

Crane 2000LE and 3000LE

Overhead Motion Assist 360 drive

Wiring, Setup and Troubleshooting Manual

RL6000-013 – 05-2022

| EN |

 **Crane**
dormakaba Group

dormakaba 

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1 General information

1.1 Installation instructions

This document contains important instructions for wiring, setup and troubleshooting of Crane 2000LE and 3000LE series revolving doors with Overhead Motion Assist 360 drive.

NOTICE

Installation Manuals.

- RL6000-004, Crane 2000LE and 3000LE Overhead Motion Assist 360 drive with floor speed control.
- RL6001-005, Crane 2000LE and 3000LE Overhead Motion Assist 360 drive and overhead speed control.

1.2 Manual storage

This document must be kept in a secure place, and accessible for reference as required. If the door system should be transferred to another facility, insure that this document is transferred as well.

1.3 dormakaba.us website

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

1.4 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.

CAUTION

Warns of a potentially unsafe procedure or situation.



TIPS AND RECOMMENDATIONS

Clarifies instructions or other information presented in this document.

1.6 Dimensions

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

1.7 Environment

Crane revolving doors are designed to operate on an interior or exterior application.

NOTICE

Revolving door order custom requirements.

- Illustrations may not reflect assembly or part customization.

Revolving door optional equipment.

- Instructions and illustrations may not reflect installed optional equipment.

2 Product description and technical information

2.1 Crane 2000LE series

Table 1.1 2000LE series doors

Enclosure	Welded construction	
	Finish	Aluminum
		Anodized
		Cladded bronze
		Stainless steel
Wings	Bolted construction	
	Finish	Aluminum
		Anodized finish
		Cladded bronze
		Stainless steel

2.2 Crane 3000LE series

Table 2.1 3000LE series doors

Enclosure	Custom Fully formed and welded	
	Finish	Aluminum
		Anodized finish
		Cladded bronze
		Stainless steel
Wings	Fully formed and welded	
	Finish	Aluminum
		Anodized
		Cladded bronze
		Stainless steel
Wood		

2.3 Motion Assist 360

2.3.1 Motion Assist 360.

- Gearless electromagnetic direct drive system.

2.3.2 Low energy application.

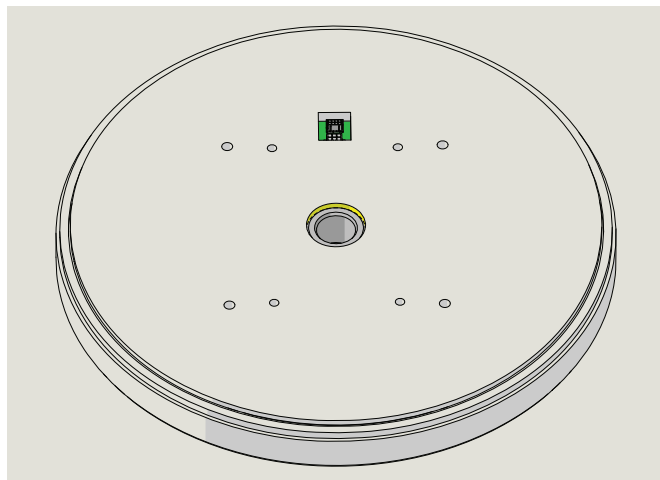
- Uses "S" Motion Assist function module.



TIPS AND RECOMMENDATIONS

Reference Para. 2.8 for function module overview.

Fig. 2.3.1 Motion Assist 360 drive



2.4 Motion Assist 360 technical information

2.4.1 Environment

Measurement	Value	Unit
Temperature range	-40 — +60	°C
	-40 — +140	°F
Relative humidity (non-condensing)	<90	%

2.4.2 Power supply

Measurement	Value	Unit
Power supply	100 - 240 ± 10%	Vac
Power frequency	50 / 60	Hz
Customer branch circuit: GFCI Circuit breaker	15	A
Power supply control voltage	24 ± 10%	Vdc
Maximum supply current for external connections	3	Adc

2.4.3 Power consumption (without lighting)

Measurement	Value	Unit
Positioning speed	58	W
Automatic mode	102	W
Speed limiter	8	W
Servomatic	58	W

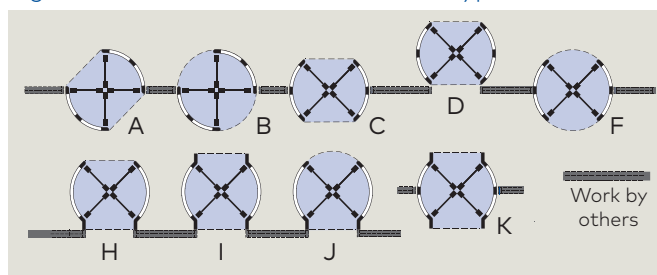
2.4.4 Drive

Measurement	Value	Unit
Type	Synchronous motor with continuous magnet rotor	
Nominal voltage	24	Vdc
Nominal output	0.58	KW
Nominal torque	40	Nm
	29.5	ft-lb
Nominal current	4	A
Starting current	Maximum 18	A
Torque	Maximum 185	Nm
	Maximum 136.5	ft-lb
Rotations per minute	Maximum 18	RPM
Protection class	IP20	
	NEMA 1	
Insulation class	B	
Gear ratio	1	
Operating noise LAeq	<50	dB(A)

2.5 2000LE series

	AL2000	SS2000	BZ2000
Material	Aluminum	Aluminum / Stainless steel	Aluminum / Bronze
Wing configuration	<ul style="list-style-type: none"> • 3 wings • 4 wings 		
Enclosure diameter	6' ID to 10' OD	ANSI/BHMA A156.27-2019, Para. 4.1: To limit door mass, the inside diameter added to the height shall not exceed 17 ft [5182 mm].	
Door opening height	7' up to 10'		
Maximum total wing assembly and center shaft assembly weight	750 pounds aluminum 850 pounds SS	Total weight may vary depending on application.	
Finish	<ul style="list-style-type: none"> • Clear anodized • Custom anodized • Dark bronze anodized • Painted 	<ul style="list-style-type: none"> • #4 satin • Non-directional • #6 fine satin • Bead blast • #7 mirror • Custom • #8 mirror 	<ul style="list-style-type: none"> • #4 satin • #8 mirror • Bead blast • Non-directional • #7 mirror • Custom
Operation	<ul style="list-style-type: none"> • Manual, mechanical speed adjuster to limit speed. To be adjusted to comply with ANSI/BHMA 156.27. 		
Attachment Types	A, B, C, D, F,H,I,J,K as indicated on the drawings. Reference Fig. 2.5.1.		
Enclosure material	<ul style="list-style-type: none"> • Glass • Aluminum panels 	<ul style="list-style-type: none"> • Glass • Solid metal 	<ul style="list-style-type: none"> • Glass • Solid metal
Enclosure glass	7/16" clear or tinted		
Canopy material	<ul style="list-style-type: none"> • Aluminum 	<ul style="list-style-type: none"> • Stainless steel 	<ul style="list-style-type: none"> • Bronze
Speed Control	<p>Manual speed control:</p> <ul style="list-style-type: none"> • Uses 100:1 gear ratio. • Sealed unit is mounted in the floor or canopy. • Centrifugal force brake slowly engages as the door reaches the maximum allowable RPM set by code. 		

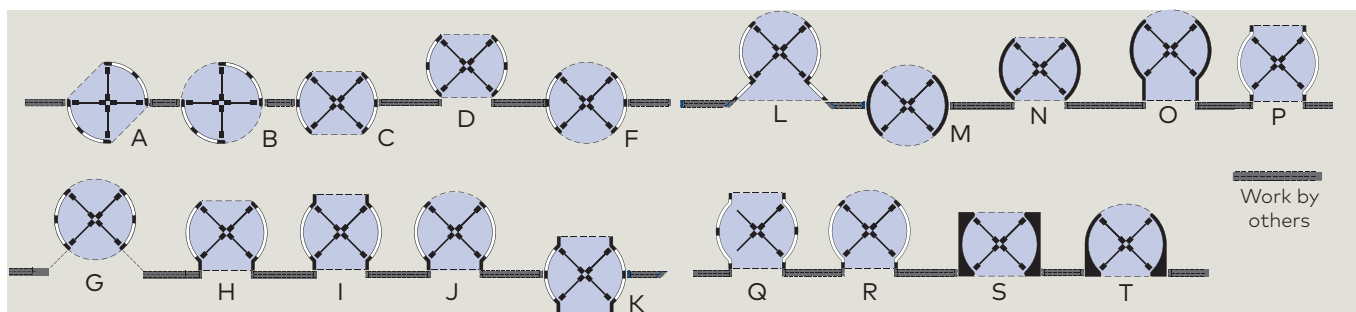
Fig. 2.5.1 Crane 2000LE attachment types



2.6 3000LE series

	AL3000	SS3000	BZ3000
Material	Aluminum	Aluminum / Stainless steel	Aluminum / Bronze
Wing configuration	<ul style="list-style-type: none"> • 3 wings • 4 wings 		
Enclosure diameter	6' ID to 10' OD	ANSI/BHMA A156.27-2019, Para. 4.1: To limit door mass, the inside diameter added to the height shall not exceed 17 ft [5182 mm].	
Door opening height	7' up to 10'		
Maximum total wing assembly and center shaft assembly weight	750 pounds aluminum 850 pounds SS	Total weight may vary depending on application.	
Finish	<ul style="list-style-type: none"> • Clear anodized • Custom anodized • Dark bronze anodized • Painted 	<ul style="list-style-type: none"> • #4 satin • Non-directional • #6 fine satin • Bead blast • #7 mirror • Custom • #8 mirror 	<ul style="list-style-type: none"> • #4 satin • #8 mirror • Bead blast • Non-directional • #7 mirror • Custom
Operation	<ul style="list-style-type: none"> • Manual, mechanical speed adjuster to limit speed. To be adjusted to comply with ANSI/BHMA 156.27. 		
Attachment Types	All, custom. Reference Fig. 5.3.1		
Enclosure material	<ul style="list-style-type: none"> • Glass • Solid metal 	<ul style="list-style-type: none"> • Glass • Solid metal 	<ul style="list-style-type: none"> • Glass • Solid metal
Enclosure glass	7/16" or 9/16"; clear or tinted		
Canopy material	<ul style="list-style-type: none"> • Aluminum 	<ul style="list-style-type: none"> • Stainless steel 	<ul style="list-style-type: none"> • Bronze
Speed Control	<p>Manual speed control:</p> <ul style="list-style-type: none"> • Uses 100:1 gear ratio. • Sealed unit is mounted in the floor or canopy. • Centrifugal force brake slowly engages as the door reaches the maximum allowable RPM set by code. 		

Fig. 2.6.1 Crane 3000LE attachment types



2.7 Revolving door assembly components overview, 3 wing door with floor speed control example

Table 2.7.1 3 wing door with Motion Assist 360 drive and controls and in-ground speed control

#	Description	Part #
1	3" canopy assembly	RS6051-002
2	Motion Assist 360 drive and controls	RS6048-001
3	Center post, AL	RE6007-030
4	Quarter post	RE6009-010
5	Enclosure bent glass	
6	Enclosure, base outer, 3", AL	RE6015-010
	Enclosure, base inner, 3"	RE6016-010
7	Wing assembly with lock, 3 wing door	
8	Steel shaft assembly, floor speed control, 3 wing door	RS6054-001
9	Assembly, floor speed control	RS6074-010



TIPS AND RECOMMENDATIONS

Canopy assemblies.
Reference Para. 5.3.

Fig. 2.7.1 Three wing revolving door, assembly example

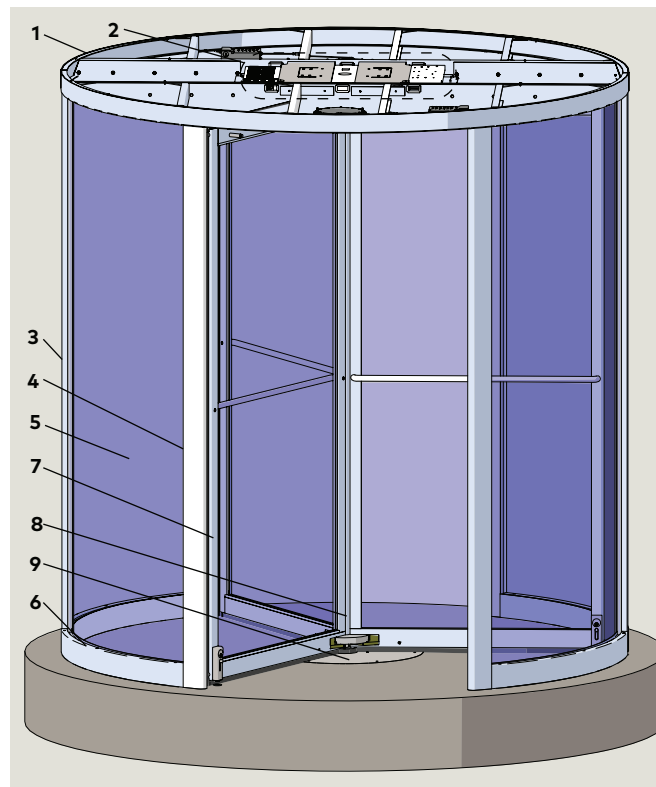


Fig. 2.7.2 Steel shaft assembly, 3 wing door

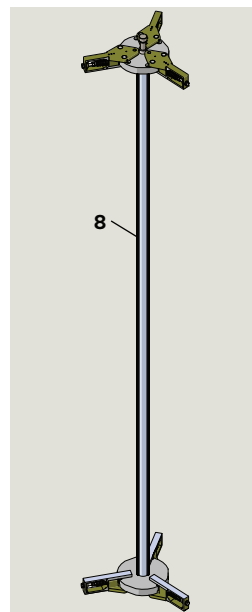


Fig. 2.7.3 Wing assembly, 3 wing door

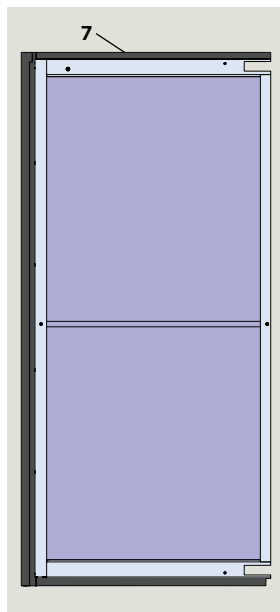


Fig. 2.7.4 Center post, quarter post

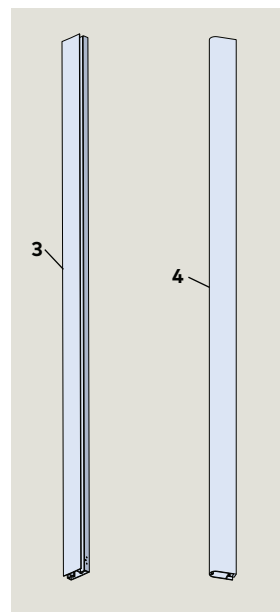


Fig. 2.7.5 Motion Assist 360 drive and control assembly

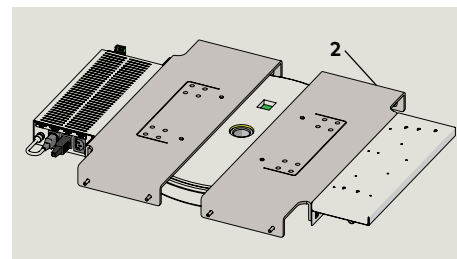


Fig. 2.7.6 Floor speed control assembly

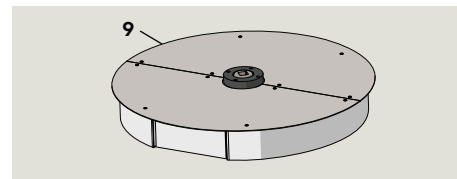
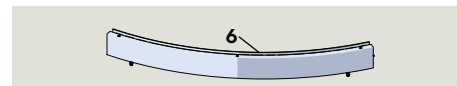


Fig. 2.7.7 Enclosure base assembly



2.8 Motion Assist "S" function module

2.8.1 Motion Assist "S" function module.

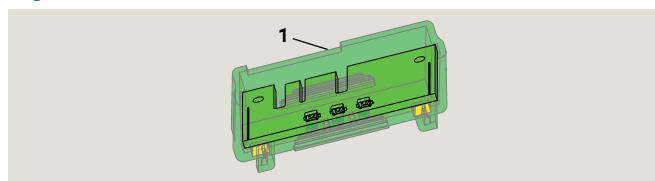
Motion Assist 360 is supplied with a "S" Motion Assist low energy function module.



TIPS AND RECOMMENDATIONS

Reference Para. 14.4 for Motion Assist 360 function module location.

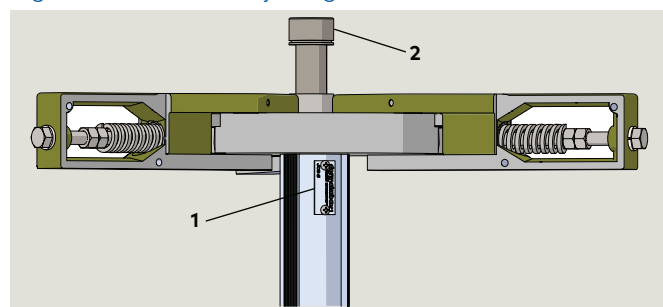
Fig. 2.8.1 "S" Motion Assist function module



- 1 "S" module (GRN)
RX6003-002

2.9 Identification labels

Fig. 2.9.1 Steel shaft job tag location



- 1 Job tag RD6001
- 2 Top plug RC6081

2.9.1 Revolving door job tag.

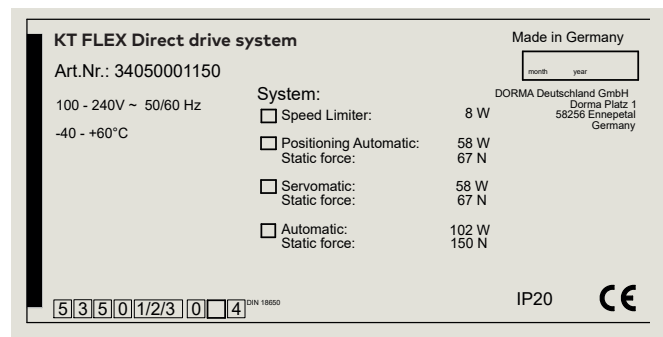
- Located on center shaft.

Fig. 2.9.1 Job tag



- 1 Job tag RD6001

Fig. 2.9.2 Identification label, Motion Assist 360 drive

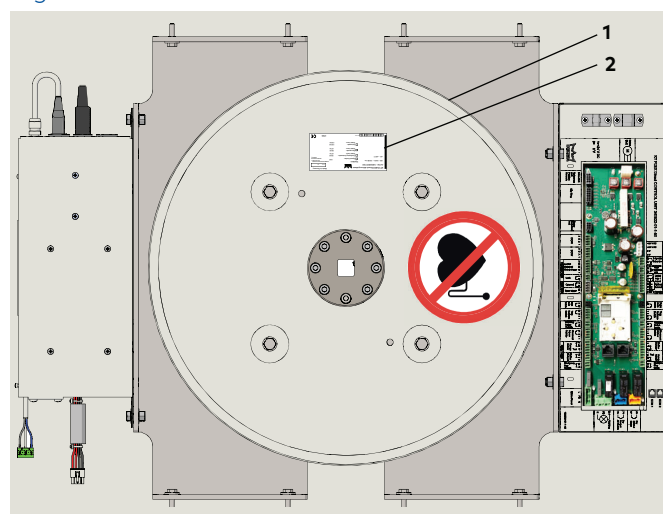


2.9.2 Drive system identification label.

Identification label for Motion Assist drive and contains the following information:

- Name and address of manufacturer.
- Drive system model
- Year of manufacture
- Electrical connection values
- Performance data
- Environmental conditions
- IP protection class
- Designation

Fig. 2.9.3 Motion Assist 360 drive identification label



- 1 Motion Assist 360 drive
- 2 Identification label

3 Safety information

3.1 Safety Warnings

3.1.1 Safety instructions.

Observe safety warnings as they are presented in this manual.

3.1.2 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

Danger of death from contact with voltage or electrical short circuits!

As a result of missing or defective electrical grounding of the drive system, contact with voltages or electrical short circuits is possible.

- Never put the revolving door into operation without an earth ground connected to the drive grounding terminal (Para. 8.3).
- Prior to drive commissioning, drive components must be connected to the grounding terminal.
 - Control unit
 - Power supply unit
 - Drive unit support system



WARNING

Metallic doors must be grounded per national and local codes!



WARNING

Hand pinch point and crushing hazards!



WARNING

Crushing hazards!

3.1.3 Pacemakers and other medical implants warning.



WARNING



This sign is located on the Motion Assist 360 drive (Fig. 2.9.3) and warns of the hazards for people with pacemakers and other active medical implants.

Strong electromagnetic or magnet fields may be present in the vicinity of this sign. These fields may disrupt pacemakers or other medical implants or cause them to malfunction. People wearing pacemakers and other active medical implants should not approach components with this safety warning.



People with pacemakers and other active medical implants should not come within 20 inches [51 cm] of the drive!

3.1.4 Intended use and door misuse.

- The 2000LE and 3000LE revolving doors are designed as 3 or 4 wing revolving doors for use as a doorway for people to pass through at entrances and in the interior of buildings.
- When wings are bookfolded, the revolving door is suitable for use as an emergency exit.



WARNING

In case of emergency, revolving door can be used as an exit, but it is not the primary path of egress. The side door(s) should be used!

- The customer can only operate the revolving door after door commissioning by dormakaba service technicians.
- Intended use encompasses adherence to the information in this document as well as all additional applicable documentation.

Any usage going beyond or different from use described as intended use is considered to be misuse.



WARNING

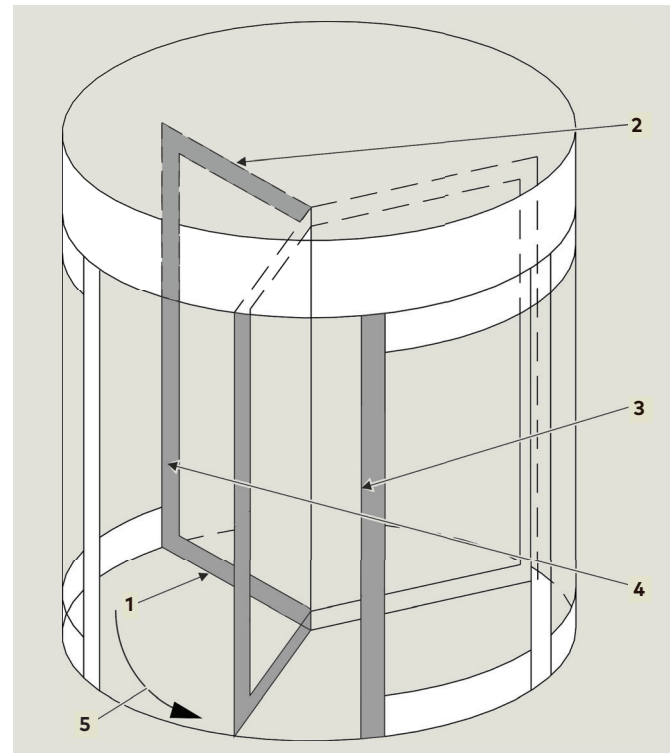
Danger of misuse!
Misuse of the revolving door can cause dangerous situations.

- Children should never be allowed to enter the revolving door without adult supervision/ accompaniment.
- Children should never be allowed to play in front of the entrance and exit of the revolving door or inside of the revolving door itself.
- Do not install the revolving door over soft flooring (e.g., carpet).
- Never mount or hang objects on the revolving door.
- Never stop or block the revolving door with an object.
- Customer - Do not operate the revolving door until "record of delivery" has been received.
- Do not walk through the revolving door with bulky objects.
- Do not walk against the wing rotation direction of the revolving door.
- Do not start up the revolving door if there is insufficient lighting.
- Do not start up the revolving door if it is damaged (e.g., broken glass).
- Never use replacement parts that are not approved by dormakaba.
- People cannot be allowed to stay in the revolving door for longer than it takes to pass through the door.

3.2 Danger points of the revolving door.

When passing through the revolving door, people may be at risk for injury at the following locations:

Fig. 3.2.1 Revolving door danger points



- | | |
|----------------------------------|--|
| 1 Secondary closing edge floor | 4 Main closing edge inner wall |
| 2 Secondary closing edge ceiling | 5 Wings rotating in a counterclockwise direction |
| 3 Opposing closing edge | |

3.3 Safety equipment



WARNING

Non-functional safety equipment can pose a life threatening hazard!

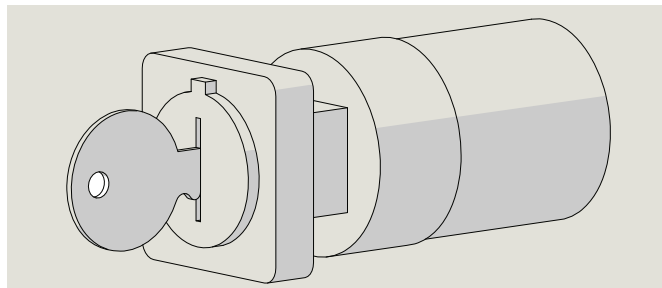
When the safety equipment is non-functional or deactivated, there is a danger that extremities or people may be crushed in the revolving door, possibly leading to serious injury or death.

- Constantly check to make sure that all safety equipment is functional.
- Never deactivate or bypass safety equipment.
- Ensure that all safety equipment is accessible.

4 Operator components

4.1 Mode switch

Fig. 4.1.1 Mode switch with key lock RX6008



4.1.1 Mode switch

- The Mode switch is located inside the building on the leading quarter post or attached separately within sight of the revolving door.
- A key or code secures the program switch against unauthorized access.





4.1.2 Low energy speed definition - ANSI/BHMA A156.27.

Door speed resulting in a maximum of 2.5 lbf-ft [3.4 Nm] of kinetic energy.

4.1.3 Knowing act

Consciously activating a switch with the knowledge of what will happen such as starting, slowing or stopping a revolving door. Switching devices may include wall or jamb-mounted contact switches such as push plates, fixed contact switches and controlled access devices such as keypads, card readers, and key switches.

4.1.4 Mode switch (low-energy) functions.

Mode switch position	Function	S - (Green module) - Motion Assist
 0	Off	<ul style="list-style-type: none"> • Revolving door will stay in the home position. • After a set period of time, any internal lighting is switched off.
 1	AUTOMATIC 1	<ul style="list-style-type: none"> • A knowing act switch starts rotary movement of the door wings at low energy speed. Acceleration to walking speed is done manually. • Manually pushing the door starts rotary movement of the door wings at low energy speed. Acceleration to walking speed is done manually. • Revolving door automatically stops in the next starting position as soon as it is no longer manually operated.
 2	AUTOMATIC 2	<ul style="list-style-type: none"> • Door rotates continuously at a low energy speed. Acceleration to walking speed is done manually. • After passage, the door slows down to low energy speed and continues to rotate at low energy speed.
 3	Summer	<ul style="list-style-type: none"> • Revolving door stops at its starting position and the drive is unlocked. • Door wings can be rotated manually. • Bookfold: wings can be folded to the side.

4.2 Emergency Stop pushbutton

4.2.1 Emergency Stop pushbutton locations.

- Building interior on the leading door quarter post.
- Second Emergency stop pushbutton may be located on the building exterior.

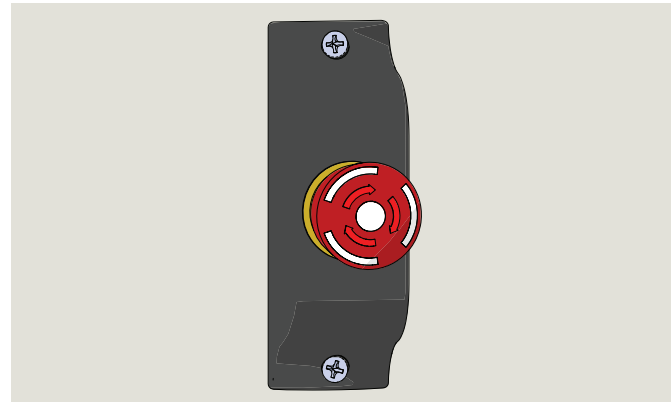
4.2.2 Actuation of Emergency Stop pushbutton.

1. A time delay disconnection of the Motion Assist 360 drive output stage is performed (approximately two seconds).
2. During this time delay the drive performs a fast braking of the door to a standstill.
3. After the time delay the drive output stage is switched off and door can then be turned manually.

4.2.3 Emergency Stop pushbutton reset.

- Emergency Stop pushbutton is reset by pulling or turning the button.

Fig. 4.2.1 Emergency Stop pushbutton DX3413



4.2.1 Triggering an Emergency Stop



WARNING

Risk of injury due to deactivated safety equipment!

After the emergency stop is activated, the drive is unlocked. Safety devices are no longer in operation. This can cause serious injuries if attempts are made to turn the door manually.

- Before turning door manually, check to make sure no one could be injured.
- If people have been locked into the revolving door, carefully turn the door until the people are able to exit the door.
- When turning the door manually, make sure there are no limbs between the closing edges.

4.2.2 Start up after an Emergency Stop



WARNING

Risk of injury due to automatic startup of revolving door!

The revolving door can set itself in motion automatically. If there are people in the door, they may be at risk of injury.

- Release the Emergency Stop button only when there are no longer any people in the revolving door.

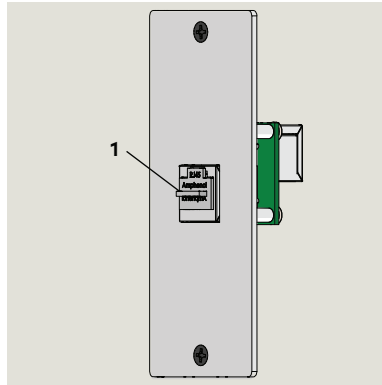
4.2.2.1 Procedure after an Emergency stop.

1. Cause for the emergency stop has been removed.
2. Reset the Emergency stop pushbutton by turning or pulling the pushbutton.
3. Door will move to the home position.
4. The revolving door will continue with the current program settings.

4.3 Service panel (option)

Fig. 4.3.1 Service panel
DX4604-08C

1 RJ45 cover



4.3.1 Service panel for handheld.

- Typically located on side of leading quarter post.
- For use by dormakaba service personnel.

4.4 Wave to Open, Push to Open plates (options)

Fig. 4.4.1 Wave to Open
plate
DX3331-001

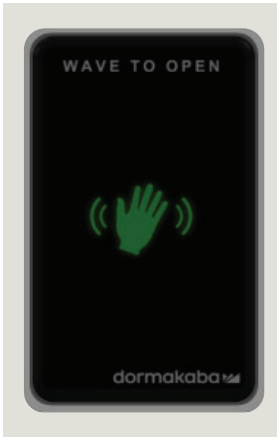
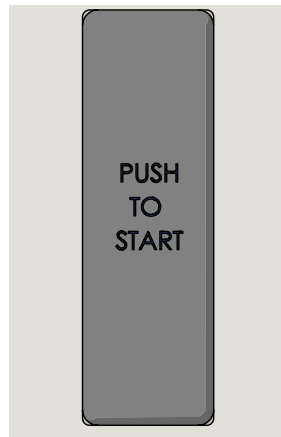


Fig. 4.4.2 Push to Start
plate
DX3339-040



4.4.1 Wave to Open or Push to Start plates.

Locations:

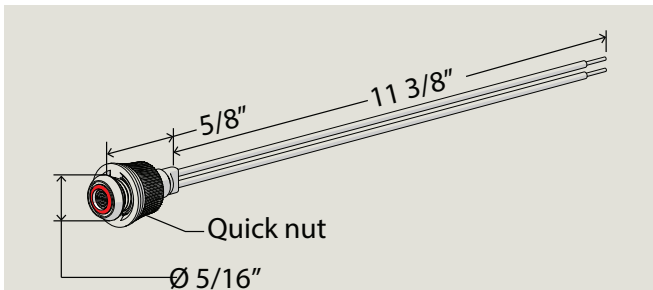
- Inside the building on the leading quarter post/end wall or attached separately within sight of the revolving door.
- Building exterior.

Plates must be located per ANSI BHMA A156.27, Power and Manually Operated Revolving Pedestrian Doors.

Plate starts rotary movement of the door wings at low energy speed (Para. 5.2.4).

4.5 Fault LED

Fig. 4.5.1 Fault LED RX6013-001



4.5.1 Fault LED.

- Fault LED provides Error number indication.
- Frequency and rate of LED flashes indicates Error number.

4.5.2 Fault LED location

- Field installed above or below Mode switch.

4.5.3 Error number and LED blinking codes.

- First digit of Error number: slowly flashing LED (approximately 1 Hz).
- Second digit of Error number: rapidly flashing LED (approximately 2 Hz).
- Error LED fault code example:
1 x slow and 4 x fast = Error no. 14
(braking distance at safety stop too long).



TIPS AND RECOMMENDATIONS

Reference Chapter 16 for fault codes.

4.6 Operator component locations

Fig. 4.6.1 4 wing door, interior view

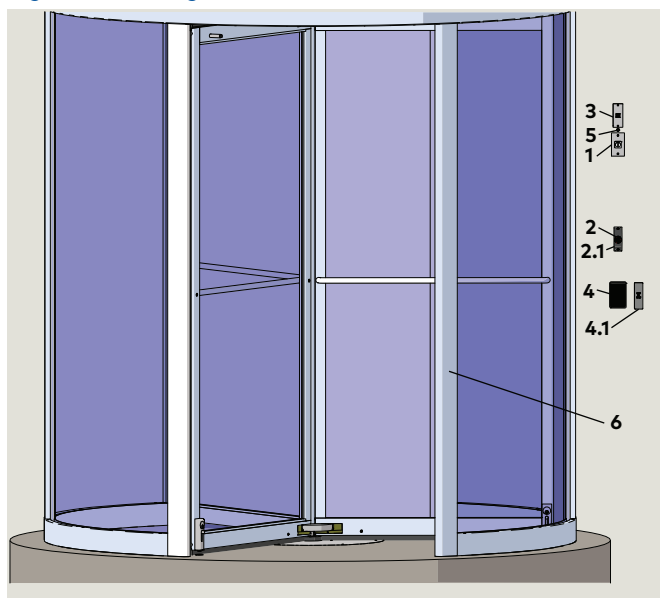


Table 4.6.1 Door operator components

#	Description	Part #
1	Mode switch with key lock	RX6008
2	Emergency stop pushbutton	RX3413-010RA
2.1	Housing	RX3413-020RA
3	Service panel (option)	DX4604-08C
4	Wave to Open plate (option)	DX3331-001
4.1	Push to Start plate (option)	DX3339-040
5	Fault LED	RX6013-001
6	Quarter post	



TIPS AND RECOMMENDATIONS

Mode switch, Wave to Open plate and Service panel located on the leading quarter post or attached separately within sight of the revolving door.

5 Revolving door assemblies

5.1 Door configurations with 3 1/8" high canopy Canopy mounted Motion Assist 360 drive, floor mounted speed control

Fig. 5.1.1 4 wing door

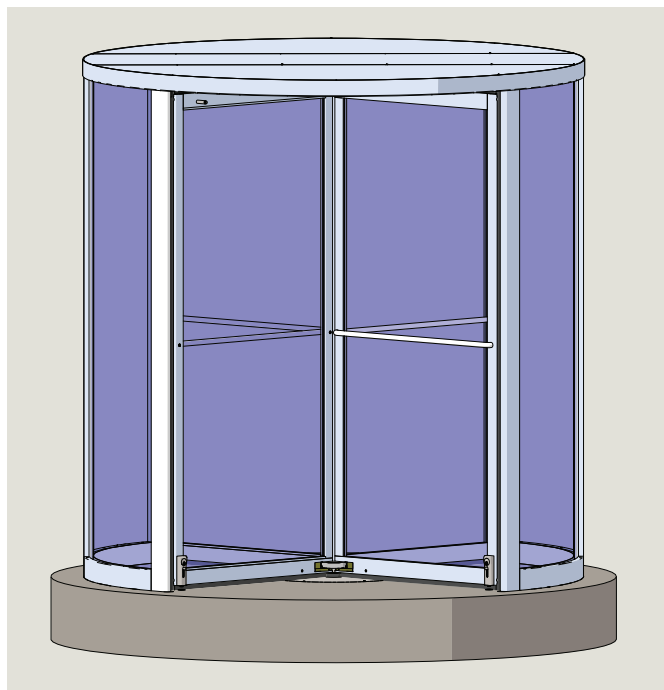
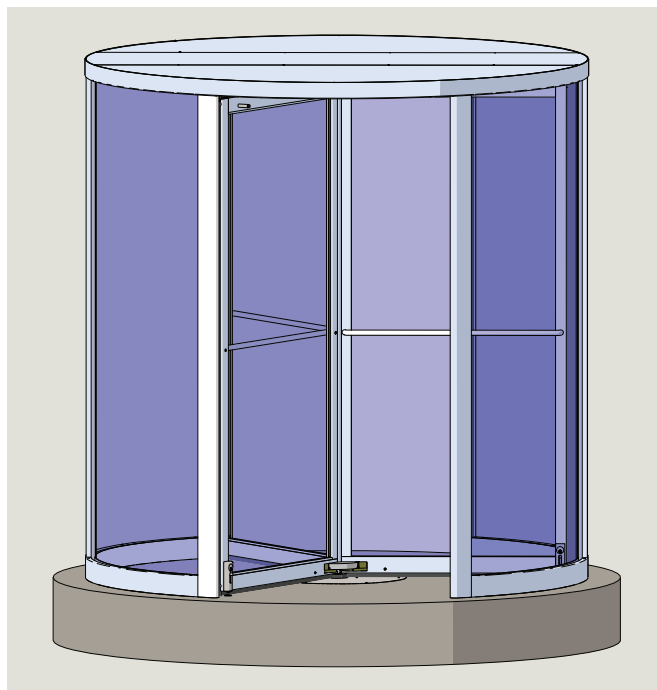


Fig. 5.1.2 3 wing door



5.2 Door configurations with 6" high canopy Canopy mounted Motion Assist 360 drive and speed control

Fig. 5.2.1 4 wing door

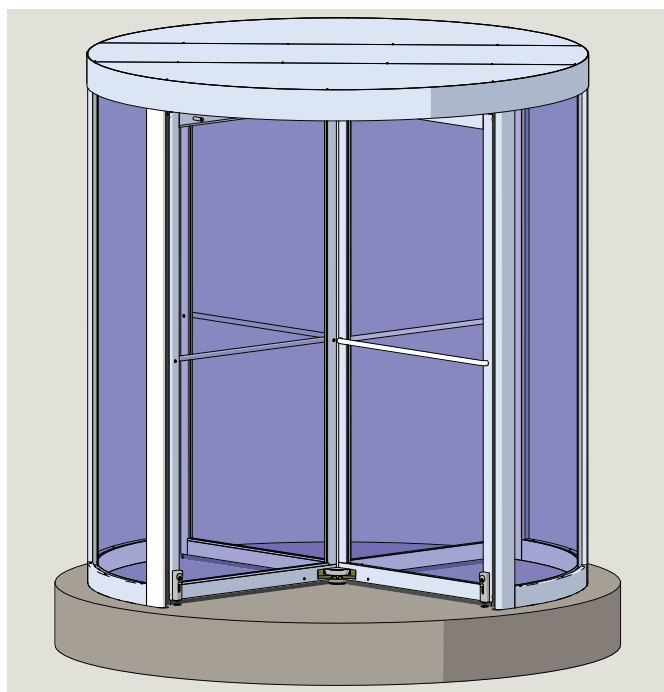
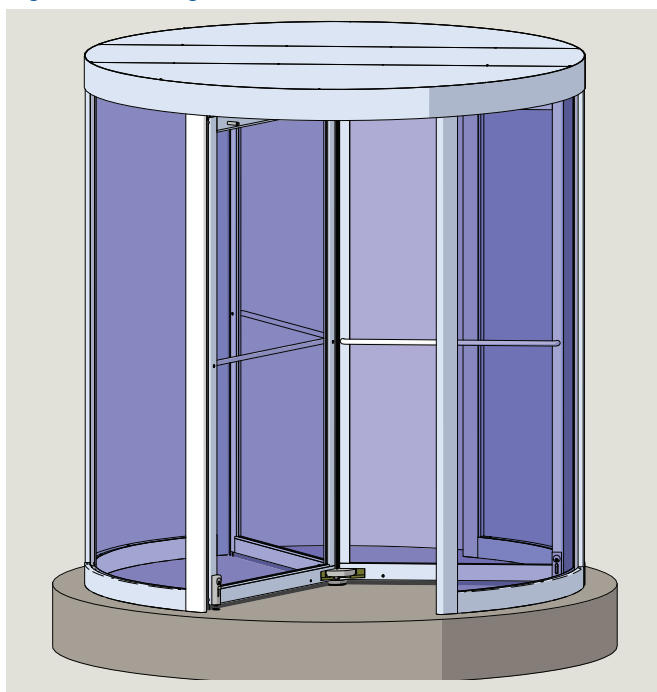


Fig. 5.2.2 3 wing door



5.3 3 1/8" inch high canopy configurations

Table 5.3.1 3 1/8" inch high canopy configurations

Canopy assembly	# wings	Figure	Item #	Motion Assist 360 drive controls
RS6051-001	4	5.3.1	1	Canopy mounted
RS6051-002	3			
RS6051-003	4	5.3.2	2	Remote enclosure
RS6051-004	3			

Fig. 5.3.1 With Motion Assist 360 drive controls

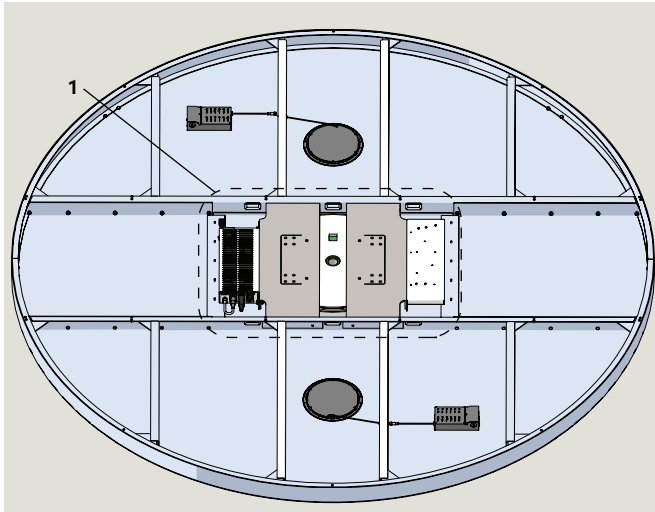
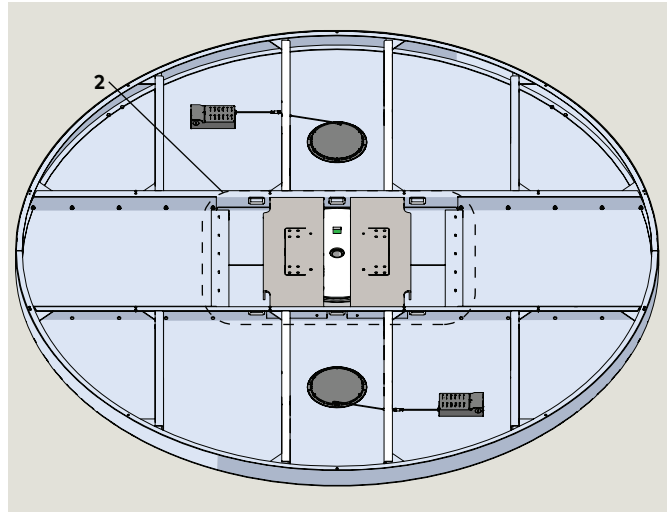


Fig. 5.3.2 Remote Motion Assist 360 drive controls



5.4 6 inch high canopy configurations

Table 5.4.1 6 inch high canopy configurations

Canopy assembly	# wings	Figure	Item #	Motion Assist 360 drive controls
RS6049-001	4	5.4.1	3	Canopy mounted
RS6049-002	3			
RS6049-003	4	5.4.2	4	Remote enclosure
RS6049-004	3			

Fig. 5.4.1 With Motion Assist 360 drive controls

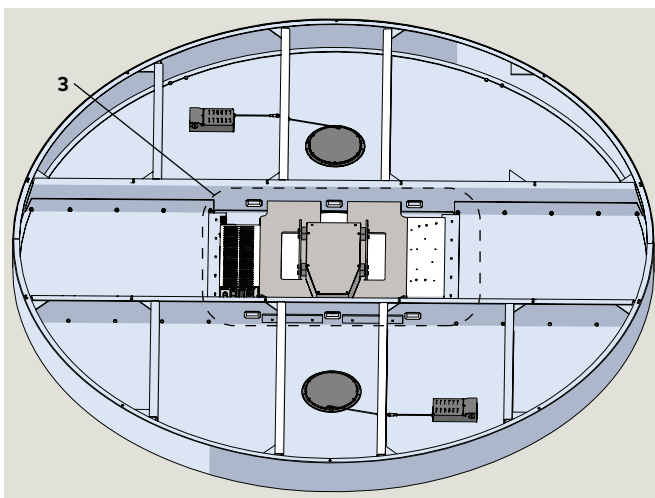
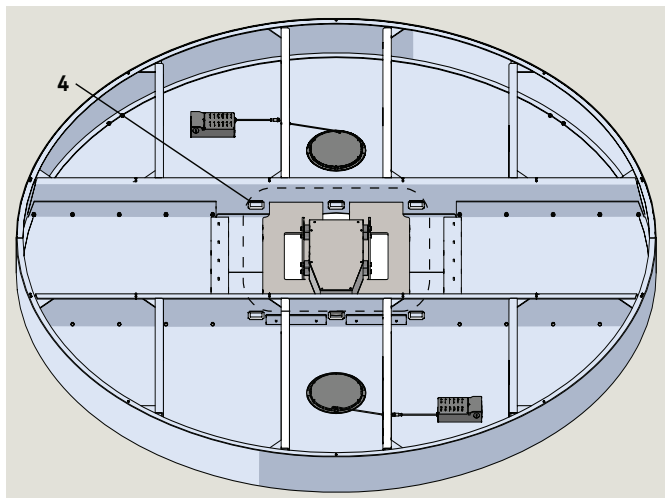


Fig. 5.4.2 Remote Motion Assist 360 drive controls



5.5 Canopy mounted drive bracket assembly, floor mounted speed control

Table 5.5.1 Motion Assist 360 drive configurations, 3 inch canopy

Drive assembly	Figure	Motion Assist 360 drive controls	Speed control
RS6048-001	2.10.1	Canopy mounted	Floor mounted
RS6048-002	2.10.2	Remote enclosure	Floor mounted

Table 5.5.2 Motion Assist 360 drive hardware

Part / Assembly	Description
1 RX6010-001	Motion Assist 360 drive
2 RC6072	Top drive plate, 24" spacing
7 RC6068	Adaptor flange, in canopy drive
11 RX6001-001	Motion Assist 360 power supply
12 RX6002-001	Motion Assist 360 control unit
13 RK6007	Remote enclosure kit assembly

Fig. 5.5.1 Assembly, drive bracket. Motion Assist 360 drive and controls, floor mounted speed control

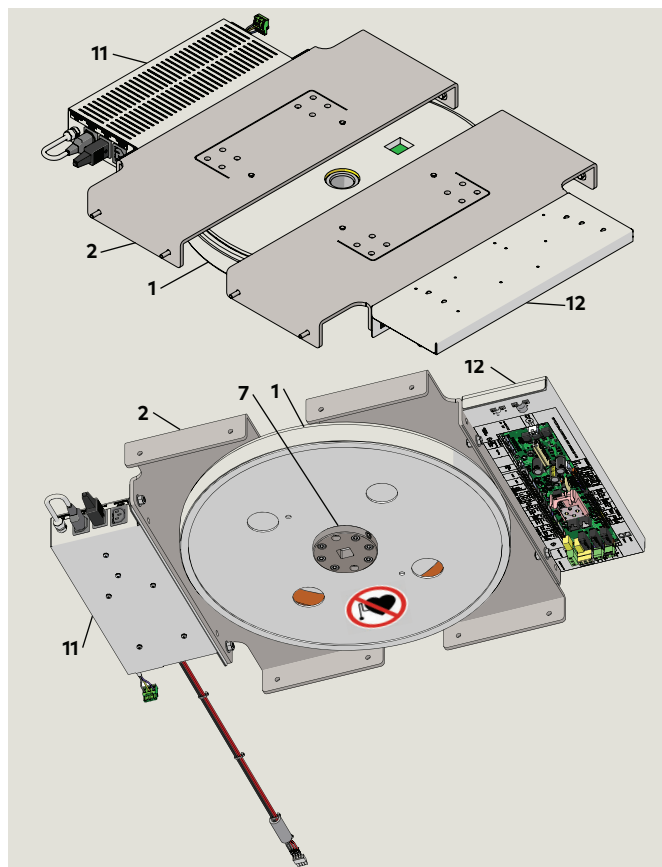


Fig. 5.5.2 Top drive plate, 24" spacing

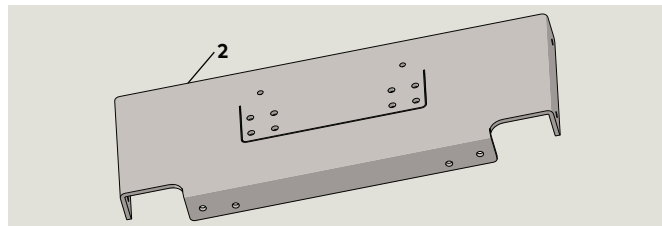


Fig. 5.5.3 Assembly, drive bracket. Motion Assist 360 drive, floor mounted speed control

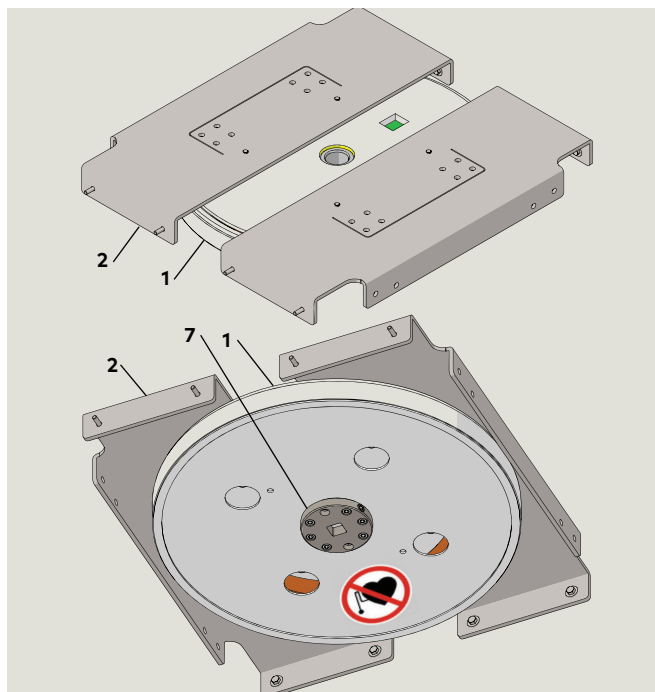
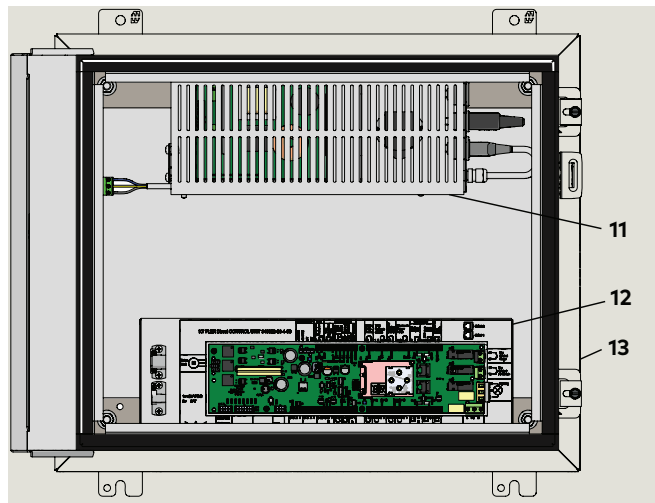


Fig. 5.5.4 Remote control enclosure (option)



5.6 Canopy mounted drive bracket assembly with speed control

Table 5.6.1 Motion Assist 360 drive configurations, 6 inch canopy

Drive assembly	Figure	Motion Assist 360 drive controls	Speed control
RS6047-001	2.10.1	Canopy mounted	Canopy mounted
RS6047-002	2.10.2	Remote enclosure	Canopy mounted

Table 5.6.2 Motion Assist 360 drive hardware

Part / Assembly	Description
1	RX6010-001 Motion Assist 360 drive
2	RC6066 Top drive plate, 24" spacing
5	RC6079-001 Speed control assembly
7	RC6068 Adaptor flange, in canopy drive
11	RX6001-001 Motion Assist 360 power supply
12	RX6002-001 Motion Assist 360 control unit
13	RK6007 Remote enclosure kit assembly

Fig. 5.6.1 Assembly, drive bracket. Motion Assist 360 drive and controls, with speed control

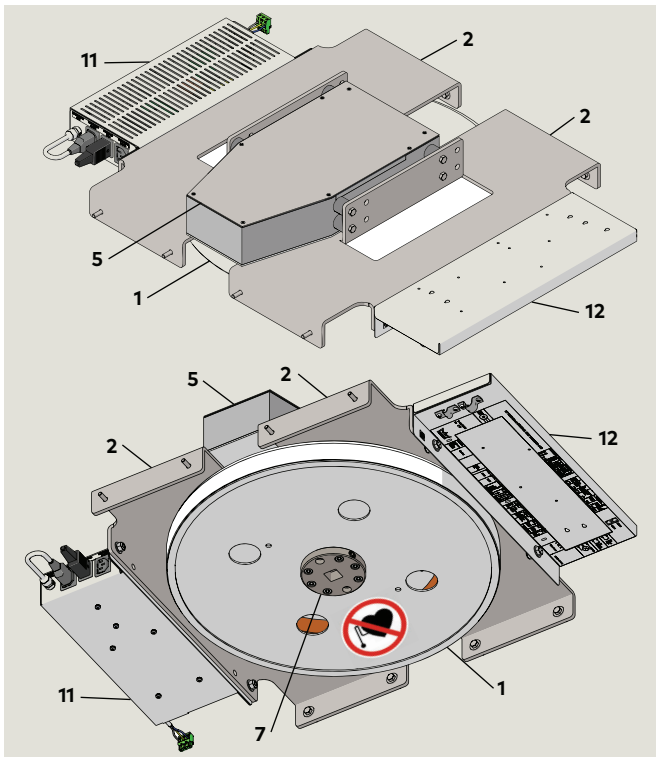


Fig. 5.6.2 Top drive plate with speed control mounting, 24" spacing

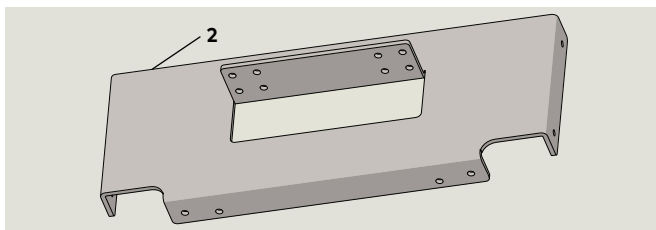


Fig. 5.6.3 Assembly, drive bracket. Motion Assist 360 drive with speed control

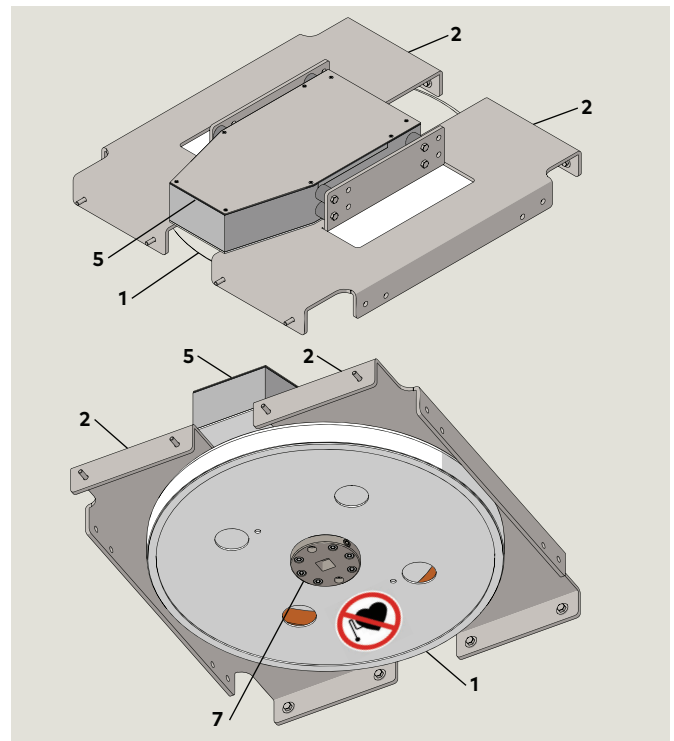
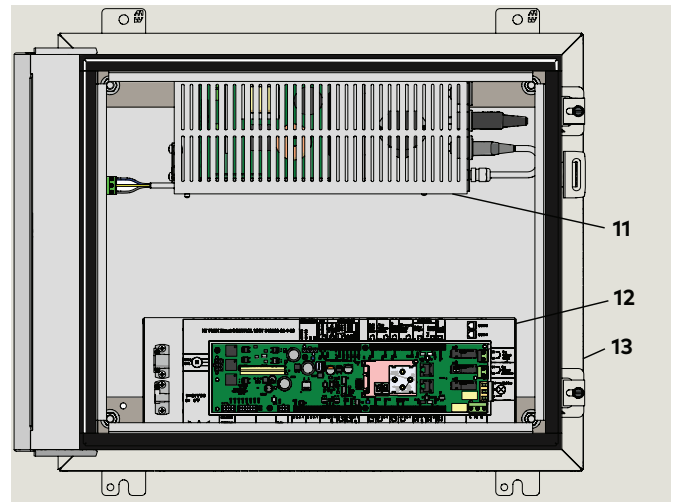


Fig. 5.6.4 Remote control enclosure (option)



5.7 Motion Assist 360 drive hardware

Table 5.7.1 Motion Assist 360 drive hardware

Part / Assembly	Description
1	Motion Assist 360 power supply
1.1	115 Vac cable to control unit (2)
1.2	DC cable to control unit (2)
1.3	Plug for customer 115Vac power cord
2 RX6002-001	Motion Assist 360 control unit
3 RX6003-002	Motion Assist 360 "S" module (Grn)
4 RX6010-001	Motion Assist 360 drive

Fig. 5.7.1 Motion Assist 360 drive

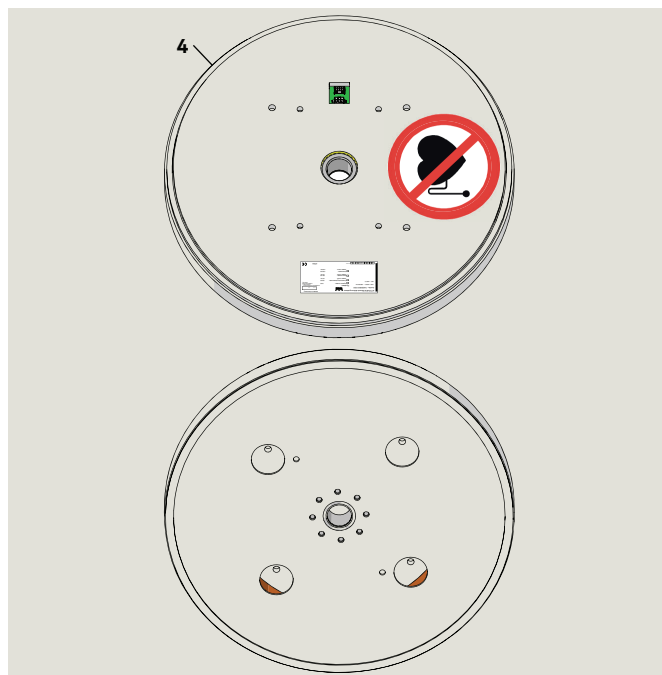


Fig. 5.7.2 Motion Assist 360 control unit

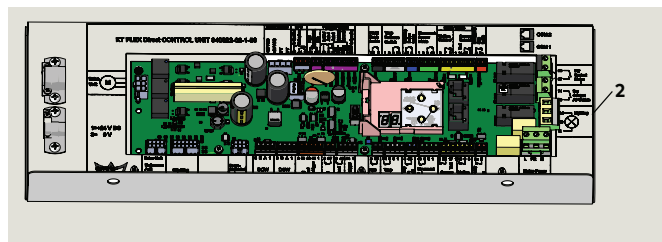
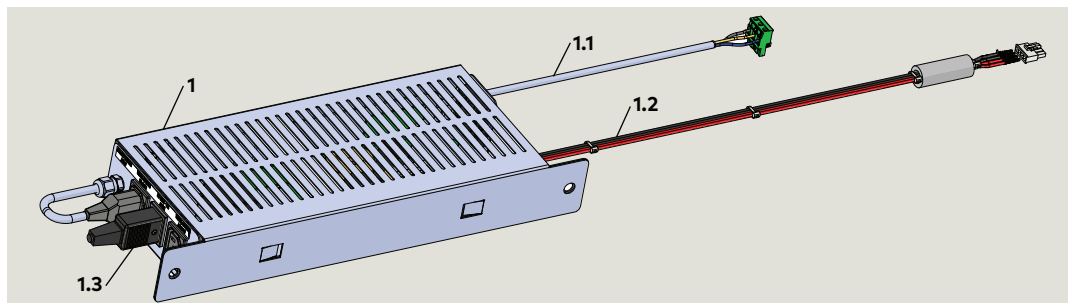


Fig. 5.7.3 Motion Assist 360 power supply and cables



Motion Assist 360 cables		
5	RX6005	Motor cable (21), 14 1/16"
	RX6016-001	Motor extension cable, 25'
6	RX6016-002	Motor extension cable, 50'
	RX6016-003	Motor extension cable, 100'
6.1	RX6016-004	Motor extension cable, 1'
7	RX6006	Motion Assist 360 Hall sensor cable (22), 13 3/4"
	RX6015-001	Hall sensor extension cable, 25'
8	RX6015-002	Hall sensor extension cable, 50'
	RX6015-003	Hall sensor extension cable, 100'
	RX6015-004	Hall sensor extension cable, 1'

Fig. 5.7.4 Drive motor cables

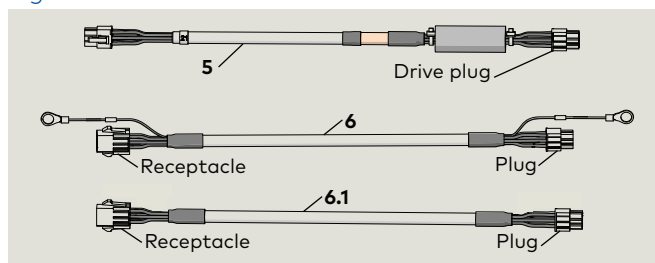


Fig. 5.7.5 Drive Hall sensor cables

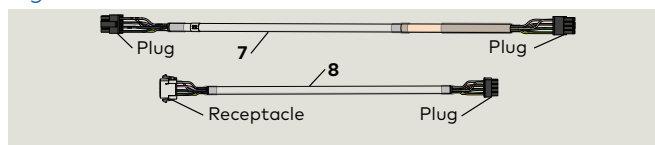
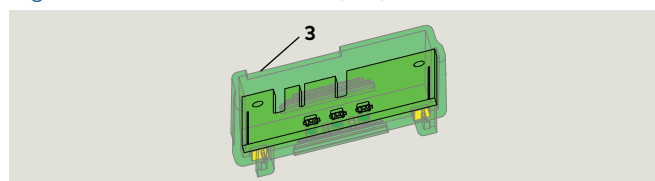


Fig. 5.7.6 "S" function module (Grn) Motion Assist



6 Remote enclosure – option

6.1 Remote enclosure assembly RK6007 hardware

Fig. 6.1.1 Remote enclosure assembly

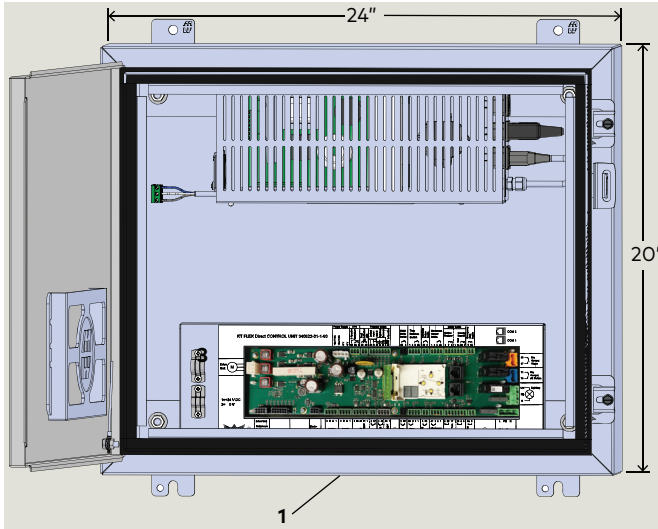


Table 6.1.1 Remote enclosure hardware

#	Description	
1	RS6032	Remote control enclosure, 24 x 20 x 7 1/4"
3	RF6018-01G	5/16 x 1/2" SHCS, SS
4	RF6019-01G	5/16" flat washer
5	RF6016-01G	External tooth lock washer
6		Motion Assist 360 power supply
6.1	RX6001	115 Vac cable to control unit
6.2		24 Vdc cable to control unit
7	RC6057	Bracket
8	RX6003-002	"S" motion assist function module
9	RX6009	Earth ground cable
9.1		Earth ground label

Fig. 6.1.2 Motion Assist 360 power supply RX6001

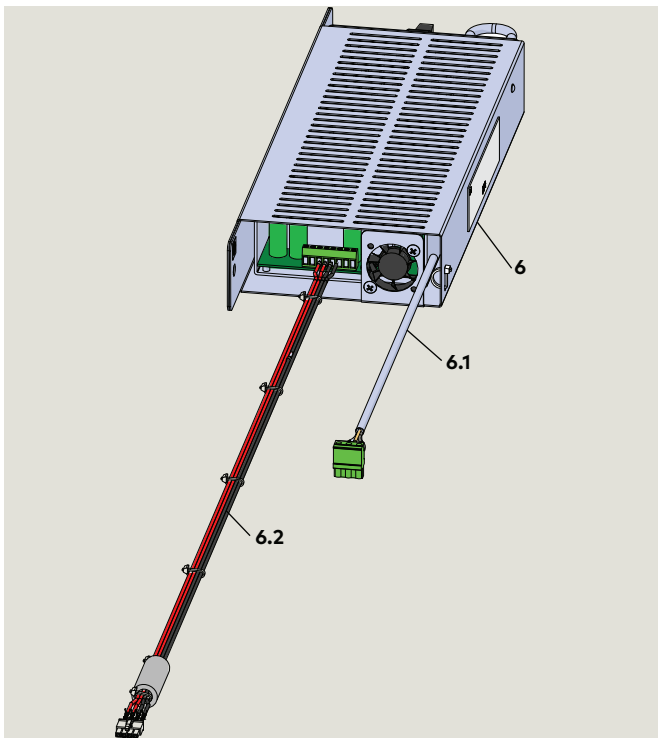


Fig. 6.1.4 Control unit / power supply brackets

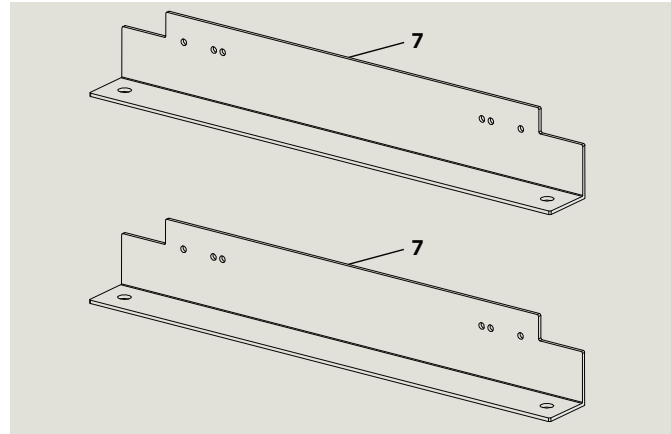


Fig. 6.1.3 Motion Assist 360 control unit RX6002

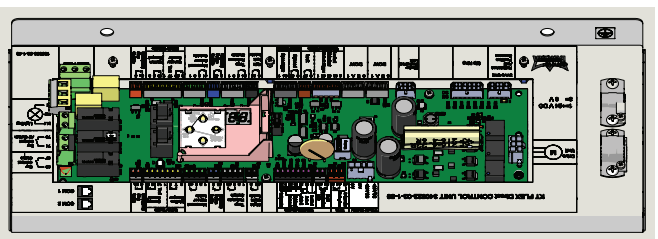


Fig. 6.1.5 Fastener hardware

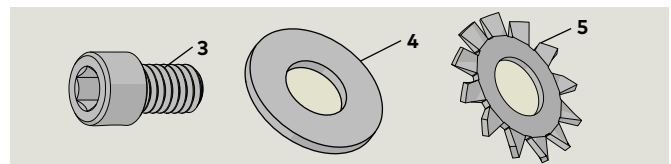


Fig. 6.1.6 Earth grounding cable

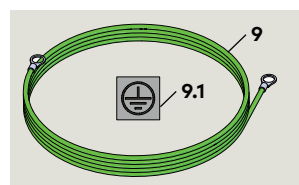
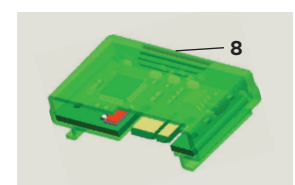


Fig. 6.1.7 "S" (GRN) Motion Assist



6.3 Install Motion Assist 360 power supply on mounting bracket

Table 6.3.1 Power supply and hardware

#	Description	
3	RF6018-01G	5/16 x 1/2" SHCS, SS
4	RF6019-01G	5/16" flat washer
5	RF6016-01G	External tooth lock washer
6		Motion Assist 360 power supply
6.1	RX6001	115 Vac cable to control unit
6.2		24 Vdc cable to control unit
7	RC6057	Bracket
9		Earth ground cable
9.1	RX6009	Earth ground label

Fig. 6.3.1 Motion Assist 360 power supply cables

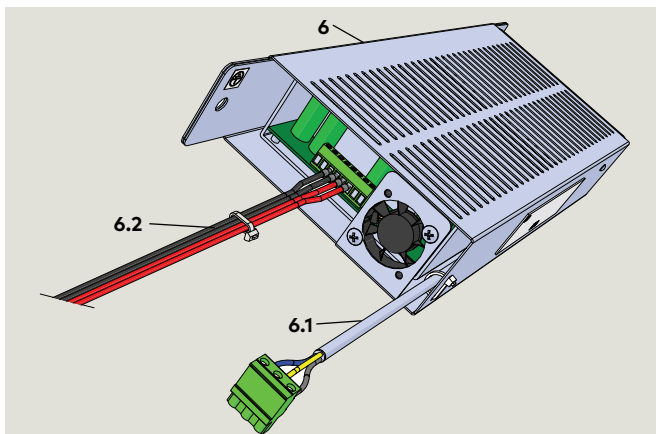


Fig. 6.3.2 Motion Assist 360 power supply mounting bracket

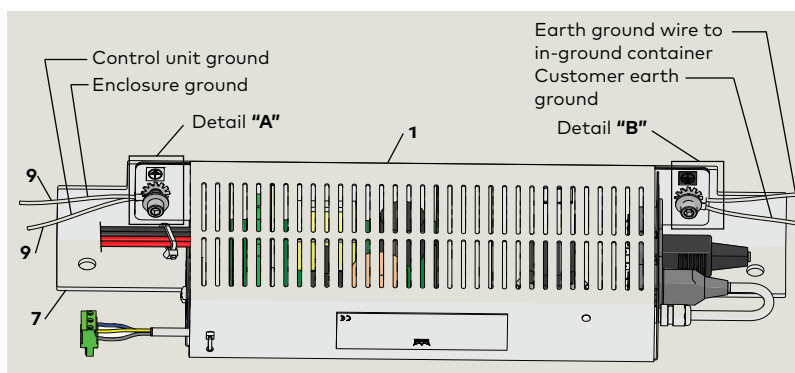


Fig. 6.3.3 Detail "A"

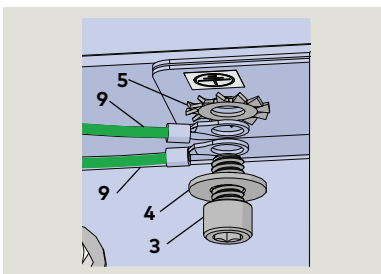
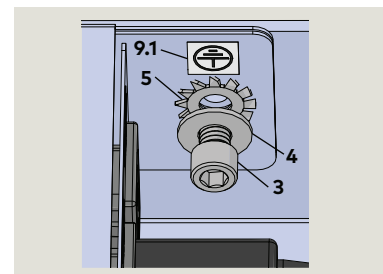


Fig. 6.3.4 Detail "B"



CAUTION

Holes for conduits into enclosure.

Drill required holes for conduits prior to installation of Motion Assist 360 hardware. Reference Para. 6.5

6.3.1 Install Motion Assist 360 power supply on mounting bracket.

1. Fasten power supply to bracket using fastener hardware referenced in Fig. 6.3.3 and 6.3.4).
 - Install ring lugs of two earth ground cables onto SHCS (3) as shown in Fig. 6.3.3 Detail "A".

CAUTION

Observe order of fastener hardware and earth grounding cable installation as referenced in Fig. 6.3.3 and 6.3.4.



TIPS AND RECOMMENDATIONS

Reference Paragraph 6.6.

- Connection of control unit earth ground wire to control unit
- Connect of enclosure ground wire to enclosure ground stud.

6.4 Install Motion Assist 360 control unit on mounting bracket

Fig. 6.4.1 Motion Assist 360 control unit installed on mounting bracket

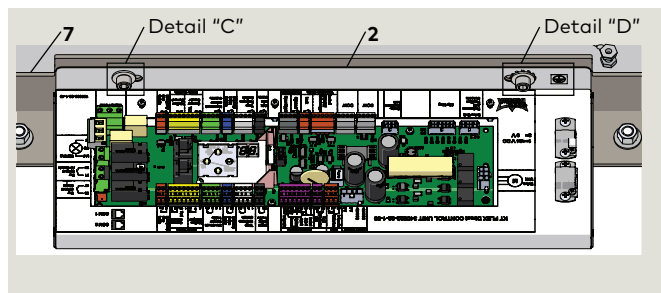


Fig. 6.4.2 Detail "C"

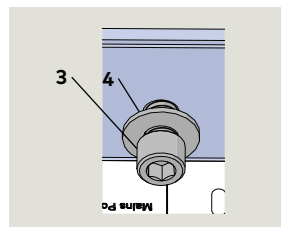


Fig. 6.4.3 Detail "D"

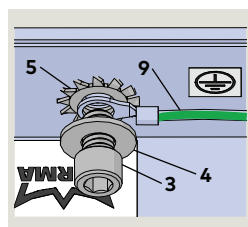


Table 6.1.1 Control unit and hardware

#	Description
2	RX6002 Motion Assist 360 control unit
3	RF6018-01G 5/16 x 1/2" SHCS, SS
4	RF6019-01G 5/16" flat washer
5	RF6016-01G External tooth lock washer
7	RC6057 Bracket
8	RX6003-002 "S" Motion assist function module
9	RX6009 Earth ground cable

CAUTION

Holes for conduits into enclosure.

Drill required holes for conduits prior to installation of Motion Assist 360 hardware.

6.4.1 Install Motion Assist 360 control unit on mounting bracket.

1. Fasten control unit to bracket using fastener hardware referenced in Fig. 6.4.2 and 6.4.3.
- Ring lug of earth ground cable (9) (Fig. 6.4.3 Detail "D") from power supply (Para. 6.3) will be installed once control unit bracket assembly installed in enclosure (Para. 6.6).

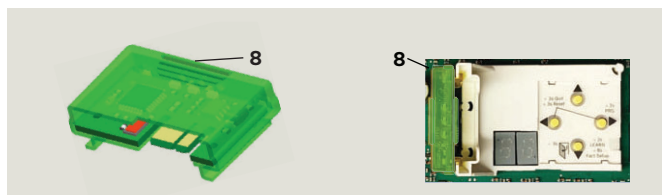


TIPS AND RECOMMENDATIONS

Reference Paragraph 6.6 for connection of control unit earth ground to control unit.

6.5 Install Motion Assist 360 "S" function module

Fig. 6.5.1 "S" (GRN) Motion Assist



6.5.1 Install Motion Assist "S" module into slot on control unit.

1. Insert function module into function module slot next to operator interface on control unit.

6.6 Install Motion Assist 360 power supply assembly into enclosure

Table 6.1.1 Power supply and hardware

#	Description
1	RX6001 Motion Assist 360 power supply
7	RC6057 Bracket
10	Enclosure internal panel stud
11	Enclosure panel stud nut



TIPS AND RECOMMENDATIONS

Power supply bracket will be installed using enclosure internal panel mounting studs.

6.6.1 Install Motion Assist 360 power supply assembly into enclosure.

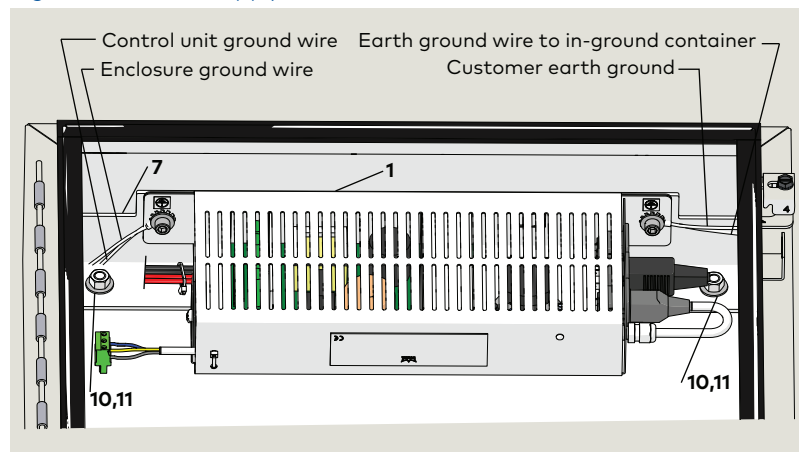
1. Remove nuts from enclosure internal panel studs.
2. Install power supply bracket onto two enclosure studs.
3. Reinstall the two enclosure nuts and tighten.



TIPS AND RECOMMENDATIONS

Refer to Para. 6.6 for connection of control unit and enclosure earth ground wires.

Fig. 6.6.1 Power supply installation in remote enclosure



6.7 Install Motion Assist control unit assembly into enclosure

Fig. 6.7.1 Control unit installation in remote enclosure

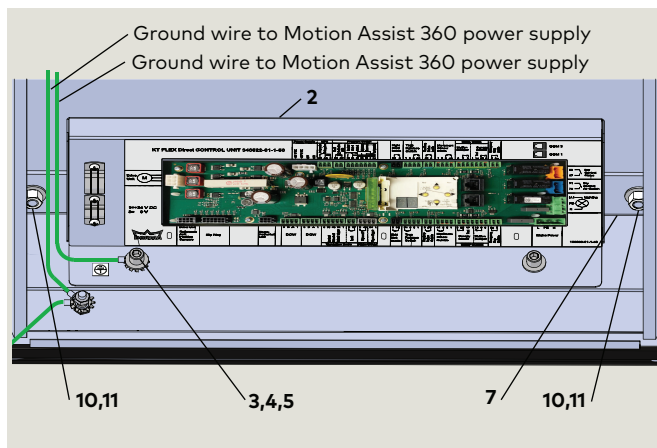


Fig. 6.7.2 Remote enclosure ground wire connections

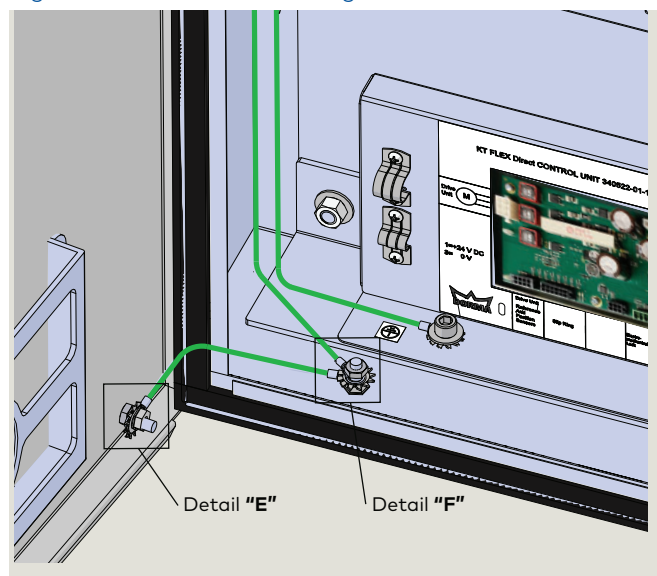


Fig. 6.7.3 Detail "E"

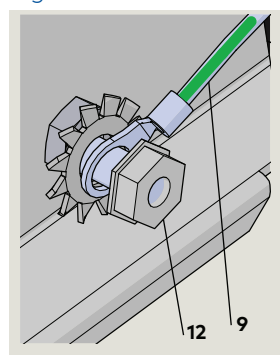


Fig. 6.7.4 Detail "F"

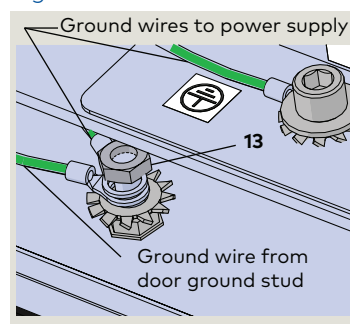


Table 6.7.1 Control unit and hardware

#	Description
2	RX6002 Motion Assist 360 control unit
3	RF6018-01G 5/16 x 1/2" SHCS, SS
4	RF6019-01G 5/16" flat washer
5	RF6016-01G External tooth lock washer
7	RC6057 Bracket
9	RX6009 Earth ground cable
10	Enclosure internal panel stud
11	Enclosure internal panel stud nut



TIPS AND RECOMMENDATIONS

Control unit bracket will be installed using enclosure internal panel mounting studs.

6.7.1 Install Motion Assist 360 control unit assembly into enclosure.

1. Remove nuts from enclosure internal panel studs.
2. Install control unit bracket onto two enclosure studs.
3. Reinstall the two enclosure nuts and tighten.

6.7.2 Connect ground wire from power supply to control unit.

1. Connect ground wire from power supply to control unit SHCS.
 - Reference Fig. 6.7.3, Detail "D"

6.7.3 Connect ground wire from power supply to enclosure ground stud.

1. Remove nut from enclosure ground stud and install ground wire from Motion Assist 360 power supply to enclosure ground stud (Fig. 6.7.4).

6.7.4 Connect ground wire from enclosure door to enclosure ground stud.

1. Remove nut (12) from door ground stud (Fig. 6.7.3).
2. Install ground wire ring lug on stud.
3. Reinstall enclosure ground stud nut (13), Fig. 6.7.4).

6.8 Install cables from Motion Assist 360 power supply to control unit

Fig. 6.8.1 Motion Assist 360 power supply cables

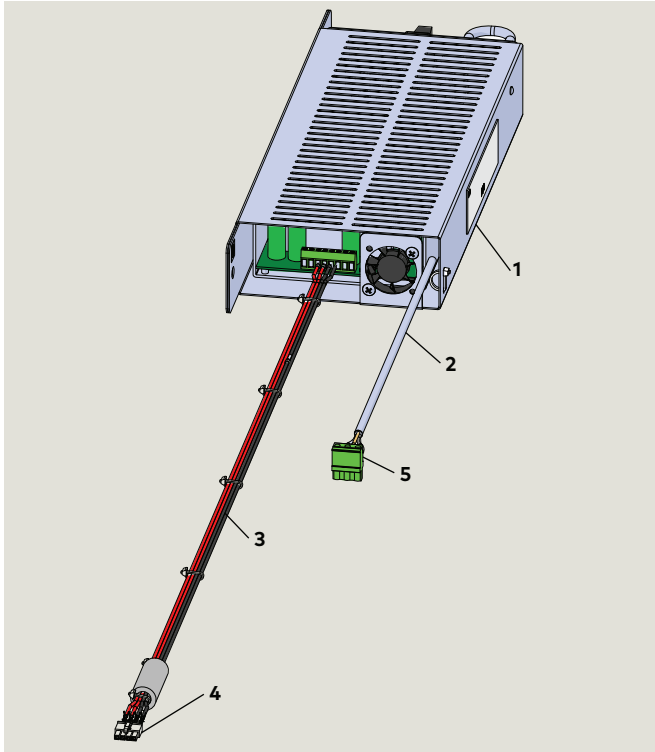


Fig. 6.8.2 Motion Assist 360 Control unit DC power supply cable connections

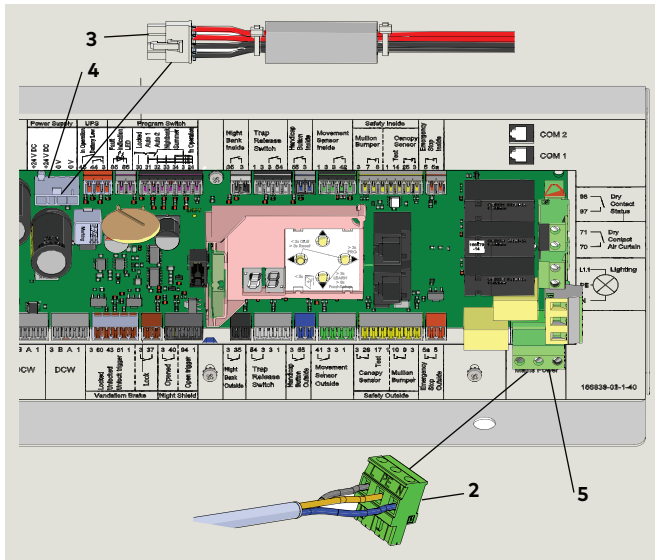


Table 6.8.1 Power supply cables to control unit

#	Description
1	Motion Assist 360 power supply
2	RX6001 115 Vac cable
3	DC cable
4	DC cable receptacle
5	RX6002 115 Vac cable receptacle
6	Motion Assist 360 control unit

6.8.1 Connect 115 Vac cable.

1. Insert 115 Vac cable (2) plug into mains power receptacle (5) on control unit.

NOTICE

- Insure plug is fully inserted and locked in receptacle.

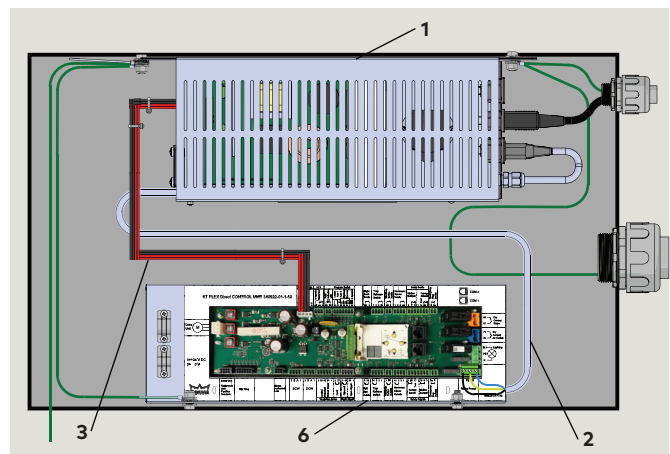
6.8.2 Connect DC power cable.

1. Insert DC power cable (3) plug into power supply receptacle (4) on control unit.

NOTICE

- Insure plug is fully inserted and locked in receptacle.

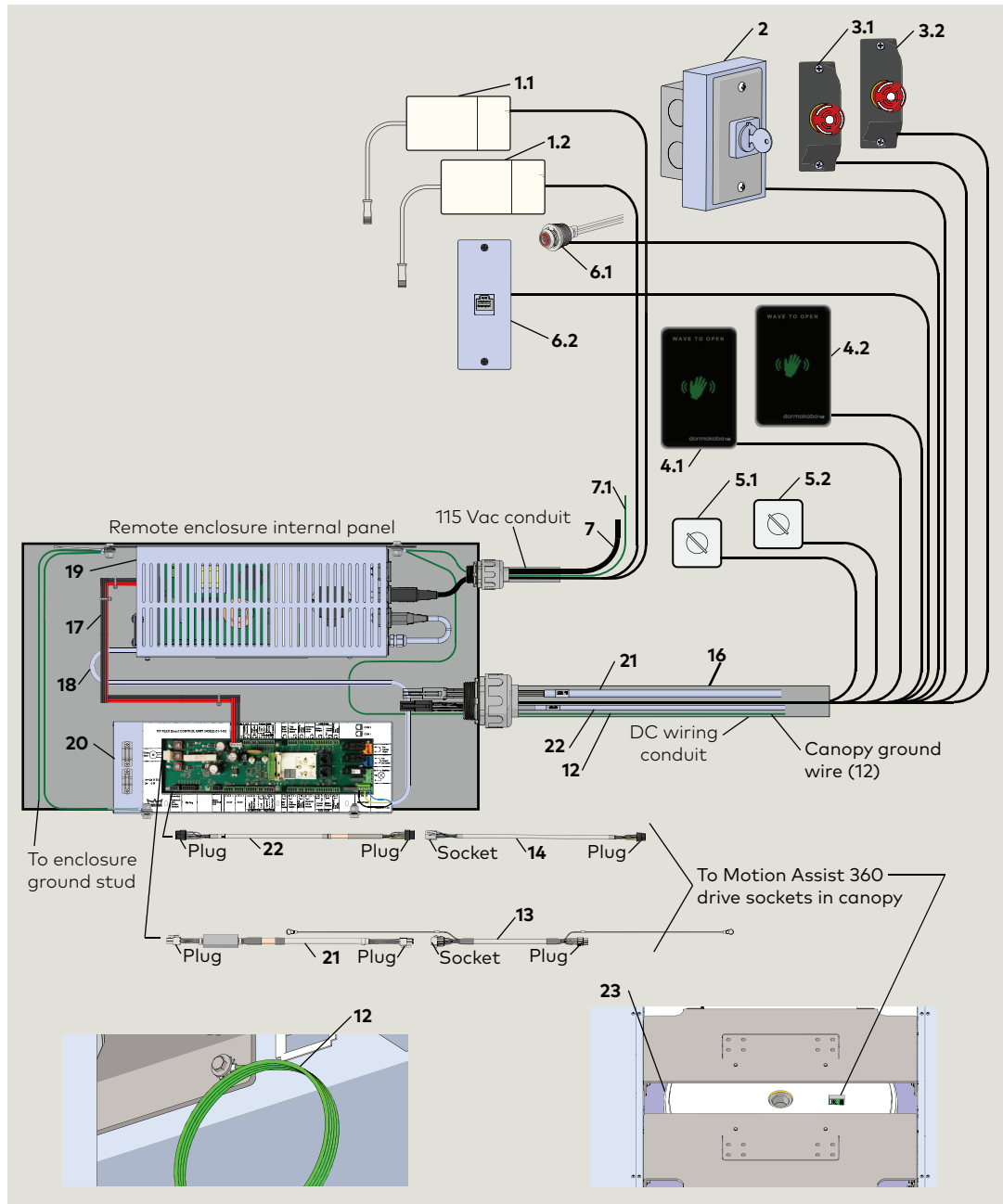
Fig. 6.8.3 Remote enclosure Motion Assist 360 cable connections



6.9 Remote enclosure wiring interfaces

Fig. 6.9.1 Wiring interfaces to Remote enclosure and to canopy

- 1.1 Canopy light LED driver 115 Vac (option)
- 1.2 Canopy light LED driver 115 Vac (option)
- 2 Program switch
- 3.1 Emergency stop, interior
- 3.2 Emergency stop, exterior
- 4.1 Wave to Open, interior (option)
- 4.2 Wave to Open, exterior (option)
- 5.1 Night bank, interior (option)
- 5.2 Night bank, exterior (option)
- 6.1 Fault LED
- 6.2 Service panel
- 7 Customer 115 Vac - (3) 14 AWG wires
- 7.1 Customer 14 AWG earth ground
- 9 Customer 1/2" liquidtight flexible conduit
- 10 1 1/2" liquid-tight conduit adapter DC6045
- 11 1 1/2" liquid-tight conduit
- 12 14 AWG earth ground wire
- 13 Extension motor cable DX6016-00X
- 14 Extension Hall sensor cable RX6016-00X 25', 50', 100'
- 16 Ground cable RX6009
- 17 DC power cable
- 18 115 Vac cable
- 19 Motion Assist 360 power supply
- 20 Motion Assist 360 control unit
- 21 Motor cable RX6005, 14"
- 22 Hall sensor cable RX6006, 13 3/4"
- 23 Motion Assist 360 drive RX6010



6.10 Connect 115 Vac and earth ground cable from remote enclosure to customer 115 Vac distribution panel

Fig. 6.10.1 Remote enclosure DC cables and 115 Vac wiring

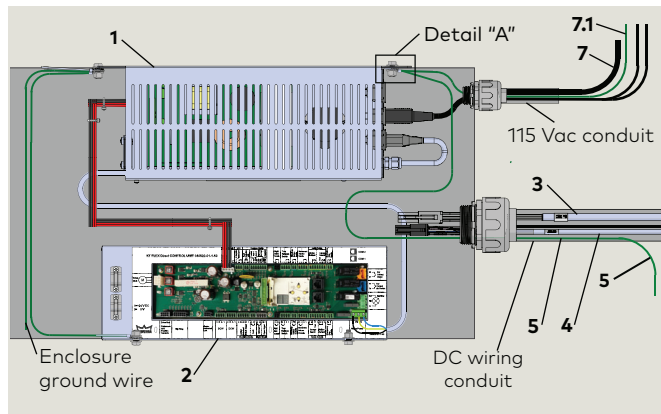


Fig. 6.10.2 Detail "A":

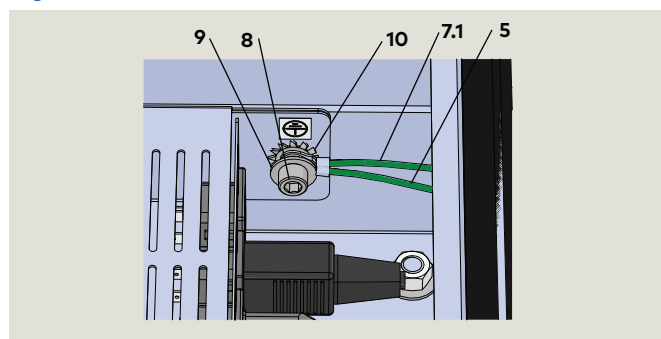


Fig. 6.10.3 Motion Assist 360 power supply

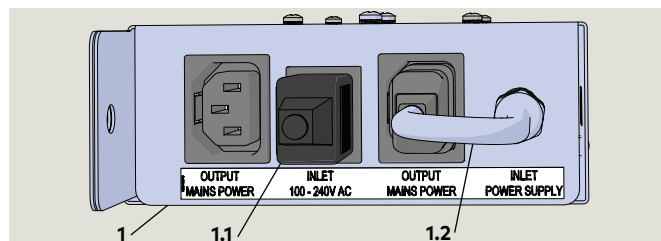


Fig. 6.10.4 Inlet socket AC plug, customer 115 Vac

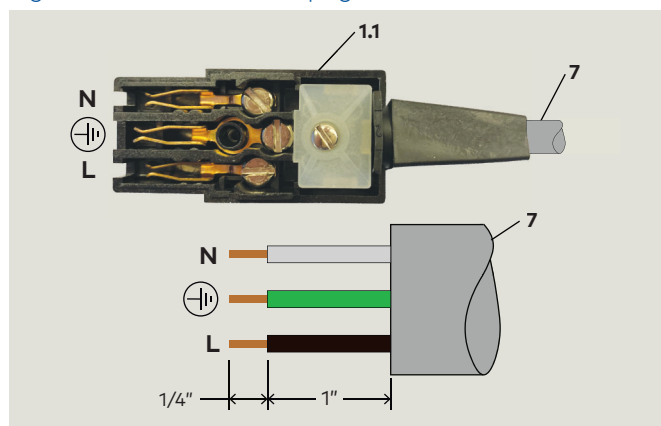


Table 6.10.1 Remote enclosure hardware and wiring

#	Description
1	Motion Assist 360 power supply
1.1	RX6001 Plug for customer 115 Vac wiring
1.2	115 Vac cable to control unit
2	RX6002 Motion Assist 360 control unit
3	RX6016-001 Motor extension cable, 25' (standard)
4	RX6015-001 Hall sensor extension cable, 25' (standard)
5	Earth ground wire to in-ground container
7	Customer 115 Vac
7.1	Customer earth ground wire
8	RF6018-01G 5/16 x 1/2" SHCS, SS
9	RF6019-01G 5/16" flat washer
10	RF6016-01G External tooth lock washer

6.10.1 Connect 14 AWG earth ground cable from remote enclosure to customer distribution panel ground.

1. Connect one end of earth ground cable to Motion Assist 360 power supply fastener as shown in Fig. 6.10.2.
2. Route earth ground wire from remote enclosure to customer distribution panel.
3. Connect earth ground wire to ground.

6.10.2 Connect 115 Vac from customer distribution panel to Motion Assist 360 power supply 115 Vac plug.

CAUTION

Customer 115 Vac circuit breaker must be OFF!

1. Connect 115 Vac wiring to Motion Assist 360 power supply 115 Vac plug as shown in Fig. 6.10.4



WARNING

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

6.11 Connect earth ground cable from remote enclosure to canopy

Fig. 6.11.1 Remote enclosure DC cables and 115 Vac wiring

- 1 Motion Assist 360 power supply RX6001
- 2 Motion Assist 360 control unit RX6002
- 3 Power extension cable
- 4 Hall sensor extension cable
- 5 Earth ground wire to in-ground container
- 7 Customer 115 Vac
- 7.1 Customer earth ground wire

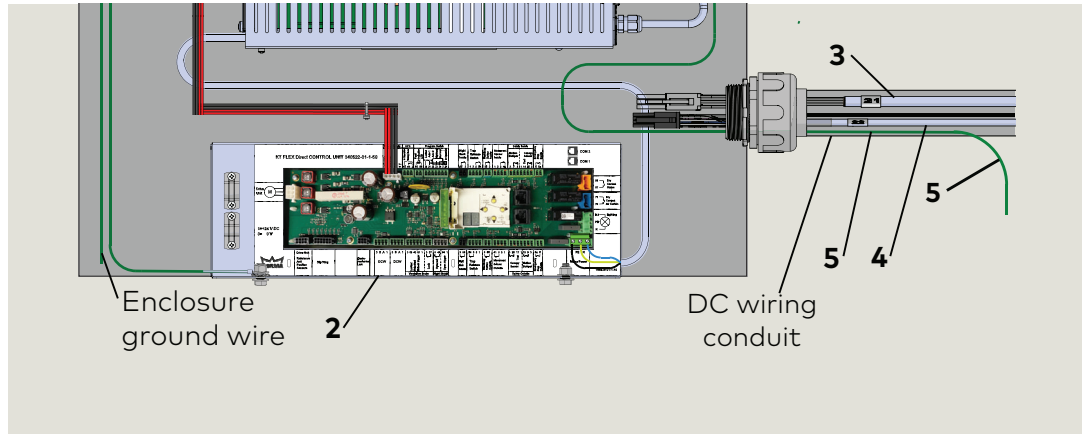
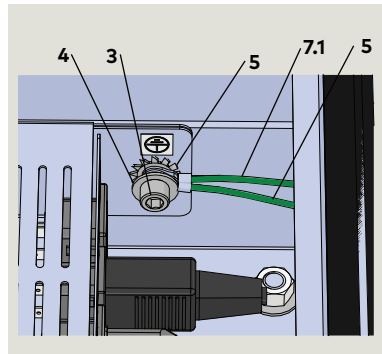


Fig. 6.11.2 Detail "A":

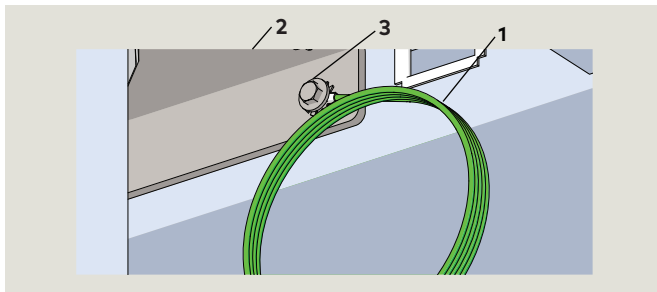
- 3 5/16 x 1/2" SHCS, SS RF6018-01G
- 4 5/16" flat washer, DF6019-01G
- 8 External tooth lock washer RF6016-01G
- 5 Earth ground wire to in-ground container
- 7.1 Customer earth ground wire



6.11.1 Connect 14 AWG earth ground cable from remote enclosure to canopy drive mounting plate hex screw.

1. Connect one end of earth ground cable to Motion Assist 360 power supply fastener as shown in Fig. 6.11.2.
2. Route earth ground wire from remote enclosure to canopy.
3. Connect opposite end of earth ground cable to drive mounting plate 1/4-20 hex screw (Fig. 6.11.3).

Fig. 6.11.3 Canopy Motion Assist 360 hex screw for ground wire



- 1 Ground wire RX6009
- 2 1/4-20 hex screw
- 3 Mounting plate

6.12 Connect Motion Assist 360 extension cables to Motion Assist 360 drive cables

Fig. 6.12.1 Motion Assist 360 drive cables

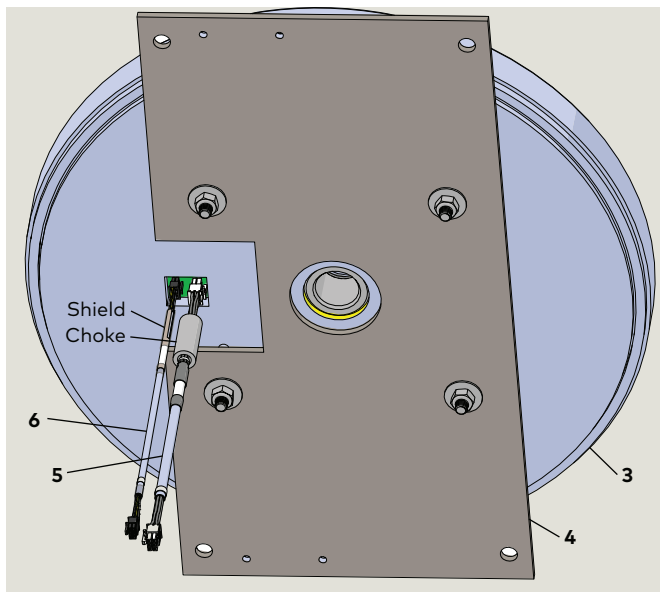


Table 6.12.1 Motion Assist 360 drive and extension cables

1	RX6016-001	Motor extension cable, 25' (standard)
		Optional motor extension cables
	RX6016-002	Motor extension cable, 50'
2	RX6016-003	Motor extension cable, 100'
	RX6015-001	Hall sensor extension cable, 25' (standard)
		Optional Hall sensor extension cables
3	RX6015-002	Hall sensor extension cable, 50'
	RX6015-003	Hall sensor extension cable, 100'
	RX6010	Motion Assist 360 drive
4	RC6060	Mounting plate
5	RX6005	Motor cable (21)
6	RX6006	Hall sensor cable (22)

6.12.1 Extension cable connections to Motion Assist 360 drive cables.

Extension cables connect Motion Assist 360 drive cables in canopy to Motion Assist 360 control unit in remote enclosure.

6.12.2 Connect Motion Assist 360 Hall sensor cable to Hall sensor extension cable.

1. Insert Hall sensor cable (6) plug into Hall sensor extension cable receptacle.

NOTICE

Insure plug is fully inserted and locked in receptacle.

- Use container cable tie to secure cable; loop and tie wrap excess cable as required.
- **Cable must not be in contact with Motion Assist 360 drive!**

6.12.3 Connect Motion Assist 360 power cable to drive extension cable.

1. Insert power cable (5) plug into Drive Unit motor receptacle (9) on control unit.

NOTICE

Insure plug is fully inserted and locked in receptacle.

- Use container cable tie to secure cable; loop and tie wrap excess cable as required.
- **Cable must not be in contact with Motion Assist 360 drive!**

Fig. 6.12.2 Motor extension cable

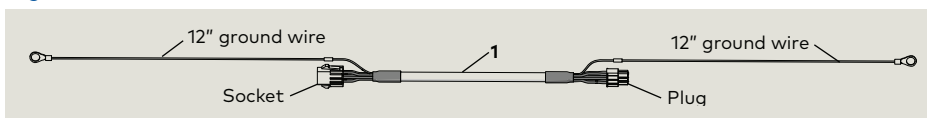
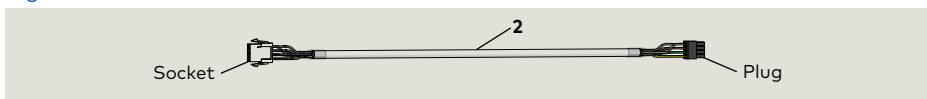


Fig. 6.12.3 Hall sensor extension cable



6.13 Connect Motion Assist 360 drive extension cables to Motion Assist 360 control unit in remote enclosure

Fig. 6.13.1 Motion Assist 360 control unit and drive extension cables

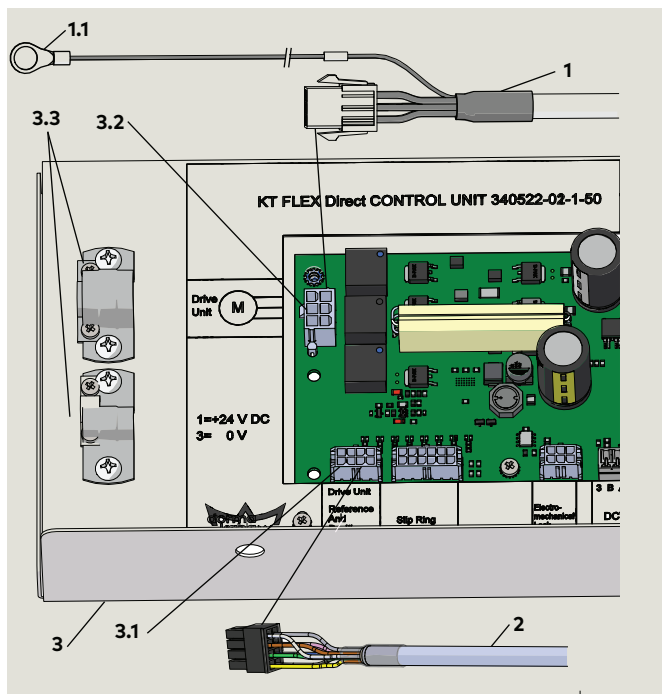


Table 6.12.1 Motion Assist 360 drive and extension cables

1	RX6016-001	Motor extension cable, 25' (standard)
		Optional motor extension cables
	RX6016-002	Motor extension cable, 50'
1.1	RX6016-003	Motor extension cable, 100'
		Ground wire ring lug
	RX6015-001	Hall sensor extension cable, 25' (standard)
2		Optional Hall sensor extension cables
	RX6015-002	Hall sensor extension cable, 50'
	RX6015-003	Hall sensor extension cable, 100'
3		Motion Assist 360 control unit
3.1	RX6002	Hall sensor cable receptacle
3.2		Motor cable receptacle
3.3		Cable clamp
4	RF6018	5/16-18 x 1/2" SHCS SS

Fig. 6.7.2 Remote enclosure ground wire connections

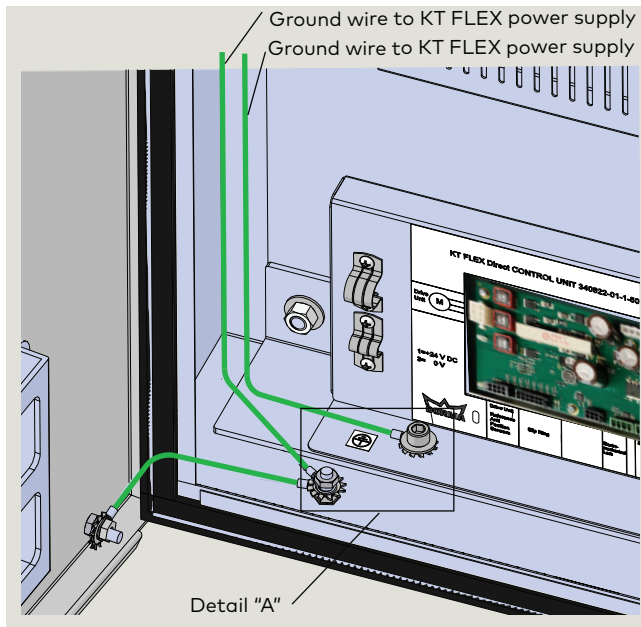
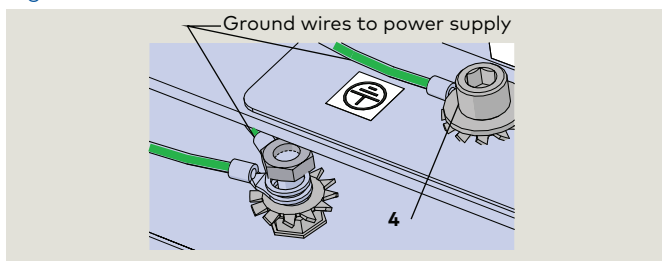


Fig. 6.7.4 Detail "A"



6.13.1 Route Motion Assist 360 drive extension cables to remote enclosure.

- Using a dedicated conduit for DC wiring, route motor extension cable (1) and Hall sensor extension cable (2) from canopy to remote enclosure.

NOTICE

Reference Para. 6.9, Fig. 6.9.1 for overview of conduit and cable routing to remote enclosure.

6.13.2 Connect operator Hall sensor extension cable.

- Insert Hall sensor extension cable (2) plug into Drive Unit Reference and Position Sensors receptacle (3.1) on control unit.

NOTICE

Insure plug is fully inserted and locked in receptacle.

6.13.3 Connect motor power extension cable.

- Insert power extension cable (1) plug into Drive Unit motor receptacle (9) on control unit.

NOTICE

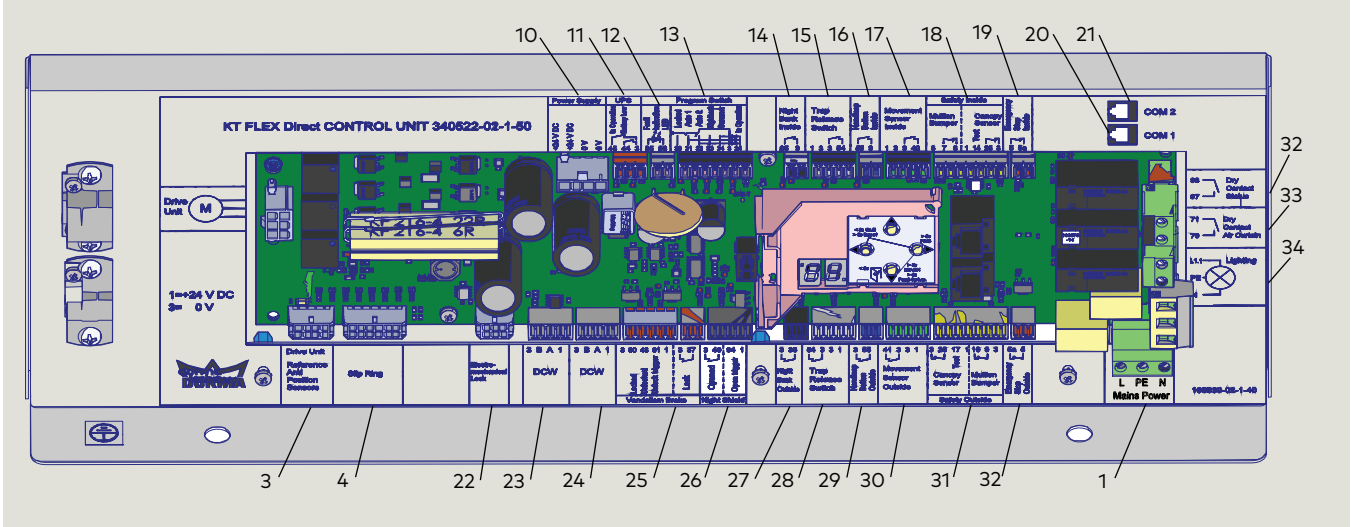
Insure plug is fully inserted and locked in receptacle.

- Install motor power extension cable ground wire ring lug (1.1) under control unit 5/16 x 1/2" SHCS (4) external tooth lock washer


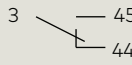
7 Motion Assist 360 control unit interfaces

7.1 Motion Assist 360 control unit connectors


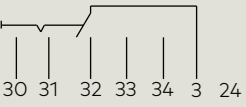
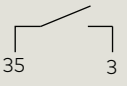
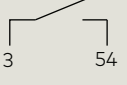
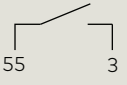
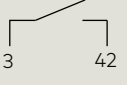
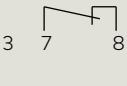
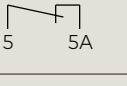


Fig. 7.1.1 Control unit 340522-01-1-50



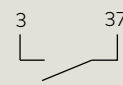
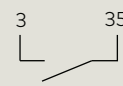
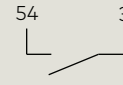
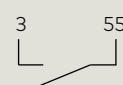
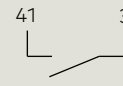
7.1.1 Motion Assist 360 control unit connectors.

#	Description	Control unit connector	Pin #	Function	Reference Chapters	"S" module
1	Mains Power	Plug Connection from Motion Assist 360 Power Supply	L	120 Vac	Chapter 8 Para. 8.4	X
			PE	Earth ground		
			N	Neutral		
2	Motion Assist 360 drive			Plug Connection; drive power		X
3	Reference And Position Sensors			Plug connection; drive sensor		X
4	Center shaft slip Ring	Plug Connection; Slip ring cable			Installation Manual	
10	Power Supply	Plug Connection from Motion Assist 360 Power Supply	24 V DC			X
			24 V DC			
			0 V			
			0 V			
11	UPS option		45	In Operation		X
			44	Battery Low		
			3	0 V		

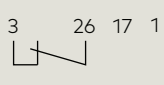
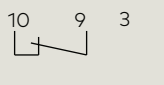



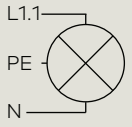
7.1.1 Motion Assist 360 control unit connectors.

#	Description	Control unit connector	Pin #	Function	Reference Chapters	"S" module
12	Fault Indication LED		85	Signal	Wiring: Chapter 9 Para. 9.6	X
			86	Common		
13	Mode switch		30	Locked	Wiring: Chapter 9 Para. 9.3	X
			31	Auto 1		
			32	Auto 2		
			33	Night bank		
			34	Summer		
			3	0 V		
			24	In Operation		
14	Night bank Inside		35	Night Bank Inside	Wiring: Chapter 9 Para. 9.5	X
			3	0 V		
15	Trip Release Switch		1	+24 V DC		
			3	0 V		
			3	0 V		
			54	Trip Release Switch		
16	Handicap Button Inside		55	Handicap Button Inside		
			3	0 V		
17	Movement Sensor Inside		1	+24 V DC	Wiring: Chapter 9 Para. 9.4	X
			3	0 V		
			3	0 V		
			42	Movement Sensor Inside		
18	Safety Inside - Mullion Bumper		3	0 V		
			7	Safety Inside - Mullion Bumper		
19	Emergency Stop Inside		1	+24 V DC	Wiring: Chapter 9 Para. 9.2	X
			14	Test		
			25	Safety Inside - Canopy Bumper		
			3	0 V		
20	COM 1					
21	COM 2			Handheld RJ45 cable connection	Wiring: Chapter 9 Para. 9.7	X

7.1.1 Motion Assist 360 control unit connectors.

#	Description	Control unit connector	Pin #	Function	Reference Chapters	"S" module
22	Electro-mechanical Lock	Plug Connection; Electro-mechanical Lock				
23	DCW		3			
			B			
			A			
			1			
24	DCW		3			
			B			
			A			
			1			
25	Vandalism Brake		3	0 V		
			60	Locked		
			43	Unlocked		
			61	Unlock Trigger		
			1	+24 V DC		
26	Night Shield		3	0 V	Jumper must be installed between connector terminals 3 and 40.	
			37	Lock		
			40	Opened		
27	Night bank Outside		3	0 V	Wiring: Chapter 9 Para. 9.5	X
			35	Night bank Outside		
			94	Open trigger		
28	Trip Release Switch		54	Trip Release Switch		
			3	0 V		
			1	+24 V DC		
29	Handicap Button Outside		3	0 V		
			55	Handicap Button Outside		
30	Movement Sensor Outside		41	Movement Sensor Outside	Wiring: Chapter 9 Para. 9.4	X
			3	0 V		
			3	0 V		
			1	+24 V DC		

7.1.1 Motion Assist 360 control unit connectors.

#	Description	Control unit connector	Pin #	Function	Reference Chapters	"S" module
31	Safety Outside-Canopy Sensor		3	0 V	Canopy Sensor	
			26			
			17			
			1	+24 V DC		
32	Safety Outside-Mullion Bumper		10	Mullion Bumper		
			9			
			3	0 V		
32	Emergency Stop Outside		5a	Emergency Stop Outside	Wiring: Chapter 9 Para. 9.2	X
33	Dry Contact Status		71			
			70			
34	Dry Contact Air Curtain		98			
			97			
35	Lighting		L1.1	120 Vac	Installation Manual	X
			PE	Protective Earth		
			N	Neutral		

8 Canopy Motion Assist 360 wiring

8.1 Canopy Motion Assist 360 power supply and control unit wiring

Table 8.1.1 control hardware not located on door

No.	Cable	Cable	Reference Para.
1	Emergency stop	2 conductor 18 AWG	8.2 8.3
2	Mode switch	6 conductor 18 AWG	8.3
3	Wave to Open plate dry contact (Option)	4 conductor 18 AWG	8.2, 8.3
4	Press to Start plate dry contact (Option)	4 conductor 18 AWG	8.2, 8.3
5	Service panel (Option)	RJ45 Comm	8.3
6	Fault LED	2 conductor	8.3
	Exterior Night bank dry contact (Option)	3 conductor 18 AWG	8.2
	Interior Night bank dry contact (Option)	3 conductor 18 AWG	8.3

NOTICE

For canopy installation with Motion Assist 360 power supply and control unit.

- If power supply and control unit located in Remote enclosure, go to Chapter ____, Remote enclosure.

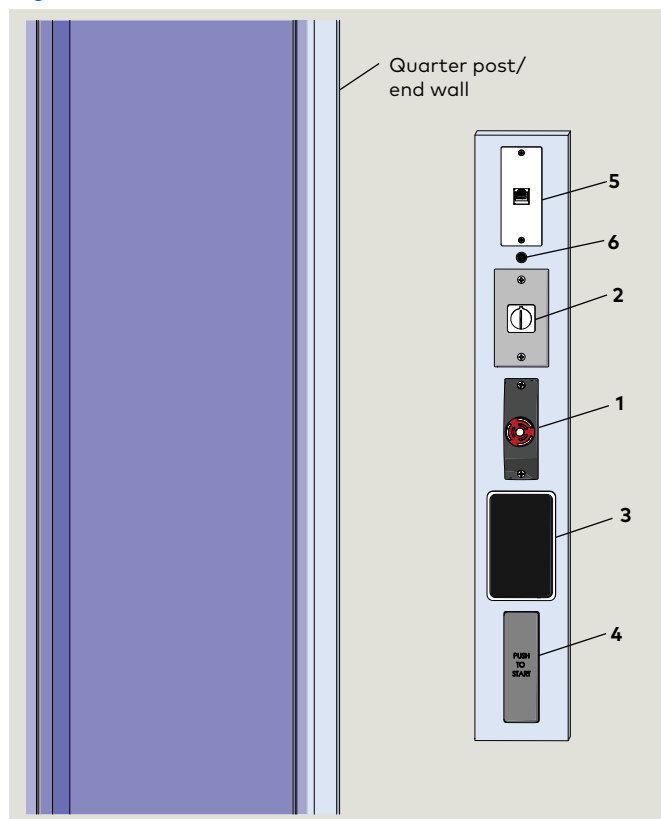
8.1.1 115 Vac contractor wiring requirement.

1. 115 Vac power; Para. 8.2
2. Protective earth; Para. 8.3

8.1.2 Control hardware installation and wiring

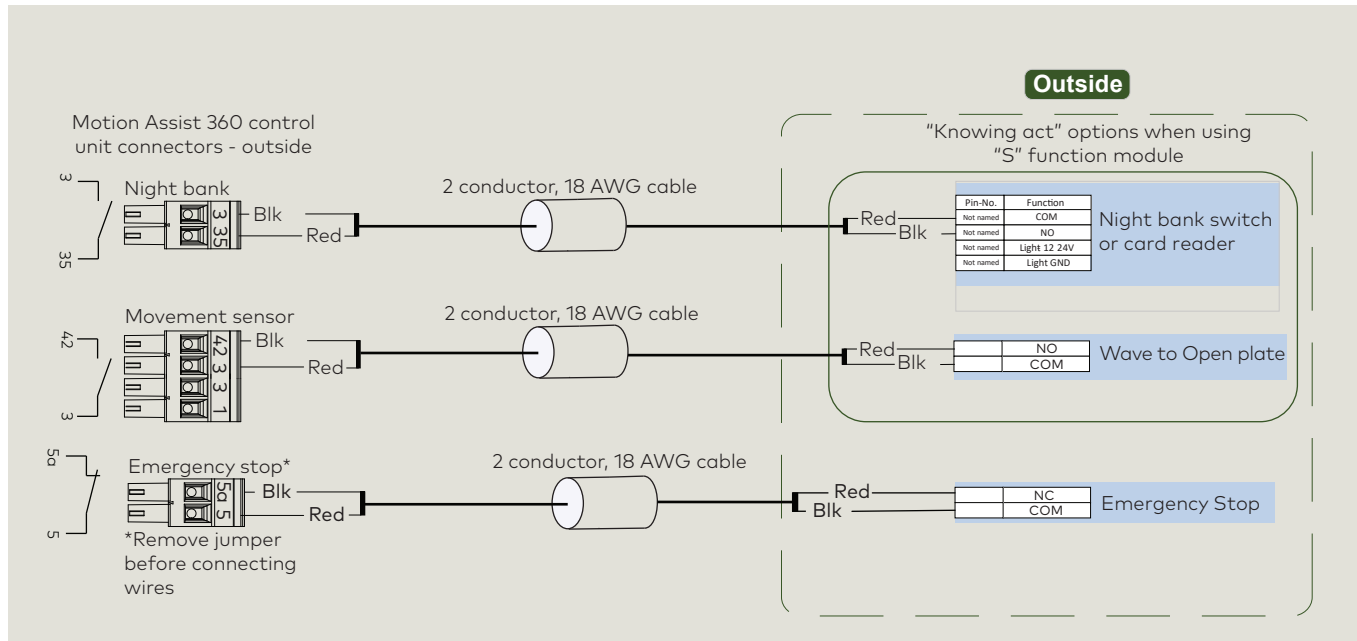
1. Reference Table 8.1.1

Fig. 8.1.1 Control hardware



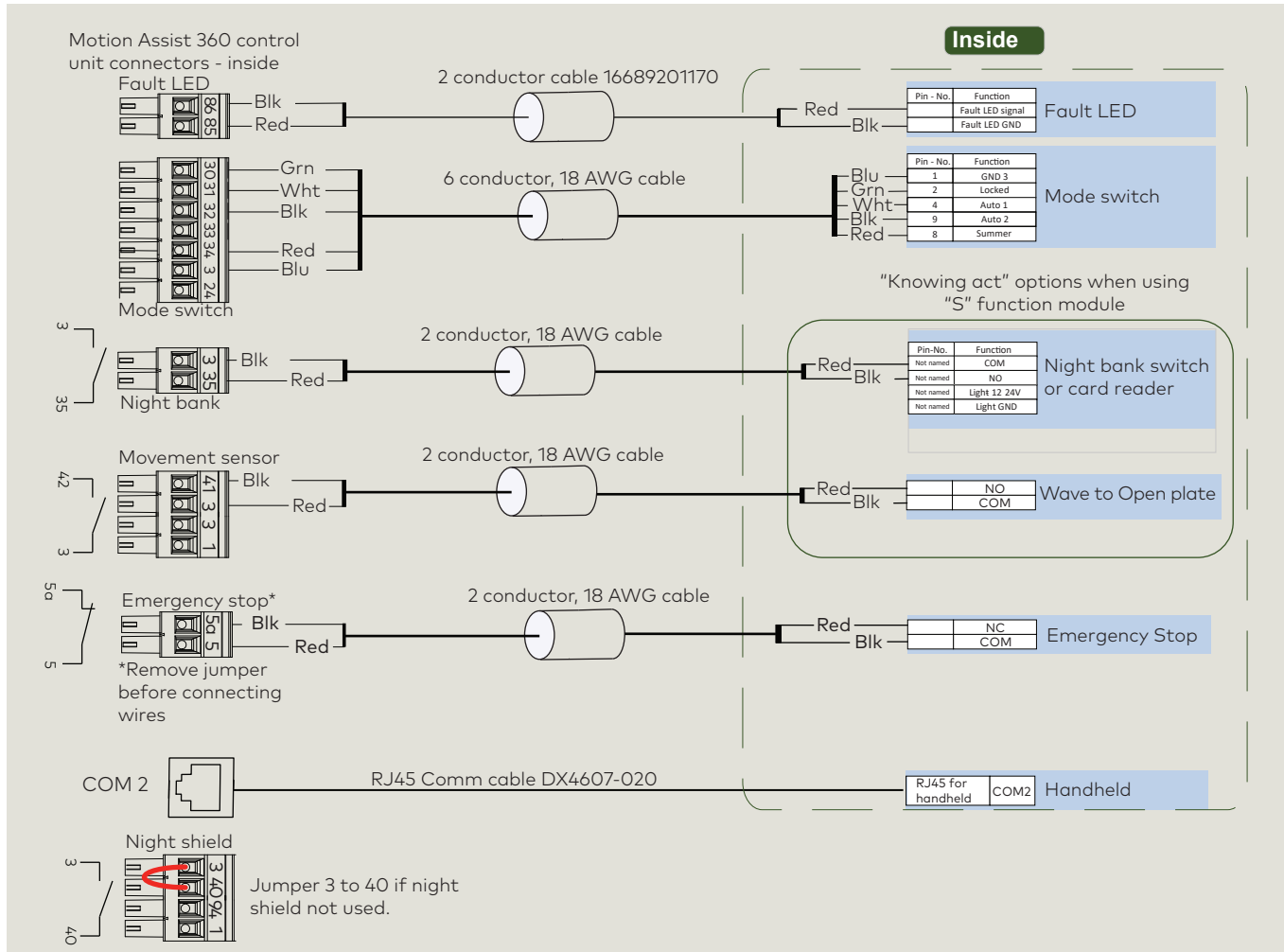
8.2 Exterior wiring interfaces to Motion Assist 360 control unit

Fig. 8.2.1 Exterior wiring interfaces



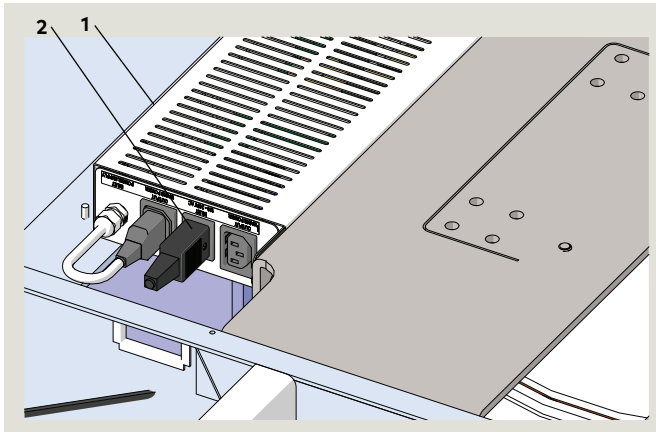
8.3 Interior wiring interfaces to Motion Assist 360 control unit

Fig. 8.3.1 Interior wiring interfaces



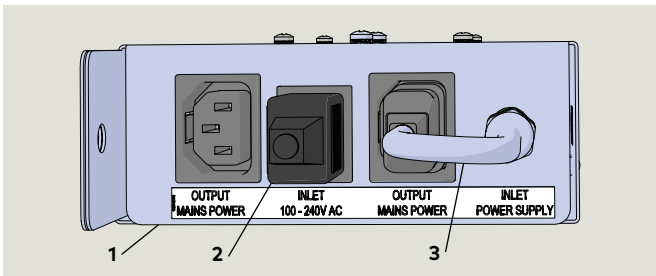
8.4 Customer 115 Vac wiring

Fig. 8.4.1 Motion Assist 360 power supply



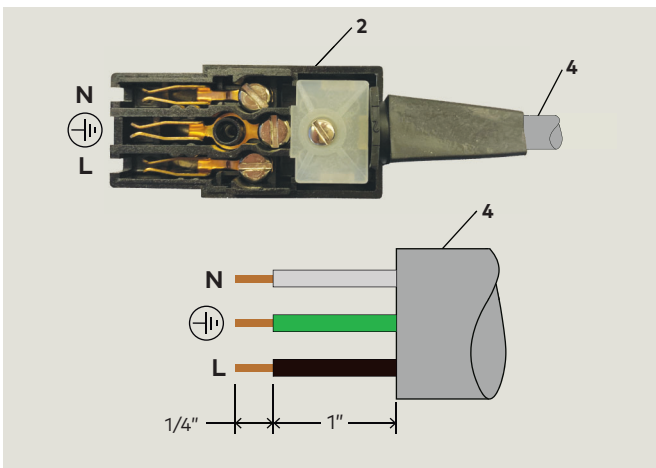
- 1 Motion Assist 360 Power supply RX6001
2 115 Vac plug

Fig. 8.4.2 Motion Assist 360 power supply



- 1 Power supply RX6001
2 Plug for customer 115 Vac wiring
3 115 Vac cable to control unit

Fig. 8.4.3 Inlet socket AC plug, customer 115 Vac



- 2 Plug for 115 Vac wiring, cover removed
4 Customer AC cable

Table 8.141 115 Vac and earth ground wiring

	Cable	Wires	Ref. Para.
1.	115 Vac power	(3) 14 AWG	8.2
2	Protective earth	(1) 10 AWG green/yellow	8.3

8.4.1 Customer 115 Vac wiring to Motion Assist 360 power supply.

NOTICE

For canopy installation with Motion Assist 360 power supply and control unit.



WARNING

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



WARNING

Branch circuit disconnect must be OFF before connecting 115 Vac wiring to inlet socket AC plug.

- Disconnect is to remain off until commissioning of Motion Assist 360 drive (Chapter 12).

1. Customer 115 Vac wiring must be routed into canopy to location for connection to the power supply "Inlet" plug.

NOTICE

UPS system.

If UPS is installed, reference Para. 8.5 for wiring.

CAUTION

Suitable hardware must be used to secure cord and wiring to canopy. Secure wiring in locations where it will not be damaged by installation of canopy covers or other hardware.

2. Connection of customer 115 Vac wiring to Inlet plug.
 - Reference Fig. 8.4.3.

8.5 Uninterruptible Power Supply (UPS)

Fig. 8.5.1 UPS 115 Vac to Motion Assist 360 power supply

- 1 Motion Assist 360 power supply RX6001
- 2 AC inlet plug, customer connection

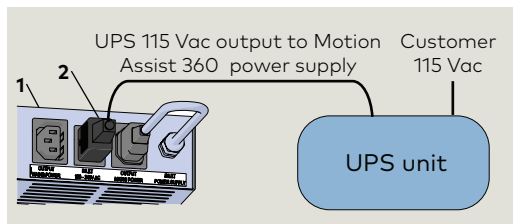
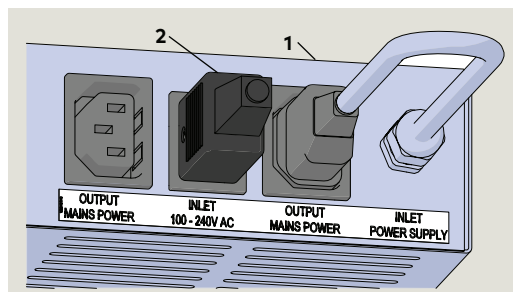


Fig. 8.5.2 Motion Assist 360 power supply

- 1 Motion Assist 360 power supply RX6001
- 2 AC inlet plug, customer connection



8.5.1 UPS AC output connection to Motion Assist 360 power supply.

UPS 115 Vac output is wired to 100 - 240 Vac inlet plug on Motion Assist 360 power supply.

8.5.2 UPS power supply units.

UPS Part #	Rating		Maximum time
	VA	Watts	
12 foot diameter door			
RX6011-001	1500	900	3 hours
RX6012-001	500	300	1 hour
7 foot diameter door			
RX6011-001	1500	900	4 hours
RX6012-001	500	300	1.5 hours

8.6 Motion Assist 360 customer protective earth terminal wiring

Fig. 8.6.1 Motion Assist 360 power supply and control unit with ground wires

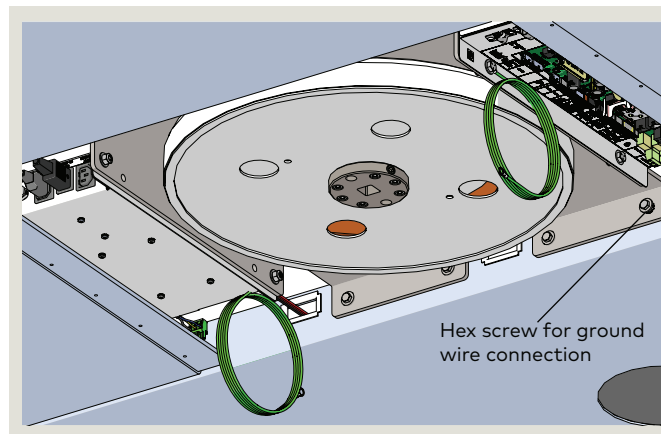
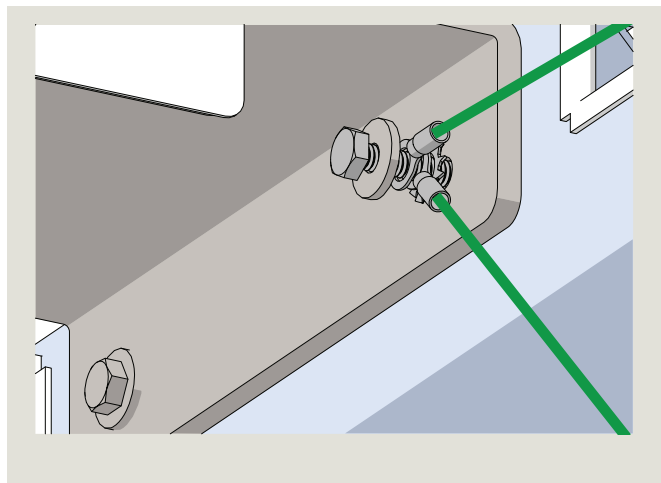


Fig. 8.6.2 Ground wire installation on hex screw



8.6.1 Motion Assist 360 protective earth wiring.

Potential earth wires are connected from the power supply and control unit to drive mounting plate hex head cap screw in the canopy.



TIPS AND RECOMMENDATIONS

Motion Assist 360 power supply and control unit may be located in Remote enclosure.



WARNING

Protective earth requirement!

Customer must install a protective earth wire from hex screw (Fig. 8.6.1) to panelboard earth ground!

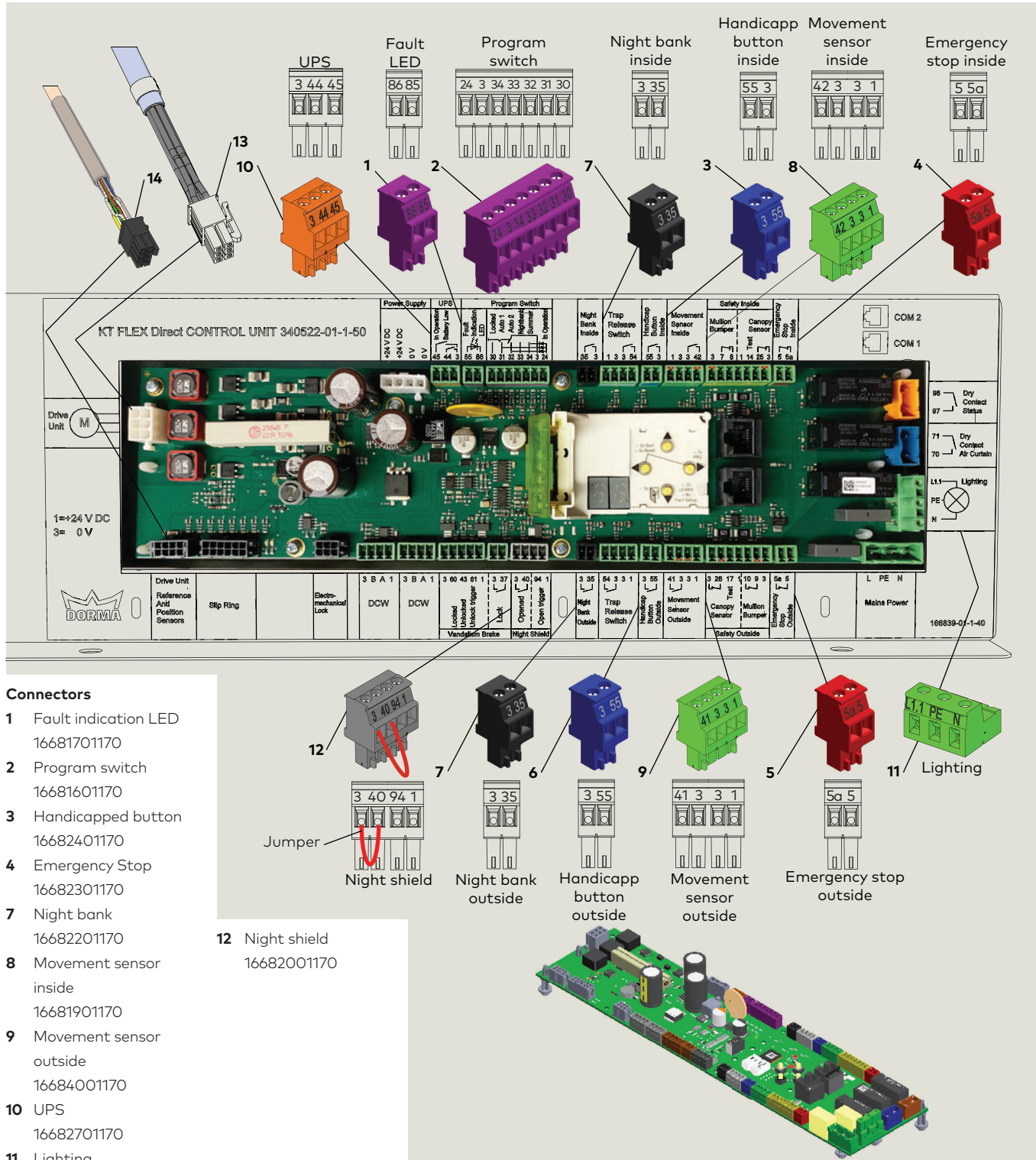
8.6.2 Connect customer protective earth wire to drive mounting plate hex screw.

1. Locate hex head cap screw on drive mounting plate (Ref. Fig. 8.6.2).
2. Remove hex screw with ground wires from Motion Assist 360 power supply and control unit.
3. Place wires and hardware on hex screw:
 - Hex head bolt
 - Large washer
 - Control unit potential earth wire ring lug
 - Power supply potential earth wire ring lug
 - Building potential earth wire ring lug (customer connection)
 - Star washer
4. Thread hex screw into drive motion support plate and tighten.

9 Motion Assist 360 control unit connectors - installation and wiring

9.1 Motion Assist 360 control unit connectors for component wiring

Fig. 9.1.1 Control unit with connectors for component wiring



9.2 Emergency stop pushbutton installation and wiring

9.2.1 Emergency stop pushbutton installation.

1. Locate and install two Emergency stop pushbuttons, one on interior side of door and one on the exterior side of the door.
- Coordinate pushbutton installation locations with customer's representative.
- Mechanical installation per manufacturer's instructions.



WARNING

ANSI/BHMA A156.27, Para. 20:
Switch button shall be installed within 48" [1220 mm] of the door and 24" [610 mm] to 48" [1220 mm] above the floor.

9.2.2 Emergency Stop pushbutton wiring.

1. Use 2 conductor, 18 AWG cable with color code:
 - Black
 - Red
1. Determine routing of cables from pushbuttons to canopy.
2. Route cable from each Emergency stop pushbutton to control unit in canopy.
3. Inside Emergency stop cable:
Terminate wires in Inside Emergency stop terminal block as shown in Fig.9.2.1.
4. Outside Emergency stop cable:
Terminate wires in Outside Emergency stop terminal block as shown if Fig. 9.2.1.
5. Secure cables and wiring in canopy.

Fig. 9.2.1 Emergency stop pushbutton wiring

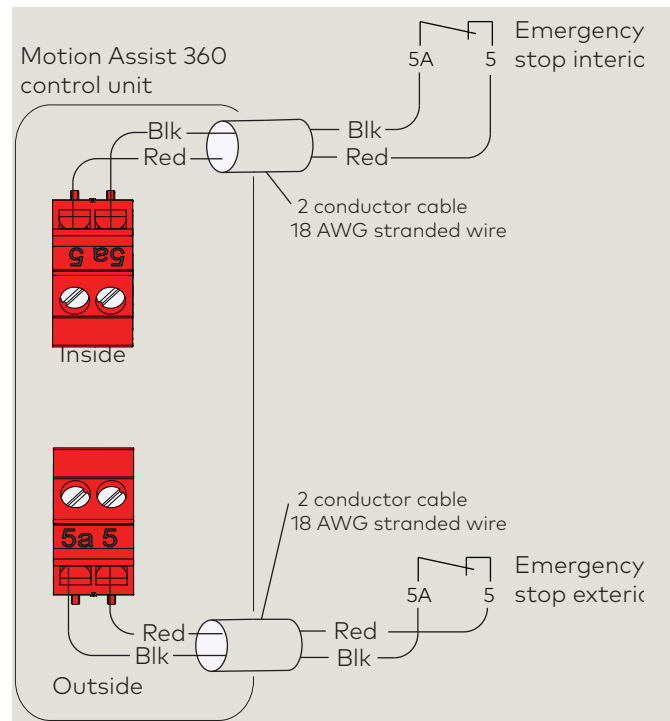
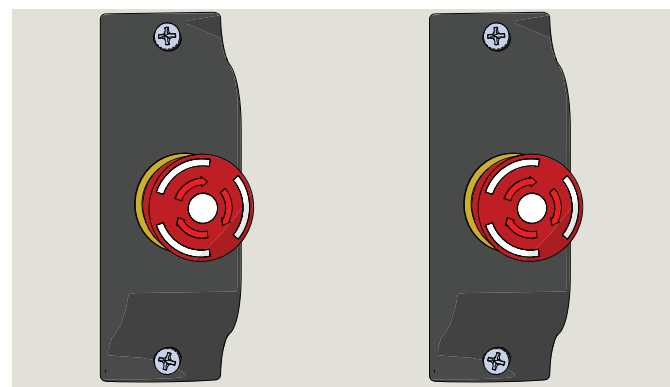


Fig. 9.2.2 Emergency Stop pushbuttons Interior Exterior



9.3 Mode switch installation and wiring

9.3.1 Install Mode switch.

1. Install Mode switch.
 - Coordinate Mode switch location with customer's representative.



TIPS AND RECOMMENDATIONS

Mode switch shown installed in steel outlet box as an example.

2. Mode switch cable (Para. 9.3.3) must be routed to canopy, then to Motion Assist 360 control unit.

9.3.2 Mode switch wiring.

1. Use 6 conductor cable (18 AWG stranded wire) with color code:
 - Black
 - White
 - Red
 - Green
 - Brown
 - Blue
2. Terminate wires in Mode switch as shown in Fig. 9.3.1.

Fig. 9.3.1 Mode switch wiring

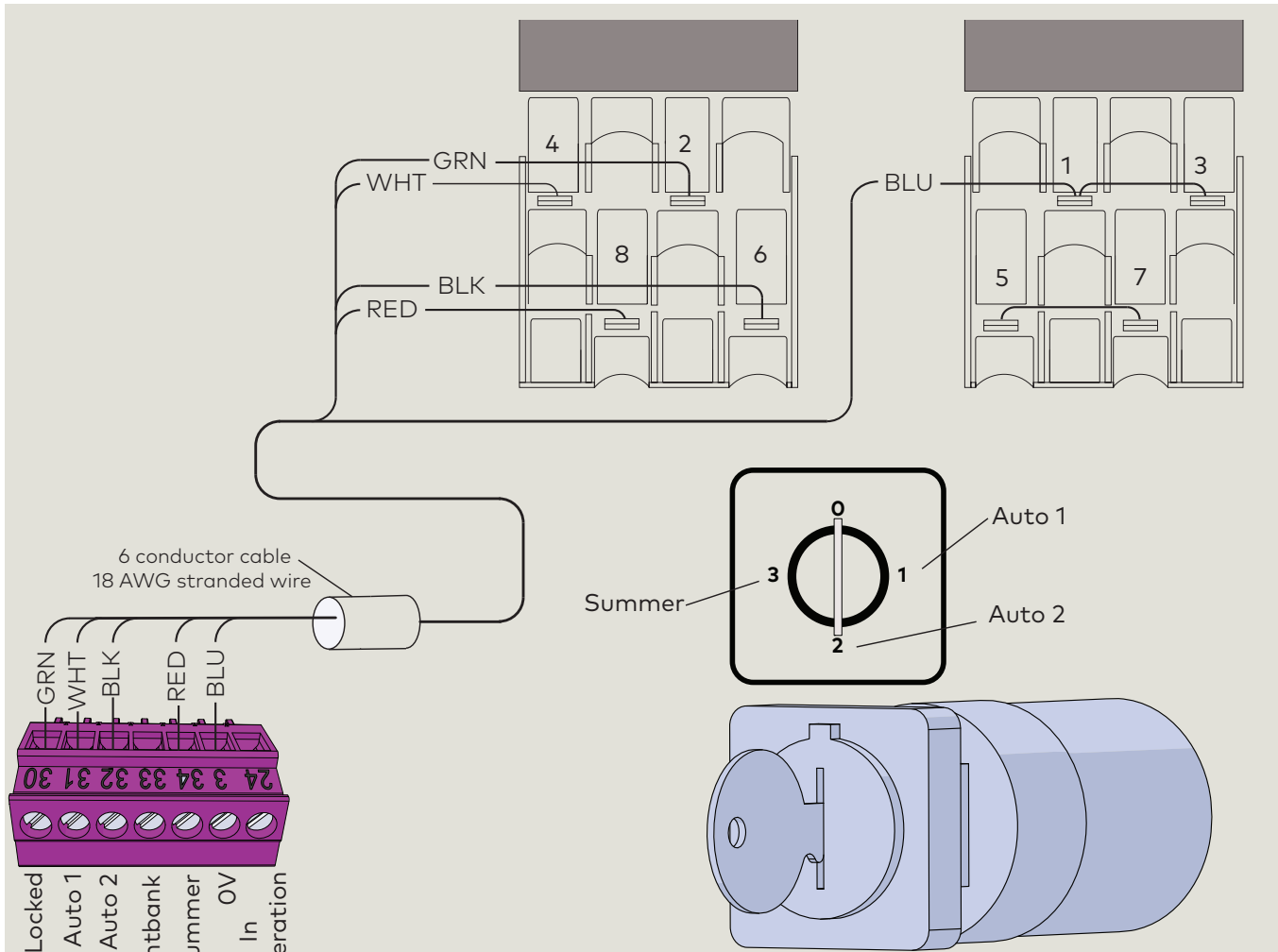
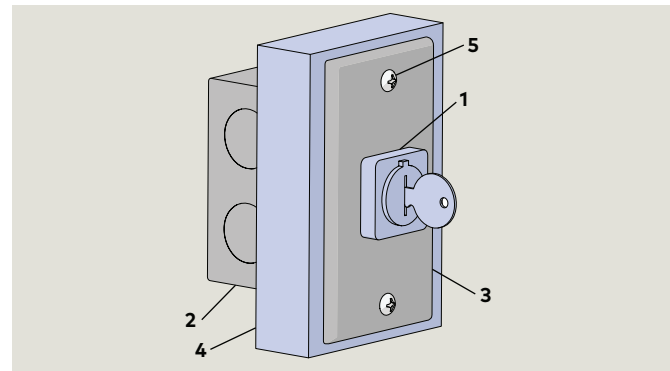


Fig. 9.3.2 Mode switch assembly



- | | |
|--------------------------|-------------------------------|
| 1 Mode switch RX6008 | 4 Spacer |
| 2 Steel outlet box | 5 Phillips pan head screw, SS |
| 3 Steel outlet box cover | |

3. Route cable from Mode switch location to Motion Assist 360 control unit in canopy.
4. Terminate wires in Mode switch terminal block at control unit.
5. Secure cable in canopy.

9.4 Wave to Open plate (option) installation and wiring

9.4.1 Wave to Open plate installation.

1. Locate and install plates, one on the interior side of door and one on the exterior side.
- Coordinate Wave to Open plate installation locations with customer's representative.
 - Mechanical installation per manufacturer's instructions.

9.4.2 Wave to Open plate wiring.

1. Use 4 conductor, 18 AWG cable with color code:
 - Black
 - Red
 - Green
 - White
1. Determine routing of cables from plates to canopy.
2. Route cable from each Wave to Open plate to Motion Assist 360 control unit in canopy.
3. Terminate cable wiring in Movement sensor terminal blocks as shown in fig. 9.4.1.
4. Secure cables in canopy.

Fig. 9.4.1 Wave to Open plate wiring

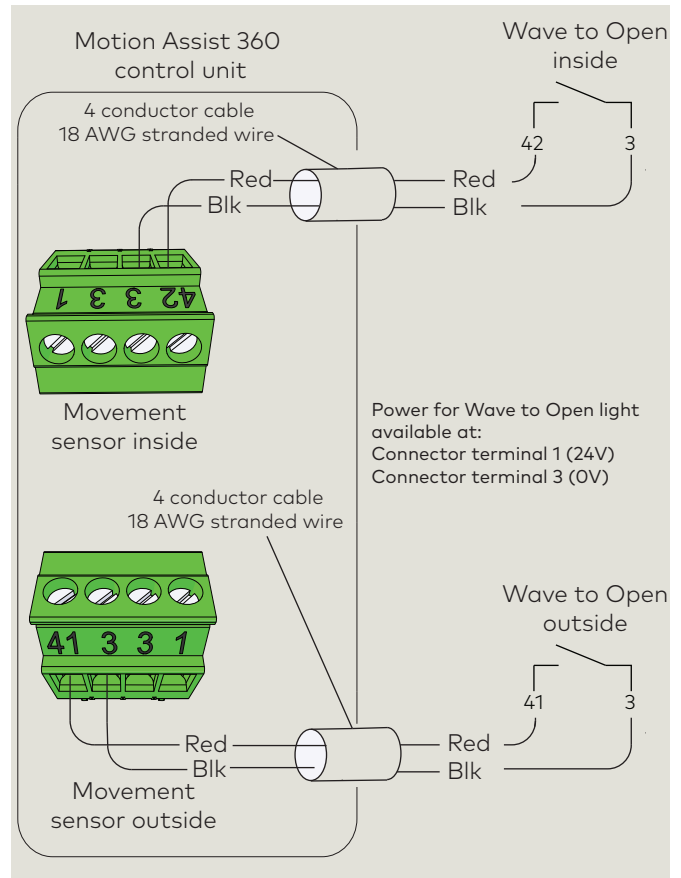


Fig. 9.4.2 Wave to Open plate
DX3331-001

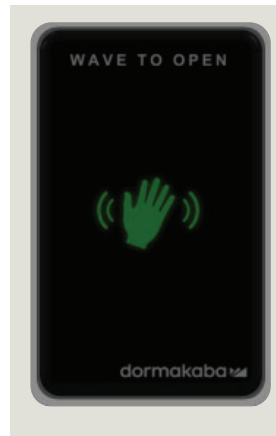
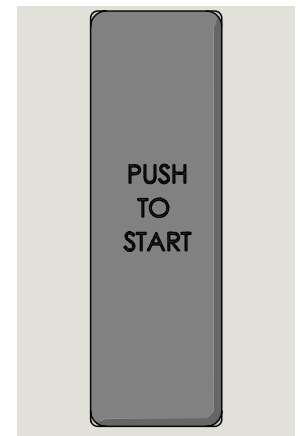


Fig. 9.4.3 Push to Start plate
DX3339-040



9.5 Night bank switch (option) installation and wiring

9.5.1 Night bank switch installation.

1. Locate and install Night bank switches per customer direction, one on the interior side of door and one on the exterior side.
- Mechanical installation per manufacturer's instructions.



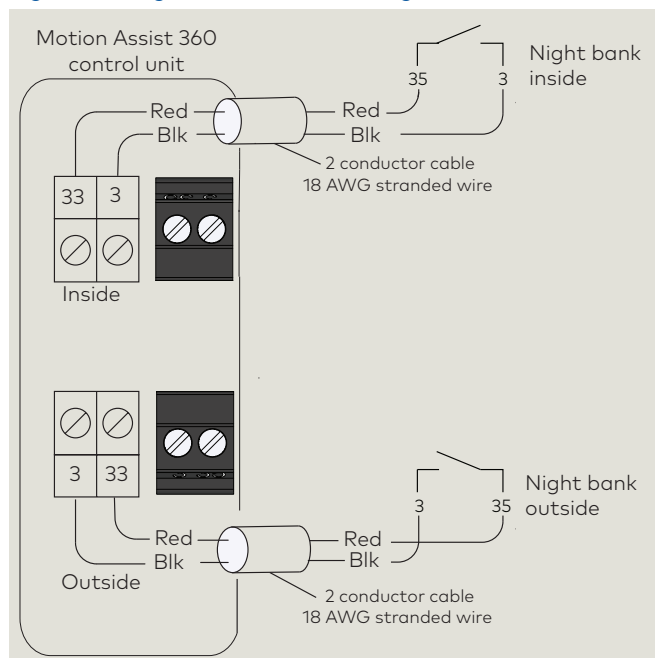
TIPS AND RECOMMENDATIONS

Night bank switch installation:
"S" function module must be installed.

9.5.2 Night bank switch wiring.

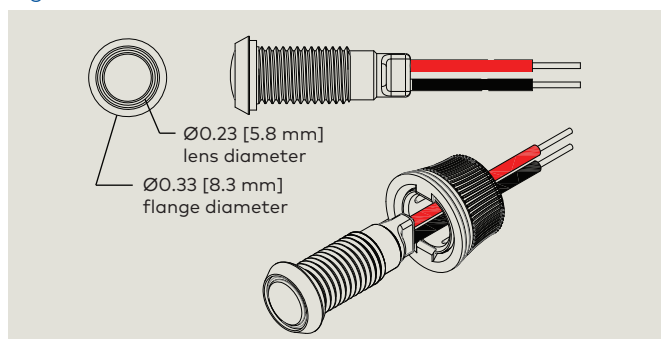
1. Use 2 conductor, 18 AWG cable with color code:
 - Black
 - Red
2. Route cable from each pushplate to Motion Assist 360 control unit in canopy.
3. Terminate cable wiring in Night bank terminal blocks as shown in fig. 9.5.1.
4. Secure cables in canopy

Fig. 9.5.1 Night bank switch wiring



9.6 Fault LED installation and wiring

Fig.9.6.1 Fault LED RX6013-001



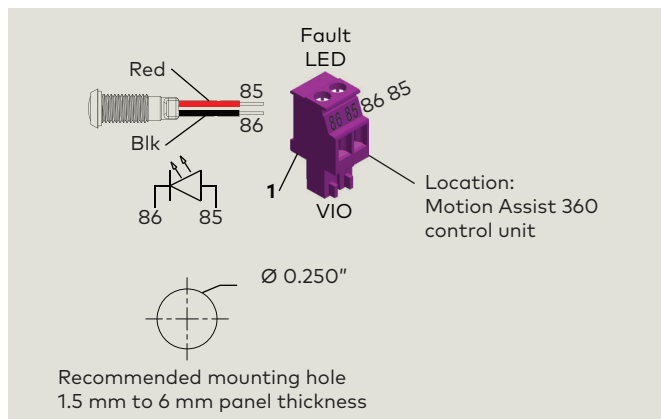
9.6.1 Fault LED installation.

1. Locate and install Fault LED below or above Mode switch.

9.6.2 Fault LED wiring.

1. Route 2 wires or two conductor cable from Fault LED to Motion Assist 360 control unit (Para. 9.1).
2. Wires terminate in Fault LED terminal block (Para. 9.1).

Fig.9.6.2 Fault LED RX6013-001 wiring



9.7 Service panel (option) installation and wiring

9.7.1 Service panel installation.

1. Locate and install Service panel.
 - Note cutout required for panel RJ45 port circuit board.
 - Fastener supplied is for installation to metal surface.

CAUTION

Note Service panel RJ45 connector cable length of 10 feet.

- Cable must be routed in canopy to Motion Assist 360 control unit COM 2 port.

9.7.2 Service panel RJ45 connector wiring.

1. Route RJ45 cable from Service panel to Motion Assist 360 control unit in canopy.
2. Plug RJ45 connector into COM 2 connector.

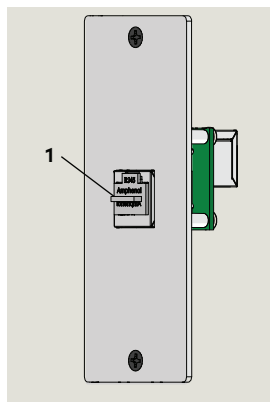


WARNING

Always use dormakaba handheld interface cable DX4607!

Never use conventional network cable with RJ 45 plug!
May cause permanent damage to handheld!

Fig. 9.7.1 Service panel DX4604-08C



1 RJ45 cover

Fig. 9.7.2 Motion Assist 360 control unit COM2

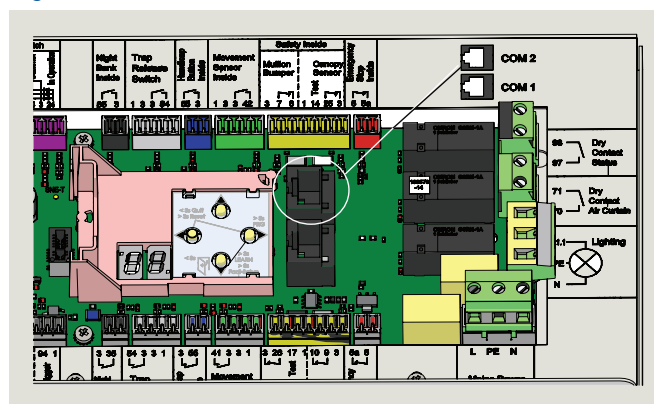
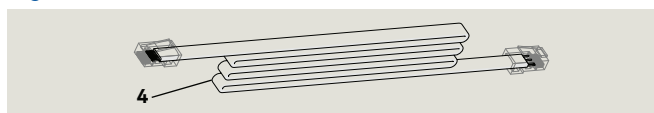


Fig. 9.7.3 RJ45 handheld communication cable

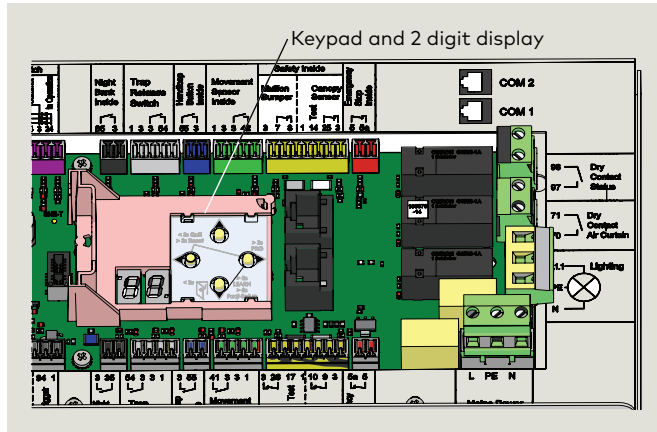


4 RJ45 communication cable, 10'
DX4607-020

10 Motion Assist 360 control unit keypad and display

10.1 Control unit keypad and display

Fig. 10.1.1 Control unit keypad and display



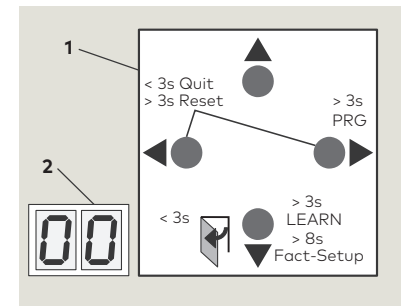
10.1.1 Control unit keypad and display.

The control unit contains the keypad and 2 digit display. Keypad and display are used for viewing and editing:

- Parameters
- Special functions
- Viewing and acting upon diagnostic information.
- Viewing and acknowledging errors.

Fig. 10.1.2 4 button keypad, 2 digit display

- 1 4 button keypad
- 2 2 digit display

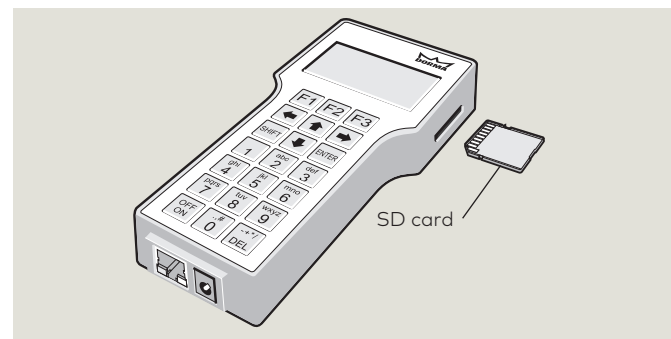


10.2 Control unit firmware version and updates

10.2.1 Firmware version and updates.

- Operator firmware version is displayed during first commissioning. Reference Chapter 12.
- dormakaba handheld can be used to check operator firmware version and to perform firmware updates.
- Reference dormakaba handheld manual and Appendix B, dormakaba handheld.

Fig. 10.2.1 dormakaba handheld terminal



10.3 Restore factory settings

10.3.1 Restore factory settings.

- Power supply reset.
- Emergency stop depressed.
- Restore factory settings by pressing the keypad ▼ key greater than 8 seconds.

10.3.2 Restore factory settings - dormakaba handheld

- Reference Appendix B, dormakaba handheld.

10.4 Acknowledging errors

10.4.1 Acknowledging errors.

- Acknowledge errors by momentarily pressing both ◀ and ▶ keys for greater than (>) 3 seconds.

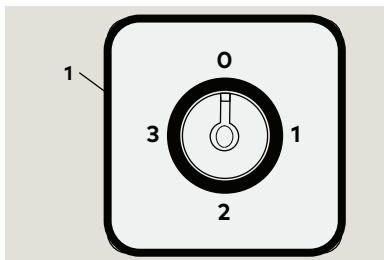
10.5 Accessing and changing parameters

10.5.1 Changing parameter values

1. Set Mode switch to "0", Off

Fig. 10.5.1 Program switch

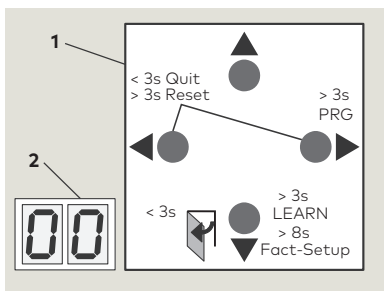
- 1 Program switch,
4 position, key removed



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

Fig. 10.5.2 4 button keypad,
2 digit display

- 1 4 button keypad
- 2 2 digit display



10.5.2 Basic parameters F, d and dE.

Basic parameters (Para. 11.1) are set during first commissioning (Chapter 12).

36.5.3 Driving parameters




Driving parameters (Para. 11.2) can be set once first commissioning has been completed..

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

11 Parameters, special functions, diagnostics

11.1 Basic parameters F, d, and dE

11.1.1 Basic parameters

Symbol	Description
 	Door type (# of wings).
 	Door diameter (mm).
 	Revolving direction European.















































TIPS AND RECOMMENDATIONS

Reference Chapter 14 for detail on parameters, special functions, and diagnostics.

11.2 Driving parameters









11.2.1 Driving parameters

Symbol	Description	"S" function modules
 	Number of base positions.	X
 	Vandalism brake.	X
 	Night bank operation.	X
 	Slow-stop time door wing sensor.	
 	Slow-stop time canopy sensor.	
 	Positioning speed after stop.	
 	Number of base positions in night bank operation.	X
 	Positioning speed.	
 	Disabled access speed.	
 	Walking speed.	
 	Acceleration ramp.	X

Symbol	Description	"S" function modules
 	Brake ramp normal.	X
 	Brake ramp hard.	
 	Minimum speed for speed limiter.	X
 	Counterforce for speed limiter.	X
 	Maximum holding force on outer wing edge in starting position.	X
 	Safety area stop.	
 	Polarity wing sensor test input	x
 	Polarity canopy sensor test input.	x
 	Fixing X-position with vandalism brake.	x
 	Release time.	
 	Function of status relay.	x

11.3 Special functions

11.3.1 Special functions

Special function	Description	"S" function modules
 	Delay time for warm air curtain.	X
 	Lighting	X
 	Rotation speed limiter	X
 	UPS unit	X
	Restore factory settings!	X
	Learning cycle!	X
	Error reset!	X



TIPS AND RECOMMENDATIONS









Functions with shaded cells in the "Description" column are only available via handheld.

- Reference Appendix B (handheld).

Special function	Description	"S" function modules
	Locking!	X
	Unlocking!	X
	Door wing sensor bridged.	
	Canopy sensor inside bridged.	
	Canopy sensor outside bridged.	
	Lock settings	X

11.4 Diagnostics

11.4.1 Diagnostics













Diagnostic	Description	"P", "S" function modules
	Software version.	X
	Firmware version revision.	X
	Actual error status.	X
	Actual revolutions.	X
  to  	Error log 1 to 9.	X
	Revolution error 1 to 9.	X
 	Delete error log.	X
 	Service Reset!	X



TIPS AND RECOMMENDATIONS

Functions with shaded cells in the "Description" column are only available via handheld.

- Reference Appendix B (handheld).

Diagnostic	Description	"P", "S" function modules
 	# Stop events.	
 	# Shock-Stop.	X
 	# Revolutions.	X
 	DCW - Reset.	X
	DCW - Address list.	X
 	Function port COM1.	X
 	Function port COM2.	X

12 First commissioning

12.1 Safety during commissioning

12.1.1 Electrical components.



WARNING

Electric shock hazard!
Drive, control unit and power supply are energized.
Touching the components poses an immediate risk of death from electric shock.

- Immediately replace components and cables with damaged insulation.
- Insure that all cable are routed flush on the structure and cannot come into contact with other components.

12.1.2 Automatic startup.



WARNING

Risk of injury due to automatic startup of revolving door!

The revolving door can set itself in motion automatically. If there are people in the door, they may be at risk of injury.

- Never turn the revolving door on or off when there are people in it.
- Release the Emergency Stop button only when there are no longer any people in the revolving door and the issue causing the emergency stop has been cleared.
- Wait until there are no longer any people in the revolving door before folding the wings back into the starting position.

12.1.3 Safety equipment not yet in operation.



WARNING

Safety equipment not yet in operation on commissioning!

During commissioning, the safety equipment required for normal operation is not yet operational. This may result in entanglement and crushing hazards at the closing edges, which may cause injuries.

- Start the learning cycle only after everyone has left the danger zone.
- Ensure that no one is present in the area of the closing edges.

12.2 Before commissioning

12.2.1 Check the revolving door.

- Customer 115 Vac power supply is connected but is turned off.
- The revolving door structure is intact (e.g. no cracks in the wing or door glass).
- Wings can be turned manually.
- Distance of the wing bottom edges to the finished floor surface is 5/16" [8 mm] maximum.

12.2.2 Operator component wiring.

The following devices must be wired to the control unit:

- Mode switch
- Emergency Stop switches

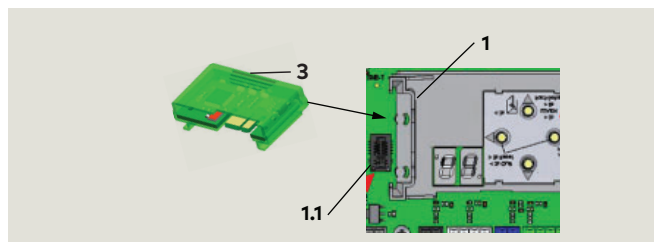
12.2.3 "S" function module installation.



WARNING

"S" Motion Assist module must be installed in control unit function module card slot prior to commissioning!

Fig. 12.2.1 "S" function module installation



- 1 Function module slot
- 1.1 Function module socket
- 3 "S" function module (GRN)



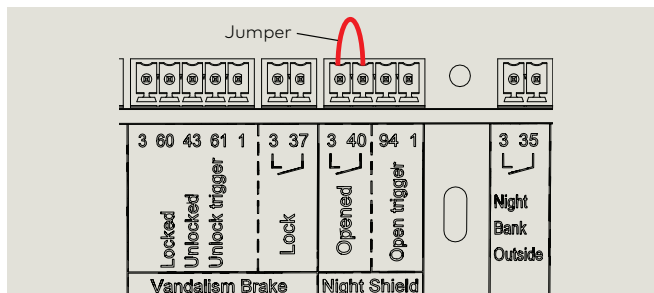
TIPS AND RECOMMENDATIONS

Reference Appendix C - Function modules.

12.2.4 Control unit Night shield terminal block jumper.

Jumper must be installed between terminals 3 and 40.

Fig. 38.2.2 Night shield jumper



12.3 Learning cycle safety and information

12.3.1 Danger due to inactive safety equipment.



WARNING

Life threatening danger due to inactive safety equipment!

During the learning cycle, safety equipment required for normal operation is not yet operational. Persons present in the revolving door during the learning cycle may sustain injuries.

- Insure that no one is present in the area of the wings.
- Start the learning cycle only after everyone has left the area.

12.3.2 Danger due to automatic startup of revolving door.



WARNING

Life-threatening danger due to automatic startup of revolving door!

12.3.3 Risk of material damage.

CAUTION

Remove all objects inside the revolving door.

Material damage due to objects left in the revolving door during the learning cycle!

12.3.4 Basic parameter settings.

CAUTION

Basic parameters (Para. 12.5. 12.6 and 12.7) must be entered before starting the learning cycle!

12.3.5 Mode switch.



TIPS AND RECOMMENDATIONS

The Mode switch has no function during the learning cycle.

38.3.6 dormakaba handheld.



TIPS AND RECOMMENDATIONS

The dormakaba handheld can be used to initiate the learning cycle and edit parameters.

12.4 Motion Assist 360 controller power up

12.4.1 Motion Assist 360 power on procedure.

Step	Action
1.	Turn program switch to "0" (Off).
2.	Press Emergency Stop pushbutton. <ul style="list-style-type: none"> At the door entrance or exit.
3.	Check wings for bookfold. <ul style="list-style-type: none"> Check that all wing deflection contacts are closed (no wings are folded).
4.	Rotate wings to Home position. <ul style="list-style-type: none"> Wing locks are in line with floor strikes.
5.	Turn on customer 115 Vac power to Motion Assist 360 power supply. <div style="background-color: #f4a460; padding: 5px; margin-top: 10px;"> WARNING After power on, "S" Function module green light must be slowly flashing off and on. </div>
.1	<ul style="list-style-type: none"> System check; series of letters and numbers rapidly displayed (5). Control unit self check; two segments jumping back and forth (6). Horizontal dashes move up and down (7).
.2	Display and keypad orientation. <ul style="list-style-type: none"> While 2 digit display segments move up and down (7), use ▲ or ▼ buttons to select display and keypad orientation.
	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> TIPS AND RECOMMENDATIONS <ul style="list-style-type: none"> ▲ Display and keypad operation inverted. ▼ Display and keypad operation unchanged. </div>
.3	Device ID and firmware display. <ul style="list-style-type: none"> After display and keypad orientation (Step 5.2) device ID and firmware version will scroll across display (Fig. 38.4.5). <div style="margin-left: 20px; margin-top: 10px;"> <ul style="list-style-type: none"> Device ID _____ Firmware version (format F x x x x) </div>
.4	Program mode is displayed (Fig. 12.4.6).
6.	Set basic parameters F, d and dE, go to Para. 12.5.

Fig. 12.4.1 Mode switch in 0 (Off) position

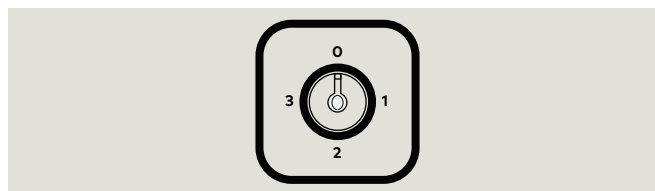


Fig. 12.4.2 Emergency Stop pushbutton

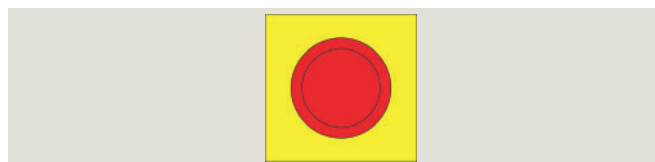


Fig. 12.4.3 Motion Assist 360 power supply

- 1 Power supply
- 2 Plug, customer 115 Vac power

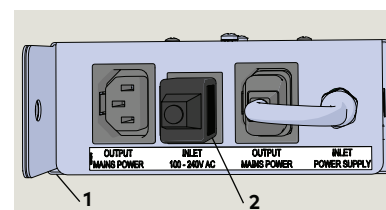


Fig. 12.4.4 Power up display

- 5 System check
- 6 Self check
- 7 Horizontal dashes move up and down

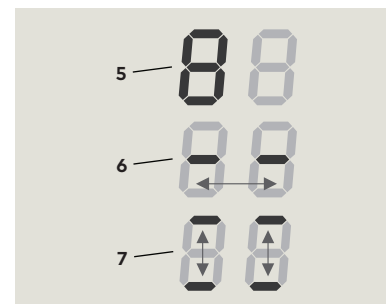


Fig. 12.4.5 Device ID, firmware version display example

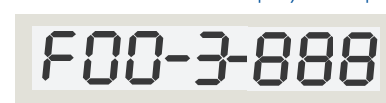
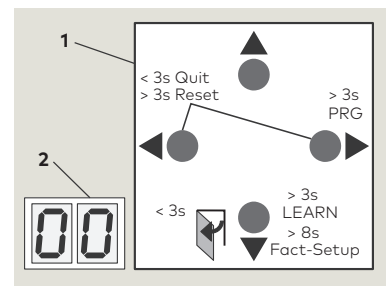


Fig. 12.4.6 Program mode



Fig. 12.4.7 Keypad / 2 digit display

- 1 Keypad
- 2 2 digit display



12.5 Set basic parameter F, door type

12.5.1 F: Door type (Number of door wings).

NOTICE

F factory setting =03, 3 wings.

- For system to recognize F = 03 steps in Para. 12.5.2 must be followed.
- To set F = 04, follow steps in Para. 12.5.3.

12.5.2 Select "03" for 3 wing door.

Step 1 Press ▶		Press and hold PRG > 3 s to enter program mode, F parameter displayed.
Step 2 Press ▶		Displays "03", factory setting.
Step 3 Press ▶		"03" starts flashing.
Step 4 Press ◆		Scroll to select "04".
Step 5 Press ◆		Scroll to select "03".
Step 6 Press ▶		Saves value. Display stops flashing.
Step 7 Press ◀		Returns to Door type parameter.

12.5.3 Select "04" for 4 wing door.

Step 1 Press ▶		Press and hold PRG > 3 s to enter program mode, F parameter displayed.
Step 2 Press ▶		Displays "03", factory setting.
Step 3 Press ▶		"03" starts flashing.
Step 4 Press ◆		Scroll to select "04" for 4 wing door.
Step 5 Press ▶		Saves value. Display stops flashing.
Step 6 Press ◀		Returns to Door type parameter.

12.6 Set basic parameter d, door diameter

12.6.1 Door diameter.

Door diameter (mm) is a 4 digit number.
2 digit display will show one digit value at a time.

- Parameter default is 3800 mm (12.5 feet).

Door diameter	
Feet	mm
7	2134
8	2438
9	2743
10	3048
11	3353
12	3658

Use inside door diameter.

Example: Change default to 2134 mm
(7 foot door diameter).

Step 1 Press ▼		Scroll to door diameter parameter d .
Step 2 Press ▶		"1" – 1st digit "3" – 1st digit value.
Step 3 Press ▶		"03" starts flashing.
Step 4 Press ◆		Scroll to select "02" for 1st digit.
Step 5 Press ▶		Saves value entered. Display stops flashing.

Step 6 Press ▼		Scrolls to 2nd digit: "2" – 2nd digit "8" – 2nd digit value
Step 7 Press ▶		"08" starts flashing.
Step 8 Press ◆		Scroll to select "01" for 2nd digit.
Step 9 Press ▶		Saves value entered. Display stops flashing.
Step 10 Press ▼		Scrolls to 3rd digit: "3" – 3rd digit "0" – 3rd digit value
Step 11 Press ▶		"00" starts flashing.
Step 12 Press ◆		Scroll to select "03" for 3rd digit
Step 13 Press ▶		Saves value entered. Display stops flashing.
Step 14 Press ▼		Scrolls to 4th digit: "4" – 4th digit "0" – 4th digit value
Step 15 Press ◆		Scroll to select "04" for 4th digit.
Step 16 Press ▶		Saves value entered. Display stops flashing.
Step 17 Press ◀		Return to door diameter parameter.

Go to Para. 12.5.3, Door rotation parameter.

12.7 Set basic parameter dE, door rotation

12.7.1 dE: Door rotation.

NOTICE

dE factory setting =01, clockwise.

- For system to recognize dE = 01 steps in Para. 12.7.2 must be followed.
- To set dE = 00, follow steps in Para. 12.7.3.

12.7.2 Door rotation: select 01, clockwise.

Step 1 Press ▼		Scroll to door rotation parameter dE..
Step 2 Press ▶		Displays "01" , factory setting.
Step 3 Press ▶		"01" starts flashing.
Step 4 Press ◆		Scroll to select "00"
Step 4 Press ◆		Scroll to select "01"
Step 5 Press ▶		Saves value entered. Display stops flashing.
Step 6 Press ◀		Returns to door rotation parameter.
Step 7 Press ◀		Exits program mode. • Display indicates ready for learning cycle.

12.7.3 Door rotation: select 00, counterclockwise.

Step 1 Press ▼		Scroll to door rotation parameter dE..
Step 2 Press ▶		Displays "01" , factory setting.
Step 3 Press ▶		"01" starts flashing.
Step 4 Press ◆		Scroll to select "00" for counterclockwise direction (in-ground drive)
Step 5 Press ▶		Saves value entered. Display stops flashing.
Step 6 Press ◀		Returns to door rotation parameter.
Step 7 Press ◀		Exits program mode. • Display indicates ready for learning cycle.



TIPS AND RECOMMENDATIONS

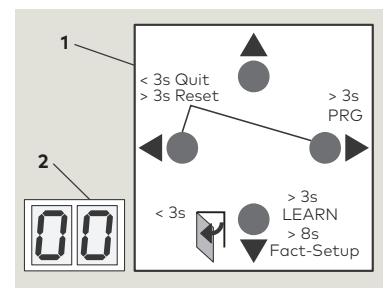
If display shows after basic parameters have been set:

- Press ▼ for 3 seconds.

- will be displayed.

- 1 4 button keypad
- 2 2 digit display

Fig. 12.7.1 4 button keypad, 2 digit display



12.8 Perform learning cycle







Step	Action
1.	 <div style="background-color: orange; padding: 2px; display: inline-block;"> WARNING</div> <p>Ensure that no one is present in or next to the revolving door!</p>
	<p>Unlock all Emergency Stop pushbuttons.</p> <ul style="list-style-type: none"> The control system saves the base position with 0° (locking position).
2.	<p>Revolving door starts learning cycle.</p> <ul style="list-style-type: none"> Current learning cycle phase is shown on 2 digit display. Reference Fig. 12.8.1. Learning cycle phases depend on options ordered with door. Learning cycle is terminated as soon as an error occurs during learning cycle.
3.	<p>Learning cycle completed.</p> <div style="text-align: center;">  </div> <p>The learning cycle is completed and door is ready for operation.</p> <p>Error during learning cycle - reset error (s).</p> <hr/> <p>Learning cycle terminated:</p> <ol style="list-style-type: none"> Press an Emergency Stop switch. Perform the fault correction according to the Error list (Para. 16.3). Start the learning cycle again from Step 1 and correct any additional errors, if any.

Fig. 12.8.1 Learning cycle phases

o1		Detection of 0° base or locking position.
o2		<p>Measurement calculation of path between sensors and locking position:</p> <ul style="list-style-type: none"> The door starts to spin in positioning speed until the two positive ramps of the reference sensors (installed in the drive system) will be activated.
o3		Determination of the wing inertia while the wings are rotating.

12.9 Verify driving parameters according to ANSI/BHMA A156.27

12.9.1 Verify Driving Parameters.

Driving parameter settings can be verified once the learning cycle has been completed.



TIPS AND RECOMMENDATIONS

Reference Chapter 14 for Driving Parameter detail.



WARNING

Material damage due to improper parameter settings!

- Contact dormakaba if additional information is required.

1. Verify driving parameter settings according to ANSI/BHMA A156.27, Power and Manual Operated Revolving Pedestrian Doors.

13 Perform learning cycle - door systems already commissioned

13.1 Learning cycle safety and information

13.1.1 Danger due to inactive safety equipment.



WARNING

Life threatening danger due to inactive safety equipment!

During the learning cycle, safety equipment required for normal operation is not yet operational. Persons present in the revolving door during the learning cycle may sustain injuries.

- Insure that no one is present in the area of the wings.
- Start the learning cycle only after everyone has left the area.

13.1.2 Danger due to automatic startup of revolving door.



WARNING

Life-threatening danger due to automatic startup of revolving door!

13.1.3 Risk of material damage.

CAUTION

Remove all objects inside the revolving door.

Material damage due to objects left in the revolving door during the learning cycle!

13.1.4 Basic parameter settings.

CAUTION

Basic parameters (Para. 14.2) must be entered before starting the learning cycle!

13.1.5 Mode switch.



TIPS AND RECOMMENDATIONS

The Mode switch has no function during the learning cycle.

13.1.6 dormakaba handheld.





TIPS AND RECOMMENDATIONS

The dormakaba handheld can be used to initiate the learning cycle and edit parameters.

13.2 Perform learning cycle

13.2.1 Perform learning cycle.

Step	Action
1.	Press Emergency Stop pushbutton.
2.	Set Program switch to "0" (Off).
3.	Verify Basic Parameter settings.
4.	Rotate wings to Home position. <ul style="list-style-type: none"> Wing locks are in line with floor strikes.
5.	Enter learning cycle. <ol style="list-style-type: none"> Press  key greater than (>) 3 seconds, then release key. Display indicates the controller is ready to start the learning cycle (Fig. 13.2.2).
6.	Unlock all Emergency Stop pushbuttons. <ul style="list-style-type: none"> The control system saves the base position with 0° (locking position).
7.	Revolving door starts learning cycle. <ul style="list-style-type: none"> Current learning cycle phase is shown on 2 digit display. Reference Fig. 13.2.3. Learning cycle phases depend on options ordered with door. Learning cycle is terminated as soon as an error occurs during learning cycle. <p>Error during learning cycle - reset error (s).</p> <p>Learning cycle terminated:</p> <ol style="list-style-type: none"> Press an Emergency Stop switch. Perform the fault correction according to the Error list (Para. 16.3). Start the learning cycle again from Step 5 and correct any additional errors, if any.
8.	Learning cycle completed. <p> The learning cycle is completed and door is ready for operation.</p>



TIPS AND RECOMMENDATIONS

For additional detail, refer to Chapter 11, First Commissioning.



WARNING

Ensure that no one is present in or next to the revolving door!

Fig. 13.2.1 Emergency Stop

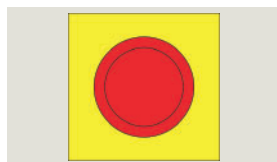


Fig. 13.2.2 o C



Fig. 13.2.5 Program switch, Off

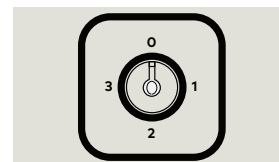


Fig. 13.2.6 4 button keypad

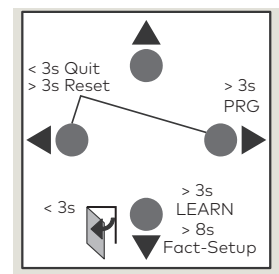


Fig. 13.2.3 Learning cycle phases







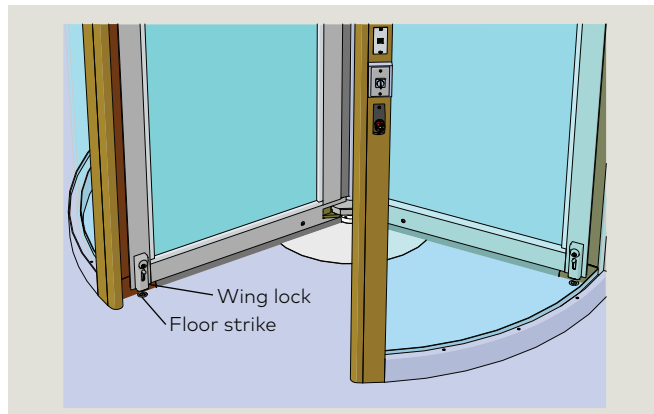
		Detection of 0° base or locking position.
		Measurement calculation of path between sensors and locking position: <ul style="list-style-type: none"> The door starts to spin in positioning speed until the two positive ramps of the reference sensors (installed in the drive system) will be activated.
		Determination of the wing inertia while the wings are rotating.

Fig. 13.2.4 3 wing door home position



14 Parameter detail

14.1 Motion Assist 360 modes of operation with "S" function card

S Motion Assist

14.2 Basic parameters F, d and dE

40.2.1 Basic Parameters

Parameter	Symbol	Description	Unit	Range	Default	S
Door type (# of wings)	F	Number of door wings. Basic parameter		3 ... 4	3	X
Door diameter	d	Door diameter. Basic parameter	mm	1600 ... 3800 5.3 ... 12.5 feet	3800	X
Revolving direction European	dE	Revolving direction counterclockwise. Basic parameter		0 = Off 1 = On	1	X

14.3 Driving parameters

CAUTION

Driving parameter default values.

Listed driving parameter default values may change after Learning Cycle completed.

14.3.1 Driving parameters

Number of base positions to travel to	P	Number of base positions to travel to in Automatic 1 or 2.		3 ... 18	5	X
Vandalism brake	SS	Vandalism brake.		0 = without V. brake 1 = with V. brake	0	X
Night bank operation	b	Switch night bank operation on or off in PGS mode OFF.		0 = Off 1 = On	0	X
Slow-stop time door wing sensor	T	Drive time in positioning speed after door wing sensor activation.	0.1 s	0 ... 15.9 16.0 = ∞	16	
Slow-stop time canopy sensor	t	Drive time in positioning speed after canopy sensor activation.	0.1 s	0 ... 15.9 16.0 = ∞	16	
Positioning speed after stop	c	Drive time in positioning speed after stop.	0.1 s	0.0 ... 2.9	2	
Number of base positions in night bank operation	h	Number of base positions in night bank operation.		3 ... 18	4	X
Positioning speed	SP	Positioning speed.	10 mm /s	15 ... 30 (0.6 ... 1.2"/s)	25	
Disabled access speed	SH	Disabled access speed.	10 mm /s	25 ... 40 (1.0 ... 1.6"/s)	30	

Parameter	Symbol	Description	Unit	Range	Default	S
Walking speed	SO	Walking speed.	10 mm /s	35 ... 75 at d > 3m (9.8') (1.4 ... 3"/s) 35 ... 99 d ≤ 3m (9.8') (1.4 ... 3.4"/s)	60	
Acceleration ramp	rb	Acceleration ramp.	...	1 = slow acceleration 9 = fast acceleration	5	X
Brake ramp normal	rn	Brake ramp normal.		1 = slow acceleration 9 = fast acceleration	5	X
Brake ramp hard	rh	Brake ramp hard.		1 = slow brake 9 = fast brake	5	
Minimum speed for speed limiter	Sd	Minimum speed for speed limiter	10 mm /s	35 ... 99 (1.4 ... 3.4"/s)	75	X
Counterforce for speed limiter	rd	Counterforce for speed limiter.		0 ... 9	5	X
Holding force in basic position	HG	Maximum holding force on the outer door wing edge.	N	1 ... 9	A: 9 S/P: 3	X
Safety area stop	S	Safety area canopy sensor slow stop	mm	800 mm (31") ... upper limit of safety area	800	
Polarity wing sensor test input	-d	Polarity of test of rotating slow stop sensors.		0: test signal 24V 1: test signal 0V	1	X
Polarity canopy sensor test input	-F	Polarity of test of fixed slow-stop sensors.		0: test signal 24V 1: test signal 0V	1	X
Fixing X-position with vandalism brake	U	Fixing X-position with vandalism brake.		0: no 1: yes	0	X
Release time	A	Time before starting up the door after an activation of a safety stop.	0.1 s	0 ... 9.9	1	
Function of status relay	Sr	<ul style="list-style-type: none"> 0 - No function 1 = Door turns at walking speed. 2 = Door turns at positioning speed. 3 = Door turns at disabled access speed. 4 = Door locked. 5 = Error 6 = Power 7 = UPS battery defective. 		0 ... 7	0	X

15 Special functions, diagnostic detail

15.1 Motion Assist 360 modes of operation with "S" function card

S Motion Assist



TIPS AND RECOMMENDATIONS

Special functions shaded gray in description column are available only in handheld.

- Reference Appendix B (handheld).

15.2 Special functions

15.2.1 Special functions

Special Function	Symbol	Description	Unit	Range	Default	S
Delay WAC		Delay time for warm air curtain.	s	0 ... 600	10	X
Lighting		Delay time lighting / manual. 0 = light always on 1 - 60 = automatic delay time		0 .. 60	15	X
Rotation speed limiter		Speed limiter 0 = deactivated 1 = activated		0 ... 1	M:1 S:0 P:0	X
UPS unit		UPS unit connected? 0 = not connected 1 = connected		0 ... 1	0	X
Restore factory settings!		Order: Restore factory settings!				X
Learning cycle!		Order: Start learning cycle!				X
Error reset!		Order: Reset error!				X
Locking!		Order: Locking!				X
Unlocking!		Order: Unlocking!				X
Door wing sensor bridged		Bridge door wing sensor. Only for service work!		No Yes	No	
Canopy sensor inside bridged		Bridge canopy sensor inside. Only for service work!		No Yes	No	
Lock settings		Switch key lock on/off.		Off On	Off	X

15.3 Diagnostics



TIPS AND RECOMMENDATIONS

Diagnostics shaded gray in description column are available only in handheld.

- Reference Appendix B (handheld).

15.3.1 Diagnostics

Diagnostic	Symbol	Description	Range	Default	S
Software version		Display of actual software version.	yyxx e.g. .0100 = Version 1.0	-	X
Revision of firmware version		Display of revision number of firmware version.	zzz	-	X
Actual error status		Display of actual error status.		C	X
Actual revolutions		Actual number of revolutions until error.		C	X
Error log 1 to 9	E1 E9	Old error log 1 to 9.		C	X
Revolution error 1 to 9		Revolution with old errors 1 to 9.			X
Delete error log	EC	Delete the value stored in the Fault. Set to 1 clears the memory, then EC is reset to 0.	0, 1		X
Service reset!	CS	Set CS to 1; resets the service cycle counter to 0. CS is then automatically reset to 0. Resets fault memory and service parameters.	0, 1		X
# Stop events	Ch	Number of stop events by safety equipment which cause a "Stop".			
# Shock stop	Cb	Number of brake events by the shock stop unit.			X
# Revolutions	CC	Number of driven revolutions. (in 1000 with the internal display.)		C	X
DCW reset	dr	DCW Reset => DCW list will be deleted and afterwards transferred to all connected clients. => Set to 1 to start DCW reset.	0 ...1		X
DCW list		Address list of connected DCW clients.			X
COM1	C1	Function port COM1	0 = Disable 1 = TMS 2 = Debug		X
COM2	C2	Function port COM2	0 = Disable 1 = Handheld 2 = Analyze		X

16 Error list

16.1 Error indication

16.1.1 Error number and LED blinking codes.

- Reference Error List, Para. 4.2.3.
- First digit of error number indicates how frequently the error LED slowly flashes (approximately 1 Hz).
- Second digit of error number indicates how frequently the error LED rapidly flashes (approximately 2 Hz).
- Error LED flash example:
1 x slow and 4 x fast = error no. 14 (braking distance at safety stop too long).

16.1.2 Display of error number.

- Errors are shown on the control unit display with an error number.
- The error list (Para. 16.3) contains information regarding each error number.



WARNING

Risk of injury due to improper error correction!

Injuries and property damage may result if malfunctions are not properly corrected.

- Have a dormakaba technician correct all errors!



WARNING

Risk of injury when eliminating fault with unknown error message!

Unauthorized fault elimination of an error message not described may result in serious injuries.

- If error message is not in Error list (Para. 16.3) always contact dormakaba for error correction.
- Never attempt to eliminate an unknown error without assistance from dormakaba service!

16.2 Reset column of error list (Para. 16.3)

16.2.1 Reset column of error list.

Indicates whether an error message:

- Is reset automatically (A).
- Must be reset with the program switch (M).

16.2.2 Error acknowledgment using the program switch.

1. Check error number on controller display and correct it according to the error list.
2. Ensure no one is in revolving door.
3. Set the program switch to "0" — Off.
4. After a minimum 3 second waiting time, restart the revolving door using the program switch.
5. If necessary, perform steps outlined in Behavior after reset column (learning cycle or commissioning of sensors).



WARNING

Life-threatening danger due to inactive safety equipment!

During the learning cycle, the safety equipment required for normal operation is not yet operational. Persons present in the revolving door during the learning cycle may sustain injuries.

- Insure that no one is present in the area of the door wings.
- Start the learning cycle only after everyone has left the area.

16.3 Error list

Reset column code.

- M Manual; after fault corrected, turn program switch to "0", then back to setting.
- A Automatic; error reset when fault corrected.

16.3.1 Error list

Category	Error No.	Error name, root cause, situation	Behavior	Behavior after reset	Reset
No error	0				
Learning cycle, speed obstacle	11	Output stage voltage is below minimum value of 20 V. (Except when emergency stop is pressed or power fail.)	Door clear.	Door ready.	M
	13	Braking distance too long when speed changes.	Door ready; limit to positioning speed.	Limitation due to positioning speed is canceled again.	M
	14	Braking distance too long with safety stop.	Door ready; limit to positioning speed.	Positioning speed limitation is canceled again.	M
	15	Obstacle fault: door was blocked more than three times within 10°.	Door clear.	Door ready.	M
	16	Motor cable incorrectly connected or defective output stage.	Door clear.	Door ready.	M
	17	Output stage IC signals overcurrent or overheating.	Door clear.	Door ready.	M
	18	Output stage IC signal error.	Door clear.	Door ready.	M
	19	Maximum output stage voltage of 50V exceeded.	Door clear.	Door ready.	M
	20	Maximum motor current exceeded for an extended period of time.	Door clear.	Door ready.	
Locking fault	21	Door is in locking position. Three unsuccessful attempts to unlock door.	Door can only be opened manually, possibly after manual unlocking.	Door ready.	M
	22	Door is in locking position. Three unsuccessful attempts to lock door.	<ul style="list-style-type: none"> • Door indicates an error but is ready. • Lighting is not switched off in the locking position. 	Door ready.	M
	23	Both limit switches of a locking device are closed.	Door can only be opened manually, possibly after manual unlocking.	Door ready.	M
	24	Locking module defective.	Door clear.	Door ready.	M
Program switch error	31	Program switch defective or missing.	Safety stop - door clear	Door ready.	A
	32	At learned locking device PGS_Auto 1, PGS_Auto 2, or PGS_Summer of the second level are missing.	Door stopped and is then disengaged.	Door ready.	M
	33	Function module missing.	Door stops and is then disengaged.	Door performs positioning travel and is then ready.	M

16.3.1 Error list

Category	Error No.	Error name, root cause, situation	Behavior	Behavior after reset	Reset
Sensor error	41	Test of canopy sensor slow-stop inside failed.	Limit to positioning speed.	Door ready.	M
	42	Test of canopy sensor slow-stop outside failed.	Limit to positioning speed.	Door ready.	M
	43	Test of wing sensor 1 failed.	Limit to positioning speed.	Door ready.	M
	44	Test of wing sensor 2 failed.	Limit to positioning speed.	Door ready.	M
	45	Test of wing sensor 3 failed.	Limit to positioning speed.	Door ready.	M
	46	Test of wing sensor 4 failed.	Limit to positioning speed.	Door ready.	M
	47	Test of SKL vertical blade; 2 x SKL bottom wing, wing deflection switch failed.	Door clear.	Door ready.	M
	48	Test of SKL post vertical inside failed.	Safety stop - door clear.	Door ready.	M
	49	Test of SKL post vertical outside failed.	Safety stop - door clear.	Door ready.	M
Displacement sensor error.	51	Failure of at least one Hall effect sensor.	Safety stop - door clear.	Door performs a positioning travel and is then ready for operation.	M
	52	At the start of a learning cycle or positioning travel: No sensor deflection within the first 120 seconds.	Door clear..	Door performs positioning travel and is then ready for operation.	M
		In operation: No sensor deflection at learned position, or			
		Sensor deflection at incorrect position.			
CPU error / error 2nd disconnection facility.	7	CPU defective.	<ul style="list-style-type: none"> Safety stop - door clear. CPU is then disabled, the error display does therefore not flash and consists only of the number "7". 	Reset only by switching the power supply off and on again. The door is then ready.	
	7	EEPROM defective (cannot be written to).	Safety stop - door clear.	Reset only by switching power supply off and on again. The door is then ready.	
	71	EEPROM error (checksum is not correct).	Safety stop - door clear.	The door is ready only after a successful learning cycle.	M
	72	Test of 2nd disconnection facility has failed.	Door clear..	Test of 2nd disconnection facility is repeated. The door is ready if OK.	M

16.3.1 Error list

Category	Error No.	Error name, root cause, situation	Behavior	Behavior after reset	Reset
Power supply failure.	81	Power supply failure with UPS connected.		Reset with no error message from UPS. Door ready.	A
UPS battery fault	82	UPS signals a battery fault, e.g., low battery.		Reset with no battery fault error message from UPS. Door ready.	A
DCW error	91	Locking module inside absent.	Safety stop - door clear.	Door ready.	A
	92	Locking module outside absent.	Safety stop - door clear.	Door ready.	A

17 Information

17.1.1 Information number.

No.	Information description	Reset
5	Night shield limit switch not actuated.	Night shield completely open.
8	Emergency Stop depressed.	No Emergency Stop depressed.

18 Revolving door functional test

18.1 Revolving door functional test

18.1.1 Functional test overview.

Revolving door functions must be tested after the learning cycle has been completed and parameters set.



WARNING

Safety equipment may not function due to incorrect wiring connections.

- Ensure no one is present in the danger zone before starting the functional tests.
- Leave the danger area immediately if safety equipment does not work or respond as intended.

Depending on revolving door version and customer order, the following functions must be tested in the course of commissioning:

- 18.1.2 Emergency stop pushbutton test
- Automatic 2 mode
- 18.1.3 Wave to Open plate test
- 18.1.4 Wing tests
- 18.1.5 Mode switch program mode test
- 18.1.6 Wing locking device test



WARNING

Risk of injury due to improper function test!

Safety equipment may not function correctly during functional testing due to incorrect connections.

- Ensure no one is present in the danger zone before starting the functional tests.
- Leave the danger area immediately if safety equipment does not work or function as intended.

Fig. 18.1.1 Function test components

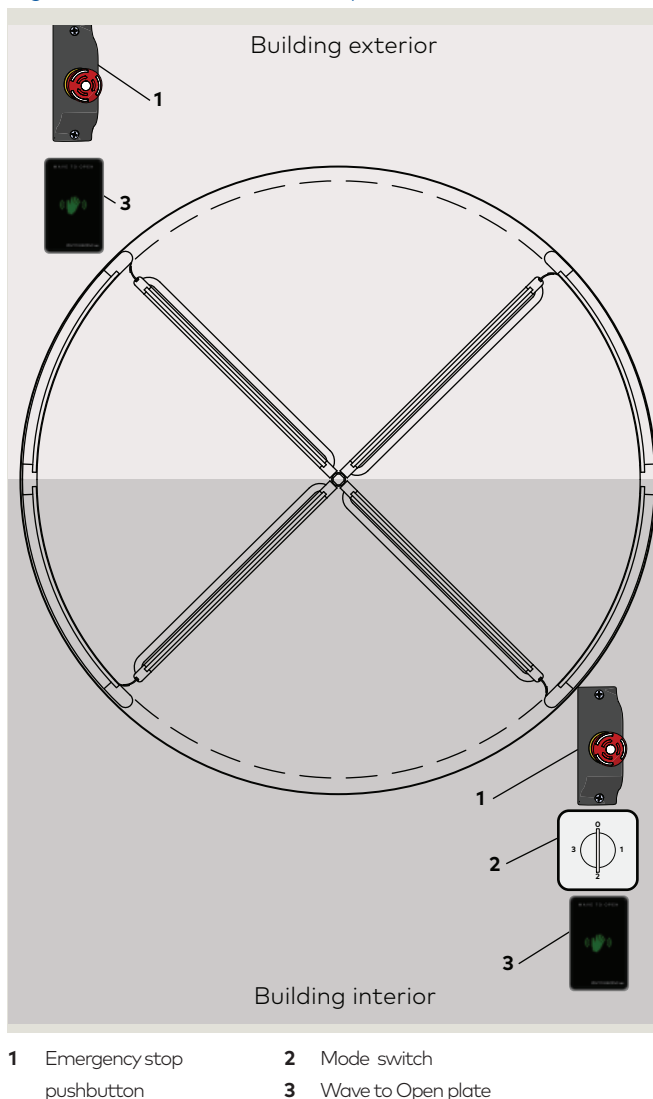
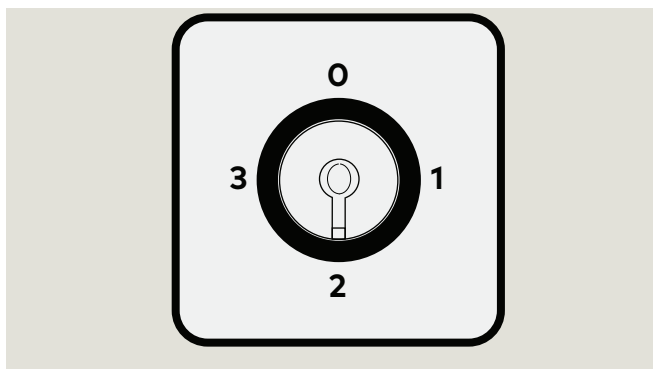



Fig. 18.1.2 Mode switch



18.1.2 Emergency stop pushbutton test - Program switch Automatic 2 mode.

2.1 Activate Emergency Stop pushbutton.		
Step	Action	Result
1.	Set program switch to Automatic 2.	
2.	Door will continuously rotate at low energy speed.	
3.	Press Emergency Stop pushbutton while door is rotating.	Revolving door stops immediately and drive is disengaged. The door can be manually rotated.
2.2 Restart after Emergency Stop.		
1.	Unlock all Emergency Stop pushbuttons.	
2.	Door will continuously rotate at walking speed.	
2.3 Repeat Emergency stop test for each Emergency Stop pushbutton.		
1.	Repeat steps in 2.1 and 2.2 for each Emergency Stop pushbutton.	



WARNING

Risk of injury due to deactivated safety equipment!

After the Emergency Stop pushbutton is activated, the drive is unlocked. The safety devices are no longer in operation. This can cause serious injuries if attempts are made to rotate the door manually.



- Before turning the door manually, check to make sure that no one is present in or next to the door.
- If people have been locked into the revolving door, carefully rotate the door unit people are able to exit.
- When turning the door manually, make sure there are no limbs between the closing edges.



TIPS AND RECOMMENDATIONS

All emergency stop pushbuttons must be unlocked to test the restart function.

18.1.3 Wave to Open plate test.

3.1 Activate Wave to Open.		
Step	Action	Result
1.	Set program switch to Automatic 1.	
2.	Activate Wave to Open plate	 Rotary movement of revolving door is started at low energy speed. Revolving door automatically stops in the next starting position as soon as it is no longer manually operated
3.2 Repeat test for each Wave to Open plate		
1.	Repeat steps in 3.1 for each Wave to Open plate.	

18.1.4 Wings.

4.1 Folding the wing.		
Step	Action	Result
1.	1. Check forward and backward folding of wings during running operation.	



TIPS AND RECOMMENDATIONS

Wave to Open only used with "S" function module.



WARNING

Risk of injury due to improper testing!

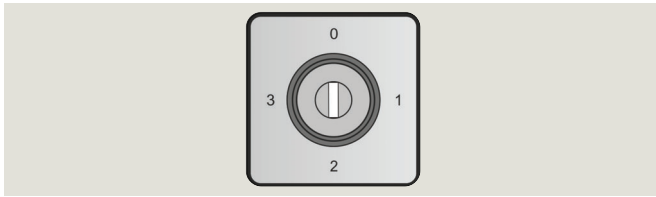


TIPS AND RECOMMENDATIONS

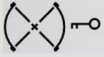



Check each of the wings individually.

18.1.5 Mode switch,

Fig. 18.1.3 Mode switch



1. Check door operation each Mode switch setting. Operation based on green "S" (Motion assist) module

Mode switch position	Description
 0 Off	<ul style="list-style-type: none"> Revolving door will stay in the home position or back to home position. After a set period of time, any internal lighting is switched off.
 1 Automatic 1	<ul style="list-style-type: none"> "Knowing act" switch starts rotary movement of the door wings at low energy speed (Para. 18.1.6). When door is no longer pushed, door will rotate automatically at low energy speed to the next starting position and stop.
 2 Automatic 2	<ul style="list-style-type: none"> Door continuously rotates at low energy speed. Door can be manually pushed to maximum allowable speed.
 3 Summer	<ul style="list-style-type: none"> Revolving door stops at its starting position and the operator is disengaged. Door wings can be rotated manually. If foldable wings have been installed (bookfold), wings can be folded to the side.

18.1.6 Low energy speed definition - ANSI/BHMA A156.27.

Door speed resulting in a maximum of 2.5 lbf-ft [3.4 Nm] of kinetic energy.

18.1.7 Knowing act

Consciously activating a switch with the knowledge of what will happen such as starting, slowing or stopping a revolving door. Switching devices may include wall or jamb-mounted contact switches such as push plates, fixed contact switches and controlled access devices such as keypads, card readers, and key switches.

Appendix A - Definitions

A.1 Revolving door definitions, from ANSI/BHMA A156.27 appendix

- A1.1 Active area** - An area where sensors detect the presence of motion
- A1.2 Automatic door operator** - A power operated door mechanism that is attached to a revolving door for the purpose of mechanically opening the door upon receipt of an activating signal (also called a power door operator).
- A1.3 Automatic home positioning** - Manual revolving doors with automatic home positioning are small 3 or 4 wing revolving doors that utilize a low energy operator or mechanism to return the doors to the home position once a person exits the door and the door stops rotating.
- A1.4 Automatic door speed** - The rate at which an automatic revolving door rotates measured in revolutions per minute (RPM). The three classifications are:
- Standard speed- the maximum allowable RPM for a revolving door.
 - Slow speed- One half of standard speed.
 - Low energy speed- Door speed resulting in maximum of 2.5 lbf-ft of kinetic energy.
- A1.5 Bookfold position** - When each wing has been released from its fixed position permitting wings to pivot in the direction of egress
- A1.6 Bottom rail** - The lower horizontal member of the door wing.
- A1.7 Breakout** - A process whereby wings and/or door panels can be pushed open manually for emergency egress.
- A1.8 Canopy** - The area above the wings and enclosure comprised of a ceiling (soffit), fascia (cladding), and roof (cover).
- A1.9 Center shaft** - The rotating center, 12 inches [305 mm] or less in diameter, of revolving doors to which the wings are attached.
- A1.10 Clearance** - The minimum gap around the wing to the ceiling, enclosure, and floor, not including the weather stripping, at any point in its rotation.
- A1.11 Control** - A unit containing electrical components for automatic control of door operation and overload protection.
- A1.12 Control mat** - A presence sensing device that detects pressure from people or objects to give an activating signal to the automatic revolving door.
- A1.13 Core** - The rotating central portion, greater than 12 inches [305 mm] in diameter of a large diameter revolving door to which the wings are attached.
- A1.14 Enclosure** - The walls in which the wings operate. Also known as Drum.
- A1.15 Entry point sensor** - A presence sensor designed to detect a person in the area between the outer leading edge of the enclosure wall and the approaching outer leading edge of the wing
- A1.16 Fascia** - The vertical surfaces of the canopy.
- A1.17 Home position** - The desired at-rest position for a revolving door. Home position "X" - the (4 wing) stops in the (X) position with all four wings in contact with the entrance wall posts.
- Home position "+" - the (4 wing) stops in the (+) position with two wings in contact with the center mullions and two wings in the middle of the throat opening.
- Home position "Y" - the (3 wing) stops in the (Y) position with two wings in contact with the entrance wall posts and one wing in contact with the wall center mullion.
- A1.18 Knowing act** - Consciously activating a switch with the knowledge of what will happen such as starting, slowing or stopping a revolving door. Switching devices may include wall or jamb-mounted contact switches such as push plates, fixed contact switches and controlled access devices such as keypads, card readers, and key switches.
- A1.19 Manual operation** - The capability of rotating the revolving door by a person applying a force to a door wing.
- A1.20 Manual speed control** - A device used to regulate manual revolving door speed by making it difficult to push the door beyond the maximum allowed RPM.
- A1.21 Motion sensor** - A sensor designed to detect the movement of a person or equivalent at the point of entry to the door that gives an activating signal to the power operated door.
- A1.22 Obstruction force** - The maximum static force the door is allowed to apply to a person or object measured at the outside edge of the rotating wing.
- A1.23 Power operated door** - A revolving door with a power operated mechanism that is attached to it for the purpose of mechanically opening the door upon receipt of an activating signal (also called Automatic Door).
- A1.24 Peripheral speed** - The rotating speed of a revolving door measured at the outer edge of the wing.
- A1.25 Presence sensor** - A sensor designed to detect the presence of a stationary person in the vicinity of the doorway and give a signal to the power operated door.
- A1.26 Push bar** - A bar attached to the wing upon which pressure is applied to set a manual revolving door in motion. A push bar is not required on automatic doors.
- A1.27 Push to slow device** - A knowing act switch used to create an activating signal to cause reduction of speed of the revolving door.
- A1.28 Safety glass** - Comprised of either fully tempered or laminated glass or other safety rated glazing to prevent injuries from breakage.
- A1.29 Sensor** - A device that detects motion or presence of a person or object.
- A1.30 Small vehicular** - Carts used to transport persons or objects.
- A1.31 Stile** - A vertical edge member of the door wing.
- A1.32 Throat opening** - The width between the enclosure side walls that creates the entry point.
- A1.33 Trained traffic** - People trained in the safe use and operation of a particular automatic door installation.
- A1.34 Weather stripping** - The material used to fill a clearance.
- 2.35 Wing** - A panel which rotates within and seals the enclosure. (Sometimes called a Leaf).

Appendix B - dormakaba handheld

B.1 Firmware update

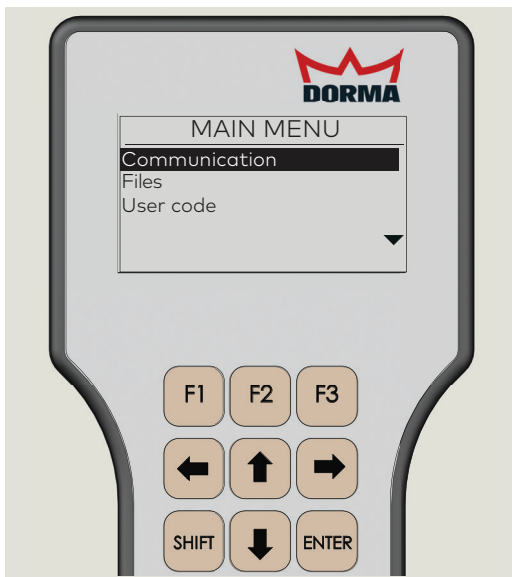
B.1.1 Firmware update procedure.

CAUTION

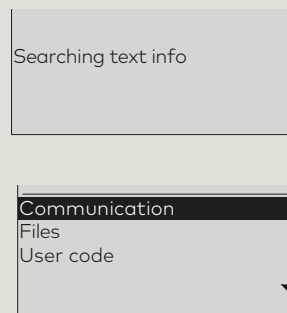
For all firmware changes, set with Mode switch to Position 1 (OFF) and allow door to close completely before any updates are made!



1. Connect Handheld to COM 1 port (Para. 18.1) and power on.



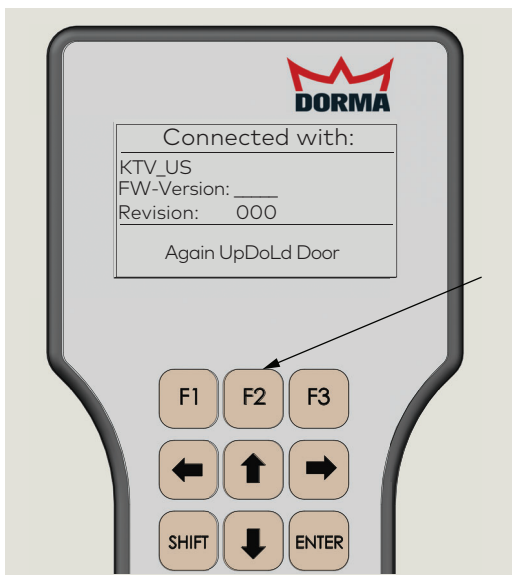
2. With Communication highlighted, press ENTER.



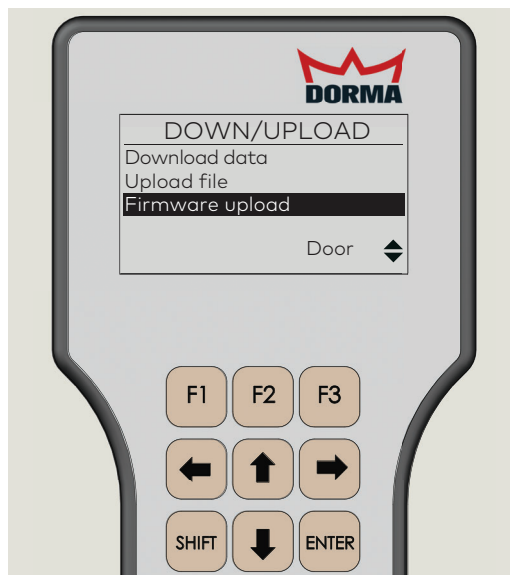
• Handheld will boot up and display main menu.



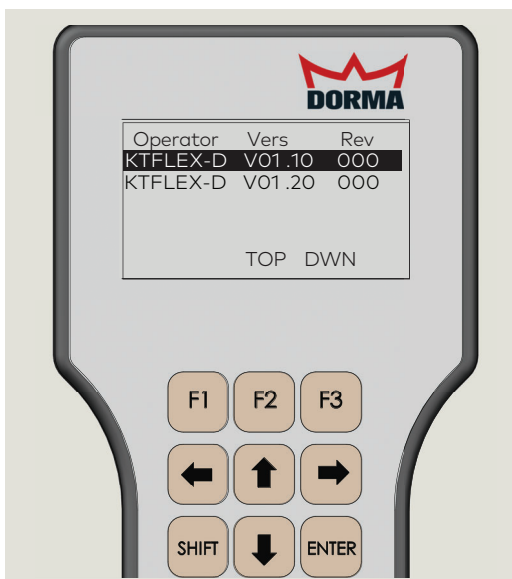
3. Enter Handheld user code; press ENTER.
• Default user code: 123456.



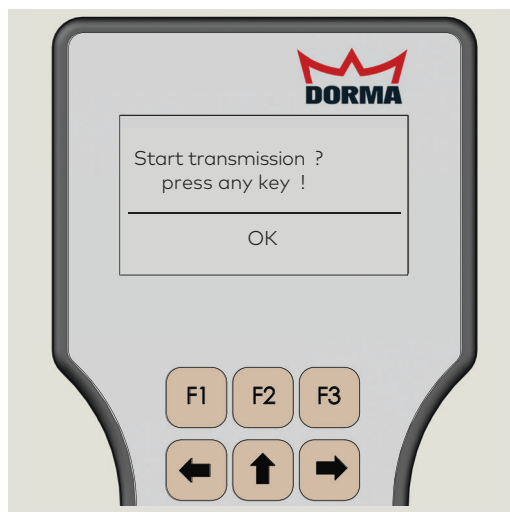
4. Press F2 to select UpDoLd.



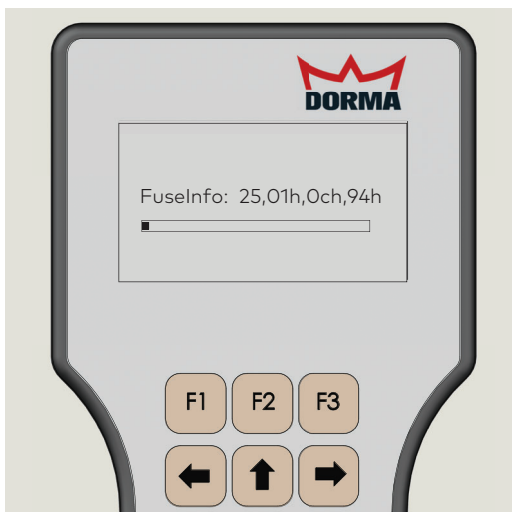
5. Using Down arrow, scroll down to highlight Firmware upload and press ENTER.



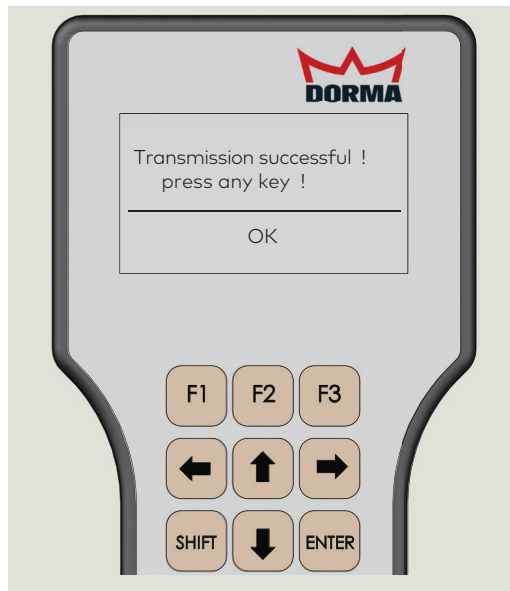
6. Using Up and Down arrows, highlight firmware version and press ENTER.



7. Press any key to start firmware upload.



8. Firmware uploading to controller.



9. Press any key to complete firmware update.

B.2 dormakaba handheld; access parameters

B2.1 Connect handheld to Motion Assist 360 control unit.

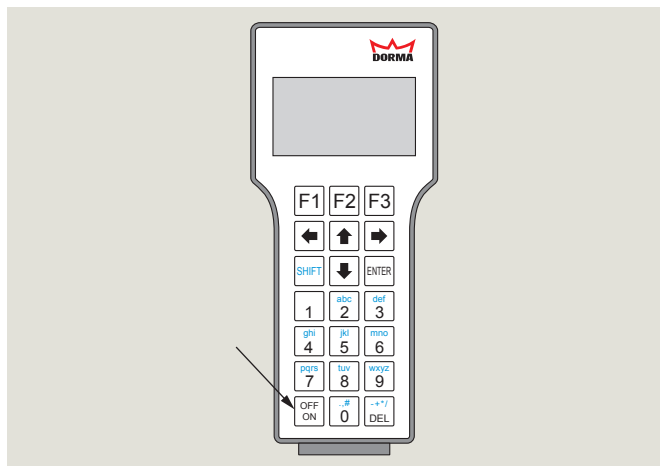
Connect dormakaba handheld interface cable DX4604-020 (Para. 9.7) to handheld plug connection on Motion Assist 360 control unit.

CAUTION

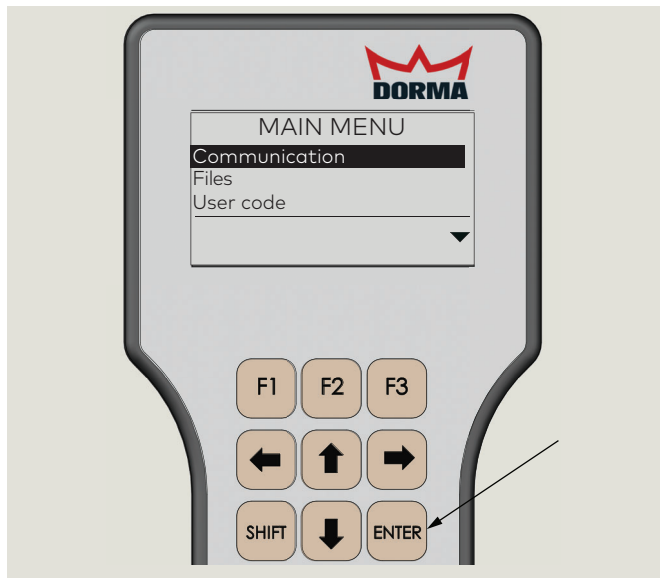
Never use conventional network cable with RJ45 plugs! Risk of permanent damage to the connected Motion Assist 360 control unit.

B2.2 Instructions to access parameters.

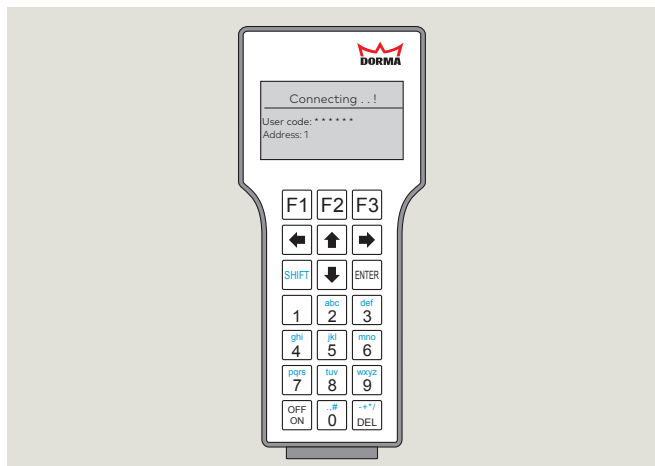
1. Press handheld OFF ON key to turn handheld ON.



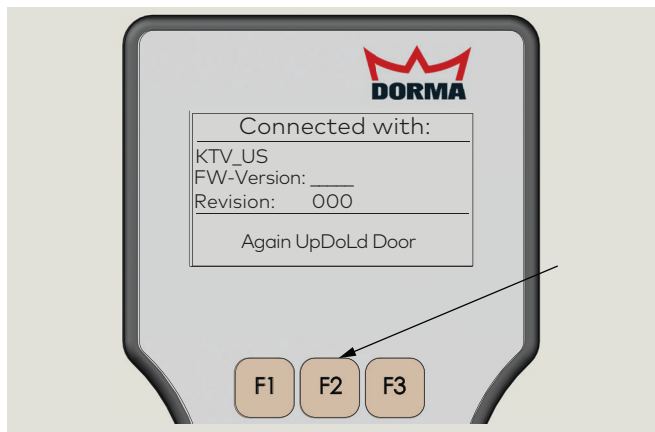
2. Handheld will boot up and display Main Menu.
3. Press ENTER to select Communication.



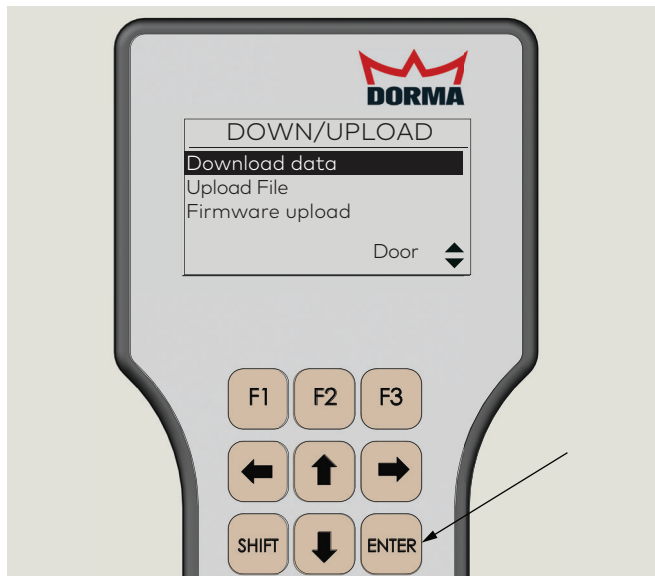
4. Enter User code (dormakaba original setting: 123456). Press ENTER..



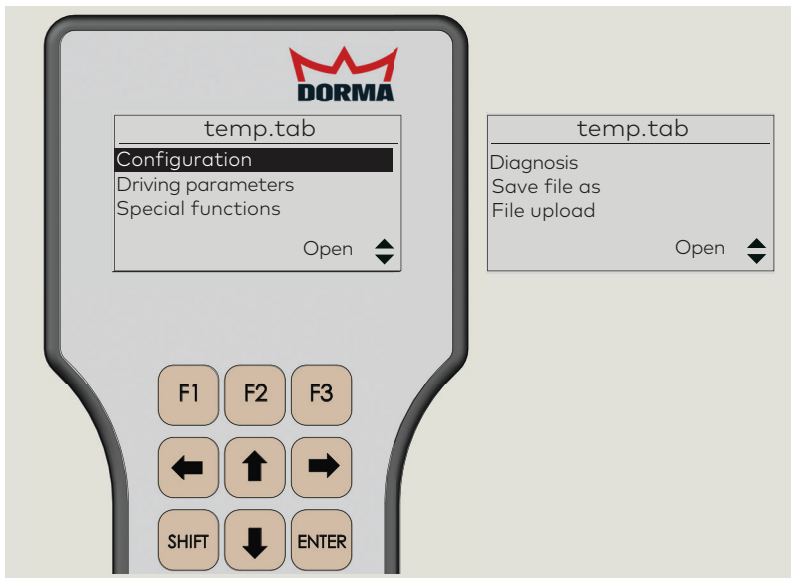
5. Handheld displays door type and current software version of the connected door.
6. Press F2 to select UpDoLd menu.



7. Down/Upload menu is displayed.
8. Press ENTER to select Download data.



9. Current adjustments and parameters are downloaded.
10. System stores this data as a temporary file under the file name "temp.tab".
 - Every change in configuration and driving parameters or special functions that is made and confirmed with the ENTER key automatically uploads to the KT Flex control unit.
 - The handheld does NOT automatically save the changes.
 - Therefore, the handheld will prompt you to save changes when exiting the menu.
 - Press left arrow.



B2.3 Editing parameter values.

1. Certain parameter value changes can only be made in a specified range.
 - If a value is entered outside of this range, the handheld will display "control unit limits value"!
 - Incorrect adjustments are not uploaded to the control unit.

B.3 dormakaba handheld Motion Assist 360 configuration parameters

NOTICE

Parameters and detail may change depending on firmware version.

B3.1 Configuration parameters

#	Parameter	Description	Setting
1	# wings	Number of door wings.	(3 .. 4) 3
2	Door diameter	Indicates diameter of door [mm]	1600 .. 3800 2500
5	Night bank operation	Activates or deactivates Night bank function.	no yes
12	Vand.brake X-pos.	Activates or deactivates anti-vandalism brake in X-position (X-pos.).	off on

B.4 dormakaba handheld Motion Assist 360 driving parameters

B4.1 Driving parameters

#	Parameter	Description	Setting
3	#start. pos Auto1-2	Indicates number of starting positions in AUTOMATIC mode 1 or 2.	(1 .. 18) 4
9	#start. pos NB	Number of starting positions (start. pos) while Night bank operation is On.	(2 .. 18) 5
7	Slow Stop canopy	Indicates slow stop time for canopy integrated sensors	(0.0 .. 15.9) s 0.5
6	Slow Stop wing	Indicates slow stop time for wing sensors	(0.0 .. 15) s 10
13	Hold after stop	Time until the door starts after a safety stop.	(0 .. 9.9) s 1.0
11	Sec. area stop	Indicates monitoring range of canopy integrated sensor for Slow Stop function.	(400 .. 6999) mm 800 (15.7 .. 276) " 32
8	Wait after stop	Time the system moves at positioning speed after leaving stationary position following a safety stop.	(0.0 .. 2.9) s 0.5
14	Status relay	Status relay function 0 No function 1 Door in walking speed 2 Door in positioning speed 3 Door in handicapped spd 4 Door locked 5 Error 6 Power supply monitoring 7 UPS low	(0 .. 7) 0

#	Parameter	Description	Setting
50	Positioning speed		(150 .. 300) mm/s 250 (5.9 .. 11.8)"/s 9.8
51	Handi-capped speed	Speed when disability access pushbutton engaged.	(250 .. 400) mm/s 300 (9.8 .. 15.7)"/s 11.8
53	Acceleration ramp	1 = slow acceleration 9 = fast acceleration	(1 .. 9) 5
54	Brake ramp normal	1 = slow brake 9 = fast brake	(1 .. 9) 5
55	Brake ramp hard	1 = slow brake 9 = fast brake	(1 .. 9) 5
56	Minimum speed for speed limiter		(350 .. 2500) mm/s 750 (9.8 .. 39.3)"/s 29.5
57	Counter-force for speed limiter	0 = no brake 1 = soft brake 9 = hard brake	5
58	Holding force in basic position	Maximum holding force on outer door leaf edge (0 ... 9) N (0 ... 2) lb f	A: 9 S/P: 3

B.5 dormakaba handheld Motion Assist 360- special functions

B5.1 Special functions

#	Description	Setting
100	Air curtain delay	Adjustment of follow up time for warm air curtain. (0 .. 600) s 10
101	Delay time lighting / manual	0 = light always on 1 -60 = automatic delay time (0 .. 60) s 15
	Speed limiter	0 = deactivated 1 = activated
116	UPS unit connected	0 = not connected 1 = connected 0
103	Original settings r/o	Press "ENTER" to reset all parameters to original settings. Command >
	Learning cycle r/o	Press ENTER to start learning cycle. Command >
	Acknowledgment r/o	Press ENTER to acknowledge errors. Command >
	Lock r/o	Press ENTER to lock the door. Command >
	Unlock r/o	Press ENTER to unlock the door. Command >
	Wing sens. act.	Activation of slow stop sensor at door wing. no yes
	Door closer mode	Manual operation off on
	Key lock	Enables/disables the keypad off on
	Bridge door wing sensor	Only for service work! no yes
	Bridge canopy sensor inside	Only for service work! no yes
	Switch key lock on/off	off on

B.6 dormakaba handheld Motion Assist 360- diagnostics

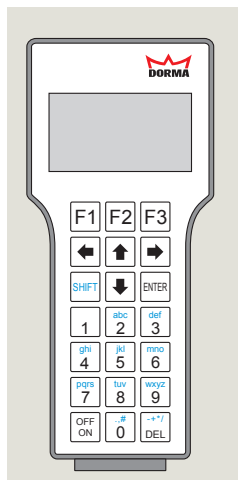
B6.1 Diagnostics

#	Description	Setting
250	Software version r/o	Indicates current version of the control unit. xx.yy (e.g., 01.00 - version 1.00) xx.yy
150	Current error r/o	Display of current error status. (0 = no error) (..)
151	Cur. revolutions r/o	Displays number of revolutions at current error (fifth position is rounded off). (..)
152 168	Error log 1 to Error log 9	This log stores errors that have occurred in the past. 0 = no error (..)
153 169	Revolutions log 1 to Revolutions log 9	Revolutions during former error 1 (fifth digit is rounded off). (..)
	Delete error log	Delete the value stored in the fault. Set to 1 clears the memory, then set to 0.
171	Service reset	Press ENTER to reset error log and maintenance parameters (current revolutions, anti-vandalism brake, wind brake activations). Command >
172	# stop events r/o	Stop events caused by a safety stop.
173	# Shock stop r/o	Number of brake events caused by shock stop unit. (..)
175	# revolutions r/o	
	Last maintenance	Last maintenance date (month and year, e.g., 1110=November 2010) mmyy
	Door diameter	Indicates door diameter. (..) mm
	Door position r/o	Indicates current door position. (0..360)°
	Door speed r/o	Indicates current door speed. (..)*0.1 °/s
	Locked r/o	Is the door locked? no yes
	Unlocked r/o	Is the door unlocked? no yes
	SCS r/o	Indicates status of safety contact strips. activated OK (=deactivated)
	Int. motion det. r/o	Indicates status of internal motion detector (inside). OK (=deactivated) activated
	Ext. motion det. r/o	Indicates status of internal motion detector (inside). OK (=deactivated) activated
	Ext. CS Slow r/o	Indicates status of external canopy sensor (CS) for Slow Stop. activated OK (=deactivated)
	Int. CS Slow r/o	Indicates status of internal canopy sensor (CS) for Slow Stop. activated OK (=deactivated)
	CS outside stop r/o	Indicates status of canopy sensor (CS) for Slow Stop (outside). activated OK (=deactivated)
	CS inside stop r/o	Indicates status of canopy sensor (CS) for Slow Stop (inside). activated OK (=deactivated)
	Wing sensor r/o	Indicates status of wing sensor. activated OK (=deactivated)
	X pos. sensor R/o	Indicates status of X position sensor. activated OK (=deactivated)
	Lock.pos.sensor	Indicates status of locking position sensor. OK (=deactivated) activated

	Emergency Stop r/o	Indicates status of Emergency Stop pushbutton.	activated OK (= deactivated)
	Disabled push. r/o	Indicates status of disabled access pushbutton.	OK (=deactivated) activated
	OFF r/o	Indicates input status of program switch while set to OFF mode.	deactivated activated
	AUTOMATIC 1 r/o	Indicates input status of program switch while set to AUTOMATIC 1 mode.	deactivated activated
	AUTOMATIC 2 r/o	Indicates input status of program switch while set to AUTOMATIC 2 mode.	deactivated activated
	Summer config. r/o	Indicates input status of program switch while set to SUMMER mode.	deactivated activated
298	DCW reset r/o	Press ENTER to initialize DCW bus. System checks how many DCW components are cpnnected	Command >
	DCW list r/o	Indicates number of logged in DCW bus components.	(...)

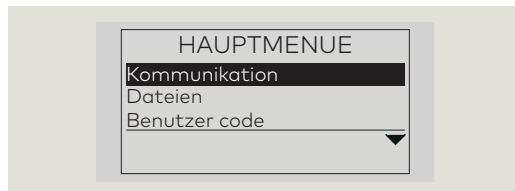
B.7 New dormakaba handheld; language change to English

Fig. B7.1.1
dormakaba handheld

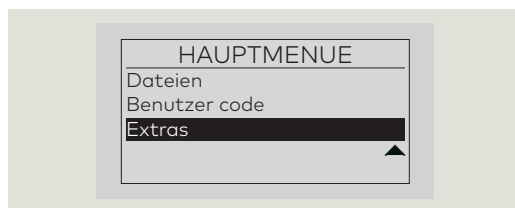


B7.1.1 New dormakaba handheld; language change.

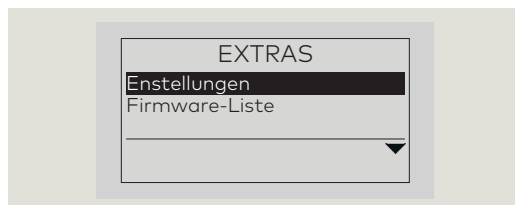
If German language is displayed on screen when handheld is first turned on use following steps to change to English.



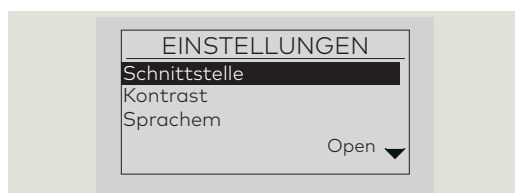
1. Scroll down Main Menu to EXTRAS:
 - Press 3 times to highlight EXTRA.



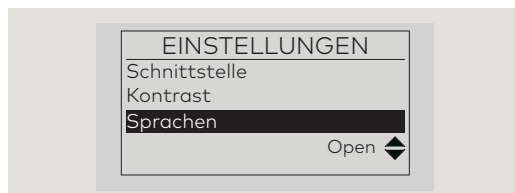
2. Press to select EXTRAS menu.



3. Press to select EINSTELLUNGEN (Settings) menu.

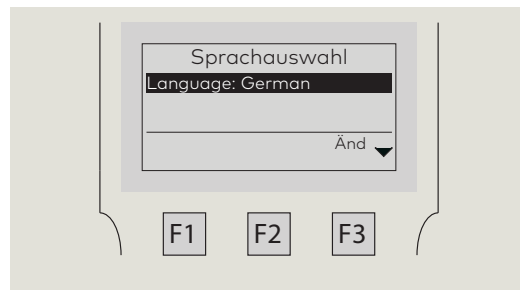


4. Scroll down EINSTELLUNGEN Menu to Sprachen (Languages):
 - Press twice to highlight Sprachen.

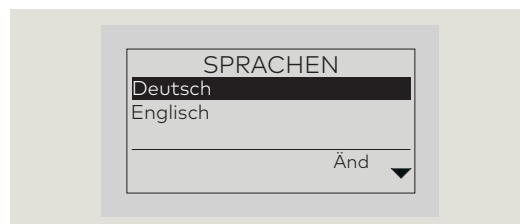


5. Press to select Sprachen.

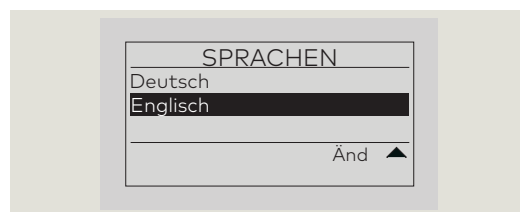
6. Sprachauswahl (Language selection) menu is displayed.



7. Press to select Änd (Amendments).
8. Sprachen (Languages) menu is displayed

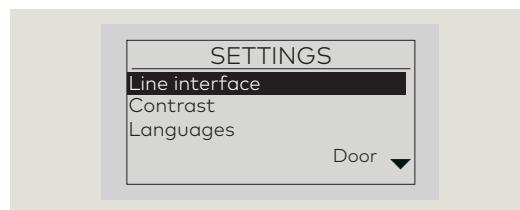


9. Scroll down SPRACHEN menu to Englisch: Press once to highlight "Englisch"



10. Press to select English.

11. Settings menu is displayed



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".

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Appendix C - Function modules

C.1 Function module

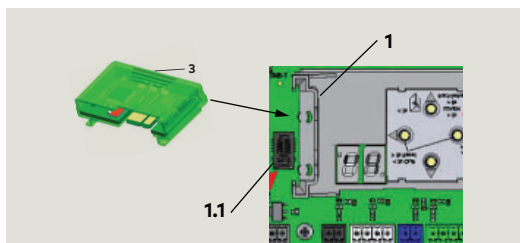
C.1.1 Function module installation.

Motion Assist 360 control unit uses the "S" Motion Assist function module.

When a function module is installed, information is exchanged between and permanently allocated to both the Control unit and the function module.

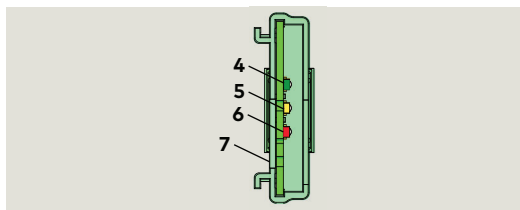
- 1 Function module slot
- 1.1 Function module socket
- 3 "S" Motion Assist function module (GRN)

Fig. C.1.1 Function module and slot



- 4 Green LED
- 5 Yellow LED
- 6 Red LED
- 7 Function module

Fig. C.1.2 Status LEDs



C.2 Container module

C.2.1 Container module

- The first function module installed becomes the container module.
- Every Control unit has only one function module.

C.2.2 Function module removal.

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

C.2.3 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.

C.2.4 Inserting a function module that has already been activated

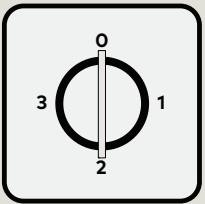

- Rapidly flashing yellow LED on upgrade card indicates card is rejected.
- Card's functions in Control unit are still valid.

C.2.5 Inserting a container module from third party control unit.

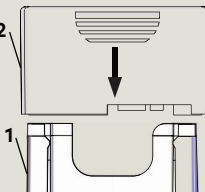
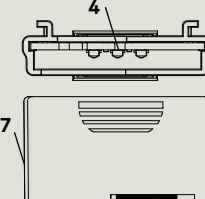
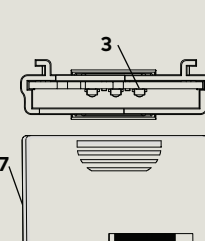
- Rapidly flashing yellow and green LEDs on container module indicates module is rejected.
- Container module can only be synchronized with one control unit.

C.3 Installing function module

C.3.1 Set program switch to Position 0 "Off".

	<p>Set Mode switch to Position 0.</p>
<p>9 2 digit display with horizontal bars</p> 	<p>2 digit display horizontal bars indicate Control unit in stand by mode.</p>

C.3.2 Installing function module.

<p>1 Function module slot 2 Function module</p>		<p>1. Insert function module into module slot. 2. This module will become the container module.</p>
<p>4 Yellow LED 7 Container module</p>		<p>3. Yellow LED flashes on and off once during module insertion.</p>
<p>1 Upgrade card slot 3 Green LED 7 Container module</p>		<p>4. Green LED slowly flashes on and off indicating communication between module and Control unit. 5. Function module becomes container module, green LED continues to slowly flash on and off. Module functions are now available.</p>

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