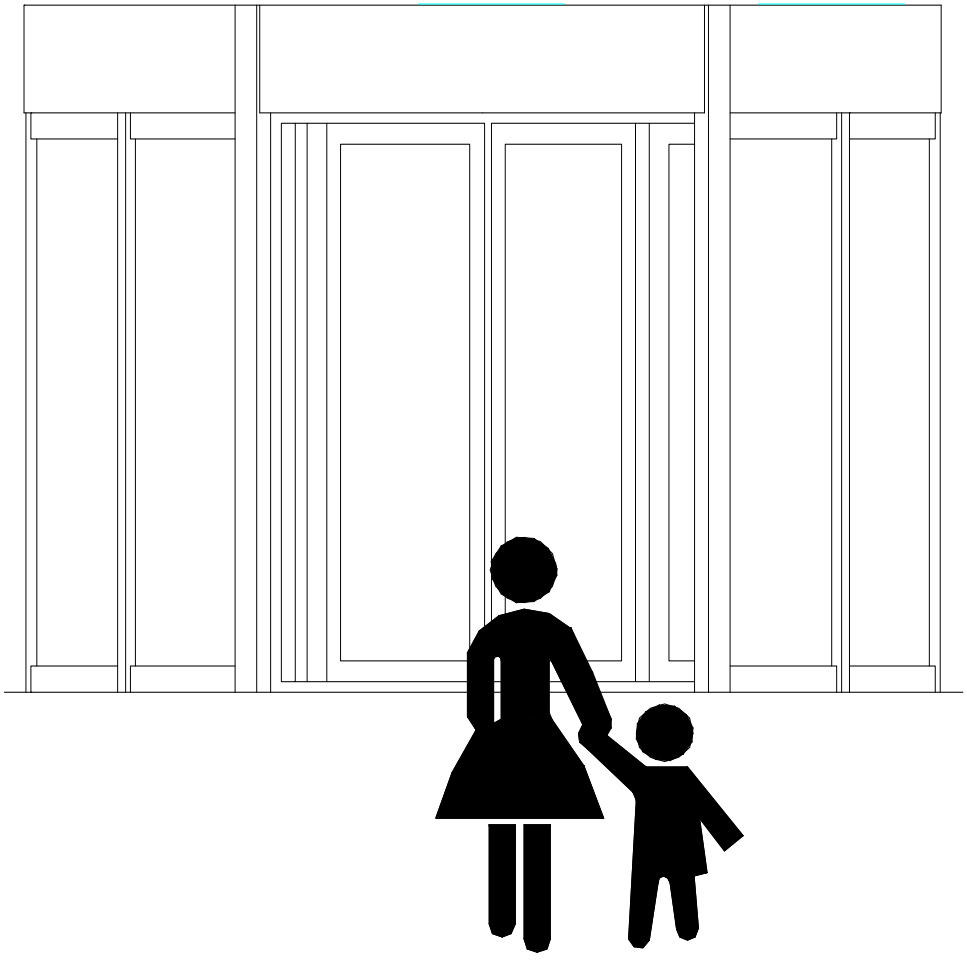
KTC-3/4 MS9

Betriebsanleitung
Operation manual

Operation Manual

KTC-3/4
Revolving Door Comfortline
(Keep manual for future use)



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1 Introduction

1.1 Area of application

The revolving door serves as entrance / exit between two spatially separated areas. It usually serves as connection between the outside and inside of the building.

By means of the technical design and geometry of the device there is almost no direct connection between the two spatially separated areas. As a result, a decrease of draft and noises as well as traffic control between both areas is achieved.

Depending on the version, the revolving door can be locked in order to block the entrance / exit.

1.2 Safety advices

Revolving doors with drive are legally regarded as a machine.
Therefore the following items need to be observed:

- Hazardous electrical voltage! May lead to electrical stroke and severe burns.
- Switch device voltage-free before working at the device and secure against re-switching on.
- Maintenance and works only to be carried out by authorized DORMA personnel

Furthermore the following items need to be observed :

- The gap between the bottom edge of the leaf and the flooring should not exceed a maximum of 8mm.
- Basically, even and gap-free solid floors are preferred to other floorings such as foot scrapping mats. Soft floorings such as carpets are not allowed.
  If a foot scrapping mat is used, it must be fixed to each other and to the floor.
  The gap between the rods must not exceed a maximum 4mm.
- When establishing the rotation speed bear in mind the expected users (handicapped or elderly people). It may lead to a reduction of the DORMA-set speed.
- When the door is in operation, staying inside the door device and near the entrance / exit opening is only allowed for entry and exit purposes of the two spatially separated areas. (except authorized and trained personnel for maintenance works)
- Do not access the ceiling of the door device while in operation.
- Children are only allowed to use the door when accompanied by or under supervision of adults.
- Do not speed up electrically driven turnstile manually.
- Do not enter door device with bulky objects. (Drive door device into summer position and fold over leaves).
- Enter door speedily only when enough opening space is provided.
- After passage, leave the door speedily when enough space is available.
- Keep walking direction within the door device.
- Follow the rotation steadily, do not make any unnecessary stops.
- Do not put body parts or any other objects in the rotation area of the turnstile.
- Door device is no playground: watch for purpose-oriented use of the device, keep clear of playing children.
- A sufficient lighting for the surroundings must be provided.

2 Mech.-/ electronical structure of the control system

This type of revolving door has a rotating turnstile with 3 or 4 leaves positioned around a mid axis in a firm case.
The complete control system is installed in the upper ceiling, which is protected by ceiling plates.

Attention: The device includes wear and tear parts, that need to be exchanged during maintenance. A list of these parts can be provided by the sales department.

2.1 Construction

The KTC-3;4 is available in different versions.
General structure:

- Drum walls made of special aluminium profile with curved glazing or aluminium sheet metal wall with insulation.
- Side columns with operating elements and safety bumper strips.
- Floor ring made of stainless steel angle profiles.
- Fixed ceiling part made of a steel support construction.
- Canopy made of aluminium sheet metal.
- The center part includes a centrically arranged unit with four or three collapsible doorleaves incl. brush seals and hydraulic door closers. The centrically arranged unit is optionally available as showcase.
- Built-in lamps in the lower ceiling.
- Optional turnstile locking via manual bolt locking or electro-mechanical locking.
- Optional with inside or outside nightshield made of special aluminium profile with curved glazing or aluminium sheet metal wall with insulation.

2.2 Drive

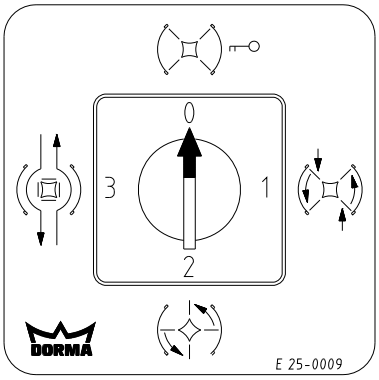
- Contrate worm gear motor (0,55KW) with mounted on spring resistance brake and incremental encoder.
- Toothed belt for transmission of torque.

2.3 Control system

- Microprocessor control system, to control all detectors, proximity switches, motors etc. integrated in the ceiling.
- Motor drive via frequency converter.
- Safety module for redundant monitoring of all safety commands.
- Signal transmission from fixed to rotating part of the door via rotating contact.
- Emergency power supply 230VAC (optional)
- Connection value: 230V, 50Hz, ca. 1kW(+/-10%)

2.4 Control- and operating elements

- Program switch (external or mounted at column) to set the functions:
  „Locking“ „AUTO1“ „AUTO2“ „Summer/Escape“.
- Emergency-off switch inside and outside the door column
- Handicapped push button inside and outside the door column



Program switch

Emergency-off switch

Handicapped push button

3 Installation and initial operation

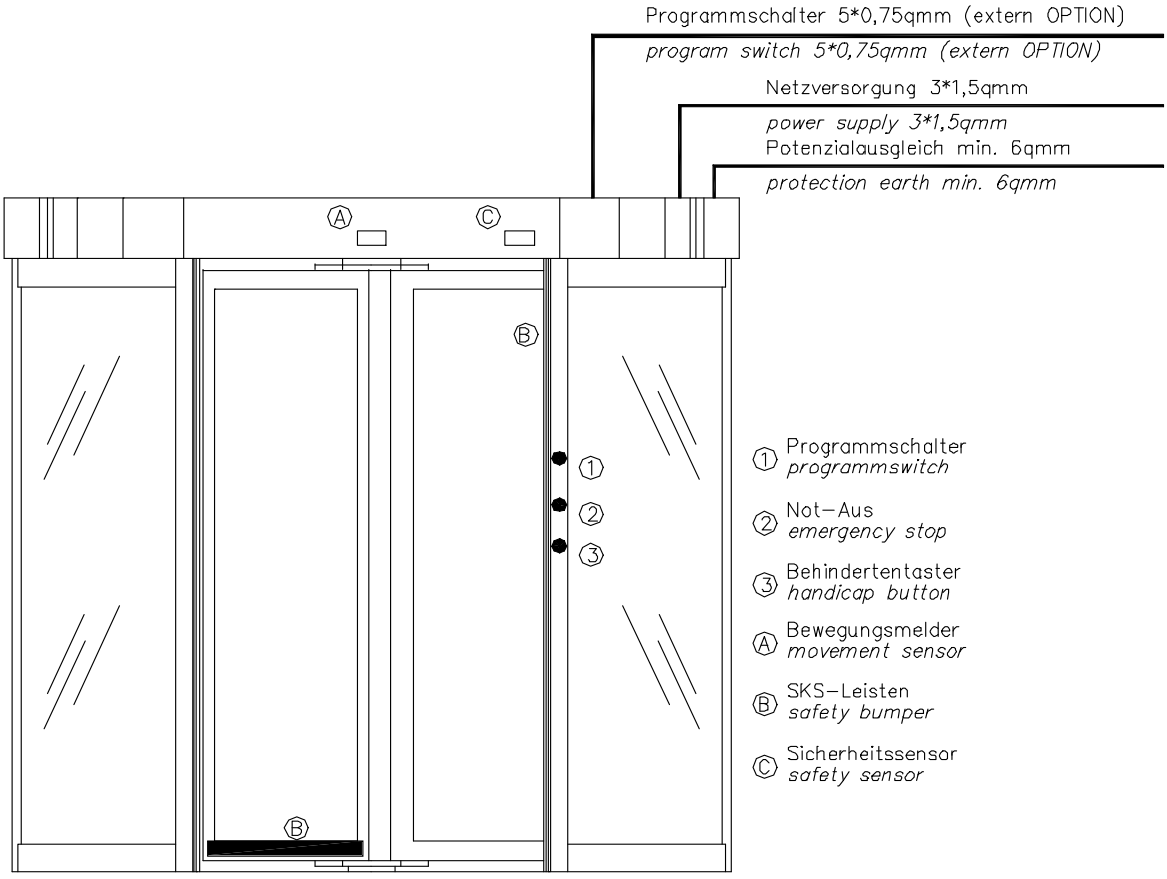
The installation and initial operation have to be carried out by DORMA trained personnel only.
Separate manuals are available.

3.1 Wiring

All cables have to be laid by others and they have to be designed up to a operating peak voltage of 500V in accordance with VDE 0812, VDE 0245 part 202.
Choose only cable types conforming to standards and watch for perfect laying and grounding.

- Equipotential bonding 1x6mm^2 (at the door).
- Supply voltage control system 230V/50Hz H05RR-F 3x1,5mm^2 (L,N,PE), fuse protection 10A
- Program switch external LIYY 6x0,75mm^2 number-coded data cable without PE.

Cable lengths are meant for up to approx. 50m distance between door and switch cabinet
For longer distances choose the next in size cable cross section



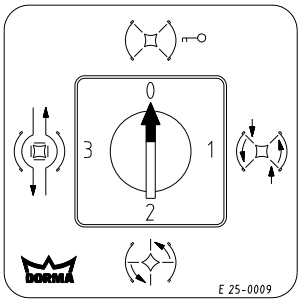
4 Operation

The safety advices indicated under item 1.2 must be closely followed when operating the door device.

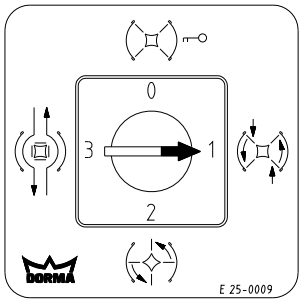
4.1 Program switch

This switch is positioned at the inner column of the door device or outside. The following operation modes can be chosen:

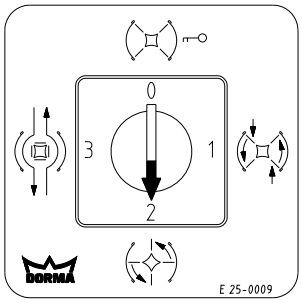
(Supply voltage must be available and the emergency-off switch must be open.)



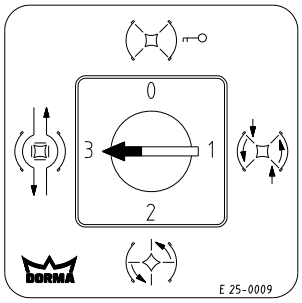
Position 0
Locking



Position 1
Automatic 1

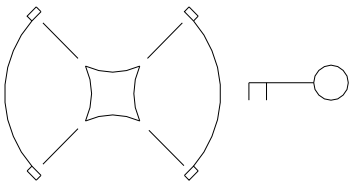


Position 2
Automatic 2



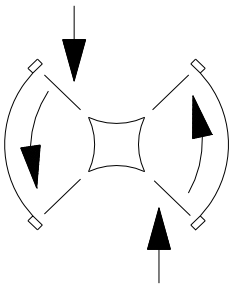
Position 3
Summer/Stop

4.1.1 Position 0 „Locking“



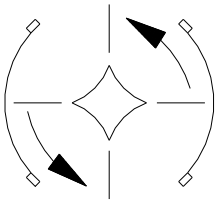
The door rotates with positioning speed approx. 200mm/sec. into the locking position and stops there.
The door may now be locked manually or automatically (depending on the chosen option, see 7.3 and 7.4).
The lighting is switched off automatically.
For a regular door operation, all locks have to be open.
The program switch position must remain in position 0 „locked“, as long as the door is locked.

4.1.2 Position 1 „Automatic 1“



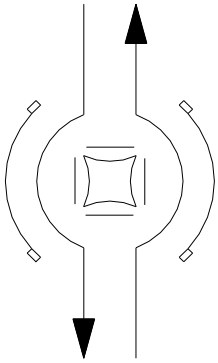
Upon activation of a radar- or movement sensor, the door device is set in motion and speeds up to walking speed approx. 600mm/sec.. After the door area is being left, the device switches automatically to positioning speed approx. 200mm/sec. and remains until the next activation in X-position (starting position).

4.1.3 Position 2 „Automatic 2“



The door device rotates constantly with positioning speed approx. 200mm/sec.. After activation of a radar- or movement sensor, the door speeds up to walking speed 600mm/sec.
After the door area is being left, the device switches automatically to positioning speed approx.200mm/sec., until a movement sensor is used again.

4.1.4 Position 3 „Summer/Stop“



The door device rotates with positioning speed approx. 200mm/sec. into the summer position and remains there.
Now the doorleaves can be opened clockwise as shown in the graphics.
The windbrake version requires the use of the emergency-off switch for the doorleaves to open.

4.2 Handicapped push button

This switch is positioned inside and outside the door column. By using the handicapped push button in the operation mode „Automatic 1 or 2“ the speed is reduced to positioning speed for one rotation. Then the door speeds up to regular walking pace speed.

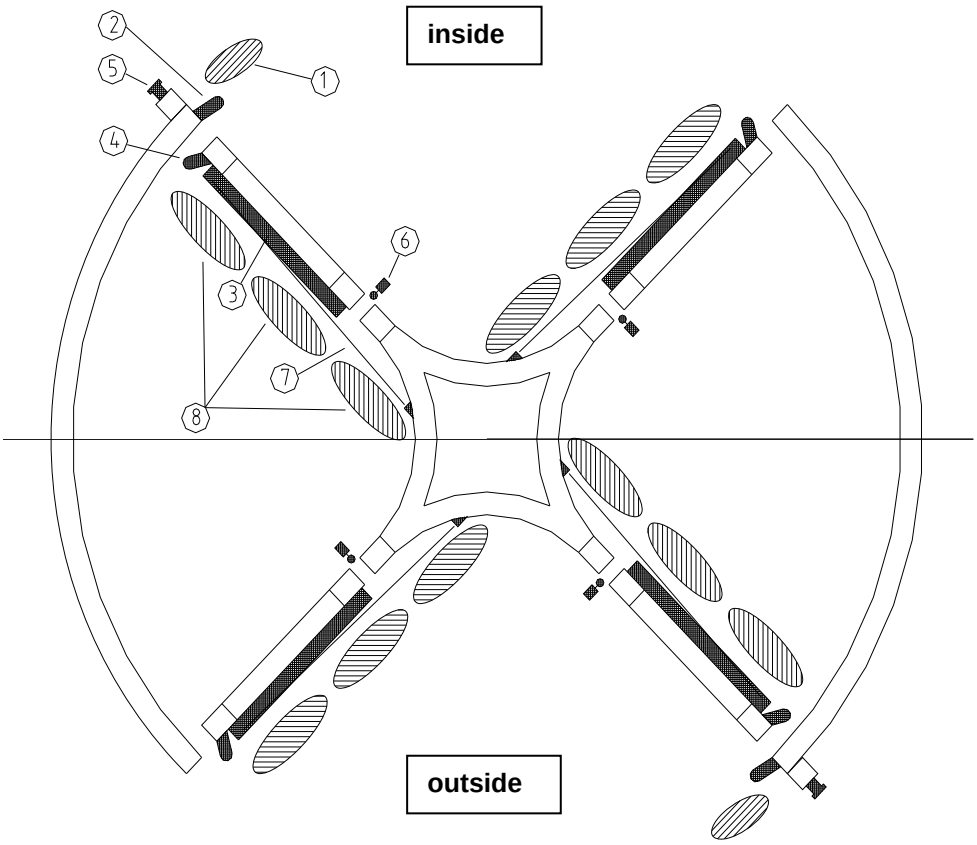
4.3 Movement sensor (radar or PIR)

This sensor is placed inside or on the canopy. When the radar- or PIR movement sensor is activated, the door device speeds up to walking pace speed. After the door area is being left, the device switches automatically to positioning speed.

5 Safety devices

1. Attendance sensor (canopy)
2. Safety bumper strip (column, vertical)
3. Safety bumper strip (bottom door leaf, horizontal)
4. Safety bumper strip (door leaf lateral, vertical)
5. Emergency-off switch (door column inside (outside*****))
6. Door breakout end switch (door leaf)
7. Light barrier (bottom door leaf, horizontal)*****
8. Attendance sensor (upper door leaf)*****

*optional (stipulated by DIN 18650)



5.1 Attendance sensor (canopy) (IRIS ON)

These non-contact operating sensors are placed in the canopy.
Safety sensors are placed in the canopy in order to detect obstacles at the main closing edges of the entrance/exit area. When an obstacle is detected at least 800mm before the door leaf reaches the column, the device switches immediately to positioning speed until the leaf enters the drum wall or the safety sensors no longer detect any obstacles.
Is an obstacle detected by the sensors for more than 1 min or the floor changes due to rain, snow or dirtc., the sensors recognize and learn the new conditions in order to guarantee the highest possible safety. During this period of time the door rotates with positioning speed in the safety area before the column.
The sensors are being checked for perfect operation by the control system, depending on the version (3 or 4 doorleaves) 3 or 4 times which each rotation. The device stops in case the sensors breakdown.

5.2 Safety bumper strips

These strips are positioned at all safety-relevant places, such as

- column, vertical
- door leaf, horizontal
- door leaf, vertical

Furthermore the windbrake, which is optionally available is unlocked, so that the doorleaves can break out.

5.3 Emergency-off switch

This switch is placed inside and outside the door column. By using the emergency-off switch, the door device can be stopped at any time. It must be open for a re-start.

5.4 Door breakout end switch (door leaf)

This switch is placed at each door leaf. By opening a door leaf during rotation, the device stops immediately. For a re-start, the doorleaves must be positioned in their basic position again.

5.5 Light barrier (Microcell)

These non-contact operating sensors are placed horizontally in the foot area between door leaf and center. Upon detection of persons, the above mentioned safety devices stop the door device immediately. After the safety area is being left, the door device starts by itself.

5.6 Attendance sensor, (4safe)

- Upper door leaf
- Upper center leaf

These non-contact operating sensors are installed at the upper part of the door leaf, center leaf and cover a certain area ahead of the doorleaves in rotation direction. In case a person is detected by one of these sensors, the drive switches to positioning speed. After the detection area is being left, the door increases the speed up to walking speed again. The detection area of the sensors is variable and must be adjusted according to the type of user. A knock over of persons must be avoided at all times.

5.7 Speed control

DORMA revolving doors, type KTC may only be adjusted to a maximum of 750mm/sec. In case of another adjustment, please bear in mind the expected user circle like handicapped or elderly people. A knock over of persons must be avoided at all times. Possibly the pre-adjusted speed must be reduced. Due to reasons of technical safety, the speed may not be exceeded by more than 750mm/sec. without permission of DORMA. The speed adjusted by DORMA is 600mm/sec.

5.8 Control system

The control system of the device is positioned in the ceiling. It is a self-monitoring system, which identifies and indicates defects and malfunctions immediately.

5.9 Doorleaves

In case of panic the doorleaves can be folded over manually, (max. force $\leq$ 220Nm).
The doorleaves must be put back into their basic position to assure a regular operation.

6 Lighting

The lighting is switched on all the time, as long as the door device is unlocked. If the device is furnished with low voltage halogen lamps, please use only lamps with a max. 12V/20W.
The use of HQ lamps / fluorescent lamps are not allowed because of possible interactions with the safety sensors. Lighting around the the door device can also lead to problems and is therefore not advisable.

7 Options

7.1 Manual Nightshield

The KTC-3/4 is available with a manual nightshield. The locking is effected via a closing cylinder which is placed inside each nightshield segment. For a safe operation of the device it is necessary, that the nightshield segments are also locked in „open“ position!

7.1.1 The locking of the door device:

1. Program switch is **not** in „locking“ position.
2. Use emergency-off switch.
3. The door device stops immediately. Fold over door leaf to enter the nightshield area.
4. Unlock the locked nightshield in „open“ position by means of a square spanner.
5. Close nightshield manually.
6. Use a square spanner at the lock to slide and lock the locking bars into the provided floor- and ceiling openings. If necessary, adjust the alignment of the locking bars to floor and ceiling manually. Lock closing cylinder.
7. Unlock emergency-open switch and put program switch in „locking“ position.
8. Door device rotates slowly and automatically into the locking position. The light is being switched off then automatically.

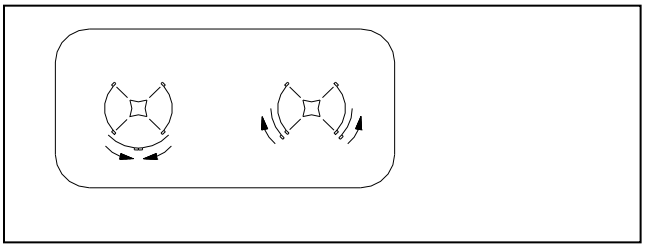
7.1.2 The opening of the door device:

1. Put program switch in „Automatic“ position, the light is being switched on automatically, the door device rotates.
2. Use emergency-off switch.
3. The door device stops immediately. Fold over door leaf to enter the nightshield area.
4. Unlock nighshield. Open closing cylinder and unlock locking bars with a square spanner.
5. Open nightshield manually.
6. Lock nightshield in „open“ position with a square spanner.(floor opening)

6 Unlock emergency-off switch, door device operates in chosen program mode.

7.2 Automatic nightshield

The KTC 3 / 4 is available with automatic night shield. The locking is carried out with a three-stage „dead man switch“. The use of the dead man switch causes the motor-driven opening and/or closing of the night shield. If the night shield is closed, it is locked via a electro-mechanical locking. While the door is in operation, it is necessary to observe the door and pay attention that no persons are inside.



7.3 Manuale Door leaf locking

The KTC-3/4 is optionally available with door leaf locking. The locking is carried out by means of a closing cylinder at the door leaf.
To proceed:

1. Put program switch into position 0 (locking).
2. The door device rotates into the locking position and remains there.
3. Lock the locking bar with a square spanner into the provided locking opening in the ceiling.
4. Lock closing cylinder.
5. Make sure that the program switch remains in position 0.

7.3.1 Unlocking procedure:

1. Unlock door leaf locking. Open closing cylinder and unlock locking bars with a square spanner.
2. Choose requested program version at program switch.

7.4 Automatic door leaf locking

In program switch position „locking“, the turnstile rotates into the locking position (see also 4.1.1). The door locks automatically via electro-mechanical operated bolts into the locking brackets of the doorleaves, when the door reaches the locking position. There is no lighting when the device is locked.

7.5 Windbrake

The hydraulically positioned doorleaves can fold over in case of stronger winds and the device´s drive is being switched off at the same time. To avoid this, windbrakes are optionally available to lock the doorleaves in addition electro-mechanically. On response of the safety bumper strips, the canopy sensors or the emergency-off, the windbrakes are de-activated and the doorleaves can be folded freely.

7.6 Trouble output (optional)

Malfunctions and defects can be analyzed via a potential-free change-over contact at the control system (terminal 30/31/32). Smaller troubles can be resetted with the program switch.
Put the program switch in position 0 „locking“ and leave it for approx. 3sec. Put the program switch afterwards back into the Automatic 1 or 2 positon.

8 Troubles

In case of troubles at the door device call the following Service Hotline:
phone: 0800/5240246 (mon.-fr. 7:00 - 21:00 h and sat. 7:00 - 17:00 h)

Possible causes and solutions may be found in the following chart.

Adjustments at the device may only be carried out by trained and authorized DORMA personnel.

8.1 Trouble shooting

The door device is not in rotation, please check the following items:

- Supply voltage available?
- Emergency-off switch open (inside/outside)?
- Program switch in correct position?
- Door blocked by obstacles?
- Door leaf not in basic position (only breakout leaves)?
- Light push button free of dust and dirt?

Press emergency-off switch in case of any undefined noises. If there is still no function after the above mentioned items have been checked, please inform the Service Hotline
Smaller troubles can be resetted with the program switch.
Put the program switch in position 0 „locking“ and leave it for approx. 3sec. Put the program switch afterwards back into the Automatic 1 or 2 positon.

9 Initial operation after a power failure

After a power failure the device returns to the adjusted operation mode by itself.

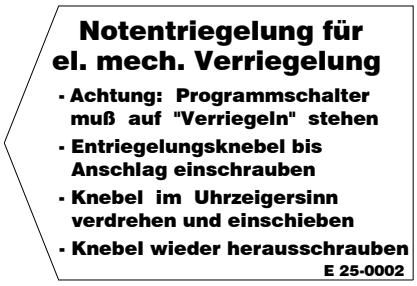
9.1 Opening in case of power failure or breakdown of the automatic door leaf locking.

9.1.1 Door devices with manual door leaf locking

1. Program switch is position 0 (locking).
2. Fold over doorleaves to reach locking.
3. Unlock door leaf locking. Open closing cylinder and unlock locking bars with square spanner.

9.1.2 Door devices with automatic door leaf locking (optional)

Program switch is in **„position "0"** (locking), the door device ist locked.
Use emergency-off switch.
Unlock by means of an emergency unlocking bar, screwed in the tapping of the locking bolt. Push upwards.
Unscrew emergency unlocking bar again.
Door can now be put into operation or doorleaves can be folded over.



Aufkleber

10 Maintenance and Care

10.1 Maintenance

The door device has to maintenanced by DORMA Service personnel according to the following items to assure safe and long-term operation.

- The device has to be checked and maintenanced before the initial operation and at least once a year according to the maintenance manual (Regulation for power-operated doors ZH1/494 edition 04.89).
- See separate manual for maintenance „*Maintenance KTC-3/4 MS9*“ .
- We advise to conclude a maintenance contract with DORMA.
- In order to avoid unintentional moves while cleaning the device, put program switch in position 3 (Stop) and push emergency-off switch.

  Wipe floor and complete door with a damp cloth only!
  Too much wetness might cause damage at the turnstile or might lead to shortcuts at electrical parts.

10.2 Daily cleaning

- Clean floor or floor mats, dragged along parts (pebbles etc.) can disturb the function of the door device.
- Dirt can build up under the footscrapping mats profiles. The mat level is increased and that results in malfunctions of the door device and could also jeopardize the users. Regular cleaning (if necessary removal and cleaning of the mat) and fixing of the footscrapping mats can avoid the above mentioned condition.
- Clean lower ceiling area in order to avoid scratching caused by dragged along smal parts.
- Push emergency-off switch in program mode Automatic 2 to check its function (device stops).

10.3 Weekly cleaning

- Clean surfaces:
  Use regular glass cleanser for all the glass.
- Wipe rust-free surfaces with sulphone soap and a non-scratchy cloth.
  Die Sulfonseife hinterläßt eine schützende Schicht.
- Clean powder coated surfaces with water and soap.
- Clean anodized surfaces with non-alkaline soft soap (ph-level between 5,5-7)
- Clean/vacuum brushes. Use hair shampoo for stronger dirt. Otherwise the dirt in the brushes might also scratch the surfaces nearby.

10.4 Yearly maintenance check up

The device must be checked for perfect function at least once a year by authorized DORMA Service personnel.

11 Technical data of the device

Supply:	230VAC; 50-60Hz
Fuse by others	1x**C**16A
Power input Automatic 2:	approx. 400W (excl. lighting)
Power input, Automatic 1, Standby:	approx. 250W (excl. lighting)
Power input in locking mode:	approx. 120W (exkl. lighting)
Lighting:	max. 500W (230VAC)
Motor:	1 frequency-controlled A.C. with 550W
Control voltage:	24VDC for sensory, microprocessor etc.
Rotation speed:	max. 600mm/s
Foundation earther:	min. 6mm^2
Admissions: depends on safety options	Machine regulatins 98/37/EG with DIN 18650-1, -2: 2005 BGR 232: 2003 Low voltage regulation 73/23/EG with EN 60335-1: 2005 in connection with DIN 18650-1:2005 AutSchR: 1997
24VDC-power supply:	SELV, EN60950:1992+A1+A2+A3+A4+A11, Cert.-no.R9452325 TÜV Rheinland
Protection mode:	IP54
Temperature range:	-20°C up to +60°C
Humidity:	dry

Subject to technical changes.

12 Operation at residual current operated protection switch *(e.l.c.bs (earth-leakage circuit-breakers))*

Danger!

The controllers have an internal mains rectifier. In the event of a short-circuit to frame, a DC fault current can prevent the activation of the AC-sensitive or pulse-current sensitive e.l.c.b. and thus block the protective function for all electrical equipment operated on this e.l.c.b..

We recommend the following to protect persons and animals (DIN VDE 0100):
– Pulse-current sensitive e.l.c.bs in machines where controllers are connected to a single-phase mains (L1/N).
– All-current sensitive e.l.c.bs in machines where controllers are connected to a three-phase mains (L1/L2/L3).Residual current operated protection switches only to be installed between supply and drive controller.
E.l.c.bs must only be installed between mains supply and controller.