

# ED250

Installation in In-ground case

## Service Manual

DL4614-080 – 08-2018

| EN |

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# 1 General information

## 1.1 Installation instructions

This manual provides service information for ED250 in-ground single door and double door installations.

## 1.2 dormakaba.com website

Manuals are available for review, download, and printing on the dormakaba.com website.

## 1.3 Symbols used in these instructions.



### WARNING

This symbol warns of hazards which could result in personal injury or threat to health.

---

### NOTICE

Draws attention to important information presented in this document.

---



### TIPS AND RECOMMENDATIONS

Clarifies instructions or other information presented in this document.

---

### CAUTION

This symbol warns of a potentially unsafe procedure or situation.

---

## 1.5 Dimensions

Unless otherwise specified, all dimensions are given in inches (").

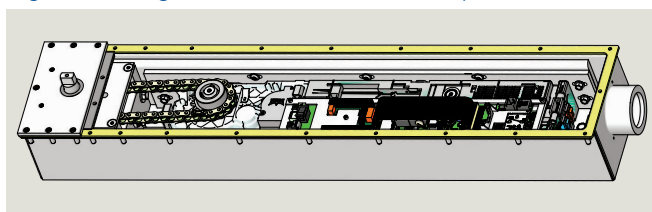
# 2 Product description

## 2.1 Intended use

The ED250 is an electromechanical operator used exclusively for opening and closing interior or exterior swing doors.

The ED250 operator is packaged in a cement case for in-ground floor installations. For double swing doors, two cement cases are supplied.

Fig. 2.1.1 In-ground case with ED250 operator



## 2.2 ED250 low energy operator.

**CAUTION**

ED250 in-ground is configured as a low energy operator from factory.

## 2.3 Arm configurations

Fig. 2.3.1 Center hung

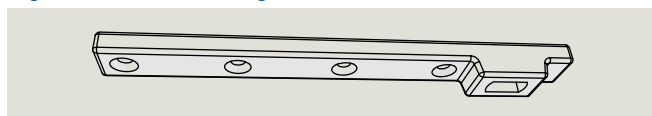


Fig. 2.3.2 Offset pivot

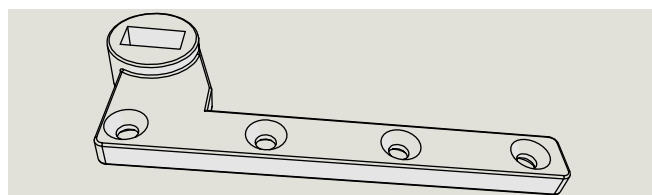
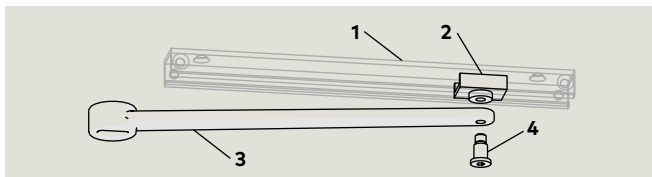


Fig. 2.3.3 Arm and track assembly (track in door)



- 1 Track
- 2 Slide
- 3 Arm
- 4 M8 shoulder screw

## 2.5 Maximum door weights

Door width		ED250	
Inches	mm	Pounds	kg
28	711.2	700	340
32	812.8	700	340
36	914.4	700	340
39	990.6	700	340
42	1067	700	340
48	1219	700	340



**TIPS AND RECOMMENDATIONS**

Insure operator is qualified for use at the respective smoke or fire-rated door.

## 2.4 Cement case enclosure

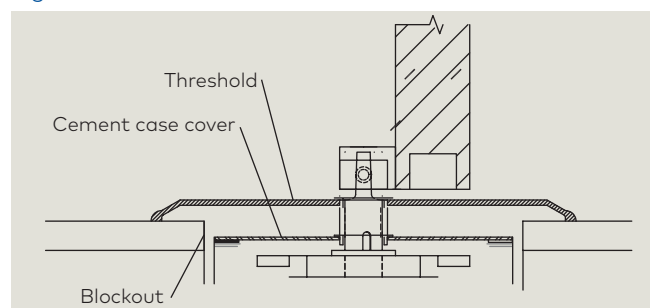
The cement case enclosure is listed and labeled to:

- UL50, NEMA 4 water resistant enclosure
- CSA 22.2

## 2.5 Floor threshold

1. Threshold to cover cement case and blockout is not supplied with the ED250 in-ground package. Threshold installation and maintenance is customer responsibility. Refer to Chapter 8 for threshold maintenance.

Fig. 2.3.4 Floor threshold



# 3 Safety information

## 3.1 Safety instructions

This document contains important instructions for installation of the ED250 in ground system. Review these instructions thoroughly prior to installation, and follow them carefully during installation, commissioning, troubleshooting and maintenance.

## 3.2 Door signage requirements

Proper signs and labels shall be applied and maintained on the door controlled by the ED250 in-ground automatic swing door operator as referenced in:

- ANSI/BHMA A156.19: Standard for power assist and low energy power operated doors. Ref. Chapter 16.
- Reference Chapter 7, Door signage.

## 3.3 Safety warnings



### WARNING

Damage to equipment or incorrect equipment operation may result from an incorrect installation.



### WARNING

Hazard to mechanical processes by use of control settings, elements, or procedures not documented in this manual!



### WARNING

Electric shock hazard!  
By use of control elements, settings, or procedures not documented in this manual!



### WARNING

Work on electrical equipment and 115 Vac wiring installation must be performed only by qualified personnel!



### WARNING

Metallic doors must be grounded per national and local codes!



### WARNING

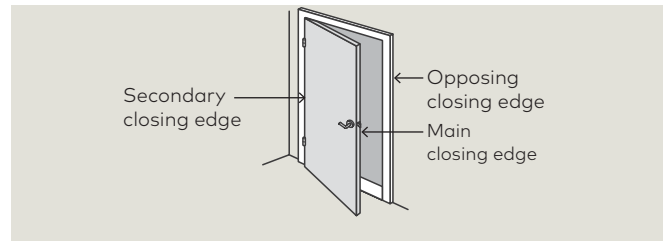
Hand pinch point and crushing hazards at door closing edges!



### WARNING

Crushing hazards at door closing edges!

Fig. 3.1 Door closing edges



## 3.4 Residual hazards



### WARNING

After installation, hazards such as minor crushing, impact with limited force, and risk to unsupervised children may exist depending on structural design of door area, type of door, and any safeguards that have been implemented.

# 4 ED250 in-ground cement case assembly

## 4.1 ED250 in-ground cement case overall assembly

Fig. 4.1.1 ED250 in-ground case dimensions

- 1 Cement case
- 2 Cover
- 3 Gasket

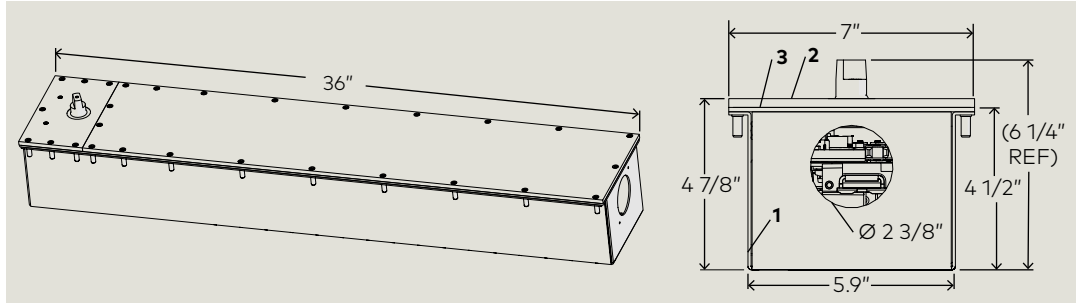
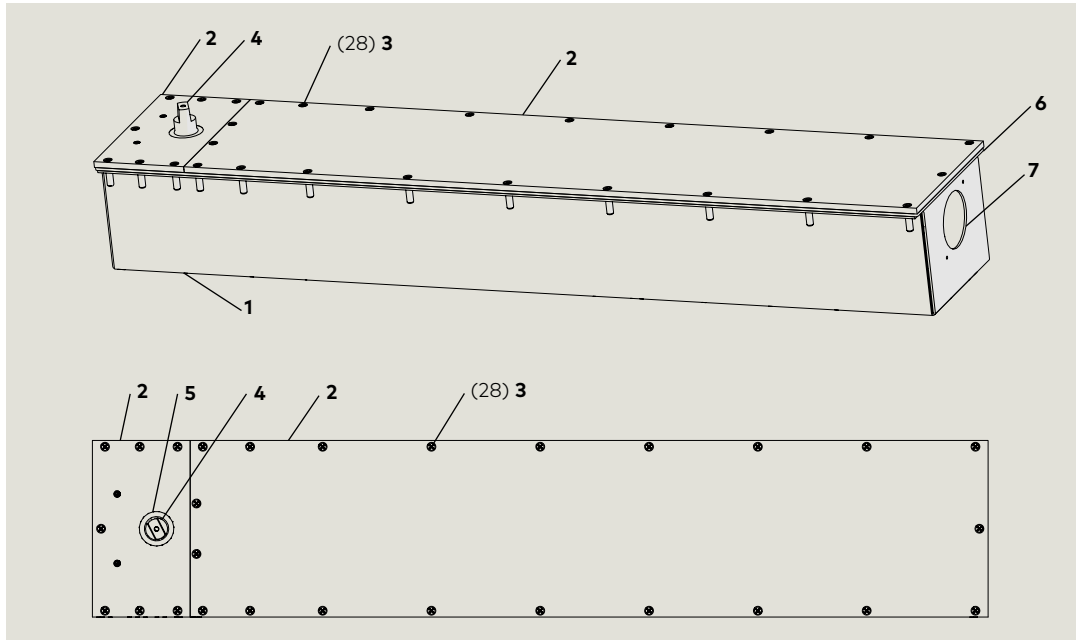


Fig. 4.1.2 ED250 in-ground case cover and fasteners

- 1 In-ground case
- 2 Covers
- 3 8-32 x 3/4" PFHMS (Phillips flat head machine screw)
- 4 Center bearing shaft, ED250-IG
- 5 Shaft seal
- 6 Gasket, 1/8" thick
- 7 2 3/8" hole for PVC reducer coupling



## 4.2 ED250 in-ground cement case internal assembly

- 1 ED250 in-ground case
- 2 Gasket, 1/8" thick
- 3 8-32 x 3/4" FHMSPH (flat head machine screw, Phillips)
- 4 ED250 operator
- 5 PCB bracket assembly
- 6 Operator drive axle
- 7 Center bearing shaft
- 8 Shaft seal
- 9 Spring tension adjustment
- 10 PVC reducer fitting

Fig. 4.2.1 ED250 in-ground case component view

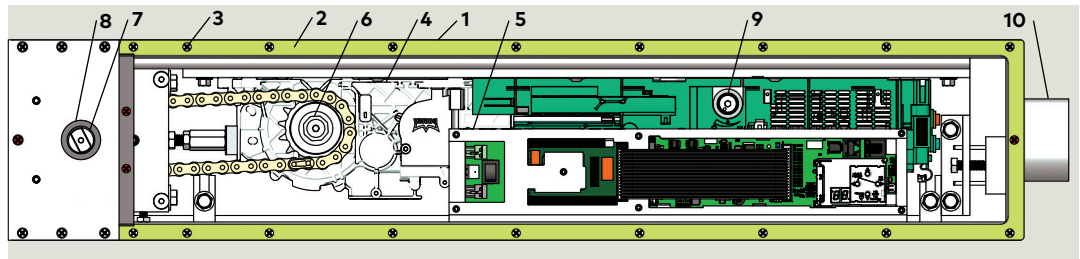
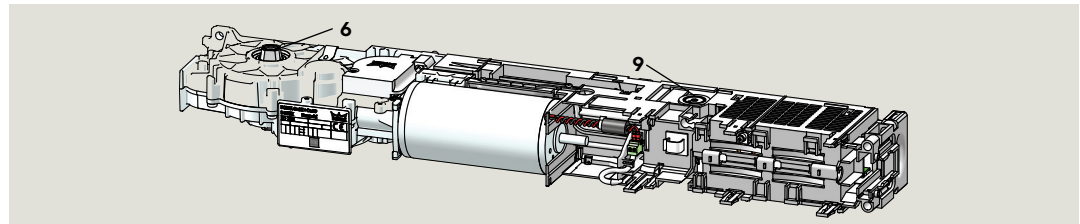


Fig. 4.2.2 ED250 operator



- 1 PCB bracket
- 1.1 PCB plate
- 1.2 PCB plate cover
- 2 Accessory connection terminal board
- 3 Power off/on switch and 115 Vac connection board
- 3.1 115 Vac terminal block and connection board
- 4 Keypad and 2 digit display
- 5 Circuit board
- 6 Braking circuit plug receptacle
- 7 Power fail closing speed potentiometer
- 8 Program switch connector
- 9 Double door operator to operator communication cable port
- 10 Dorma Handheld communication port
- 11 Upgrade card slot
- 11.1 Upgrade card socket
- 12 1/4 x 1/2" x 1/2" SHCS
- 13 Ribbon cable

Fig. 4.2.3 ED250 PCB bracket assembly

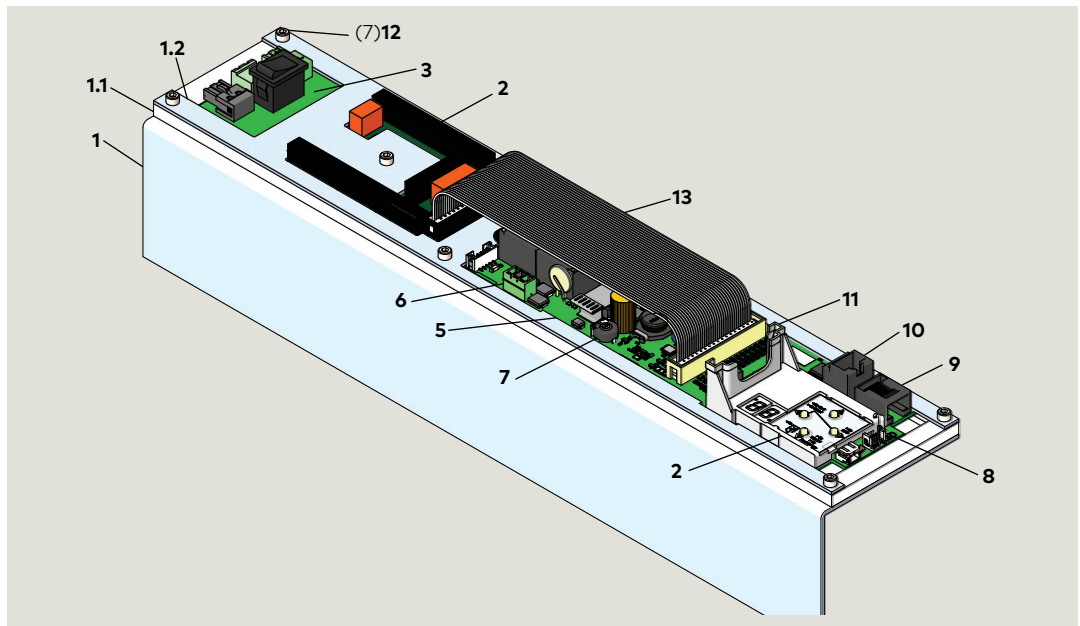
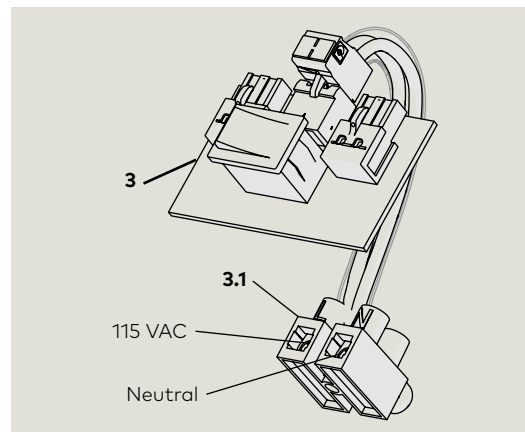
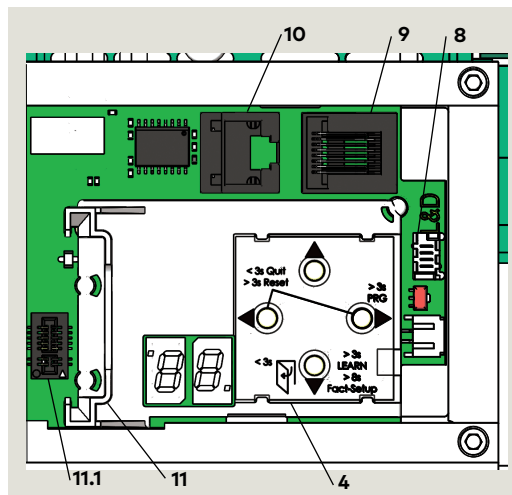


Fig. 4.2.4 Operator communication connectors, upgrade card slot

Fig. 4.2.5 115 Vac terminal block and wire harness assembly

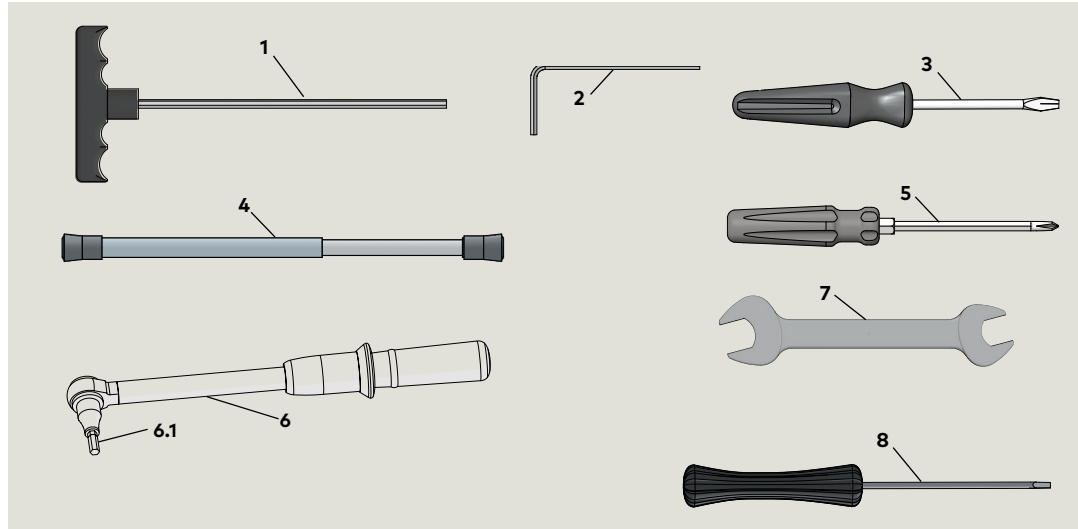


# 5 Recommended tools and torque chart

## 5.1 Recommended tools

Fig. 5.1.1 Recommended tools

- 1 T-handle hex key, 5 mm
- 2 Hex keys, 2.5 mm, 3 mm, 5 mm, 5/32"
- 3 Screwdriver, flat blade
- 4 Door pressure gauge, 0 to 35 ft - lbf
- 5 Screwdriver, Phillips, #2, #3
- 6 Torque wrench, 3 to 50 ft lb min.
- 6.1 Metric hex key sockets
- 7 Open end wrench, 13 mm
- 8 Screwdriver, flat blade, M2 (1/16 to 3/32")



## 5.2 Standard tightening torque

### 5.2.1 Standard tightening torque

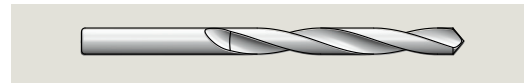
Fastener size	ft lb
M5	3.7
M6	7
M8	17
M10	34
M12	58

## 5.3 Drill bits

### 5.3.1 Drill bit sizes for fasteners

Fastener	Drill bit size	
#10 wood screw	Hardwood 9/64"	Softwood 1/8"
#12 wood screw	Hardwood 5/32"	Softwood 9/64"
#14 wood screw	Hardwood 11/64"	Softwood 5/32"
1/4 -20 metal self tapping screw	7/32"	
10-24 barrel nut	5/32"	

Fig. 5.3.1 Drill bit

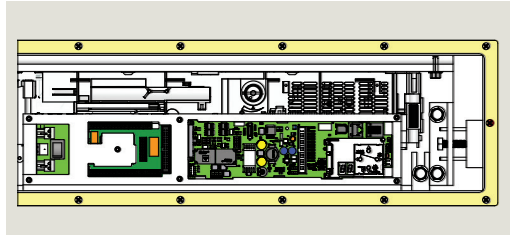


# 6 User and terminal board interfaces

## 6.1 Overview, user interface

- 1 2 digit display
- 2 4 button keypad
- 3 PCB assembly

Fig. 6.1.1 ED250 in-ground cement case

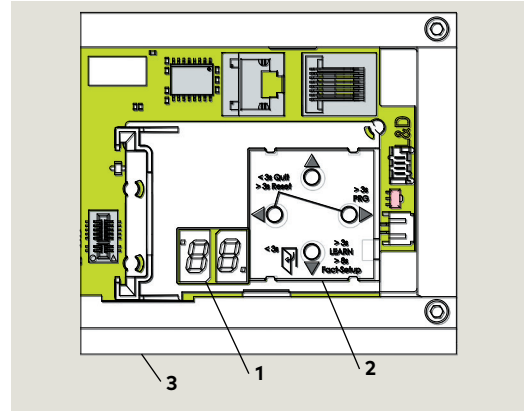


### 6.1.1 Operator user interfaces

4 button keypad and 2 digit display:

- 4 button keypad to select, input and adjust door parameter values.
- 2 digit display; parameter values, error and information codes.

Fig. 6.1.2 Operator keypad and display



## 6.2 4 button keypad and display

- 2 2 digit display
- 6 Button legend

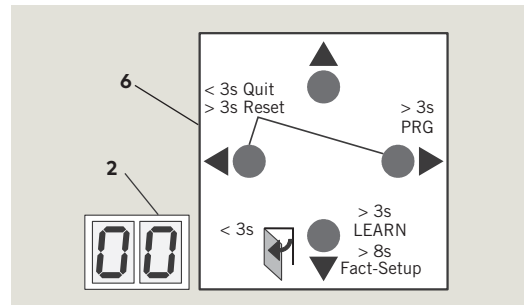
### 6.2.1 4 button keypad

4 button legend can be orientated so buttons have same function and position regardless of operator orientation. Button legend can be removed and rotated.

### 6.2.2 4 button keypad functions

▶ Right button	<ol style="list-style-type: none"> <li>1. Access parameter menu, press button &gt; 3 seconds.</li> <li>2. Edit selected parameter.</li> <li>3. Save changed value.</li> </ol>
◀ Left button	<ol style="list-style-type: none"> <li>1. Cancel parameter edit process.</li> <li>2. Exit parameter menu, press button &lt; 3 s.</li> </ol>
◀▶ Both buttons together	<ol style="list-style-type: none"> <li>1. Acknowledge errors, press both buttons &lt; 3 s.</li> <li>2. Reset, press both buttons &gt; 3 s.</li> </ol>
▲ Up button	<ol style="list-style-type: none"> <li>1. Scroll through parameters and error messages.</li> <li>2. Increase parameter value.</li> </ol>

Fig. 6.2.1 Keypad and display



▼ Down button	<ol style="list-style-type: none"> <li>1. Scroll through parameters and error messages.</li> <li>2. Reduce parameter value.</li> <li>3. Opening pulse, press button &lt; 3 s.</li> <li>4. Learning cycle, press button &gt; 3 s.</li> <li>5. Reset with factory setting, press button &gt; 8 s (program switch CLOSE).</li> <li>6. Identify operator orientation for display.</li> </ol>
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### TIPS AND RECOMMENDATIONS

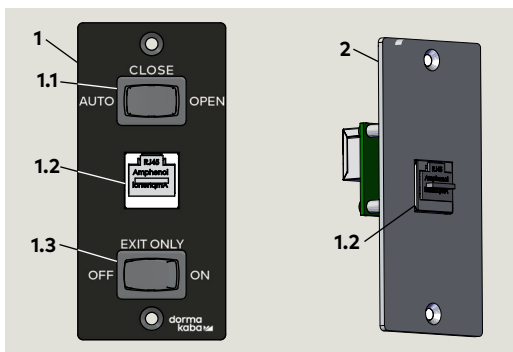
Keypad arrow symbols  
 <, "less than" symbol  
 >, "greater than" symbol

<3s: momentarily press button.  
 >3s: Press button greater than 3 seconds.

### 6.3 Program switch panel

- 1 Program switch panel
- 1.1 Program switch, 3 position
- 1.3 Exit Only switch, 2 position
- 1.2 Comm port for Dorma Handheld
- 2 RJ45 panel

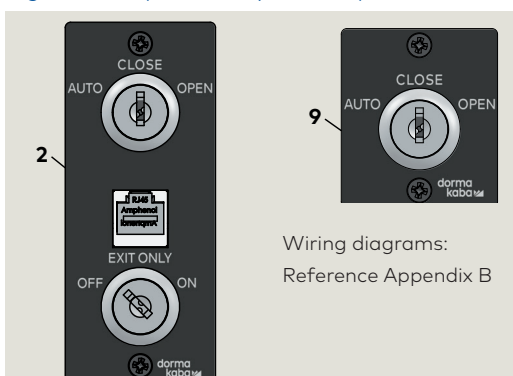
Fig. 6.3.1 Program switch, RJ45 panels



### 6.4 Optional key switch panels

- 2 Key switch panel, RJ45, DX4604-21C
- 9 Key switch panel DX4604-11C

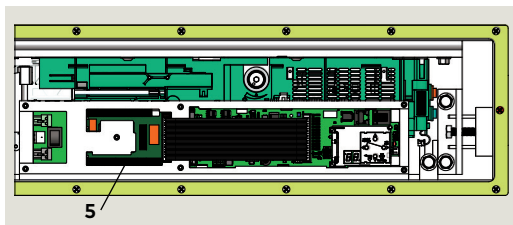
Fig. 6.4.1 Optional key switch panels



### 6.5 Operator status LEDs

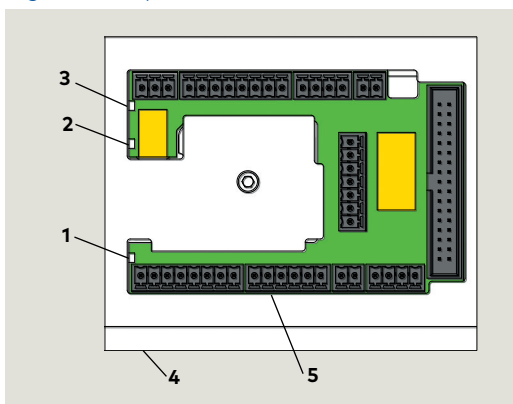
- 5 Accessory terminal board

Fig. 6.5.1 ED250 in ground case assembly



- 1 Red LED
- 2 Yellow LED
- 3 Green LED
- 4 PCB assembly
- 5 Accessory terminal board

Fig. 6.5.2 Operator status LEDs



#### 6.3.1 Program switch control modes.

- Auto, door opens automatically when one of the activators is actuated or triggered and closes on expiration of adjustable hold open time with no activators or actuators triggered.
- Close, door closes automatically, or remains closed until program switch position changed.
- Open, door opens automatically and remains open until program switch position changed.

#### 6.3.2 Exit only switch modes.

- Off, Interior and exterior activation sensors both active.
- On, exterior activation sensor disabled when door fully closed. Only interior activation sensor will enable door opening.

#### 6.3.3 RJ45 panel

- Supplied on double door installations.
- RJ45 cable connects panel to second ED250 in-ground operator for dormakaba handheld connection.

#### 6.5.1 Operator status LEDs

In ground case cover must be opened to view LEDs.

1. Red LED  
Blinking codes are used to indicate "In\_" information (system status or operating conditions) or certain error codes "E\_".
2. Yellow LED  
Maintenance interval indicator. When illuminated, an indication the operator system has to be serviced.
3. Green LED
  - On, internal 24 Vdc power is On.
  - Off, internal 24 Vdc power is Off.



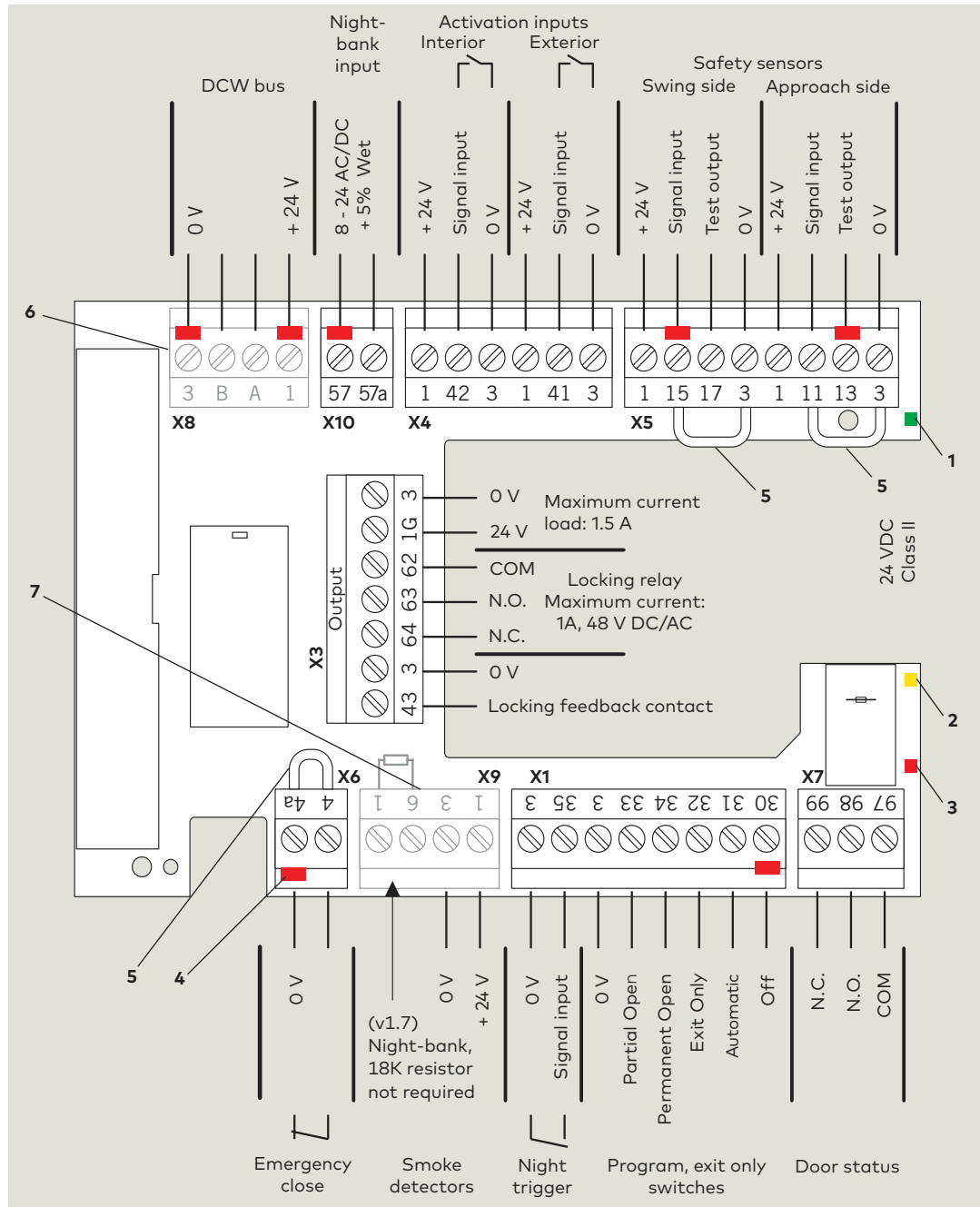
#### TIPS AND RECOMMENDATIONS

Details on LED status codes and maintenance intervals can be found in Chapter 18, troubleshooting chart.

## 6.6 ED250 terminal board accessory interfaces

Fig. 6.6.1 Terminal board electrical connections

- 1 Green LED (Para. 6.5)
- 2 Yellow LED (Para. 6.5)
- 3 Red LED (Para. 6.5)
- 4 Key (red insert) location in socket. Assigned plug has tab broken off in same location.
- 5 Jumpers, factory installed at following terminals:
  - 4 and 4a
  - 15 and 3\*
  - 11 and 3\*
 \* Remove jumpers if safety sensors installed.
- 6 DCW® upgrade card plug included in scope of delivery.
- 7 Fire protection upgrade card plug included in scope of delivery.



# 7 ED250 door signage

## 7.1 Low energy operator

### 7.1.1 Overview

Signage and warnings are specified in ANSI /BHMA A156.19, American National Standard for power assist and low energy power operated doors.

### 7.1.2 All low energy doors

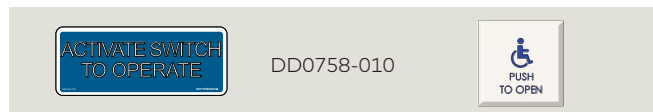
Fig. 7.1.1 AUTOMATIC CAUTION DOOR decal



1. AUTOMATIC CAUTION DOOR decal.
  - All low energy doors shall be marked with signage visible from both side of door with the words "AUTOMATIC CAUTION DOOR".
  - Signs shall be mounted 50" ± 12" from floor to centerline of sign.

### 7.1.3 Knowing act switch used to initiate door operation1

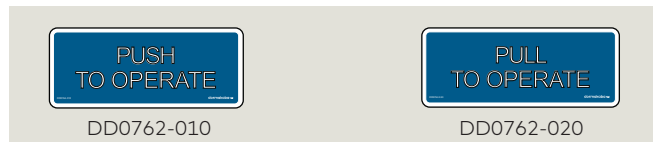
Fig. 7.1.2 ACTIVATE SWITCH TO OPERATE decal



1. ACTIVATE SWITCH TO OPERATE decal.
  - When a knowing act device is used to initiate operation of door operator, door shall be provided with sign on each side of door where switch is operated with message "ACTIVATE SWITCH TO OPERATE".

### 7.1.4 Push/Pull used to initiate door operation.

Fig. 7.1.3 PUSH TO OPERATE, PULL TO OPERATE decals



1. PUSH TO OPERATE, PULL TO OPERATE decals.
  - When push/pull is used to initiate operation of door operator, doors shall be provided with the message "PUSH TO OPERATE" on push side of door and "PULL TO OPERATE" on pull side of door.

## 7.2 Door signage, low energy swing doors, initiation of door operation

### 7.2.1 Single door

Fig. 7.2.1 Activate Switch To Operate

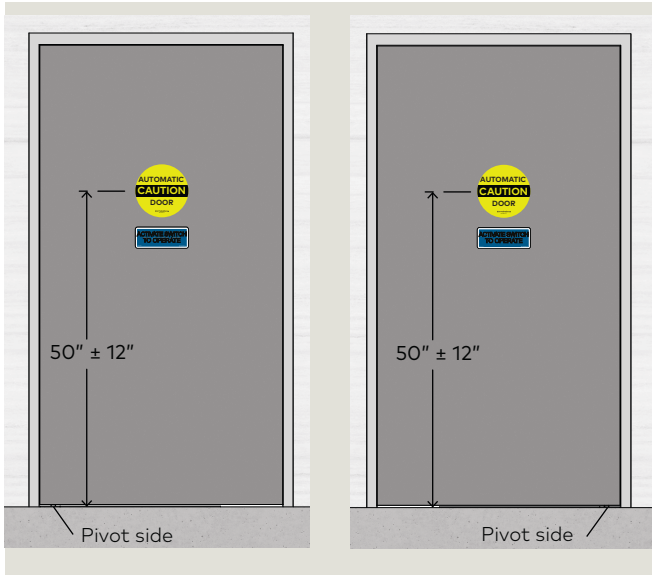
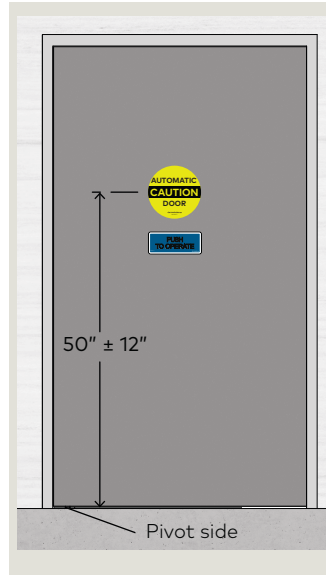
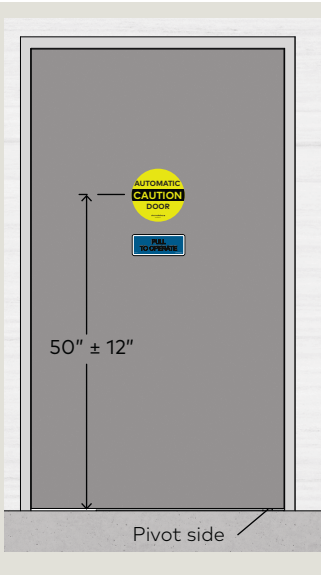


Fig. 7.2.2 Push/Pull  
Push To Operate



Pull To Operate



### 7.2.2 Double doors

Fig. 7.2.1 Activate Switch to Operate

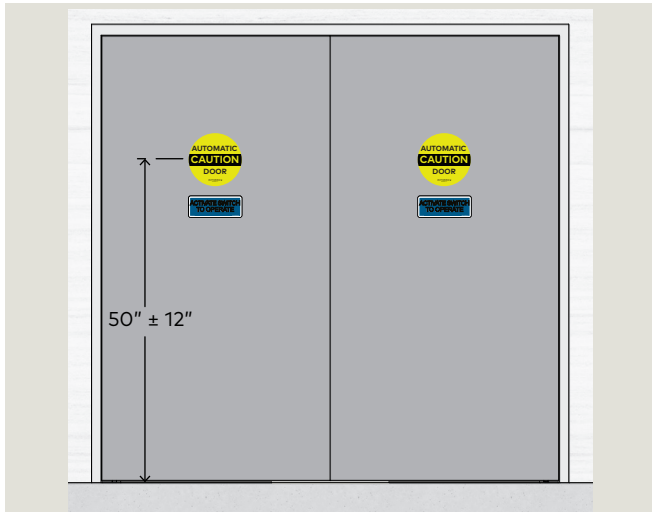


Fig. 7.2.2 Opposite side, no device

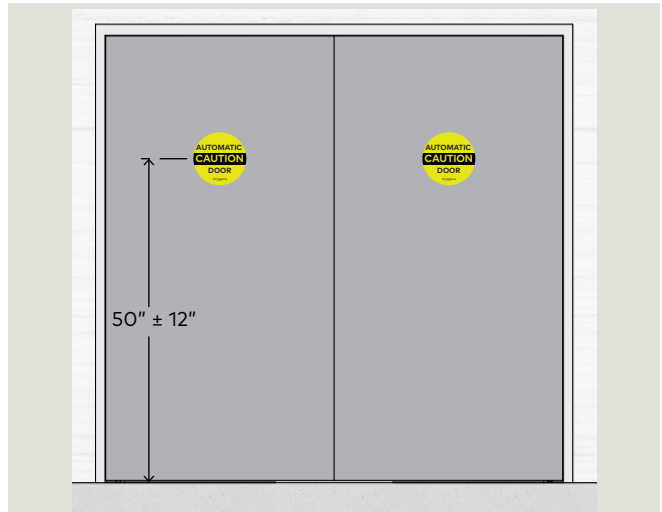


Fig. 12.623 Push/Pull, Pull side

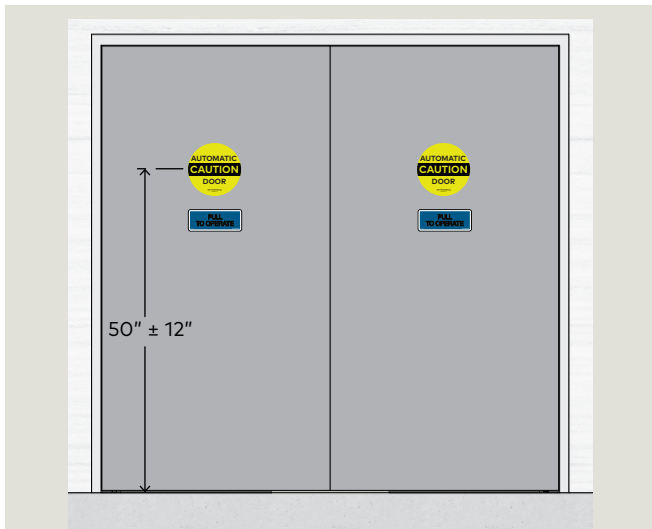
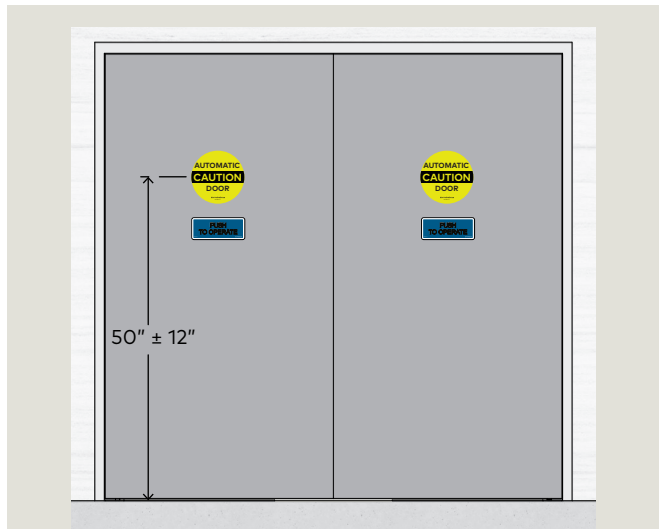


Fig. 12.2.4 Push/Pull, Push side



## 7.3 Safety information label, low energy swing doors

### 7.3.1 Low energy swinging door safety information label

This AAADM label (Fig. 7.7.2) outlines safety checks that should be performed daily on singing door controlled by an ED250 configured for low energy operation.

### 7.3.2 Safety information label location

Place label in a protected, visible location on door frame, near program switch panel if possible.

### 7.3.3 Annual compliance section of label

This section of label is only completed on low energy swing doors that comply with ANSI/BHMA A156.19 standard and pass inspection by an AAADM certified dormakaba USA, Inc. technician.

### 7.3.4 Additional annual compliance inspection labels

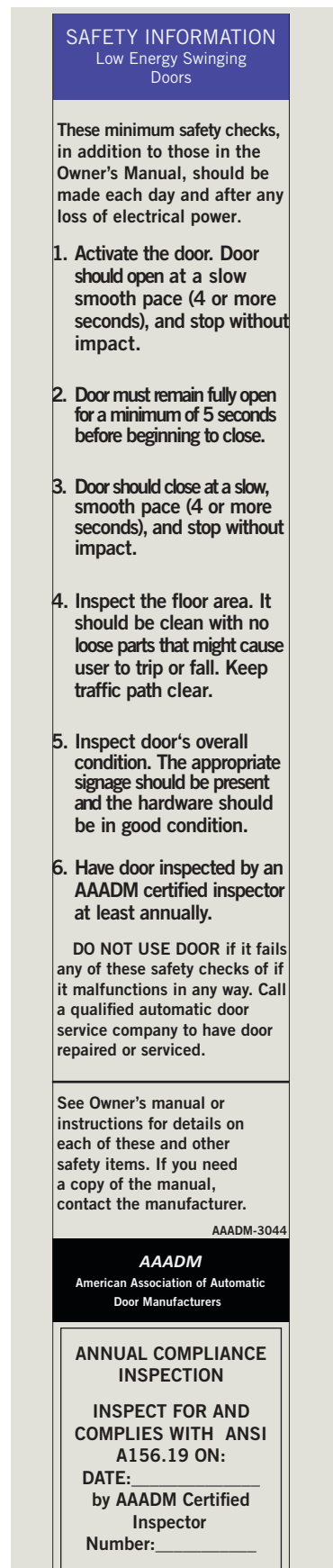
Place additional labels over annual compliance inspection section of safety information label.

Fig. 7.3.1 Annual compliance label, low energy



### 7.3.5 Safety information label

Fig. 7.3.2 Low energy



# 8 ED250 in-ground door threshold

## 8.1 In-ground door threshold

Fig. 8.1.1 Threshold example for ED250 in-ground

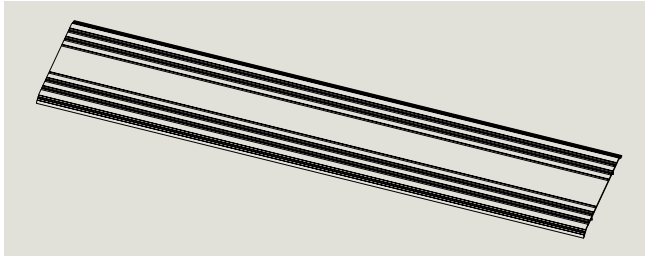


Fig. 8.1.2 Door threshold installation example for ED250 in-ground

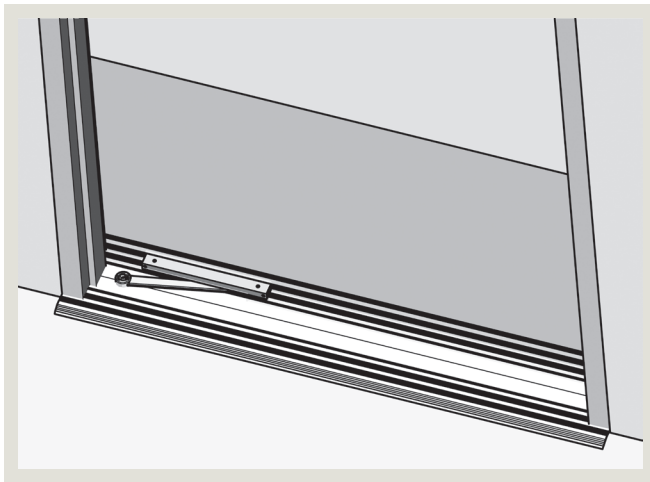
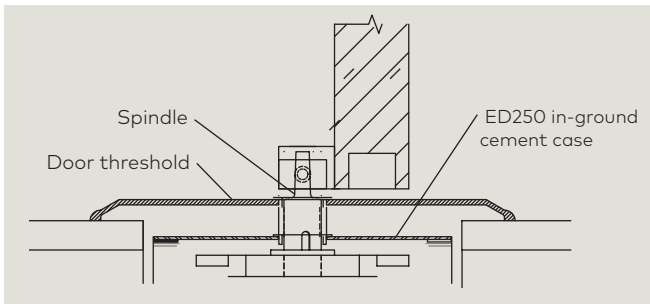


Fig. 8.1.3 Threshold installation end view example



### NOTICE

Door threshold installation and maintenance is owner's responsibility

#### 8.1.1 Door threshold seal at spindle.

##### CAUTION

Spindle opening at threshold must be sealed with an O-ring or similar device.

#### 8.1.2 Door threshold perimeter seal

##### CAUTION

Threshold perimeter must be sealed with a silicone sealant.

#### 8.1.3 Cleaning door threshold and floor area around threshold.

##### CAUTION

Do not pressure wash door threshold or floor area adjacent to door threshold!



### WARNING

Access to the ED250 in-ground cement case must only be done by dormakaba USA Inc. certified technicians!

# 9 ED250 in-ground door maintenance

## 9.1 In-ground single swing door with offset pivot arm

Fig. 9.1.1 Left hand door with offset pivot arm

- 1 ED250 in-ground cement case
- 2 Offset pivot arm
- 3 Door pivot (by others)
- 4 Door frame pivot (by others)
- 5 Door frame
- 6 Blockout
- Threshold not shown
- Door transparent for hardware views

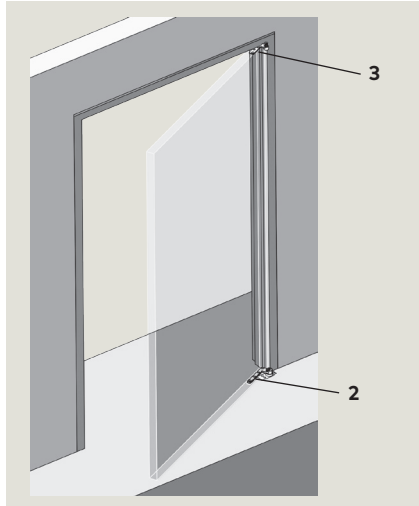
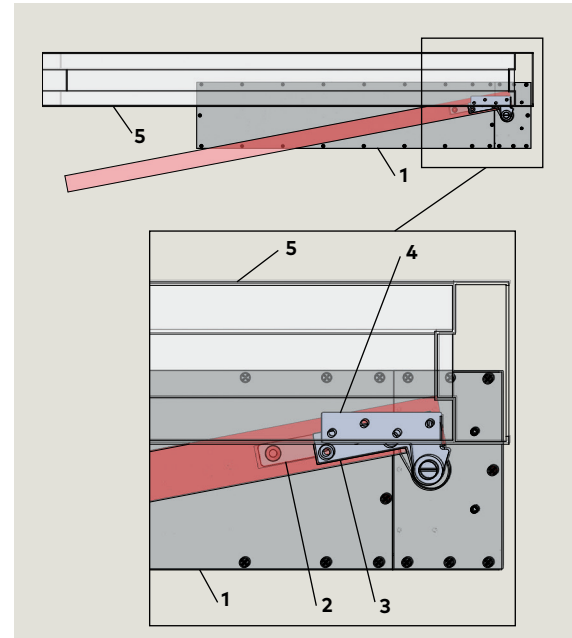


Fig. 9.1.2 Door overhead view



### 9.1.1 Offset pivot arm door maintenance.

1. Pivot arms, check for wear and tear.

## 9.2 ED250 in-ground single swing door with center hung arm

Fig. 9.2.1 Door with center hung arm

- 1 ED250 in-ground cement case
- 2 Blockout
- 5 Door frame
- 6 Center hung arm
- 9 Top of door and door frame hardware (by others)
- Threshold not shown

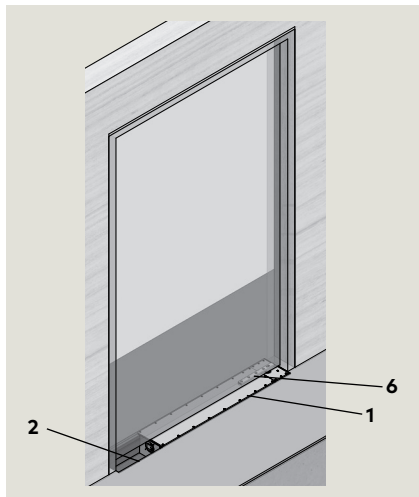
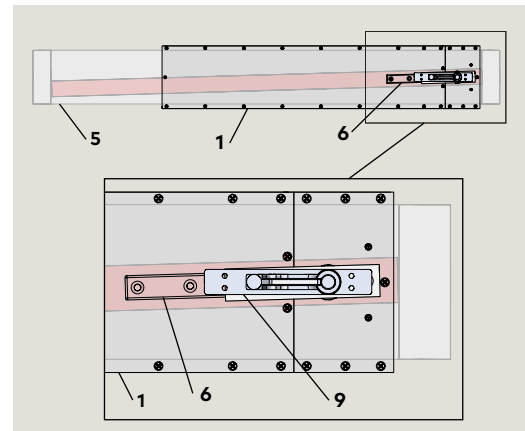


Fig. 9.2.2 Door overhead view



### 9.2.1 Center hung door maintenance.

1. Center hung arms, check for wear and tear.

### 9.3 ED250 in-ground single swing door with arm and track

- 1 ED250 in-ground cement case
- 2 Blockout
- 3 Door
- 4 Butt hinge (by others)
- 7 Track
- 8 Arm
- 9 Threshold (by others)

Fig. 9.3.1 LH door with arm and track

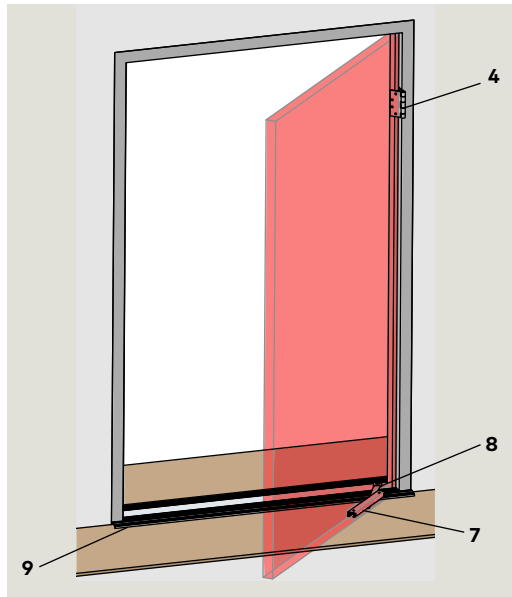


Fig. 9.3.2 Overhead view, door closed

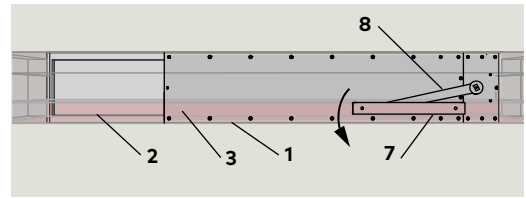


Fig. 9.3.3 Front view

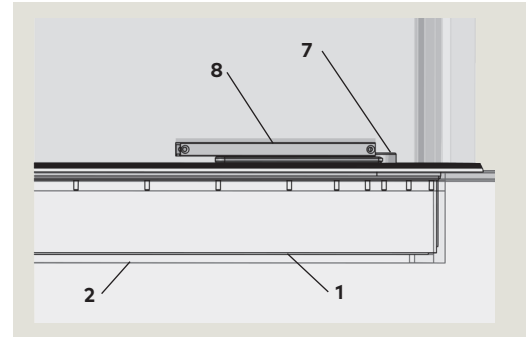
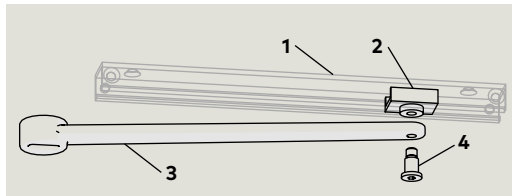


Fig. 9.3.4 Arm and track

- 1 Track
- 2 Slide
- 3 Arm
- 4 M8 shoulder screw



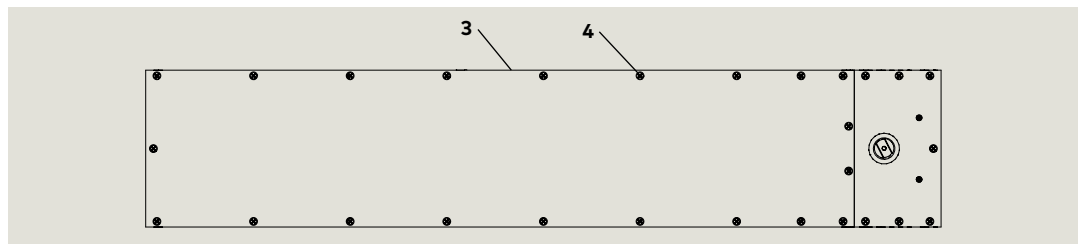
**9.3.1 Arm and track door maintenance.**

1. Track, check for wear or damage.
2. Track, check for debris in track.
3. Slide, check for wear or damage.

### 9.4 Removing and reinstalling cement case cover

- 3 Cover
- 4 (21) 8-32x3/4" PFHMS (Phillips flat head machine screws)

Fig. 9.4.1 ED250 cement case with cover installed.



**9.4.1 Removing cement case cover.**

1. Use a Phillips No. 2 screwdriver bit to remove the twenty one 8-32 x 3/4" PFHMS securing the cover to the cement case.

**9.4.2 Reinstalling cement case cover.**

1. Insure gasket is clean and aligned with case mounting holes, then place cover over gasket.
2. Using a Phillips No. 2 screwdriver bit, install the twenty one 8-32 x 3/4" PFHMS securing the cover to the cement case.



**WARNING**

Access to the ED250 in-ground cement case must only be done by dormakaba USA Inc. certified technicians!

3. Hand tighten screws using a Phillips No. 2 screwdriver.

**CAUTION**

Do not over tighten cover screws!

# 10 Measure door width

## 10.1 Door width parameter Tb

### 10.1.1 Door width parameter.

Door width is set in increments of 100 mm (4"),  
 Measured width of 1000 mm (39.4") = **Tb** value of "10".  
 ED250: [700- 1600 mm] 28" - 63"

### 10.1.2 Record door width

Parameter Tb value	Door width measurement

## 10.2 Tb parameter values



### 10.2.1 ED250 door widths.

Door width measurement			
Inches	[mm]	<b>Tb</b>	Width inches
36 to 39 15/16	[914] to [1014]	9	36
40 to 43 15/16	[1016] to [1116]	<b>10*</b>	40

Door width measurement			
Inches	[mm]	<b>Tb</b>	Width inches
44 to 47 15/16	[1118] to [1218]	11	44
48 to 51 15/16	[1219] to [1319]	12	48

# 11 Set reveal depth

## 11.1 Reveal depth parameter rd

Parameter	Description	Reference paragraph
2  	Reveal depth	Para. 17.2

### 11.1.1 Reveal depth parameter.

1. Reveal depth is set in increments of 10 mm (approximately 3/8").

### 11.1.2 Reveal depth parameter, center hung door.

1. Reveal depth: 0, **rd** = 0

### 11.1.3 Reveal depth parameter, offset pivot door.

1. Reveal depth: 3/4", **rd** = 2

### 11.1.4 Reveal depth parameter, arm and track.

1. Reveal depth: 1", **rd** = 3

## 11.2 rd parameter values

### 11.2.1 ED250 reveal depths, rd parameter.

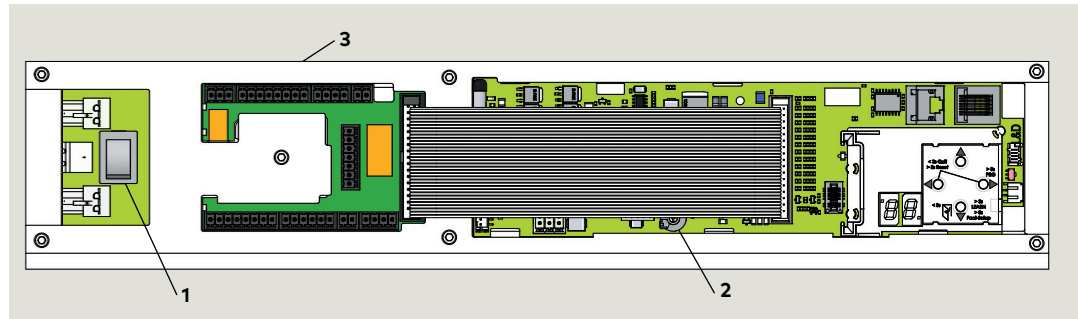
Reveal measurement		
ED250		
Inches	[mm]	<b>rd</b>
0	<b>0*</b>	0
3/8	10	1
3/4	20	2
1 1/8	30	3

# 12 Power fail closing speed

## 12.1 Set power fail closing speed

- 1 Power switch
- 2 Power fail closing speed potentiometer
- 3 PCB bracket assembly

Fig. 12.1.1 Power fail closing speed potentiometer



### 12.1.1 Power fail closing speed potentiometer.

- Single turn
- Factory setting: fully CCW
- CCW increases closing speed.
- CW decreases closing speed.
- 3/32" [2-3 mm] flat blade screwdriver required for adjustment.

### 12.1.2 Setting door closing speed upon power failure.

1. Turn ED250 power switch OFF.
2. Manually open door to 90° angle and let it close.
3. If door closes in less than 3 seconds, turn potentiometer 1/4 turn CW and retry test.



### TIPS AND RECOMMENDATIONS

Total door closing time from full open to fully closed should not be less than 5 seconds.

### NOTICE

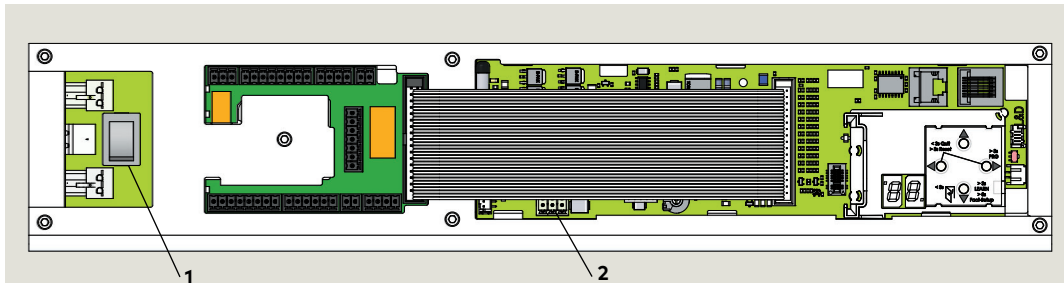
It is imperative that this door closing time be set. If door closes in less than three seconds, error message **E 73** (System error 3, braking circuit) will be displayed. Reference Chapter 18, Troubleshooting.

# 13 Set braking circuit plug position

## 13.1.1 Set braking circuit plug position

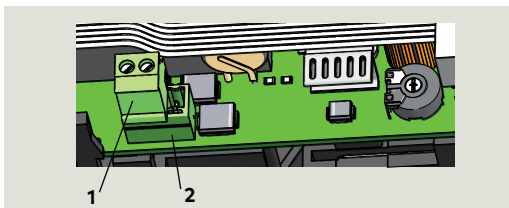
- 1 Power switch
- 2 Braking circuit 3 pin socket

Fig. 13.1.1 ED250 PCB bracket assembly



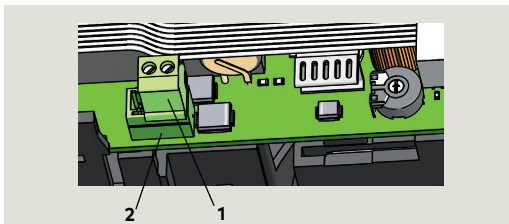
- 1 Braking circuit plug
- 2 Braking circuit 3 pin socket

Fig. 13.1.2 Plug position, pull



- 1 Braking circuit plug
- 2 Braking circuit 3 pin socket

Fig. 13.1.3 Plug position, push



### 13.1.1 Braking circuit plug

Braking circuit plug is positioned in its 3 pin socket for either a door pull or push configuration.

- **Braking circuit plug is factory installed in the left 2 pins, the pull position.**

(Fig. 13.1.2).



**WARNING**

Braking circuit will not work correctly if braking circuit plug is improperly positioned, or if an incorrect plug is used!

Door may close at high speed and/or be difficult to open!

### 13.1.2 Change braking circuit plug position.

To change plug position for push door application, install plug in right 2 pins, toward user interface (Fig. 13.1.3).



**WARNING**

Insure power switch is OFF before changing plug position!

**NOTICE**

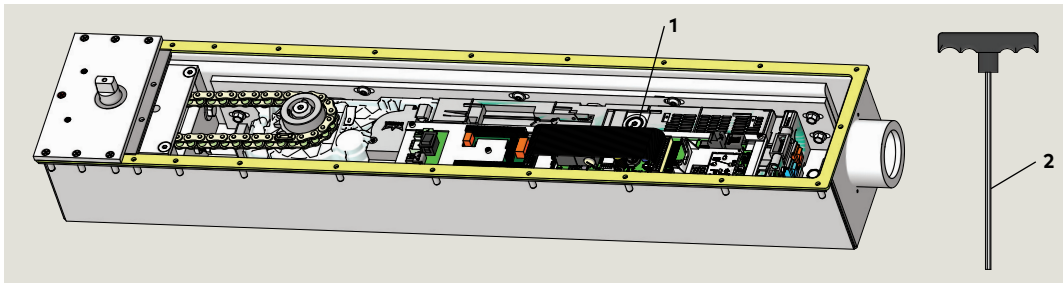
Refer to Para. 17.2, configuration parameter **AS** (installation type) for door in-ground push and pull configurations.

# 14 Operator spring tension

## 14.1 Set operator spring tension

Fig. 14.1.1 Spring tension adjustment

- 1 Spring tension adjustment
- 2 T handle hex key, 5 mm



### 14.1.1 Spring tension setting revolutions

Door width			
Inches	36	42	48
mm	914	1067	1219
Spring setting revolutions			
ED250	14	14	18

### 14.1.2 Operator spring tension function

- 1. Spring tension sets closing force on door.
- 2. Required spring tension is based on door width.

### 14.1.3 Spring tension adjustment factory setting

- 1. Spring tension adjustment is factory set fully CCW, no spring tension.
- 2. Spring has to be pretensioned per Para. 14.1.1. Use 5 mm T handle hex key.

**CAUTION**

A minimum of ten spring tension revolutions are required to operate system.

**CAUTION**

Any change to spring tension setting requires a new learning cycle (Chapter 15)!



**TIPS AND RECOMMENDATIONS**

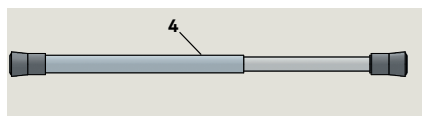
System checks spring tension during learning cycle (Chapter 15).

Learning cycle will be canceled if spring is insufficiently tensioned; door will stop and display will show a rotating "0" and an "F".



Fig. 14.1.2 Door pressure gauge

- 4 Door pressure gauge



**TIPS AND RECOMMENDATIONS**

Reference Chapter 16, ANSI/BHMA standards for closing forces.

# 15 Learning cycle

**CAUTION**

Learning cycle must be performed while motor is cold!

**CAUTION**

Door must not be manually moved or held in position during the learning cycle!

**CAUTION**

Verify that the following parameters have been set (Para. 17, Parameters):

- **AS**, Installation type
- **rd**, Reveal depth
- **Tb**, Door width
- **dL**, Door type (double doors only)



**TIPS AND RECOMMENDATIONS**

During learning cycle:

- Safety sensors and activators, are switched off to insure learning cycle sequence is not interrupted.
- Operator functions are deactivated.

**Step 1**

Secure motion range of door.



**WARNING**

No personnel or objects must be in range of door motion!

**Step 2**



Set program switch to CLOSE position.



Rotating "0" and an O indicate operator is ready for learning cycle.

**Step 3**  
Press



Press and hold down button until display changes.

- Door performs several movements and display shows a sequence of symbols.
- Movements of door must not be interrupted!



Display indicates door is at 70° position and is waiting for door opening angle to be set.

**Step 4**

Manually move door to desired maximum opening angle (maximum door angle: 110°).

**Step 5**  
Press



Momentarily press down button to continue learning cycle.

**CAUTION**

Insure there are no obstacles to door movement!

- Door performs several movements and display shows a sequence of symbols.
- Movements of door must not be interrupted!



- Spring tension is too low if door stops and display shows a small rotating "o" and an "F".

**Step 6**

If spring tension is too low::

- Turn off power and push or let door close.
- Increase spring tension (Chapter 14), turn on power and restart learning cycle (Step 3).



- Door will complete learning cycle.
- Display with two horizontal bars indicate operator is ready for operation.

**Step 7**  
Press



Momentarily press down button to cycle door.

**Step 8**

Following automatic learning cycle, actual forces on door, and door opening and closing times must be measured and changed if necessary to insure compliance with ANSI/ BHMA standards, reference Chapter 16.

**Step 9**



Set program switch to Auto.

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# 16 ANSI/BHMA standards

## 16.1 A156.19 Low energy power operated doors

The following table references portions of content from ANSI/BHMA A156.19. Refer to the standard, available through ANSI or BHMA for additional information. Standard material reprinted with BHMA permission.

### 16.1.1 Door measurements, low energy power operated door

ED250 Parameter				A156.19 standard		
Parameter	Function	Factory setting	Adjustment range	Para.	Requirement	
<b>So</b>	Opening speed	Swing door opening speed	25%/s Note 1	ED250 8%/s - 27%/s Note 2	4.2	Opening Doors shall open from closed to back check or 80°, whichever occurs first, in 3 seconds or longer as required in Table I.  Total opening time to 90° shall be as in Table II (next page) If door opens at more than 90°, it shall continue at the same rate as backcheck speed.
<b>bc</b>	Backcheck	Checking or slowing down of door speed before door being fully opened.	10°	5° - 40°	4.2	Backcheck shall not occur before 60° opening.
<b>Sc</b>	Closing speed	Swing door closing speed, automatic mode.	25%/s Note 1	ED250 8%/s - 27%/s Note 2	4.4	Closing Doors shall close from 90° to 10° in 3 s or longer as required in Table I (next page).  Doors shall close from 10° to fully closed in not less than 1.5 s.
<b>dd</b>	Hold open time	Hold open time	5 s	5 s - 30 s	4.3	Time delay When powered open, the door shall remain open at the fully opened position for not less than 5 s. Exception: when push-pull activation is used, the door shall remain at the fully opened position for not less than 3 s.
<b>hS</b>	Reference ED250 service manual for parameter detail.	Support for manual mode in door closed position.			4.5	Doors shall open: <ul style="list-style-type: none"> <li>• With a manual force not to exceed 15 lb f to release a latch if equipped with a latch.</li> <li>• To set a door in motion 30 lb f.</li> <li>• To fully open the door 15 lb f.</li> <li>• Forces shall be measured 1" from latch edge of door.</li> </ul>
<b>hA</b>		Adjustment, door activation angle.				
<b>hF</b>		Power assist function.				
<b>Fo</b>	Static force in opening direction	Static force on door closing edge in opening direction.	13.5 lb f	4.5 lb f - 15 lb f	4.5	The force required to prevent a stopped door from opening or closing shall not exceed 15 lb f measured 1" from latch edge of the door at any point during opening or closing.
<b>Fc</b>	Static force in closing direction	Static force on door closing edge in closing direction.	13.5 lb f	4.5 lb f - 15 lb f	4.5	

Note 1: Speed may be slower after learning cycle completed.

Note 2: Speed limited to 27% s in low energy mode.

**16.1.2 A156.19, Table I: Minimum opening and closing times.**

"D" door width, inches	"W" door weight, pounds				
	100	125	150	175	200
36	3.0 s	3.5 s	3.5 s	3.0 s	3.0 s
42	3.5 s	4.0 s	4.0 s	4.5 s	4.5 s
48	4.0 s	4.5 s	4.5 s	5.0 s	5.5 s

Minimum opening time to backcheck or 80 degrees (whichever occurs first).  
 Minimum closing time from 90 degrees to latchcheck or 10 degrees (whichever occurs first).

**16.1.3 A156.19, Table II: Total opening time to 90 degrees.**

Backcheck at 60°	Backcheck at 70°	Backcheck at 80°
Table I plus 2 s	Table I plus 1.5 s	Table I plus 1 s
If door opens more than 90°; it shall continue at the same rate as backcheck speed.		
Backcheck occurring at a point between positions shall use lowest setting.		

**16.1.4 Other door weights and widths**

Closing time  $T = (D \sqrt{W}) / 188$   
 D = Width of door in inches.  
 W = Weight of door in pounds.  
 T = Closing time to latch check in seconds.

# 17 Parameters

## 17.1 Parameters

### 17.1.1 Firmware version



#### TIPS AND RECOMMENDATIONS

- Parameters descriptions incorporate firmware versions v1.7 through v2.1.
- Version numbers are noted next to each applicable parameter description.

### 17.1.2 Firmware version and updates.

- Operator firmware version is displayed during first commissioning. Reference ED250 Installation Instructions Chapter 21.
- Dorma Handheld can be used to check operator firmware version and to perform firmware updates. Reference Chapter 20, Dorma Handheld, or Dorma Handheld manual.

Fig. 17.1.1 Dorma Handheld terminal



### 17.1.3 Configuration parameters

Configuration parameters (Para. 17.1.6) are set during first commissioning, reference ED250 Installation Instructions Chapter 21.

### 17.1.4 Driving parameters

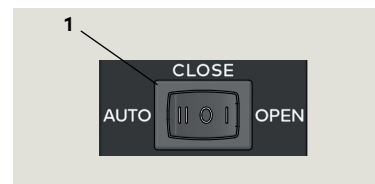
Driving parameters can be set once first commissioning has been completed.

- Reference Para. 17.1.7 for a list of driving parameters.
- Reference Para. 17.3 for details on each driving parameter.

### 17.1.5 Changing parameter values.

- Set program switch to the CLOSE position

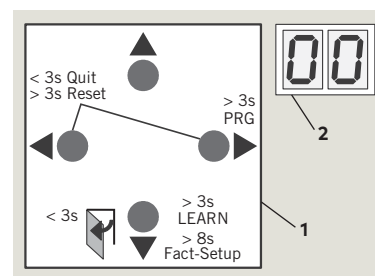
Fig. 17.1.2 Program switch



- Program switch, 3 position

- Use 4 button keypad as outlined in Steps 1 through 8 to view or change parameter values.

Fig. 17.1.3 4 button keypad, 2 digit display



- 4 button keypad
- 2 digit display

<b>Step 1</b> ▶	Press and hold right button greater than 3 s to enter program mode.
<b>Step 2</b> ◀	Press up or down button to scroll through parameters until desired parameter is displayed.
<b>Step 3</b> ▶	Press right button to display current parameter value.
<b>Step 4</b> ▶	Press right button again to enable editing of value, display will start flashing.
<b>Step 4</b> ◀	Press up or down button to select desired parameter value.
<b>Step 5</b> ▶	Press right button to save selected value. Display stops flashing.
<b>Step 6</b> ◀	Press left button to return to selected parameter.
<b>Step 7</b> ◀	Press up or down button to scroll through parameters until next desired parameter is displayed.
<b>Step 8</b> ◀	Press left button for a minimum of 3 s to exit program mode.

### 17.1.6 Configuration parameters

Parameter	Description
1 AS AS	Installation type, Reference Para. 17.2.
2 rd rd	Reveal depth, Reference Chapter 11
3 Tb rb	Door width, Reference Chapter 10
4 dL dL	Door type, Reference Installation manual, Chapter 22.

### 17.1.7 Driving parameters

Reference Para. 17.3 for parameter details.

Driving parameter	Description
5 So So	Opening speed, automatic mode
6 Sc Sc	Closing speed, automatic mode
7 dd dd	Hold open time, automatic mode
8 dn dn	Hold open time, night/bank
9 do do	Hold open time, manual opening of door
10 Sb Sb	Wall masking on door swing (hinge) side
11 ST ST	Safety sensor test
12 SA SA	Activation by safety sensor on approach (opposite hinge) side
13 SP SP	Suppression of safety sensor on swing hinge side during initial movement (v1.9)
14 Ud Ud	Locking mechanism delayed opening time
15 Pu Pu	Door preload prior to unlocking
16 TS TS	PR (Power reserve) module test
17 Fo Fo	Static force on door closing edge in opening direction (wind load control)
18 Fc Fc	Static force on door closing edge in closing direction (wind load control)
19 EP EP	Motor driven latching action, automatic mode
20 EA EA	Door opening angle at which motor driven latching action is activated
21 FH FH	Keep closed force
22 PG PG	Push and Go
23 PS PS	Program switch type
24 S1 S1	DCW® EPS, electronic program switch behavior following a power reset
25 S2 S2	Internal program switch; switch function on delay
26 du du	Door unlocking during business hours
27 Sr Sr	Status relay function, terminal block X7

Driving parameter	Description
28 bE bE	Input 4/4a and X3, 1G 24V locking device output configuration
29 CC CC	Cycle counter, number displayed * 10000
30 EC EC	Delete error log
31 CS CS	Reset service interval display (yellow LED)
32 SL SL	Factory setting level (Fact Setup button)
33 OA OA	Opening angle, set during learning cycle
34 hd hd	Door closer mode, automatic or manual
35 hA hA	Power assist function activation angle
36 hF hF	Power assist function force adjustment
37 hS hS	Power assist function support for manual mode in door closed position (v1.9)
38 F1 F1	Upgrade card, fire protection
39 F2 F2	This paragraph left intentionally blank.
40 F3 F3	Professional upgrade card, flip flop function, night/bank
41 F4 F4	Professional upgrade card, extended hold open time
42 F5 F5	Professional upgrade card, nurse-bed function (double doors only)
43 F7 F7	Upgrade card, barrier free toilet
44 F8 F8	Upgrade card, DCW® I/O module
45 C1 C1	Configuration of COM 1 interface
46 bc bc	Back check angle when door opened manually
47 Td Td	Door thickness [mm]
48 d1 d1	Deactivation of drive, emergency pushbutton at X4, 4 and 4a, trigger type (v1.7)
49 d2 d2	Night/bank function, trigger type (v1.7)
50 FC FC	Hold open system release by manually closing door, trigger type (v1.7)
51 Ad Ad	Active door with astragal: caster angle, angle door must reach before passive door starts to open
52 HS HS	Hinge clearance
53 S3 S3	OHC mode; permanent open via night-bank input (v2.1)
54 S4 S4	OHC mode; manual force overload drive release (v2.1).

## 17.2 AS installation type parameter

### 17.2.1 Set AS installation type parameter.

<b>Step 1</b> Press		Press and hold right button greater than 3 sec. to enter parameter mode; AS parameter displayed.
<b>Step 2</b> Press		Displays "00", factory setting.
<b>Step 3</b> Press		"00" starts flashing.
<b>Step 4</b> Press		Scroll to select parameter value. "1" shown as example.
<b>Step 5</b> Press		Saves value entered. Display stops flashing.
<b>Step 6</b> Press		Returns to Installation type parameter.
<b>Step 7</b> Press		Exits parameter mode.

### 17.2.2 AS parameter.

	Installation type, in-ground (IG)
Parameter value	Parameter description
0*	IG - Arm and track, LH push
1	IG - Arm and track, RH pull
2	IG - N/A
3	Overhead concealed (OHC) RH In-ground cement case: Offset pivot arm, LH pull Center hung arm, pivot at right jamb, LH pull/in Center hung arm, pivot at left jamb, LH push/out
4	OHC, LH In-ground cement case: Offset pivot arm, RH pull Center hung arm, pivot at right jamb, RH push/out Center hung arm, pivot at left jamb, RH pull/in
*	Factory setting

Fig. 17.2.1 Arm and track, LH (push)

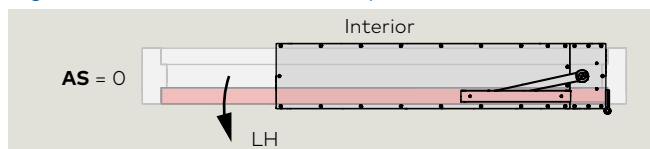


Fig. 17.2.2 Arm and track, RH (pull)

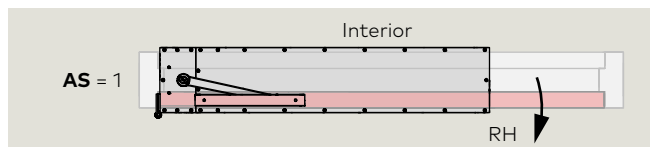


Fig. 17.2.3 Offset pivot arm, RH pull

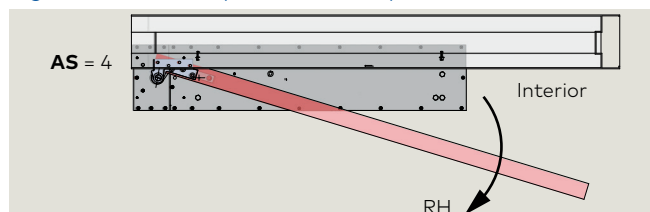


Fig. 17.2.4 Offset pivot arm, LH pull

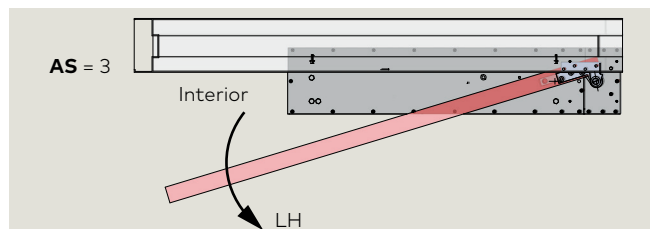


Fig. 17.2.5 Center hung arm, pivot at right jamb

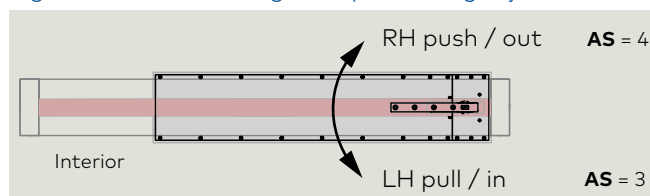
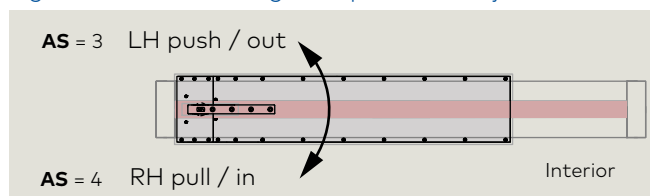









Fig. 17.2.6 Center hung arm, pivot at left jamb









## 17.3 Driving parameters detail

### 17.3.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
<b>Opening speed, automatic mode</b>				
5	 ED250 8 - 60*	%s	<b>25</b>	<ol style="list-style-type: none"> <li>Opening speed refers to automatic mode, speed can be adjusted using this parameter.</li> <li>Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value.</li> <li>After parameter set, verify setting meets A156.19 (low energy) standards. See Chapter 16. * Maximum opening speed reduced to 27%/s in low energy mode.</li> </ol>
<b>Closing speed, automatic mode</b>				
6	 ED250 2 - 60* (v2.0)	%s	<b>25</b>	<ol style="list-style-type: none"> <li>Closing speed refers to automatic mode, speed can be adjusted using this parameter.</li> <li>Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value.</li> <li>After parameter set, verify setting meets A156.19 (low energy) standards. See Chapter 16. *Maximum closing speed reduced to 27%/s in low energy mode.</li> </ol>
<b>Hold open time, automatic mode</b>				
7	 0 - 30 ----- 0 - 180*	s	<b>5</b>	<ol style="list-style-type: none"> <li>Hold open time starts once all internal, external, safety and push and go inputs have been opened or dropped, and door is in an open position.</li> <li>Hold open time values from 0 to 30 are set in increments of 1 second.</li> <li>Hold open time values greater than 30 seconds are set in increments of 5 seconds.</li> <li>In low energy mode, a minimum hold open time of 5 seconds is required.</li> <li>Hold open time can be re-triggered.</li> </ol> <p>*If hold open times greater than 30 seconds are desired, professional upgrade card extends maximum hold open time to 180 seconds.</p>
<b>Night-bank hold open time</b>				
8	 0 - 30	s	<b>10</b>	<ol style="list-style-type: none"> <li>Night-bank (key switch) hold open time is set using this parameter.</li> <li>Night-bank Hold open time starts once contact on night-bank activator input is opened and door is in an open position.</li> <li>Night-bank hold open time can be re-triggered.</li> </ol>
<b>Hold open time, manual opening</b>				
9	 0 - 30	s	<b>1</b>	<ol style="list-style-type: none"> <li>Default hold open time of 1 second that follows every manual opening of door can be adjusted using parameter <b>do</b> (v1.9).</li> <li>Hold open time starts when door is released.</li> </ol>
<b>Wall masking on door hinge side</b>				
10	 -----  60 - 99	°	<b>80</b>	<ol style="list-style-type: none"> <li>Wall masking required if door opens against an obstacle.</li> <li>When door reaches set wall masking angle, system will ignore signal from safety sensor on door swing (hinge) side.</li> <li>The wider the detection range of safety sensor used, the greater the area must be in which system has to ignore sensor's emitted signal. To insure personnel safety, it is advised to keep this range as small as possible.</li> <li>If set wall masking angle is exceeded when door is being opened, a rapidly flashing dot appears in top left hand corner of 2 digit display.</li> <li>Rapidly flashing dot disappears when door angle drops below set wall masking angle.</li> </ol>






17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description	
<b>Safety sensor test</b>					
  	0 - 8		0	Safety sensor parameter <b>ST</b> must be set to sensors used and if they are active-high or active-low. See E 04 safety sensor test error, Para. 18.4.	
				0	Sensor test off.
				1	Sensor test on swing (hinge) side. Active-high
				2	Sensor test on swing and approach sides. Active-high
				3	Sensor test on swing and approach sides. Active-high
				4	Sensor test on swing side. Active-low
				5	Sensor test on approach side. Active-low
				6	Sensor test on swing and approach sides. Active-low
				7	Wall mounted sensor with data line. Lock monitoring not available.
8	Sensor test, overhead sensor type Bodyguard III or Premier T with monitoring input. (v2.1)				
<b>Activation by safety sensor on approach (opposite hinge) side</b>					
	0 - 1		0	0 Safety sensor's input is disregarded as soon as door is closed.	
				1	Safety sensor can trigger an opening pulse while door is closed.
<b>Suppression of safety sensor on swing (hinge) side during initialization drive</b>					
	0 - 1		0	0 Safety sensor on swing side is active during an initialization drive after a power on reset.	
				1	<ul style="list-style-type: none"> <li>1. With SP set to 1, operator will disregard swing side safety sensor during initialization drive (v1.9).</li> <li>• After a power on reset, operator starts an initialization drive at slow speed. The initialization drive cannot be completed if safety sensor on hinge side is, or has been triggered.</li> </ul>
<b>Delayed opening time for locking mechanism</b>					
	0 - 40 * 100	ms	3 *100	<ol style="list-style-type: none"> <li>1. Delayed opening time delay starts as soon as door opening pulse has been generated.</li> <li>2. Door opens on expiration of time delay.</li> <li>3. If parameter is set to "0" and input for locking feedback contact is closed, door will not perform a preload <b>Pu</b> before door unlocks.</li> <li>4. Since various motor locks do not have feedback contacts, a delay of up to 4 seconds is possible (v1.7).</li> </ol>	
<b>Door preload prior to unlocking</b>					
	0 - 9		0	<ol style="list-style-type: none"> <li>1. Door preload prior to unlocking; force with which door is pushed in the "closed" direction before door is opened.</li> <li>2. The door may need to be pushed in closing direction (preload) in order to release electric strike to insure door opens.</li> <li>3. Preload time is set by parameter <b>Ud</b>, delayed opening time for locking mechanism.</li> <li>4. To maintain long service life, set preload force only as high as necessary.</li> </ol>	






17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Power reserve module SVP-PR 12 test</b>				
16	0 - 1		0	<p>0 Test off</p> <p>1</p> <ol style="list-style-type: none"> <li>SVP-PR 12 power reserve module test is performed once every 24 hours, or 10 minutes after AC power has been turned on. In event of an error:                             <ul style="list-style-type: none"> <li>Unlocking is not performed and no automatic door movements are initiated.</li> <li>Error code <b>E 25</b> is displayed, See Chapter 18, Para. 18.4, troubleshooting error codes.</li> </ul> </li> <li>SVP-PR 12 power reserve module can be used but must be tested on a regular basis if using:                             <ul style="list-style-type: none"> <li>SVP-2000 DCW® emergency escape motor lock with automatic latching action.</li> <li>M-SVP 2000 DCW® emergency escape lock, v1.5 or later.</li> </ul> </li> <li>Test is automatically activated if a fire protection module is recognized in conjunction with SVP-2000 DCW® or M-SVP 2000 DCW locks.</li> </ol>
<b>Static force in opening direction</b>				
17	2- 15 *10	N	6 *10	<ol style="list-style-type: none"> <li>Static force in opening direction (basic parameter for wind load control). Static force on door closing edge can be changed using this parameter.</li> <li>Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value.</li> <li>After parameter set, verify setting meets ANSI/BHMA A156.19 standard. See Chapter 16.</li> <li>Static force range is reduced with Low Energy mode. See Chapter 16.</li> </ol>
	.45- 3.4 *10	lbf	1.35 *10	
<b>Static force in closing direction</b>				
18	2- 15 *10	N	6 *10	<ol style="list-style-type: none"> <li>Static force in closing direction (basic parameter for wind load control). Static force on door closing edge can be changed using this parameter.</li> <li>Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value.</li> <li>After parameter set, verify setting meets ANSI/BHMA A156.19 standard. See Chapter 16.</li> <li>Static force range is reduced with Low Energy mode. See Chapter 16.</li> </ol>
	.45- 3.4 *10	lbf	1.35 *10	
<b>Motor driven latching action, automatic mode</b>				
19	0 - 9		0	<ol style="list-style-type: none"> <li>System offers a motor driven latching action in automatic mode in addition to mechanical latching action.</li> <li>The <b>EP</b> parameter setting (v1.7) is designed to increase static force on door to insure proper closing despite resistance caused by door seals or locking devices.</li> <li>Setting should be increased step by step from a low setting so as to avoid damage to the system. Use the lowest possible setting.</li> <li>Ensure that both the door itself and the arm or track installation are suitable for the additional, permanent forces.</li> </ol>
<b>Motor driven latching action angle (v1.7)</b>				
20	2 -10	°	3	<p>Door opening angle at which motor driven latching action <b>EP</b> is activated.</p> <ul style="list-style-type: none"> <li>Starting angle of the latching angle adjustable from 10°. (v1.7).</li> </ul>
<b>Keep closed force</b>				
21	0 - 9		0	<p>0 Off</p> <p>1 to 9</p> <ol style="list-style-type: none"> <li>Keep closed force is:                             <ul style="list-style-type: none"> <li>Permanently applied following motor drive latching action.</li> <li>Designed to keep door in closed position even if wind acts on door.</li> </ul> </li> <li>Keep closed force can be set from 0 (off) to 9, maximum force.</li> </ol>





17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Push &amp; Go</b>				
22		0 - 1	0	0 Off
				1 <ol style="list-style-type: none"> <li>Parameter is activated.</li> <li>Automatic opening of door is started when door is manually moved 4° out of the closed position.</li> <li>Door close mode parameter <b>hd</b> must be set to "0" (manual) to enable this function.</li> </ol>
<b>Program switch type</b>				
23		0 - 4	0	0 Internal, operator mounted program switches are active.
				1 External mechanical program switch with contacts is connected to operator terminal board. Internal program switch connector must be removed.
				2 External DCW® electronic program switch (EPS) is connected to operator terminal board. Internal program switch connector must be removed.
				3 Program switch control by TMS Soft control software.
4 <ol style="list-style-type: none"> <li>DCW® electronic program switch (EPS) is installed, and operator is also connected by the building management system to TMS Soft control software.</li> <li>When PS is set to 4, the program switch functions can be changed from DCW® (EPS) to TMS Soft (v1.9).</li> </ol>				
<b>DCW Electronic program switch (EPS) behavior following power reset</b>				
24		0 - 1	0	0 <ol style="list-style-type: none"> <li>In event of power failure, or if operator is deliberately switched off, EPS will automatically switch to last known position when power returns.</li> <li><b>Important:</b> The time at which power returns might not be during business hours and may affect insurance-compliant door locking requirements.</li> </ol>
				1 <ol style="list-style-type: none"> <li>In event of power failure, or if operator is deliberately switched off, EPS will automatically switched to OFF position when power returns.</li> <li>This function should be used if insurance compliant locking is required.</li> </ol>
<b>Internal program switches, switch on delay</b>				
25		0 - 1	0	0 Operator will perform function of new switch setting as soon as internal program switch is moved.
				1 <ol style="list-style-type: none"> <li>Operator will perform function of new switch setting after a delay of ten seconds from when internal program switch is moved.</li> <li>This function is useful if user has to pass through door and its connected detectors and sensors after program switch is set to new function.</li> </ol>
<b>Unlocking during business hours</b>				
26		0 - 1	0	0 Door is always locked when it reaches closed position.
				1 <ol style="list-style-type: none"> <li>In automatic mode, door will not lock when it reaches closed position. This achieves faster door opening when system is equipped with motor driven locks.</li> <li>If an electric strike opener is used, it must be suitable for 100% continuous duty factor to avoid possibility of damage.</li> </ol>







17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Status relay function, X7 terminals</b>				0 Status relay is deactivated.
27		0 - 6	<b>1</b>	1 Status relay activated as soon as door reaches door "closed" position.
				2 Status relay activated as soon as door reaches door "open" position.
				3 Status relay activated when error codes are displayed on 2 digit operator display.
				4 "Door closed and locked" activates status relay.
				5 Status relay activated when information or error codes are displayed on 2 digit operator display (v1.9).
				6 <ol style="list-style-type: none"> <li>Status relay activated when door is opened further than opening angle parameter <b>OA</b>, set during learning cycle.</li> <li>Parameter <b>OA</b> value can only be changed using Dorma Handheld or by performing another learning cycle.</li> </ol>
<b>Locking device output configuration; output X3, 1G (24V) and input X6, 4/4a</b>				Reference Chapter 6
28		0 - 1	<b>0</b>	0 Locking device output terminal X3, 1G (24V) is independent of Input X6, 4/4a.
				1 <ol style="list-style-type: none"> <li>Locking device output terminal X3, 1G (24V) is turned on as soon as contact at X6, 4/4a is opened (<b>v1.9</b>).</li> <li>Terminal X3, 1G 24V output is on for as long as contact at X6, 4/4a is open, motor lock with a 100% duty factor is required.</li> <li>This function is not available for DCW® motor locks.</li> </ol>
<b>Cycle counter</b>				1. Total number of opening and closing cycles displayed is shown in increments of 10000. <ul style="list-style-type: none"> <li>Display value, "4", 40,000 cycles.</li> <li>Display value, "53", 530,000 cycles.</li> </ul> 2. Total number of cycles can be displayed on Dorma Handheld.                     3. A display value of "99" means 990,000 cycles or greater.
29		0 - 99 * 10000	cycles	
<b>Delete error log</b>				0 No function.
30		0 - 1	<b>0</b>	1 <ol style="list-style-type: none"> <li>When "1" entered, Error log is deleted.</li> <li>Parameter is then automatically reset to "0".</li> </ol>
<b>Reset service interval display, operator yellow LED</b>				0 No function.
31		0 - 1	<b>0</b>	1 <ol style="list-style-type: none"> <li>When "1" entered:                             <ul style="list-style-type: none"> <li>Service cycle counter is reset to 200,000.</li> <li>Service interval is reset to 12 months.</li> <li>Yellow LED not illuminated.</li> </ul> </li> <li>Parameter is then automatically reset to "0".</li> <li>Values other than default values must be set using Dorma Handheld:                             <ul style="list-style-type: none"> <li>Maintenance interval</li> <li>Maintenance cycles</li> </ul> </li> </ol>







## 17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Factory setting level</b>				
32	 1 - 2		<b>1</b>	<p>Parameter <b>SL</b> is used to determine what data will be reset during factory setting process.</p> <p>Standard factory settings</p> <ul style="list-style-type: none"> <li>• Program switches OFF.</li> <li>• Door closed.</li> </ul> <p>1</p> <ul style="list-style-type: none"> <li>• Press 4 button keypad down button ▼ for &gt; 8 s.</li> </ul> <ol style="list-style-type: none"> <li>1. All parameters reset to factory settings.</li> <li>2. Procedure completed when "8" on 2 digit displays blinks twice.</li> <li>3. Installed upgrade cards remain valid and do not require reinstallation.</li> <li>4. Learning cycle required.</li> </ol>
				<p>Extended factory settings</p> <ul style="list-style-type: none"> <li>• Program switches OFF.</li> <li>• Door closed.</li> <li>• Press 4 button keypad down button ▼ for &gt; 8 s.</li> </ul> <p>2</p> <ol style="list-style-type: none"> <li>2. Procedure completed when "8" on 2 digit displays blinks twice.</li> <li>3. Installed upgrade cards deleted from operator memory.</li> <li>4. Parameter <b>SL</b> automatically reset to 1.</li> <li>5. Control unit and upgrade cards can be used independently (delivery status).</li> <li>6. Learning cycle required..</li> </ol>
<b>Opening angle</b>				
33	 0 - 110	°		<ol style="list-style-type: none"> <li>1. Door opening angle set during learning cycle is displayed.</li> <li>2. Opening angle can only be changed during learning cycle.</li> <li>3. Due to installation and parameter tolerances, display value may not match actual door position.</li> </ol>
<b>Door closer mode</b>				
34	 0 - 1		<b>1</b>	<p>0</p> <ol style="list-style-type: none"> <li>1. Automatic mode. This mode is applicable whenever door is mainly opened automatically and where motion detectors are installed.</li> <li>2. Mode is optimized for high frequency use.</li> <li>3. Full energy upgrade card provides for higher door opening and closing speeds.</li> <li>4. In case door is blocked during a closing cycle, operator reverses automatically.</li> <li>5. Driving phase is optimized to provide reliable closing cycles.</li> <li>6. Keep closed force (wind load control) parameter <b>FH</b> and Push &amp; Go function parameter <b>PG</b> are only available in automatic mode.</li> </ol> <p>1</p> <ol style="list-style-type: none"> <li>1. Manual mode. This mode is applicable whenever door is mainly used manually and only rarely automatically.</li> <li>2. In case door is blocked during a closing cycle, door will stop at its current position.</li> <li>3. Driving phase optimized for manual opening cycles.</li> <li>4. Power assist function parameter <b>hf</b> is only available in manual mode.</li> </ol>
<b>Power assist activation angle (v1.7)</b>				
35	 1 - 5	°	<b>3</b>	<ol style="list-style-type: none"> <li>1. Setting of door activation angle for Power assist function (<b>hF</b>).</li> <li>2. Higher settings of <b>hA</b> result in better spring force compensation for easier manual opening.</li> <li>3. Power assist function is more sensitive the smaller the activation angle.</li> </ol>










17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Power assist function (v1.7)</b>				
36	 0 - 10		0	<ol style="list-style-type: none"> <li>Force setting for Power assist function.</li> <li>Power assist function only available with <b>hd</b> parameter = 1, manual mode.</li> <li>"0"; power assist function OFF; power assist function enabled for available values greater than 0.</li> <li>Power assist function enabled when power assist activation angle <b>hA</b> reached.</li> <li>The greater the value of <b>hF</b>, the easier the door can be manually opened from power assist activation angle <b>hA</b>.</li> <li>If power assist set too high, door can open automatically.</li> <li>Power assist function is not available                             <ul style="list-style-type: none"> <li>If operator is switched off</li> <li>A smoke detector or emergency button has been triggered.</li> </ul> </li> </ol>
<b>Power assist function support for manual mode in door closed position (v1.9)</b>				
37	  0 - 10		0	<ol style="list-style-type: none"> <li>Setting for power assist function support with door in <b>closed</b> position.</li> <li>Power assist function only available with <b>hd</b> parameter = 1, manual mode.</li> <li>The greater the value of <b>hS</b>, the easier the door can be manually opened from the <b>closed</b> position.</li> </ol>
<b>F1, F3-F8 Upgrade card parameter values F2, ED100 full/low energy mode</b>				
			0	Upgrade card not installed, function not available.
	0 - 3		0	<ol style="list-style-type: none"> <li>Upgrade card installed, function not activated.</li> <li>Upgrade card installed, function activated.</li> <li>Upgrade card has been removed, function no longer available.</li> </ol>
<b>Upgrade card, fire protection</b>				
38	 0, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 2.</li> <li>Following activation, drive may be used as a electrically controlled hold-open system according to EN 14637, Building hardware-Electrically controlled hold-open systems for fire/smoke door assemblies, or similar standards.</li> <li>Full energy function is automatically activated.</li> <li>Plug for terminal board X9 socket included with upgrade card.</li> </ol>
39				This paragraph left intentionally blank.
<b>Upgrade card professional, impulse relay</b>				
40	 0, 1, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 1.</li> <li>Function must be activated by changing parameter <b>F3</b> to 2.</li> <li>Door can be controlled with a pushbutton connected to Night-bank input without a door hold open time:                             <ul style="list-style-type: none"> <li>Door opens with first pulse and remains open. The hold open time is not limited.</li> <li>Door closes only with second pulse of pushbutton.</li> </ul> </li> <li>Pushbutton in 3. must be connected to terminal board Night-bank input:                             <ul style="list-style-type: none"> <li>X1, 3 and 35 (dry)</li> <li>X10, 57 and 57a (wet)</li> </ul> </li> <li>Standard hold-open time <b>dd</b> is available when door is opened using other internal and external detectors.</li> </ol>

## 17.3.1 Driving parameters detail (Continued)

Parameter	Value range	Units	Factory setting	Description
<b>Upgrade card professional, extended hold-open time</b>				
41	 0, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 2.</li> <li>Setting range of <b>dd</b>, hold -open time is extended from 0 - 30 s to 0 - 180 s.</li> </ol>
<b>Upgrade card professional, nurse - bed function (double doors only)</b>				
42	 0, 1, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 1.</li> <li>Function must be activated by changing parameter <b>F5</b> to 2.</li> <li>For double doors, this function enables: <ul style="list-style-type: none"> <li>Separate door opening (only active door, nurse)</li> <li>Both doors open (active, inactive doors, bed)</li> </ul> </li> <li><b>Permanent opening?</b></li> <li>The activator connected to the external detector (terminal board X4, 41 and 3) controls the active door (nurse function). Only the active door will open.</li> <li>The activator connected to the internal detector (terminal board X4, 42 and 1) controls the both active and inactive doors (bed function), both doors will open.</li> <li>If Push &amp; Go function <b>PG</b> is activated, only the active door will open in the event of a manual opening.</li> <li>Night-bank inputs will only cause the active door to open.</li> <li>Exit only program switch function is not available with <b>F5</b> activated.</li> </ol>
<b>Upgrade card barrier free toilet</b>				
43	 0, 1, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 1.</li> <li>Function must be activated by changing parameter <b>F7</b> to 2.</li> <li>Operator power reset is required; turn power switch off, wait 10 s and turn power back on.</li> <li>Upgrade card assigns inputs and outputs of the control unit with functions which are required for this application.</li> </ol>
<b>Upgrade card DCW®</b>				
44	 0, 2, 3		0	<ol style="list-style-type: none"> <li>Once upgrade card installed, parameter value will automatically change to 2.</li> <li>Upgrade card provides operator with DCW® bus connection.</li> <li>Plug for terminal board X8 socket included with upgrade card.</li> <li>DCW® bus enables connection of: <ul style="list-style-type: none"> <li>Program switch EPS DCW® (max. 2)</li> <li>Motor lock controls SVP-S 2x DCW® (max. 2)</li> <li>Motor lock SVP 2000 (max. 1)</li> <li>RM-ED lintel mounted smoke detector</li> <li>Key switch button ST 32 DCW® (max. 2)</li> <li>I/O module DCW® (max. 1)</li> </ul> </li> </ol>
<b>COM 1 configuration interface</b>				
45	 0 - 1		0	<p>0 Interface programmed for communication with Dorma Handheld.</p> <p>1 Interface programmed for use with Dorma TMS Soft control software.</p>
<b>Back check when door opened manually</b>				
46	 5 - 40 (v1.9)	°	10	<ol style="list-style-type: none"> <li>Angle after which door is braked when manually opened.</li> <li>Back check level is automatically optimized during manual door opening cycles. This function improves door braking behavior in end position so door does not move beyond set opening angle <b>OA</b> (v1.7).</li> <li>Entered value is subtracted from set opening angle <b>OA</b>.</li> <li>Example <ul style="list-style-type: none"> <li>Opening angle, 90°</li> <li>Parameter <b>bc</b>, 12°</li> <li>Door back check starts at 78°</li> </ul> </li> </ol>

17.3.1 Driving parameters detail (Continued)

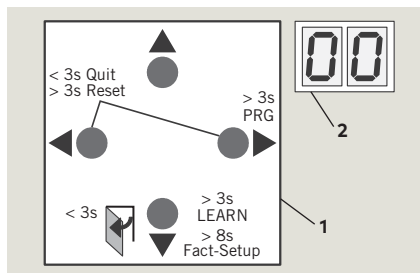
Parameter	Value range	Units	Factory setting	Description	
<b>Door thickness</b>					
47	 fd	0 - 99	mm	<ol style="list-style-type: none"> <li>Parameter is entered in mm.</li> <li>Door thickness affects measured door opening angle.</li> <li>Parameter <b>Td</b> enables a more accurate door width to be entered, if required.</li> </ol>	
	 Td	0 - 3 7/8"			1 3/8"
<b>Deactivation of drive; X6, 4 and 4a, trigger type (v1.7)</b>					
48	 d1	0 - 1	0	0 NC contact, drive function is deactivated when NC contact is open.	
				1 NO contact, drive function is deactivated when NO contact is closed.	
<b>Night-bank contact X1; 3 and 35, trigger type (v1.7)</b>					
49	 d2	0 - 1	0	0 <ol style="list-style-type: none"> <li>NO contact, night-bank function is triggered when NO contact is closed.</li> <li>Typically used when using a key switch or an access control system.</li> </ol>	
				1 <ol style="list-style-type: none"> <li>NC contact, night-bank function is triggered when NC contact is opened.</li> <li>Typically used when connected to building management system to trigger doors (signal normally present).</li> </ol>	
<b>Release of hold-open system (v1.7)</b>					
50	 FC	0 - 1	1	1 <ol style="list-style-type: none"> <li>Upgrade care Fire Protection installed, users may release hold-open by manually moving door in closed direction.</li> <li>A manual release button is not required.</li> </ol>	
				0 <ol style="list-style-type: none"> <li>Hold-open release by manually moving door in closed direction is deactivated.</li> <li>A manual release button is required.</li> </ol>	
<b>Castor angle for double doors</b>					
51	 Ad	0 - 30	°	30	Active door with astragal, angle active door must open before passive door opens.
<b>Hinge clearance</b>					
52	 HS	± 5	mm	3	<ol style="list-style-type: none"> <li>Clearance between hinges is critical for the calculated door angle.</li> <li>It may only have a small effect but the clearance can be adjusted in extreme cases to improve accuracy.</li> <li>Factory setting is 3 * 10, 30 mm, 1 3/16".</li> </ol>
		*10			
		±3/16	inches	*10	
<b>Overhead concealed (OHC) mode, permanent open via night-bank input (v2.1)</b>					
53	 S3	0 - 1	0	0 Function disabled.	
				1 If night-bank is triggered > 5 s, operator changes to permanent open mode. The function is canceled by repeated impulse.	
<b>Overhead concealed (OHC) mode, manual force overload drive release (v2.1)</b>					
53	 S4	0 - 1	0	0 Function disabled.	
				1 If door is manually moved against the direction of operator motor rotation, this is detected and the motor driving force is released to avoid damage to the operator mechanics.	

# 18 Troubleshooting

## 18.1 Information and error codes

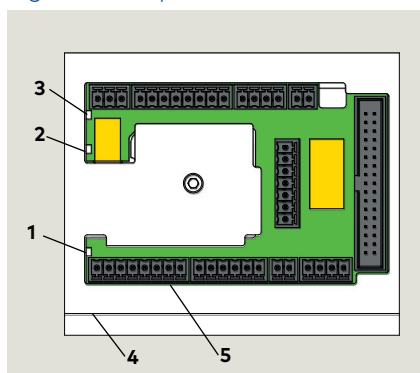
- 1 4 button keypad
- 2 2 digit display

Fig. 18.1.1 User interface



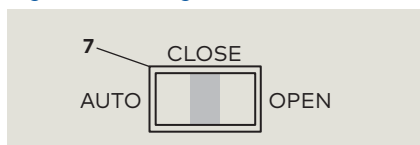
- 1 Red LED
- 2 Yellow LED
- 3 Green LED
- 4 PCB assembly
- 5 Accessory terminal board

Fig. 18.1.2 Operator status LEDs



- 7 Program switch, Close position

Fig. 18.1.3 Program switch



### TIPS AND RECOMMENDATIONS

Para. 18.2, LED status codes  
 Para. 18.3, Information codes  
 Para. 18.4, Error codes

### NOTICE

Cement case cover must be removed to access user interface and status LEDs.

#### 18.1.1 Overview

Operator monitors internal circuits and external safety circuits managed by the operator.

#### 18.1.2 Error and information messages

1. With operator in use, certain situations may develop resulting in error or information messages.
2. Operator attempts to identify the cause and respond accordingly.
3. Response depends on the severity of the error:
  - Information message (**In**)
  - Error message (**E**)
  - Deactivating the operator's automatic function; operator will switch to emergency mode. Users can then access door manually.

#### 18.1.3 User information display.

User interface display, or Dorma Handheld displays:

- Information **In** codes
- Error message **E** codes

#### 18.1.4 Viewing error messages.

To access and view error messages, briefly press the right **▶** button on the 4 button keypad.

#### 18.1.5 Red LED on operator .

Red LED on terminal interface board displays blinking codes for:

- Certain **In** information
- **E** status codes (Para. 18.2)

#### 18.1.6 Resetting error codes.

Options for resetting error codes:

1. Set program switch in Close (off) position.
2. User interface Reset buttons:
  - Press both left **◀** and right **▶** buttons >3s to reset system (v1.8).
3. Power reset:
  - Turn power switch OFF.
  - Turn power switch back on after 10 seconds.

### CAUTION

Always analyze and remove cause for error before resetting error message!  
 E status code troubleshooting chart (Para. 18.3.4) is intended as a guide for diagnosing errors.

### 18.1.6 Error message memory.

1. There are ten error message memory locations; E 0 through E 9.
2. The latest error message is always stored in error memory location E 0:
  - As soon as another error occurs, the existing error stored in E 0 will be moved to E 1 and the latest error will be stored in E 0.
3. A maximum of 9 errors can be stored in memory locations E1 through E9.
4. Identical error messages occurring one after another are not stored again.

## 18.2 Red LED status codes

### 18.2.1 Red LED status codes

Red LED status	Display	Description
Steady flashing		Control unit has detected error, emergency mode activated.
On steady	In 11	Hold-open device triggered.
Flashing 2 times	E 02	Locking device error.
Flashing 4 times	E 04	Safety sensor test error.
Flashing 5 times	E 25	SVP PR DCW® module test negative.
Flashing 5 times	E 51 E 52 E 53	Incremental encoder error.
Flashing 6 times	E 62	Double door operation, 2nd system has incompatible firmware version.
Flashing 6 times	E 63	Double door operation, 2nd system has incompatible fire protection setting.
Flashing 7 times	E 71	System error 1 (test), second shutdown option.
Flashing 7 times	E 72	System error 2 (test), current measuring circuit.
Flashing 7 times	E 73	System error 3 (test), braking circuit
Flashing 12 times	E 12	EEPROM error
Flashing 13 times	E 13	Motor overcurrent
Flashing 15 times	E 15	Faulty learning cycle

## 18.3 Troubleshooting chart, "In" codes

### 18.3.1 Troubleshooting chart, information messages.

No.	Display	Red LED	Description	Troubleshooting information messages
	In 01	Off	<p><b>Obstruction</b> Door obstructed by an obstacle or person; door movement stopped by operator.</p>	<p>Sustained operation on a door with an obstruction can result in damage to drive.</p> <ol style="list-style-type: none"> <li>Object or person obstructing door movement. <ul style="list-style-type: none"> <li>Check door movement while system is deenergized.</li> <li>Remove cause of anything obstructing door movement.</li> </ul> </li> <li>Sensor detection range too small. <ul style="list-style-type: none"> <li>Obstructions are often caused by people using door due to sensor's detection range not matching operator's opening speed. Door is unavoidably contacted by person using door.</li> <li>Sensors detection range should be increased and/or operator's opening speed should be increased.</li> </ul> </li> <li>Test system operation after cause of obstruction found.</li> </ol>
2	In 08	Off	<p><b>Deactivation of drive function</b></p> <ul style="list-style-type: none"> <li>Contact at X6, 4 and 4a is opened.</li> <li>Operator switched to emergency mode, door can only be used manually.</li> </ul>	<p>An emergency close switch, lock switch, or other system safety device may be connected to the X6 input.</p> <ol style="list-style-type: none"> <li>One of the activators connected to X6 may have opened, or a defect is present.</li> <li>Reset the applicable activator. Operator should start operation automatically.</li> <li>If In 08 still present, check activators or system wiring.</li> </ol>
3	In 09	Off	<p><b>Upgrade card error</b></p> <ul style="list-style-type: none"> <li>Installed upgrade card has been removed.</li> <li>If two upgrade cards were installed, the upgrade card installed first (container module) has not been reinstalled or is defective.</li> </ul>	<ol style="list-style-type: none"> <li>Installed Upgrade card may not be removed from operator.</li> <li>If more than one upgrade card is installed, the first card installed becomes the container module. <ul style="list-style-type: none"> <li>Reference chapter 19 for Upgrade card installation.</li> <li>The container module must be installed last, after all other Upgrade cards are installed.</li> </ul> </li> <li>If container module defective, first upgrade card (container module) must be replaced and all other upgrade cards must be reinstalled,</li> </ol>
4	In 11	On	<p><b>Hold-open system triggered.</b></p>	<ol style="list-style-type: none"> <li>Hold-open system can be triggered: <ul style="list-style-type: none"> <li>Automatically by smoke detector or building interface system.</li> <li>Manually by a manual release button.</li> <li>Manually moving door.</li> </ul> </li> <li>The system must be reactivated by a deliberate action.</li> <li>Depending on system's configuration, reactivation can be done by: <ul style="list-style-type: none"> <li>Manually moving door to taught opening angle.</li> <li>Switching program switch to Close (off).</li> <li>Pressing both 4 button keypad left ◀ and right ▶ buttons &gt;3s.</li> </ul> </li> <li>It must be ensured that a smoke detector or building interface has not been triggered.</li> <li>If reactivation is unsuccessful, there may be a defect in the smoke detector or building interface system or its connections.</li> </ol>
5	In 23	Off	<p><b>Locking alarm</b></p> <ul style="list-style-type: none"> <li>Door is blocked while in the closed position.</li> </ul>	<ol style="list-style-type: none"> <li>Most common cause of this error is the drive unit attempting to open a locked door.</li> <li>To eliminate the occurrence of this error, install a lock status switch. <ul style="list-style-type: none"> <li>Lock switch detects the lock pin's switching status and switches the drive unit off if necessary.</li> </ul> </li> <li>It is recommended to use a lock status switch, as repeated attempts to open a locked door may damage the drive unit or the door.</li> </ol>

### 18.3.1 Troubleshooting chart, information messages.

No.	Display	Red LED	Description	Troubleshooting information messages
6	In 61	Off	<b>Communication error, double door system</b> <ul style="list-style-type: none"> <li>No communication between the two operators.</li> </ul>	<ol style="list-style-type: none"> <li>Check communication cable connection at the two operators. <ul style="list-style-type: none"> <li>Cable connects to the horizontal RJ45 connector next to the user interface (Chapter 4).</li> </ul> </li> <li>Check communication cable.</li> </ol>
7	In 72	Off	<b>Current measuring circuit</b> <ul style="list-style-type: none"> <li>System could not successfully perform internal current measuring test, performed once every 24 hours.</li> </ul>	<ol style="list-style-type: none"> <li>The initial current measuring test may not always be successfully completed due to system tolerances and environmental conditions.</li> <li>The test may also fail, as an example, if someone uses the door while the test is in progress.</li> </ol>
8	In 73	Off	<b>Braking circuit test</b> <ul style="list-style-type: none"> <li>System could not successfully perform internal braking circuit test, performed once every 24 hours.</li> </ul>	<ol style="list-style-type: none"> <li>The initial braking circuit test may not always be successfully completed due to system tolerances and environmental conditions.</li> <li>The test also may fail, as an example, if someone uses the door manually while the test is in progress.</li> <li>If the cyclical test fails ten times in a row, error message <b>In 73</b> will be displayed.</li> </ol>
9	In 91	Off	<b>DCW® communication</b> <ul style="list-style-type: none"> <li>At least one registered DCW® device is missing.</li> </ul>	<ol style="list-style-type: none"> <li>Reconnect the corresponding DCW® device.</li> <li>If this is not possible, reactivate the drive. Reactivation can be done by: <ul style="list-style-type: none"> <li>Switching program switch to Close (off).</li> <li>Pressing both 4 button keypad left ◀ and right ▶ buttons &gt;3s.</li> </ul> </li> </ol>

## 18.4 Troubleshooting chart, "E" codes

### 16.4.1 Troubleshooting chart, "E" codes.

No.	Display	Red LED	Description	Troubleshooting error codes
1	E 02	Flashing 2 x	<b>Locking device error</b> <ul style="list-style-type: none"> <li>Operator is attempting to open or close a locking device with feedback, or a DCW® locking device. An error has occurred during this process.</li> </ul>	<ol style="list-style-type: none"> <li>Probable causes are a defective locking device or wiring defect. <ul style="list-style-type: none"> <li>Check the locking device and feedback system.</li> </ul> </li> </ol>
2	E 03	Flashing 3 x	<b>DCW® program switch is missing.</b>	<ol style="list-style-type: none"> <li>Check the DCW® program switch and its connections.</li> </ol>
3	E 04	Flashing 4 x	<b>Safety sensor test error</b> <ul style="list-style-type: none"> <li>Test of moving safety sensors was unsuccessful.</li> </ul>	<ol style="list-style-type: none"> <li>Factory setting level of "safety sensor test" parameter <b>ST</b> is 0, test off (Chapter 17, Parameters).</li> <li>When ST is configured to installed safety sensors, a test signal is sent to the sensors before each door opening or closing cycle. Operator waits for a response within a certain time window.</li> <li>Check whether parameter <b>ST</b> has been configured to the installed safety sensors and their active-high or active-low signal level.</li> <li>Check for activation of the test at the safety sensors.</li> </ol>
4	E 12	Flashing 12 x	<b>EEPROM error</b> <ul style="list-style-type: none"> <li>Internal memory check could not be completed.</li> <li>Drive unit works in door closer mode.</li> </ul>	<ol style="list-style-type: none"> <li>Using Dorma Handheld, reload current firmware to reinitialize system.</li> <li>If the error is still present, the control unit must be replaced.</li> </ol>

**18.4.1 Troubleshooting chart, "E" codes.**

No.	Display	Red LED	Description	Troubleshooting error codes
5	E 13	Flashing 13 x	<p><b>Overcurrent detection</b></p> <ul style="list-style-type: none"> <li>Motor is consuming more current than drive unit can provide.</li> </ul>	<ol style="list-style-type: none"> <li>Motor is consuming too much power, check for any external causes.</li> <li>Drive unit or control unit is defective.</li> <li>If error repeats, operator must be replaced.</li> </ol>
6	E 15	Flashing 15 x	<p><b>Faulty learning cycle.</b></p> <ul style="list-style-type: none"> <li>Learning cycle could not be completed (Chapter 12).</li> </ul>	<ol style="list-style-type: none"> <li>Error may occur if learning cycle has been interrupted, for example if door movement has been interrupted during the learning cycle.</li> <li>Learning cycle must be repeated.</li> </ol>
7	E 25	Flashing 5 x	<p><b>SVP-PR 12 power reserve module test negative</b></p>	<ol style="list-style-type: none"> <li>See Chapter 17, parameter <b>TS</b>, Power reserve module test.</li> <li>Check power reserve module and its wiring.</li> </ol>
8	E 51 E 52 E 53	Flashing 5 x	<p><b>Incremental encoder error</b></p> <ul style="list-style-type: none"> <li>Motor gear unit encoder monitoring detected a faulty state.</li> </ul>	<ol style="list-style-type: none"> <li>Check encoder plug connection at operator: Ref. Chapter 4.                             <ul style="list-style-type: none"> <li>Secure connection.</li> <li>Wiring terminations</li> <li>Short circuits.</li> </ul> </li> <li>Check locking device for short circuits.</li> <li>Error can be caused by defective motor or short circuit in locking device.</li> <li>Motor gear unit must be replaced in event of defective motor.</li> </ol>
9	E 62	Flashing 6 x	<p><b>Incompatible firmware version, double door system, second system.</b></p>	<ol style="list-style-type: none"> <li>Equip both operators with same firmware version.</li> </ol>
10	E 63	Flashing 6 x	<p><b>Incompatible fire protection setting, double door system.</b></p>	<ol style="list-style-type: none"> <li>For double door systems, the Upgrade card fire protection must be installed in both control units.</li> </ol>
11	E 71	Flashing 7 x	<p><b>System error 1, 2nd shutdown option</b></p>	<ol style="list-style-type: none"> <li>In order to reliably switch off the drive unit, several switching elements are used and their functions are tested periodically.</li> <li>If the function test always results in the error code, the control unit must be replaced.</li> </ol>
12	E 72	Flashing 7 x	<p><b>System error 2, current measurement circuit</b></p>	<ol style="list-style-type: none"> <li>The current measurement circuit is part of the safety mechanisms and its function is tested periodically.</li> <li>If the function test always results in the error code, the control unit must be replaced.</li> </ol>
13	E 73	Flashing 7 x	<p><b>System error 2, current measurement circuit</b></p>	<ol style="list-style-type: none"> <li>The braking circuit is a safety element in the closer mode and will be tested every 24 hours.                             <ul style="list-style-type: none"> <li>During the test the motor is shut down during door closing and when the door closes at a set angle in emergency mode.</li> <li>Test can be noticed as a short jerk on the door and is normal.</li> </ul> </li> <li>Error can be due to door closing in the deenergized state too fast (under 3 seconds). See Chapter 12.</li> <li>Check the closing speed and reduce if necessary.</li> </ol>
14			<p><b>Energy management</b></p> <ul style="list-style-type: none"> <li>Motor is too hot (for example, too high an ambient temperature)</li> <li>System responds automatically.</li> </ul>	<ol style="list-style-type: none"> <li>Movement dynamics in the closed direction will be reduced.</li> <li>Movement dynamics in both the open and closed directions will be reduced.</li> <li>System shuts down for 3 minutes (door closer mode).</li> <li>Hold-open time will be extended.</li> </ol>

# 19 Upgrade cards

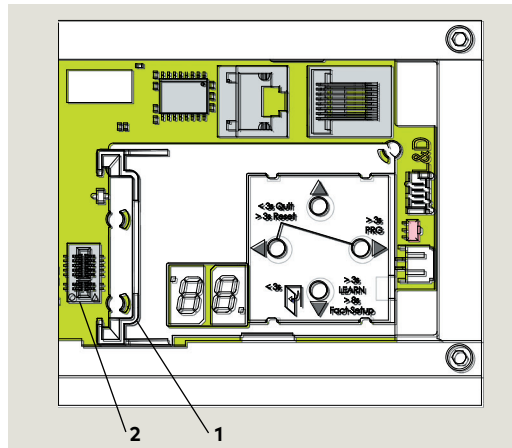
## 19.1 Upgrade cards

### 19.1.1 Upgrade card installation

dormakaba USA Inc. upgrade cards can be used to expand the range of functions of the ED250 operator. When upgrade cards are installed, information is exchanged between and permanently allocated to both the operator control unit and the upgrade card.

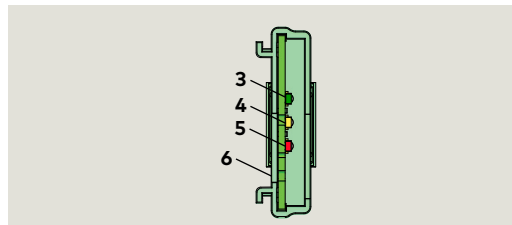
Fig. 19.1.1 Upgrade card slot and socket

- 1 Upgrade card slot
- 2 Upgrade card socket



- Status LEDs
- 3 Green LED
  - 4 Yellow LED
  - 5 Red LED
  - 6 Upgrade card professional (green)

Fig. 19.1.2 Upgrade card status LEDs



### 19.1.2 Upgrade cards

Upgrade card	Upgrade card color	
Fire protection	ED250	Transparent red
Professional	ED250	Green
DCW®	ED250	Yellow
Barrier free toilet	ED250	

## 19.2 Container module

### 19.2.1 Container module

- The first upgrade card installed becomes the container module.
- Every operator control unit has only one container module.
- Functions of upgrade cards installed after the first upgrade card are saved in the container module.

### 19.2.2 Container module removal

- If the container module is removed, all previously enabled functions will be deactivated **after a certain time**.

### 19.2.3 Operator control unit replacement

- If the control unit is replaced, the container module is removed from the old control unit and inserted into the new control unit.
- The new control unit synchronizes with the container module and all upgrade card functions are available.

### 19.2.4 Inserting an upgrade card that has already been activated

- Rapidly flashing yellow LED on upgrade card indicates card is rejected.
- Card's functions in operator control unit are still valid.

### 19.2.5 Inserted a container module from third party control unit.

- Rapidly flashing yellow and green LEDs on container module indicates module is rejected.
- Container module can only be synchronized with one control unit.

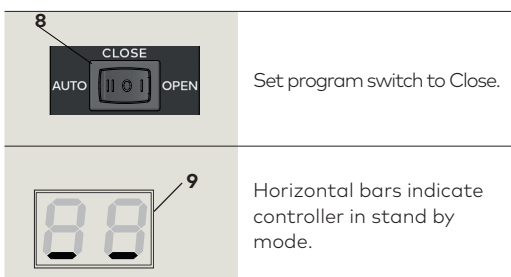
### 19.2.6 Container module defective

- Upgrade cards that were installed after the container module must be reinstalled.

## 19.3 Installing upgrade cards

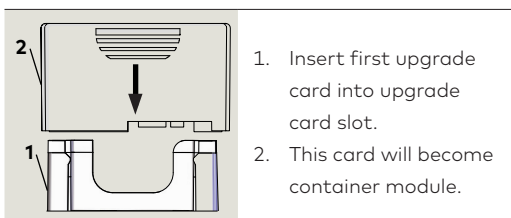
### 19.3.1 Set program switch to CLOSE.

- 1 Upgrade card slot
- 6 Professional upgrade card
- 7 Container module
- 8 Program switch
- 9 2 digit display with horizontal bar

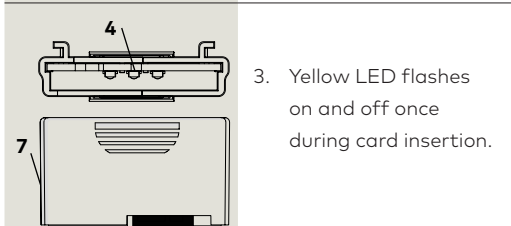


### 19.3.2 Installing first upgrade card

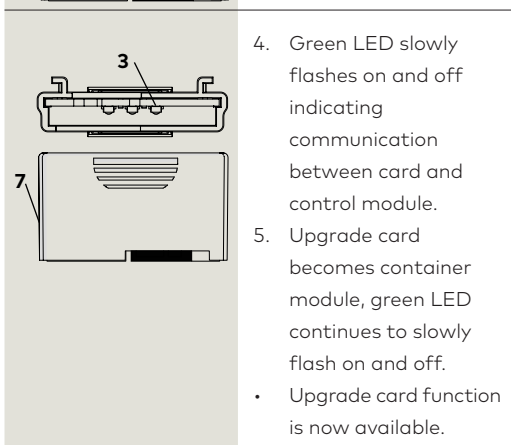
- 1 Upgrade card slot
- 2 First upgrade card



- 4 Yellow LED
- 7 Container module



- 1 Upgrade card slot
- 3 Green LED
- 7 Container module



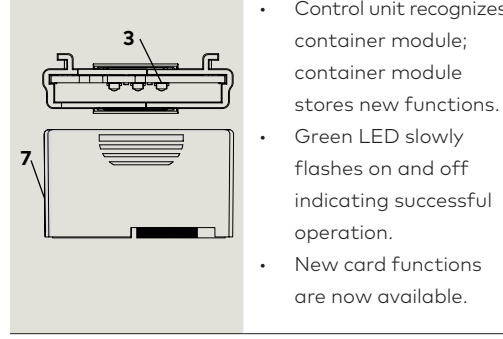
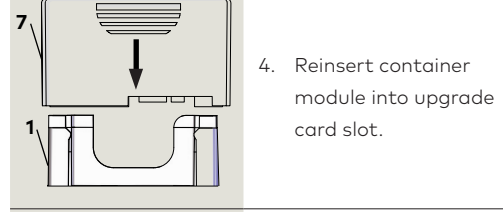
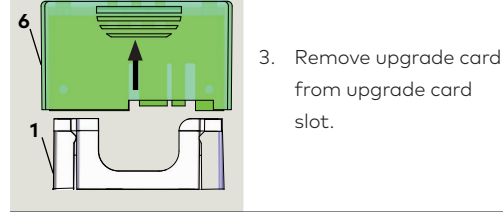
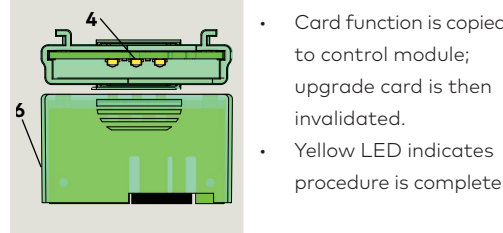
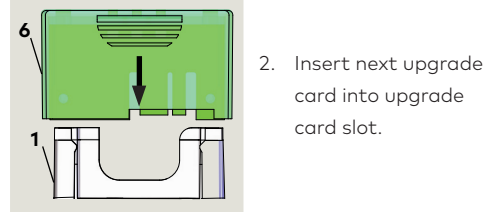
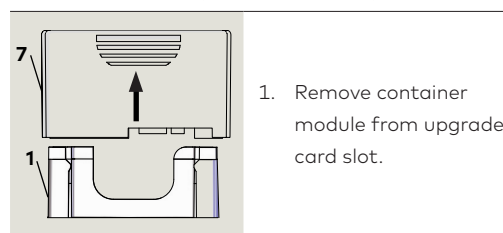
- 3 Green LED
- 7 Container module



#### TIPS AND RECOMMENDATIONS

Container module can be configured using applicable parameter (F1 - F8) for card. Reference Chapter 17.

### 19.3.3 Installing additional upgrade cards



#### TIPS AND RECOMMENDATIONS

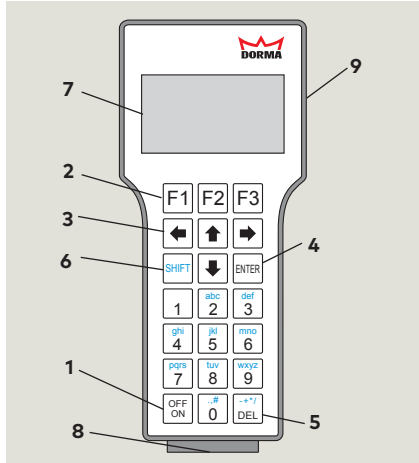
New upgrade card can be configured using applicable parameter (F1 - F8) for card. Reference Chapter 17.

# 20 dormakaba handheld

## 20.1 dormakaba handheld terminal

Fig. 20.1.1 dormakaba handheld

- 1 Off/On key
- 2 Function keys
- 3 Arrow keys
- 4 ENTER key
- 5 DEL key
- 6 SHIFT key
- 7 Alpha numeric keyboard
- 8 LED, recharging battery status (Off when batteries fully charged)
- 9 SD card slot



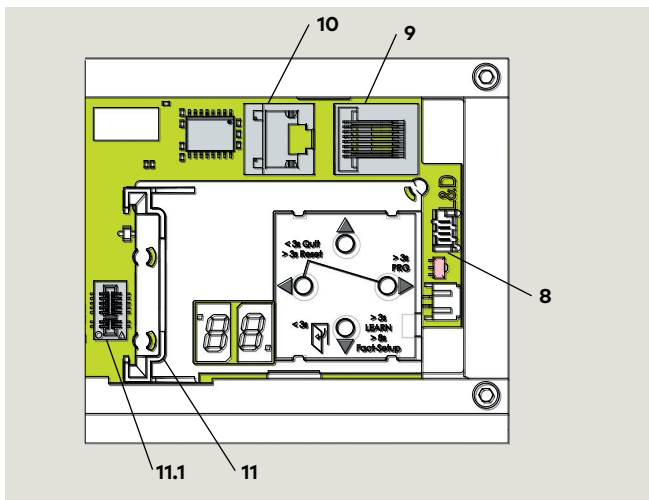
### 20.1.1 Interface cable

Use dormakaba interface cable (Article No. 16596101170) to connect dormakaba handheld to operator Com 1 interface.

**CAUTION**

Never use conventional network cable with RJ45 plug! Using conventional cable may result in permanent damage to operator!

Fig. 20.1.2 Operator communication connectors, upgrade card slot



- 8 Program switch connector
- 9 Double door operator to operator communication cable port
- 10 Dorma Handheld communication port COM 1
- 11 Upgrade card slot
- 11.1 Upgrade card socket

### 20.1.2 Handheld key functions.

1. OFF ON, switches Handheld on or off.
2. Function keys F1 - F3, trigger functions shown in bottom line of display (e.g., "RPT" for repeat, "UP" and "DOWN" to switch lines, "UpDoLd" for file up and download, "CHANGE" to change values, "OPEN" to trigger opening pulses).
3. Arrow keys, allow navigation within the display. Use left arrow to get back to previous screen.
4. ENTER, selects individual menu items and confirms changes of values and settings.
5. DEL, deletes figures or letters.
6. SHIFT, switch between figures and letters or small and capital letters. Current function is indicated on display (n: numeral, A: capital letters, a: small letters).
7. Alpha numeric keyboard, allows entering values and file names in small and capital letters. There are several special characters (dot, comma, hash key, plus, minus, asterisk and diagonal slash).

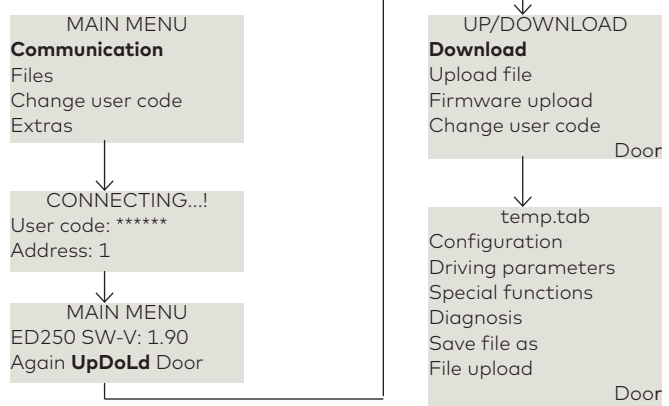
### 20.1.3 Handheld startup.

1. Press OFF ON to turn on Handheld terminal.
2. Screen displays Current version, creation date and name of data base. Handheld is ready for operation.
3. Select "COMMUNICATION" and enter user code (DORMA original setting: 123456).
4. Handheld displays current software version of the connected operator (e.g., ED250 SW- V1.90).

### 20.1.4 Downloading current parameters.

1. Press function key F2 "UpDoLd" to access menu "UP/DOWNLOAD".
2. Select "Download" to download current adjustments and parameters. System stores this data as temporary file under file name "temp.tab".
3. Every change in configuration, parameter setting or special functions confirmed with the "ENTER" key automatically uploads to the operator.
4. The Handheld does **not** automatically save the changes. The Handheld will prompt you to save the changes when quitting the menu.

### 20.1.5 Menu structure



**NOTICE**

Parameters and detail may change depending on firmware version.

## 20.2 dormakaba handheld; configuration parameters

"#" refers to reference numbers in Parameter list, Chapter 17.

### 20.2.1 Configuration parameters

#	Parameter and default	Description / Selections
1	Installation *	Pull arm
		Push arm
		Gleit BGS (Track w push arm)
		cm      Inches
2	Reveal depth 0	ED250 -3 ... 50      -1 3/16 ... 19 11/16
3	Door width (steps of 4") 100	ED250 70 ... 160      28 ... 63
4	Door type *	single*
		1. leaf
		2. leaf
		Master
		Slave
11	Sensor test 0	0      off
		1      Pull side high active
		2      Push side high active
		3      Both sides high active
		4      Pull side low active
		5      Push side low active
		6      Both sides low active
		7      Bodyguard
12	Start safety push side *	Off*      Signal ignored once door closed
		On      Sensor can trigger pulse with door closed

#	Parameter and default	Description / Selections
14	Lock delay 3	Delayed opening time for locking mechanism (0 ... 3) *100 msec
15	Unlock force 0	Preload prior to unlocking 0 ... 9
12	Test PR module *	0*      Test off
		1*      Test once every 24 hrs.
23	Program switch *	Internal*
		External
		DCW
24	PGS power up (DCW) *	Last*
		Off
25	PGS delay *	Off*
		On
26	Daytime unlock *	Off*
		On      Locking device remains permanently unlocked while door is in closed position.
27	Door status (Status relay function, X7 terminals) *	Off      Relay off
		Open*      Door reaches closed position
		Close      Door reaches open position
		Error      Any error message
		Door closed and locked
		Information or error codes displayed
		Door opened further than opening angle
34	Manual mode On	On*      Manual mode on.
		Off      Manual mode disabled.
35	Power assist winkel (angle) 3	Activation angle for power assist function (0 ... 5)

**20.2.1 Configuration parameters (continued)**

#	Parameter and default	Description / Selections
36	Power assist kraft (force) <b>0</b>	Force adjustment for power assist. 0 ... 10
21	Keep closed force <b>0</b>	Force activated after latching action 0 ... 9
50	Manual release <b>On</b>	Off; function deactivated. Manual release button required to deactivate hold open function.
		On; function activated. Moving door manually in closing direction from hold open position deactivates hold open function.
48	Input enable operator <b>*</b>	Normal* NC contact, operator deactivated when contact is open
		Inverse NO contact, operator deactivated when contact is closed

#	Parameter and default	Description / Selections
49	Input Night-bank	Normal* NO contact; night-bank function triggered while contact closed.
		Inverse NC contact; Night-bank function triggered while contact open.
47	Door depth <b>35</b>	0 ... 99 mm 0 ... 7/8"
52	Hinge clearance <b>3</b>	-5 ... +5 mm -3/16 ... +3/16"
	I04 Out 1	
	I04 Out 1	
	I04 Out 1	
	I04 Out 1	

**20.3 dormakaba handheld; driving parameters**

**20.3.1 Driving parameters**

#	Parameter and default	Description / Selections
		%/s          %/s
5	Speed open <b>25</b>	ED250 8 ... 60 27 max. L.E. mode
6	Speed close <b>25</b>	ED250 2 ... 60 27 max. L.E. mode
17	Limit force open <b>60</b>	Static force in opening direction (wind load control) (20 ... 150) N
18	Limit force close <b>60</b>	Static force in closing direction (wind load control) (20 ... 150) N
7	Hold-open time <b>5</b>	Hold-open time automatic mode (0 ... 180) s
8	Nurse bed function <b>10</b>	Hold-open time nurse bed function (0 ... 180) s

#	Parameter and default	Description / Selections
5	Offenhaltezeit man. <b>1</b>	Hold-open time manual mode (0 ... 30 s)
10	Wall blanking <b>80</b>	Angle when system ignores safety sensor on hinge side (60 ... 99)°
19	Latching action <b>0</b>	Motor-driven latching action, automatic mode (0 ... 9)
20	Latching angle <b>3</b>	Opening angle, motor-driven latching angle activated. (2 ... 10)°
46	Back check angle <b>10</b>	Back check angle for manual opening cycles. (5 ... 40)°
51	Coord. offset angle <b>30</b>	Starting angle for second door of two door system. (0 ... 30)°

## 20.4 dormakaba handheld; special functions (Upgrade cards)

### 20.4.1 Special functions (upgrade cards)

#	Parameter and default	Description / Selection
	<b>Upgrade card status codes</b>	<ul style="list-style-type: none"> <li>locked: not available</li> <li>unlocked: available, not active</li> <li>activ or active: activated</li> <li>fehlt: upgrade card missing</li> </ul>
40	Flip-flop func.	locked unlocked active fehlt Upgrade card professional
41	extend HOT (extended hold-open time) r/o	locked unlocked active fehlt Upgrade card professional
42	Nurse-Bed func.	locked unlocked active fehlt Upgrade card professional
38	Fire protection r/o	locked unlocked active fehlt Upgrade card fire protection

#	Parameter and default	Description / Selection
39	Full energy r/o	locked unlocked active fehlt Upgrade card full energy <b>(N/A)</b>
44	DCW r/o	locked unlocked active fehlt Upgrade card DCW®
43	Disabled restr r/o	Upgrade card Barrier-free toilet
22	Push & Go *	Off* On Door opens automatically when moved manually by 4° from closed position. Only available when "manual operation" is turned "off".

## 20.5 dormakaba handheld; diagnostics

### 20.5.1 Diagnostics

Parameter name	Description	Setting
FW vers BM r/o	Displays firmware (FW) version of basic module	x.x y y (e.g., 0190 v 1.9.0)
Rev FW version r/o		0 ... zzz
FW version SK r/o	Displays firmware version of Service Key	x x.y y (e.g., 01.00 = v 1.0.0)
FW bootloader		x x y y
Current error r/o	Displays current error	(...)
Error log 1		(...)
Error log 2		(...)
Error log 3		(...)
Error log 4		(...)
Error log 5		(...)
Error log 6		(...)
Error log 7		(...)
Error log 8		(...)
Error log 9		(...)
Current information	Displays current error	(...)
Delete errors	Press "ENTER" to delete error log.	Cmd ->
Installation dat r/o	Displays date of installation (month / yr)	mmyy (e.g., 1110 November 2010)
Hours counter r/o	Displays number of operating hours	(..) h
Service time interval	Enter maintenance interval	(6 .. 24) months <b>12</b>
Service cycle interval	Enter number of opening and closing cycles until next maintenance	(200 .. 1000)* 1000 <b>200</b>

Parameter name	Description	Setting
Wartungs datum	Maintenance data	x x y y (month, year)
Cycles total r/o	Displays total opening and closing cycles	(..)
Zyklen max h r/o	Displays maximum number of cycles in one hour	(..) h
Zyklen / h r/o	Displays number of cycles in previous hour	(..) h
Zyklen / h akt.	Displays number of cycles in current hour	(..) h
Learning cycle	Press "ENTER" to start learning cycle.	Cmd->
Learn cycle stat. r/o	Indicates status of learning cycle	(..)
Factory reset	Press "ENTER" to reset system to original settings	Cmd ->
Latching action p/u		(...) kg
Setup level (Ref. parameter SL, no. 28)	- Level 1, standard original settings. - Level 2, extended original settings	- Level 1 - Level 2
DCW® list r/o	Displays DCW® list	List ->
DCW® reset		Cmd ->
Function mode r/o	Displays program switch setting	(..)

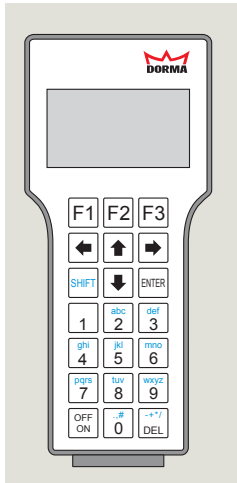
## 20.5.1 Diagnostics (continued)

Parameter name	Description	Setting
<b>Setting code</b>		0, low active (function on) 1, function off
Inp. Night - bank r/o	Status of Night -bank input X9, 6 and 1	0 1
Inp. OPEN r/o	Status of program switch permanent OPEN input X1, 34	0 1
Inp. PART OPEN r/o	Status of program switch PARTIAL OPEN input X1, 33	0 1
Inp. EXIT ONLY r/o	Status of program switch EXIT ONLY input X1, 32	0 1
Inp. AUTO r/o	Status of program switch AUTO input X1, 31	0 1
Inp. OFF r/o	Status of program switch OFF input X1, 30	0 1
Inp. Sfty pull side r/o	Status of safety sensor, hinge side input X5, 15	0 1
Inp. Sfty push side r/o	Status of safety sensor, opposite hinge side X5, 11	0 1
Inp. Activ extern r/o	Status of external activation sensor X6, 41	0 1
Inp. Activ intern r/o	Status of internal activation sensor X6, 42	0 1
Inp enable operator r/o	Status of Emergency close input X6, 4 and 4a	0 1
Inp. smoke detector r/o	Status of smoke detector input X9, 3 and 1	0 1
Inp. lock status r/o	Status of locking device input X3, 43 and 3	0 1
Locking status		locked

Parameter name	Description	Setting
Klemme 1G	Clamp X3, 1G and 3, 24 V out	
Opening width r/o	Displays opening angle	(.. )°
Cur. door position r/o	Displays current door angle	(.. )°
Amb. temp. r/o	Displays ambient temperature	(.. )°C
Amb. max r/o	Displays maximum ambient temperature	(.. )°C
Motor temp. r/o	Displays motor temperature	(.. )°C
Motor temp max. r/o	Displays maximum motor temperature	(.. )°C
Com 1 r/o	Com 1 connection	(.. )

## 20.6 New dormakaba handheld; language change to English

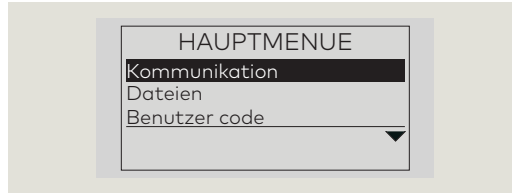
Fig. 20.6.1 dormakaba handheld



### 20.6.1 New dormakaba handheld; language change.

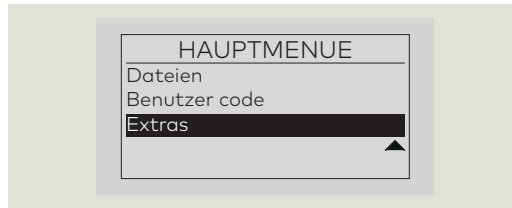
If German language is displayed on screen when handheld is first turned on (Fig. 20.7.1, handheld power on sequence), use following steps to change to English.

Fig. 20.6.2 HAUPTMENUE (main menu)



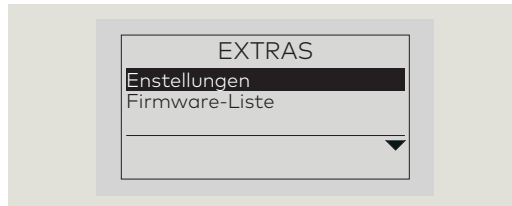
1. Scroll down Main Menu to EXTRAS:
  - Press 3 times to highlight EXTRA.

Fig. 20.6.3 Main Menu; EXTRAS highlighted.



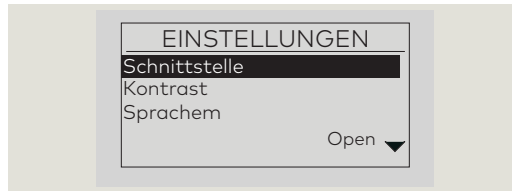
2. Press to select EXTRAS menu.

Fig. 20.6.4 EXTRAS menu



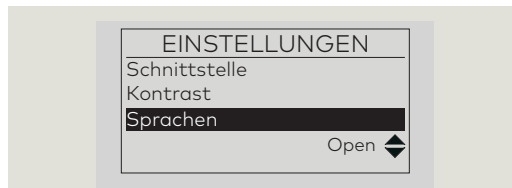
3. Press to select EINSTELLUNGEN (Settings) menu.

Fig. 20.6.5 EINSTELLUNGEN menu



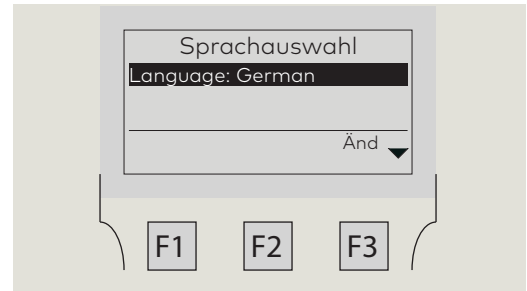
4. Scroll down EINSTELLUNGEN Menu to Sprachen (Languages):
  - Press twice to highlight Sprachen.

Fig. 20.6.6 Sprachen highlighted



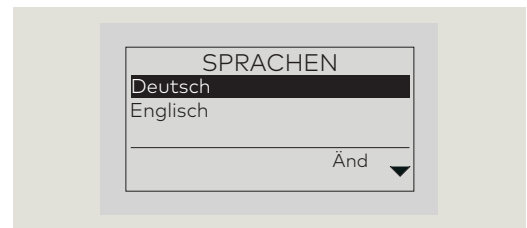
5. Press to select Sprachen (Fig. 20.6.6).

Fig. 20.6.7 Sprachauswahl (Language Selection) menu



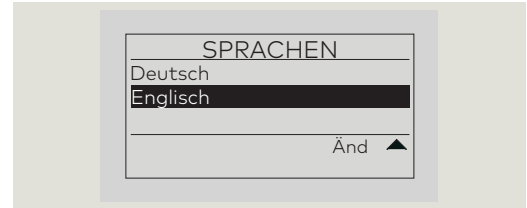
6. Press to select Änd (Amendments).

Fig. 20.6.8 SPRACHEN menu



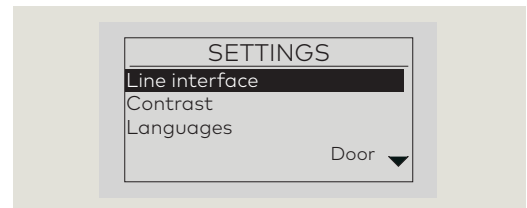
7. Scroll down SPRACHEN menu to English: Press once to highlight "Englisch"

Fig. 20.6.9 Englisch highlighted



8. Press to select English.

Fig. 20.6.10 SETTINGS menu



### TIPS AND RECOMMENDATIONS

Handheld programmer will retain English setting when unit is turned off. Change to English only required the first time the programmer is turned on "out of the box".

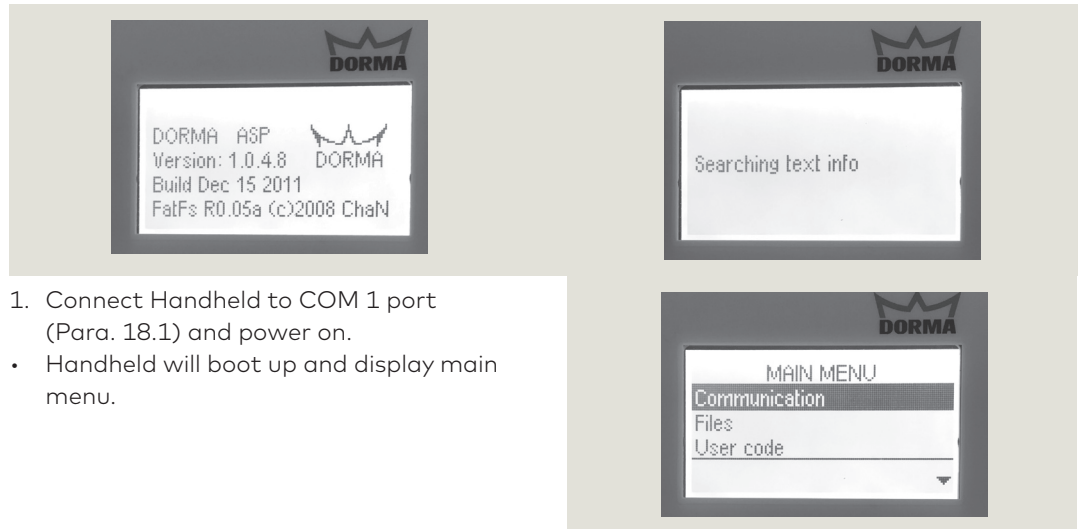
## 20.7 dormakaba handheld; firmware update

### 20.7.1 Firmware update procedure.

**CAUTION**

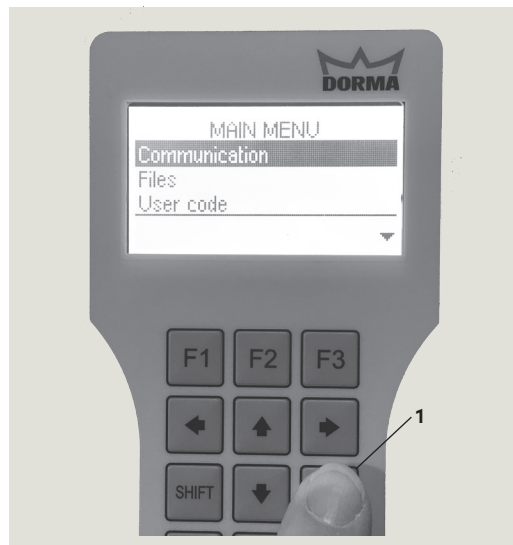
For all firmware changes, set program switch to CLOSE and allow door to close completely before any updates are made!

Fig. 20.7.1 Handheld power on sequence



1. Connect Handheld to COM 1 port (Para. 18.1) and power on.
- Handheld will boot up and display main menu.

Fig. 20.7.2 Select communication menu



2. With Communication highlighted, press ENTER.

Fig. 20.7.3 Enter Handheld user code



3. Enter Handheld user code and press ENTER.

1 ENTER button

- 1 ENTER button
- 2 F2 button
- 3 Up/down arrows

Fig. 20.7.4 Select UpDoLd



4. Press F2 to select UpDoLd.

Fig. 20.7.5 Select Firmware upload



5. Use Up and Down arrows to select Firmware upload and press ENTER.

Fig. 20.7.6 Select Firmware version



6. Use Up and Down arrows to select firmware version and press ENTER.

Fig. 20.7.7 Start transmission



7. Press any key to start firmware transmission.

Fig. 20.7.8 Firmware uploading



8. Firmware uploading to controller. Wait time of 3 to 5 minutes to upload.

Fig. 20.7.9 Complete firmware update



9. Press any key to complete firmware update.

# 21 Cement case spindle and chain

## 21.1 Cement case chain tension

Fig. 21.1.1 Operator mounting screws

- 1 BHSCS (Flanged button head socket cap screw)
- 2 Operator mounting main extrusion
- 3 Spacer plate
- 4 1/4" x 5/8" FHCS (flanged head cap screw) and washer)

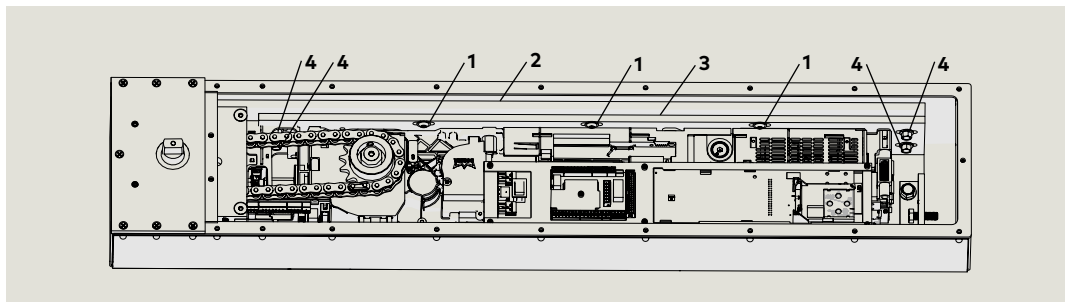
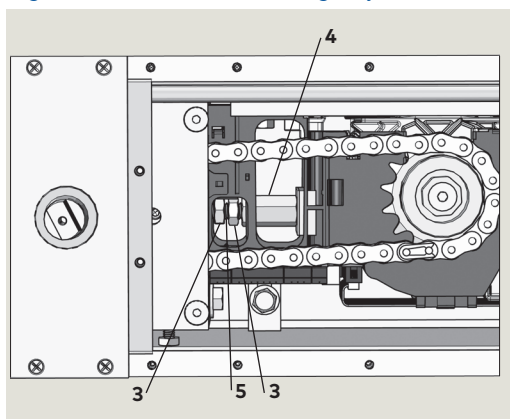


Fig. 21.1.2 Chain tensioning adjustment

- 3 3/8" hex nut
- 4 Chain tension nut (3/8" x 11/4" hex standoff)
- 5 3/8" x 2" long threaded stud



### 21.1.1 Check chain tension.

Chain tension is set for a 3/8" deflection in chain when squeezed together. Chain tension adjustment is accomplished by adjusting chain tension nut (4) on a threaded stud. This moves ED250 operator toward or away from spindle drive, loosening or tightening chain.

### 21.1.2 Chain tension adjustment procedure.

1. Loosen four 1/4" x 5/8" FHCS (4) and three BHSCS (1) that secure operator to spacer plate (Fig. 21.1.1).
2. Loosen both 3/8" hex nuts (3) on threaded stud (Fig. 21.1.2).
3. Adjust chain tension nut (4) CCW to tighten chain or CW to loosen chain until 3/8" deflection in chain when squeezed together (Fig. 21.1.3).
4. Tighten both 3/8" nuts (3) against gearbox side (Fig. 21.1.4).
5. Retighten operator mounting screws loosened in step 1 to secure operator against spacer plate.

Fig. 21.1.3 Hex nuts loosened for chain tensioning

- 1 3/8" thick pad
- 2 Plate for pad
- 3 3/8" hex nut
- 4 Chain tension nut (3/8" x 11/4" hex standoff)
- 5 3/8" x 2" long threaded stud
- 6 Gearbox side

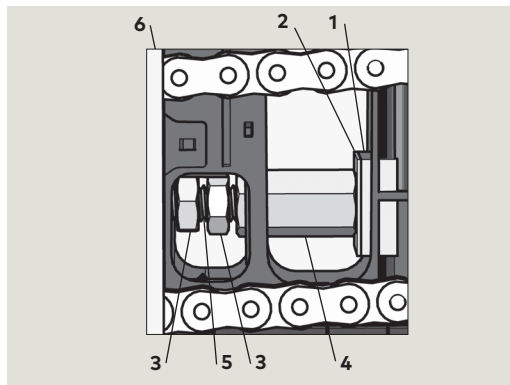
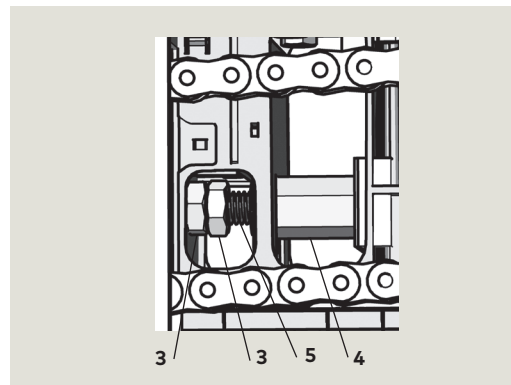


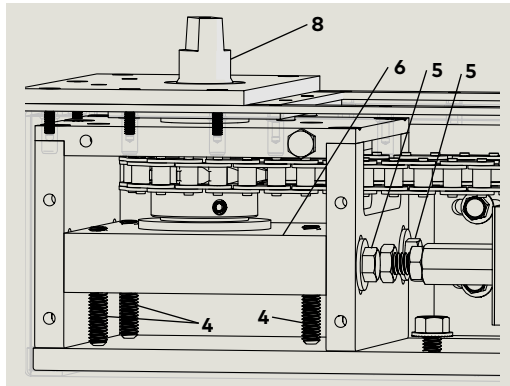
Fig. 21.1.4 Hex nuts tightened after adjustment



## 21.2 Cement case spindle height adjustment

- 4 5/16" x 2" cup point set screw
- 5 5/16" x 5 1/2" cap screw
- 6 Adjustable plate
- 8 Spindle

Fig. 21.2.1 Height adjustment set screws



### 21.2.1 Spindle height adjustment.

Spindle bearing is mounted to adjustable plate (6). Two 5/16" x 5 1/2": cap screws (5) secure the adjustable plate and spindle height in position.

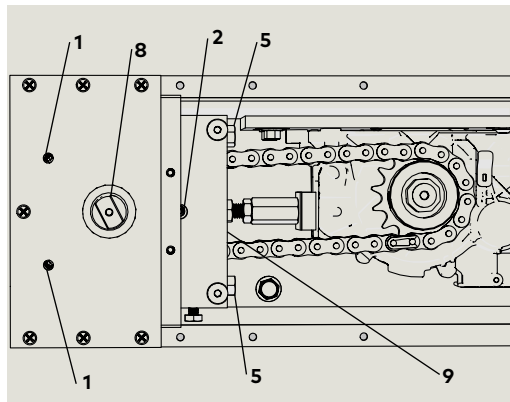
Spindle height adjustment is accomplished by turning three 5/16" x 2" set screws (4) clockwise to raise the adjustable plate and counter clockwise to lower the adjustable plate.

### 21.2.2 Access holes for set screws.

1. Gearbox cover contains access holes (1) for two set screws (Fig. 21.2.2).
2. Top gearbox plate (9) contains access hole (2) for one set screw (Fig. 21.2.2).

Fig. 21.2.2 Threaded post adjustment holes, 5/16" x 5 1/2" cap screws

- 1 Gearbox cover access hole for set screw
- 2 Top gearbox plate access hole for set screw
- 5 5/16" x 5 1/2" cap screw
- 6 Adjustable plate
- 7 Cement case cover
- 8 Spindle
- 9 Top gearbox plate

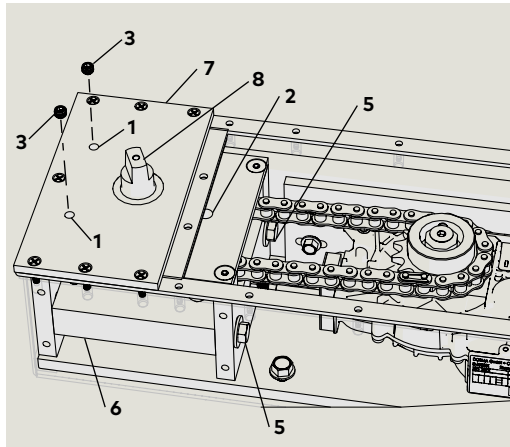


### 21.2.3 Adjusting spindle height.

1. Remove two set screws (3) from gearbox cover access holes (1) using 5/32" T-handle hex key (Fig. 21.2.3).
2. Slightly loosen two 5/16" x 5 1/2" cap screws (5) using 9/16" socket.
3. Rotate the three cup point set screws (4) (Fig. 21.2.1) clockwise to raise spindle height and counter clockwise to lower height. Use 5/32" T-handle hex key.
  - Turn each set screw an equal amount when adjusting spindle height.

Fig. 21.2.3 Set screw removal

- 1 Cover access hole; set screw
- 2 Top gearbox plate access hole; set screw
- 3 Access hole set screw
- 5 5/16" x 5 1/2" cap screw
- 6 Adjustable plate
- 7 Cement case cover
- 8 Spindle



### 21.2.4 Spindle height adjustment completed.

1. Tighten two 5/16" x 5 1/2" cap screws (5) using 9/16" socket (Fig. 21.2.3).
2. Reinstall two set screws (3) in cover access holes (Fig. 21.2.3).

## 21.3 Spindle centering

- 1 Spindle
- 1.1 Spindle gearbox
- 2 5/16" x 3/8" flange head cap screw
- 3 Slide mounting plate
- 4 1/4" x 3/4" cap screw
- 5 Gearbox top
- 6 5/16" x 1" cap screw
- 7 Block, operator mounting
- 8 Operator mounting main extrusion
- 9 Angle iron with threaded hole for (6)
- 10 Pad, operator mounting
- 12 Cement case

Fig. 21.3.1 Spindle centering hardware

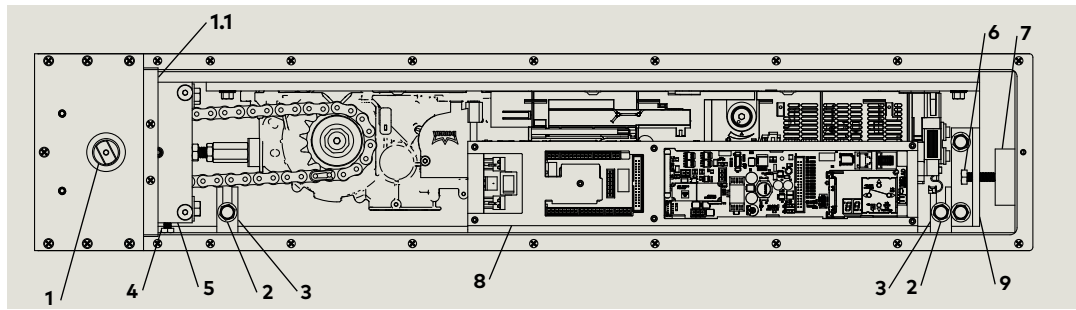
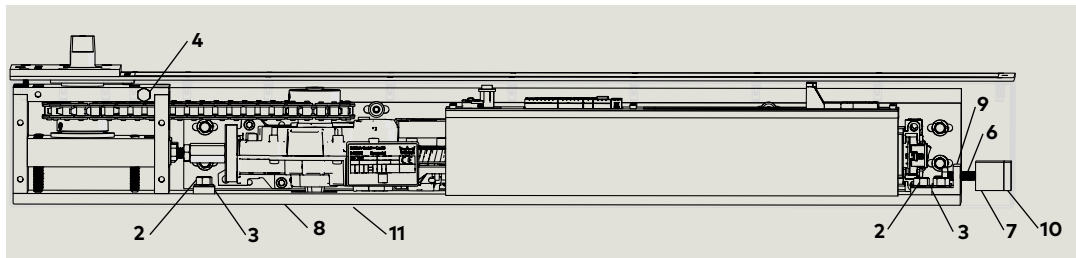


Fig. 21.3.2 Spindle centering hardware, cement case side view



### CAUTION

Cement case adjustments include:

- Spindle height (Para. 21.2)
- Chain tension (Para. 21.1).

Para. 21.3 is reference information for establishing spindle center at factory.



### TIPS AND RECOMMENDATIONS

Cement case shown transparent for internal case views.

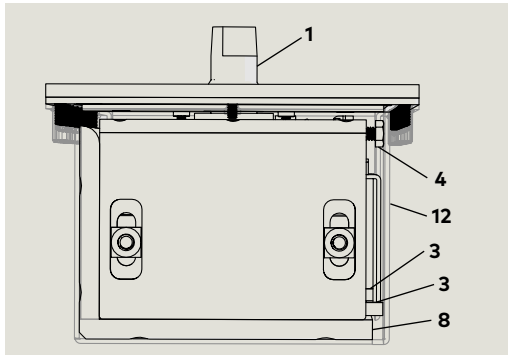
#### 21.3.1 Spindle centering in cement case.

Spindle gearbox (Fig. 21.3.1, item 1.1) is secured to operator mounting main extrusion (Fig. 21.3.1 item 8).

Main extrusion location is set at factory against cement case sidewalls using adjustments in Para. 21.3.2 and .3.

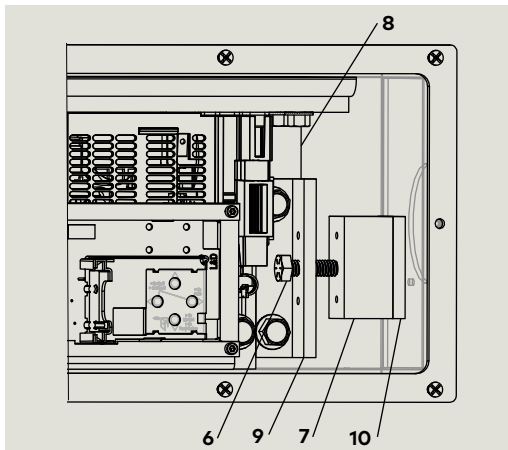
- 1 Spindle
- 2 5/16" x 3/8" flange head cap screw
- 3 Slide mounting plate
- 4 1/4" x 3/4" cap screw
- 8 Main extrusion, operator mounting
- 12 Cement case

Fig. 21.3.3 Spindle side adjustment



- 6 5/16" x 1" cap screw
- 7 Block, operator mounting
- 8 Operator mounting main extrusion
- 9 Angle iron with threaded hole for (6)
- 10 Pad, operator mounting
- 12 Cement case

Fig. 21.3.4 Spindle lateral adjustment



**21.3.2 Operator mounting main extrusion side position against cement case.**

1. Two side mounting plates (Fig. 21.3.3, item 3) are used as spacers holding extrusion against opposite cement case wall.

**21.3.3 Main extrusion side position adjustment.**

1. 1/4" x 3/4" cap screw (Fig. 21.3.3, item 4) is used to move extrusion against opposite cement case wall (factory adjustment).

**21.3.4 Main extrusion lateral position.**

1. 5/16" x 1" cap screw and operator mounting block and pad (Fig. 21.3.4, item 6,7 and 10).
2. Cap screw is adjusted against block and pad to hold position of main extrusion against end of cement case (factory adjustment).

