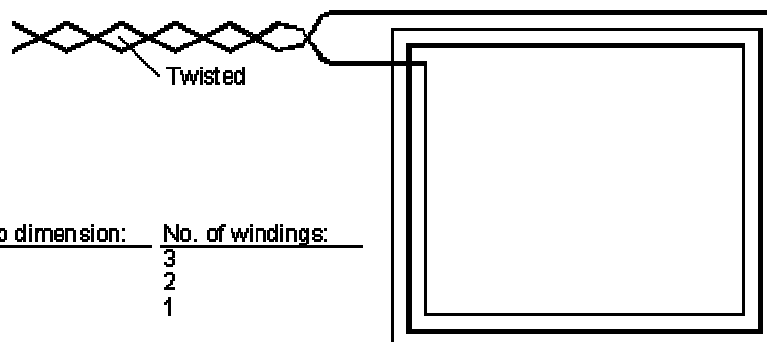
K000972

L= 5,4 mtr

K003084

L= 8 mtr

#### Plan:



| With Loop dimension: | No. of windings: |
|----------------------|------------------|
| < 8 mtr              | 3                |
| 8-40 mtr             | 2                |
| > 40 mtr             | 1                |

## 14.1 Magnetic loop – connection diagram

| Position    | 0     | 1  | 2  | 3  | 4       | 5  | 6  | 7  | 8     | 9  | 10 | 11 | 12      | 13 | 14 | 15 |
|-------------|-------|----|----|----|---------|----|----|----|-------|----|----|----|---------|----|----|----|
| Sensitivity | 0,5   | 15 | 05 | 02 | 0,5     | 15 | 05 | 02 | 0,5   | 15 | 05 | 02 | 0,5     | 15 | 05 | 02 |
| Presence    | 5 min |    |    |    | 120 min |    |    |    | 5 min |    |    |    | 120 min |    |    |    |
| Frequency   | High  |    |    |    |         |    |    |    | Low   |    |    |    |         |    |    |    |

### ▲ SWITCH SETTINGS

#### INSTRUCTIONS

1) Select required switch position

High sens. = ,02

Low sens. = 0,5

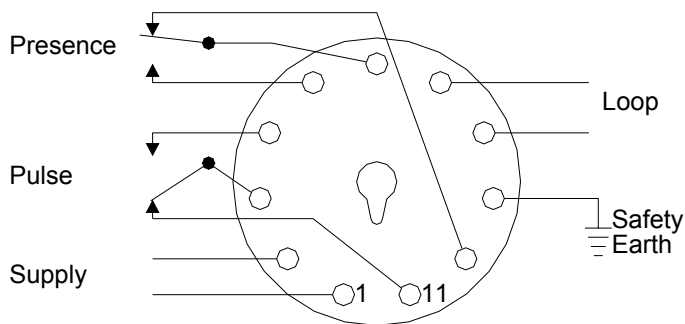
2) On application of power detector will retune in < 2 sec

3) Observe detection of vehicles on LED

*if required, reset can be effected by rotating switch at least one position & returning to required setting.*

| Fault                                   | Flash Rate |
|---|------------|
| Open Circuit Loop                       | 1 Hz       |
| Short Circuit Loop or faulty oscillator | 2 Hz       |

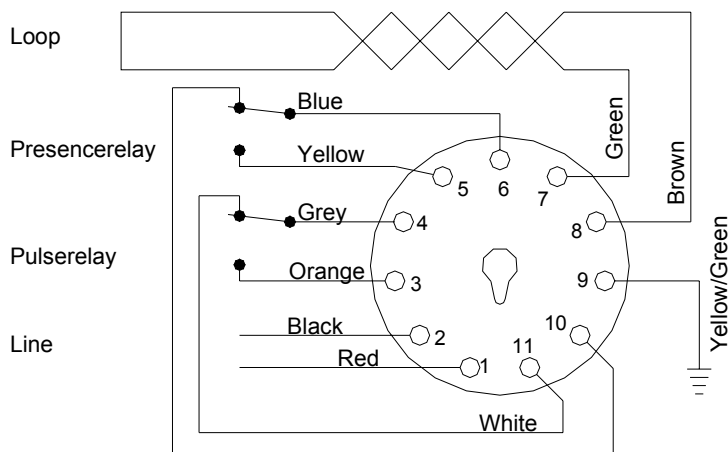
### ▲ LED FAULT INDICATION



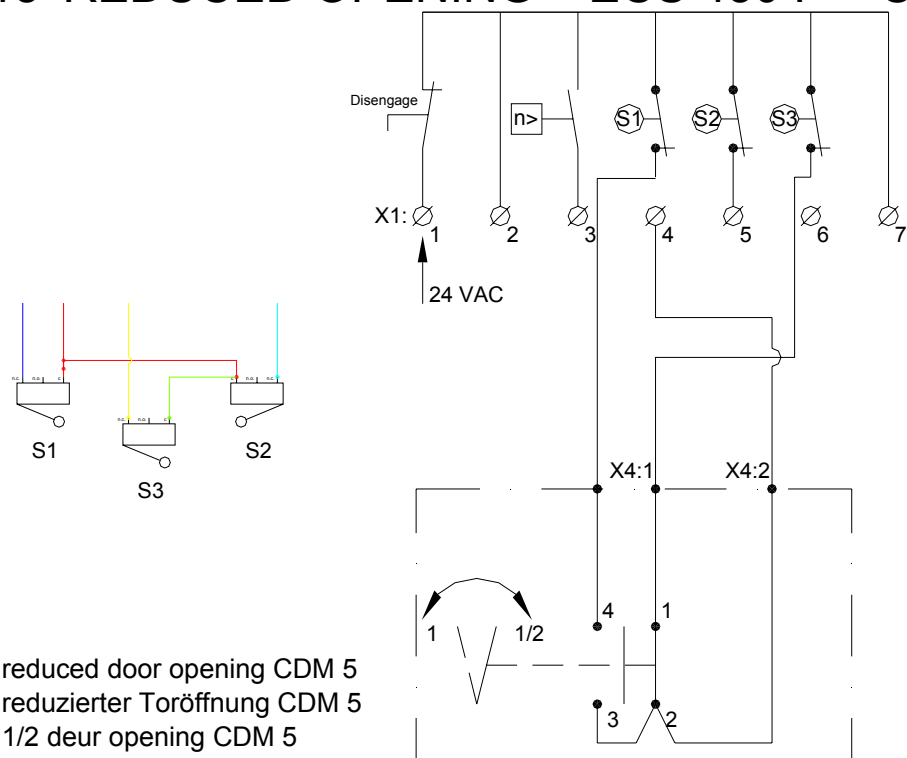
### ▲ CONNECTIONS - Viewed from base

| Mode switch position     |           |      |     |     |     |
|--------------------------|-----------|------|-----|-----|-----|
| Frequency mode:          |           | HIGH |     | LOW |     |
| Presence time (minutes): |           | 5    | 120 | 5   | 120 |
| Sensitivity:             | Low       | 0    | 4   | 8   | 12  |
|                          | med. Low  | 1    | 5   | 9   | 13  |
|                          | med. High | 2    | 6   | 10  | 14  |
|                          | High      | 3    | 7   | 11  | 15  |

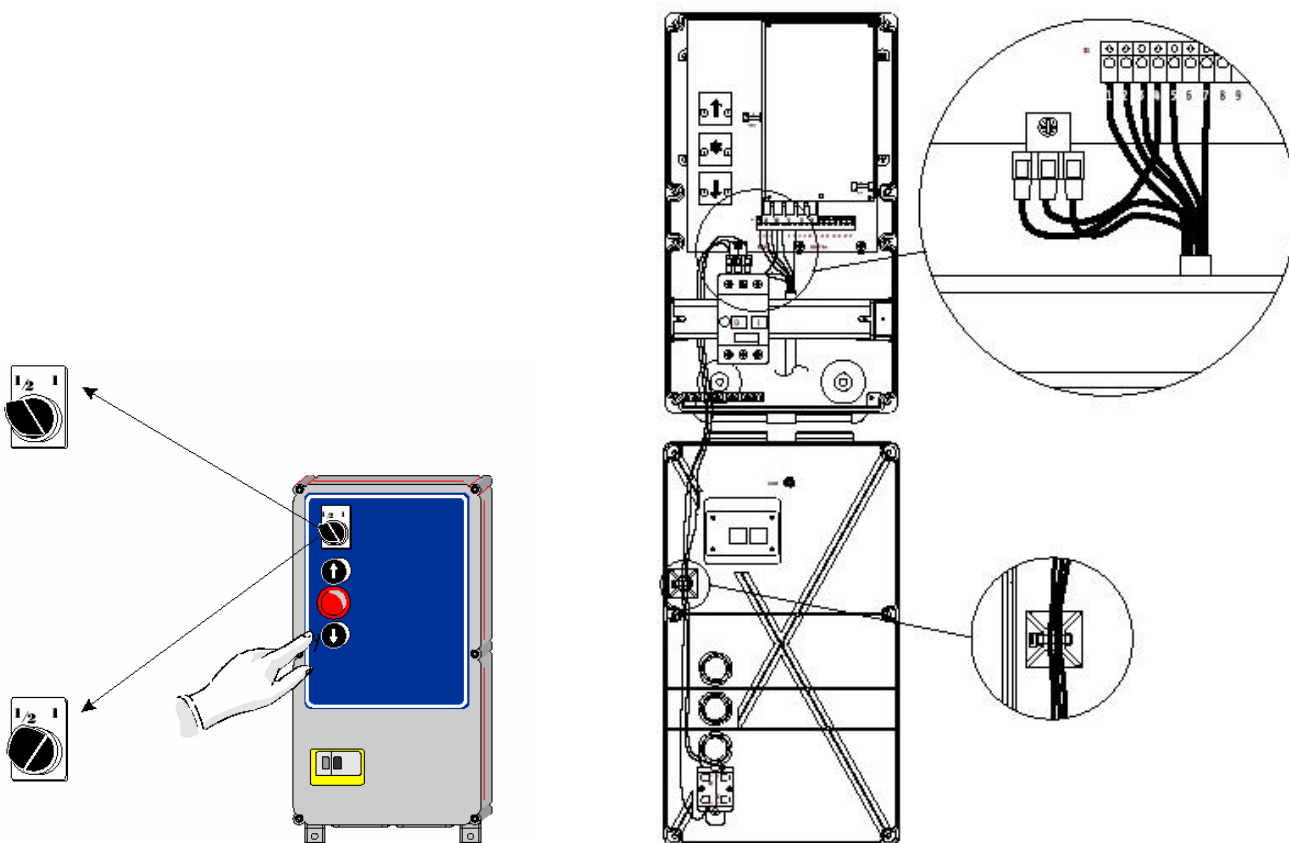
### ▼ SOCKET CONNECTION



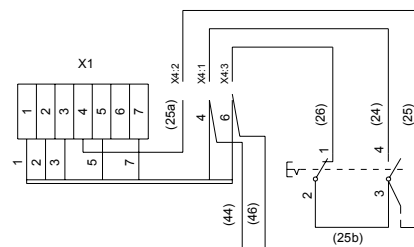
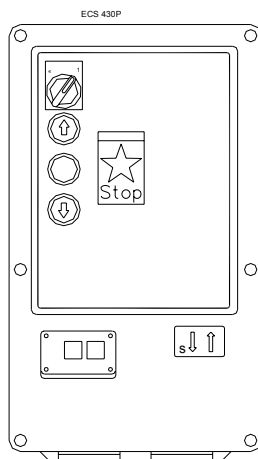
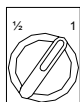
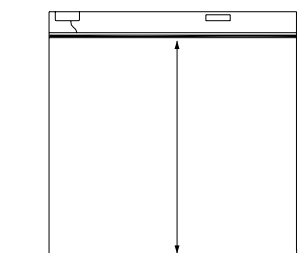
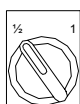
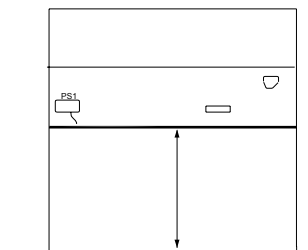
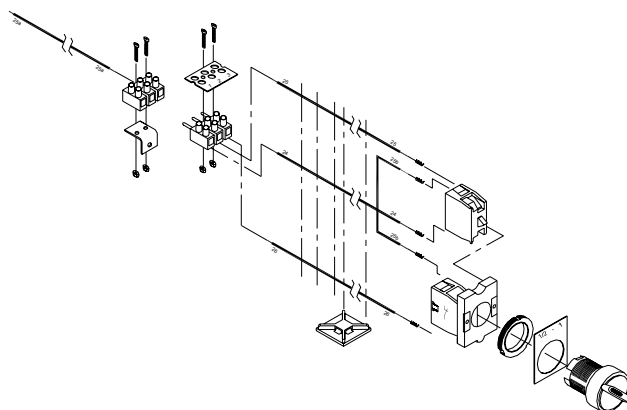
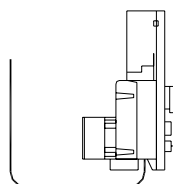
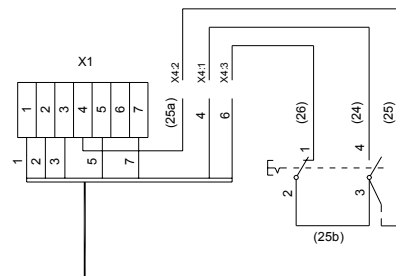
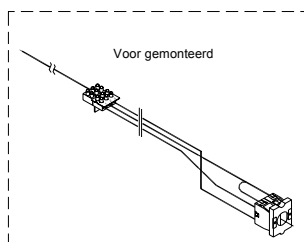
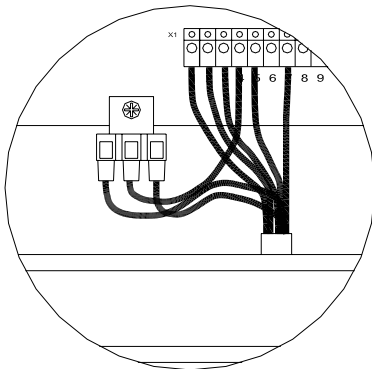
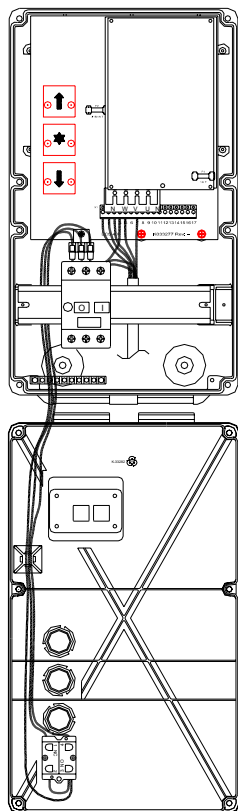
## 15 REDUCED OPENING – ECS 430 P – CDM 5



reduced door opening CDM 5  
 reduzierter Toröffnung CDM 5  
 1/2 deur opening CDM 5



## 16 REDUCED OPENING ECS 430P – CDM6



Additional system  
ECS 400 CDM-6  
Reduced Door travel



## 17 REDUCED OPENING – ECS 930A / 940A\* – CDM 9



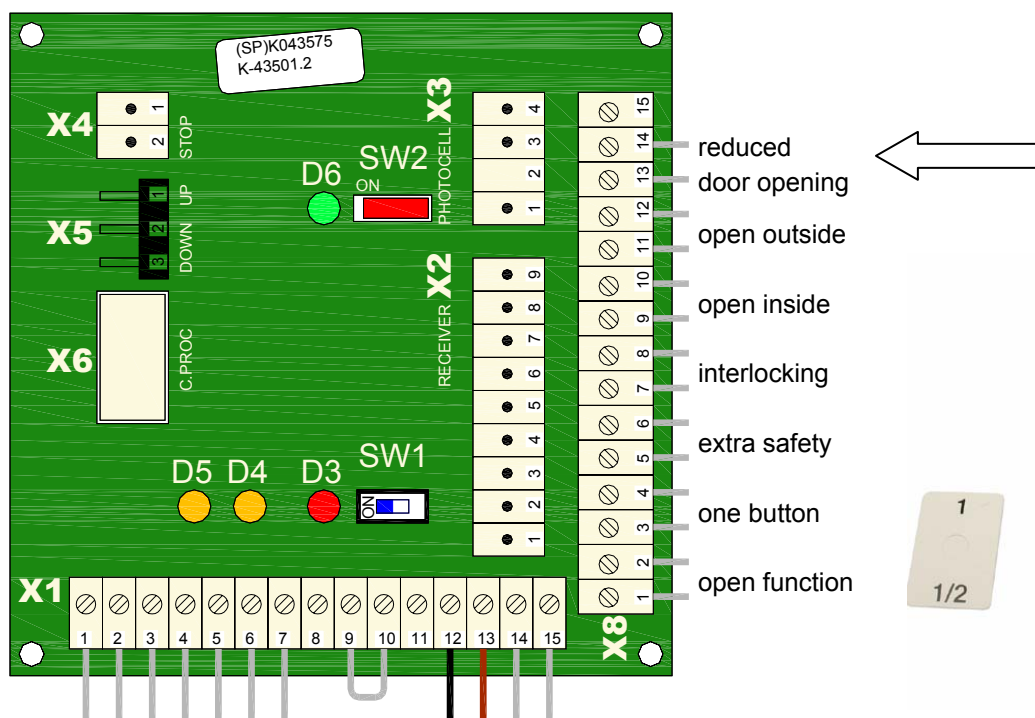
*\*) the ECS 940A for the 855 does not have reduced door travel*

Installing the reduced door travel (K043434) (reduced door opening) on an ECS 930A:



**Dip Switch S2:2 (in the LID of the ECS 930A)** is used to set the position for reduced opening.

- Put the door in the wanted position.
- Turn the DIP Switch S2:2 switch **ON and directly OFF** to store the position in memory.
- Change-over switch in the lid for fully open and reduced position.



## 18 DIPSWITCH SETTINGS – ECS 930A/ 940A – CDM 9

**S1:1** unused.

**S1:2** unused.

**S1:3 ON** gives flashing red light between the limit positions. (Only at Warning lights, not at Traffic lights).

**S1:4 ON** gives red light at fully closed door. (Both at Warning and Traffic lights)

One always gets green light at fully open door if it is connected, no adjustments.

**S1:5 ON** gives flashing red light before automatic closing (**t2**).

**S1:5 OFF** gives red light before automatic closing (**t2**).

(**S1:5 ON** and **OFF** are only valid at Warning lights not at Traffic lights).

**S1:6 ON** disengages "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** gives direction sensing Traffic lights (controls opposing traffic by red and green light).

**S1:7 OFF** gives Warning lights.

**S1:8 ON** gives FR-function. (All commands except safety are delayed 2,5 seconds while warning lights are flashing). At automatic closing **t2** is replaced by the 2,5 seconds. At Traffic lights one gets a steady light during **t2**.

**S2:1 ON** gives DK-function (The Door (Operator) goes always over into dead man's grip down if the safety edge has been activated.)

**S2:2** is used to set the position for reduced opening. (Put the Door in the wanted position; turn the switch ON-OFF. Change-over switch in the lid for fully open and reduced position).

**S2:3 ON** gives automatic closing after passing of the safety photocell and fully open door. (Can be combined with **S2:5 ON**). Works also from reduced open door, safety photocell is then demanded. NOTE! If the Door during automatic closing for some reason is reversed a new acknowledgement signal to the automatic closing function is demanded in order for the Door to close automatically. The same thing goes if the stop function has been activated. Example: If passing of the safety photocell has reversed the Door, one has to pass the safety photocell one more time in order to close automatically.

**S2:3 OFF** gives automatic closing from fully open door (Not working from reduced open door, not allowed).

**S2:4 ON** doubles the adjusted time on **t1** if no acknowledgement has been given, and cuts it by half if acknowledgement is given (Both the safety photocell and additional safety are able to give acknowledgement).

**S2:5 ON** gives automatic closing after additional safety, connected to X8:5-6, has been activated (can be combined with **S2:3 ON**) NOTE! Additional safety is working with a normally open contact.

**S2:6 ON** gives a memory (open) to an interlocked door. If an interlocked door is given an open command it will store this and open when it is not interlocked anymore.

**S2:7** unused.

**S2:8** unused.

Potentiometer **t1**: Time for automatic closing without flashing signal, 4-80 seconds.

Potentiometer **t2**: Time for flashing signal before closing, 3-32 seconds.

Total time (always): **t1+t2**.