

KTV-A MS9

Betriebsanleitung
Operation manual

Original Operation Manual

KTV-A Revolving Door Varioline (Keep manual for future use)



Revision index:

Rev.1	Revision	06.07.07
Rev.2	General revisions	
Rev.3	Extension with glass ceiling and breakout turnstile and General revisions	25.03.08
Rev.4	Description of the safety devices	13.11.08
Rev.5	Sound level	17.02.09
Rev.6	Operation at residual current operated protection switch	04.07.11

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1 Introduction

1.1 Range of application

A revolving door serves as entrance / exit between two spatially separated areas. Normally the revolving door is being used to connect the outside area with the inside of the building.

Due to the technical design and the geometry of the device, there is no direct connection between these two spatially separated areas. This leads to a reduction of draft and noise as well as a traffic control between these two areas.

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

1.2 Safety advices

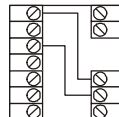


Revolving doors with drive are legally regarded as a machine. Therefore the following items have to be observed:

- Hazardous electrical voltage! May lead to electrical stroke and severe burns.
- Before working on the device, switch voltage-free and secure against restarting.
- Maintenance and all other works have to be performed by authorized personnel only.

The construction also requires observation of the following items :

- The gap between bottom leaf edge and flooring should not exceed a maximum of 8mm.
- Even, non-split solid floors are basically preferred against other coverings such as foot scrapping mats. Soft coverings like carpets are not allowed. In case a foot scrapping mat is requested, it has to be fixed to the floor and each other. The gaps between the rods may not exceed a maximum of 4mm.
- Possible users (handicapped or elderly people) have to be taken into consideration when determining the rotation speed. The speed, pre-adjusted by DORMA, may be reduced if necessary.
- Staying within the door device or close to the entrance / exit opening is only allowed while the door is in operation for the duration and the purpose of entering or leaving the two spatially separated areas (except for authorized personnel during maintenance).
- The ceiling is not accessible during door operation.
- Children may only enter the door device when accompanied by adults.
- Do not speed up the electrically operated turnstile manually.
- Do not enter the door device with bulky objects (device with optionally collapsible doorleaves: drive in summer position and fold over leaves)
- Enter door device speedily when enough opening space is available.
- Leave door device speedily when enough opening space is available.
- Keep walking direction while inside the door device.
- Follow the rotation constantly, do not stop unnecessarily.
- Do not expose body parts or any other objects to the rotation area of the turnstile..
- The door device is no playground: watch for adequate use of the device, playing children must be kept away.
- Sufficient surrounding lighting must be available.
- In case of glass breakage of the ceiling (option Atrium) or the doorleaves, the door has to be set out of order immediately and blocked. DORMA Service has to be informed about necessary spare parts immediately.



2 Mech./ electronical structure of the control system

A turnstile with 3 or 4 leaves rotating around a mid axis in a solid cage is characteristic for this type of revolving door.

The complete control system of the door device is installed in the upper ceiling or in the floor, protected by ceiling plates or floor covers.

Attention: Wear parts are included in the device that need to be exchanged during maintenance. A list of wear parts can be obtained from the sales department.

2.1 Construction

The KTV-A is available in different versions.

General structure:

- Drum walls made of special aluminium profiles with bended glazing or aluminium sheet metal with insulation.
- Side columns with operational elements and protection strips.
- Floor ring made of stainless steel angle profiles.
- Ceiling made of DORMA aluminium profile system with canopy made of bended aluminium cant sheet metal.
- Ceiling is optionally available in a glass (TVG) version, depending on version with or without ceiling ring.
- Fixed turnstile with 3 or 4 doorleaves incl. brush sealings.
- Optional with fine-framed or collapsible doorleaves.
- Turnstile lock via manual bolt lock or electro-mechanical lock (optional). Not possible with optional glass ceiling.
- Night shield (inside or outside running) made of special aluminium profile with curved glazing or aluminium sheet metal wall with insulation.
- Integrated night shield lock with manual bolt lock (standard) or electro-mechanical bolt lock (optional). Not possible with optional glass ceiling.

2.2 Drive

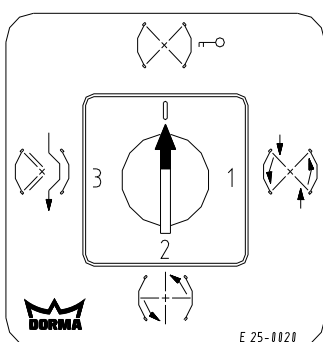
- 1 rotary current motor (60W) with attached single-face clutch.
- Toothed belt for torque transmission.

2.3 Control system

- Microprocessor control system, for control of all sensors and motors etc. integrated in the ceiling or optionally in the floor or external (maximum cable length 20m).
- Motor driven by frequency converter.
- Safety module for a redundant supervision of all safety instructions.
- Signal transmission from the fixed to the rotating part of the door via rotating contact.
- Emergency power supply 230VAC (optional)
- Connected load: 230V, 50Hz, approx. 1kW(+/-10%)

2.4 Control- and operational elements

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



Program switch



Emergency-off switch



Handicapped push button

3 Assembly and initial operation

Assembly and initial operation may only be performed by authorized DORMA personnel according to separate manuals.

3.1 Wiring

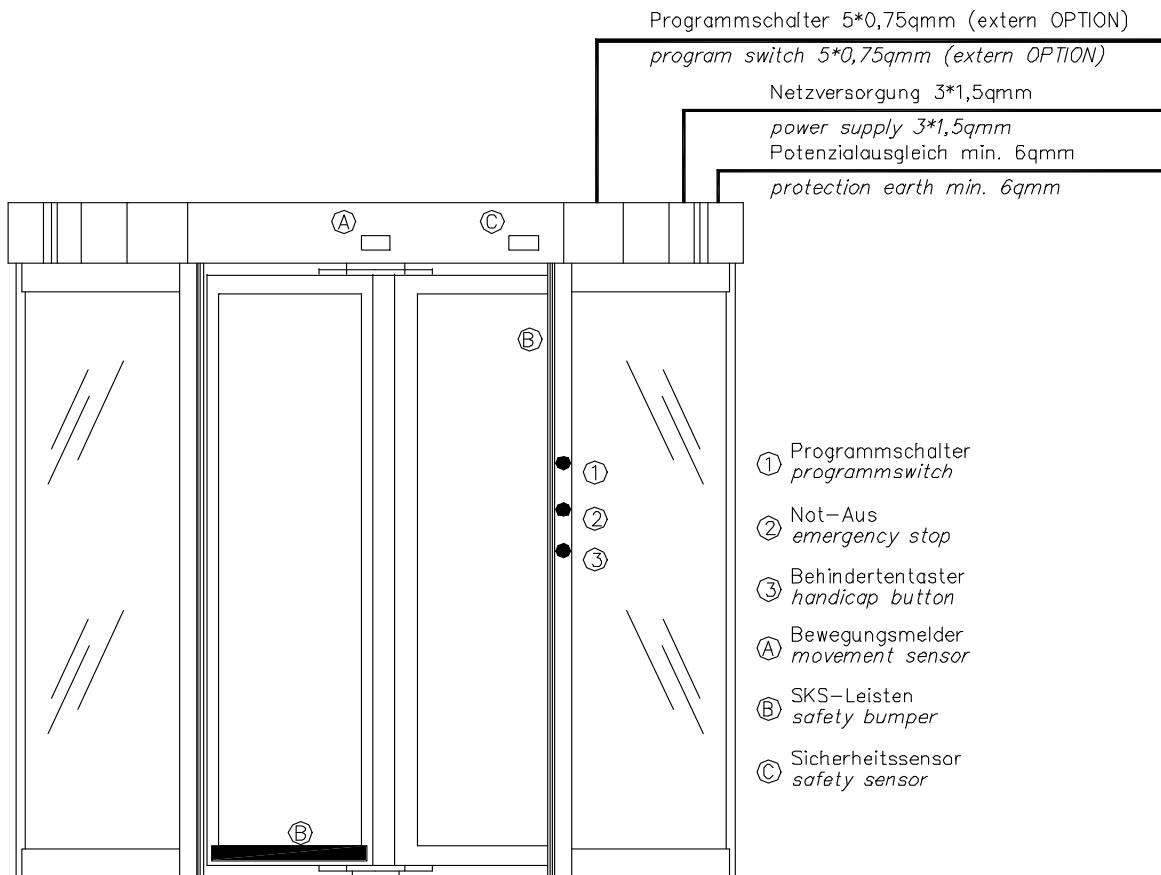
All wiring has to be laid by others and has to be designed for a maximum operating voltage up to 500V in accordance with VDE 0812, VDE 0245 part 202.

Use standardized cable types and watch for correct wiring and grounding.

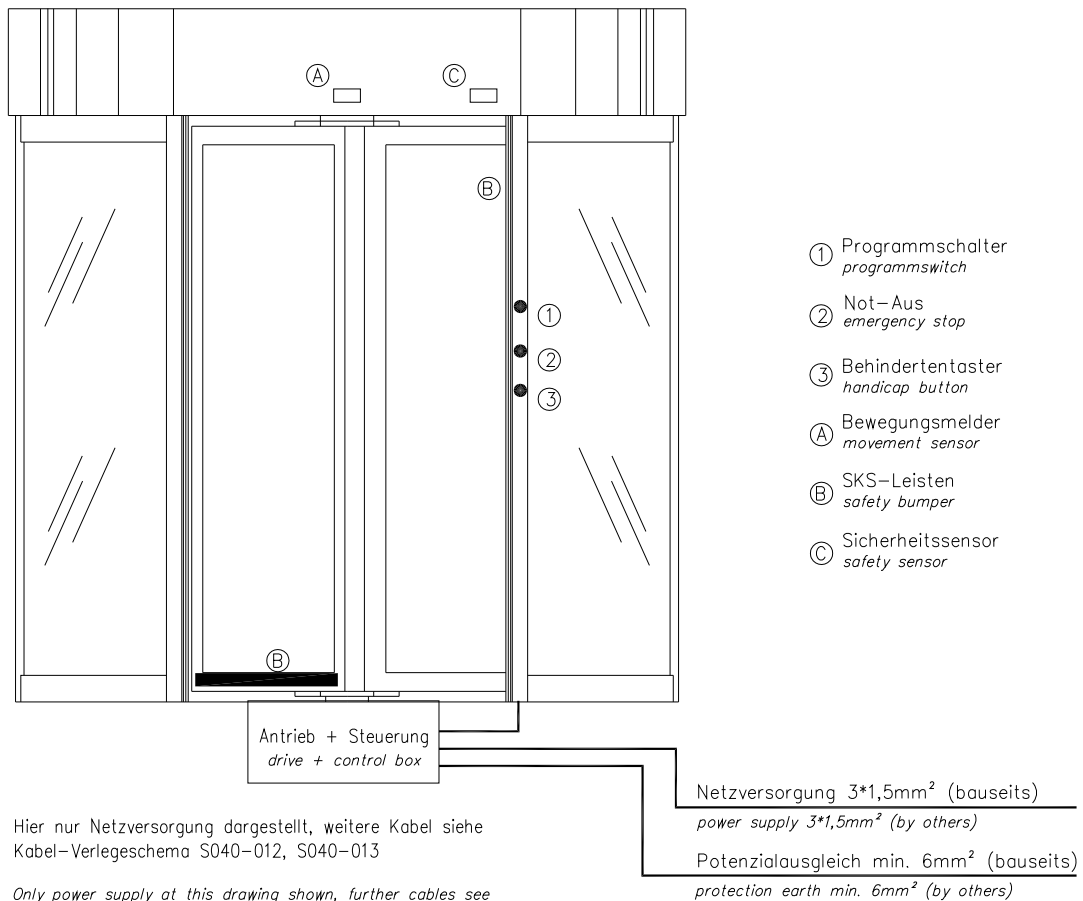
- Equipotential bonding 1x6mm² (at door).
- Supply voltage control system 230V/50Hz H05RR-F 3x1,5mm² (L,N,PE), fuse 10A
- External program switch LIYY 6x0,75mm² number-coded data cable without PE.

Cable lengths up to approx. 50m distance between door and control cabinet. For larger distances choose next size of cable cross-section.

3.1.1 Wiring upper floor drive



3.1.2 Wiring underfloor drive



4 Operating instructions

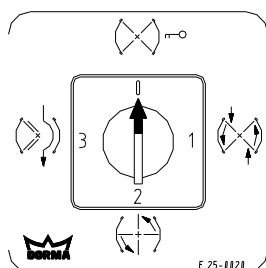
Pay attention to the safety advices given under 1.2 when operating the door device.



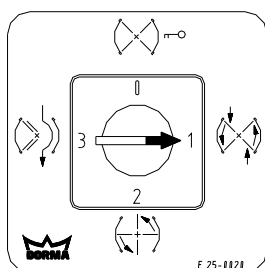
4.1 Program switch

With the program switch (at the inner column of the door device or external) the following operation modes may be chosen:

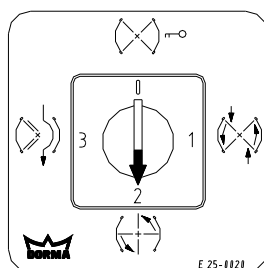
(Supply voltage must be available and the emergency-off switch must be open in order to put the device into operation)



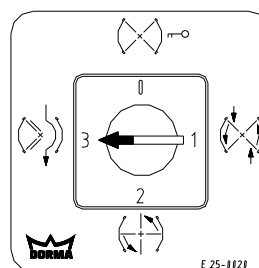
Position 0
Locking



Position 1
Automatic 1

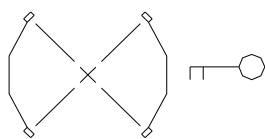


Position 2
Automatic 2



Position 3
Summer/Stop

4.2 Position 0 „Locking“

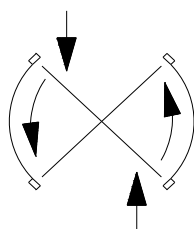


The door turns with positioning speed approx. 200mm/sec. into the locking position and stops there. Now the door can be locked either manually or automatically (depending on chosen option, see 7.3 and 7.4).

The lighting is switched off automatically. For a regular operation all locks have to be open.

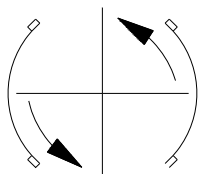
As long as the door is locked, the program switch position must remain on position 0 „locked“.

4.3 Position 1 „Automatic 1“



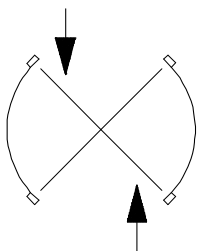
When activated by a radar- or movement sensor, the door device starts turning and speeds up to walking pace. After leaving the door area, the device automatically switches to positioning speed and remains in X-position (basic position) until the next activation.

4.4 Position 2 „Automatic 2“



The door device turns constantly with positioning speed. When activated by a radar- or movement sensor, the door device starts turning and speeds up to walking pace. After leaving the door area, the device automatically switches to positioning speed until a sensor is activated again.

4.5 Position 3 „Summer/Stop“



The door device turns into the next basic position and remains there. The turnstile remains blocked until the emergency-off switch is activated again. The door can then be operated manually.

4.6 Handicapped push button (optional)

This switch is positioned inside and outside the door column. The speed of the device is reduced for one rotation, when using the handicapped push button in operation mode „Automatic 1 or 2“. Thereafter the device speeds up to regular walking pace.

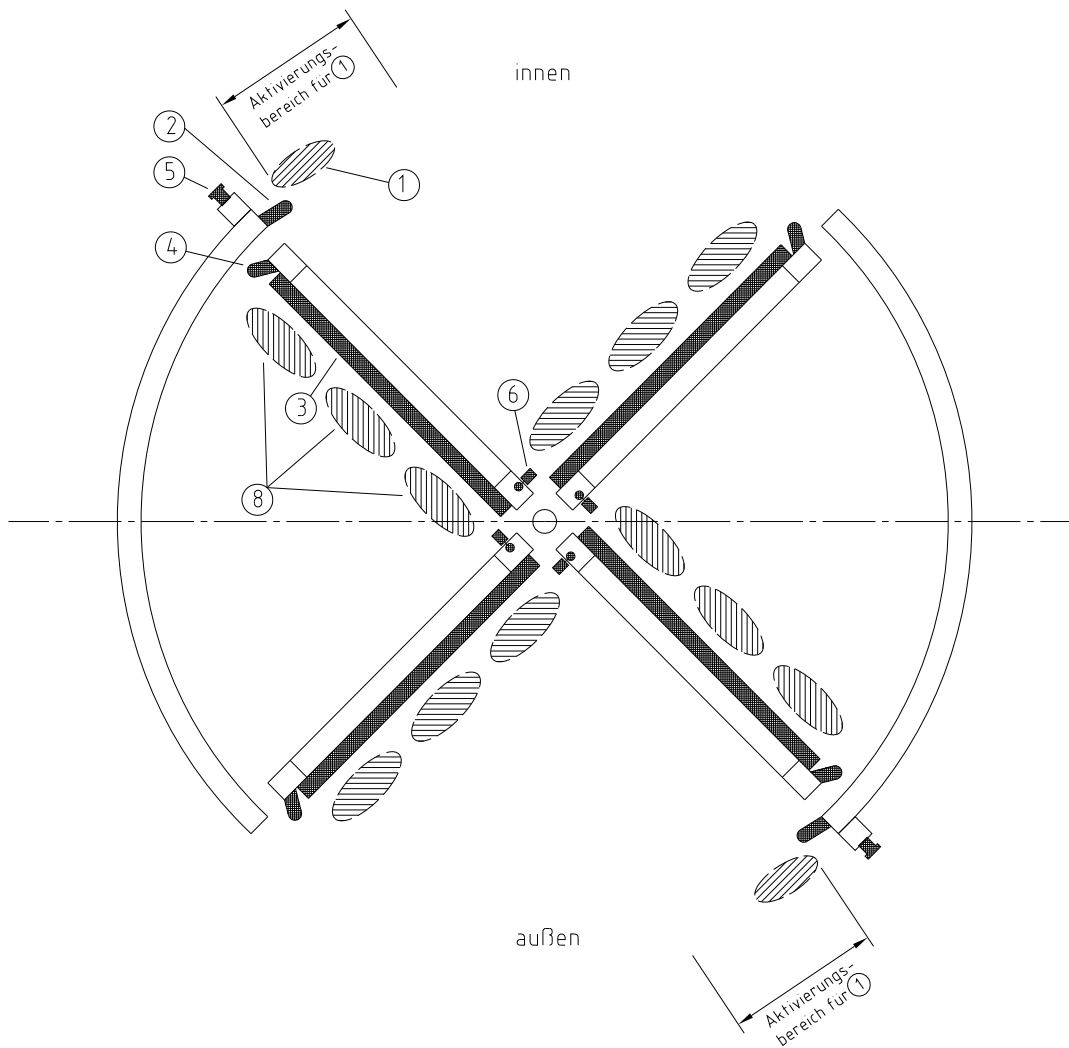
4.7 Movement sensor (Radar or PIR)

This sensor is positioned in or on the canopy or on the ceiling in case of optional glass ceiling. When Radar or PIR sensor is activated, the device speeds up to walking pace. After leaving the door area, it switches automatically to positioning speed.

5 Safety devices

1. Presence sensor (canopy, ceiling)
2. Safety bumper strip (column, vertical)
3. Safety bumper strip (bottom door leaf, horizontal)
4. Safety bumper strip (door leaf on the side, vertical)*
5. Emergency-off switch (door column inside (outside*))
6. Door breakout end switch (door leaf)
8. Presence sensor door leaf*

* The use of the marked components may vary according to country. Doors according to DIN 18650 must include all components. (8. Presence sensor door leaf: only from internal diameter of minimum 3001mm)



5.1 Presence sensor (canopy, ceiling)

These non-contact operating sensors are situated at the canopy or, in case of option glass ceiling, on top of the ceiling above the right-hand side door column. They detect obstacles at the main closing edge in the entry-/ exit area. If a person / obstacle is detected by this sensor, the rotation speed of the doorleaves is reduced or the rotation stops depending on the setting. The sensor is activated in the following area: leaf approx. 800mm from main closing edge (right-hand side column) until it enters the drum wall area. Is an obstacle detected for longer than 1 min. or the flooring changes (rain, snow, dirt etc.), the new data are being read in. During that time the door operates in the safety area before the column depending on the setting with reduced speed or stops. The drive is being switched off in case of a sensor's breakdown.

5.2 Safety bumper strips (column / leaves)

These strips are positioned as follows:

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

The drive is being switched off when the strips are in operation. If the strips are no longer in operation, the device starts again by itself after an adjusted time.

5.3 Emergency-off switch (column)

This switch is positioned inside and outside* the door column. By using the emergency-off switch the door device can be stopped at any time. For a re-start the emergency-off switch has to be unlocked.

*The use of the marked components may vary according to country. Doors according to DIN 18650 must include all components. (Presence sensor door leaf: only from internal diameter of minimum 3001mm)

5.4 Door breakout end switch (door leaf)

At devices with collapsible leaves (optional), this switch is positioned at the doorleaf / center column. The device stops in case the doorleaves are being folded over during rotation. For a re-start the doorleaves must be back in basic position.

5.5 Presence sensor* (leaf)

These non-contact operating sensors are mounted at the upper part of the door leaf and cover the area in front of the leaves in rotation direction. If a person is detected by one of these sensors, the drive is being switched to reduced speed. After leaving the detection area the device speeds up to walking pace again. The detection area of the sensors is adjustable and must be adapted to the circle of users. A knocking over of persons must be avoided at all times.

* The use of the marked components may vary according to country. Doors according to DIN 18650 must include all components. (Presence sensor door leaf: only from internal diameter of minimum 3001mm)

5.6 Speed control

DORMA revolving doors, type KTV are set to a maximum of 600mm/sec and/or 750mm/sec depending on the safety equipment. In case of a new speed setting the expected circle of users (handicapped or elderly people) has to be taken into consideration.

5.7 Control system

The control system of the device is positioned in the ceiling or with option glass ceiling in the floor (external position is also possible). It is a self-monitoring system, which identifies and indicates defects or malfunctions immediately.

6 Lighting

If the door device is not locked, the lighting is switched on all the time. If the door is furnished with low voltage halogen lamps, it is important that only lamps with max. 12V/20W are being used. The use of HQ lamps / fluorescent lamps is not allowed because of the interaction with safety sensors. A surrounding lighting with these lamps outside the door device can also lead to problems and the use is not advisable.

* The use of the marked components may vary according to country. Doors according to DIN 18650 must include all components. (Presence sensor door leaf: only from internal diameter of minimum 3001mm)

7 Options

7.1 Manual nightshield

The KTV-3/4 is available with a manual nightshield. It is being locked via a locking cylinder from the inside at each nightshield segment.

For a safe operation of the device it is very important to watch for the nightshield segments being locked in open position as well.

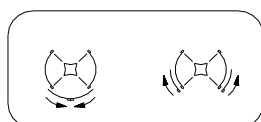
7.1.1 Door device locking procedure:

1. Program switch is **not** in locking position.
2. Use emergency-off switch.
3. The door device stops immediately. To reach the nightshield, move the turnstile manually or with option „Bookfold“: fold over door leaf.
4. Open the locked nightshield (in open position) via square wrench.
5. Close nightshield manually.
6. By means of a square wrench the locking bars will go into the prepared floor and ceiling pouches. If necessary adjust the alignment of the locking bars to the lock opening in the floor and ceiling.
Lock closing cylinder.
7. Unlock the emergency-off switch and put program switch into locking position.
8. Door device rotates slowly and automatically into the locking position. If this is accomplished, the light is being switched off.

7.1.2 Door device unlocking procedure:

1. Put program switch into Automatic position, the light is switched on and the door starts rotating.
2. Use emergency-off switch
3. The door device stops immediately. To reach the nightshield, move the turnstile manually or with option “Bookfold”: fold over door leaf.
4. Open nightshield. Open closing cylinder and unlock locking bars via square wrench.
5. Open nightshield manually.
6. Lock nightshield in open position by means of a square wrench (opening in the floor).
7. Open emergency-off switch, door device operates in chosen program mode.

7.2 Elektric nightshield (not possible with option glass ceiling)



The KTV-3/4 is available with automatic nightshield to be used by means of a three-stage switch. The use of the switch causes the motor-driven opening and/or closing of the nightshield. The drive stops immediately in case the switch is let loose. If the nightshield is closed, it is locked via an electro-mechanical locking.



While using the switch observe the nightshield. If persons or obstacles are in the nightshield's rotation area, stop the rotation immediately (switch let loose). The rotation may only be continued when the area is cleared. The turnstile may only be taken into operation when the nightshield is completely open. The motor brake blocks the nightshield in open position.

7.3 Manual door leaf lock

The KTV-3/4 is optionally available with door leaf lock. The locking mode is carried out by a closing cylinder at the door leaf.

Procedures:

A: Frame leaf version:

1. Put program switch into 0 position (lock).
2. The door device rotates into the locking position and remains there.
3. Put the locking bars via square wrench into the prepared locking pouches in the ceiling, (option glass ceiling: below the glass ceiling).
Attention: closing cylinder locks double-turn.
4. Make sure that the program switch remains in 0 position.

B: Fine-framed leaf version:

1. Put program switch into 0 position (lock).
2. The door device rotates into the locking position and remains there.
3. Via locking cylinder (bottom door leaf profile) put lock into the prepared floor sleeve.

The unlocking is carried out as follows:

1. Open door leaf locking.
Either open closing cylinder and unlock locking bars with a square wrench (version A) or open lock with locking cylinder (version B).
2. Choose requested program mode at program switch.

7.4 Automatic door leaf lock (not possible with option glass ceiling)

With program switch position "lock" the turnstile rotates into the locking position (see also 4.2). The door locks automatically into the outer door leaf via electro-mechanical driven bolts if the position is achieved.

If the device is locked, the lights are being switched off.

7.5 Trouble output (optional)

Malfunctions and defects can be analyzed by a potential-free change-over at the control system (terminal 30/31/32). Smaller malfunctions can be resetted with the program switch. Put the program switch in position 0 "locking" and leave it there for approx. 3 sec. Put program switch afterwards in Automatic 1 or 2 position.

7.6 Nightbank



Door devices with nightbank function have a 5-grade program switch. If the program switch position "Nightbank" is chosen, the door remains in basic position. A potential-free contact (door opener, card reader etc. or the inner movement sensors) removes the blocking and the door device is put back into rotation. After a $\frac{3}{4}$ turn (min.) – approx. 2 rotations (adjustable) the turnstile rotates again into the basic position and is blocked until a movement sensor is activated again. The lighting of the door device is constantly switched on.

7.7 Shock-Stop vandalism brake

The vandalism brake can be released by means of a separate switch.

Activation in „standstill“:

If the device is not working, the turnstile is locked in the current position by means of a vandalism brake. By releasing the switch, the turnstile is open again.

Activation in "rotating turnstile":

If the turnstile is in rotation, the vandalism brake will stop the turnstile abruptly and lock the turnstile in the current position. The turnstile is open again when the switch is released.

The sudden braking of the turnstile rotation can cause injuries with people inside the door device who may run against the door leaf. Therefore the vandalism brake should only be activated in standstill or when there are no persons inside.

If the vandalism brake is released with a rotating turnstile, a DORMA service maintenance is necessary

The vandalism brake opens in case of complete power failure, the turnstile is open.

7.8 Bookfold turnstile (breakout doorleaves / suitable for escape routes)

In case of a panic, all doorleaves can be folded over manually (max. force < 220N at outside edge of door leaf). To carry out a controlled breakout, switch program switch in position 3 "summer/stop" and wait until the turnstile stops in basic position. The drive is being switched off. In order to return to a regular operation, put doorleaves back into their basic position.

Now the requested program switch position can be chosen again.

7.9 Transport opening (min. one door leaf collapsible)

For transportation of bulky or long items one door leaf (3-/or 4-leaf version) or two doorleaves (4-leaf version) can be folded over. In order to carry out a controlled breakout, switch the program switch to position 3 "summer/stop" and wait until the turnstile stops in the basic position. After that a toggle has to be put into "open" position each at top and bottom, use a suitable tool (e.g. hexagon wrench key SW5). Then the door leaf can be folded over. The leaf is retained in the passage area and the turnstile is being rotated. The drive is switched off. In order to avoid an uncontrolled swaying of the doorleaves, they are being fastened at the opposite side by means of a magnet.

The collapsed door leaf can cause injuries because the top and bottom breakout lap over. Therefore only use as transport opening for authorized personnel.



Possible additional options:

The option „manual door leaf locking“ and a lower ceiling locking plate should also be chosen along with this option in order to lock the complete turnstile. In order to close the door leaf, apply some pressure to loosen it from the opposite door leaf. Then put the door leaf back into basic position and lock the toggles at top and bottom again. Choose now your requested program switch position again.

7.10 Windbrake function

In exposed areas it is possible that, caused by heavy winds or draft, the turnstile starts to rotate by itself. (e.g. in Automatic 1, basic position). This chosen mode blocks the turnstile in basic position. The block is reversed and the door is put into motion when a radar- or movement sensor is activated (min. 360° rotation).

7.11 Water sensor

In the underfloor version a water sensor can be optionally chosen. An acoustic signal is released in case of a water penetration at drive and/or control system. A potential-free contact is also made available.

8 Disturbances

In case of disturbances at the device, call our Service-Hotline-Number:
phone: 0180-5240246 (mon.-fr. 7:00 - 21:00 h and sat. 7:00 - 17:00 h)

Take possible causes and solutions from the attached list.

Adjustments at the device only to be performed by authorized personnel.

8.1 *Trouble shooter*

Check the following items in case the door is not rotating:

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

Push emergency-off switch immediately in case of indefinable sounds.

If there is still no function after checking the above mentioned items, please contact a service engineer.

Smaller malfunctions can be resetted with the program switch.

Put the program switch in position 0 „locking“ and leave it there for approx. 3 sec. Put program switch afterwards in Automatic 1 or 2

9 Start of operation after power failure

After a power failure the device switches on again in the present operation mode.

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 in position 0 (locking).
2. Move turnstile manually, option bookfold: fold over doorleaves to reach the locking.
3. Open door leaf locking. Open closing cylinder and unlock locking bars with a square wrench.

9.1.2 Door devices with automatic door leaf locking (optional, not possible with option glass ceiling)

Program switch is in **position "0"** (locking), the door device is locked

Use emergency-off switch.

Unlock by means of an emergency-unlocking bar which is screwed into the thread of the locking bolt and has to be pushed upwards.

Unscrew emergency-unlocking bar again.

The door can now be put back into operation or the doorleaves can be folded over.

Emergency opening for electro-mechanical lock

- **attention:** program switch must be in "locked" position
- screw threaded rod into
- turn threaded rod clockwise and push in
- screw threaded rod anti-clockwise

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10 Maintenance and Cleaning

10.1 Maintenance

The door device has to be maintained by authorized personnel (DORMA Service) according to the following guidelines in order to guarantee a safe operation and long-term steadiness and function.

- The device has to be checked and maintained ahead of the initial operation and at least once a year by authorized personnel (Regulations for power-driven doors according to ZH1/494 04.89 edition).
- See separate maintenance manual „Maintenance KTV-3/4 MS 9“.
- We advise to conclude a maintenance contract with DORMA.
- In order to avoid unintentional moves while cleaning the device, put program switch into position 3 (manual) or push the emergency-off switch.

10.2 Daily cleaning

- The floor in the rotating area has to be kept clean. Dragged along parts (pebbles etc.) may lead to reduced door functions. Dirt may build up in the profiles of the foot scrapping mats. The mat level is increased and leads to malfunctions of the door and jeopardizes the user. Regular cleaning is therefore necessary. (removal and cleaning of the mat) and an effective fixing of the footscrapping mats
- Clean lower ceiling area of the door device in order to avoid scratches on the surface by dragged along parts.
- Push emergency-off switch in program mode Automatic 2 in order to check its function (device stops).

10.3 Weekly cleaning

- Clean surfaces:
Use regular glass cleaners for all the glass.
- Wipe rust-free surfaces with suitable cleaning liquids and a non-scratchy cloth.
- Clean powder-coated surfaces with water and soap.
- Clean anodized surfaces with soft soap (ph-level between 5,5 and 7)
- Vacuum/clean brushes. Use hair shampoo in case of more intense dirt. Otherwise the dirt in the brushes may scratch the surfaces of the attached areas.



Clean door device and floor area with a damp cloth only.
Too much wetness may lead to a turnstile damage or shorts at electrical parts.

10.4 Yearly maintenance check-up

The device has to be checked at least once a year by authorized personnel (DORMA Service) for proper function.

11 Technical data

Power supply:	230VAC; 50-60Hz
Fuse protection by others:	1xC16A
Power input	
Automatic 2:	approx. 400W (without lighting)
Power input,	
Automatic 1, Standby:	approx. 250W (without lighting)
Power input	
In locking position:	approx. 120W (without lighting)
Lighting:	max. 500W (230VAC)
Motor:	1 frequency-controlled rotary current motor with 60W
Control voltage:	24VDC for sensors, microprocessors etc.
Wing speed:	max. 750mm/s
Foundation ground:	min. 6mm ²
Admissions (depends on safety options) :	Machine regulations 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 according to AutSchR: 1997
24VDC-supply unit:	SELV
Protection mode:	IP54
Temperature scale:	-20°C to +60°C
Sound level:	the A-assessed level is <70dB(A)
Luftfeuchtigkeit:	dry

Subject to technical changes without notice.

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.