

Operating Instructions

for Automatic Revolving Doors

REVOLVEDOOR
Universal Drive 5201
and
Drive TRP

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1 Regarding these Instructions

Addressee/Status

These instructions are directed at the system operator and user of an automatic TORMAX door system and it is presumed that the system was installed and tested by professional persons, i.e. that it is ready for operation.

Applicability

This document has validity for two, three and four-wing revolving doors with TORMAX control system TCP 101 and TORMAX opening automatic of type:

REVOLVEDOOR Universal Drive 5201

REVOLVEDOOR Drive TRP

Explanation of Symbols



In these instructions, we have designated all positions concerning your safety with this symbol.



This symbol warns of electrical voltage.

Text with grey background must absolutely be considered for reliable operation of the system! Non-observance might cause material damage.

- ◆ This symbol denotes optional components which do not form part of all systems.



Functions that are marked with this sign correspond to the basic adjustments. Modifications to the program can be made by the authorised technician.

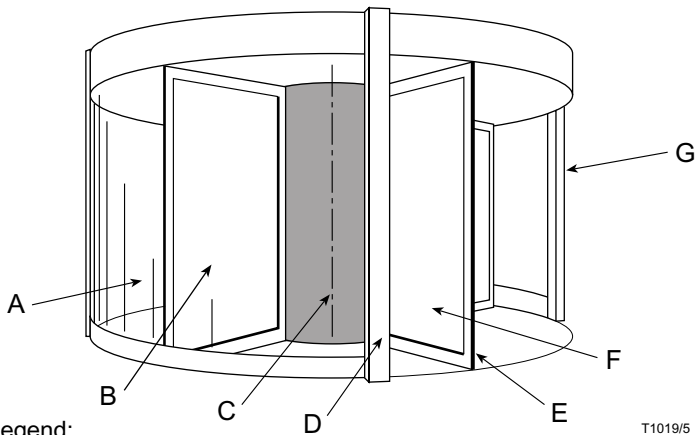
System Test Book

Please refer also to the system test book which contains a list of checks that need to be performed during the periodic maintenance (see also section 5.1). The system test book is located at the corresponding door system.

System test book: T-1151 e

Languages

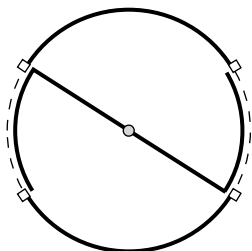
These instructions are available in various languages. Please ask your TORMAX dealer.



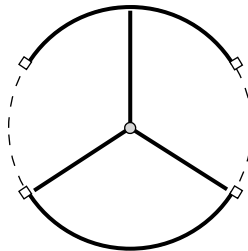
Legend:

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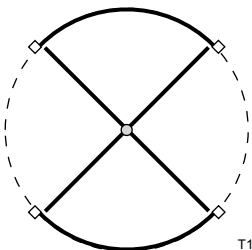
- A Side wall
- B Door wing
- C Centre column of revolving door
- D Trailing mullion
- E Leading edge of door wing
- F Rear area of door wing
- G Mullion



Two-wing revolving door
in final position



Three-wing revolving door
in final position



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Four-wing revolving door
in final position

2 Safety

2.1 General Safety and Accident Prevention Instructions

Please read the operating instructions carefully prior to commissioning of the door—especially the following notes relating to safety—and adhere to them!



Pay particular attention to the specially marked notes in this manual! (For an explanation of the symbols please refer to chapter 1.)

Correct Application

The TORMAX operators Universal Drive 5201 and Drive TRP have been designed and constructed according to the current state of technology and the recognized safety related rules and are intended exclusively for the operation of revolving doors. The enclosure of the operators corresponds to IP 22 in the protective system. The operators may only be installed at the inside of buildings without additional safety measures.

Any other use is considered incorrect and may result in injuries to the user or third parties. The manufacturer will not be liable for damages resulting from incorrect application; the risk of such applications must be borne entirely by the operator of the door system.

Basic Precautionary Measures – Careful Behaviour

Do not use the system in other than technically perfect condition. Make sure that faults which could diminish safety are eliminated immediately by professionals.

The following are consequences of incorrect application of the door operator or the door system:

- Danger of the user's or a third party's injury or loss of life.
- Risk of damage to the system or associated equipment.

Relevant Instructions

The operating service and maintenance conditions specified by the manufacturer are to be observed. TORMAX drive units may only be maintained and repaired by trained people who are aware of any possible danger that may occur.

In addition to the operating instructions, the generally accepted legal and otherwise relevant rules relating to accident prevention and to environmental protection—in the country where the door system is installed—are also applicable.

The manufacturer is exempted from any liability for damages caused by unauthorized alterations of the system.

2.2 Organisational Measures

Doors are to be operated and maintained in such a way that the safety of the user, maintenance personnel or third party is guaranteed at all times.



Should any fault occur on the safety devices (i.e. sensor strip), they may not be bypassed to maintain the automatic door functions.

Working on TORMAX Door Systems

The person operating, checking or maintaining door systems must have the relevant operating instructions present.

Personnel charged with duties on the door system must have read and understood the operating instructions prior to performing any work.

Mechanical and electrical work on the door system and the control system may only be performed by our trained personnel or by fitters after consulting our trained personnel.

All other persons are prohibited from performing any repairs or alterations on the system.

Labels

Notices on doors and control devices must be easily legible, clearly understandable and of durable quality.

If instructions are necessary for assuring the safety of people (marking of escape routes) and for servicing, these instructions must be provided.

2.3 Safety Devices (Standard Settings)

Obstacle Recognition

If the door blocks for any reason (e.g. due to mechanic blockage), it is braked down to standstill and remains steady during ... seconds (preset value) with the brakes off. After the downtime has elapsed, the interrupted motion is continued.

Overwind Safety

If the door is moved too quickly by hand, the drive unit brakes the door down to the preset maximum speed, whether power is applied or not.

Edge Safety ◆

If a person or an object is detected by a safety sensor, the door is stopped by motor force or does not commence moving and remains steady without the brakes being applied (the door is moveable by hand). When the sensor field is free again, the door re-accelerates to normal speed after 1 second.

Mullion Safety ♦

If a person or an object gets caught between a door wing and a mullion in such a way that the safety strip attached there responds, emergency braking takes place immediately. The door remains steady without the brakes being applied and is moveable by hand. As soon as the safety strip is free again, the door re-accelerates to normal speed after ... seconds (preset value).

Pre-Mullion Safety ♦

If a person or an object is detected by a leading mullion sensor and the distance between door wing and leading mullion is below the configured danger-distance, the door brakes by motor force—if necessary right down to standstill. The door remains steady without the brakes being applied. When all leading mullion sensors within the danger area are inactive again, the door re-accelerates to normal speed after ... seconds (preset value).

Emergency-Off Function ♦

Emergency braking takes place immediately when the emergency-off push-button is pressed. As soon as the door is at standstill, it can be operated manually.

Lock ♦

The door is locked in the final position (see chapter 1, terms) in the operating mode NIGHT.

Escape Position ♦

On an alarm (e.g. fire), the door turns into the escape position, so that an open passageway is ensured (two-wing doors preferably).

Door Wing Deflection ♦

If a door wing is deflected, the door brakes or does not commence moving and remains steady without the brakes being applied (the door is moveable by hand). When the door wing is no longer deflected, the door re-accelerates to normal speed after ... seconds (preset value).

3 Operation

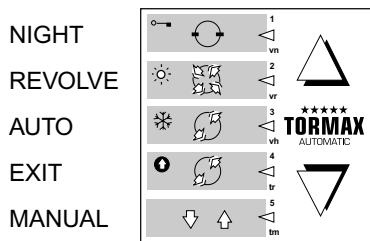
3.1 Commissioning



It is absolutely necessary that the commissioning of the revolving door system has been performed according to chapter 5 in T-1021/T-1025, Installation Instructions.

Switching On

- Switch on electricity mains.
- Select the desired operating mode at the control panel with one of the UP/DOWN push-buttons.
→ The corresponding LED is on. The door starts a final position run, unless it is already there.



Re-Commissioning

If the door has not been operated for a longer period, it must be checked prior to re-commissioning according to section 5.2 and repaired if necessary so that the safety of people is ensured at all times.

3.2 Normal Duty – Operation

The TORMAX door operator ensures the automatic rotation of the revolving door. The door turns electromechanically, based on an impulse, and it brakes by motor force. By selecting an operating mode at the control panel, the behaviour of the door can be affected by the system operator.

Activation

The actuation of the door takes place automatically or manually:

- Automatically through sensors ◆, motion sensors ◆, switching mats ◆, etc.
- Manually through push-buttons ◆, key switches ◆, hand switches ◆, etc.

Safety Facilities

The door system may only be operated if all safety relevant facilities are installed and functional!



Monitoring

The TORMAX processor control system TCP supervises numerous functions of the door and displays malfunctions on the control panel (see fault diagnosis diagram section 6.2).

Shutdown in Case of Fault

The door must be placed out of operation whenever malfunctions occur, that may influence the safety of people. Make sure that faults and deficiencies are eliminated at once.

- Activate main system switch or emergency-off push-button. The door can be turned manually in both directions. Ensure that deficiencies and faults are repaired immediately!



Doors may be returned to service only after the malfunctions have been corrected (repaired) or the hazard eliminated (separate operator from mains supply).

Damage

Components that no longer ensure the required safety standard due to wear or tear must be replaced or repaired by a qualified TORMAX dealer.

3.3 Functional Description



Course of Motion in Operating Mode AUTO

When an activator becomes active and if it is approved for the selected operating mode, the door is accelerated to preset speed (standard 0.8 m/sec at the leading edge of the wing). If the activator becomes inactive again, the door continues to turn until the preset distance has been reached (measured in number of sectors).

Course of Motion in other Operating Modes

See chapter 4.2, Selection of Operating Modes.


3.4 Operation in Case of Power Failure

Once commissioning has taken place by the fitter, the unit is ready for operation even after a power interruption if the corresponding door wing is in final position. It will otherwise move slowly to the end position after power recovery.

During a power interruption, the door can be turned manually in both directions. The overwind safety prevents a movement that is too fast.

4 Control Panel Operation

The most important element for the user is the TORMAX control panel with the following options:

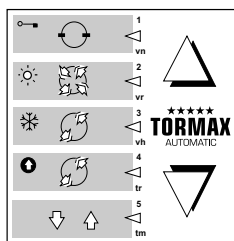
- Selection of operating mode → section 4.2
- Setting of parameters → section 4.3
- Code lock  → section 4.4
- Fault indication → chapter 6
- Reset → section 6.3

Some functions may be inhibited or limited due to door specific adjustments performed by the fitter.

4.1 Brief Instructions

Control Panel

NIGHT
REVOLVE
AUTO
EXIT
MANUAL



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Operating Mode:		Adjustable door parameters:
NIGHT	In final position, locked,	vn Normal speed
REVOLVE	Automatic continuous operation until time-out	vr Standby speed (velocity revolve)
AUTO	Automatic operation starting from standstill	vh Slow speed (velocity handicapped)
EXIT	Shop closing mode	tr Time-out in operating mode REVOLVE
MANUAL	Door movement by hand	tm Time-out

Indication:

The continuously illuminated LED indicates the currently active operating mode.

Selection:

- Press UP or DOWN key.



Setting Parameters

- Select parameter using UP or DOWN key.
- Press both keys simultaneously until the LEDs are flashing.
- Adjust parameters with UP or DOWN push-buttons. The flash-frequency becomes slower or faster according to the preset value.
- If no key is pressed during 60 seconds, the adjustment process is terminated automatically and the settings remain unchanged → to safe setting: press both keys simultaneously.

Fault Indication

Display flashes → see chapter 6 “Trouble shooting”.

4.2 Selection of Operating Modes

Setting Operating Mode

The operating mode determines the behaviour of the automatic door.

- Press UP or DOWN key till desired operating mode is indicated on the panel.

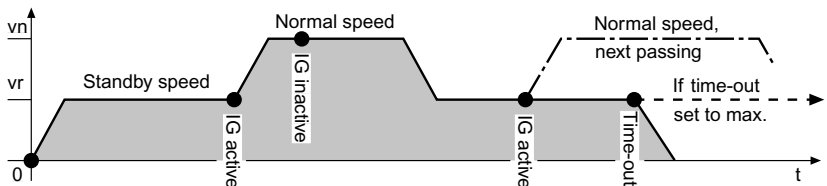
The continuously illuminated LED shows the selected operating mode. If the top operating mode (NIGHT) is left in upward direction, the bottom operating mode (MANUAL) is selected and vice versa. An operating mode is only valid if the LED has been illuminated for at least 1 second.

Operating Mode NIGHT

In operating mode NIGHT, the door is at standstill and can only be activated by the sensors approved for night-duty. Afterwards, the door turns into final position and is held by the magnetic brake and locked ◆ if necessary.

Operating Mode REVOLVE

As soon as the operating mode REVOLVE is activated at the control panel, the door starts turning with standby speed (v_r). If an activator (IG) becomes active



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that is approved for this operating mode, the door accelerates to normal speed (vn). If the activator becomes inactive again, the door continues to turn for the preset number of sectors and then brakes down again to standby speed (vr). If nobody passes through the door during the preset time-out (tm), it stops in the final position and restarts only when the activator becomes active again. If the time-out at the panel is set to maximum, the door never stops.

Operating Mode AUTO

The operating mode AUTO is the main operating mode. With activated and approved opening activators inside or outside, the door turns from standstill to normal velocity or slow speed depending on the preset parameter (see chapter 4.1). If the opening activator becomes inactive again, the door continues to turn for the preset number of sectors, brakes down to standstill and waits with brakes applied for a new passage instruction.

Operating Mode EXIT

The operating mode EXIT can, for example, be applied during shop-closure time. The door is activated only by the activator that is located at the inside of the building. Apart from that, the door behaves just as in the operating mode AUTO.

Operating Mode MANUAL

In the operating mode MANUAL, the door can be moved by hand. If, during the programmed downtime (time-out), the door is no longer moved by hand or by an activator approved for MANUAL operation, a final-position run takes place. The overwind safety prevents a rotational speed that is too fast for manual operation (see section 2.3).

4.3 Optimising the Course of Motion

The course of motion is automatically set to default values when the system is commissioned. It can, however, at any time be adapted to individual requirements via five parameters. The parameters are shown on the control panel by pairs of letters (vn, vr, vh, tr, tm). However, they are not in every case associated with the operating mode shown next to them. With each parameter—detailed description see later on—, a specific door behaviour can be optimised.



Setting Parameters

Procedure:

- Select operating mode corresponding to the letter pair (parameter) to be adjusted.
- Press both keys simultaneously for one second → the LED flashes to indicate that the optimization can be performed.
- Change respective parameter by pressing the UP or the DOWN key once or several times.

If, for example, the speed is to be faster, the UP key is pressed. The flashing rhythm, as well, changes accordingly.

Increments:

→ for adjustment of a speed value: 20 mm/sec.

→ for adjustment of a time value: 1/16 of set-time, at least 2 sec.

- To save the new parameter setting: press both keys again simultaneously
→ now the LED is again continuously illuminated. The new setting is now in effect.

All other settings, e.g. acceleration and braking distances, may only be changed by authorised technicians.

Speed in the Operating Mode AUTO v_N

v_N (velocity normal) normal speed

Speed always refers to the leading edge of a wing and cannot exceed the upper limit independently of the door diameter.

Significance of indications:

UP key:

Faster flashing → higher speed

DOWN key:

Slower flashing → lower speed

Standard setting

Limit values:

1000 mm/sec.

200 mm/sec.

800 mm/sec.

Standby Speed in Operating Mode REVOLVE v_r

v_r (velocity revolve) standby speed

If nobody passed through the revolving door, it continues to turn with standby speed until the preset time-out has elapsed.

Significance of indications:

UP key:

Faster flashing → higher speed

DOWN key:

Slower flashing → lower speed

Standard setting

Limit values:

800 mm/sec.

50 mm/sec.

300 mm/sec.

Slow Speed v_h in Operating Mode AUTO

v_h (velocity handicapped) slow speed

The slow speed is particularly recommended for passageways for handicapped people.

Significance of indications:

UP key:

Faster flashing → higher speed

Limit values:

800 mm/sec.

DOWN key:	
Slower flashing → lower speed	100 mm/sec.
Standard setting	400 mm/sec.

Time-out in Operating Mode REVOLVE tr

tr (time revolve) time-out (time interval to standstill)

If nobody passes through door during the preset time-out, the door stops in the final position and waits for a new passage instruction. If the time-out is set on the maximum value (320 sec.), the door never stops.

Significance of indications:	Limit values:
-------------------------------------	----------------------

UP key:	
Faster flashing → longer time-out	320 sec.
DOWN key:	
Slower flashing → shorter time-out	0 sec.
Standard setting	320 sec.

Time-Out in Operating Mode MANUAL tm

tm (time manual) time-out (time interval to final-position run)

If nobody passed through the door during the preset time-out, it runs into the final position. If the time-out function is set on the maximum value (320 sec.), the door never runs to the final position.

Significance of indications:	Limit values:
-------------------------------------	----------------------

UP key:	
Faster flashing → longer time-out	320 sec.
DOWN key:	
Slower flashing → shorter time-out	0 sec.
Standard setting	120 sec.

4.4 Specifics of Operation



Code Lock

The control panel can be protected by the installation fitter against unauthorized manipulation by means of a code lock.

To change the operating mode or a parameter setting, the code preprogrammed by the installation fitter has to be entered first. This may be the standard code – 3 x UP, 3 x DOWN, 3 x UP—or a user-specific code. The control panel is now ready for adjustments during a limited period of time. After this time has elapsed, the LEDs are automatically switched off and the control panel is protected again.

Skipping Operating Modes

The desired mode is selected by pressing the UP or DOWN key once or multiple times. The respective LED lights up immediately—the operating mode, however,

does not become active before one second. Thus, by pressing the key rapidly in succession, the undesired activation of an operating mode can be avoided.

Adjusting Parameters while Maintaining the Operating Mode

Example

The operating mode REVOLVE is selected. The time-out in operating mode REVOLVE is to be adjusted without that the door stops:

- Press the DOWN key two times in rapid succession, and then immediately press both keys simultaneously for one second.
- Adjust time-out as described in section 4.3.
- After the input, press both keys again for one second → now the LED at the symbol REVOLVE lights up again, indicating that the operating mode has not been changed during the adjustment process.

5 Maintenance



- The responsibilities of maintenance personnel must be clearly defined.
- Keep hands and other body parts away from moving devices.

Spare parts must comply with the technical requirements of the manufacturer. Use exclusively original spare parts.

5.1 Periodic Maintenance

Maintenance Interval

The maintenance interval is determined under consideration of the frequency of use of the system. However, checking and maintenance must be performed at least once a year by an authorised technician.

Requirements Concerning Maintenance Personnel

Authorised technicians are persons who have adequate knowledge in the discipline of power operated doors based on their vocational training and experience and who are acquainted with the applicable accident prevention regulations, guidelines and generally recognized rules of that technology to such an extent that they can appraise the safe working condition of power operated doors. These persons include for example authorised technicians of the manufacturing or supplying company and experienced technicians of the system operator.

Authorised technicians have to submit their expertise objectively from the point of view of accident prevention and not influenced by other, e.g. financial, perspectives.

Maintenance work on electrical parts and cables must be performed by an electrical fitter who must work in accordance with the relevant regulations.



For all work, a clear separation must be created between mains supply and drive system; either by unplugging the mains plug or through securing the main system switch in the off position.

Extent of Maintenance Work

The extent of maintenance work is shown in the system test book.

The inspection results are to be entered into the system test book by the authorised technician together with date and signature.

5.2 Inspections by the System Operator

The inspection must be performed periodically, but not less than once every 3 months.

The system operator of an automatic door must check the proper functioning of the automatic door system and of the safety facilities as well as the sound condition of covers for pinching and shearing positions in regular intervals. Thus, an early recognition of functional faults, or of mutations to the system that diminish safety, is ensured.



If deficiencies are found during the periodic checks, ensure that these are repaired immediately by an authorized TORMAX dealer (address see at back of these instructions).



When performing these inspections, consider always the possibility of a malfunction of the system! No parts of the body may be used for functional checks if there is not enough free space available; substitute a suitable object from wood, rubber or similar material.

The maintenance work to be performed by the system operator requires only a minimum of time but is essential for a safe and faultless functioning of the system.

This work includes:

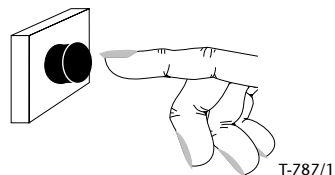
Inspection of the Automatic Opening Activators

Manually Operated Activators

- Push-buttons ◆
- Key switches ◆

Check:

- Initiate corresponding activator briefly:
 - The door rotates at least as long as the activator is initiated.



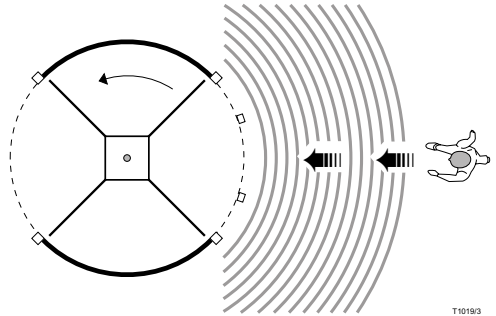
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Automatically Operated Activators

- Motion sensors ◆
- Sensors ◆
- Switching mats ◆

Check:

- Passing through the door in a normal manner in operating mode AUTO:
→ The door starts turning, runs through the number of preset sectors and brakes down again to standstill.

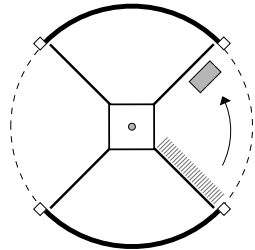


Checking the Safety Devices

Edge Safety

Check:

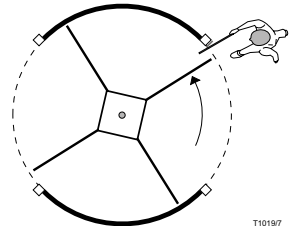
- Activate operating mode NIGHT. Place an object into the open sector near the rear area of the wing at the detection level of the starting sensor. Activate operating mode REVOLVE:
→ The door starts turning; the starting sensor detects the obstacle and the door brakes down to standstill.



Mullion Safety ◆

Check:

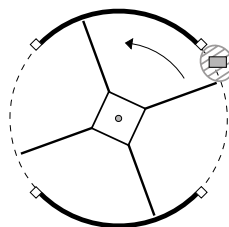
- Passing through the door in operating mode AUTO. Hold an object (e.g. a wooden stick) to the front posts so that it gets caught by the turning wing:
→ The door performs an emergency braking sequence.



Pre-mullion Safety ♦

Check:

- Place an object (height max. 20 cm) directly before the leading mullion just after a door wing has passed it:
→ As soon as the distance to the following wing falls below the preset danger-distance, the door brakes—if necessary right down to standstill.

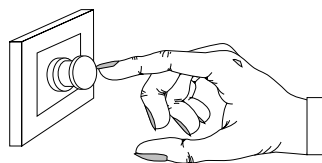


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Emergency-off Function ♦

Check:

- Activate the “Emergency off” push button:
→ The door stops immediately.
- Reset the “Emergency off” push-button.
The door is again operational.



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Checking the System for Traces of Excessive Wear

Check:

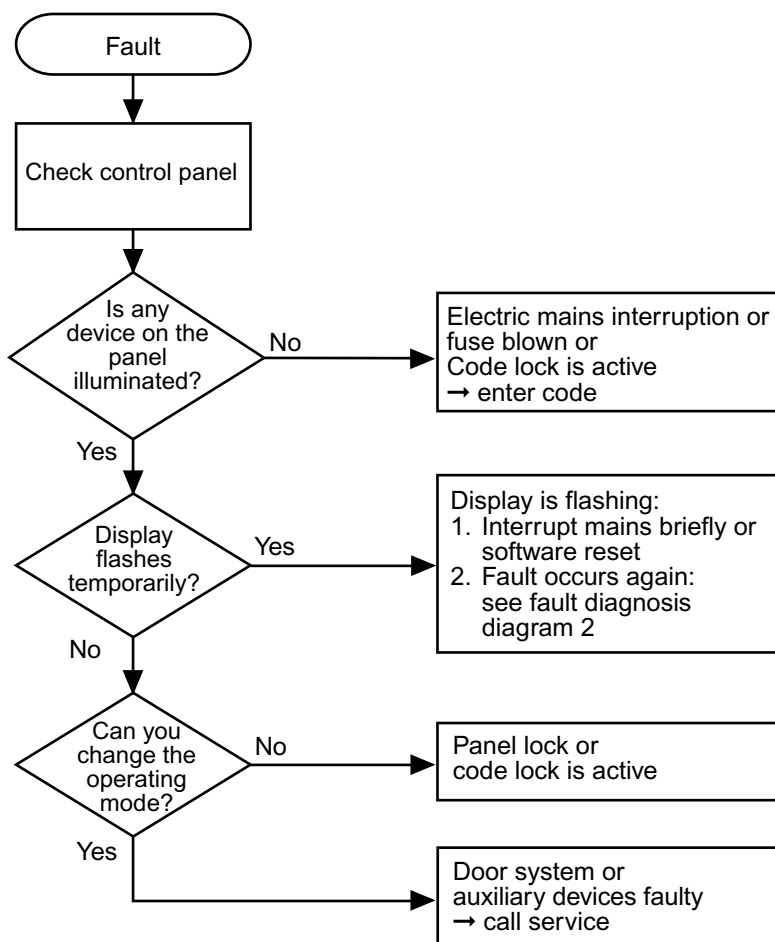
- Check the system for traces of wear.

If there are excessive deposits of rubber, steel or aluminium (door wing, drive support) on the ground around the system, contact a qualified TORMAX contract partner, so that the system may be given a thorough check.

6 Troubleshooting

The microprocessor control system TCP 101 performs a self-diagnosis continually and displays faults by means of periodically flashing combinations of LEDs on the control panel. Faults are recorded for later queries by the service technician. For fault analysis and fault removal proceed according to the following fault diagnosis diagrams.

6.1 Fault Diagnosis Diagram 1



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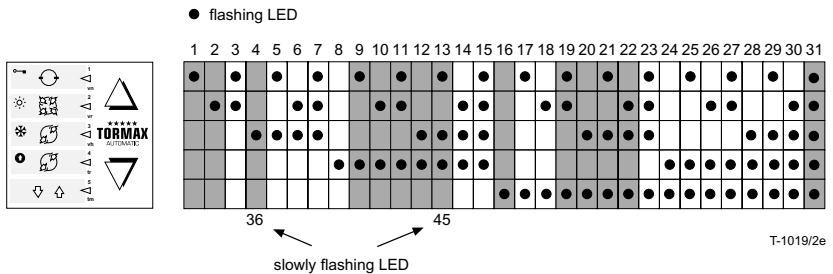
6.2 Fault Diagnosis Diagram 2

Fault Display

With the occurrence of a fault, the corresponding fault code is displayed on the control panel (please submit this code when contacting the service department). For fault recovery, please proceed in accordance with fault diagnosis diagram 1.

Fault code 1 to 45:

The table shows the LED combinations (code) of the individual faults. The currently applicable fault codes are marked in grey.



Explanation of Fault Code Trouble Shooting

- 1 Lock not locked → select operating mode AUTO (wait 5 sec.). Afterwards select operating mode NIGHT. Check lock play/position/required force.
- 2 Circumference of the revolving door is not yet registered or is invalid: if fault is obtained repeatedly → call for service.
- 9 Transmission error: if fault is obtained repeatedly → call for service.
- 10 Emergency off was activated: reset this button and select operating mode NIGHT.
- 11 Motor temperature too high: if fault is obtained repeatedly → call for service.
- 12 Overload: if fault is obtained repeatedly → call for service.
- 13 Standstill in final position run: if fault is obtained repeatedly → call for service.
- 16 Door stopped due to an obstacle: if fault is obtained repeatedly → call for service.
- 19 Burglary alarm → software reset
- 20 Maintained contact of an activator during at least 1 min.
- 21 Maintained contact of a safety device during at least 1 min.
- 22 Maintained contact of a rear activator during at least 1 min.

- 31 Caused by a system reset: if fault is obtained repeatedly → call for service.
- 36 Adjusting to reference force.
- 45 Service: Call service → non-observance leads to shut-down of the system after preset time.

6.3 Software-Reset

Restarting the Door Control System

A software reset occurs during a fault-recovery procedure (see fault diagnosis diagram 1).

- Press any key at the control panel during 5 sec. min. → the door runs to the final position switch (if not already in this position).

7 Additional Notes

7.1 Technical Data

Mains supply:	1 x 230 V AC / 1 x 115 V AC
Frequency:	50/60 Hz
Protective class:	IP 22
Power consumption:	Universal Drive 5201 max. 320 W Drive TRP max. 380 W
Ambient temperature range:	-20 °C to +40 °C
Designation of drive:	CE
Equivalent continuous sound level:	≤ 70 dB(A)

7.2 Warranty

Deliberate or malicious damaging of system components and staining of system parts, as well as alterations to the drive or control system by a third party, will result in the loss of all warranty!

7.3 Disposal

At the end of its useful lifetime, the system is to be disposed of according to the relevant national regulations. We recommend you to contact a company specializing in waste disposal.

7.4 Maintenance

After commissioning checking and maintenance of the system must be performed at least once a year (acc. prEN 12650) by an authorised technician. The maintenance work must be recorded in the system test book.



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