Automatic
Under-floor Swing Door Operator
C 127 SU S

Operating instructions E

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1 General

These operating instructions are intended for the C 127 SU S automatic under-floor swing door operator (herein after referred to as C 127). The operator is the person responsible for the technical maintenance of this door system.

These instructions describe the use of the C 127 swing door operator. They form the basis for satisfactory functioning.

These operating instructions should be read by the door operator before commissioning and the safety instructions observed!

It is recommended to keep these operating instructions close to the automatic sliding door.

Product designation:	***Automatic swing door operator***
Product name:	***C 127 SU S***
Serial number:	_____ (please complete when installing)

2 Safety instructions

The operator has been constructed in accordance with the latest state of the art and the recognised technical safety regulations, including limiting of forces and speeds. Nevertheless, danger can arise for the user if not used as intended.

Installation, maintenance and repairs to the operator must only be performed by qualified and authorized personnel (technicians).

2.1 Use as intended

The C 127 swing door operator is constructed exclusively for normal service with swing doors in dry rooms and must be installed within or inside buildings. The stainless steel casing with protection class IP 67 for the insertion of the drive is usually embedded into the floor.
The dimension data indicated for proper installation must absolutely be observed.

A different application or use extending beyond this purpose is not considered use for the intended purpose. The manufacturer declines all responsibility for resulting damage; the operator alone shall bear the associated risk.

Use for the intended purpose also includes observation of the operating conditions specified by the manufacturer, including use and adjustment of the correct type of arms, in addition to regular maintenance and repair.

Unauthorised modifications to the automatic door operator will exclude any liability of the manufacturer for resulting damage.

2.2 General safety and accident prevention regulations

In general no safety devices (sensors) may be dismantled or put out of service.

During the learning cycle (which must only be performed by trained personnel) the safety devices (sensors) are switched off! It must be ensured, therefore, before initiating the learning cycle that no persons or objects are situated in the danger zone of the moving door leaves during the operation in order to avoid injury or damage!

No objects must be placed in the opening zone / path of the swing door to avoid crushing and shearing points!
The safeguard for crushing and shearing strains at the side edge must be provided by the manufacturer.

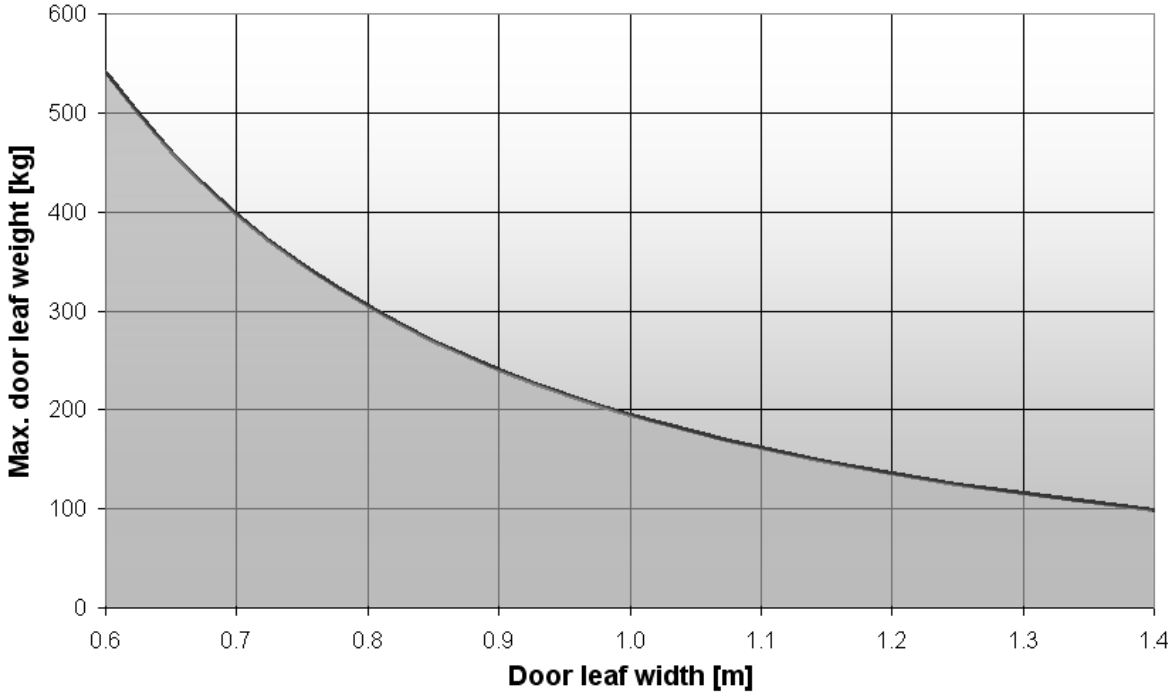
3 Technical Data

Dimensions:	710 x 200 x 130 mm (stainless steel casing LxBxT)
Operating voltage:	230VAC, 50/60 Hz
Power consumption:	Standby 13 W, rated power 67 W
Max. torque:	50 Nm
Mass moment of inertia:	65 kgm^2 (C 127 SU S)
Opening angle:	Adjustable from 70° to 115°
Time delay:	Adjustable from 0 to 60 seconds (40 steps)
Opening speed:	Adjustable from 3 to 20 seconds (40 steps)
Closing speed:	Adjustable from 5 to 20 seconds (40 steps)
Noise emission:	< 45 dB
Protection class:	IP 67

Environment conditions

Temperature range:	-15° to +50° C
Humidity range:	Up to 85% relative humidity, non condensing
Wind load:	

3.1 Door leaf weights and door widths



The curves are calculated using to the following formula:

$$J = 1/3 \cdot m \cdot b^2$$

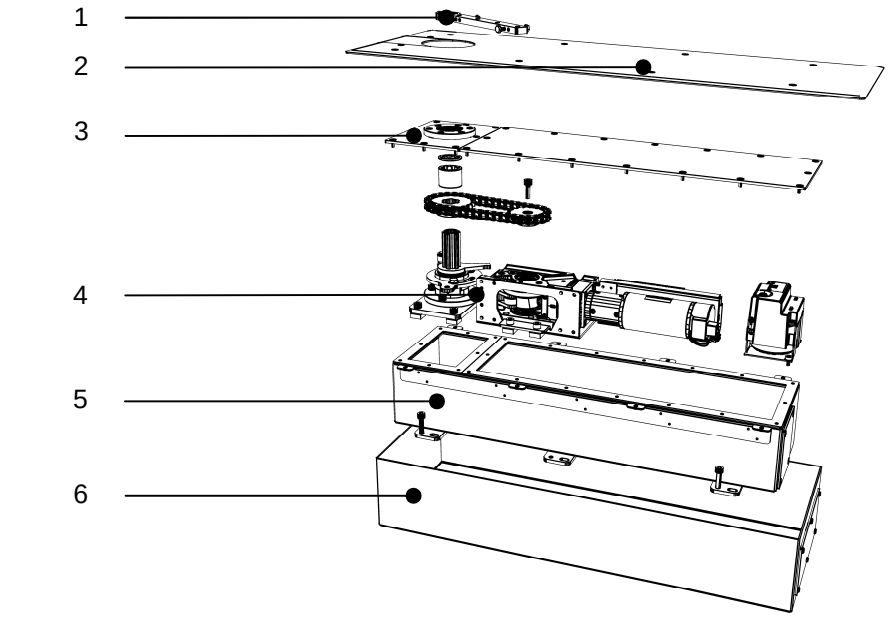
Standard arms : J max. 65 kgm^2

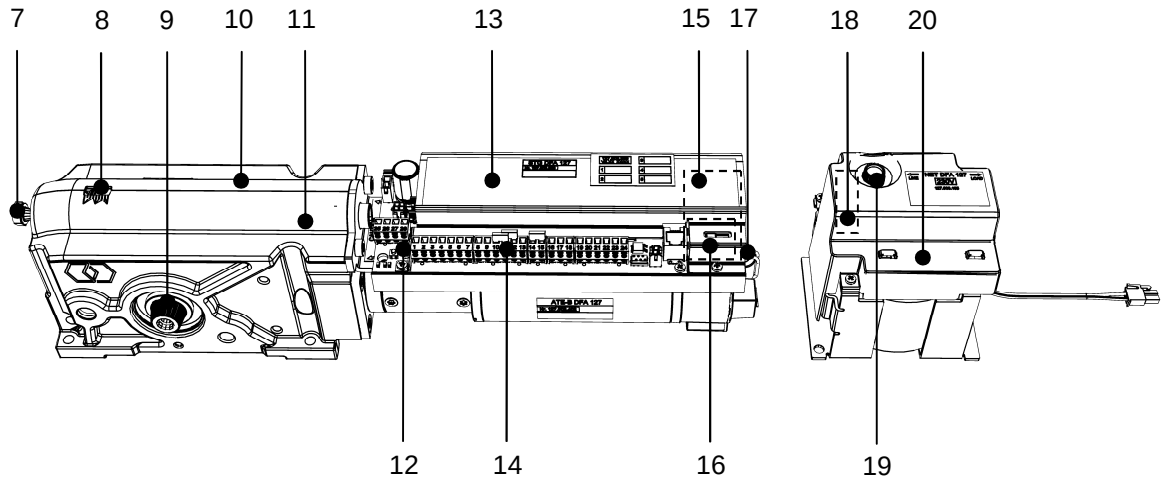
Slide arms : J max. 65 kgm^2

Key : J = mass moment of inertia [kgm^2]
m = door leaf weight [kg]
b = door leaf width [m]

4 Construction and Function

4.1 Construction





Key to illustration:

1	Standard arm	11	Closing spring
2	Floor plate	12	Multifunctional switch MF on STG
3	Cover with flat seal	13	STG control unit
4	Drive C 127 incl. control unit	14	STG connection terminals
5	Stainless steel casing	15	Motor print MOT
6	Box out for floor installation	16	Slide switch S1 (rotation direction)
7	Adjusting screw for spring tension	17	ATE drive unit terminals
8	Vision panel, adjust. spring tension	18	Mains connection terminals
9	Connectors for arms (both sides)	19	Fine-wire fuse
10	ATM drive unit	20	NET power supply

Construction and Function

4.2 Components

The C 127 swing door operator forms part of an electromechanical swing door system and comprises the following main components:

Control unit STG: Intelligent, learning, microprocessor-controlled control system.

Driving unit ATE: Low maintenance DC geared motor with electronic path measurement and integral thermostatic protective switch, gear box with adjustable spring tension.

Power supply NET: Compact 230 V power supply with integral input filter and overvoltage protection.

Control unit BDE: As required with convenient, simple mechanical control unit and / or a programmable electronic BDE-D.

Arm types: Power transmission to the door leaf by use of standard arm SG pushing or sliding arm GG pulling/pushing.

Locking VRR (optional): It is possible to connect an electrical door opener (24VDC) to the operator.

Sensing units: Aesthetic actuating and self-monitoring safety elements with adjustable sensitivity ensure optimum, smooth and reliable operation of the door system.

4.3 Functional description

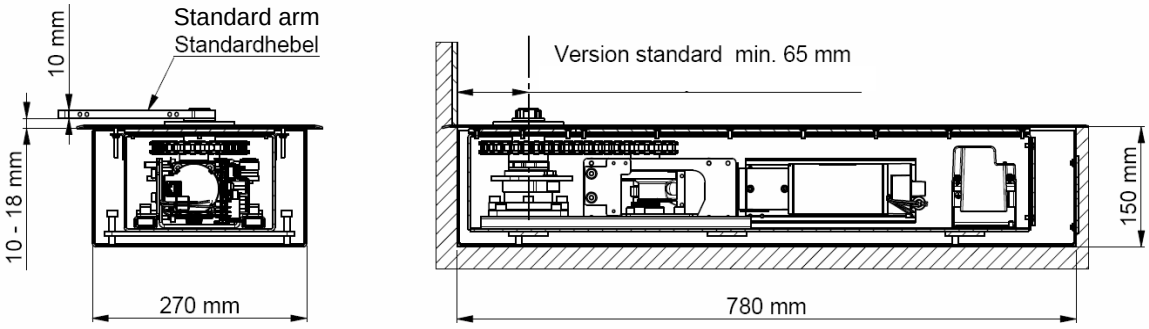
In the standard "Automatic" mode of operation the door system opens by the response of an actuating device (e.g. radar unit) to persons or objects approaching. The door closes after the door hold-open time, provided no further opening pulse is received.

In the "Lock" mode of operation, the door is only opened by actuation of an optional key-operated contact (SSK). The door closes after the SSK door hold-open time, provided no further opening pulse is received.

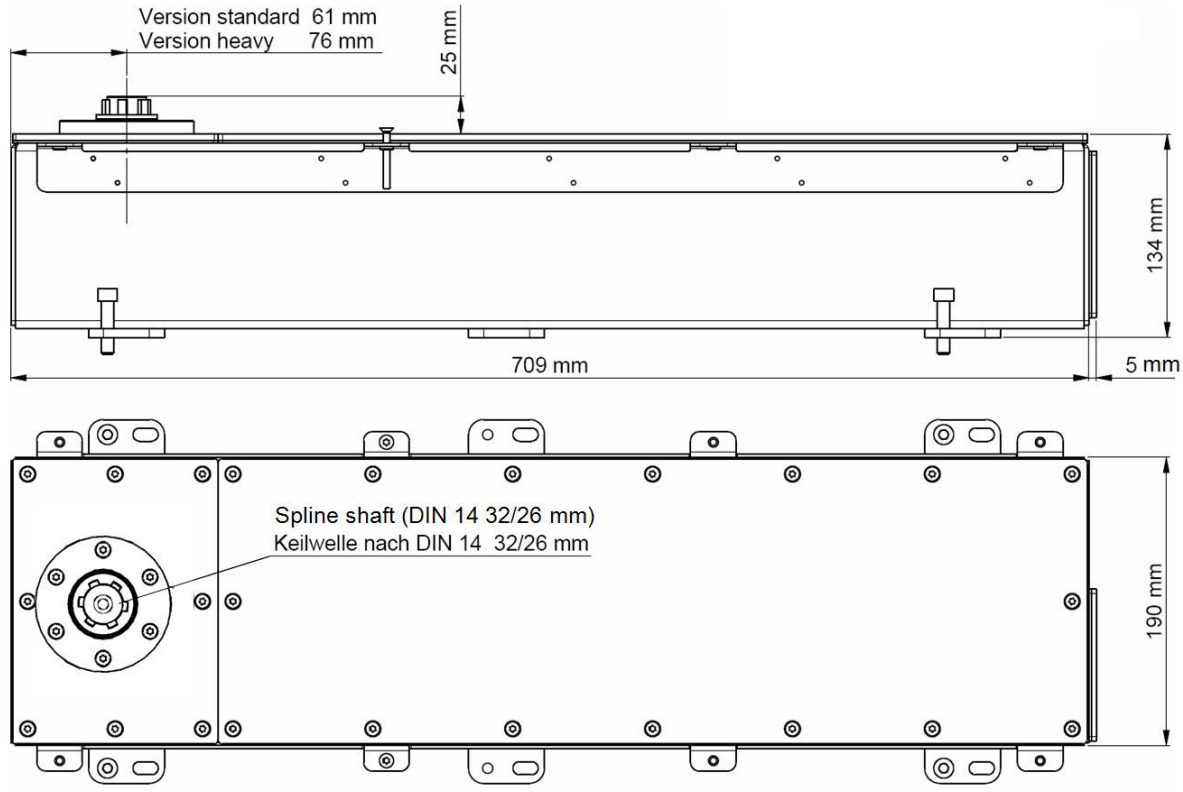
An obstacle to the swing door leave during ***Closing*** leads to an immediate re-opening (reverse). The obstacle position is recorded in the door operator and this position is approached slowly when next closing. An obstacle to the swing door leaf when ***Opening*** results in an immediate stop.

5 Dimensions

5.1 Installation with box out



5.2 Operator in stainless steel casing



6 Operating instructions

6.1 Controls on the STG 127

General

The STG 127 operates with an active HIGH level, i.e. a +24 V level must be applied to activate a function. Safety inputs are activated during interruptions.
The signal ground (0V) is connected to the protective earth.

Jumpers

J13: CAN line termination

J14: Master / Slave
jumper at position M1 for master (factory setting)
jumper at position S1 for slave

LED's

LD1: (red) Control LED for push-button operation (S1)

LD2: (green) +35V
Off for power failure

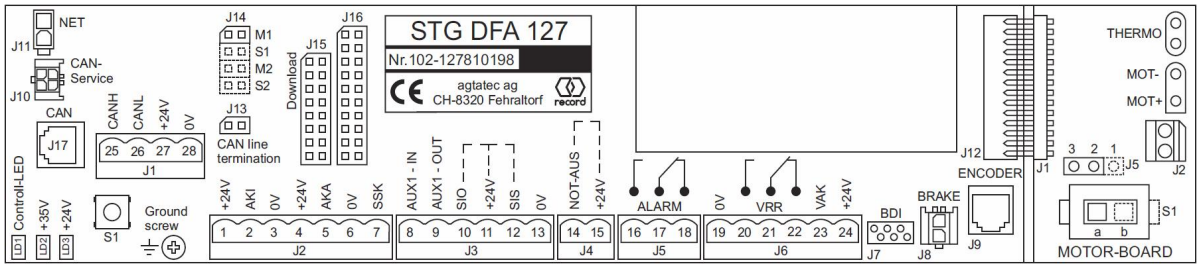
LD3: (green) +24V
Lights up if +24V present.
Caution: in the event of a power failure a processor reset takes place 1 second after this LED goes out.

Key (S1)

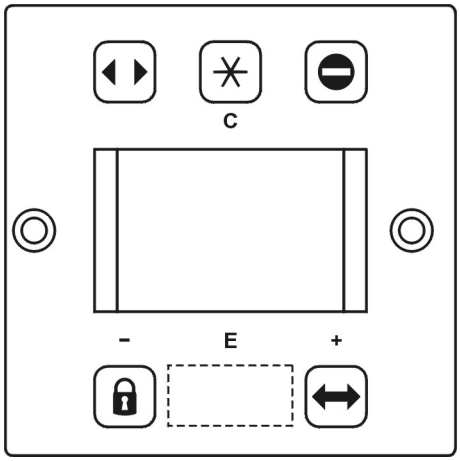
This is a multifunctional key.

The use of this switch is reserved exclusively for trained and authorized persons.

Top view of the control unit STG:



6.2 Functions of electronic controller BDE-D (optional)



The BDE-D electronic controller is an easily operated input and output device for the control and adjustment of door operators.
Logically arranged pushbuttons allow intuitive operation and navigation through the operator-specific menu. The LCD with backlight shows data and information about the door status with symbols and text messages.
Additional information can be found in the BDE-D manual.

6.3 Operation modes

Table of signals (X marks a release reaction)

Automatic / AUTO

Normal function. The door opens and closes automatically, either by activating an actuating device or by pushing the door set on “Push to actuate”.

	CLOSED	OPENING	OPEN	CLOSING
AKI	x	x	x	x
AKA	x	x	x	x
SSK	x	x	x	x
SIO		x	x	x
SIS			x	x
TIPP	x			

One-way traffic / EXIT

In one-way traffic mode people cannot enter the room from the outside but they can leave it from the inside.

	CLOSED	OPENING	OPEN	CLOSING
AKI	x	x	x	x
AKA*		x	x	x
SSK	x	x	x	x
SIO		x	x	x
SIS			x	x
TIPP				

* AKA is active as safety device while closing

Operating instructions

Manual operation / PROG HAND

The door can be opened and closed by hand. The actuating devices connected are ignored.

Continuously open / OPEN OPEN

The door is opened and stays open. If an obstruction stands in the way while opening, the operator tries another five times within a few seconds to bring the door to the target open position. Should the obstruction remain, the current position is then validated as the continuously open position.

Locked

The locking is activated in the Locked operation mode.

	CLOSED	OPENING	OPEN	CLOSING
AKI		x	x	x
AKA		x	x	x
SSK	x	x	x	x
SIO		x	x	x
SIS			x	x
TIPP				

Reset

After pushing on the button E for approx. 5sec. this status message on the display is:

No
Reset Operator?
Yes

Pushing again on the E button resets the operator.

7 Configurations

7.1 Parameter Overview

Factory settings: **Basic operator** (Full Power)

System DFA 127 parameter overview D = Value will reset after default parameter loading S = Programming of slave 1 or slave 2 M = Parameter modification via MFT (key) on STG (technical level)				STG 127 ☐ Master ☐ Slave					≥ V2.30
PARAMETER				Parameter value (**factory settings** printed bold)					
Description	D	S	M	1	2	3	4	5	6
DRIVING CYCLE									
↳ Closing speed	D			**20**	*(Speedo)*				
↳ Opening speed	D			**36**	*(Speedo)*	***DIN**: > 1.5 s < 4 s*			
↳ Acceleration	D		M	**36**	*(Speedo)*	*Different accelerations*			
↳ Latch check	D		M	**0**	*(Speedo)*	*Start latch check by closing*			
↳ Force when closing	D		M	**0**	*(Speedo)*	***DIN**: 0*			
TIME DELAY OPEN									
↳ Time delay open	D			**2**	*(Speedo)*				
↳ Time delay SSK	D			**5**	*(Speedo)*				
DRIVE									
↳ Opening angle	D	S		**35**	*(Speedo)*	***DIN**: min. 95°*			
↳ Collision close	D	S	M	**20**	*(Speedo)*				
↳ Collision open	D	S	M	**20**	*(Speedo)*				
↳ Brake		S	M	**Without**	Closing position	Opening posit.	Open/Clos pos.		
↳ Types of arms		S	M	Standard arm	**Sliding pulling**	Sliding pushing	Inheader		
↳ Invers			M	**Disabled**	Enabled				
↳ Spring type		S	M	**Unknown**	EN 4	EN 5	EN 6		
↳ Limit open	D	S	M	**Disabled**	Enabled				
ENTRANCE SYSTEM									
↳ Measure A			M	**0**	*(Speedo)*				
↳ Measure G			M	**0**	*(Speedo)*				
↳ Fire alarm			M	**Disabled**	Enabled				
↳ Control		S	M	**Single control**	Master control	Slave control	Master Interlock	Slave Interlock	
↳ Interlock			M	Disabled	All operation modes	**Only one-way /locked**			
↳ Door type			M	**Basic operator**	USA	US Low Energy	EU Low Energy	UK	UK Low Energy
				Airport Brussels	Default 1				
MS 2-LEAVES									
↳ Function AKA	D		M	**Master+slave**	Master only				
↳ Overlap	D		M	**5**	*(Speedo)*	*0 = No overlap*			
↳ Open sequence	D		M	**5**	*(Speedo)*	*0 = Simultaneous opening*			
↳ Close sequence	D		M	**15**	*(Speedo)*	*0 = Simultaneous closing*			
MANUAL CONTROL									
↳ During closing	D		M	**Disabled**	Enabled				
↳ When locked	D		M	**Disabled**	Enabled				
↳ When automatic	D		M	**Disabled**	Enabled				
↳ Collision	D		M	**Disabled**	Enabled				
↳ Support during closing	D		M	**Disabled**	Constant	Cumulative	Final bang	Slowly, cumulative	Slowly, final bang
↳ Active sensors	D		M	**Disabled**	SIS disabled	SIS enabled	SIS enabled AUTO		
↳ Closing speed	D		M	**20**	*(Speedo)*				
CONTROL PANEL									
↳ Mech. Panel	D	S	M	**3 Pos. (AUTO)** *Manual;* *Automatic;* *Cont. Open*	4 Positions *Automatic;* *Manual;* *Cont. Open;* *Locked*	3 Pos.(OFF-A) *Automatic;* *OFF;* *Cont. Open*	3 Pos. (OFF-M) *Manual;* *OFF;* *Cont. Open*	3 Pos.(Lock-A) *Automatic;* *Locked;* *Cont. Open*	3 Pos(Lock-M) *Manual;* *Locked;* *Cont. Open*
↳ BDE-D									
↳ Language			M	Deutsch	Français	**English**	English US	Espanol	Nederlands
				Danish	Slovenscina	Polski	Magyar	Italiano	Czech
↳ Keyboard	D		M	**Normal**	OFF-Mode				
↳ Contrast BDE 1			M	**20**	*(Speedo)*				
↳ Contrast BDE 2			M	**20**	*(Speedo)*				
↳ Brightness BDE 1			M	**20**	*(Speedo)*				
↳ Brightness BDE 2			M	**20**	*(Speedo)*				
↳ Light time			M	**10**	*(Speedo)*	*40 = permanent lighting*			
LOCKING									
↳ Locking function			M	**Normally locked**	Always locked				
↳ Lock type			M	**Standard**	Locking bolt	Magnet	Pulse		
↳ VRR manually		S	M	**Disabled**	Enabled				
↳ Start delay			M	**0**	*(Speedo)*				
CAN-BUS									
↳ *(Units connected to CAN bus)*	D		M	FEM 0… FEM 2	AKI 1	SI 1	AKA 1	SA 1	AKI 1
				SI 2	AKA 2	SA 2			
INPUT/OUTPUT									
↳ STG									
↳ AUX1_IN	D		M	**Disabled**	BEA Bodyguard				
↳ AKA_IN	D		M	**AKA**	Railbeam				
↳ AUX1_OUT	D		M	**Disabled**	BEA Bodyguard	Test sensors	Locked	Closed	
MISCELLANEOUS									
↳ Push to actuate to open	D	S	M	**Disabled**	Normal (motored)	Slow (motored)	HB with sensors		
↳ Alarm display									
↳ Time activation	D	S	M	**16**	*(Speedo)*				
↳ Time safety	D	S	M	**16**	*(Speedo)*				

Order number:	Client:					
Programming by end customer / changes	Date / Initials					

This parameter overview shows all possible settings. Depending on drive type and configuration the access is restricted.

Configurations

Configurations of the C 127 can only be made with the electronic BDE-D.

Further information for parameter changes can be taken from the user manual of the BDE-D (no. 102-903109271).

Please always leave the configuration review sheet in the drive!

7.2 Parameter description

Parameter	Setting range	Factory default	Description
DRIVING CYCLE			
Closing speed	0 - 40 (5 - 20 s)	18	Slider control with 40 steps
Opening speed	0 - 40 (3 - 20 s)	36	Slider control with 40 steps **DIN**: > 1.5 s < 4 s
TIME DELAY OPEN			
Time delay open	0 - 40 (0 - 60 s)	2	Effective with AKA, AKI and push to actuate 0 - 20: Steps of 1 s 21 - 40: Steps of 2 s
Time delay SSK	0 - 40 (0 - 60 s)	4	Effective with SSK 0 - 20: Steps of 1 s 21 - 40: Steps of 2 s
DRIVE			
Opening angle	0 - 40 (70 - 115°)	35	The opening angle is estimated during the calibration run and is equivalent to the value of 40. **DIN**: min. 95°

8 Maintenance instructions

8.1 General

The C 127 swing door operator is a product of the latest technology. It has been carefully made and only leaves the factory following thorough testing.
Automatic swing doors should be operated and maintained to ensure safety at all times.

8.2 Care

The entire swing door system can be cleaned with a damp cloth and commercially available cleaning agents. The cleaning agent must be harmonised to the surface which has to be cleaned.
It is recommended to select the "Continuously open" or "Locked" mode of operation for this purpose, so that the door does not continually open and close unnecessarily.

8.3 Maintenance, periodic inspection

It is recommended to have a technical safety test with servicing performed by a specialist before first commissioning and as required, but at least twice a year.

Regular testing and servicing by our fully trained personnel therefore offers the best guarantee for a long service life and satisfactory operation. We therefore recommend the signing of a maintenance agreement. Our service department will be pleased to submit a proposal.

If nevertheless a fault should occur, which you cannot eliminate (see section 8) our service organisation or the maintenance personnel of our agents are available.

8.4 Acceptance of hold-open system

Acceptance, tests and maintenance should only be carried out by a specialist or a person specifically trained for that. The authorization of these persons exclusively lies with the manufacturer of the hold-open system. Extent, results and time of the periodical inspection must be recorded. These records must be kept by the operator.

8.5 Service centres

In Switzerland: Phone +41 44 954 92 92 / Fax +41 44 954 92 00

Alternative service centre: _____

9 Action in case of faults

9.1 Fault indication

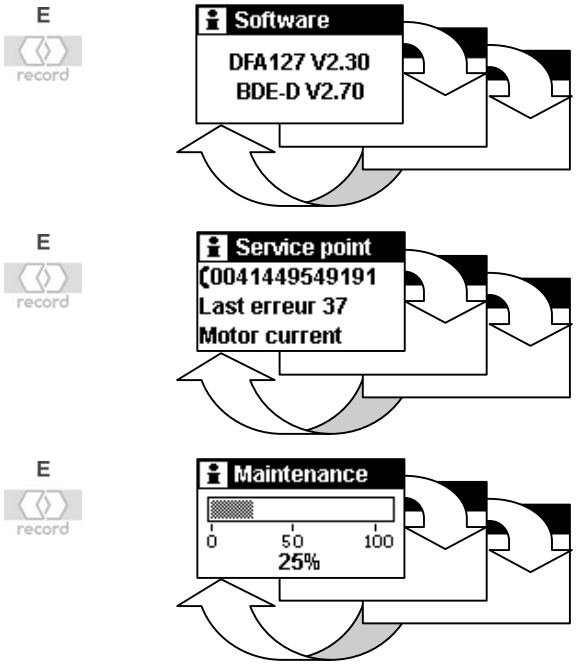
Various indications are given for an irregularity or fault depending on the control unit connected BDE-E or BDE-M.

When using an electronic BDE-D

Information about the operator system, like e.g. the software version, can be read out of the BDE-D main display by pressing the E key.
Telephone number, fault and maintenance are only displayed, when this function has been activated by the service technician.
After pressing this key once again, the phone number of the responsible service centre and the last appeared fault indication is displayed in the screen. If the fault message consists of several lines the first line will be displayed only.

Press key about 2 seconds

Browse through informations by tapping the key

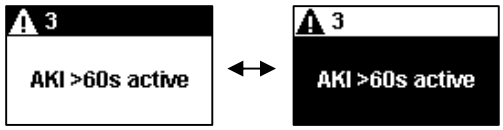


Back to main display by pressing the key or automatically after 20 seconds.

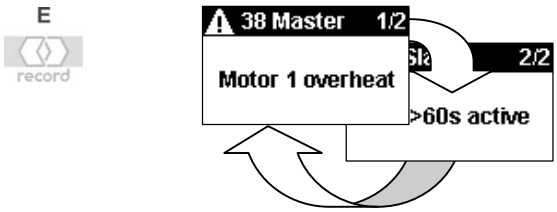
Action in case of faults

9.2 Error display and troubleshooting

Various indications are given for an irregularity or fault depending on the control unit connected BDE-E or BDE-M. In case of an anomaly in the operator system, the standard screen of the BDE-D automatically shifts from operating mode to error display. After 2 seconds, display changes between normal / inverse.



If several errors are active, they are numbered:
For instance, error **1/2** means that the first one of 2 errors is displayed.
Browsing through error displays:



Temporary return to main display for 4 seconds after browsing through error displays.

9.3 Common error displays

The possible error messages are listed in the table below according to their number and together with a problem description and data for troubleshooting the errors and resetting the display. The following abbreviations and symbols are used:

Abbreviation/ Symbol	Meaning
No.	Status or error number
Reset	A service technician is required for resetting the error display. After removing an error, no automatic reset happens.
W	If a “W” is displayed after the status or error number, it means that the error on display is a warning message and not an error message.
	Despite the upcoming error the door can provisionally be locked as follows: • Set BDE-D on MANUAL operating mode • Set BDE-D on LOCKED operating mode • Door remains closed and locked

Action in case of faults

No.	Display text	Reset	Comments and possible troubleshooting
3	AKI > 60s active		Inside radar longer than 60 sec. active and door remains open. Check that no moving objects are activating the radar. Door can be locked with 
5	AKA > 60s active		Outside radar longer than 60 sec. active and door remains open. Check that no moving objects are activating the radar. Door can be locked with 
6	Unlocking error	X	Unlocking error: it is impossible to unlock the door. Repeat unlocking attempt after changing the BDE operating mode. If door cannot unlock, check locking device.
9	Opening unsuccessful (after 4 collisions)	X	Door does not open or only slowly. SIO might possibly be active or motion be mechanically hindered (e.g. dirt in floor track). Check the interlock / remove obstacle.
11	Faulty motor current	X	Possibly faulty wiring in prefabricated cables.
23	Slave control unit defective	X	Replacement by service fitter.
25	Slave connection (CAN) to Master interrupted	X	Check connection via CAN insulator.
31	EMERGENCY STOP		EMERGENCY STOP key has been pressed, motor relay de-energises Reset by resetting the EMERGENCY STOP button.
37	Motor current	X	Faulty motor current, motor is overloaded. Possibly STG or ATE defective.
38	Motor overheat	X	Manual control effective. Door leaves possibly too heavy, or too much friction. Reset by motor cooling down.
39	Overload 24V	X	24 volts supply for peripheral units is overloaded. Too many external units possibly connected or short-circuited, check wiring.
40	Closing unsuccessful (after 10 collisions)	X	Door leaf motion be mechanically hindered (e.g. dirt in floor track). Check the interlock / remove obstacle.
41	Temp. sensor 1	X	With motor 1: temperature sensor is faulty or motor cable is disconnected.
43	Encoder fault	X	Encoder or cable is faulty or not plugged in. Reset.
45	Motor current - time product to high		Motor relay de-energises manual control effective. Automatic reset by motor cooling.
46	STG defective	X	Control unit is defective. Includes the following individual faults: EPROM, RAM, Watchdog, Imax, ImaxT, difference on SHE-EXT Reset. If no success, then replace control unit.
47	SIO > 60s active	X	Door does not open or slides at reduced speed. Verify safety element SIO, auto-adaptation time longer than 60s or filter screen is covered or extremely dirty. Remove obstacle in the detection range of the sensor.
50	CPU2 is defective		Watchdog fault. Load factory settings. See error 60. Replace control unit.
51	Software version		Software version of Master and Slave do not correspond to each other. Software update by service fitter

Action in case of faults

No.	Display text	Reset	Comments and possible troubleshooting
52	No running parameter	X	Door must be calibrated (perform teach-in run).
53	Interruption motor	X	Motor is not plugged in. Motor is faulty. Afterwards reset.
54 W	Calibration run	X	Warning message: Calibration run is performed.
59	SIS > 60s active	X	Door does not close. Light barriers disconnected and door remains open. Check that safety barriers are not covered or extremely dirty. Check that the cabling to the sensor is not interrupted, the learning time is longer than 60 s or the filter is covered or extremely dirty. Possibly remove any obstacle from the presence detection area of the sensor. Door can be locked with 
60	EEPROM defective	X	Load factory settings. 9 light pulses with MFT and reset within 10 seconds. Afterwards language selection has to be displayed on BDE-D. Attention! All programming are reset. Reconfigure door. Replace control unit if door still fails to function.
61	SSK > 60s active		Key-operated contact stays active. Door remains open. Control SSK-switch and wiring/connections. Door can be locked with 
62 W	BDE has no priority		Cancel higher-order mode of operation. BDE is locked e.g. by a time switch.
63 W	Collision		Door collision or door leaf is stiff to operate. Possibly remove any obstacle from the moving area of the door leaf.
72	Slave connection		Master has no connection to Slave operator. Check connection by CAN insulator. Reset by service fitter.
88	Difference parameter	X	The common parameters of M/S operators do not correspond to each other. Reset by service fitter.
89	Master connection	X	Slave has no connection to Master operator. Check connection by CAN insulator. Reset by service fitter.
90	Rail beam > 60s active		Light beam in front of the door for activation AKA (AUX2_IN) active longer than 60 s and door remains open. Check that safety barriers are not covered or extremely dirty.
91	Bodyguard > 60s active		Safety sensor BODYGUARD on input AUX1_IN active longer than 60 s and door remains open. Check that the cabling to the sensor is not interrupted, the learning time is longer than 60 s or the filter is covered or extremely dirty.
92	STG relay defect	X	Change control unit.
93	Overvoltage 24 V	X	Voltage < 27 V. Wiring error. Check connections.
94	Spring calibration		After the mech. adjustment of the spring tension the calibration run must be performed.
95	Error in sense of rotation	X	Check position of slide switch S1.
96	EEPROM void	X	Load factory settings. See error 60.

Action in case of faults

No.	Display text	Reset	Comments and possible troubleshooting
97W	Maintenance exceeded	X	Warning message: Actual value = 105% of target value of cycles or operating hours. Acknowledge message. Alarm is reset for 13 days. Inform after-sales service and have installation serviced.
98W	Maintenance is due	X	Warning message: Actual value = 95% of target value of cycles or operating hours. Repeat at 100%. Acknowledge message. Alarm is reset for a short time. Inform after-sales service and have installation serviced.
99W	Operator rotates	X	*Rotate + lubricate* function for grease spreading in gearbox has been activated.
105W	Test brake		Automatic test only on operators with electromagnetic brake.
106	Brake defective	X	Brake test was unsuccessful. See error 105.
107	SIS defective	X	SIS defective A safety sensor (with test input) in closing direction is defective. Reset by service fitter.
108	SIO defective	X	SIO defective A safety sensor (with test input) in opening direction is defective. Reset by service fitter.
109	Factory settings	X	
110	No motor	X	No motor detection during initialisation (motor temperature sensor). Check motor temperature sensor. Reset by service fitter.

10 Taking out of service and disposal

10.1 Taking out of service

When the swing door operator C 127 is discontinued or taken out of service, it is disconnected from the power supply.
After every temporary discontinuation, a new commissioning has to be carried out.

10.2 Dismantling and disposal

ATTENTION
All the parts of the machine must be sorted by material types and disposed of according to local regulations and guidelines.

The swing door operator C 127 installation can consist of the following materials among other things:

Aluminium:

- Chassis profile, profiles of the arm system
- Gearbox
- Door leaves
- Casing
- Various profiles and small parts

Steel and iron parts:

- Stainless steel casing
- Floor plate
- Box out for floor installation
- Optionally spacing or reinforcing profiles
- Gearbox components, spring
- Various small parts like fittings, covers, parts of the arm system, etc.

Non-ferrous metals:

- Lever adapters, hard stop adapter

Glass:

- Door leaves

Various electronical and electromechanical components:

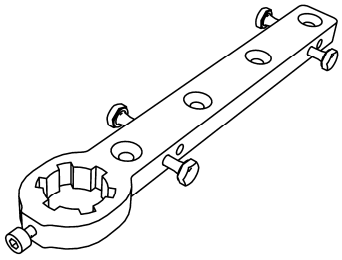
- Control and operator components
- Sensors

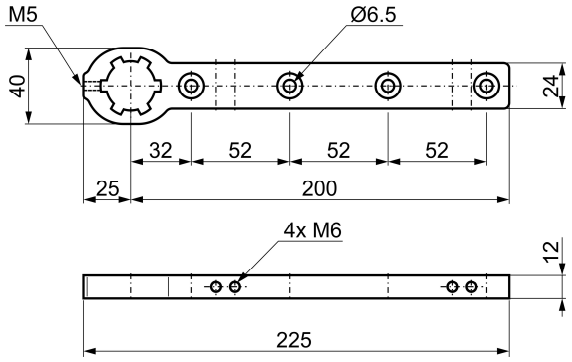
Various plastics:

- Cable clips, side caps, parts of the coupling and the arm system
- Sealing profiles
- Casings of electromechanical components and sensors

11 Appendix

11.1 Standard arm SG





11.2 Sliding arm GG